

## B29C

**SHAPING OR JOINING OF PLASTICS; SHAPING OF MATERIAL IN A PLASTIC STATE, NOT OTHERWISE PROVIDED FOR; AFTER-TREATMENT OF THE SHAPED PRODUCTS, e.g. REPAIRING (making preforms [B29B 11/00](#); making laminated products by combining previously unconnected layers which become one product whose layers will remain together [B32B 37/00](#) - [B32B 41/00](#))**

### Definition statement

*This place covers:*

Processes and apparatus for:

- shaping or joining of plastics;
- shaping of material in a plastic state when a specific material is not identified;
- shaping of material in a plastic state, not otherwise provided for.

Products obtained by processes provided for in this subclass, as long as the products are characterised by said processes.

### Relationships with other classification places

Subclass [B29C](#) is often connected with the following areas:

- [B29B](#), related to preparation or pre-treatment of the material to be shaped, making granules or preforms, beyond recovery of plastics or other constituents of waste material containing plastics;
- [B29D](#), related to processes and apparatus for the production of particular articles characterised by their global structure, e.g. flat, hollow, or tubular articles, by their structural features, e.g. provided with screw threads, corrugations, grooves or projections, or by their purpose, e.g. buttons, optical elements, tyres or footwear. Attention should be paid to [B29](#) note (3), i.e. classification according to production of particular articles in subclass [B29D](#) is restricted to:
- aspects which are characteristic for the production of a particular article, and not classifiable in subclass [B29B](#) or [B29C](#);
- combined operations for making the particular article which are not fully classifiable in subclass [B29C](#); [B29C](#);
- [B32B](#), related to layered products (products built-up of strata of flat or non-flat, e.g. cellular or honeycomb form) as well as methods or apparatus for making layered products;
- [C08J](#), related to chemical aspects or features for treating, compounding, working-up or recovery of macromolecular substances not covered by subclasses [C08B](#), [C08C](#), [C08F](#), [C08G](#) or [C08H](#);
- [C08K](#), related to the use of inorganic or non-macromolecular organic substances, or mixture thereof, as additives in composition of macromolecular compounds;
- [C08L](#), related to composition of organic macromolecular compounds, such as polysaccharides and derivate, rubbers and derivate, macromolecular compounds obtained by reactions involving or not carbon-to-carbon unsaturated bonds, natural macromolecular compounds and derivatives.

### References

#### Limiting references

*This place does not cover:*

Making preforms	<a href="#">B29B 11/00</a>
Methods or apparatus for laminating	<a href="#">B32B 37/00</a>
Ancillary operations in connection with laminating processes	<a href="#">B32B 38/00</a>
Layout of apparatus or plants for lamination processes	<a href="#">B32B 39/00</a>

Arrangements for controlling or monitoring lamination processes	<a href="#">B32B 41/00</a>
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### **Application-oriented references**

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Moulding devices for producing toilet or cosmetic sticks	<a href="#">A45D 40/16</a>
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### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Processing doughs	<a href="#">A21C</a>
Processing meat	<a href="#">A22C</a>
Working chocolate	<a href="#">A23G</a>
Foundry moulding	<a href="#">B22C</a>
Casting of Metals	<a href="#">B22D</a>
Working metallic powder	<a href="#">B22F</a>
Machine tools	<a href="#">B23</a>
Grinding or polishing	<a href="#">B24</a>
Machines, devices or processes for grinding or polishing of optical elements	<a href="#">B24B</a>
Cutting work and details of apparatus related with	<a href="#">B26D</a>
Means of perforating, punching, cutting-out, stamping-out and severing	<a href="#">B26F</a>
Shaping clay or other ceramic compositions	<a href="#">B28B</a>
Preparing clay and mixtures containing thereof	<a href="#">B28C</a>
Presses in general	<a href="#">B30B</a>
Extrusion presses	<a href="#">B30B 11/22</a>
Making wound articles of paper, cardboard or material worked in a manner analogous to paper	<a href="#">B31C</a>
Working glass	<a href="#">C03B</a>
Preparation, chemical working-up and compositions of organic macromolecular compounds	<a href="#">C08</a>
Candle making	<a href="#">C11C 5/02</a>
Making soap	<a href="#">C11D 13/00</a>
Manufacture of artificial filaments, threads, fibres, bristles or ribbons	<a href="#">D01D</a> , <a href="#">D01F</a>
Manufacture of articles from cellulosic fibrous suspensions or from papier-mâché	<a href="#">D21J</a>

### **Special rules of classification**

In this subclass, the following rules must be applied:

- The working of plastics is, as far as possible, classified primarily according to the particular shaping technique used in this subclass;
- Combined operations for making a particular article which are not fully classifiable in this subclass must be classified in subclass [B29D](#).



Products per se are not classified in this subclass. However, if a product is characterised by the way it is produced and not by its structure or composition, the production method should be classified in this subclass. In this subclass:

- repairing of articles shaped or produced by using techniques covered by this subclass or subclass [B29D](#) is classified in group [B29C 73/00](#);
- component parts, details, accessories or auxiliary operations which are applicable to more than one moulding technique are classified in groups [B29C 31/00](#) - [B29C 37/00](#);
- component parts, details, accessories or auxiliary operations which are only applicable or only of use for one specific shaping technique are classified only in the relevant subgroups of groups [B29C 39/00](#) - [B29C 71/00](#).

In this subclass, it is desirable to add the indexing codes of subclasses [B29K](#) and/or [B29L](#).

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

A plastic	is a macromolecular compound or composition based on such a compound
In a plastic state	refers to a state in which the material is more or less easily deformable, locally or as a whole, by force in any direction, to assume and retain any desired shape.

## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

Resins	Japanese patent applications usually refer to resins instead of plastics
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## B29C 31/00

**Handling, e.g. feeding of the material to be shaped {, storage of plastics material before moulding; Automation, i.e. automated handling lines in plastics processing plants, e.g. using manipulators or robots (discharging moulded articles from the mould [B29C 37/0003](#); storage of prepregs or SMC after impregnation or during ageing [B29C 70/54](#); baling of rubber [B29B 15/02](#))}**

## References

### Limiting references

*This place does not cover:*

Discharging moulded articles from the mould, using means operable from outside the mould between mould parts, e.g. robots	<a href="#">B29C 37/0007</a>
Handling tyres or parts thereof, e.g. supplying, storing, conveying	<a href="#">B29D 30/0016</a>
Building tyres; devices for transferring annular tyre components during the building-up stage, e.g. from the first stage to the second stage building drum	<a href="#">B29D 30/2607</a>

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Feeding material to presses	<a href="#">B30B 15/30</a>
Transport or storage devices	<a href="#">B65G</a>
Measuring volume, volume flow, mass flow, or liquid level	<a href="#">G01F</a>

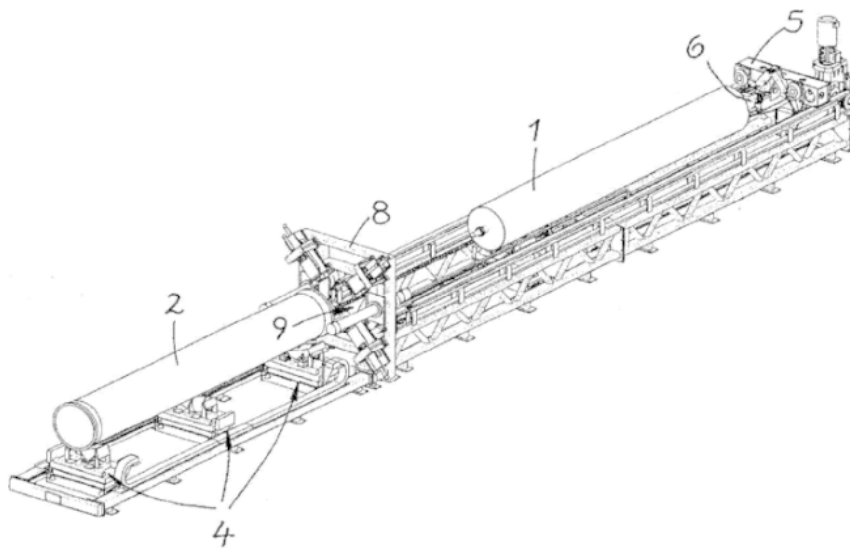
**B29C 31/002**

{Handling tubes, e.g. transferring between shaping stations, loading on mandrels}

**Definition statement**

This place covers:

Fig. 3



Patent Application Publication Apr. 28, 2011 Sheet 3 of 8 US 2011/0094095 A1

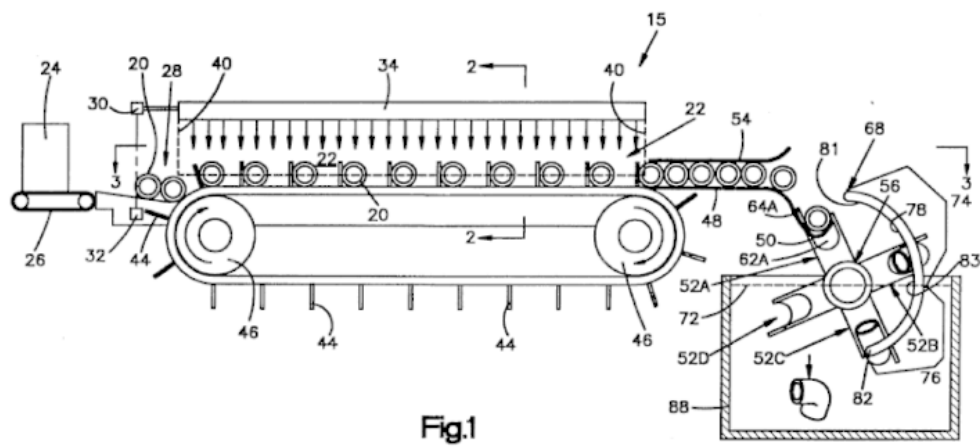


Fig.1

U.S. Patent  
Nov. 3, 1992  
Sheet 1 of 5  
5,160,685

US-A-3,849,052

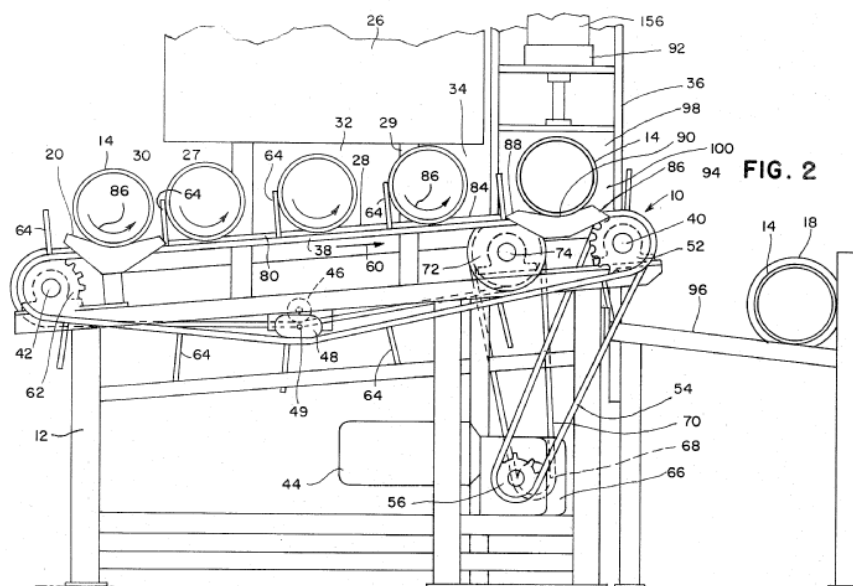
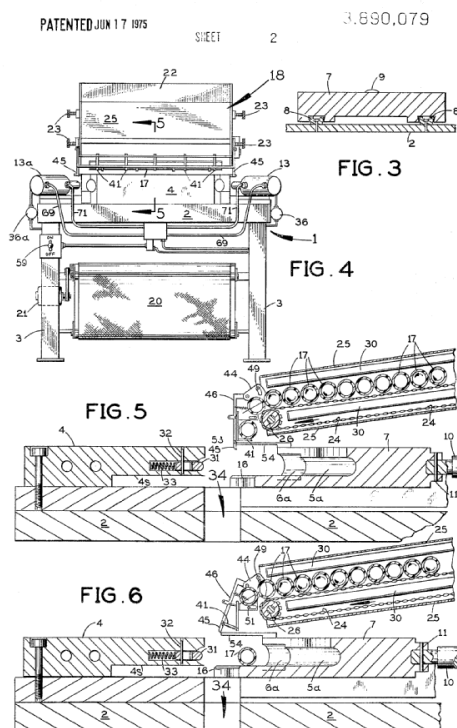


FIG. 2

PATENTED NOV 19 1974  
SHEET 2 OF 5  
3,849,052

US-A-3,890,079



## References

### Limiting references

*This place does not cover:*

Conditioning or physical treatment of the material to be shaped, by heating hollow bodies, e.g. tubes or profiles	<a href="#">B29B 13/024</a>
Conditioning or physical treatment of the material to be shaped, by heating tube ends	<a href="#">B29B 13/025</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

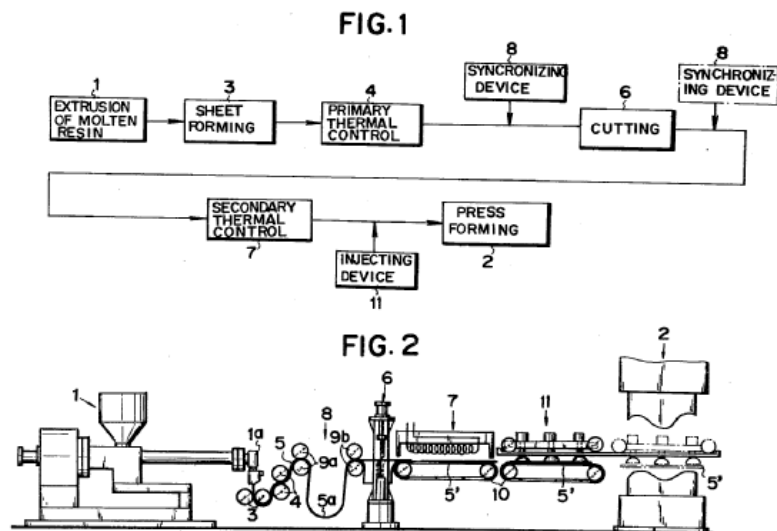
Blow-moulding; handling means, e.g. transfer, loading or discharging	<a href="#">B29C 49/4205</a>
Shaping by bending of tubes	<a href="#">B29C 53/083</a>
Shaping of tube ends; e.g. flanging, belling, closing. Apparatus therefor	<a href="#">B29C 57/00</a>
Shaping tubes or blown tubular films; turning tubes inside out	<a href="#">B29C 67/0014</a>
Producing tubular articles	<a href="#">B29D 23/00</a>

**B29C 31/004**

{Arrangements for converting the motion of a material which is continuously fed to a working station in a stepwise motion}

**Definition statement**

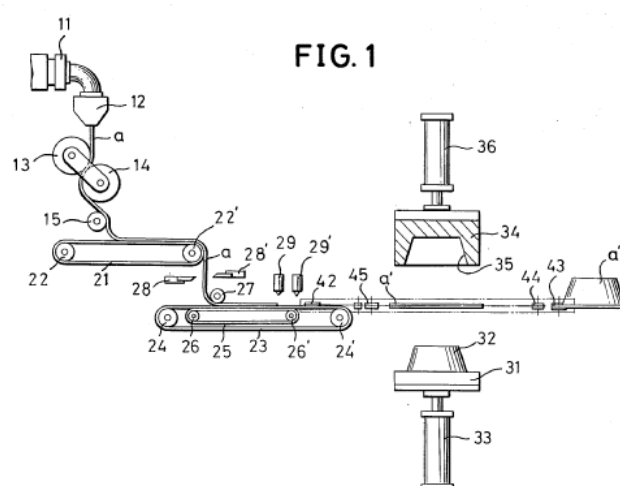
*This place covers:*



U.S. Patent Mar. 13, 1984

Sheet 1 of 4

4,436,685



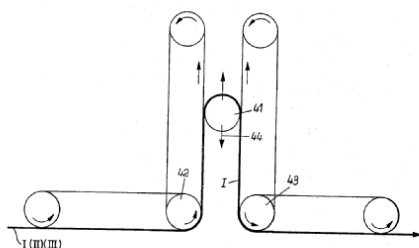
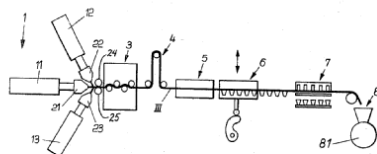
U.S. Patent Jul. 10, 1984

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4,459,093

U.S. Patent April 25, 1978 Sheet 2 of 16 4,086,045

**Fig. 3**



**Fig. 8**

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping by thermoforming, handling means, e.g. transfer means, feeding means	<a href="#">B29C 51/261</a>
Advancing webs in general	<a href="#">B65H 20/00</a>
Advancing webs; by looping or like devices	<a href="#">B65H 20/24</a>

## B29C 31/006

{Handling moulds, e.g. between a mould store and a moulding machine (movable moulds [B29C 33/34](#); for injection moulding [B29C 45/1756](#))}

### Definition statement

*This place covers:*

e.g. storing moulds;

e.g. clamping mould halves outside the machine,

e.g. using a clamp for transporting.

U.S. Patent

Aug. 24, 1999

Sheet 1 of 3

5,940,953

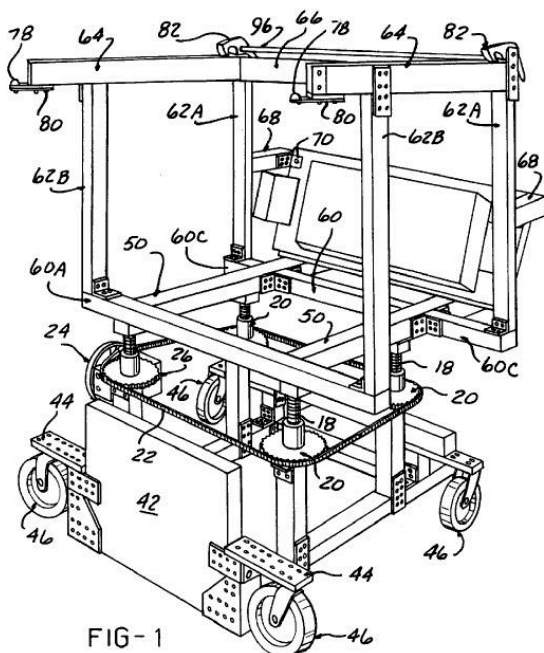
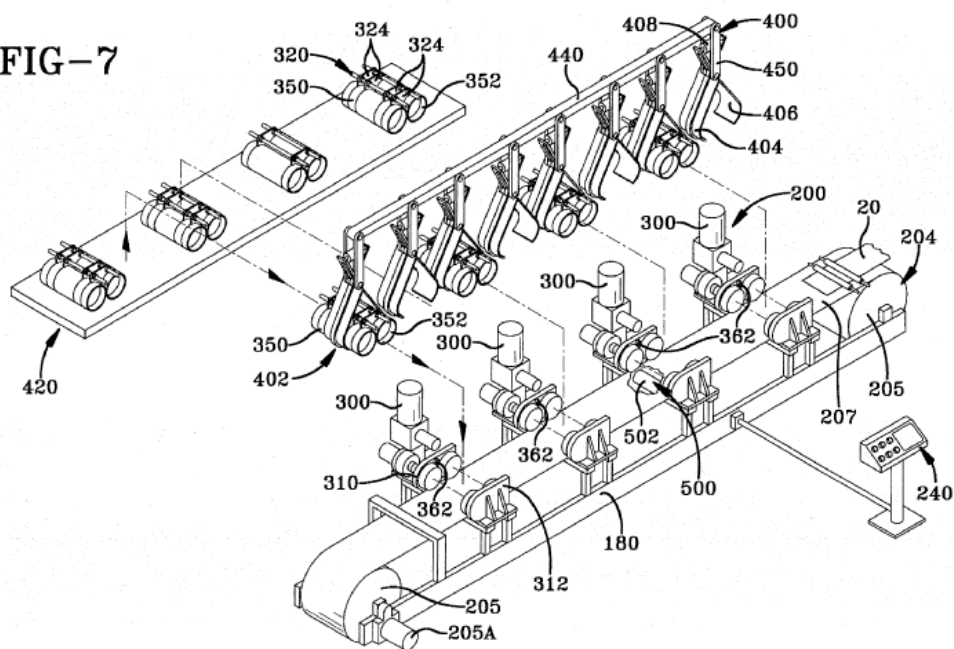


FIG-1

FIG-7



U.S. Patent

May 7, 1996

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5,513,560

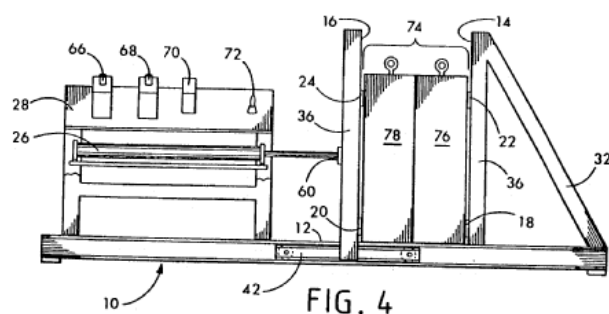


FIG. 4

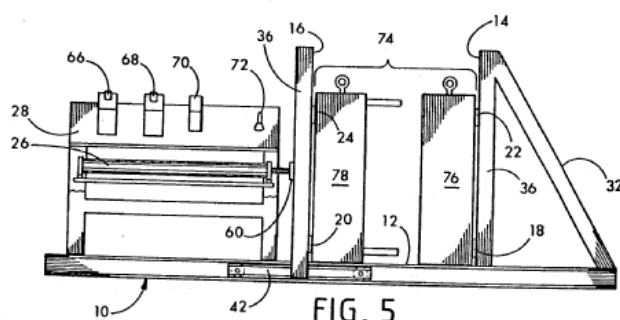


FIG. 5

U.S. Patent

Apr. 16, 1991

Sheet 3 of 3

5,007,814

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

- Moulds; mounting of moulds or moulds support plates	<a href="#">B29C 33/305</a>
Movable moulds or cores, e.g. to or from the moulding station	<a href="#">B29C 33/34</a>
Continuously movable moulds, in one direction, e.g. in a closed circuit	<a href="#">B29C 33/36</a>
Injection moulding; handling of moulds or mould parts, e.g. mould changing means	<a href="#">B29C 45/1756</a>
Devices holding, supporting, or positioning work or tools, of a kind normally removable from the machine	<a href="#">B23Q 3/00</a>
Arrangements for handling work specially combined with or arranged in, or specially adapted for use in connection with, machine tools, e.g. for conveying, loading, positioning, discharging, sorting	<a href="#">B23Q 7/00</a>
-Producing contact lenses; auxiliary operations, e.g. conveying moulds from a storage to the production line in an inert atmosphere	<a href="#">B29D 11/00125</a>
Presses, loading or unloading of dies, platens or press rams	<a href="#">B30B 15/028</a>

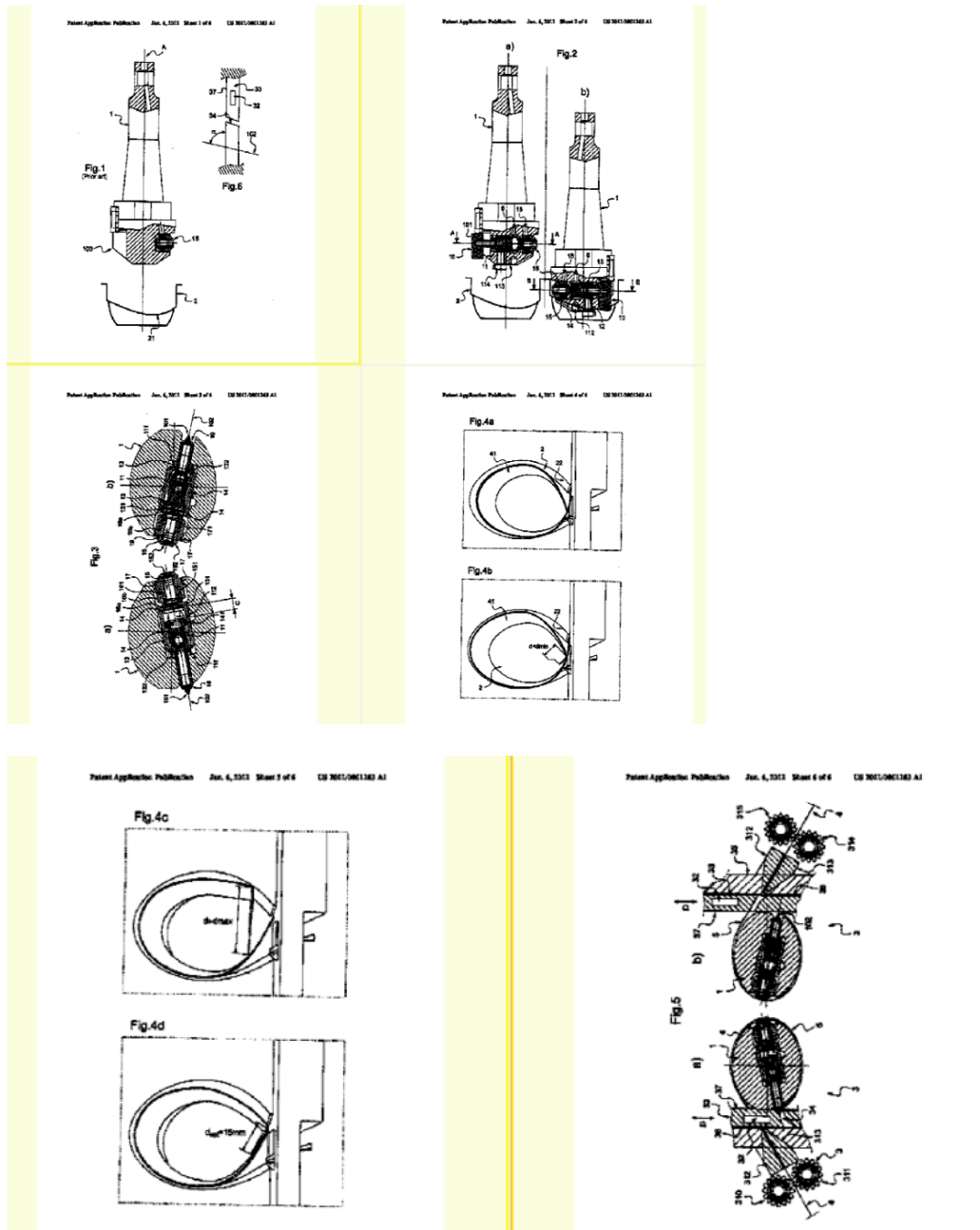


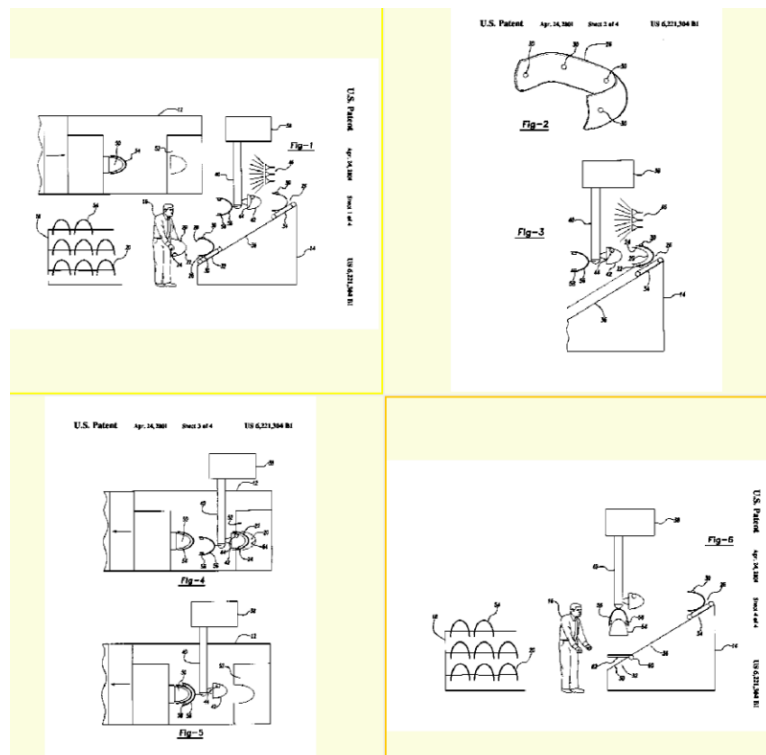
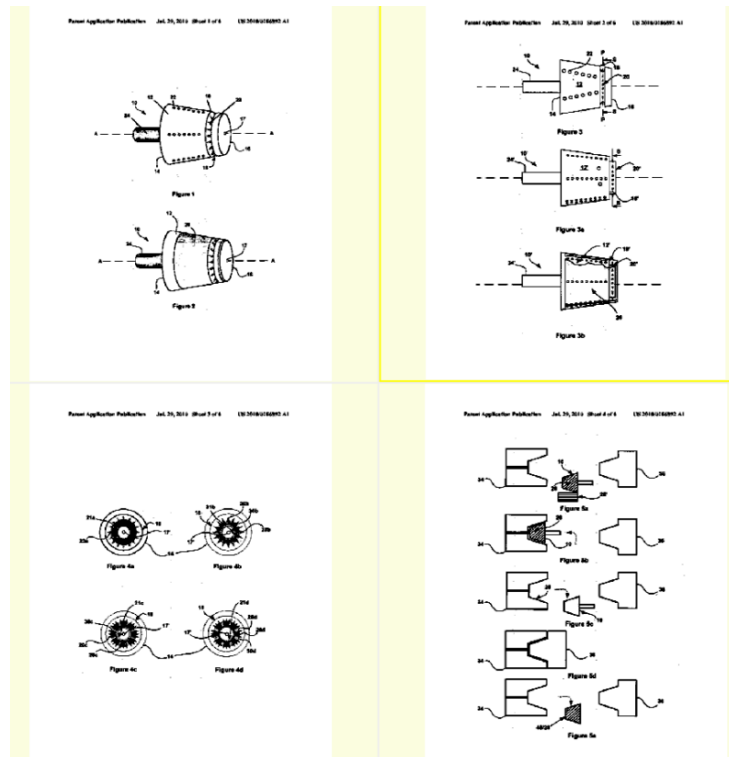
## B29C 31/008

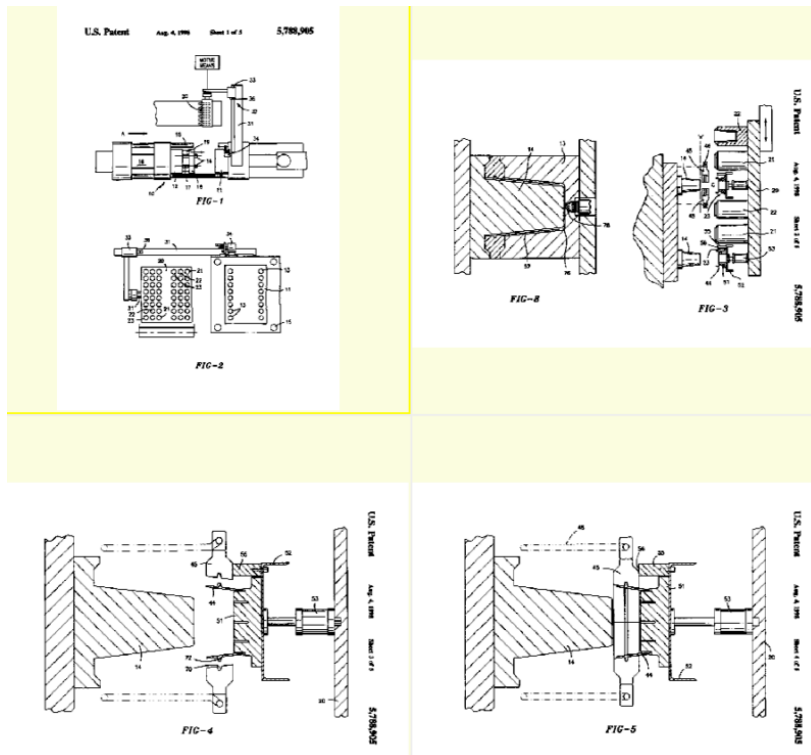
{Handling preformed parts, e.g. inserts ([B29C 37/001](#) takes precedence; for injection moulding [B29C 45/14008](#); for blow moulding [B29C 49/2408](#); for thermoforming [B29C 51/165](#))}

### Definition statement

*This place covers:*







## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping by casting; incorporating preformed parts or layers, e.g. casting around inserts or for coating articles	<a href="#">B29C 39/10</a>
Compression moulding; incorporating preformed parts or layers, e.g. compression moulding around inserts or for coating articles	<a href="#">B29C 43/18</a>
Foaming; incorporating or moulding on preformed parts, e.g. inserts, reinforcements	<a href="#">B29C 44/12</a>
Injection moulding; incorporating preformed parts or layers; inserting articles into the mould	<a href="#">B29C 45/14008</a>
Extrusion moulding; incorporating preformed parts or layers, e.g. extrusion moulding around inserts or for coating articles	<a href="#">B29C 48/15</a>
Blow moulding; inserting labels or films into blow moulds, e.g. in-mould-labellers	<a href="#">B29C 49/2408</a>
Thermoforming; lining or labelling	<a href="#">B29C 51/16</a>

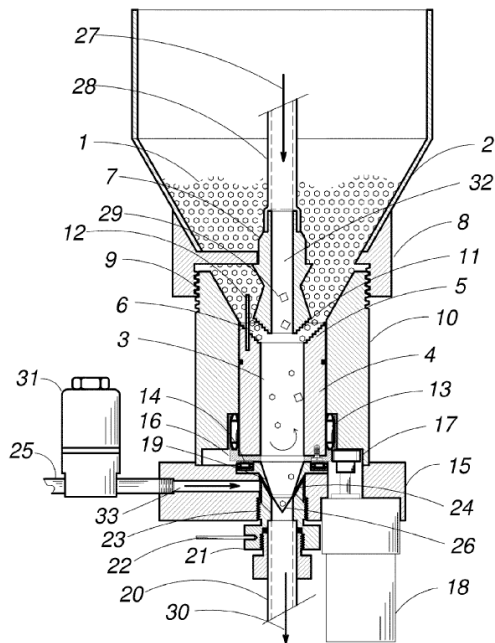
**B29C 31/02**

Dispensing from vessels, e.g. hoppers {(into a mould cavity [B29C 31/04](#); large containers characterised by discharge means [B65D 88/28](#), [B65D 88/54](#))}

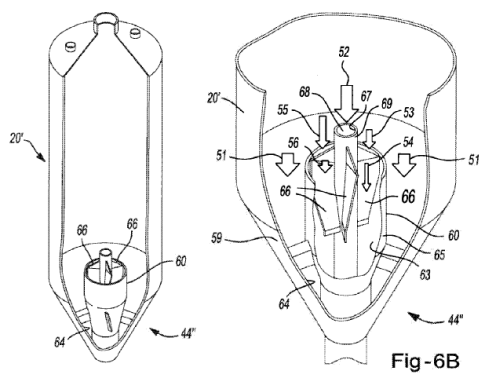
**Definition statement**

*This place covers:*

Patent Application Publication Jun. 16, 2011 Sheet 1 of 3 US 2011/0142552 A1



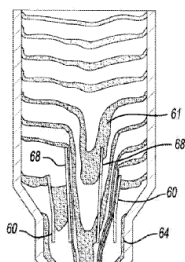
Patent Application Publication Jan. 6, 2011 Sheet 4 of 6 US 2011/0001265 A1



**Fig-6A**

**Fig-6B**

**Fig-6C**



**U.S. Patent**



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**5,282,548**

**U.S. Patent**

Nov. 9, 1993

Sheet 1 of 4

**5,259,749**



### **Informative references**

Injection moulding; feeding the material into the injection moulding apparatus, i.e. feeding the non-plastified material into the injection unit	<a href="#">B29C 45/18</a>
Extrusion moulding, feeding the material to the extruder	<a href="#">B29C 48/285</a>
Methods or devices for filling or emptying bunkers, hoppers, tanks or like containers	<b>B60G65/30</b>

**B29C 31/04**

Feeding {of the material to be moulded}, e.g. into a mould cavity {([B29C 39/08](#) takes precedence; using a material distribution system to two or more fixed injection moulds [B29C 45/125](#))}

**Definition statement**

*This place covers:*

Patent Application Publication Mar. 19, 2009 Sheet 1 of 20 US 2009/0072440 A1

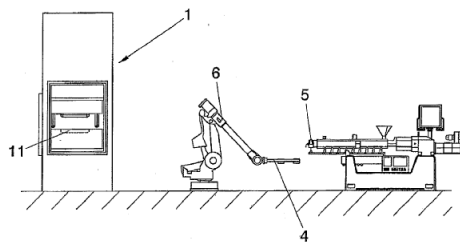


FIG. 1A

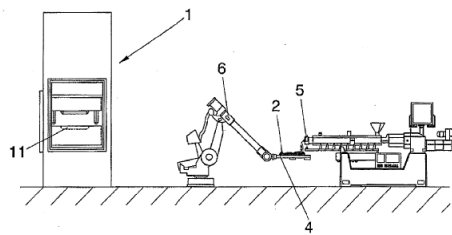


FIG. 1B

Patent Application Publication Mar. 19, 2009 Sheet 2 of 20 US 2009/0072440 A1

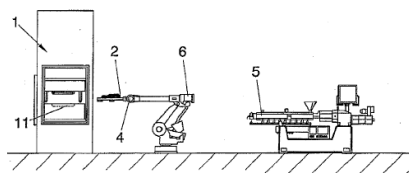


FIG. 1C

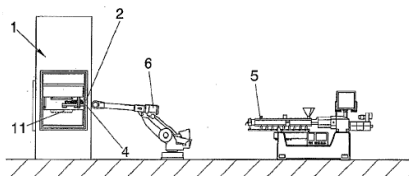


FIG. 1D

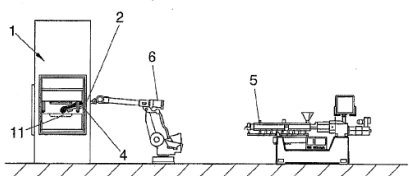
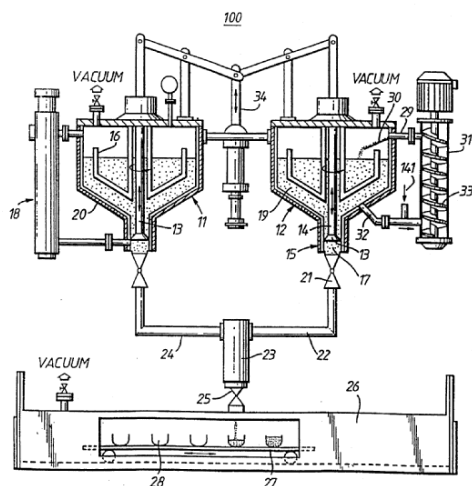


FIG. 1E

Fig. 1.



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping by casting; feeding the material into the mould	<a href="#">B29C 39/24</a>
Shaping by coating; feeding the material on to the mould, core or other substrate	<a href="#">B29C 41/36</a>
Shaping by casting; feeding the material into the mould	<a href="#">B29C 43/085</a>
Compression moulding; feeding the material to the mould or the compression means	<a href="#">B29C 43/34</a>
Foaming; feeding the material to be shaped	<a href="#">B29C 44/36</a>
Injection moulding; feeding the material into the injection moulding apparatus, i.e. feeding the non-plastified material into the injection unit	<a href="#">B29C 45/18</a>
Extrusion moulding; feeding the material to the extruder	<a href="#">B29C 48/285</a>
Accessories for mixers, feed mechanisms	<a href="#">B01F 35/71</a>
Producing lenses, machine for filling the moulds	<a href="#">B29D 11/00432</a>
Feeding material in particulate or plastic state to moulding presses	<a href="#">B30B 15/302</a>

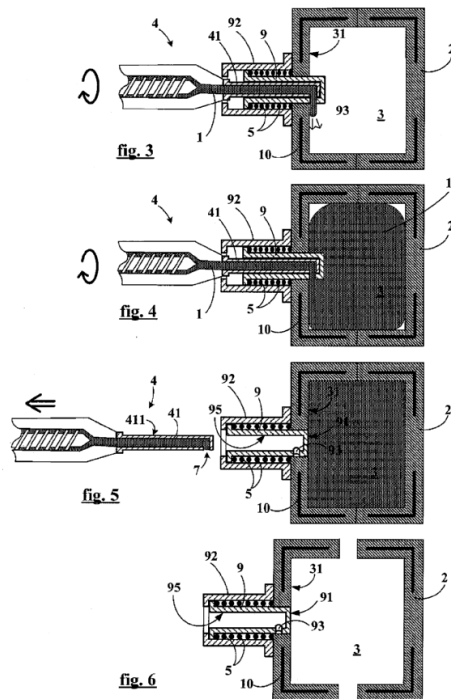
**B29C 31/041**

{using filling or dispensing heads placed in closed moulds or in contact with mould walls ([B29C 45/27](#) takes precedence)}

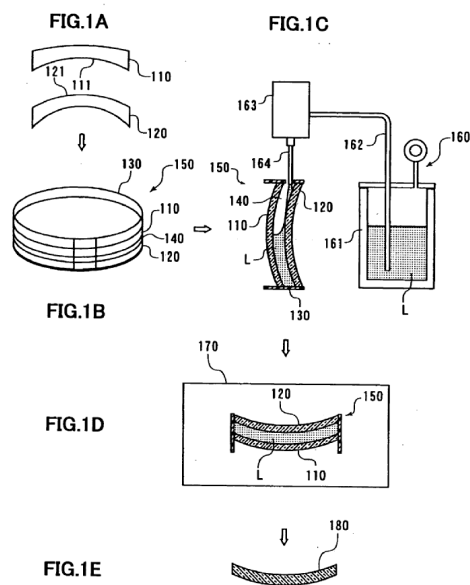
**Definition statement**

*This place covers:*

Patent Application Publication Aug. 13, 2009 Sheet 2 of 4 US 2009/0200706 A1

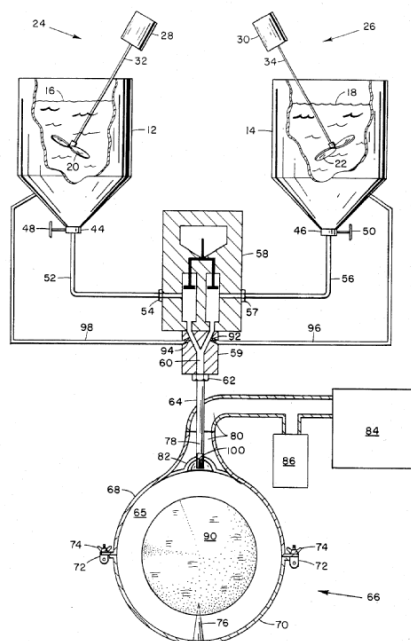


Patent Application Publication Sep. 16, 2004 Sheet 1 of 2 US 2004/0178526 A1





U.S. Patent Jun. 11, 1985 Sheet 1 of 2 4,522,397

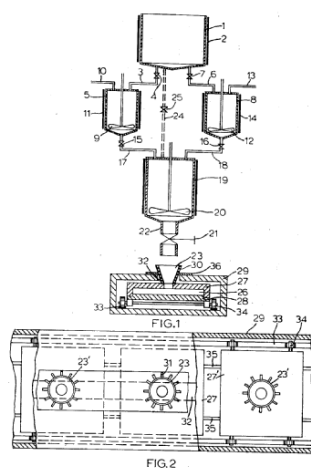
**FIG. 1****B29C 31/042**

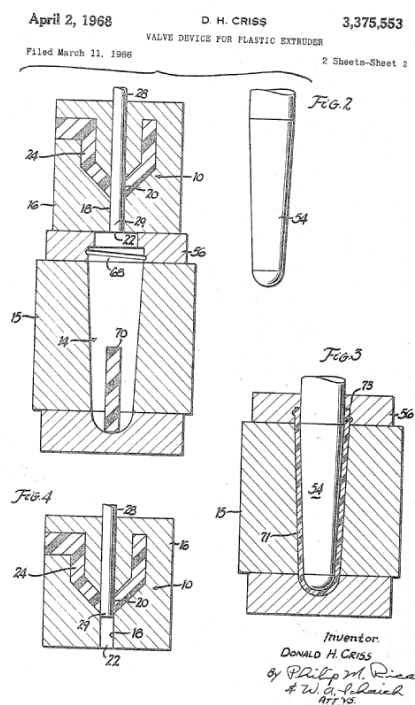
{using dispensing heads, e.g. extruders, placed over or apart from the moulds  
(positioning extruded preforms on conveyors [B29C 31/085](#))}

**Definition statement**

*This place covers:*

April 7, 1970 J. W. H. ZILP ET AL. 3,505,448  
PROCESS FOR THE PREPARATION OF POLYLACTAMS  
OF HIGH MOLECULAR WEIGHT  
Filed April 28, 1967

**FIG. 2**



## B29C 31/044

{with moving heads for distributing liquid or viscous material into the moulds}

### Definition statement

This place covers:

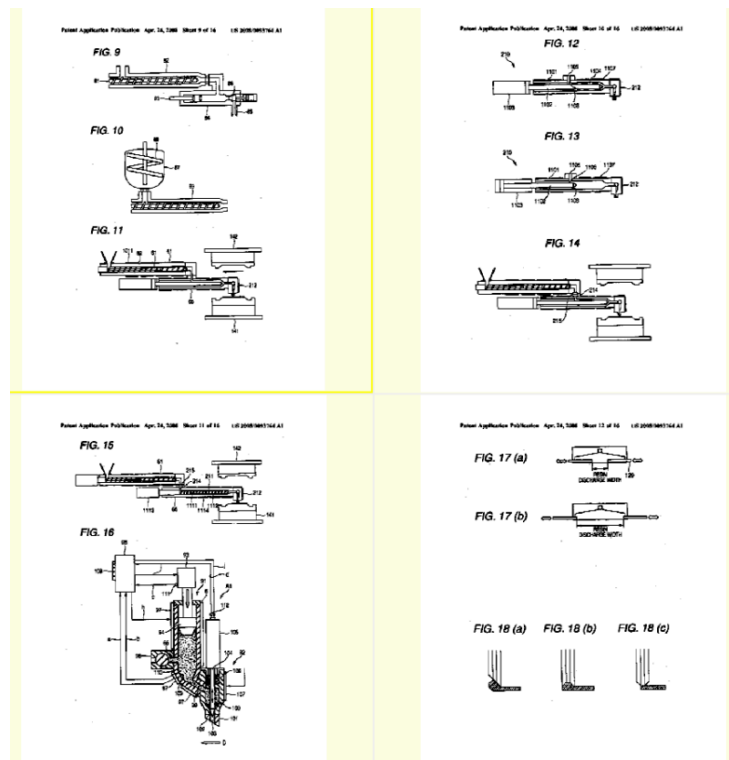


FIG.5

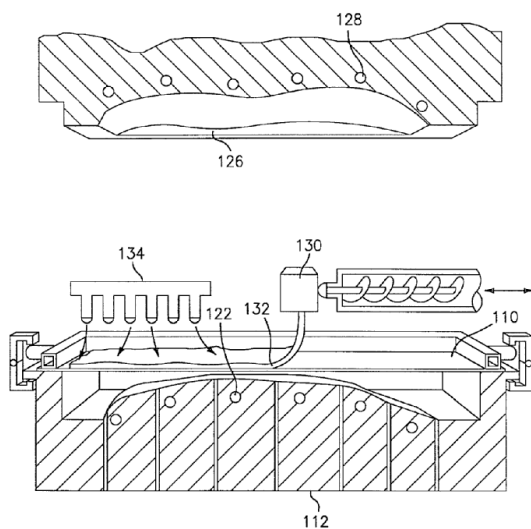
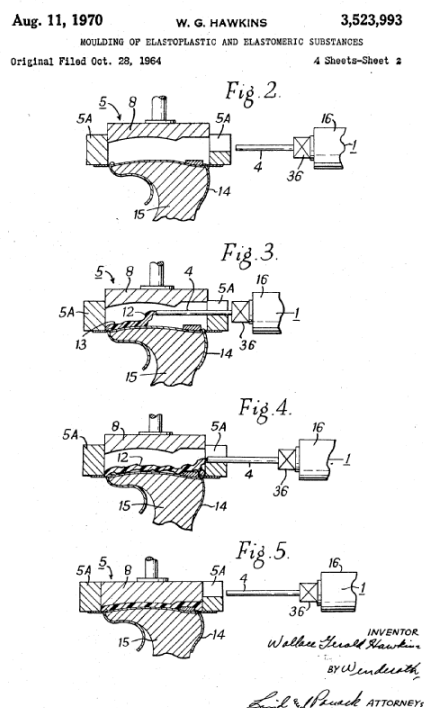


FIG. 6

## Definition statement



## B29C 31/045

{moving along predetermined circuits or distributing the material according to predetermined patterns}

## Definition statement

This place covers:

Patent Application Publication Aug. 13, 2009 Sheet 1 of 11 US 2009/0200704 A1

FIG. 1

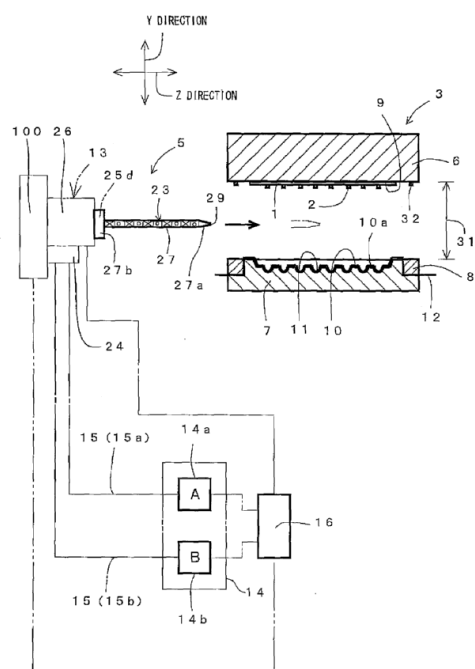


FIG. 6

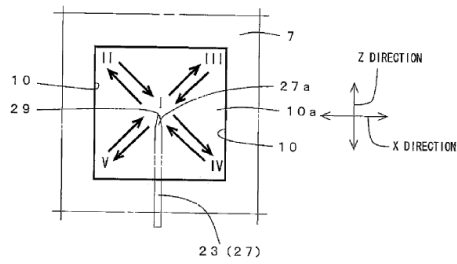


FIG. 7

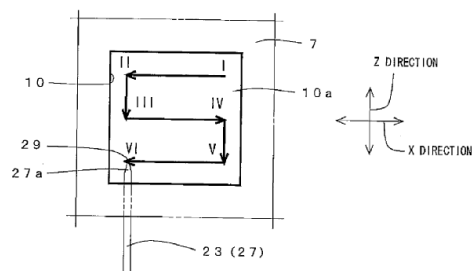
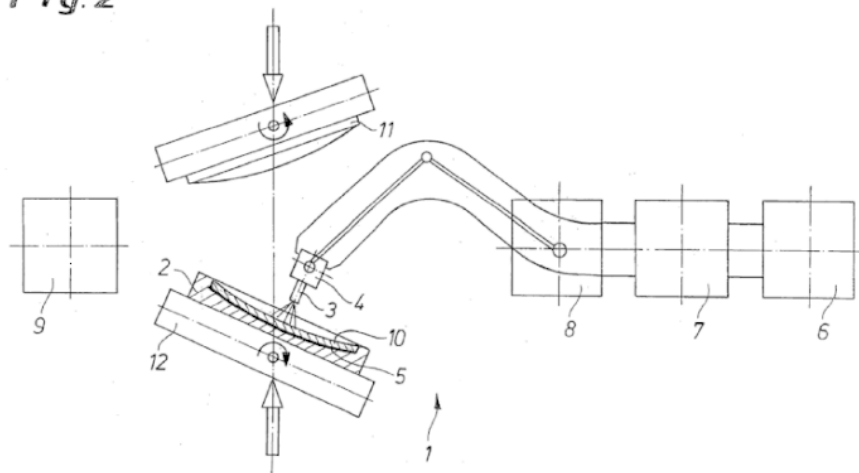
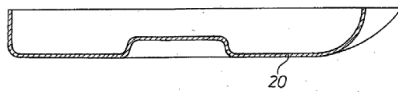


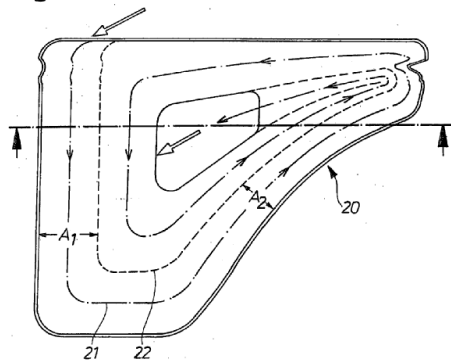
Fig. 2



**Fig. 4**



**Fig. 5**



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Apparatus in which liquid or other fluent material is projected, poured or allowed to flow on to the surface of the work; by relative movement according to a predetermined path	<a href="#">B05C 5/0216</a>
--	-----------------------------

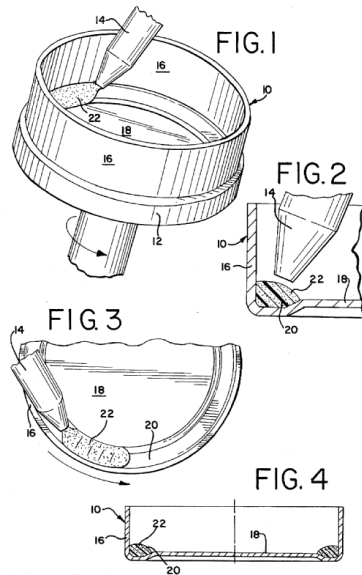
**B29C 31/047**

{combined with moving moulds ([B29C 31/044](#), [B29C 31/048](#) take precedence)}

**Definition statement**

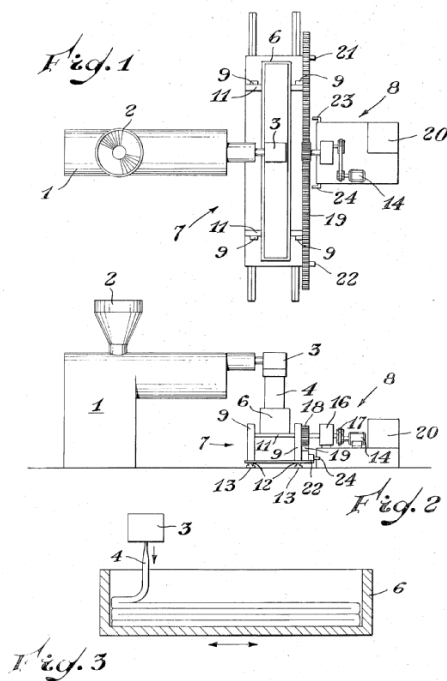
*This place covers:*

U.S. Patent      Nov. 11, 1997      Sheet 1 of 3      5,686,040



PATENTED MAY 28 1974

3,813,040



May 7, 1963

G. E. GARD  
BLENDING METHOD  
Filed May 9, 1960

3,088,713

Fig. 1

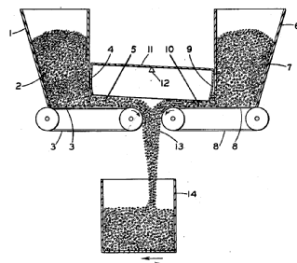
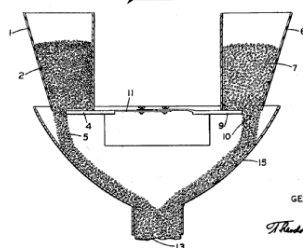


Fig. 2



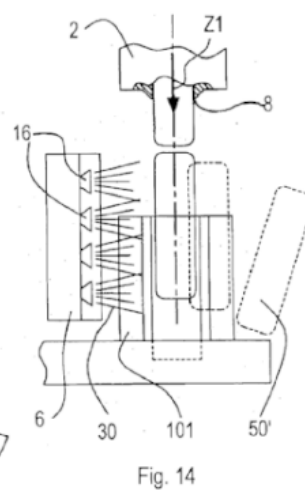
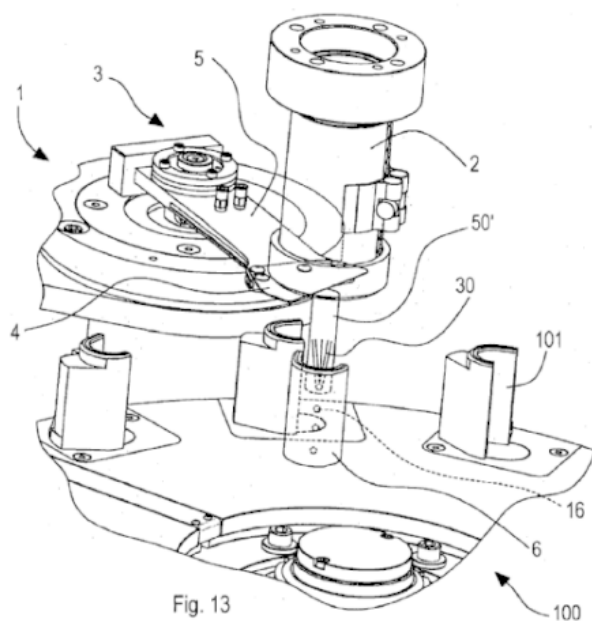
INVENTOR  
GEORGE E. GARD  
by  
*Robert L. Thorne*  
ATTORNEY

## B29C 31/048

{the material being severed at the dispensing head exit, e.g. as ring, drop or gob, and transported immediately into the mould, e.g. by gravity}

## Definition statement

This place covers:





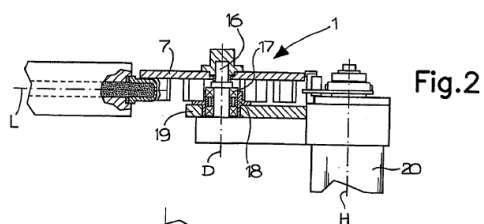


Fig.2

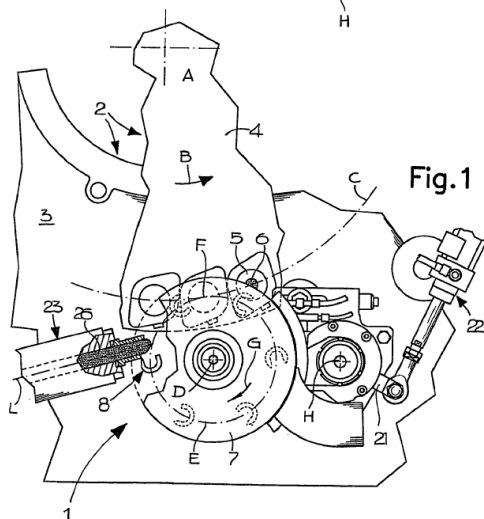


Fig.1

FIG.9

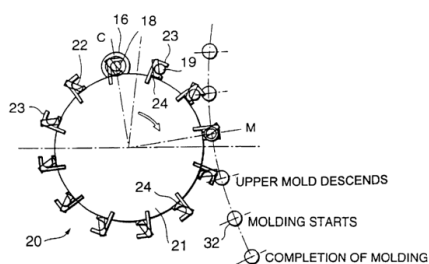
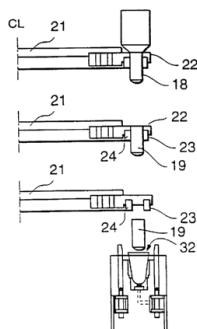


FIG.10



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Compression moulding; for articles of definite length; using movable moulds with circular movement; the material being fed in a continuous form

[B29C 43/085](#)

**B29C 31/06**

### Definition statement

PATENTED MAY 9 1972 3,661,485

SHEET 3 OF 4



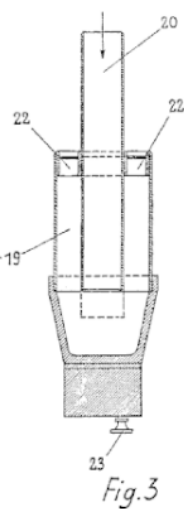
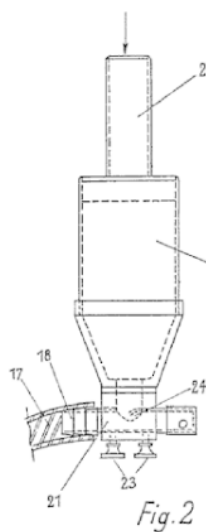
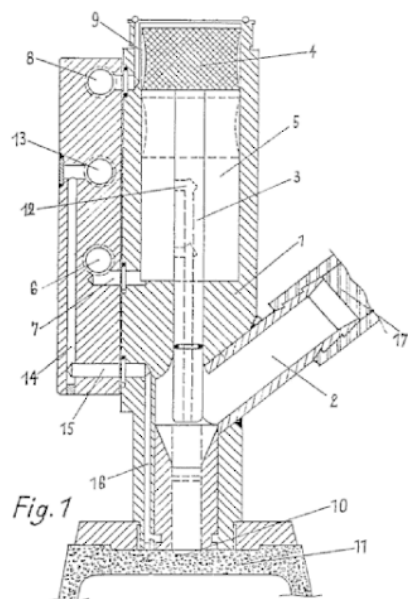
*This place does not cover:*

### **Informative references**

Injection moulding; feeding the material into the injection moulding apparatus, i.e. feeding the non-plastified material into the injection unit; feeding measured doses	<a href="#">B29C 45/1808</a>
--	------------------------------

**B29C 31/061****{using stationary volumetric measuring chambers}****Definition statement***This place covers:*

994245 COMPLETE SPECIFICATION  
 2 SHEETS This drawing is a reproduction of  
 the Original on a reduced scale  
 Sheets 1 & 2

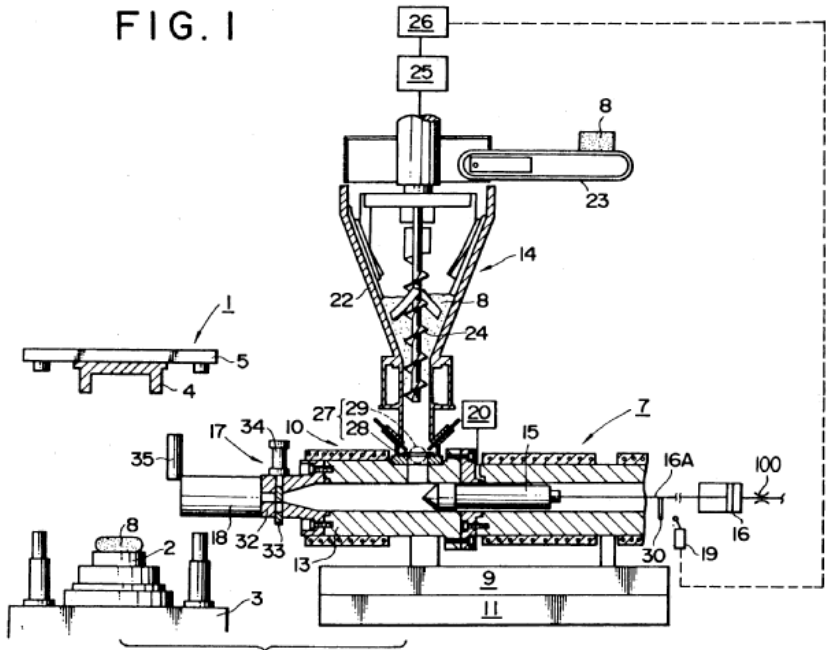


B29C 31/063

{of the piston type}

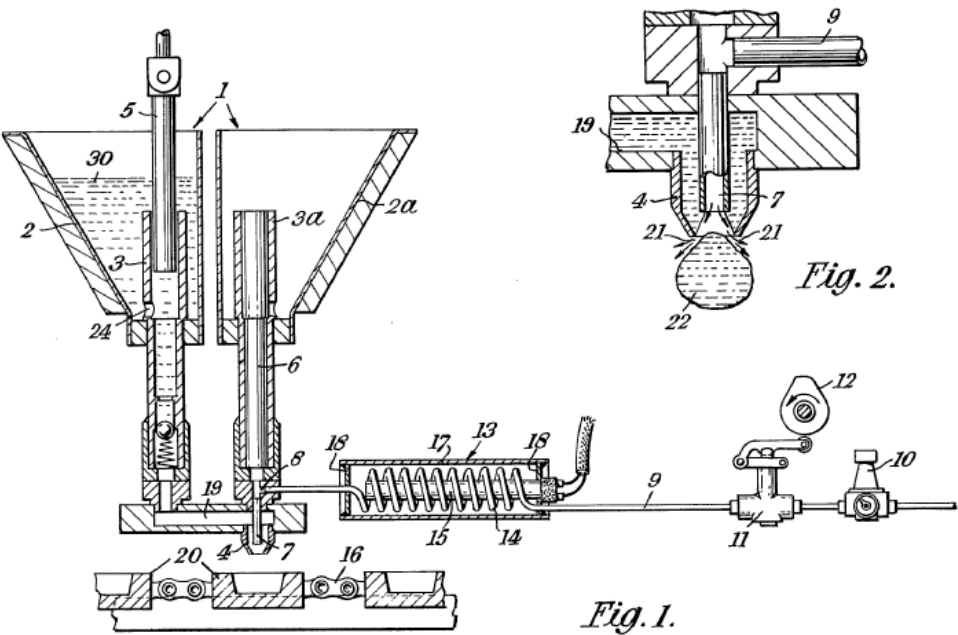
Definition statement

This place covers:



U.S. Patent July 9, 1991 Sheet 1 of 6 5,030,080

GB-2026378



1/2

2026378

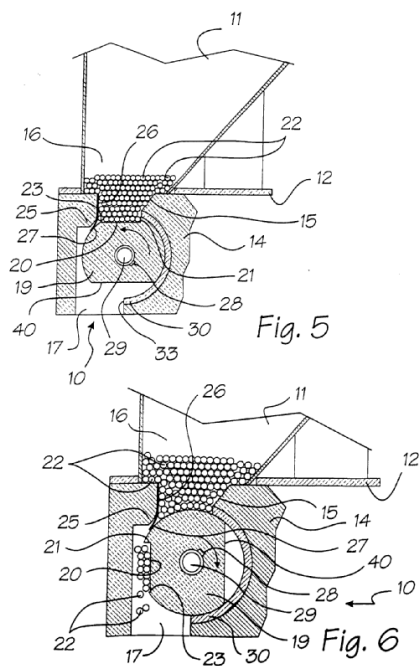
**B29C 31/065**

{using volumetric measuring chambers moving between a charging station and a discharge station}

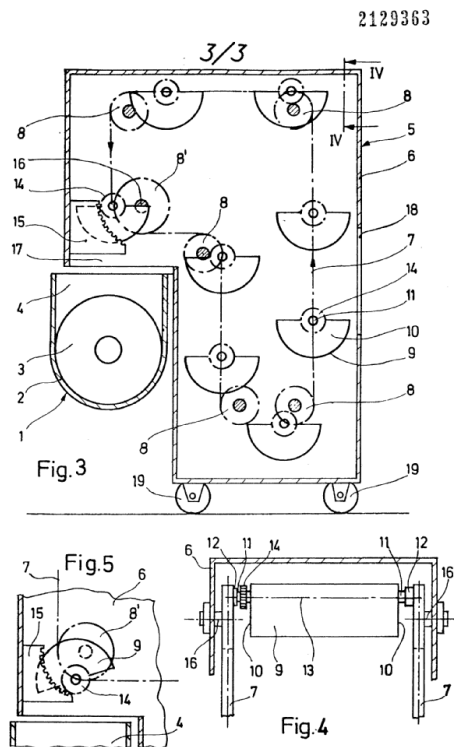
**Definition statement**

*This place covers:*

EP 1 306 179 A1

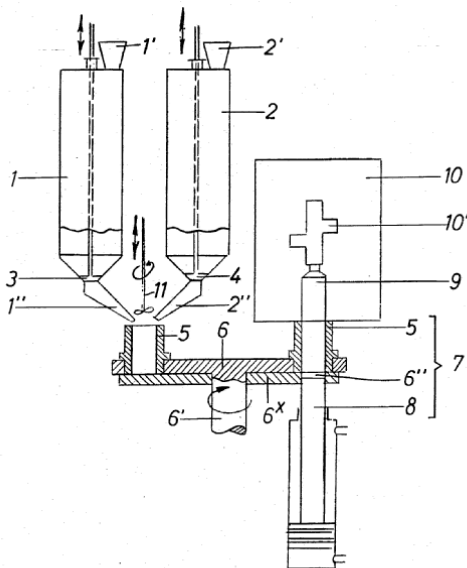


GB-2129363



ZEICHNUNGEN BLATT 1

Nummer: 1 529 945  
Int. Cl.: B 29 f, 1/00  
Deutsche Kl.: 39 a4, 1/00  
Auslegungstag: 4. Mai 1972



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Apparatus requiring external operation and adapted at each repeated and indential operation to measure and separate a predetermined volume of fluid or fluent solid material from a supply or container without regard to weight and to deliver it, with measuring chambers moved during operation

[G01F 11/10](#)

## B29C 31/066

{using feed frames, e.g. for dry material}

### Definition statement

This place covers:

U.S. Patent May 20, 2003 Sheet 4 of 9 US 6,565,783 B1

FIG.4

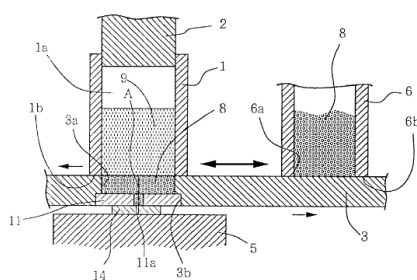
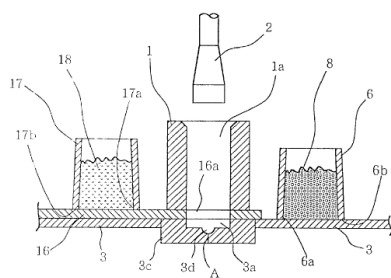
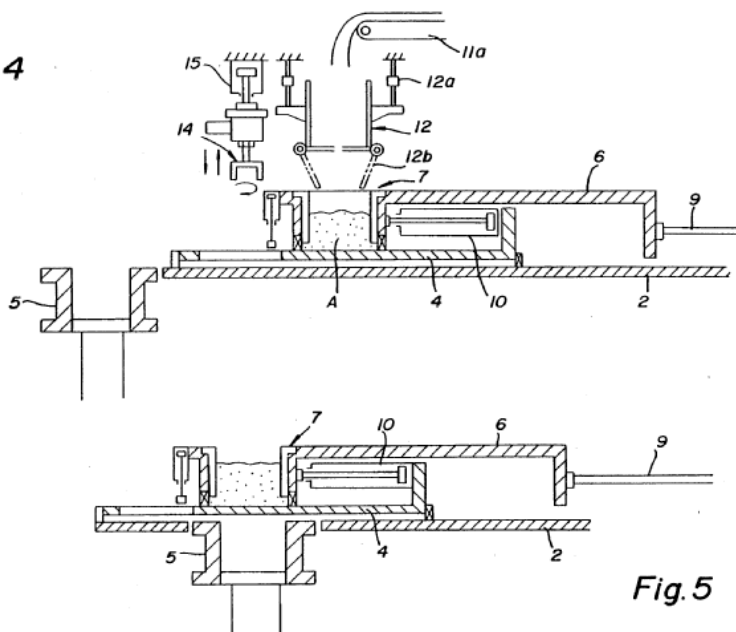


FIG.5



**Fig. 4**



**Fig. 5**

U.S. Patent

Dec. 24, 1991

Sheet 3 of 5

5,074,774

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Feeding material in particulate or plastic state to moulding presses; by using feed frames or shoes with relative movements	<a href="#">B30B 15/304</a>
For multi-layer articles	<a href="#">B30B 15/306</a>

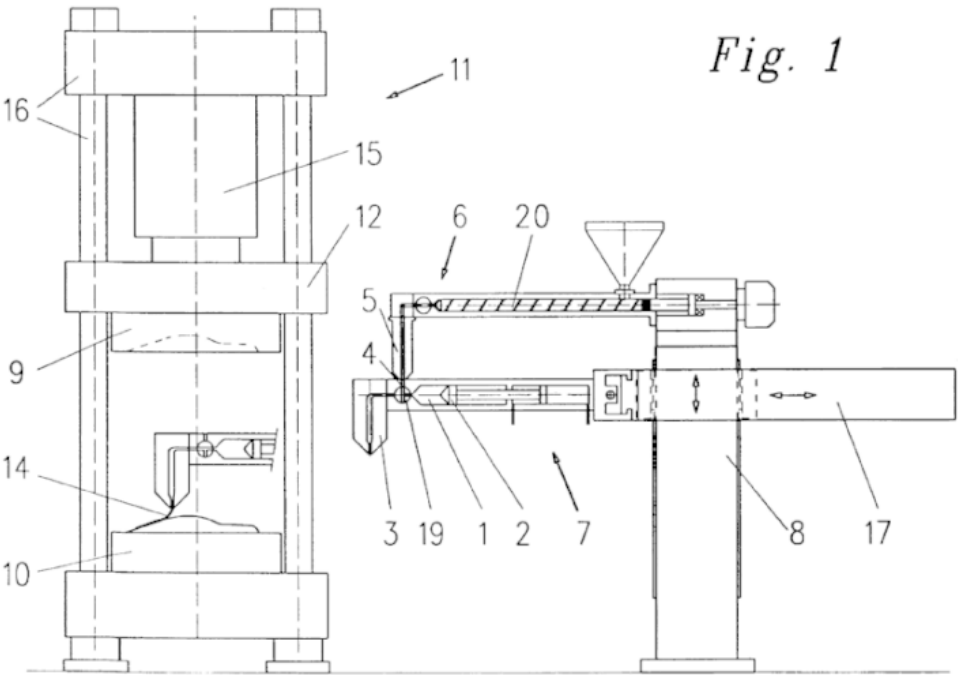


**B29C 31/068**

{of the piston type}

**Definition statement**

*This place covers:*



*Fig. 1*

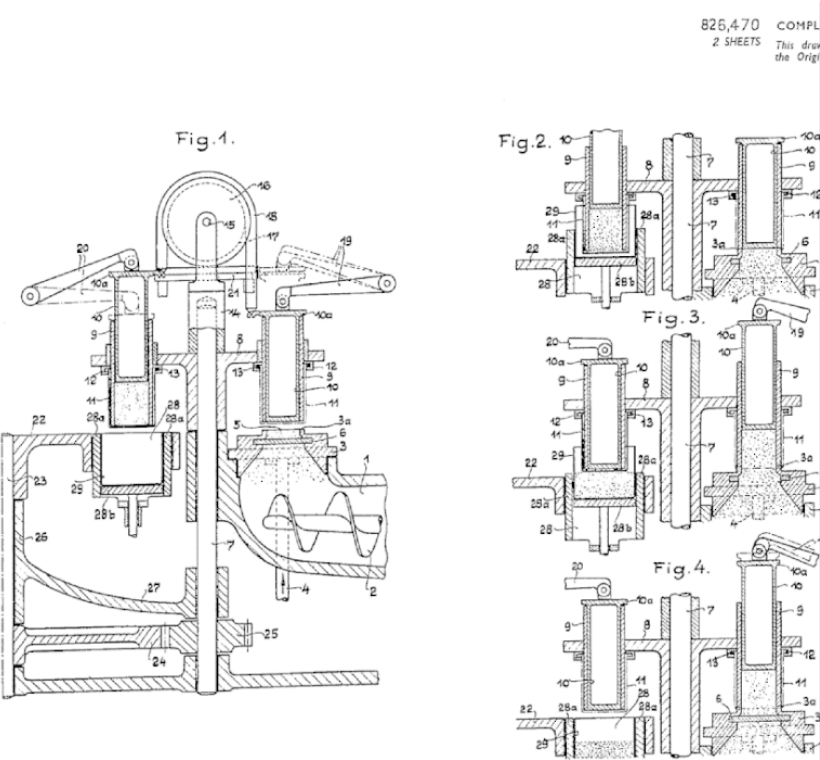
U.S. Patent

Oct. 3, 2000

Sheet 1 of 7

6,126,433

GB-826,470



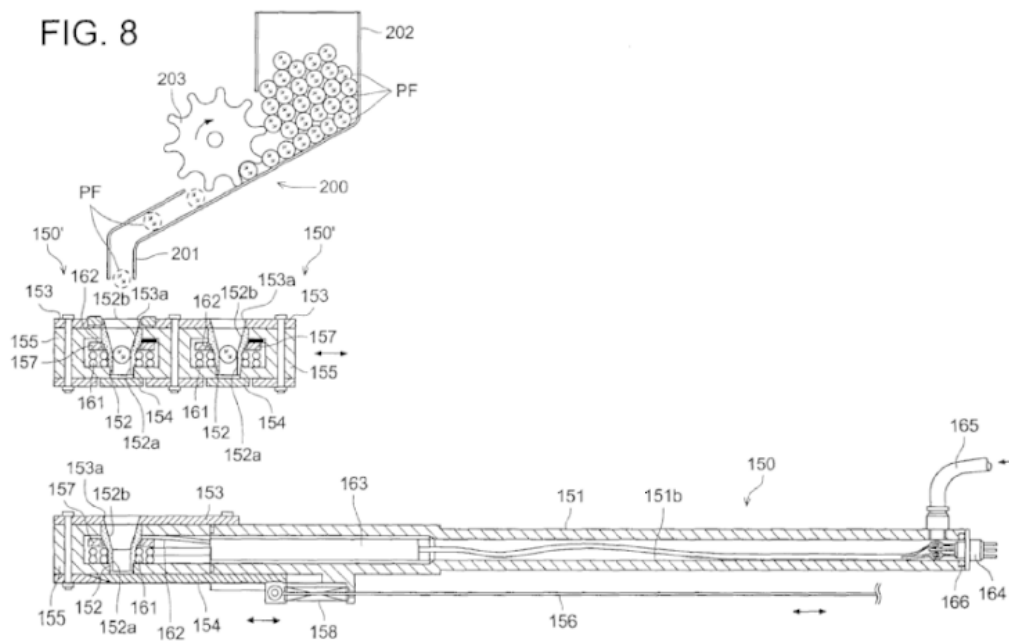
826,470 COMPL  
2 SHEETS This draw  
the Orig

**B29C 31/08**

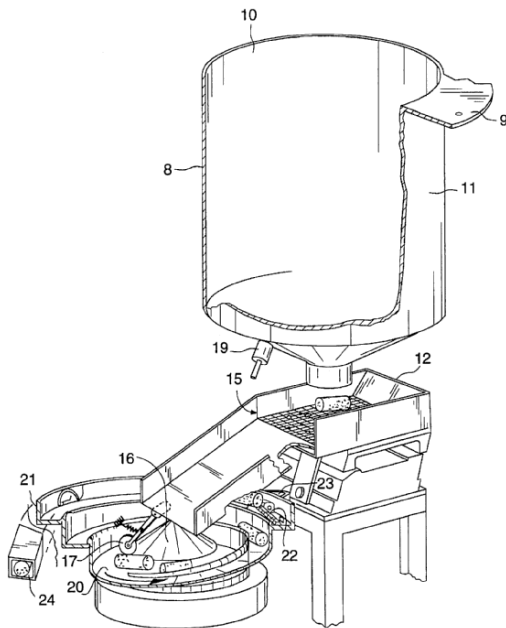
of preforms {to be moulded, e.g. tablets, fibre reinforced preforms, extruded ribbons, tubes or profiles; Manipulating means specially adapted for feeding preforms, e.g. supports conveyors ([B29C 31/066](#), [B29C 37/001](#), [B29C 43/085](#) take precedence)}

**Definition statement**

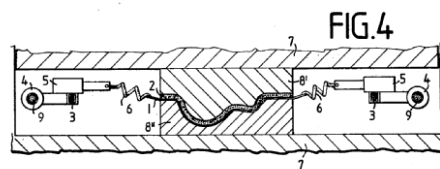
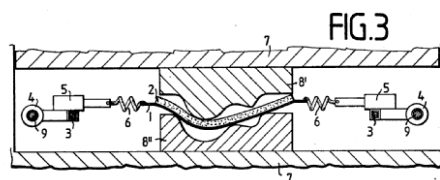
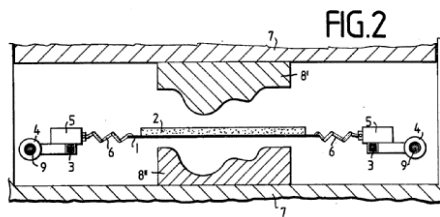
*This place covers:*



U.S. Patent Aug. 12, 1997 Sheet 2 of 9 5,656,305



U.S. Patent Feb. 21, 1984 Sheet 2 of 2 4,432,716



**B29C 31/085**

{combined with positioning the preforms according to predetermined patterns, e.g. positioning extruded preforms on conveyors ([B29C 70/30](#) takes precedence; for building tyres [B29D 30/08](#))}

**Definition statement**

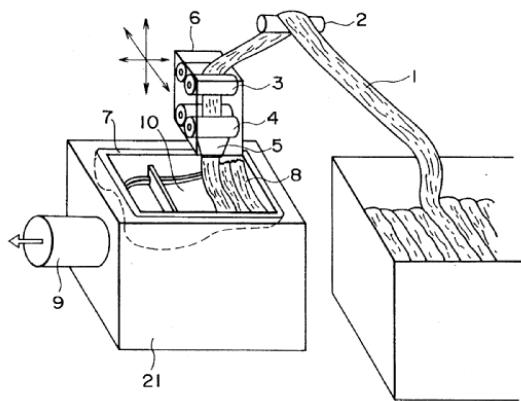
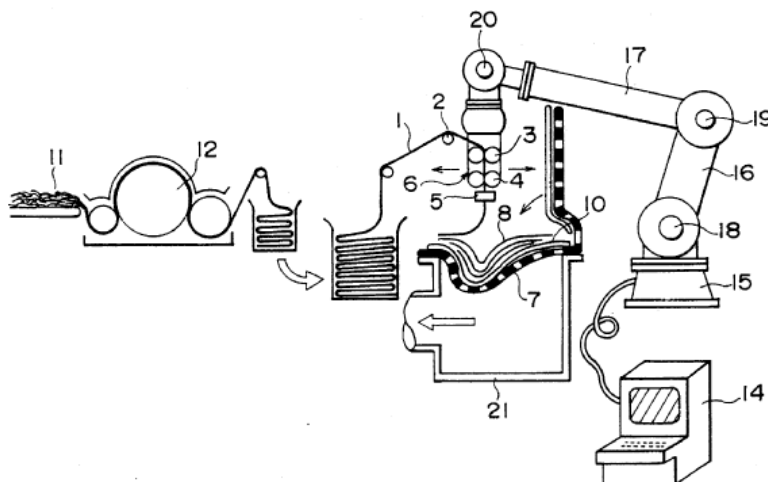
*This place covers:*

U.S. Patent

Feb. 6, 1996

Sheet 1 of 10

5,489,351

**FIG. 1****F I G. 2**

U.S. Patent

Feb. 6, 1996

Sheet 2 of 10

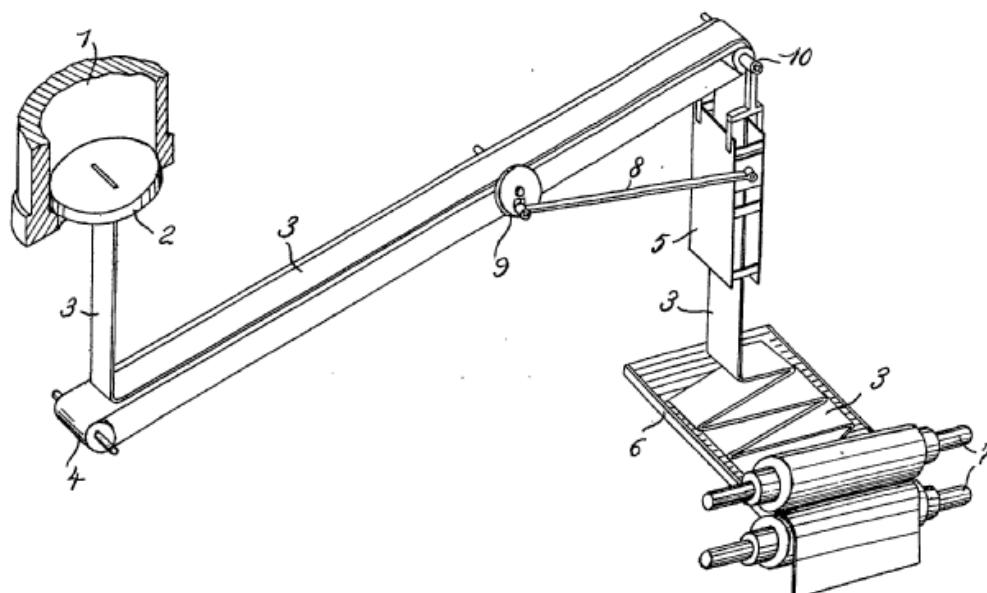
5,489,351

FR-A-982.282

N° 982.282

M. Ricciarelli

Pl. unique



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping composites; positioning reinforcements in a mould
---

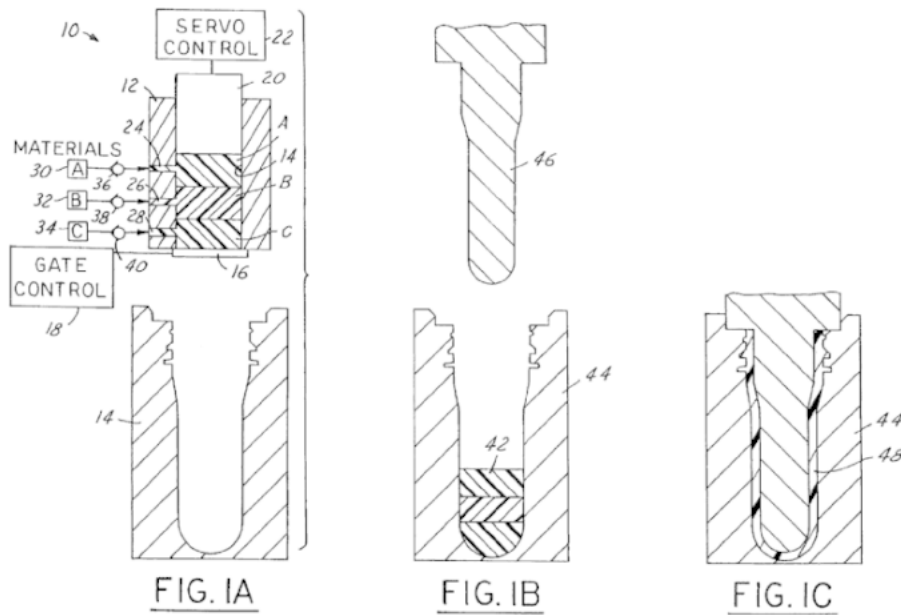
<a href="#">B29C 70/54</a>
----------------------------

**B29C 31/10**

of several materials

**Definition statement**

This place covers:



U.S. Patent

Feb. 20, 2007

Sheet 1 of 2

US 7,179,071 B1

Patent Application Publication Mar. 31, 2005 Sheet 6 of 6 US 2005/0067735 A1

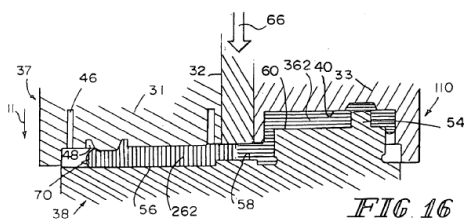
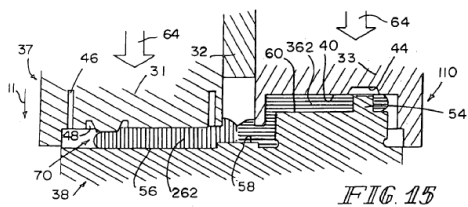
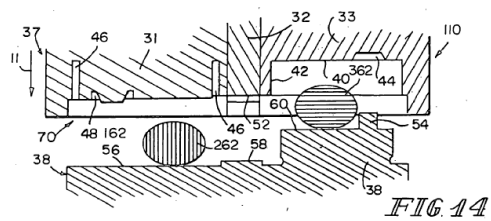
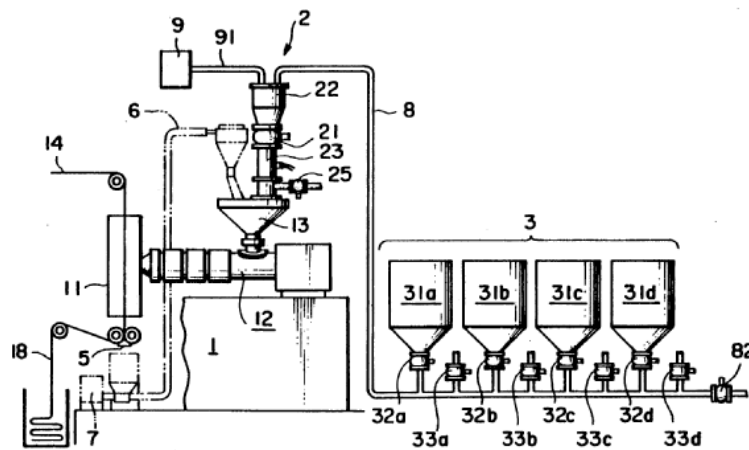


FIG. 1



May 7, 1963 G. E. GARD 3,088,713  
BLENDING METHOD  
Filed May 9, 1960

Fig. 1

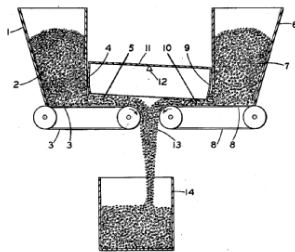
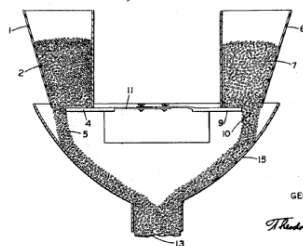


Fig. 2



INVENTOR  
GEORGE E. GARD  
by  
Richard L. Thomas  
ATTORNEY

## B29C 33/00

### Moulds or cores; Details thereof or accessories therefor

#### Definition statement

*This place covers:*

Moulds or dies being the tool used to shape the plastic parts in moulding processes in its desired form. A mould typically comprises a cavity to shape a plastic part.

## Definition statement

Rolls used in continuous moulding processes

Making of moulds

Designing moulds.

## Relationships with other classification places

The scope of [B29C 33/00](#) is limited to moulds for shaping substances being in a plastic state

Moulds for shaping other substances are not covered by this class, but by the class in their field of application

## References

### Limiting references

*This place does not cover:*

Moulds for making tyres	<a href="#">B29D 30/0606</a>
-------------------------	------------------------------

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Moulds for pressure die casting	<a href="#">B22D 17/22</a>
Moulds for shaping clay or other ceramic products	<a href="#">B28B 7/34</a>

## Special rules of classification

Moulds specific for a single moulding technology are classified in that technology: e.g. moulds for injection moulding [B29C 45/26](#), moulds for blow moulding [B29C 49/48](#).

Since the classification scheme present in [B29C 45/00](#) is much more detailed, for reasons of search efficiency, classification in [B29C 45/00](#) is preferred above a classification in [B29C 33/00](#) in the case that both classifications would be applicable.

## Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

- "Mould", " mold" and "die"

## B29C 33/04

using liquids, gas or steam {(tyre moulds with incorporated heating or cooling means using liquids, gas or steam [B29D 30/0601](#))}

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

heating using liquids, gas or steam in presses	<a href="#">B30B 15/064</a>
--	-----------------------------



**B29C 33/3842****{Manufacturing moulds, e.g. shaping the mould surface by machining}****Definition statement***This place covers:*

Making of moulds made out of a plastic substance. The application of the created mould, does not necessarily need to be in the field of [B29C](#)

**References****Limiting references***This place does not cover:*

Making of moulds by metal processing	<a href="#">B22</a> , <a href="#">B23</a> , in particular <a href="#">B23P 15/24</a>
--------------------------------------	--

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Mould materials, implicitly disclosed by the process of making them	<a href="#">B29C 33/38</a> , <a href="#">B29C 33/40</a> , <a href="#">B29C 33/565</a>
---	---

**B29C 2033/385****{by laminating a plurality of layers}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Modular mould systems [MMS], e.g. plates, blocks, rods in general	<a href="#">B29C 33/301</a>
Constructional features of the moulds for pneumatic tyres, the moulds being made of a plurality of laminations	<a href="#">B29D 2030/0609</a>

**B29C 33/442****{with mechanical ejector or drive means therefor}****References****Limiting references***This place does not cover:*

Mechanical ejectors for injection moulding	<a href="#">B29C 45/4005</a>
--	------------------------------

**B29C 33/444**

{for stripping articles from a mould core, e.g. using stripper plates}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Discharging by stripping articles from cores	<a href="#">B29C 37/0003</a>
--	------------------------------

**B29C 33/56**

Coatings {, e.g. enameled or galvanised}; Releasing, lubricating or separating agents {(in-mould coating [B29C 37/0028](#); using or applying separating agents [B29C 37/0067](#))}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Coating compositions	<a href="#">C09D</a>
Lubricating compositions	<a href="#">C10M</a>

**B29C 35/00**

Heating, cooling or curing, e.g. crosslinking or vulcanising; Apparatus therefor (moulds with incorporated heating or cooling means [B29C 33/02](#) {; thermal after-treatment of shaped articles [B29C 71/02](#)}; curing devices for plastics dental prostheses [A61C 13/14](#); before moulding [B29B 13/00](#))

**References****Limiting references**

This place does not cover:

Moulds with incorporated heating or cooling means	<a href="#">B29C 33/02</a>
Thermal after-treatment of shaped articles	<a href="#">B29C 71/02</a>
Curing devices for plastic dental prostheses	<a href="#">A61C 13/14</a>
Thermal treatment of the material to be shaped before moulding	<a href="#">B29B 13/00</a>
Conditioning or physical treatment of the material to be shaped	<a href="#">B29B 13/00</a>

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Crosslinking of macromolecular substances	<a href="#">C08J 3/24</a>
---	---------------------------

**B29C 35/007**

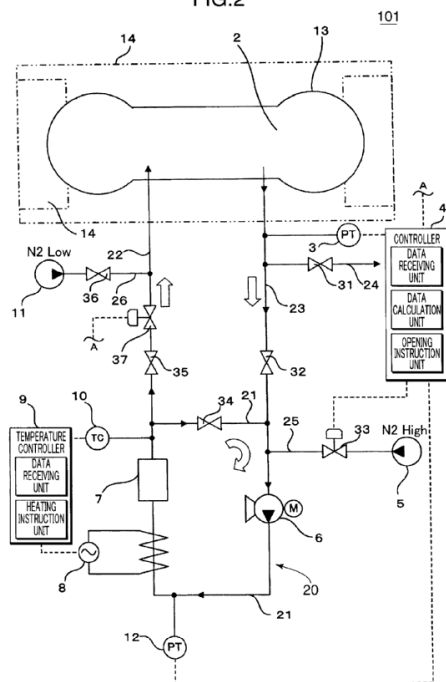
**{Tempering units for temperature control of moulds or cores, e.g. comprising heat exchangers, controlled valves, temperature-controlled circuits for fluids ([B29C 35/0294](#) takes precedence)}**

## Definition statement

*This place covers:*

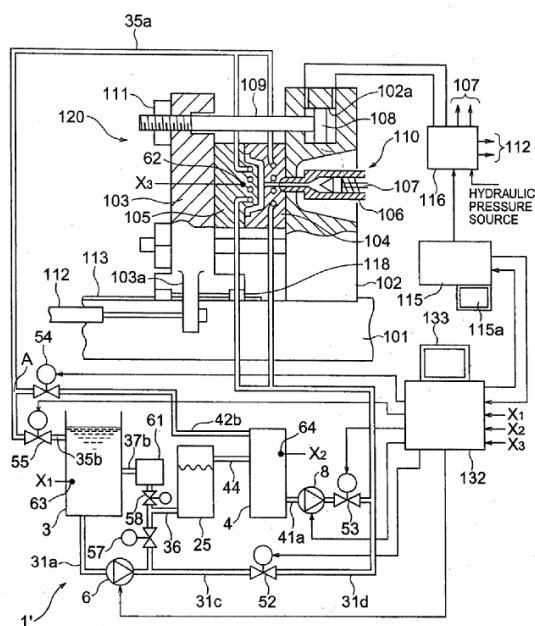
Patent Application Publication Jan. 14, 2010 Sheet 2 of 5 US 2010/0007038 A1

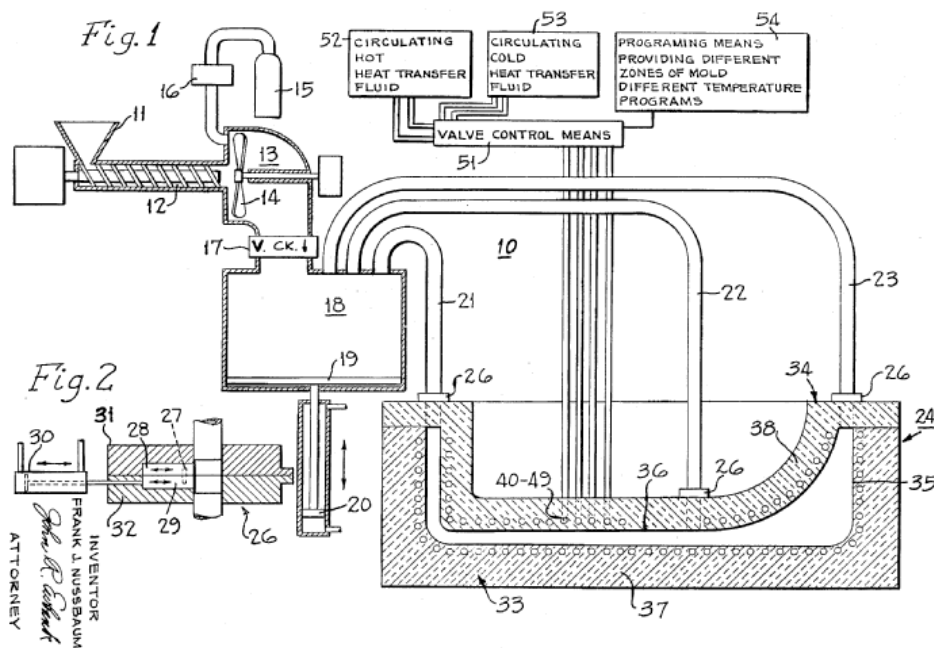
FIG.2



Patent Application Publication Aug. 9, 2007 Sheet 12 of 17 US 2007/0184139 A1

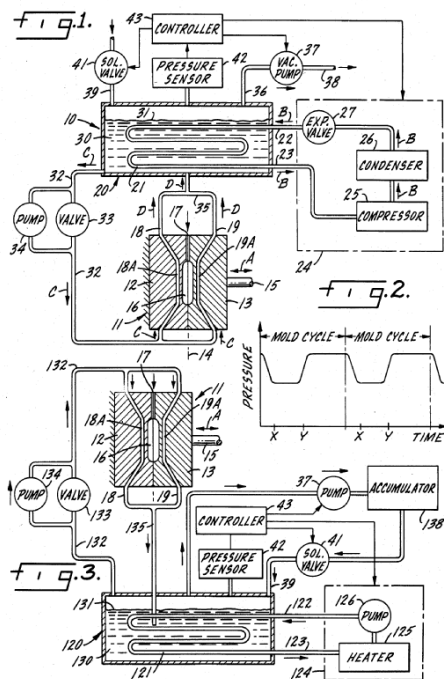
FIG. 14





Oct. 2, 1973  
F. J. NUSSBAUM  
3,763,293  
PROCESS OF MOLDING GIANT ARTICLES OF STRUCTURED PLASTIC  
Filed Feb. 3, 1972  
2 Sheets-Sheet 1

U.S. Patent Nov. 18, 1986 4,623,497



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds or cores with incorporated heating or cooling mean, using liquids, gas or steam	<a href="#">B29C 33/04</a>
Injection moulding, heating or cooling of the mould, control circuit therefor	<a href="#">B29C 45/7306</a>

## B29C 35/02

Heating or curing, e.g. crosslinking or vulcanizing {during moulding, e.g. in a mould} (cold vulcanisation [B29C 35/18](#) {; vulcanising tyres, presses therefor [B29D 30/0601](#)})

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds or cores with incorporated heating or cooling means	<a href="#">B29C 33/02</a>
Shaping by casting, heating or cooling	<a href="#">B29C 39/38</a>
Shaping by coating, heating or cooling	<a href="#">B29C 41/46</a>
Compression moulding, heating or cooling	<a href="#">B29C 43/52</a>
Shaping by swelling, foaming, heating or cooling	<a href="#">B29C 44/3415</a>
Injection moulding, heating or cooling	<a href="#">B29C 45/72</a>
Extrusion moulding, heating	<a href="#">B29C 48/78</a>
Blow-moulding, heating or cooling	<a href="#">B29C 49/64</a>
Shaping by thermoforming, heating or cooling	<a href="#">B29C 51/42</a>
Shaping by bending, folding, heating or cooling	<a href="#">B29C 53/84</a>
Lining or sheathing, heat treatment	<a href="#">B29C 63/0065</a>
Producing pneumatic tyres, vulcanising tyres, vulcanising presses for tyres	<a href="#">B29D 30/0601</a>
Heating or cooling presses or parts therefor	<a href="#">B30B 15/34</a>

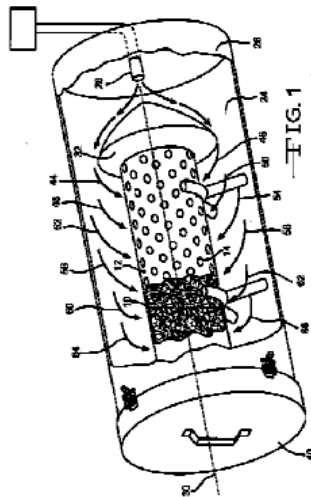
**B29C 35/0227**

{using pressure vessels, e.g. autoclaves, vulcanising pans ([B29C 35/065](#) takes precedence)}

**Definition statement**

*This place covers:*

Patent Application Publication Pub. 18, 2011 Sheet 1 of 2 US 2011/081158 A1



Patent Application Publication Pub. 18, 2011 Sheet 1 of 2 US 2011/081158 A1

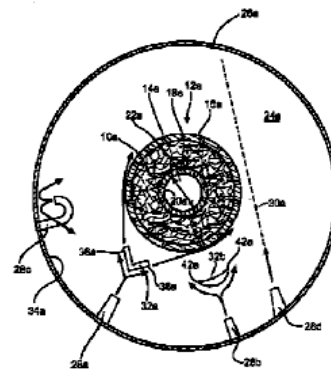


FIG. 2

Patent Application Publication Jul. 24, 2008 Sheet 6 of 6 US 2008/0175753 A1

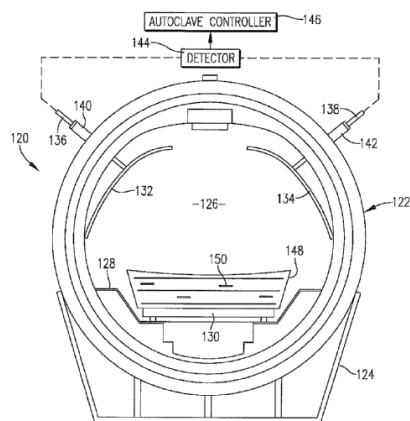


FIG. 12.

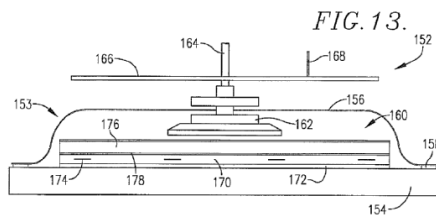
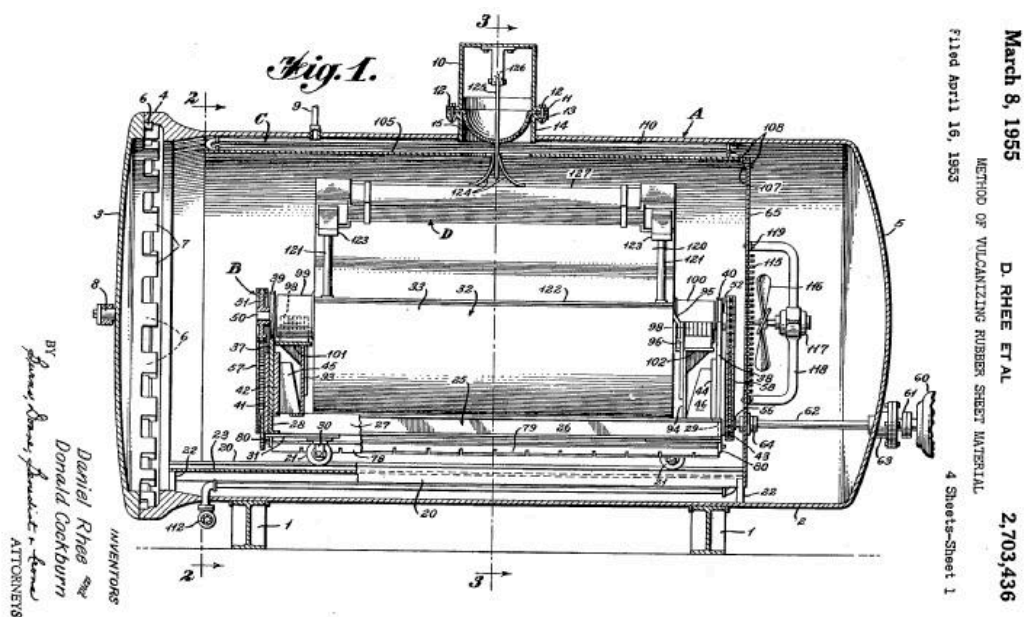
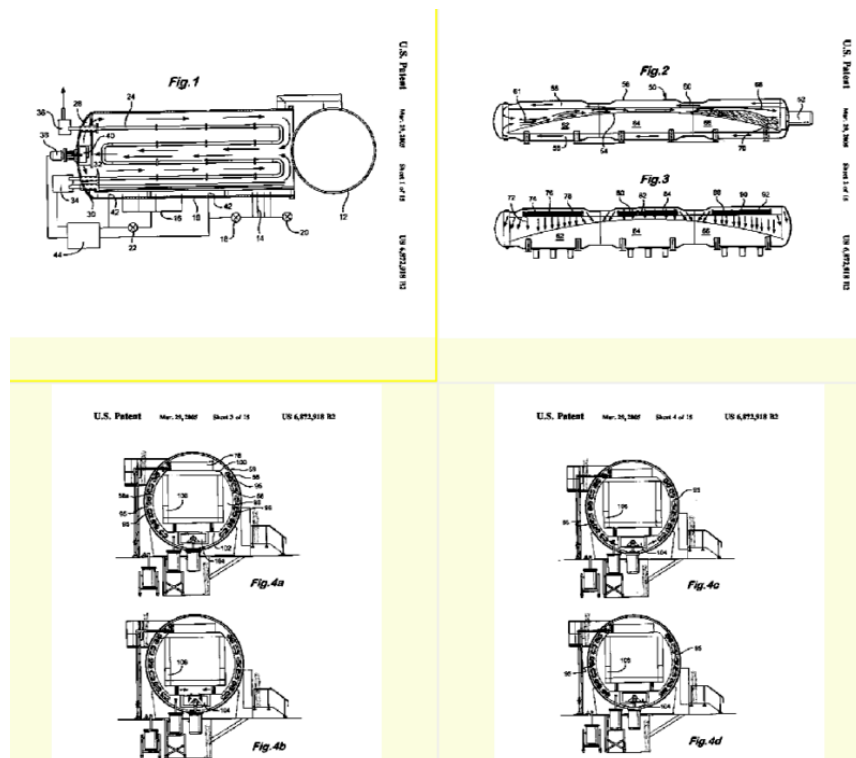


FIG. 13.



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

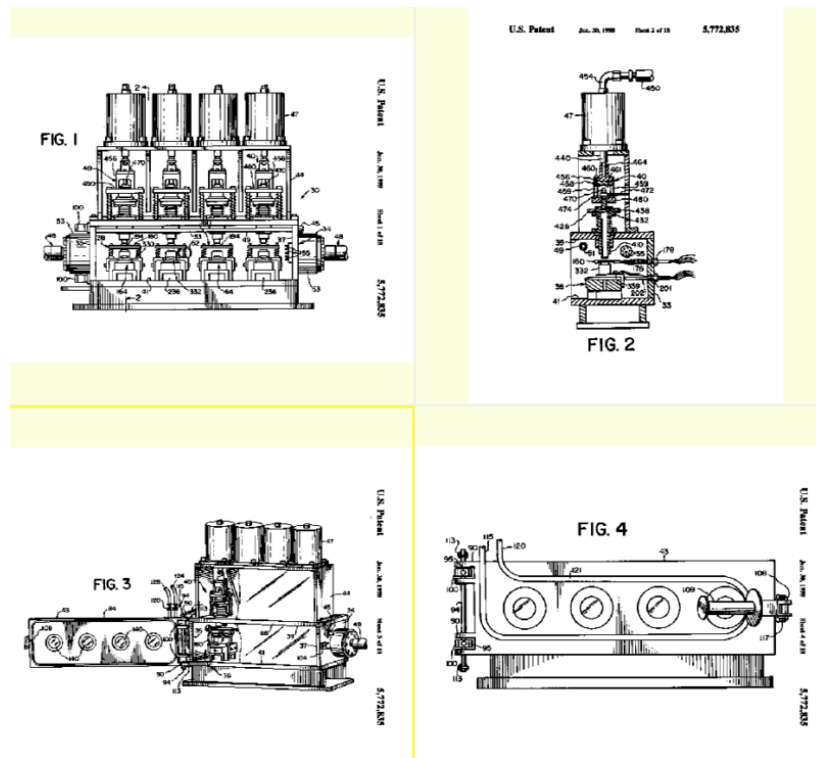
Shaping composites, using isostatic pressure, e.g. autoclave	<a href="#">B29C 70/44</a>
Processes of utilising sub-atmospheric or super-atmospheric pressure to effect chemical or physical change of matter, pressure vessels, autoclaves	<a href="#">B01J 3/04</a>

**B29C 35/0238**

{Presses provided with pressure vessels, e.g. steam chambers}

**Definition statement**

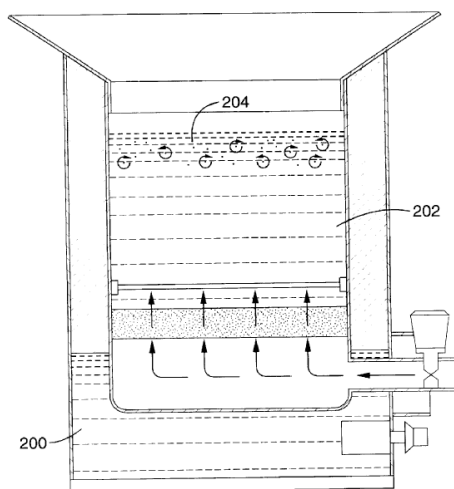
*This place covers:*



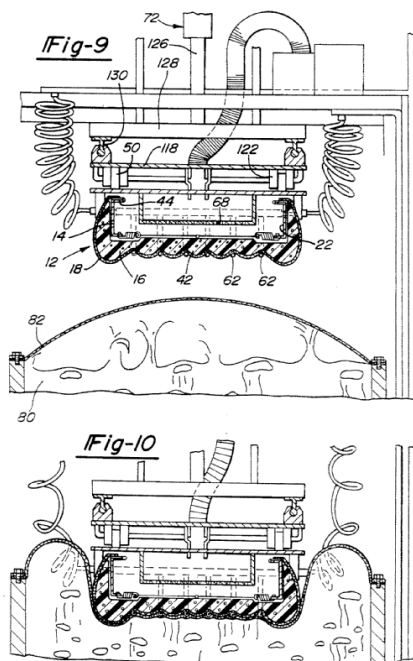


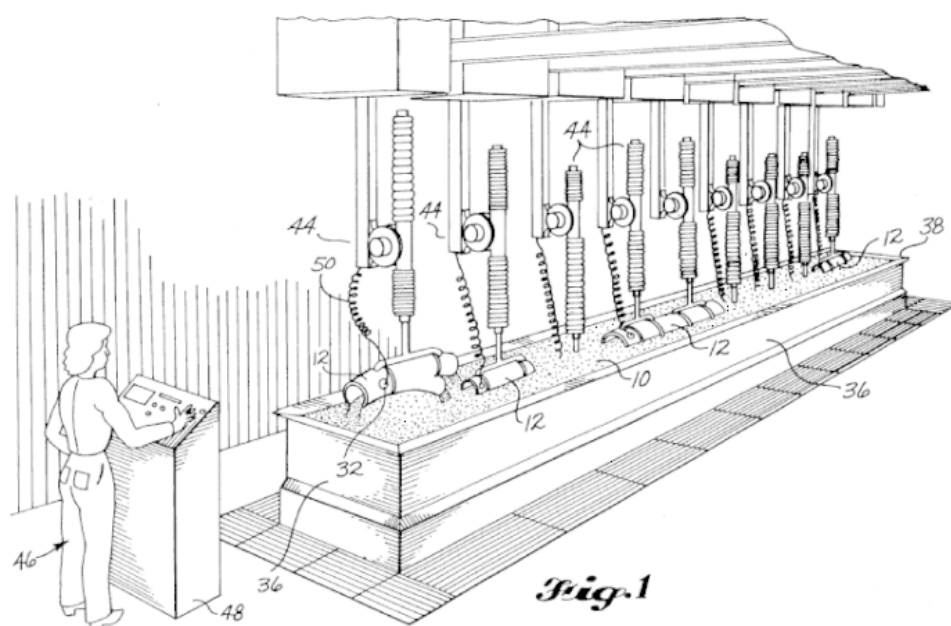
**B29C 35/0244****{using fluidised bed}****Definition statement***This place covers:*

U.S. Patent      May 1, 2001      Sheet 4 of 10      US 6,224,798 B1

**FIG. 5**

U.S. Patent      Apr. 18, 1995      Sheet 5 of 7      5,407,510





U.S. Patent

Sep. 24, 1991

Sheet 1 of 4

5,051,226

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Chemical or physical process in general, conducted in the presence of fluids and solid particles, with fluidised particles, according to "fluidised bed" technique

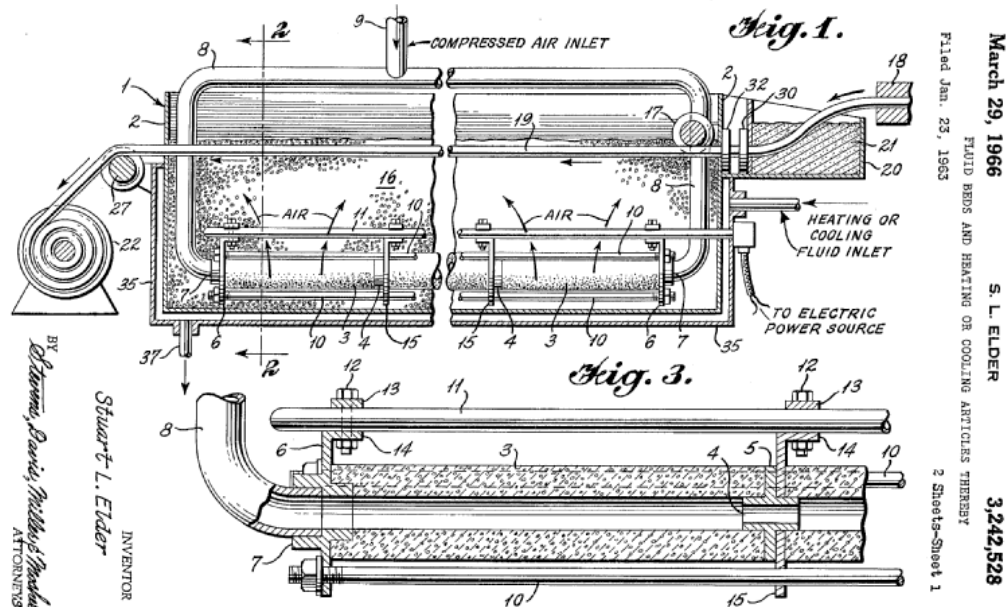
[B01J 8/24](#)

**B29C 35/025**

{for articles of indefinite length}

**Definition statement**

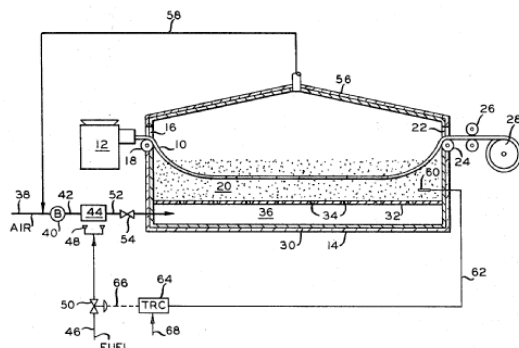
This place covers:



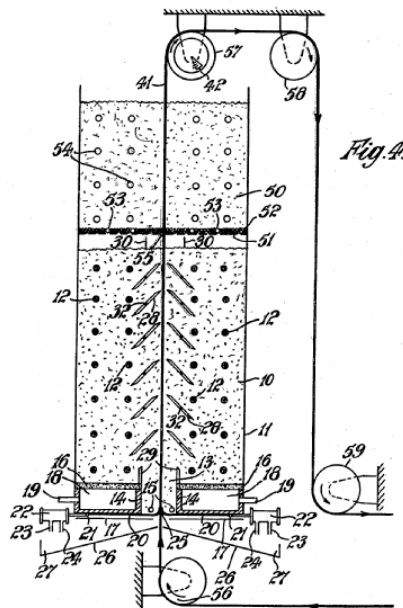
April 13, 1971

A. K. THORSRUD  
 CONTINUOUS HEAT-CURING OF MATERIALS  
 Filed March 30, 1967

3,574,783



Nov. 6, 1962 R. S. GOY ET AL 3,061,941  
APPARATUS FOR THE HEAT TREATMENT OF THERMOPLASTIC MATERIALS  
Filed Aug. 12, 1958 4 Sheets-Sheet 3



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Chemical or physical process in general, conducted in the presence of fluids and solid particles, with fluidised particles, according to "fluidised bed" technique, for treatment of endless filamentary, band or sheet material	<a href="#">B01J 8/46</a>
--	---------------------------

## B29C 35/0255

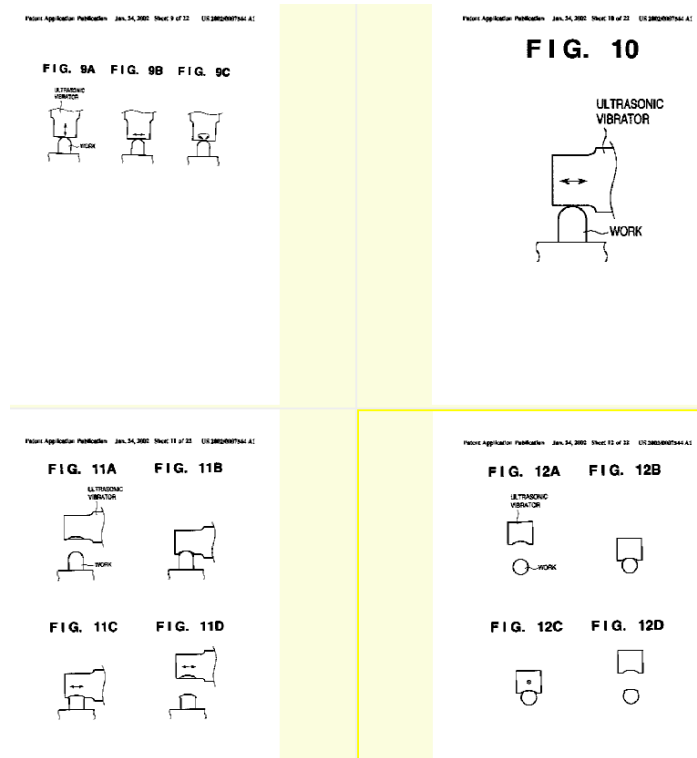
{using friction}

## References

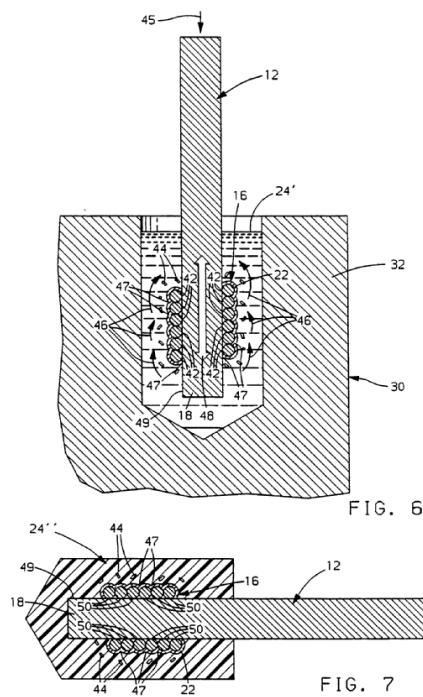
### Informative references

Attention is drawn to the following places, which may be of interest for search:

Joining of preformed parts, by heating, using friction	<a href="#">B29C 65/06</a>
--	----------------------------

**B29C 35/0261****{using ultrasonic or sonic vibrations}****Definition statement***This place covers:*

U.S. Patent Dec. 13, 1994 Sheet 3 of 4 5,372,665



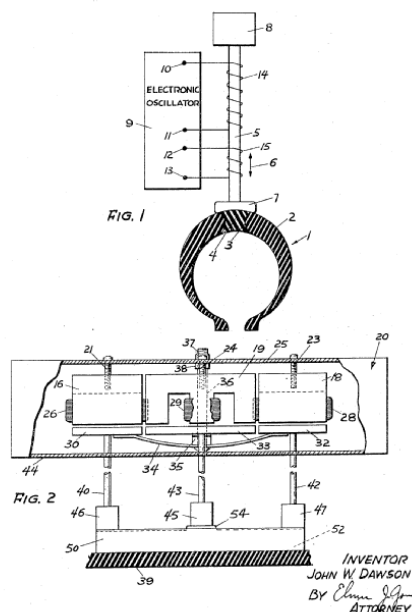
Jan. 27, 1953

J. W. DAWSON  
VULCANIZING

2,626,430

Filed Aug. 10, 1946

2 SHEETS—SHEET 1

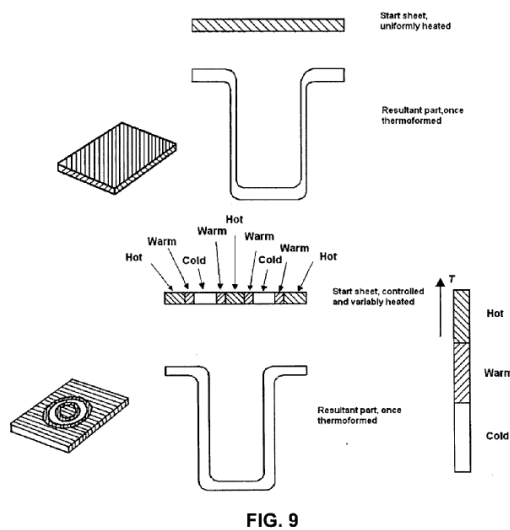
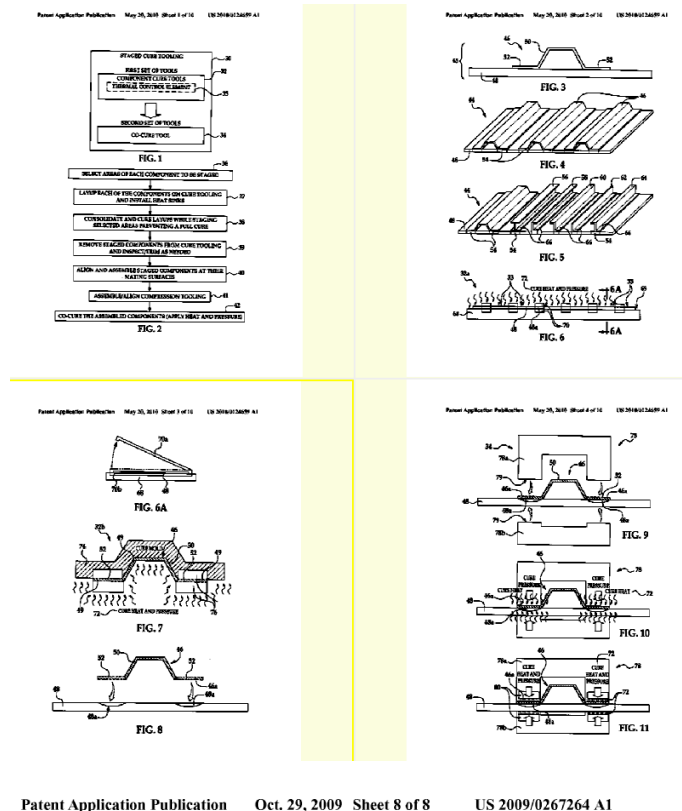


## References

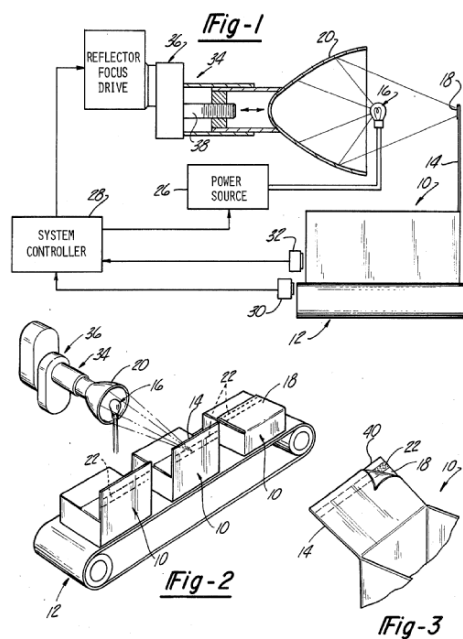
### Informative references

Attention is drawn to the following places, which may be of interest for search:

Joining of preformed parts, by heating, using ultrasonic vibrations	<a href="#">B29C 65/08</a>
Chemical, physical or physico-chemical processes in general, employing sonic or ultrasonic vibrations	<a href="#">B01J 19/10</a>

**B29C 35/0266**{Local curing (for repairing [B29C 73/34](#))}**Definition statement***This place covers:*

U.S. Patent May 29, 1979 Sheet 1 of 2 4,156,626

**B29C 35/0272**

{using lost heating elements, i.e. heating means incorporated and remaining in the formed article (for preforms with internal stresses [B29C 61/0625](#); joining using lost heating elements [B29C 65/34](#); making electrically conductive articles [B29C 70/882](#))}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Shaping by liberation of internal stresses, making preforms comprising incorporated or associated heating means	<a href="#">B29C 61/0625</a>
Joining of preformed parts, by heating, using heated elements which remain in the joint	<a href="#">B29C 65/34</a>

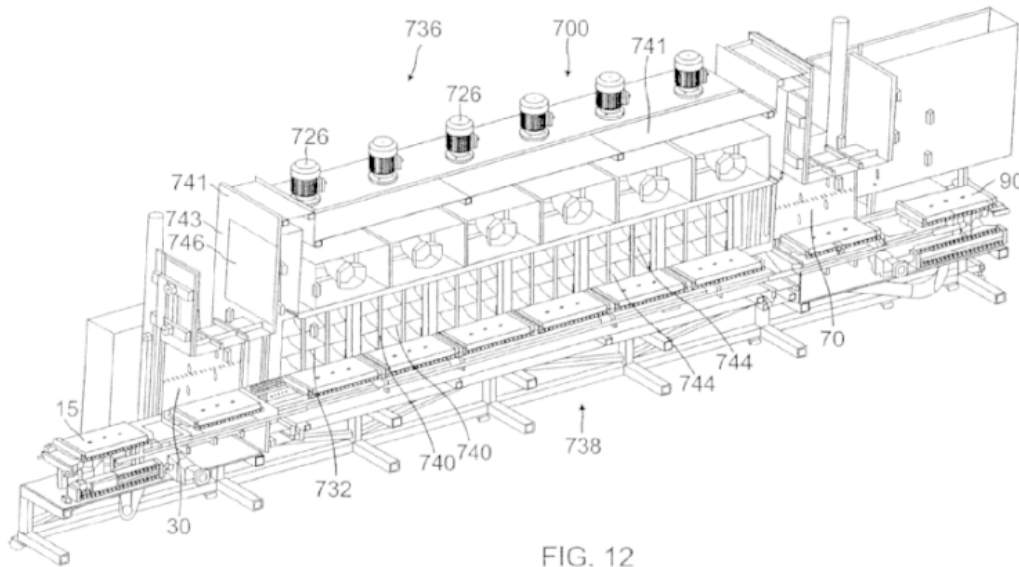


**B29C 35/0277**

{Apparatus with continuous transport of the material to be cured ([B29C 35/025](#), [B29C 35/06](#), [B29C 35/10](#), [B29C 35/14](#) take precedence)}

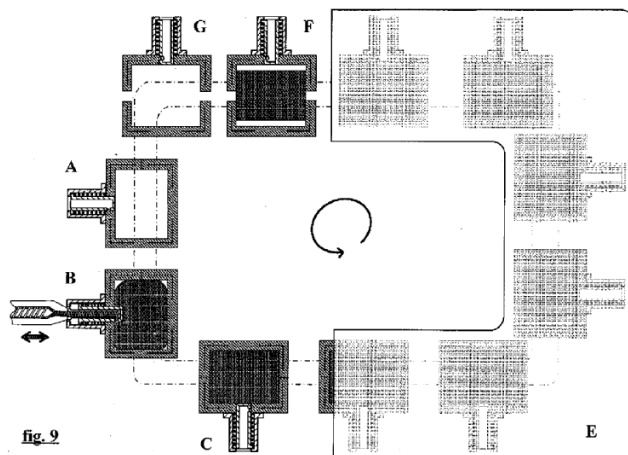
**Definition statement**

*This place covers:*



Patent Application Publication Mar. 24, 2011 Sheet 18 of 20 US 2011/0068496 A1

Patent Application Publication Aug. 13, 2009 Sheet 4 of 4 US 2009/0200706 A1



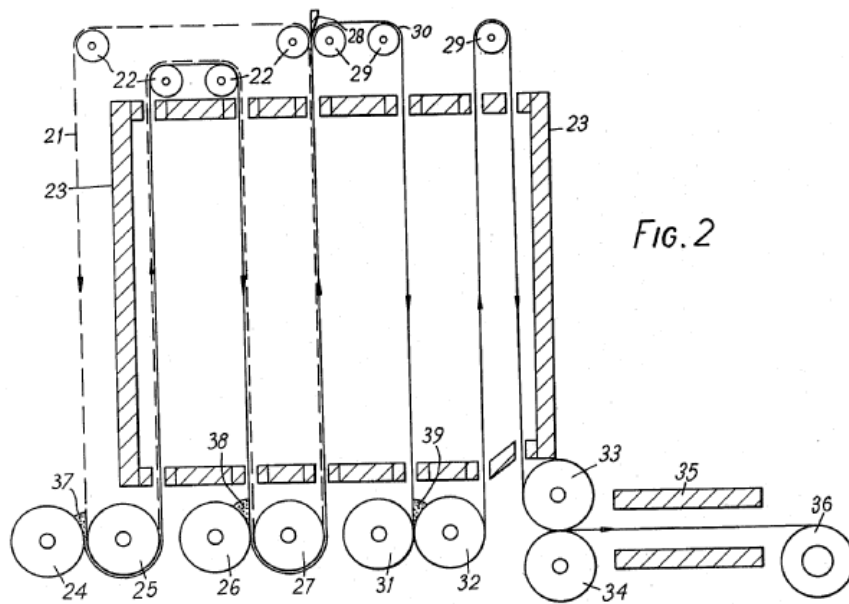
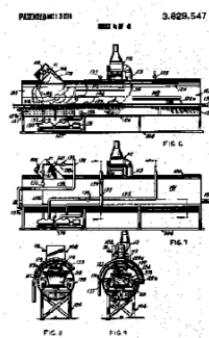
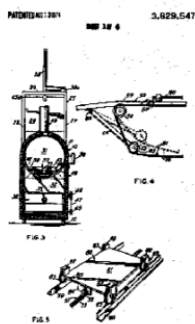
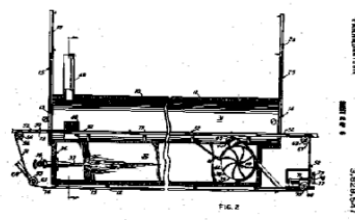
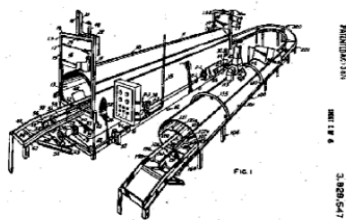


FIG. 2

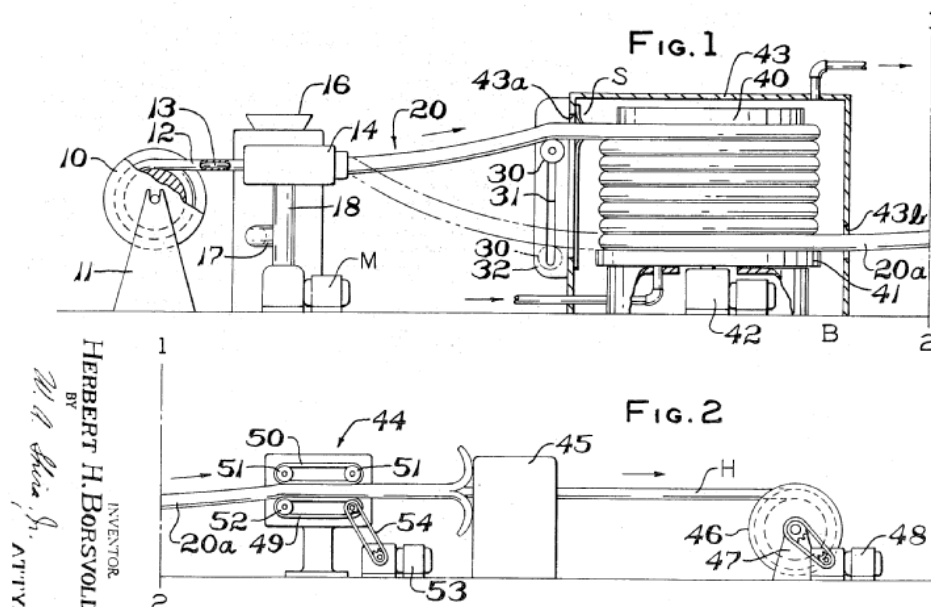
U.S. Patent Oct. 13, 1981  
Sheet 2 of 2  
4,294,790



### Definition statement

Patented Sept. 12, 1972

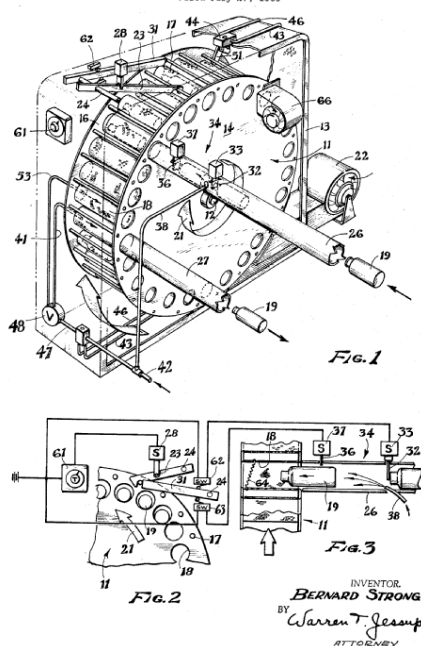
3,690,796



Oct. 15, 1968

B. STRONG  
FLUID DRIVEN PROCESSING MACHINE  
Filed July 27, 1966

3,405,455



## References

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Movable moulds or cores	<a href="#">B29C 33/34</a>
Continuously movable moulds or cores	<a href="#">B29C 33/36</a>

**B29C 2035/0283****{Thermal pretreatment of the plastics material}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

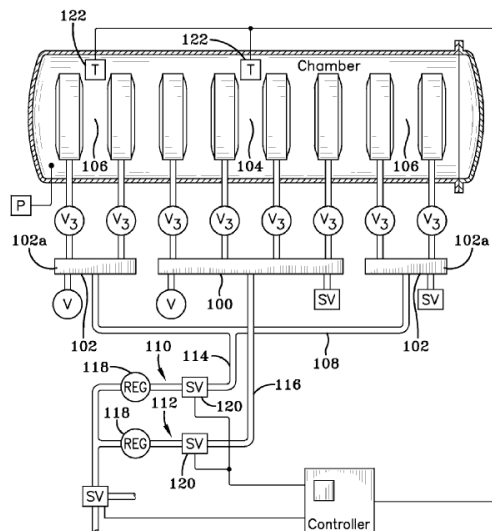
Thermal after-treatment of articles without altering their shape	<a href="#">B29C 71/02</a>
--	----------------------------

**B29C 35/0288**

**{Controlling heating or curing of polymers during moulding, e.g. by measuring temperatures or properties of the polymer and regulating the process (controlling or regulating chemical, physical or physico- chemical processes in general [B01J 19/0006](#))}**

**Definition statement***This place covers:*

Patent Application Publication Mar. 10, 2011 Sheet 4 of 4 US 2011/0056627 A1

**FIG-4**

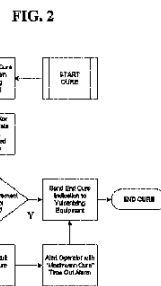
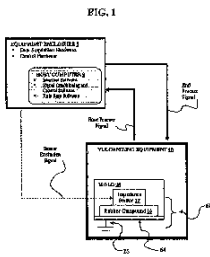
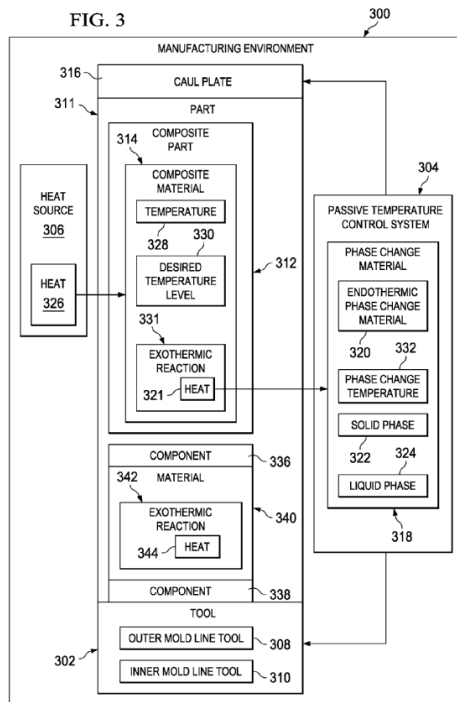
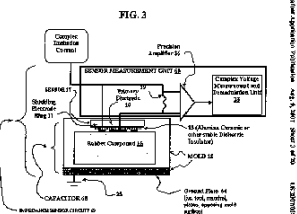
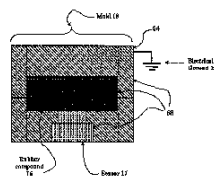
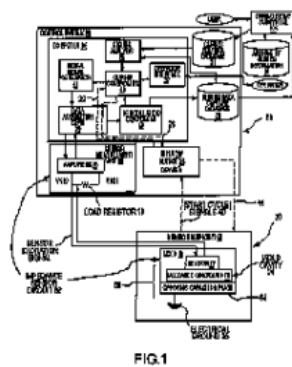


FIG. 4





**FIG.1**

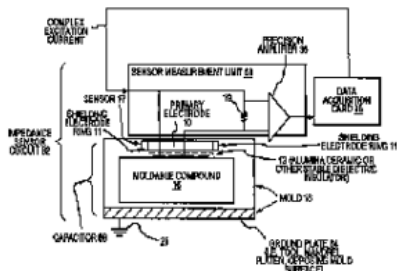
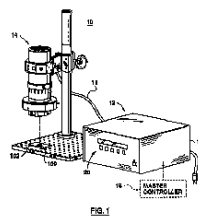
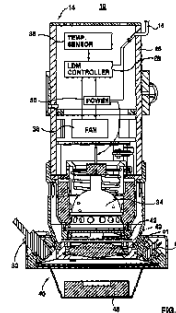


FIG.2



**FIG. 1**



**FIG. 2**

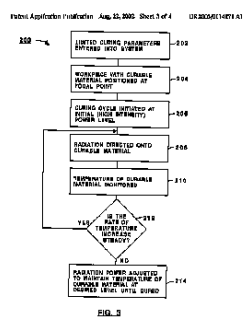
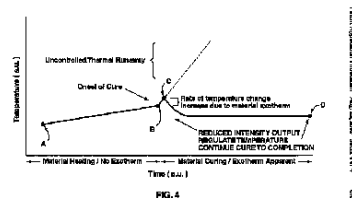


FIG. 3



**FIG. 4**

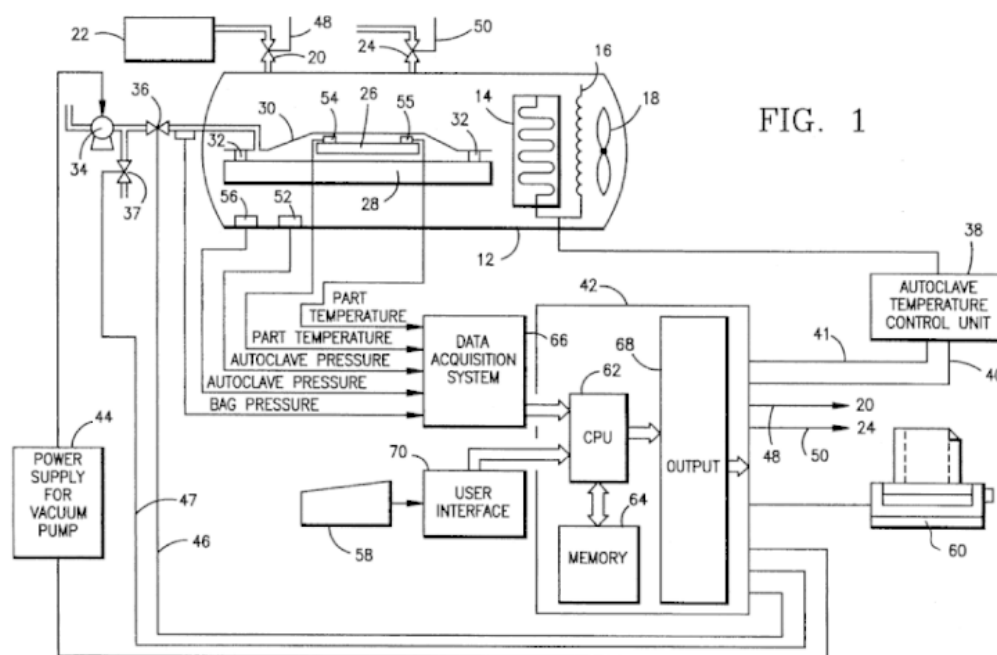


FIG. 1

U.S. Patent

Sep. 6, 1994

Sheet 1 of 9

5,345,397

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

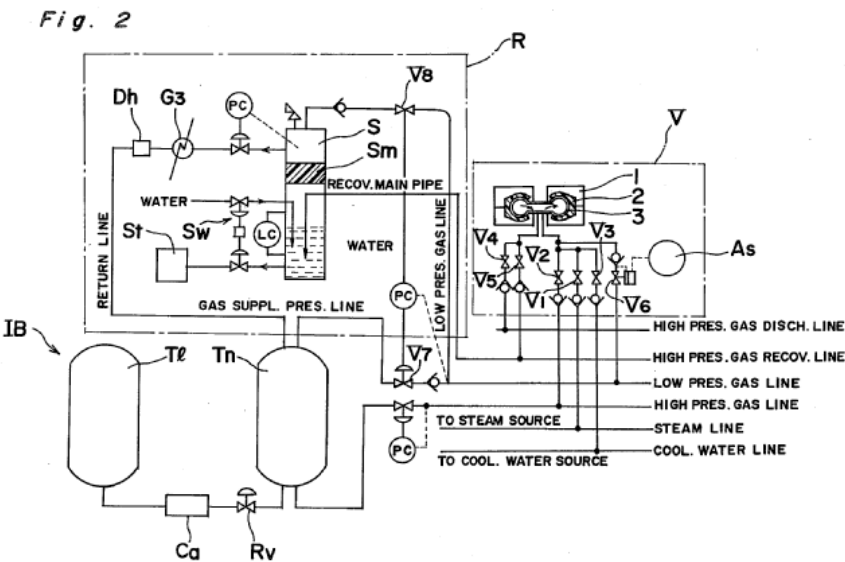
Shaping by casting, measuring, controlling or regulating	<a href="#">B29C 39/44</a>
Shaping by coating, measuring, controlling or regulating	<a href="#">B29C 43/58</a>
Compression moulding, measuring, controlling or regulating Shaping by swelling, foaming, measuring, controlling or regulating	<a href="#">B29C 44/60</a>
Injection moulding, measuring, controlling or regulating of temperature	<a href="#">B29C 45/78</a>
Extrusion moulding, measuring, controlling or regulating	<a href="#">B29C 48/92</a>
Blow-moulding, measuring, controlling or regulating	<a href="#">B29C 49/78</a>
Shaping by thermoforming, measuring, controlling or regulating	<a href="#">B29C 51/46</a>

B29C 35/0294

{using tempering units for temperature control of moulds or cores}

Definition statement

This place covers:



U.S. Patent Jan. 25, 1983 Sheet 2 of 2 4,370,283

B29C 35/04

using liquids, gas or steam

References

Informative references

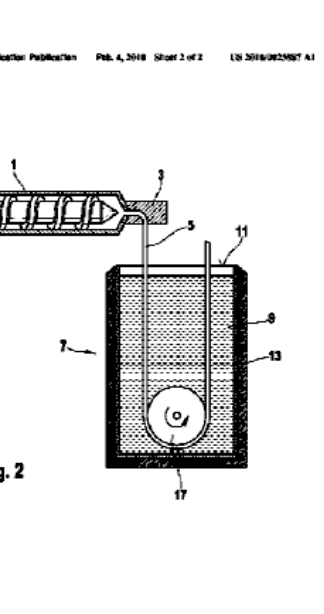
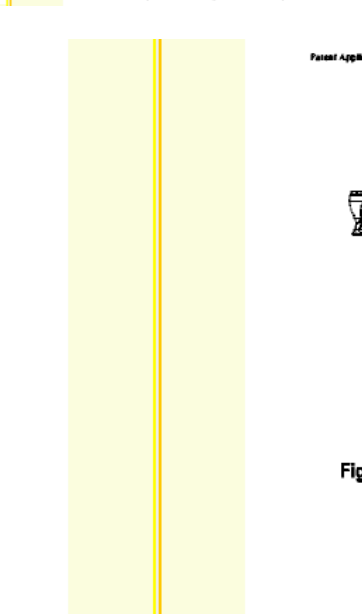
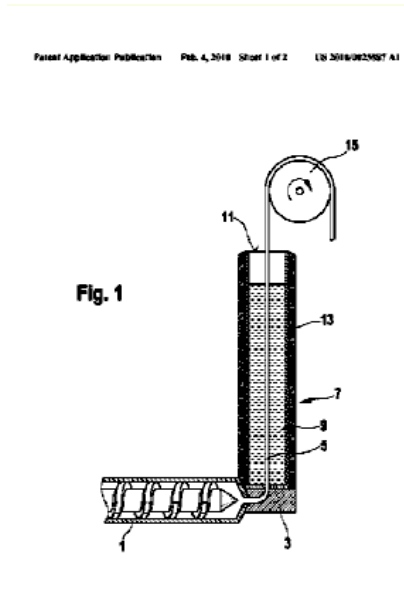
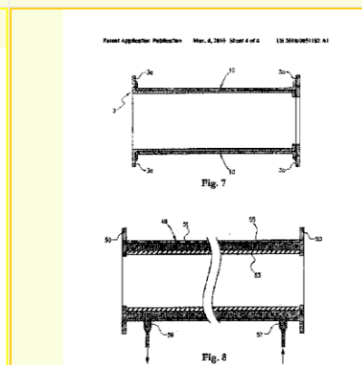
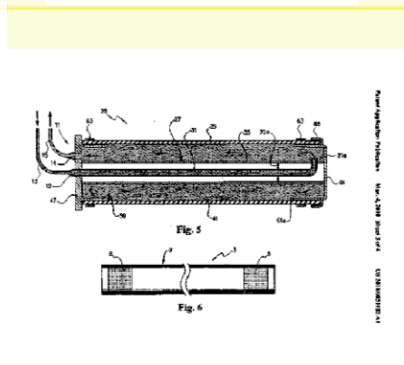
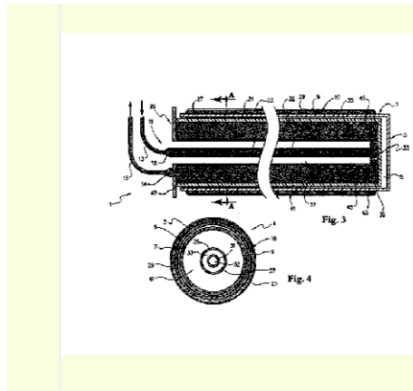
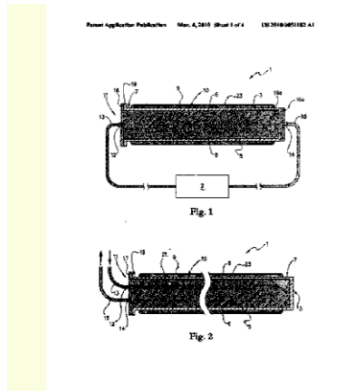
Attention is drawn to the following places, which may be of interest for search:

Joining of preformed parts; e.g. welding of plastics materials; making use of hot liquids, i.e. the liquid is in contact with the material to be joined	<a href="#">B29C 65/026</a>
Joining of preformed parts; e.g. welding of plastics materials; using hot gases	<a href="#">B29C 65/10</a>
Joining of preformed parts; e.g. welding of plastics materials; using flames	<a href="#">B29C 65/106</a>



**B29C 35/041**

{using liquids}

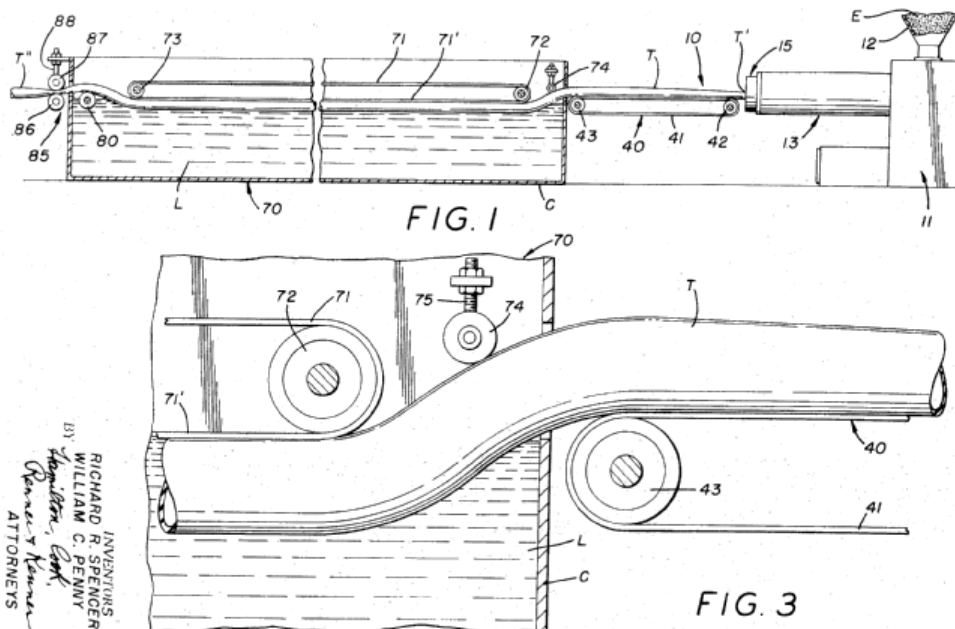
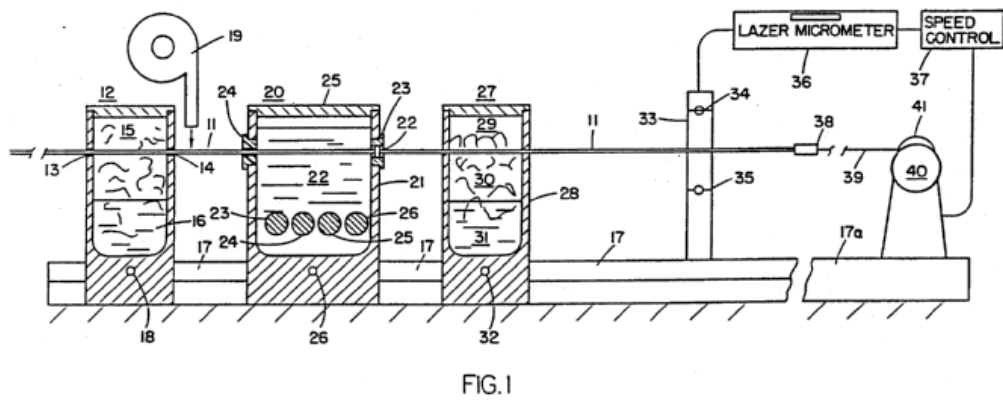
**Definition statement***This place covers:*

**B29C 35/06**

for articles of indefinite length

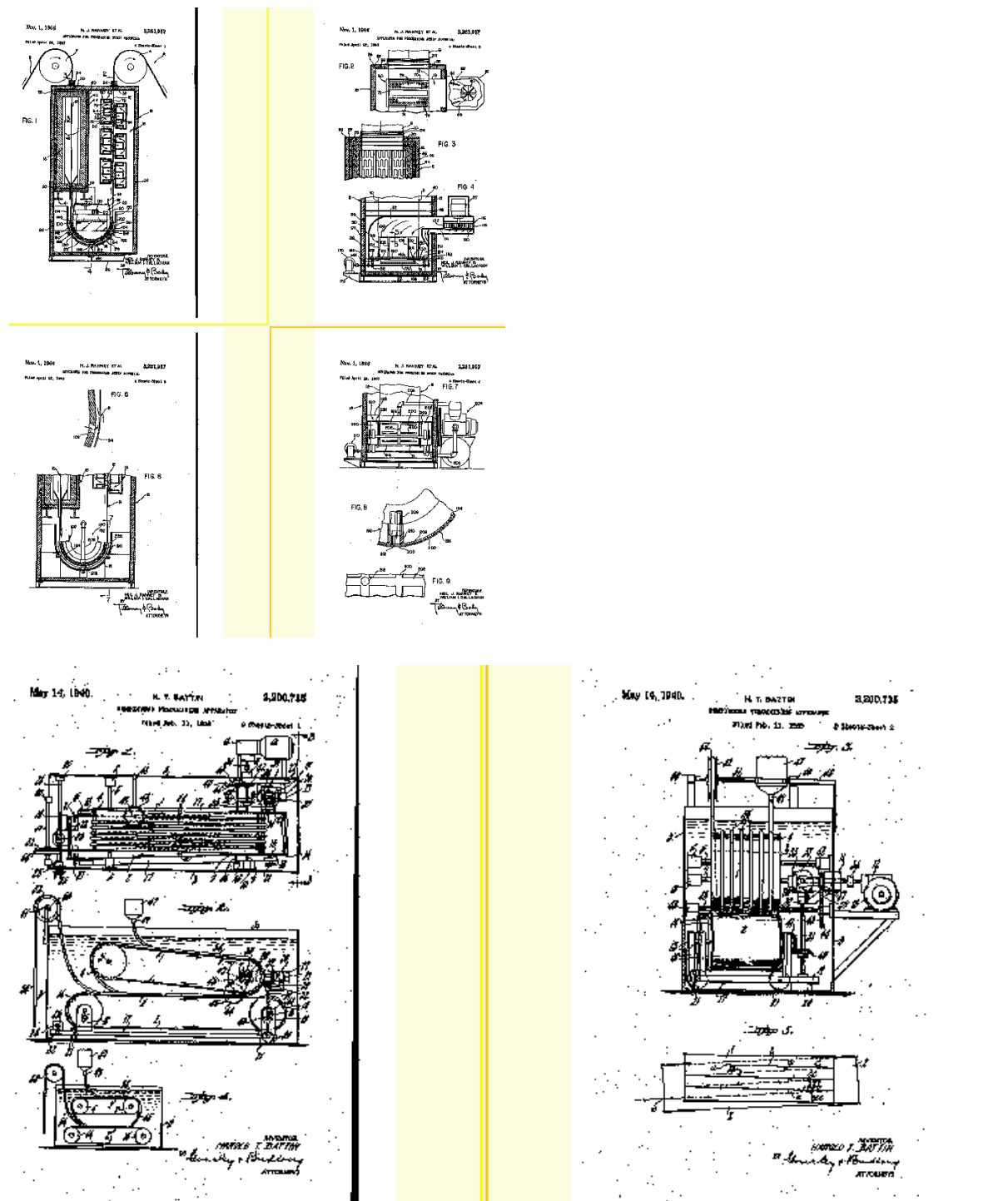
**Definition statement**

This place covers:



INVENTORS  
 RICHARD R. SPENCER  
 BY WILLIAM C. PENNY  
*William C. Penny, Esq.*  
 Attorneys

U.S. Patent  
 Sep. 21, 1993  
 Sheet 1 of 4  
 5,246,752  
 Jan. 22, 1974  
 Filed Dec. 21, 1970  
 METHOD AND APPARATUS FOR FORMING THINWALLED TUBULAR ARTICLES  
 R. R. SPENCER ET AL.  
 3,787,552  
 2 Sheets-Sheet 1



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

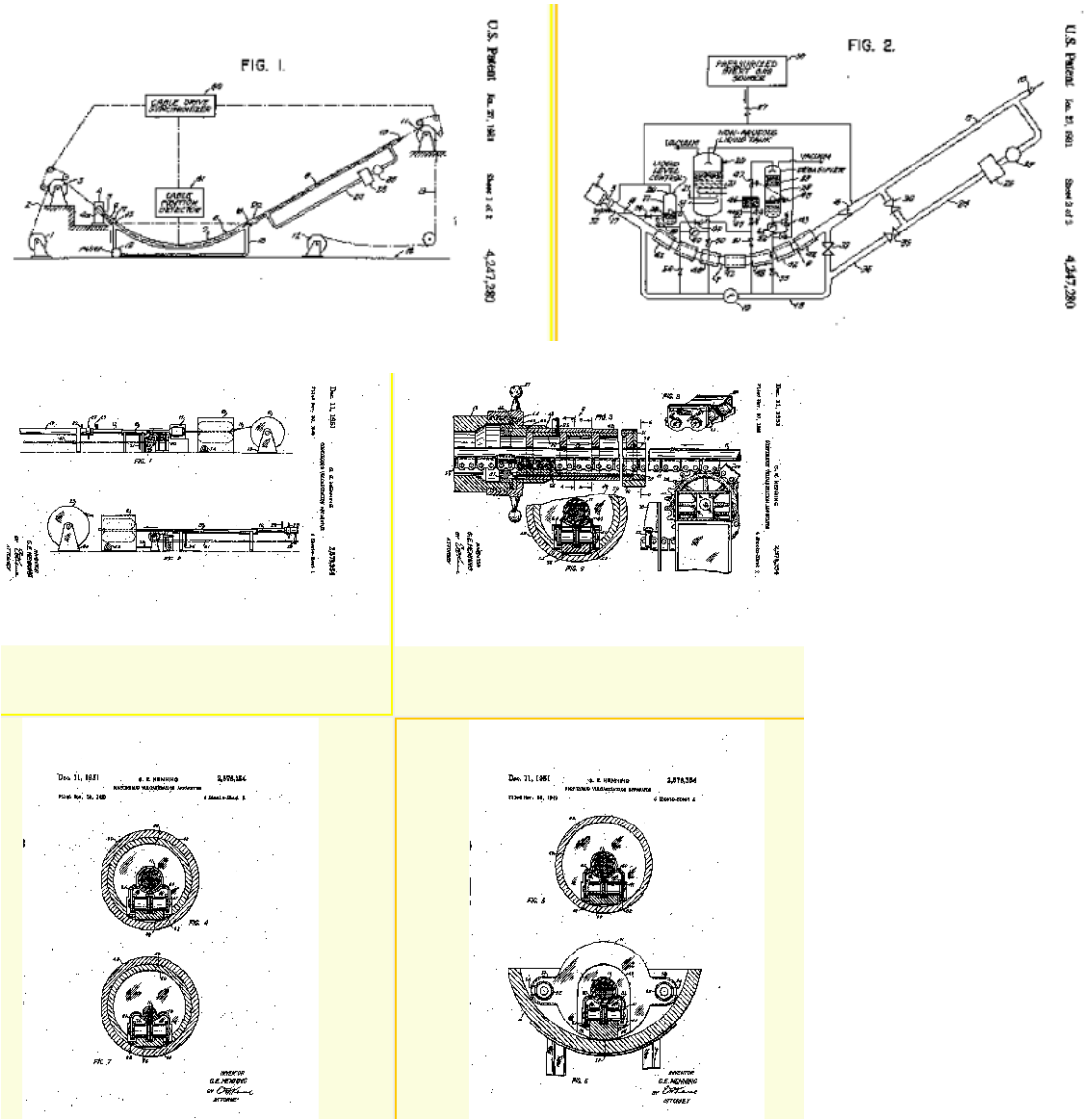
Extrusion moulding; heating the stream of extruded material	<a href="#">B29C 48/91</a>
---	----------------------------

B29C 35/065

{in long tubular vessels}

Definition statement

This place covers:



B29C 35/08

by wave energy or particle radiation {(B29C 64/00, B29C 71/04 take precedence)}

References

Informative references

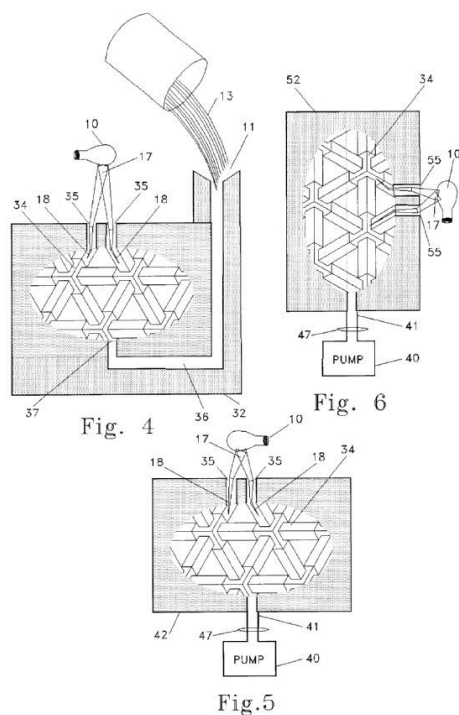
Attention is drawn to the following places, which may be of interest for search:

Using wave energy for welding	<a href="#">B29C 65/14</a>
Using laser for welding	<a href="#">B29C 65/16</a>

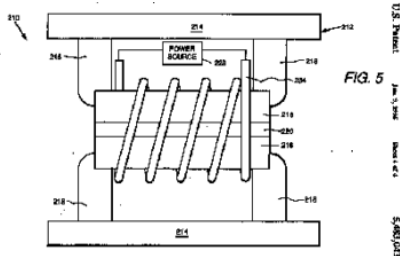
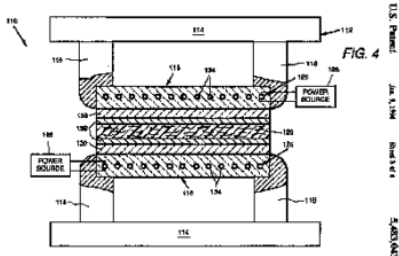
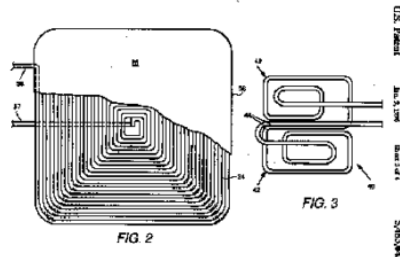
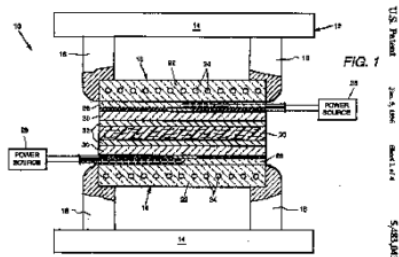
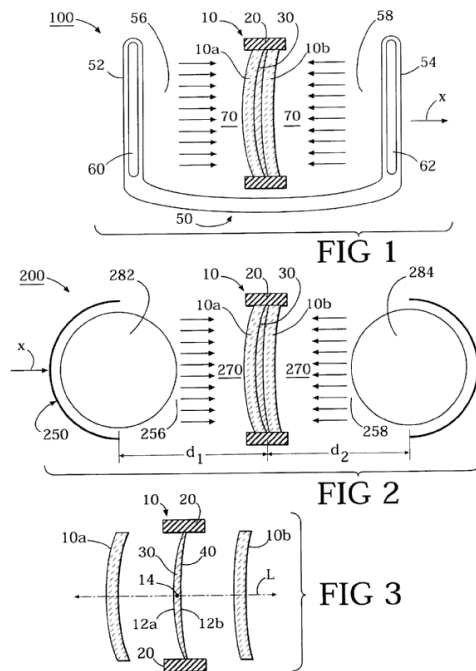
Using induction heating for welding	<a href="#">B29C 65/3656</a> , <a href="#">B29C 65/36</a>
Dental auxiliary appliances, apparatus for curing resin by radiation	<a href="#">A61C 19/003</a>
Chemical, physical or physico-chemical processes in general, employing particle radiation or gamma-radiation	<a href="#">B01J 19/081</a>
Chemical, physical or physico-chemical processes in general, employing electromagnetic waves	<a href="#">B01J 19/12</a>
Producing optical elements, curing the lens material	<a href="#">B29D 11/00442</a>
Processes of treating or compounding macromolecular substances, treatment by wave energy or particle radiation	<a href="#">C08J 3/28</a>
Irradiation devices	<a href="#">G21K 5/00</a>
Induction heating	<a href="#">H05B 6/02</a>

**B29C 35/0805****{using electromagnetic radiation}****Definition statement***This place covers:*

U.S. Patent Apr. 23, 2002 Sheet 2 of 3 US 6,375,887 B1



U.S. Patent Oct. 8, 2002 Sheet 1 of 2 US 6,462,884 B2



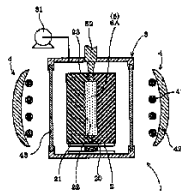
**B29C 35/0888**

{using transparant moulds}

**Definition statement***This place covers:*

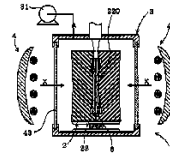
Patent Application Publication May 29, 2001 Sheet 1 of 10 US 2001/0101098 A1

FIG. 1



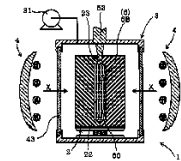
Patent Application Publication May 29, 2001 Sheet 2 of 10 US 2001/0101098 A1

FIG. 2



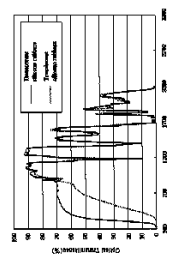
Patent Application Publication May 29, 2001 Sheet 3 of 10 US 2001/0101098 A1

FIG. 3



Patent Application Publication May 29, 2001 Sheet 4 of 10 US 2001/0101098 A1

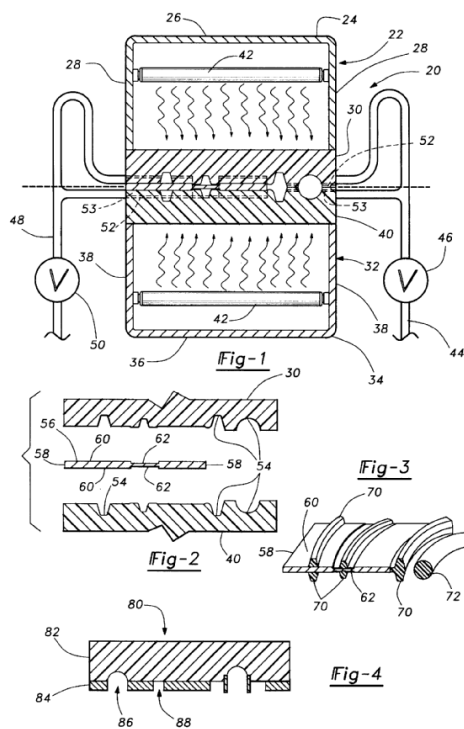
FIG. 4



U.S. Patent

Mar. 23, 1999

5,885,514



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Producing optical elements, curing the lens material	<a href="#">B29D 11/00442</a>
Photomechanical, e.g. photolithographic, production of textured or patterned surfaces, lithigraphic processes using patterning methods other than those involving the exposure to radiation, e.g. by stamping	<a href="#">G03F 7/0002</a>

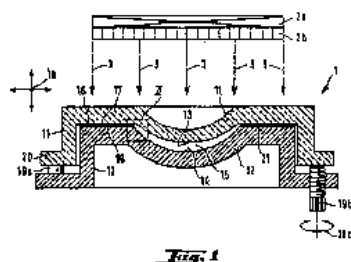
## B29C 35/0894

{provided with masks or diaphragms}

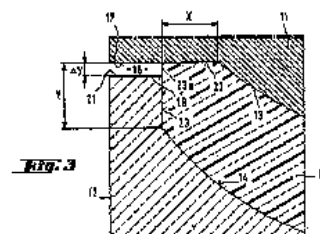
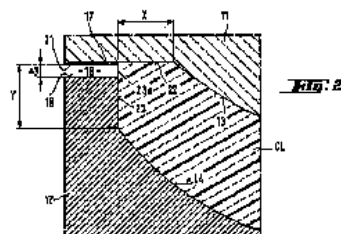
### Definition statement

This place covers:

U.S. Patent Oct. 5, 1904 Sheet 1 of 9 US 6,800,225 B1



U.S. Patent Oct. 5, 1904 Sheet 3 of 9 US 6,800,225 B1

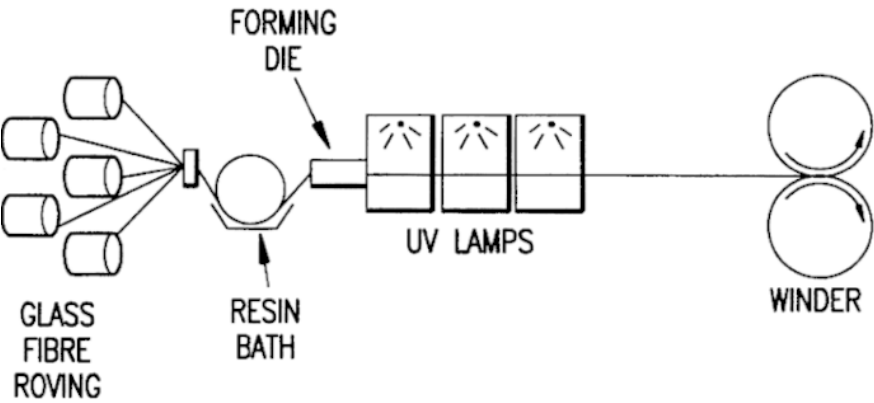




**B29C 35/10**  
**for articles of indefinite length**

**Definition statement**

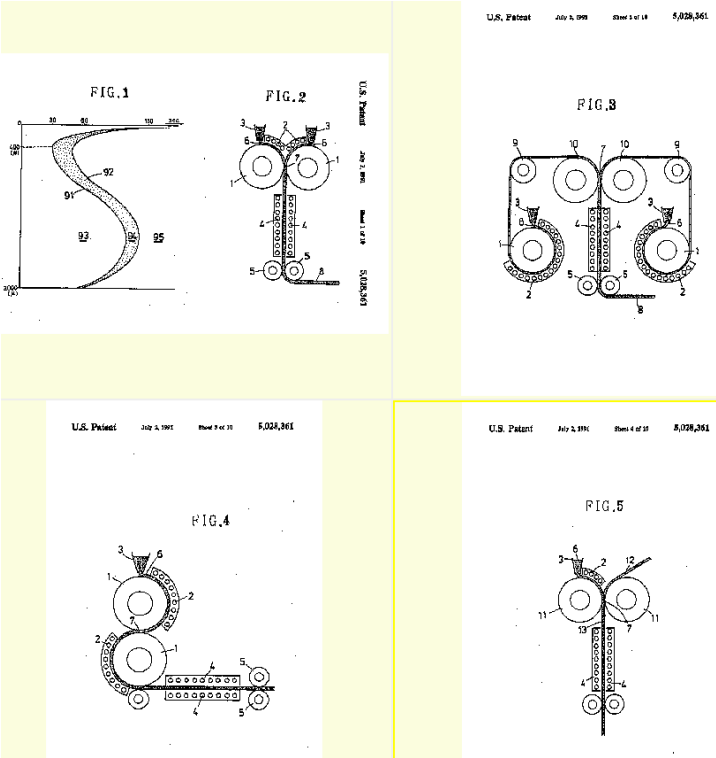
*This place covers:*



U.S. Patent

Dec. 23, 1997

5,700,417



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Extrusion moulding; heating the stream of extruded material

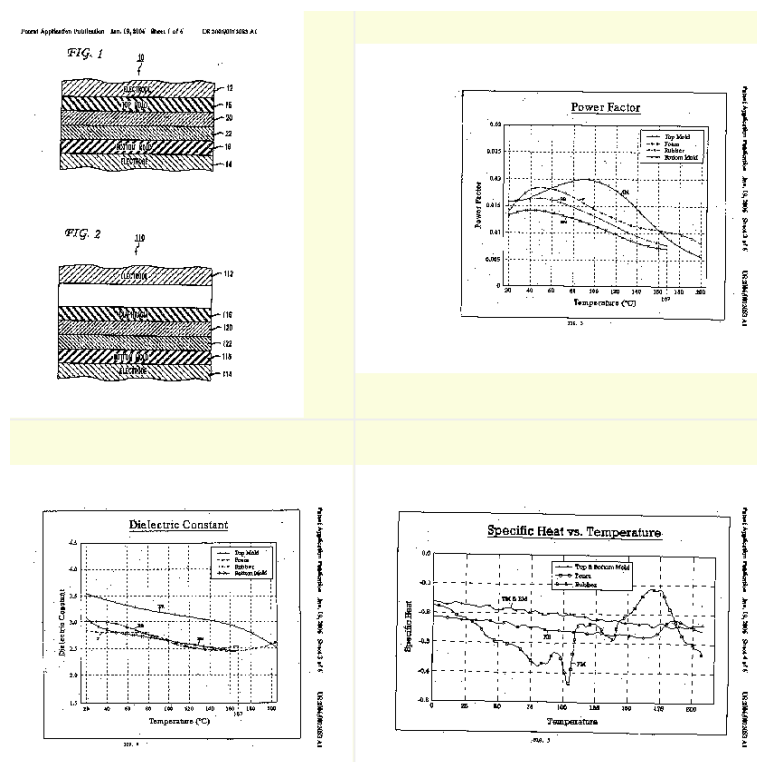
[B29C 48/91](#)

## B29C 35/12

### Dielectric heating

### Definition statement

This place covers:



U.S. Patent No. 11,301,262 Sept. 1, 2019 US 6,209,275 B2

U.S. Patent	Mar. 19, 2003	Serial 2,679	US 6,209,273 B1
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U.S. Patient	Mar. 19, 2012	Sec. 3 of 14	U.S. 4,568,275 B2
--------------	---------------	--------------	-------------------

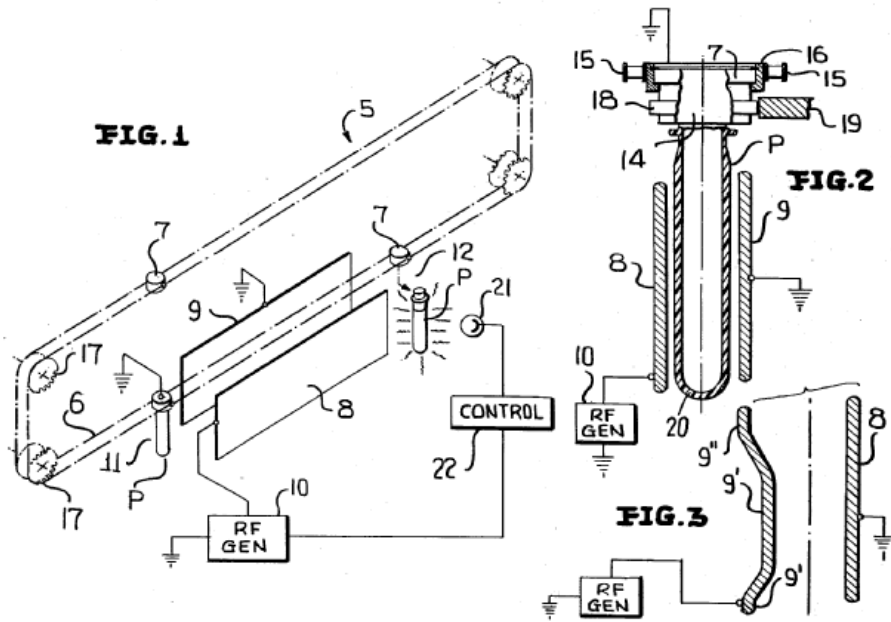
U.S. Patent Mar. 19, 2023 Sheet 4 of 10 US 6,839,275 B1

FIG. 3

FIG. 9

U.S. Patient May 5, 1996 Issue 5 of 6 4,921,546

77



U.S. Patent

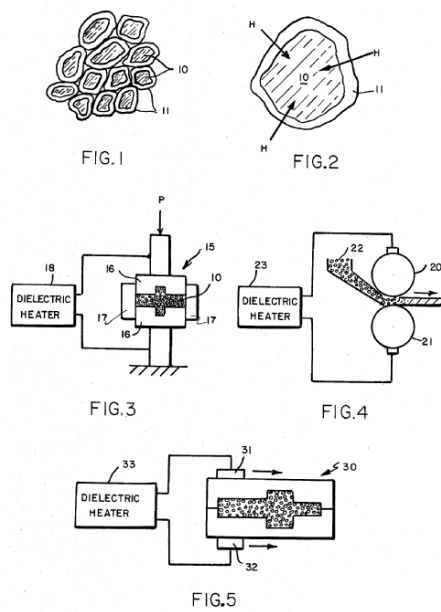
Aug. 2, 1983

4,396,816

U.S. Patent

May 19, 1981

4,268,465



PATENTED JUL 9 1974

3,823,293

SHEET 2 OF 2

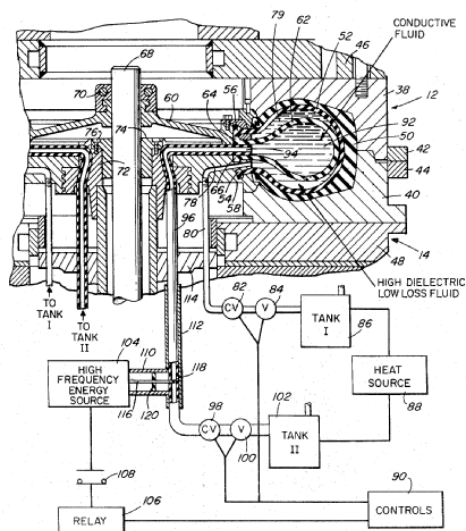


FIG. 2

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

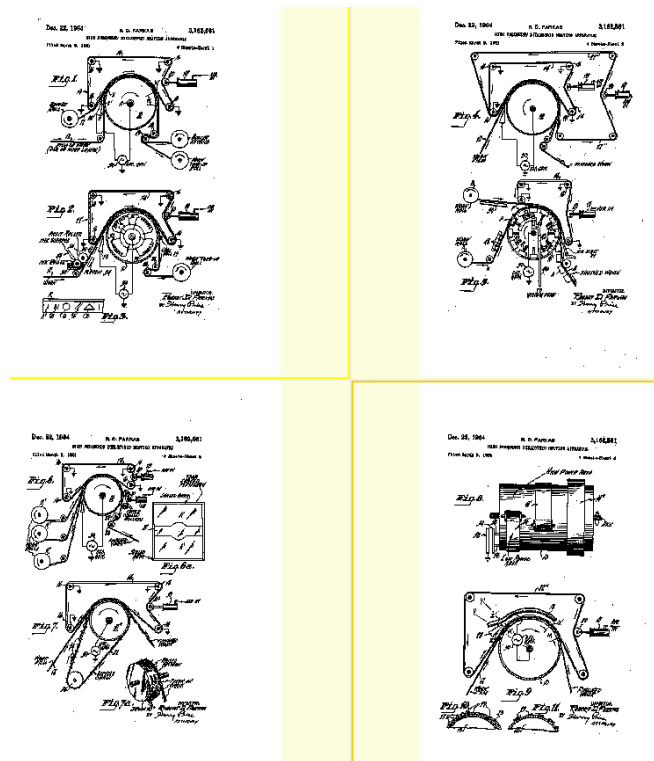
Moulds or cores with incorporated heating means for dielectric heating	<a href="#">B29C 33/08</a>
Dielectric heating for welding	<a href="#">B29C 65/04</a>

**B29C 35/14**

for articles of indefinite length

**Definition statement**

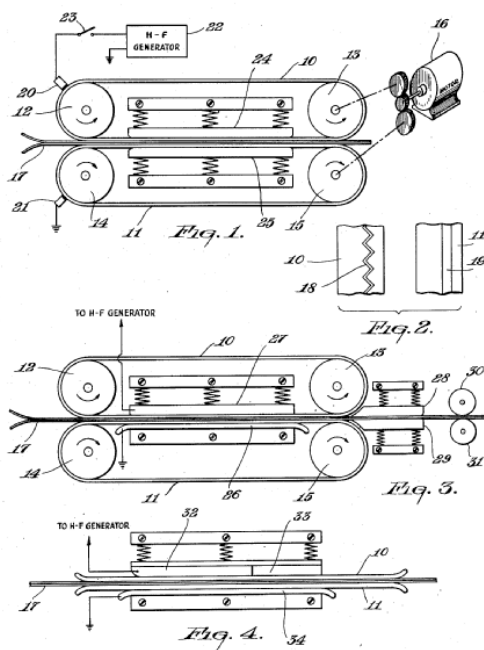
This place covers:



Dec. 21, 1954 J. GORDON 2,697,773

DIELECTRIC HEATING CONVEYER APPARATUS

Filed Aug. 16, 1951



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Extrusion moulding; heating the stream of extruded material	<a href="#">B29C 48/78</a>
---	----------------------------

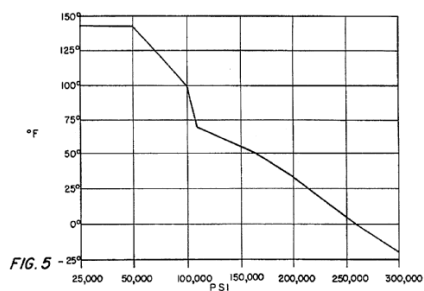
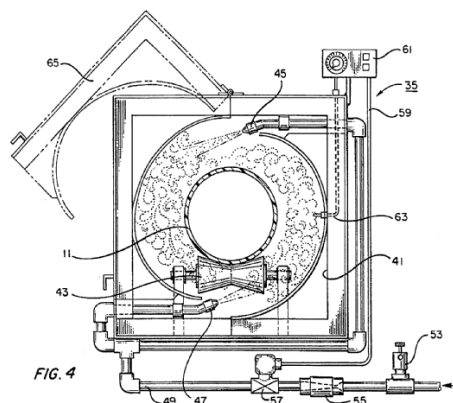
## B29C 35/16

Cooling {(cooling extruded material [B29C 48/911](#); cooling preforms for blow moulding [B29C 49/6427](#); cooling blown articles [B29C 49/66](#); cooling tyres during post cure inflation [B29D 30/0643](#))}

## Definition statement

This place covers:

U.S. Patent May 6, 1997 Sheet 2 of 2 5,626,801



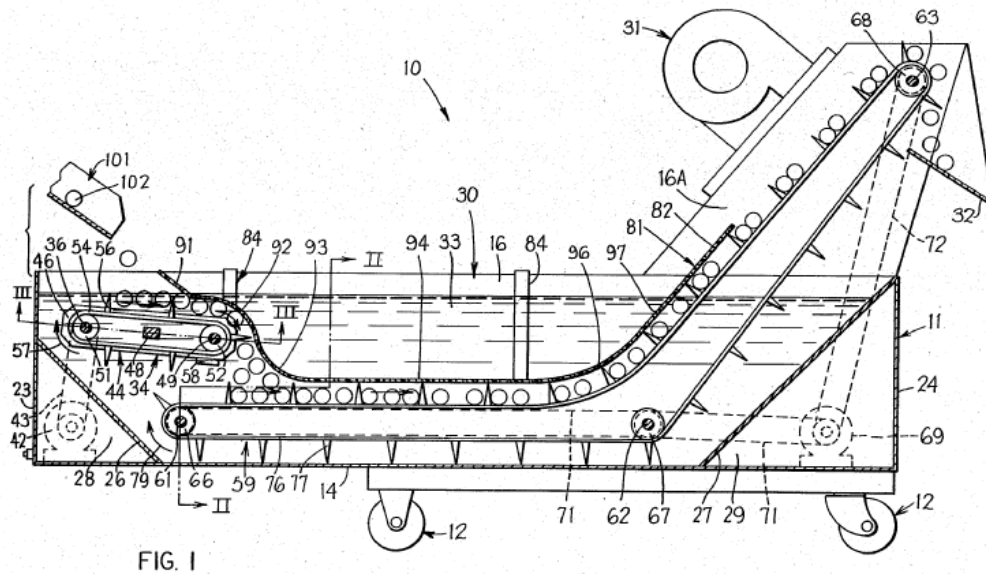


FIG. 1

U.S. Patent Feb. 4, 1986 Sheet 1 of 3 4,567,906

## References

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Moulds or cores with incorporated heating or cooling means	<a href="#">B29C 33/02</a>
Extrusion moulding, cooling the stream of extruded material	<a href="#">B29C 48/911</a>
Blow-moulding, thermal conditioning of preforms by cooling hot or molten preforms	<a href="#">B29C 49/6427</a>
Blow-moulding; cooling by refrigerant introduced into the blown article	<a href="#">B29C 49/66</a>

**B29C 37/00**

**Component parts, details, accessories or auxiliary operations, not covered by group [B29C 33/00](#) or [B29C 35/00](#)**

### Definition statement

*This place covers:*

## Methods and processes for removing articles from the mould,

Applying surface layers to moulded articles during moulding, e.g. in mould coating,

### Methods for compensating volume or shape change during moulding,

Method for degassing moulded articles during moulding (e.g. draining off gas during moulding),

Methods wherein separating agents are used during or after moulding,

### Methods for obtaining anchoring effects between layers during moulding,

### Method for trouble-shooting during starting or stopping moulding apparatus,

## Methods for deburring or deflashing moulded articles.



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

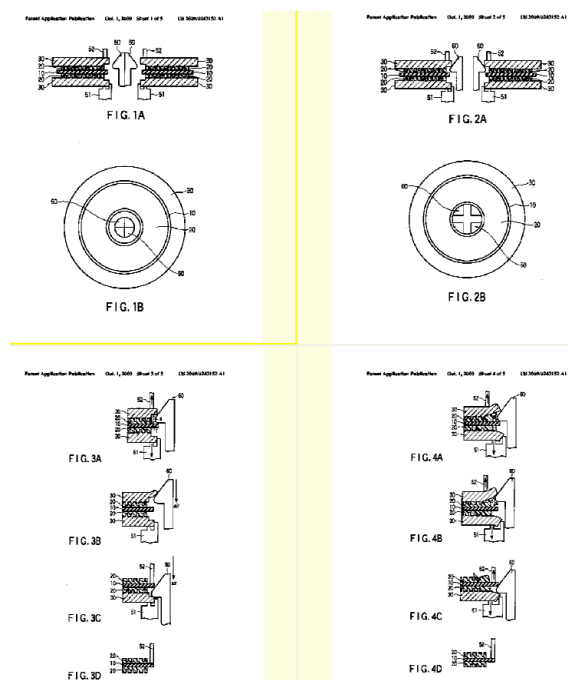
measuring or controlling heating, curing	<a href="#">B29C 35/0294</a>
measuring, controlling or regulating casting	<a href="#">B29C 39/44</a>
measuring, controlling or regulating moulding by coating	<a href="#">B29C 41/52</a>
measuring, controlling or regulating compression moulding	<a href="#">B29C 43/58</a>
measuring, controlling or regulating foaming	<a href="#">B29C 44/60</a>
dehumidifying moulds during injection moulding	<a href="#">B29C 45/1701</a>
measuring, controlling or regulating injection moulding	<a href="#">B29C 45/76</a>
detecting absence or presence of articles during injection moulding after ejection	<a href="#">B29C 45/7626</a>
measuring, controlling or regulating extrusion	<a href="#">B29C 48/92</a>
measuring, controlling or regulating blow moulding	<a href="#">B29C 49/78</a>
measuring, controlling or regulating thermoforming	<a href="#">B29C 51/46</a>
detecting absence or presence of articles during welding	<a href="#">B29C 66/8746</a>

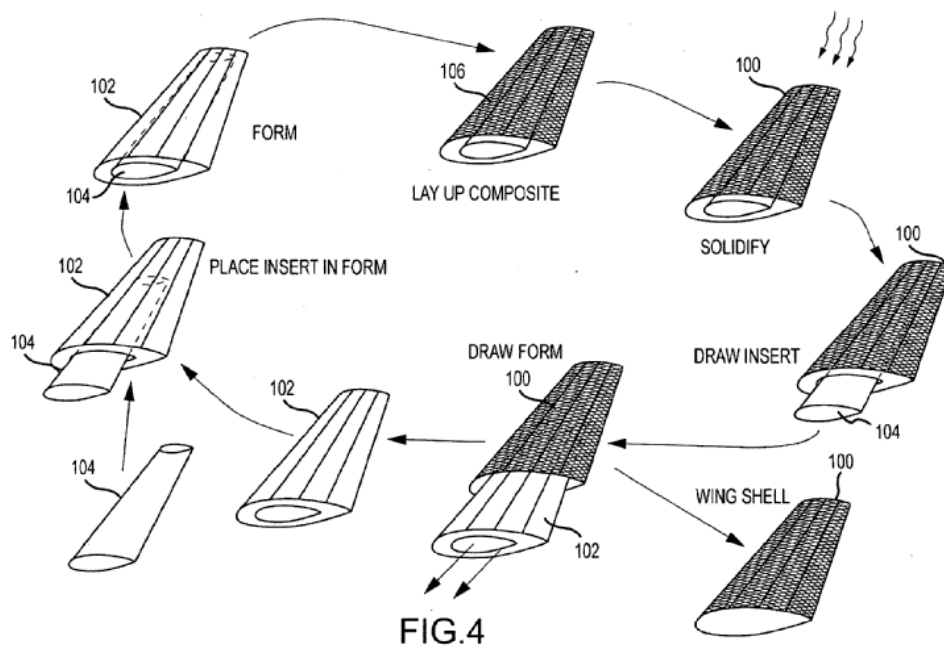
## B29C 37/0003

{Discharging moulded articles from the mould (constructions for removing the articles [B29C 33/44](#))}

### Definition statement

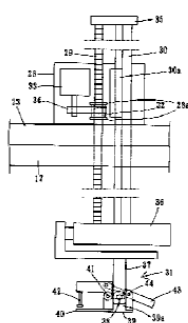
This place covers:





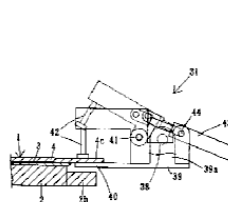
Patent Application Publication Jun. 13, 2007 Sheet 13 of 16 US 2007/0079668 A1

FIG. 11



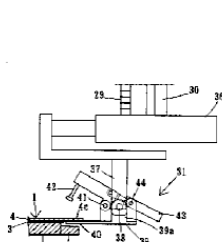
Patent Application Publication Jun. 13, 2007 Sheet 14 of 16 US 2007/0079668 A1

FIG. 12



Patent Application Publication Jun. 13, 2007 Sheet 15 of 16 US 2007/0079668 A1

FIG. 13(A)



Patent Application Publication Jun. 13, 2007 Sheet 16 of 16 US 2007/0079668 A1

FIG. 13(B)

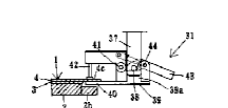
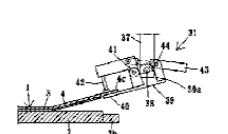
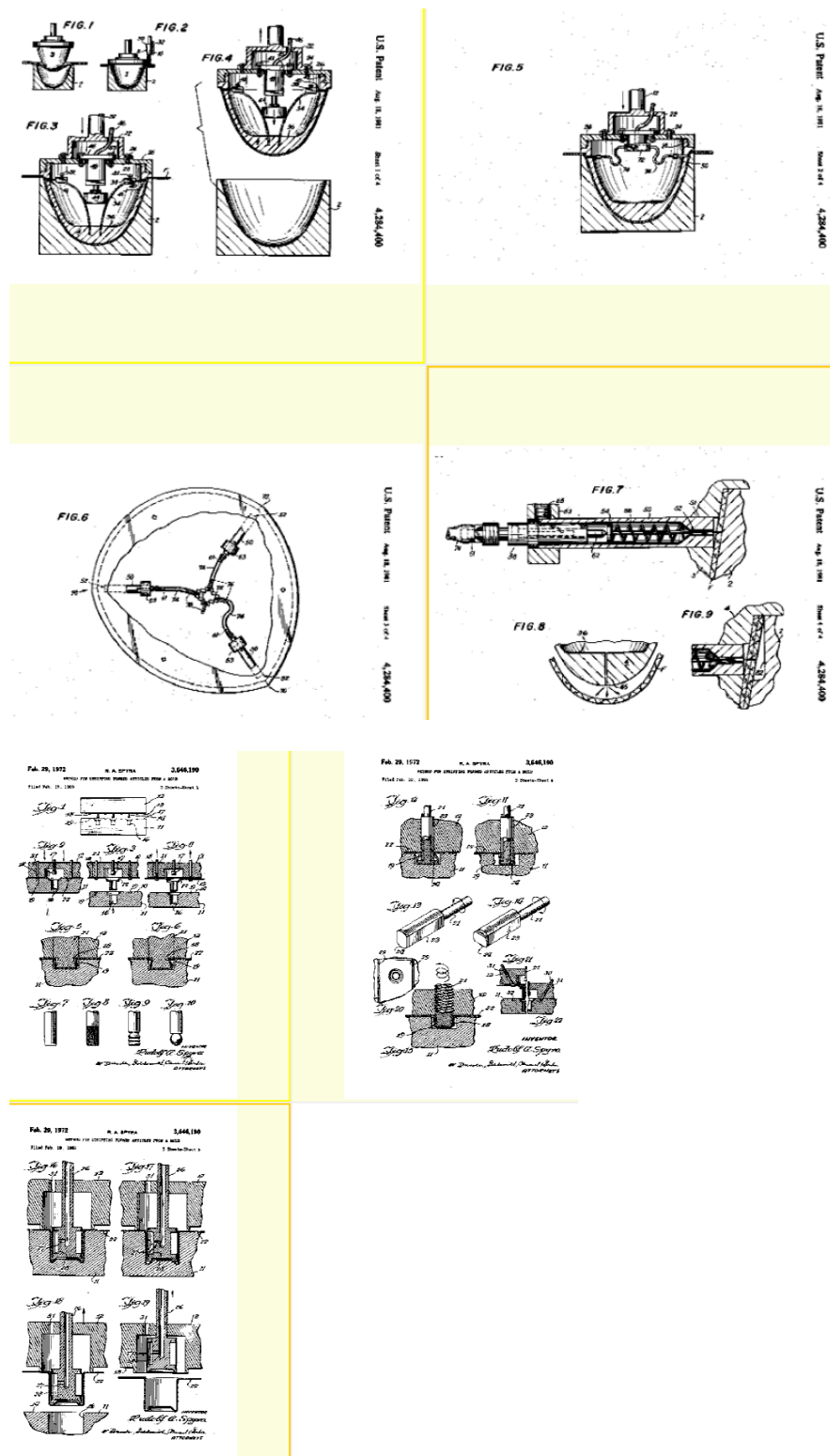


FIG. 13(C)





## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Discharging casting moulds	<a href="#">B29C 39/36</a>
Discharging coated moulds	<a href="#">B29C 41/42</a>

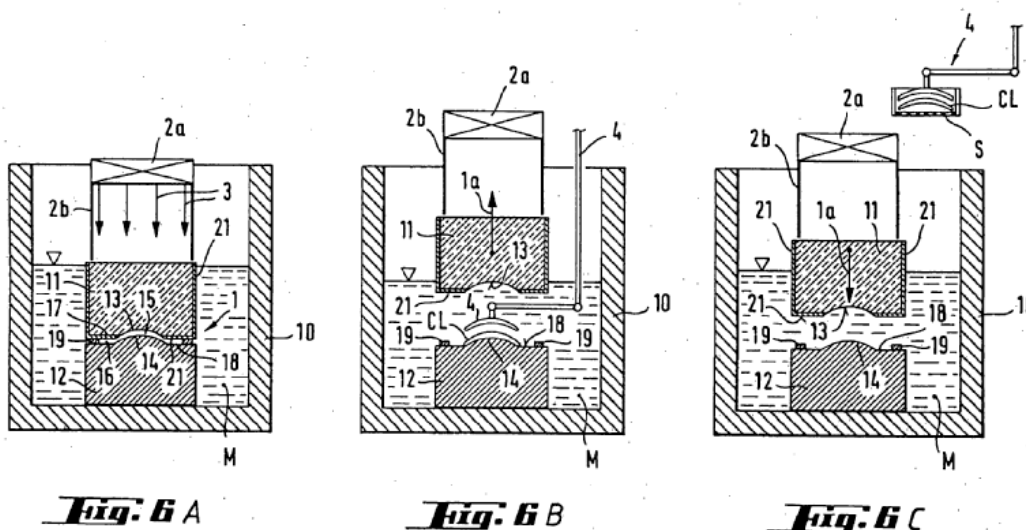
Discharging compression moulds	<a href="#">B29C 43/50</a>
Discharging injection moulds	<a href="#">B29C 45/40</a>
Discharging blow moulds	<a href="#">B29C 49/70</a>
Discharging thermoforming moulds	<a href="#">B29C 51/44</a>
Demoulding optical elements, e.g. lenses	<a href="#">B29D 11/00192</a>
Producing tyres, loading or unloading tyres presses	<a href="#">B29D 30/0603</a>

## B29C 37/0007

{using means operable from outside the mould for moving between mould parts, e.g. robots}

### Definition statement

*This place covers:*



Patent Application Publication Apr. 16, 2008 Sheet 9 of 11 US 2008/064590 A1

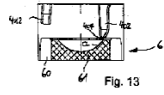


Fig. 13

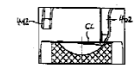


Fig. 14

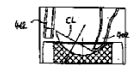


Fig. 15

Patent Application Publication Apr. 16, 2008 Sheet 10 of 11 US 2008/064590 A1

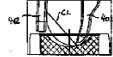


Fig. 16



Fig. 17



Fig. 18



Fig. 19

Patent Application Publication Apr. 16, 2008 Sheet 11 of 11 US 2008/064590 A1

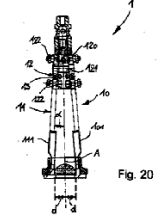


Fig. 20

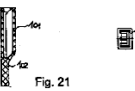


Fig. 21

Fig. 22

U.S. Patent Jan. 30, 1996 Sheet 1 of 2 5,769,833

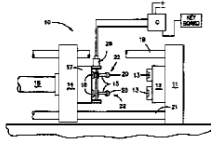


FIG-1

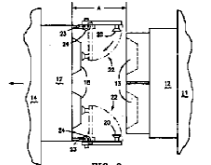


FIG-2

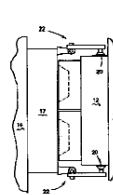


FIG-4

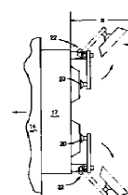


FIG-3

U.S. Patent Jan. 30, 1996 Sheet 1 of 2 5,769,833

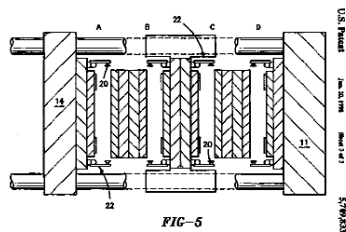
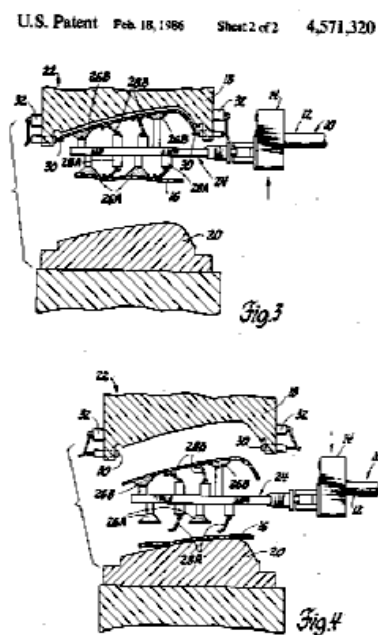
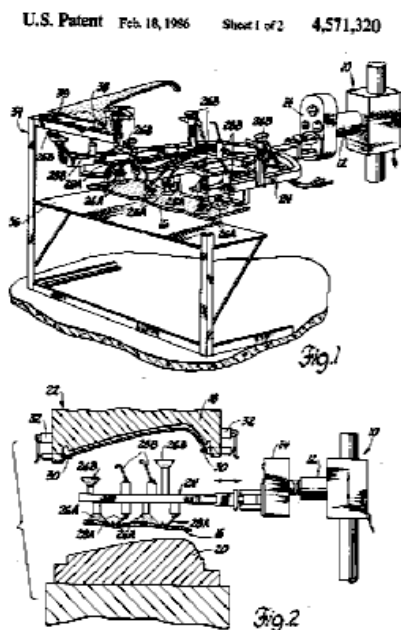


FIG-5

U.S. Patent Jan. 30, 1996 Sheet 1 of 2 5,769,833



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Discharging injection moulds, using means movable from outside the mould
--

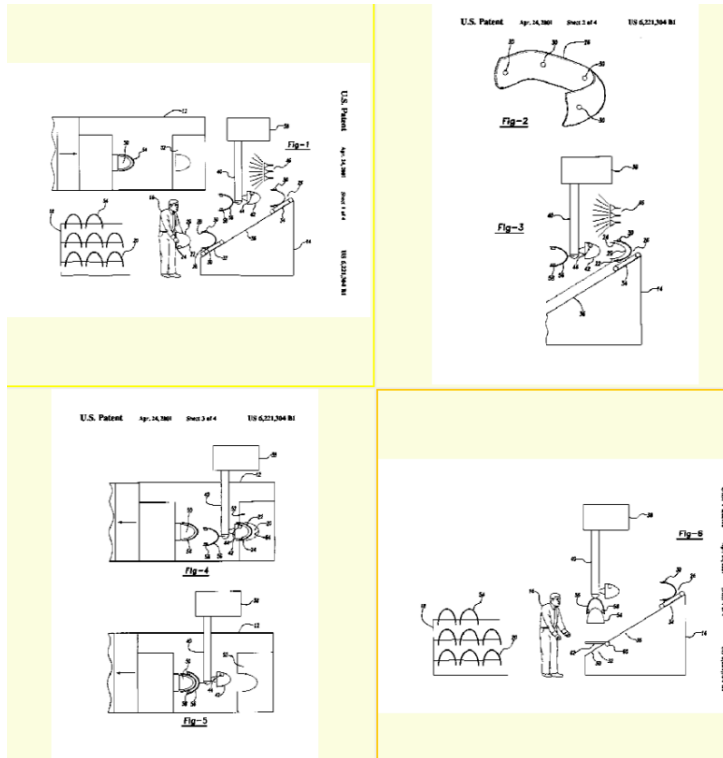
<a href="#">B29C 45/42</a>
----------------------------

**B29C 37/001**

{combined with means for loading preforms to be moulded or inserts, e.g. preformed layers}

**Definition statement**

*This place covers:*



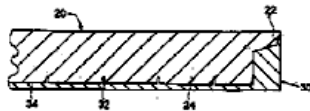
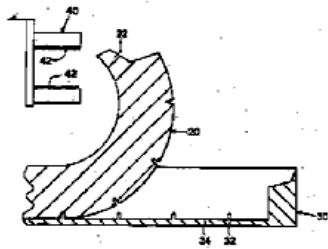
**B29C 37/0014**

{by flexibly or permanently deforming undercut portions of the articles}

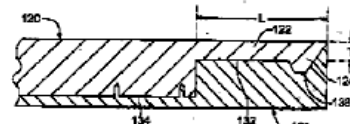
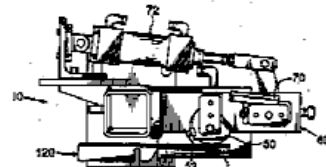
**Definition statement**

*This place covers:*

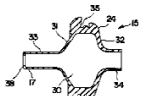
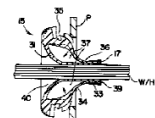
Patent Application Publication May 5, 2011 Sheet 1 of 3 US 2011/0101568 A1

**FIG. 1****FIG. 2**

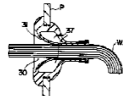
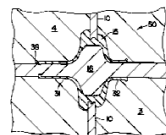
Patent Application Publication May 5, 2011 Sheet 2 of 3 US 2011/0101568 A1

**FIG. 3****FIG. 4**

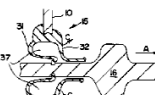
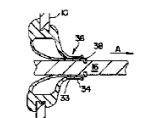
U.S. Patent Jan. 6, 2009 Sheet 1 of 11 US 6,171,539 B1

**FIG. 1**  
PRIOR ART**FIG. 2**  
PRIOR ART

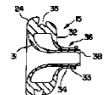
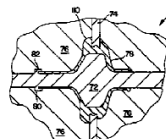
U.S. Patent Jan. 6, 2009 Sheet 2 of 11 US 6,171,539 B1

**FIG. 3**  
PRIOR ART**FIG. 4**

U.S. Patent Jan. 6, 2009 Sheet 3 of 11 US 6,171,539 B1

**FIG. 5****FIG. 6**

U.S. Patent Jan. 6, 2009 Sheet 4 of 11 US 6,171,539 B1

**FIG. 7****FIG. 8**



U.S. Patent Jan. 9, 2007 Sheet 7 of 11 US 6,171,539 B1

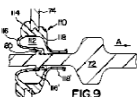


FIG. 9

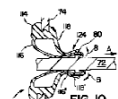


FIG. 10

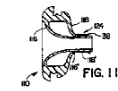


FIG. 11

U.S. Patent Jan. 9, 2007 Sheet 8 of 11 US 6,171,539 B1

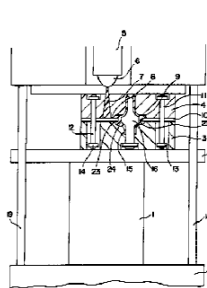


FIG. 12

U.S. Patent Jan. 9, 2007 Sheet 9 of 11 US 6,171,539 B1

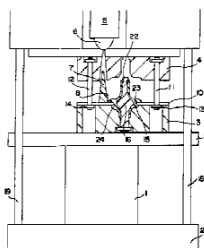


FIG. 13

U.S. Patent Jan. 9, 2007 Sheet 10 of 11 US 6,171,539 B1

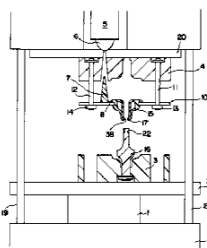
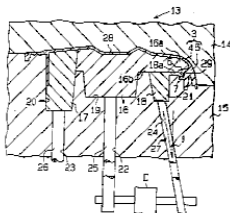


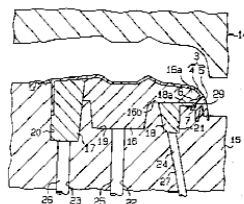
FIG. 14

Fig. 1 (a)



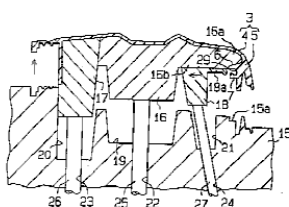
U.S. Patent Apr. 26, 1995 Sheet 1 of 10 \$,095,621

Fig. 1 (b)



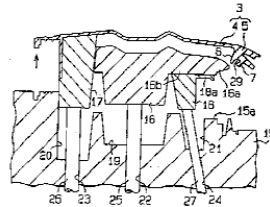
U.S. Patent Apr. 26, 1995 Sheet 1 of 10 \$,095,621

Fig. 2

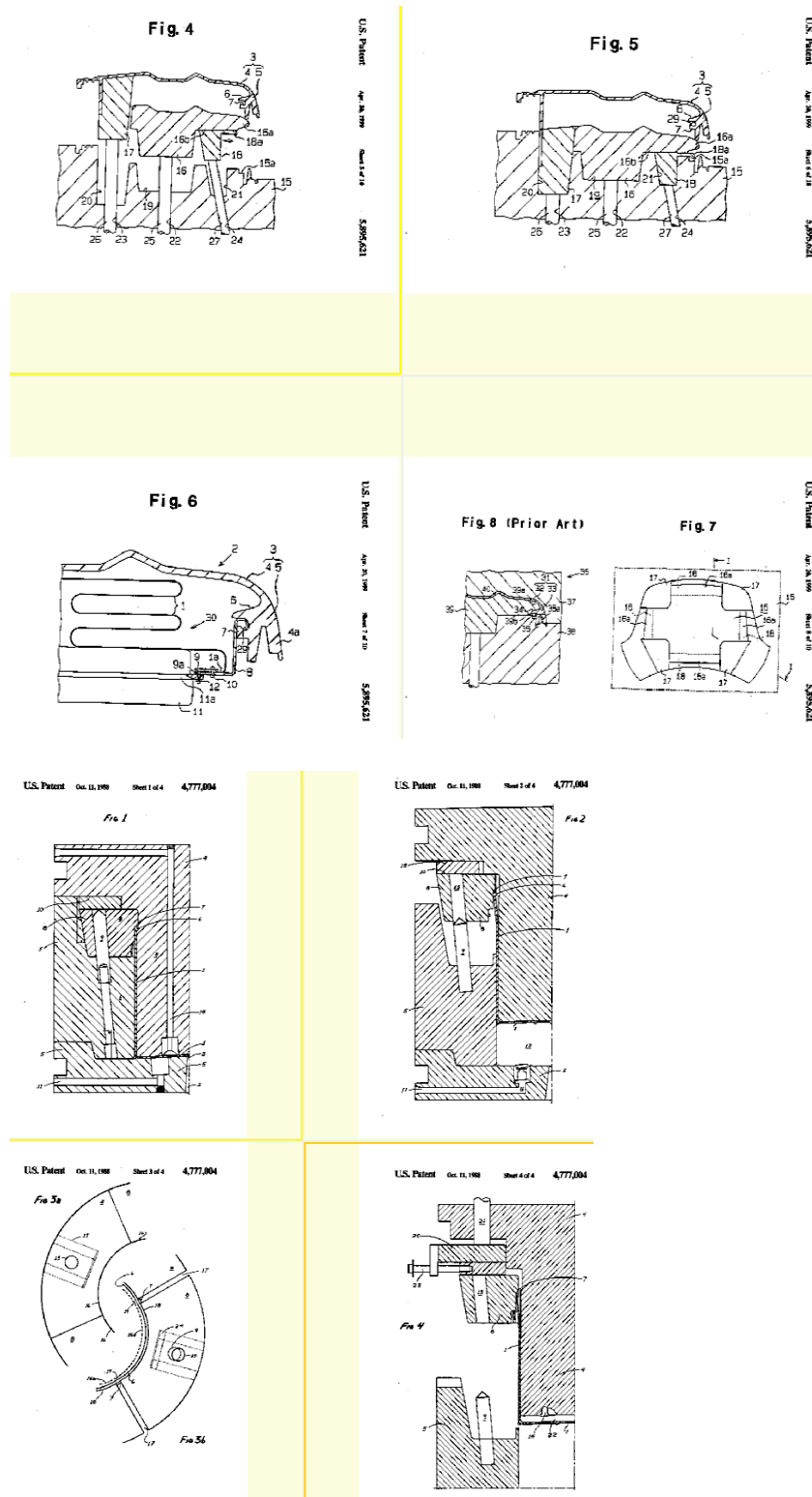


U.S. Patent Apr. 26, 1995 Sheet 2 of 10 \$,095,621

Fig. 3



U.S. Patent Apr. 26, 1995 Sheet 3 of 10 \$,095,621



## References

### Informative references

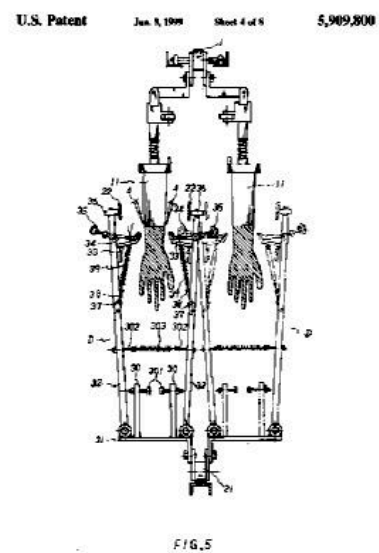
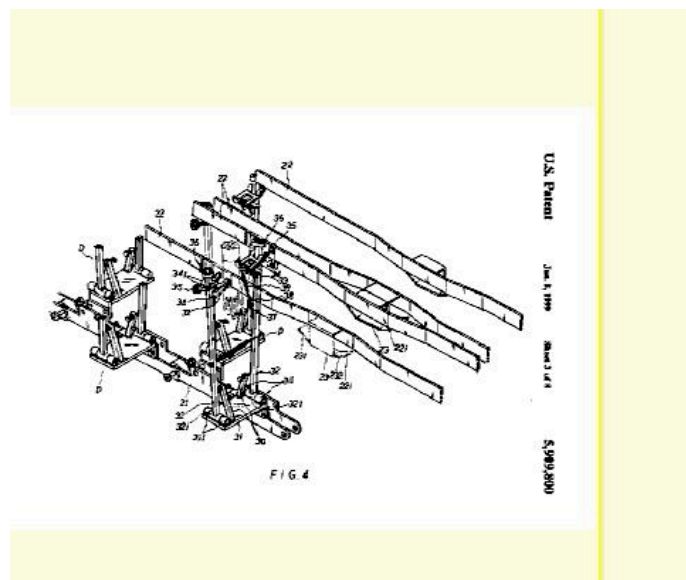
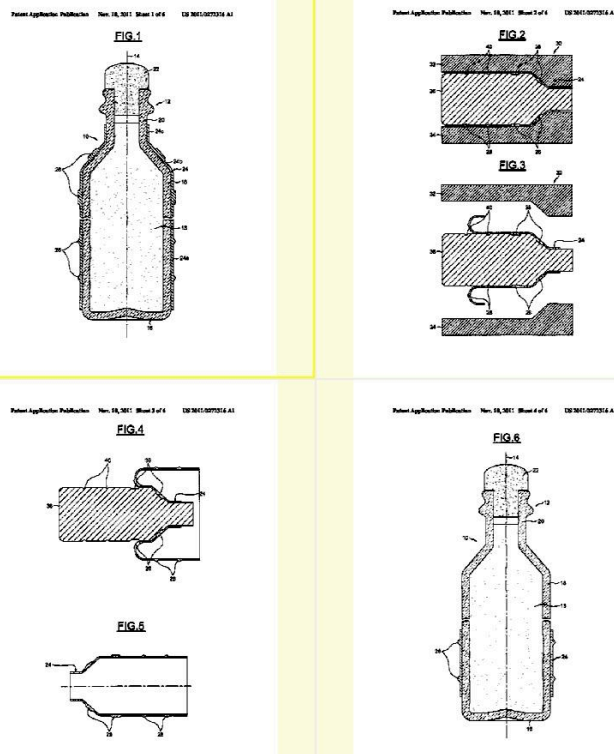
Attention is drawn to the following places, which may be of interest for search:

Discharging injection moulds, by flexible movement of undercut article

[B29C 45/4407](#)

**B29C 37/0017**

{by stripping articles from mould cores}

**Definition statement***This place covers:*

## Definition statement

U.S. Patent Jan. 8, 1999 Sheet 5 of 6 5,909,800

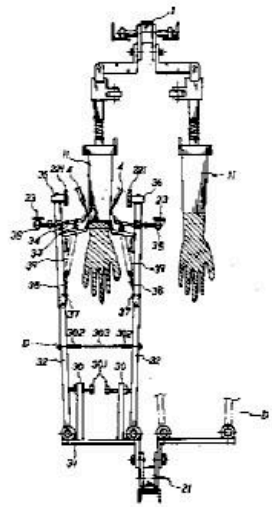


FIG. 6

U.S. Patent Jan. 8, 1999 Sheet 6 of 6 5,909,800

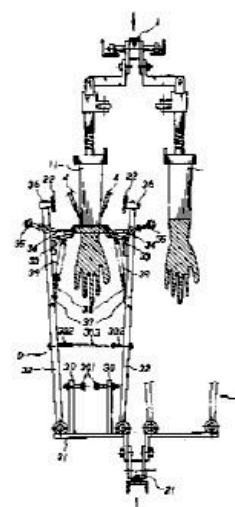
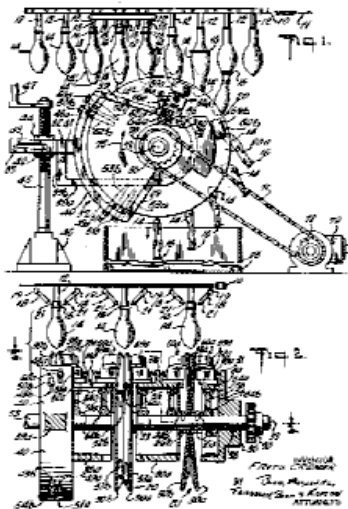
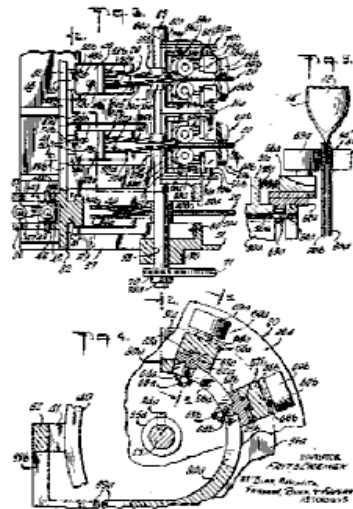


FIG. 7

March 21, 1967 P. CHAMBERLAIN 3,369,732  
ATTACHMENT FOR STRIPPING ARTICLES FROM TONGS  
Filed Oct. 13, 1963 2 Sheets-Sheet 1March 21, 1967 P. CHAMBERLAIN 3,369,732  
ATTACHMENT FOR STRIPPING ARTICLES FROM TONGS  
Filed Oct. 13, 1963 2 Sheets-Sheet 2

## References

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds or cores with means for the removal of articles; with mechanical ejector or drive means for stripping articles from a mould core, e.g. using stripper plates

[B29C 33/444](#)

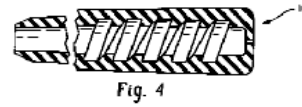
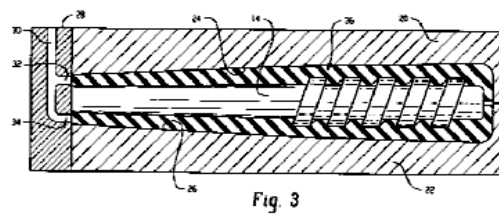
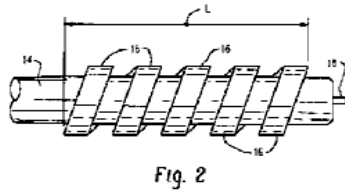
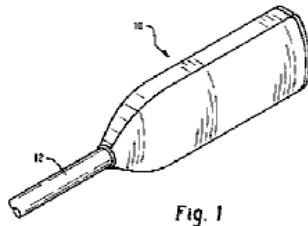
**B29C 37/0021**

{and using a rotating movement to unscrew articles (in particular used in injection moulding [B29C 45/178](#))}

**Definition statement**

*This place covers:*

Patent Application Publication Apr. 9, 2009 Sheet 1 of 2 US 2009/0089972 A1



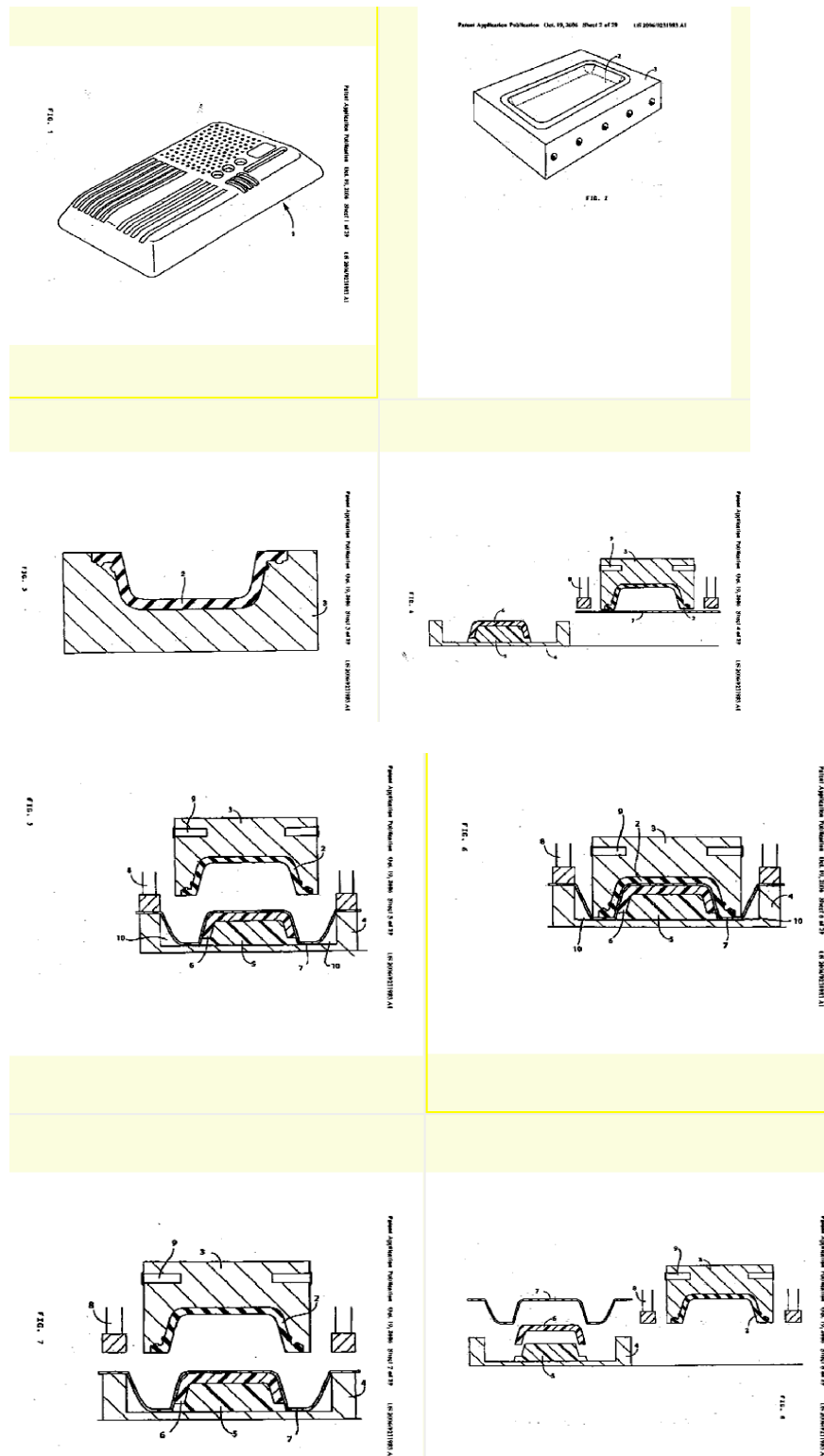
Patent Application Publication Apr. 9, 2009 Sheet 2 of 2 US 2009/0089972 A1

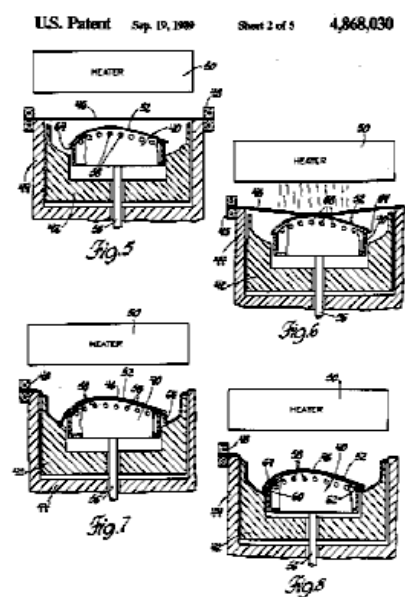
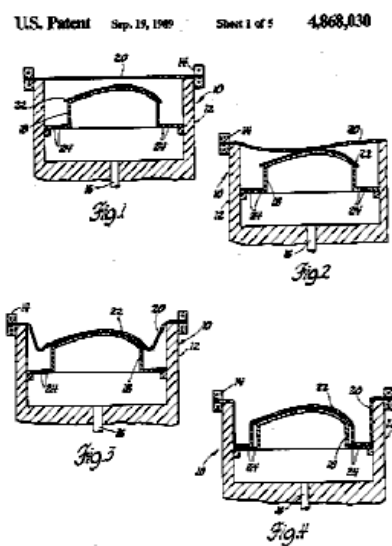
## B29C 37/0025

{Applying surface layers, e.g. coatings, decorative layers, printed layers, to articles during shaping, e.g. in-mould printing (moulding on preformed layers as inserts [B29C 70/68](#); applying fluent material to surfaces in general [B05](#))}

### Definition statement

*This place covers:*





## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

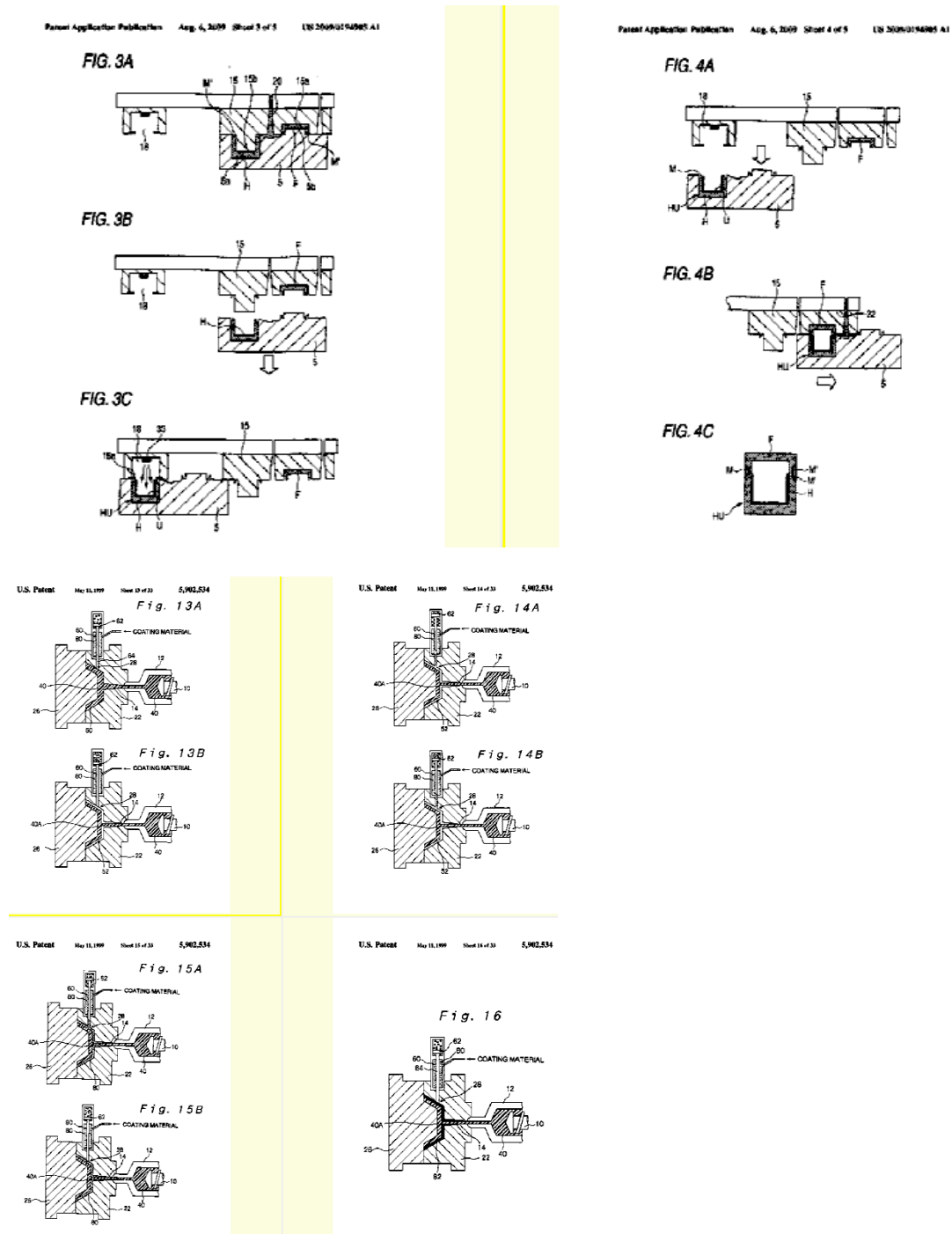
Compression moulding of definite length, incorporating preformed linings	<a href="#">B29C 43/183</a>
Injection moulding, incorporating preformed parts or layers, multilayered articles	<a href="#">B29C 45/14811</a>

**B29C 37/0028**

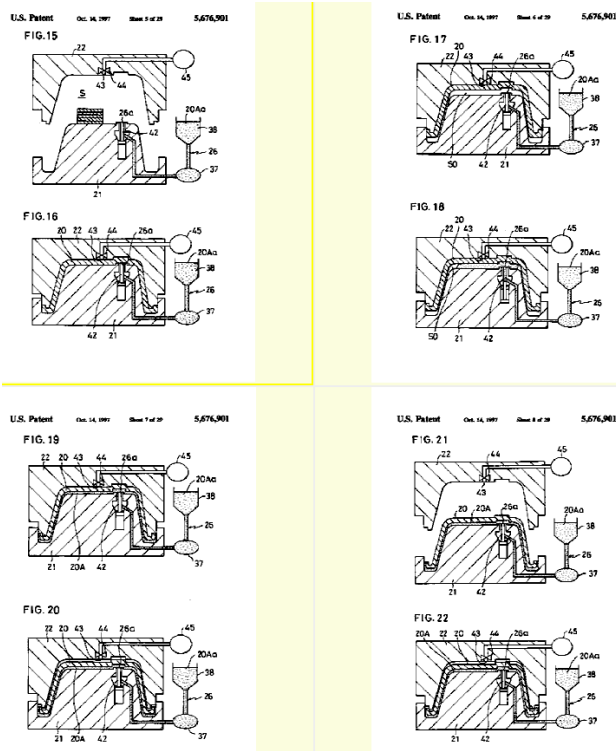
{In-mould coating, e.g. by introducing the coating material into the mould after forming the article}

**Definition statement**

*This place covers:*







## References

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

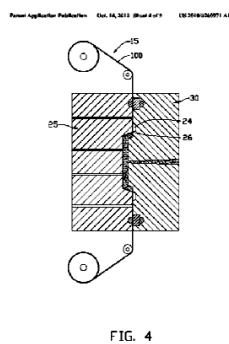
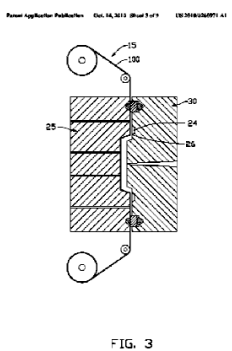
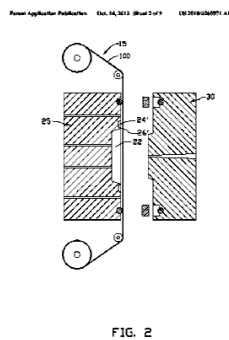
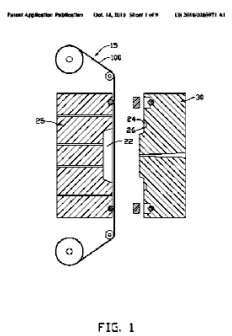
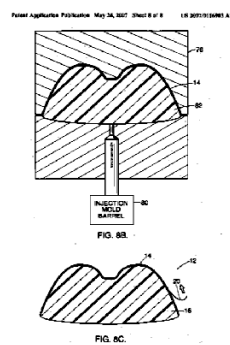
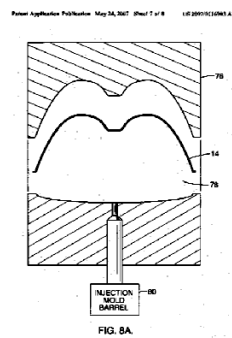
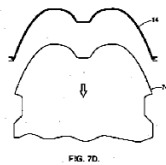
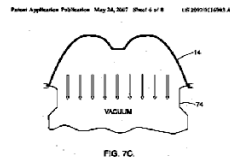
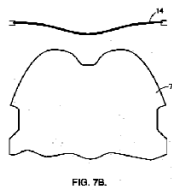
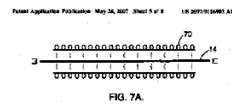
Injection moulding, making multilayered or multicoloured articles	<a href="#">B29C 45/16</a>
---	----------------------------

**B29C 37/0032**

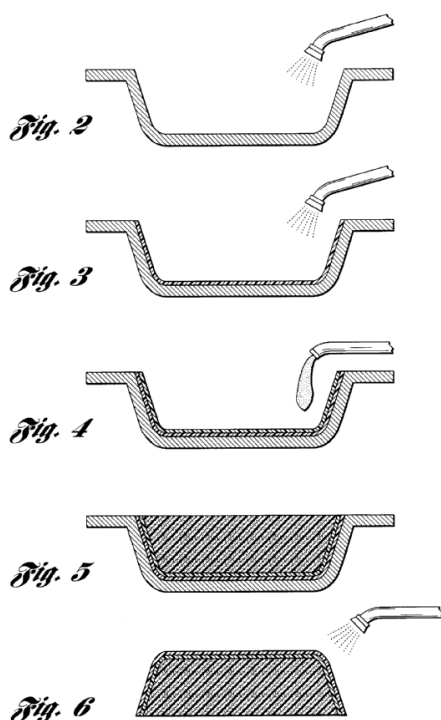
{the coating being applied upon the mould surface before introducing the moulding compound, e.g. applying a gelcoat ([B29C 44/14](#) and [B29C 44/32](#) take precedence)}

**Definition statement**

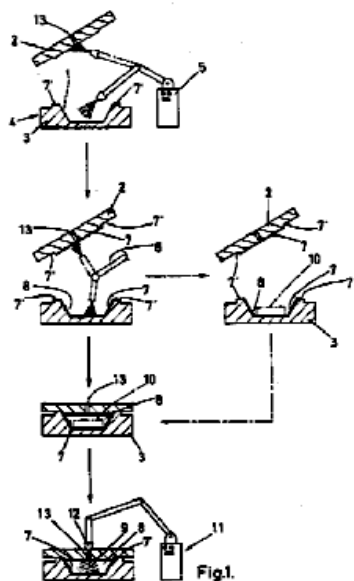
*This place covers:*



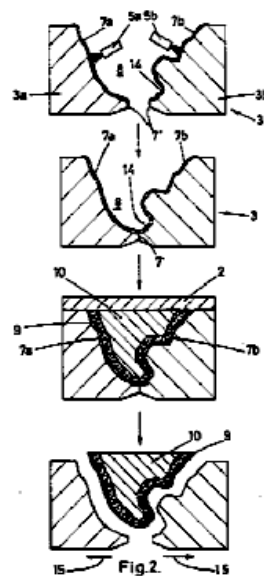
U.S. Patent Sep. 3, 2002 Sheet 2 of 3 US 6,444,303 B1



U.S. Patent May 26, 1992 Sheet 1 of 3 5,116,557



U.S. Patent May 26, 1992 Sheet 2 of 3 5,116,557



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping by coating a mould, making multilayered or multicoloured articles of definite length	<a href="#">B29C 41/22</a>
Injection moulding, making multilayered articles, applying surface layers inside the mould cavity, e.g. in mould coating (IMC)	<a href="#">B29C 45/1679</a>

**B29C 37/005****{Compensating volume or shape change during moulding, in general}****Definition statement***This place covers:*

Patent Application Publication Oct. 4, 2001 Sheet 1 of 7 US 2001/0026875 A1

FIG.1

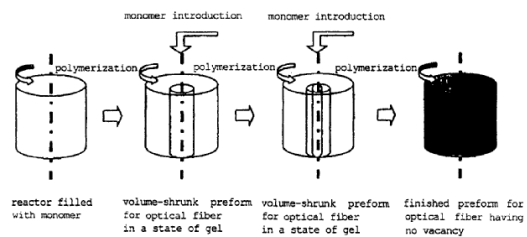
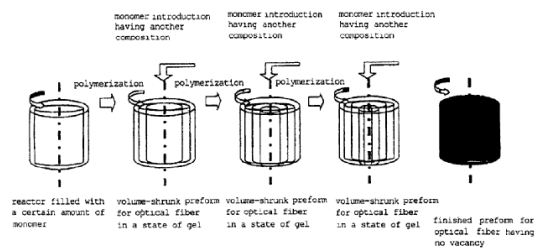


FIG.2

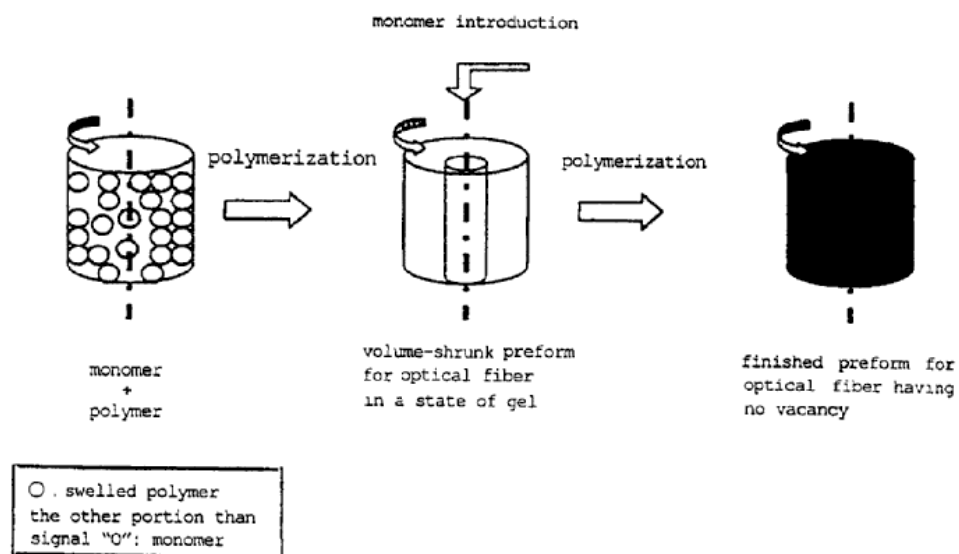


Patent Application Publication

Oct. 4, 2001 Sheet 2 of 7

US 2001/0026875 A1

FIG.3



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping by casting; compensating volume change, e.g. retraction	<a href="#">B29C 39/44</a>
Shaping by coating a mould or a core; compensating volume change, e.g. retraction	<a href="#">B29C 41/48</a>
Compression moulding, compensating volume change, e.g. retraction	<a href="#">B29C 43/54</a>

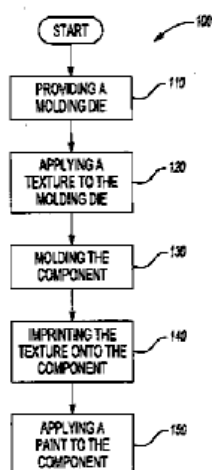
## B29C 37/0053

{Moulding articles characterised by the shape of the surface, e.g. ribs, high polish (mould construction therefor [B29C 33/42](#); surface shaping of articles [B29C 59/00](#); by incorporating filler in or near the surface [B29C 70/64](#))}

## Definition statement

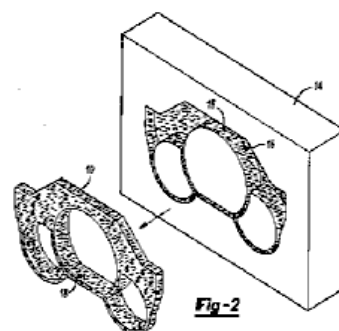
This place covers:

Patent Application Publication Sep. 16, 2009 Sheet 1 of 3 US 2009/0226619 A1



**Fig-1**

Patent Application Publication Sep. 16, 2009 Sheet 2 of 3 US 2009/0226619 A1



**Fig-2**



**Fig-3**

Patent Application Publication Oct. 9, 2008 (Sheet 3 of 10) US 2008/0246190 A1

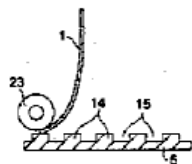


FIG. 3A

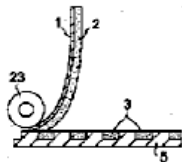


FIG. 3B

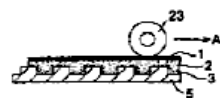


FIG. 3C

Patent Application Publication Oct. 9, 2008 (Sheet 4 of 10) US 2008/0246190 A1

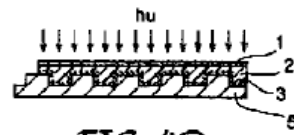


FIG. 4D

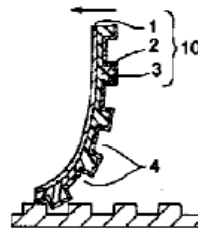


FIG. 4E

U.S. Patent

Mar. 31, 1998

5,732,477

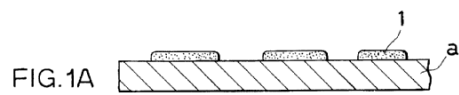


FIG. 1A

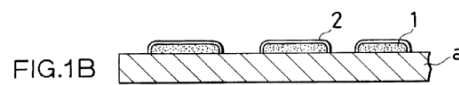


FIG. 1B

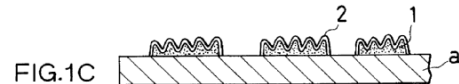


FIG. 1C



FIG. 1D

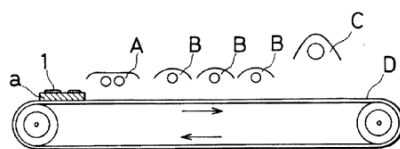
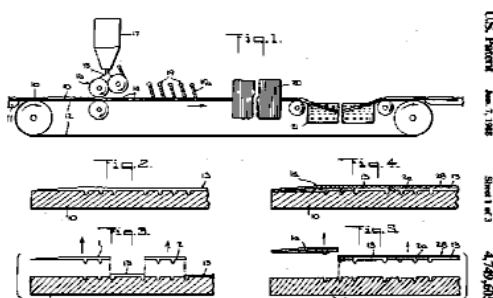
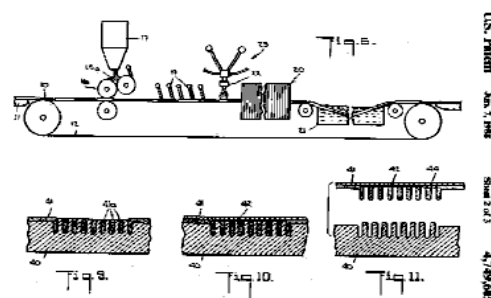


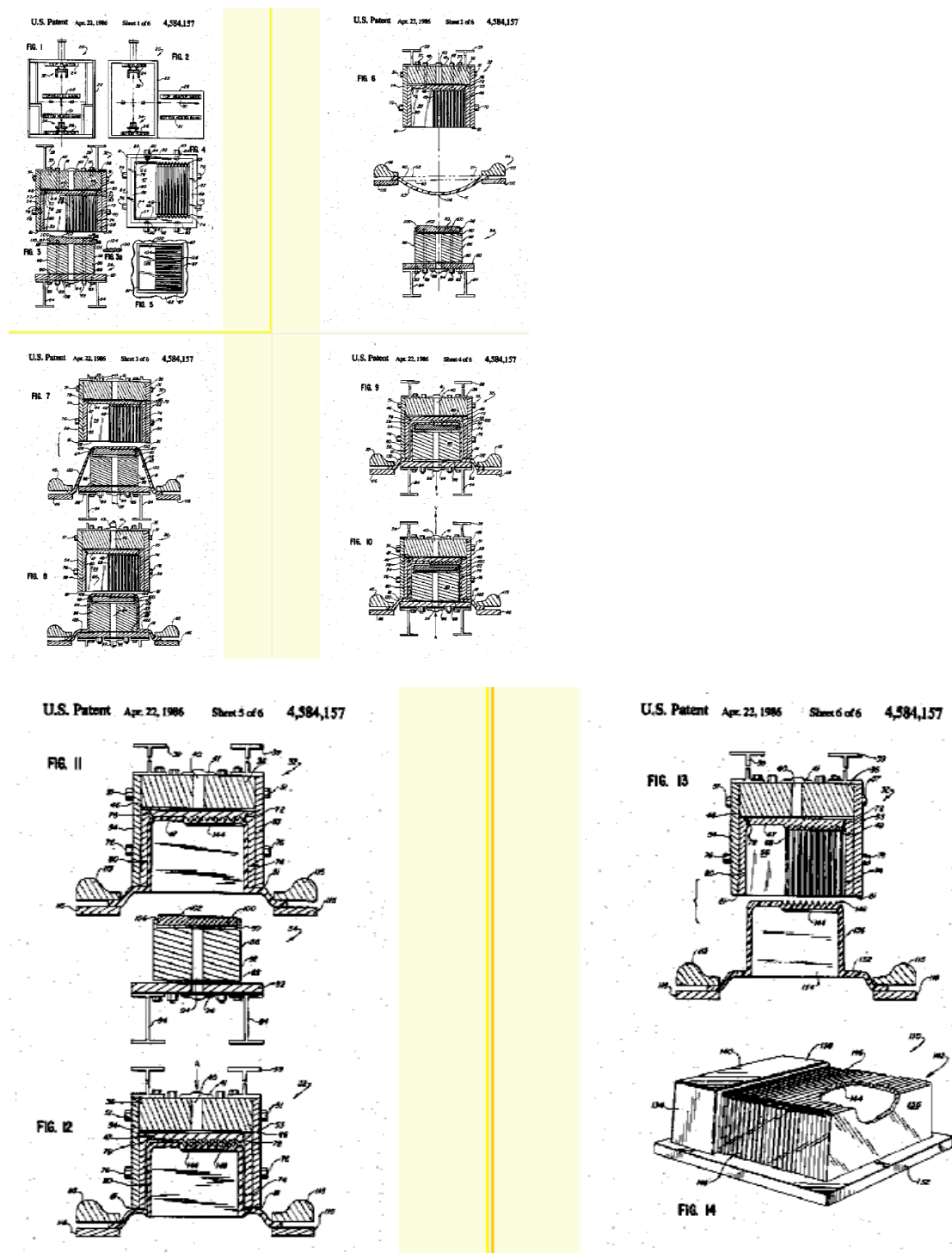
FIG. 2



U.S. Patent Mar. 31, 1998 Sheet 4 of 10 4,799,015



U.S. Patent Mar. 31, 1998 Sheet 5 of 10 4,799,015



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds or cores characterized by the shape of the moulding surface, e.g. ribs, grooves	<a href="#">B29C 33/42</a>
Shaping by casting, making articles of definite length characterised by the shape of the surface	<a href="#">B29C 39/026</a>

Compression moulding of article of definite length characterised by the shape of the surface	<a href="#">B29C 43/021</a>
Injection moulding, mould cavity walls provided with means for marking or patterning	<a href="#">B29C 45/372</a>
Blow moulding moulds having decorating or printing means	<a href="#">B29C 49/52</a>
Photomechanical, e.g. photolithographic, production of textured or patterned surfaces, e.g. printing surfaces, lithographic processes using patterning methods other than those involving the exposure to radiation, e.g. by stamping	<a href="#">G03F 7/0002</a>

## B29C 37/0057

{Moulding single grooves or ribs, e.g. tear lines (folding lines [B29C 53/06](#))}

### Definition statement

*This place covers:*

U.S. Patent Feb. 19, 2002 Sheet 4 of 5 US 6,348,172 B1

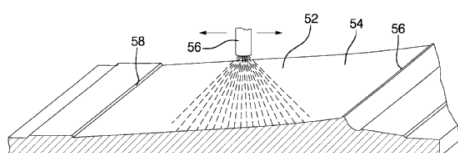


FIG. 5

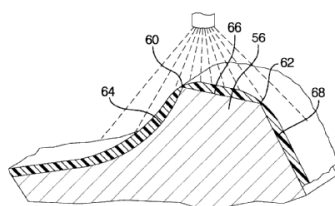


FIG. 6

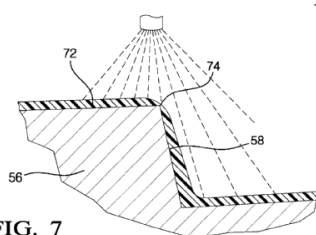
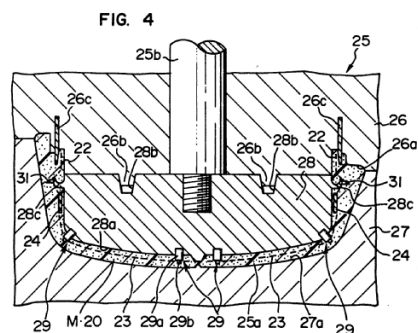
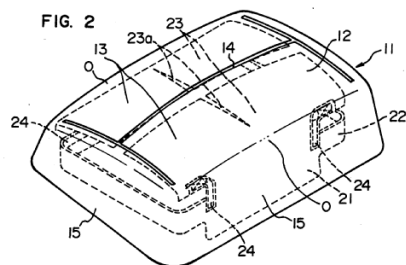


FIG. 7



U.S. Patent Apr. 20, 1993 Sheet 2 of 8 5,203,586



## B29C 37/006

{Degassing moulding material or draining off gas during moulding (venting means in moulds [B29C 33/10](#))}

### Definition statement

This place covers:

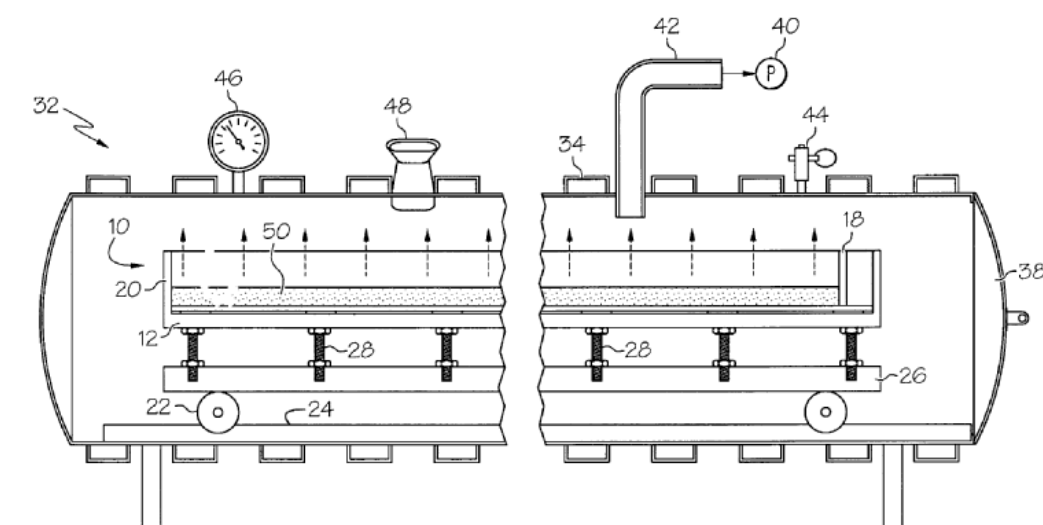


FIG. 4

Patent Application Publication Jan. 4, 2009 Sheet 1 of 9 US 2009/0166448 A1

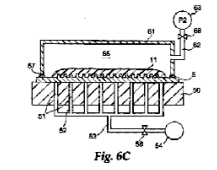


Fig. 6C

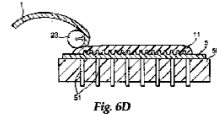


Fig. 6D

Patent Application Publication Jan. 4, 2009 Sheet 6 of 9 US 2009/0166448 A1

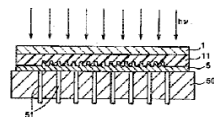


Fig. 6E

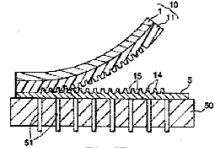


Fig. 6F

Patent Application Publication Jan. 4, 2009 Sheet 7 of 9 US 2009/0166448 A1

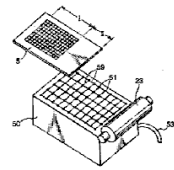


Fig. 7

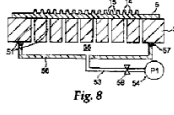


Fig. 8

Patent Application Publication Jan. 4, 2009 Sheet 8 of 9 US 2009/0166448 A1

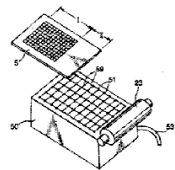


Fig. 7

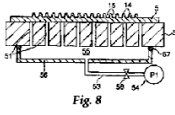


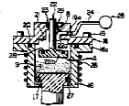
Fig. 8

U.S. Patent May 2, 1989 Sheet 1 of 6 4,826,931

FIG. 1



FIG. 2

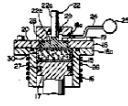


U.S. Patent May 2, 1989 Sheet 2 of 6 4,826,931

FIG. 3



FIG. 4



U.S. Patent May 2, 1989 Sheet 3 of 6 4,826,931

FIG. 5

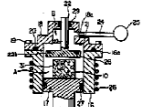
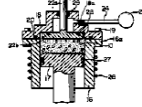


FIG. 6



U.S. Patent May 2, 1989 Sheet 4 of 6 4,826,931

FIG. 7

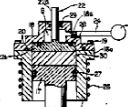
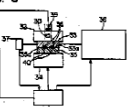
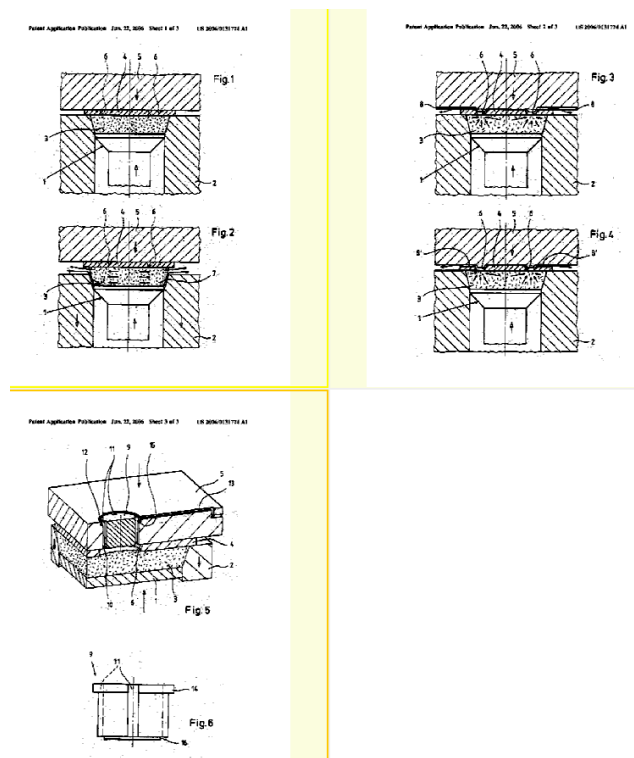


FIG. 8





## References

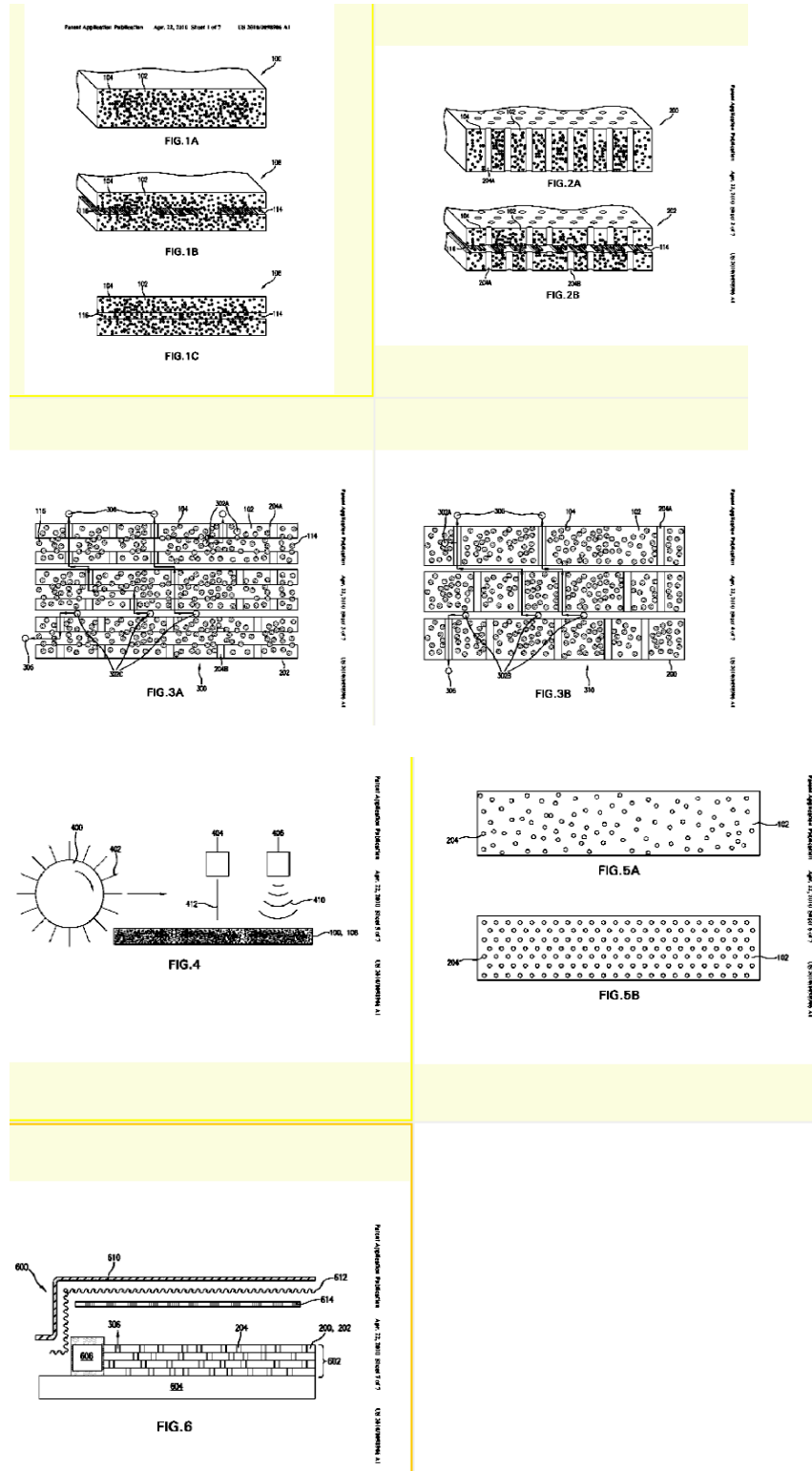
### Informative references

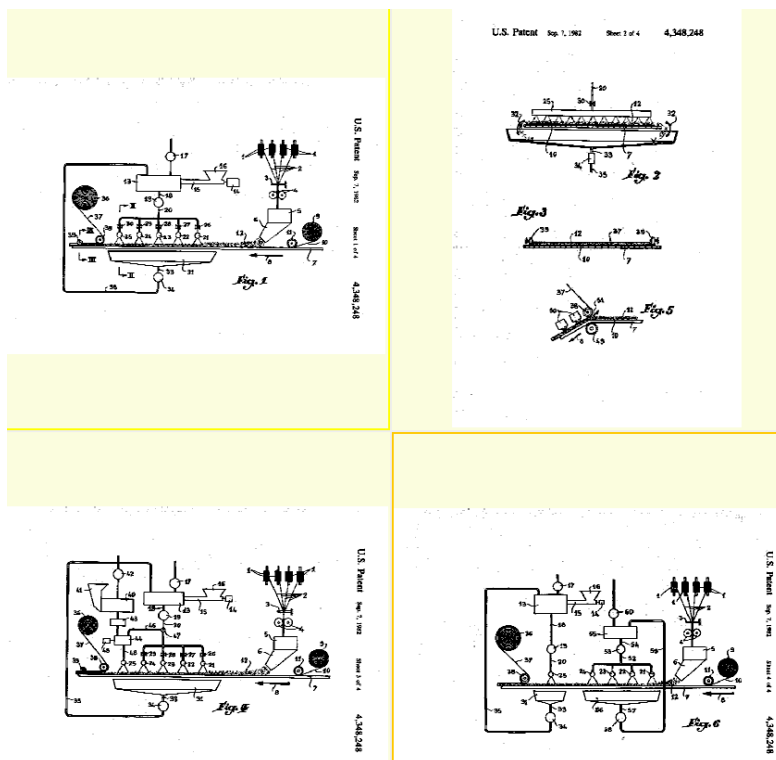
Attention is drawn to the following places, which may be of interest for search:

Shaping by casting; casting under special conditions, e.g. vacuum:	<a href="#">B29C 39/42</a>
Degassing, draining off gases, as after treatment	<a href="#">B29C 71/00</a>
Producing lenses, removing oxygen from the mould	<a href="#">B29D 11/00125</a>

**B29C 37/0064**

{of reinforced material}

**Definition statement***This place covers:*



## B29C 37/0067

{Using separating agents during or after moulding; Applying separating agents on preforms or articles, e.g. to prevent sticking to each other (separating agents [B29C 33/60](#))}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

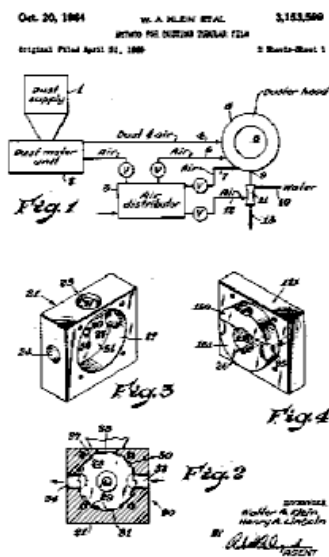
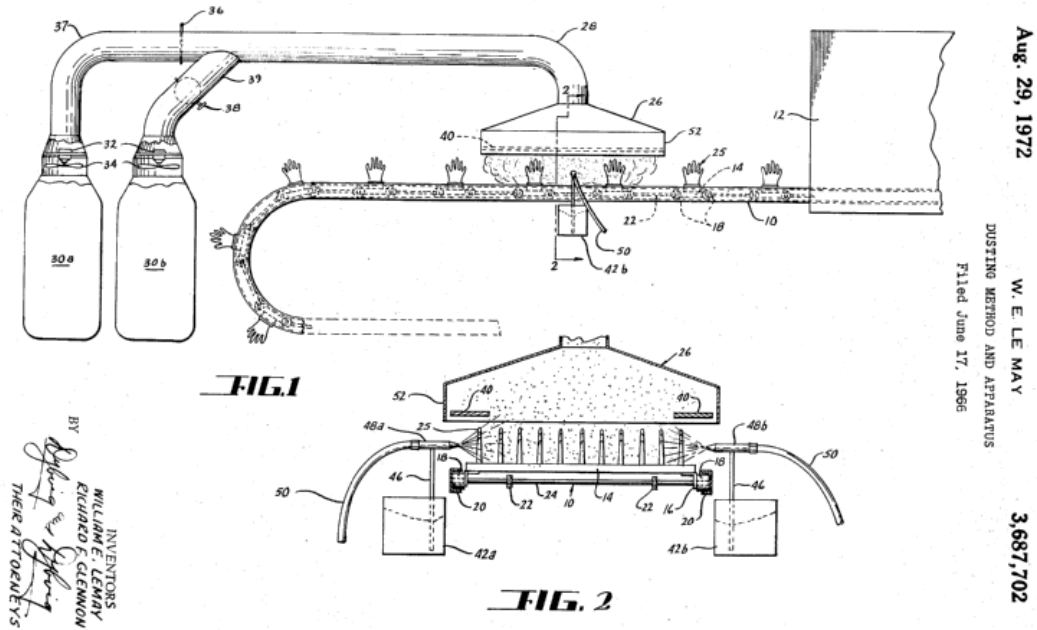
Moulds or cores, coatings, applying the releasing agent	<a href="#">B29C 33/58</a>
Moulds or cores, coatings, releasing, lubricating or separating agent	<a href="#">B29C 33/60</a>

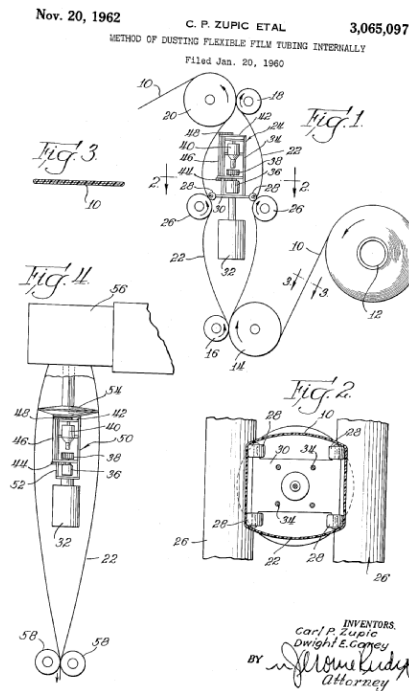
**B29C 37/0071**

{Dusting machines}

**Definition statement**

This place covers:



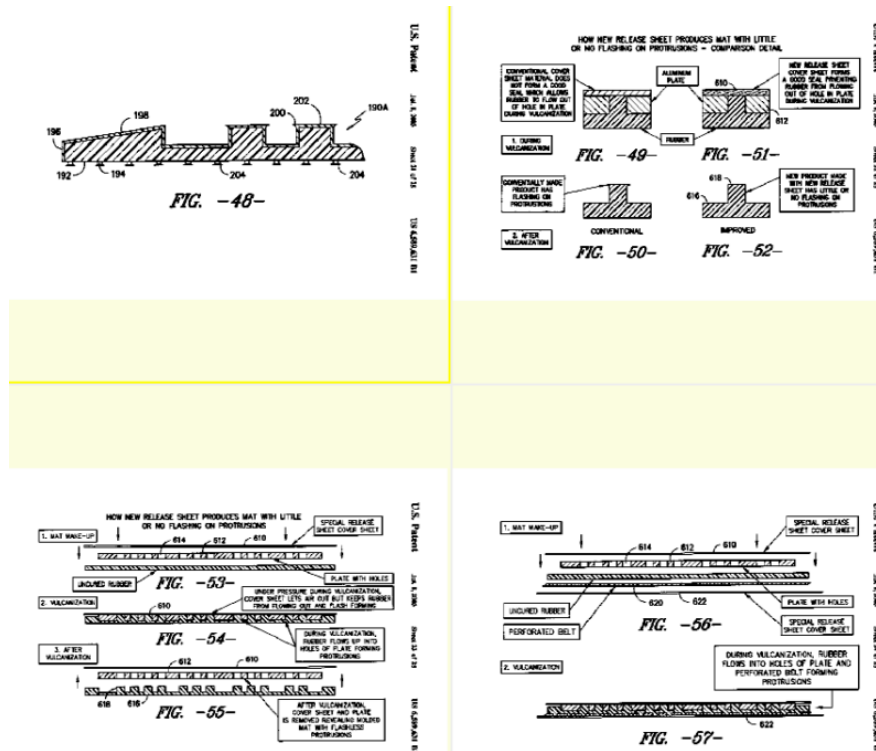


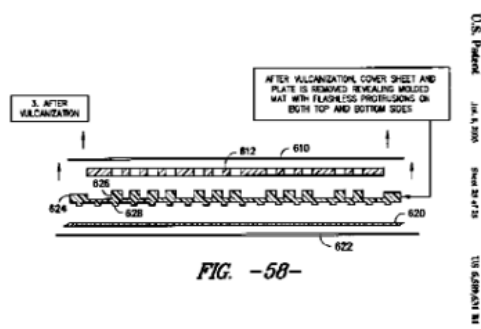
## B29C 37/0075

{using release sheets}

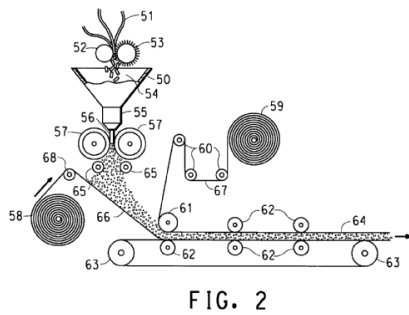
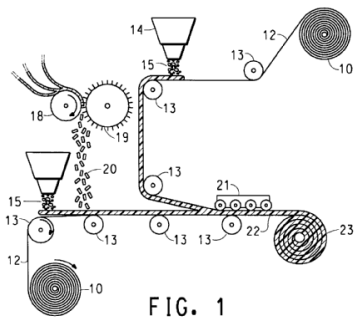
## Definition statement

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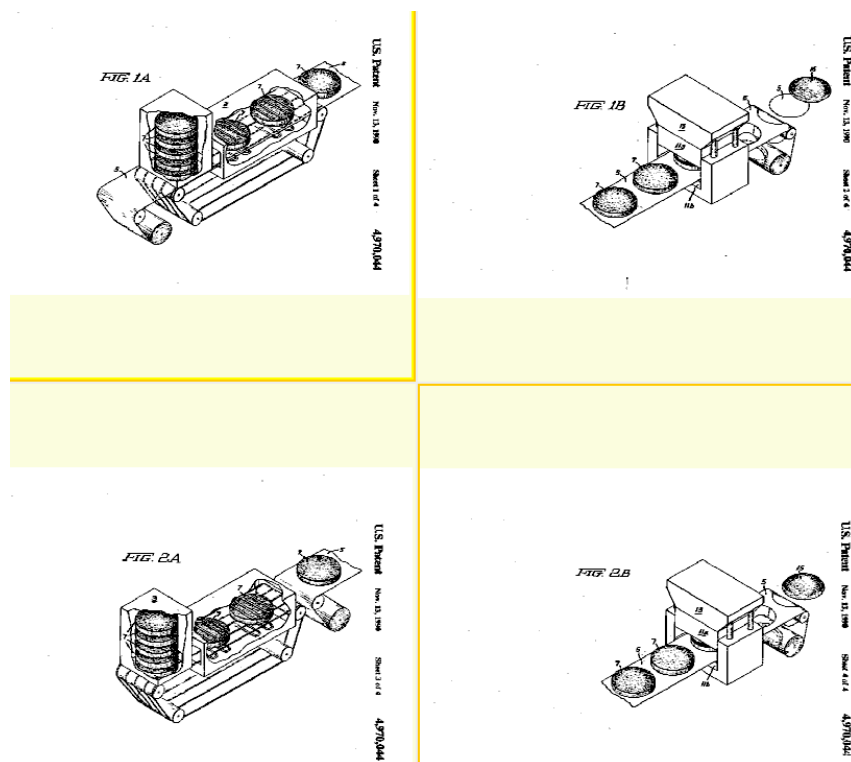




U.S. Patent Sep. 28, 1999 5,959,031







Oct. 3, 1961

R. KERN ET AL  
ANTI-TACK COMPOSITION  
Filed Feb. 26, 1959

3,002,840

FIG. 1

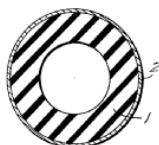
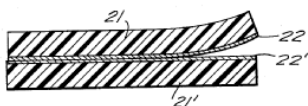


FIG. 2



FIG. 3



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Release sheets for moulds or cores
------------------------------------

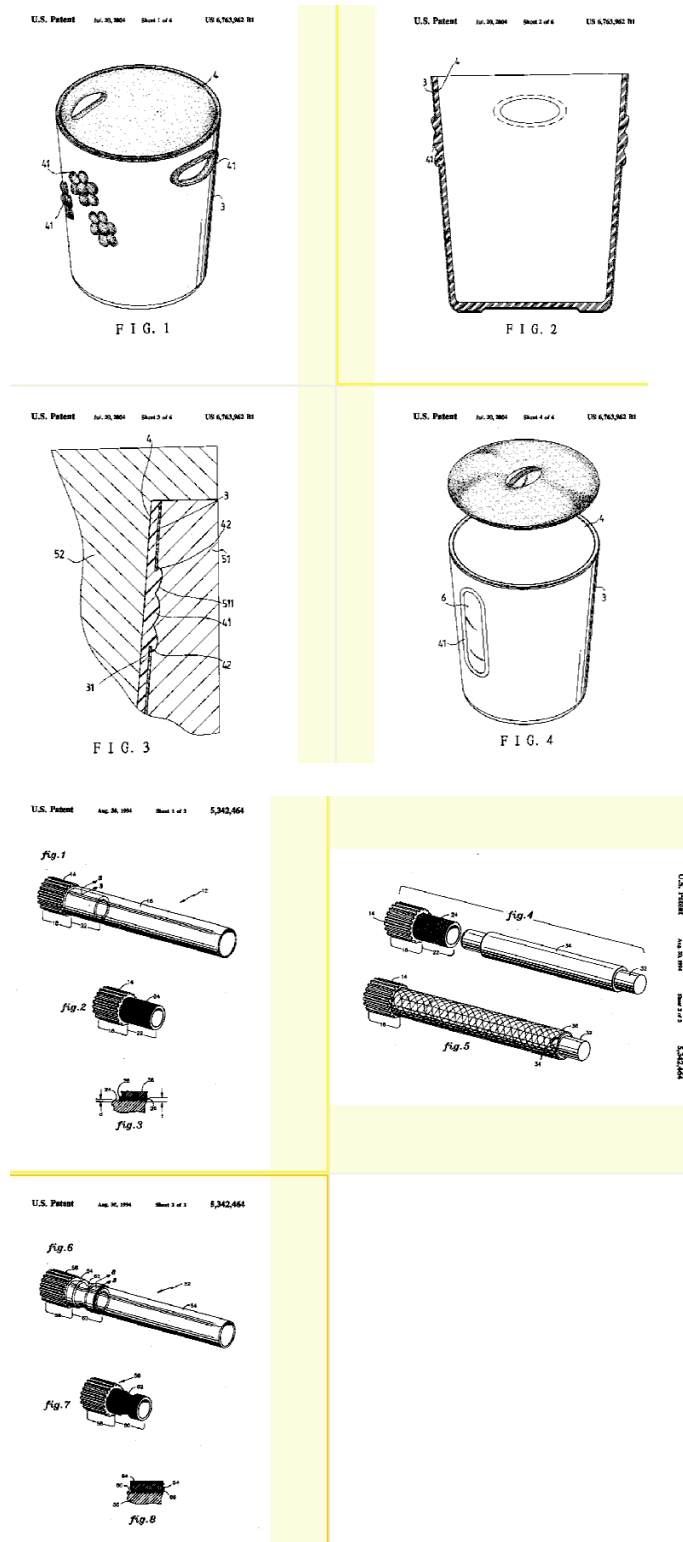
<a href="#">B29C 33/68</a>
----------------------------

**B29C 37/0078**

{Measures or configurations for obtaining anchoring effects in the contact areas between layers (surface shaping [B29C 59/00](#); [B29C 66/02](#) takes precedence)}

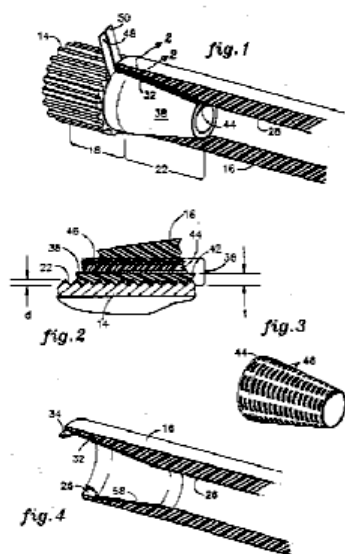
**Definition statement**

*This place covers:*

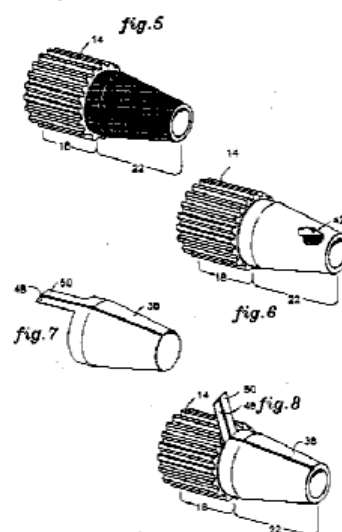


## Definition statement

U.S. Patent June 21, 1994 Sheet 1 of 2 5,322,580



U.S. Patent June 21, 1994 Sheet 2 of 2 5,322,580



## References

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping composites, comprising fillers only, the filler influencing the surface characteristics of the material, e.g. by concentrating near the surface or by incorporating in the surface by force

[B29C 70/64](#)

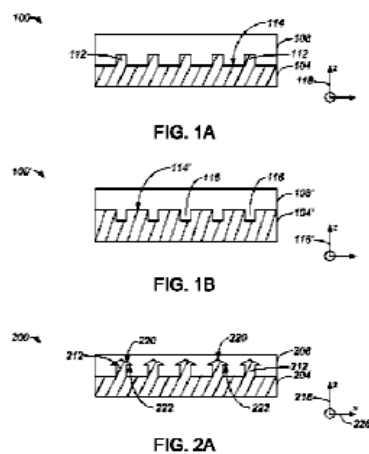
## B29C 37/0082

{Mechanical anchoring ([B29C 66/303](#) takes precedence)}

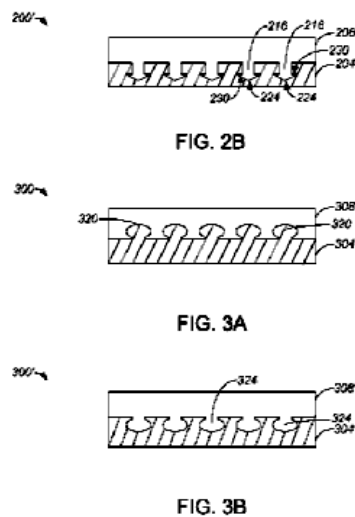
## Definition statement

This place covers:

Patent Application Publication Jan. 15, 2009 Sheet 1 of 11 US 2009/017242 A1



Patent Application Publication Jan. 15, 2009 Sheet 2 of 11 US 2009/017242 A1



Power Applcation Publication Mar. 30, 2019 Sheet 1 of 14 (30/2019/081487 A1)

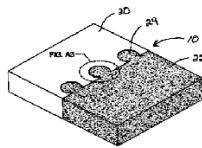


FIG. A1

Power Applcation Publication Mar. 30, 2019 Sheet 2 of 14 (30/2019/081487 A1)

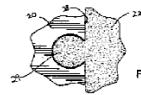


FIG. A3

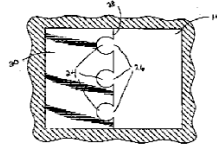


FIG. A4

Power Applcation Publication Mar. 30, 2019 Sheet 3 of 14 (30/2019/081487 A1)

DESCRIPTION FIG. A5 FIG. A6

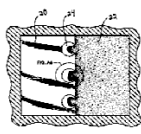


FIG. A5

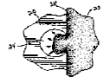


FIG. A6

Power Applcation Publication Mar. 30, 2019 Sheet 4 of 14 (30/2019/081487 A1)

DESCRIPTION FIG. A7

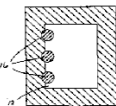


FIG. A7

Power Applcation Publication Mar. 30, 2019 Sheet 5 of 14 (30/2019/081487 A1)

DESCRIPTION FIG. B1 FIG. B2

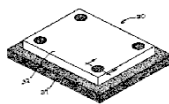


FIG. B1

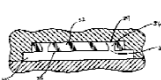


FIG. B2

Power Applcation Publication Mar. 30, 2019 Sheet 6 of 14 (30/2019/081487 A1)

DESCRIPTION FIG. B3 FIG. B4



FIG. B3



FIG. B4

Power Applcation Publication Mar. 30, 2019 Sheet 7 of 14 (30/2019/081487 A1)

DESCRIPTION FIG. B5 FIG. B6



FIG. B5



FIG. B6

Power Applcation Publication Mar. 30, 2019 Sheet 8 of 14 (30/2019/081487 A1)

DESCRIPTION FIG. C1

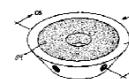
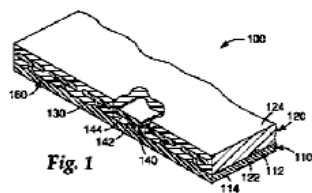


FIG. C1



**Fig. 1**

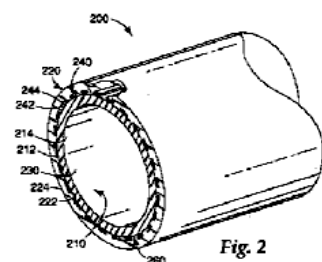
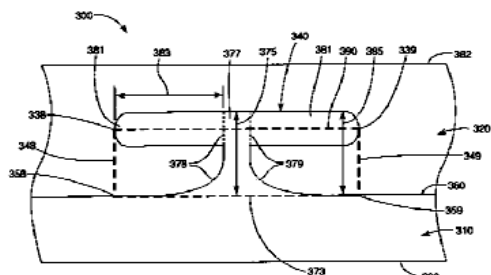
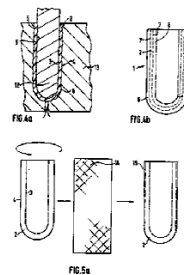
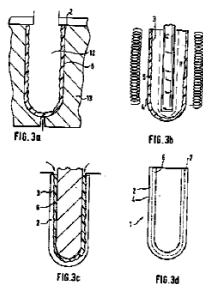
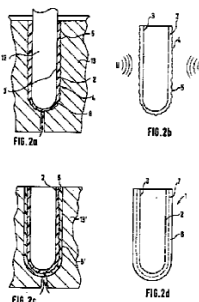
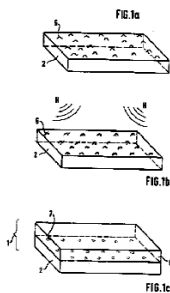


Fig. 2



**Fig. 3**

United Applications Publications Inc. 15, 2009 Sheet 2 of 9



Patent Application Publication Sep. 20, 2001 Sheet 6 of 8 US 2001/0022303 A1

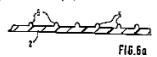


FIG. 6a



FIG. 6b

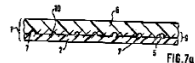


FIG. 7a

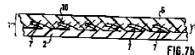


FIG. 7b

Patent Application Publication Sep. 20, 2001 Sheet 6 of 8 US 2001/0022303 A1



FIG. 5b

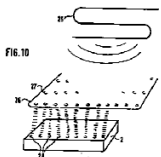


FIG. 10

Patent Application Publication Sep. 20, 2001 Sheet 7 of 8 US 2001/0022303 A1

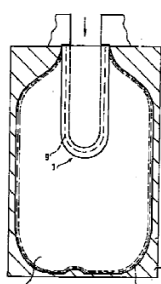


FIG. 8

Patent Application Publication Sep. 20, 2001 Sheet 8 of 8 US 2001/0022303 A1

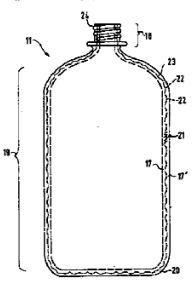


FIG. 9

U.S. Patent Apr. 16, 2003 Sheet 1 of 2 US 6,572,479 B1

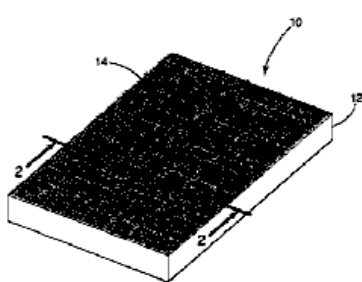


Fig. 1

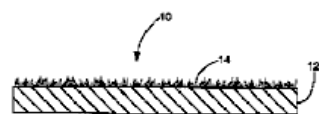


Fig. 2

U.S. Patent Apr. 16, 2003 Sheet 2 of 2 US 6,572,479 B1

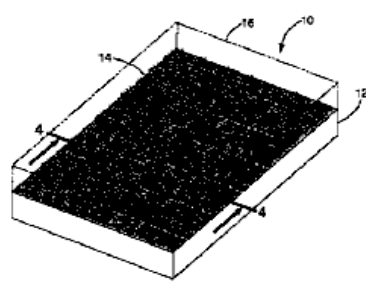


Fig. 3

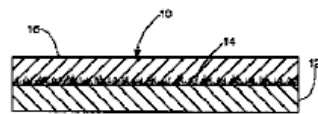
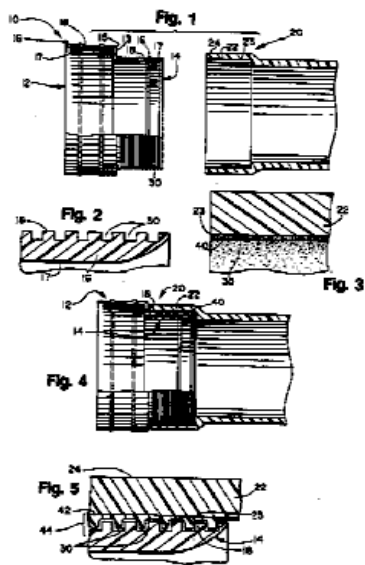
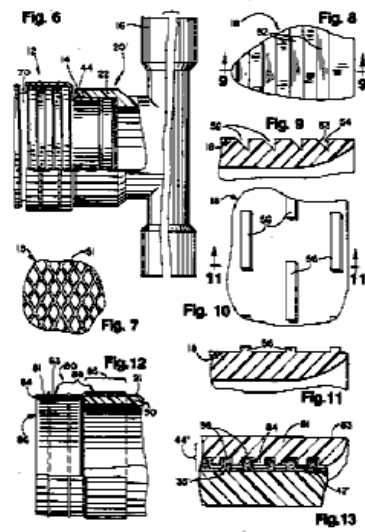


Fig. 4

U.S. Patent Aug. 9, 1994 Sheet 2 of 2 5,336,351



U.S. Patent Aug. 9, 1994 Sheet 2 of 2 5,336,351



U.S. Patent Oct. 11, 1994 Sheet 3 of 3 5,354,239

FIG. 5

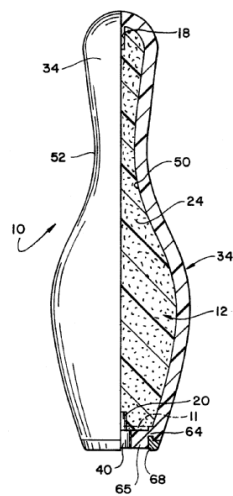
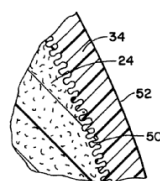


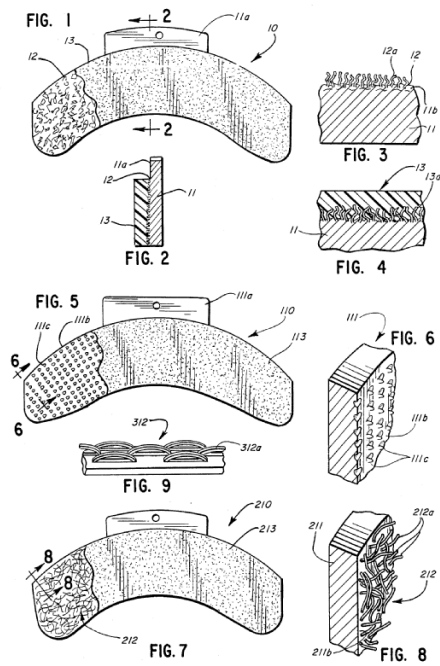
FIG. 6



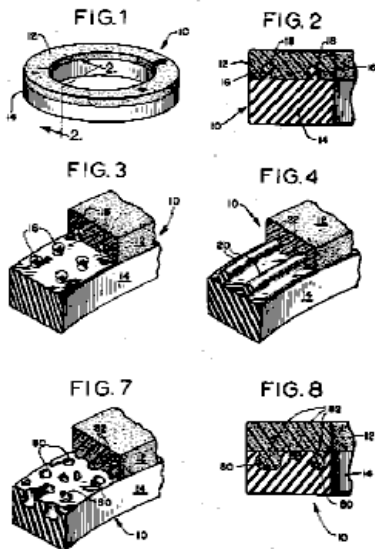
U.S. Patent

Jan. 24, 1989

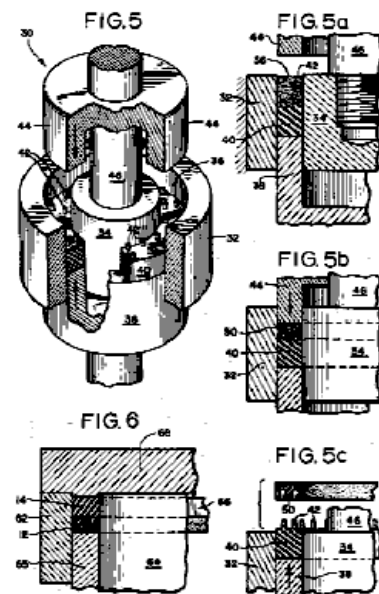
4,799,579



U.S. Patent Nov. 7, 1978 Sheet 1 of 2 4,124,676



U.S. Patent Nov. 1, 1978 Sheet 2 of 2 4,124,676



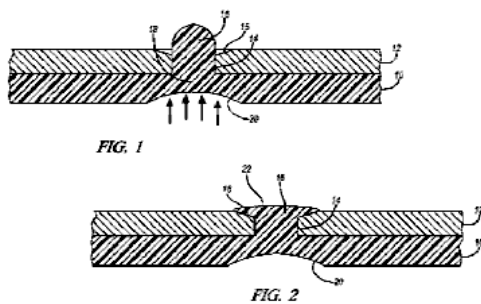


**B29C 37/0085**

{by means of openings in the layers (joining through openings [B29C 66/304](#))}

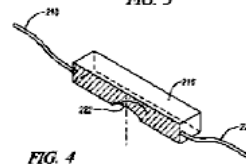
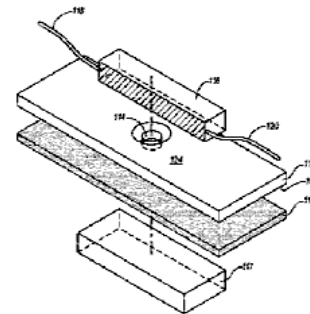
**Definition statement**

This place covers:

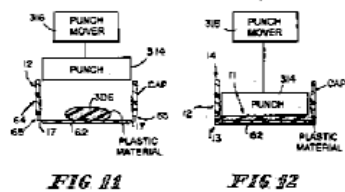
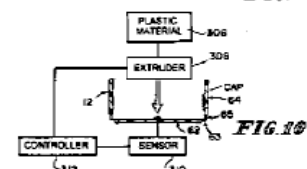
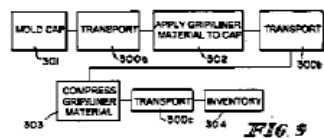


Patent Application Publication US 2006/0136730 A1

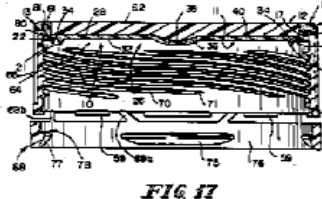
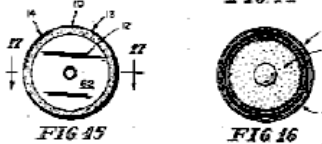
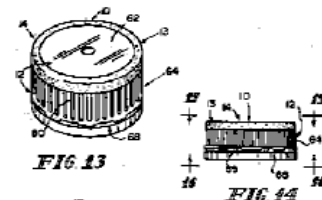
Patent Application Publication US 2006/0136730 A1

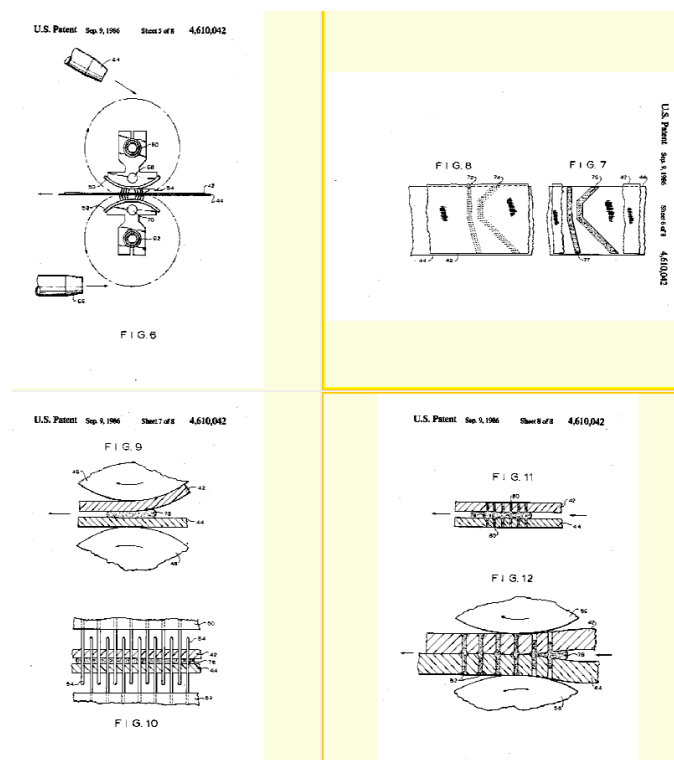


Patent Application Publication Mar. 24, 2005 Sheet 5 of 6 US 2006/0136730 A1



Patent Application Publication Mar. 24, 2005 Sheet 4 of 6 US 2006/0136730 A1





## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

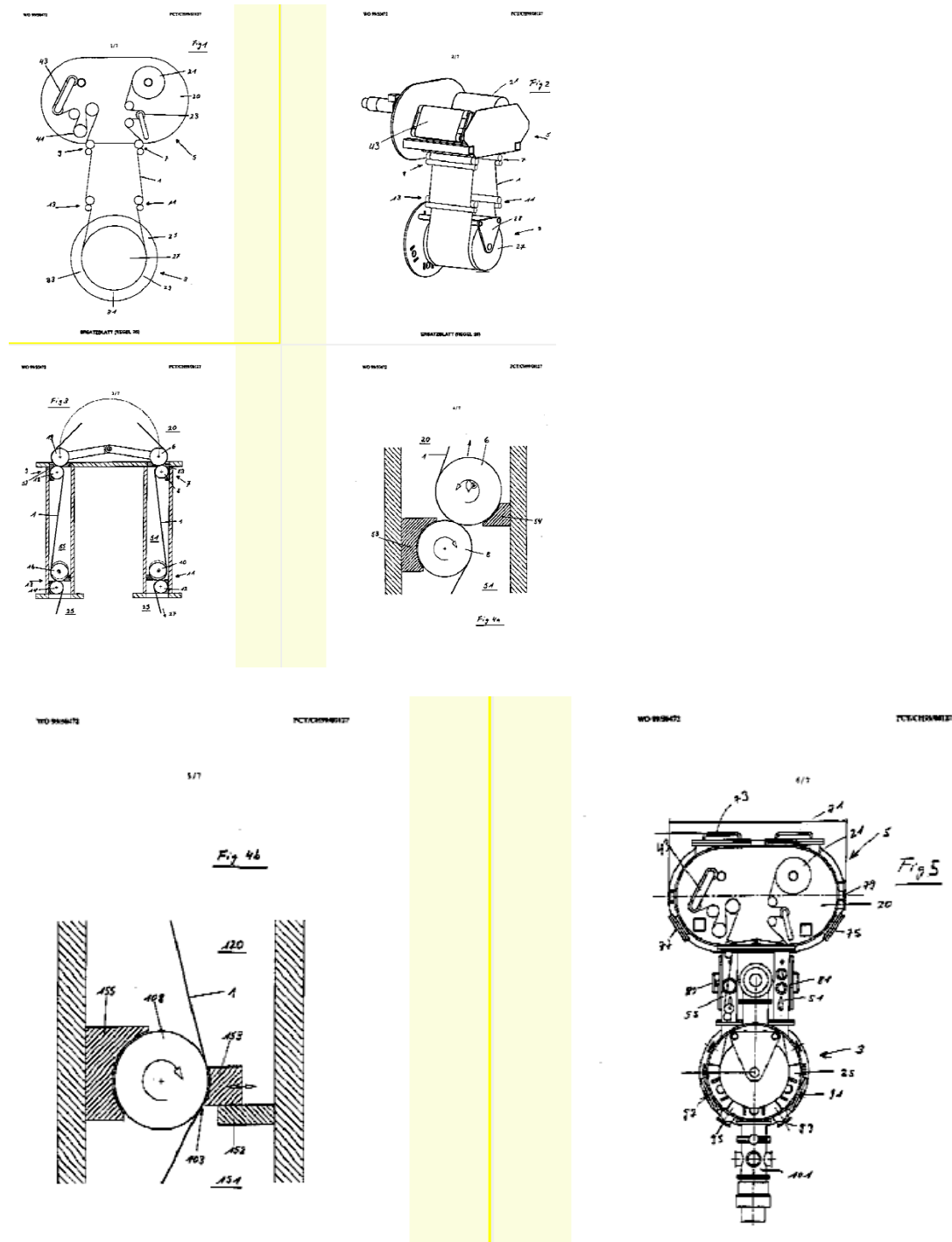
Injection moulding in or through a hole in the article	<a href="#">B29C 45/14344</a>
Joining by riveting	<a href="#">B29C 65/60</a>

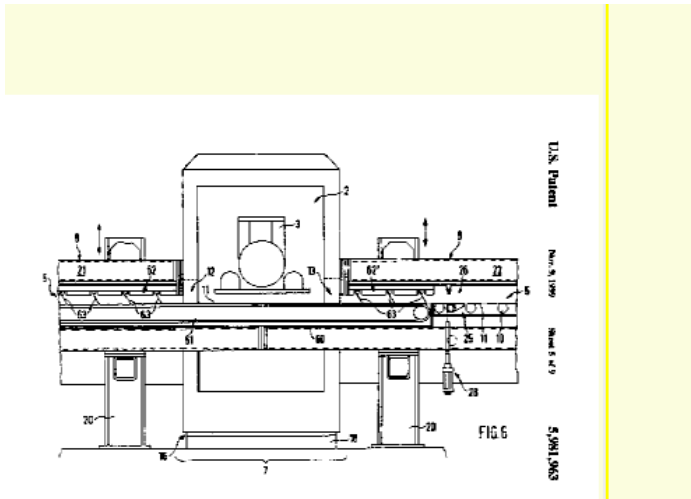
**B29C 37/0089**

**{Sealing devices placed between articles and treatment installations during moulding or shaping, e.g. sealing off the entrance or exit of ovens or irradiation rooms, connections between rooms at different pressures}**

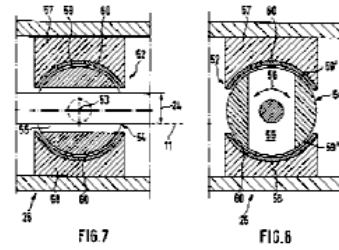
## Definition statement

*This place covers:*

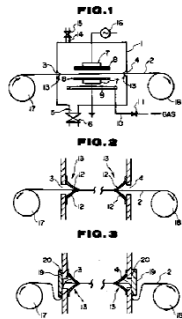




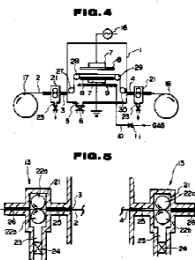
U.S. Patent Nov. 9, 1999 Sheet 6 of 7 5,981,963



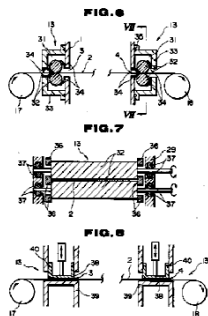
U.S. Patent Jan. 26, 1994 Sheet 1 of 2 5,529,631



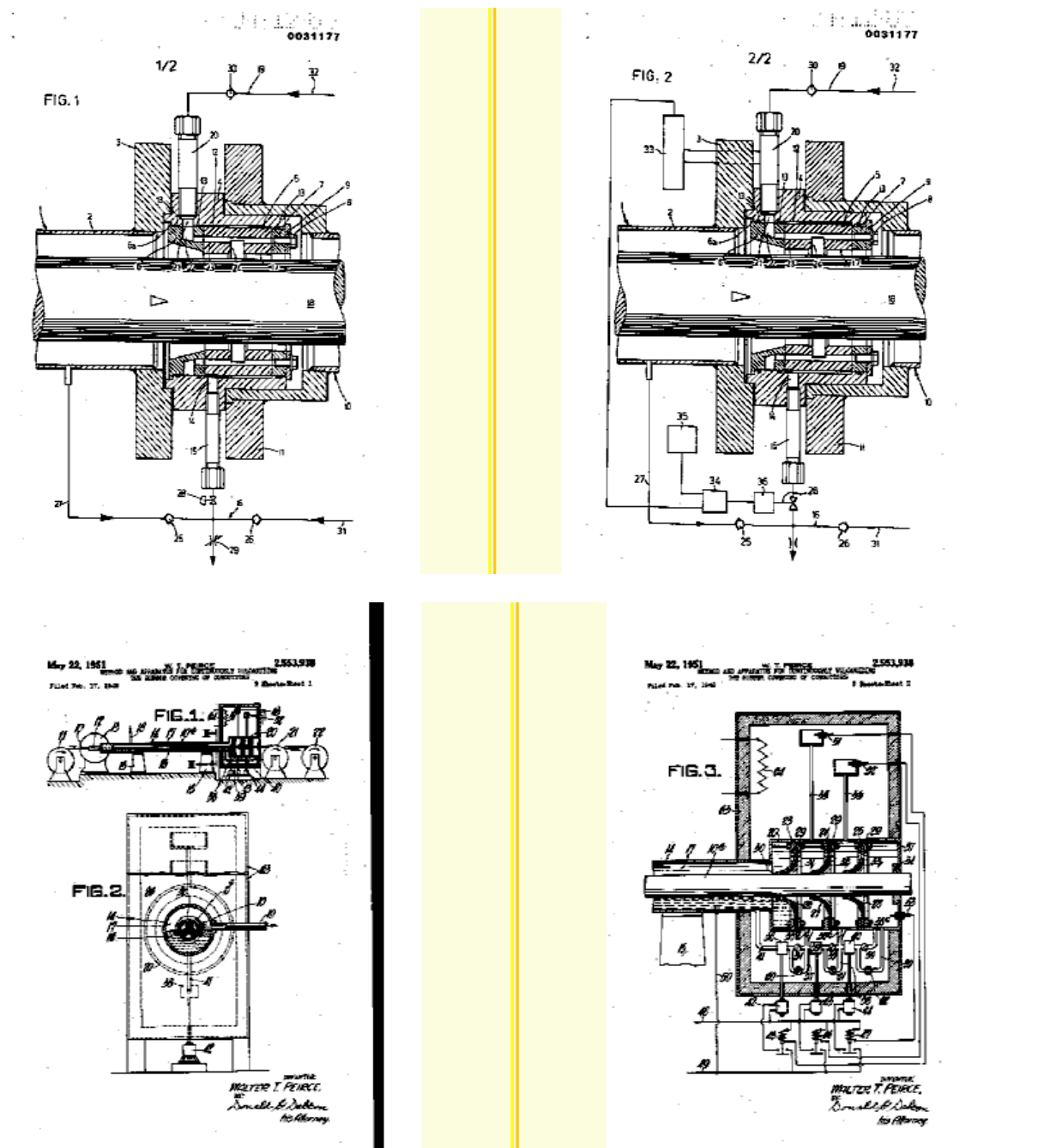
U.S. Patent Jan. 26, 1994 Sheet 2 of 2 5,529,631



U.S. Patent Jan. 26, 1994 Sheet 3 of 3 5,529,631



## Definition statement



## References

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Sealings between relatively moving surfaces which permits material to be continuously conveyed

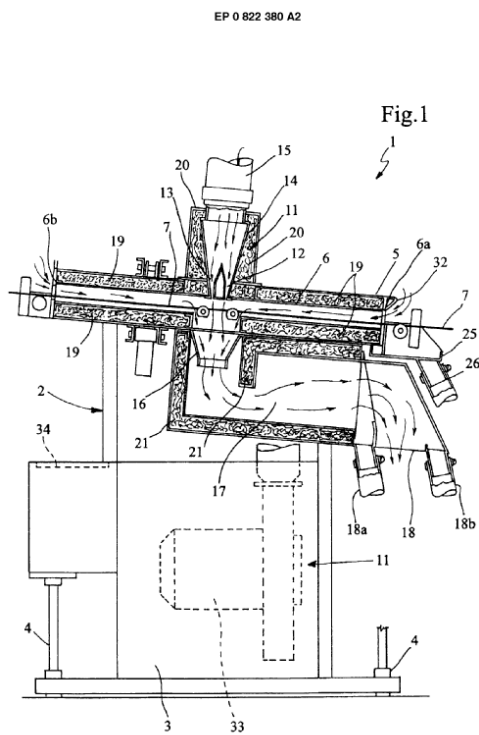
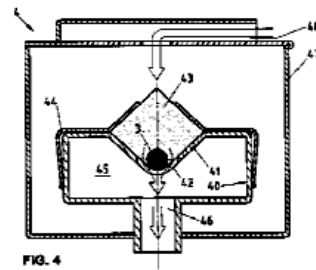
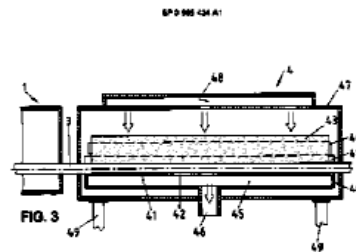
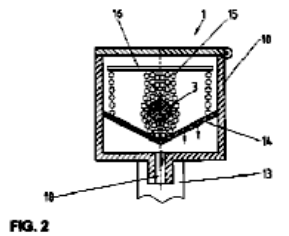
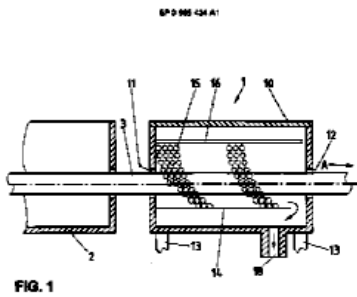
[F16J 15/168](#)

**B29C 37/0092**

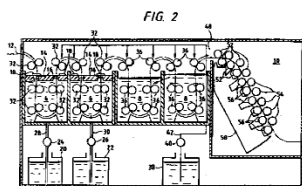
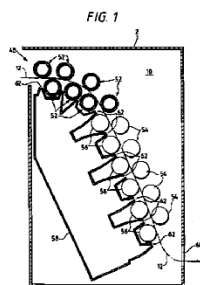
{Drying moulded articles or half products, e.g. preforms, during or after moulding or cooling}

**Definition statement**

*This place covers:*

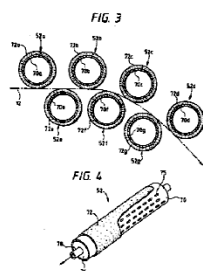


U.S. Patent Jan. 16, 1991 Sheet 1 of 3 5,079,853



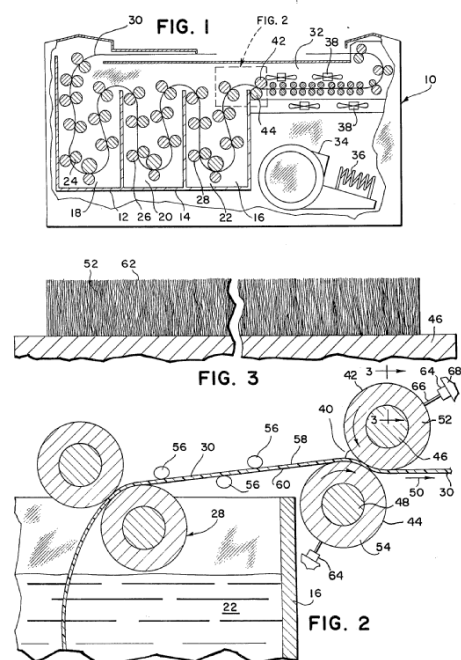
U.S. Patent Jan. 16, 1991 Sheet 2 of 3 5,079,853

U.S. Patent Jan. 16, 1991 Sheet 3 of 3 5,079,853



U.S. Patent Jan. 27, 1976

3,934,354



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

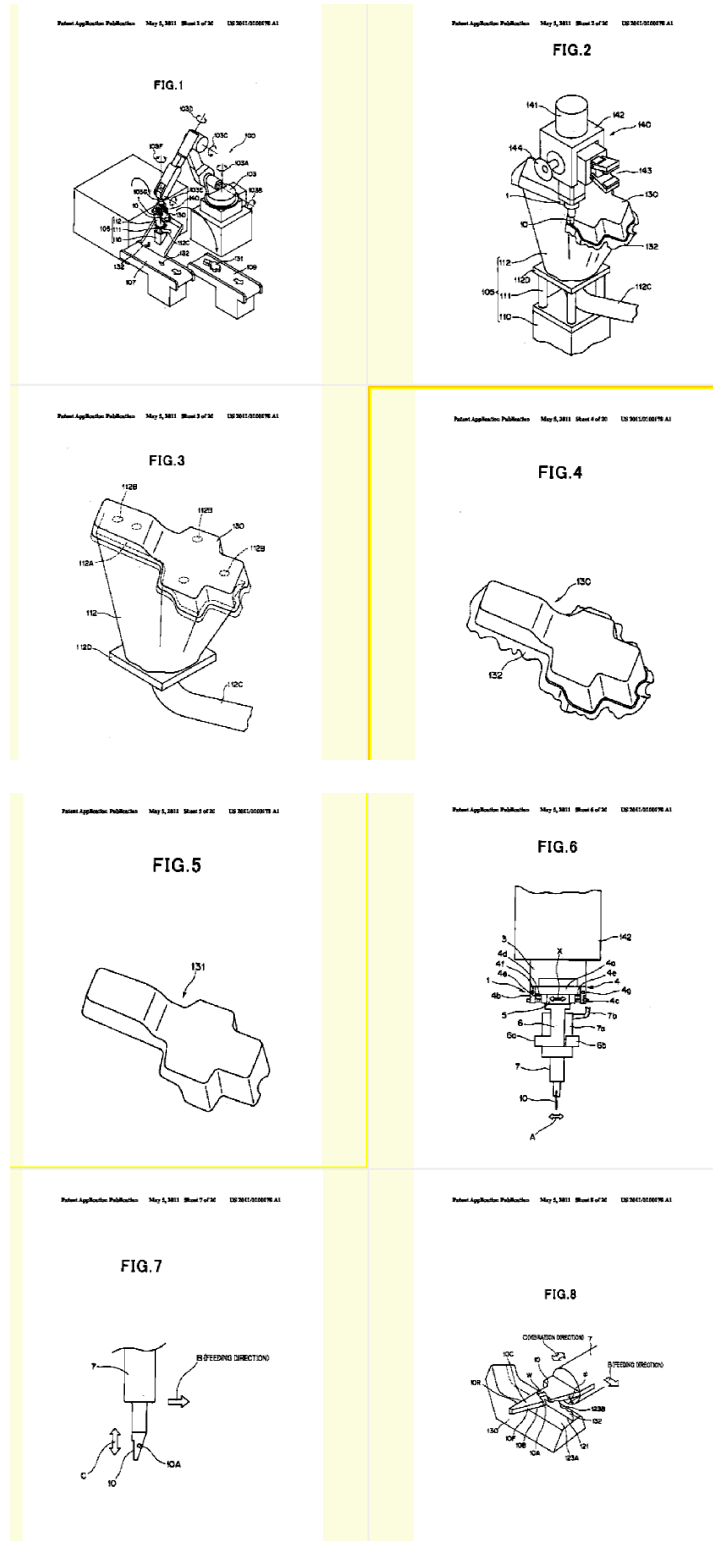
Drying in general	<a href="#">F26B</a>
-------------------	----------------------

**B29C 37/02**

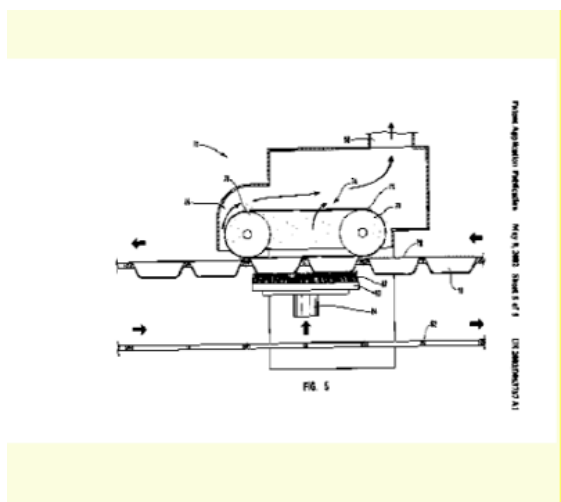
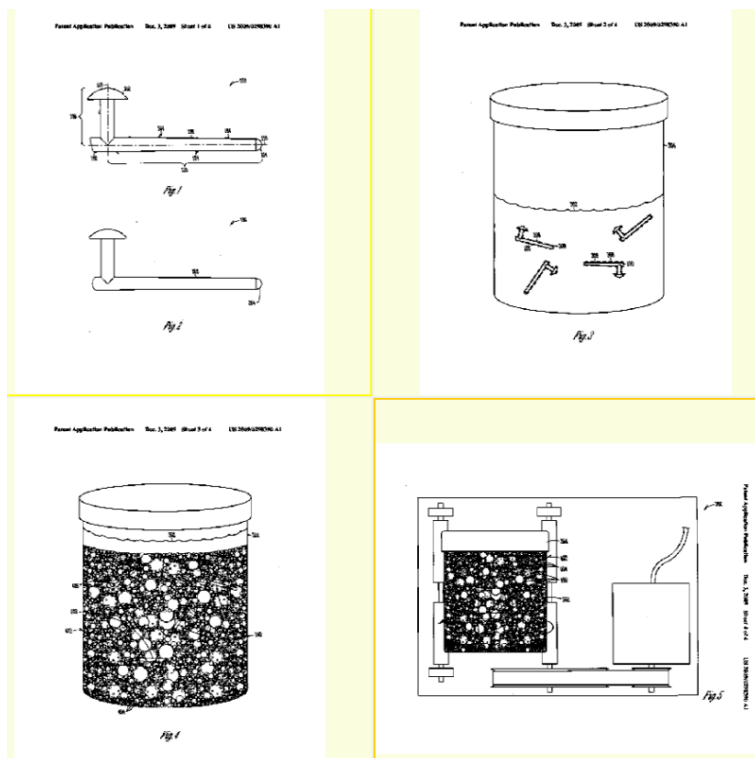
Deburring or deflashing {(thermal deburring in general [B23D 79/005](#))}

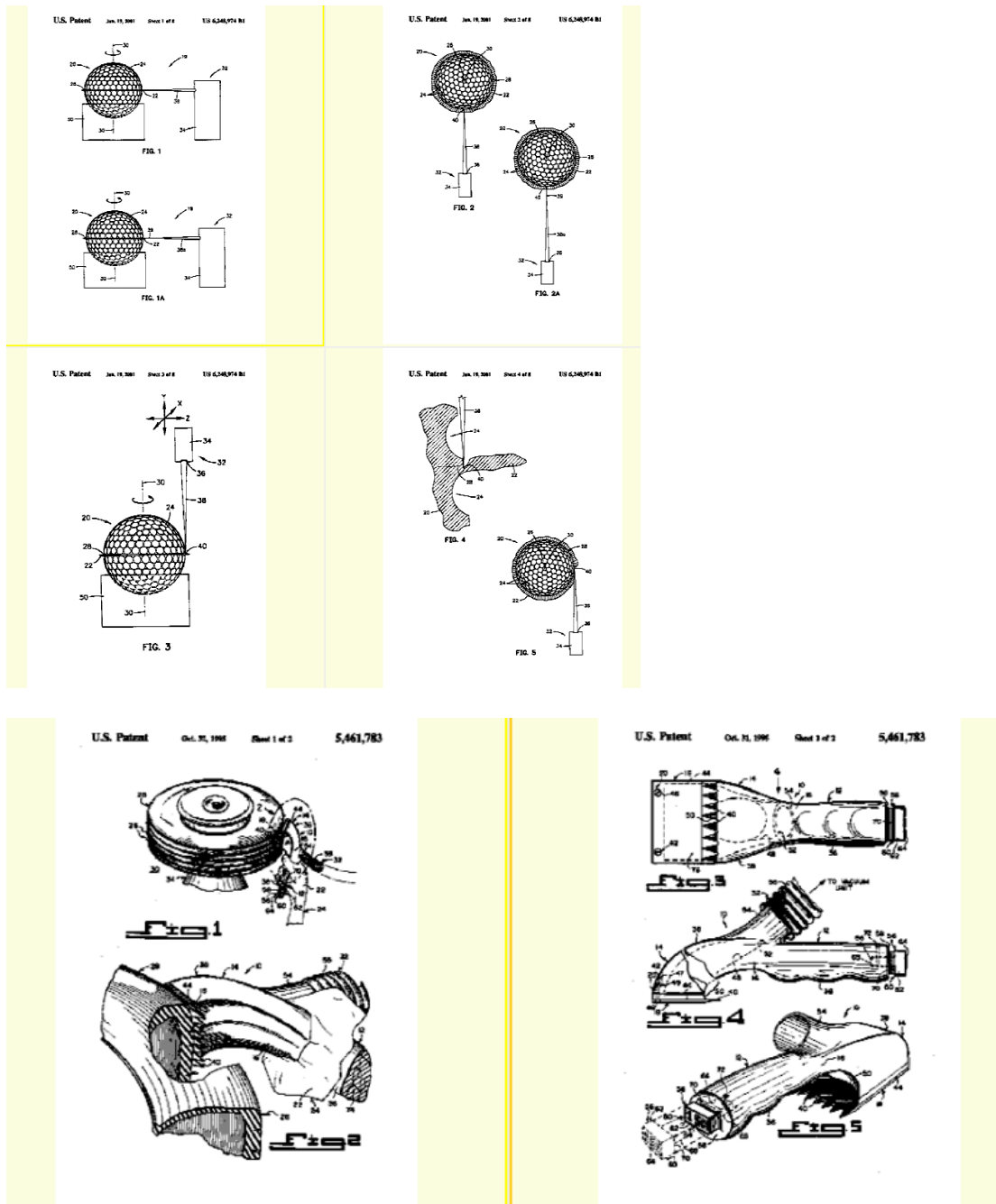
**Definition statement**

*This place covers:*

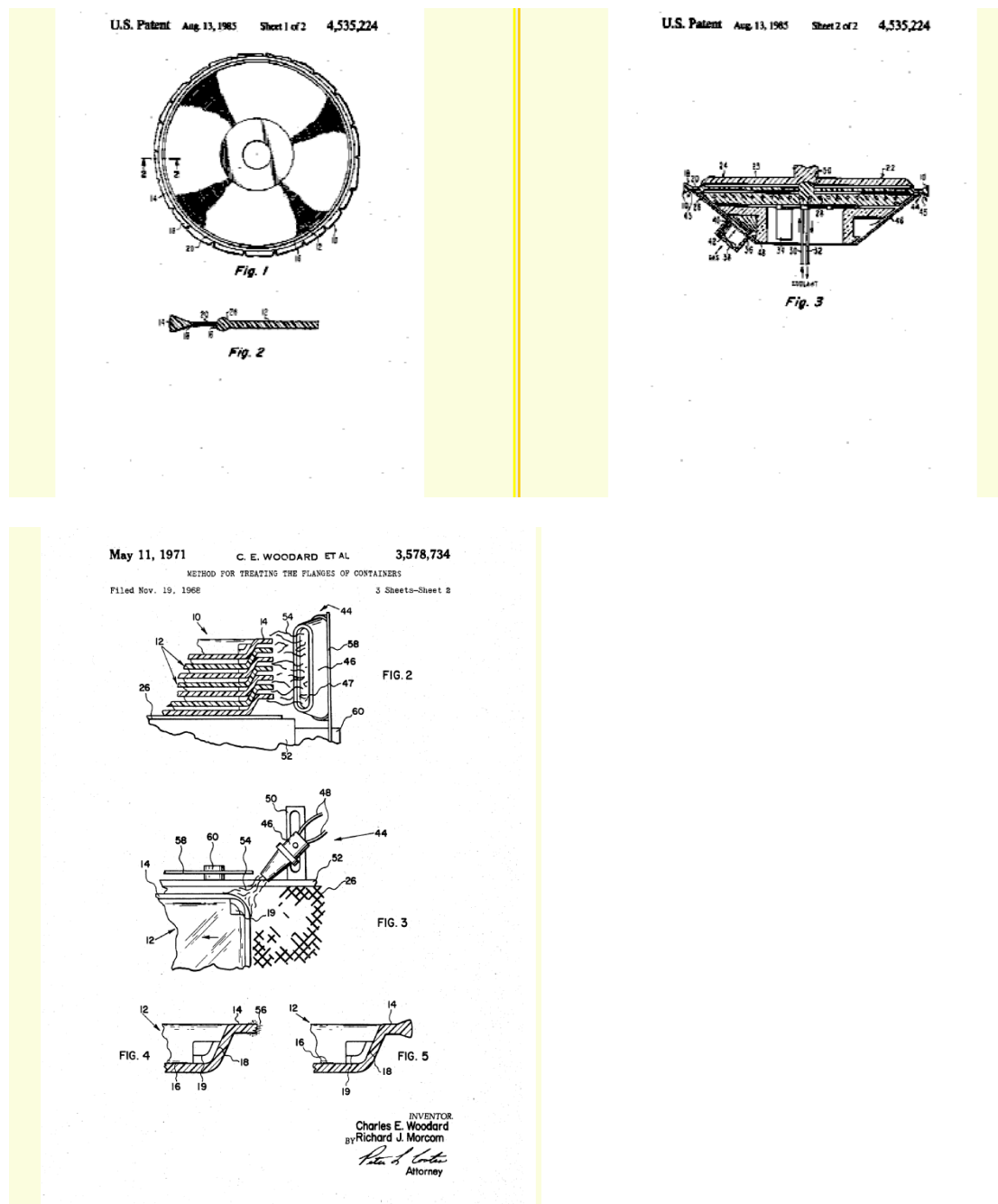








## Definition statement



## References

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Blow-moulding; deflashing outside the mould; deflashing the neck portion	<a href="#">B29C 49/72</a>
Cutting work characterised by the nature of the cutting made	<a href="#">B29C 70/00</a>
Method, machines, or devices for working metals by removal of material for thermal deburring	<a href="#">B23D 79/005</a>
Machines or devices designed for grinding edges or bevels on works or for removing burrs characterised by a special design for grinding plastic materials	<a href="#">B24B 9/20</a>
Methods for use of abrasive blasting for polishing surfaces for deburring	<a href="#">B24C/08B</a>

Abrasive blasting machines or devices	<a href="#">B24C 3/00</a>
Machines or devices designed for polishing or abrading surfaces on work by means of tumbling apparatus	<b>B24D31/00</b>

## B29C 39/00

**Shaping by casting, i.e. introducing the moulding material into a mould or between confining surfaces without significant moulding pressure; Apparatus therefor ([B29C 41/00](#) takes precedence)**

### Definition statement

*This place covers:*

Low or zero pressure casting methods of polymers or their pre-cursors into a mould or between confining surfaces, apparatus and articles obtained by casting, when these articles are characterised by the casting method.

### References

#### Limiting references

*This place does not cover:*

Spin casting	<a href="#">B29C 41/045</a>
Casting of dental prostheses	<a href="#">A61C 13/20</a>
Casting of membranes,	<a href="#">B01D 67/0013</a>
Centrifugal casting specially adapted for tyres or parts thereof	<a href="#">B29D 30/0679</a>
Casting of microstructured devices	<a href="#">B81C 99/0085</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Shaping by internal pressure generated in the material, e.g. swelling, foaming	<a href="#">B29C 44/00</a>
Joining by applying molten plastics or by moulding	<a href="#">B29C 65/40</a> , <a href="#">B29C 65/42</a> , <a href="#">B29C 65/70</a>
Screen moulding	<a href="#">B29C 67/08</a>
Molding wax	<a href="#">B29C 67/241</a>
Liquid injection molding of liquid silicone rubbers, polyurethanes and other highly reactive materials under high pressure	<a href="#">B29C 67/246</a>
Spinning of moulds for a specific filler concentration or distribution of the filler	<a href="#">B29C 70/64</a>
Encapsulating inserts having non-encapsulated projections, e.g. terminal portions of electrical components	<a href="#">B29C 70/72</a>
Moulding sealings into closures	<a href="#">B29C 70/80</a>
Casting of foodstuff or confectionary	e.g. <a href="#">A23G 3/2023</a> , <a href="#">A23G 1/205</a>
Casting cosmetic material, such as lipsticks	<a href="#">A45D 40/16</a>
Making brushes by casting a body around bristles	<a href="#">A46D 3/005</a>

Methods for making crowns for teeth	<a href="#">A61C 5/77</a>
Encapsulating hollow fibres, e.g. for filters,	<a href="#">B01D 63/022</a>
Metal casting	<a href="#">B22D 17/00</a>
Casting of ceramics or other cementitious material	<a href="#">B28B 1/00</a> , <a href="#">C04B 33/28</a>
Moulding, e.g. casting of optical elements, e.g. lenses, prisms	<a href="#">B29D 11/00413</a>
Designs imitating natural patterns	<a href="#">B44F 9/00</a>
Manufacture of films or sheets	<a href="#">C08J 5/18</a>
Encapsulation, potting and similar processes used in electronics	<a href="#">H10W 74/01</a> , <a href="#">H01F 41/005</a> , <a href="#">H01F 41/127</a> , <a href="#">H10W 74/00</a> , <a href="#">H05K 3/284</a> , <a href="#">H05K 3/101</a>

## Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "casting", "moulding", "pouring", "potting" and "encapsulating"

## B29C 41/00

**Shaping by coating a mould, core or other substrate, i.e. by depositing material and stripping-off the shaped article; Apparatus therefor (with compacting pressure [B29C 43/00](#) {; by lay-up of reinforcement of substantial or continuous length [B29C 70/30](#)})**

## Definition statement

*This place covers:*

depositing material and stripping-off the shaped article

## Relationships with other classification places

Processes for applying liquids or other fluent materials are provided in [B05D 1/00](#) e.g. coating by rotation: [B05D 1/002](#); coating by spin coating [B05D 1/005](#); coating by dipping [B05D 1/18](#); coating performed by gravity only [B05D 1/30](#).

The difference with the processes provided in the group [B29C 41/00](#), is that in addition to coating step, a step of stripping of the article is provided (cf. the title of [B29C 41/00](#) "...i.e. by depositing material and stripping-off the shaped article...")

## References

### Limiting references

*This place does not cover:*

Shaping by spraying of fibres on a mould, former or core:	<a href="#">B29C 70/30</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Spinning the mould for a specific filler concentration or distribution	<a href="#">B29C 70/64</a>
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Gloves	<a href="#">A41D 19/00</a> , <a href="#">A47L 13/18</a> , <a href="#">A61B 42/10</a>
Automotive skins	<a href="#">B60R 13/00</a>

## Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

- spraying, slush moulding or casting, rotational moulding, rotomoulding, moulding by spinning, spin casting, centrifugal casting.

## B29C 43/00

**Compression moulding, i.e. applying external pressure to flow the moulding material; Apparatus therefor {(by liberation of internal stresses [B29C 61/006](#))}**

## Definition statement

*This place covers:*

Compression moulding refers to shaping polymeric materials by using moulding devices movable against the material to apply pressure for shaping and achieving a residual filling of a cavity;

Continuous compression moulding refers to making indefinite articles by using rotatable devices, e.g. wheels or rollers or calenders;

Devices to supply the material to the compression moulding device.

## Relationships with other classification places

Related moulding processes are:

- Transfer moulding, i.e. transferring the required volume of moulding material by a plunger from a "shot" cavity into a mould cavity. Transfer moulding is classified in [B29C 45/02](#).
- Injection compression moulding, i.e. injecting the polymeric material under pressure into a mould followed by moving the mould or mould parts to compress the material to achieve filling of the cavity and the final shape of the article, wherein initially the mould can be open or closed and/or the cavity can be in a state with enlarged or reduced size. Injection compression moulding is classified in [B29C 45/561](#).
- Shaping by thermoforming (i.e. shaping sheets or sheet-like preforms after heating), e.g. shaping sheets by matched moulds or by deep-drawing and apparatus therefor. Thermoforming is classified in [B29C 51/00](#).
- Surface shaping of already moulded polymeric articles, e.g. by embossing and apparatus therefor. In the case of mechanical embossing, the surface shaping requires a reheating step for the surface to be embossed. Surface shaping of already moulded polymeric articles is classified in [B29C 59/00](#).
- Shaping composites, i.e. plastics material comprising reinforcements, fillers or preformed parts, e.g. inserts, are classified in [B29C 70/00](#). The use of moulding compounds comprising chopped or short fibres are classified in the moulding technique used, e.g. for compression moulding are classified in [B29C 43/003](#) or [B29C 43/006](#), for injection moulding using fibre reinforcements are classified in [B29C 45/0005](#) or for extrusion moulding using fibre reinforcements are classified in [B29C 48/2886](#).

## References

### Limiting references

*This place does not cover:*

Shaping by liberation of internal stresses, the force created by the liberation of the internal stresses being used for compression moulding	<a href="#">B29C 61/006</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Manufacturing of articles by compacting or sintering metallic powders	<a href="#">B22F 3/00</a>
Shaping clay or other ceramic compositions using presses	<a href="#">B28B 3/00</a>
Presses in general	<a href="#">B30B</a>
Photomechanical production of textured or patterned surfaces by imprinting or stamping whereby the pattern is fixed via light or thermal curing.	<a href="#">G03F 7/002</a>

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Compression moulding	shaping of polymeric materials by using moulding devices movable against the material to apply pressure for shaping and achieving residual filling of a cavity
Continuous compression moulding	making of indefinite articles by shaping polymeric materials using rotatable devices, e.g. calenders or rollers or wheels

## Synonyms and Keywords

*In patent documents, the following words/expressions are often used with the meaning indicated:*

"compacting"	"compression moulding".
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## B29C 43/003

{characterised by the choice of material}

### Definition statement

*This place covers:*

compression moulding processes characterised by the choice of material, e.g. using organic, inorganic or mineral fillers or fibres, using plasticised particulate materials bonded by resin, recycled materials

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Moulding processes characterised by the choice of the material, e.g. wax, aggregates:	<a href="#">B29C 67/24</a>
Pressing of glass:	<a href="#">C03B 11/00</a>

Making brake linings:	<a href="#">F16D 69/00</a> , <a href="#">F16D 2250/0023</a>
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## **B29C 43/006**

**{Pressing and sintering powders, granules or fibres}**

### **Definition statement**

*This place covers:*

e.g. pressing fleeces made of thermoplastic fibres;

hot-fusion under pressure particles, granules or fibres etc, particles are heated and compressed to partial melt and bond together; thermal bonding under pressure; shaping monoliths

### **References**

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Sintering (without pressure)	<a href="#">B29C 67/04</a>
Surface fusion and bonding of particles to form voids	<a href="#">B29C 67/205</a>
Moulding processes characterised by the choice of mineral aggregates bonded with resin as the moulding material	<a href="#">B29C 67/242</a>
Prostheses	<a href="#">A61F 2/02</a>
Sintering metallic powders	<a href="#">B22F 3/10</a>
Preheating powders	<a href="#">B29B 13/00</a>
Partial melting of one or more layers to form the bond	<a href="#">B32B 37/04</a>
Sintering fibres	<a href="#">D04H 1/005</a> , <a href="#">D04H 3/16</a>
Making brake linings	<a href="#">F16D 69/00</a> , <a href="#">F16D 2250/0023</a>

## **B29C 43/021**

**{characterised by the shape of the surface}**

### **Definition statement**

*This place covers:*

making articles characterised by the shape of the surface

### **References**

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Grooves	<a href="#">B29C 37/0053</a>
Folding lines	<a href="#">B29C 53/06</a>
Surface shaping	<a href="#">B29C 59/00</a>
Moulding of lenses	<a href="#">B29D 11/00009</a>



Moulding of Fresnel lenses	<a href="#">B29D 11/00269</a>
Imprinting	<a href="#">B41F</a>
Embossing machines	<a href="#">B44B 5/00</a>
Decorative arts	<a href="#">B44C</a>
Packages or encapsulation of microstructural systems	<a href="#">B81B 7/0032</a>
Processes for packaging: MEMS	<a href="#">B81C 1/00261</a>
Fresnel lenses	<a href="#">G02B 3/08</a>
Apparatus for making LCD's	<a href="#">G02F 1/1303</a>
Lithographic processes using stamping	<a href="#">G03F 7/0002</a>
Fine patterning magnetic record carriers	<a href="#">G11B 5/84</a>
Optical record carriers	<a href="#">G11B 7/26</a>
Masters, stampers:	<a href="#">G11B 7/261</a> , <a href="#">G11B 7/263</a>
Manufacturing printed circuits	<a href="#">H05K 3/0014</a>
Laminating circuit boards	<a href="#">H05K 3/4611</a>
Apparatus for mechanical treatment of semiconductors	<a href="#">H10P 72/0428</a>
Making masks on semiconductor bodies	<a href="#">H10P 76/00</a>

**B29C 2043/022****{having locally depressed lines, e.g. hinges}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulds or cores characterised by the location of the parting line of the mould parts	<a href="#">B29C 33/005</a>
Moulding single grooves or ribs, e.g. tear lines	<a href="#">B29C 37/0057</a>
Forming folding lines by pressing or scoring	<a href="#">B29C 53/06</a>

**B29C 43/027****{having an axis of symmetry ([B29C 43/102](#) takes precedence)}****Definition statement***This place covers:*

Compression moulding of symmetrical articles, e.g. balls or ring-like shaped articles or tubular articles.

**References****Limiting references***This place does not cover:*

Isostatic pressing using rigid mould parts specially adapted for moulding articles having an axis of symmetry	<a href="#">B29C 43/102</a>
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**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Apparatus or methods for manufacturing balls	<a href="#">A63B 45/00</a>
Making spherical articles, e.g. balls	<a href="#">B29D 22/04</a>
Moulded articles with a profiled transverse cross-section	<a href="#">B29L 2031/003</a>
Ring or ring-like shaped moulded articles	<a href="#">B29L 2031/7096</a>

**B29C 43/04****using movable moulds****Definition statement**

*This place covers:*

movable moulds with the movement being other than open, closing, clamping, or pressurising, e.g. for curing in a closed mould outside the pressure exerting means, transferring moulds or mould parts between a feeding and a compressing station

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Handling of moulds in general	<a href="#">B29C 31/006</a>
Movable moulds in general	<a href="#">B29C 33/34</a>
Movable moulds for injection moulding	<a href="#">B29C 45/04</a>
Movable moulds for blow moulding	<a href="#">B29C 49/30</a>

**B29C 43/06****continuously movable {in one direction, e.g. mounted on chains, belts}****Definition statement**

*This place covers:*

e.g. moulds or mould parts travelling continuously along a path

**B29C 43/08****with circular movement {, e.g. mounted on rolls, turntables}****Definition statement**

*This place covers:*

moulds or mould parts mounted on rotating supporting construction, rotary machines, e.g. turntables, drums, carousels, star wheels

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

For injection moulding	<a href="#">B29C 45/06</a>
For blow moulding	<a href="#">B29C 49/36</a>
For presses	<a href="#">B30B 11/08</a>

## B29C 43/10

**Isostatic pressing, i.e. using non-rigid pressure-exerting members against rigid parts or dies**

### Definition statement

*This place covers:*

Flexible pressure exerting means, e.g. material characteristics of the pressure exerting member (e.g. special density, composition or syntactic foam).

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Flexible collapsible moulds for facilitating demoulding	<a href="#">B29C 33/50</a>
Applying pressure through membranes	<a href="#">B29C 51/28</a>
Vacuum bagging	<a href="#">B29C 70/44</a>
Hydroforming	<a href="#">B21D 26/033</a>
Bladders for making tyres	<a href="#">B29D 30/0654</a>
Flexible pressing means	<a href="#">B30B 5/02</a>
Membrane presses	<a href="#">B30B 9/22</a>
Isostatic pressing in general	<a href="#">B30B 11/001</a>
Laminating glass sheets	<a href="#">B32B 17/10853</a>
Vacuum laminating	<a href="#">B32B 37/1018</a>

## B29C 43/12

**using bags surrounding the moulding material {or using membranes contacting the moulding material}**

### Definition statement

*This place covers:*

Compression moulding processes by using vacuum or inflatable bags.

## References

### Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Shaping or impregnating composites of definitive length by compression using isostatic pressure	<a href="#">B29C 70/44</a>
Flexible cores for vulcanising tyres	<a href="#">B29D 30/0654</a>

## B29C 2043/141

{for making single layer articles}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

For indefinite articles	<a href="#">B29C 43/26</a>
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## B29C 2043/181

{encapsulated}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Outsert moulding	<a href="#">B29C 70/74</a>
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## B29C 2043/182

{completely}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Completely encapsulating inserts	<a href="#">B29C 70/70</a>
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## B29C 2043/185

{using adhesives}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Joining of preformed parts using adhesives	<a href="#">B29C 65/48</a>
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**B29C 2043/186****{hot-melt or heat activated adhesives}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Joining of preformed parts by heating, with or without pressure, and applying molten plastics	<a href="#">B29C 65/40</a>
Joining of preformed parts using adhesives	<a href="#">B29C 65/48</a>

**B29C 2043/188****{thermosetting adhesives, e.g. polyurethane adhesives}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Joining of preformed parts by heating	<a href="#">B29C 65/02</a>
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**B29C 43/22****of articles of indefinite length****References****Application-oriented references***Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Shaping or impregnating composites by compression for producing articles of indefinite length	<a href="#">B29C 70/50</a>
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**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Floor coverings obtained by sintering or gluing the granules together	<a href="#">D06N 7/0057</a>
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**B29C 43/24****Calendering****Definition statement***This place covers:*

e.g. measuring and regulating calender banks

**B29C 43/32****Component parts, details or accessories; Auxiliary operations****Definition statement**

*This place covers:*

Pressure exerting means or methods (mechanical, e.g. deformable nets or springs or non-mechanical, e.g. thermal expansion), e.g. pressure equalising means or methods.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Material characteristics of the isostatic pressure exerting member	<a href="#">B29C 43/10</a>
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**B29C 2043/3205****{Particular pressure exerting means for making definite articles}****Definition statement**

*This place covers:*

Single pressing elements, e.g. magnets or vibrating elements.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Compression moulds as such	<a href="#">B29C 43/36</a>
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**B29C 43/34****Feeding the material to the mould or the compression means {(B29C 43/085 takes precedence)}****References****Limiting references**

*This place does not cover:*

Feeding material in a continuous form to continuous movable compression moulds	<a href="#">B29C 43/085</a>
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**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Feeding of the material to be moulded in general	<a href="#">B29C 31/04</a>
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**B29C 2043/3427**

{hopper, vessel, chute, tube, conveying screw, for material in discrete form, e.g. particles or powder or fibres}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Dispensing from vessels	<a href="#">B29C 31/02</a>
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**B29C 2043/3433**

{using dispensing heads, e.g. extruders, placed over or apart from the moulds}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Feeding using dispensing heads	<a href="#">B29C 31/042</a>
Applying fluent material for coatings	<a href="#">B05D 1/26</a>
Extrusion coating	<a href="#">B05D 1/265</a>

**B29C 2043/3438**

{moving during dispensing over the moulds, e.g. laying up}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Feeding using moving dispensing heads	<a href="#">B29C 31/044</a>
Applying fluent material for coatings	<a href="#">B05D 1/26</a>
Extrusion coating	<a href="#">B05D 1/265</a>

**B29C 2043/3444**

{using pressurising feeding means located in the mould, e.g. plungers or pistons}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Injection-compression moulding	<a href="#">B29C 45/561</a>
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**B29C 2043/3466****{using rotating supports, e.g. turntables or drums}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Feeding in general by using volumetric measuring chambers moving between a charging station and a discharge station	<a href="#">B29C 31/065</a>
Turntables as movable moulds	<a href="#">B29C 43/08</a>
Feeding materials to moulding presses	<a href="#">B30B 15/302</a>
Transfer turntables	<a href="#">B65G 47/80</a>

**B29C 2043/3472****{using star wheels comprising arms}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Transfer stars	<a href="#">B65G 47/84</a>
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**B29C 2043/3477****{centrally fed, e.g. feeding the material in the center of the mould turntables}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Turntables as movable moulds	<a href="#">B29C 43/08</a>
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**B29C 2043/3602****{with means for positioning, fastening or clamping the material to be formed or preforms inside the mould}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulds with incorporated means for positioning inserts	<a href="#">B29C 33/14</a>
Positioning articles in the mould for injection moulding	<a href="#">B29C 45/14065</a>



**B29C 2043/3615**

**{Forming elements, e.g. mandrels or rams or stampers or pistons or plungers or punching devices}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Moulding lenses	<a href="#">B29D 11/00413</a>
Ram pressing	<a href="#">B30B 11/02</a>
Ram press cooperating with fixed mould	<a href="#">B30B 11/04</a>
Forming pockets in sheets	<a href="#">B65B 47/04</a>

**B29C 43/3642**

**{Bags, bleeder sheets or cauls for isostatic pressing}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Flexible cores for vulcanising tyres	<a href="#">B29D 30/0654</a>
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**B29C 2043/3644**

**{Vacuum bags; Details thereof, e.g. fixing or clamping}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Applying pressure through membranes	<a href="#">B29C 51/28</a>
Vacuum bag-moulding	<a href="#">B29C 70/44</a>
Bladders for making tyres	<a href="#">B29D 30/0601</a>
Flexible pressing means	<a href="#">B30B 5/02</a>
Membrane press	<a href="#">B30B 9/22</a>
Vacuum laminating	<a href="#">B32B 37/1018</a>

**B29C 2043/3647****{Membranes, diaphragms}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Applying pressure through membranes	<a href="#">B29C 51/28</a>
Vacuum bagging	<a href="#">B29C 70/44</a>
Bladders for making tyres	<a href="#">B29D 30/0601</a>
Flexible pressing means	<a href="#">B30B 5/02</a>
Membrane press	<a href="#">B30B 9/22</a>
Vacuum laminating	<a href="#">B32B 37/1018</a>

**B29C 2043/3649****{Inflatable bladders using gas or fluid and related details}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Flexible moulds	<a href="#">B29C 33/50</a>
Deep drawing membranes	<a href="#">B29C 51/28</a>
Vacuum bagging	<a href="#">B29C 70/44</a>
Bladders for making tyres	<a href="#">B29D 30/0601</a>
Flexible pressing means	<a href="#">B30B 5/02</a>
Membrane press	<a href="#">B30B 9/22</a>
Vacuum laminating	<a href="#">B32B 37/1018</a>

**B29C 2043/3652****{Elastic moulds or mould parts, e.g. cores or inserts}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Elastomeric moulds	<a href="#">B29C 33/405</a>
Plastic moulds or cores	<a href="#">B29C 33/50</a>
Isostatic pressing	<a href="#">B29C 43/10</a>

**B29C 2043/3655****{Pressure transmitters, e.g. caul plates; pressure pads}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Details of caul plates for shaping composites comprising reinforcements only	<a href="#">B29C 70/549</a>
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**B29C 2043/3668****{destructible or fusible}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Lost moulds	<a href="#">B29C 33/0016</a>
Moulds for making articles with holes	<a href="#">B29C 33/0033</a>
Fusible cores	<a href="#">B29C 33/52</a>
Making porous articles	<a href="#">B22F 3/11</a>

**B29C 2043/3678****{on cylindrical supports with moulds or mould cavities provided on the periphery}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Rollers for making indefinite articles	<a href="#">B29C 43/46</a>
Roller presses	<a href="#">B30B 11/006</a>
Turntable presses	<a href="#">B30B 11/08</a>

**B29C 2043/3689****{on a support table, e.g. flat disk-like tables having moulds on the periphery}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Press rams on turntables	<a href="#">B30B 9/042</a>
Presses adapted for forming shaped articles using a press ram cooperating with moulds on turntables	<a href="#">B30B 11/08</a>

**B29C 43/42****for undercut articles****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulds for moulding articles provided with holes in general	<a href="#">B29C 33/0033</a>
Moulds for undercut articles in general	<a href="#">B29C 33/44</a>
Manufacture of work pieces or articles provided with cavities or holes from metallic powder	<a href="#">B22F 5/10</a>

**B29C 2043/425****{mould parts or sliders being movable independently from the mould halves for making undercut portions}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Collapsible cores or mandrels	<a href="#">B29C 33/485</a>
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**B29C 43/44****Compression means for making articles of indefinite length****Definition statement***This place covers:*

e.g. exchanging rollers or belts;

e.g. exchanging the coating of rollers;

e.g. adjusting rollers;

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

driving arrangements for rollers	<a href="#">D21G 1/0006</a>
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**B29C 43/46****Rollers****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

rollers for mixing plastic material to be shaped	<a href="#">B29B 7/62</a>
rollers with deflection compensating systems, e.g. hydraulic systems	<a href="#">F16C 13/028</a>

**B29C 2043/467**

**{plurality of rollers arranged in a specific manner in relation to each other}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Calendering	<a href="#">B29C 43/24</a>
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**B29C 2043/468**

**{take-off rollers, i.e. arranged adjacent a material feeding device}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Calendering	<a href="#">B29C 43/24</a>
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**B29C 2043/5015**

**{having undercuts or being threaded}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Using a rotating movement to unscrew articles	<a href="#">B29C 33/446</a>
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**B29C 2043/5023****{moving away}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Collapsible cores or mandrels	<a href="#">B29C 33/485</a>
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**B29C 2043/5084****{using rotary devices, e.g. turntables or carousels}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Blow moulding machines rotatable about one axis	<a href="#">B29C 49/36</a>
Handling means for blow moulding machines	<a href="#">B29C 49/4205</a>

**B29C 43/52****Heating or cooling****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Press plates with heating or cooling means	<a href="#">B30B 15/064</a>
--	-----------------------------

**B29C 43/56****Compression moulding under special conditions, e.g. vacuum****Definition statement***This place covers:*

e.g. compression moulding using vibrations;

e.g. compression moulding while steaming

**B29C 2043/561****{under vacuum conditions}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulds or cores with incorporated venting means	<a href="#">B29C 33/10</a>
Vacuum bag-moulding	<a href="#">B29C 70/44</a>
Vacuum laminating	<a href="#">B32B 37/1018</a>

**B29C 43/58****Measuring, controlling or regulating {(for bank adjustment in calendering  
[B29C 43/245](#))}****Definition statement***This place covers:*

- enabling a value, or its relation to a datum, to be determined in the sense of measuring as defined in Note 2 of class [G01](#);
- affecting a variable of the compression moulding process in any way, e.g. changing its direction or its value, maintaining its constant or limiting its range of variation;
- maintaining a variable at a desired value or within a desired range of values;
- selecting a specific value for a parameter, e.g. temperature or pressure, that has a substantial influence on the compression moulding process.

The mere selection of optimum or workable values or ranges of values, without accompanying disclosure of the influence on the compression moulding process or its objective does not qualify for classification in this group.

**References****Limiting references***This place does not cover:*

Measuring and regulating calender parameters, e.g. bank quantity	<a href="#">B29C 43/245</a>
--	-----------------------------

**B29C 2043/5841****{for accommodating variation in mould spacing or cavity volume during moulding}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Compensating shrinkage	<a href="#">B29C 43/54</a>
------------------------	----------------------------

**B29C 44/00**

**Shaping by internal pressure generated in the material, e.g. swelling or foaming {; Producing porous or cellular expanded plastics articles}**

**References****Limiting references**

*This place does not cover:*

Chemical aspects of foaming	<a href="#">C08J 9/00</a>
-----------------------------	---------------------------

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Metal foams	<a href="#">B22D 25/005</a>
Ceramic foams	<a href="#">C04B 38/00</a>

**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

reticulated	cell wall membranes are removed, leaving a framework only.
-------------	--

**Synonyms and Keywords**

*In patent documents, the following words/expressions are often used with the meaning indicated:*

"foaming"	"expanding" and "swelling".
-----------	-----------------------------

**B29C 44/04**

**consisting of at least two parts of chemically or physically different materials, e.g. having different densities**

**Definition statement**

*This place covers:*

e.g. a soft, porous core covered by a skin or lining when they are made in the same procedure

**References****Limiting references**

*This place does not cover:*

incorporating preformed parts	<a href="#">B29C 44/12</a>
-------------------------------	----------------------------



**B29C 44/182****{Filling flexible bags not having a particular shape}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Filling cushion pads	<a href="#">B31D 5/0078</a>
----------------------	-----------------------------

**B29C 44/188****{Sealing off parts of the cavities}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Insulating elements for vehicles	<a href="#">B60R 13/08</a>
Foam in superstructures for vehicles	<a href="#">B62D 29/002</a>

**B29C 44/20****for articles of indefinite length****Definition statement***This place covers:*

continuous processes, even if it is followed by a subdivision into separate articles

**B29C 44/3415****{Heating or cooling}****Definition statement***This place covers:*

particular characteristics of the heating or cooling method

**B29C 44/3461****{Making or treating expandable particles}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Feeding moulds with granules	<a href="#">B29C 44/445</a>
Making granules	<a href="#">B29B 9/00</a>
under-water, e.g. underwater pelletizers	<a href="#">B29B 9/065</a>

**B29C 44/445****{in the form of expandable granules, particles or beads}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Making or treating expandable particles	<a href="#">B29C 44/3461</a>
---	------------------------------

**B29C 44/56****After-treatment of articles, e.g. for altering the shape****Definition statement***This place covers:*

Characteristics of methods for working on an already foamed object

**B29C 44/569****{Shaping and joining components with different densities or hardness}****Definition statement***This place covers:*

e.g. putting a foam layer and a lining in a mould, followed by compression moulding and joining

**B29C 44/588****{with means for venting, e.g. releasing foaming gas}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Venting of moulds in general	<a href="#">B29C 33/10</a>
Injection moulds with venting means	<a href="#">B29C 45/34</a>

**B29C 45/00****Injection moulding, i.e. forcing the required volume of moulding material through a nozzle into a closed mould; Apparatus therefor (injection blow-moulding [B29C 49/06](#))****Definition statement***This place covers:*

Injection moulding methods

Injection moulding apparatuses

## Definition statement

Articles obtained by injection moulding, as far as these articles are characterised by the injection moulding method

## References

*Limiting references*

*This place does not cover:*

Reaction injection moulding, liquid injection moulding	<a href="#">B29C 67/246</a>
--	-----------------------------

## Special rules of classification

It is desired to identify the obtained articles and the applied materials by allocating the appropriate Indexing Codes as provided in the subclass [B29K](#) and [B29L](#).

Particular attention should be paid to the break down Indexing Codes, that are available only at additional informative level.

## B29C 45/0001

{characterised by the choice of material}

## Definition statement

*This place covers:*

Injection moulding processes characterised by the plastic material. The group contains documents concerning injection moulding with a special material or a process adapted for a certain material.

## References

*Limiting references*

*This place does not cover:*

Injection moulding characterised by the use of fibres.	<a href="#">B29C 45/0005</a>
Injection moulding characterised by the use of fillers	<a href="#">B29C 45/0013</a>

## B29C 45/0003

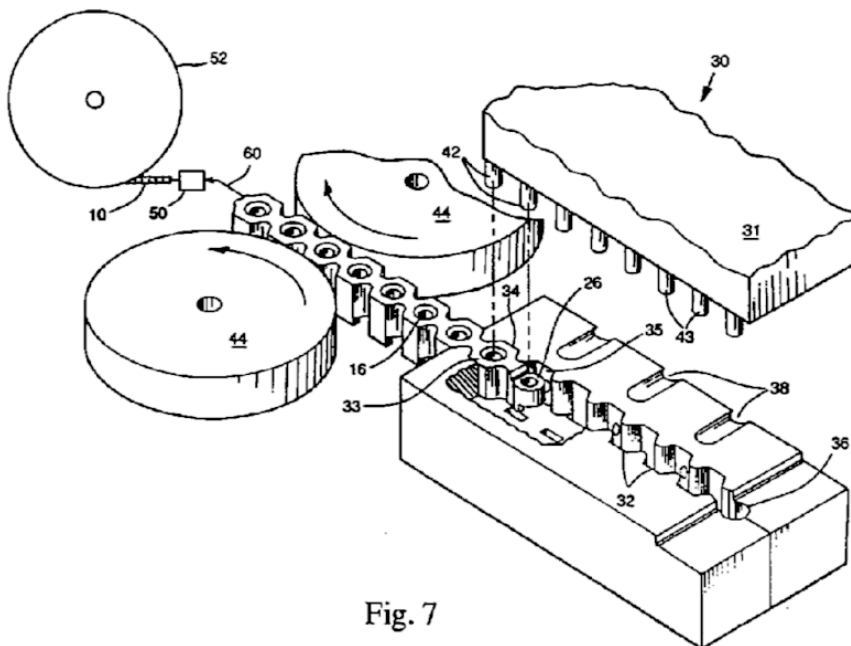
{of successively moulded portions rigidly joined to each other}

## Definition statement

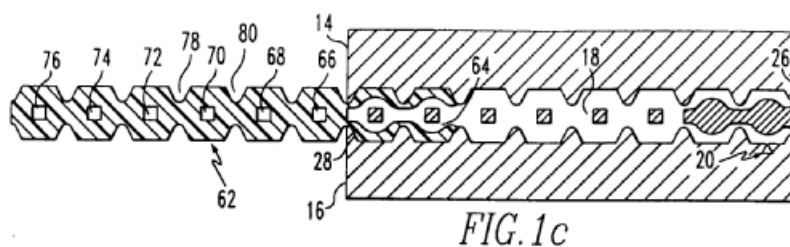
*This place covers:*

Injection moulding processes of continuous or endless articles.

EP847112, fig 7,



EP826475 fig 1c.



### Special rules of classification

Although this group covers a combination of several injection steps, the documents are not classified in [B29C 45/16](#)

## B29C 45/0005

{using fibre reinforcements}

### Definition statement

*This place covers:*

Injection moulding processes, whereby the fibres are dispersed in the plastic material. The dispersion is usually randomly.

Example EP893228

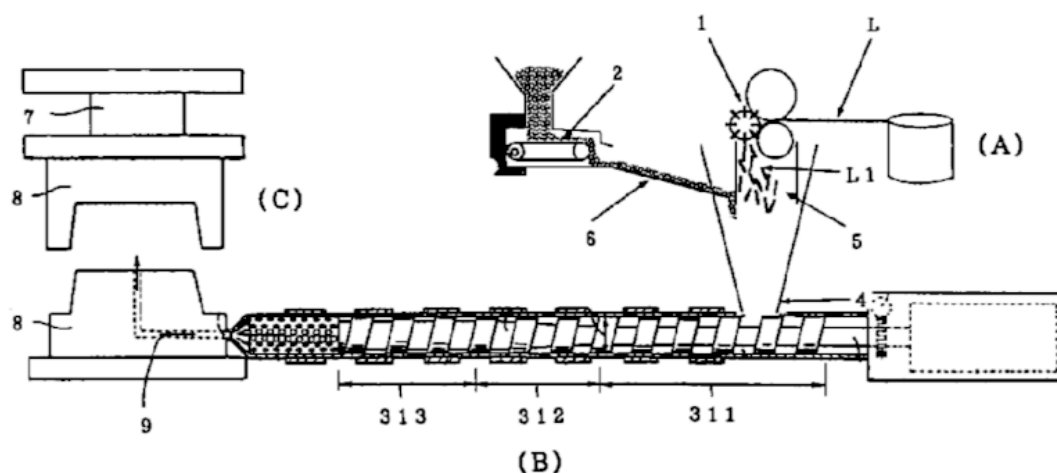


Fig. 1

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Coating reinforcement	<a href="#">B29C 45/14631</a>
Coating fibrous material or fibre containing material	<a href="#">B29C 45/14786</a>
Resin transfer moulding	<a href="#">B29C 70/48.</a>
Injection moulding with short fibres	(Japanese F-term) 4F206/AB25
Injection moulding with long fibres	(Japanese F-term) 4F206/AD16

## B29C 45/0013

{using fillers dispersed in the moulding material, e.g. metal particles}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping composites comprising fillers only	<a href="#">B29C 70/58</a>
--	----------------------------

## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Fillers	relatively inert substances in the form of particles, powder, beads, flakes or spheres, which improve the physical properties or increases the bulk or weight of an article and are randomly dispersed in the material, e.g. additives, dyestuff, colouring material, recycled material
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**B29C 45/0017**

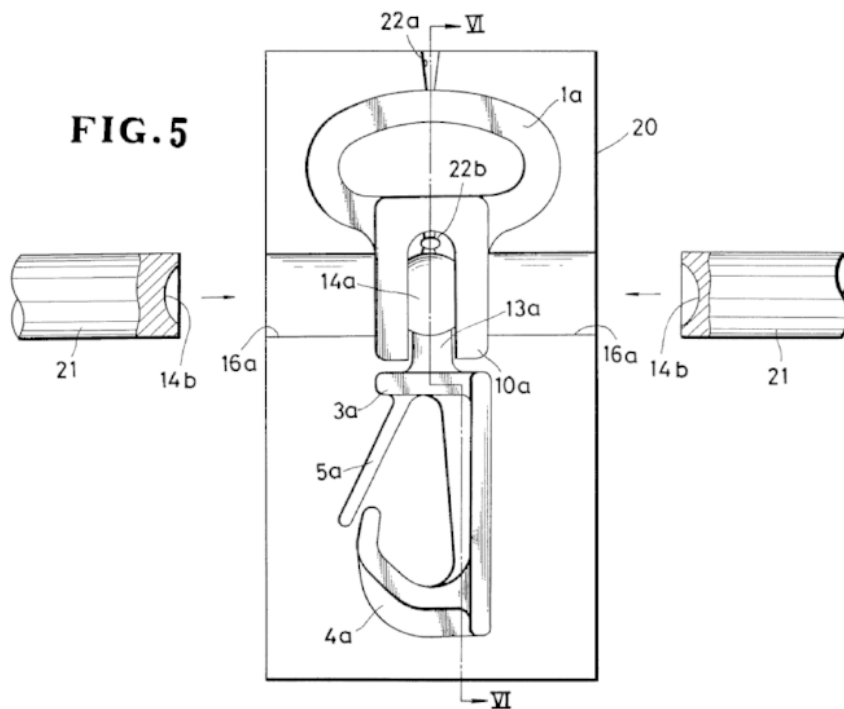
{moulding interconnected elements which are movable with respect to one another, e.g. chains or hinges}

**Definition statement**

*This place covers:*

Moulding of movable interconnected elements in a two step moulding process, without applying inserts.

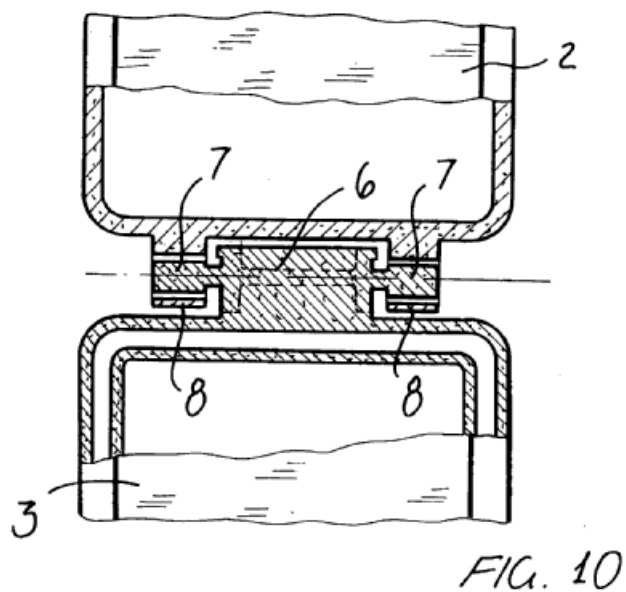
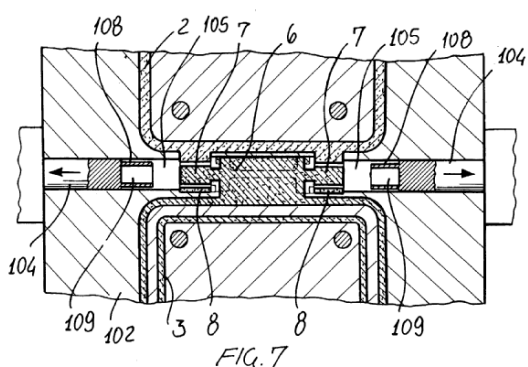
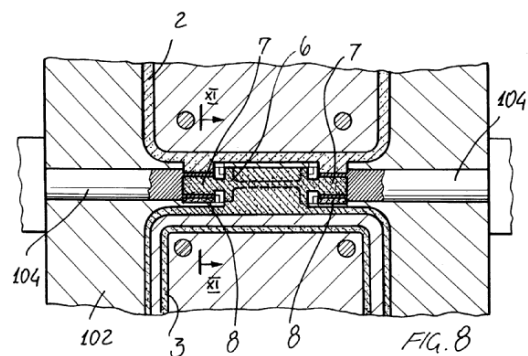
EP159614, fig 5



3  
110

0159614

WO0189795, fig 7,8,10



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Metal casting of rotational elements:	<a href="#">B22D 19/12</a>
Manufacturing of ventilating devices:	<a href="#">B60H 2001/3492</a>

## Special rules of classification

Documents contained in this group are NOT additionally classified in [B29C 45/16](#) and/or [B29C 45/26](#)

## B29C 45/0025

{Preventing defects on the moulded article, e.g. weld lines, shrinkage marks (preventing defects on the preformed parts or layers [B29C 45/14836](#))}

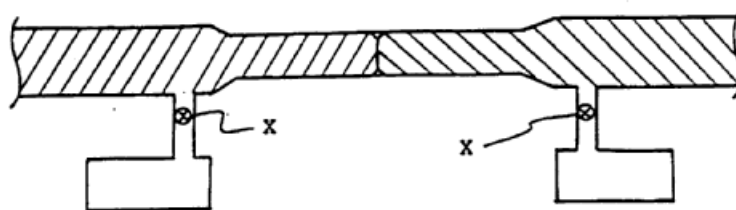
## Definition statement

*This place covers:*

Moulding processes to avoid the occurrence of burrs, sink marks, warping, location of gate marks or the like on the moulded article

EP508732, fig 8

Figure 8



## References

### Limiting references

*This place does not cover:*

Applying external gas moulding technology for avoiding shrinkage marks	<a href="#">B29C 45/174</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Compensation volume change during moulding	<a href="#">B29C 37/005</a>
Details relating to the flow path during moulding	<a href="#">B29C 45/0046</a>

## B29C 2045/0044

{expelling moulding material outside the mould cavity at the weld line location}

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Moulds with means for removing excess material, e.g. with overflow cavities	<a href="#">B29C 45/2669</a>
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**B29C 45/0046**

**{Details relating to the filling pattern or flow paths or flow characteristics of moulding material in the mould cavity}**

**Definition statement**

*This place covers:*

Moulding processes concerning the filling pattern or flow characteristics. Typically this is related to the moulding of parts having thin and thick sections, e.g. for avoiding weld lines.

EP749821 fig 4

FIG. 4a

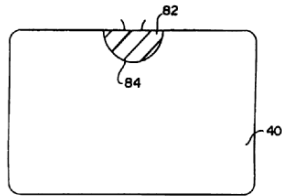


FIG. 4b

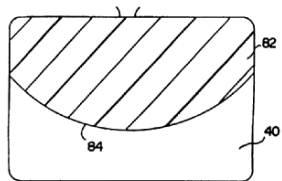
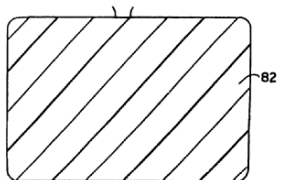


FIG. 4c



EP666159 fig 1, relates to filling, flow patterns.

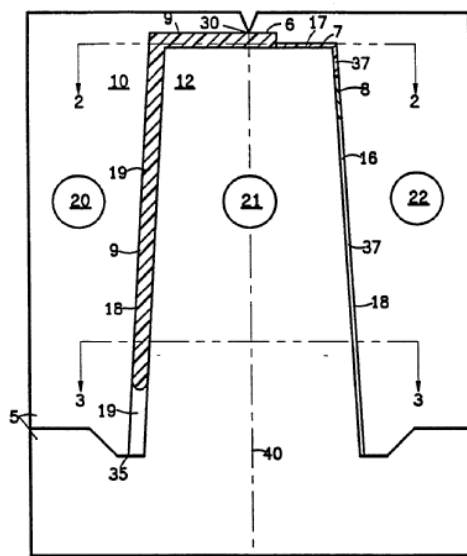


FIG. 1

EP362648, fig 6

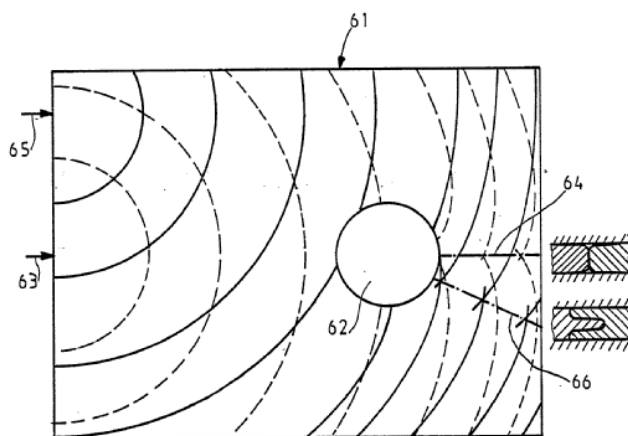


FIG. 6

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Preventing defects on the moulded articles	<a href="#">B29C 45/0025</a>
--	------------------------------

## Special rules of classification

Documents are classified in [B29C 45/0046](#) only, if the inventions concerns only the filling pattern.

Documents are classified in [B29C 45/0025](#) and [B29C 45/0046](#), if the inventions concerns the relation between the filling pattern and the weld line.

## **B29C 45/0053**

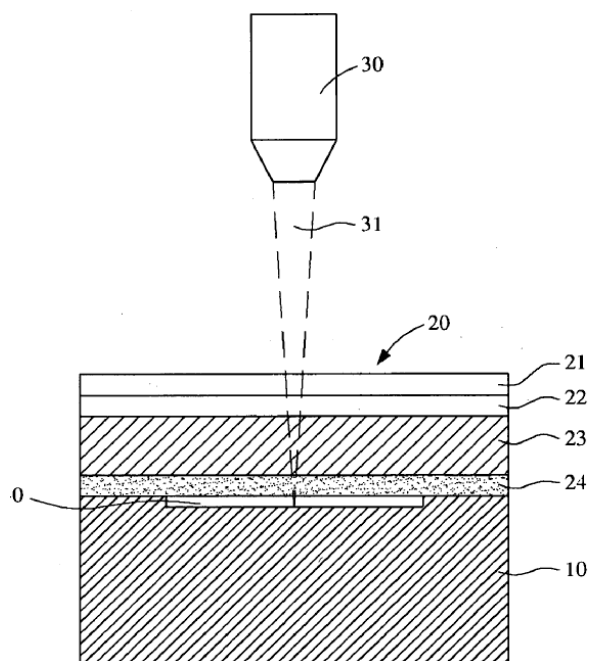
**{combined with a final operation, e.g. shaping (injection-compression moulding [B29C 45/561](#))}**

### **Definition statement**

*This place covers:*

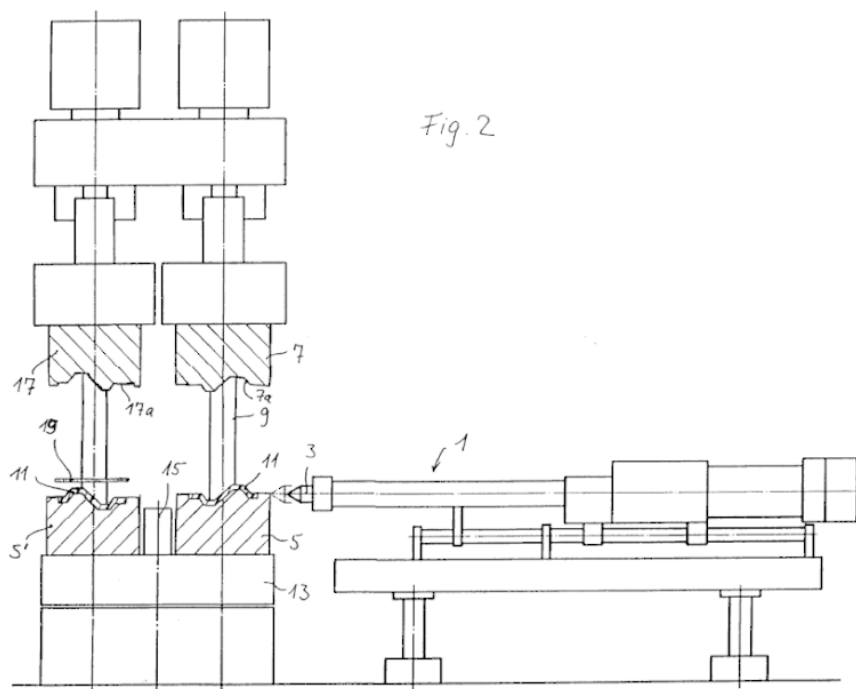
e.g. irradiation

US20100156007 figure 1,



addition of an insert

EP495219, fig 2



## References

### Limiting references

*This place does not cover:*

Post thermal treatment of articles	<a href="#">B29C 45/7207</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

In-mould coating	<a href="#">B29C 37/0028</a>
------------------	------------------------------

## B29C 45/0055

### {Shaping}

### Definition statement

*This place covers:*

Moulding processes comprising a shaping step after moulding.

Shaping refers to after treatment by mechanical means, e.g. bending, cutting, drilling, punching.

## Definition statement

EP546950 shows in fig 1 & fig 2 a bending step.

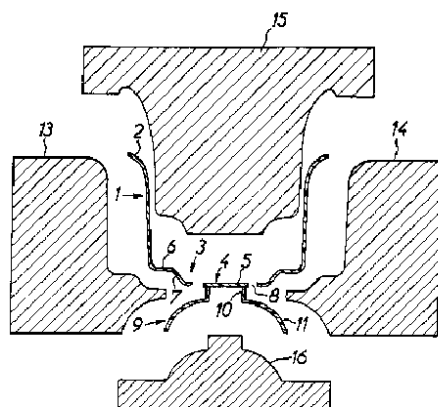


FIG. 1

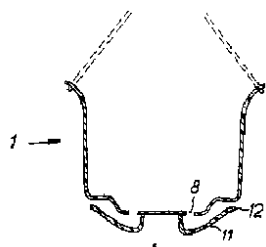
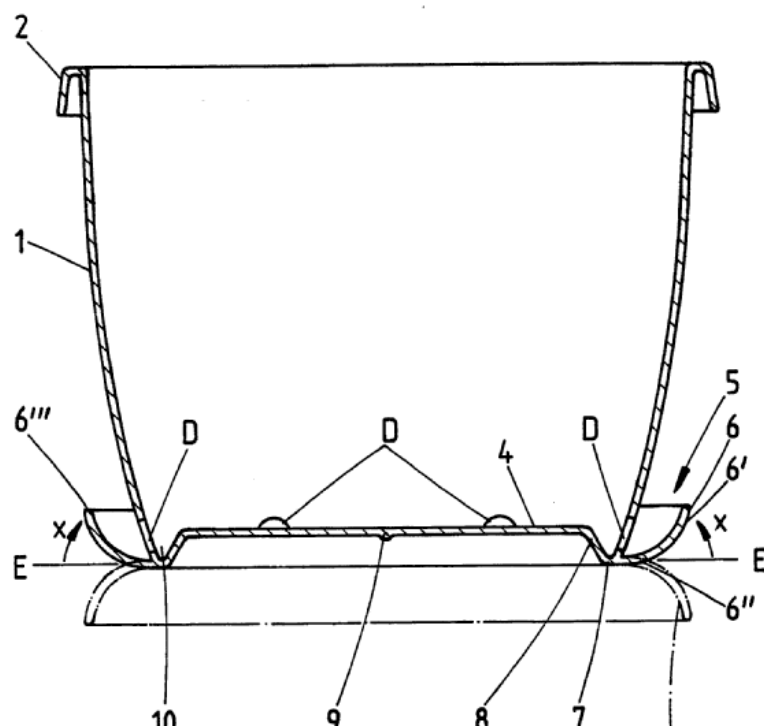


FIG. 2

EP381023



**B29C 45/0062****{Joined by injection moulding}****Special rules of classification**Documents classified in this group are not additionally classified in [B29C 45/16](#)**B29C 2045/0072****{the parts to be joined being moulded in a stack mould}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulds having several axially spaced mould cavities	<a href="#">B29C 45/32</a>
---	----------------------------

**B29C 2045/0077****{removing burrs or flashes}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Deburring or deflashing in general	<a href="#">B29C 37/02</a>
------------------------------------	----------------------------

**B29C 45/0081****{of objects with parts connected by a thin section, e.g. hinge, tear line}****Definition statement***This place covers:*

Moulding processes, whereby the thin section is part of the moulded material

EP775639, figures 3, 4.

Fig.3

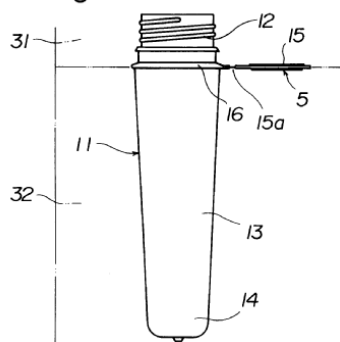
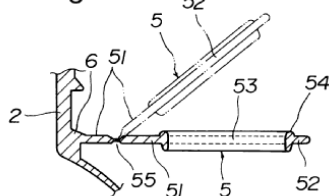


Fig.4



## References

### Limiting references

*This place does not cover:*

Using movable wall parts for making orifices in or through the moulded article	<a href="#">B29C 45/5675</a>
--	------------------------------

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Moulding single grooves, ribs, e.g. tear lines in general	<a href="#">B29C 37/0057</a>
---	------------------------------

## B29C 45/0082

**{Reciprocating the moulding material inside the mould cavity, e.g. push-pull injection moulding}**

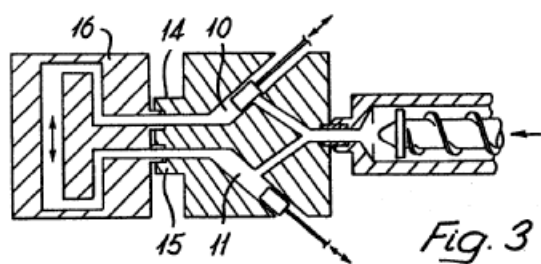
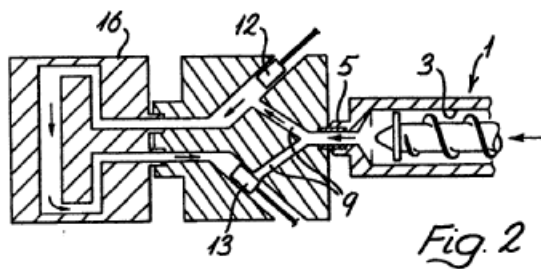
### Definition statement

*This place covers:*

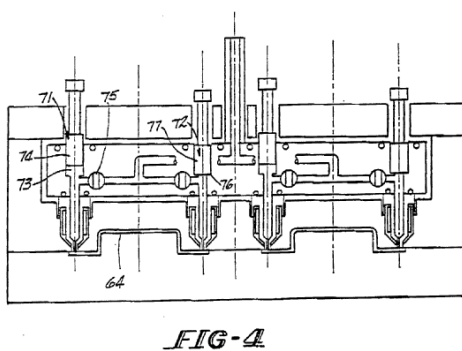
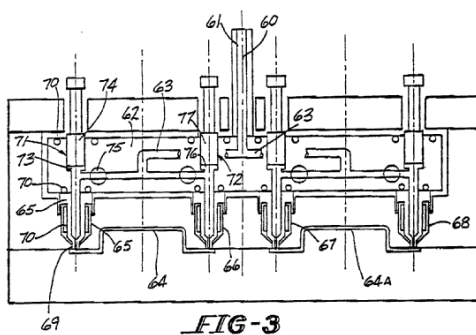
Moulding processes whereby the material is 'swung' between several positions in/around the cavity. The material flow is not limited to one direction.

Definition statement

EP188120 figures 2 &amp; 3



EP442255 fig 3,4.



## References

### Limiting references

This place does not cover:

Applying vibration to mould parts

[B29C 45/568](#)



**B29C 45/0084**

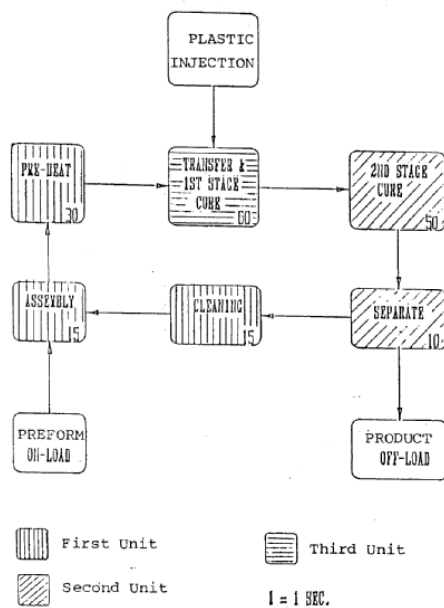
{General arrangement or lay-out of plants ([B29C 45/1468](#) takes precedence)}

**Definition statement**

*This place covers:*

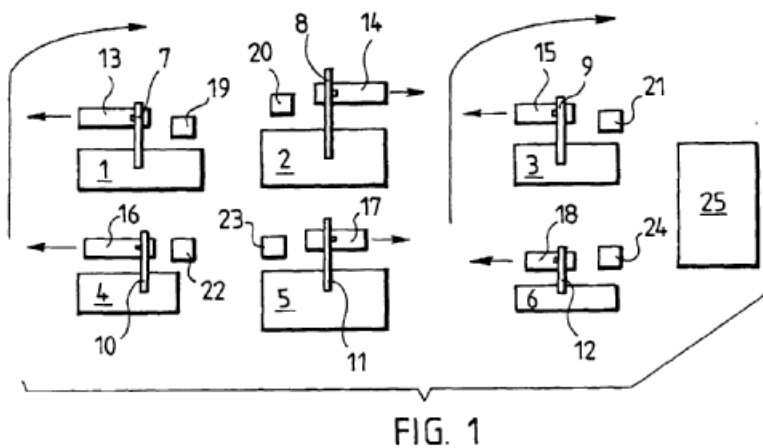
Plants showing several working positions or operations, e.g. EP576196

FIG. 7 PROCESS FLOW CHART

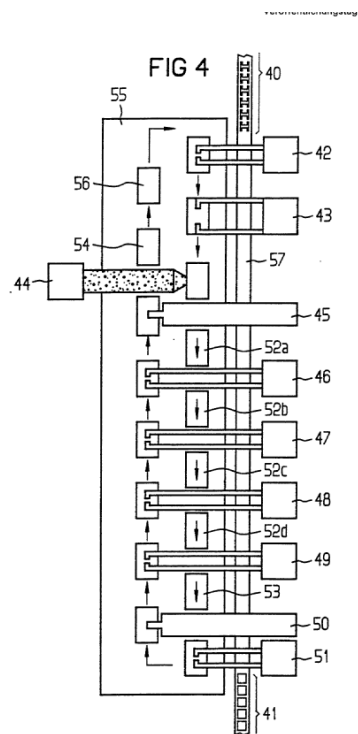


Lay out of plants, e.g.

EP765726



DE19634843, fig 4.



## References

### Limiting references

*This place does not cover:*

Plants for encapsulating articles mounted on a carrier, e.g. lead frame	<a href="#">B29C 45/1468</a>
---	------------------------------

## B29C 45/02

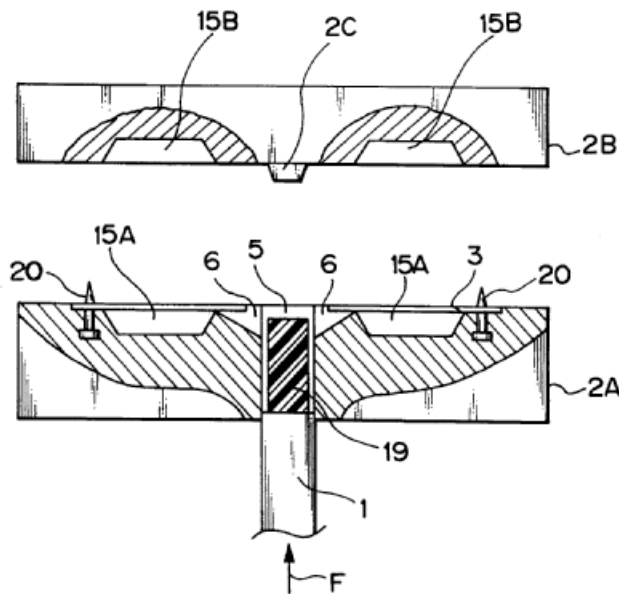
**Transfer moulding, i.e. transferring the required volume of moulding material by a plunger from a "shot" cavity into a mould cavity**

### Definition statement

*This place covers:*

Transfer moulding, whereby a shot cavity is provided within the mould. The material is transferred from the shot cavity into the mould cavity/cavities. The plunger is also part of the mould, the transfer takes place within a closed mould.

EP646948, fig 3.



### Relationships with other classification places

The difference between transfer moulding and compression moulding, is that in case of the latter, the material is compressed while closing the mould and not by separate mould parts after closing.

A typical example of compression moulding

EP510414, fig 3 & 4

Fig. 3

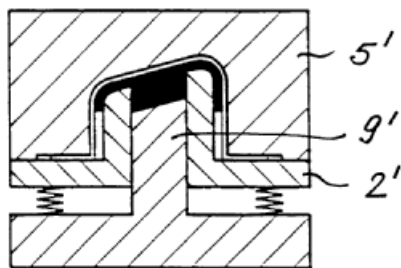
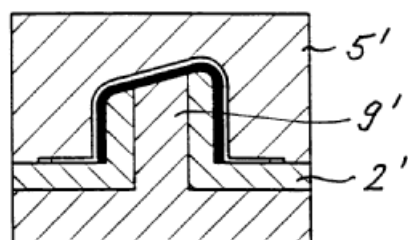


Fig. 4



## References

### Limiting references

*This place does not cover:*

Resin transfer moulding	<a href="#">B29C 70/48</a>
-------------------------	----------------------------

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Compression moulding with pressing members independently movable of the parts for opening and closing the mould	<a href="#">B29C 43/361</a>
---	-----------------------------

## B29C 45/021

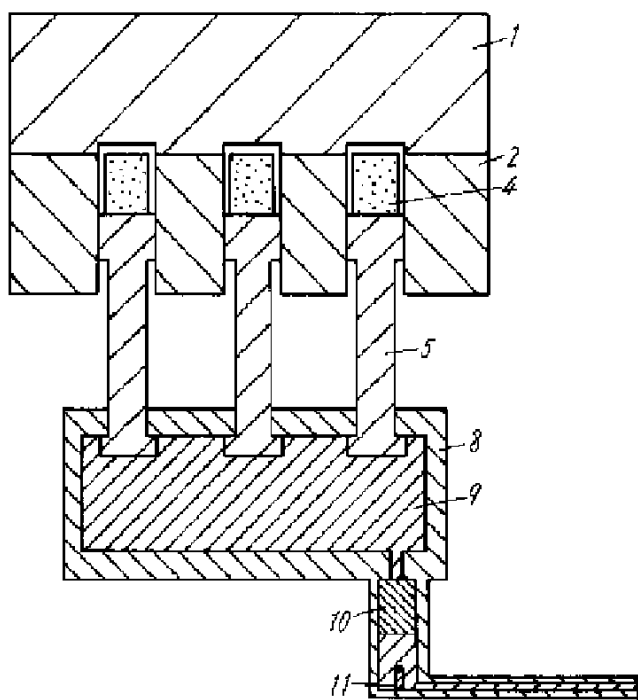
{Plunger drives; Pressure equalizing means for a plurality of transfer plungers}

### Definition statement

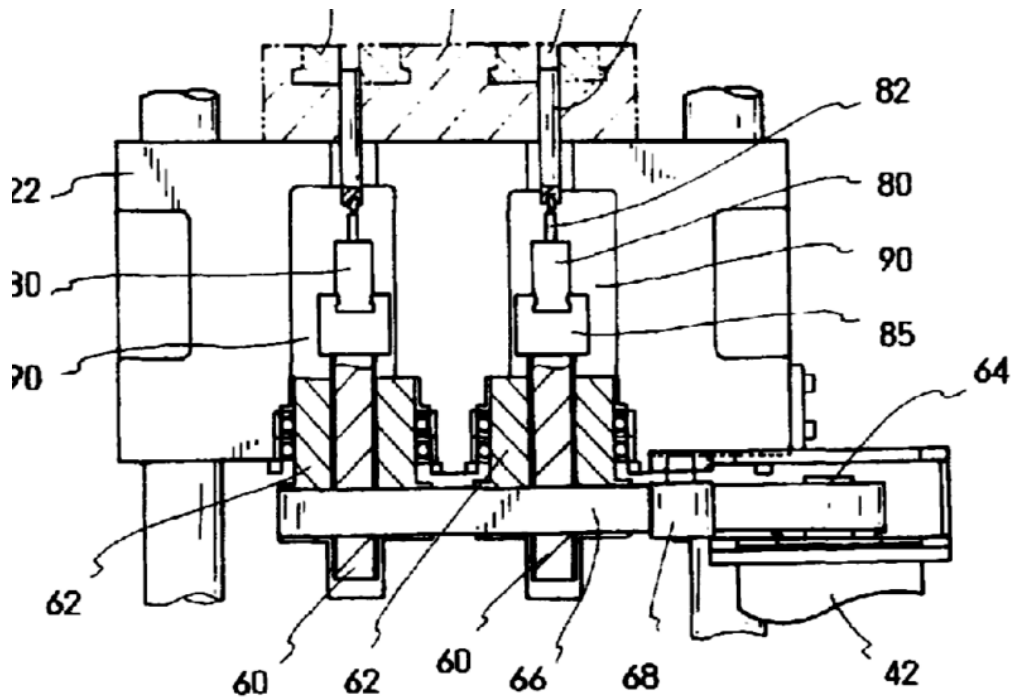
*This place covers:*

Drives or pressure equalizing means.

JP5329870, hydraulic chamber 9.



EP0778116



### B29C 45/03

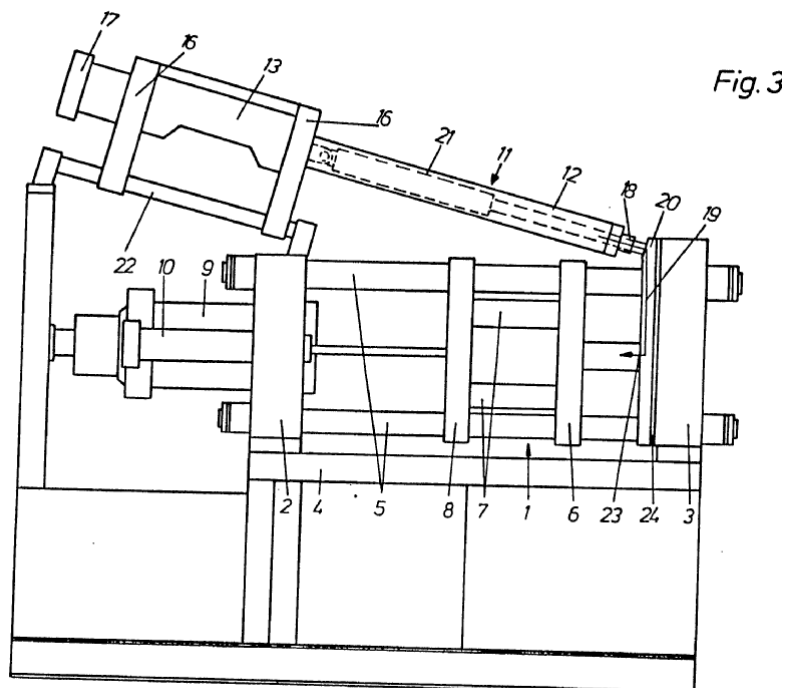
Injection moulding apparatus (transfer moulding [B29C 45/02](#))

#### Definition statement

*This place covers:*

The configuration of the injection moulding apparatus

EP34203, fig 3.



## References

### Limiting references

*This place does not cover:*

Injection apparatuses combining the feeding means with opening, closing or clamping means	<a href="#">B29C 45/70</a>
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## B29C 45/036

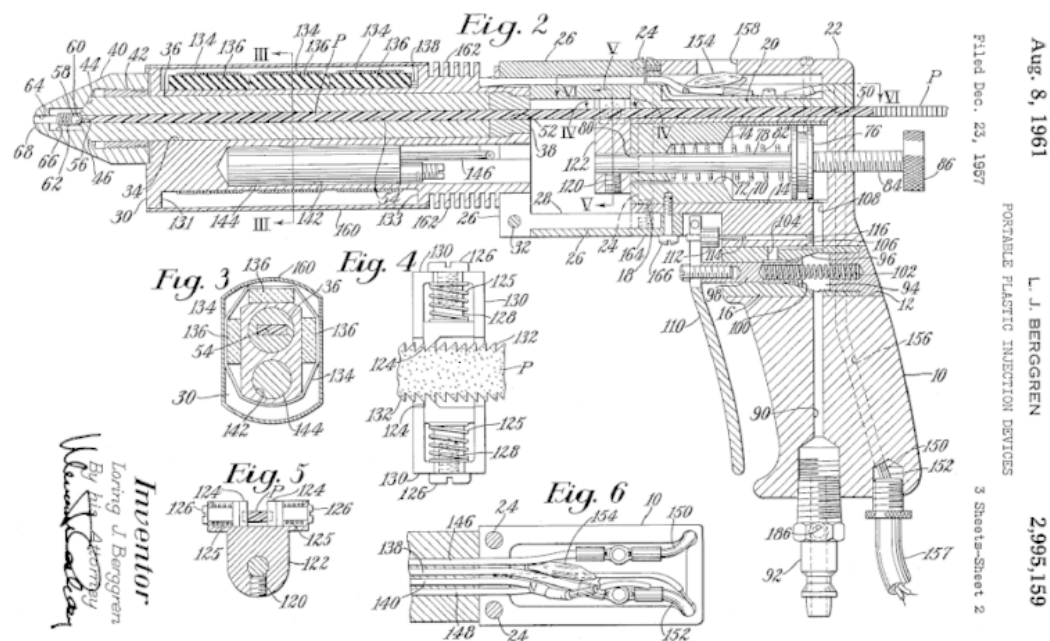
### {Injection pistols}

### Definition statement

*This place covers:*

Mainly hand-held injection moulding machines

US2995159



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Spray-up equipment for coating a mould, a core or other equipment:	<a href="#">B29C 41/365</a>
Hand tools for applying fluid in general	<a href="#">B05C 17/00</a>

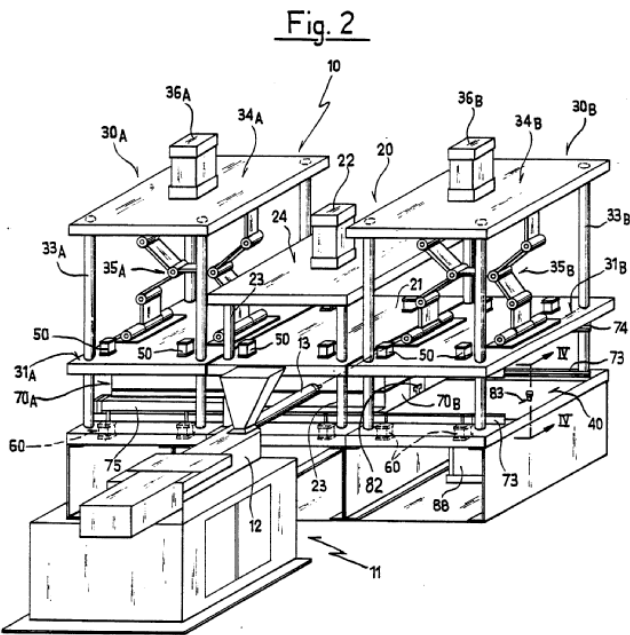
**B29C 45/04**

using movable moulds {or mould halves} ([B29C 45/08](#) takes precedence)

**Definition statement**

*This place covers:*

EP0268174



**References**

**Limiting references**

*This place does not cover:*

Movable moulds for making multilayered or multicoloured articles	<a href="#">B29C 45/1615</a>
--	------------------------------



**B29C 45/0408**

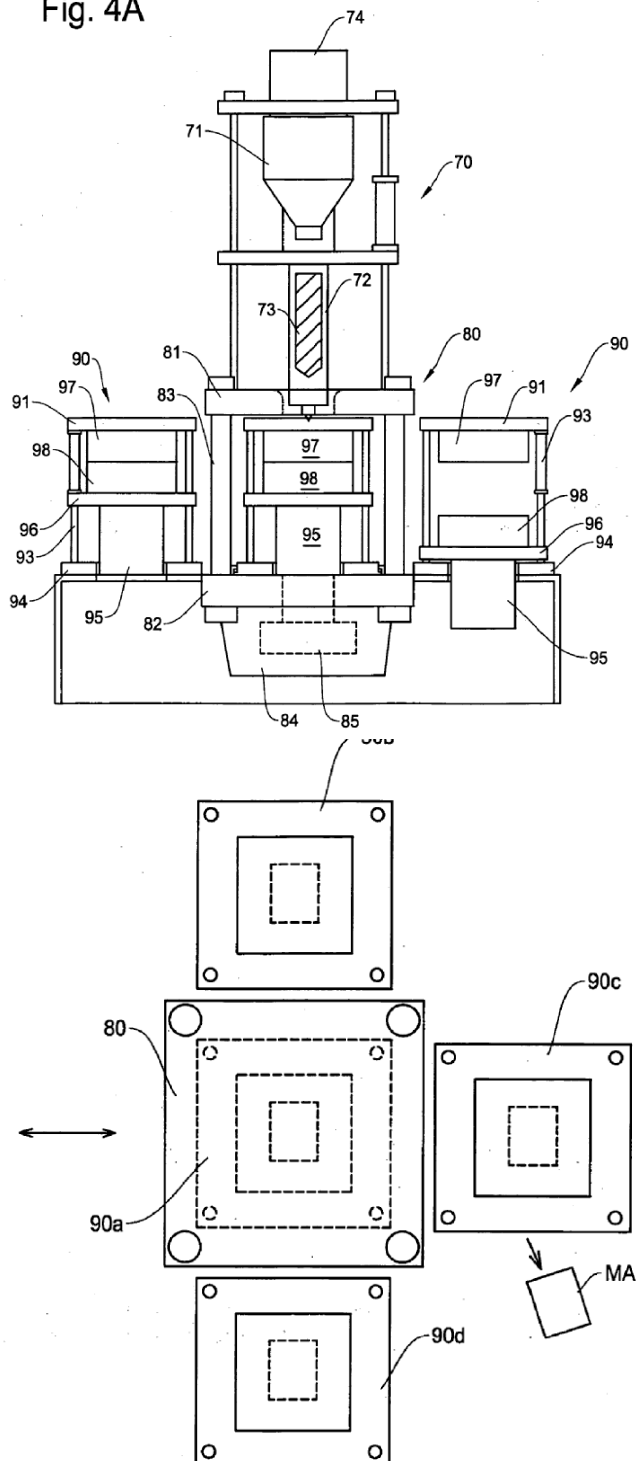
{involving at least a linear movement (**B29C 45/0433** takes precedence)}

**Definition statement**

*This place covers:*

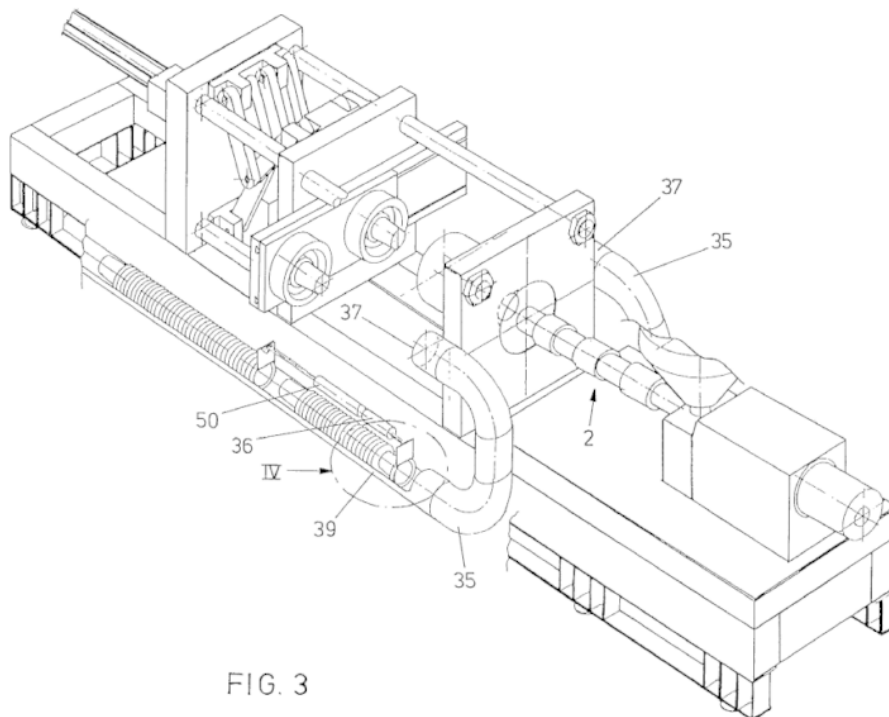
US20060172039

Fig. 4A



**B29C 45/0416****{co-operating with fixed mould halves}****Definition statement***This place covers:*

DE29517714U



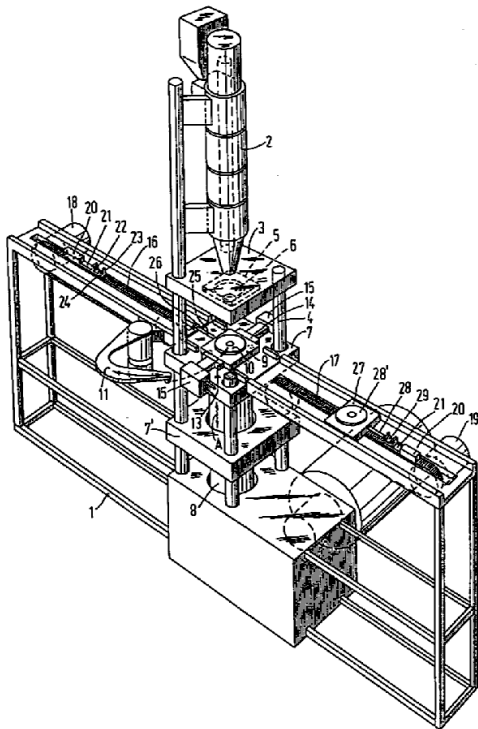
**B29C 45/0433**

{mounted on a conveyor belt or chain}

**Definition statement**

*This place covers:*

EP0577169



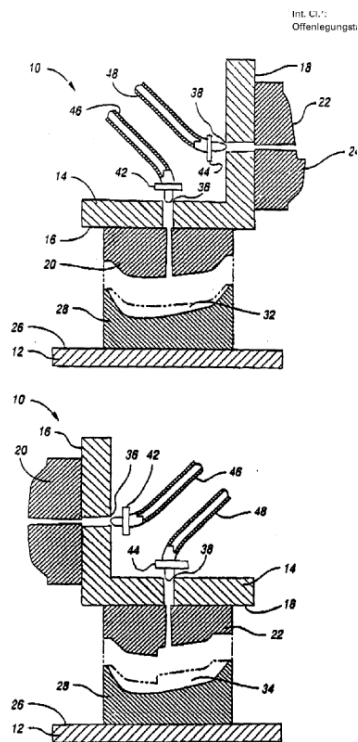
**B29C 45/0441**

**{involving a rotational movement (B29C 45/06 takes precedence)}**

### Definition statement

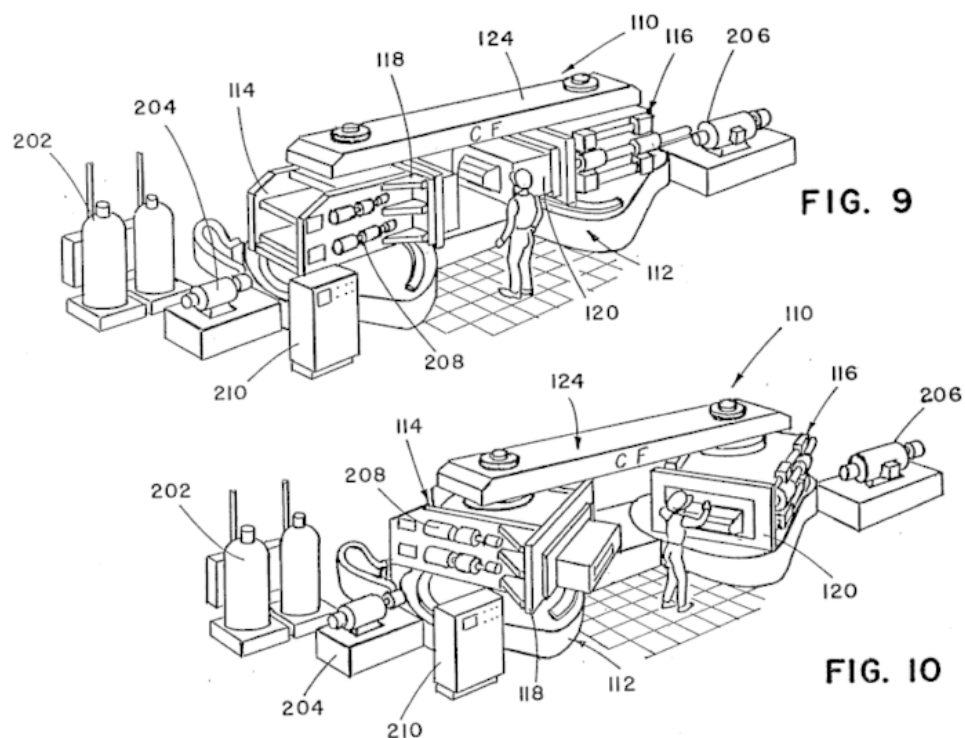
*This place covers:*

DE10120267



Definition statement

EP351895, fig 9/10.



## References

### Limiting references

*This place does not cover:*

Rotatable moulds or mould halves mounted on a turntable
---

<a href="#">B29C 45/06</a>
----------------------------

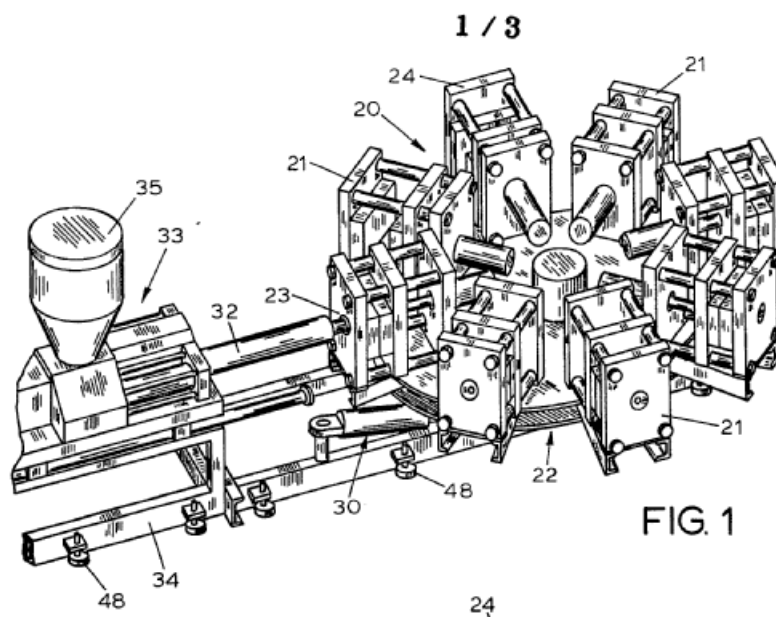
**B29C 45/045**

{mounted on the circumference of a rotating support having a rotating axis perpendicular to the mould opening, closing or clamping direction}

**Definition statement**

*This place covers:*

EP42012

**Synonyms and Keywords**

*In patent documents, the following words/expressions are often used with the meaning indicated:*

"circumference"	"surface "
-----------------	------------

**B29C 45/06**

{mounted} on a turntable {, i.e. on a rotating support having a rotating axis parallel to the mould opening, closing or clamping direction}

**Definition statement**

*This place covers:*

Injection moulding machines comprising a turntable, being a horizontal moving table with complete moulds or mould halves (the mould halves are covered by [B29C 45/062](#)). The rotation axis is normally parallel to the open/closing axis of the moulds.

WO9739870

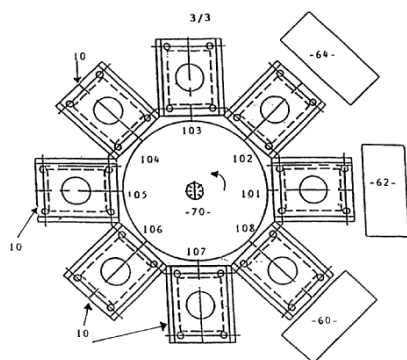


FIG. 3

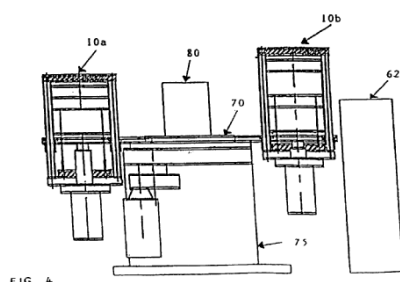


FIG. 4

1

EP0529940

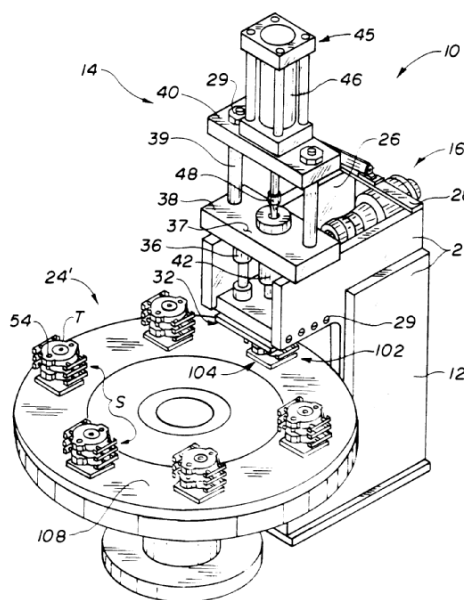


FIG. 7

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Turntables for presses	<a href="#">B30B 15/0023</a>
------------------------	------------------------------

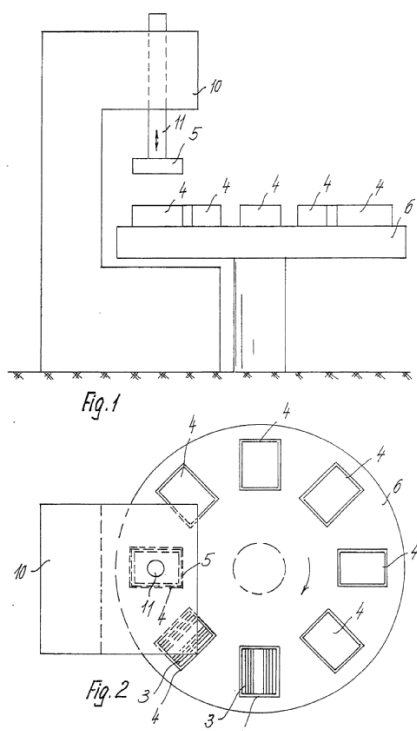
## B29C 45/062

{carrying mould halves co-operating with fixed mould halves}

### Definition statement

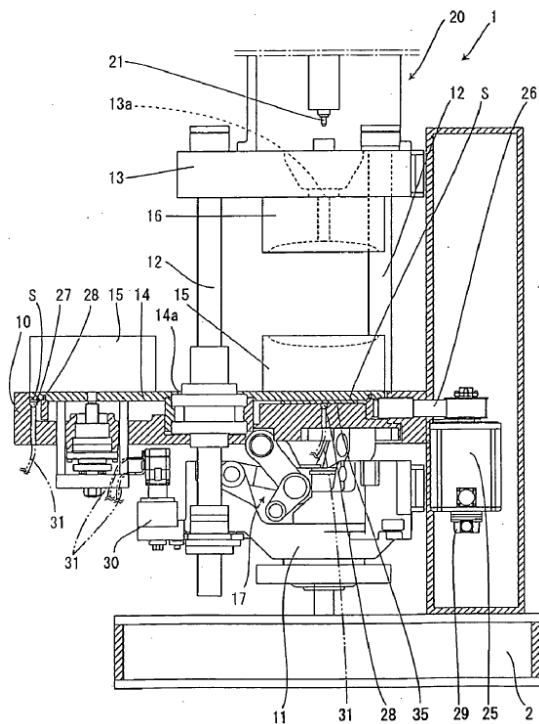
This place covers:

EP300068 fig 1





US20060177539



## **B29C 45/07**

**using movable injection units**

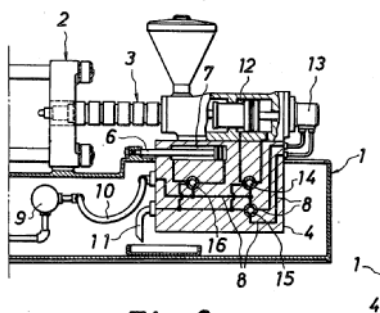
### **Definition statement**

*This place covers:*

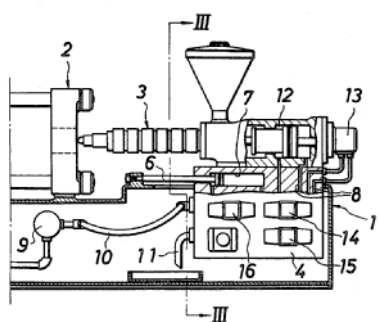
Injection moulding processes, whereby EACH moulding cycle, the injection unit is MOVED and removed.

US3924994, fig 1& 2.

**Fig.1**

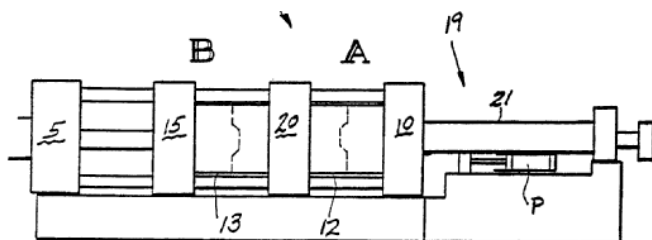
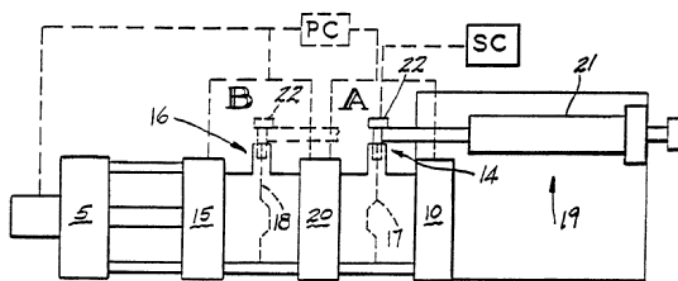


**Fig.2**



**B29C 45/076****{cooperating with two or more moulds}****Definition statement***This place covers:*

EP438721 fig 1,2 position A &amp; B

**FIG-1****FIG-2**

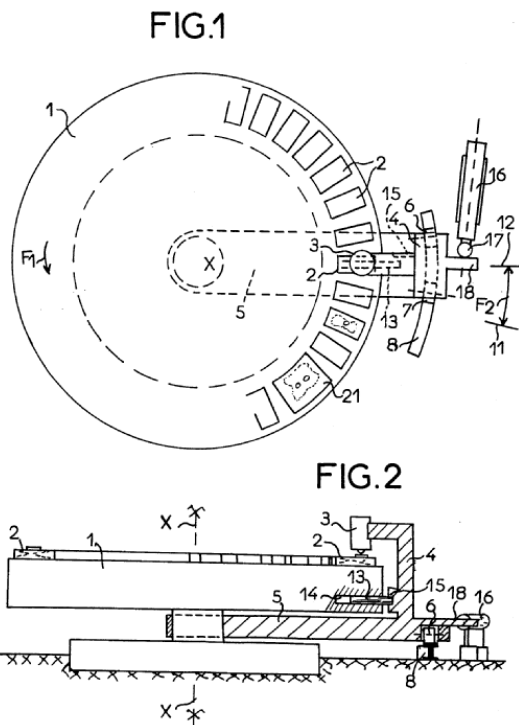
**B29C 45/08**

moving with the mould during the injection operation

**Definition statement**

*This place covers:*

Injection moulding processes, whereby the injection unit and the mould move at the same time.  
FR2155808 dashed line 5

**B29C 45/10**

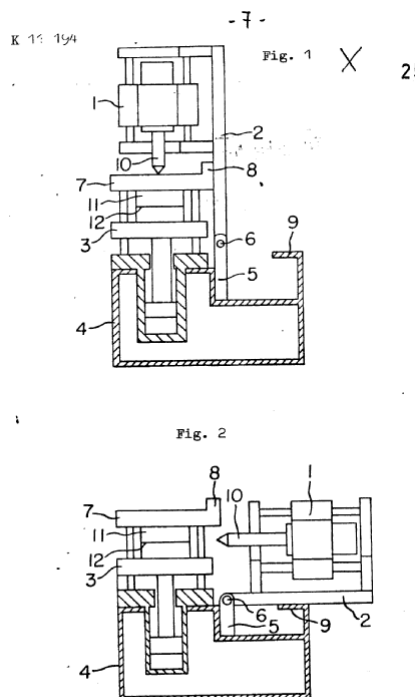
using moulds or injection units usable in different arrangements or combinations to each other

**Definition statement**

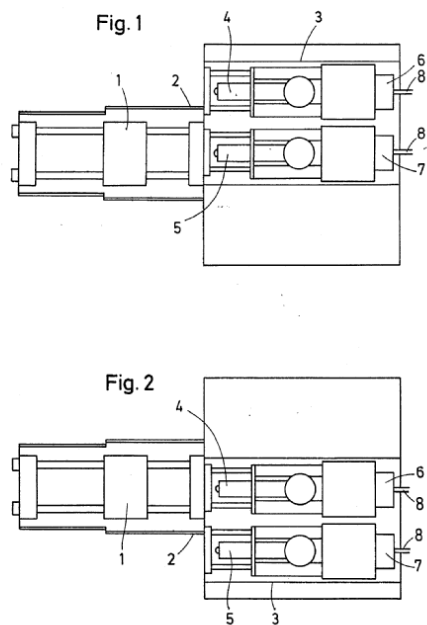
*This place covers:*

Different arrangements or combinations concerning the mould AND the injection unit.

Different arrangement of the mould and injection unit DE2543448, fig 1 & 2



Different combination of the mould and injection unit EP138169, fig 1 & 2



Note that the different arrangement or combination are not related to one moulding cycle but to a long period of use.

## References

### Limiting references

*This place does not cover:*

Moulds in different combinations	<a href="#">B29C 45/2673</a>
----------------------------------	------------------------------

## B29C 45/12

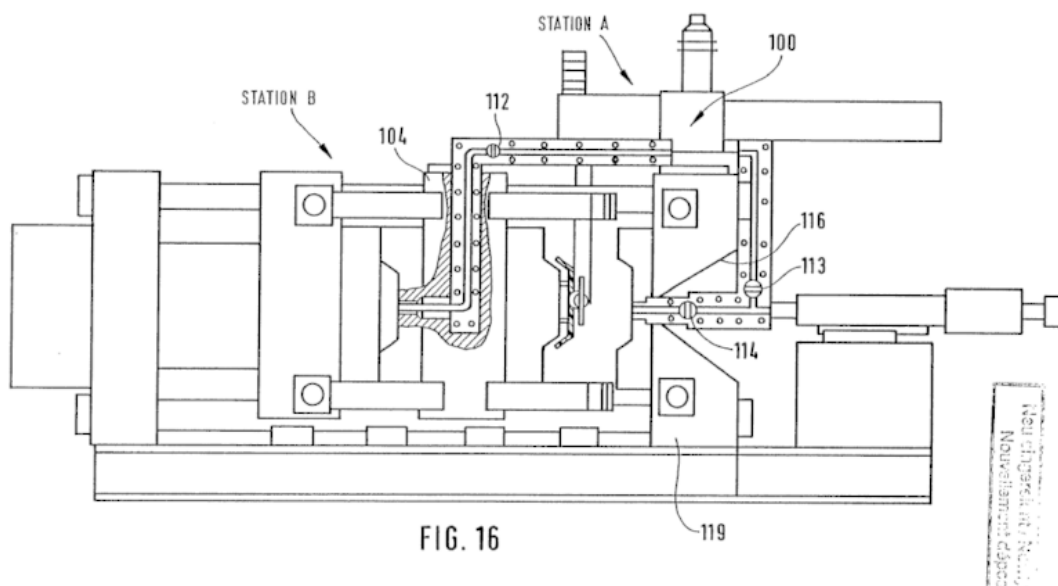
using two or more fixed moulds, e.g. in tandem {([B29C 45/076](#) takes precedence)}

### Definition statement

*This place covers:*

The INJECTION UNIT cooperates with BOTH MOULDS through a runner channel.

EP326175, figure 16



## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Stack moulds	<a href="#">B29C 45/32</a>
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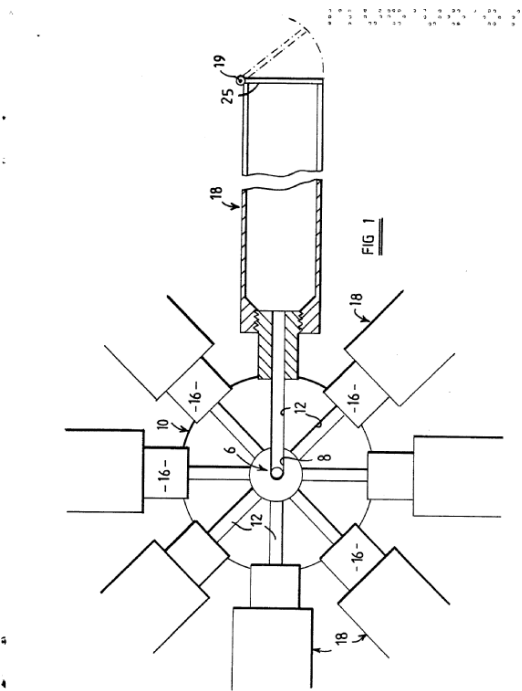
**B29C 45/125**

{using a material distributing system}

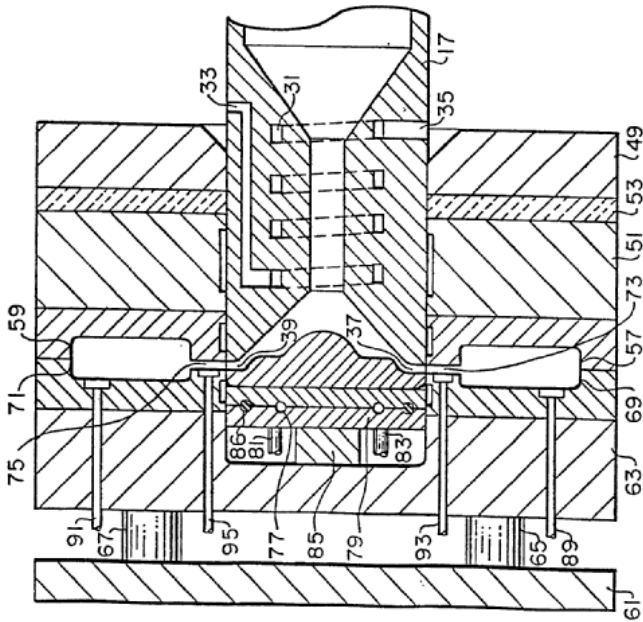
**Definition statement**

*This place covers:*

EP265603 fig 1

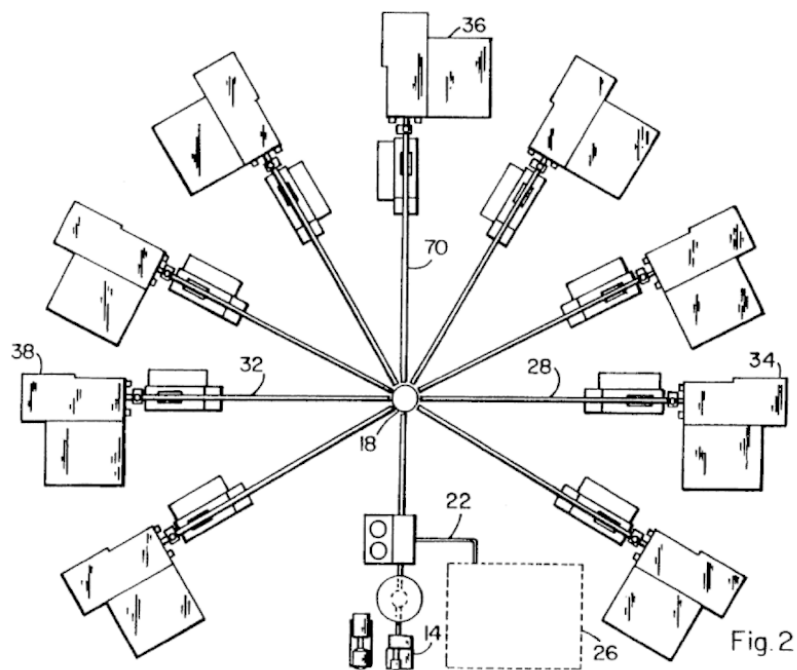


EP13118 fig 2,



**FIG. 2**

WO9702126 fig 2.



## **B29C 45/13**

**using two or more injection units co-operating with a single mould**

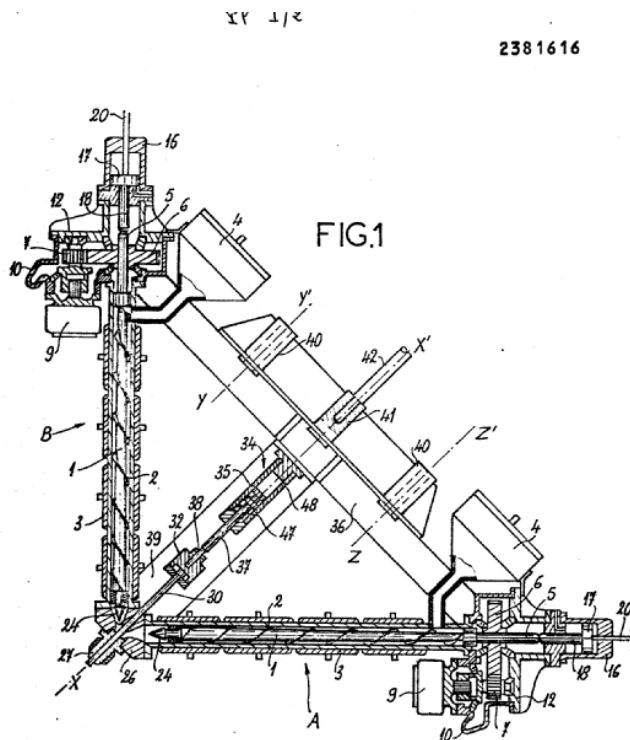
### **Definition statement**

*This place covers:*

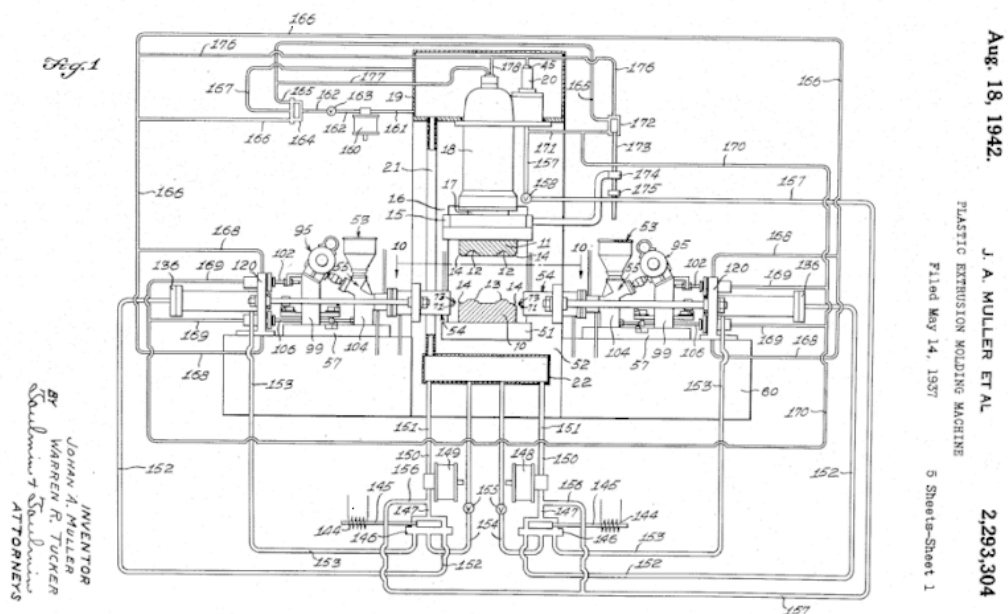
Several injection units, typically for quickly filling one mould.



FR2381616, figure 1



US2293304, figure 1



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Multi-component injection moulding	<a href="#">B29C 45/16</a>
------------------------------------	----------------------------

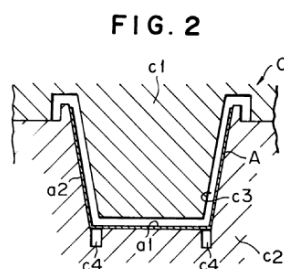
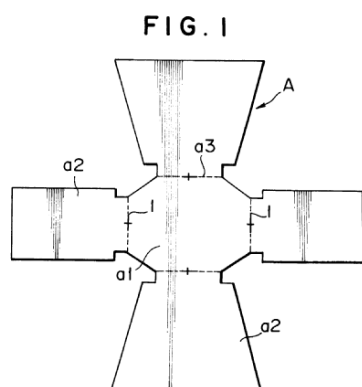
## B29C 45/14

incorporating preformed parts or layers, e.g. injection moulding around inserts or for coating articles {([B29C 45/1671](#) takes precedence)}

### Definition statement

*This place covers:*

EP492052 fig 1 & 2, label A.



### Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

- "inserts", "preformed parts", "articles", "films" and "preformed layers"

## B29C 45/14008

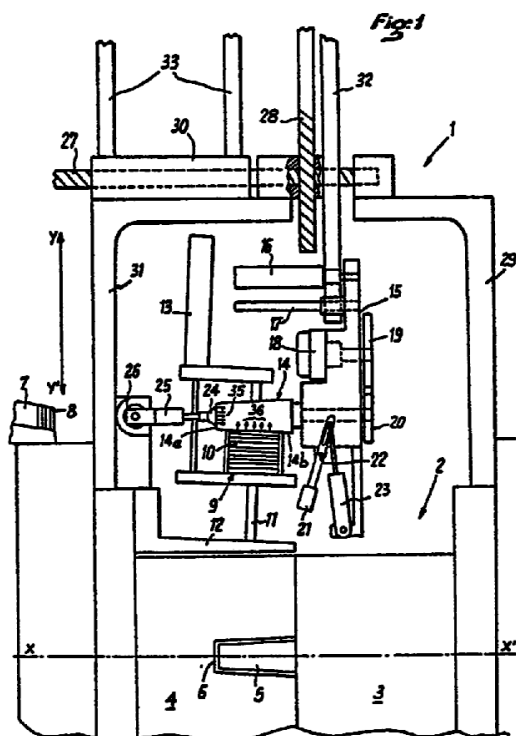
{Inserting articles into the mould ([B29C 45/14827](#) takes precedence)}

### Definition statement

*This place covers:*

Usually robots for inserting the to be overmoulded articles into the mould cavity

EP373023, figure 1



### Relationships with other classification places

Attention is being paid to the difference between [B29C 45/14008](#) and [B29C 45/14065](#), [B29C 45/14008](#) concerns the inserting of the articles INTO the mould. [B29C 45/14065](#) concerns the positioning of the already inserted article WITHIN the mould (cavity).

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Handling of preformed parts in general	<a href="#">B29C 31/008</a>
Inserting labels or films into blow moulds	<a href="#">B29C 49/2408</a>
Feeding of linings or labels for thermoforming	<a href="#">B29C 51/165</a>
Locating or holding inserts in metal casting	<a href="#">B22D 17/24</a>
Orienting articles in an article feeder for assembling machines	<a href="#">B23P 19/002</a>

### B29C 45/14016

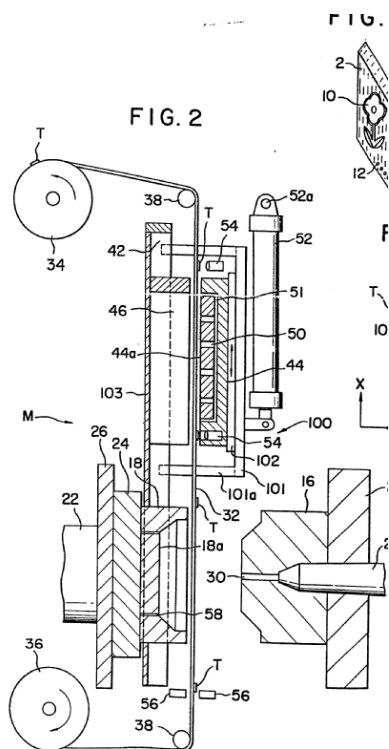
{Intermittently feeding endless articles, e.g. transfer films, to the mould  
([B29C 45/14262](#) takes precedence)}

### Definition statement

This place covers:

Non-continuous feeding of a film

EP101095, fig 2



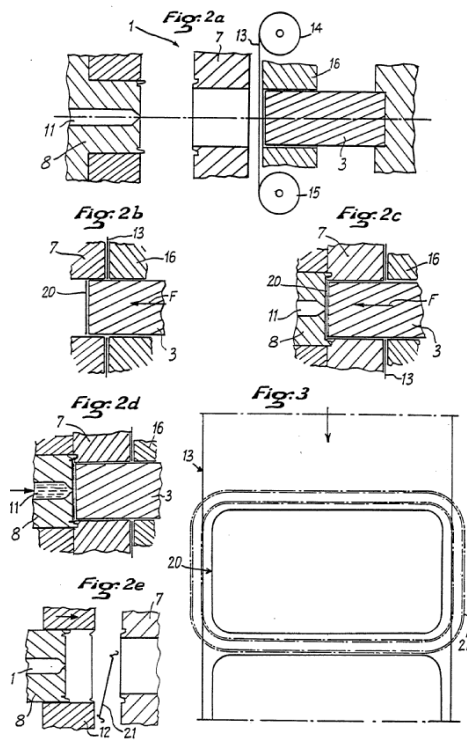
**B29C 45/14024**

{and punching or cutting a portion from the endless articles during mould closing}

**Definition statement**

*This place covers:*

EP231670, punch mechanism 3



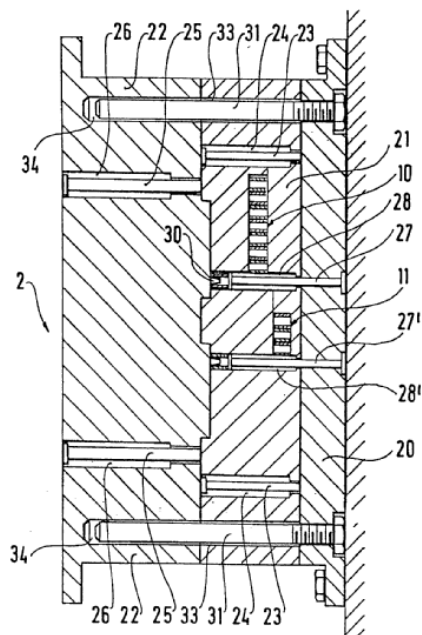
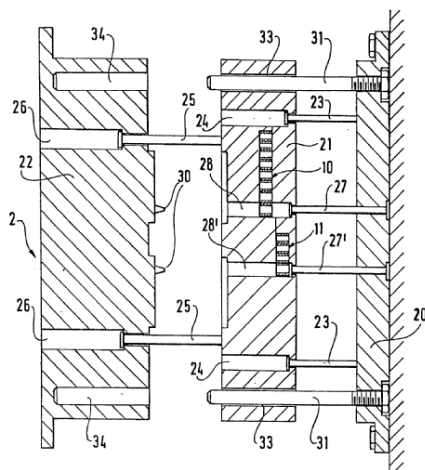
**B29C 45/14032**

{Transferring the inserts from a storage space inside the mould to the mould cavity}

**Definition statement**

*This place covers:*

EP37032 fig 3 & 4.

**FIG. 3****FIG. 4**

Inserts are introduced in storage space 10 inside the mould and when the mould is closed, one insert is transferred each moulding cycle by transfer means 27.

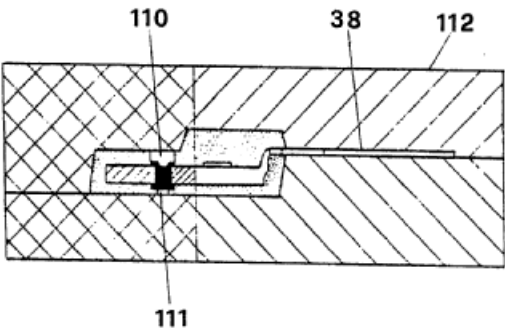
**B29C 45/14065**

**{Positioning or centering articles in the mould}**

**Definition statement**

*This place covers:*

EP257681 pin 110 in fig 11(means are here part of the insert)



**FIG. 11**

**Relationships with other classification places**

Where [B29C 45/14008](#) concerns the inserting of the insert INTO the mould, [B29C 45/14065](#) concerns the positioning or centering in the cavity of the already inserted insert.

**References**

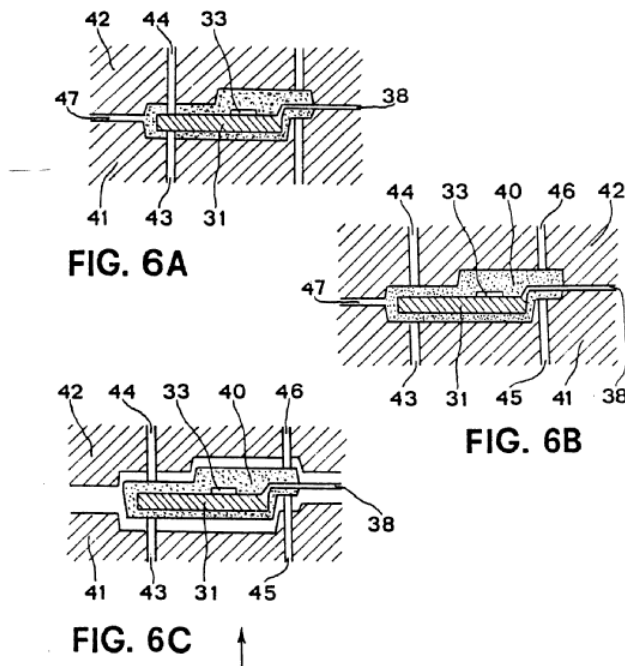
**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Moulds with incorporated means for centering inserts in general	<a href="#">B29C 33/12</a>
Moulds using magnetic means for positioning inserts in general	<a href="#">B29C 33/16</a>
Moulds using vacuum to position inserts in general	<a href="#">B29C 33/18</a>

**B29C 45/14073****{using means being retractable during injection}****Definition statement***This place covers:*

EP257681, retracting pins





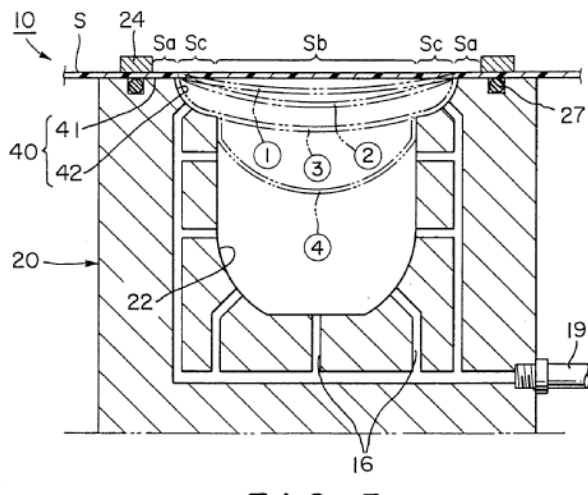
**B29C 45/1418**

{the inserts being deformed or preformed, e.g. by the injection pressure}

**Definition statement**

*This place covers:*

EP782908 insert S



**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Shaping linings by compression of the moulding material	<a href="#">B29C 43/184</a>
---	-----------------------------

**B29C 45/14196**

{the inserts being positioned around an edge of the injected part}

**Definition statement**

*This place covers:*

Moulding of edge wrapped articles

**References**

**Informative references**

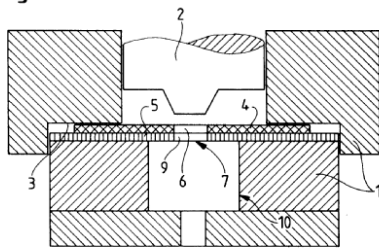
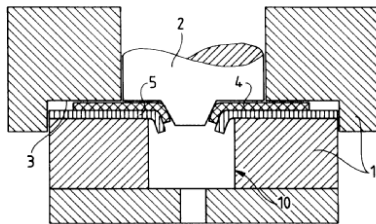
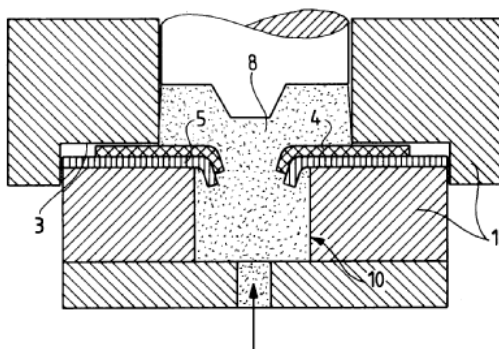
*Attention is drawn to the following places, which may be of interest for search:*

Lining or sheeting by folding, winding, bending or the like	<a href="#">B29C 63/04</a>
---	----------------------------

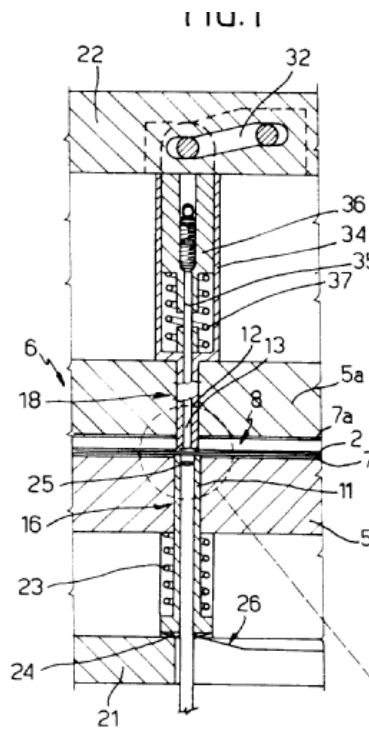
**B29C 45/14221****{by tools, e.g. cutting means}****Definition statement***This place covers:*

Deformation by mechanical means

EP721831, fig 1-3,

**Fig. 1****Fig. 2****Fig. 3**

EP592768, fig 1,



P517614, parts 11a, fig 1

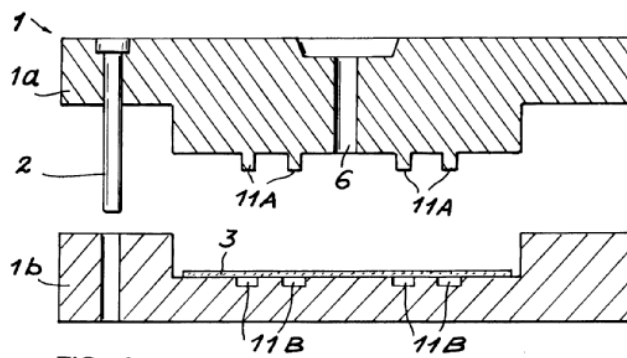


FIG. 1

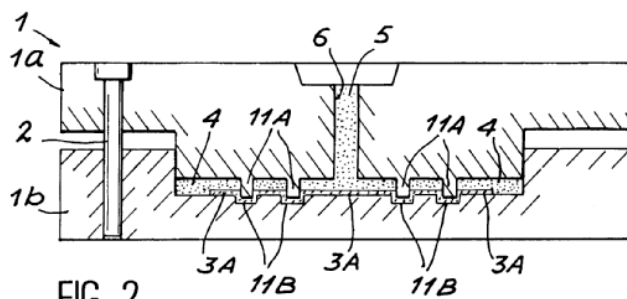


FIG. 2

## References

### Limiting references

*This place does not cover:*

Deformation by injection pressure	<a href="#">B29C 45/1418</a> , <a href="#">B29C 45/14196</a>
-----------------------------------	---

## B29C 45/14311

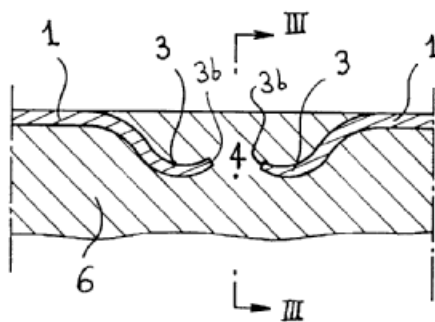
{using means for bonding the coating to the articles ([B29C 45/14795](#) takes precedence)}

### Definition statement

*This place covers:*

Bonding means, e.g. adhesives, chemical means, locking configurations

EP976519, perforation in fig 2.



## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Measures or configurations for obtaining an anchoring effect in contacting areas general	<a href="#">B29C 37/0078</a>
--	------------------------------

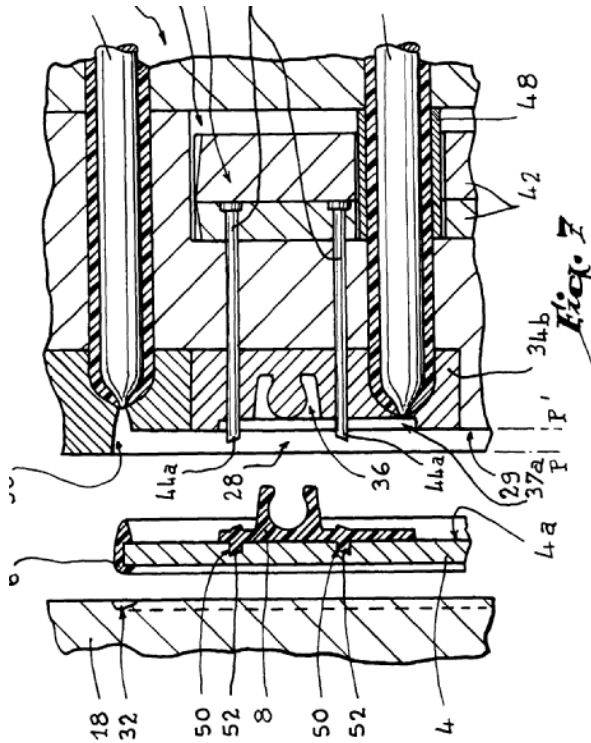
**B29C 45/14336**

{Coating a portion of the article, e.g. the edge of the article ([B29C 45/14573](#) and [B29C 45/14598](#) take precedence)}

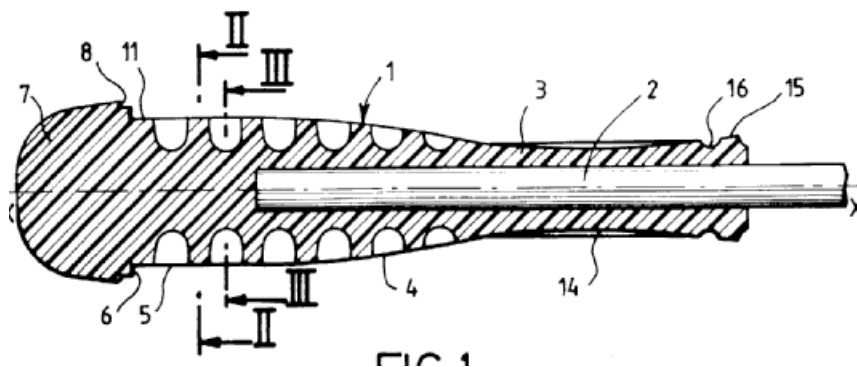
**Definition statement**

*This place covers:*

Moulding processes, whereby a part of the insert is outside the cavity during the moulding process.  
EP1013392 fig 7, insert 4, coating 6 & 8



EP727289, only handle of the insert

**References****Limiting references**

*This place does not cover:*

Coating the edge of articles at spaced locations	<a href="#">B29C 45/14573</a>
--	-------------------------------

Coating a portion of tubular articles	<a href="#">B29C 45/14598</a>
---------------------------------------	-------------------------------

## B29C 45/14344

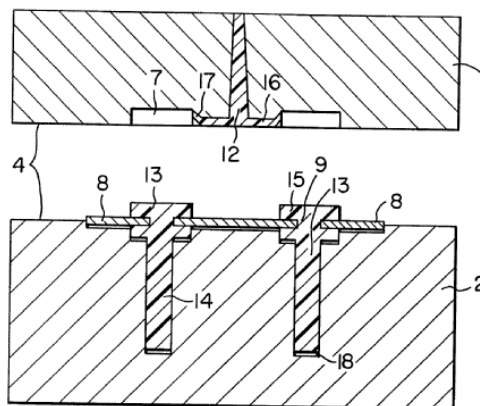
{Moulding in or through a hole in the article, e.g. outsert moulding}

### Definition statement

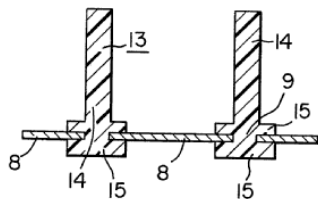
*This place covers:*

outsert moulding: EP65220, insert 8 is, at least partially OUTSIDE the moulding material 14

F I G. 5



F I G. 6



### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Permeable inserts	<a href="#">B29C 45/14795</a>
Moulding in general on a relative small portion of the preformed part e.g. outsert moulding	<a href="#">B29C 70/74</a>

## B29C 45/14377

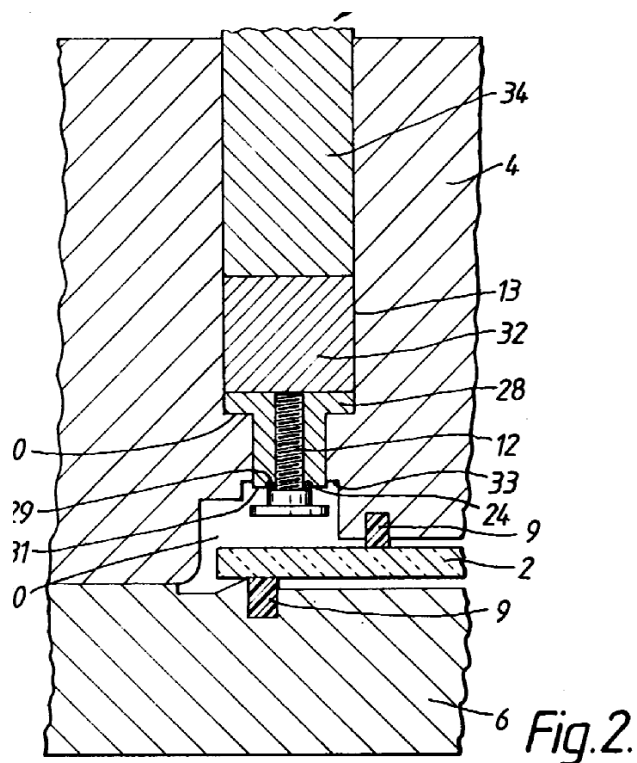
{using an additional insert, e.g. a fastening element}

### Definition statement

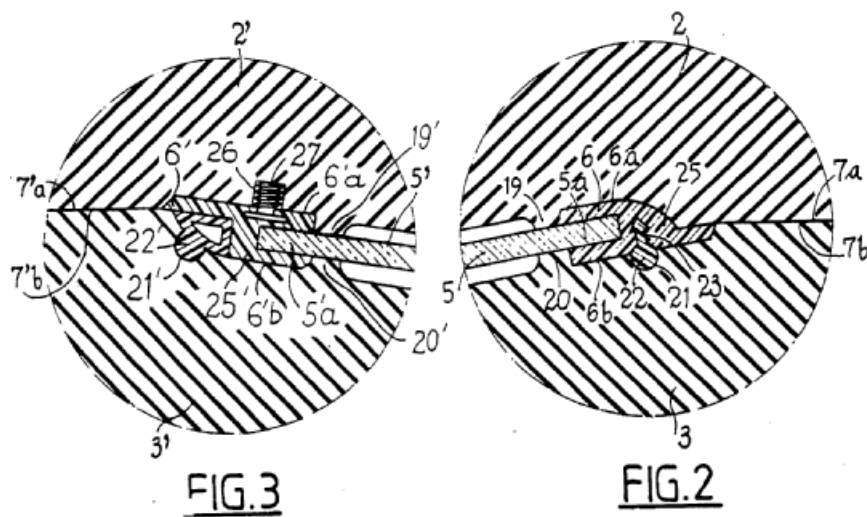
*This place covers:*

The use of an additional fastening element in combination with partial coating of an insert only (note: [B29C 45/14467](#) takes precedence)

EP468713, fig 2 insert 2 and additional fastening means 12



EP436438 with additional fastening means 22 & 27 (fig 2 & 3).



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulding in general on a relative small portion of preformed parts to be joined

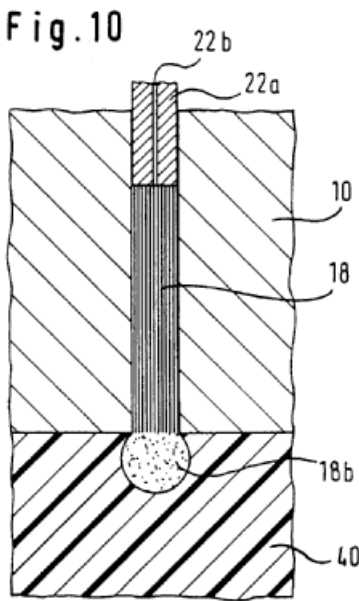
[B29C 70/845](#)

**B29C 45/14385**

{Coating a portion of a bundle of inserts, e.g. making brushes}

**Definition statement**

*This place covers:*  
EP676268



**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Brushes characterised by mouldable materials for fixing the bristles	<a href="#">A46B 3/04</a>
Moulding or casting a brush body around bristles or tufts	<a href="#">A46D 3/005</a>



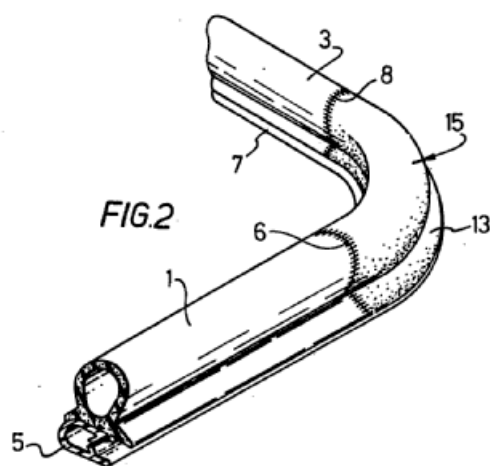
**B29C 45/14409**

{Coating profiles or strips by injecting end or corner or intermediate parts}

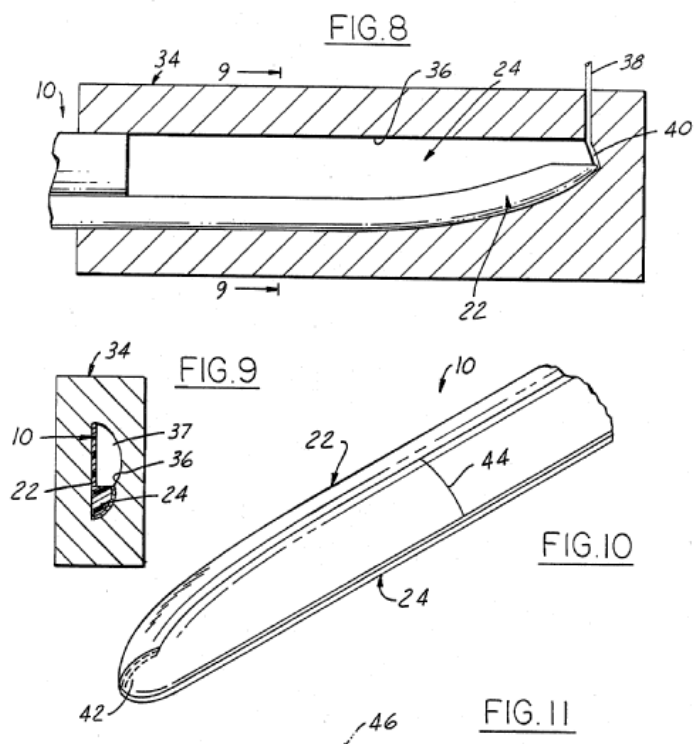
**Definition statement**

*This place covers:*

GB1431460, fig 2 corner 5;



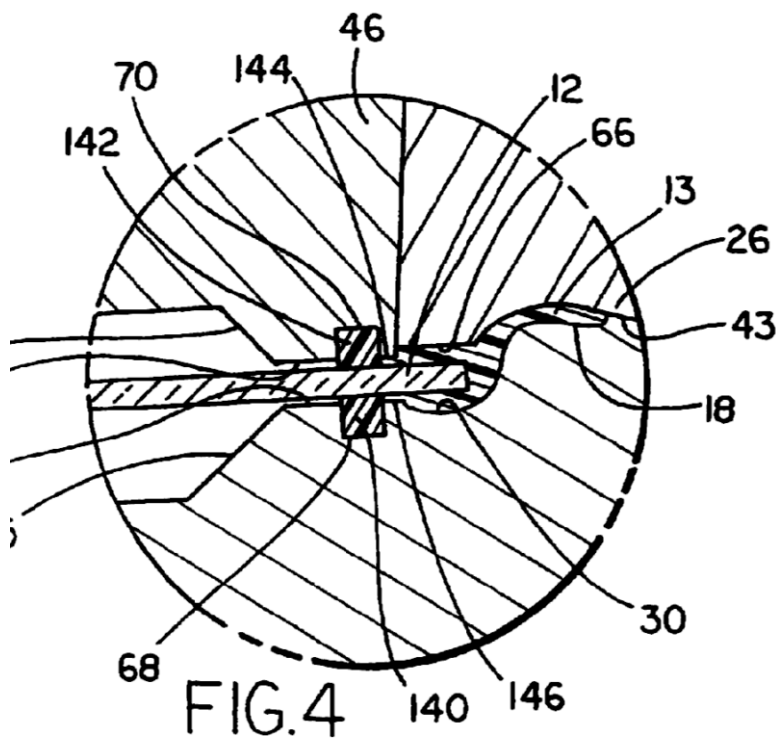
US4778550 end part 22



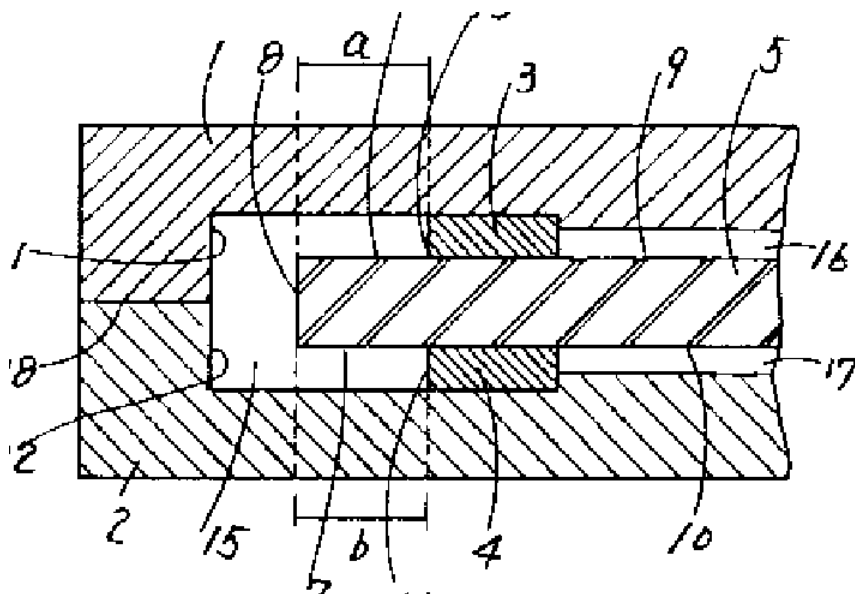
**B29C 45/14418****{Sealing means between mould and article}****Definition statement***This place covers:*

The application of separate sealing means, as well as sealing by mould parts, e.g. core mould and cavity walls

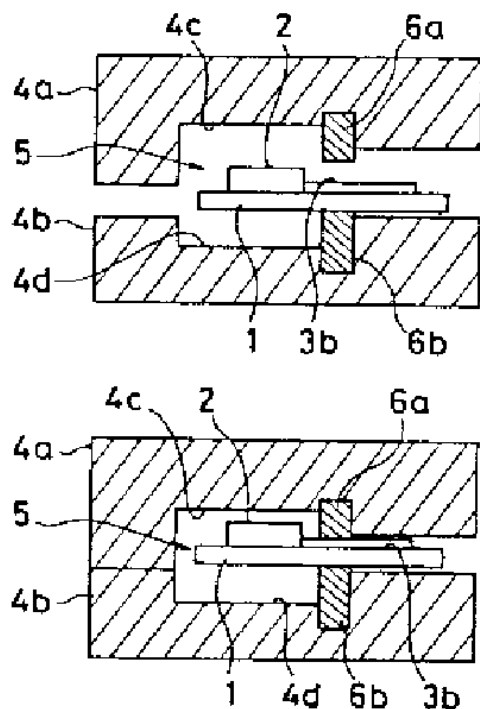
EP0845340-fig 4, seals 140 & 142,



JP63-67127, sealing members 3 & 4



JP63-89313, seals 6a & 6b,



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Sealing means for sealing off parts of the insert during moulding in general
--

<a href="#">B29C 33/0044</a>
------------------------------

## B29C 45/14434

{Coating brittle material, e.g. glass ([B29C 45/14377](#), [B29C 45/14418](#) take precedence)}

### Definition statement

*This place covers:*

Moulding on glass inserts

Moulding on windcreens, whereby the windscreen is not made out of the brittle material glass, but out of a transparent plastic.

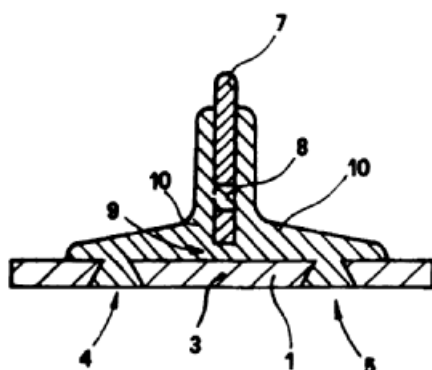
## B29C 45/14467

{Joining articles or parts of a single article ([B29C 45/14377](#), [B29C 45/14385](#), [B29C 45/14581](#), [B29C 45/14614](#) and [B29C 45/006](#) take precedence)}

### Definition statement

*This place covers:*

EP792960, fig 2 parts 1 & 7, connected by material 10



### References

#### Limiting references

*This place does not cover:*

Joining articles moulded in separate cavities as final operation	<a href="#">B29C 45/006</a>
Joining tubular articles	<a href="#">B29C 45/14614</a>

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Joining preformed parts by the expansion of the moulding material	<a href="#">B29C 44/1228</a>
Joining of preformed parts by moulding	<a href="#">B29C 65/70</a>
Moulding in general on preformed parts to be joined	<a href="#">B29C 70/84</a>
Casting around parts for joining	<a href="#">B22D 19/04</a>
Key-type connections formed by solidification of injected material	<a href="#">F16B 3/005</a>

**B29C 45/14475**

{Joining juxtaposed parts of a single article, e.g. edges of a folded container blank}

**Definition statement**

*This place covers:*

FR2272816 fig 1 & 2

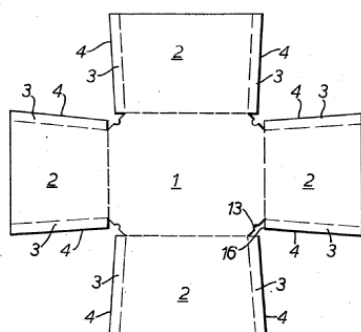


FIG. 1.

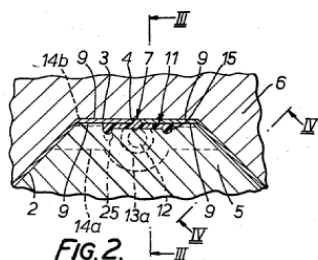


FIG. 2.

GB1360801 fig 1 part 5

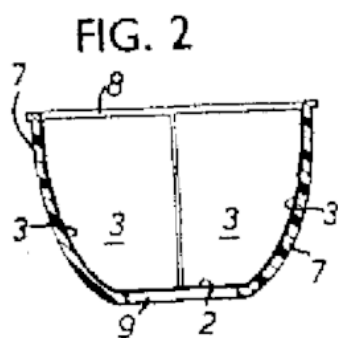


FIG. 2

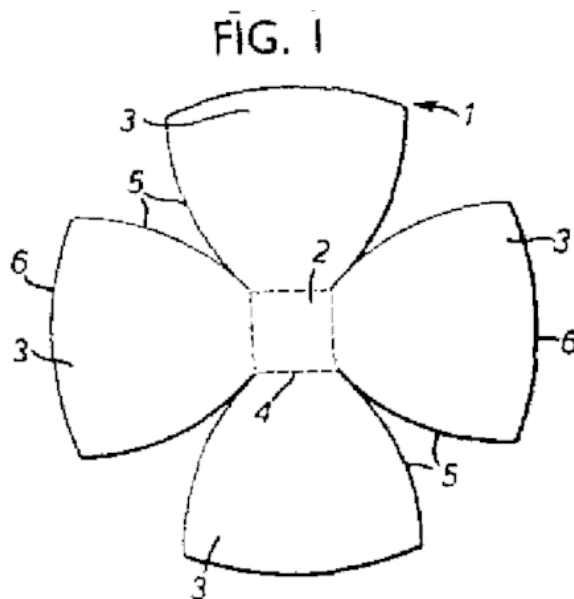


FIG. 1

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Machines for making boxes by folding sheets combined with injection moulding for joining opposed edges	<a href="#">B31B 50/26</a> , <a href="#">B31B 50/61</a>
--	---

## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Juxtaposed	is being defined as lying next to each other within the same plane, while the juxtaposed parts touch each other along one edge
------------	--

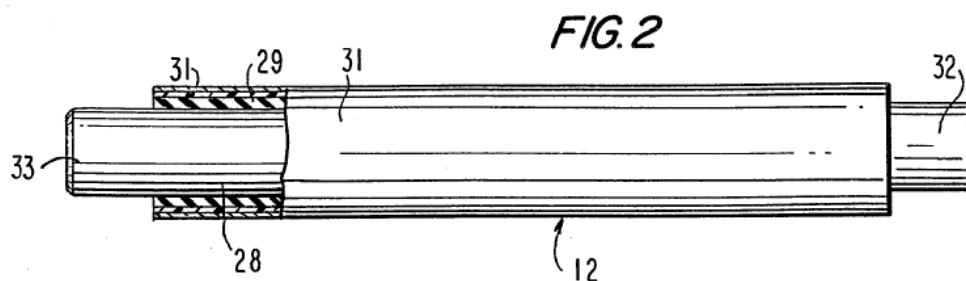
## B29C 45/14491

{Injecting material between coaxial articles, e.g. between a core and an outside sleeve for making a roll}

### Definition statement

This place covers:

WO0024561, fig 2, parts 31 and 33 connected by plastic 29



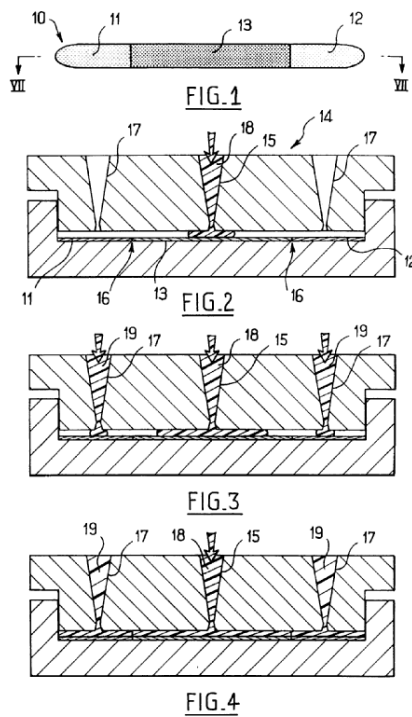
**B29C 45/14508**

{Joining juxtaposed sheet-like articles, e.g. for making trim panels}

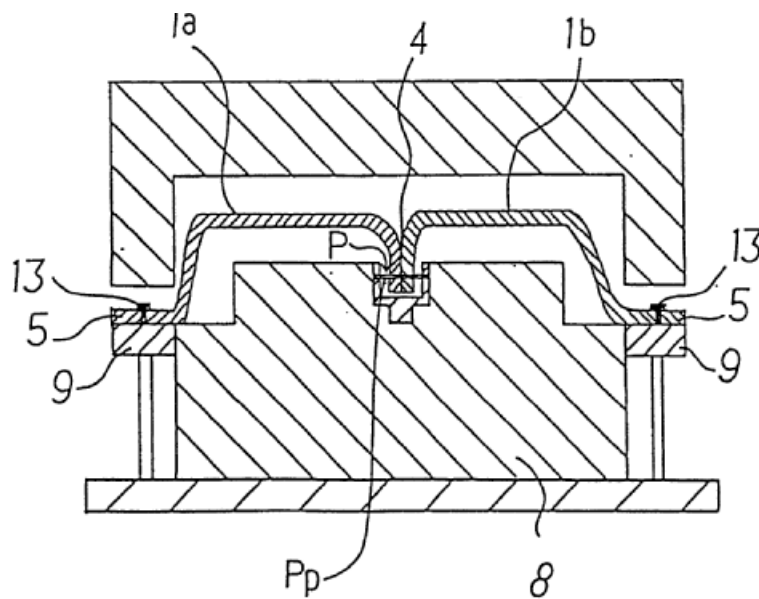
**Definition statement**

*This place covers:*

EP953423 fig 1-3, articles 11-13

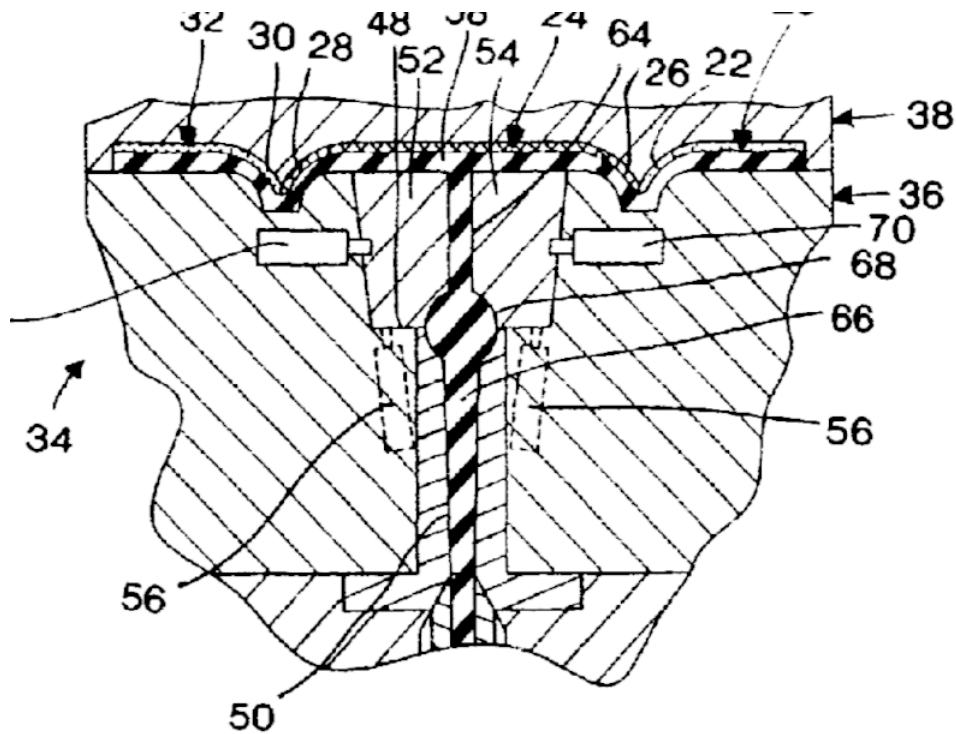


EP376263, fig 4, sheets 1a, 1b.



Definition statement

EP829337 fig 6 &amp; fig 10.

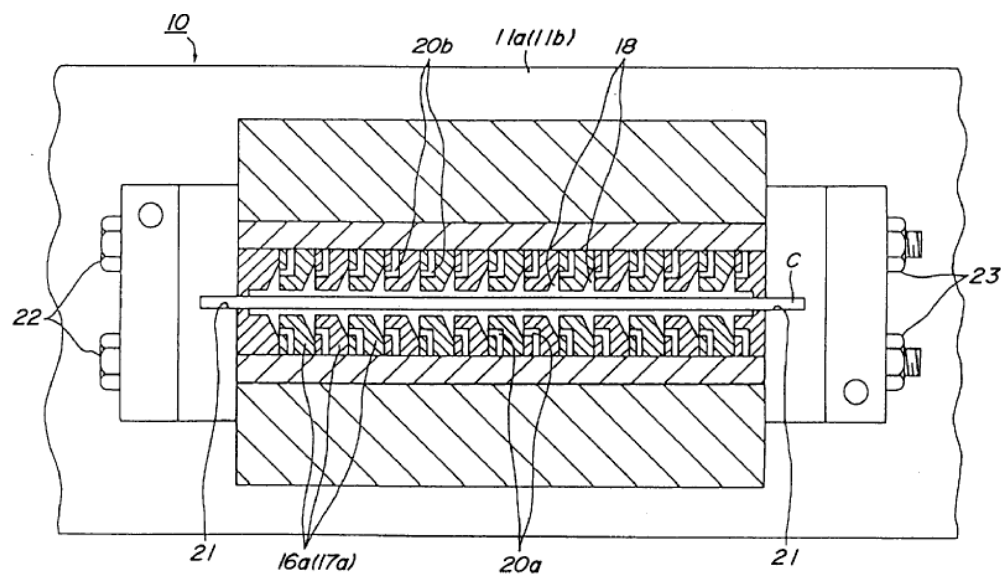
**B29C 45/14549**

{Coating rod-like, wire-like or belt-like articles ([B29C 45/14426](#) takes precedence)}

**Definition statement**

*This place covers:*

EP719628, figure 1, rod like insert 21





EP33848, figure 5 insulator insert 11

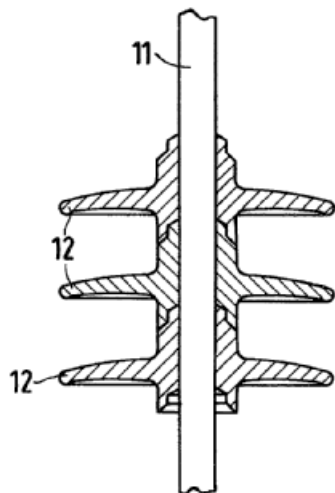
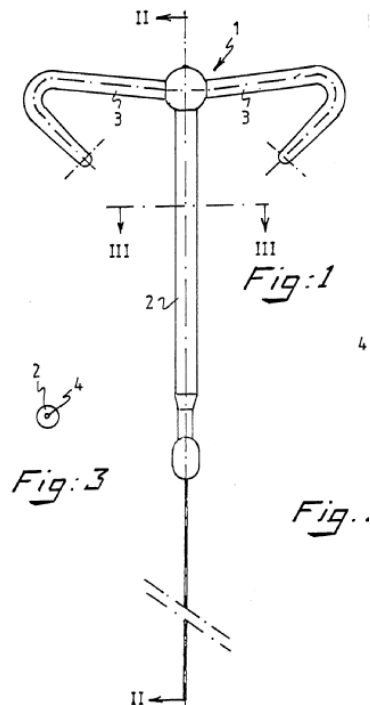


FIG 5

WO9107934, figure 3.



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Assembly methods and manufacture of light guides	<a href="#">G02B 6/3833</a>
--	-----------------------------

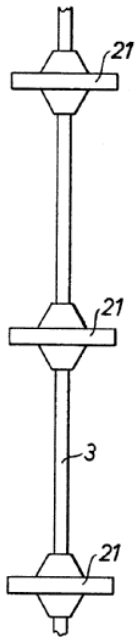
**B29C 45/14565**

{at spaced locations, e.g. coaxial-cable wires}

**Definition statement**

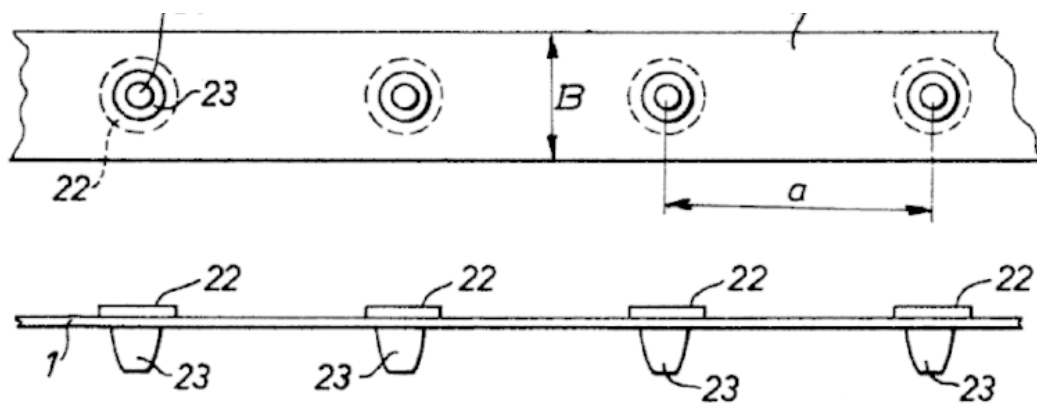
*This place covers:*

EP225846, fig 4 wire 3, several plastic locations 21



*Fig. 4*

EP221851, fig 6. Insert 1, plastics 22,23



*Fig. 6*

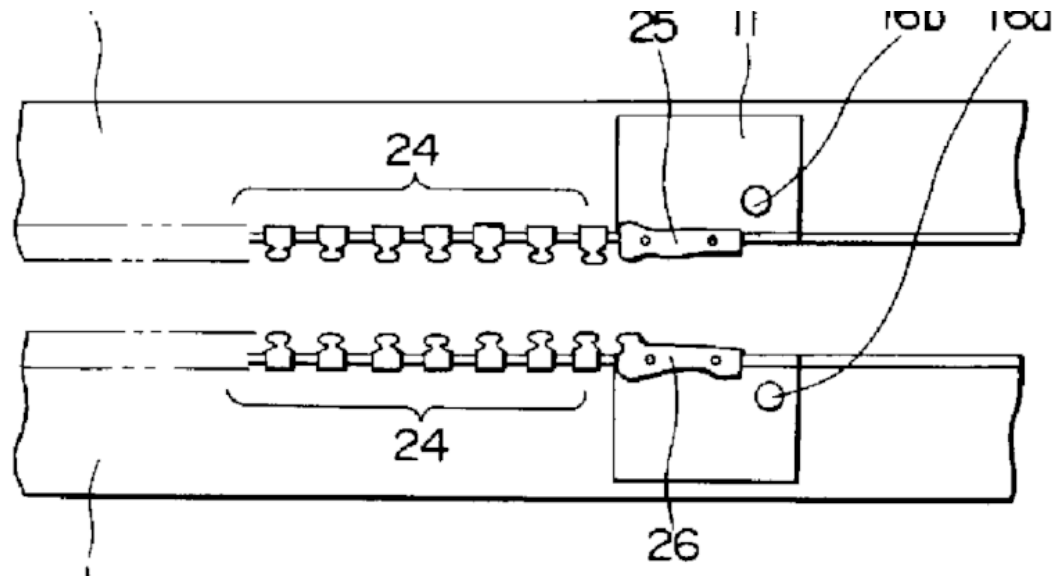
**B29C 45/14573**

{Coating the edge of the article, e.g. for slide-fasteners}

**Definition statement**

*This place covers:*

EP641637 Insert 1, 24 at THE EDGE, at SPACED LOCATIONS.



**References**

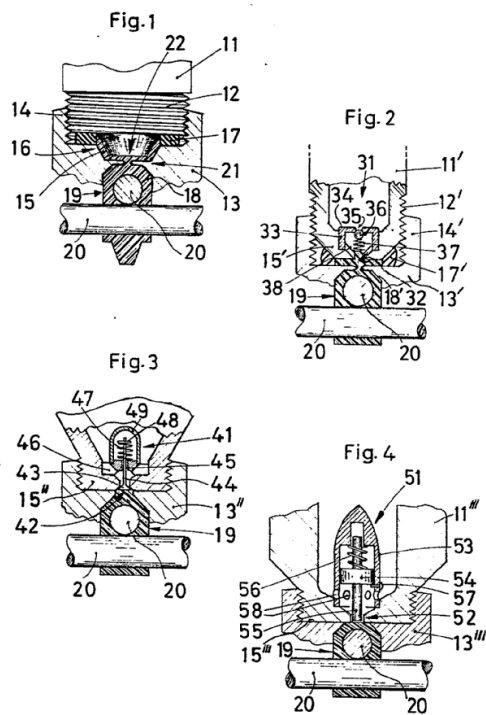
**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

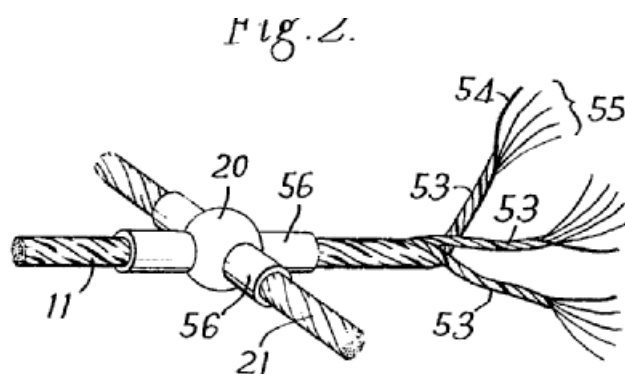
Pressure die casting of slide fasteners	<a href="#">B22D 17/16</a>
Producing fasteners with separate interlocking members	<a href="#">B29D 5/02</a>

**B29C 45/14581****{Coating the cross-over points of articles in the form of a network}****Definition statement***This place covers:*

GB1128619 Inserts 20 &amp; 20, plastic 18,

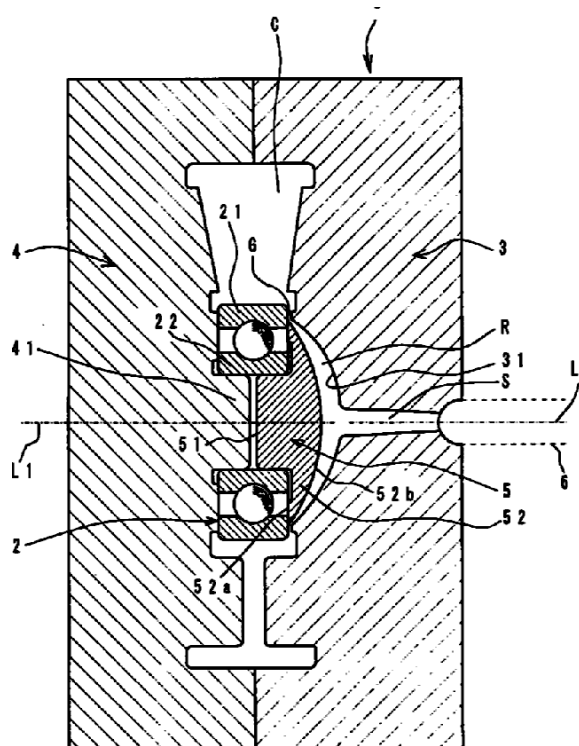


FR1435472, figure 2, wire 11 &amp; 21, plastic 20

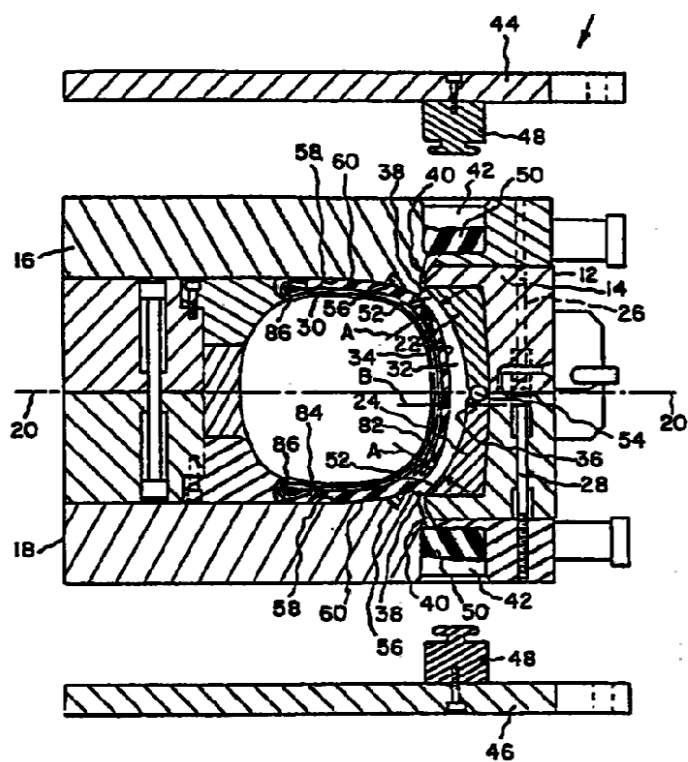
**B29C 45/1459****{Coating annular articles}****Definition statement***This place covers:*

Insert moulding processes for making rollers, wheels, bearings, tyres

EP712708 fig 1. Insert 21 & 22 - annular cavity C.



EP287495, fig 1. Retreading of a tyre.



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Producing roller bodies	<a href="#">B29D 99/0032</a>
Assembling wheels on an axle for making a castor	<a href="#">B60B 33/0028</a>
Guiding rollers, wheels or the like formed by or on the outer element of a single bearing	<a href="#">F16C 13/006</a>

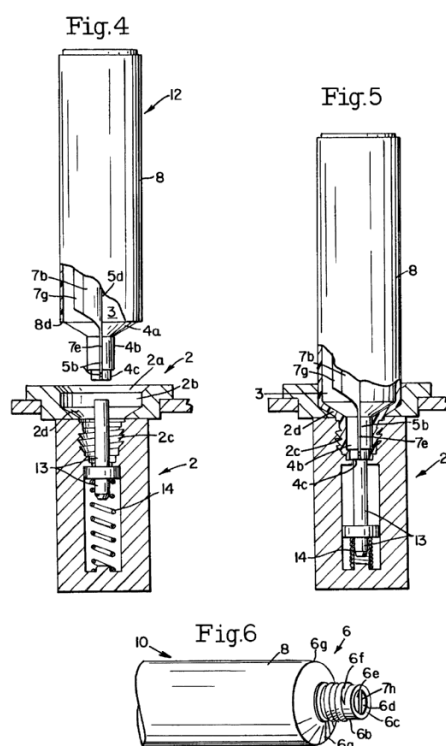
## B29C 45/14598

### {Coating tubular articles}

### Definition statement

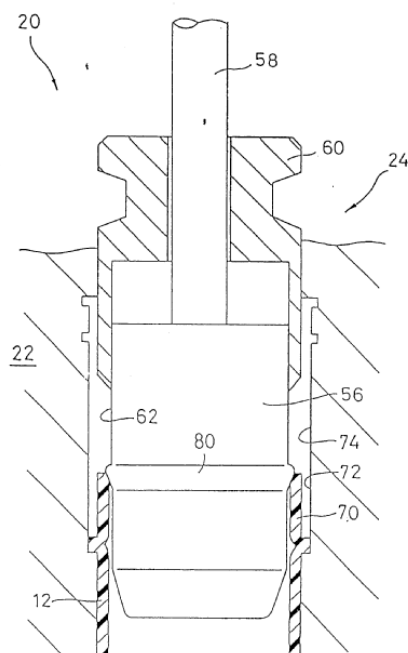
This place covers:

US6210621, fig 4- 6 Part 61 is moulded onto part 8d.



EP810073, fig 12

Fig . 12



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulding on the end part of tubular articles in general	<a href="#">B29C 70/766</a>
Producing rollers of cylinders	<a href="#">B29D 99/0035</a>

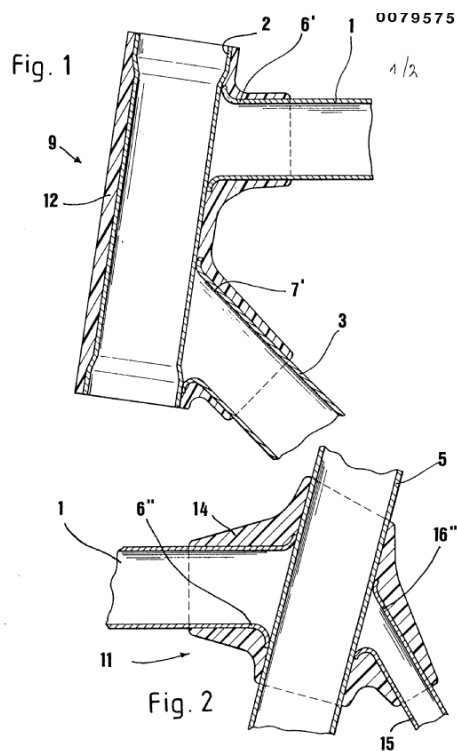
### Special rules of classification

Note that although the article is often coated only partly, the classification is only done in [B29C 45/14598](#), since it takes precedence over [B29C 45/14336](#)

**B29C 45/14614****{Joining tubular articles}****Definition statement**

*This place covers:*

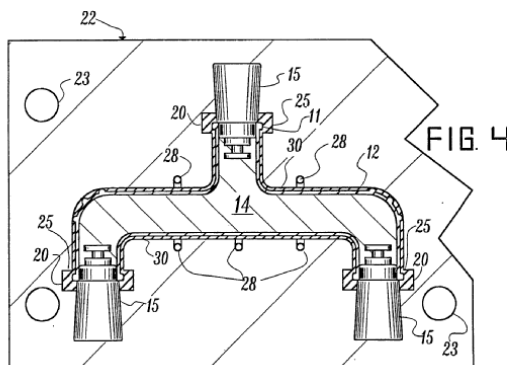
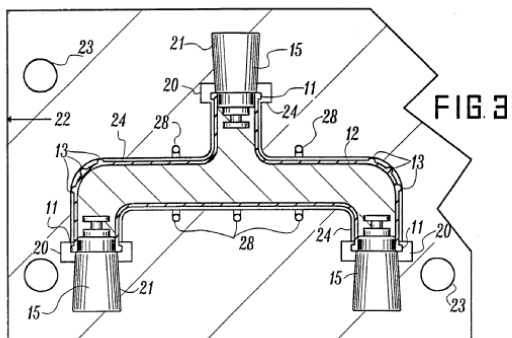
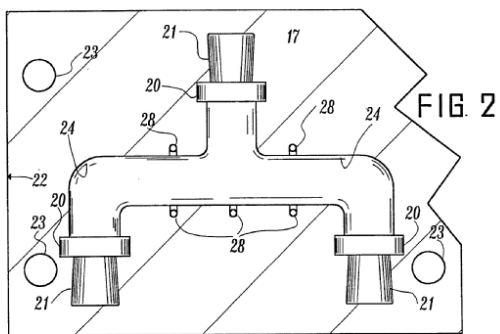
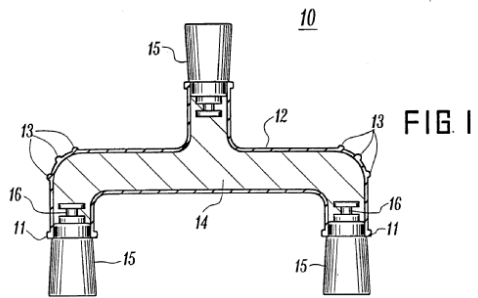
EP79575, fig 1 & 2. Plastic 12 and 14 connect the tubes 1, 2 and 3.



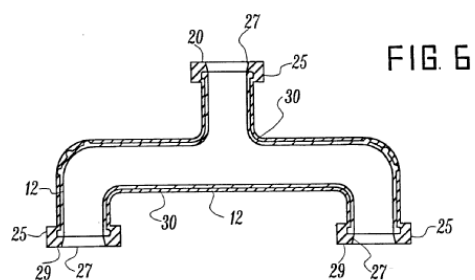
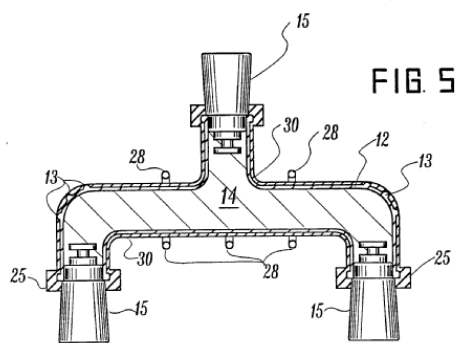


**B29C 45/14622****{Lining the inner or outer surface of tubular articles}****Definition statement***This place covers:*

WO9317847, fig 1-6, tubular article 12, core inside for pressure compensation, lining 30



## Definition statement

**B29C 45/14631**

{Coating reinforcements (fibre reinforcements [B29C 45/0005](#))}

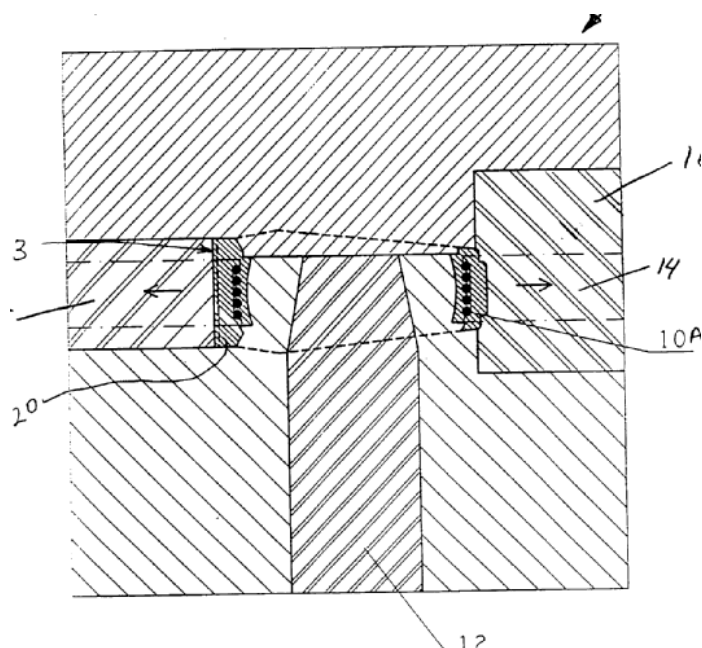
**Definition statement**

*This place covers:*

Overmoulding of reinforcements, being an insert not forming a part of the moulding material before the moulding process:

e.g. overmoulding single wires or fibres, overmoulding metal parts used as reinforcement.

EP487476



EP439033

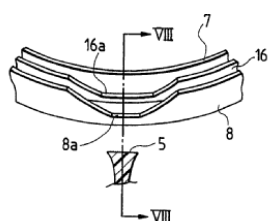


FIG. 8

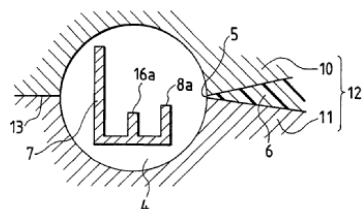
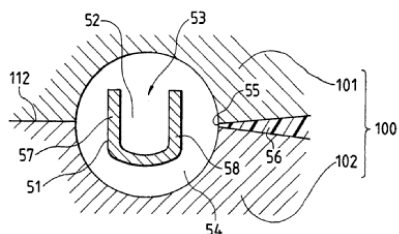


FIG. 9



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Injection moulding using fibre reinforced plastics	<a href="#">B29C 45/0005</a>
Incorporating articles with special properties	<a href="#">B29C 45/14778</a>
Resin transfer moulding	<a href="#">B29C 70/48</a>

**B29C 45/14639**

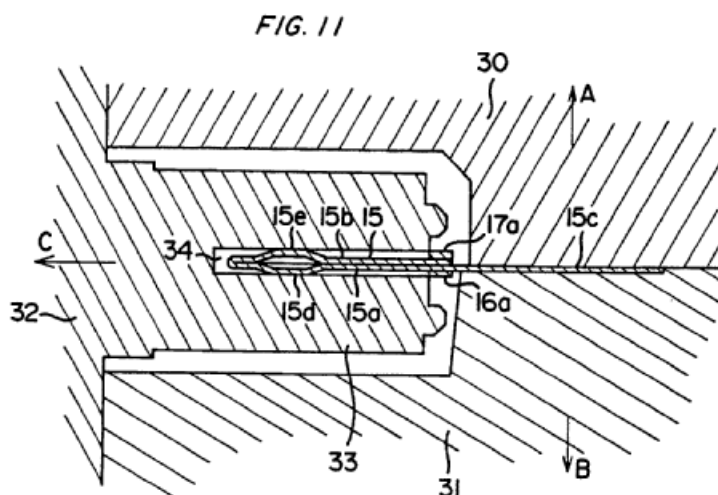
{for obtaining an insulating effect, e.g. for electrical components}

**Definition statement**

*This place covers:*

Overmoulding only when the disclosed moulding process is of importance due to the potentially very wide scope of possible applications (see also the informative references).

EP446489, fig 11

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

IC or chip cards	<a href="#">B42D 25/00</a> , <a href="#">G06K 19/07745</a>
Cables, conductors	<a href="#">H01B 13/06</a>
Resistors	<a href="#">H01C 17/02</a> , <a href="#">H01C 1/034</a>
Transformer, windings	<a href="#">H01F 41/127</a> , <a href="#">H01F 27/022</a> , <a href="#">H01F 41/005</a>
Capacitors	<a href="#">H01G 13/00</a> , <a href="#">H01G 4/002</a>
Plugs, electric contacts	<a href="#">H01R 43/24</a>
Repairing electric cables, joints, connectors	<a href="#">H02G 1/00</a> , <a href="#">H02G 1/145</a>
Machine engines, motors	<a href="#">H02K 15/12</a>
Sealed casings	<a href="#">H05K 5/06</a>
Apparatus or processes specially adapted for manufacturing or adjusting assemblages of electric components	<a href="#">H05K 13/00</a>
LEDs	<a href="#">H10H 20/00</a>

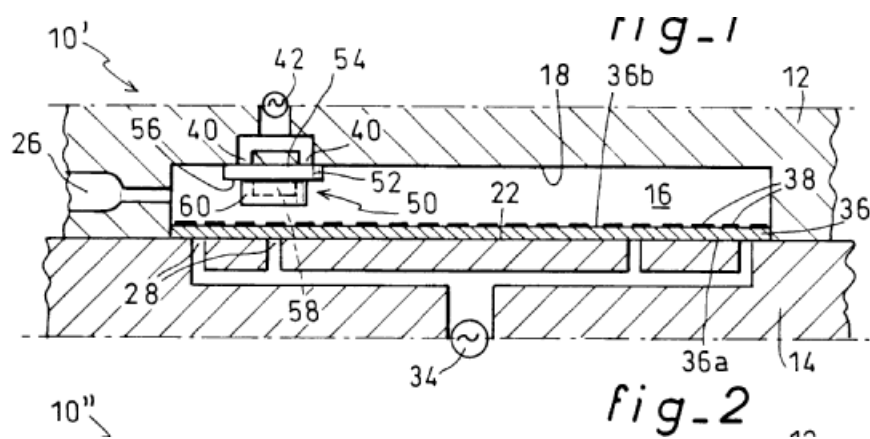
**B29C 45/14647**

{Making flat card-like articles with an incorporated IC or chip module, e.g. IC or chip cards}

**Definition statement**

*This place covers:*  
Moulding processes, whereby the chip is embedded during the moulding process.

EP481557



**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Identity cards and the like	<a href="#">B42D 25/00</a>
Mounting details of chip cards in general	<a href="#">G06K 19/07745</a>

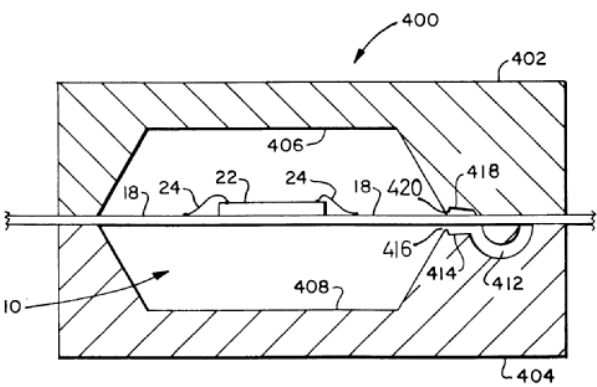
**B29C 45/14655**

{connected to or mounted on a carrier, e.g. lead frame}

**Definition statement**

*This place covers:*

EP489349, fig 4, chip 22, lead frame 18. Runner 412 & Gate 416, 418. The moulding step in this group usually concerns transfer moulding.



**Relationships with other classification places**

The scope of this group is small in comparison to a typical related product group like [H10W 74/016](#), since [B29C 45/14655](#) is limited to disclosures related to the moulding process as such.

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Apparatus for sealing, encapsulating for manufacturing or treating semiconductor or solid state devices	<a href="#">H10P 72/0441</a>
Moulds for encapsulating semi-conductors	<a href="#">H10W 74/016</a>

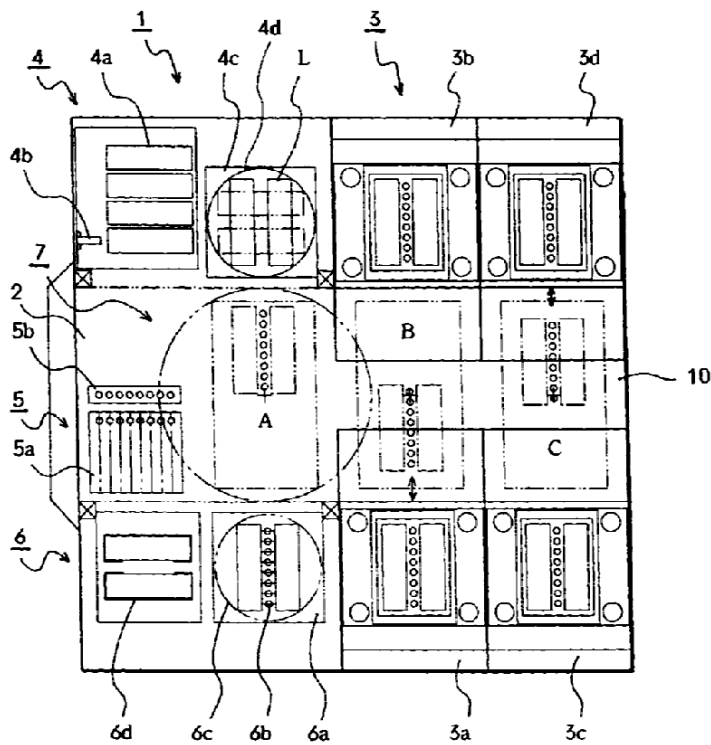
**B29C 45/1468**

{Plants therefor}

**Definition statement**

*This place covers:*

EP825006, fig 1. Loading, unloading, etc.



**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Plants in general	<a href="#">B29C 45/0084</a>
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**B29C 45/14688**

{Coating articles provided with a decoration}

**Relationships with other classification places**

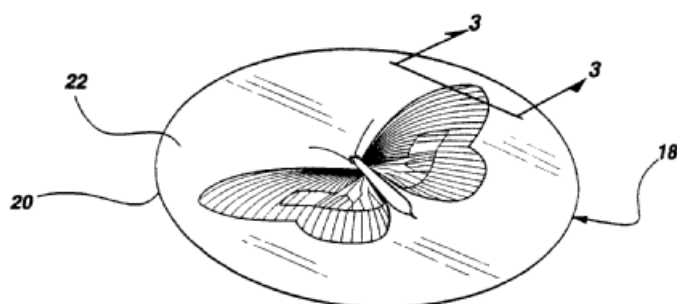
In [B29C 45/14688](#), the insert is the decoration itself or the insert comprises a decoration and nothing more.

In the case with a plurality of layers where the decoration layer is one of them, the classification is [B29C 45/14811](#)

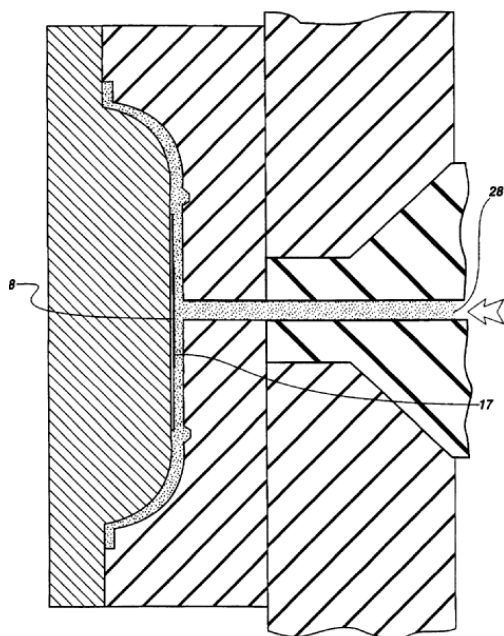
Furthermore, typical for [B29C 45/14688](#) is that the moulding process is adapted or optimised for coating articles with a decoration.

Standard film overmoulding is classified [B29C 45/14778](#), even if the film is provided with a decoration.

WO98/09790, fig 2 & 5, insert 18 and plastic 28.



**Fig.2**



**Fig.5**

## References

### Limiting references

*This place does not cover:*

Incorporating decorated single layer or multi layered films by standard moulding processes	<a href="#">B29C 45/14778</a> , <a href="#">B29C 45/14811</a>
Applying transfer foils	<a href="#">B29C 45/14827</a>

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Decoration	A film provided with ink, paint or like means to create a decorative effect or information.
------------	---



**B29C 45/14754**

{being in movable or releasable engagement with the coating, e.g. bearing assemblies}

**Definition statement**

*This place covers:*

Overmoulding inserts that can move relatively to the plastic after finishing the moulding process. Typically applied for making bearings and to preventing adhesion.

EP27770, insert 37 and plastic 16.

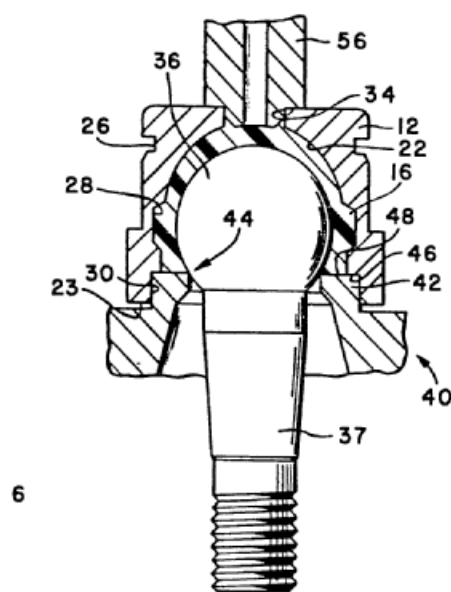


FIG. 4

**B29C 45/14778**

{the article consisting of a material with particular properties, e.g. porous, brittle}

**Definition statement**

*This place covers:*

E.g. moulding on films

**Special rules of classification**

In this group, it is of upmost importance that the material, condition or the property of the insert is identified by allocating the appropriate Indexing Code as provided in the subclass [B29K](#)

## B29C 45/14786

{Fibrous material or fibre containing material, e.g. fibre mats or fibre reinforced material}

### Definition statement

*This place covers:*

Moulding processes whereby inserts are coated, but not impregnated

EP547625, insert 13 is not completely impregnated but coated at only one side

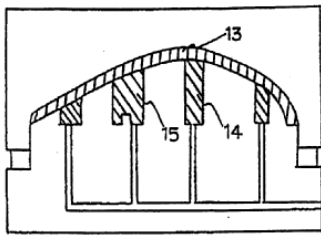
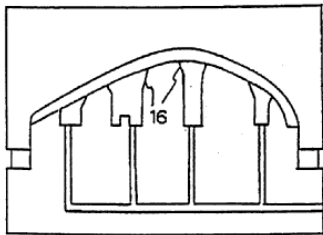
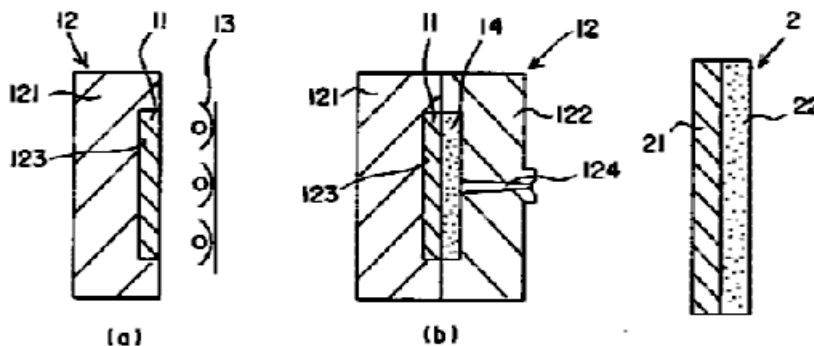


Fig. 3



JP5269785



### Relationships with other classification places

The difference between [B29C 45/14786](#) and resin transfer moulding ([B29C 70/48](#)) is the way of coating.

In the group [B29C 45/14786](#), the fibrous insert is not completely impregnated but coated at only one side.

A process, whereby an insert of fibrous material is complete impregnated refers to resin transfer moulding, even if the process is done by injection moulding.

Coating of single fibres/wires is classified [B29C 45/14631](#)

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Coating reinforcement	<a href="#">B29C 45/14631</a>
Resin transfer moulding	<a href="#">B29C 70/48</a>

## B29C 45/14795

{Porous or permeable material, e.g. foam}

### Definition statement

*This place covers:*

EP743155 fig 8a-8d, directly injection on two layers of foam.

FIG. 8A

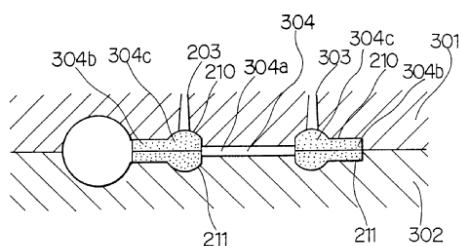
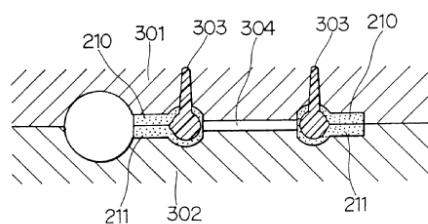


FIG. 8B



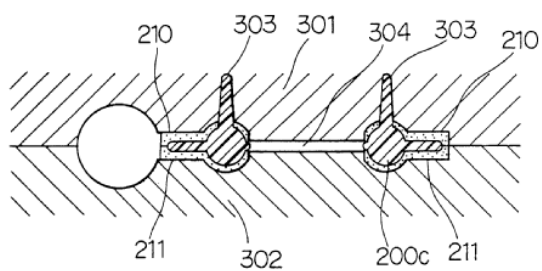
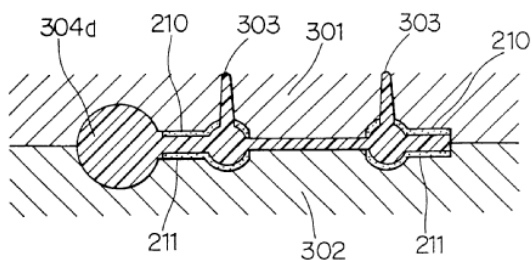


FIG. 8D



## Relationships with other classification places

Note the difference between [B29C 45/14795](#) and [B29C 45/14811](#).

Moulding processes, whereby material is injected directly on foam, is covered by [B29C 45/14795](#).

In the case of a multilayer insert where one of the layers consist of foam, the classification is [B29C 45/14811](#)

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Coating multilayered articles	<a href="#">B29C 45/14811</a>
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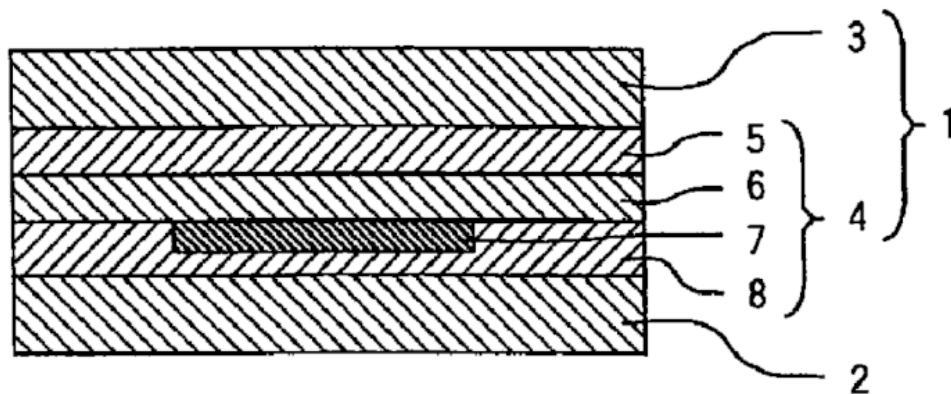
**B29C 45/14811**

{Multilayered articles ([B29C 45/14827](#) takes precedence)}

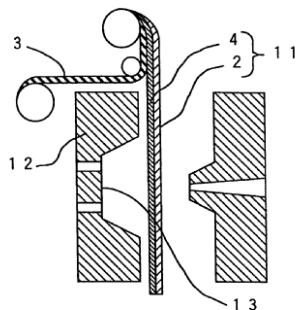
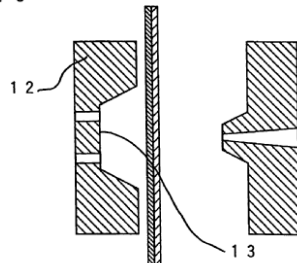
**Definition statement**

*This place covers:*

EP1025973, fig 1, release layer, protecting layer, etc.

**Fig. 1**

Injection fig 7 & 8.

**Fig. 7****Fig. 8****Relationships with other classification places**

Concerning the preference of [B29C 45/14827](#), it should be taken into account that this preference concerns either a double layered product where one layer is the transfer foil or a multilayered product, but were the invention concerns the use transfer foil as such (the identity of the other layers are not important for the invention).

Moulding processes, where the invention concerns the making of the multilayered inserts and where the fact that one of the layers can be removed is only disclosed on the level of additional information, is covered by the group [B29C 45/14811](#).

## References

### Limiting references

*This place does not cover:*

Insert and adhesive layer only	<a href="#">B29C 45/14311</a>
Insert with only decoration, paint, ink	<a href="#">B29C 45/14688</a>
Coating a porous layer	<a href="#">B29C 45/14795</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

laminated inserts overmoulded by injection moulding (Japanese F-term)	4F206/AD20, 4F206/AG03
---	------------------------

## Special rules of classification

In this group, it is highly desirable to identify every layer of the insert by allocating the appropriate Indexing Code as provided in the subclass [B29K](#), or even the ones provided in [B29L](#).

Typical examples:

Fabric layers: [B29K 2713/00](#)

Scratch resistant layers, Abrasion resistant layers, protection layers: [B29K 2995/0089](#)

Barrier layers for gases: [B29K 2995/0067](#)

Decorative layers: [B29K 2995/002](#)

Porous layers, foam layers: [B29K 2715/003](#)

Adhesive layers: [B29K 2715/006](#)

Paint layers: [B29L 2009/006](#)

Metal layers: [B29K 2705/00](#), [B29L 2009/003](#)

Layers with a metalized surface: [B29L 2009/008](#)

Hydrophobic layers: [B29K 2995/0093](#)

Hologram layers: [B29L 2031/7224](#)

## B29C 45/14819

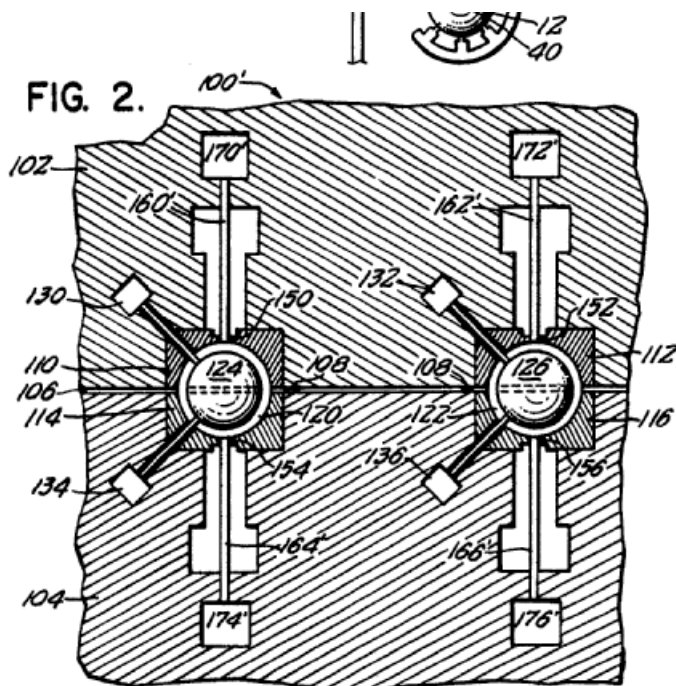
**{the inserts being completely encapsulated}**

### Definition statement

*This place covers:*

Making of golf balls by insert moulding

EP425933



## References

### Limiting references

This place does not cover:

Completely encapsulating reinforcement	<a href="#">B29C 45/14631</a>
--	-------------------------------

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Positioning articles in the mould by means being retractable during the injection	<a href="#">B29C 45/14073</a>
---	-------------------------------

## B29C 45/14827

{using a transfer foil detachable from the insert}

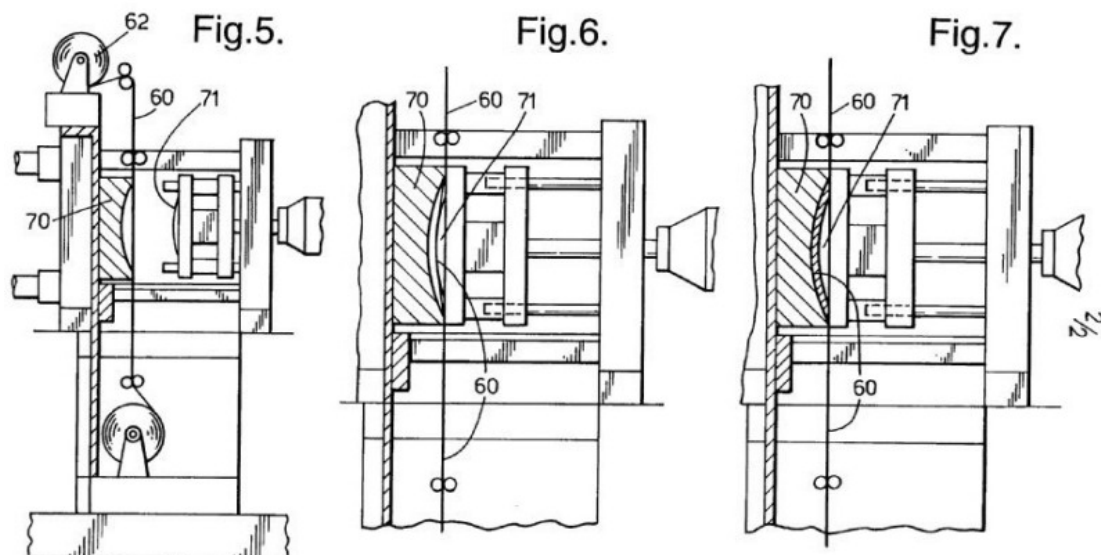
### Definition statement

This place covers:

E.g. applying transfer foils to obtain decorative moulded articles.

Multilayered inserts whereby one layer is transfer foil to be removed from the remaining insert during the moulding process.

WO9516555, the dye material is transferred from the support layer to the plastic, the support layer is afterwards removed.



## B29C 2045/14852

{incorporating articles with a data carrier, e.g. chips}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Memory cards or chip cards	<a href="#">B29L 2017/006</a>
----------------------------	-------------------------------

## B29C 2045/14934

{Preventing penetration of injected material between insert and adjacent mould wall}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Sealing means between mould and article	<a href="#">B29C 45/14418</a>
---	-------------------------------



**B29C 45/16**

**Making multilayered or multicoloured articles {(B29C 45/0062 takes precedence; feeding colouring materials into the injection unit B29C 45/1816)}**

**References****Limiting references**

*This place does not cover:*

Injection moulding of successively moulded portions rigidly joined to each other	<a href="#">B29C 45/0003</a>
Injection moulding of interconnected elements which are movable with respect to each other	<a href="#">B29C 45/0017</a>
Joining articles injection moulded in separate cavities by injection moulding as final operation	<a href="#">B29C 45/0062</a>

**B29C 45/1615**

**{The materials being injected at different moulding stations}**

**Special rules of classification**

If of general interest, classification as provided in the [B29C 45/04](#) and its subgroups can be allocated to documents classified in this group, typically at additional information level to identify the type of mould movement. Exceptionally the classification in [B29C 45/04](#) or its subgroup can be added at inventive level, if the alleged invention relates to the movement of the mould, whereby said movement is of general interest and use.

**B29C 45/1634**

**{with a non-uniform dispersion of the moulding material in the article, e.g. resulting in a marble effect}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Co-extruding a multicoloured striated pattern	<a href="#">B29C 48/175</a>
---	-----------------------------

**B29C 45/1639**

**{Removable partitions between adjacent mould cavity portions}**

**Definition statement**

*This place covers:*

Multi-component injection moulding processes whereby the second cavity is present before movement of the displaceable mould part.

**B29C 45/1642**

{having a "sandwich" structure ([B29C 45/1603](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Multiway nozzles	<a href="#">B29C 45/1603</a>
------------------	------------------------------

**B29C 45/1646**

{Injecting parison-like articles ([B29C 45/1643](#) takes precedence)}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Blow moulding of parisons with at least one injected layer	<a href="#">B29C 2949/3032</a>
--	--------------------------------

**B29C 45/1671**

{with an insert}

**Special rules of classification**

In this class it is highly desirable to identify all aspects related to insert moulding by allocating the appropriate classification as provided for in [B29C 45/14](#) and subgroups at additional information level.

**B29C 45/1675**

{using exchangeable mould halves}

**References****Limiting references**

*This place does not cover:*

Multi-component injection moulding using different moulding stations	<a href="#">B29C 45/1615</a>
--	------------------------------

**B29C 45/1684**

{Injecting parison-like articles ([B29C 45/1625](#), [B29C 45/1643](#) and [B29C 45/1646](#) take precedence)}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Blow moulding of parisons with at least one injected layer	<a href="#">B29C 2949/3032</a>
--	--------------------------------

**B29C 2045/1698****{multicoloured articles moulded in one step}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Making multi-layered or multicoloured articles with a non-uniform dispersion of the moulding material in the article, e.g. resulting in a marble effect	<a href="#">B29C 45/1634</a>
---	------------------------------

**B29C 45/17****Component parts, details or accessories; Auxiliary operations****Definition statement***This place covers:*

filters not in the nozzle located

exchanging runner channels

locking of mold halves during transport

**B29C 45/1701****{using a particular environment during moulding, e.g. moisture-free or dust-free}****Definition statement***This place covers:*

Moulding in an environment of inert gasses, reactive gasses, e.g. for preventing mould sweating or plastic oxidation

**References****Limiting references***This place does not cover:*

Injection moulding in vacuum environment	<a href="#">B29C 45/34</a>
--	----------------------------

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Casting under special conditions	<a href="#">B29C 39/42</a>
Compression moulding under special conditions	<a href="#">B29C 43/56</a>
Blow moulding in a particular environment	<a href="#">B29C 49/46</a>
Moulding in general using a particular environment	<a href="#">B29C 2791/005</a>
Clean rooms for manipulators	<a href="#">B25J 21/005</a>

**B29C 45/1703**

{Introducing an auxiliary fluid into the mould ([B29C 45/1701](#) takes precedence)}

**Definition statement**

*This place covers:*

the application of cooling or heating fluids as auxiliary fluid, counterpressure methods

**B29C 45/1704**

{the fluid being introduced into the interior of the injected material which is still in a molten state, e.g. for producing hollow articles ([B29C 45/1732](#) and [B29C 45/1734](#) take precedence; injection blow-moulding [B29C 49/06](#))}

**Definition statement**

*This place covers:*

IGM (internal gas moulding)

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

EGM (external gas moulding)	<a href="#">B29C 45/174</a>
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**B29C 45/1706**

{using particular fluids or fluid generating substances}

**Definition statement**

*This place covers:*

E.g. the use of a plurality of gasses, refrigerating gasses, and other substances in combination with standard fluid

**B29C 45/1735**

{Nozzles for introducing the fluid through the mould gate, e.g. incorporated in the injection nozzle}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Blow needles for blow moulding	<a href="#">B29C 49/58</a>
--------------------------------	----------------------------

**B29C 45/174**

{Applying a pressurised fluid to the outer surface of the injected material inside the mould cavity, e.g. for preventing shrinkage marks}

**Definition statement**

*This place covers:*

EGM (External Gas Moulding)

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

IGM	<a href="#">B29C 45/1704</a>
-----	------------------------------

**Special rules of classification**

This technology is mainly applied for avoiding shrinkage marks, however these documents are not additionally being classified in [B29C 45/0025](#)

**B29C 2045/1741**

{Seals preventing pressurized fluid to escape from the mould cavity}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Mould seals for injection moulding	<a href="#">B29C 45/2608</a>
------------------------------------	------------------------------

**B29C 45/1742**

{Mounting of moulds; Mould supports (mounting of exchangeable mould inserts [B29C 45/2675](#))}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Mounting of moulds in general	<a href="#">B29C 33/305</a>
Mould plates mounted on frames	<a href="#">B29C 33/307</a>
Mounting of stampers	<a href="#">B29C 45/263</a>

**B29C 45/1744****{Mould support platens}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Means for maintaining press tables or press platens against deflection	<a href="#">B30B 15/007</a>
--	-----------------------------

**B29C 45/1747****{Tie-rod connections}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Mounting of press columns in presses	<a href="#">B30B 15/045</a>
--------------------------------------	-----------------------------

**B29C 45/1748****{Retractable tie-rods}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Mounting of press columns in presses	<a href="#">B30B 15/045</a>
--------------------------------------	-----------------------------

**B29C 45/1751****{Adjustment means allowing the use of moulds of different thicknesses}****Definition statement***This place covers:*

the control and regulation of mould thickness adjustment

**B29C 45/1753****{Cleaning or purging, e.g. of the injection unit ([B29C 45/24](#) takes precedence)}****Definition statement***This place covers:*

cleaning the injection unit

cleaning the mould

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Cleaning of moulds and cores in general	<a href="#">B29C 33/72</a>
Cleaning extruder parts	<a href="#">B29C 48/27</a>

## B29C 45/1756

{Handling of moulds or mould parts, e.g. mould exchanging means (moulds per se [B29C 45/26](#))}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Handling of moulds in general	<a href="#">B29C 31/006</a>
Mounting of moulds	<a href="#">B29C 33/305</a>

## B29C 45/176

{Exchanging the injection unit or parts thereof}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Exchanging extruder parts	<a href="#">B29C 48/256</a>
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## B29C 45/1761

{Means for guiding movable mould supports or injection units on the machine base or frame; Machine bases or frames ([B29C 45/1747](#) takes precedence)}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Mould plates mounted on frames:	<a href="#">B29C 33/307</a>
---------------------------------	-----------------------------

**B29C 45/1769**

{Handling of moulded articles or runners, e.g. sorting, stacking, grinding of runners}

**Definition statement**

*This place covers:*

Sorting, guiding, stacking, grinding

**References****Limiting references**

*This place does not cover:*

shaping of moulded articles	<a href="#">B29C 45/0055</a>
heating and/or cooling moulded parts	<a href="#">B29C 45/7207</a>

**B29C 45/1774**

{Display units or mountings therefor; Switch cabinets}

**Definition statement**

*This place covers:*

(mechanical) features of the display unit itself.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

using visualisation means in moulding processes general	<a href="#">B29C 2037/906</a>
---	-------------------------------

**B29C 45/1775**

{Connecting parts, e.g. injection screws, ejectors, to drive means}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Drive connections for presses	<a href="#">B30B 15/068</a>
-------------------------------	-----------------------------

**B29C 45/1777**

{Nozzle touch mechanism}

**Definition statement**

*This place covers:*

Adjusting the nozzle in respect to the mould



**B29C 2045/1793****{by an electric linear motor}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Linear motors; Sectional motors	<a href="#">H02K 41/02</a>
---------------------------------	----------------------------

**B29C 2045/1794****{by a rotor or directly coupled electric motor, e.g. using a tubular shaft motor}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Axially movable screws rotated by the coaxial rotor of an electric motor	<a href="#">B29C 2045/5024</a>
--	--------------------------------

**B29C 2045/1797****{Machine parts provided with a shroud or cover or shield, e.g. for preventing oil or dust scattering}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Auxiliary operation using a particular environment during moulding, e.g. moisture-free or dust-free	<a href="#">B29C 45/1701</a>
Means for guiding or orienting articles while dropped from the mould	<a href="#">B29C 45/1771</a>
Moulds having venting means	<a href="#">B29C 45/34</a>
Used as safety device	<a href="#">B29C 45/84</a>

**B29C 45/18****Feeding the material into the injection moulding apparatus {, i.e. feeding the non-plastified material into the injection unit}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Dispensing moulding material from hoppers in general	<a href="#">B29C 31/02</a>
Feeding of the material to be moulded	<a href="#">B29C 31/04</a>
Feeding the material to be extruded	<a href="#">B29C 48/285</a>

**B29C 45/1808****{Feeding measured doses}****Definition statement***This place covers:*

feeding of tablets, preforms

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Injection of preformed charges of material	<a href="#">B29C 45/462</a>
--	-----------------------------

**B29C 45/1816****{Feeding auxiliary material, e.g. colouring material}****Definition statement***This place covers:*

E.g. feeding auxiliary material into the runner channel, the auxiliary material can for example be recycled material or fibre reinforcements

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Feeding additives to the extruder	<a href="#">B29C 48/29</a>
-----------------------------------	----------------------------

**B29C 45/1858****{Changing the kind or the source of material, e.g. using a plurality of hoppers}****Definition statement***This place covers:*

Changing the feed from hoppers containing the same material or different materials, using one hopper to which different materials are supplied

Material switches

**B29C 45/20****Injection nozzles {([B29C 45/1603](#) takes precedence)}****Definition statement***This place covers:*

The machine nozzle, injecting the moulding material into the mould

## References

### Limiting references

*This place does not cover:*

Machine nozzles specially adapted for multi-component injection moulding	<a href="#">B29C 45/1603</a>
--	------------------------------

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Runner nozzles, i.e. the nozzles located within the mould	<a href="#">B29C 45/27</a>
---	----------------------------

## B29C 45/22

### Multiple nozzle systems

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Using a material distribution system for two or more fixed moulds	<a href="#">B29C 45/125</a>
---	-----------------------------

## B29C 45/231

### {Needle valve systems therefor}

## Definition statement

*This place covers:*

needles valves that are pushed against a seat inside of a nozzle.

## B29C 45/24

### Cleaning equipment

## Definition statement

*This place covers:*

all filters, when they are located upstream of the nozzle within the injection unit.

## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Filters in the mould	<a href="#">B29C 45/17</a>
Filters in extrusion nozzles or dies	<a href="#">B29C 48/69</a>
Filtering material to be shaped	<a href="#">B29B 13/10</a>

**B29C 45/26****Moulds****Definition statement**

*This place covers:*

Moulds for particular articles

EP263575

**Special rules of classification**

Attention for the assignment of the Indexing Codes as provided in the subclass [B29L](#)!

**B29C 45/2602****{Mould construction elements}****Definition statement**

*This place covers:*

DE4337942, fig 1 Klinkenzug (=constructional element) to allow the several mould elements to move in a certain order.

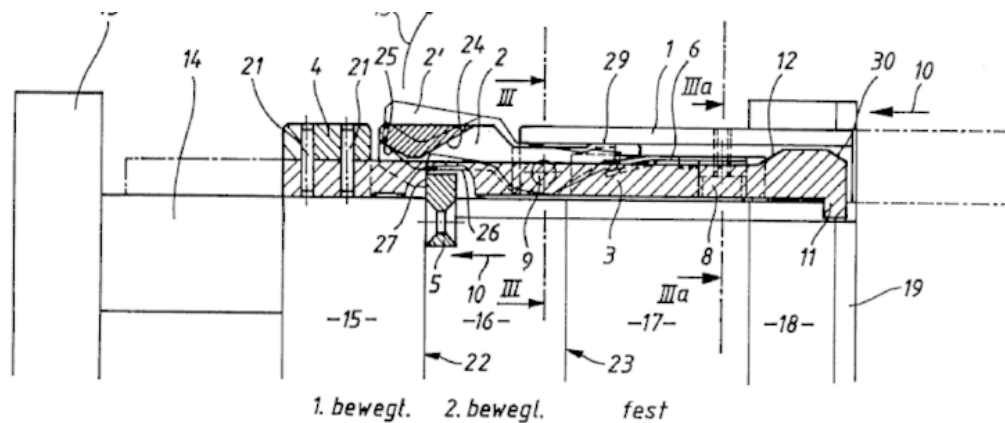
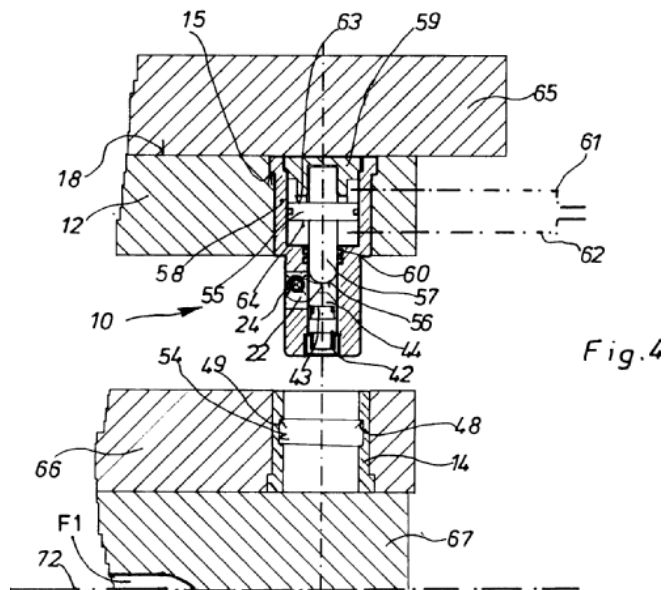


FIG 1

DE4124590, fig 4, interconnecting elements



**B29C 45/2606**

**{Guiding or centering means}**

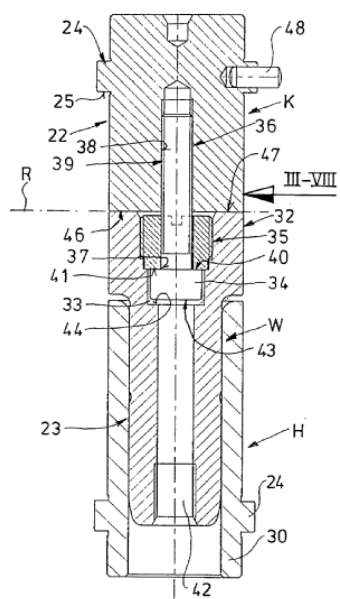
### Definition statement

*This place covers:*

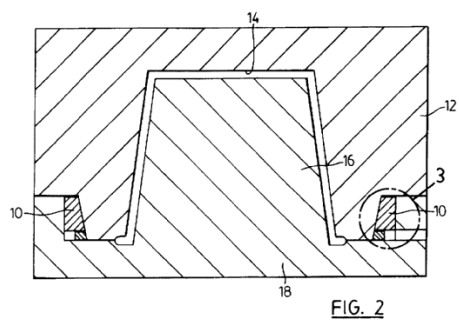
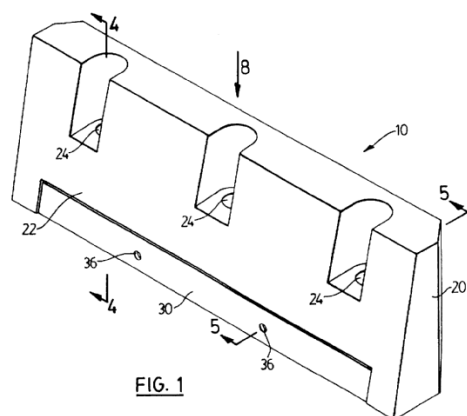
### Guiding and centering of the moulds relatively to each

### Guiding and centering a mould half on the mould carrier plate

DE1951908, fig 2,



US5776517, cf. centering means 10



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Centering mould halves or parts in general	<a href="#">B29C 33/303</a>
--	-----------------------------

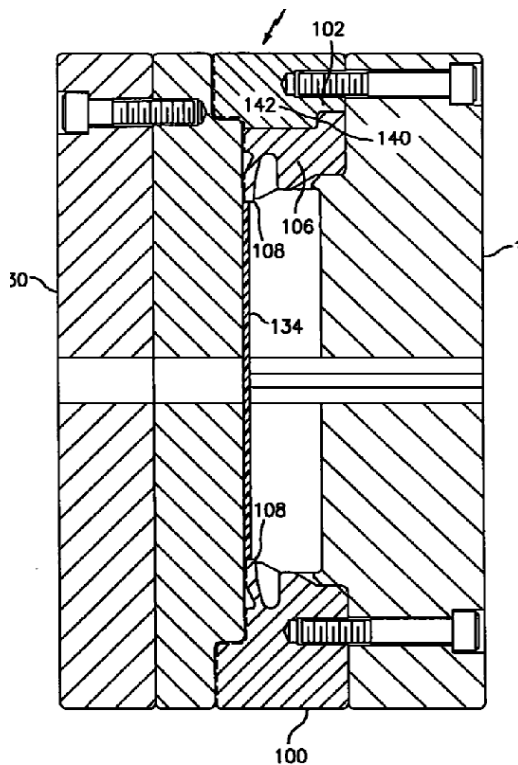
## B29C 45/2608

### {Mould seals}

### Definition statement

This place covers:

EP958908, Element 106 is a sealing element.



## References

### Limiting references

This place does not cover:

Applying a sealing means as an insert	<a href="#">B29C 45/14418</a>
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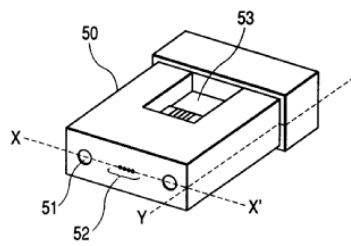
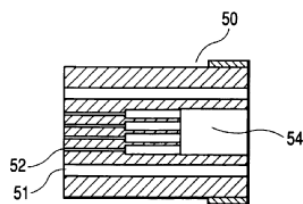
### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds in general provided with sealing means	<a href="#">B29C 33/0038</a>
Compression moulds provided with means to avoid flashes	<a href="#">B29C 43/38</a>
Die seals for pressure casting	<a href="#">B22D 17/2227</a>

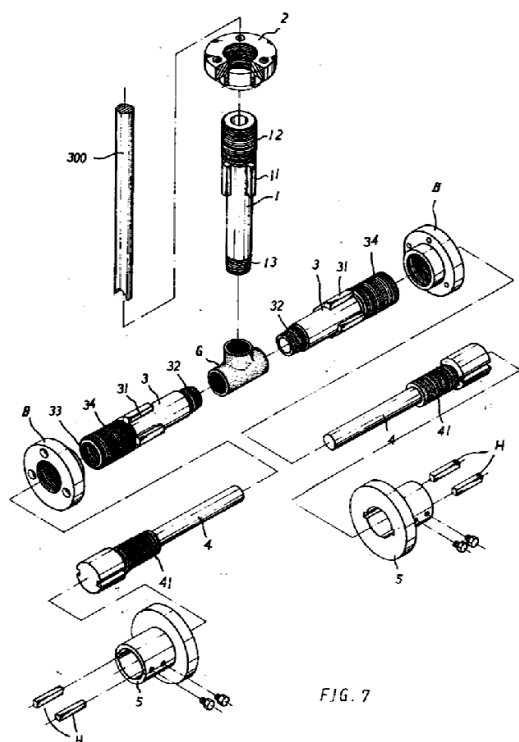
**B29C 45/261****{having tubular mould cavities}****Definition statement***This place covers:*

EP852339 optical connectors, fig 7b, 51,52 = tubular

**FIG. 7A****FIG. 7B**



EP501091, fittings, element G in figure 7



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Producing pipe or pipe joints	<a href="#">B29D 23/001</a>
Ferrules for optical fibres	<a href="#">G02B 6/3885</a>

## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Tubular	refers to being open at both ends and hollow
---------	--

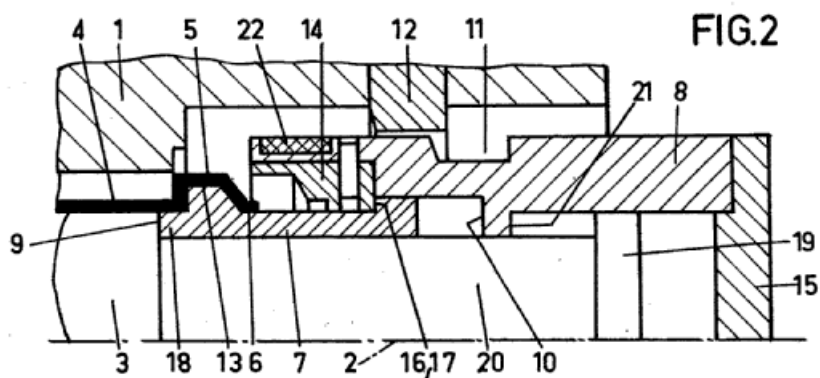
**B29C 45/2612**

{for manufacturing tubular articles with an annular groove}

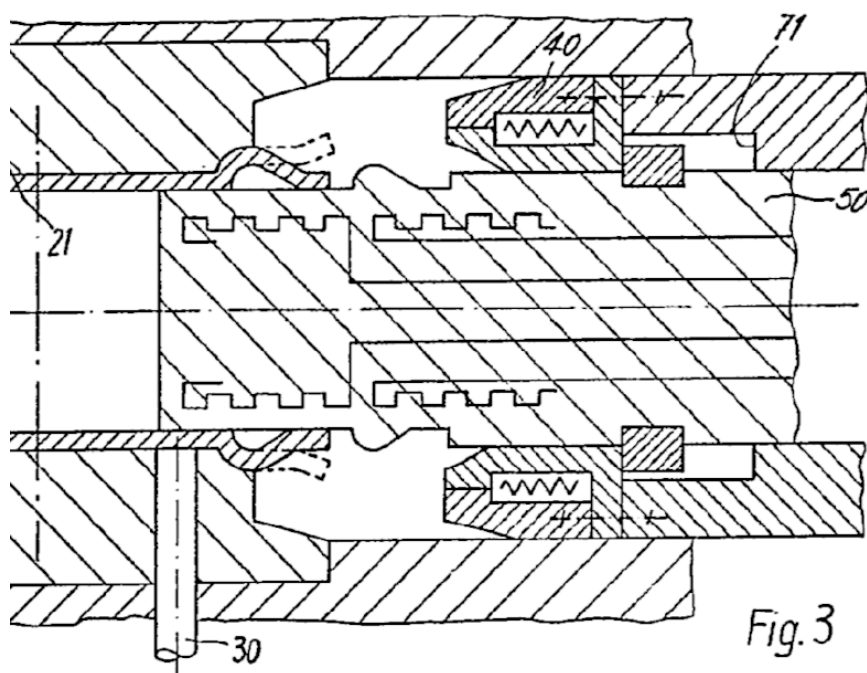
**Definition statement**

*This place covers:*

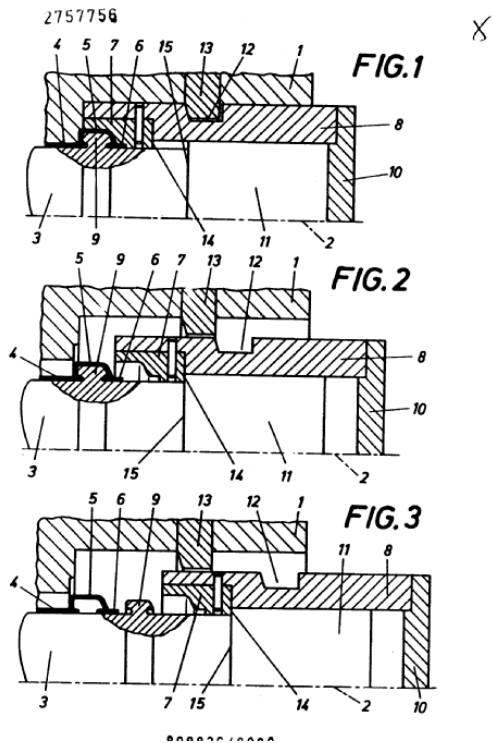
DE2633050 see element 13, fig 2.



GB2145364



DE2757756



**B29C 45/2616**

{having annular mould cavities}

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Producing tyres or parts thereof by injection moulding	<a href="#">B29D 30/0678</a>
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**B29C 45/262**

{provided with unscrewing drive means (unscrewing means outside the mould [B29C 45/178](#))}

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Moulds in general for stripping articles from a mould core using a rotating movement: to unscrew articles	<a href="#">B29C 33/446</a>
Discharging articles by stripping from a mould core using a rotating movement: to unscrew articles	<a href="#">B29C 37/0021</a>

**B29C 45/2624**

{provided with a multiplicity of wall-like cavities connected to a common cavity, e.g. for battery cases}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Producing casings, e.g. accumulator cases	<a href="#">B29D 99/006</a>
---	-----------------------------

**B29C 45/2626**

{provided with a multiplicity of narrow cavities connected to a common cavity, e.g. for brushes, combs}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Moulds with deep narrow cavities in general	<a href="#">B29C 33/0027</a>
Making of toothbrushes	<a href="#">A46D 3/005</a> , <a href="#">A46B 1/00</a>

**B29C 45/2628**

{with mould parts forming holes in or through the moulded article, e.g. for bearing cages}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Moulds for making articles with holes in general	<a href="#">B29C 33/0033</a>
--	------------------------------

**B29C 45/263**

{with mould wall parts provided with fine grooves or impressions, e.g. for record discs}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Producing phonographic records	<a href="#">B29D 17/002</a>
Preparing and using a stamper for the manufacture of records or carriers	<a href="#">G11B 7/263</a>
Record carriers characterised by their resin composition	<a href="#">G11B 23/0092</a>

**B29C 45/2632****{Stampers; Mountings thereof}****Definition statement***This place covers:*

the mounting of stamper layers

**B29C 45/2642****{Heating or cooling means therefor}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Heating or cooling the injection mould in general	<a href="#">B29C 45/73</a>
---	----------------------------

**B29C 45/2673****{with exchangeable mould parts, e.g. cassette moulds ([B29C 45/1756](#) takes precedence)}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulds with exchangeable mould parts in general:	<a href="#">B29C 33/306</a>
Adjustable moulds in general:	<a href="#">B29C 33/308</a>
Adjustable moulds for injection moulding:	<a href="#">B29C 45/376</a>

**B29C 45/27****Sprue channels {; Runner channels or runner nozzles}****Definition statement***This place covers:*

Sprue bushings, runner nozzles, runner channels

**References****Limiting references***This place does not cover:*

Runner nozzles for multi-component injection moulding	<a href="#">B29C 45/1603</a>
---	------------------------------

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Machine nozzles (i.e. the nozzles injecting the material into the mould)	<a href="#">B29C 45/20</a>
--	----------------------------

**B29C 45/2701**

{Details not specific to hot or cold runner channels ([B29C 45/2725](#) takes precedence)}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Material feeding channels in general	<a href="#">B29C 33/0061</a>
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**B29C 45/2703**

{Means for controlling the runner flow, e.g. runner switches, adjustable runners or gates}

**Definition statement**

This place covers:

e.g. rotatable sprue bushings

**B29C 45/2708**

{Gates ([B29C 45/2703](#) takes precedence)}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Mould filling gates in general	<a href="#">B29C 33/0077</a>
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**Glossary of terms**

In this place, the following terms or expressions are used with the meaning indicated:

gate	the mould part that connects the runner with the cavity or cavity entrance.
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**B29C 45/2735**

{for non-coaxial gates, e.g. for edge gates}

**Definition statement**

This place covers:

Side gates

**B29C 45/2806**

{consisting of needle valve systems ([B29C 45/2896](#) takes precedence)}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Needle valves in spray nozzles in general	<a href="#">B05B 1/3046</a>
---	-----------------------------

**B29C 45/32**

having several axially spaced mould cavities {, i.e. for making several separated articles}

**Definition statement**

*This place covers:*

Stack moulds

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Stack moulds in general	<a href="#">B29C 33/0088</a>
Presses having several platens arranged one above the other	<a href="#">B30B 7/02</a>

**B29C 45/34**

having venting means

**Definition statement**

*This place covers:*

E.g. moulding in a vacuum environment

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Moulds with incorporated venting means in general	<a href="#">B29C 33/10</a>
Moulding using vacuum in general	<a href="#">B29C 2791/006</a>
Venting means for metal casting moulds	<a href="#">B22D 17/145</a>

**B29C 45/37**

**Mould cavity walls {, i.e. the inner surface forming the mould cavity, e.g. linings}**

**Definition statement**

*This place covers:*

Mould cavity wall materials

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Mould coatings in general	<a href="#">B29C 33/56</a>
---------------------------	----------------------------

**B29C 45/372**

**{provided with means for marking or patterning, e.g. numbering articles}**

**Definition statement**

*This place covers:*

Moulds walls provided with a surface roughness

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Moulds provided with means for marking or patterning in general	<a href="#">B29C 33/424</a>
---	-----------------------------

**B29C 45/374**

**{for displaying altering indicia, e.g. data, numbers}**

**Definition statement**

*This place covers:*

Mould cavity wall indicator means which are able to be adjusted in the mould.

**References****Limiting references**

*This place does not cover:*

Indicators by exchanging parts of the cavity wall	<a href="#">B29C 45/2673</a> , <a href="#">B29C 45/372</a>
---	---



**B29C 45/376**

{adjustable ([B29C 45/374](#) takes precedence)}

**Definition statement**

*This place covers:*

Changing of the cavity configuration, e.g. by mould parts that are movable

**B29C 45/38**

**Cutting-off equipment for sprues or ingates**

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Cutting-off sprues in pressure die casting	<a href="#">B22D 17/2076</a>
Cutting-off surplus material in metal casting	<a href="#">B22D 31/00</a>

**B29C 45/40**

**Removing or ejecting moulded articles**

**Definition statement**

*This place covers:*

The process of the ejection

EP92916

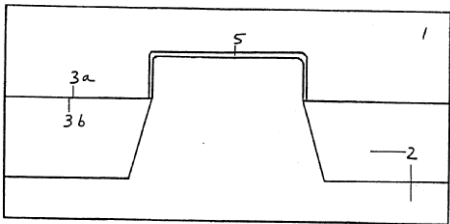


FIG 2

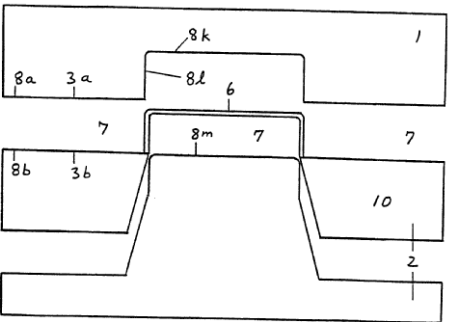


FIG 3

Mechanical details of the ejector (covered by [B29C 45/4005](#) and [B29C 45/401](#))

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds with means for removing or ejecting articles in general	<a href="#">B29C 33/44</a>
Discharging articles from the mould in general	<a href="#">B29C 37/0003</a>
Ejecting castings in pressure die casting	<a href="#">B22D 17/2236</a>

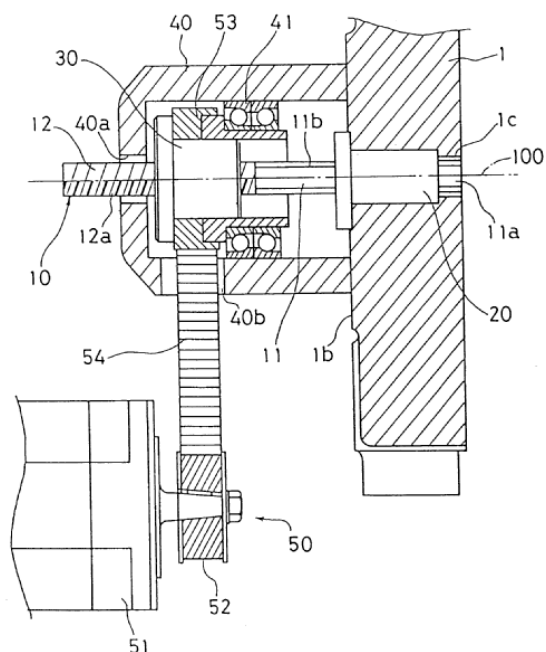
## B29C 45/4005

{Ejector constructions; Ejector operating mechanisms ([B29C 45/44](#) takes precedence)}

### Definition statement

This place covers:

EP503068 fig 1, construction of the drive of the ejection unit.



## References

### Informative references

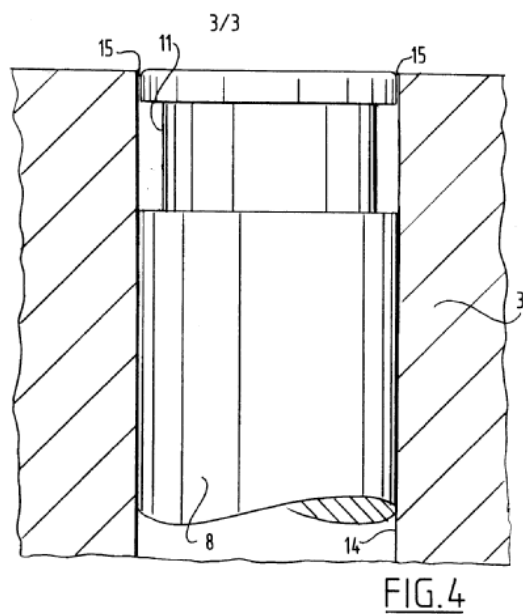
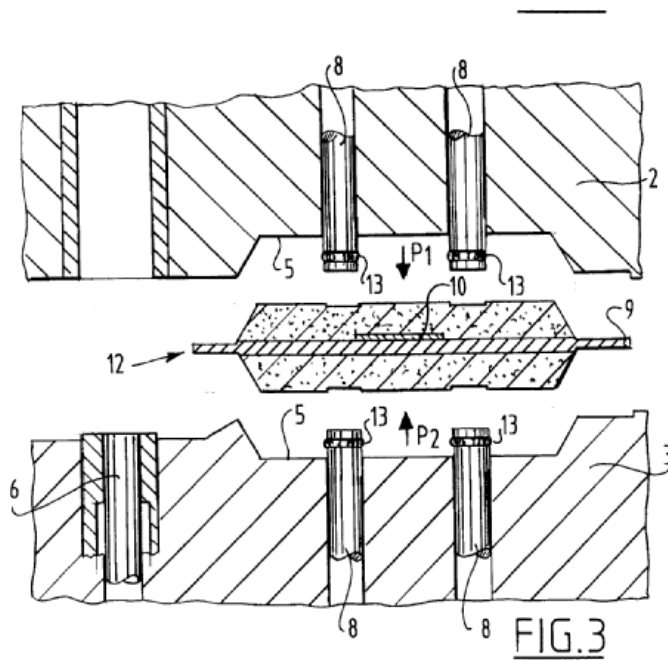
Attention is drawn to the following places, which may be of interest for search:

Mechanical ejectors of moulds in general	<a href="#">B29C 33/442</a>
--	-----------------------------

**B29C 45/401****{Ejector pin constructions or mountings}****Definition statement**

*This place covers:*

WO9819845, fig 3 and 4, sealing means 13 and construction 15 are special features of the pin.



**B29C 45/42**

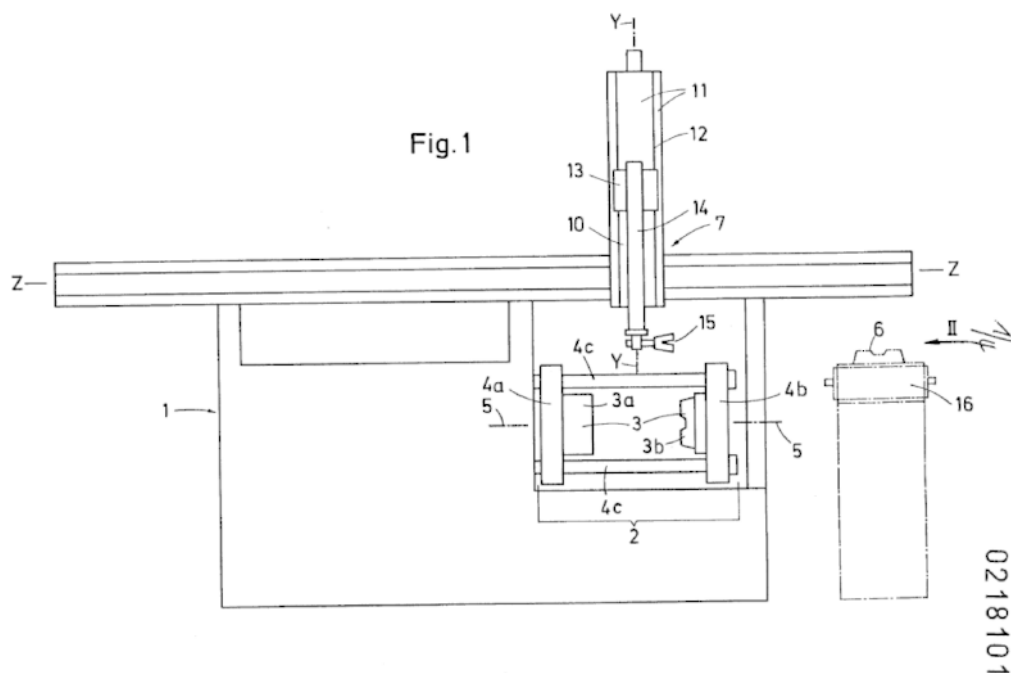
**using means movable from outside the mould between mould parts {, e.g. robots}**

## Definition statement

*This place covers:*

## Robots for removing moulded articles

EP218101



## References

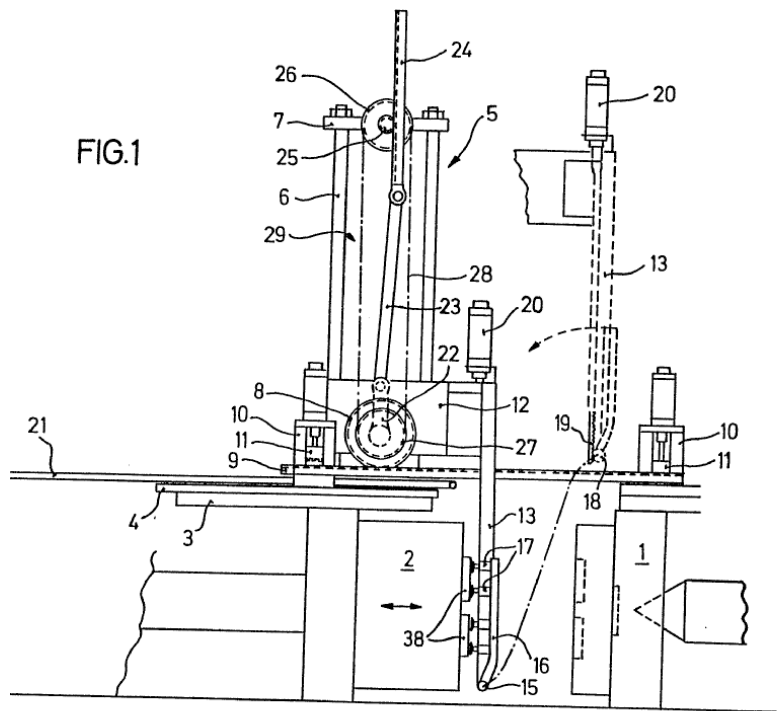
### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Discharging moulded articles by robots in general	<a href="#">B29C 37/0007</a>
Manipulators for evacuating cast pieces in pressure die casting	<a href="#">B22D 17/2084</a>
Robots in general	<a href="#">B25J</a>

**B29C 45/4208****{and driven by the movable mould part}****Definition statement***This place covers:*

EP837666, the moving mould causes the rack to rotate the pignon to move the robot

**B29C 45/4225****{Take-off members or carriers for the moulded articles, e.g. grippers}****Definition statement***This place covers:*

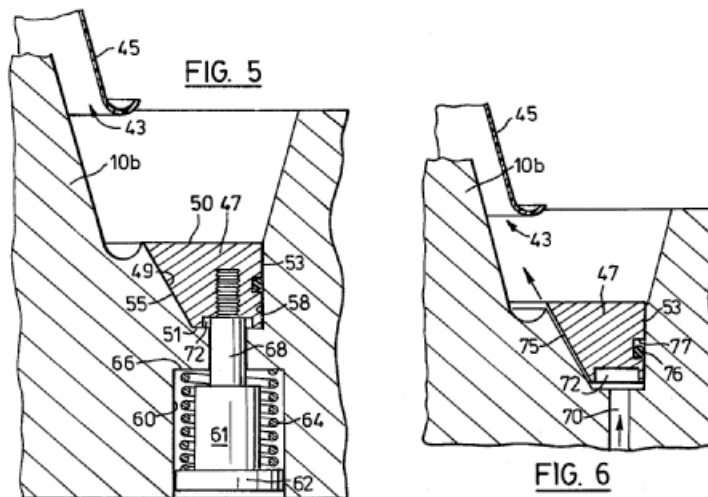
The part of the robot that picks up the moulded article

### ***Informative references***

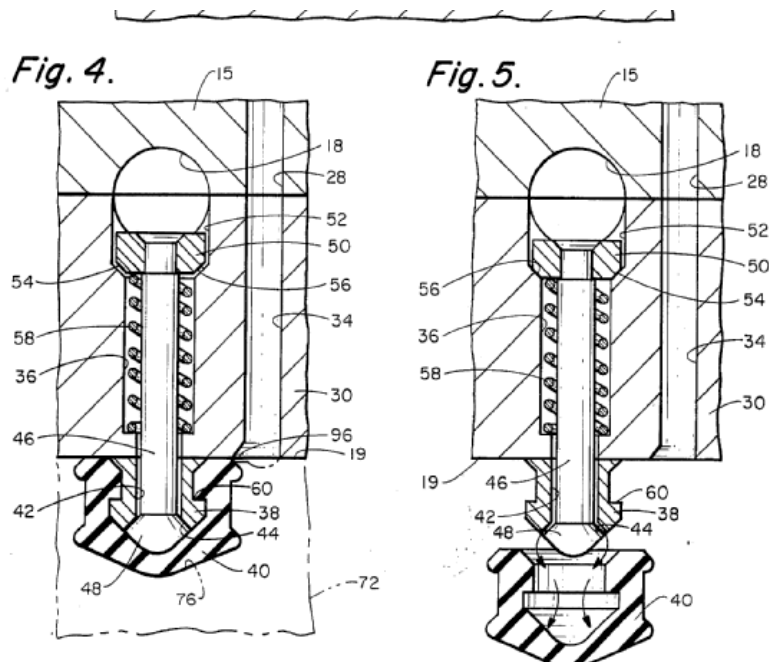
Gripping heads of manipulators in general	<a href="#">B25J 15/00</a>
Gripping devices for feeding or discharging articles from a conveyor	<a href="#">B65G 47/90</a>

**B29C 45/43****using fluid under pressure****Definition statement***This place covers:*

US4438065, fig 5 &amp; 6, air through channel 70 &amp; 75



US3892512, fig 4 &amp; 5

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Using fluid pressure to remove articles from the mould in general

[B29C 33/46](#)

**B29C 45/435**

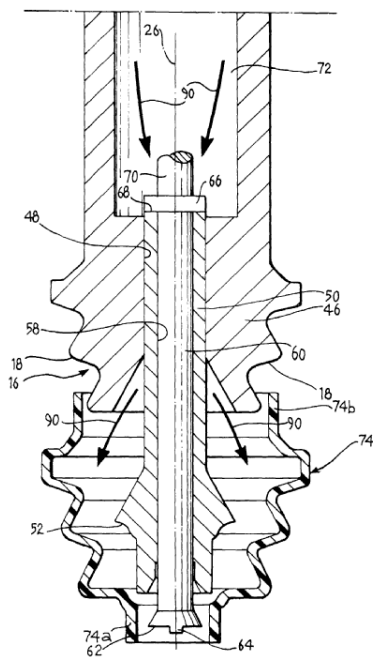
{introduced between a mould core and a hollow resilient undercut article, e.g. bellows}

**Definition statement**

*This place covers:*

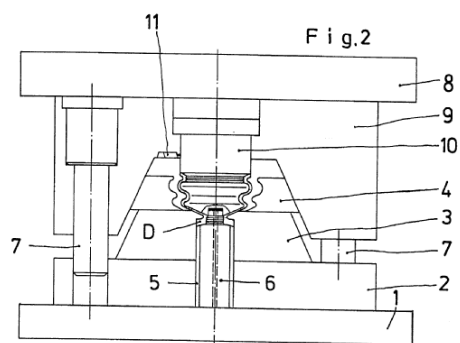
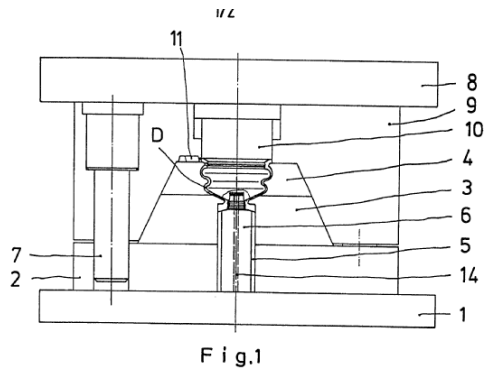
EP818297, fig 5

FIG. 5





EP100422 fig 1 & 2



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Bellows obtained by moulding	<a href="#">B29L 2031/703</a>
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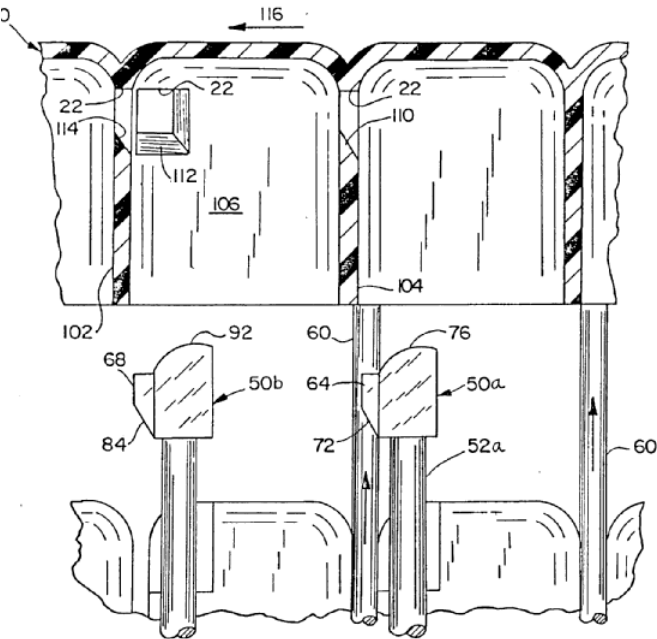
**B29C 45/44**

**for undercut articles**

**Definition statement**

*This place covers:*

EP595491



**FIG. 8**

**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

undercut	an opening in a moulded article made by a supplementary mould part which can not move in an axial direction upon mould opening.
----------	---

**B29C 45/4407**

**{by flexible movement of undercut portions of the articles}**

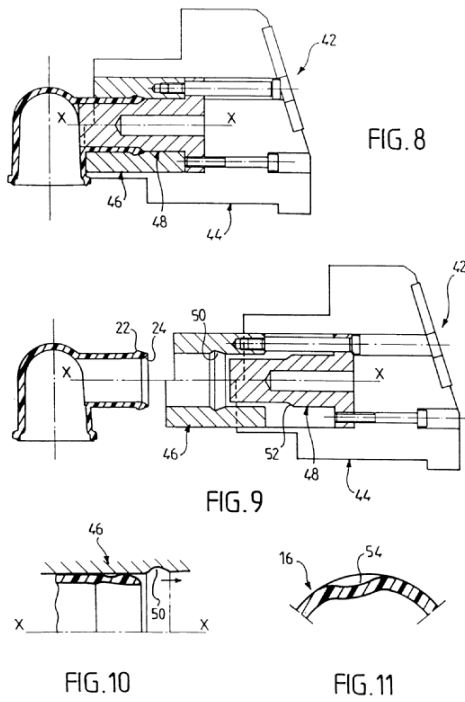
**Definition statement**

*This place covers:*

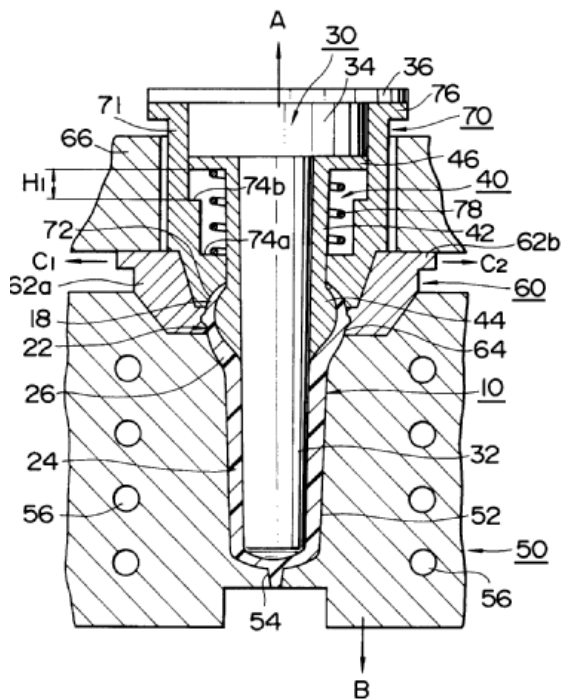
the flexible movement is the UNDERCUT PORTION of the ARTICLE

## Definition statement

EP635351, fig 8,9,10 part 24 can move flexible



EP510650, fig 1, undercut 44,/64. fig 2b & 4b core moves and undercut can flex away



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Discharging moulded articles from the mould by deforming undercut portions of the article in general	<a href="#">B29C 37/0014</a>
--	------------------------------

## B29C 45/4421

{using expansible or collapsible cores}

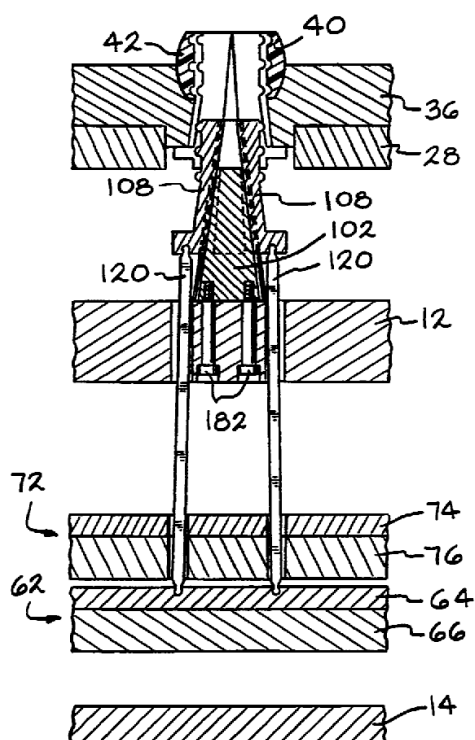
### Definition statement

This place covers:

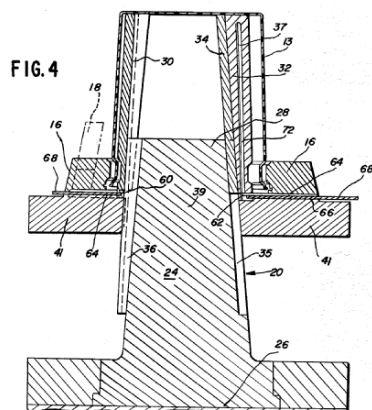
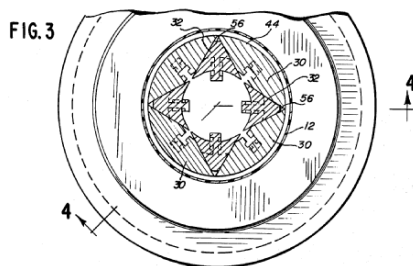
moulds comprise usually two types of cores.

US5403179, items 108 and 138 are collapsible, because of the insertable and removable pin.

The movement of the cores is linked to each other.



US4286766



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Collapsible cores or mandrels for removing or ejecting moulded articles in general	<a href="#">B29C 33/485</a>
Collapsible cores for winding and joining	<a href="#">B29C 53/824</a>

## B29C 45/4435

{using inclined, tiltable or flexible undercut forming elements driven by the ejector means}

### Definition statement

*This place covers:*

Only undercut forming element being driven by the ejector means.

Three types of undercut forming elements are present:

Flexible:

Definition statement

EP1201396, fig 4, undercut forming element 3, flexing at 2, driven by 9/10

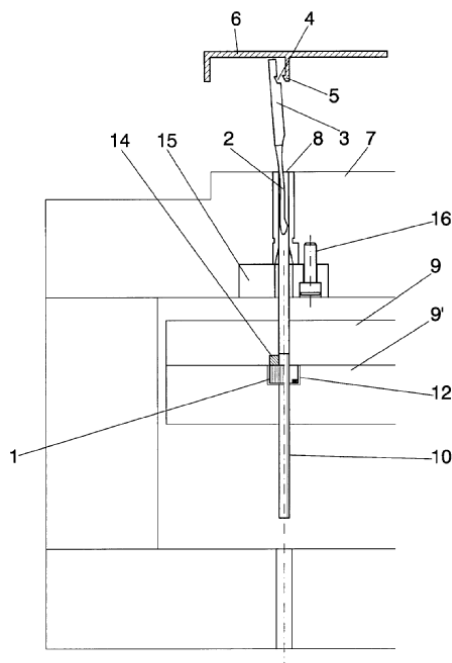
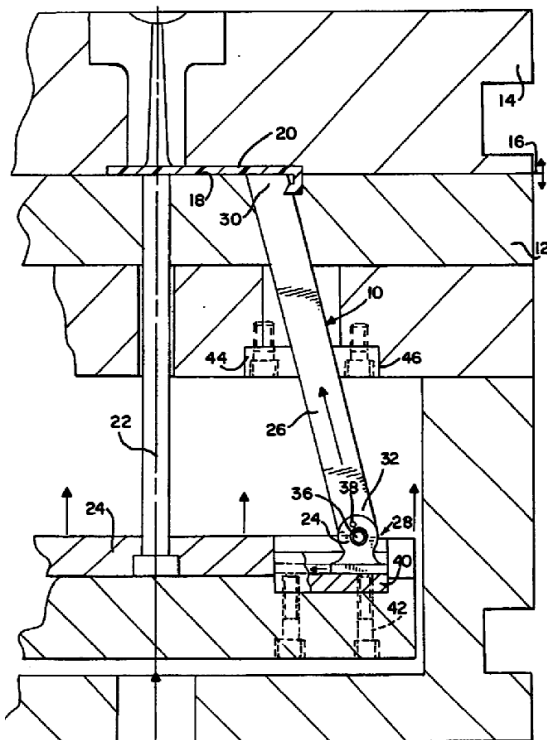


FIG.4

Inclined:

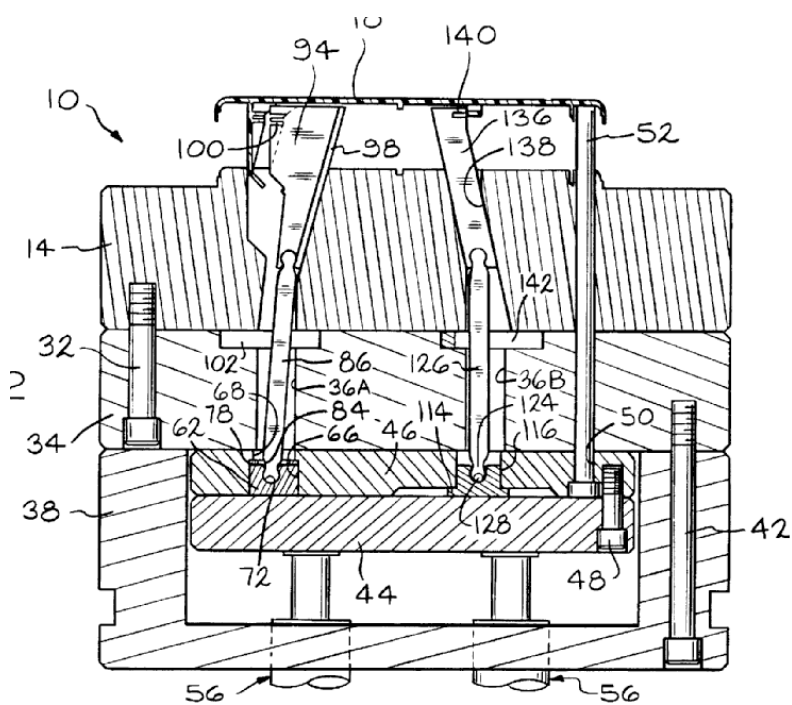
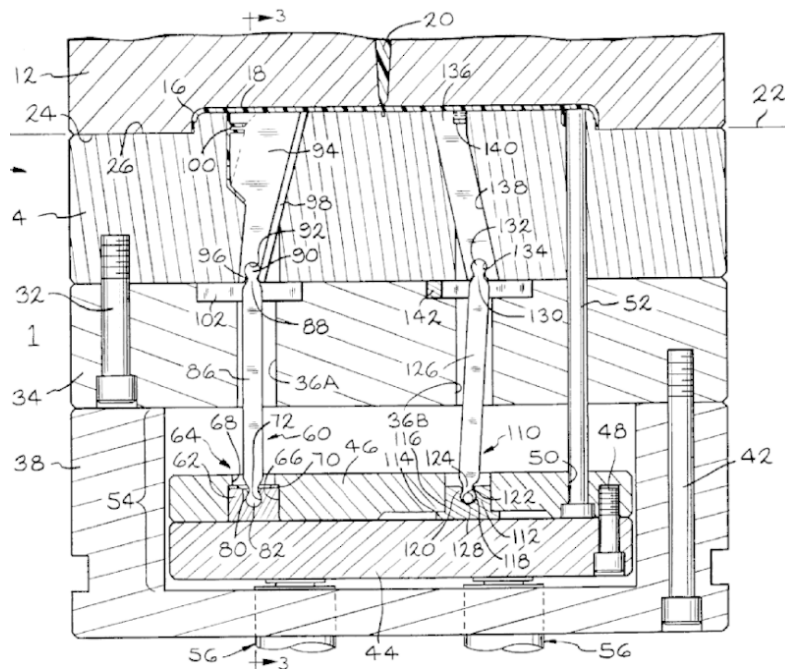
US5551864, inclined element 26 driven by 24



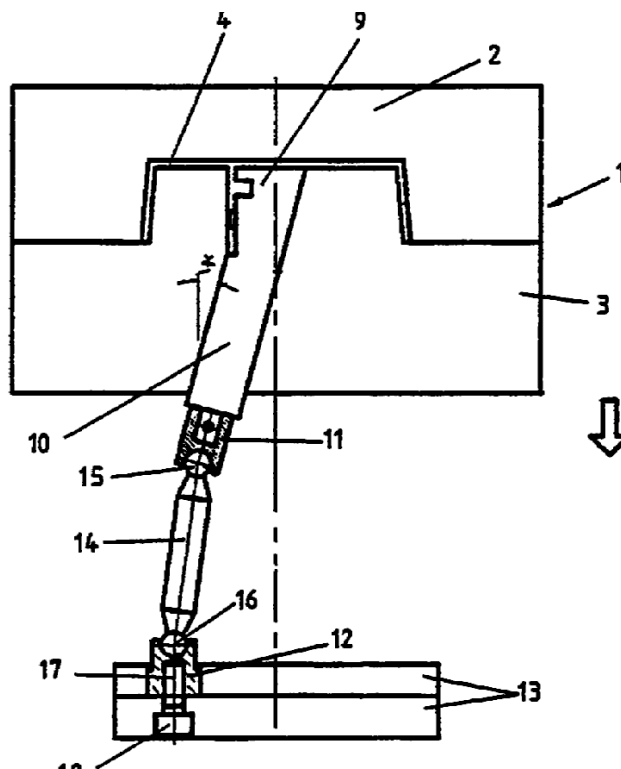
Tiltable (or pivotable),

## Definition statement

US5773048, Undercut forming element 94, driven by ejector 46. See hinge 90-92 (fig 1 & 2)



DE19507009, figure 1



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Inclined, tiltable or flexible undercut forming elements driven by other means than the ejector	<a href="#">B29C 45/4471</a>
---	------------------------------

## B29C 45/4457

{using fusible, soluble or destructible cores}

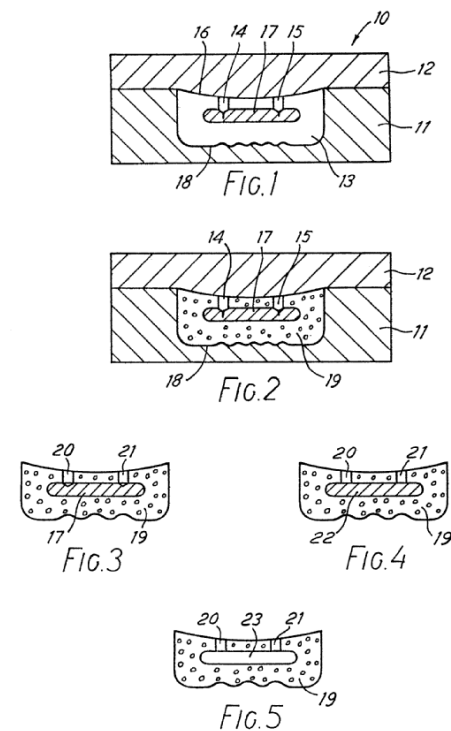
### Definition statement

This place covers:

Soluble cores, e.g. salt, ice, wax, plastic, metal



EP173447, claim 1, core 17 (fig 1-5)



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Destructible cores to facilitate the removal or ejection of moulded articles in general	<a href="#">B29C 33/448</a>
Soluble cores to facilitate the removal or ejection of moulded articles in general	<a href="#">B29C 33/52</a>

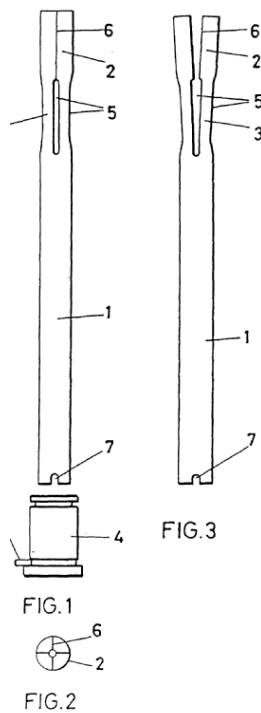
**B29C 45/4471**

{using flexible or pivotable undercut forming elements ([B29C 45/4435](#) takes precedence)}

**Definition statement**

*This place covers:*

EP1223021, fig 2 & 3. The pincers of the head open automatically.



## Definition statement

EP421136, pivotable/tiltable. Plastic = 5, part 14/14a pivotable. The outside pivoting movement of 14 is actioned by 16.

FIG. 1

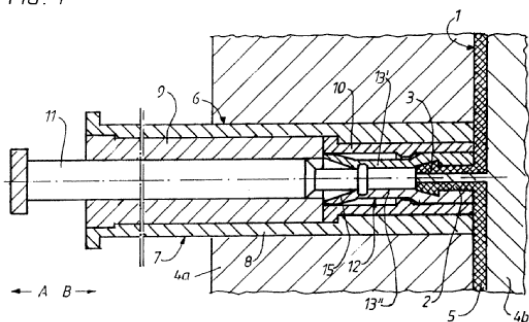
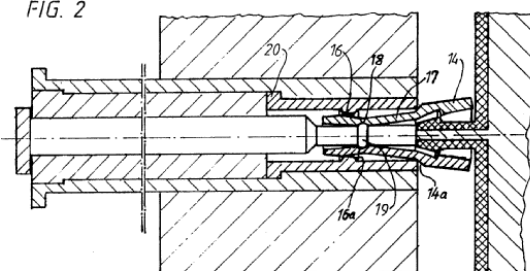


FIG. 2



EP738578, fig 5-7, pivotable part 9

FIG. 5

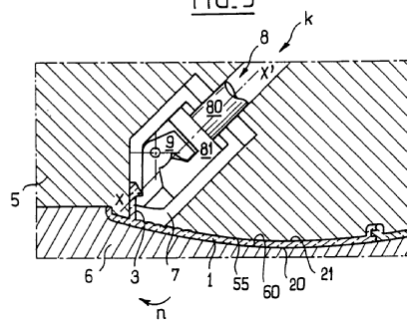
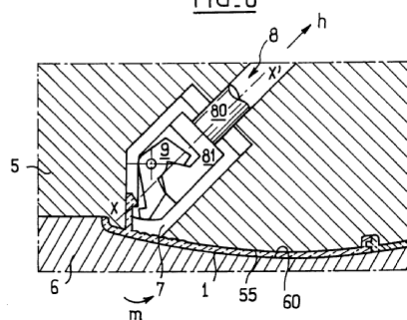
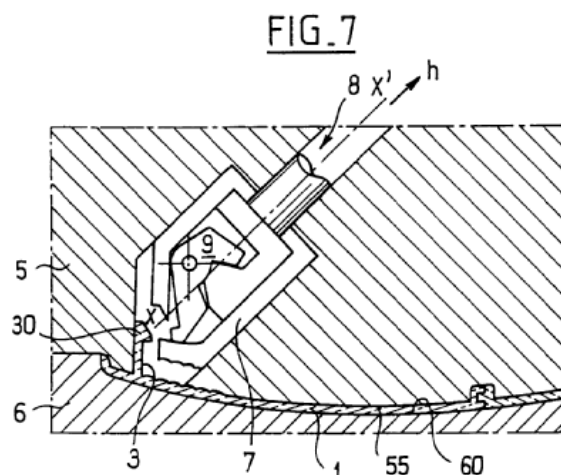
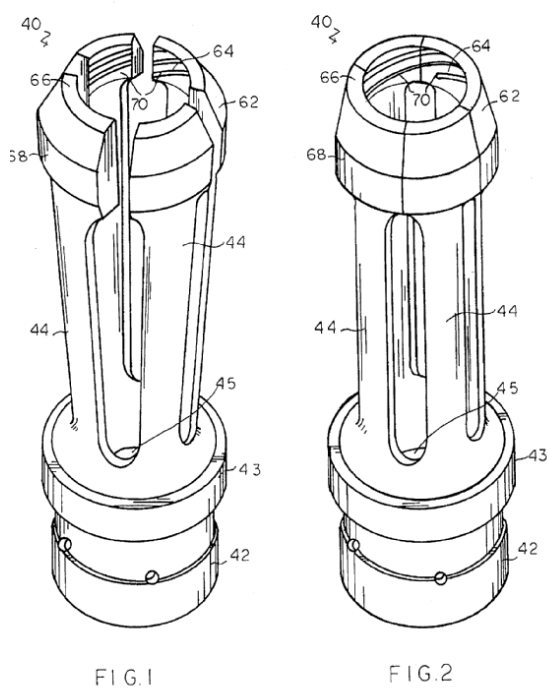


FIG. 6





US5630977 fig 1 & 2 (flexible)



## References

### Limiting references

*This place does not cover:*

Pivotable undercut forming elements driven by the ejector	<a href="#">B29C 45/4435</a>
---	------------------------------

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Elastic or flexible cores or mandrels to facilitate the removal of the moulded article	<a href="#">B29C 33/50</a>
--	----------------------------

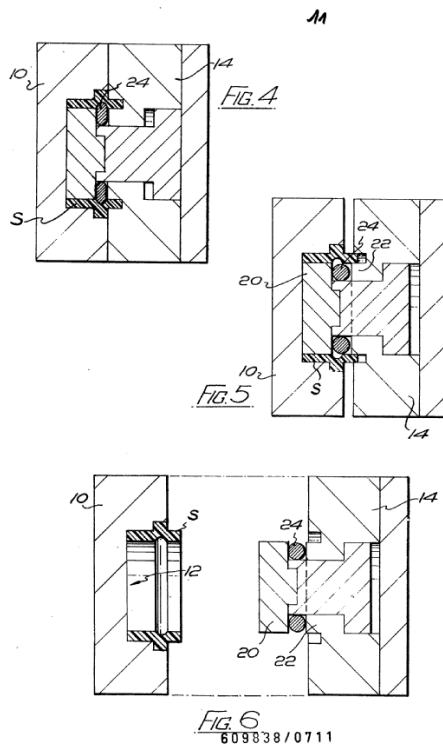
**B29C 45/4478**

{using non-rigid undercut forming elements, e.g. elastic or resilient}

**Definition statement**

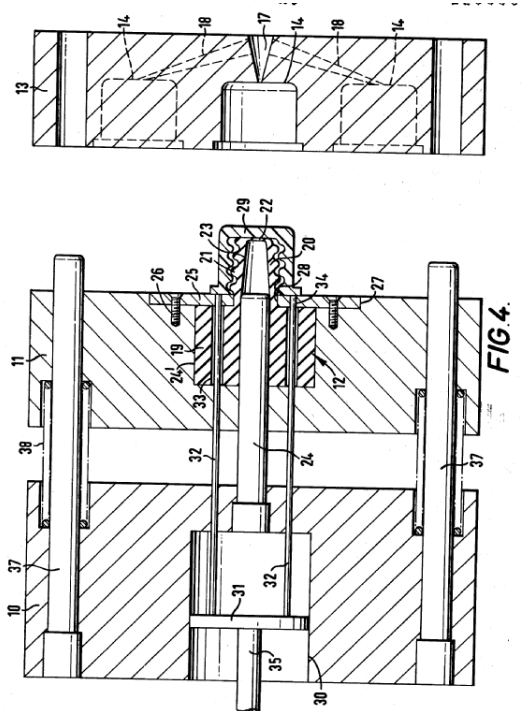
*This place covers:*

DE2609198, fig 4-6, non-rigid element 24,

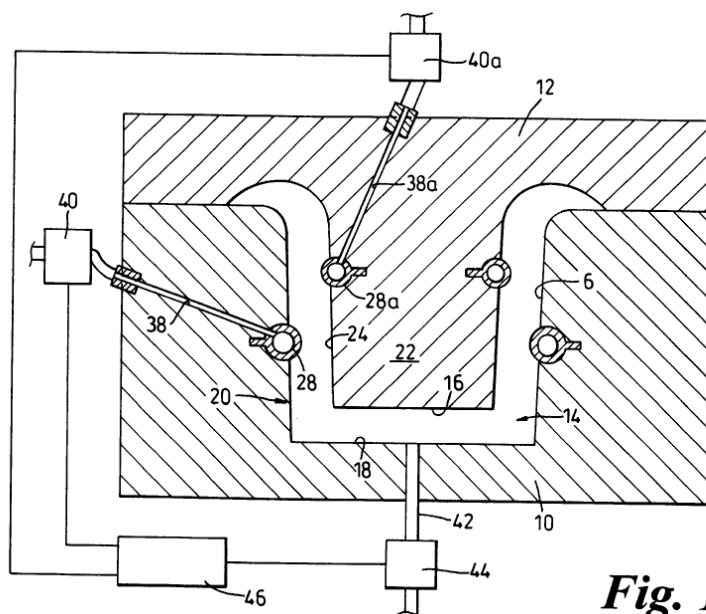


Definition statement

DE2239508, element 20 can act in a flexible way after rod 24 is removed

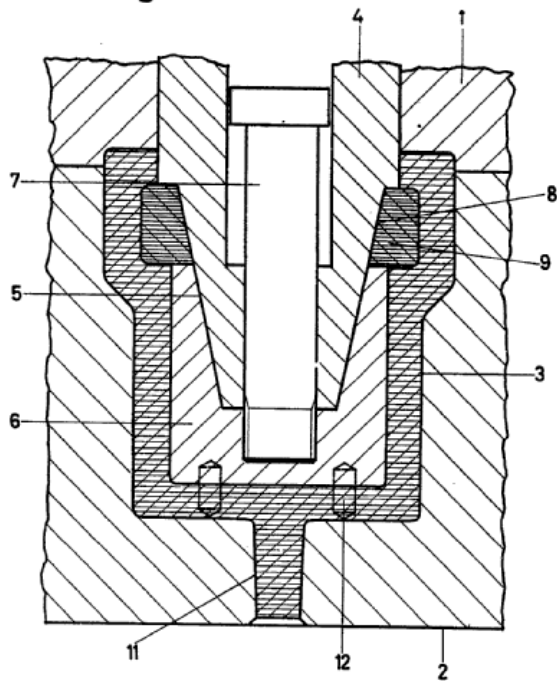


GB2323321, inflatable means 28,

**Fig. 1**

FR1559371, element 9

Fig. 1



US5080576, element 16

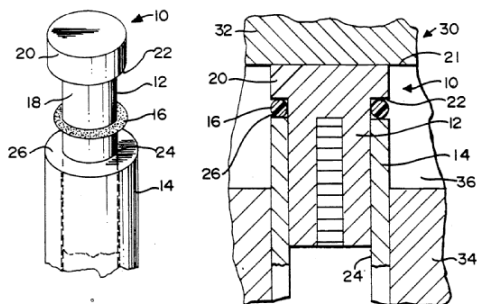


FIG. 1

FIG. 2

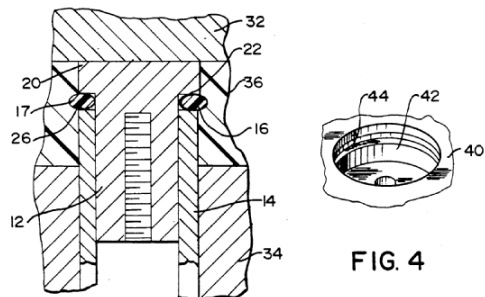


FIG. 3

FIG. 4

**B29C 45/462****{Injection of preformed charges of material}****Definition statement***This place covers:*

Injection of lumps, billets, tablets, preforms

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Feeding of measured doses	<a href="#">B29C 45/1808</a>
Blocks, tablets as preform for moulding	<a href="#">B29K 2105/255</a>

**B29C 45/464****{using a rotating plasticising or injection disc}****Definition statement***This place covers:*

Grooved conical discs for plasticising or injection

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Using rollers or discs in extrusion moulding	<a href="#">B29C 48/46</a>
--	----------------------------

**B29C 45/5008****{Drive means therefor}****Definition statement***This place covers:*

Drives for axially movable screws by rotation and translation or translation only

**References****Limiting references***This place does not cover:*

Drives for axially movable screws by rotation only	<a href="#">B29C 45/47</a>
--	----------------------------

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Hydraulic circuits in injection moulding machines as such	<a href="#">B29C 45/82</a>
---	----------------------------



**B29C 45/5605****{Rotatable mould parts}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulding articles between moving mould surfaces	<a href="#">B29C 67/0003</a>
---	------------------------------

**B29C 2045/5665****{Compression by transversely movable mould parts}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulds having transversely, e.g. radially, movable mould parts	<a href="#">B29C 45/33</a>
--	----------------------------

**B29C 45/568****{Applying vibrations to the mould parts}****Definition statement***This place covers:*

applying vibrations to runners, gates, etc. during moulding.

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Using vibrations during moulding in general	<a href="#">B29C 2791/008</a>
---	-------------------------------

**B29C 45/57****Exerting after-pressure on the moulding material {([B29C 45/174](#) takes precedence)}****Definition statement***This place covers:*

the application of dwell pressure

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

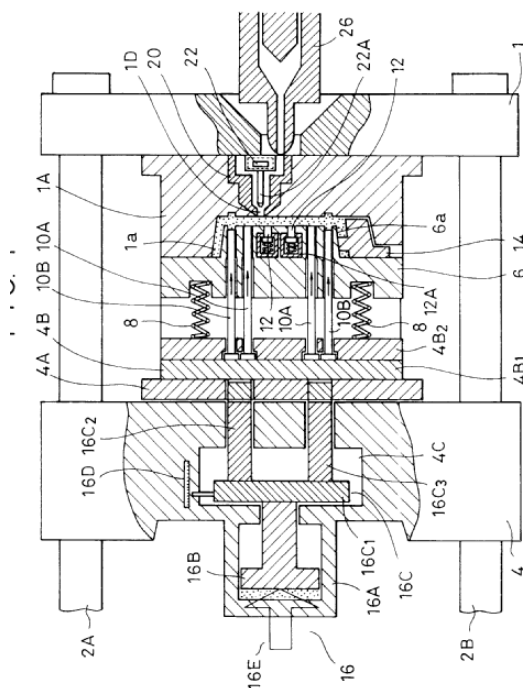
Compensating volume or shape change during moulding in general	<a href="#">B29C 37/005</a>
--	-----------------------------

**B29C 45/572**

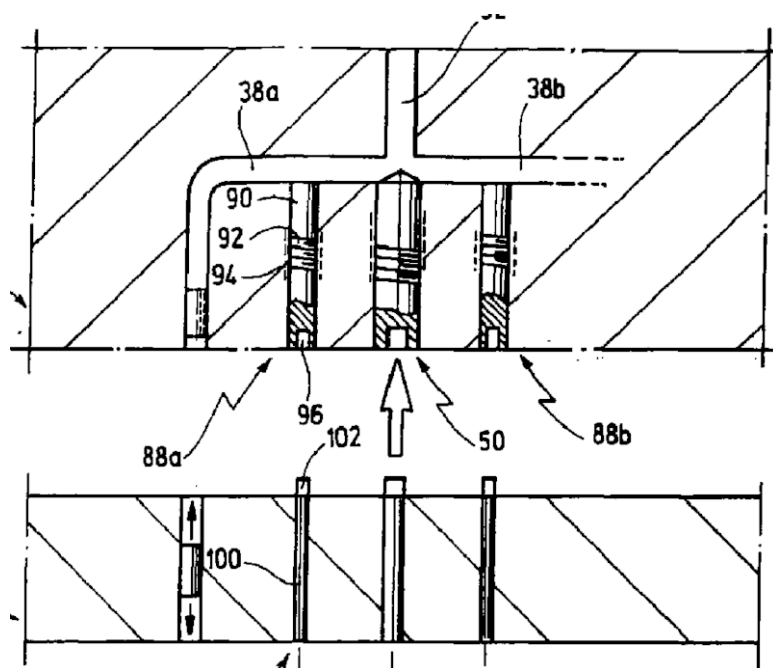
### Definition statement

the application of dwell pressure by means incorporated in the mould, e.g. locally pressurizing pins

EP662383 (mould wall part)



EP1052078 (runner part)



### Relationships with other classification places

The difference between injection compression moulding ([B29C 45/561](#)) and [B29C 45/572](#) is typically that in injection compression moulding a movable mould half is used for shaping the material in the cavity, while in [B29C 45/572](#) the already shaped material is pressed for compensating the volume change caused by the shrinkage. Pressurizing is typically done locally e.g. by pressurizing pins

It is further noted, that [B29C 45/56](#) comprises a reference out, that [B29C 45/572](#) takes precedence.

## B29C 45/58

### Details

#### Definition statement

*This place covers:*

Details of the injection unit

## B29C 45/581

{Devices for influencing the material flow, e.g. "torpedo constructions" or mixing devices}

### References

#### Limiting references

*This place does not cover:*

Details of the screw	<a href="#">B29C 45/60</a>
Heating or cooling of the injection unit	<a href="#">B29C 45/72</a>

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Mixing devices in extrusion moulding	<a href="#">B29C 48/36</a>
Extruder like static flow mixers in general	<a href="#">B01F 25/434</a>

**B29C 45/585**

{Vibration means for the injection unit or parts thereof}

**Definition statement**

This place covers:

Vibrating screws or plungers

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Applying vibration to mould parts	<a href="#">B29C 45/568</a>
Applying vibrations during extrusion moulding	<a href="#">B29C 48/14</a>
Applying vibrations during moulding in general	<a href="#">B29C 2791/008</a>
Applying vibrations during extrusion moulding of ceramics	<a href="#">B28B 3/205</a>

**B29C 45/586**

{Injection or transfer plungers}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Injection pistons for pressure die casting	<a href="#">B22D 17/203</a>
--	-----------------------------

**B29C 45/60****Screws****Definition statement**

This place covers:

mixing parts connected to the screw

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Screws in extrusion moulding:	<a href="#">B29C 48/505</a>
-------------------------------	-----------------------------

**B29C 45/62****Barrels or cylinders****Definition statement**

*This place covers:*

Also transfer pots

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Details of extruder barrels or cylinders	<a href="#">B29C 48/68</a>
Construction of extruder barrels	<a href="#">B29C 48/6801</a>

**B29C 45/63****Venting or degassing means****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Venting or degassing means in extrusion moulding	<a href="#">B29C 48/76</a>
--	----------------------------

**B29C 45/64****Mould opening, closing or clamping devices {(combined with means for plasticising or homogenising [B29C 45/70](#))}****Definition statement**

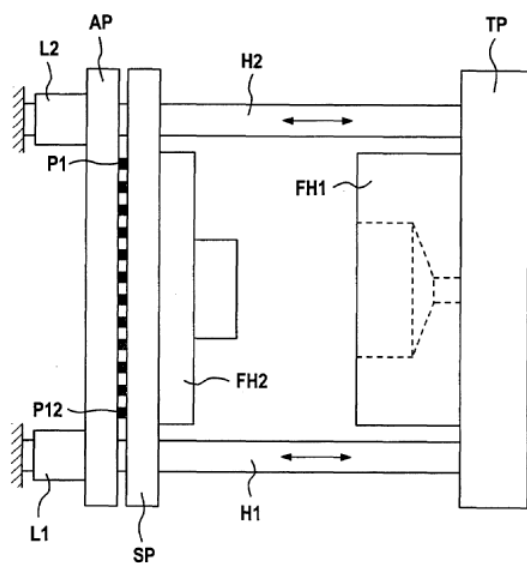
*This place covers:*

Mechanical, hydraulic and hydro-mechanical opening, closing & clamping means. For these aspects subgroups are present.

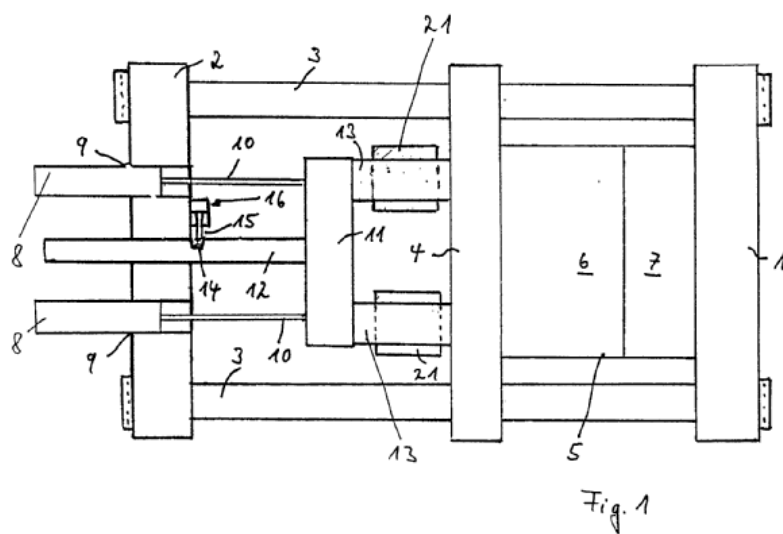
The remaining scope of [B29C 45/64](#) is small, e.g. magnetic, piezoelectric, magnetostrictive means, using shape memory alloy.

Definition statement

DE10053424: linear motors L1 &amp; L2

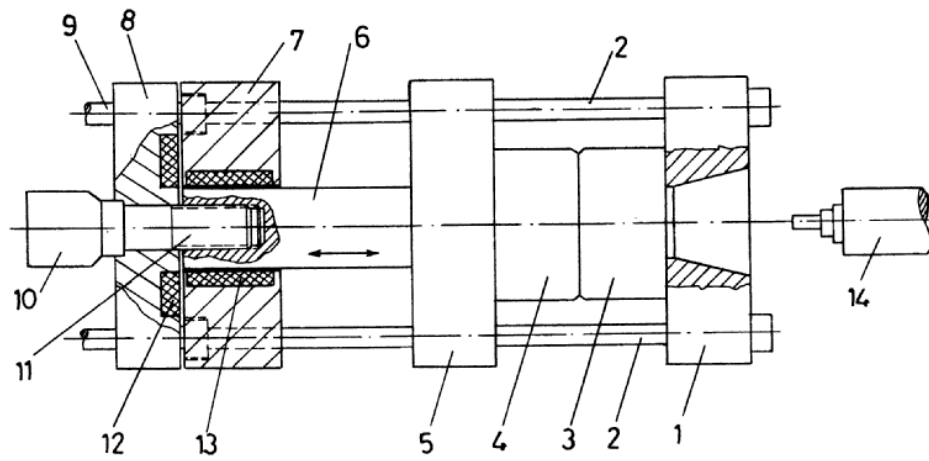


DE4336572, magnetostrictive elements (13)



DE3715161, electromagnet 12

Fig. 2



ORIGINAL INSPECTED

EP272138, claim 1, elongation of the tie-bar by energy storage.

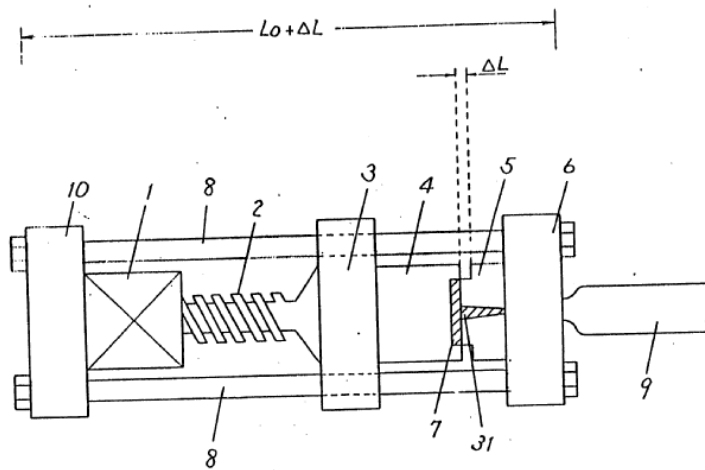
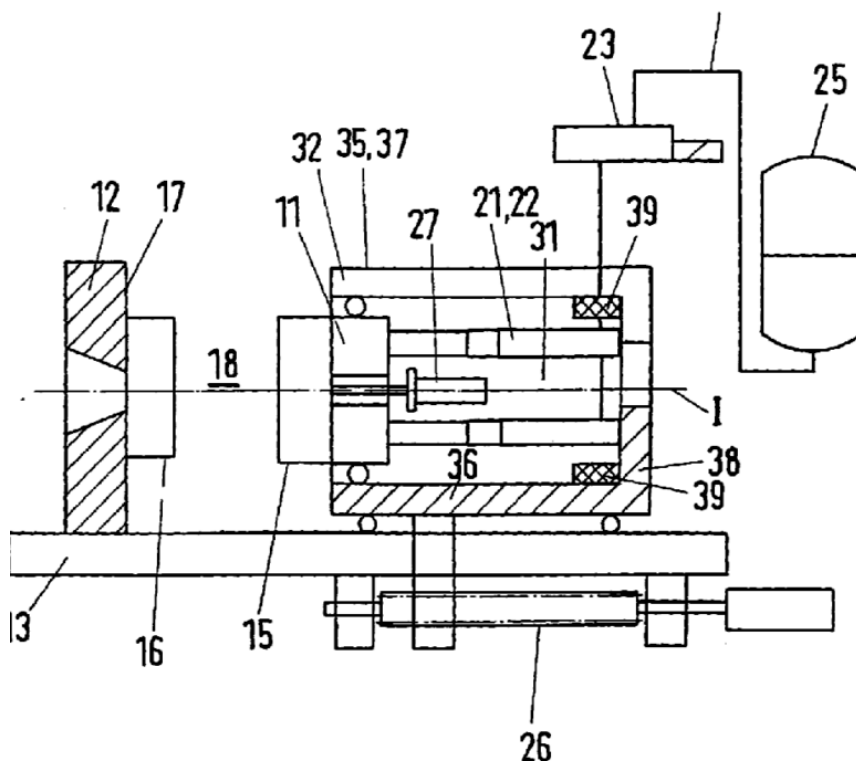


FIG. 4

EP807508



## B29C 45/641

{Clamping devices using means for straddling or interconnecting the mould halves, e.g. jaws, straps, latches}

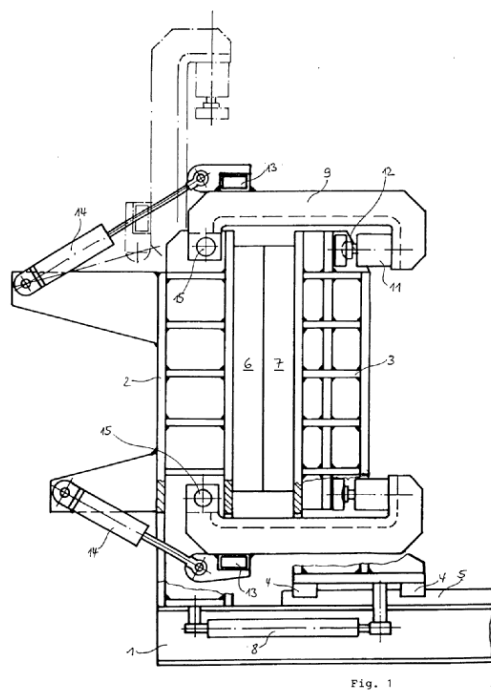
### Definition statement

*This place covers:*

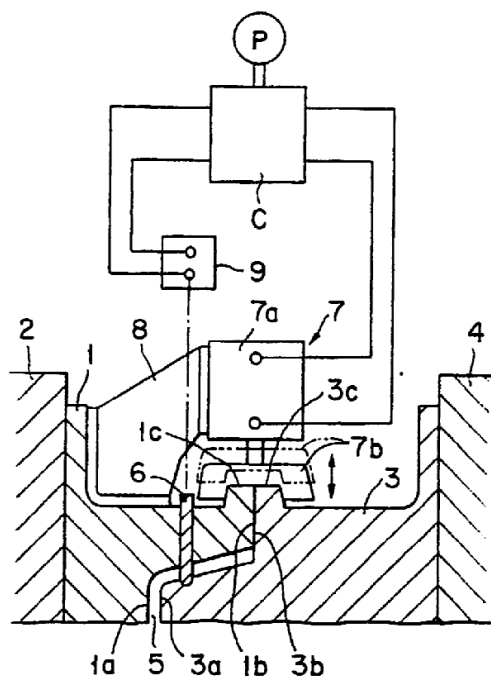
Clamping devices applicable to moulds which are ALREADY CLOSED.



EP1214999, fig 1, stradling means 9

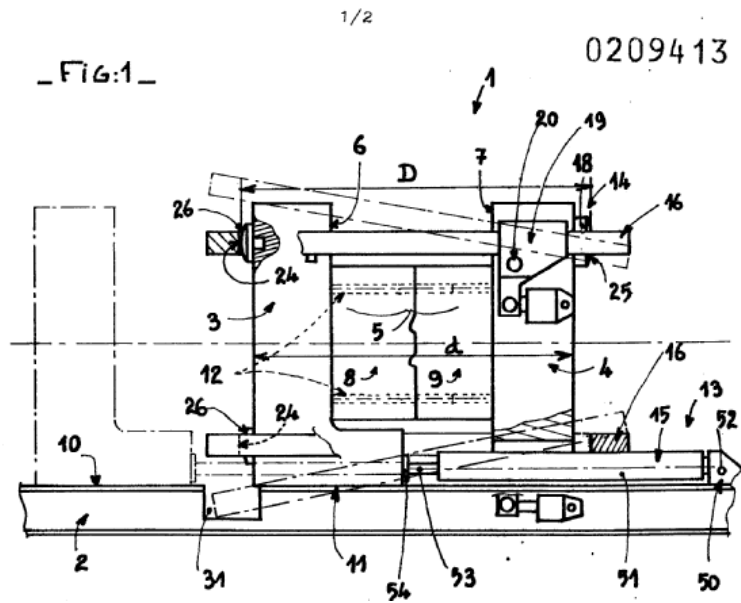


EP420098, stradling means 7b

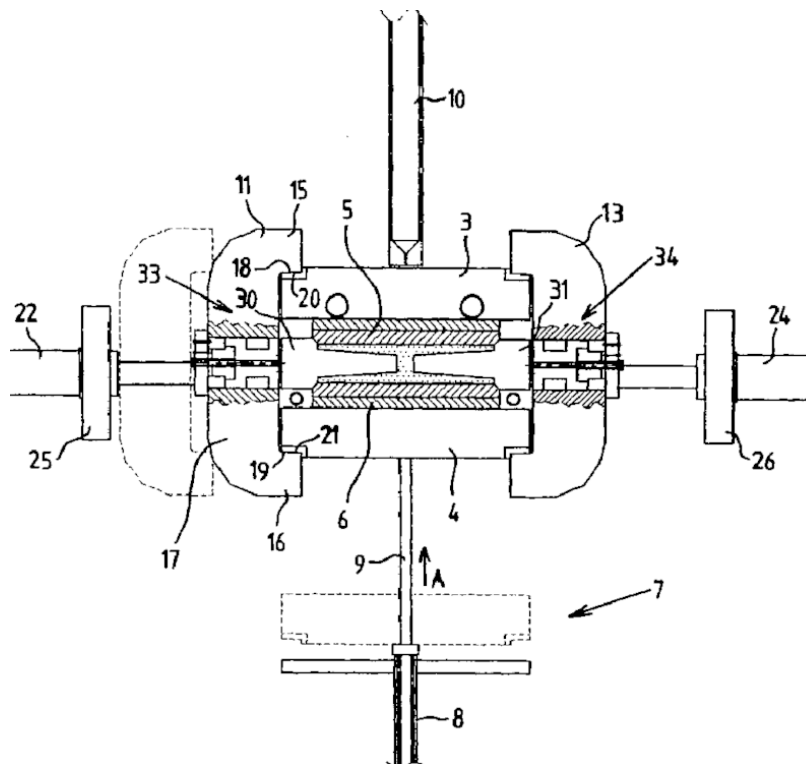


**FIG. 1**

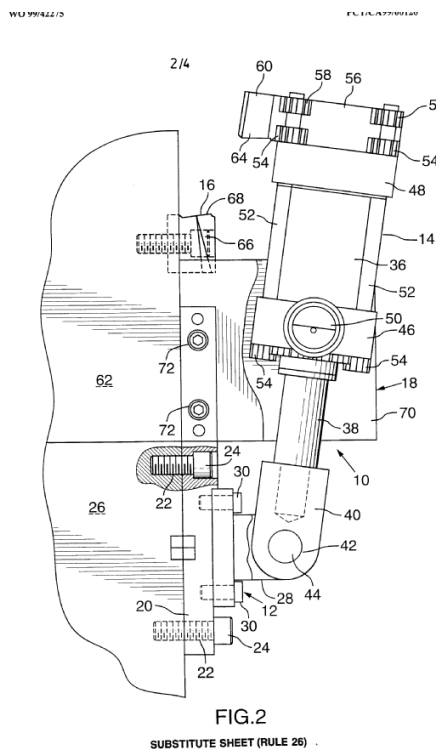
EP0209413, locking means 11 after closing



WO0121378, stradling means 13



WO9942275, mould halves 26/62 clamped by 10 (fig 2)



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Clamping means operating on closed or nearly closed mould parts, the clamping means being independently movable of the opening or closing means in general

[B29C 33/202](#)

## B29C 45/66

### mechanical

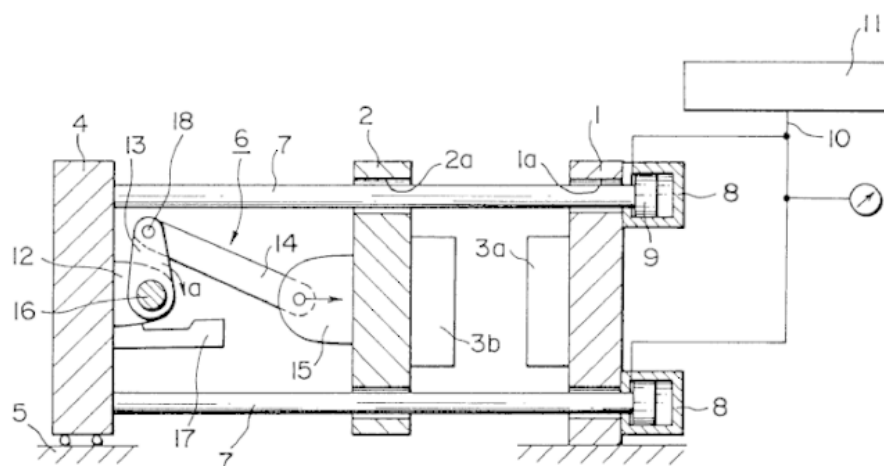
### Definition statement

*This place covers:*

Mechanical means for opening closing and clamping. A motor for driving the mechanical means can only be electric or servo but not hydraulic.

EP645228 fig 1 (note: this is not a toggle, then it should have been driven at point 18, it is driven at 16)

FIG. 1



EP627577 lever

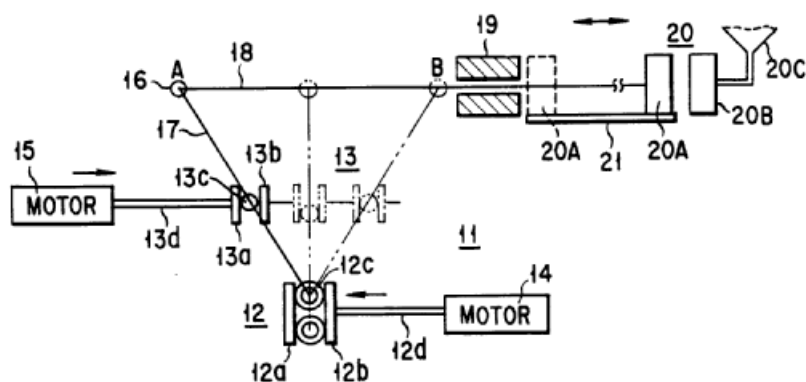
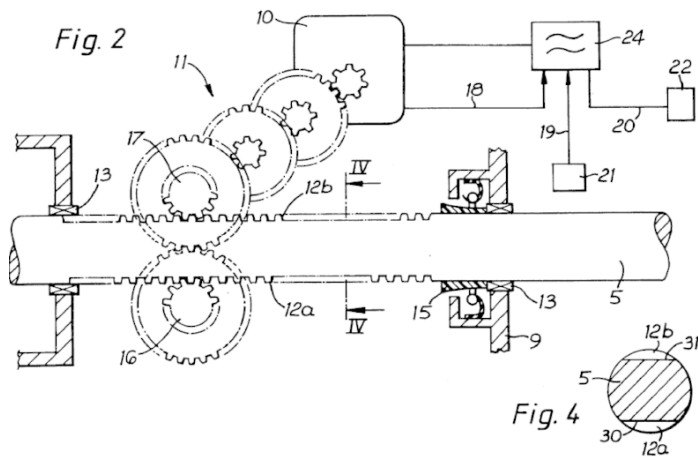
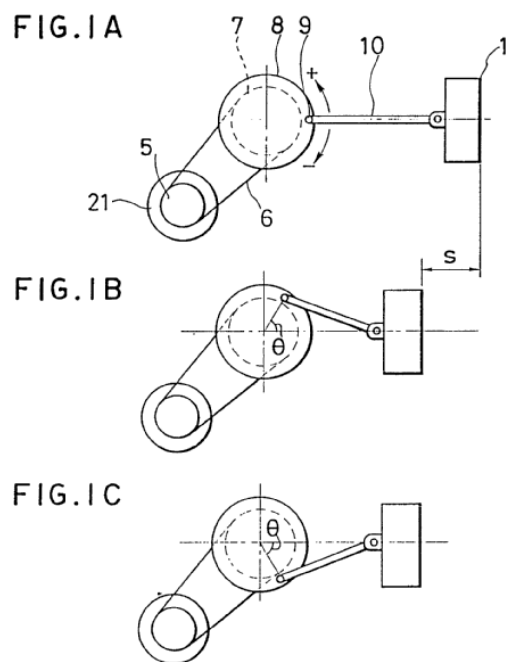


FIG. 1

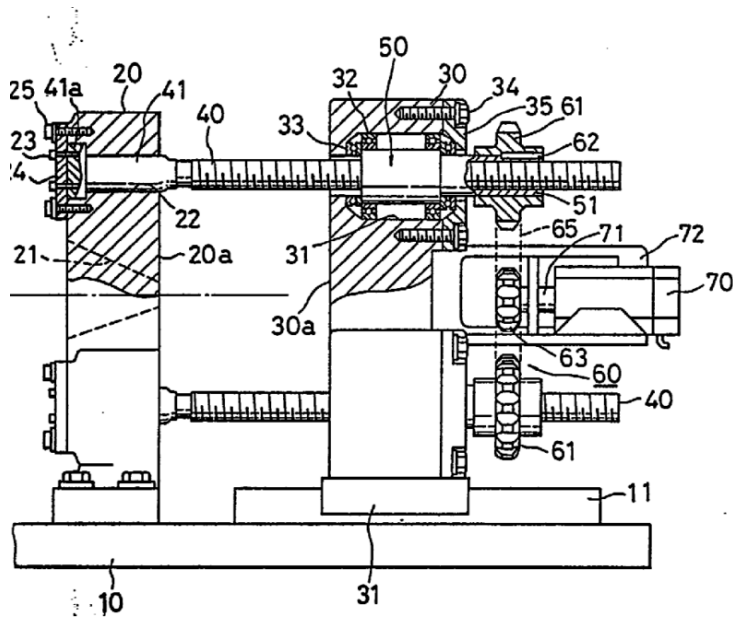
EP427438 fig 2, pignon/rack 11/12



EP386233 crank mechanism fig 1a,b,c



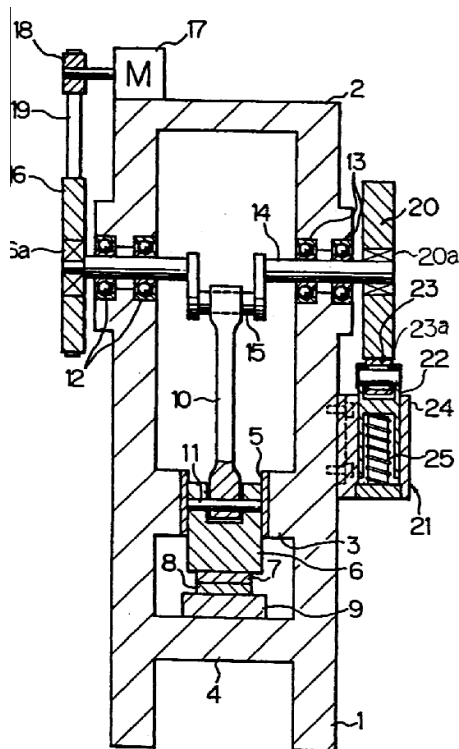
EP381770 40,50 ball nut & screw mechanism.



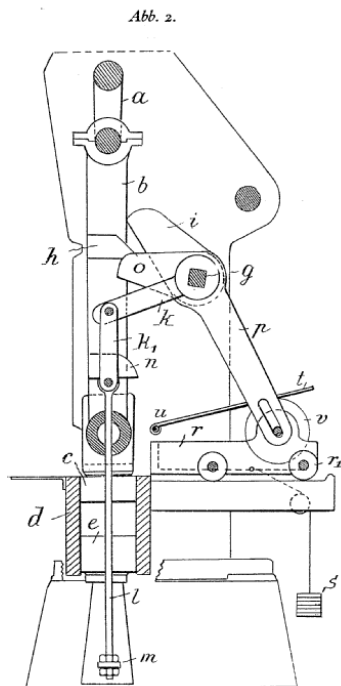
Examples for cranks and excentrics as mechanical opening, closing and clamping means are taken from the field of presses ([B30B](#)) for reference purpose.

Cranks:

US5544577, driven crank axis is 14, 6 is like the mould

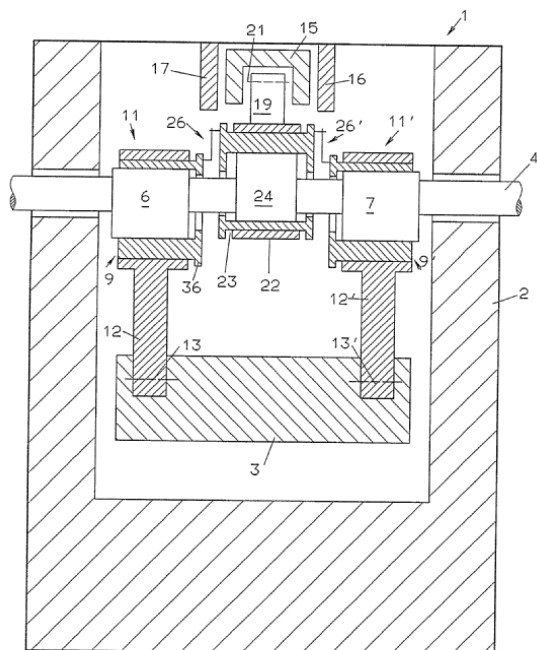


DE403768 Driven axis is a which drives b



Eccentrics:

DE19810425 continuous axis 4 is driven, around the excenter or cam is the bush which is rotated in an excentric way to drive part 12 for 'opening closing clamping mould 3'



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Presses driven by a lever mechanism	<a href="#">B30B 1/02</a>
Presses driven by cranks, cams, or eccentrics	<a href="#">B30B 1/26</a>

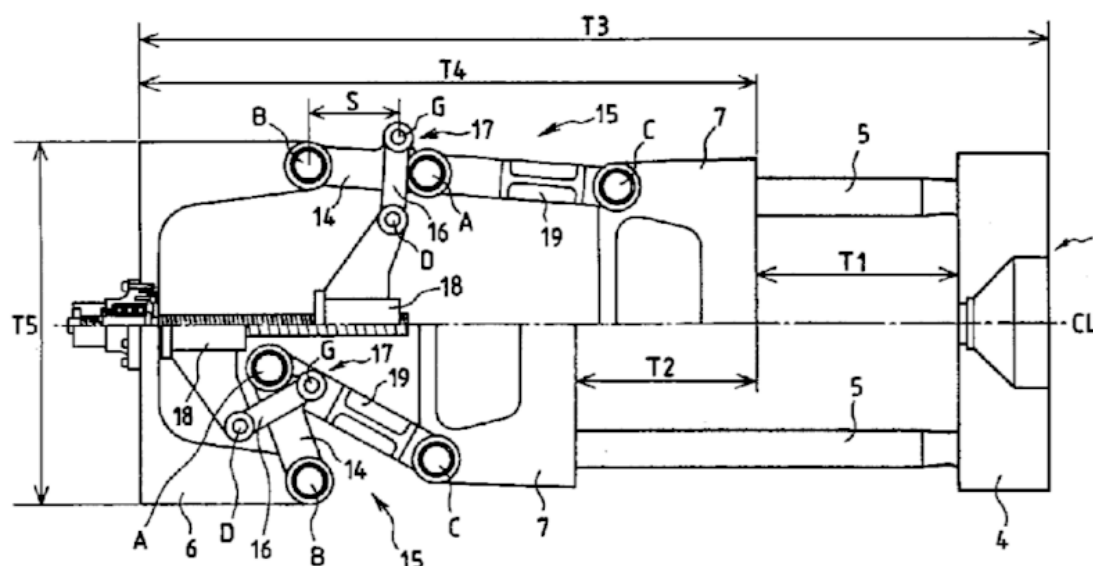
## B29C 45/661

{using a toggle mechanism for mould clamping}

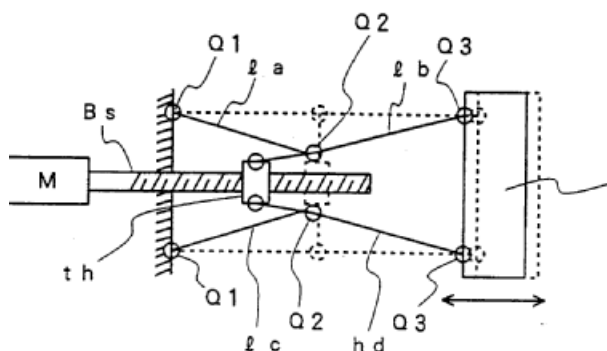
### Definition statement

This place covers:

EP775567 screw nut drives the toggle, the toggle drives the moving mould, therefore toggle

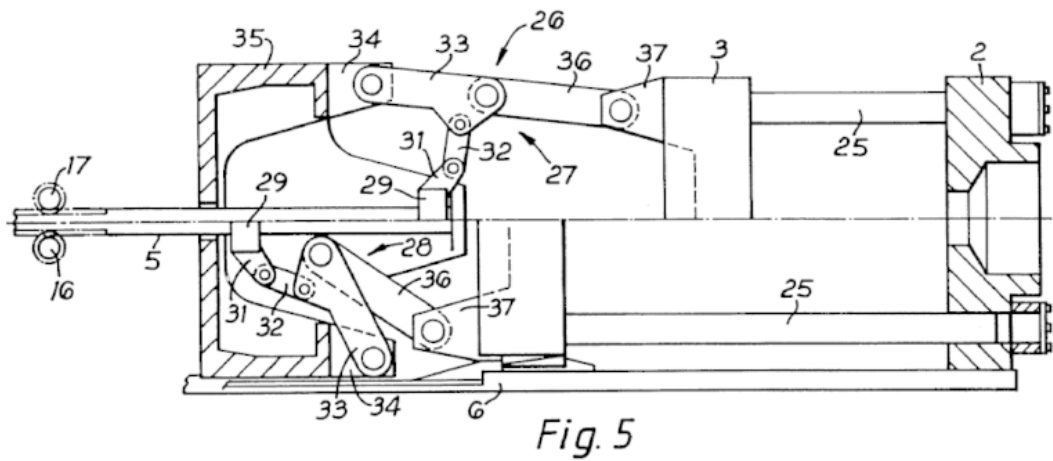


EP546187 fig 5 toggle

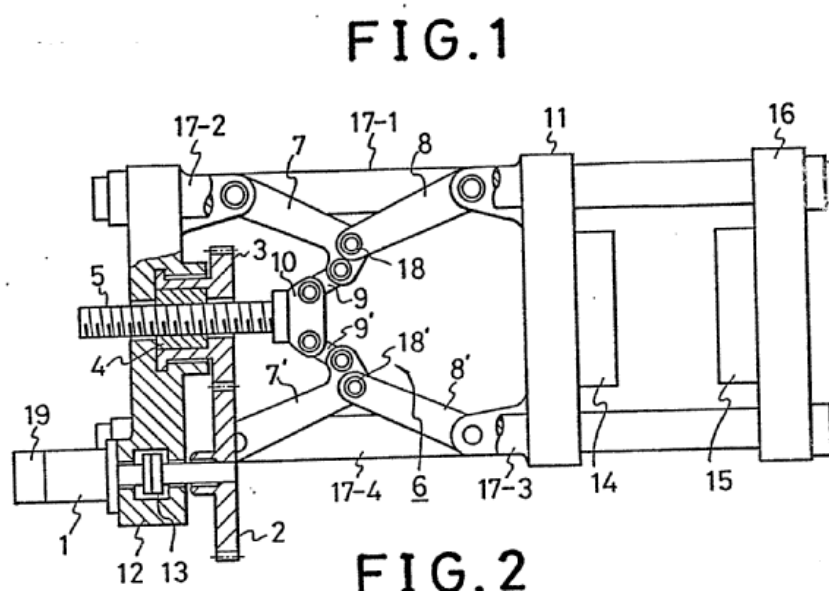




EP427438 fig 5 rack & pignon drives the toggle



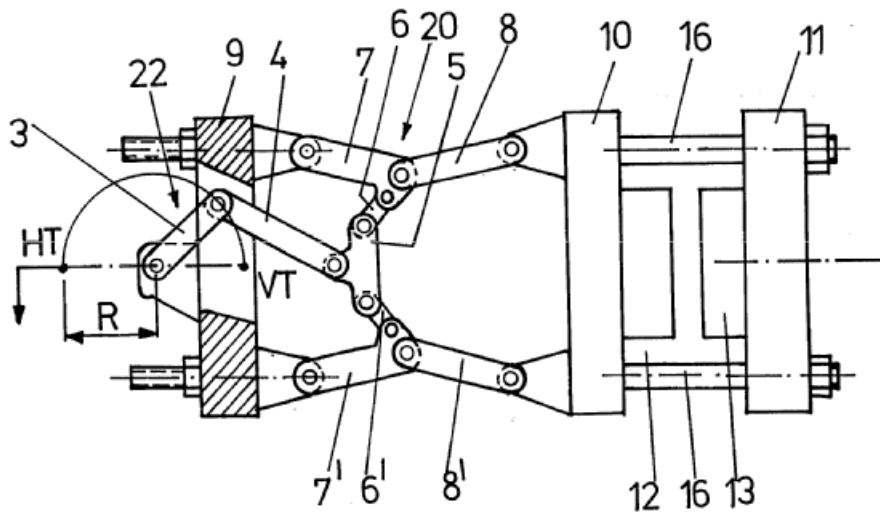
EP164419 fig 1, servomotor 1 driving nut 4 & screw drives the toggle



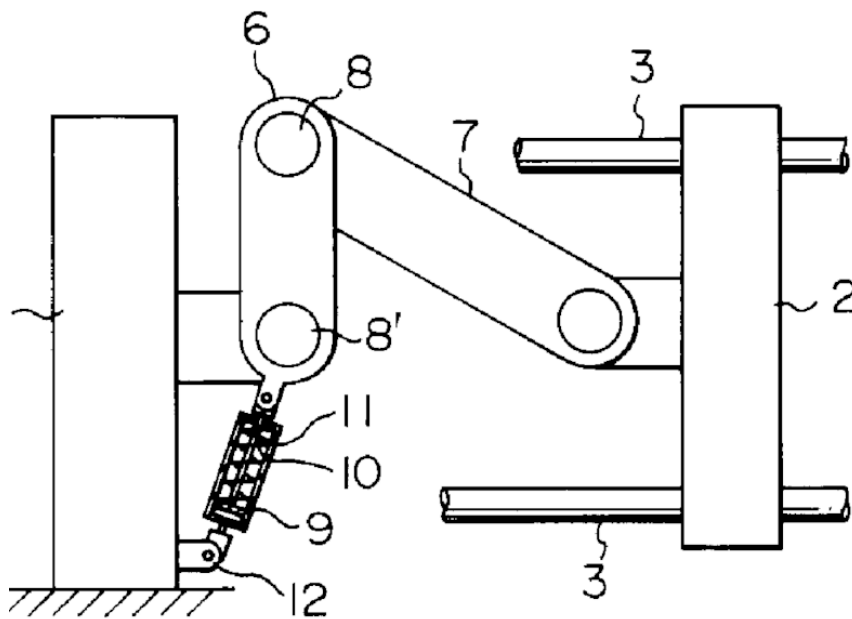
Reference is further made to several types of toggle mechanisms for mould clamping:

DE9403353U figures 1,2 and 3,

Fig. 1



EP573917 fig 1,



[illegible]

### ***Informative references***

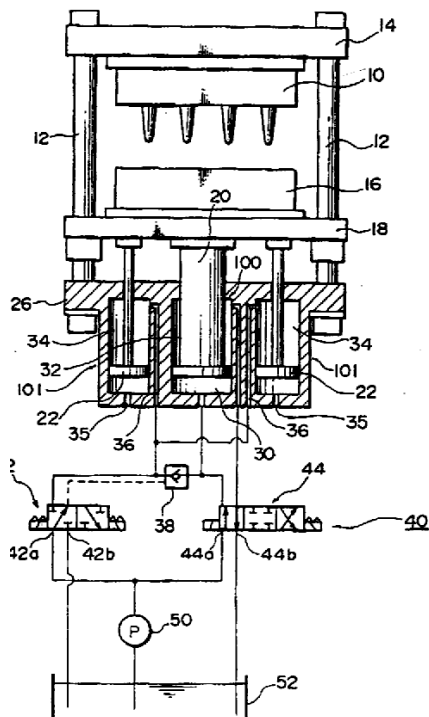
Presses driven by a toggle mechanism	<a href="#">B30B 1/10</a>
--------------------------------------	---------------------------

**hydraulic**

*This place covers:*

EP665093, clamping cylinder 32, opening & closing cylinder 22

hydraulic includes also other fluids & gas (e.g. pneumatic)



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Hydraulic circuits in general	<a href="#">B29C 45/82</a>
-------------------------------	----------------------------

## B29C 45/6707

{without relative movement between the piston and the cylinder of the clamping device during the mould opening or closing movement}

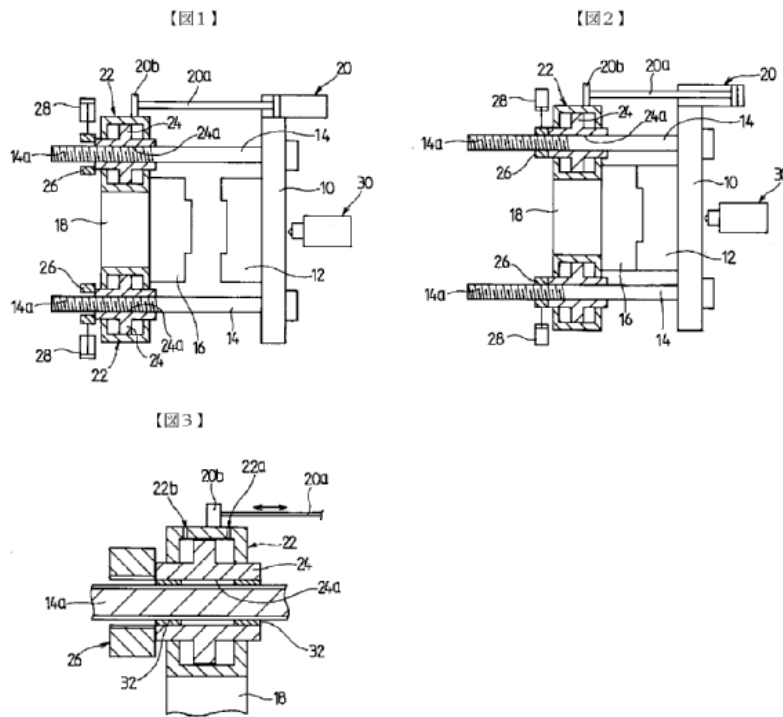
### Definition statement

*This place covers:*

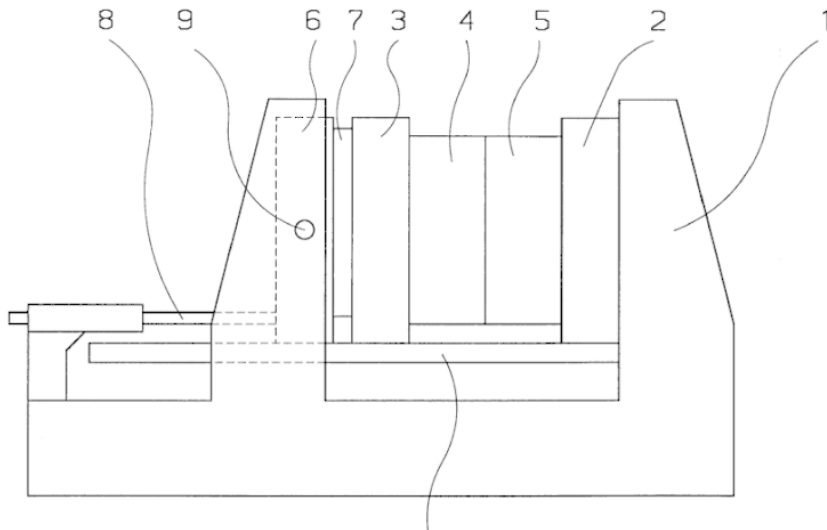
JP10296809, during opening and closing operation by cylinder 20, the clamping force cylinder 22 is inactive and moves together with the movable platen 18. Only after closing the mould and clamping on

## Definition statement

the tie rods (locking nut & cylinder 26,28), there is a relative movement between the piston 24 and the cylinder 22 of the clamping device



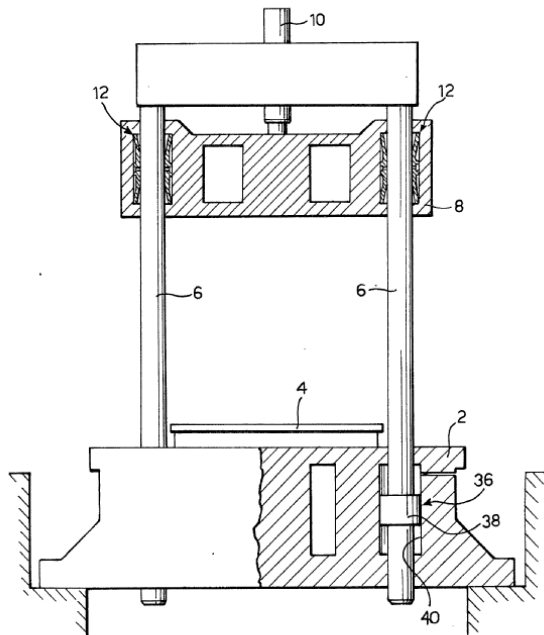
EP689924, opening & closing by cylinder 8, locking means 9 after locking clamping by cylinder 6.



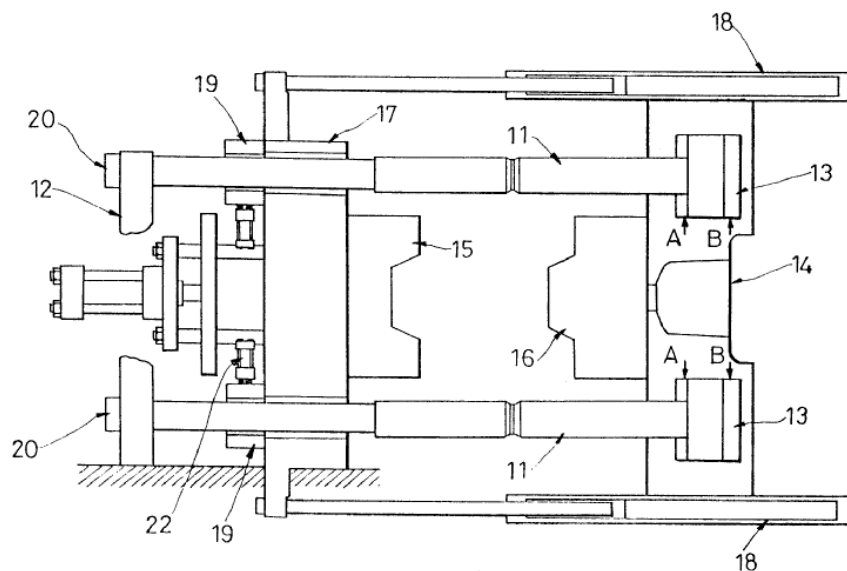
## Definition statement

EP319487 10 = closing means, clamping on tie rod by 12, pulling & clamping by 36

FIG. 1

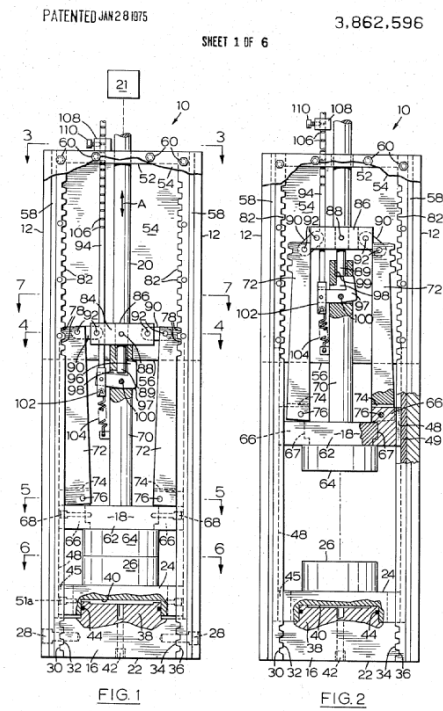


WO99/00239, closing by cylinder 5, blocking on tie rod by 19, tie rod clamped by cylinder 13

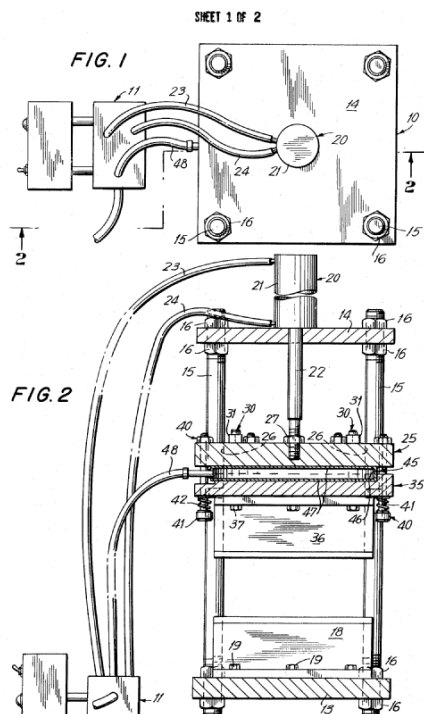


## Definition statement

US3862596, exceptional no clamping on the tie rods, similar no movement for the clamping cylinder



US3833333 movable cylinder, clamping cylinder 45/47/48, opening & closing 20/21



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Presses using low fluid pressure long stroke plunger for opening and closing and high pressure short stroke cylinder means
--

<a href="#">B30B 1/323</a>
----------------------------

## B29C 45/6714

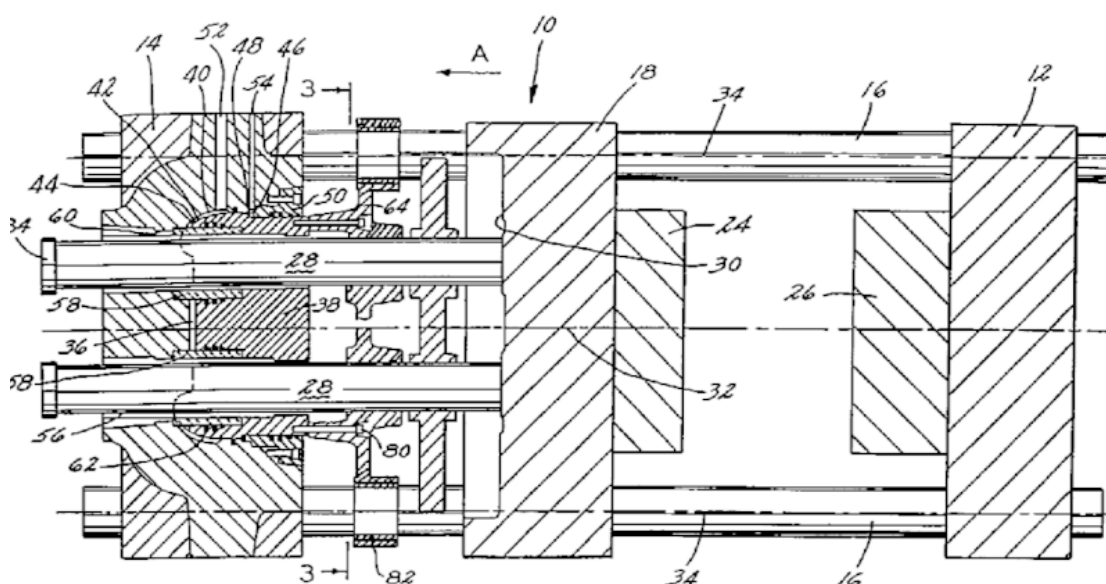
{using a separate element transmitting the mould clamping force from the clamping cylinder to the mould}

### Definition statement

This place covers:

Separate element is MCFTM (mould clamping force transmitting means)

EP551099 fig 1, element 28 = MCFTM & moves with the movable mould.

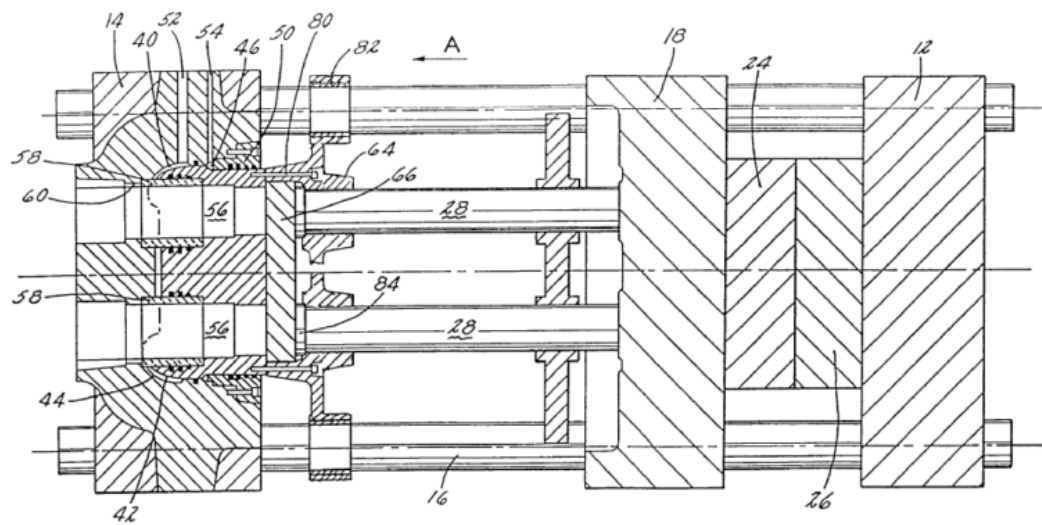


**FIG-1**



## Definition statement

Once the mould is closed (fig 2), block plate 66, required for being able to transmit the clamping force. Note that the clamping cylinder is not operative during opening & closing

**FIG-2**

EP513572: MCFTM 30/31.

Fig 1 mould closed, blocked position

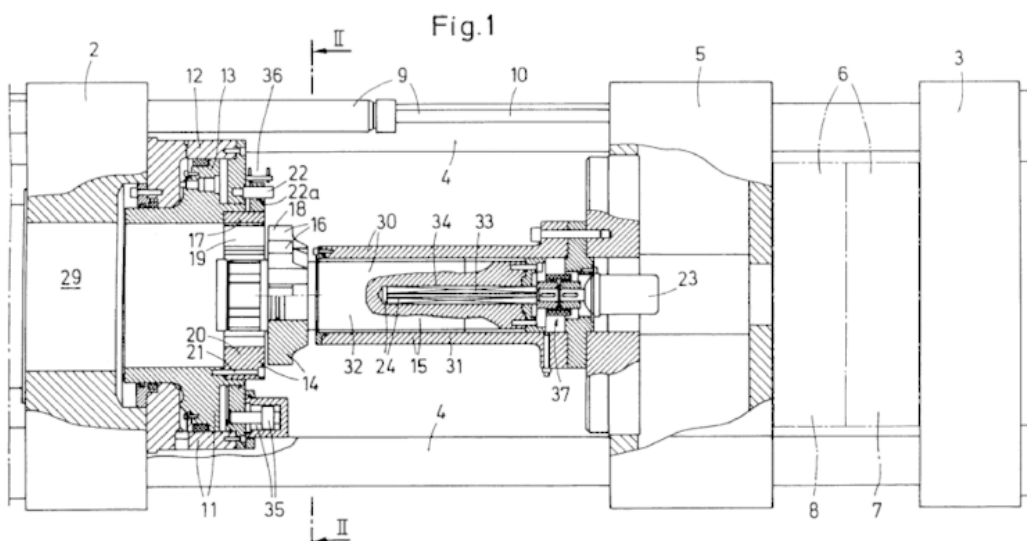
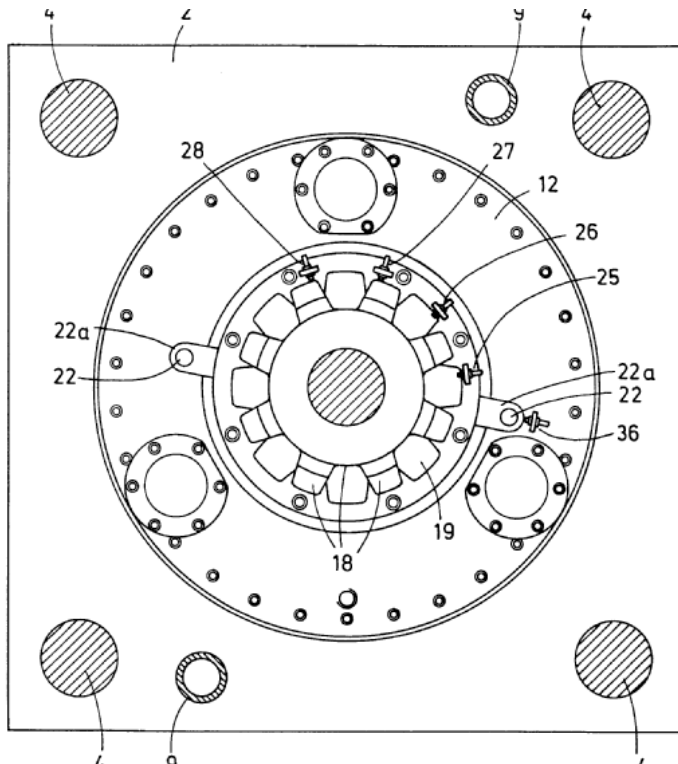
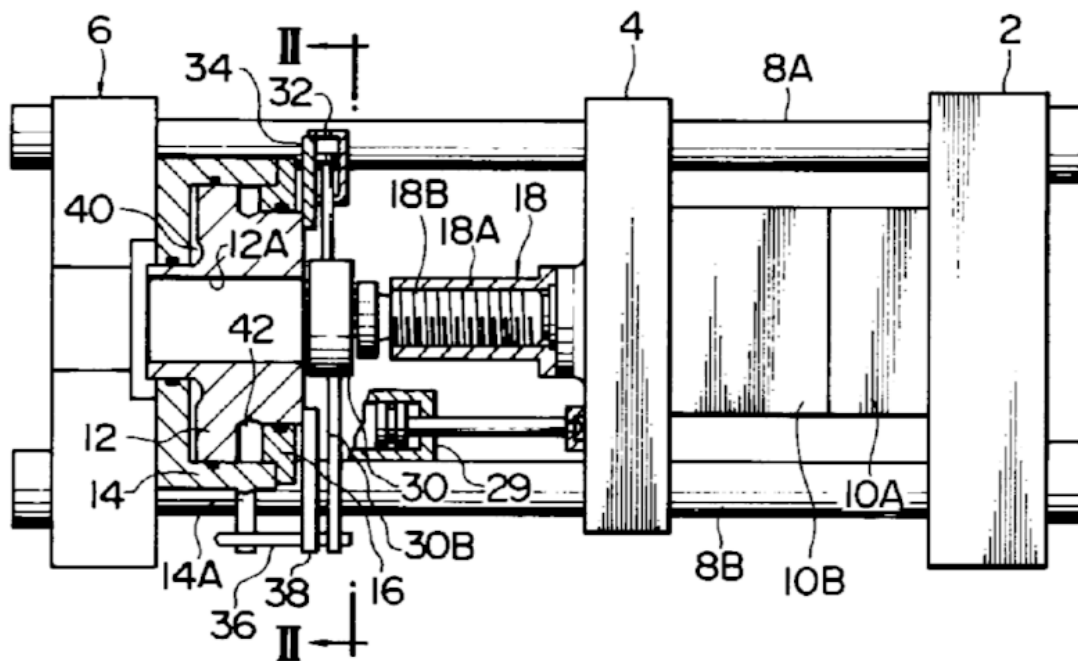


fig 3 & clamping force can be transmitted



EP480351 MCFTM = element 18



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Presses using low fluid pressure long stroke plunger for opening and closing and high pressure short stroke cylinder means

[B30B 1/323](#)

**B29C 45/6721**

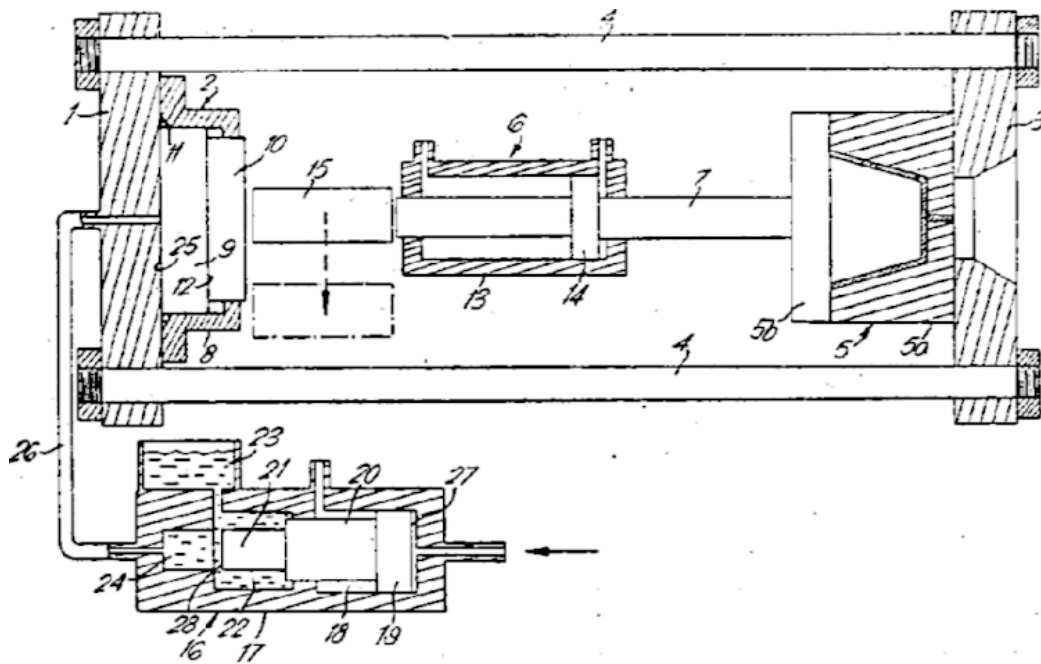
{the separate element being displaceable with respect to the mould or the clamping cylinder}

**Definition statement**

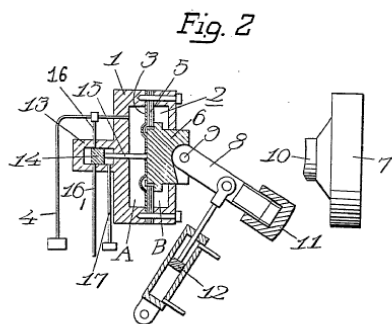
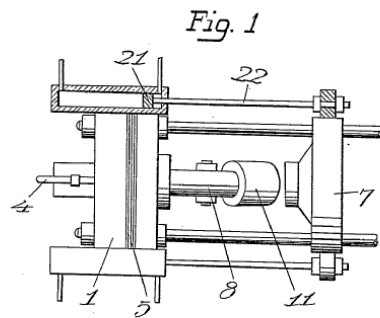
*This place covers:*

MCFTM (mould clamping force transmission means, cf. [B29C 45/6714](#)) is 'removable'.

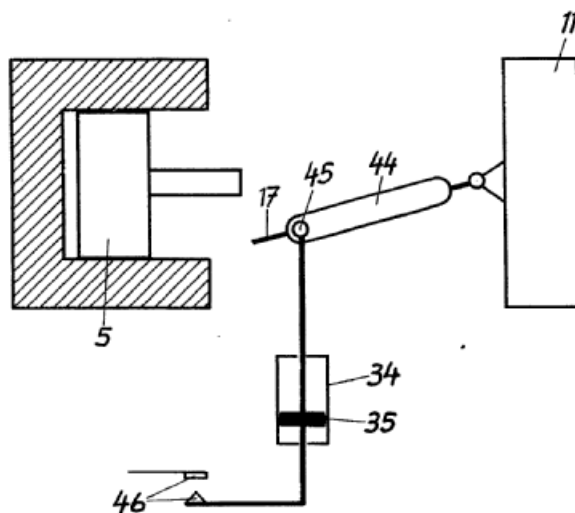
GB1220970 MCFTM 15 is put in between only when the mould is closed, see fig 1, otherwise opening & closing cylinder 6,7 would not be able to open the mould.



GB1032477 element 8 = removable MCFTM (fig 1 & 2)



FR2084078 removable MCFTM = element 44



**B29C 45/6728**

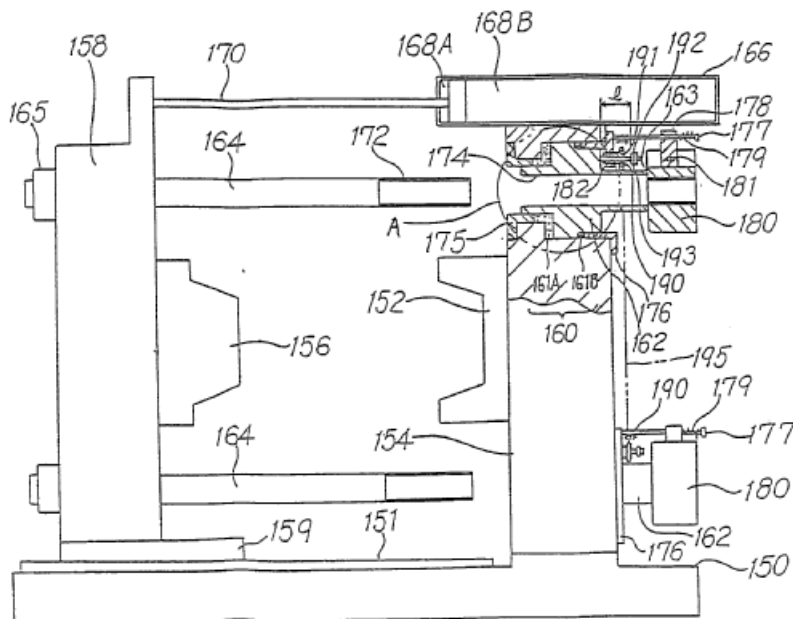
{the separate element consisting of coupling rods}

**Definition statement**

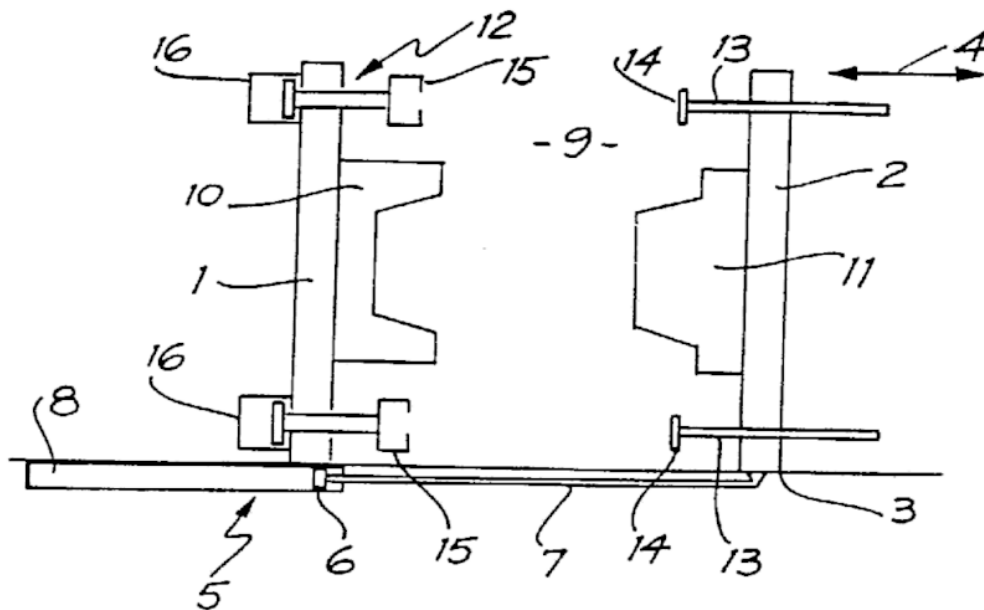
*This place covers:*

tie rods mounted on and movable with the movable mould plate and coupled to the fixed mould plate during mould clamping. Bayonet couplings are typically applied.

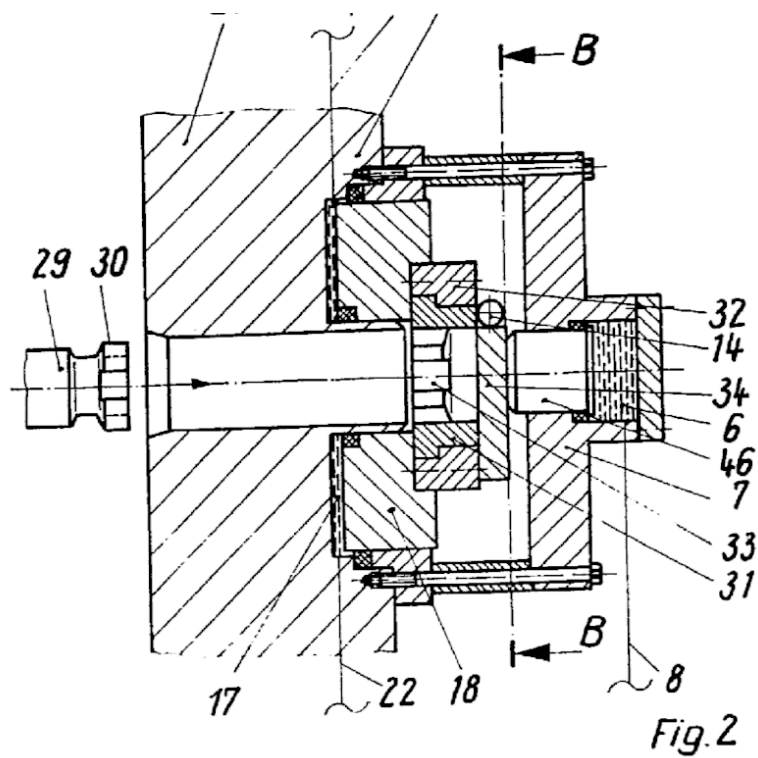
The separate mould clamping force transmission means, (SMCFTM) is the coupling rod 164 in EP296410, coupling means 180.



WO8902357, SMCFTM = coupling members 12,13. clamping by 16.



GB2064415 clamping bush 31, piston 18.



**B29C 45/6764**

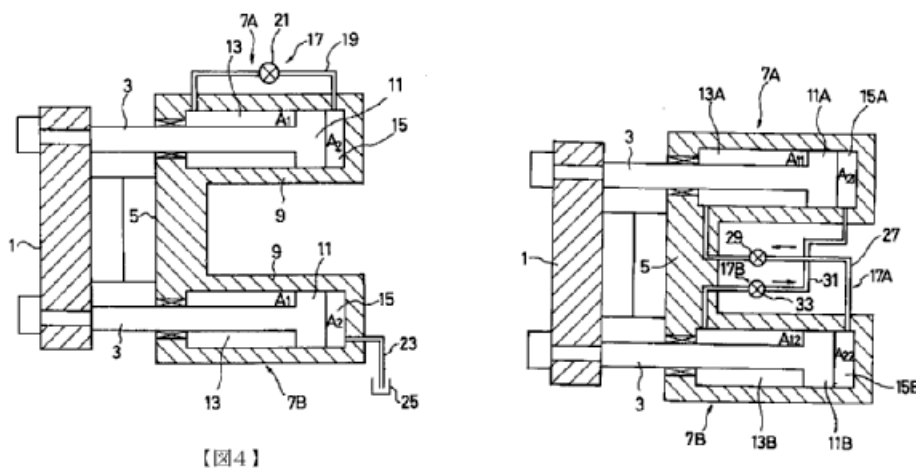
{using hydraulically connectable chambers of the clamping cylinder during the mould opening and closing movement}

**Definition statement**

*This place covers:*

JP7186220, hydraulic chambers A1 & A2 are able to communicate through passage 19 and valve 21 during the opening and closing movement of the clamping die. Note the difference in active piston surface area on the left side and right side of 11

Clamping pressure is typically applied to only one of the chambers (A1), note the possibility of fluid leakage through 23 & 25.



EP281330, fig 1, cylinder 27 during closing volume hydraulic chamber decreases so hydraulic oil moves through 33 into W. Fig 2, valve 34 is closed and high pressure oil is fed from pump 14 to W.

FIG.1

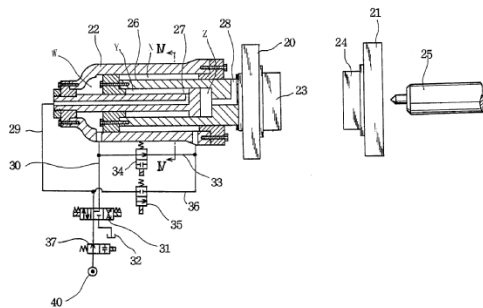
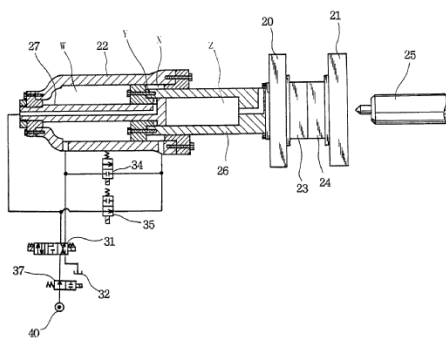


FIG. 2





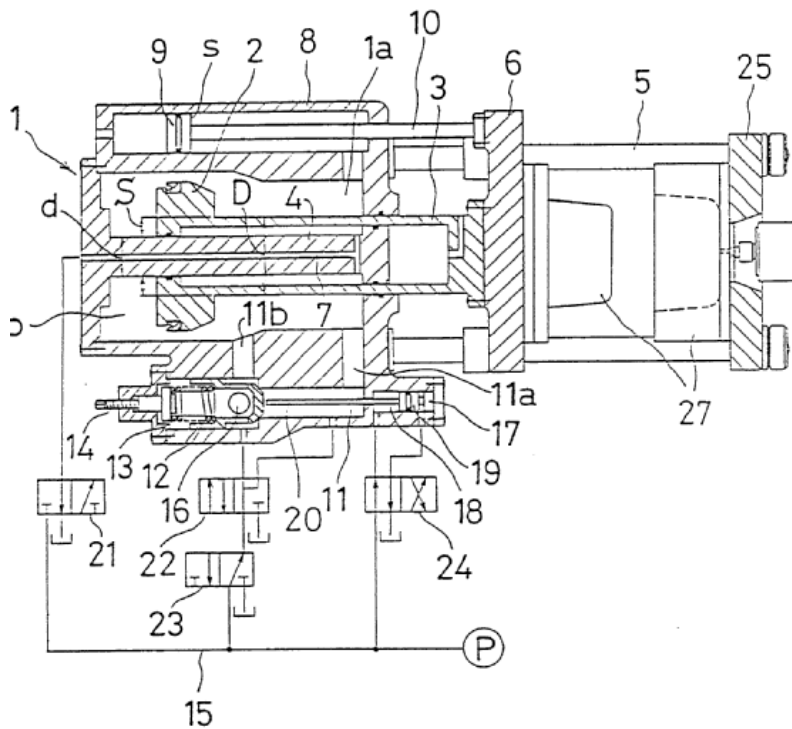
**B29C 45/6771**

{the connection being provided within the clamping cylinder}

**Definition statement**

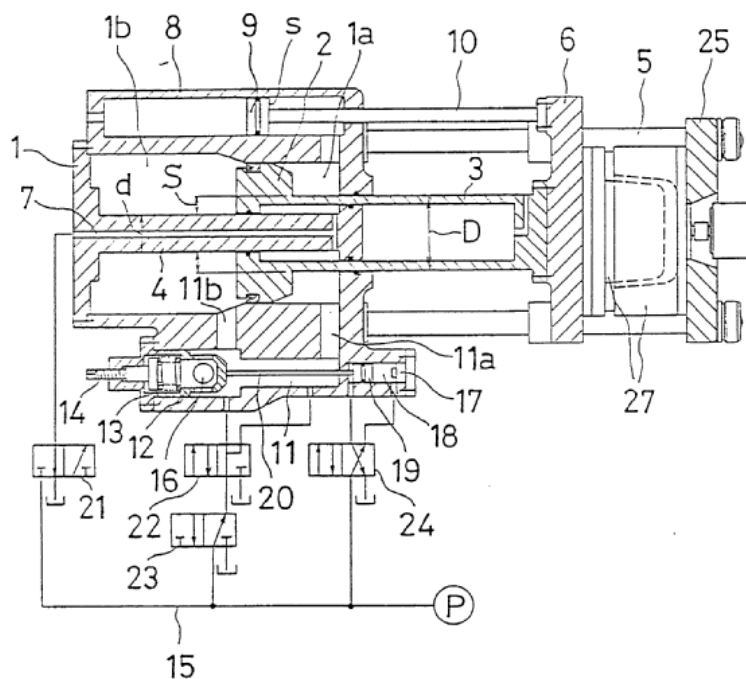
*This place covers:*

EP342235, see fig 1,2 the different diameter clamping piston & cylinder. After closing, no connection between chamber 1a & 1b. In fig 1, the oil still flows between the chambers.



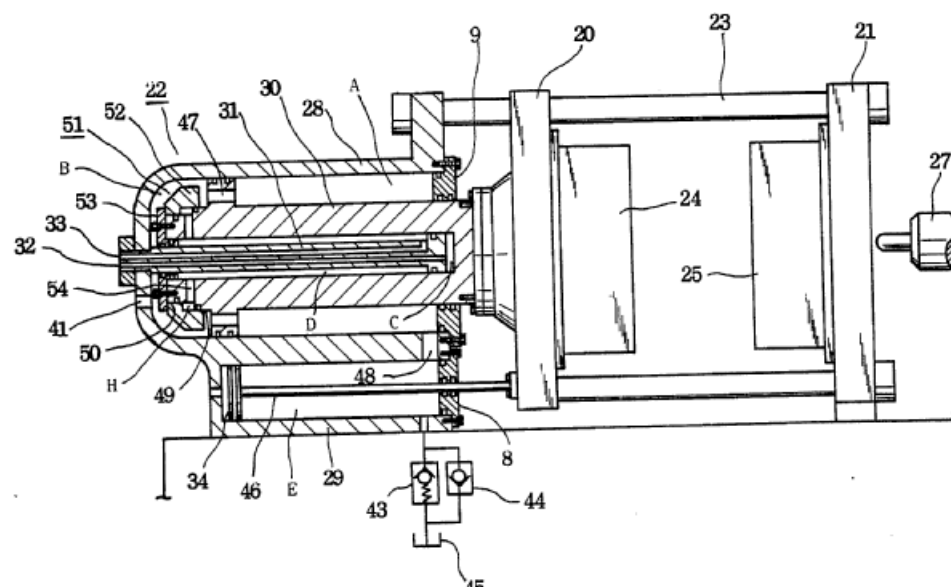
Definition statement

In fig 2, clamping is possible (chamber 1b).



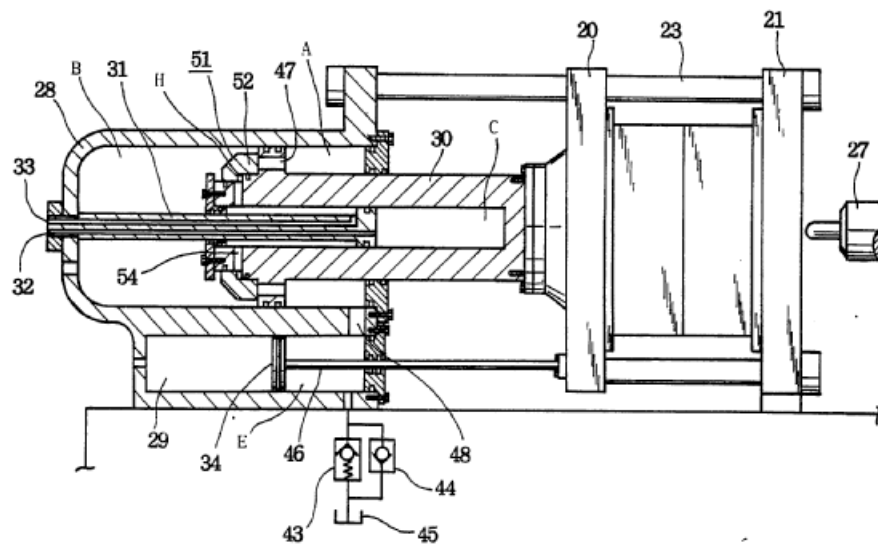
EP281329, opening 47 can be closed by valve 52.

Fig 4, open.



Definition statement

Figure 6, closed valve, now high pressure in room B, possible to clamp. The connection is done through the plunger.



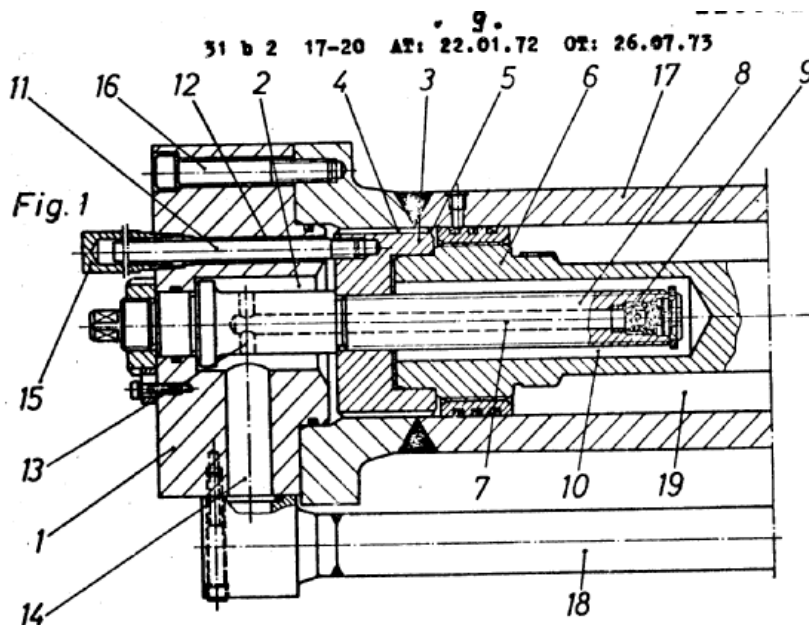
## B29C 45/6778

{Stroke adjusting or limiting means}

### Definition statement

This place covers:

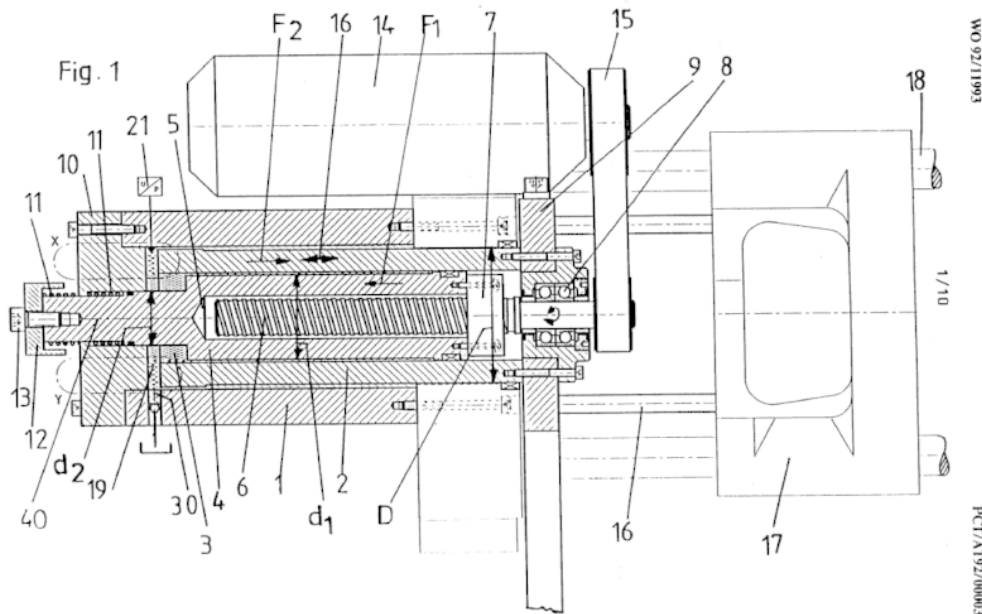
DE2203020 cf. element 3



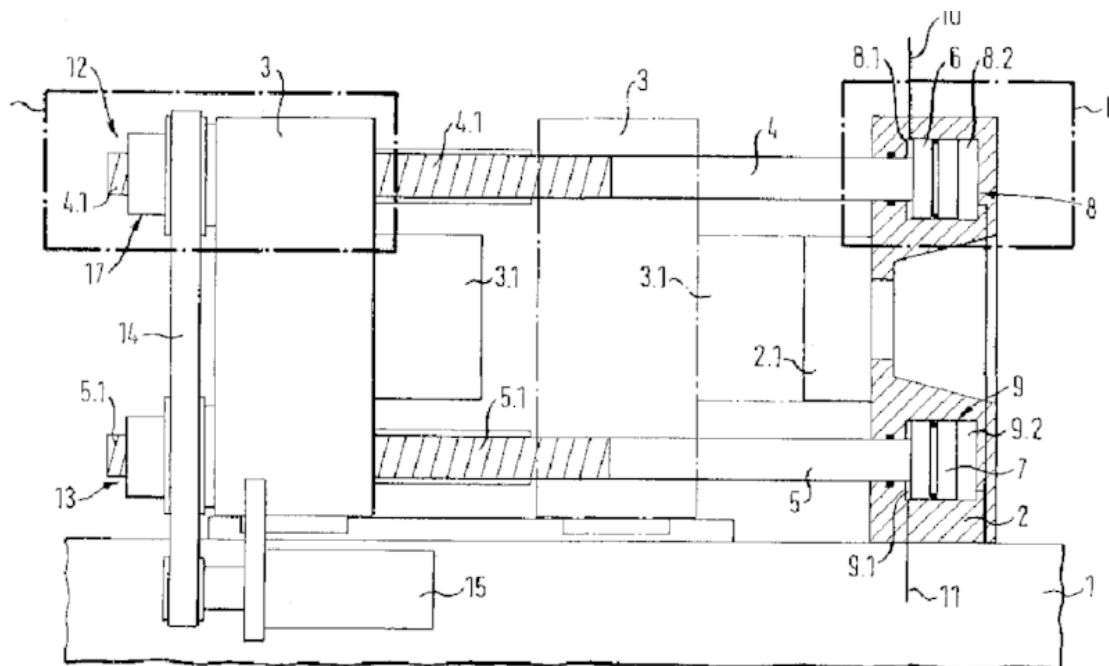
**B29C 45/68****hydro-mechanical****Definition statement**

*This place covers:*

WO9211993, closing by screw/nut (fig 1), hydraulic chamber 19 for clamping.



DE10103983



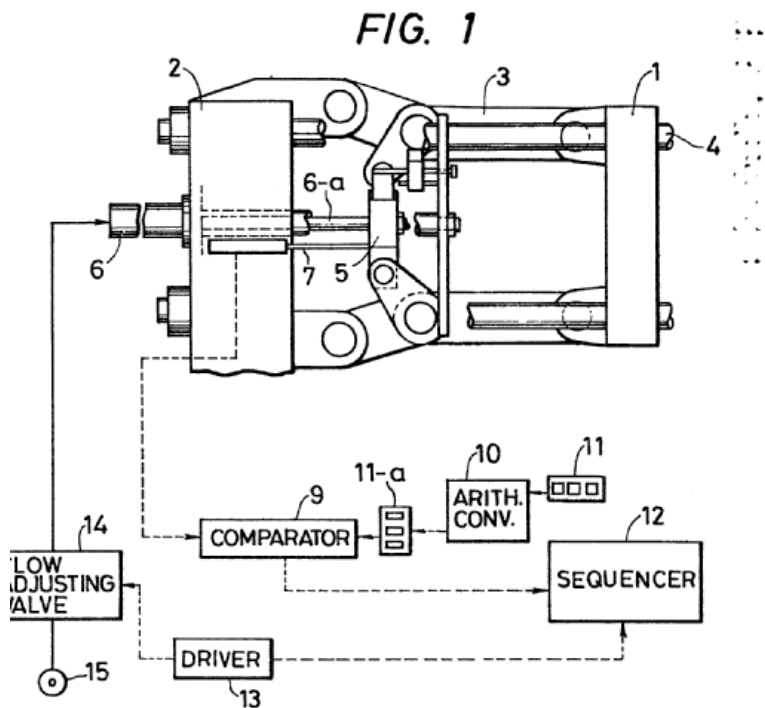
**B29C 45/681**

{using a toggle mechanism as mould clamping device}

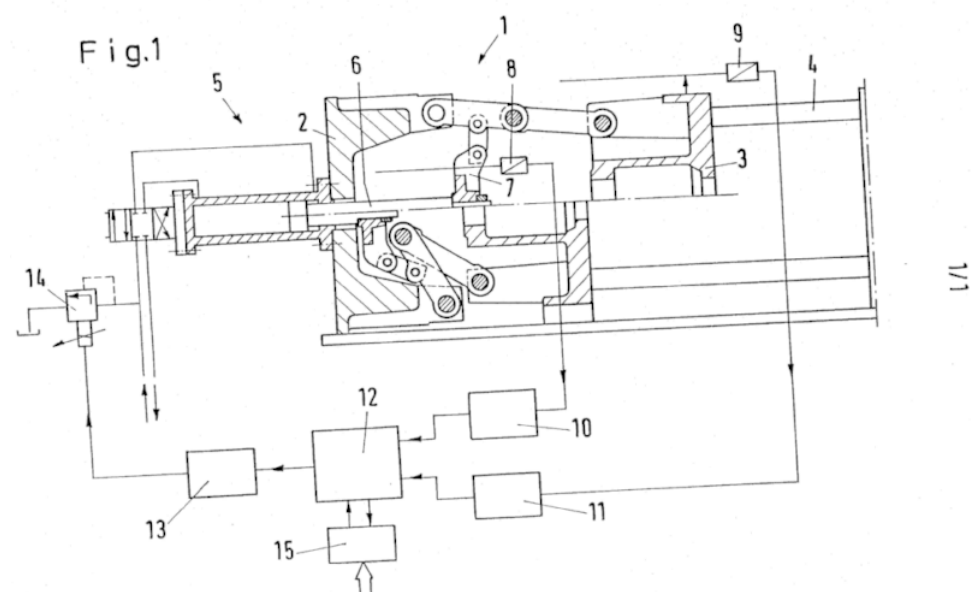
**Definition statement**

*This place covers:*

EP192484, piston 4 drives the toggle 5 for opening, closing and clamping.



WO8900914, cf. fig 1



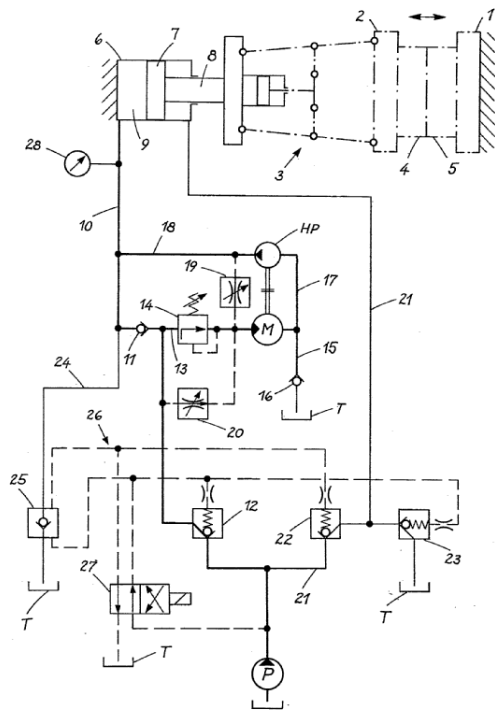
**B29C 45/683**

{using both a toggle mechanism as mould closing device and another mechanism as mould clamping device}

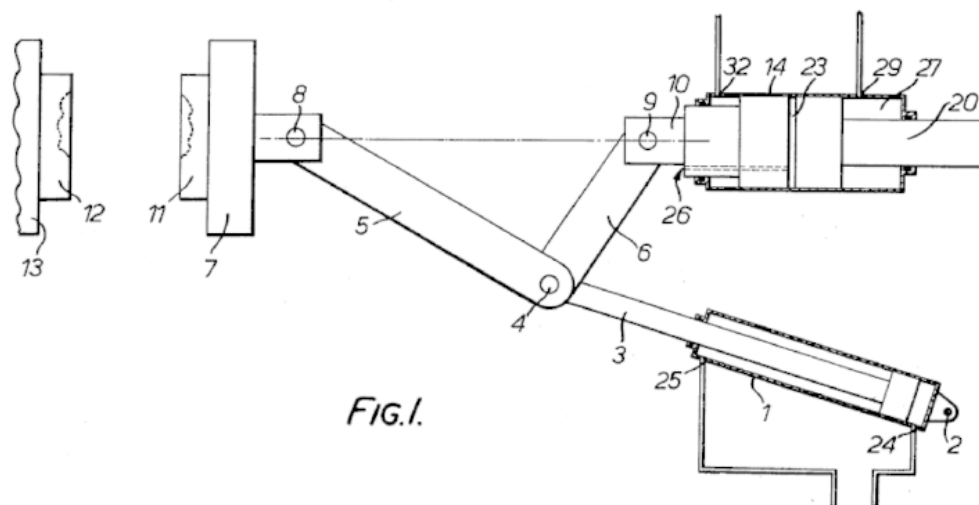
**Definition statement**

*This place covers:*

FR2317982, closing by toggle. The toggle is only used for closing, not for clamping. A separate cylinder (6,7,8) is provided for clamping.



FR2302187, Closing of toggle 5,6 by cylinder 1. Separate means (14) for clamping



## B29C 45/72

### Heating or cooling

#### Definition statement

*This place covers:*

Heating or cooling of the mould (covered by [B29C 45/73](#)), the moulded articles (covered by [B29C 45/7207](#)), the injection unit (covered by [B29C 45/74](#)) as well as the mould and the injection unit (covered by [B29C 45/72](#)).

#### References

##### Limiting references

*This place does not cover:*

Heating or cooling means for moulds provided with fine grooves or impressions	<a href="#">B29C 45/263</a>
Heating or cooling means for runner channels	<a href="#">B29C 45/2737</a>
Heating of tablets	<a href="#">B29C 45/462</a>

## B29C 45/7207

### {of the moulded articles}

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Cooling preforms during blow moulding:	<a href="#">B29C 49/6427</a>
--	------------------------------

Cooling in general:	<a href="#">F25D 13/065</a>
---------------------	-----------------------------

## B29C 45/73

of the mould {([B29C 45/2642](#) and [B29C 45/2737](#) take precedence)}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds with incorporated heating or cooling means in general	<a href="#">B29C 33/02</a>
Cooling or heating equipment for pressure casting dies	<a href="#">B22D 17/2218</a>
Press plates with heating or cooling means	<a href="#">B30B 15/064</a>

## B29C 45/7306

{Control circuits therefor}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Tempering units for temperature control of moulds or cores in general	<a href="#">B29C 35/007</a>
---	-----------------------------

## B29C 45/74

of the injection unit

### Definition statement

*This place covers:*

heating of the injection unit, including everything which belongs to it, e.g. hopper, cylinder.

### References

#### Limiting references

*This place does not cover:*

Heating and cooling of the injection unit AND the mould	<a href="#">B29C 45/72</a>
---	----------------------------

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heating or cooling of the extrusion cylinder	<a href="#">B29C 48/83</a>
--	----------------------------



**B29C 45/76**

Measuring, controlling or regulating {(measuring in general [G01](#); controlling or regulating in general [G05](#))}

**References****Limiting references**

*This place does not cover:*

Control and regulation of mould thickness adjustments	<a href="#">B29C 45/1751</a>
---	------------------------------

**Special rules of classification**

Document classified in [B29C 45/76](#) and subgroups are indexed by allocating [B29C 2945/00](#) Indexing Codes to identify all aspect related to what, how, when, where the measurement is done and what, how, where and when the regulation is done. .

**B29C 45/7626**

{the ejection or removal of moulded articles}

**Definition statement**

*This place covers:*

e.g. using a camera or laser to inspect if an article has been correctly ejected, the process of ejection.

**Special rules of classification**

Since [B29C 45/7626](#) takes precedence over [B29C 45/84](#), inspection systems for controlling the ejection, including an alarm system as a safety device, are only classified in [B29C 45/7626](#).

**B29C 2045/764**

{detecting or preventing overload of an ejector}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Force sensors associated with industrial machines or actuators with specific indicating arrangements, e.g. of overload	<a href="#">G01L 5/0071</a>
--	-----------------------------

**B29C 45/7686**

{the ejected articles, e.g. weight control}

**Relationships with other classification places**

Measuring and controlling of the articles once they are ejected.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Control of the ejection process of moulded articles	<a href="#">B29C 45/7626</a>
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## B29C 45/82

### Hydraulic {or pneumatic} circuits

## References

### Limiting references

This place does not cover:

Hydraulic or pneumatic circuits for mould clamping	<a href="#">B29C 45/67</a>
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## B29C 45/83

### Lubricating means

## References

### Limiting references

This place does not cover:

Release agents, lubricating means for mould cavity walls	<a href="#">B29C 33/60</a>
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### Informative references

Attention is drawn to the following places, which may be of interest for search:

Cleaning or lubricating moulds in pressure die casting	<a href="#">B22D 17/2007</a>
Lubricating means for presses	<a href="#">B30B 15/0088</a> , <a href="#">B30B 15/0011</a>

## B29C 45/84

### Safety devices {([B29C 45/7626](#) takes precedence)}

## References

### Limiting references

This place does not cover:

Safety devices for the ejection process	<a href="#">B29C 45/7626</a>
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### Informative references

Attention is drawn to the following places, which may be of interest for search:

Safety devices for pressure die casting	<a href="#">B22D 17/2092</a>
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**B29C 45/842****{Detection of insert defects, e.g. inaccurate position, breakage}****Definition statement***This place covers:*

e.g. detection of broken glass to be overmoulded, misfeeding the inserts

**B29C 2045/848****{detecting or preventing overload of an injection plunger}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Force sensors associated with industrial machines or actuators with specific indicating arrangements, e.g. of overload	<a href="#">G01L 5/0071</a>
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**B29C 48/00****Extrusion moulding, i.e. expressing the moulding material through a die or nozzle which imparts the desired form; Apparatus therefor (extrusion blow-moulding [B29C 49/04](#))****Definition statement***This place covers:*

Processes whereby material of substances in a plastic state (e.g. polymers) are being pressed through a nozzle, thereby obtaining a cross sectional shape. This shape could be any hollow or solid shape.

Combinations of extrusion and other shaping techniques.

**References****Limiting references***This place does not cover:*

Extrusion blow-moulding	<a href="#">B29C 49/04</a>
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**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Apparatus for additive manufacturing	<a href="#">B29C 64/20</a>
Combined blow-moulding and manufacture of the preform or the parison, whereby the parison is being partly injected and partly extruded	<a href="#">B29C 2949/3032</a> , <a href="#">B29C 2949/3041</a>
Mixing dough	<a href="#">A21C 1/00</a>
Mixing chocolate	<a href="#">A23G</a>
Mixing in general, phases	<a href="#">B01F 23/00</a>
Mixing in general, mixer types	<a href="#">B01F 25/00</a>

Mixing in general, mixers with rotary stirring devices	<a href="#">B01F 27/00</a>
Hand held extruders	<a href="#">B05C 17/00</a>
Extruding metal	<a href="#">B21C 23/00</a>
Presses for clay or mixtures containing cement wherein material is extruded	<a href="#">B28B 3/20</a>
Extruding clay	<a href="#">B28B 3/22</a>
Mixing, kneading of the material to be shaped	<a href="#">B29B 7/00</a>
Mixing or kneading with more than one shaft	<a href="#">B29B 7/46</a>
Making preforms by extrusion moulding	<a href="#">B29B 11/10</a>
Presses using a press ram	<a href="#">B30B 1/00</a>
Extrusion presses	<a href="#">B30B 11/22</a>
Machinery for making envelopes or bags etc	<a href="#">B31B</a>
Folding and filling bags	<a href="#">B65B 9/08</a>
Extruding microstructures	<a href="#">B81B</a> , <a href="#">B81C</a>
Reaction extrusion	<a href="#">C08</a>
Formation of filaments, threads, or the like, e.g. by melt spinning	<a href="#">D01D 5/00</a>

### Special rules of classification

All material aspects, not only the moulding material as such, but also fillers, preformed parts of mould (die) composition has to be identified by allocating the appropriate Indexing Code of [B29K](#). This also applies to moulding material properties, e.g. tear strength for identifying that extruded layers are easily torn apart is classified in [B29K 2995/0081](#).

Extrusion techniques characterised by the material must be allocated a classification in [B29C 48/0022](#).

All SHAPING CONDITIONS influencing the extrusion technique, e.g. extrusion in sterile or vacuum environments, the application of vibrations, must be identified by allocating the appropriate Indexing Code as provided in [B29C 2791/004](#) and subgroups, as well the classification in [B29C 48/14](#) or subgroups.

Cutting operations and printing operations must be identified by allocating the appropriate Indexing Code as provided in [B29C 2793/00](#) and [B29C 2795/00](#).

All ARTICLES must be identified by allocating the appropriate Indexing Codes as provided for by the subclass [B29L](#), e.g. anchoring between layers in general, e.g. due to chemical treatment [B29C 2045/1664](#), mechanical anchoring in general, e.g. layers gripping into each other [B29C 37/0082](#).

COMBINATIONS of extrusion and other techniques corresponding to the subgroups of [B29C 48/001](#) are classified in [B29C 48/001](#) or one of its subgroups.

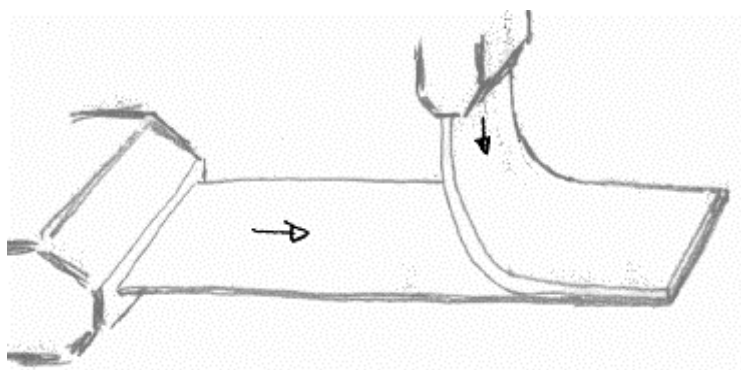
Orienting or stretching of extruded materials should be identified by allocation the Indexing Code [B29K 2995/005](#) and [B29K 2995/0046](#) or one of its subgroups.

The Indexing Codes [B29C 2791/00](#) - [B29C 2791/003](#) are generally not used in this group [B29C 48/00](#).

All MEASURING and CONTROL aspects must receive the relevant code(s) in the [B29C 2948/92](#) indexing scheme.

**B29C 48/0011****{combined with compression moulding}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Compression moulding, i.e. applying external pressure to flow the moulding material, e.g. foaming	<a href="#">B29C 43/00</a>
Coagulating materials by using a bath	<a href="#">B29C 48/919</a>
Polymer / Wood fiber composites	<a href="#">B27N 3/28</a>
Moulding materials	<a href="#">B29K 2001/00</a> - <a href="#">B29K 2103/00</a>
Condition form or state of the material to be shaped or moulded material	<a href="#">B29K 2105/00</a>
Use of materials as reinforcements	<a href="#">B29K 2201/00</a> - <a href="#">B29K 2313/00</a>
Use of materials as preformed parts, e.g. inserts	<a href="#">B29K 2601/00</a> - <a href="#">B29K 2713/00</a>
Use of materials as mould material	<a href="#">B29K 2801/00</a> - <a href="#">B29K 2913/00</a>
Properties of the moulding materials	<a href="#">B29K 2995/00</a>
Compositions of Macromolecular compounds in general	<a href="#">C08L 1/00</a> - <a href="#">C08L 101/10</a>

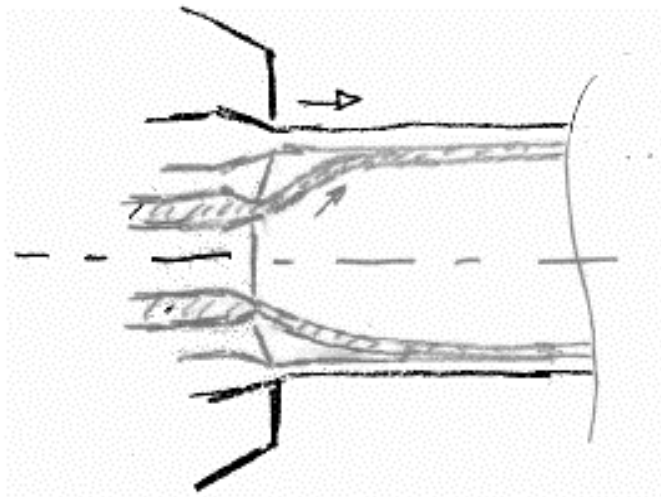
**B29C 48/0014****{producing flat articles having components brought in contact outside the extrusion die}****Definition statement***This place covers:*

**B29C 48/0015**

{producing hollow articles having components brought in contact outside the extrusion die}

**Definition statement**

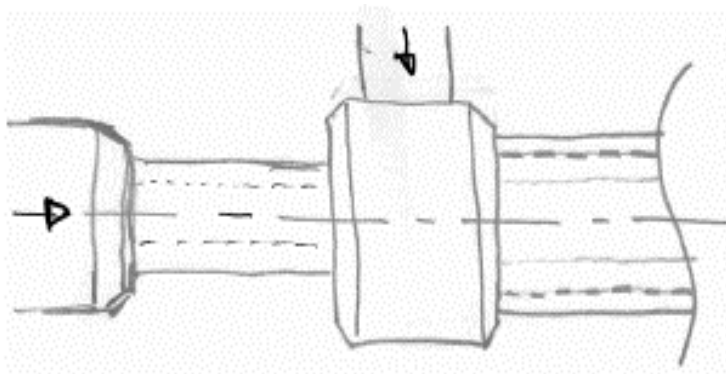
*This place covers:*

**B29C 48/0016**

{using a plurality of extrusion dies}

**Definition statement**

*This place covers:*

**B29C 48/0017**

{combined with blow-moulding or thermoforming}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Blow moulding combined with the manufacture of the preform	<a href="#">B29C 49/02</a>
Thermoforming combined with the manufacture of the preform	<a href="#">B29C 51/02</a>

**B29C 48/0018**

{combined with shaping by orienting, stretching or shrinking, e.g. film blowing  
([B29C 48/0017](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Extrusion moulding combined with blow-moulding or thermoforming	<a href="#">B29C 48/0017</a>
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**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Oriented material	<a href="#">B29K 2995/005</a>
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**Special rules of classification**

The Indexing Codes as provided in [B29K 2995/005](#) and [B29K 2995/0046](#) and subgroups should preferably be allocated to identify aspects relating to orienting or stretching.

**B29C 48/0019**

{combined with shaping by flattening, folding or bending}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Shaping by bending, folding, twisting, straightening or flattening of blown tubular films	<a href="#">B29C 53/10</a>
Folding sheets for making bags	<a href="#">B31B 50/26</a>
Folding and filling bags	<a href="#">B65B 9/08</a>

**B29C 48/002**

{combined with surface shaping}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Surface shaping of articles, e.g. embossing; Apparatus therefor	<a href="#">B29C 59/00</a>
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**B29C 48/0021****{combined with joining, lining or laminating}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Lining or sheathing, i.e. applying preformed layers or sheathings of plastics; Apparatus therefor	<a href="#">B29C 63/00</a>
Joining or sealing of preformed parts, e.g. welding of plastics materials; Apparatus therefor	<a href="#">B29C 65/00</a>
Methods or apparatus for laminating, e.g. by curing or by ultrasonic bonding	<a href="#">B32B 37/00</a>

**B29C 48/0022****{combined with cutting}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Cutting	<a href="#">B29C 2793/00</a>
Cutting off	<a href="#">B29C 2793/0027</a>
Cutting longitudinally	<a href="#">B29C 2793/0063</a>

**Special rules of classification**

The Indexing Codes as provided in [B29C 2793/00](#) and subgroups should preferably be allocated to identify aspects relating to the process of cutting

**B29C 48/0023****{combined with printing or marking}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Printing	<a href="#">B29C 2795/00</a>
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**Special rules of classification**

The Indexing Codes as provided in [B29C 2795/00](#) and subgroups should preferably be allocated to identify aspects relating to the process of printing.



**B29C 48/02****Small extruding apparatus, e.g. handheld, toy or laboratory extruders****Definition statement**

*This place covers:*

- Handheld extruders;
- Toy extruders;
- Laboratory extruders, e.g. extruders used for material testing or for making test specimens for testing material properties.

Illustrative examples of subject matter classified in this place:

1.

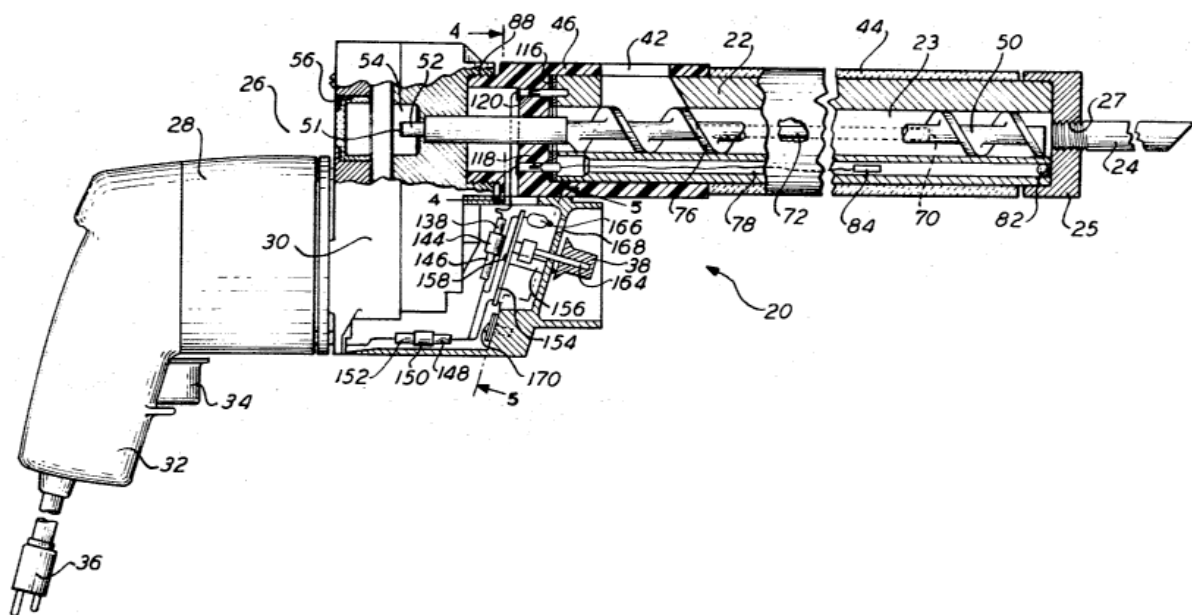


Figure 1 illustrates a handheld extruder.

2.

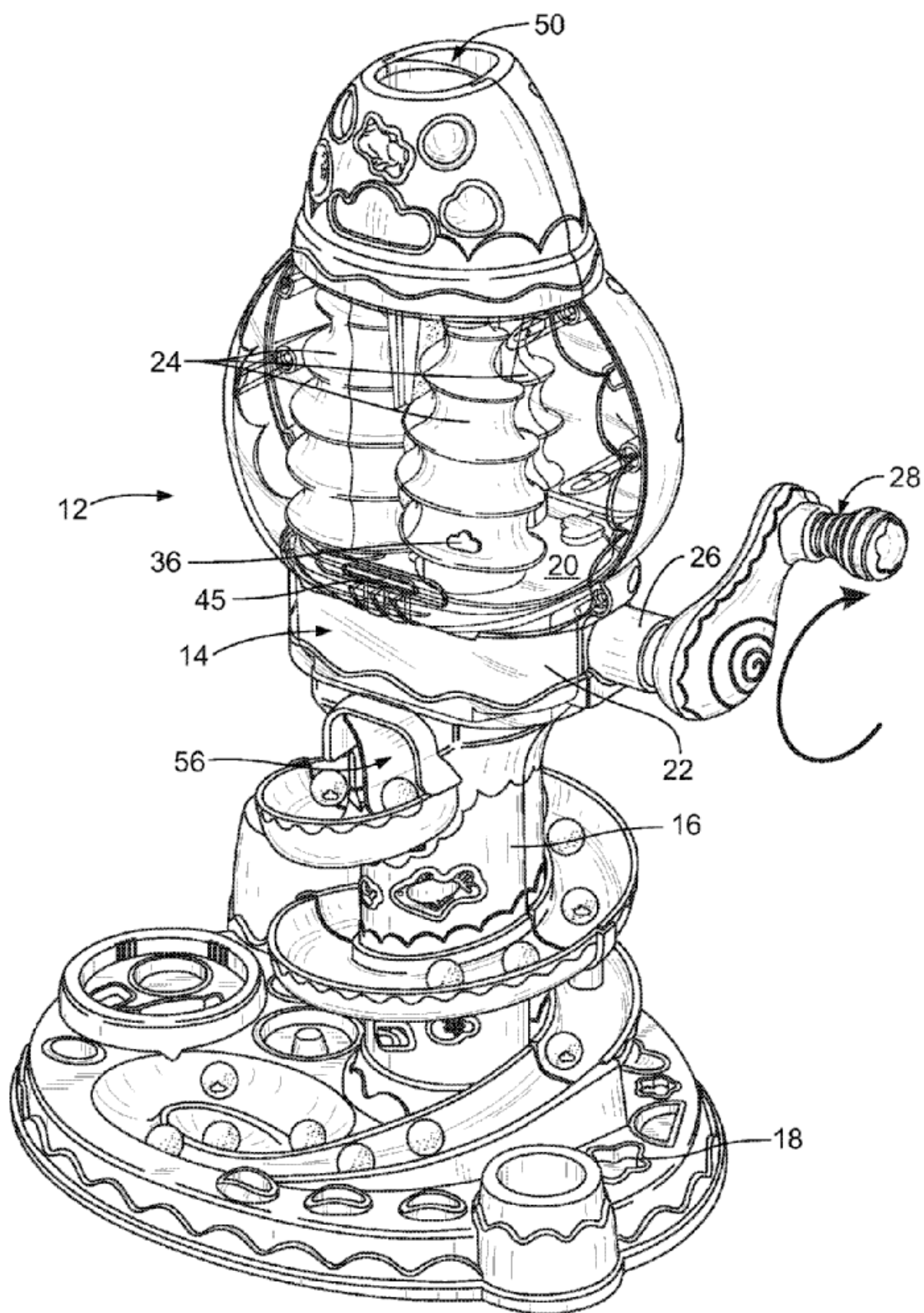


Figure 2 illustrates a toy extruder.

3.

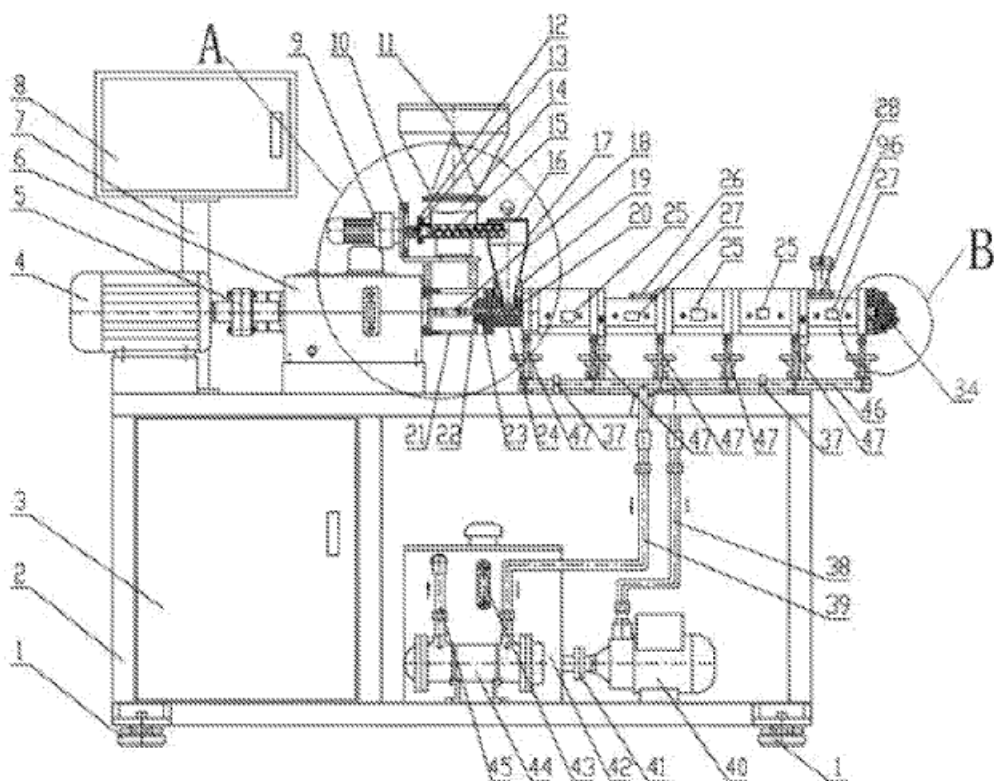


Figure 3 illustrates a laboratory extruder.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Design of extruder parts, e.g. by modelling based on mathematical theories or experiments	<a href="#">B29C 48/251</a>
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## B29C 48/022

{characterised by the choice of material}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Coagulating materials by using a bath	<a href="#">B29C 48/919</a>
Polymer / Wood fiber composites	<a href="#">B27N 3/28</a>
Moulding materials	<a href="#">B29K 2001/00</a> - <a href="#">B29K 2103/00</a>
Condition form or state of the material to be shaped or moulded material	<a href="#">B29K 2105/00</a>
Use of materials as reinforcements	<a href="#">B29K 2201/00</a> - <a href="#">B29K 2313/00</a>

Use of materials as preformed parts, e.g. inserts	<a href="#">B29K 2601/00</a> - <a href="#">B29K 2713/00</a>
Use of materials as mould material	<a href="#">B29K 2801/00</a> - <a href="#">B29K 2913/00</a>
Properties of the moulding materials	<a href="#">B29K 2995/00</a>
Compositions of Macromolecular compounds in general	<a href="#">C08L 1/00</a> - <a href="#">C08L 101/10</a>

**B29C 48/023****{Extruding materials comprising incompatible ingredients}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Feeding at several locations	<a href="#">B29C 48/297</a>
Degradable materials	<a href="#">B29K 2995/0059</a>

**B29C 48/025****General arrangement or layout of plant****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Using more than one extruder to feed one die, e.g. adapter blocks	<a href="#">B29C 48/49</a>
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**B29C 48/0255****{for extruding parallel streams of material, e.g. several separate parallel streams of extruded material forming separate articles ([B29C 48/0013](#), [B29C 48/345](#) takes precedence)}****References****Limiting references***This place does not cover:*

Extrusion moulding in several steps	<a href="#">B29C 48/0013</a>
Extrusion nozzles comprising two or more adjacently arranged ports	<a href="#">B29C 48/345</a>

**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Using more than one extruder to feed one die, e.g. adapter blocks	<a href="#">B29C 48/49</a>
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**B29C 48/03**

characterised by the shape of the extruded material at extrusion

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Extrusion dies or nozzles	<a href="#">B29C 48/30</a>
Manufactured articles	<a href="#">B29L</a>

**B29C 48/04**

Particle-shaped (making granules [B29B 9/00](#))

**Definition statement**

*This place covers:*

The extrusion moulding articles characterised by their shape, the shape being particle, powder, or granule.

**References****Limiting references**

*This place does not cover:*

Making granules	<a href="#">B29B 9/00</a>
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**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Particles, powder, granules	<a href="#">B29K 2105/251</a>
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**B29C 48/05**

Filamentary, e.g. strands

**Definition statement**

*This place covers:*

The extrusion moulding articles characterised by their shape, the shape being filamentary (e.g. threads, fibres).

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Multiple annular extrusion nozzles in coaxial arrangement, e.g. for making multi-layered tubular articles	<a href="#">B29C 48/335</a>
Producing filamentary materials	<a href="#">B29D 99/0078</a>
Filamentary material	<a href="#">B29L 2031/731</a>

## B29C 48/06

### Rod-shaped

#### Definition statement

This place covers:

The extrusion moulding articles characterised by their shape, the shape being non-tubular rigid (e.g. rod).



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Producing rods	<a href="#">B29D 99/0046</a>
Rods	<a href="#">B29L 2031/06</a>

## B29C 48/07

### Flat, e.g. panels

#### Definition statement

This place covers:

The extrusion moulding articles characterised by their shape, the shape being flat rigid (e.g. panel or plate).



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Flat articles	<a href="#">B29L 2007/00</a>
Belts or bands	<a href="#">B29L 2029/00</a>

**B29C 48/08****flexible, e.g. films****Definition statement***This place covers:*

The extrusion moulding articles characterised by their shape, the shape being flat flexible (e.g. sheet, foil, or film).

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Flat articles	<a href="#">B29L 2007/00</a>
Films webs	<a href="#">B29L 2007/008</a>
Belts or bands	<a href="#">B29L 2029/00</a>

**B29C 48/09****Articles with cross-sections having partially or fully enclosed cavities, e.g. pipes or channels****Definition statement***This place covers:*

The extrusion moulding articles characterised by their shape, the shape being tubular rigid (e.g. one hole).

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Hollow articles	<a href="#">B29L 2022/00</a>
Tubular articles	<a href="#">B29L 2023/00</a>
Tubes or pipes, i.e. rigid	<a href="#">B29L 2023/22</a>
Articles with hollow walls	<a href="#">B29L 2024/00</a>

**B29C 48/10****flexible, e.g. blown foils****Definition statement***This place covers:*

The extrusion moulding articles characterised by their shape, the shape being tubular flexible (e.g. foil or film).

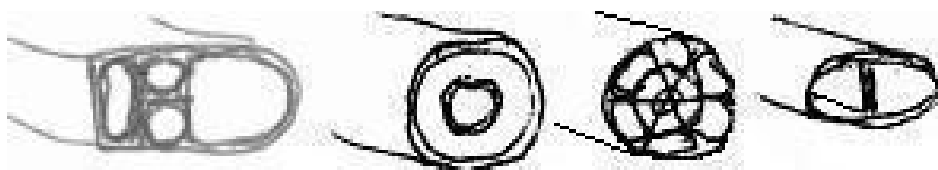
**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Tubular articles	<a href="#">B29L 2023/00</a>
Tubular films, sleeves	<a href="#">B29L 2023/001</a>

**B29C 48/11****comprising two or more partially or fully enclosed cavities, e.g. honeycomb-shaped****Definition statement***This place covers:*

The extrusion moulding articles characterised by their shape, the shape being multi hole (e.g. honeycomb).

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Extruding ceramic honeycomb structures	<a href="#">B28B 2003/203</a>
Producing honeycomb structures	<a href="#">B29D 99/0089</a>
Multi-tubular articles	<a href="#">B29L 2031/60</a>
Honeycomb	<a href="#">B29L 2031/608</a>



**B29C 48/12**

**Articles with an irregular circumference when viewed in cross-section, e.g. window profiles**

**Definition statement**

*This place covers:*

The extrusion moulding articles characterised by their shape, the shape being irregular (e.g. non-flat or non-cylindrical).

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Articles having a profiled cross section	<a href="#">B29L 2031/003</a>
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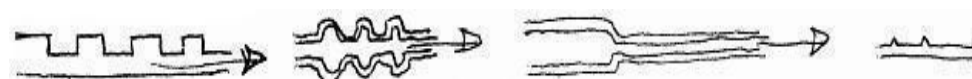
**B29C 48/13**

**Articles with a cross-section varying in the longitudinal direction, e.g. corrugated pipes**

**Definition statement**

*This place covers:*

The extrusion moulding articles characterised by their shape, the shape being longitudinally irregular.

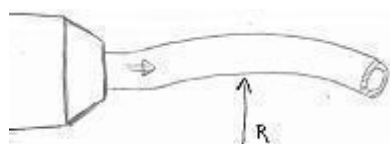
**B29C 48/131**

**{Curved articles}**

**Definition statement**

*This place covers:*

The extrusion moulding articles characterised by their shape, the shape being curved.



**B29C 48/14**

characterised by the particular extruding conditions, e.g. in a modified atmosphere or by using vibration

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Shaping conditions, e.g. vacuum	<a href="#">B29C 2791/004</a>
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**B29C 48/142**

{using force fields, e.g. gravity or electrical fields ([B29C 48/9165](#) takes precedence)}

**Definition statement**

*This place covers:*

Vertical extrusion

**References****Limiting references**

*This place does not cover:*

Electrostatic pinning	<a href="#">B29C 48/9165</a>
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**B29C 48/15**

incorporating preformed parts or layers, e.g. extrusion moulding around inserts

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Relative movement between apparatus parts, e.g. moving die along preformed part to be coated	<a href="#">B29C 48/266</a>
Thermal treatment of preformed parts	<a href="#">B29C 48/79</a>
Applying material to surfaces	<a href="#">B05C 5/02</a>
Applying material to a part of an article	<a href="#">B05C 5/0216</a>

**B29C 48/16****Articles comprising two or more components, e.g. co-extruded layers****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Feedblocks or adapter blocks	<a href="#">B29C 48/495</a>
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**B29C 48/17****the components having different colours****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Applying surface layers, e.g. coatings, decorative layers	<a href="#">B29C 37/0025</a>
Applying coating, colouring	<a href="#">B29D 11/00865</a> , <a href="#">B29D 11/00894</a>
Pigments, colouring agents	<a href="#">B29K 2105/0032</a>
Materials having optical properties	<a href="#">B29K 2995/0018</a>
Coloured articles	<a href="#">B29K 2995/002</a>
Multi-coloured articles	<a href="#">B29K 2995/0021</a>

**B29C 48/175****{comprising a multi-coloured single component, e.g. striated, marbled or wood-like patterned}****Definition statement***This place covers:***B29C 48/18****the components being layers****Definition statement***This place covers:*

Co-extrusion of several components, e.g. layers

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Incorporating preformed components	<a href="#">B29C 48/15</a>
Dies for co-extrusion of multi-component articles	<a href="#">B29C 48/304</a> , <a href="#">B29C 48/335</a>
Flow dividers for layer multiplication	<a href="#">B29C 48/71</a>
Plastic layered products	<a href="#">B29L 2009/00</a>
Layered products	<a href="#">B32B 1/00</a> - <a href="#">B32B 33/00</a>
Methods or apparatus for laminating	<a href="#">B32B 37/00</a>

## B29C 48/185

{comprising six or more components, i.e. each component being counted once for each time it is present, e.g. in a layer}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

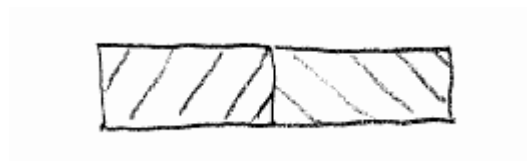
Layer multiplication	<a href="#">B29C 48/71</a>
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## B29C 48/19

the layers being joined at their edges

### Definition statement

This place covers:

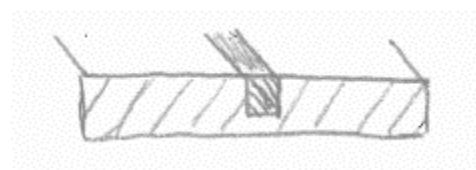


## B29C 48/20

one of the layers being a strip, e.g. a partially embedded strip

### Definition statement

This place covers:

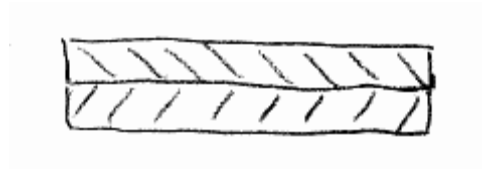


**B29C 48/21**

the layers being joined at their surfaces

**Definition statement**

*This place covers:*

**B29C 48/22**

with means connecting the layers, e.g. tie layers or undercuts

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Mechanical anchoring in general, e.g. layers gripping to each other	<a href="#">B29C 37/0082</a>
Anchoring between layers in general, e.g. due to chemical treatment	<a href="#">B29C 2045/1664</a>
Tear strength in general, e.g. layers easily torn apart	<a href="#">B29K 2995/0081</a>

**B29C 48/23**

with means for avoiding adhesion of the layers, e.g. for forming peelable layers

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Decreased tear strength	<a href="#">B29K 2995/0081</a>
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**B29C 48/251**

{Design of extruder parts, e.g. by modelling based on mathematical theories or experiments}

**Definition statement**

*This place covers:*

Extruder calculations, e.g. analytical or numerical, theory or experiments.

**B29C 48/2519****{by modelling of mechanical strength}****Definition statement***This place covers:*

For example, analytical or numerical

**B29C 48/252****{Drive or actuation means; Transmission means; Screw supporting means}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Drive means for presses	<a href="#">B30B 11/241</a>
Gearings	<a href="#">F16H 1/22</a>

**B29C 48/2528****{Drive or actuation means for non-plasticising purposes, e.g. dosing unit}****Definition statement***This place covers:*

For example, drives for conveyor unit or cutting unit

**B29C 48/255****Flow control means, e.g. valves (flow dividers [B29C 48/695](#))****Definition statement***This place covers:*

Valves or adjustable parts, e.g. for changing flow direction, to change or modify the flow pattern or to throttle the flow.

**References****Limiting references***This place does not cover:*

Flow dividers	<a href="#">B29C 48/695</a>
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**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Explicit throttling in general	<a href="#">B29C 48/268</a>
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**B29C 48/256****{Exchangeable extruder parts ([B29C 48/691](#) takes precedence)}****References*****Limiting references****This place does not cover:*

Arrangements for replacing filters	<a href="#">B29C 48/691</a>
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***Informative references****Attention is drawn to the following places, which may be of interest for search:*

Injection moulding exchanging the injection unit or parts thereof	<a href="#">B29C 45/176</a>
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**B29C 48/2564****{Screw parts}****Definition statement***This place covers:*

For example, modular screw parts

**B29C 48/2565****{Barrel parts}****Definition statement***This place covers:*

For example, modular barrel parts

**B29C 48/2566****{Die parts}****Definition statement***This place covers:*

For example, modular die parts

**B29C 48/2567****{Hopper or feeder parts}****Definition statement***This place covers:*

For example, modular hopper or feeder parts

**B29C 48/2568****{Inserts}****Definition statement**

*This place covers:*

Small parts, e.g. for changed flow pattern, changed extrudate shape, to throttle flow or replaceable parts due to wear

**B29C 48/266**

**{Means for allowing relative movements between the apparatus parts, e.g. for twisting the extruded article or for moving the die along a surface to be coated}**

**Definition statement**

*This place covers:*

Illustrative examples of subject matter classified in this place:

1.

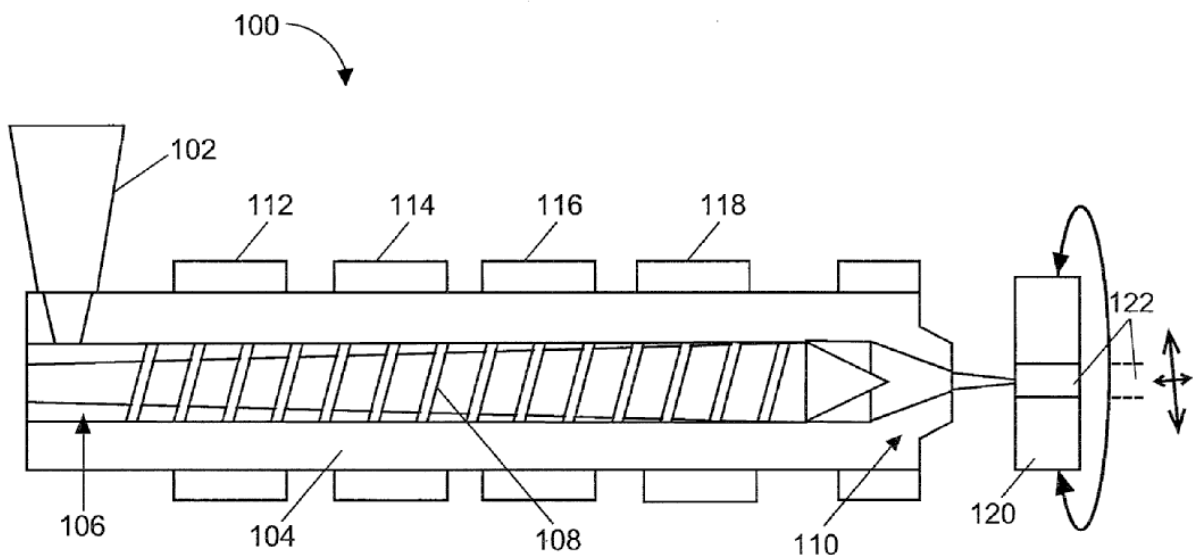


Figure 1 illustrates relative movement between die (120) and nozzle (110) for twisting the extruded article.



2.

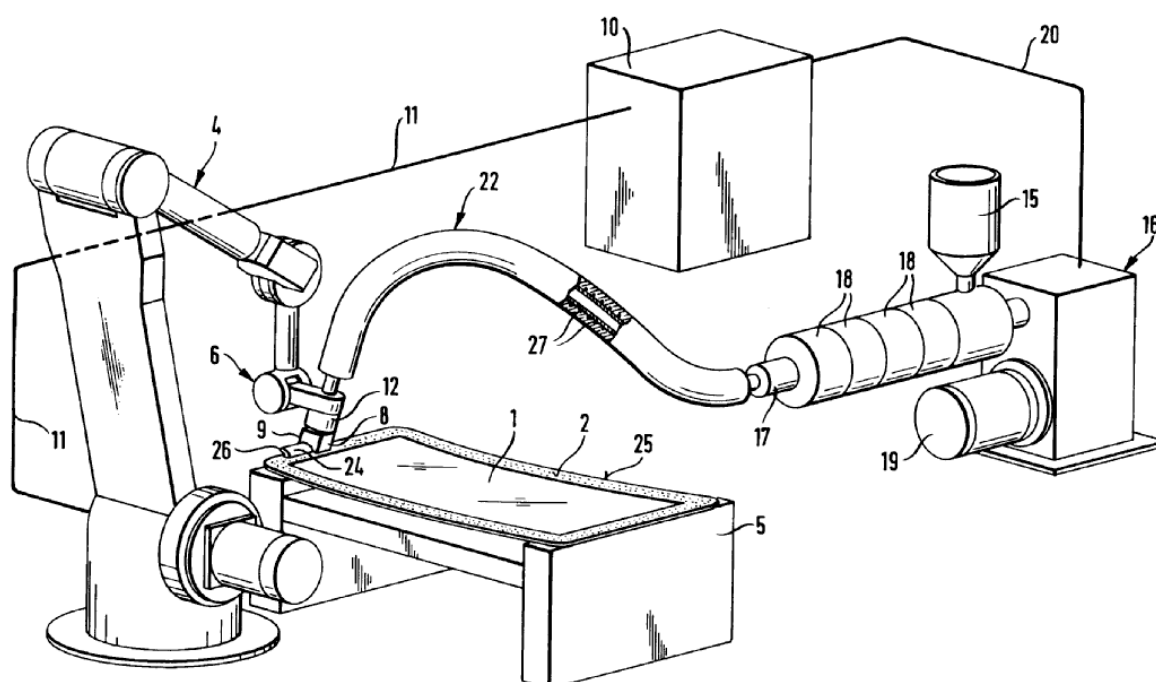


Figure 2 illustrates manipulation head (6) of robot (4), which moves extrusion nozzle (8) along edge of glass pane (1).

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Extruding onto a preformed part or component	<a href="#">B29C 48/15</a>
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## B29C 48/268

{Throttling of the flow, e.g. for cooperating with plasticising elements or for degassing (flow control means [B29C 48/255](#))}

## Definition statement

This place covers:

Explicit throttling

## References

### Limiting references

This place does not cover:

Flow control means	<a href="#">B29C 48/255</a>
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### Informative references

Attention is drawn to the following places, which may be of interest for search:

Throttling in mixers	<a href="#">B29B 7/488</a>
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**B29C 48/2694****{Intermittent extrusion}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Articles of definite length	<a href="#">B29C 2791/002</a>
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**B29C 48/285****Feeding the extrusion material to the extruder****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Handling material to be moulded	<a href="#">B29C 31/02</a>
Injection moulding, feeding	<a href="#">B29C 45/18</a>
Conveying of bulk material	<a href="#">B65G 53/00</a>

**B29C 48/286****{Raw material dosing}****Definition statement***This place covers:*

Raw material dosing in proximity to or during the feeding, e.g.

- handling and feeding pre-formed parts in the correct velocity
- handling and/or mixing materials in foreseen quantities and feeding these.

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Feeding in measured doses	<a href="#">B29C 31/06</a>
Control aspects of volume	<a href="#">B29C 2948/92161</a> , <a href="#">B29C 2948/92657</a>
Control aspects of weight	<a href="#">B29C 2948/9218</a> , <a href="#">B29C 2948/92676</a>
Control aspects of dosing	<a href="#">B29C 2948/92333</a> , <a href="#">B29C 2948/92828</a>
Mixing, kneading	<a href="#">B29B 7/00</a>
Making preforms	<a href="#">B29B 11/00</a>
Weighing	<a href="#">G01G 13/00</a> , <a href="#">G01G 19/22</a>

**B29C 48/287**

{Raw material pre-treatment while feeding ([B29C 48/78](#) takes precedence)}

**Definition statement**

*This place covers:*

Pre-treatment in proximity to or during feeding, e.g. drying or cleaning

**References****Limiting references**

*This place does not cover:*

Thermal treatment of the extrusion moulding material or of preformed parts or layers	<a href="#">B29C 48/78</a>
--	----------------------------

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Conditioning of physical pre-treatment of a material to be shaped	<a href="#">B29C 31/00</a>
Drying of half products, e.g. preforms	<a href="#">B29C 37/0092</a>
Control aspects of pre-treatment	<a href="#">B29C 2948/92342</a> , <a href="#">B29C 2948/92838</a>
Conditioning or physical pre-treatment of a material to be shaped	<a href="#">B29B 13/00</a>
Pre-treatment of a material to be shaped in general	<a href="#">B29B 15/00</a>

**B29C 48/288**

{in solid form, e.g. powder or granules}

**Definition statement**

*This place covers:*

For example, feeding the main material in solid form

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Solid material	<a href="#">B29K 2105/25</a>
Particle, powder, granule	<a href="#">B29K 2105/251</a>

**B29C 48/2883**

**{of preformed parts, e.g. inserts, retaining their shape during the extrusion process}**

**Definition statement**

*This place covers:*

- Inserts fed and transported generally uninfluenced through the extruder, e.g. due to the high melting point of the insert material.
- Inserts fed directly to the die, e.g. for cable coating.

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Containing inserts	<a href="#">B29K 2105/20</a>
Use of materials as reinforcements	<a href="#">B29K 2201/00</a> - <a href="#">B29K 2313/00</a>
Use of materials as preformed parts, e.g. inserts	<a href="#">B29K 2601/00</a> - <a href="#">B29K 2713/00</a>

**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

preformed part	a part made of any material, being completely shaped to have a determined form and which is not used as a reinforcement, e.g. wires or nets forced only into the surface of an article
insert	a preformed part incorporated in an article during moulding

**B29C 48/2886**

**{of fillers or of fibrous materials, e.g. short-fibre reinforcements}**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Moulding materials containing continuous reinforcements	<a href="#">B29K 2105/08</a>
Moulding materials containing short length reinforcements	<a href="#">B29K 2105/12</a>
Moulding materials containing fillers	<a href="#">B29K 2105/16</a>
Use of materials as reinforcements	<a href="#">B29K 2201/00</a> - <a href="#">B29K 2313/00</a>
Use of materials as fillers	<a href="#">B29K 2401/00</a> - <a href="#">B29K 2511/00</a>

## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

filler	a relatively inert substance in the form of particles, powder, beads, flakes or spheres, which improves the physical properties or increases the bulk or weight of an article
fibrous reinforcement	a reinforcement in the form of fibres

## B29C 48/2888

{in thread form or in strip form, e.g. rubber strips}

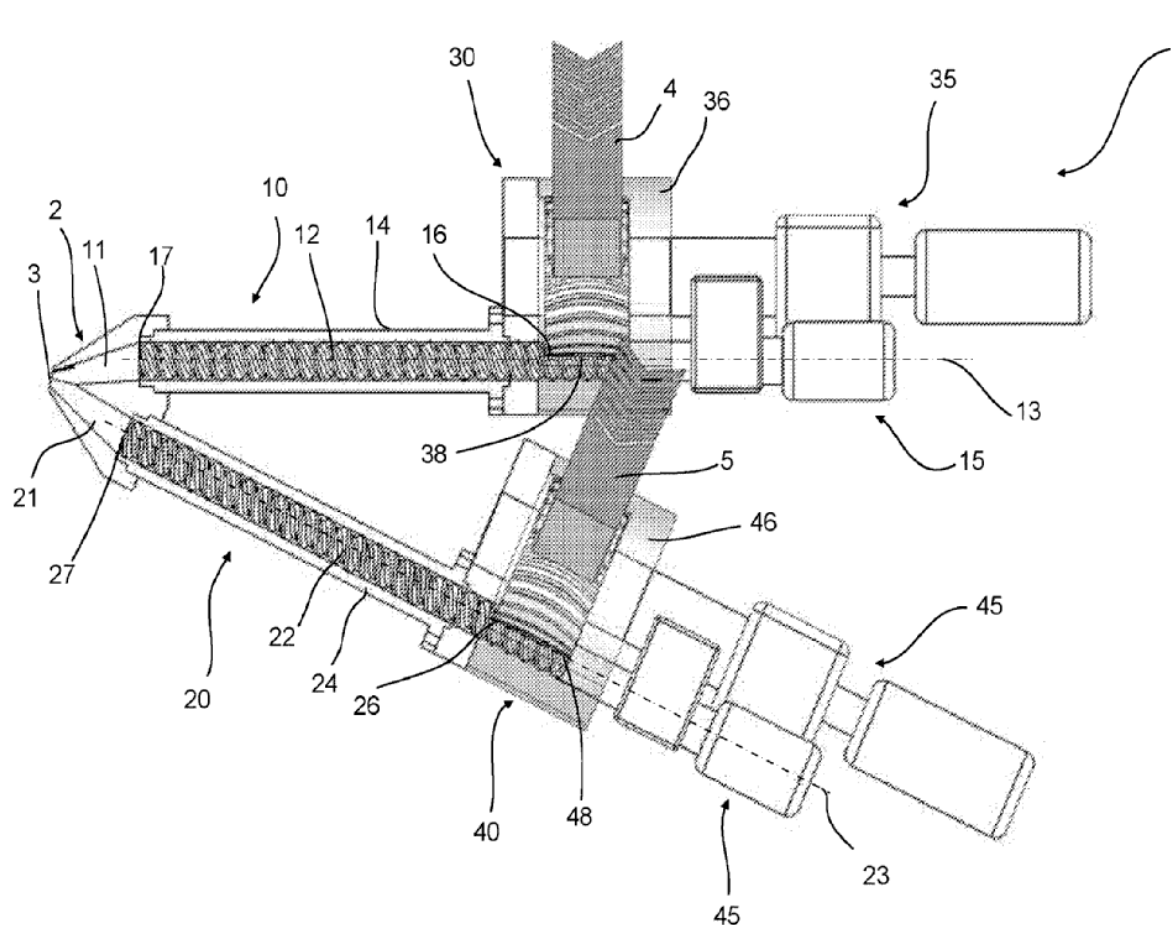
## Definition statement

This place covers:

- Feeding the extrusion material to the extruder in strip form, e.g. feeding rubber strips to extruders for producing multicomponent tyre treads or sidewalls.
- Feeding the extrusion material to the extruder in thread form, e.g. feeding welding wires or rods to welding extruders.

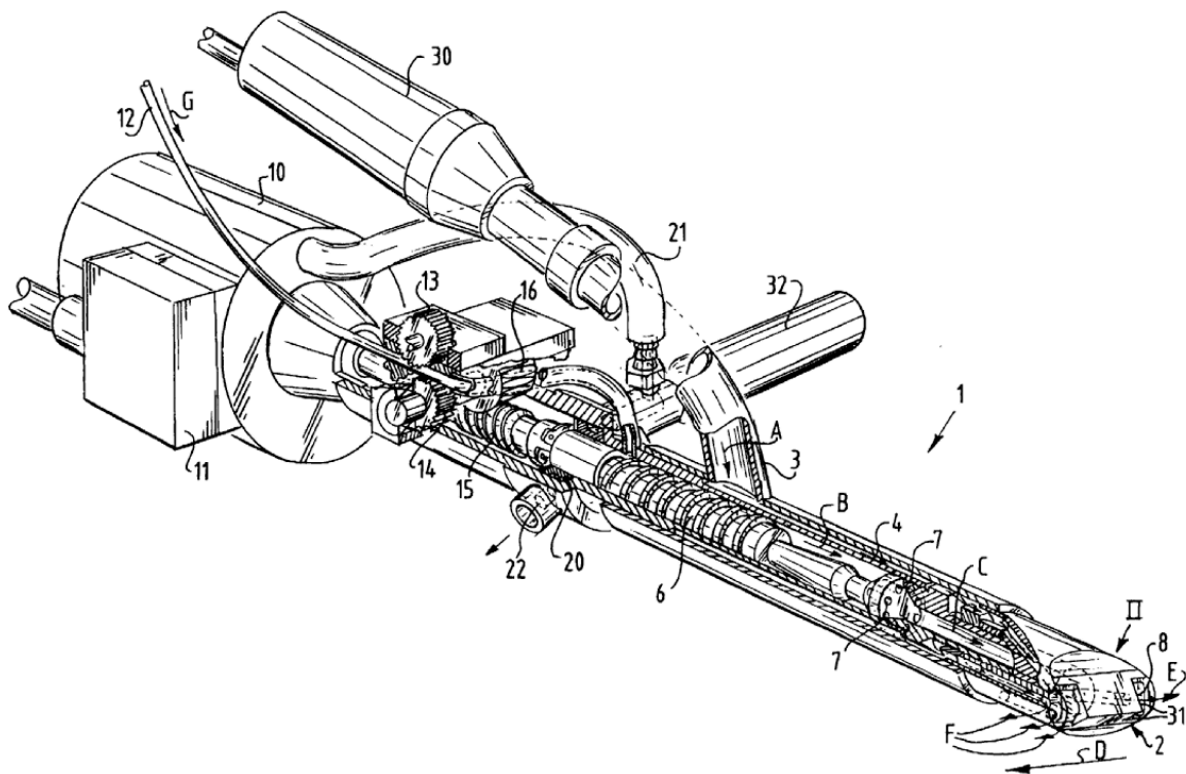
Illustrative examples of subject matter classified in this place:

1.



Strips (4, 5) are fed to extruders (10, 20) for producing a coextruded profiled element.

2.



Plastic wire (12) is fed to extruder (1).

**B29C 48/29**

in liquid form

**Definition statement**

*This place covers:*

For example, feeding additives

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Plasticisers	<a href="#">B29K 2105/0038</a>
Liquid or viscous moulding materials	<a href="#">B29K 2105/0058</a>

**B29C 48/295**

in gaseous form

**Definition statement**

*This place covers:*

For example, feeding of blowing agents

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulding material in a gaseous state	<a href="#">B29K 2105/0055</a>
Moulding material in plasma state	<a href="#">B29K 2105/0082</a>

## B29C 48/297

{at several locations, e.g. using several hoppers or using a separate additive feeding}

### Definition statement

This place covers:

For example, using separate reinforcement feeding

## B29C 48/3001

{characterised by the material or their manufacturing process}

### Special rules of classification

Materials and coatings for calibrators are classified in the same groups as for dies, [B29C 48/3001](#), [B29C 48/3003](#)

## B29C 48/302

{being adjustable, i.e. having adjustable exit sections}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Flow control means before the exit section	<a href="#">B29C 48/2556</a>
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## Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

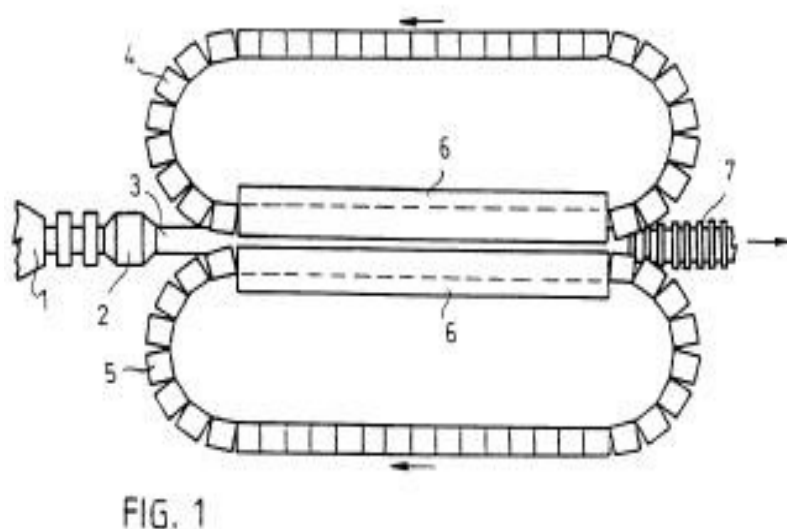
Exit section	last part of die shaping the material
--------------	---------------------------------------

**B29C 48/303**

{using dies or die parts movable in a closed circuit, e.g. mounted on movable endless support ([B29C 48/35](#) takes precedence)}

**Definition statement**

*This place covers:*

**References****Limiting references**

*This place does not cover:*

Extrusion nozzles or dies with rollers	<a href="#">B29C 48/35</a>
--	----------------------------

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Continuously moving moulds in general	<a href="#">B29C 33/36</a>
Casting between endless belts	<a href="#">B29C 39/16</a>
Compression moulding between endless belts	<a href="#">B29C 43/228</a>
Foaming between endless belts	<a href="#">B29C 44/30</a>
Blow moulding of articles of indefinite length using moulds movable in closed circuit	<a href="#">B29C 49/0021</a>
Blow moulding using moulds mounted on movable endless supports	<a href="#">B29C 49/38</a>



**B29C 48/304**

{specially adapted for bringing together components, e.g. melts within the die}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Co-extrusion of multi-component articles	<a href="#">B29C 48/18</a>
--	----------------------------

**B29C 48/305**

having a wide opening, e.g. for forming sheets

**Definition statement**

*This place covers:*

For example, extrusion dies for panels or plates

**B29C 48/307**

{specially adapted for bringing together components, e.g. melts within the die}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Co-extrusion of multi-component articles	<a href="#">B29C 48/18</a>
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**B29C 48/31**

{being} adjustable {, i.e. having adjustable exit sections}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Flow control means before the exit section	<a href="#">B29C 48/2556</a>
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**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

Exit section	last part of die shaping the material
--------------	---------------------------------------

**B29C 48/325**

{being} adjustable {, i.e. having adjustable exit sections}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Flow control means before the exit section	<a href="#">B29C 48/2556</a>
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**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

Exit section	last part of die shaping the material
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**B29C 48/335**

**Multiple annular extrusion nozzles in coaxial arrangement, e.g. for making multi-layered tubular articles**

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Co-extrusion of multi-component articles	<a href="#">B29C 48/18</a>
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**B29C 48/34**

**Cross-head annular extrusion nozzles, i.e. for simultaneously receiving moulding material and the preform to be coated**

**Definition statement**

*This place covers:*

Side feeding the nozzle, i.e. nozzle axis not on the extruder axis, but normally perpendicular to it or at an angle

**B29C 48/345**

**Extrusion nozzles comprising two or more adjacently arranged ports, for simultaneously extruding multiple strands, e.g. for pelletising**

**Definition statement**

*This place covers:*

Multiple separate nozzle outlets next to each other.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Extrusion of particle, powder, granular shapes	<a href="#">B29C 48/04</a>
Extrusion of filamentary shapes	<a href="#">B29C 48/05</a>
Extrusion followed by under-water pelletizing	<a href="#">B29B 9/065</a>
Producing filamentary material	<a href="#">B29D 99/0078</a>
Electro spinning	<a href="#">D01D 5/00</a>
Melt blowing	<a href="#">D04H 1/54</a>

### Special rules of classification

Pure melt-extrusion where the filaments are not shaped/formed by extrusion through the die but with other extrusion aspects should be allocated the Indexing Code [B29C 48/00](#), but not an inventive or additional classification in [B29C 48/345](#) for this aspect.

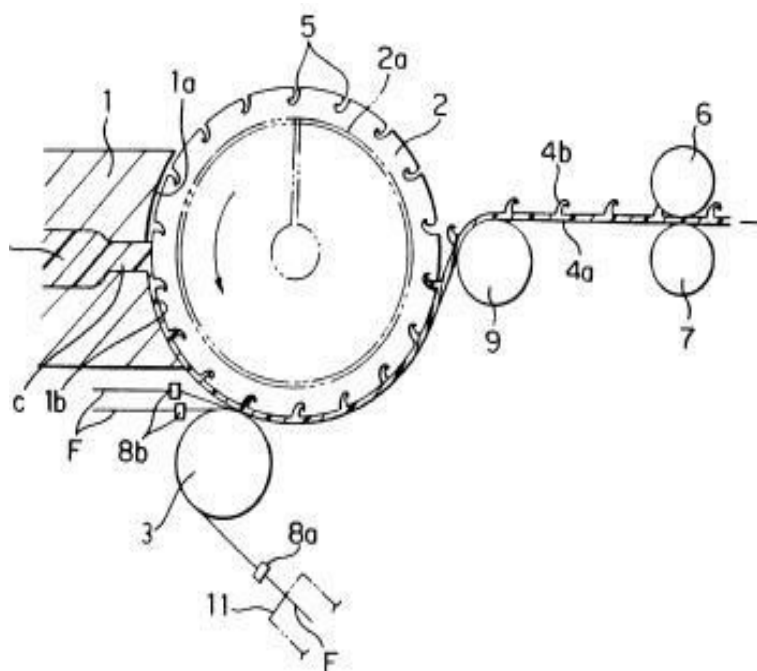
## B29C 48/35

### with rollers

### Definition statement

*This place covers:*

Rollers shape the material exiting the extruder nozzle - normally nozzle exit at a roller or between rollers



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Calendering	<a href="#">B29C 43/24</a>
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## B29C 48/36

Means for plasticising or homogenising the moulding material or forcing it through the nozzle or die

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Means for plasticising or homogenising in injection moulding	<a href="#">B29C 45/46</a>
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## B29C 48/37

Gear pumps

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Gear pumps	<a href="#">F04C 2/08</a>
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## B29C 48/375

Plasticisers, homogenisers or feeders comprising two or more stages

## Definition statement

This place covers:

For example, one plasticiser after the other

## B29C 48/38

using two or more serially arranged screws in the same barrel

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Multi stage plasticising using separate plasticisers, e.g. screw extruder followed by a gear pump	<a href="#">B29C 48/375</a>
Mixers with consecutive casings or screws	<a href="#">B29B 7/487</a>

**B29C 48/387****{using a screw extruder and a gear pump}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Injection moulding using screws and injection ram or piston	<a href="#">B29C 45/54</a>
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**B29C 48/39****a first extruder feeding the melt into an intermediate location of a second extruder****Definition statement***This place covers:*

Feeding a plasticised melt into another plasticised melt, e.g. feeding one plasticised melt into the middle of an extruder plasticising another melt.

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Feeding of the raw material to be extruded	<a href="#">B29C 48/285</a>
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**B29C 48/395****using screws surrounded by a cooperating barrel, e.g. single screw extruders****Definition statement***This place covers:*

Screws or worms that transport, melt, mix and pump the material out through the nozzle and where the interaction between barrel to screw or screw to screw is important.

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Means for plasticising or homogenising using screws in injection moulding	<a href="#">B29C 45/47</a>
Design, e.g. calculations, experiments or theory, e.g. for intermeshing screws, mechanical strength or flow	<a href="#">B29C 48/251</a> - <a href="#">B29C 48/2519</a>
Flow control by valves	<a href="#">B29C 48/2552</a>
Explicit throttling	<a href="#">B29C 48/268</a>
Cleaning or purging	<a href="#">B29C 48/2715</a>
Screws	<a href="#">B29C 48/505</a>
Screw elements, i.e. element shapes affecting flow	<a href="#">B29C 48/51</a> - <a href="#">B29C 48/67</a>

Barrels	<a href="#">B29C 48/68</a>
Venting	<a href="#">B29C 48/766</a>
Heating or cooling at plasticising zone	<a href="#">B29C 48/80</a>
Handheld extruders	<a href="#">B05C 17/00</a>
Mixers with screw or helix	<a href="#">B29B 7/42</a>
Presses using screws or worms	<a href="#">B30B 11/24</a>

**B29C 48/40**

using two or more parallel screws {or at least two parallel non-intermeshing screws}, e.g. twin screw extruders

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Mixers with two or more intermeshing devices	<a href="#">B29B 7/46</a>
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**B29C 48/42**

Non-identical or non-mirrored screws

**Definition statement**

*This place covers:*

For example, the screws having differing lengths or different screw element types

**B29C 48/425**

using three or more screws (serially arranged screws [B29C 48/38](#), [B29C 48/385](#))

**Definition statement**

*This place covers:*

For example, screws arranged next to each other in a circular configuration

**References****Limiting references**

*This place does not cover:*

Plasticizers, homogenisers or feeders using two or more serially arranged screws	<a href="#">B29C 48/38</a> , <a href="#">B29C 48/385</a>
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**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Mixers with three or more screws	<a href="#">B29B 7/485</a>
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**B29C 48/435****Sub-screws****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Mixers with three or more screws	<a href="#">B29B 7/485</a>
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**B29C 48/45****Axially movable screws****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Axially movable screws in injection moulding	<a href="#">B29C 45/50</a>
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**B29C 48/46****using vanes****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Roller extrusion nozzles	<a href="#">B29C 48/35</a>
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**B29C 48/475****using pistons, accumulators or press rams****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Injection moulding using screws and injection ram or piston	<a href="#">B29C 45/54</a>
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**B29C 48/49****using two or more extruders to feed one die or nozzle****Definition statement**

*This place covers:*

For example, means to combine melt flows, e.g. using adapter blocks.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

General arrangement or layout of extrusion plants	<a href="#">B29C 48/025</a>
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## B29C 48/501

{Extruder feed section}

### Definition statement

*This place covers:*

Constructional details of the section of the extruder that is located around the inlet of material, details of cylinder or screw in that particular location.

## B29C 48/503

{Extruder machines or parts thereof characterised by the material or by their manufacturing process ([B29C 48/256](#) takes precedence)}

### Definition statement

*This place covers:*

For example, first time assembly

For example, cooling a barrel lining and inserting it into the barrel

## References

### Limiting references

*This place does not cover:*

Exchangeable extruder parts	<a href="#">B29C 48/256</a>
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### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds characterised by the manufacturing process	<a href="#">B29C 33/3842</a>
Manufacturing dies	<a href="#">B23P 15/00</a>
Use of materials as mould material	<a href="#">B29K 2801/00</a> - <a href="#">B29K 2913/00</a>

## B29C 48/505

Screws

### Definition statement

*This place covers:*

Details of the construction and layout of the screw.



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Means for plasticising or homogenising using screws in injection moulding	<a href="#">B29C 45/47</a>
Injection moulding, details, screws	<a href="#">B29C 45/60</a>
Design, e.g. calculations, experiments or theory, e.g. for intermeshing screws, mechanical strength or flow	<a href="#">B29C 48/251</a> - <a href="#">B29C 48/2519</a>
Drives, screw supports, bearings	<a href="#">B29C 48/2522</a>
Flow control by valves	<a href="#">B29C 48/2552</a>
Mounting or handling of screws	<a href="#">B29C 48/2561</a>
Exchangeable screw parts or segments, e.g. modular screws	<a href="#">B29C 48/2564</a>
Inserts, i.e. small exchangeable parts, e.g. for replacement due to wear	<a href="#">B29C 48/25682</a>
Explicit throttling	<a href="#">B29C 48/268</a>
Cleaning or purging of screws	<a href="#">B29C 48/2715</a>
Feeding, e.g. blowing agents, through a screw	<a href="#">B29C 48/298</a>
Screw elements, i.e. element shapes affecting flow	<a href="#">B29C 48/51</a> - <a href="#">B29C 48/67</a>
Venting through the screw	<a href="#">B29C 48/766</a>
Heating or cooling screws	<a href="#">B29C 48/80</a>
Screws for mixers	<a href="#">B29B 7/42</a> - <a href="#">B29B 7/48</a>
Presses using screws or worms	<a href="#">B30B 11/24</a>
Details of the screws of screw conveyors	<a href="#">B65G 33/26</a>

## B29C 48/515

for auxiliary fluids, e.g. foaming agents

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Thermal treatment of the extrusion moulding material or of preformed parts or layers, e.g. by heating or cooling	<a href="#">B29C 48/78</a>
Thermal treatment of the stream of extruded material, e.g. cooling	<a href="#">B29C 48/88</a>

## B29C 48/59

characterised by details of the thread, i.e. the shape of a single thread of the material-feeding screw

## Definition statement

This place covers:

For example, openings, interruptions or changing thread thickness

**B29C 48/625**

characterised by the ratio of the threaded length of the screw to its outside diameter [L/D ratio]

**Definition statement**

*This place covers:*

For example, section length L/D

**B29C 48/63**

having sections without mixing elements or threads, i.e. having cylinder shaped sections

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

With discontinuous threads	<a href="#">B29C 48/605</a>
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**B29C 48/68**

Barrels or cylinders

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Injection moulding, details, barrels or cylinders	<a href="#">B29C 45/62</a>
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**B29C 48/685**

characterised by their inner surfaces, e.g. having grooves, projections or threads

**Definition statement**

*This place covers:*

Irregular inner surfaces being not simple cylindrical or conical surfaces

**B29C 48/69**

Filters or screens for the moulding material

**Definition statement**

*This place covers:*

Filters to prevent contaminants in the melt from reaching the nozzle and ending up in the finished product

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Injection moulding cleaning equipment	<a href="#">B29C 45/24</a>
Sealings for filters	<a href="#">B29C 48/2545</a>
Flow control, e.g. valves in proximity to filters	<a href="#">B29C 48/2554</a>
Cleaning or purging	<a href="#">B29C 48/2725</a>
Filters in general	<a href="#">B01D 29/00</a>
Changing filters	<a href="#">B01D 35/12</a>
Filtering liquids in general	<a href="#">B01D 39/00</a>
Condition, form or state of moulded materials, containing impurities	<a href="#">B29K 2105/065</a>

## B29C 48/70

comprising means for dividing, distributing and recombining melt flows

### Definition statement

*This place covers:*

Divided melts merging before the die zone

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Static mixers, e.g. breaker plates in the end of the plastizising unit	<a href="#">B29C 48/362</a>
Non-actuated dynamic mixing devices, e.g. free rotating mixing elements	<a href="#">B29C 48/363</a>
Flow division and recombination for layer multiplication	<a href="#">B29C 48/71</a>

## B29C 48/705

{in the die zone, e.g. to create flow homogeneity}

### Definition statement

*This place covers:*

Divided melts merging in the die zone

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Flow division and recombination for layer multiplication	<a href="#">B29C 48/71</a>
--	----------------------------

**B29C 48/72**

**Feedback means, i.e. part of the molten material being fed back into upstream stages of the extruder**

**Definition statement**

*This place covers:*

Melt flow feed-back means, i.e. a part of the melt is fed back into the extruder line when still molten

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Feed-back in the sense of measuring/controlling/regulating	<a href="#">B29C 48/92</a>
--	----------------------------

**B29C 48/74**

**Bypassing means, i.e. part of the molten material being diverted into downstream stages of the extruder**

**Definition statement**

*This place covers:*

Part of the melt by-passes a part of the extruder to re-enter at a later stage

**B29C 48/76**

**Venting {, drying} means; Degassing means**

**Definition statement**

*This place covers:*

Steam, gas or vapour arising during heating and melting of the material is let out of the extruder in a controlled manner

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Venting or degassing means during injection moulding	<a href="#">B29C 45/63</a>
Flow control by valves	<a href="#">B29C 48/2552</a>
Explicit throttling	<a href="#">B29C 48/268</a>
Venting or degassing during mixing or kneading	<a href="#">B29B 7/84</a>

**B29C 48/762****{Vapour stripping}****Definition statement***This place covers:*

Removing a component, e.g. by adding a second component binding to the first component

**B29C 48/763****{Vent constructions, e.g. venting means avoiding melt escape}****Definition statement***This place covers:*

For example, means for improving venting

**B29C 48/765****{in the extruder apparatus}****Definition statement***This place covers:*

For example, venting of the melt in a gear pump or in a separate venting chamber

**B29C 48/766****{in screw extruders}****Definition statement***This place covers:*

For example, venting through a screw, a screw bearing or a feed inlet

**B29C 48/78****Thermal treatment of the extrusion moulding material or of preformed parts or layers, e.g. by heating or cooling****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Raw material pretreatment	<a href="#">B29C 48/287</a>
Conditioning or physical pre-treatment of a material to be shaped	<a href="#">B29B 13/00</a>
Pre-treatment of a material to be shaped in general	<a href="#">B29B 15/00</a>

**B29C 48/875**

**for achieving a non-uniform temperature distribution, e.g. using barrels having both cooling and heating zones**

**Definition statement**

*This place covers:*

Thermal treatment of the extrusion moulding material or of preformed parts or layers to obtain a non-uniform temperature distribution.

**B29C 48/88**

**Thermal treatment of the stream of extruded material, e.g. cooling**

**Definition statement**

*This place covers:*

Heating or cooling of the material having left the extruder nozzle

**B29C 48/885**

**External treatment, e.g. by using air rings for cooling tubular films**

**Special rules of classification**

External cooling of hollow articles is classified by allocating the CPC symbols [B29C 48/885](#) and [B29C 48/9115](#).

External cooling of tubular films is classified by allocating the CPC symbols [B29C 48/885](#) and [B29C 48/912](#).

**B29C 48/89**

**Internal treatment, e.g. by applying an internal cooling fluid stream**

**Special rules of classification**

Internal cooling of hollow articles is classified by allocating the CPC symbols [B29C 48/89](#) and [B29C 48/9115](#).

Internal cooling of tubular films is classified by allocating the CPC symbols [B29C 48/89](#) and [B29C 48/912](#).

**B29C 48/90**

**with calibration or sizing, i.e. combined with fixing or setting of the final dimensions of the extruded article**

**Definition statement**

*This place covers:*

Finalising shaping of the article while cooling takes place to correct for warp and shrinking

**B29C 48/902****{internally}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Shaping by stretching of blown tubular films using internal mechanical means, e.g. mandrel	<a href="#">B29C 55/285</a>
--	-----------------------------

**B29C 48/914****{Cooling drums}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Moulds and cores with heating or cooling means in rolls, calenders or drums	<a href="#">B29C 33/044</a>
---	-----------------------------

**B29C 48/919****{using a bath, e.g. extruding into an open bath to coagulate or cool the material}****Definition statement***This place covers:*

For example, using a bath for coagulatable material

**B29C 48/92****Measuring, controlling or regulating****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Design of extruder parts, e.g. by modelling based on mathematical theories or experiments	<a href="#">B29C 48/251</a>
Measuring, controlling or regulating in general	<a href="#">G01</a>
Taking samples	<a href="#">G01N 1/2035</a>
Adaptive control, learning, e.g. fuzzy logic	<a href="#">G05B 13/0265</a>

## Special rules of classification

For all documents to be classified in [B29C 48/92](#) for inventive or additional information, all measuring and controlling aspects therein must be identified by adding the relevant codes in the [B29C 2948/92](#) indexing scheme.

In case of classification in the [B29C 2948/92](#) indexing scheme, the allocation of [B29C 48/92](#) as additional information is optional.

## B29C 48/94

### Lubricating

#### Definition statement

*This place covers:*

Using internal lubrication, e.g. adding a plasticiser, or using external lubrication, e.g. adding a film of lubricating material in the interface between the melt and the extruder, die, calibrator or conveyor.

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Lubricating for moulds or cores in general	<a href="#">B29C 33/56</a>
Lubricating means for injection moulding	<a href="#">B29C 45/83</a>
Moulding materials containing plasticisers	<a href="#">B29K 2105/0038</a>
Liquid or viscous moulding materials	<a href="#">B29K 2105/0058</a>
Moulding materials having a particular viscosity	<a href="#">B29K 2105/0094</a>

## Special rules of classification

Materials and coatings for calibrators are classified in the same groups as for dies, [B29C 48/3001](#), [B29C 48/3003](#)

## B29C 48/95

### by adding lubricant to the moulding material

#### References

##### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Lubricating compositions	<a href="#">C10M</a>
--------------------------	----------------------



## B29C 49/00

**Blow-moulding, i.e. blowing a preform or parison to a desired shape within a mould; Apparatus therefor**

### Definition statement

*This place covers:*

Blow-moulding methods, blow-moulding apparatus and articles obtained by blow-moulding, when these articles are characterised by the blow-moulding method.

Simulation of blow-moulding or any other simulated aspect related to blow-moulding, e.g. simulating heating a preform before blow-moulding. This aspect is covered in the group [B29C 49/42398](#).

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Injection a fluid, e.g. air, in molten plastic in injection moulding	<a href="#">B29C 45/1704</a>
Extrusion moulding of tubular films	<a href="#">B29C 48/10</a>
Vacuum or pressure forming of sheet like materials	<a href="#">B29C 51/10</a>
Enlarging tube ends using pressure difference	<a href="#">B29C 57/08</a>
Making of balloon catheters	<a href="#">A61M 25/1027</a>
Metal blow-moulding	<a href="#">B21D 26/00</a>
Making preforms per se	<a href="#">B29B 11/00</a>
Packaging individual articles in containers or receptacles whereby the machines incorporate means for making the containers	<a href="#">B65B 3/022</a>
Labelling of blow-moulded articles outside the mould	<a href="#">B65C 3/00</a>
Glass blow-moulding	<a href="#">C03B 9/00</a>

### Special rules of classification

For articles and materials, as much as possible additional classification by adding the Indexing Codes of [B29K](#) and [B29L](#) is recommended.

If more than 4 different thermoplastic materials are described in the disclosure, then the Indexing Code [B29K 2101/12](#) should be allocated. In addition, only up to 4 of the disclosed uncommon thermoplastic materials are classified (common thermoplastics for blow-moulding are PET, PE, PP) by allocating the appropriate Indexing Code as provided in [B29K 2001/00](#) - [B29K 2101/00](#).

Inventive and additional information disclosed in documents to be classified should be identified by allocation the appropriate classification codes of [B29C 49/00](#) - [B29C 49/78](#). In particular attention should be paid to the so called break down Indexing Codes, which are only present at additional information level, but should be allocated if applicable.

If during blow-moulding also vacuum is used, or only vacuum is used for deformation of the tubular parison then one or both of the following classification codes are additionally allocated: [B29C 2791/006](#) and/or [B29C 2791/007](#).

The indexing of preforms for blow-moulding bottles using the coding scheme under [B29C 2949/07](#) is obligatory when the structure of the preform differs from the conventional shape (one layer, open neck, flange, cylindrical body, closed semi-spherical end).

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Preform or parison	A tubular object obtained by moulding substantially consisting of plastic material, which has to undergo an additional processing step, e.g. blow-moulding, to obtain its final shape, examples are: tubes, extruded parisons, two parallel sheets which behave like tubular preforms, injection moulded tubular preforms normally with one end closed.
Blowing	using a pressurized blowing gas to deform the tubular preform or parison; but also applying a vacuum on one side of the tubular article, since the ambient pressure is deforming the tubular preform or parison.

## B29C 49/0005

{characterised by the material}

### Definition statement

*This place covers:*

- Blow moulding processes, whereby their disclosure focuses on the materials or material parameters

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Compositions of macromolecular compounds in general	<a href="#">C08L 1/00</a> - <a href="#">C08L 101/10</a>
---	---

### Special rules of classification

If reinforcing material is comprised in the material to be thermoformed, then the following Indexing Codes should additionally be allocated: the appropriate subgroups of [B29K 2105/06](#) and [B29K 2201/00](#) - [B29K 2313/00](#).

## B29C 49/0006

{for heating or cooling}

### Definition statement

*This place covers:*

Modification or selection of the moulding material to facilitate heating or cooling.

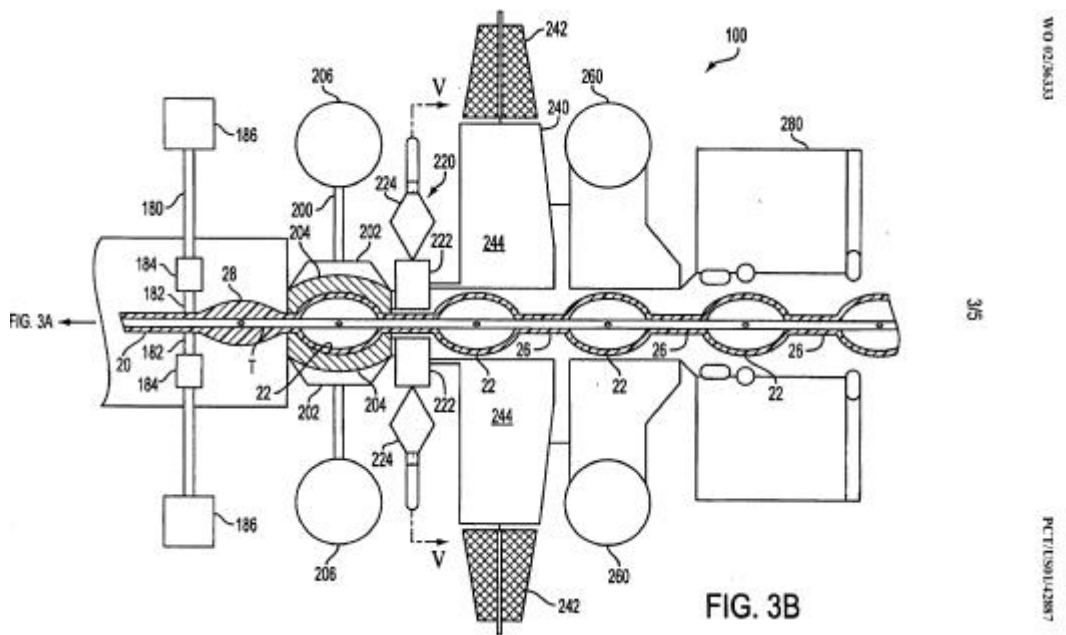
**B29C 49/0015**

{Making articles of indefinite length, e.g. corrugated tubes}

**Definition statement**

*This place covers:*

- WO02/36333

**B29C 49/0021**

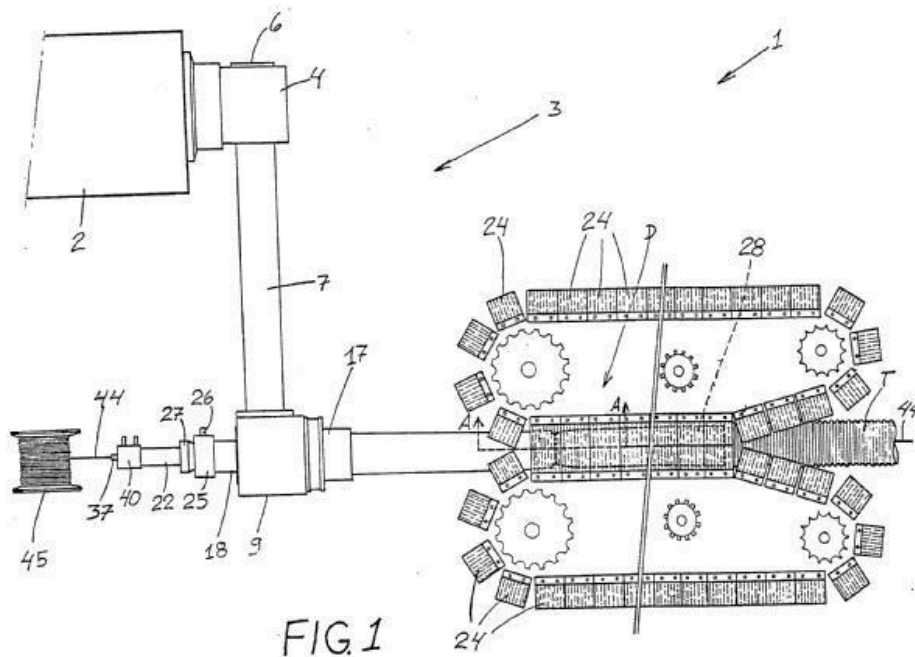
{using moulds or mould parts movable in a closed path, e.g. mounted on movable endless supports}

**Definition statement**

*This place covers:*

- Blow moulding processes whereby either only pressure, pressure and vacuum or only vacuum is used during the forming process of indefinite length articles, as long as the preform is three dimensionally deformed.

- WO2004110734



### Special rules of classification

It is highly desirable that all documents classified in [B29C 49/0021](#) the appropriate Indexing Code in [B29L 2023/00](#) is added to identify the type of tubular product

### B29C 49/0022

{characterised by mould return means}

#### Definition statement

*This place covers:*

Details of the device to return the moulding section to a receiving portion of the parison.

### B29C 49/0023

{using adjustable machine tables, e.g. to align extrusion nozzles with the moulds}

#### Definition statement

*This place covers:*

Relative movement of the mould table or support of the extrusion nozzle for alignment of the apparatus.

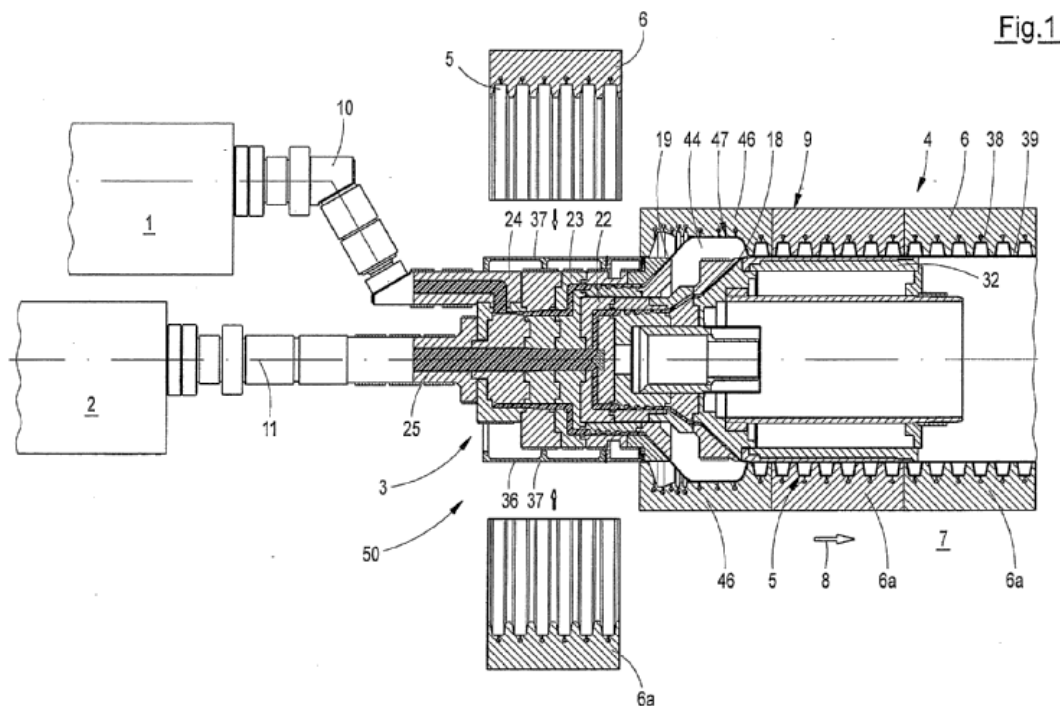
**B29C 49/0024****{using varying mould speed}****Definition statement***This place covers:*

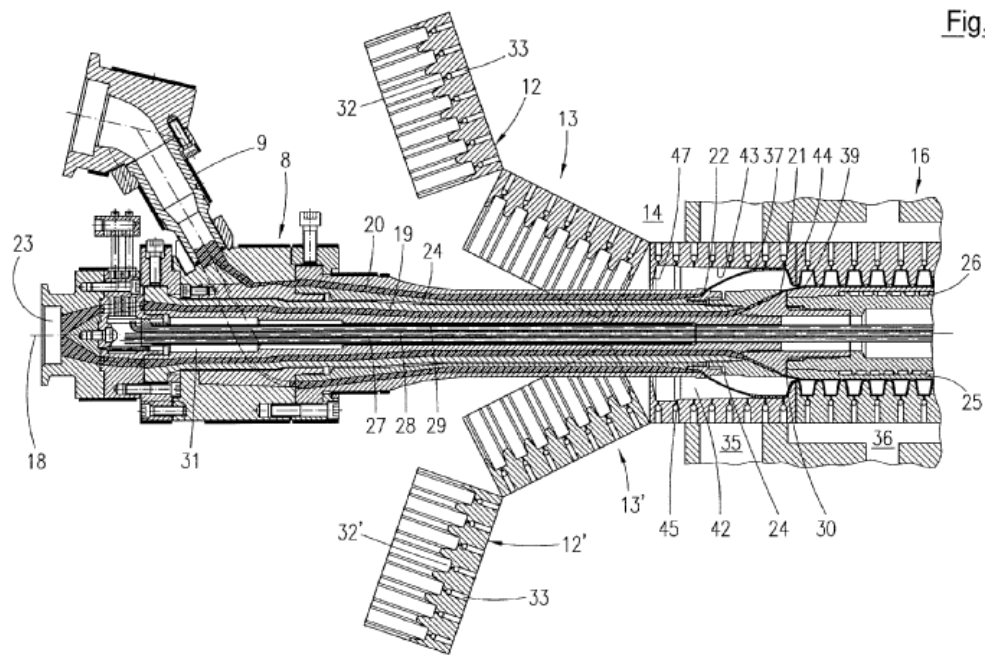
Modification of the mould speed to account for changes in mould geometry or extrudate thickness. Usually to form a product having uniform thickness.

**B29C 49/0025****{subsequent mould cavities being different, e.g. for making bells}****Definition statement***This place covers:*

Indefinite length moulding apparatus which has cavities of different configurations along the mould path.

Illustrative example of subject matter classified in this group:





## B29C 49/0027

{involving the change of moulds, e.g. in production processes without interrupting the production processes}

### Definition statement

*This place covers:*

Using an auxiliary device, e.g. conveyor, to change the moulds without pausing the moulding apparatus.

## B29C 49/0028

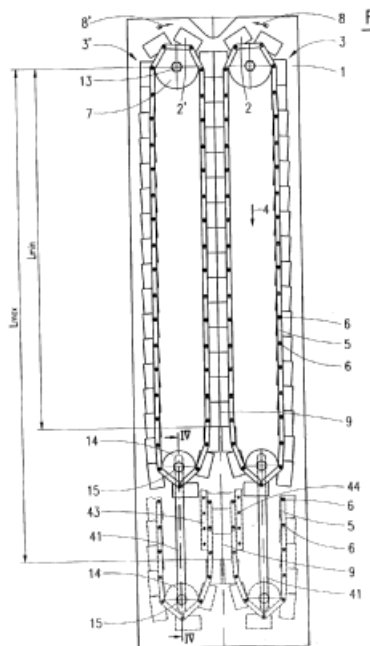
{using variable forming length, e.g. adapted to cooling needs}

### Definition statement

*This place covers:*

Indefinite length moulding apparatus whose length can be varied according to desired process conditions or outcomes (e.g. cooling).

Illustrative example of subject matter classified in this group:



## **B29C 49/0029**

{wherein the process is characterised by the pressure used, e.g. using varying pressure depending on sequence of cavity shapes}

### **Definition statement**

*This place covers:*

Indefinite length moulding apparatus which uses varying/controlled pressure in the moulding process.

## **B29C 49/003**

{wherein the process is characterised by temperature conditioning, e.g. using inside cooling by air}

### **Definition statement**

*This place covers:*

Indefinite length moulding apparatus which involves various temperature conditioning techniques (e.g. interior cooling air). Examples include cooling of fused layers and details of the internal cooling plug.

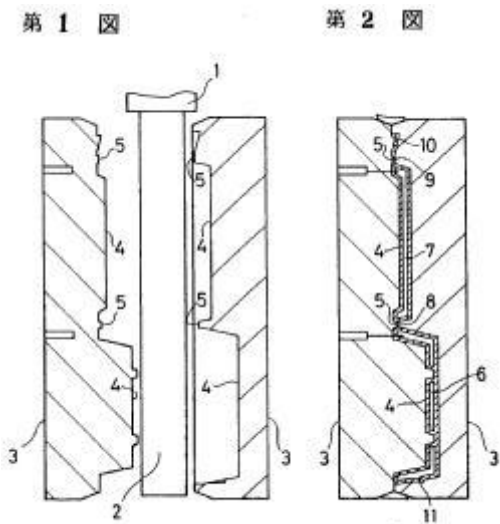
B29C 49/0031

{Making articles having hollow walls}

Definition statement

This place covers:

- JP60149432



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hollow walled articles	<a href="#">B29L 2024/00</a>
------------------------	------------------------------



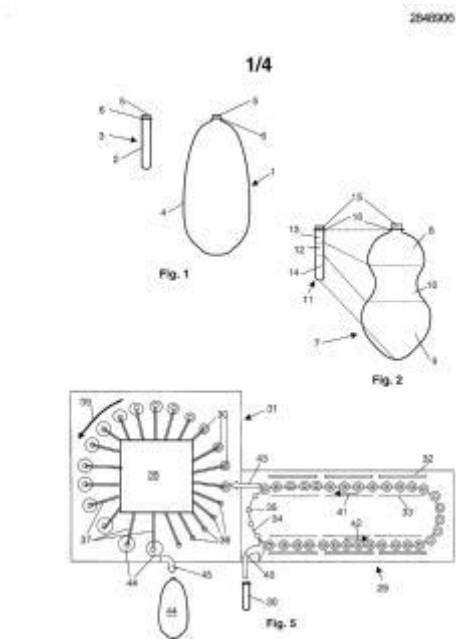
**B29C 49/0042**

{without using a mould ([B29C 49/1602](#) takes precedence)}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:



**References**

**Limiting references**

*This place does not cover:*

Pre-blowing without using a mould	<a href="#">B29C 49/1602</a>
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**B29C 49/006**

{Blow-moulding plants, e.g. using several blow-moulding apparatuses cooperating}

**Definition statement**

*This place covers:*

A combination of different apparatus to form a single blow-moulding plant. More than just extrusion or injection moulding combined with blow-moulding, could also be more than one blow-mould or other moulding apparatus.

**B29C 49/0062**

{using two or more parallel stations, e.g. two parallel heating or blowing stations}

**Definition statement**

*This place covers:*

A plant wherein the plurality of stations are parallel to one another.

**B29C 49/0064**

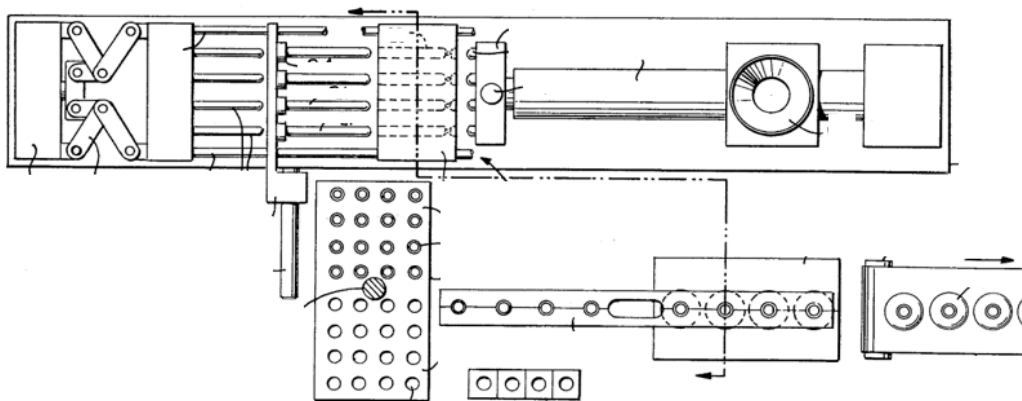
{the number of preform manufacturing stations being different to the number of blowing stations}

**Definition statement**

*This place covers:*

Blow-moulding plants that have preform manufacturing segments and blow-moulding segments which are not equal in number.

In the example below the injection mould has 32 cavities and the blow-mould has 4 cavities.

**B29C 49/0208**

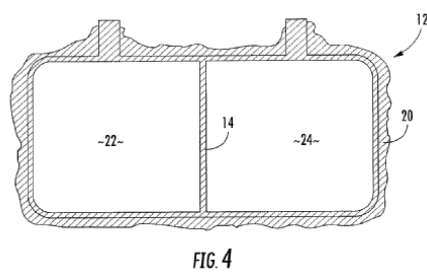
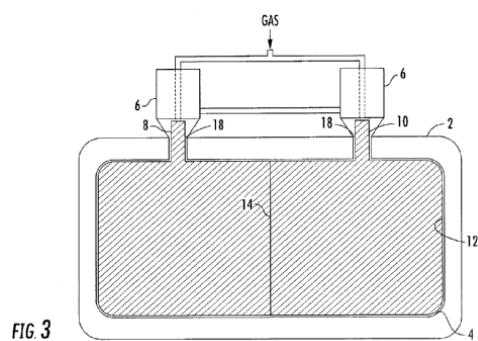
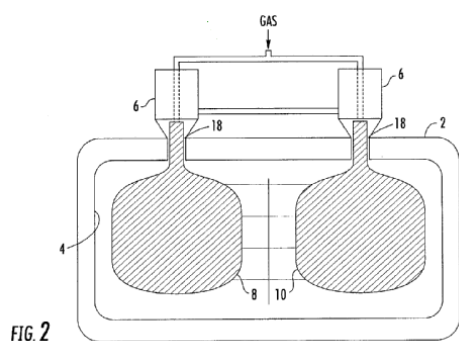
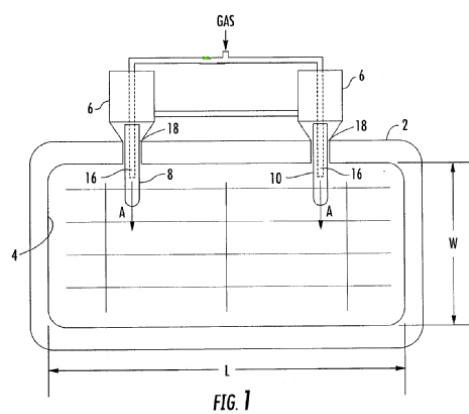
{joining several separate preforms while blow-moulding, e.g. two cylindrical preforms welded together during blowing}

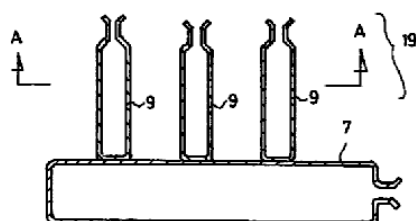
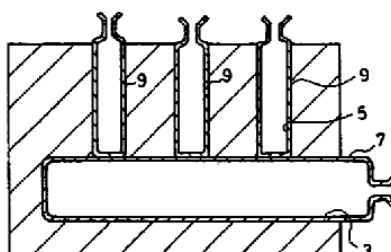
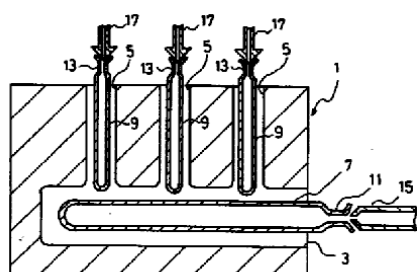
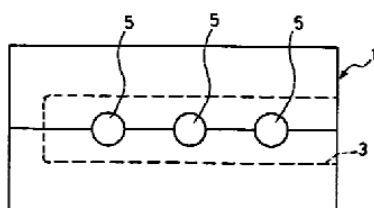
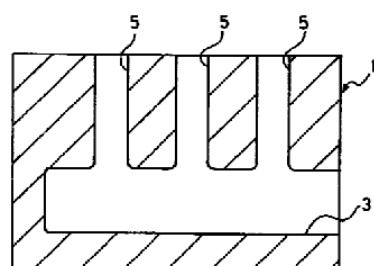
**Definition statement**

*This place covers:*

Manufacturing process which includes both preform manufacture and blow-moulding of the preform, especially including manufacturing more than one distinct preforms and joining them together during blow-moulding.

Illustrative example of subject matter classified in this group:





## B29C 49/04

### Extrusion blow-moulding

#### References

##### Informative references

Attention is drawn to the following places, which may be of interest for search:

Making preforms by extrusion moulding	<a href="#">B29B 11/10</a>
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#### Special rules of classification

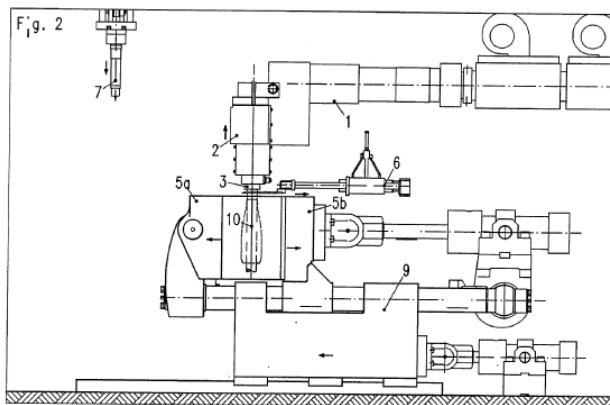
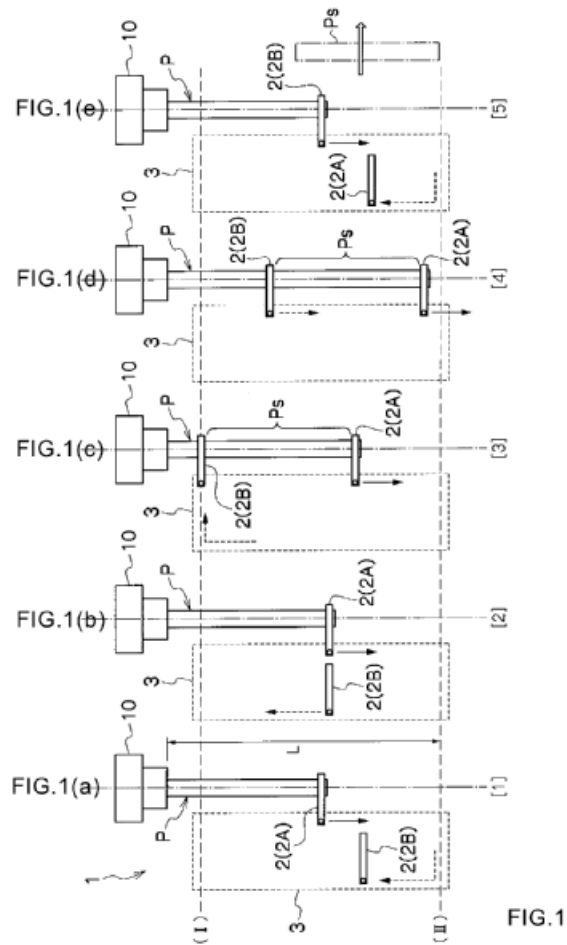
- If the parison shape, e.g. the cross section or thickness distribution, is different from the standard cylindrical shape, then the to be classified document should receive a class in [B29C 49/071](#) as inventive information and only [B29C 49/04](#) as additional information.

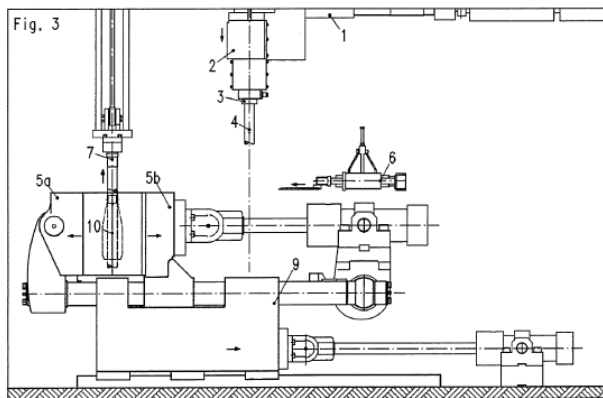
- If the parison is multilayered, then the to be classified document should receive a class in [B29C 49/22](#) as inventive information and only [B29C 49/04](#) as additional information.

**B29C 49/04102****{extruding the material continuously}****Definition statement***This place covers:*

Manufacturing preforms via continuous extrusion prior to blow-moulding the preforms.

Illustrative example of subject matter classified in this group:





**B29C 49/04104**

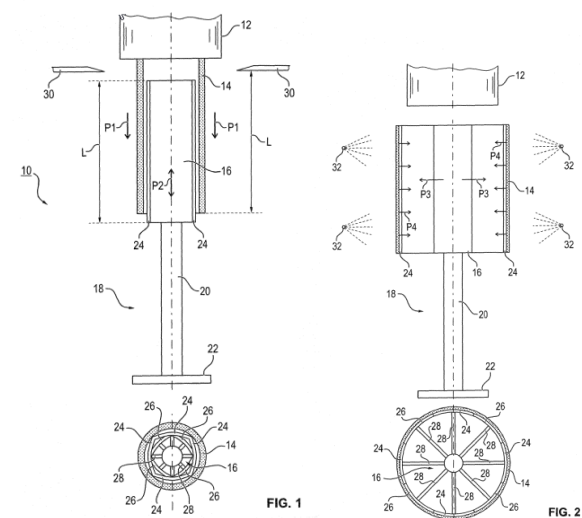
**{extruding the material discontinuously}**

### Definition statement

*This place covers:*

Manufacturing preforms via extrusion which is not continuous, prior to blow-moulding the preforms.

Illustrative example of subject matter classified in this group:



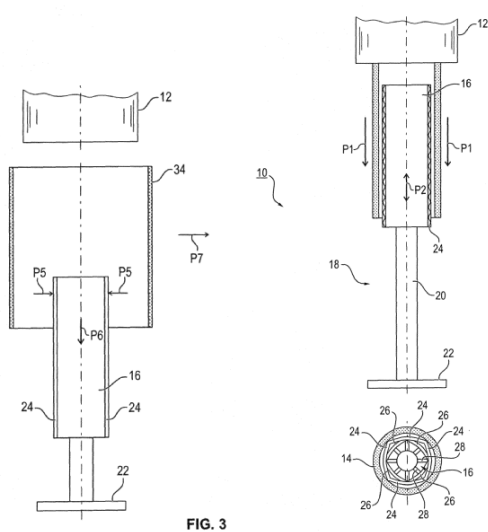


FIG. 3

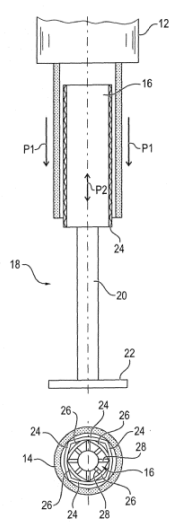


FIG. 4

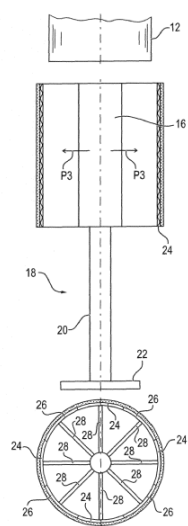


FIG. 5

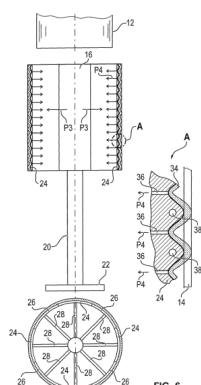
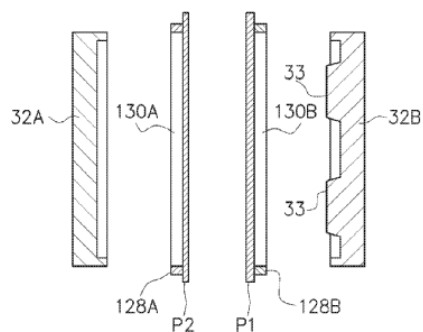


FIG. 6

FIG. 4



**B29C 49/04106**

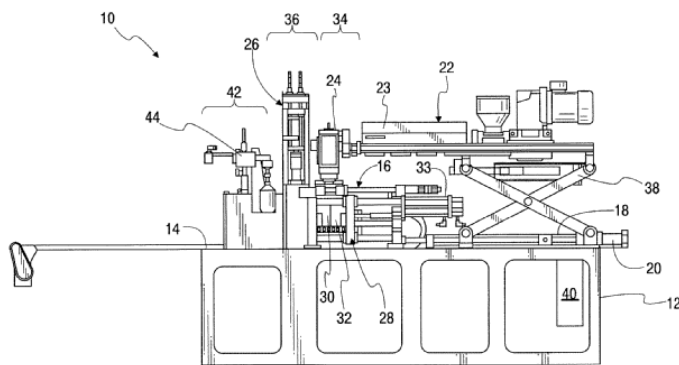
{Means for moving the extruder head up and down, e.g. to continue extruding the next parison while blow-moulding the previous parison in the blow-mould}

**Definition statement**

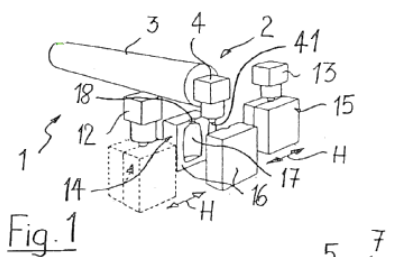
*This place covers:*

Manufacturing method which includes preform manufacture followed by blow-moulding and also including a vertically movable extruder. This allows the extruder to be repositioned during the process to accommodate subsequent moulding operations concurrently with extrusion.

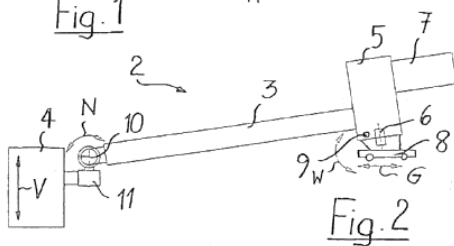
Illustrative example of subject matter classified in this group:



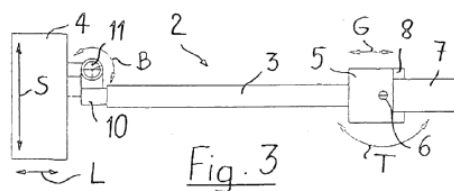
*Fig. 1*



*Fig. 1*



*Fig. 2*



*Fig. 3*



**B29C 49/04108**

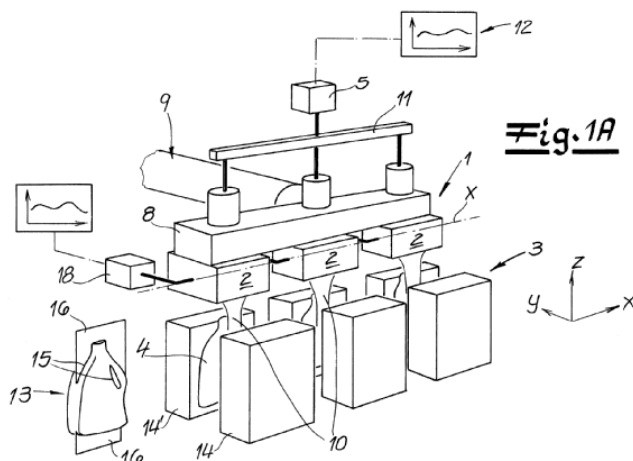
{extruding several parisons parallel to each other at the same time}

**Definition statement**

*This place covers:*

Preform extrusion including several preforms (i.e. parisons) being extruded simultaneously and parallel to each other.

Illustrative example of subject matter classified in this group:

**B29C 49/0411**

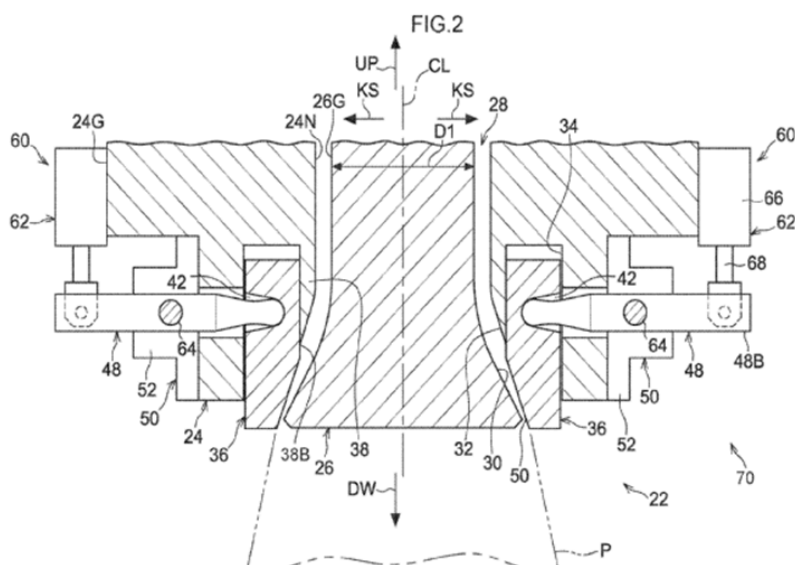
{Means for defining the wall or layer thickness}

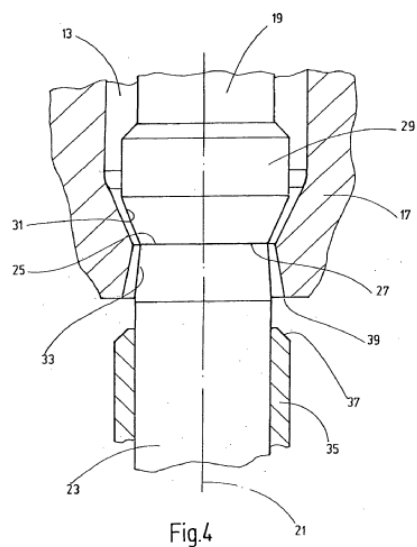
**Definition statement**

*This place covers:*

Preform extrusion in which the wall/layer thickness is particularly controlled by an apparatus feature.

Illustrative example of subject matter classified in this group:





## B29C 49/04114

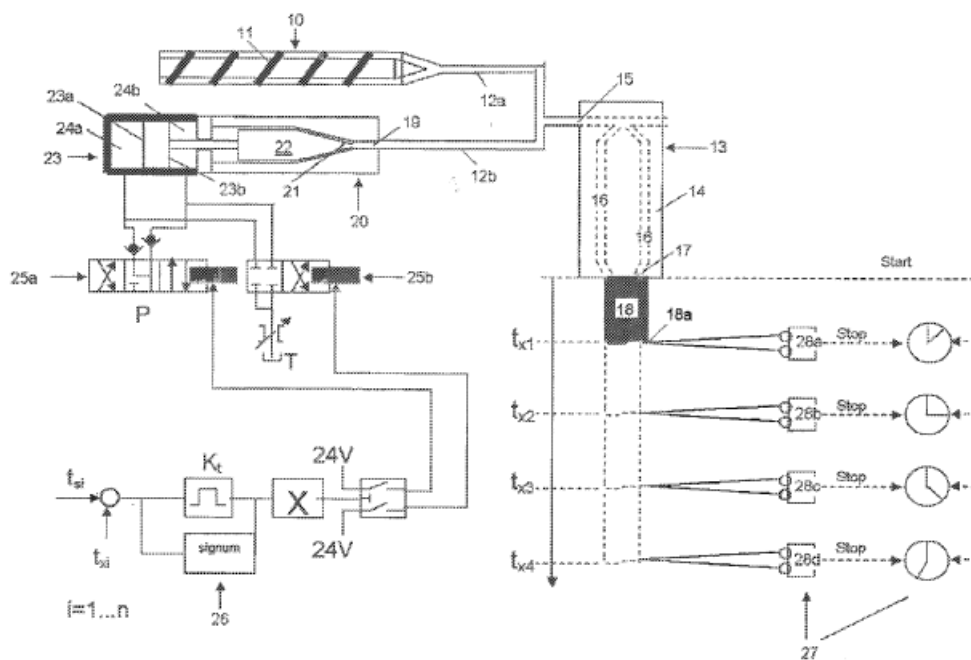
{for keeping constant thickness}

### Definition statement

*This place covers:*

Preform extrusion wherein it is ensured that the preform wall/layer thickness is constant.

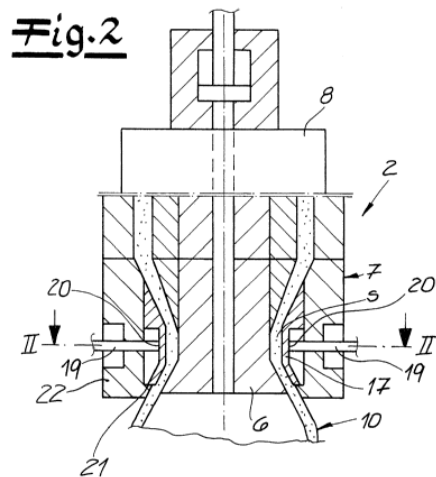
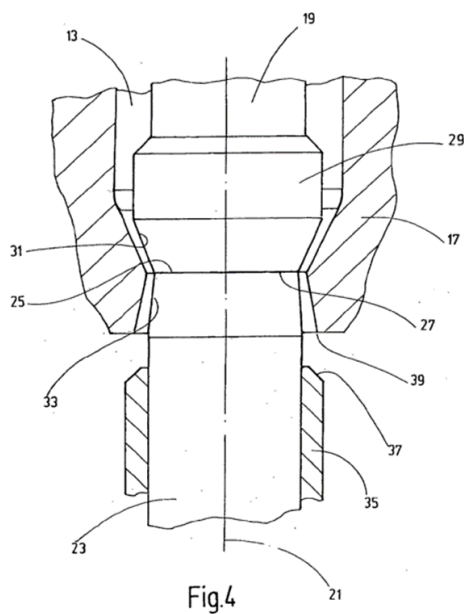
Illustrative example of subject matter classified in this group:



**B29C 49/04116****{characterised by the die}****Definition statement***This place covers:*

Preform extrusion wherein the die configuration is of particular importance and effect.

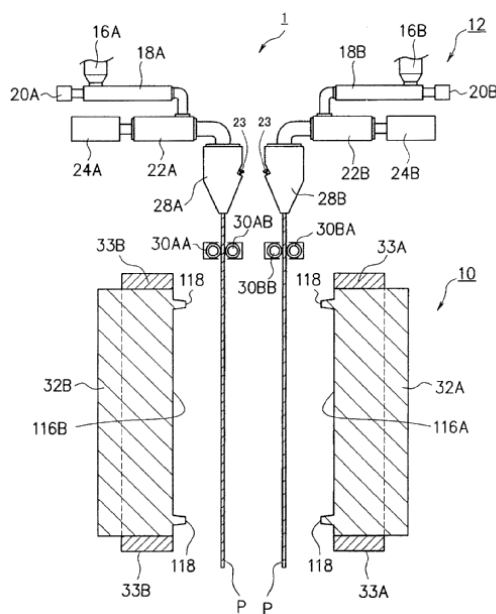
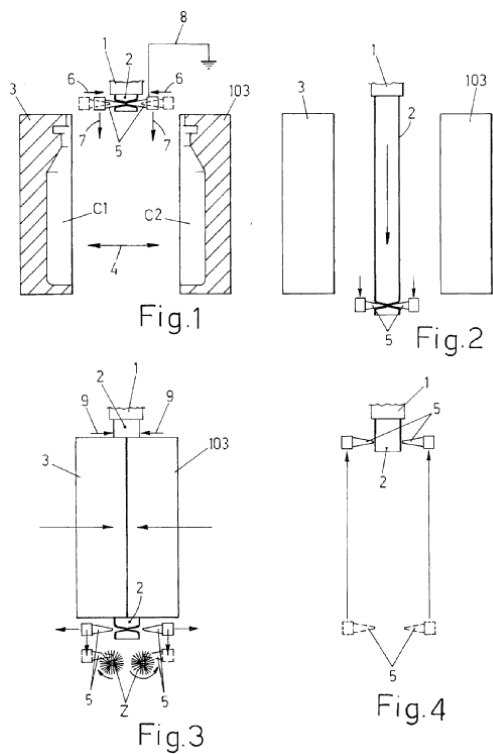
Illustrative example of subject matter classified in this group:

**B29C 49/04118****{Means for supporting the extruded parison}****Definition statement***This place covers:*

Preform extrusion method including elements which support or guide the preform after it is extruded.

## Definition statement

Illustrative example of subject matter classified in this group:



## B29C 49/0412

{Means for cutting the extruded preform}

## Definition statement

*This place covers:*

Cutting to length of the parison or cutting the tubular parison to form sheets.

## Definition statement

Illustrative example of subject matter classified in this group:

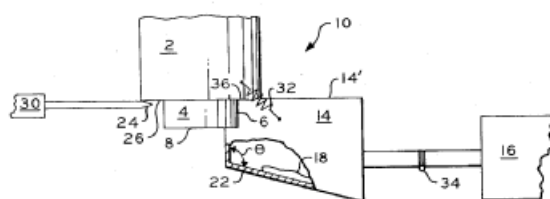
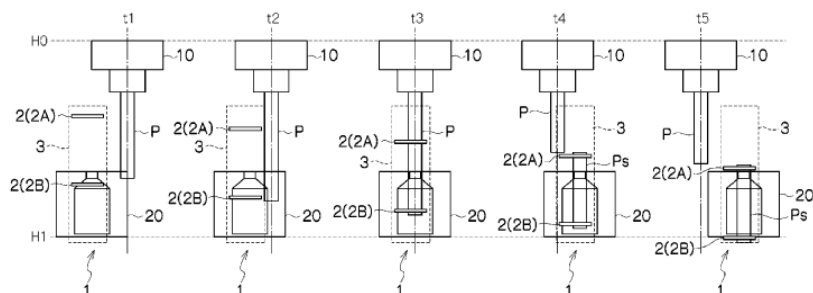


FIG. 1

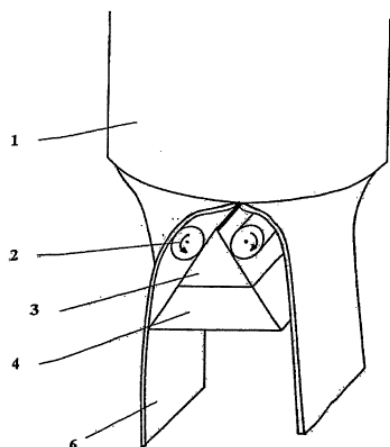


FIGURE 1

**B29C 49/06****Injection blow-moulding****Definition statement**

*This place covers:*

The injection moulding apparatus, with which the preform is produced.

The blow-moulding apparatus, with which the preform is blow-moulded.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Injection moulding	<a href="#">B29C 45/00</a>
Making preforms by injection moulding	<a href="#">B29B 11/08</a>

### Special rules of classification

The additional information classification [B29C 49/06](#) is allocated to a document to be classified, when the preform is produced by injection moulding but when the injection moulding apparatus is not disclosed in greater detail.

[B29C 49/42](#) has to be allocated as additional information where appropriate.

For the heating or cooling of preforms, as much as possible additional classification by adding appropriate classification in [B29C 49/64](#) or its subgroups, e.g. [B29C 49/6409](#) is recommended.

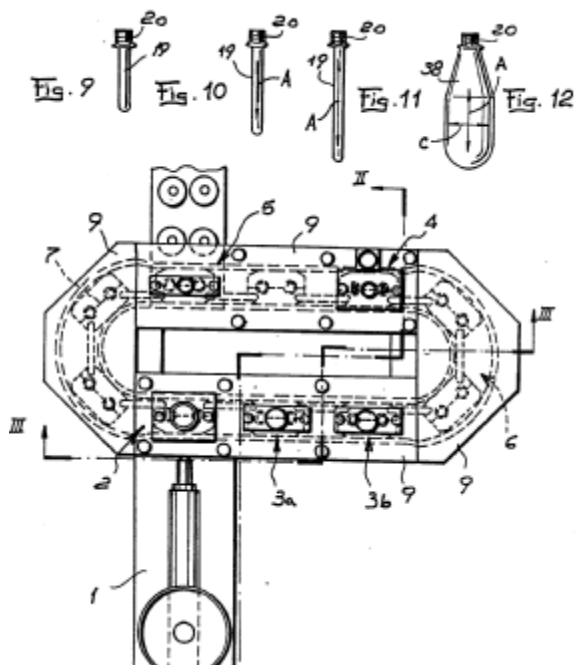
## B29C 49/061

{with parison holding means displaceable between injection and blow stations}

### Definition statement

This place covers:

- EP0228106



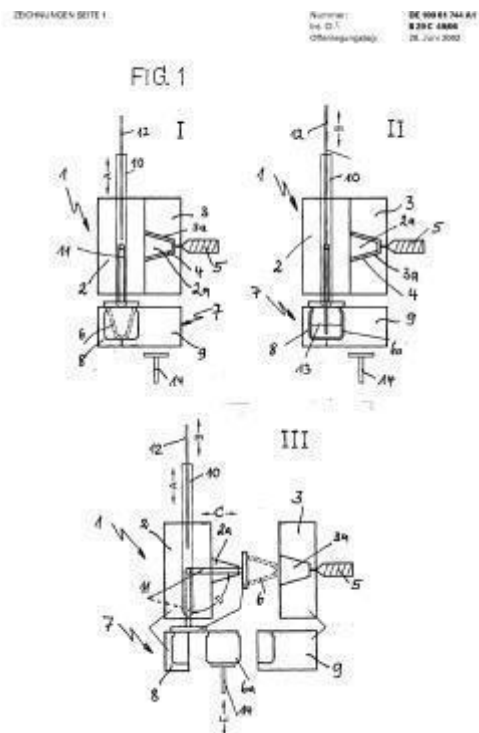
**B29C 49/062**

{following an arcuate path, e.g. rotary or oscillating-type}

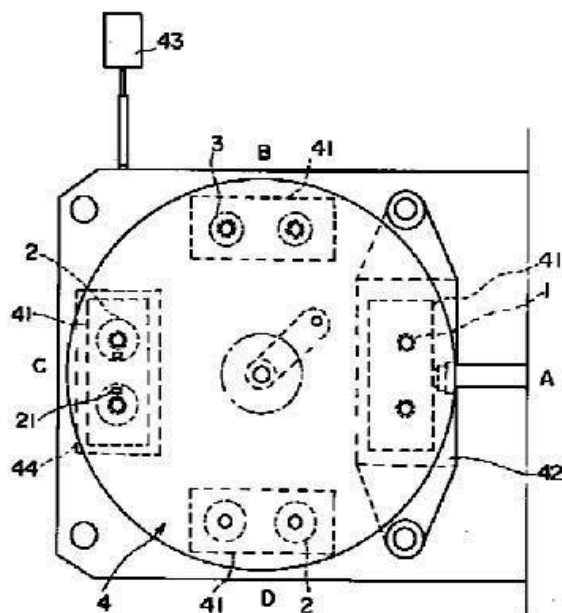
**Definition statement**

*This place covers:*

- DE10061744



- JP6238742



【図5】

## B29C 49/063

{with the parison axis held in the plane of rotation}

### Definition statement

*This place covers:*

- US2008118686

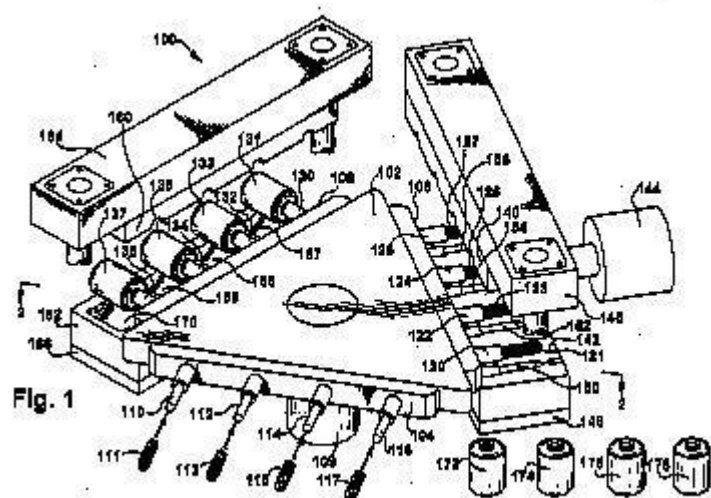


Fig. 1

Patent Application Publication May 22, 2008 Sheet 1 of 3

US 2008/018686 A1



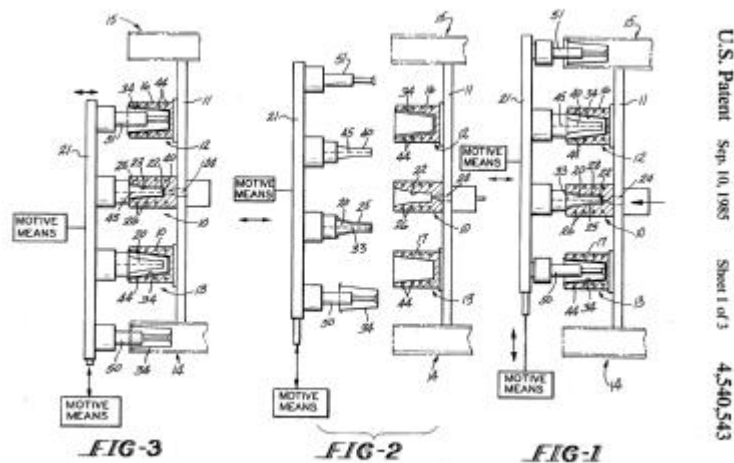
**B29C 49/064**

{following a rectilinear path, e.g. shuttle-type}

**Definition statement**

*This place covers:*

- US4540543



U.S. Patent Sep. 10, 1985 Sheet 1 of 3 4,540,543

**B29C 49/0665**

{the injection mould cavity and the blow-mould cavity being displaceable to the geometrically fixed injection core mould}

**Definition statement**

*This place covers:*

An injection moulding apparatus of creating a preform and a blow-moulding apparatus for blowing of the preform, which includes a stationary core that is common between the injection mould and the blow-mould.

Illustrative example of subject matter classified in this group:

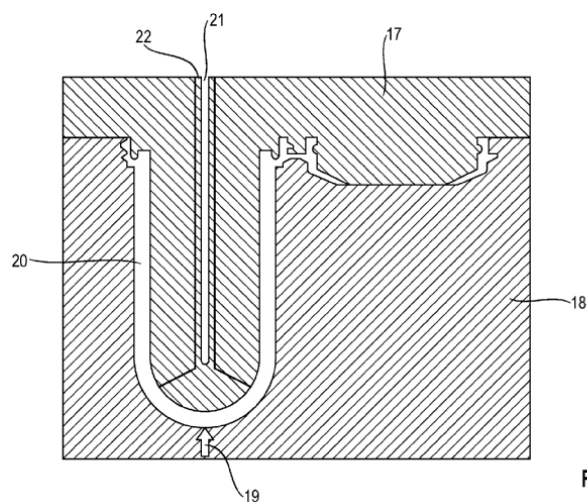
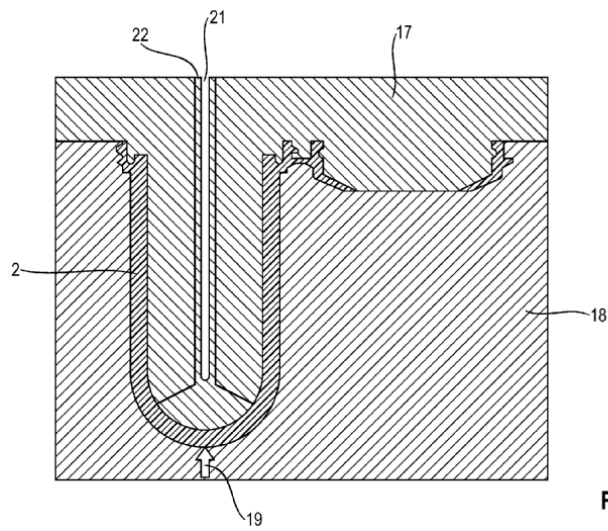
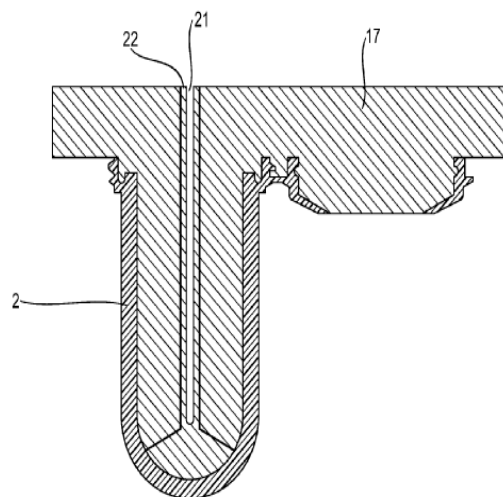


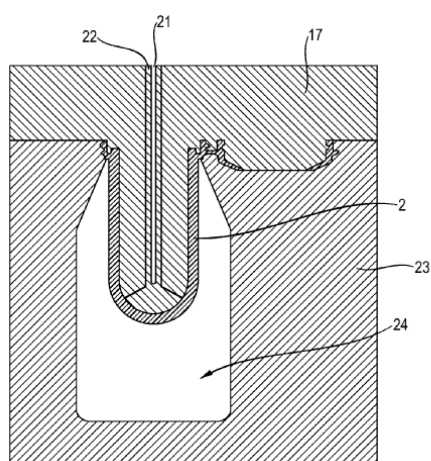
Fig. 9



**Fig. 10**



**Fig. 11**



**Fig. 12**

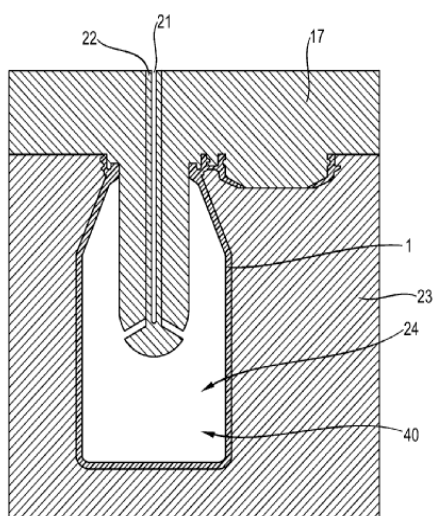


Fig. 13

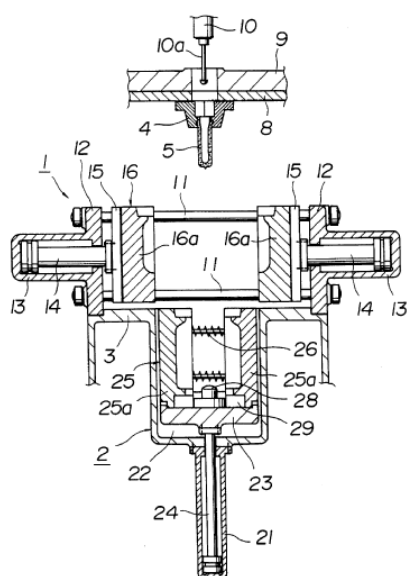


FIG. 2

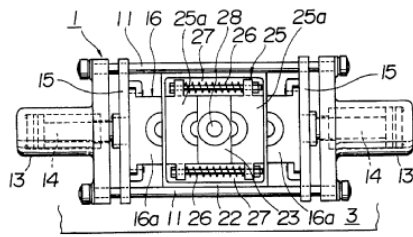


FIG. 3

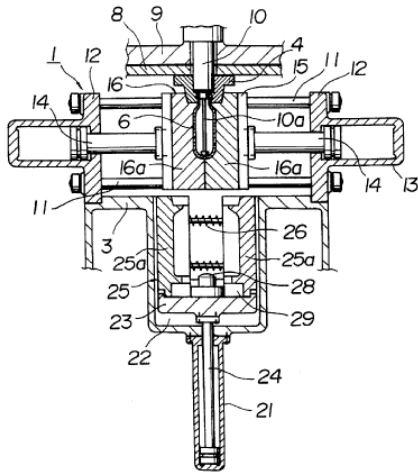
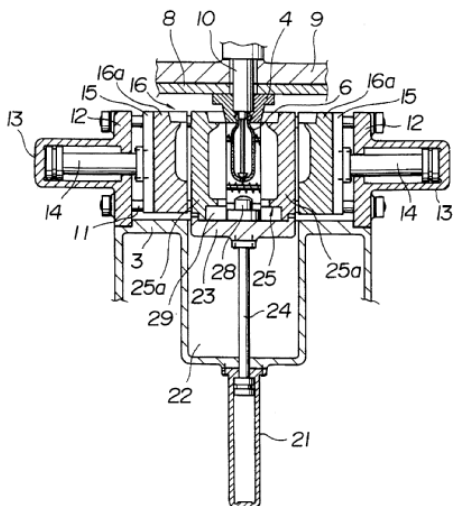
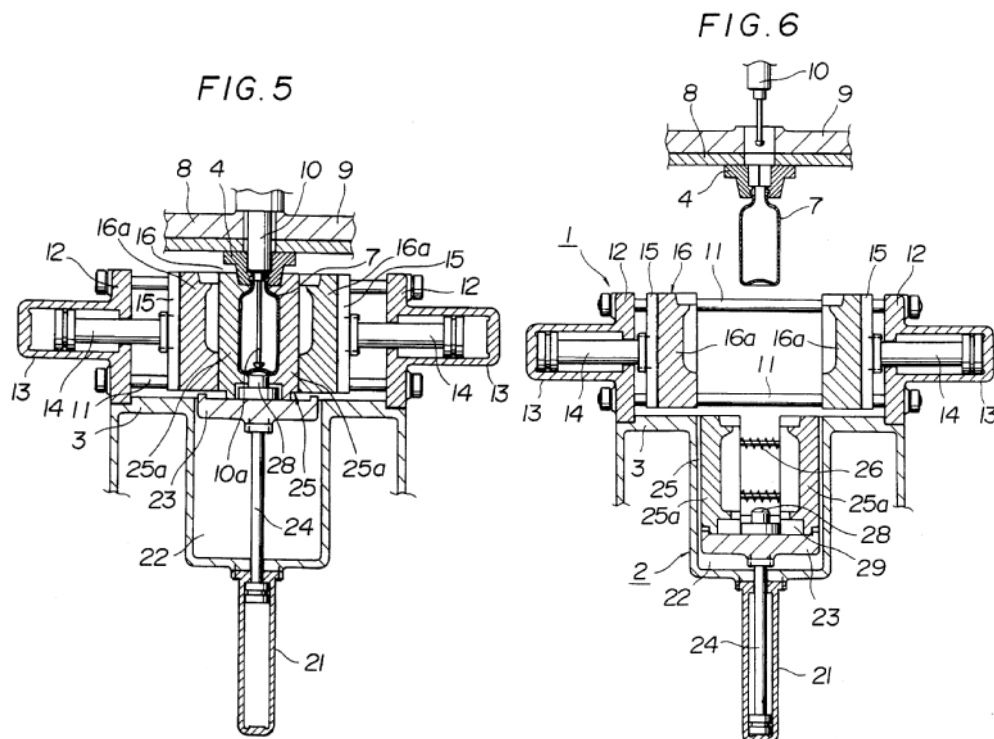


FIG. 4

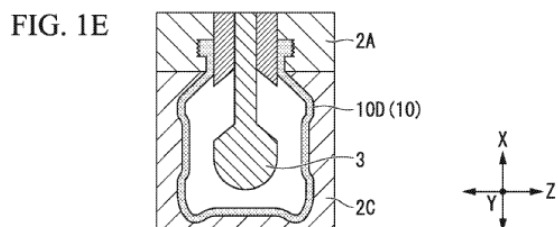
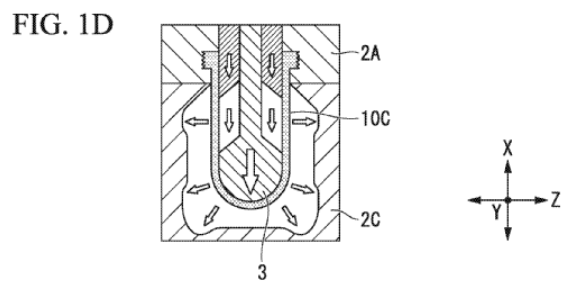
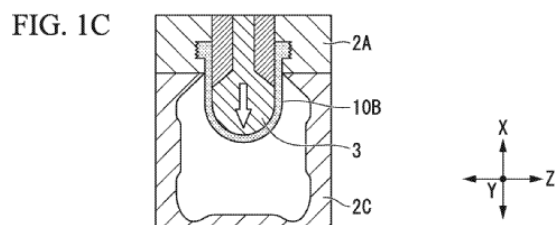
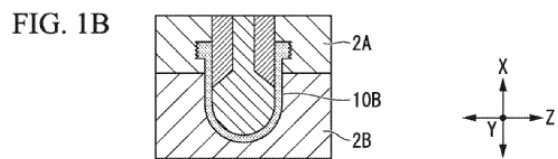
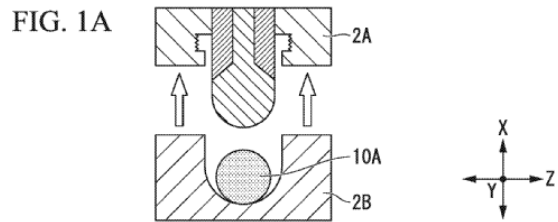


**B29C 49/0685****{Compression blow-moulding}****Definition statement**

*This place covers:*

Blow-moulding where the preform is made by compression moulding and then blow-moulded into a final article.

Illustrative example of subject matter classified in this group:



**B29C 49/06905****{Using combined techniques for making the preform}****Definition statement***This place covers:*

Preform manufacturing which includes a variety of moulding processes, e.g. compression, injection, extrusion, or casting.

Illustrative example of subject matter classified in this group:

The figure shows a combination of injection moulding followed by extrusion as the die moves away from the neck mould.

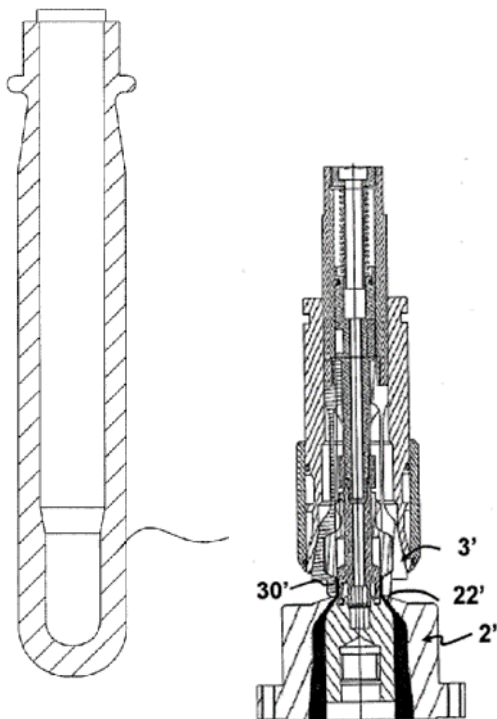


Fig.7

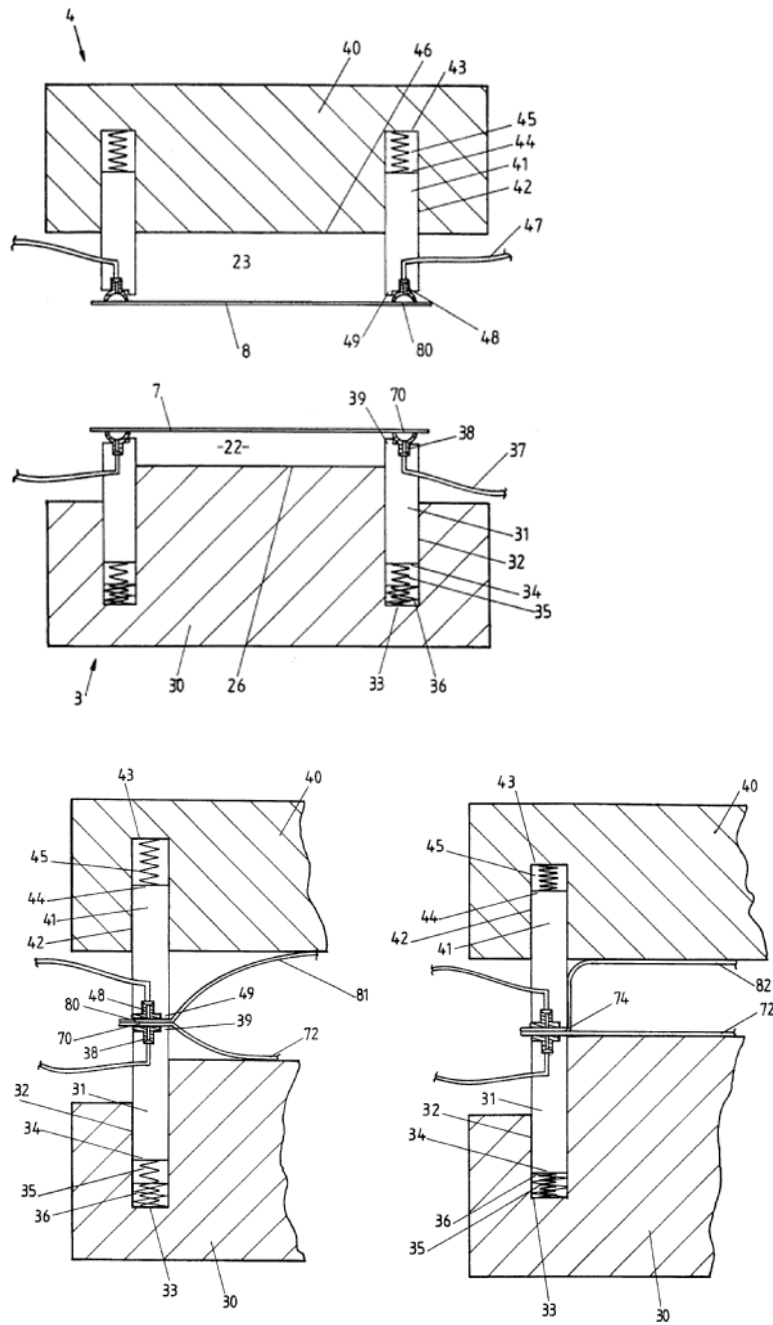
**B29C 49/06912****{using folded sheets as a preform, e.g. folded into parallel sheets or rolled into cylindrical shape}****Definition statement***This place covers:*

Preform manufacturing which includes making sheets followed by a folding process to create the preform.

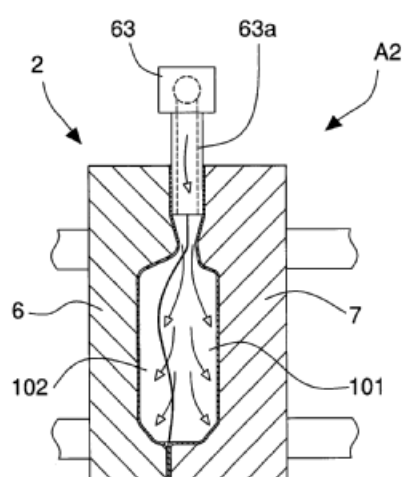
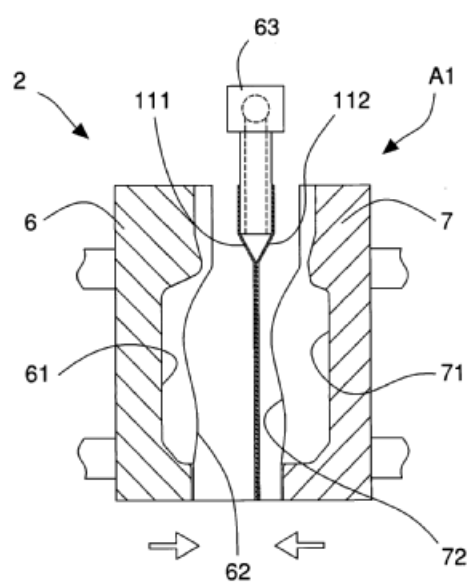
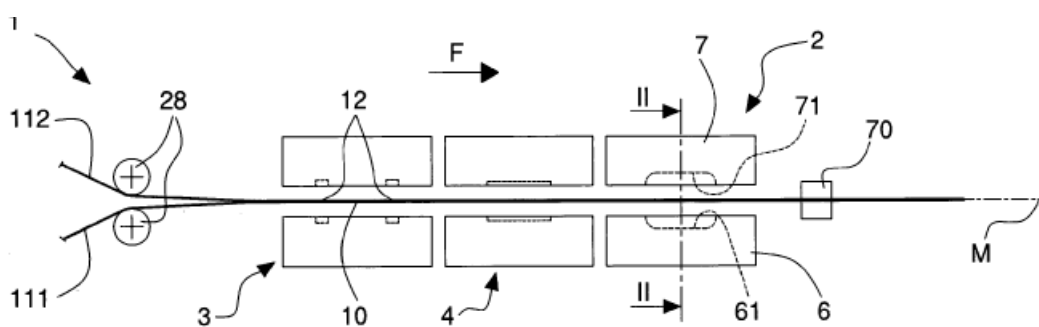
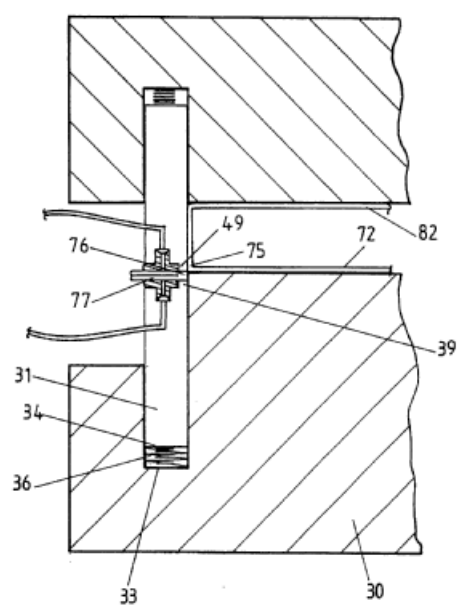
**B29C 49/06914****{using parallel sheets as a preform}****Definition statement***This place covers:*

Manufacturing process which identifies the preform as two parallel sheets.

Illustrative example of subject matter classified in this group:







**B29C 49/06916**

{Means for avoiding parts of the sheets to stick together, e.g. to provide blow opening}

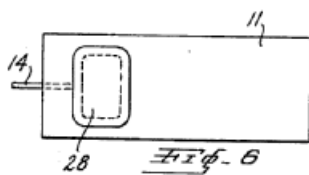
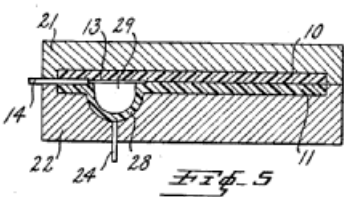
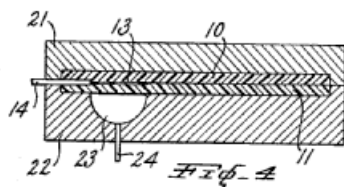
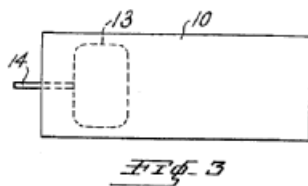
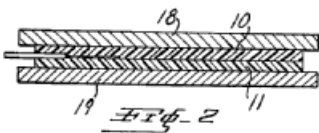
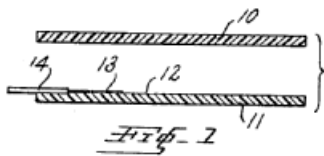
**Definition statement**

*This place covers:*

A process which uses two preformed sheets which are prevented from contacting each other in certain areas.

Illustrative example of subject matter classified in this group:

A hollow container producing device comprising a jetting unit that discharges a jet of gas toward each of the pair of parison sheets from an intermediate frame side of the parison sheet.



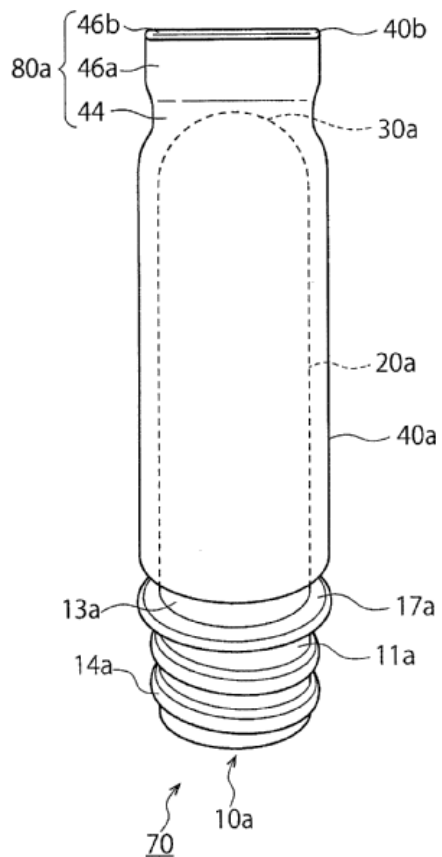
**B29C 49/071**

**{Preforms or parisons characterised by their configuration, e.g. geometry, dimensions or physical properties}**

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:



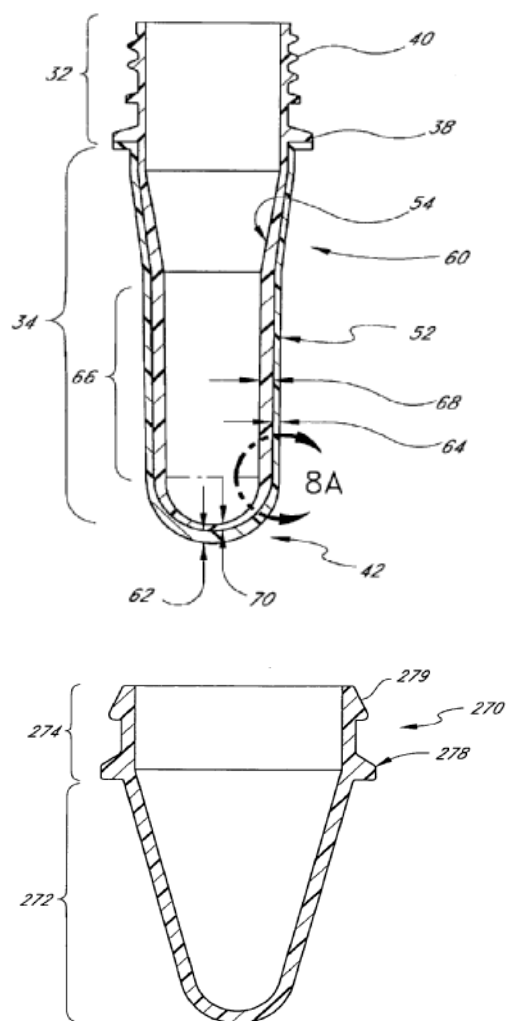
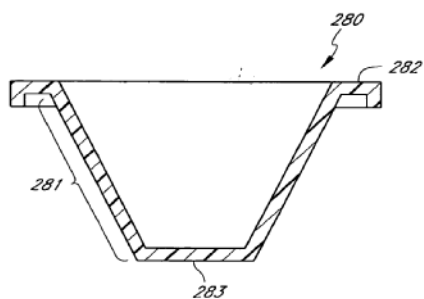


FIG. 16



**B29C 49/08****Biaxial stretching during blow-moulding****Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

Biaxial stretching	stretching in two directions whereby one stretching component must be in longitudinal direction of the preform or in extrusion direction of an extruded parison
--------------------	---

**B29C 49/085**

**{without pre-stretching, e.g. simple blowing step}**

**Definition statement**

*This place covers:*

Blow moulding processes, whereby the preform length before blow moulding is shorter than the mould cavity. The preform has therefore also a stretching component in the longitudinal direction during the blowing operation.

**B29C 49/086**

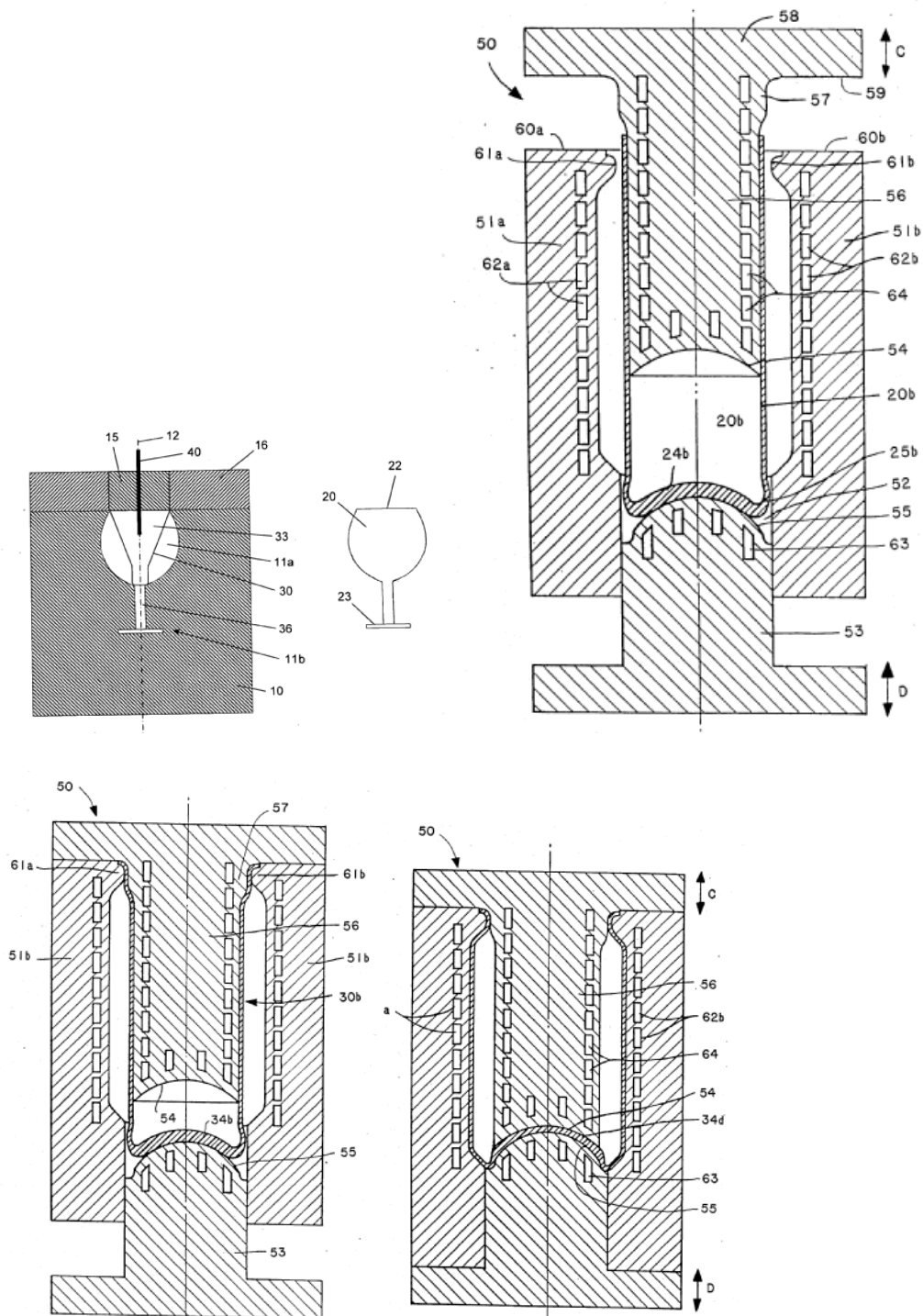
**{mono-axial stretching, e.g. either length or width}**

**Definition statement**

*This place covers:*

Blow-moulding process where a preform of a particular configuration is stretched only one direction.

Illustrative example of subject matter classified in this group:



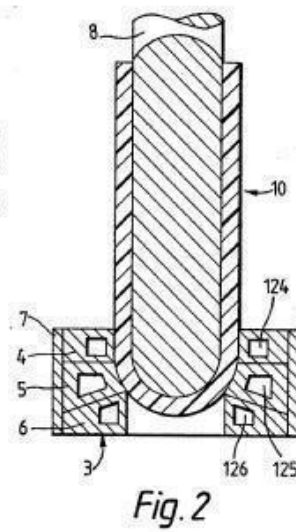
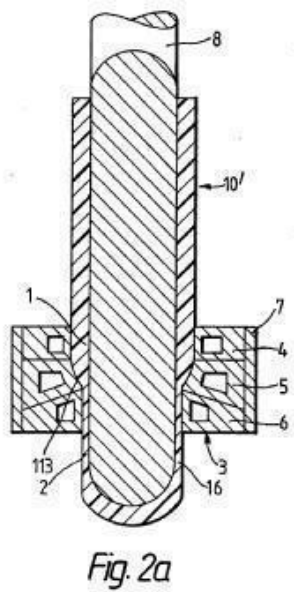
**B29C 49/10**

using mechanical means {for prestretching}

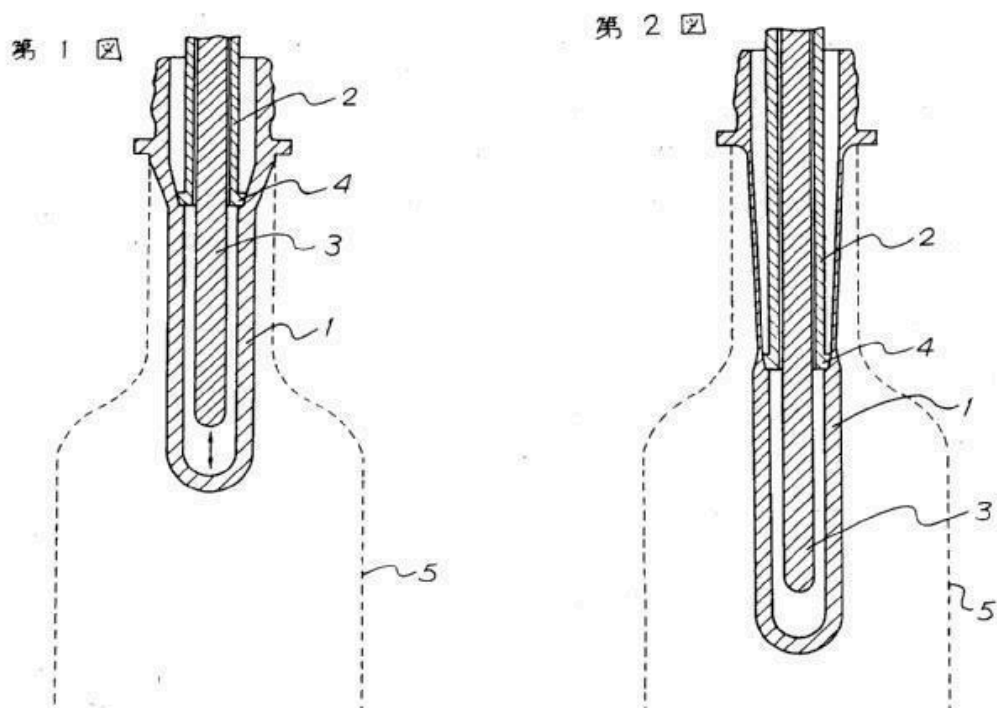
**Definition statement**

*This place covers:*

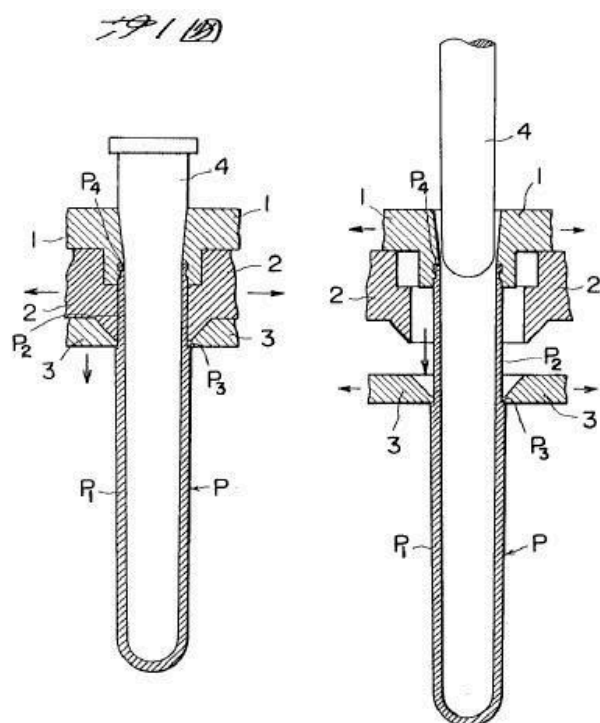
- FR2516855



- JP58045030

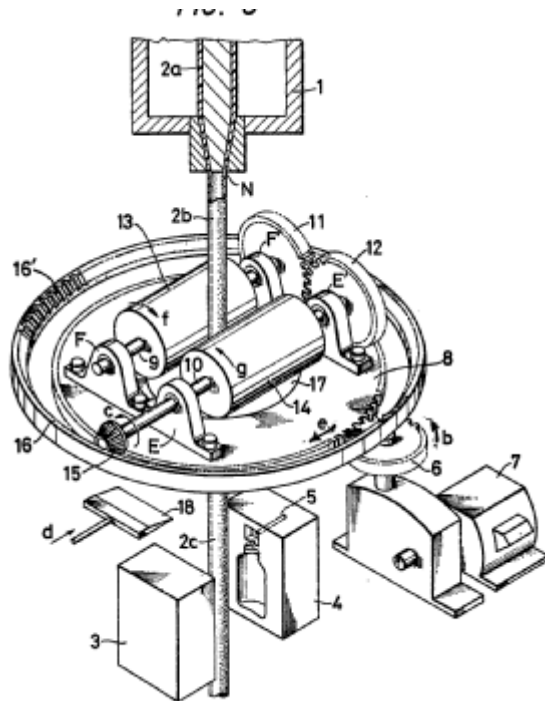


- JP58016826





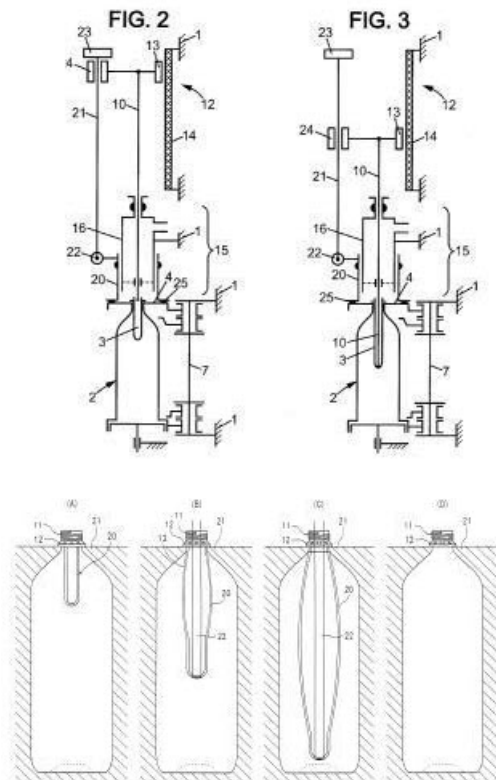
- GB1501775



**B29C 49/12****Stretching rods****Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:

**B29C 49/1202**

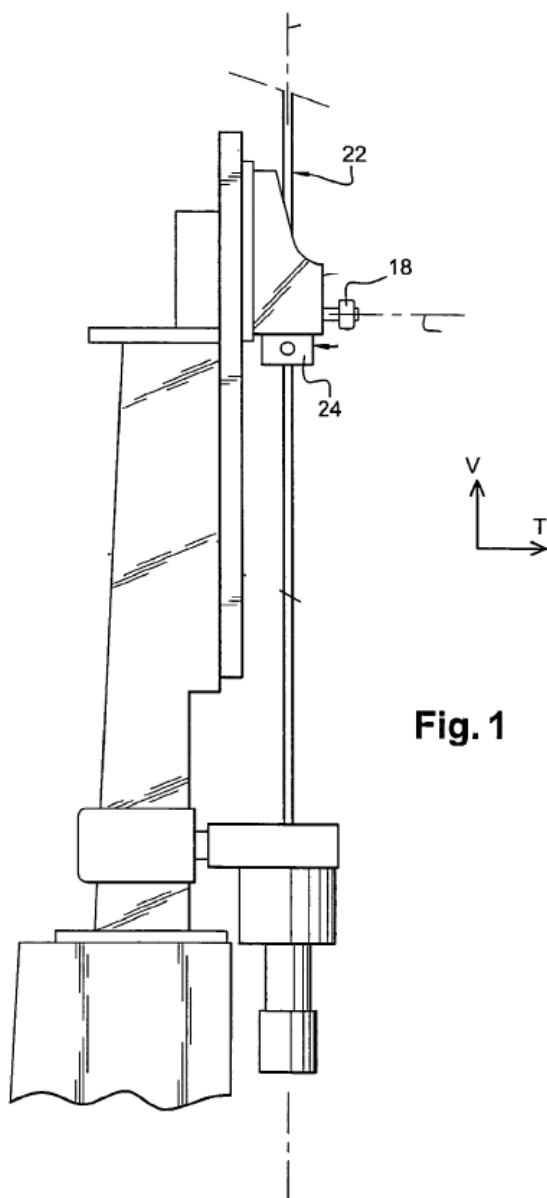
**{Means for fixing the stretching rod to the driving means, e.g. clamping means or bayonet connections}**

**Definition statement**

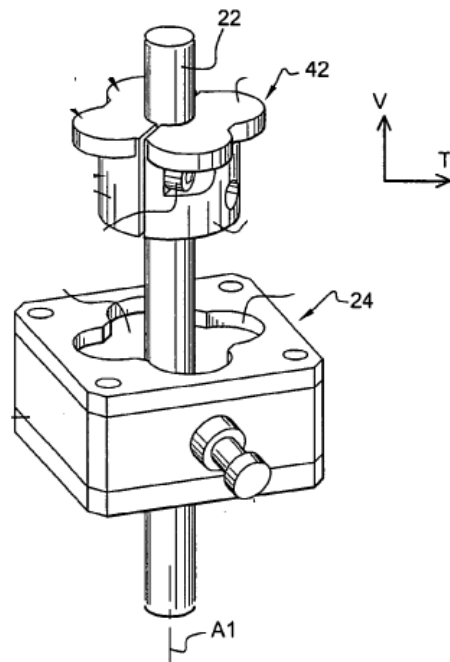
*This place covers:*

Stretching rods which are attached to their driving means by mechanical features.

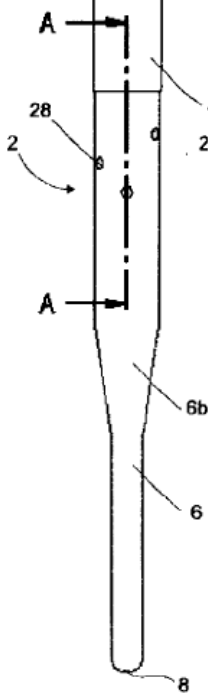
Illustrative example of subject matter classified in this group:



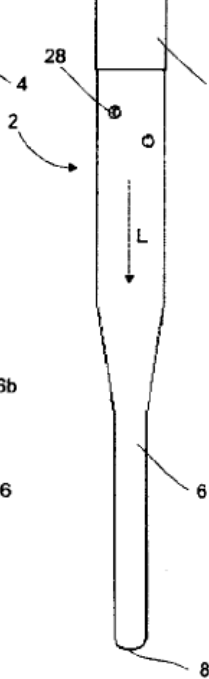
**Fig. 2**



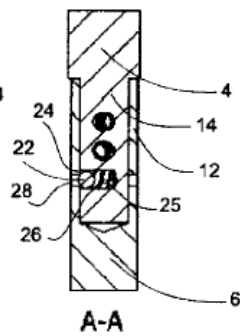
**Fig. 2a**



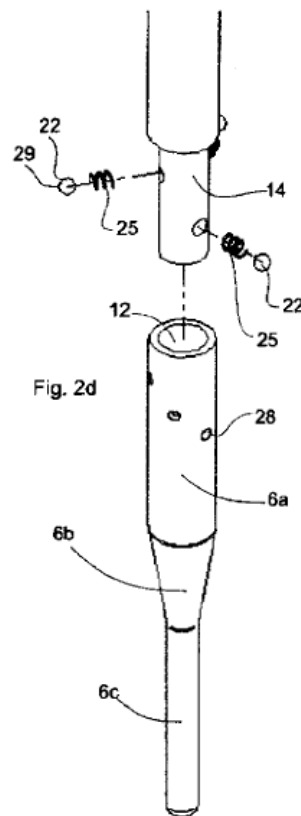
**Fig. 2b**



**Fig. 2c**



**Fig. 2d**



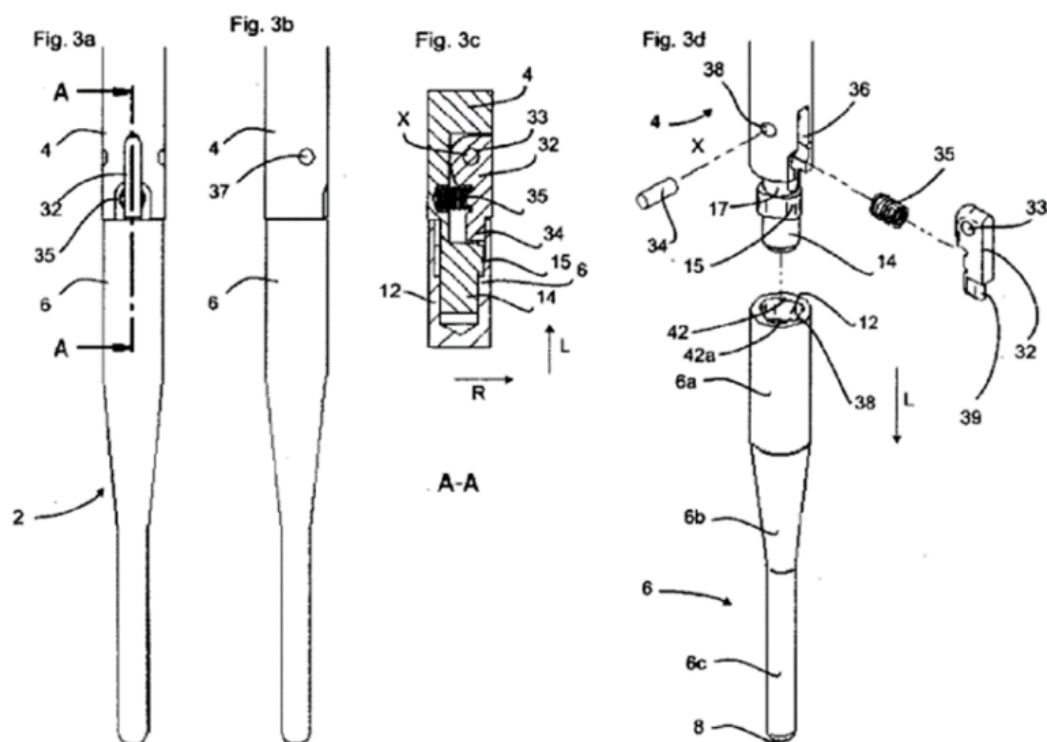


Fig. 4

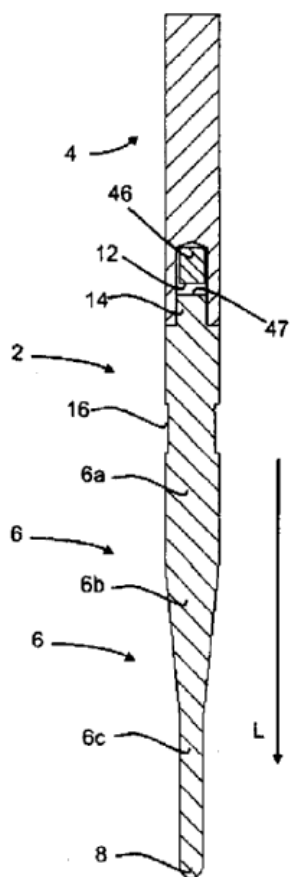
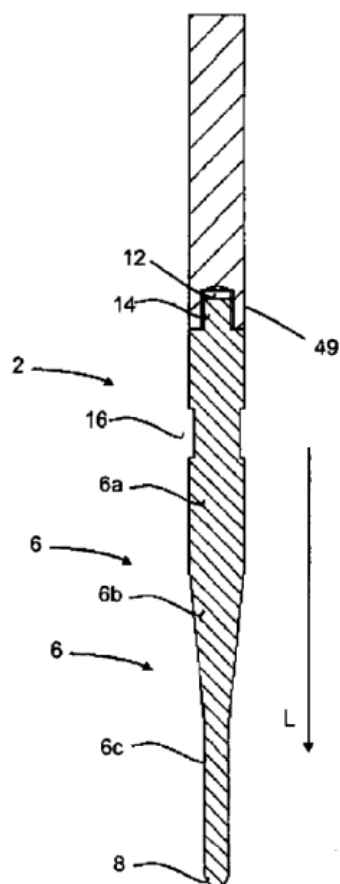


Fig. 5



**B29C 49/1205**

{relative rotation between the preform and the stretch rod}

**Definition statement**

*This place covers:*

Stretch rod configuration which allows rotation between the stretch rod and the preform.

**B29C 49/1206**

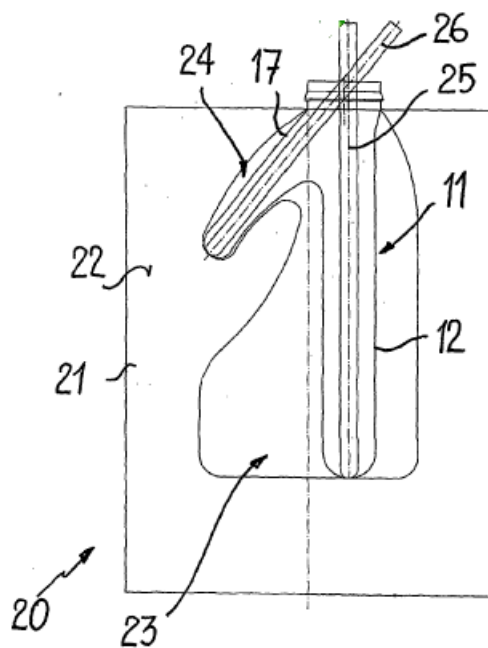
{using at least two stretching rods for stretching different parts of the preform}

**Definition statement**

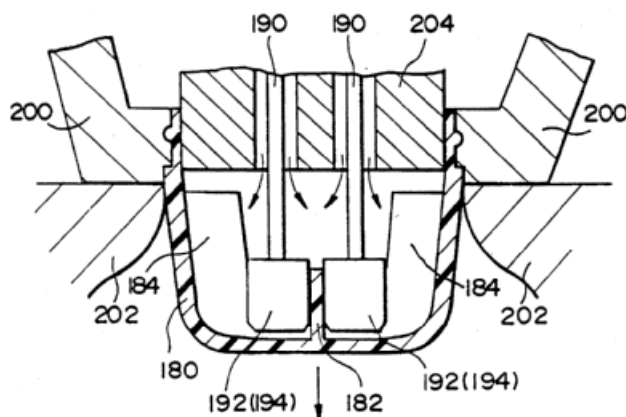
*This place covers:*

Several biaxial stretching rods which are each positioned to act upon different areas of the preform.

Illustrative example of subject matter classified in this group:



**Fig. 3**



**B29C 49/1208**

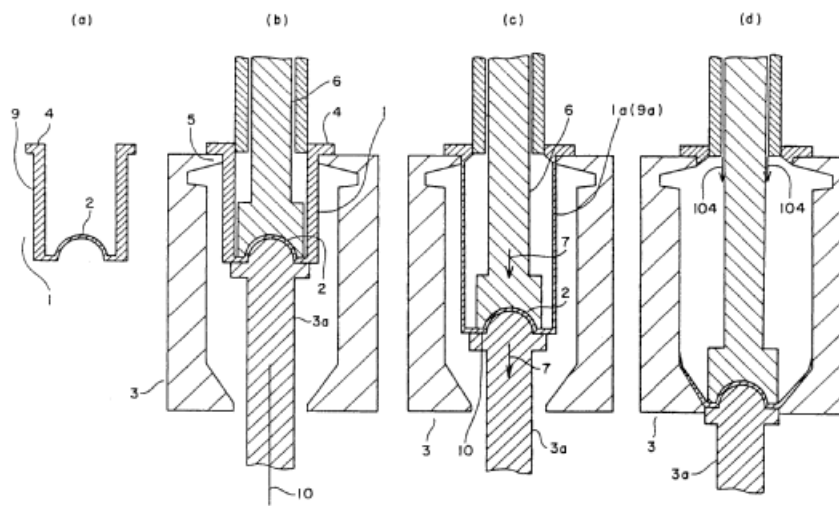
{using additional means to clamp the preform bottom while stretching the preform}

**Definition statement**

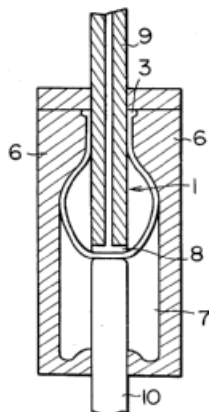
*This place covers:*

Stretching rods which include the ability to hold/clamp the preform bottom while stretching occurs.

Illustrative example of subject matter classified in this group:



*Fig. 3*

**B29C 49/1212**

{the stretching rod comprising at least one opening on the surface, e.g. through which compressed air is blown into the preform to expand the same}

**Definition statement**

*This place covers:*

Stretching rod which includes openings on its surface which facilitate compressed air to be blown through the openings into the preform.

Illustrative example of subject matter classified in this group:

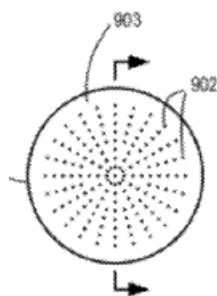


FIG. 15A

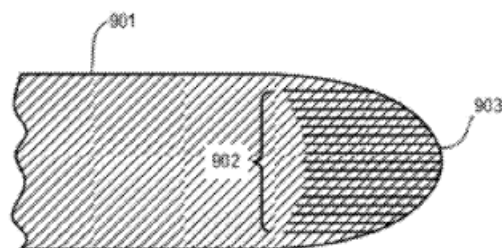
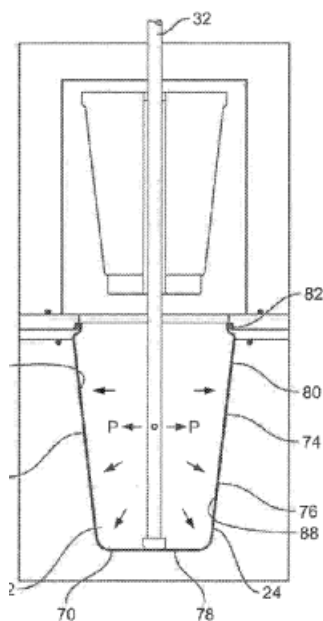
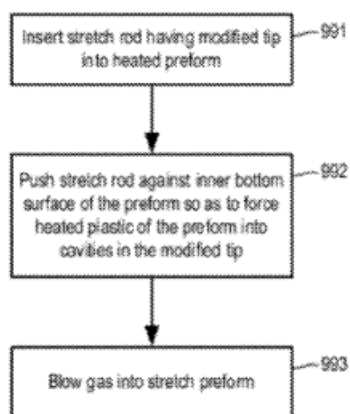


FIG. 15B





**B29C 49/1215**

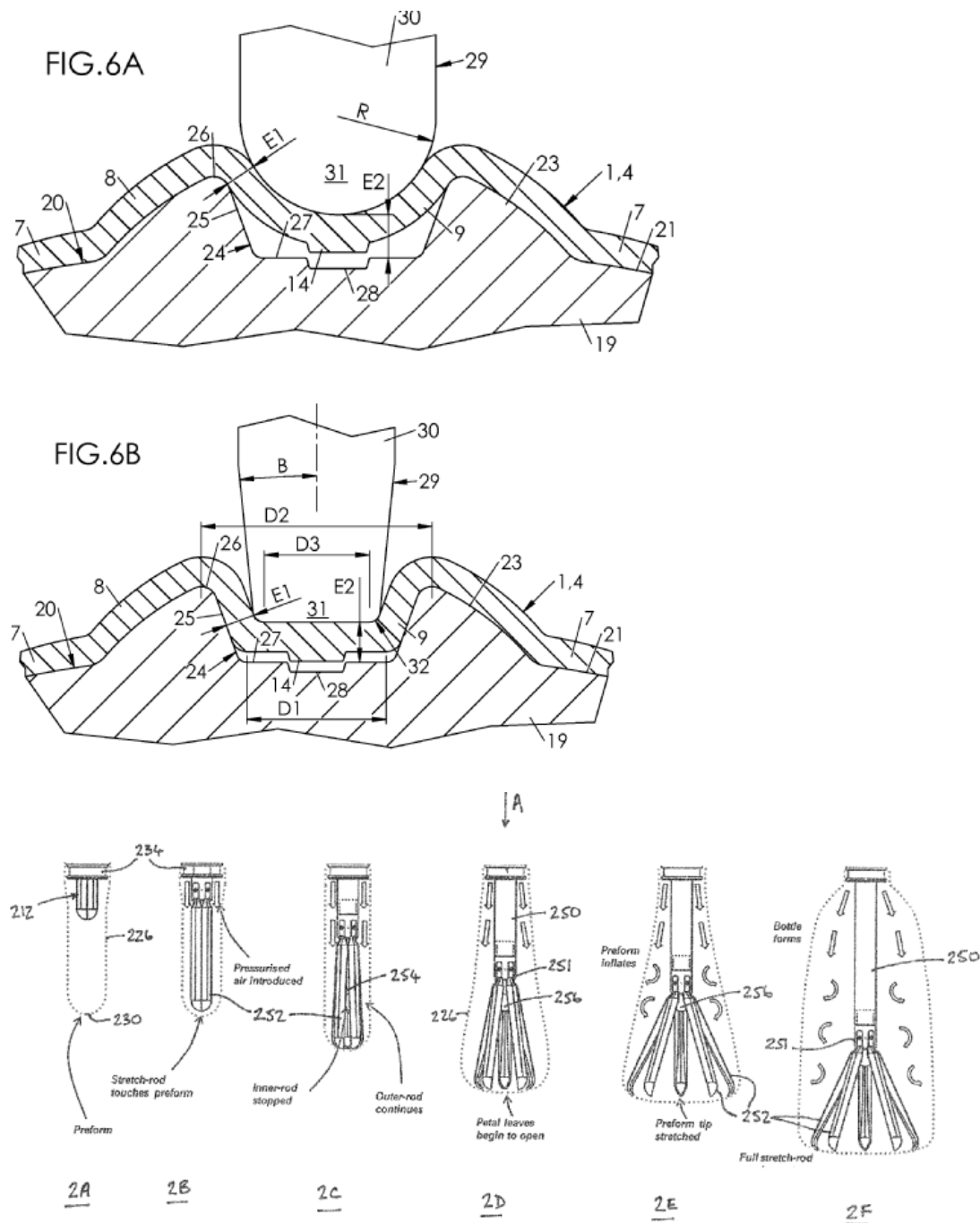
{Geometry of the stretching rod, e.g. specific stretching rod end shape}

**Definition statement**

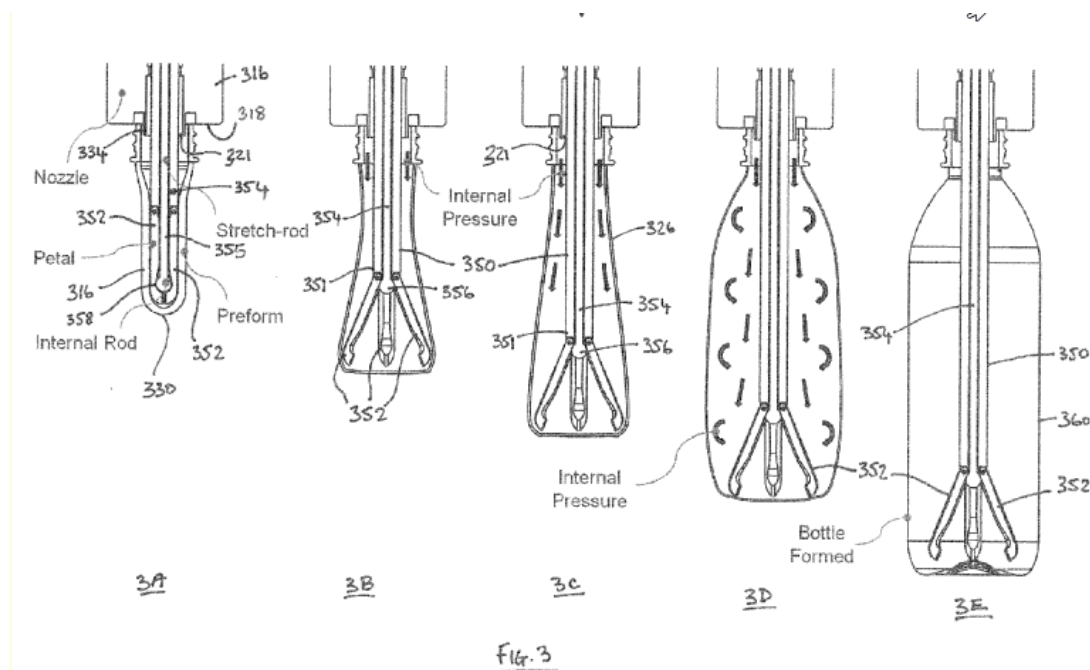
*This place covers:*

Stretching rods which are particularly configured to have a specific geometry or shape.

Illustrative example of subject matter classified in this group:



## Definition statement

**B29C 49/1216**

{Material for stretching rods or parts thereof, e.g. heat insulating material}

**Definition statement**

*This place covers:*

Stretching rods which are characterised by specific material, usually for a specific purpose.

**B29C 49/1218**

{to stretch heated tubes}

**Definition statement**

*This place covers:*

Stretching rods which are particularly suited to act upon heated preforms, e.g. tubes.

**B29C 49/1222**

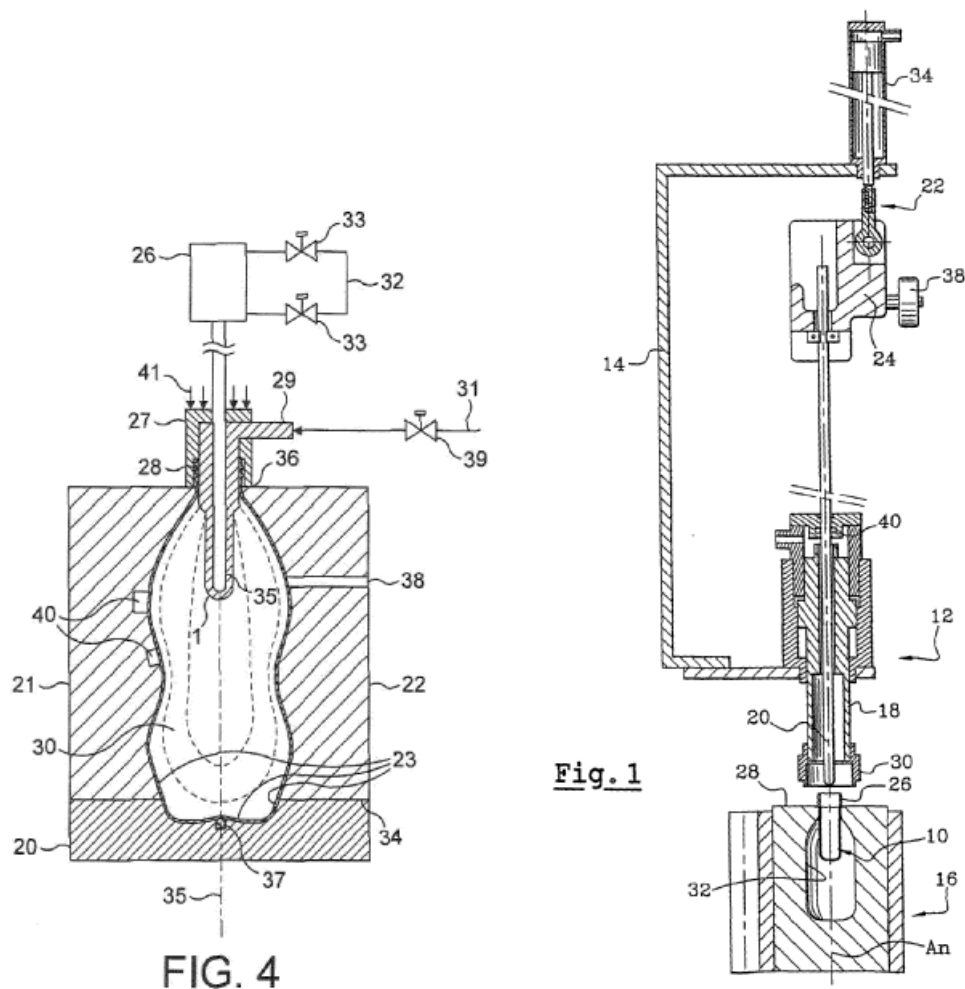
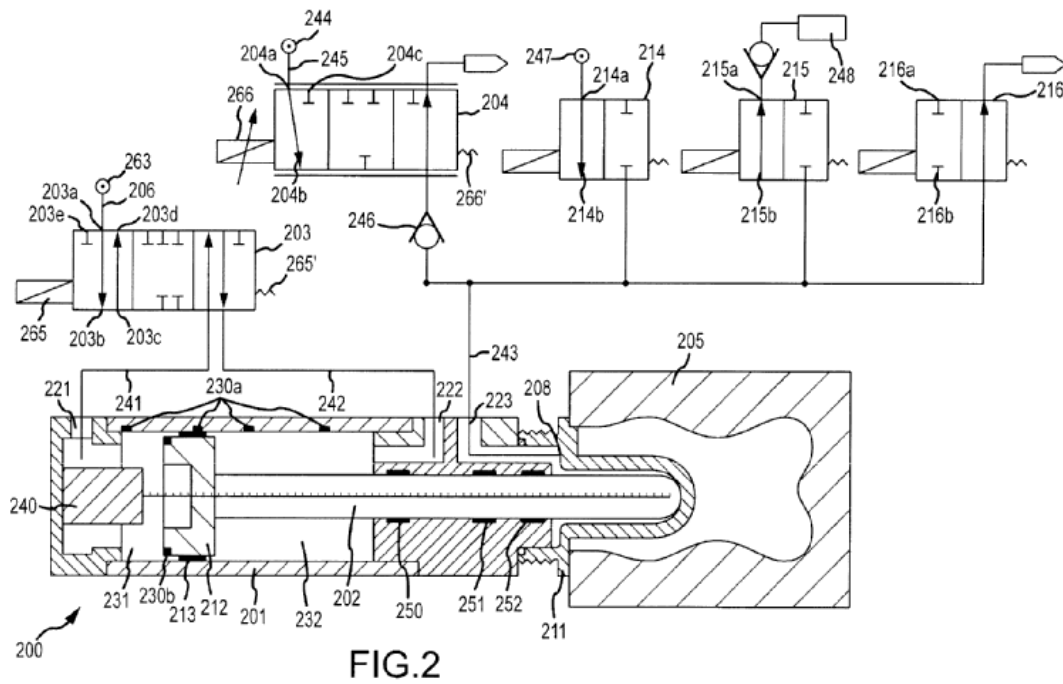
{Pneumatic}

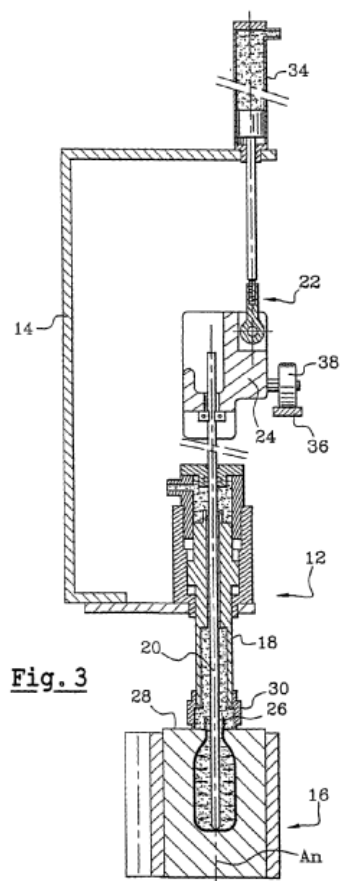
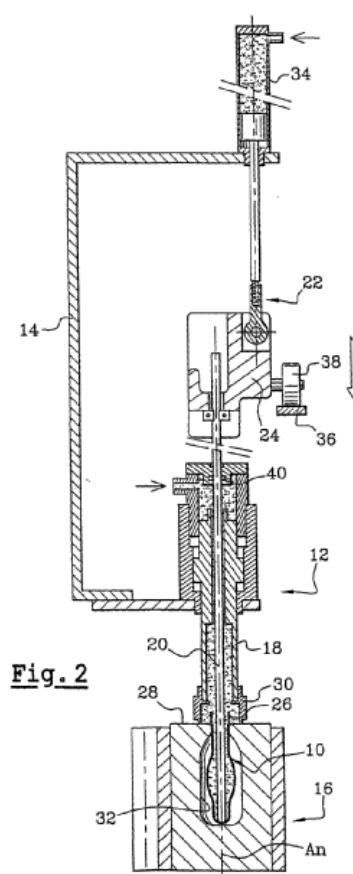
**Definition statement**

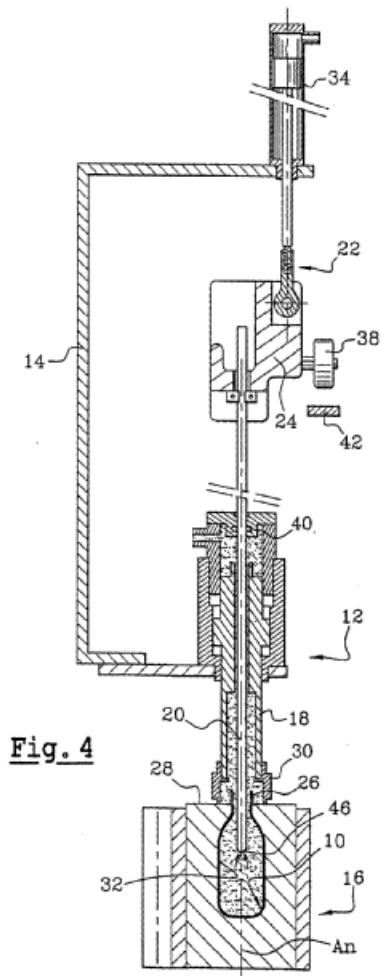
*This place covers:*

Pneumatic drive apparatus for a stretching element that provides a controlled stretch ratio.

Illustrative example of subject matter classified in this group:







## **B29C 49/1224**

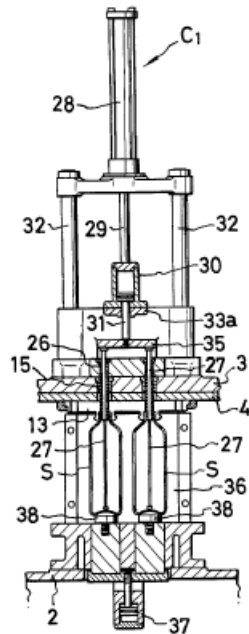
**{Hydraulic}**

### **Definition statement**

*This place covers:*

Hydraulic drive apparatus for a stretching element that provides a controlled stretch ratio.

Illustrative example of subject matter classified in this group:



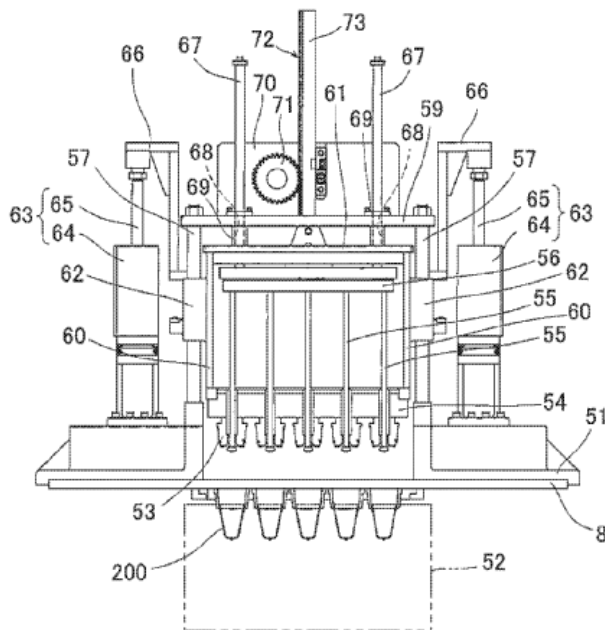
## {Mechanical}

*This place covers:*

Mechanical drive apparatus for a stretching element that provides a controlled stretch ratio.

## Definition statement

Illustrative example of subject matter classified in this group:

**B29C 49/1229**

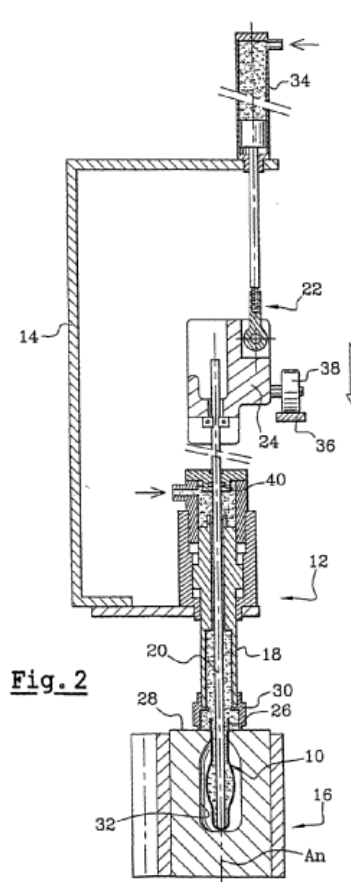
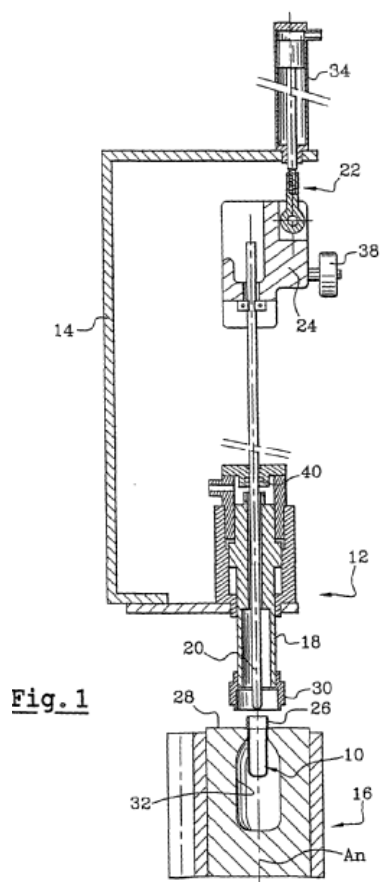
{being a cam mechanism}

**Definition statement**

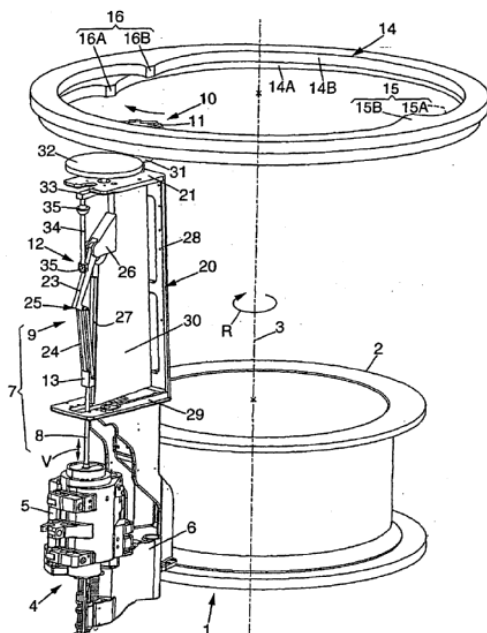
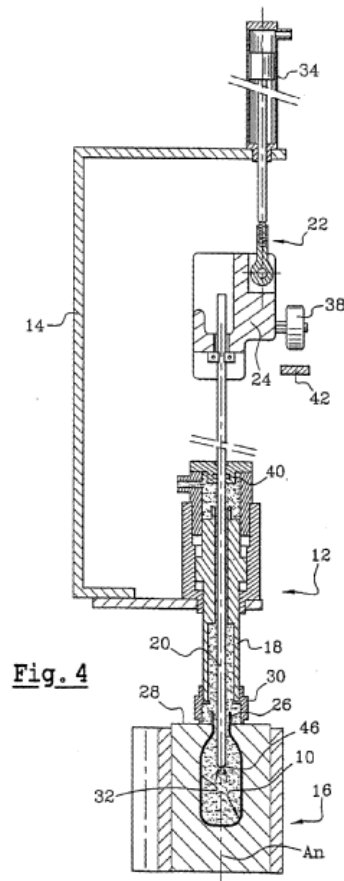
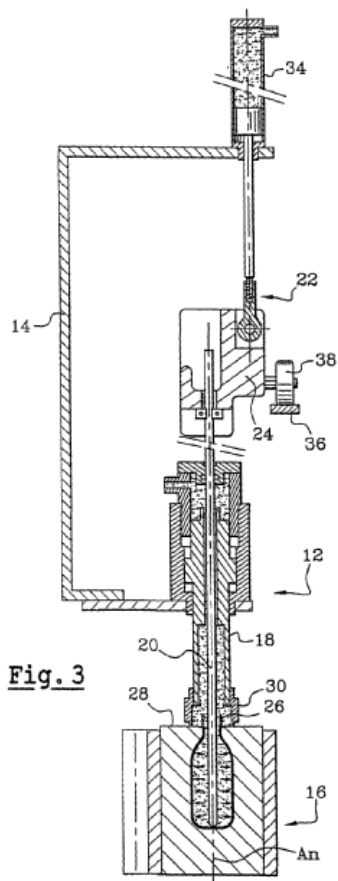
*This place covers:*

Stretching rod having a cam mechanism drive means, which stretching rod provides a controlled stretch ratio.

Illustrative example of subject matter classified in this group:







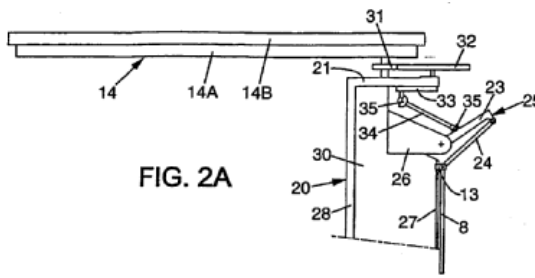


FIG. 2A

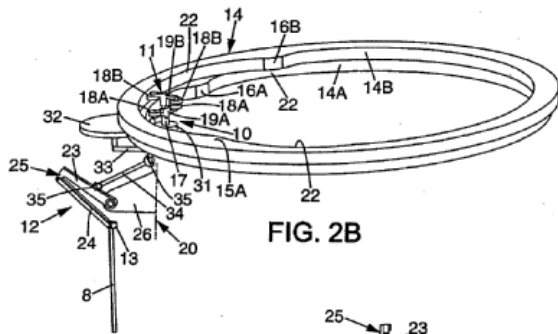


FIG. 2B

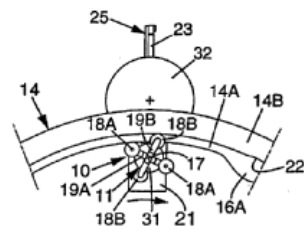


FIG. 2C

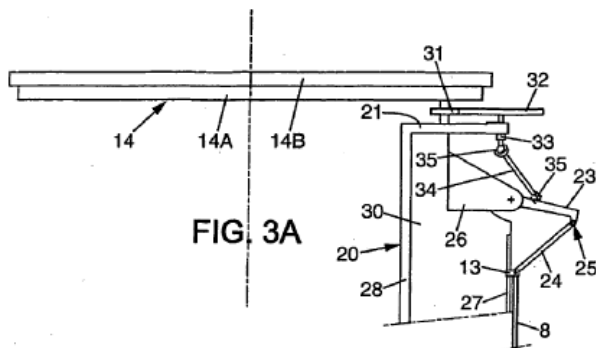


FIG. 3A

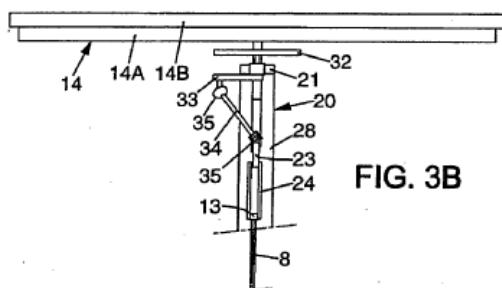


FIG. 3B

Definition statement

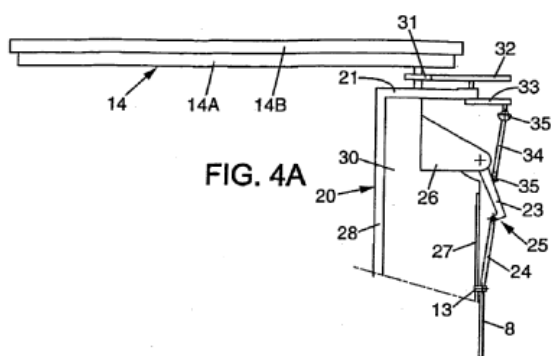


FIG. 4A

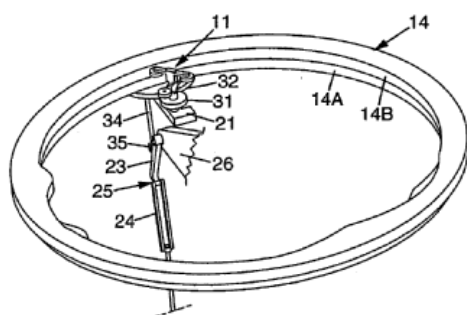


FIG. 4B

**B29C 49/123**

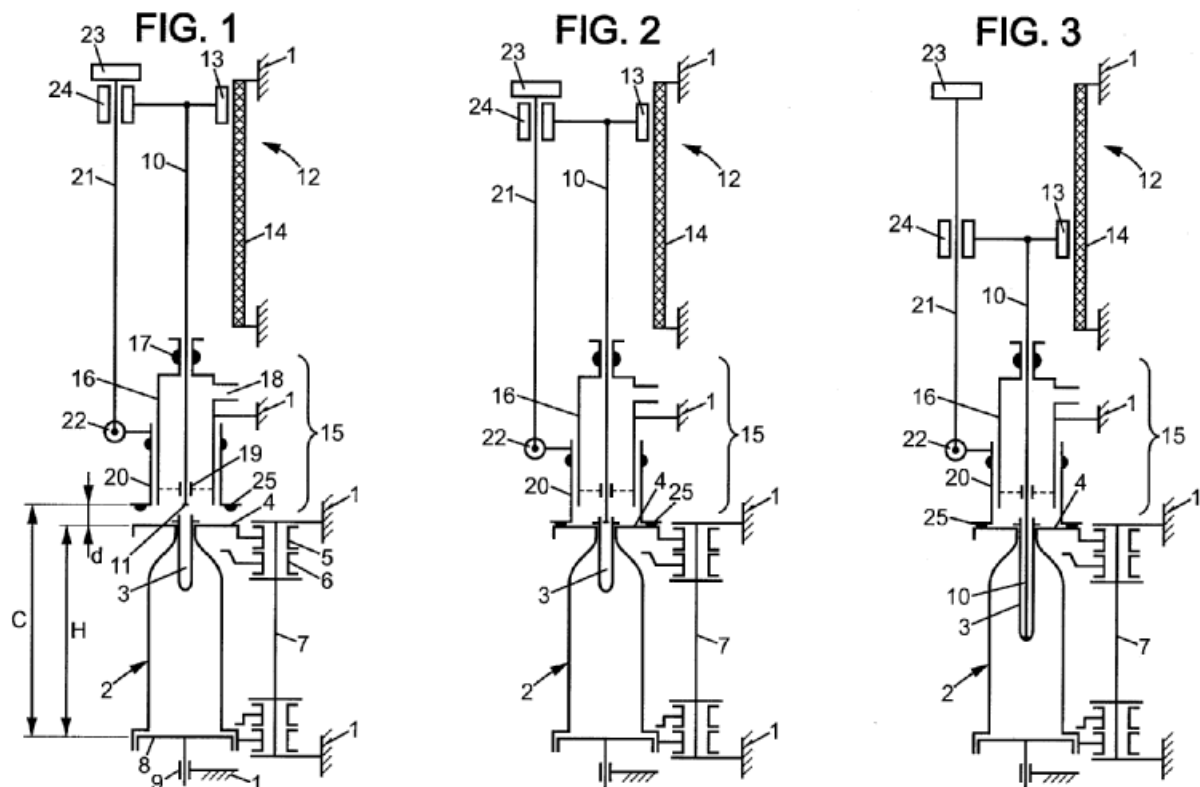
{Electric drives, e.g. linear motors}

**Definition statement***This place covers:*

Blow-moulding which includes a stretch rod which is driven by electric motors.

## Definition statement

Illustrative example of subject matter classified in this group:



## B29C 49/1232

{Magnetic}

## Definition statement

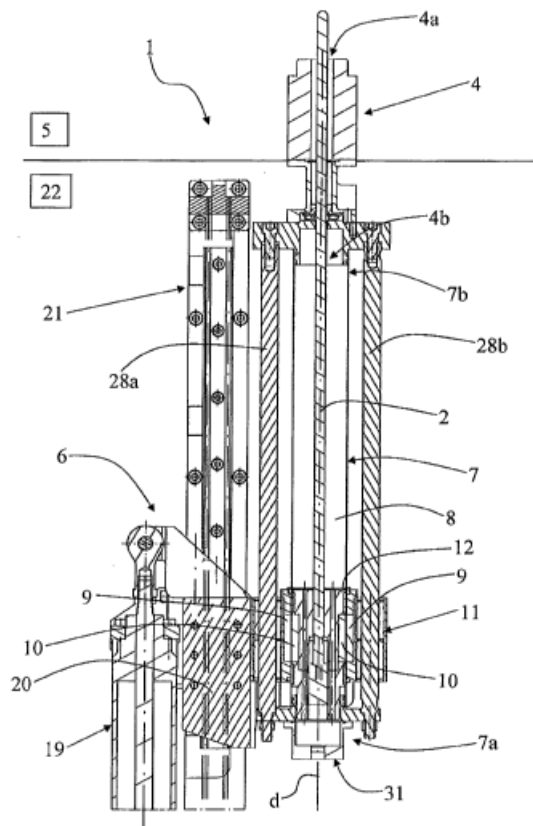
*This place covers:*

Magnetic drive apparatus for a stretching element that provides a controlled stretch ratio.

Illustrative example of subject matter classified in this group:

## Definition statement

The activating means 6 comprise a first magnet arrangement 9 which is magnetically coupled with a second magnet arrangement 10 located within said chamber 8 and integral to the stretching rod 2.



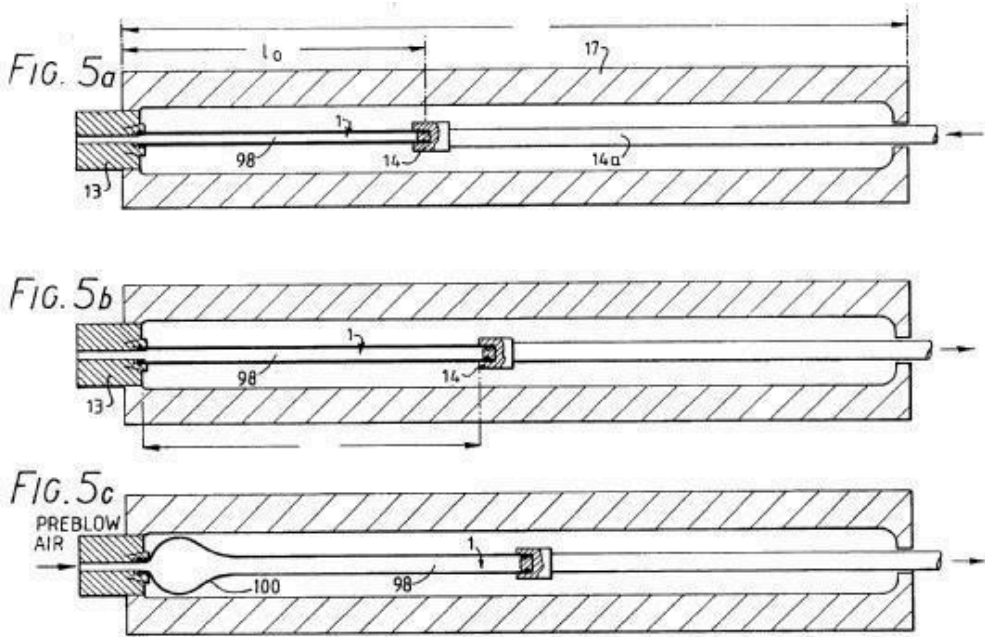
B29C 49/14

Clamps

Definition statement

This place covers:

- EP0434277

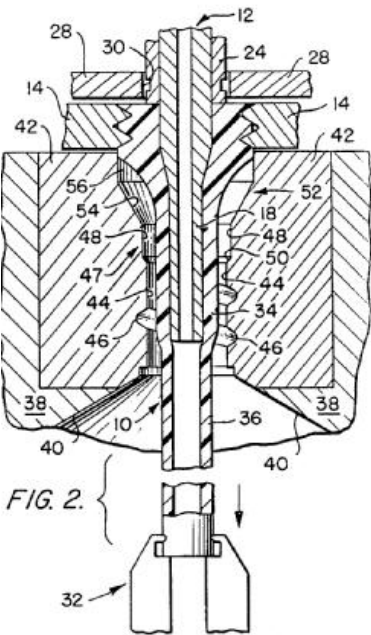


EP 0 434 277 A1

US4442063

Sheet 1 of 3

4,442,063



**B29C 49/16**

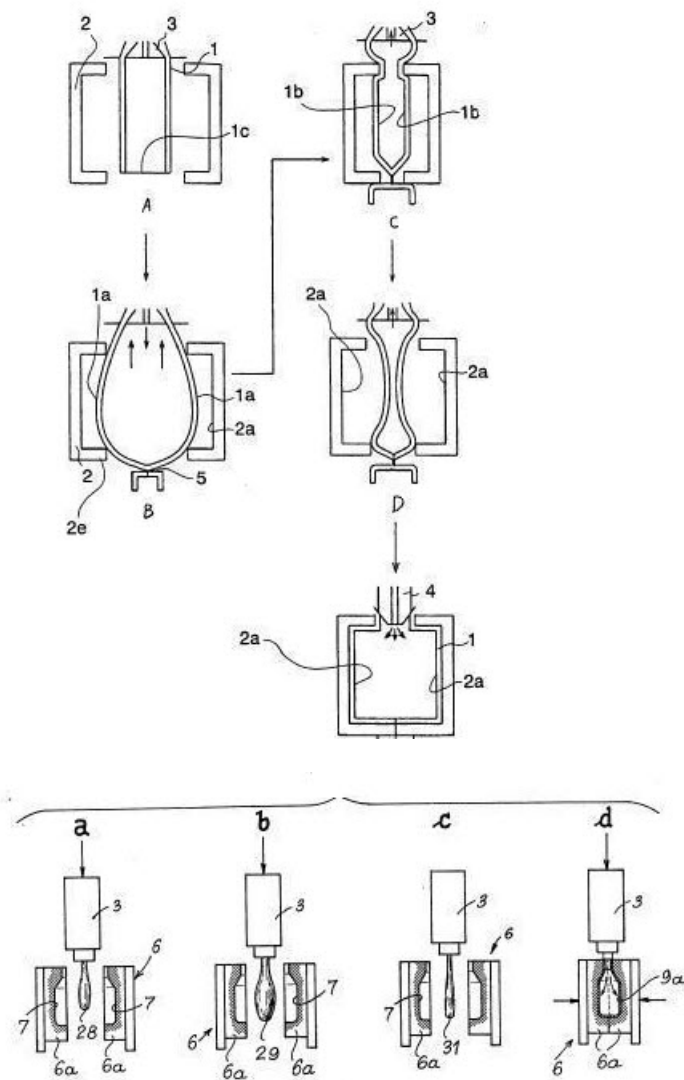
using pressure difference {for pre-stretching}, e.g. pre-blowing

**Definition statement**

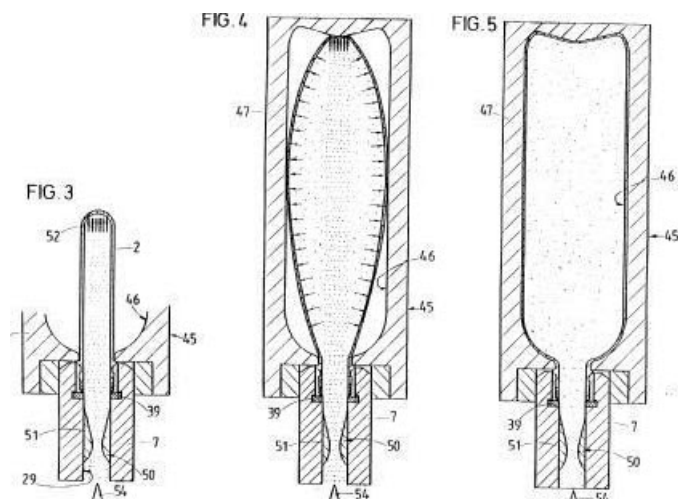
*This place covers:*

Blow-moulding processes, whereby the pressure difference is used to stretch the preform in its longitudinal direction.

Illustrative example of subject matter classified in this group:



Definition statement

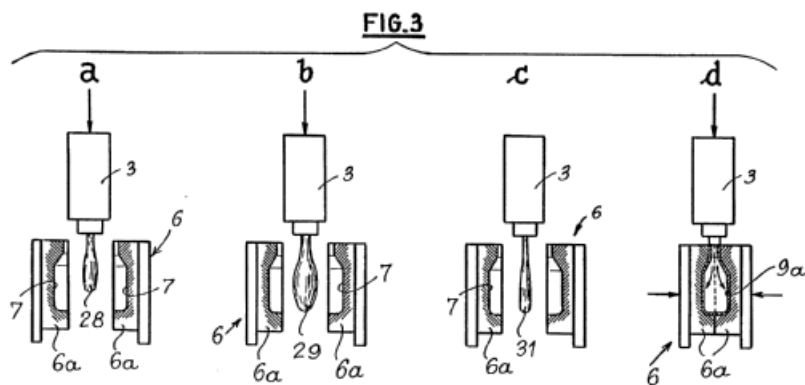
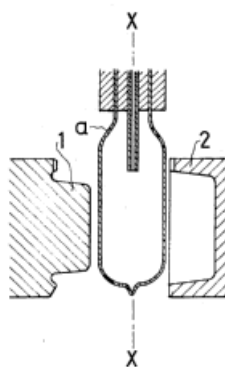
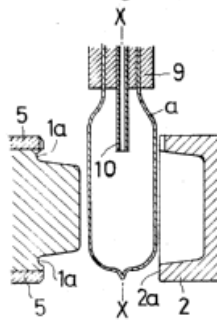
**B29C 49/1602**

{pre-blowing without using a mould}

**Definition statement***This place covers:*

Blow-moulding method in which a pre-blowing step does not take place in a mould.

Illustrative example of subject matter classified in this group:

**Fig. 1****Fig. 4**



B29C 49/18

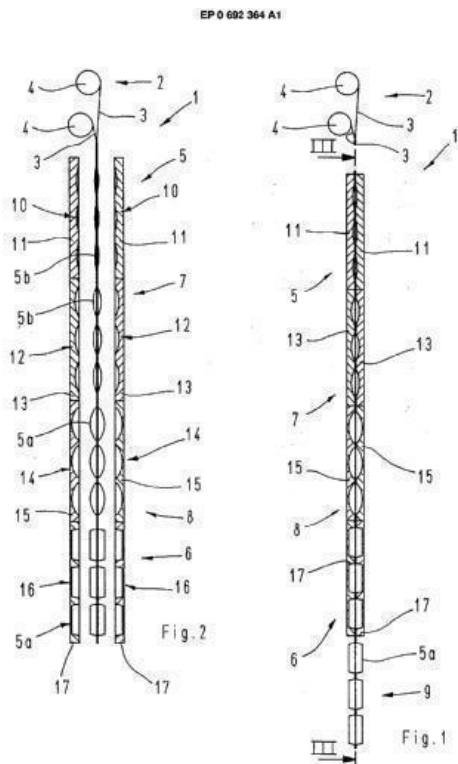
using several blowing steps ([B29C 49/16](#) takes precedence)

Definition statement

This place covers:

Blow-moulding using several blowing steps, whereby between each blowing step for a period of time, depressurisation is being applied, thereby causing a period with atmospheric pressure inside the preform/container.

Illustrative example of subject matter classified in this group:



References

Limiting references

This place does not cover:

Multiple blow moulding steps, whereby one step is used to expand the preform in longitudinal direction	<a href="#">B29C 49/16</a>
--	----------------------------

Informative references

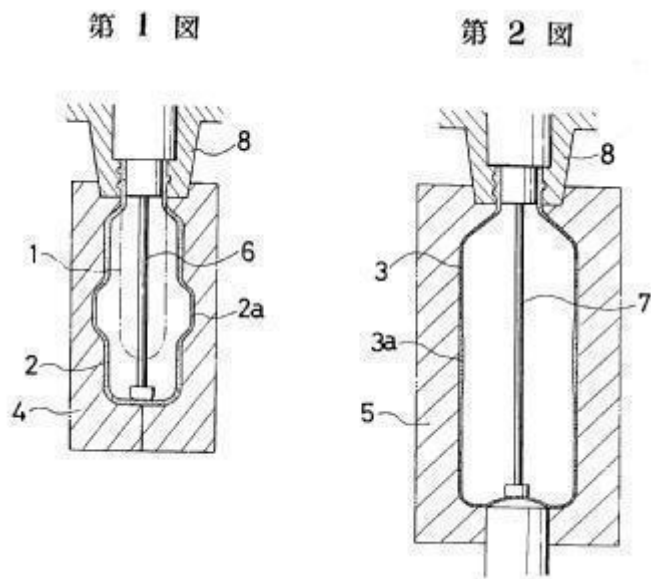
Attention is drawn to the following places, which may be of interest for search:

Multiple blow-moulding steps followed by additional heat shrinking	<a href="#">B29C 49/6472</a>
--	------------------------------

Special rules of classification

Multiple blow-moulding steps, with longitudinal stretching during each blowing step are additionally classified in [B29C 49/08](#) or one of its subgroups.

As example the following disclosure should be classified [B29C 49/12](#) and [B29C 49/18](#).



## **B29C 49/1802**

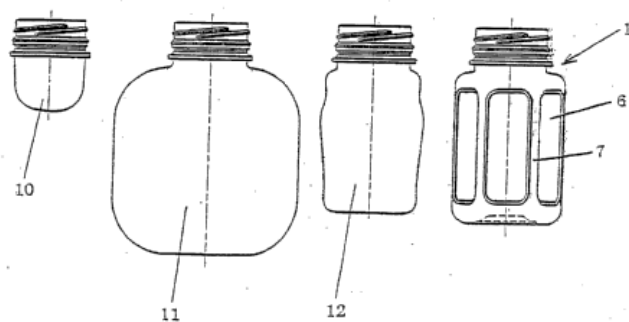
{the first mould cavity being bigger than a second mould cavity}

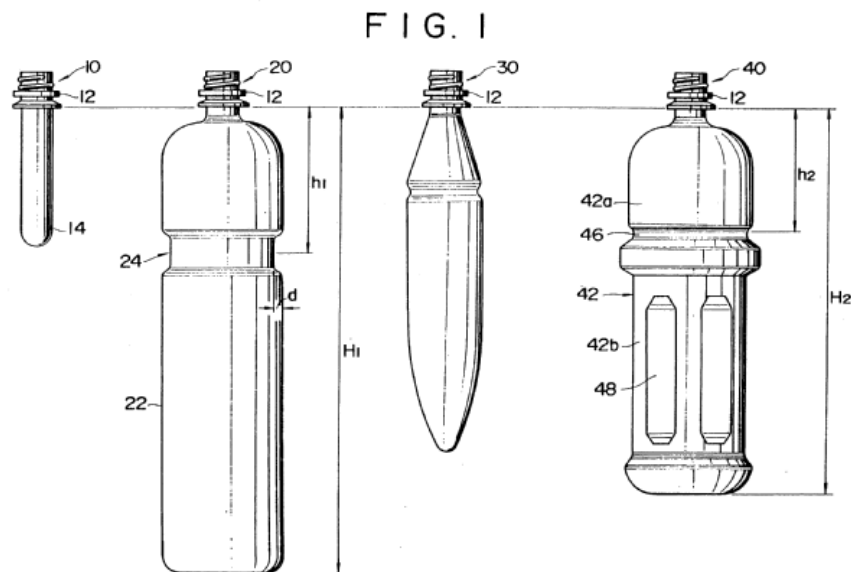
### **Definition statement**

*This place covers:*

A blow-moulding method which is characterised by at least two mould cavities: the first cavity is larger than the second, often times to allow for a shrinkage/temperature conditioning step between the two cavities.

Illustrative example of subject matter classified in this group:





## **B29C 49/20**

**of articles having inserts or reinforcements {; Handling of inserts or reinforcements}**

### **Definition statement**

*This place covers:*

- Auxiliary operations or auxiliary means relating to inserts or reinforcements, e.g. handling or transferring of inserts

### **Special rules of classification**

Details of the location of the insert (on the inside or outside of the final article), handling of the inserts (e.g. feeding into the mould) or treatment of the inserts (e.g. preheating) are identified by the allocation of break down Indexing Codes, which are only present at additional information level.

When details of inserts or reinforcements are indicated, then it is highly desirable to allocate additionally the following classification codes for additional information:

- [B29K 2601/00](#) - [B29K 2713/02](#)

- [B29K 2201/00](#)- [B29K 2313/02](#)

## **B29C 2049/2071**

**{comprising electronic elements or detection means, e.g. chips, RFIDs or barcodes}**

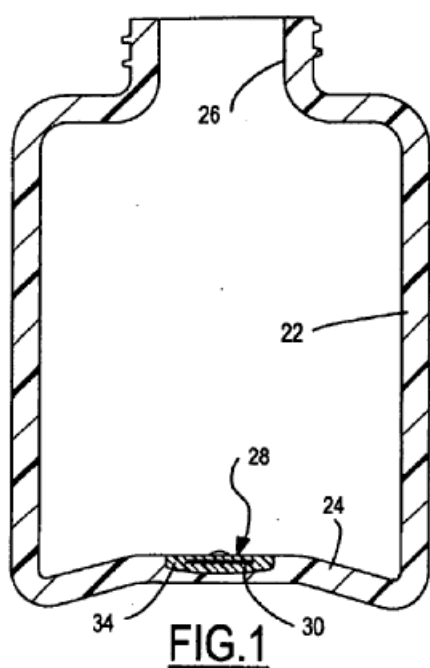
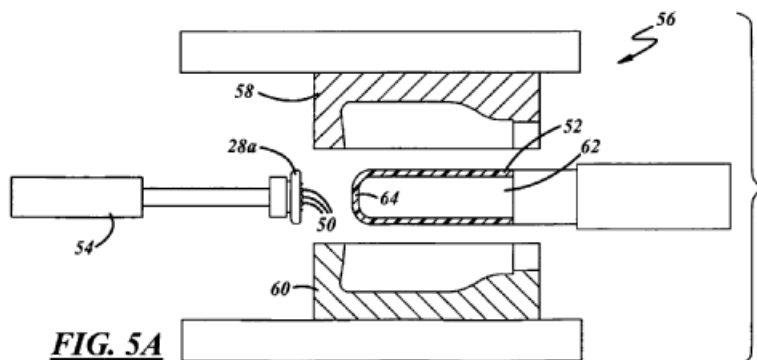
### **Definition statement**

*This place covers:*

Blow-moulding articles comprising inserts of an electronic nature.

## Definition statement

Illustrative example of subject matter classified in this group:

**B29C 49/22**

using multilayered preforms or parisons

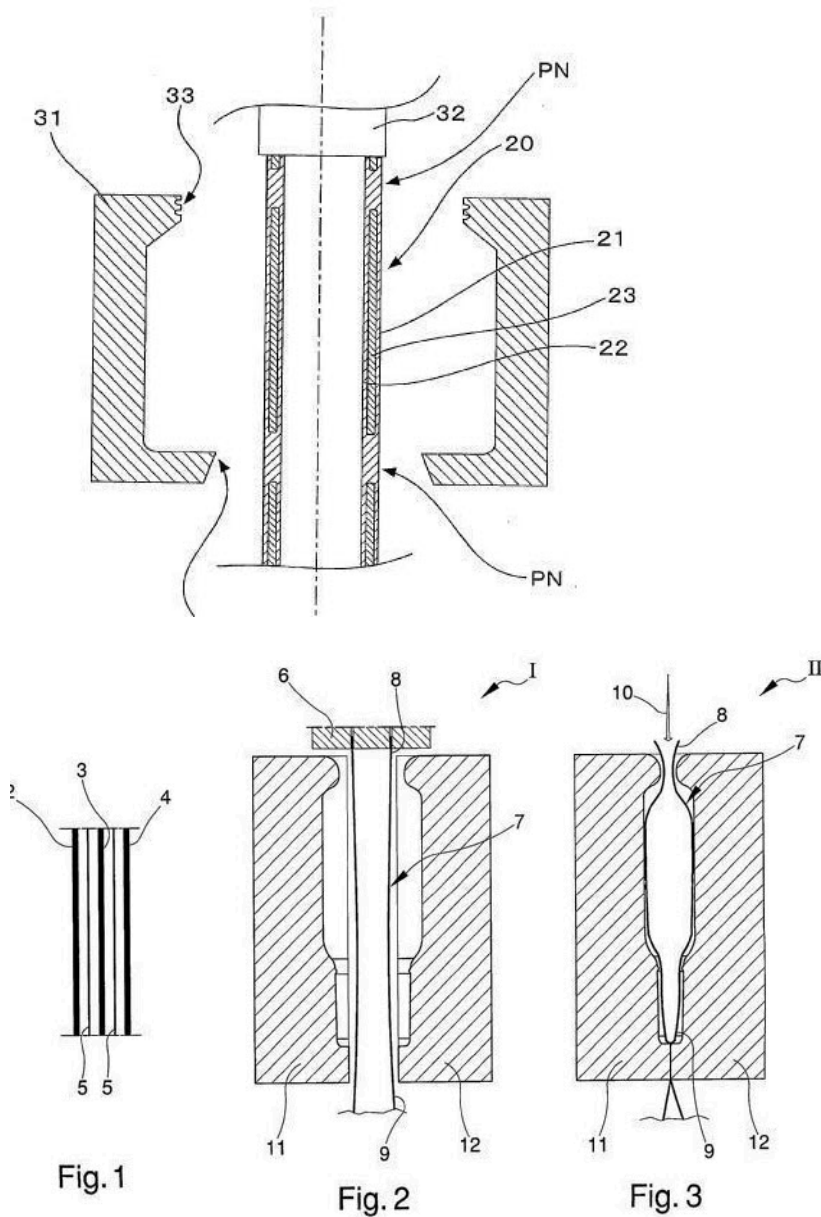
**Definition statement**

*This place covers:*

Multilayered parisons produced by extrusion moulding.

Parisons having loose layers before blow-moulding.

Illustrative example of subject matter classified in this group:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Tubular layered products per se	<a href="#">B32B 1/08</a>
Multilayered plastic containers, e.g. bottles	<a href="#">B65D 1/0215</a>

## Special rules of classification

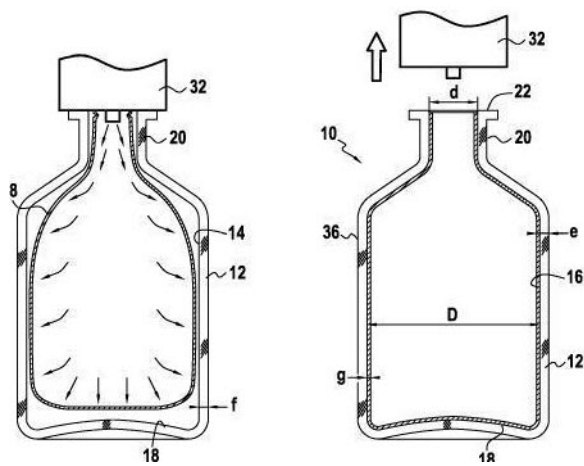
If applicable, it is highly desirable to allocate classification in [B29C 2949/07](#) and subgroups, in particular [B29C 2949/30](#), for information related to the geometrical distribution or dimensions of the layers.

**B29C 49/24****Lining or labelling****Definition statement**

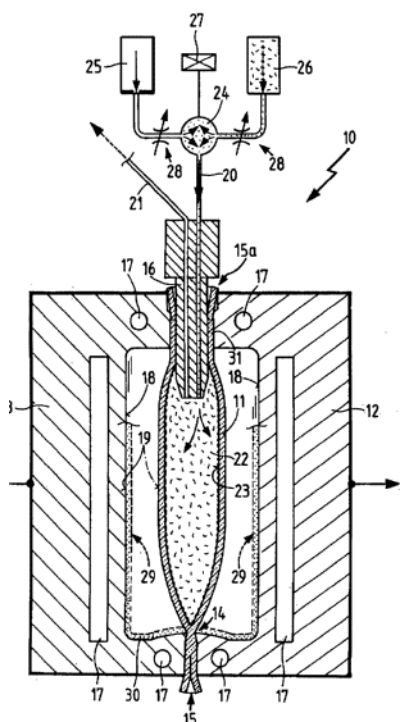
*This place covers:*

Lining

Illustrative example of subject matter classified in this group:



Labelling



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Lining or sheeting in general	<a href="#">B29C 63/00</a>
Producing labels	<a href="#">B31D 1/02</a>
Labelling other than flat surfaces in general	<a href="#">B65C 3/00</a>
In mould labelled containers	<a href="#">B65D 23/0864</a>
Labels in general e.g. for thermo adhesion	<a href="#">G09F 3/04</a>

### Special rules of classification

If the label itself is specific then the Indexing Code [B29L 2031/744](#) should be allocated

### Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Lining	Covering the whole outer and/or inner surface of articles with a heated preform or parison. The heated preform or parison is stretched and three dimensionally deformed.
Labelling	Connecting a label which is inside of a mould to a heated preform or parison while the preform or parison is blow moulded. Often also called "in mould labelling"

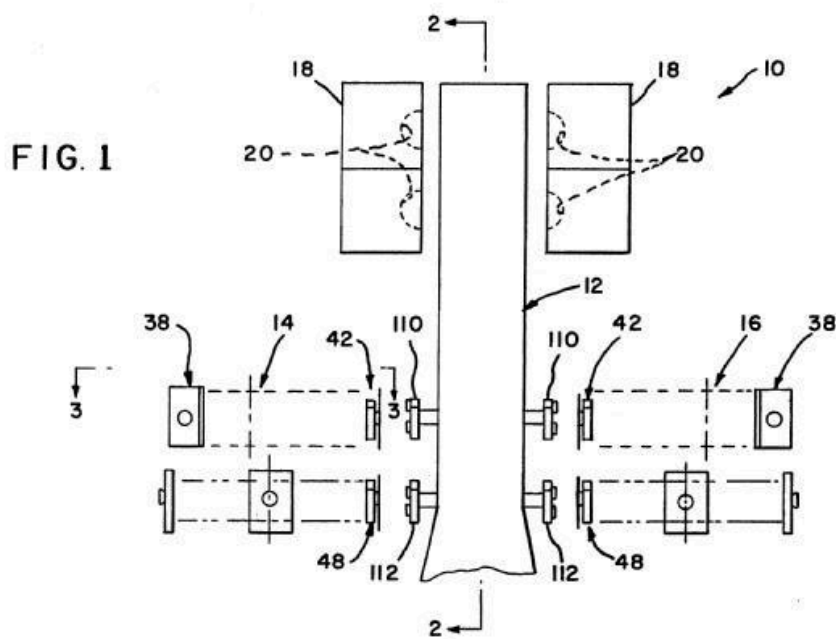
**B29C 49/2408**

**{In-mould lining or labelling}**

### Definition statement

*This place covers:*

- US5256365



**U.S. Patent**

Oct. 26, 1993

Sheet 1 of 7

5,256,365



Definition statement

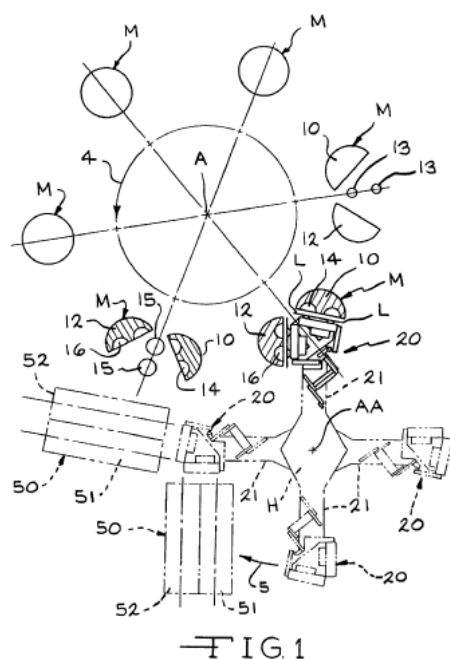
- US6264876

U.S. Patent

Jul. 24, 2001

Sheet 1 of 6

US 6,264,876 B1

**B29C 2049/2442**

{while blow-moulding, e.g. the preform expansion deforms the label or lining}

**Definition statement***This place covers:*

Blow-moulding process/apparatus which uses multi-layered preforms or parisons as the elements to which air is applied to cause shaping.

**B29C 49/249**

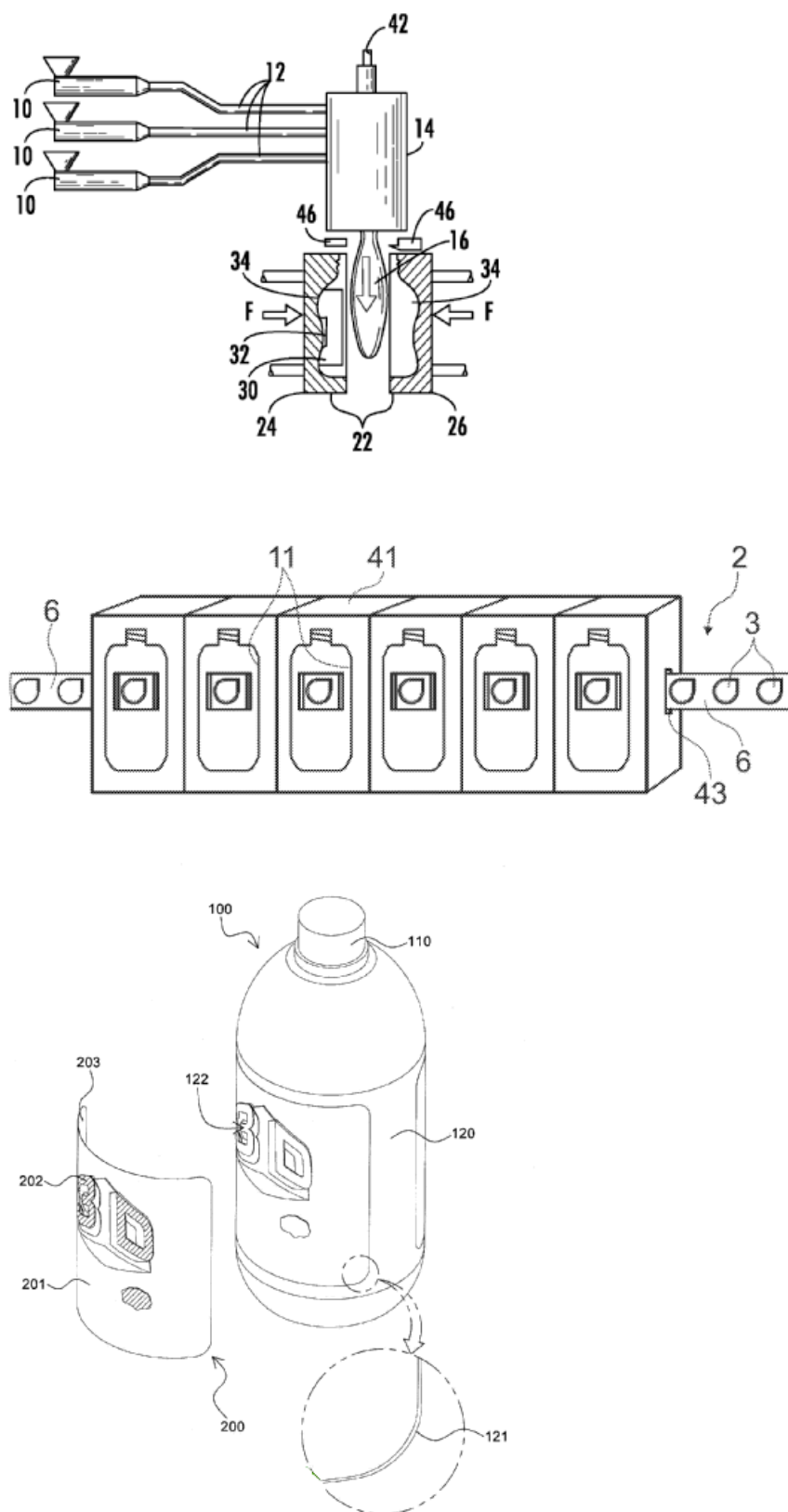
{explicit labelling}

**Definition statement***This place covers:*

Labelling process which includes a method for moulding a plastic container within a mould including an RFID tag to generate a container which leaves a mould having an RFID tag bonded between the

## Definition statement

container and a label. This method provides for an integrally, extrusion blow-moulded container, label and RFID tag combination.



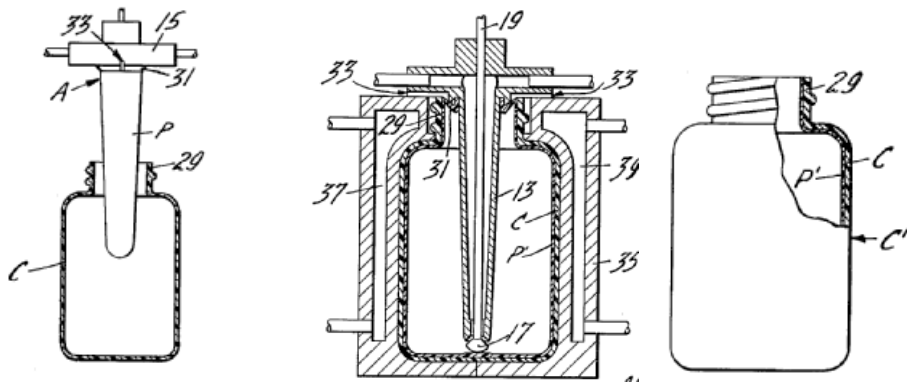
B29C 49/251

{explicit lining (B29C 49/26 takes precedence)}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group:



References

Limiting references

This place does not cover:

Inner lining of tubes	<a href="#">B29C 49/26</a>
-----------------------	----------------------------

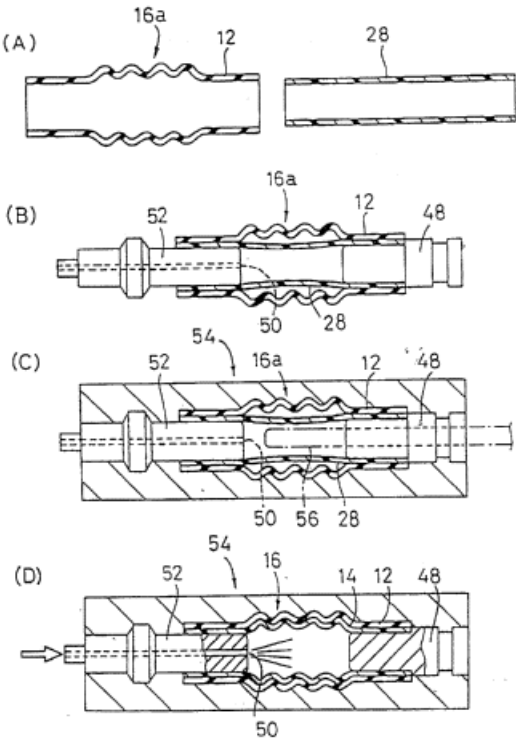
**B29C 49/26**

**inner lining of tubes**

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:



**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Coating the interior of hollow articles by extrusion moulding	<a href="#">B29C 48/152</a>
Lining of internal surfaces by applying preformed layers or sheets of plastic	<a href="#">B29C 63/26</a>

**B29C 49/28**

**Blow-moulding apparatus**

**Special rules of classification**

- If the alleged inventive information of the document to be classified is already classified somewhere else then the classification as provided for in [B29C 49/28](#) - [B29C 49/40](#) should be allocated as additional information only.

**B29C 49/28002**

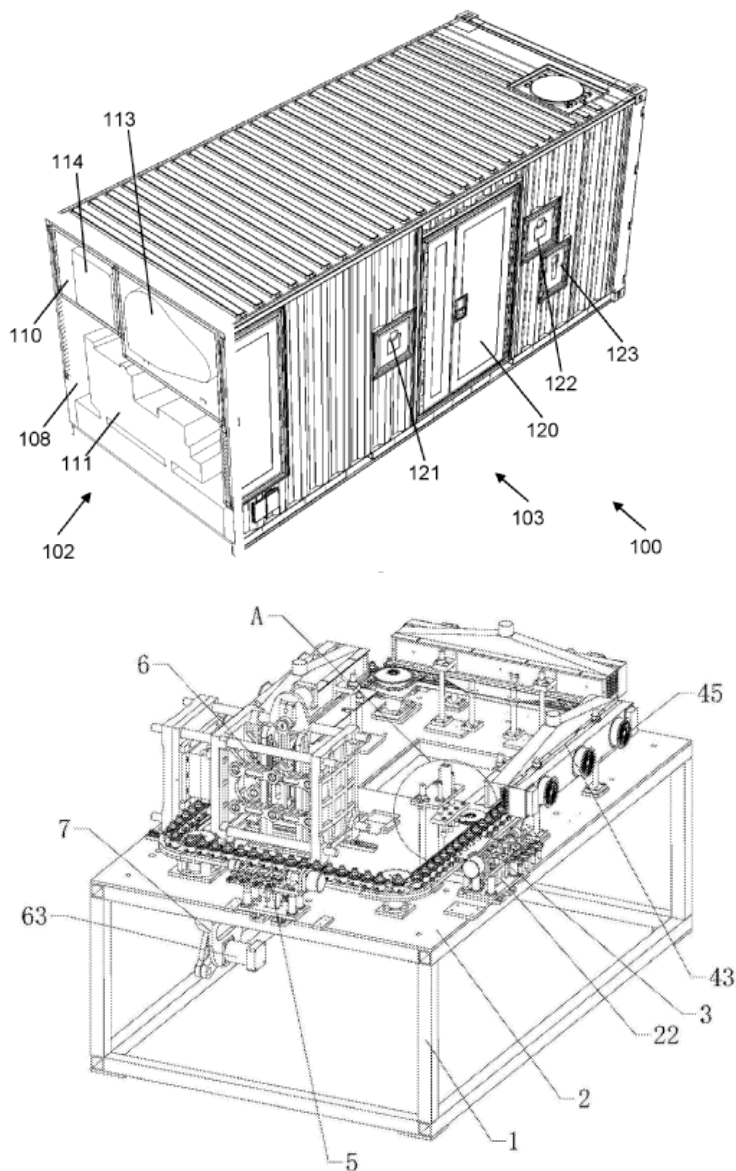
{designed for reduced size or for experiments, e.g. lower inertia, transportable or experimental apparatus}

**Definition statement**

*This place covers:*

Blow-moulding machines which are smaller in scale than other machines to accommodate experimental environments or situations where transportability is ideal.

Illustrative example of subject matter classified in this group:



**B29C 49/28004****{designed for easy access by operator}****Definition statement***This place covers:*

A blow-moulding machine which is designed to be easily accessed/operated by an operator.

**B29C 49/28006****{having special frame}****Definition statement***This place covers:*

A blow-moulding machine which is characterised by a particular frame configuration.

Illustrative example of subject matter classified in this group:

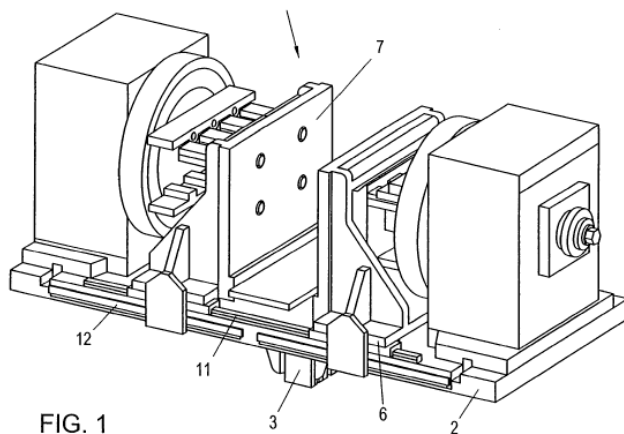
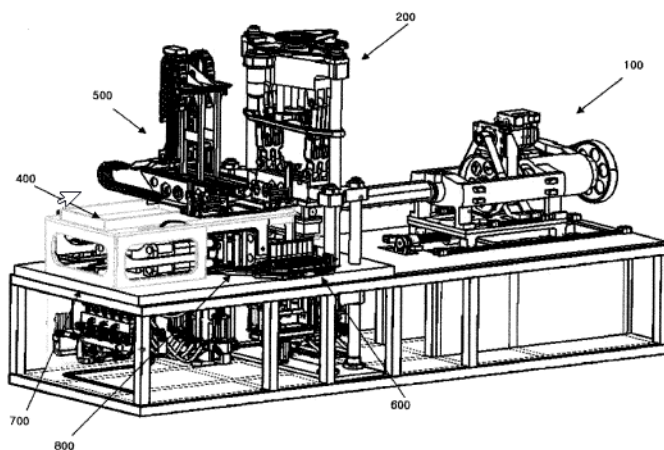


FIG. 1



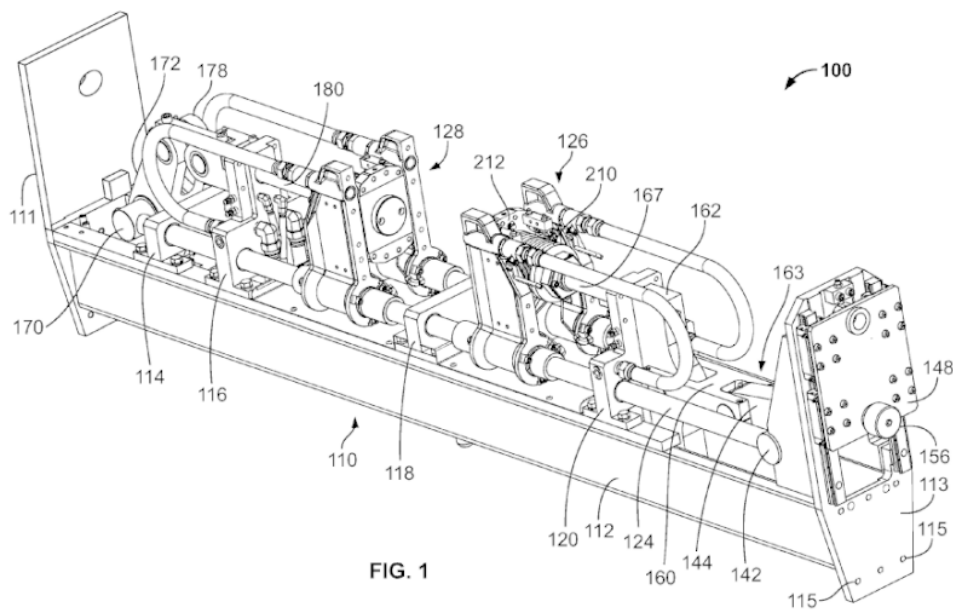
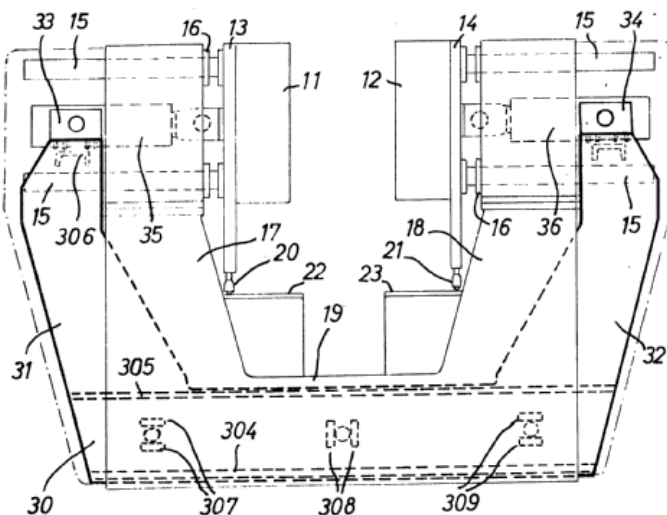


FIG. 1



## B29C 49/28008

{mounting, exchanging or centering machine parts, e.g. modular parts}

### Definition statement

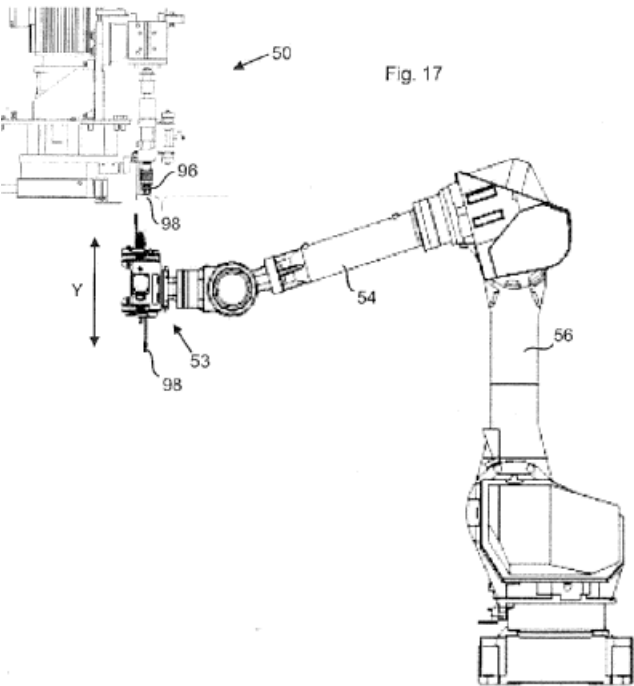
*This place covers:*

A blow-moulding machine which includes interchangeable/modular parts, allowing for ease of mounting, exchanging or repositioning.

Illustrative example of subject matter classified in this group:

FIG. 17 shows a presentation as an illustration of the process of changing a handling part. Here, the change arm 54 is essentially moved upwards vertically (cf. double arrow Y) by the respective joints, in order to exchange the handling parts, here heating mandrels 96 and shielding plates 98. It is possible

to, at first, remove the existing handling parts 96 and 98, then turn the changing element 53 by 180° in order to arrange immediately the new handling parts on the heating device 50.



**B29C 49/28012**

{using several moulds whereby at least one mould is different in at least one feature, e.g. size or shape ([B29C 49/0025](#) takes precedence)}

**Definition statement**

*This place covers:*

A blow-moulding machine which includes several moulds having different features than each other, e.g. size, shape.

**References**

**Limiting references**

*This place does not cover:*

Making articles of indefinite length by subsequent mould cavities being different	<a href="#">B29C 49/0025</a>
---	------------------------------

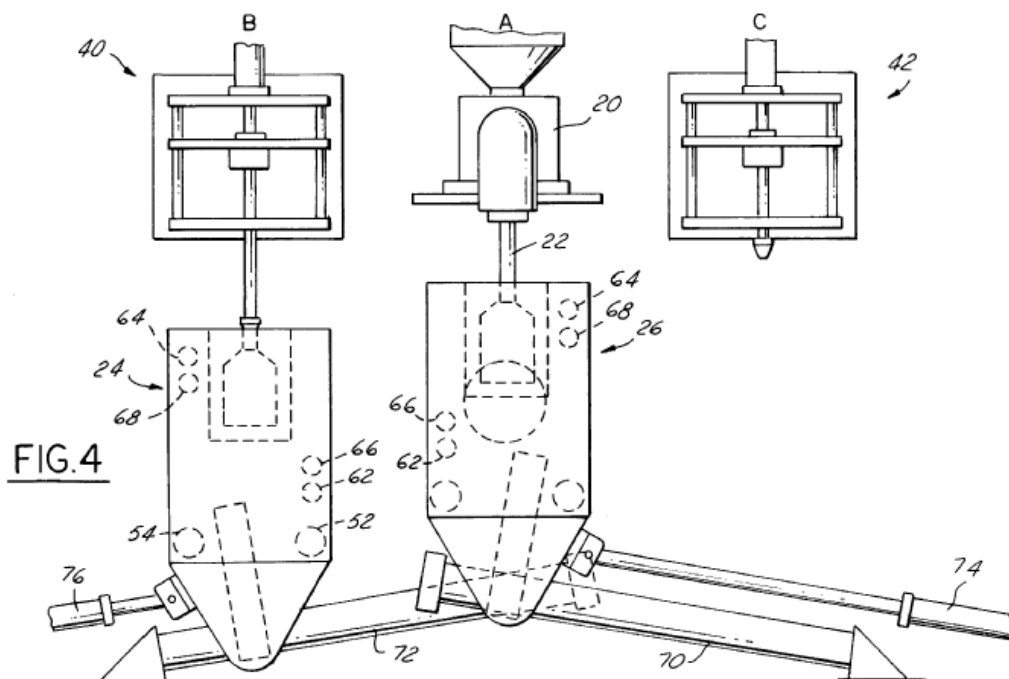


**B29C 49/32**

moving "to and fro"

**Definition statement***This place covers:*

- US5976452



U.S. Patent

Nov. 2, 1999

Sheet 4 of 4

5,976,451

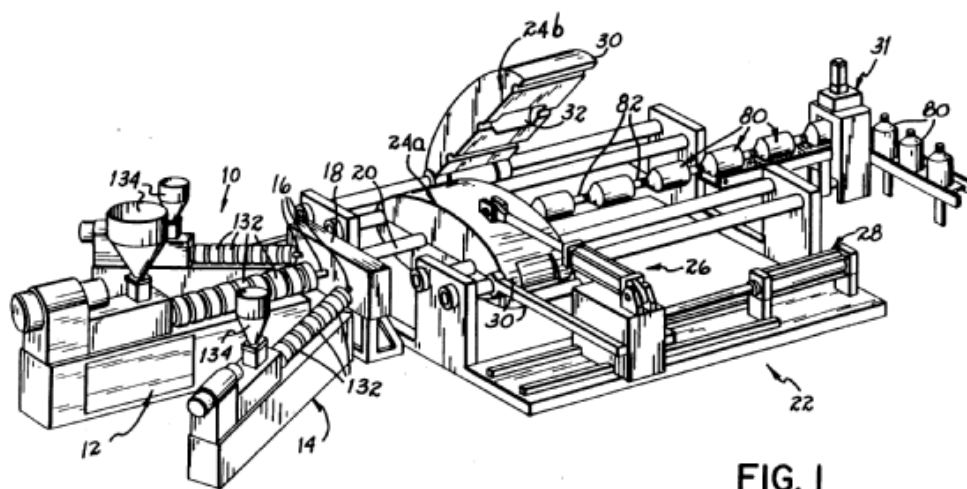
**B29C 49/34**

the mould parts moving "hand-over-hand"

**Definition statement**

*This place covers:*

- US4988279



U.S. Patent

Jan. 29, 1991

Sheet 1 of 7

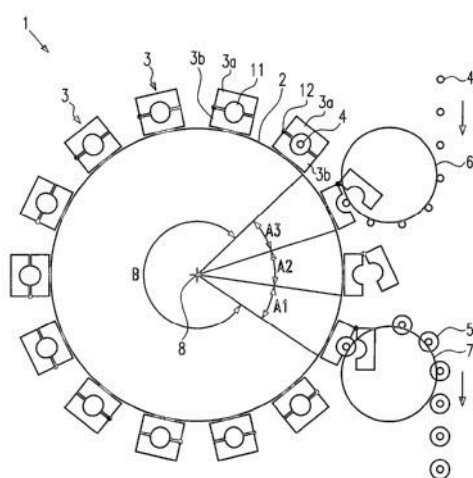
4,988,279

**B29C 49/36****rotatable about one axis****Definition statement***This place covers:*

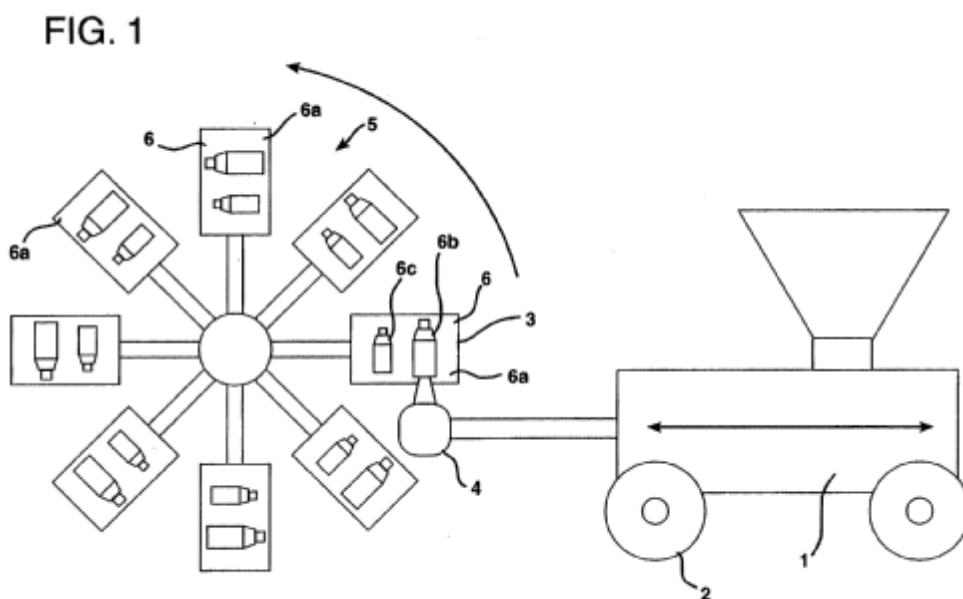
- DE102004057102

DE 10 2004 057 102 A1 2006.06.01

Anhängende Zeichnungen



US5433916



J.S. Patent

July 18, 1995

Sheet 1 of 3

5,433,916

**B29C 49/38**

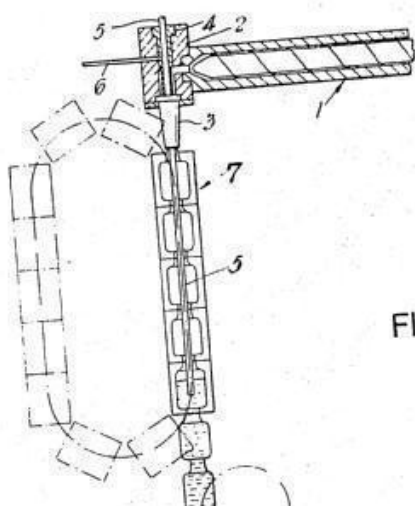
mounted on movable endless supports {([B29C 49/0021](#) takes precedence)}

**Definition statement**

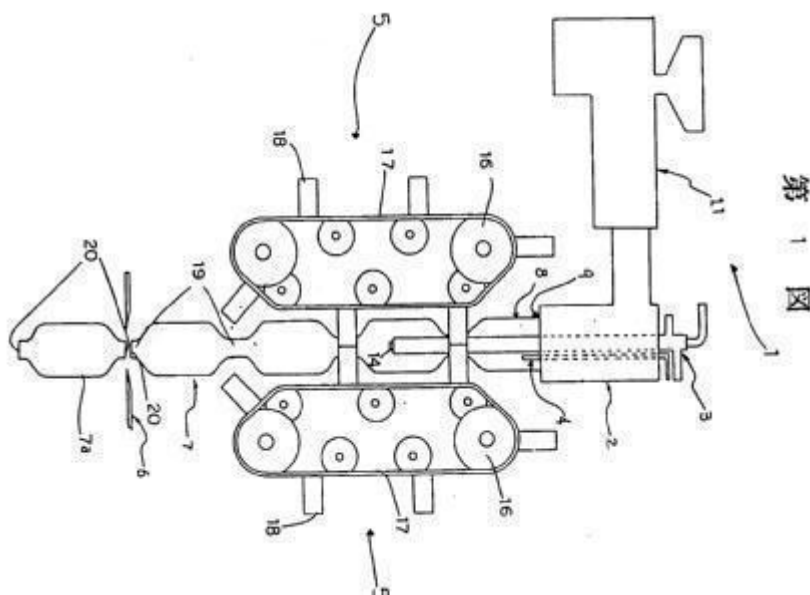
*This place covers:*

- articles of definitive length, bottles
- US3597516

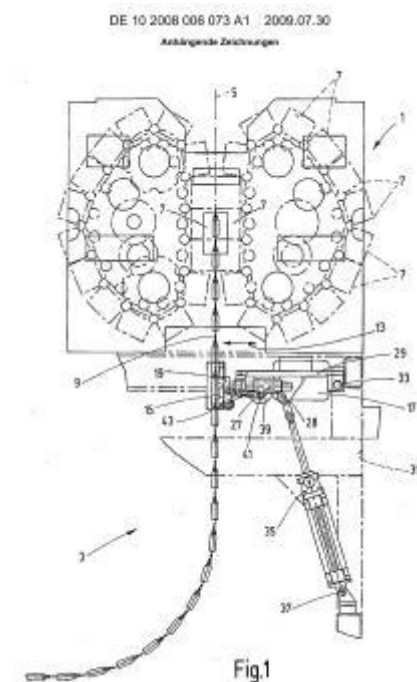
Aug. 3, 1971  
N. F. HARWOOD  
METHOD OF PRODUCING FILLED MOULDED CONTAINERS  
3,597,516  
5 Sheets-Sheet 1  
Filed Sept. 26, 1968



- JP3197117



- DE102008006073



## References

### Limiting references

*This place does not cover:*

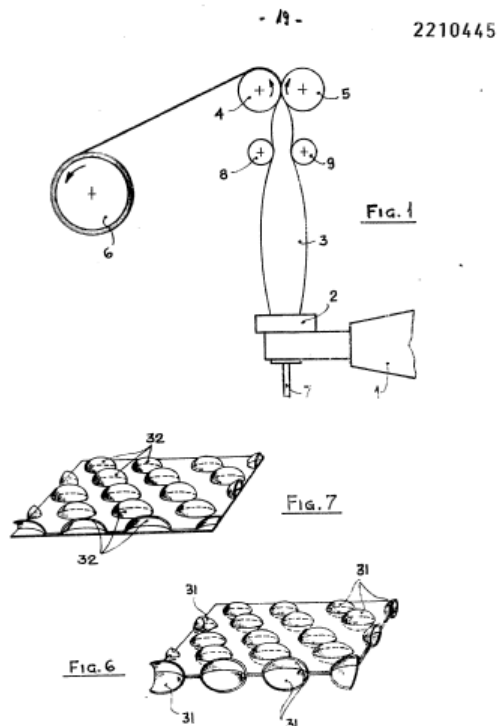
Using moulds movable in a closed path for blow moulding of articles of indefinite length

[B29C 49/0021](#)

**B29C 49/40****on co-operating drums****Definition statement**

*This place covers:*

- DE2210445

**B29C 49/42****Component parts, details or accessories; Auxiliary operations****Definition statement**

*This place covers:*

Details of extrusion dies used during blow-moulding.

Closing parison ends before blow-moulding e.g. with a fluid stream or by grippers.

Antistatic treatment of preforms.

Cleaning of preforms.

Sterilisation of preforms.

Mould change.

Cutting and recycling material.

Avoiding malfunctioning.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Handling of moulds between a mould store and a moulding machine in general	<a href="#">B29C 31/006</a>
Maintenance of moulds namely cleaning of moulds in general	<a href="#">B29C 33/72</a>
Extrusion nozzles or dies in general	<a href="#">B29C 48/30</a>
Disinfection or sterilisation of materials or objects, in general; Accessories therefor	<a href="#">A61L 2/00</a>

## B29C 49/4205

{Handling means, e.g. transfer, loading or discharging means (handling of inserts or reinforcements [B29C 49/20](#); handling of linings or labels [B29C 49/2408](#))}

### Definition statement

This place covers:

Gripping and holding means for preforms, parisons or blown articles.

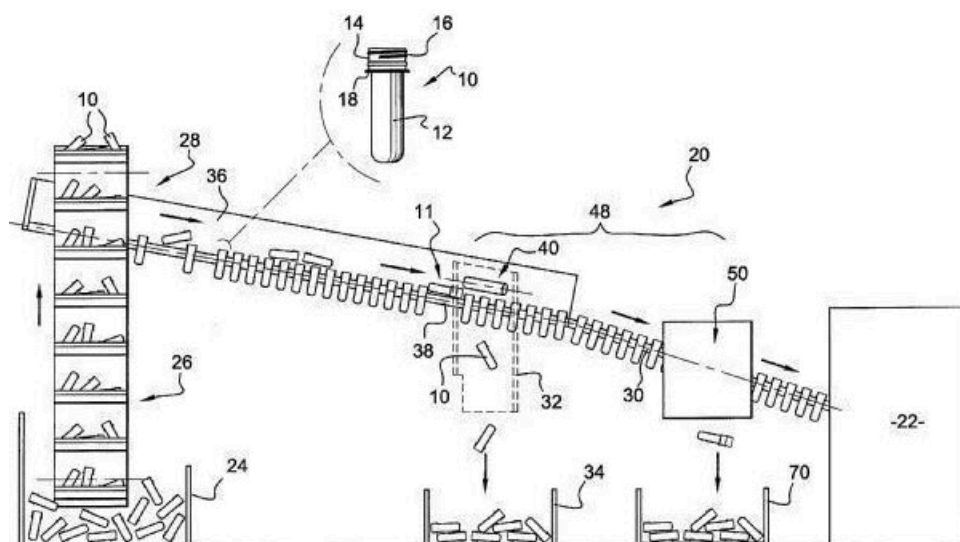
Adjustable transporting means depending on the size of the preforms, parisons or blown articles.

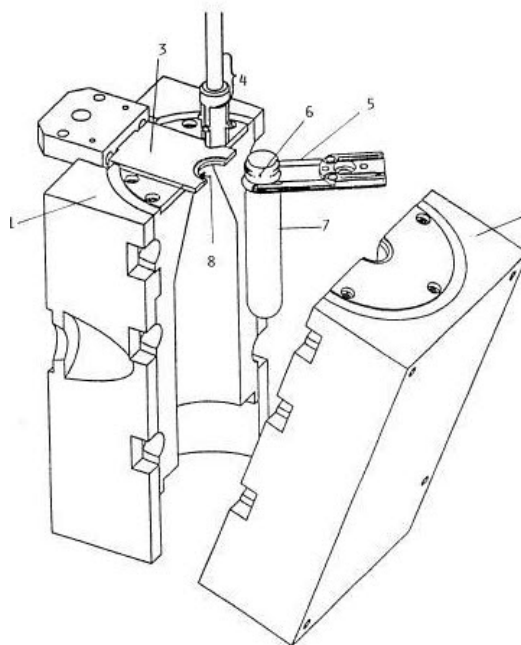
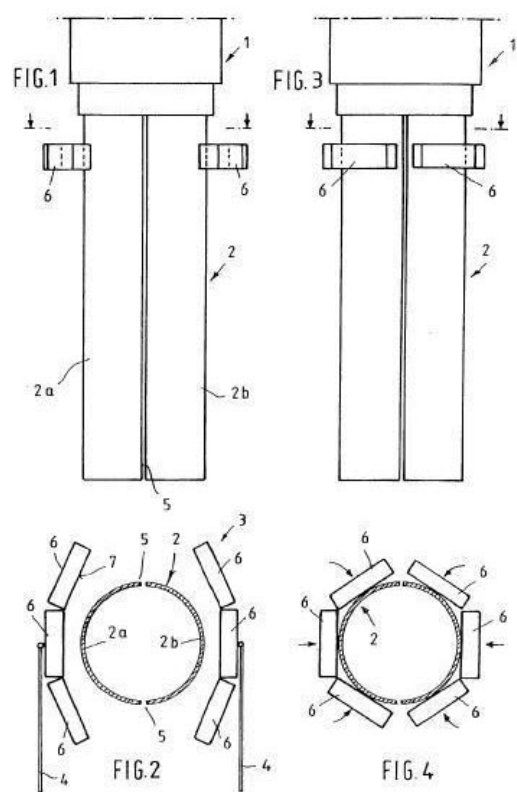
Air conveyors for preforms or blown articles.

Orientating unorientated preforms.

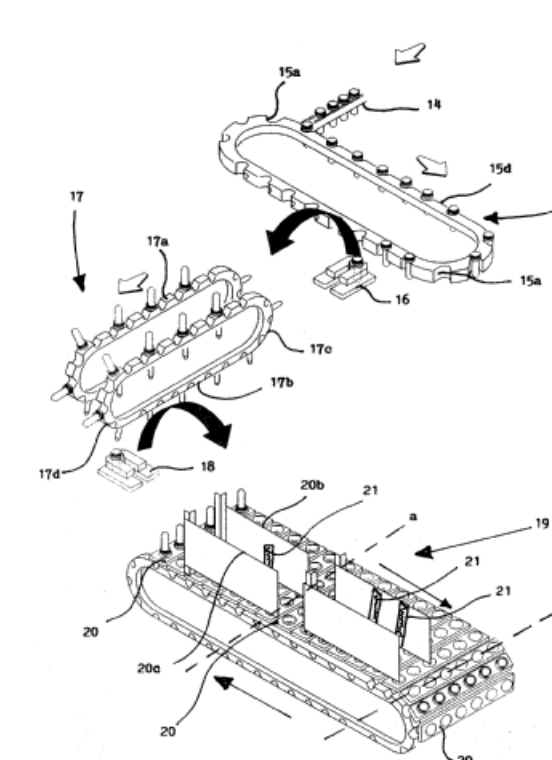
Feeding of preforms or parisons.

Illustrative example of subject matter classified in this group:









References

Limiting references

This place does not cover:

Handling of inserts or reinforcements	<a href="#">B29C 49/20</a>
Handling of linings or labels	<a href="#">B29C 49/2408</a>

Informative references

Attention is drawn to the following places, which may be of interest for search:

Handling materials in general	<a href="#">B65G 47/00</a>
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B29C 49/42053

{Stripping preforms from moulds, e.g. from injection moulds or cores}

Definition statement

This place covers:

Auxiliary blow-mould element which facilitates removal of a preform from mould elements.

Illustrative example of subject matter classified in this group:

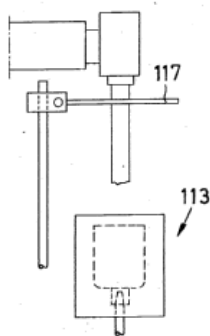
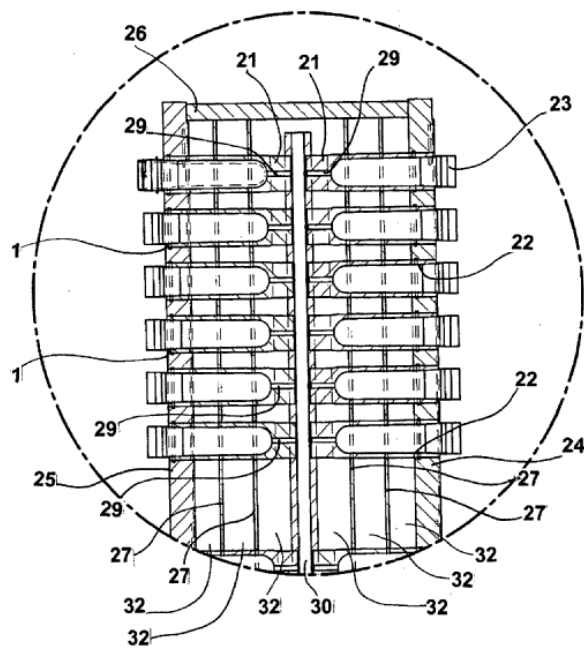


FIG. 4a

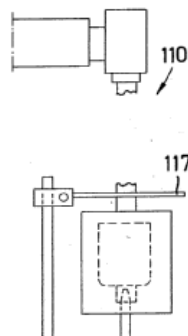


FIG. 4b

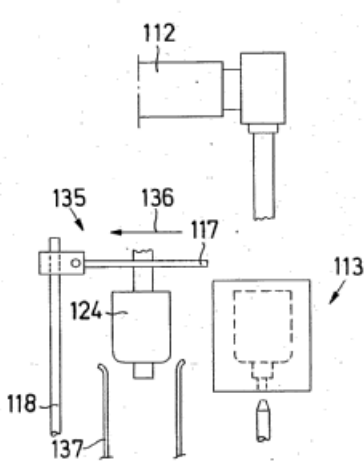


FIG. 4c

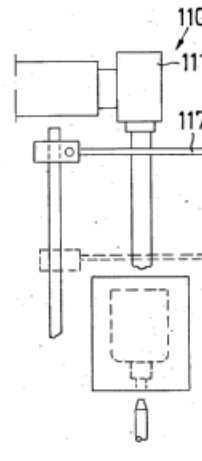
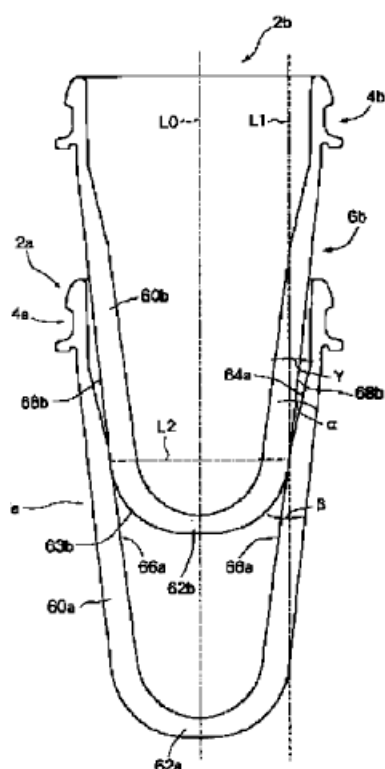


FIG. 4d

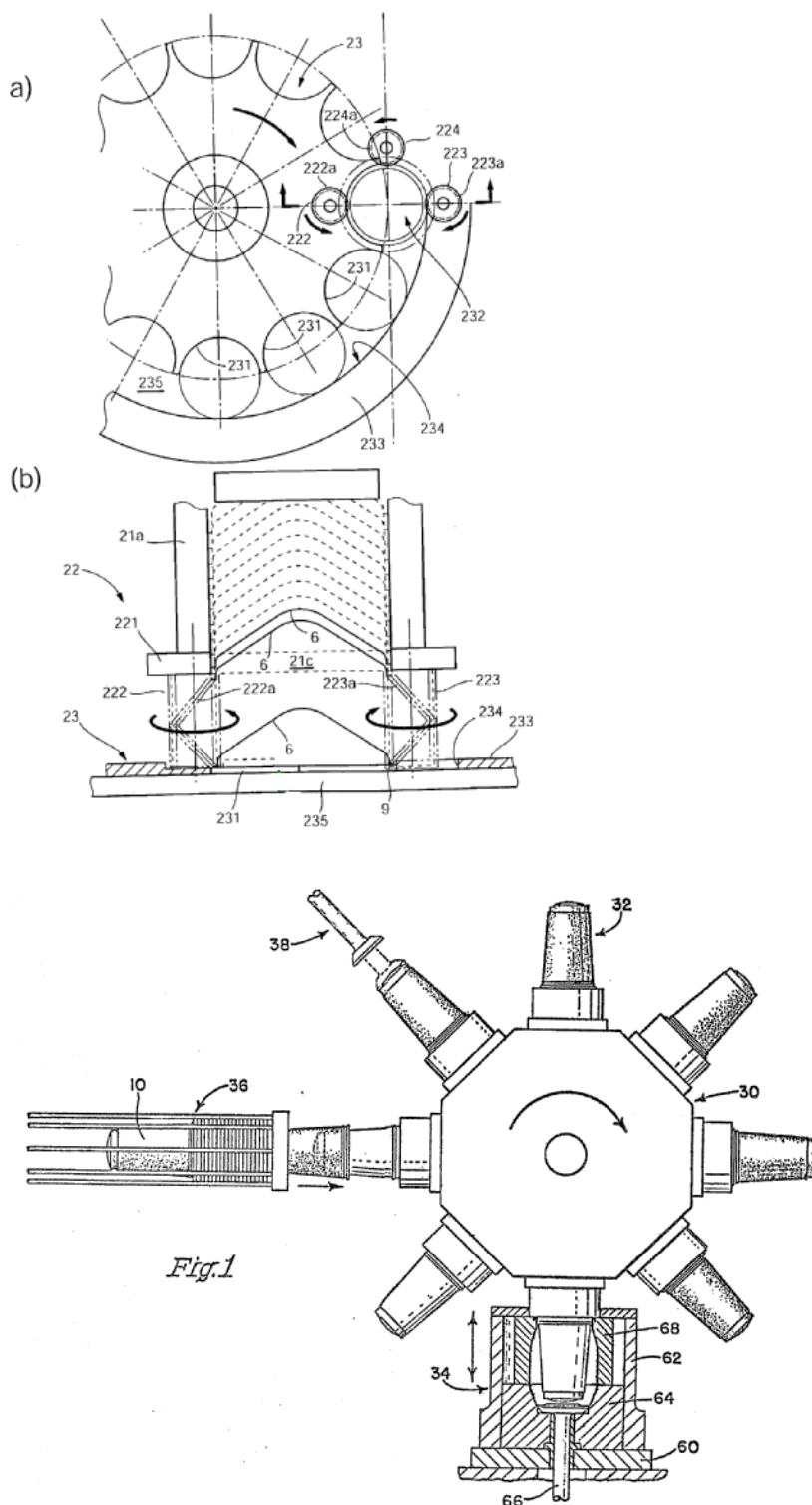
**B29C 49/42055****{De-stacking preforms, e.g. delivered in a stacked configuration}****Definition statement***This place covers:*

Auxiliary blow-mould element which unstacks preforms which are originally arranged in a stacked configuration.

Illustrative example of subject matter classified in this group:



## Definition statement

**B29C 49/42057**

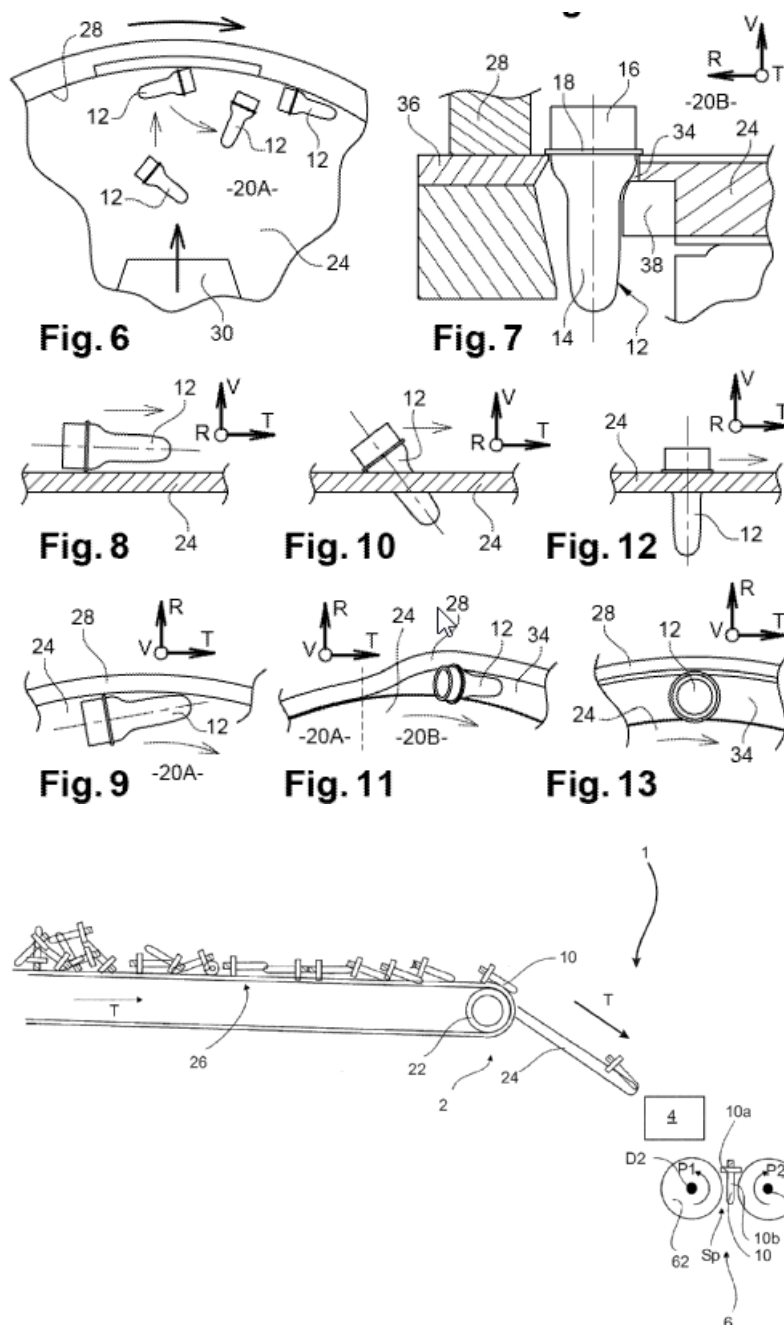
{Aligning disorderly arranged preforms, e.g. delivered disorderly}

**Definition statement**

*This place covers:*

Auxiliary blow-mould element which facilitates organization of preforms which are originally not arranged in any sort of order.

Illustrative example of subject matter classified in this group:



**B29C 49/42059**

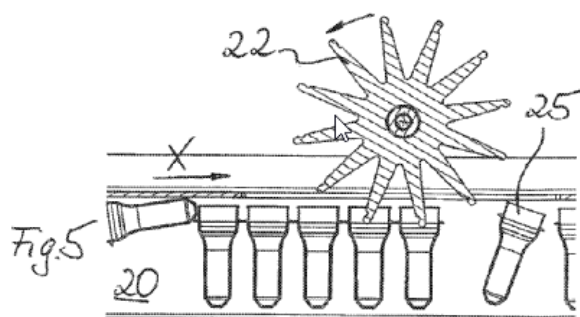
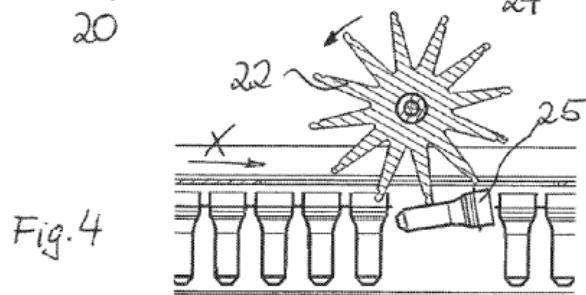
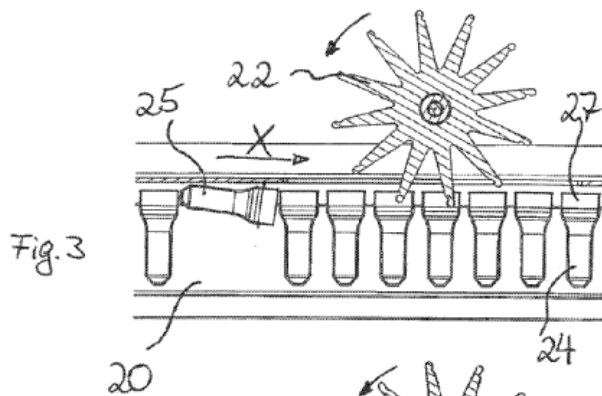
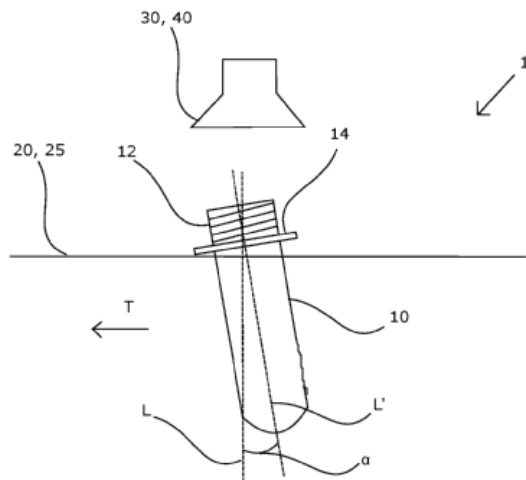
**{Aligning of preforms getting stuck, unaligned or stacked during transport}**

### Definition statement

*This place covers:*

Preform handling process or method which would correct any preforms which are not oriented in the proper way, e.g. tilted, misaligned.

Illustrative example of subject matter classified in this group:



**B29C 49/42061**

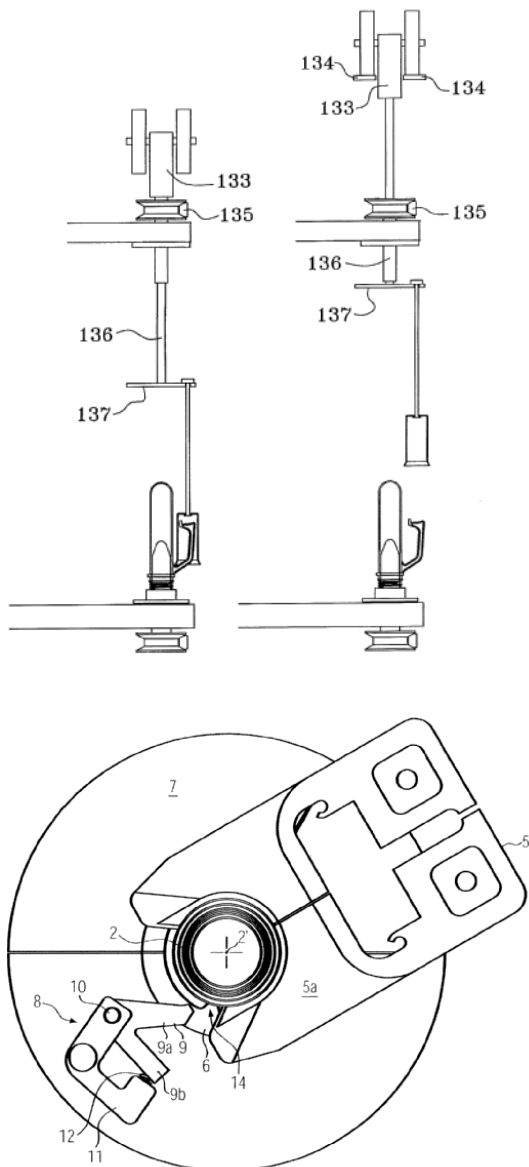
**{Means for correcting, aligning or straighten preforms, e.g. gripper with correcting means}**

**Definition statement**

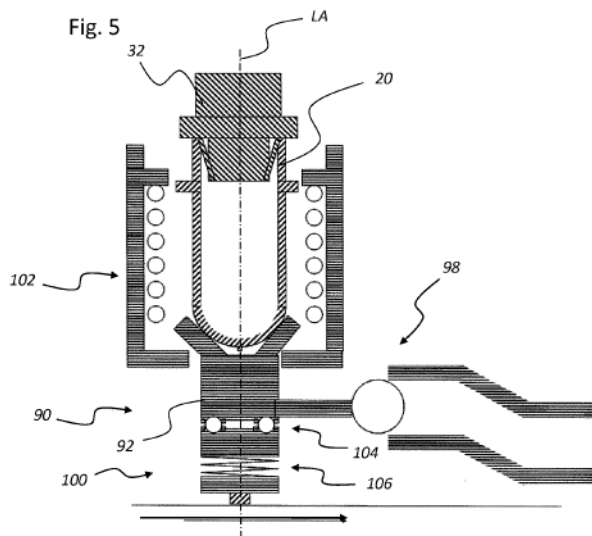
*This place covers:*

Structures associated with the handling means that correct or ensure the proper orientation of the preforms.

Illustrative example of subject matter classified in this group:



Definition statement

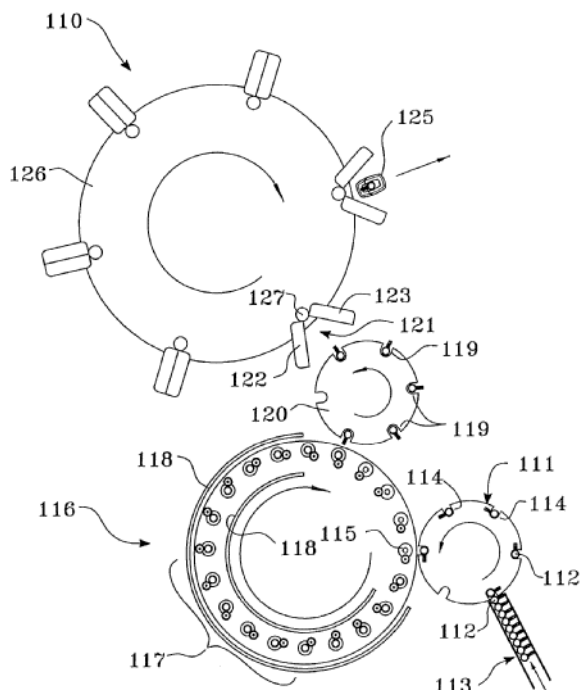
**B29C 49/42063**

{in relation to the mould, e.g. preform centring means in the mould}

**Definition statement***This place covers:*

Structures associated with the handling means that correct or ensure the proper orientation of the preforms with respect to the mould.

Illustrative example of subject matter classified in this group:

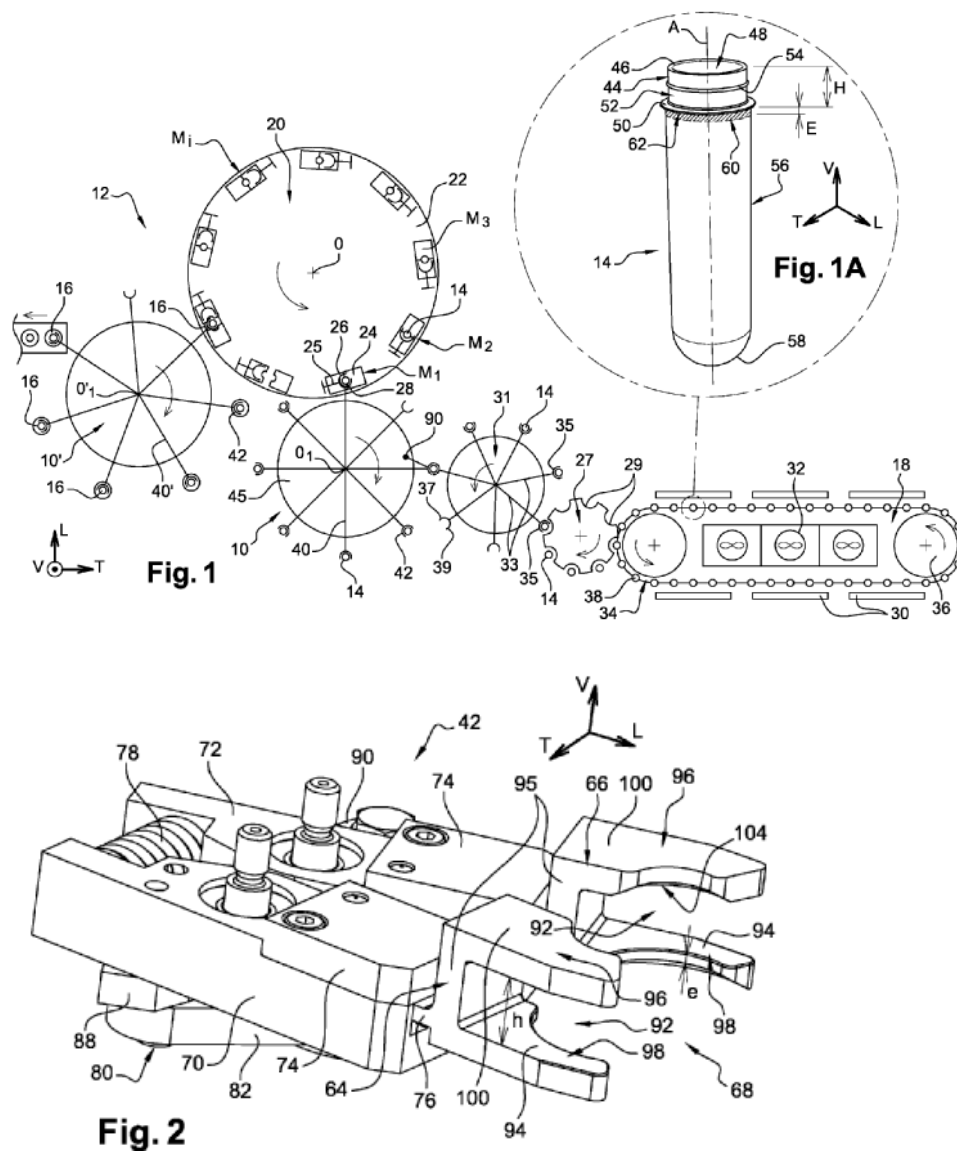


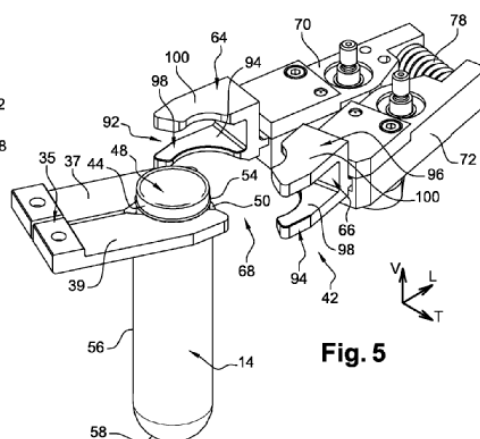
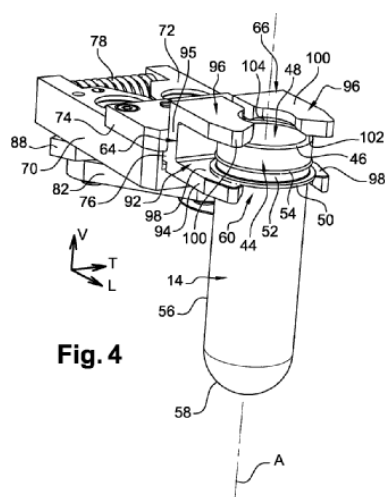
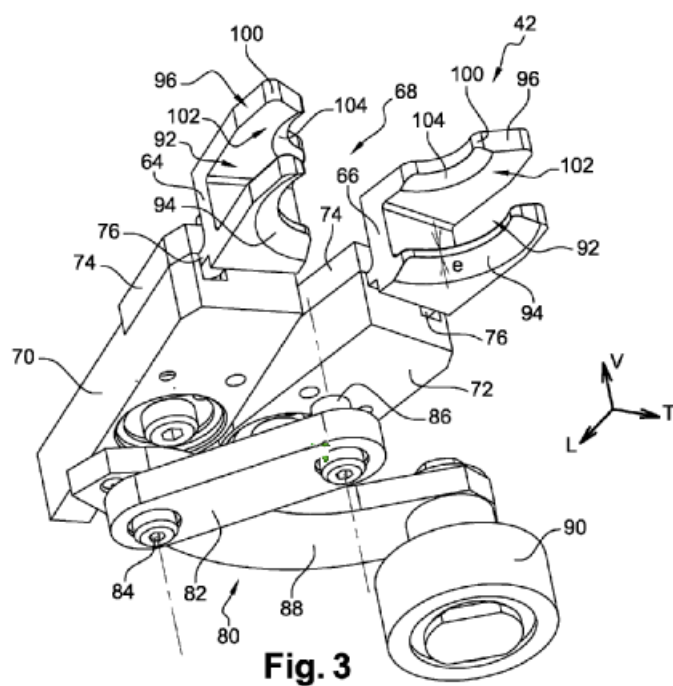


**B29C 49/42065****{Means specially adapted for transporting preforms}****Definition statement***This place covers:*

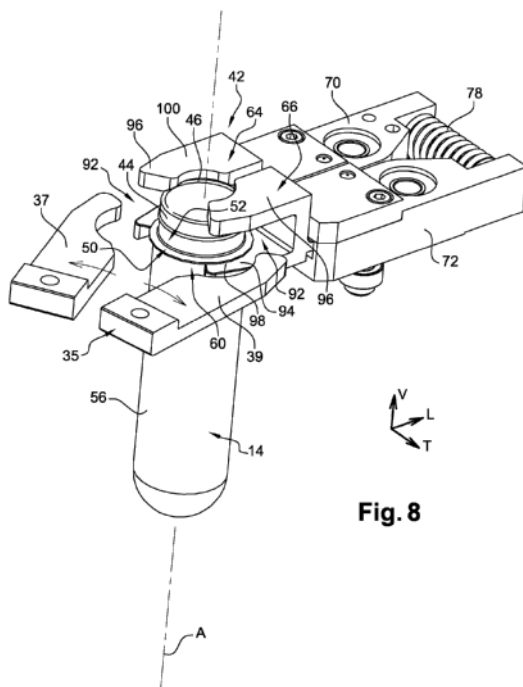
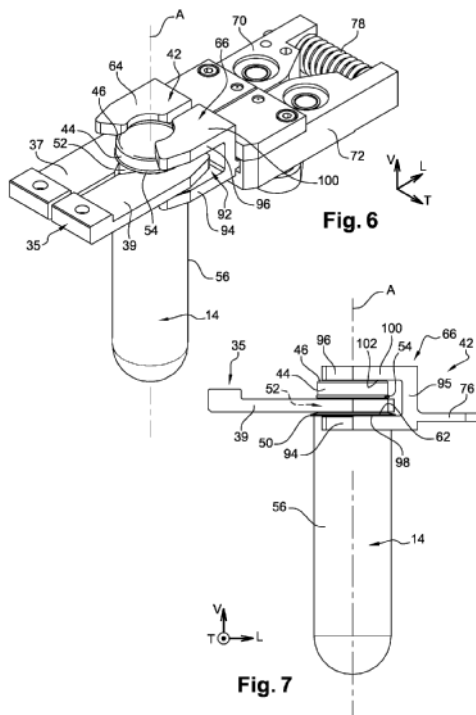
Handling means structures which move, transfer, grip, carry, or otherwise relocate preforms from one location to another location.

Illustrative example of subject matter classified in this group:





## Definition statement

**B29C 49/42069**

{Means explicitly adapted for transporting blown article}

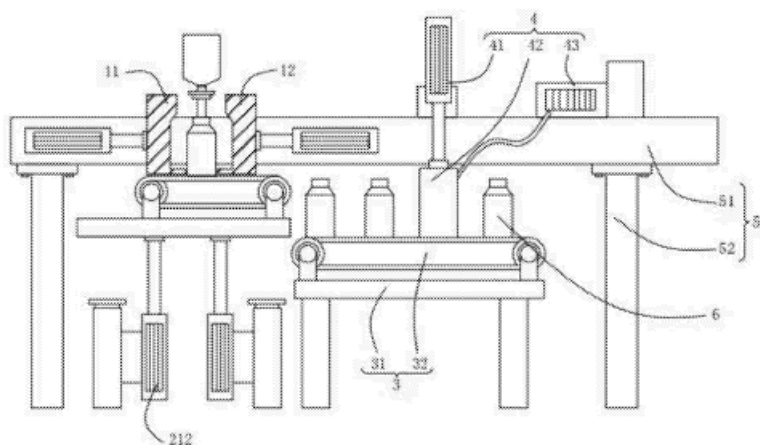
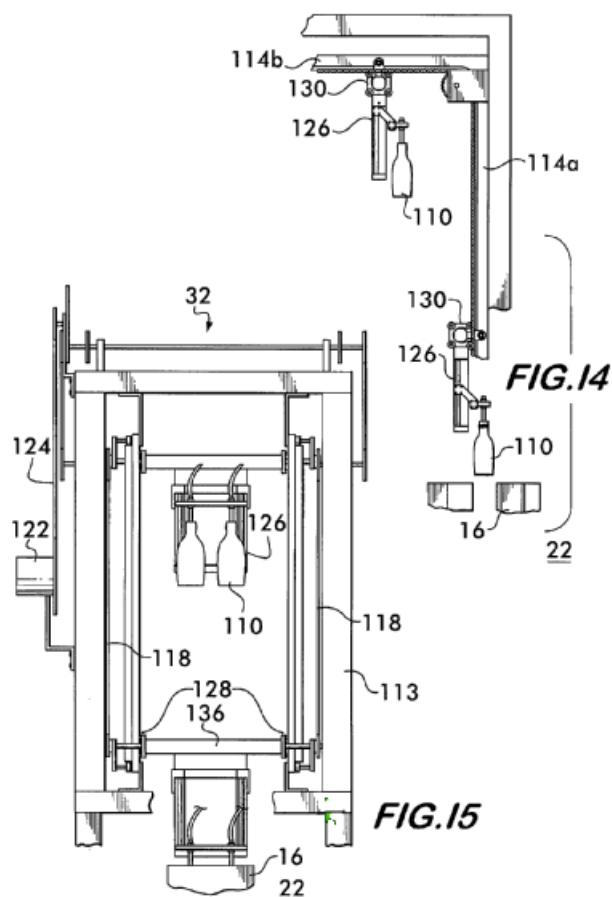
**Definition statement**

*This place covers:*

Handling means structures which are only for transporting the blown article.

## Definition statement

Illustrative example of subject matter classified in this group:



## B29C 49/4207

{with stacking means, e.g. stacking the articles for further transport}

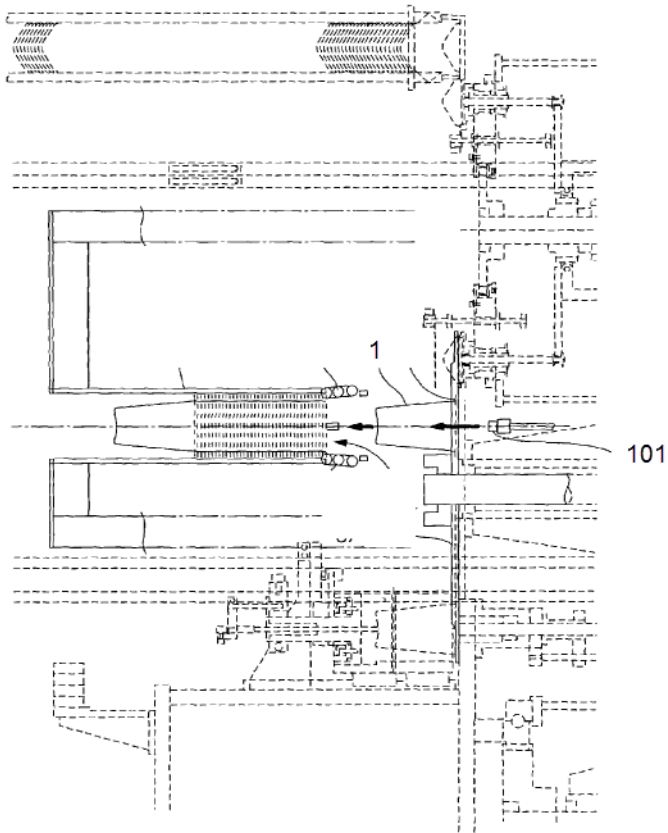
## Definition statement

*This place covers:*

Structures which stack, in any orientation, the blown articles for transporting purposes.

Illustrative example of subject matter classified in this group:

Air nozzle 101 lifts containers 1 into a cylindrical stacker.



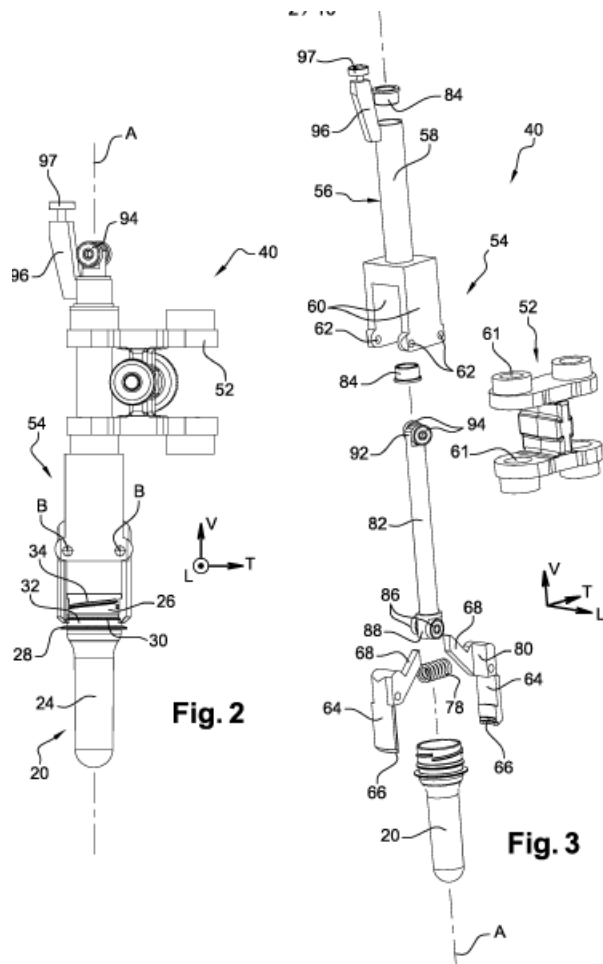
**B29C 49/42075**

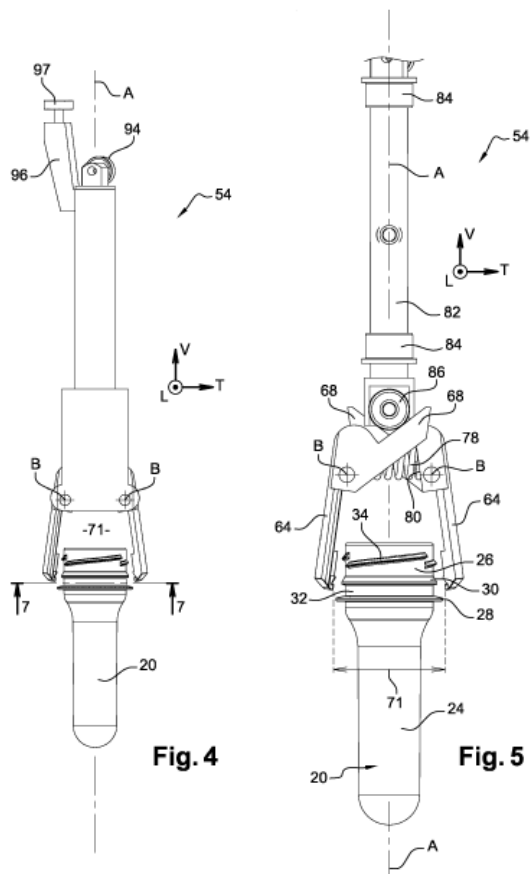
**{with pivoting clamps}**

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:





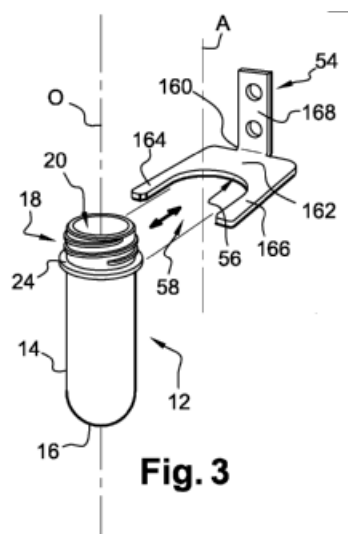
## B29C 49/42077

{with U-shaped holder}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:



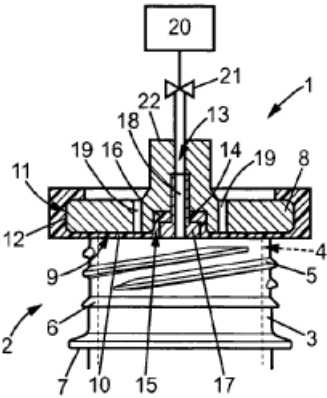
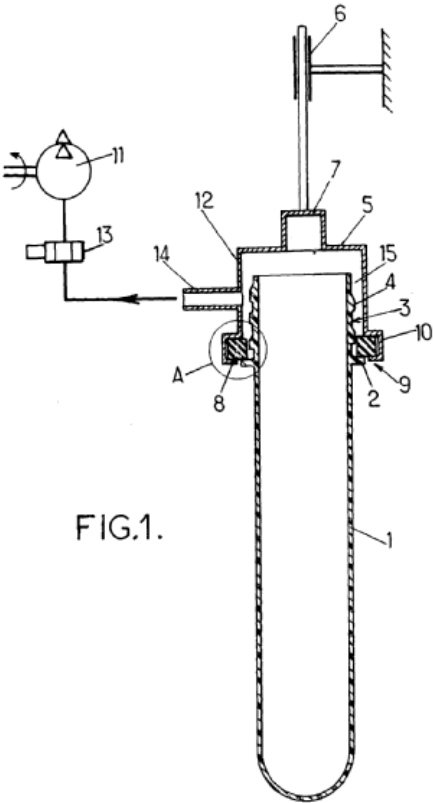
**B29C 49/42079**

{using vacuum for gripping}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:





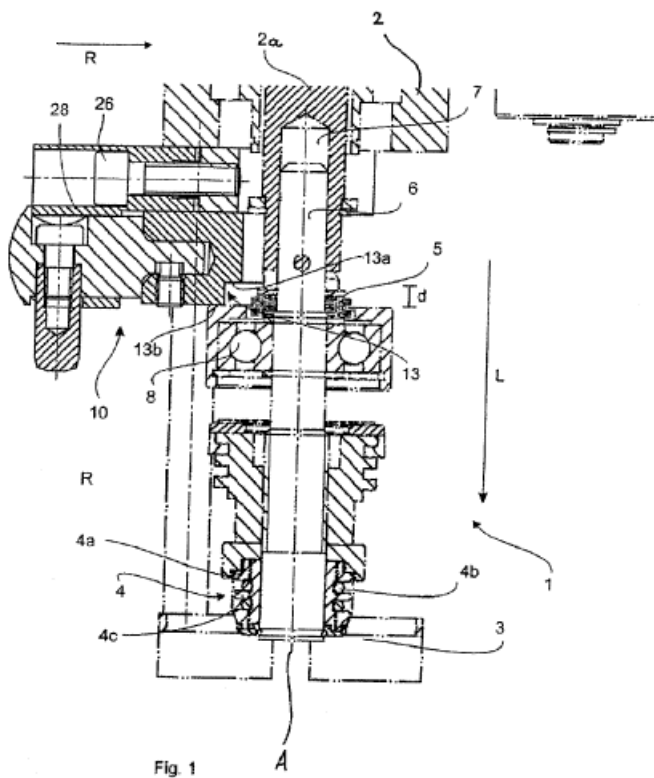
**B29C 49/42081**

{adjustable for different preform size}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:

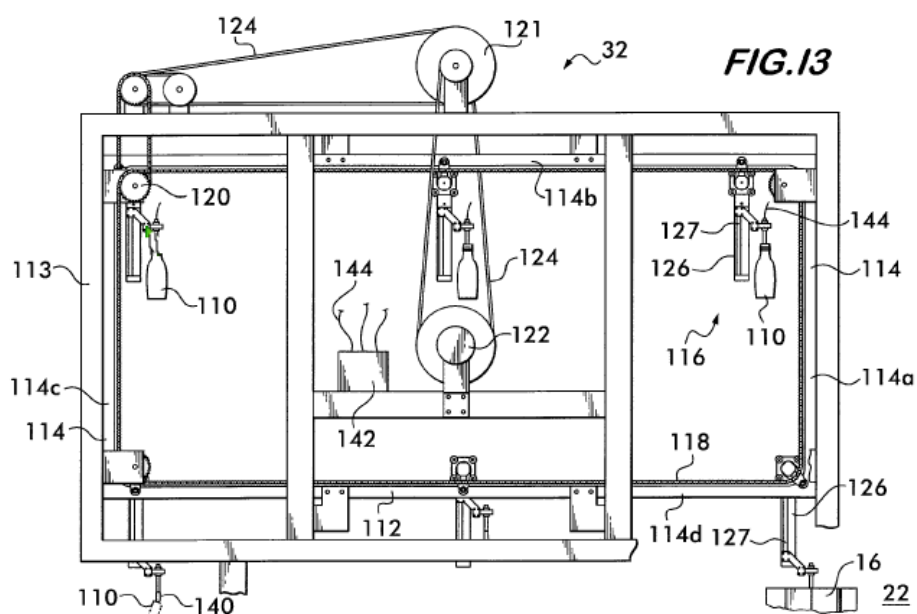
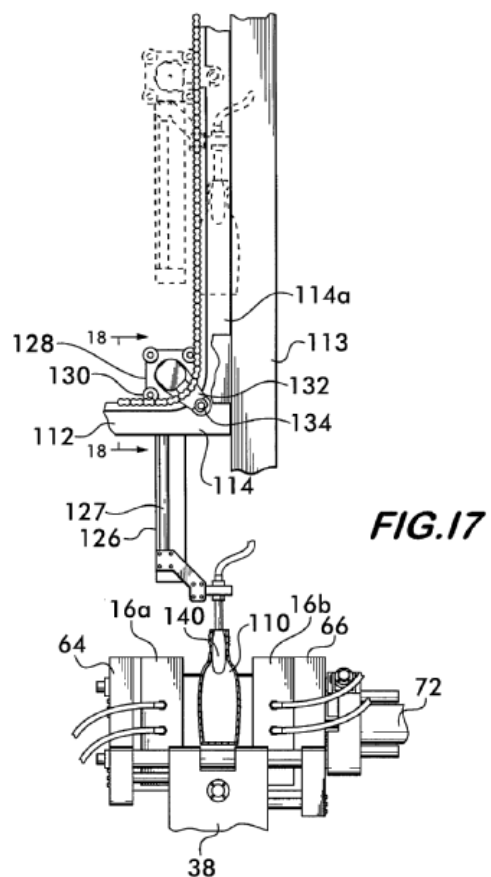


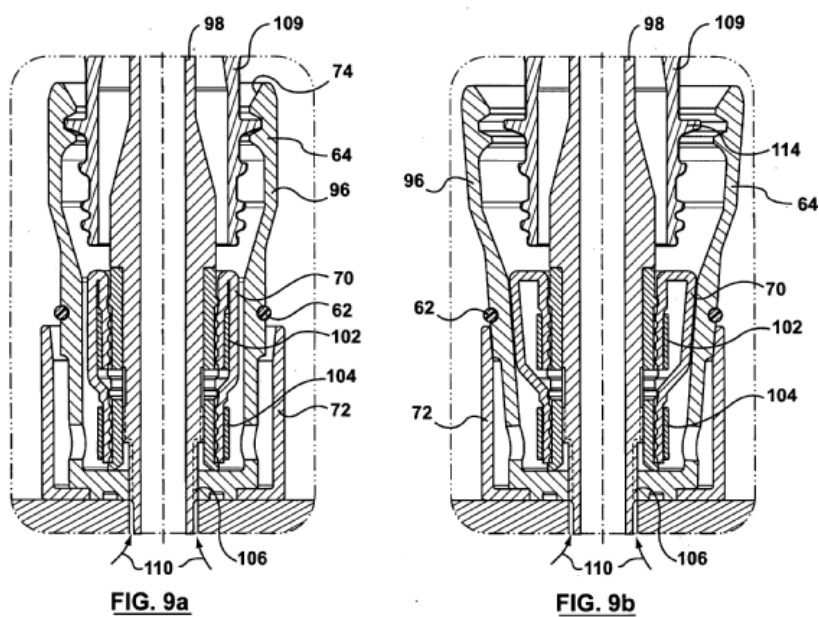
**B29C 49/42083**

{being inflatable}

**Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:





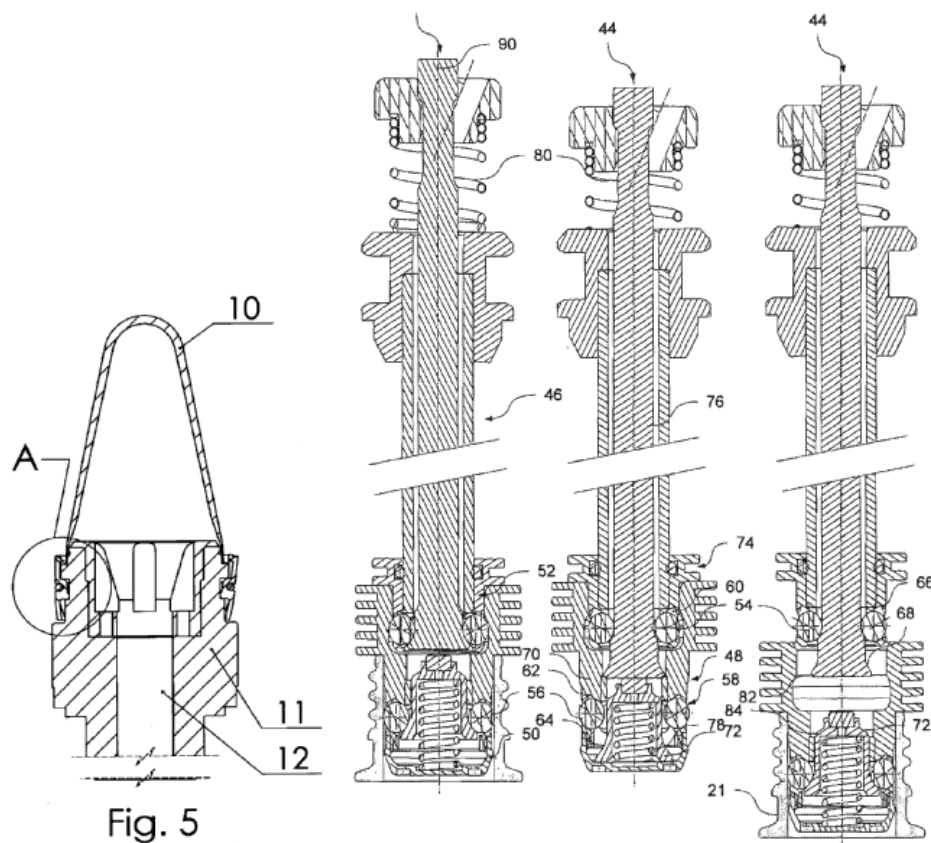
## B29C 49/42085

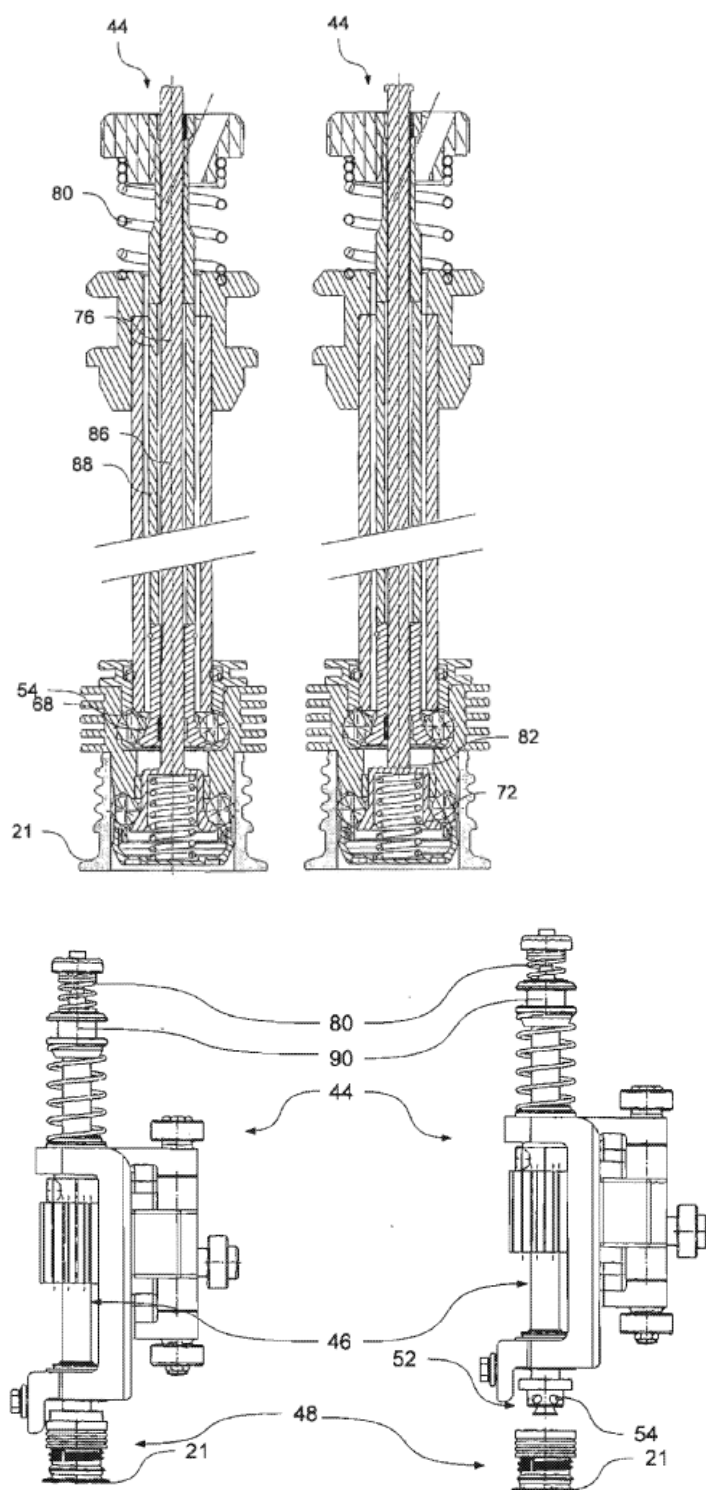
{holding inside the neck}

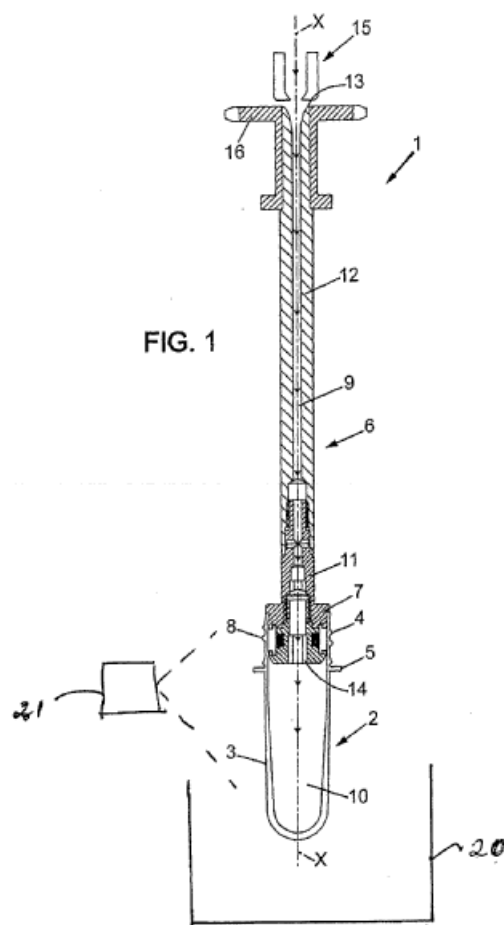
### Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:







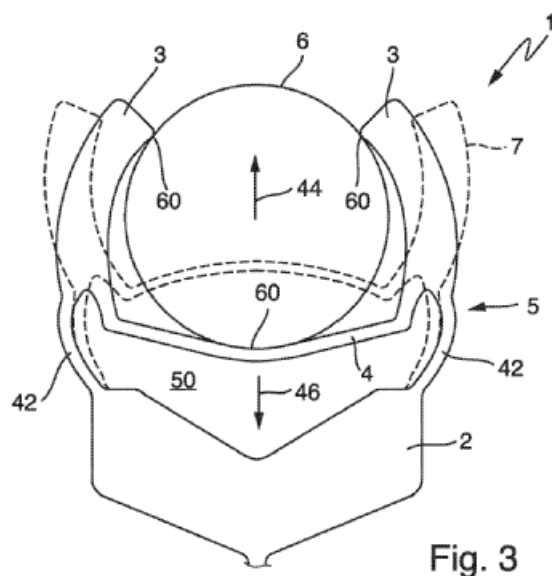
## B29C 49/42087

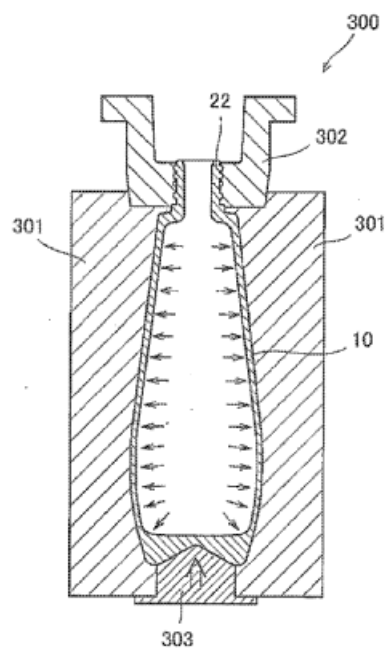
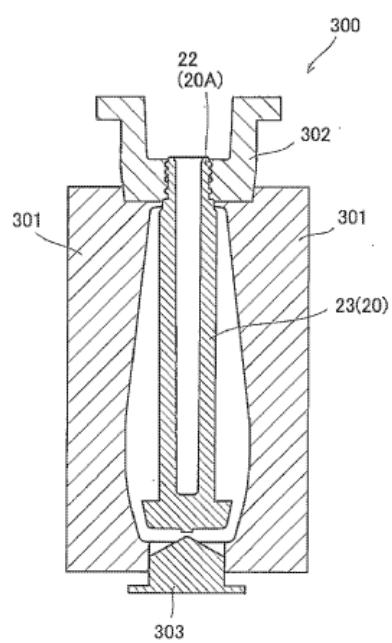
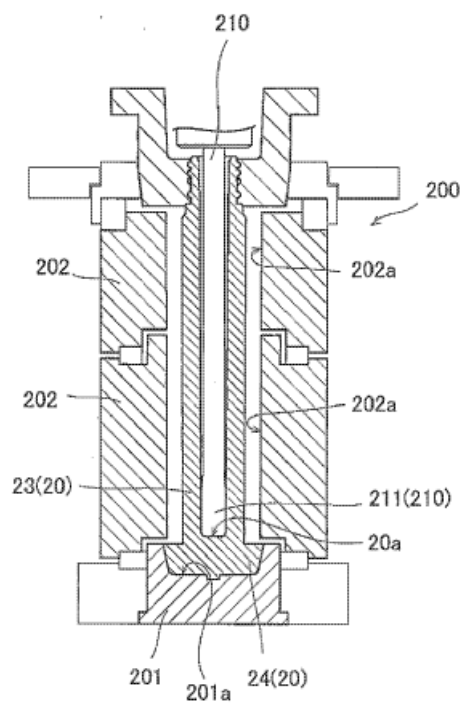
{holding outside the neck}

### Definition statement

*This place covers:*

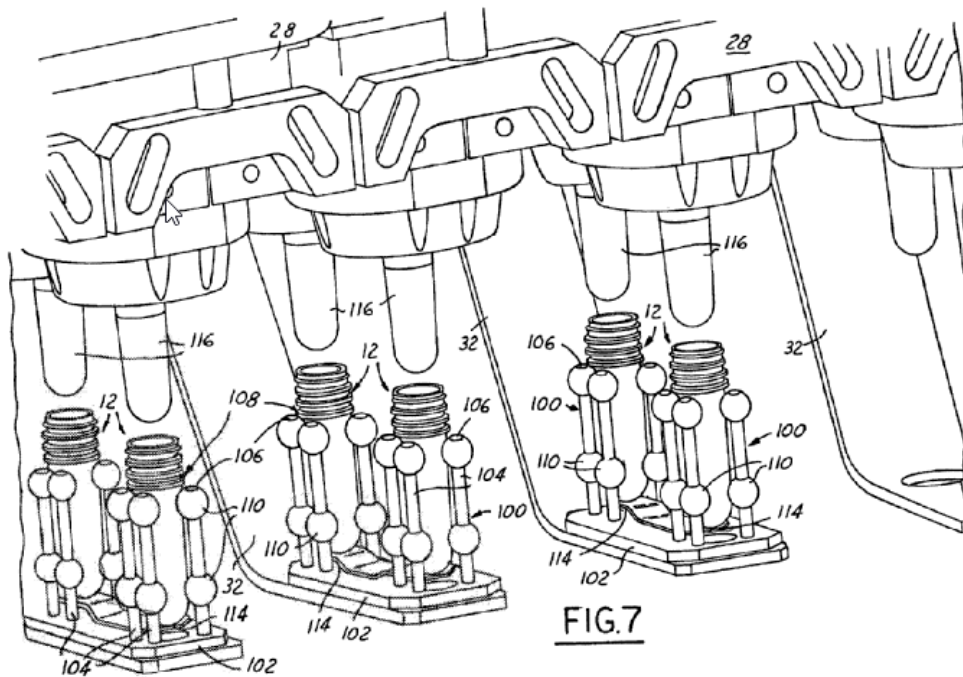
Illustrative example of subject matter classified in this group:





**B29C 49/42089****{holding body portion}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:



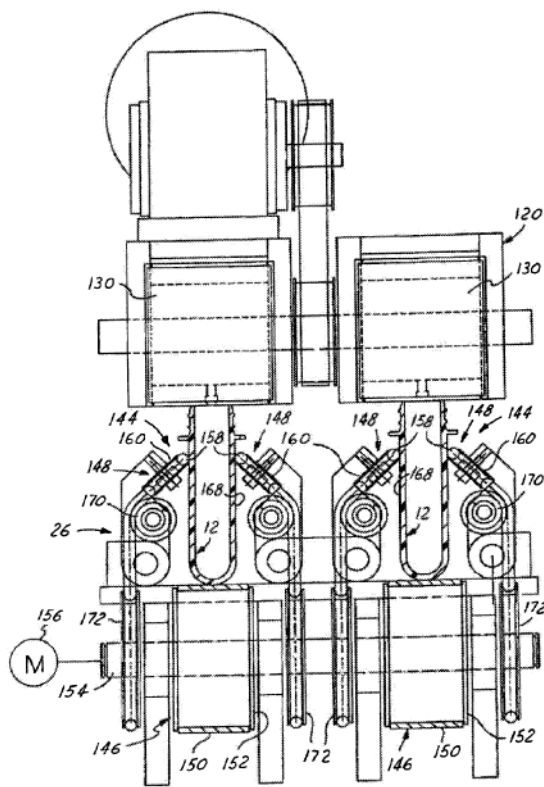


FIG. 9

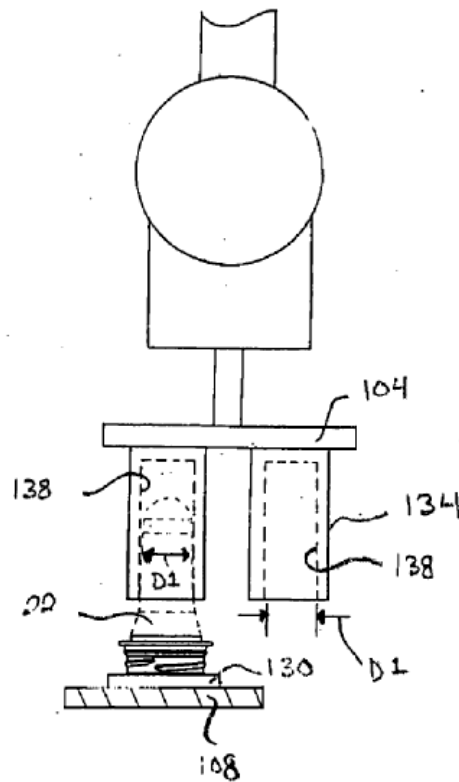
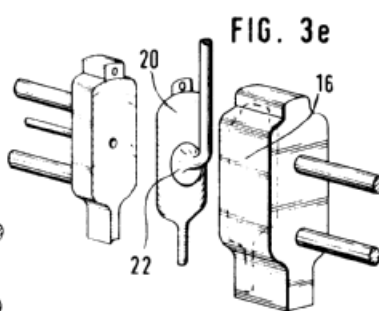
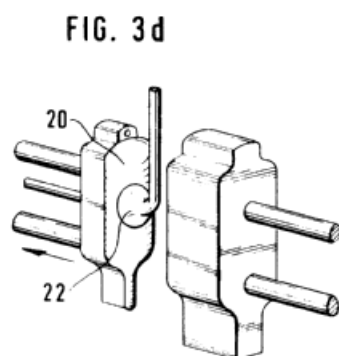
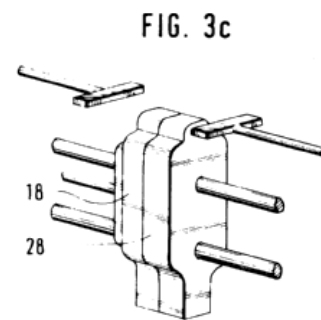
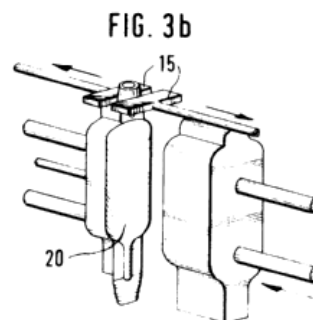
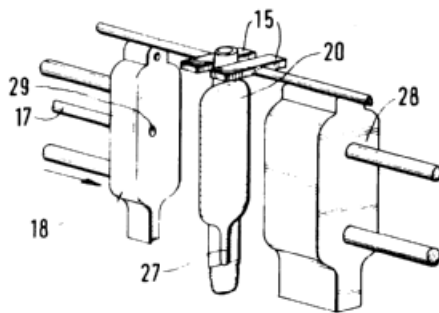


FIG. 4





**B29C 49/42091****{holding bottom portion or sprue}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

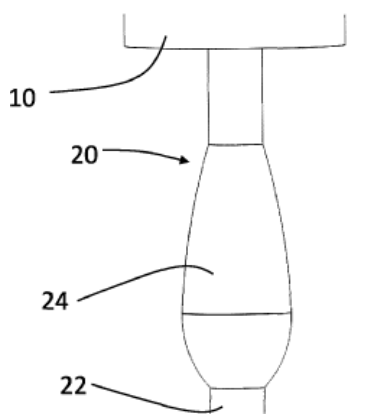


Fig. 2

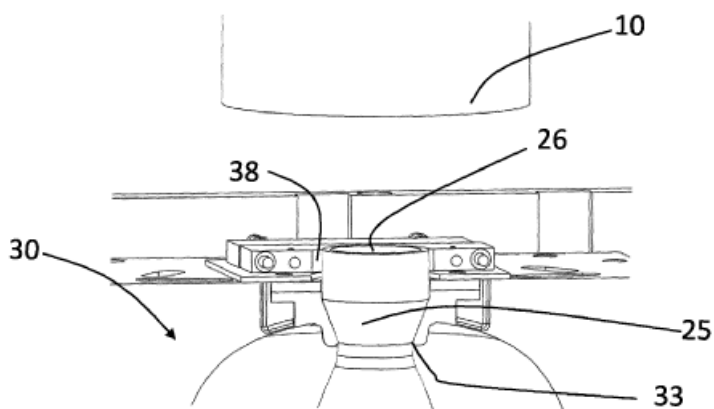
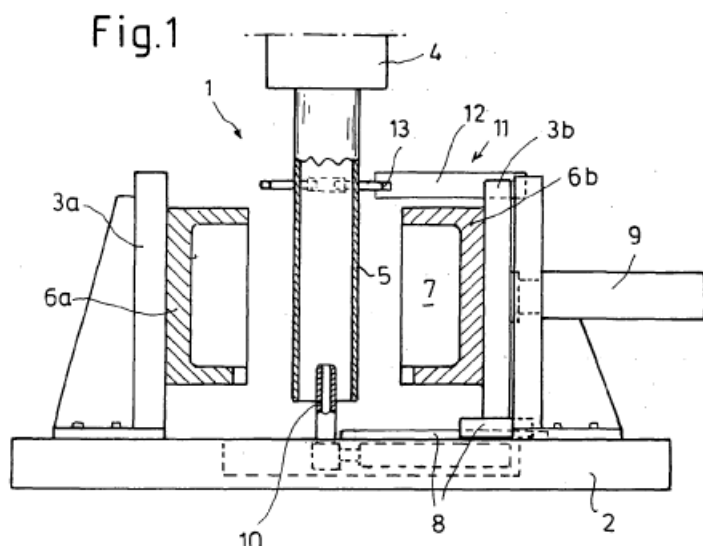
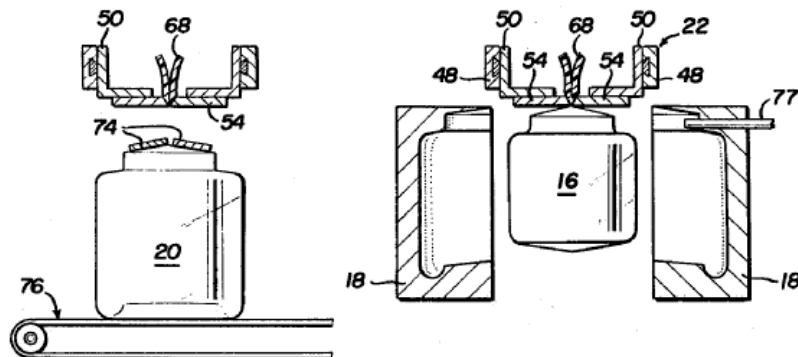
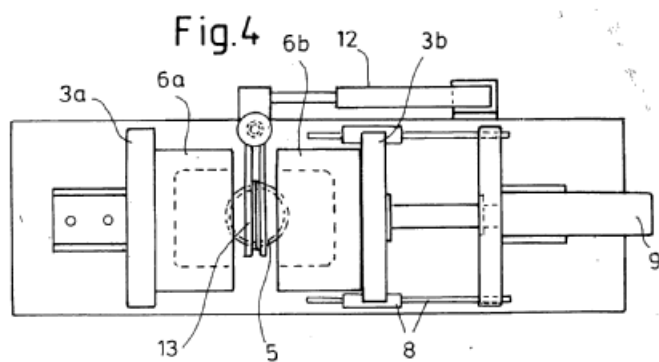
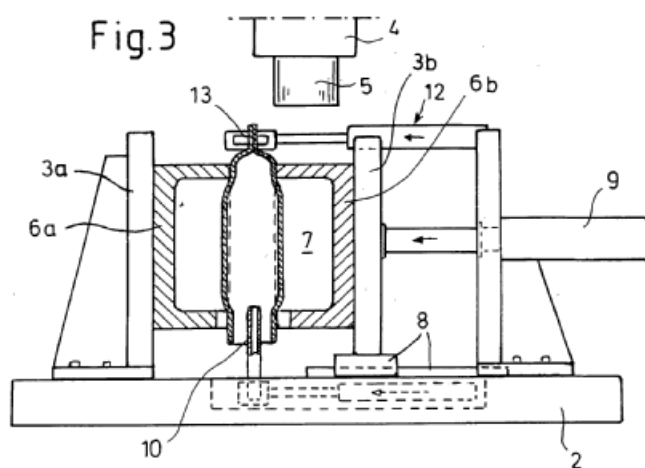
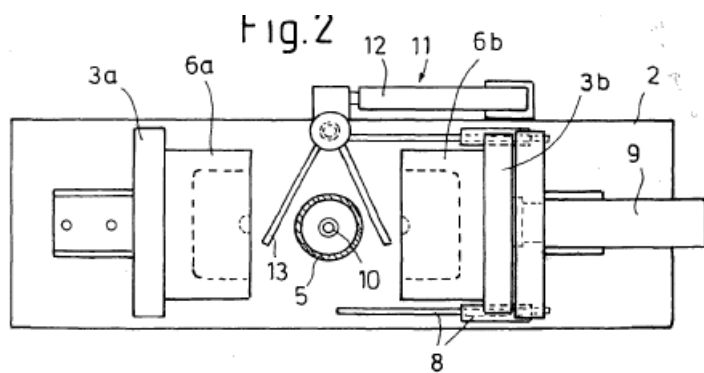


FIG. 4

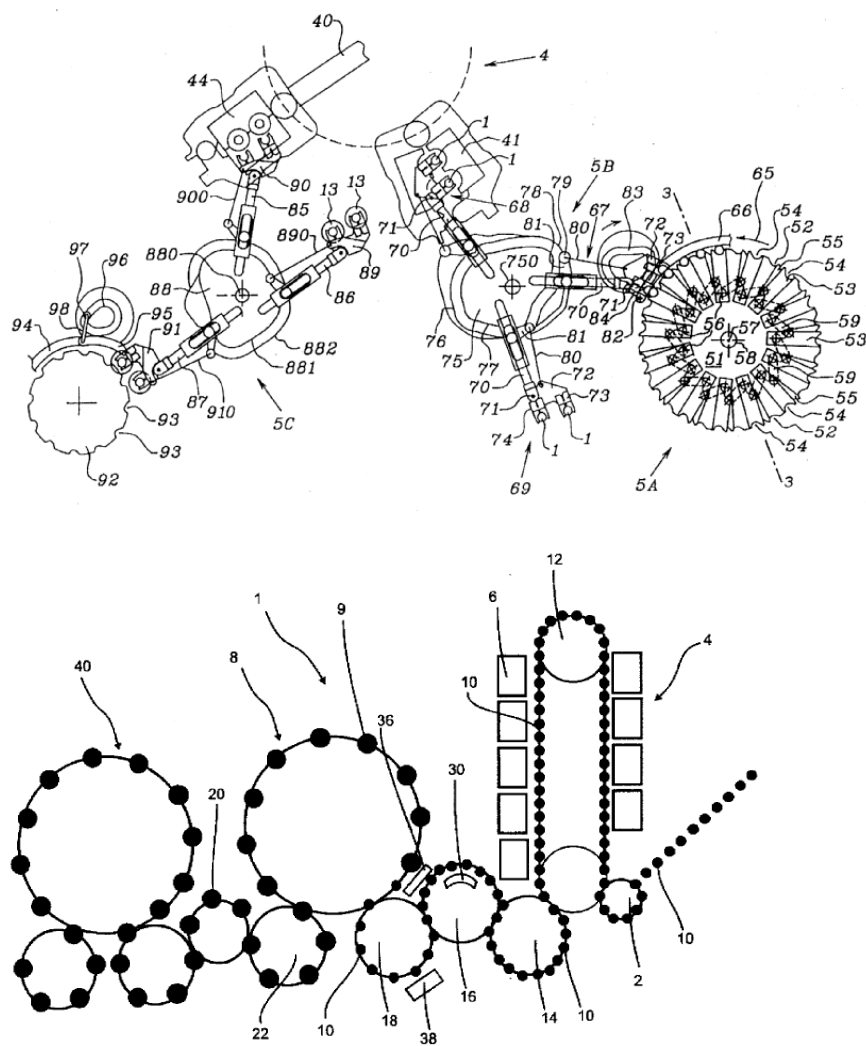
FIG. 5





**B29C 49/42095****{Rotating wheels or stars}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:



Definition statement

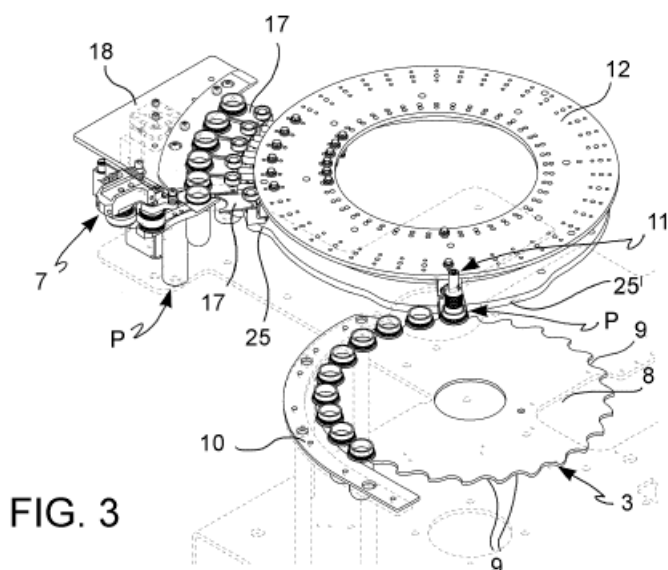


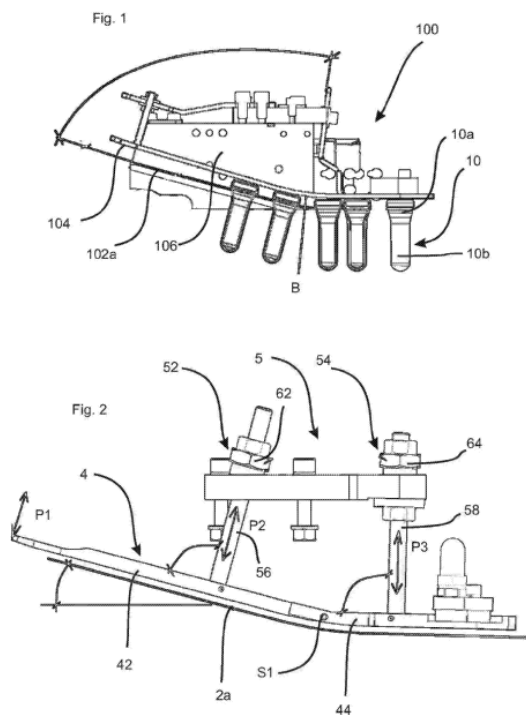
FIG. 3

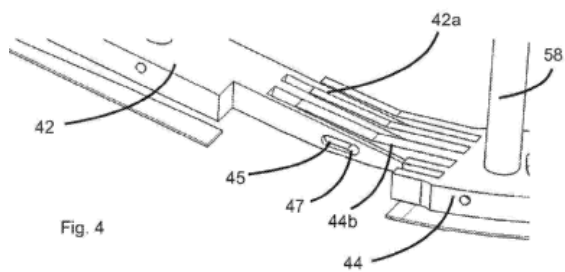
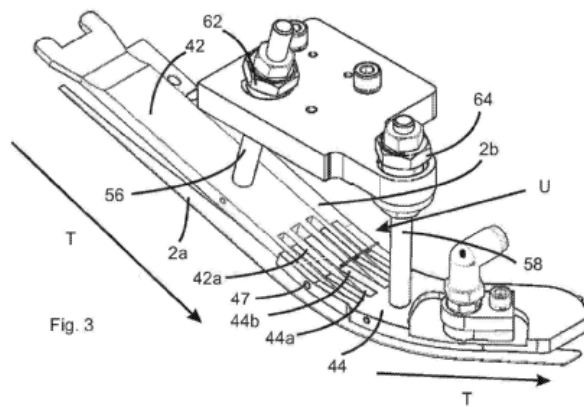
**B29C 49/42097**

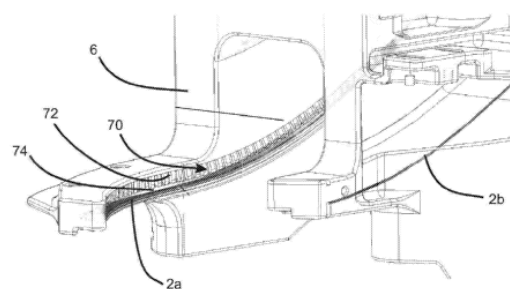
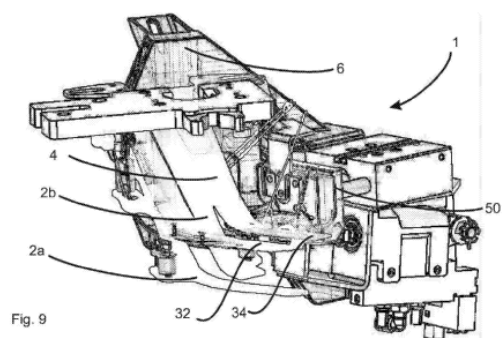
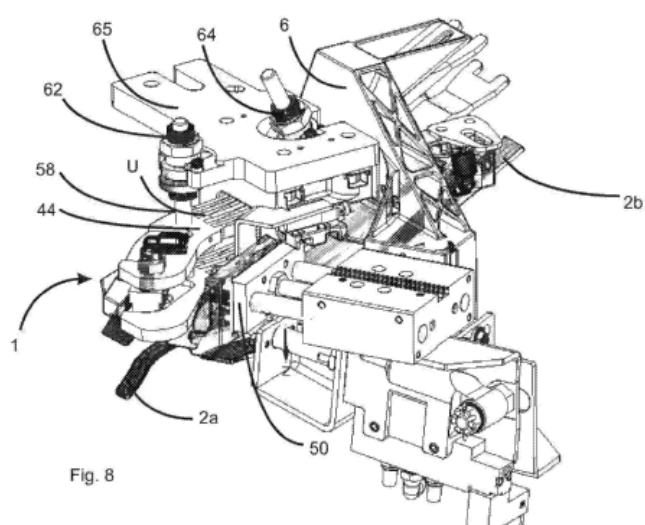
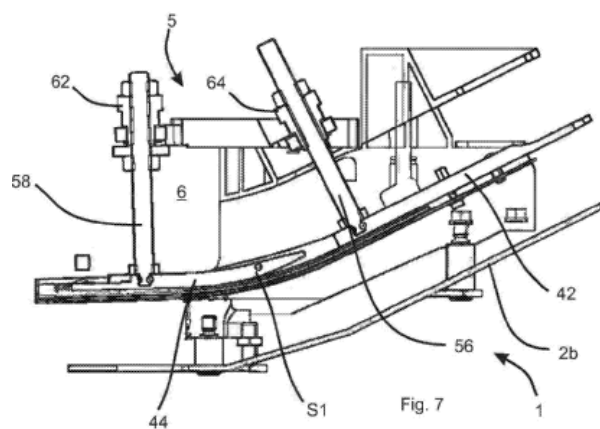
{Sliding rails, e.g. inclined}

**Definition statement***This place covers:*

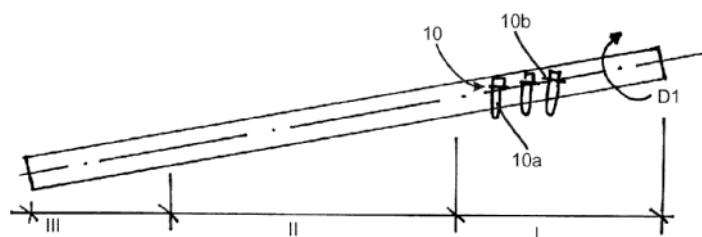
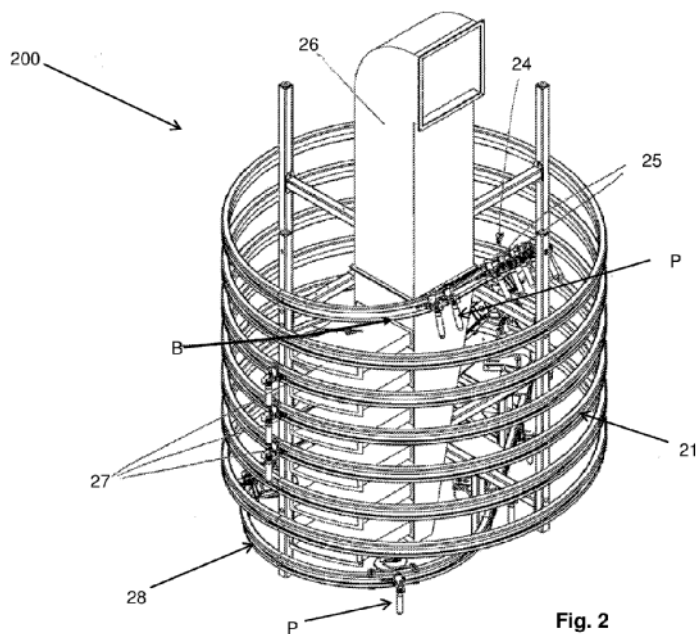
Illustrative example of subject matter classified in this group:







## Definition statement

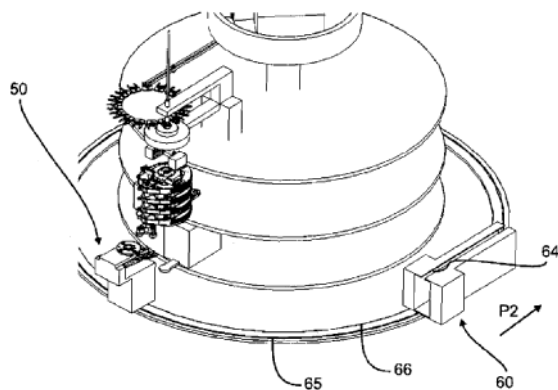
**B29C 49/42099**

{Pushing by air}

**Definition statement***This place covers:*

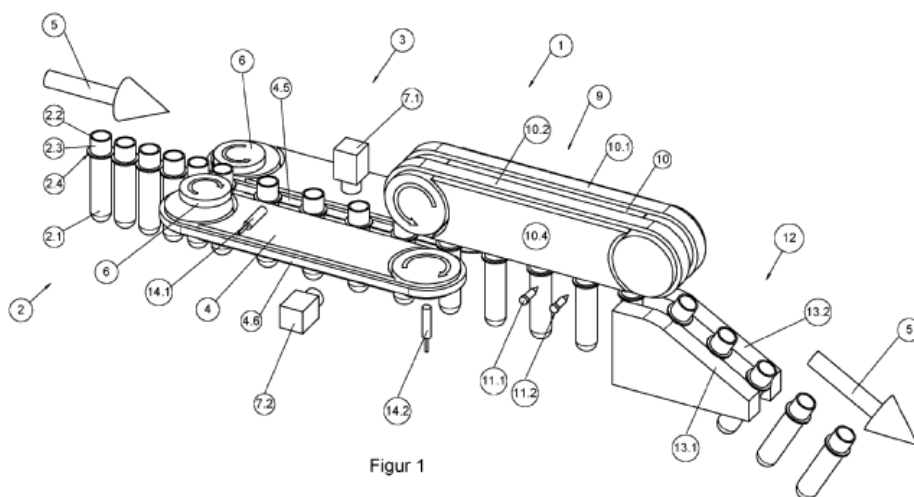
Where the movement along the sliding rail is caused by or aided by air or gas flow.

Illustrative example of subject matter classified in this group:



**B29C 49/42101****{Conveyors, e.g. flat conveyor or clamping between two bands}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:



Figur 1

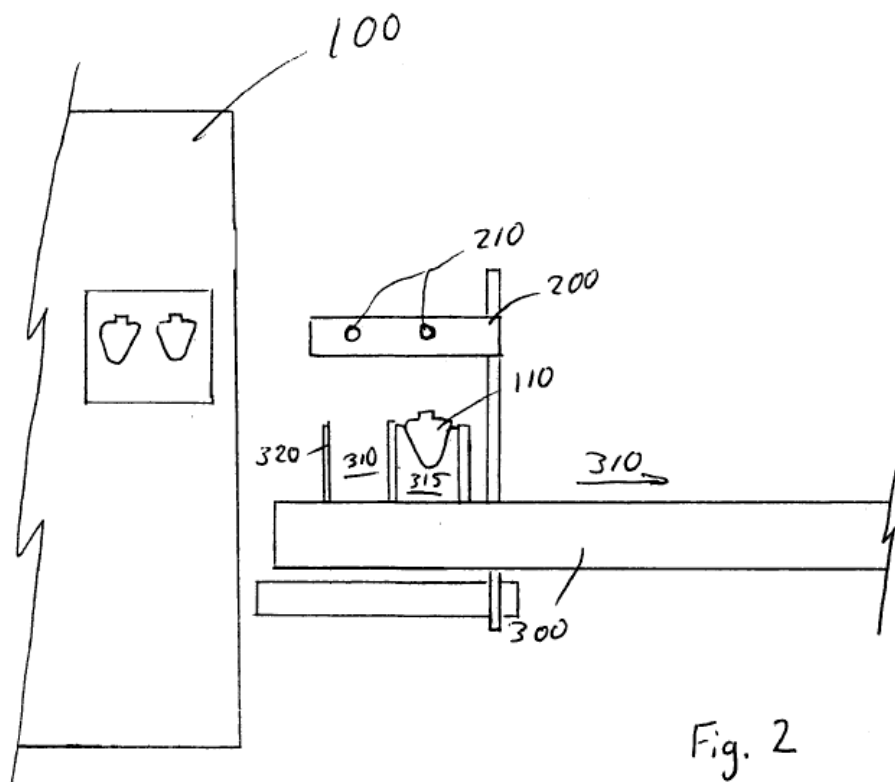


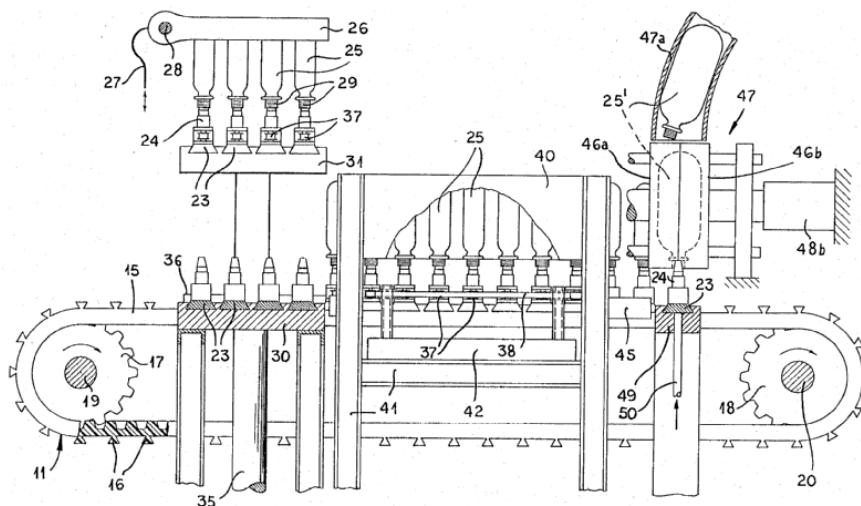
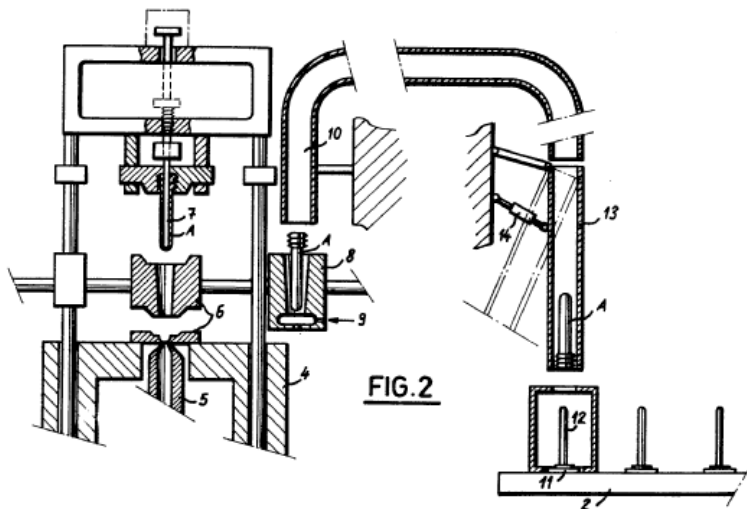
Fig. 2



**B29C 49/42103****{Vacuum suction pipes}****Definition statement***This place covers:*

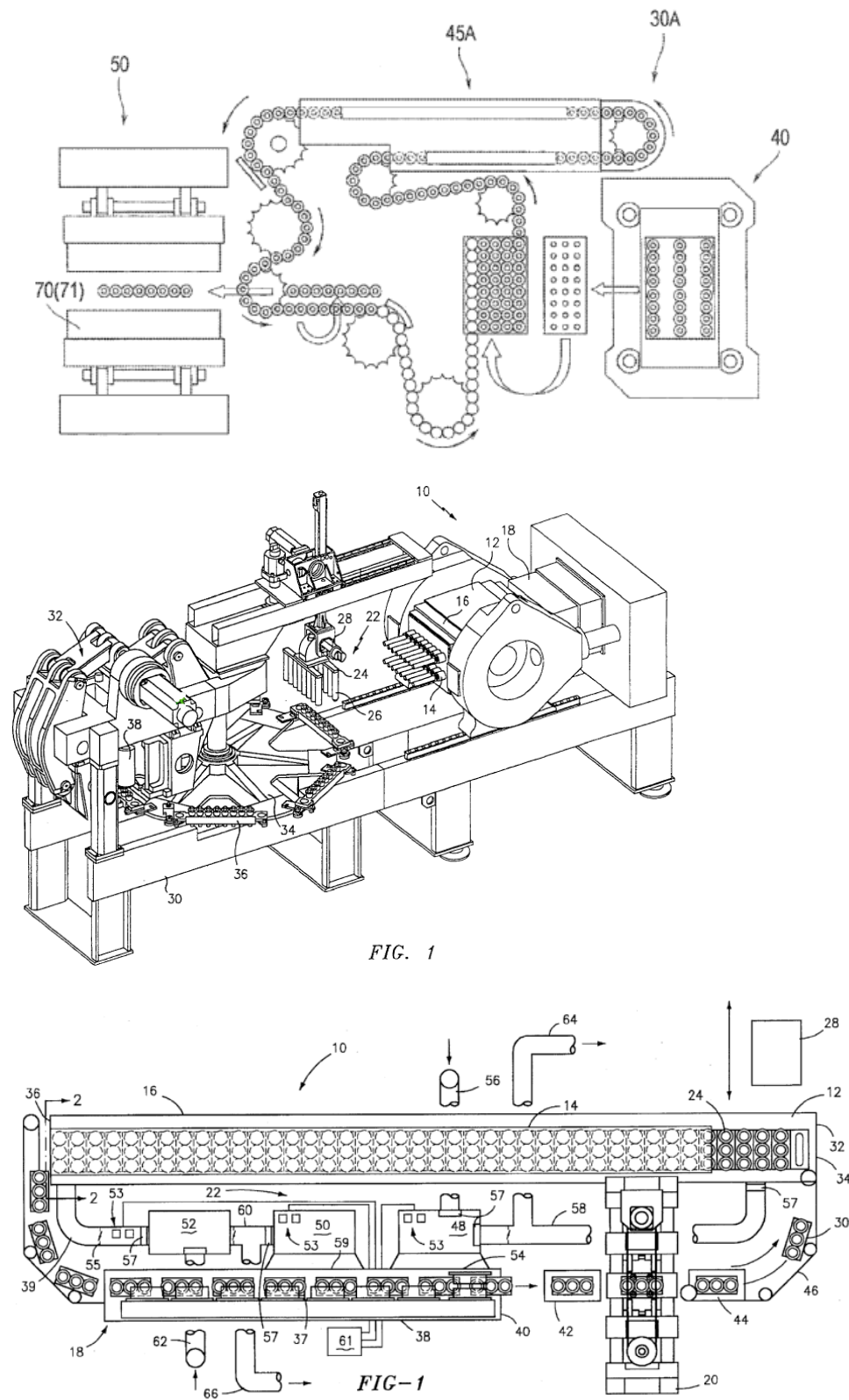
Transportation means that uses vacuum or suction along a tube/pipe/conduit (e.g. a pneumatic tube).

Illustrative example of subject matter classified in this group:

**B29C 49/42105****{for discontinuous or batch transport}****Definition statement***This place covers:*

Handling means for movement of a discrete number of preforms or blown articles.

Illustrative example of subject matter classified in this group:



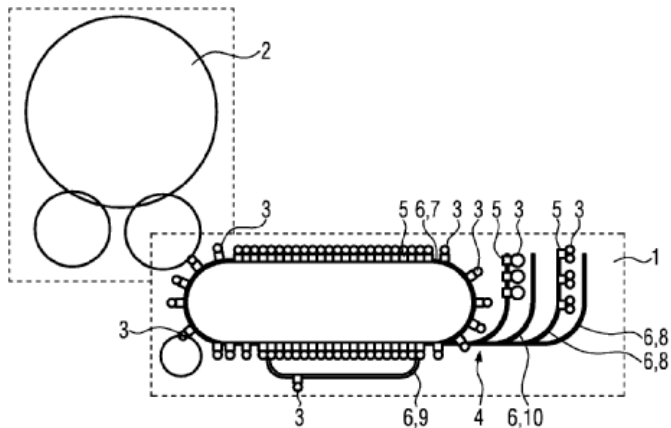
**B29C 49/42107**

{with accumulator or temporary storage, e.g. while waiting for the blowing apparatus}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:

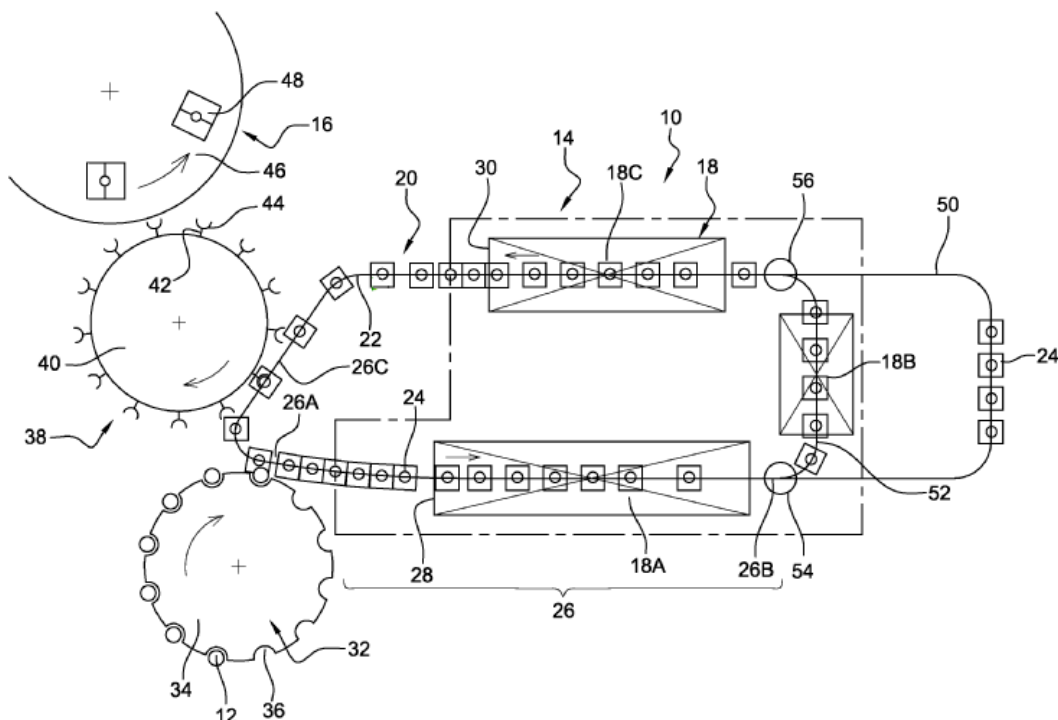
**B29C 49/42111**

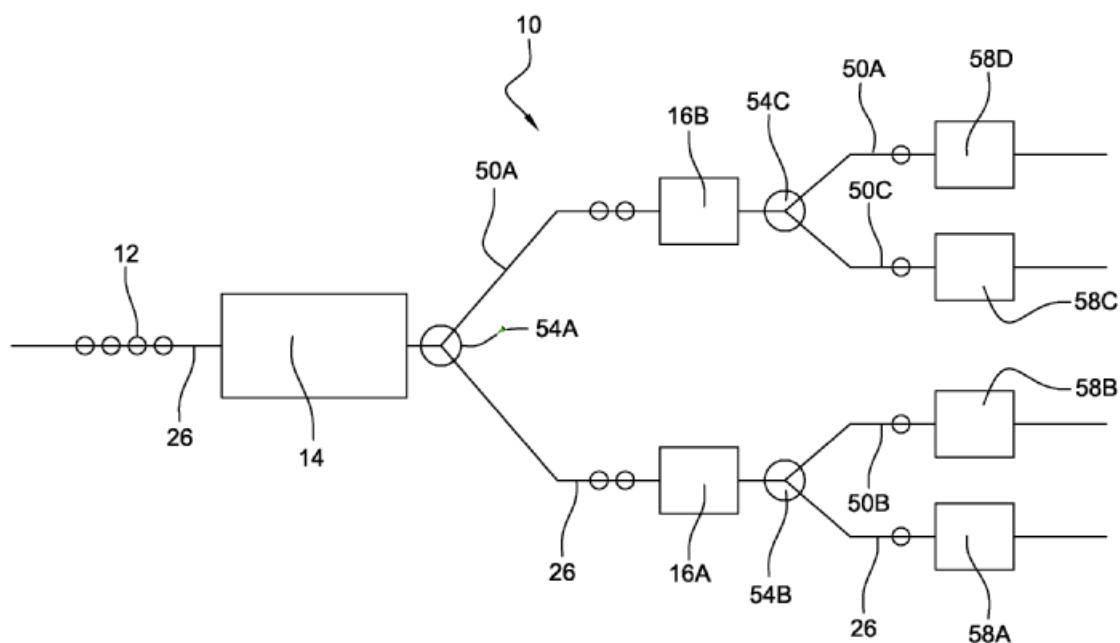
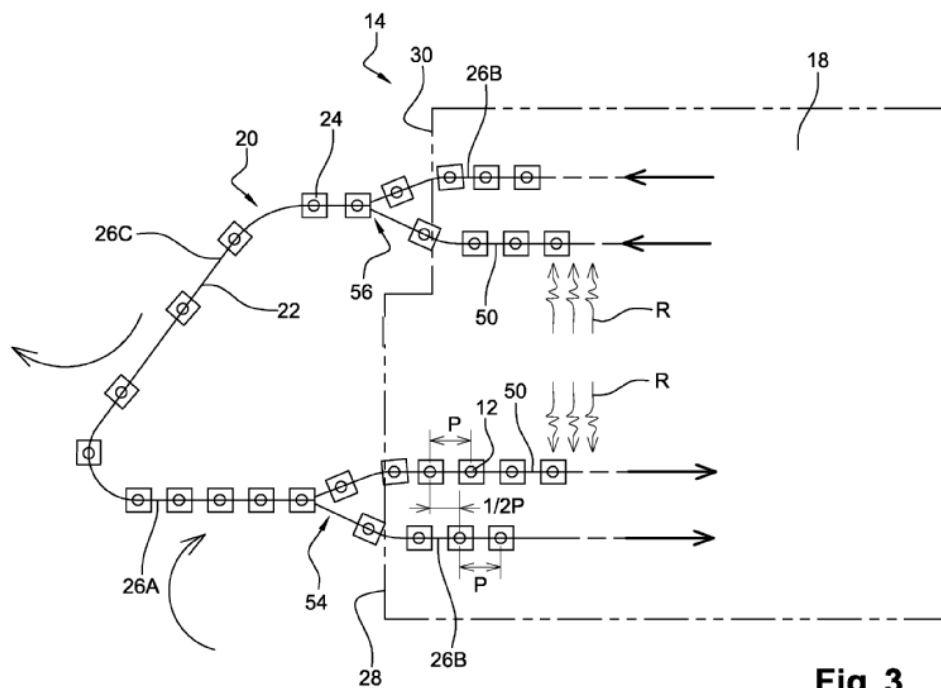
{with changeable transporting paths or lengths}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:





## B29C 49/42115

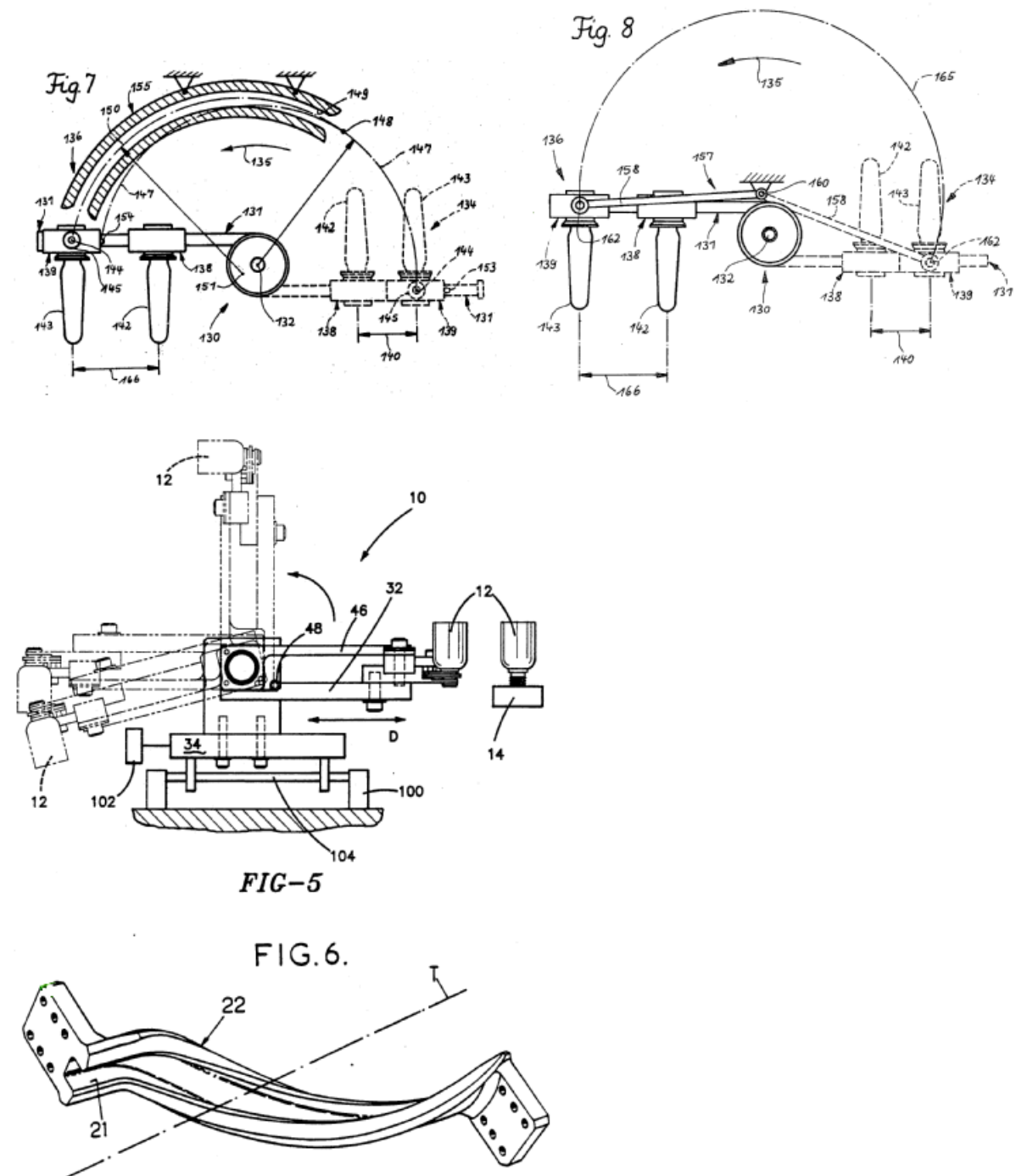
{Inversion, e.g. turning preform upside down}

### Definition statement

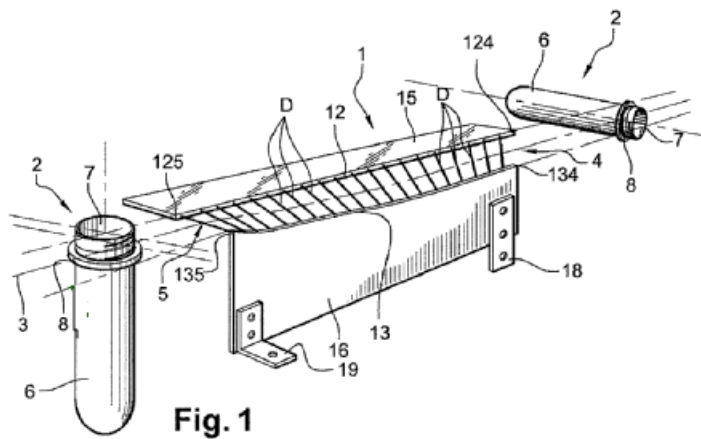
*This place covers:*

Handling means which invert the preform or article so that the top faces down or the bottom faces up.

Illustrative example of subject matter classified in this group:



Definition statement

**B29C 49/42117**

{Translation e.g. telescopic movement to pick up a preform}

**Definition statement***This place covers:*

Handling means which include a structure which moves, translates, or telescopes in order to reach a preform or blown article.

## Definition statement

Illustrative example of subject matter classified in this group:

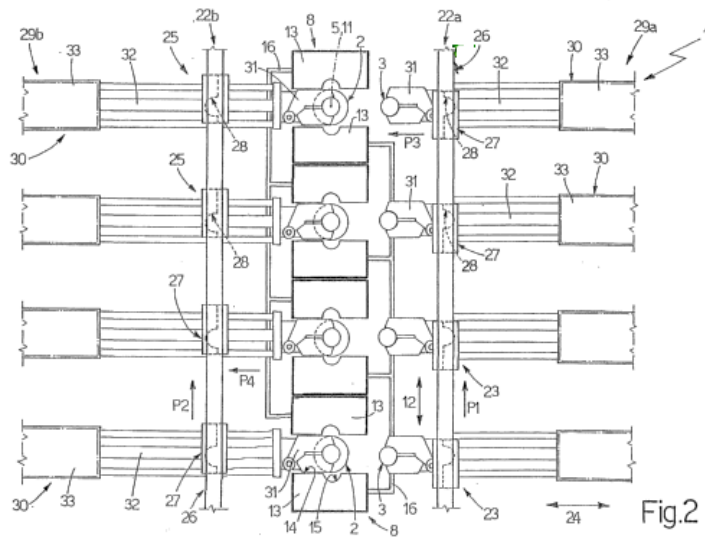
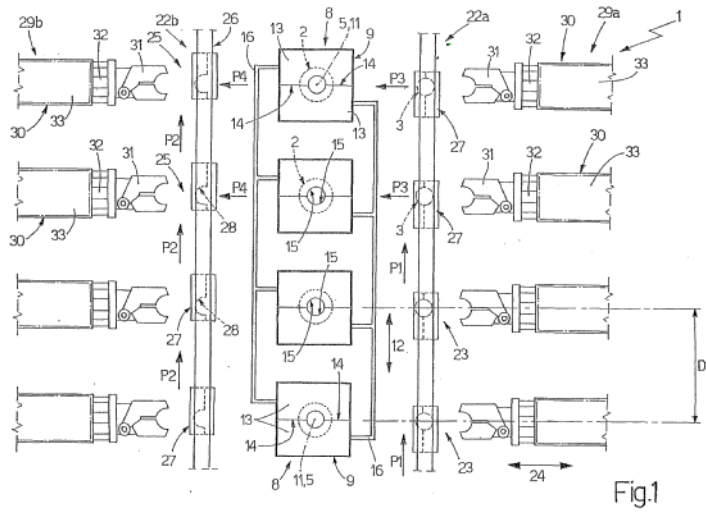
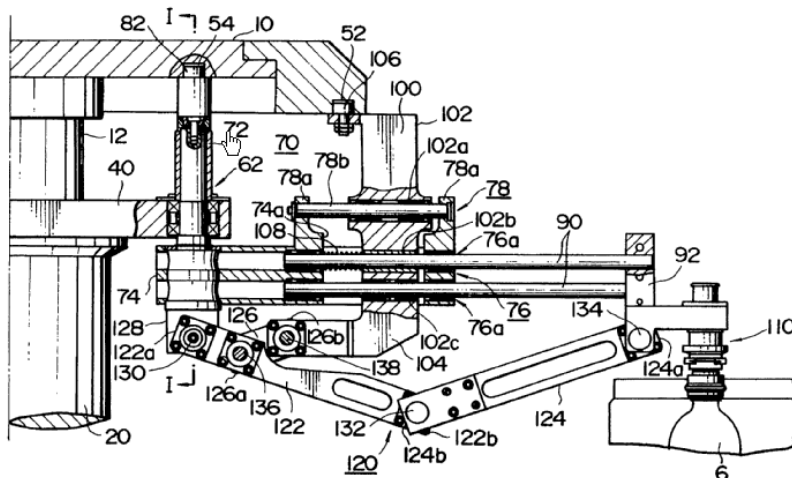
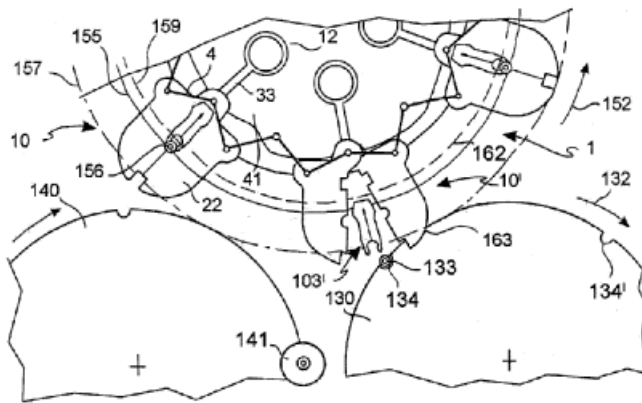


FIG. 3



Definition statement

**B29C 49/42121**

{Changing the center-center distance}

**Definition statement***This place covers:*

Handling means that alters the spacing between preforms or blown articles during transportation.

Illustrative example of subject matter classified in this group:

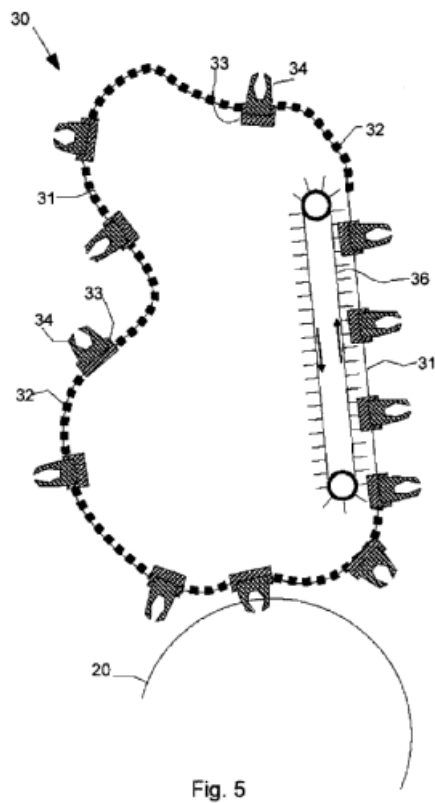
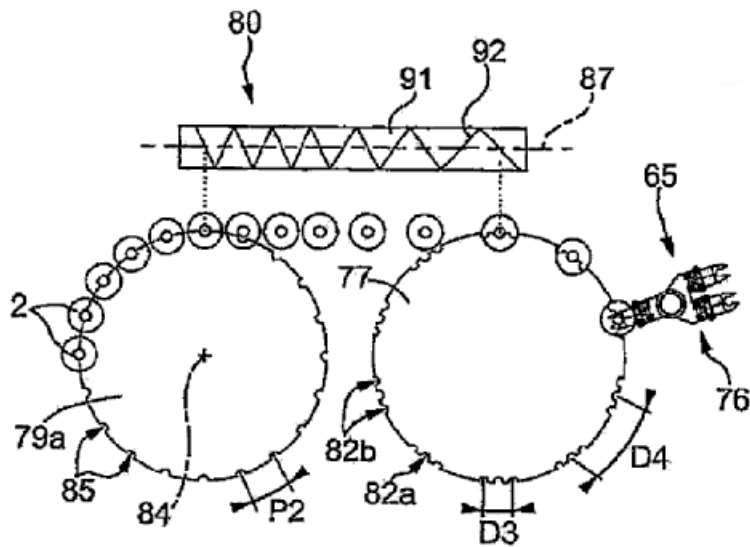


Fig. 5



Definition statement

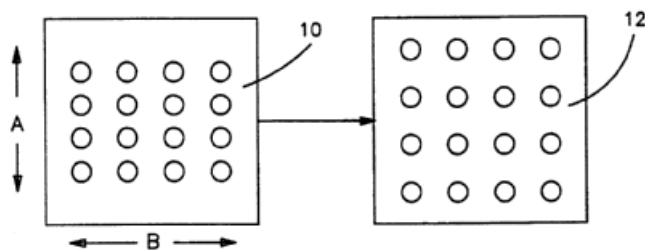
**B29C 49/42122**

{Adapting to blow-mould cavity center-center distance}

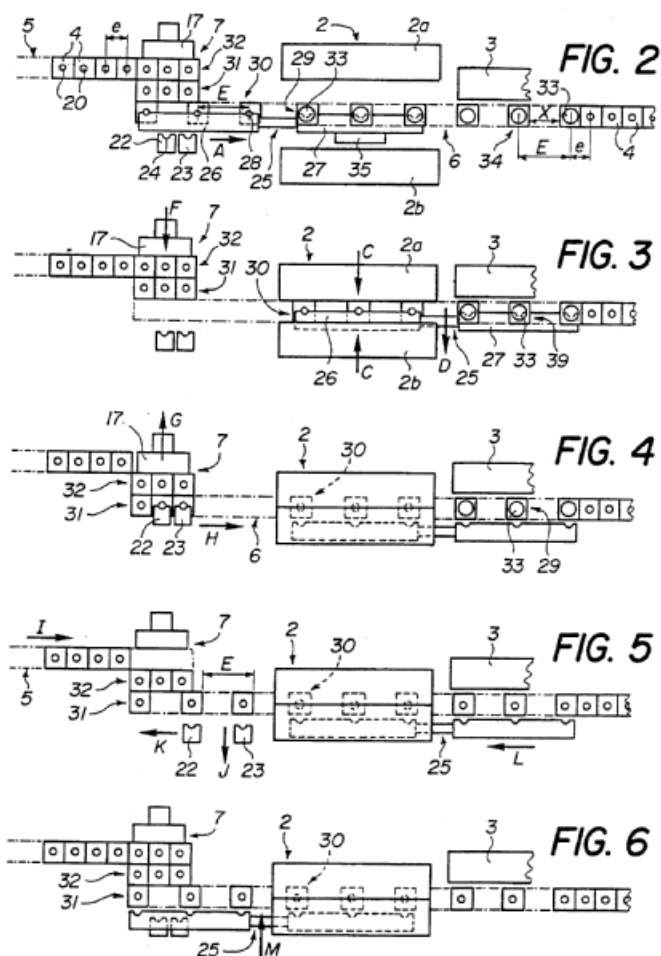
**Definition statement***This place covers:*

Where mould cavity spacing is different than the spacing of the preforms during transportation to the mould.

Illustrative example of subject matter classified in this group:



## Definition statement



## B29C 49/42155

{Keeping center-center distance constant}

## Definition statement

*This place covers:*

Handling means which maintains a constant spacing between preforms or blown articles during transportation.

Illustrative example of subject matter classified in this group:

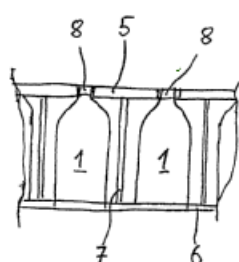


Fig. 3

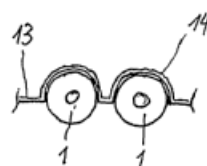


Fig. 5

Definition statement

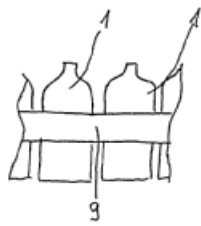


Fig. 4.1

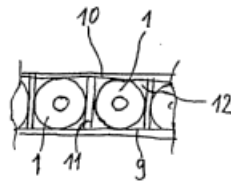


Fig. 4.2

**B29C 49/42362**

{Electric drive means, e.g. servomotors}

**Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

Where the drive mechanism relies on electrical signals in order to provide movement (i.e. servomotor, linear actuator, etc.).

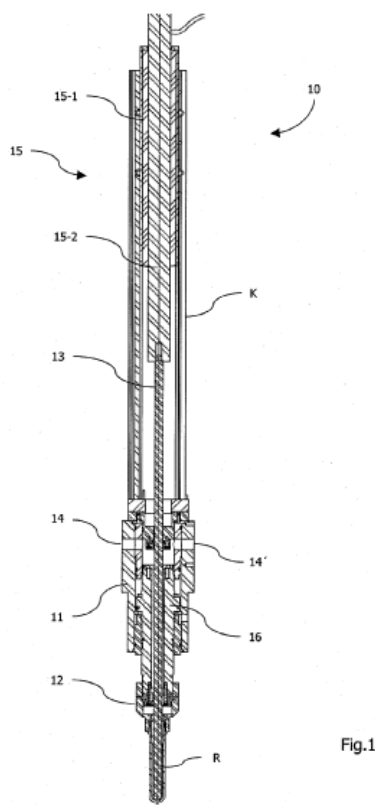


Fig. 1

**B29C 49/42374**

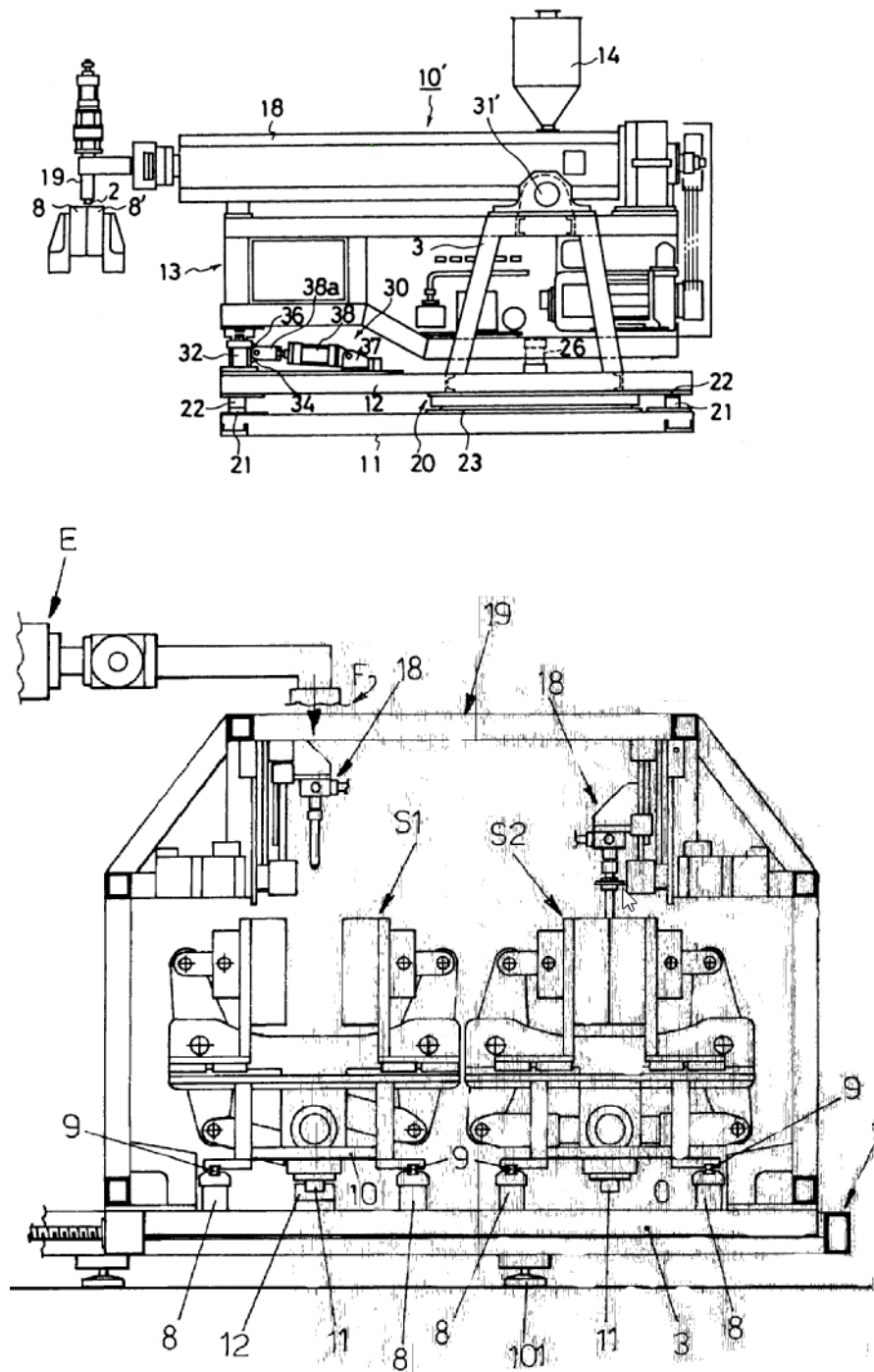
{for the extruder, e.g. extruder moving up and down}

**Definition statement***This place covers:*

Apparatuses that alter the position of an extruder.

## Definition statement

Illustrative example of subject matter classified in this group:



## B29C 49/42376

{for moulds other than opening, closing and clamping}

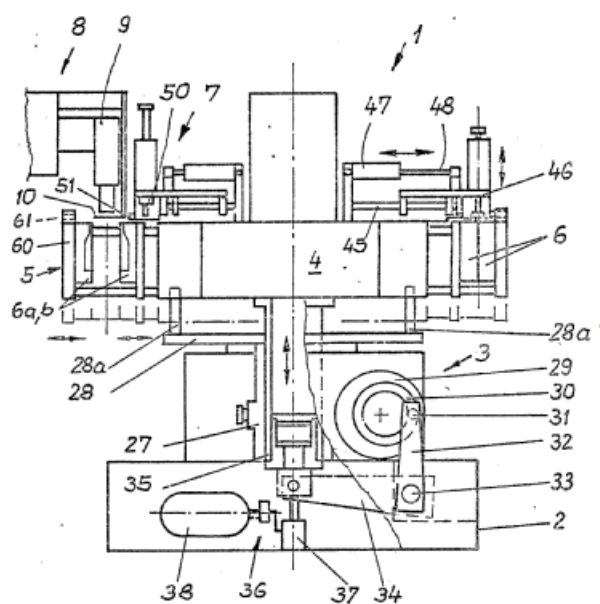
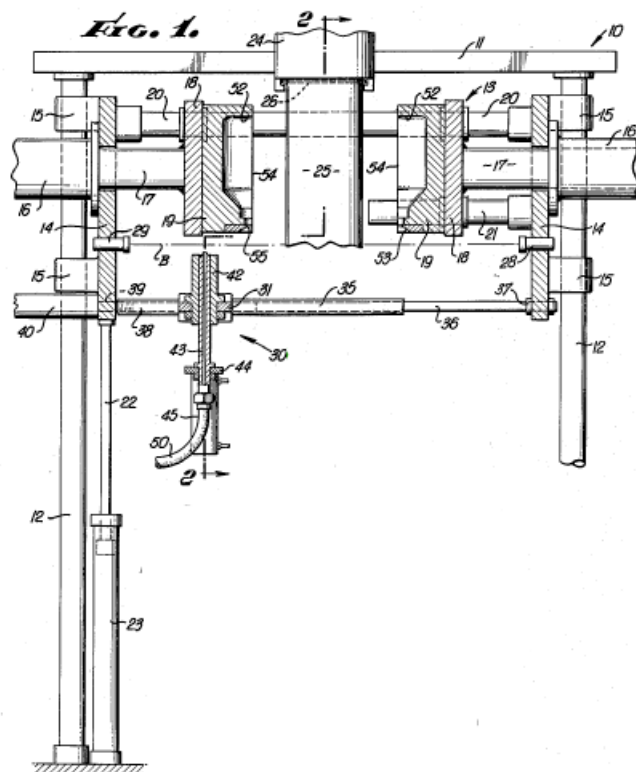
### Definition statement

*This place covers:*

Apparatuses that alter the position and/or location of a mould; not including opening, closing, or clamping the mould.

Definition statement

Illustrative example of subject matter classified in this group:



## B29C 49/42384

{Safety, e.g. operator safety}

### Definition statement

This place covers:

Safety devices preventing injuries while operating a blow-moulding apparatus.

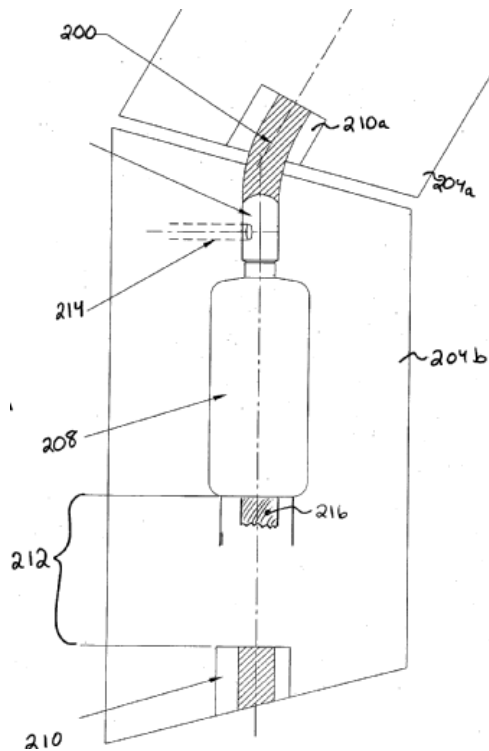
**B29C 49/42386**

**{Improving flash formation, e.g. providing for easily removable flash from extrusion moulded articles}**

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:



**B29C 49/4239**

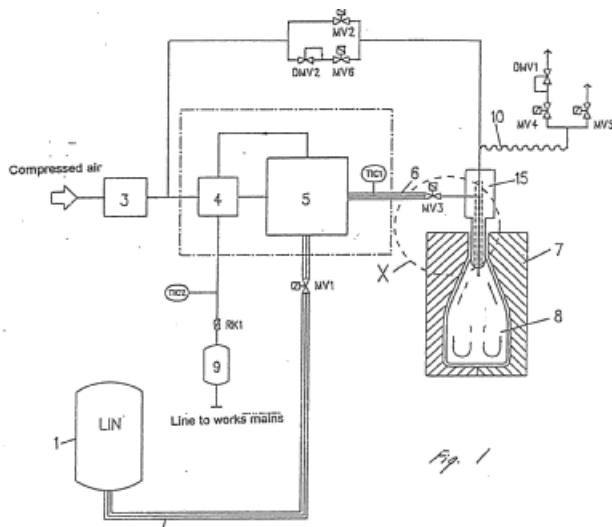
**{Avoiding condense, e.g. on cooled mould surfaces}**

### Definition statement

*This place covers:*

Methods and apparatuses that prevent or lessen the occurrence of condensation during blow-moulding.

Illustrative example of subject matter classified in this group:



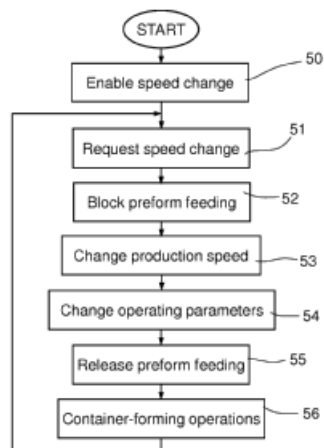
**B29C 49/42407**

**{Procedures for start-up or material change}**

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:



**B29C 49/42409****{Special pressurization during start-up of the machine}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

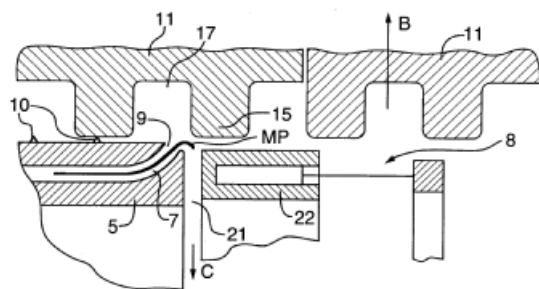


FIG.3

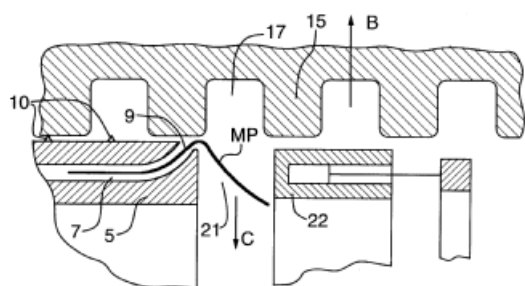


FIG.4

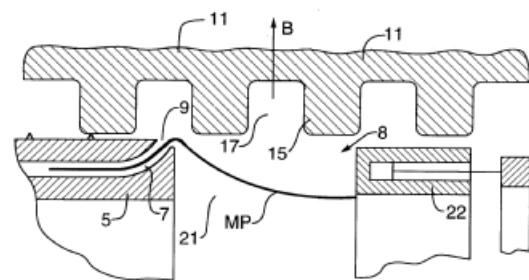


FIG.5

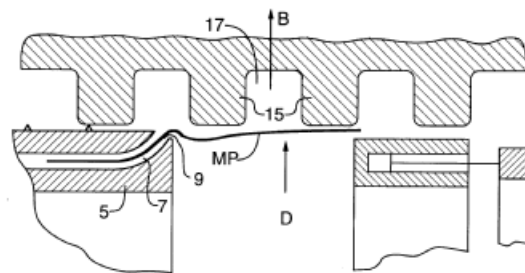


FIG.6



## Definition statement

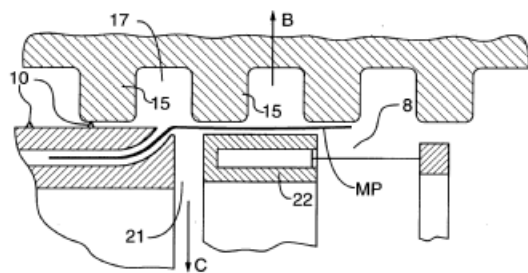


FIG. 7

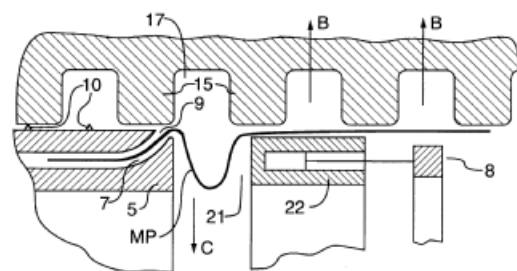


FIG. 8

**B29C 49/42412****{Marking or printing}****Definition statement**

*This place covers:*

Methods or apparatuses for applying an indicia (e.g. pattern, marking, design, identifying feature, etc.).

Illustrative example of subject matter classified in this group:

A marking step can also be used to mark usual information on the filler product that is contained in the container, such as, for example, an expiration date or the like. Thus, a single marking step makes it possible to print information relative to the traceability of the container and relative to the product that is contained in the container.



FIG. 4a



FIG. 4b

## Definition statement

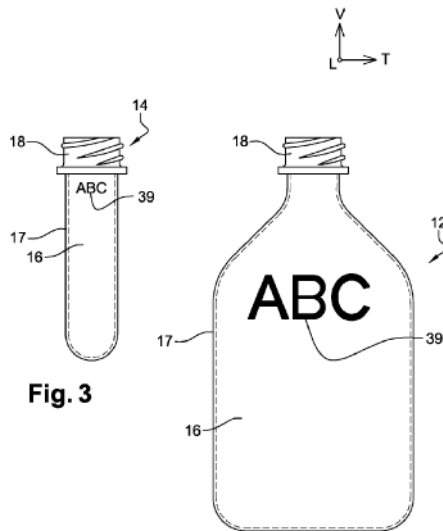


Fig. 3

Fig. 4

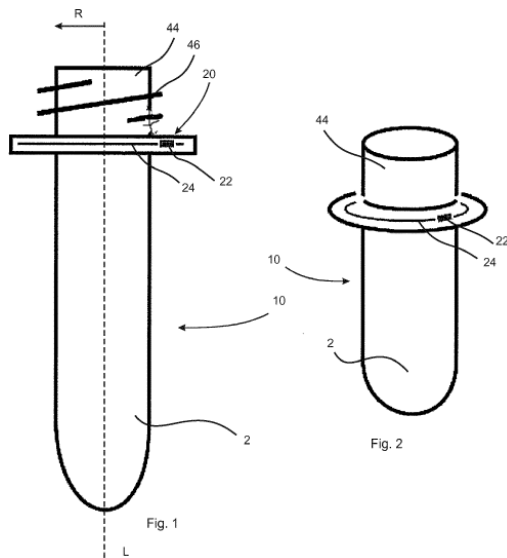


Fig. 2

**B29C 49/42413**

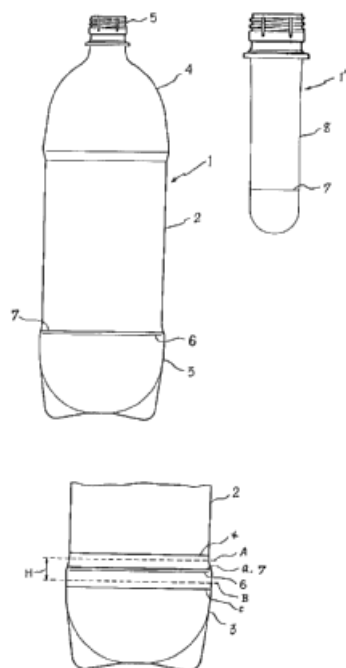
{with a pattern for analysing deformation}

**Definition statement***This place covers:*

Where the applied indicia can be used to measure or indicate the deformation that a preform undergoes during processing.

## Definition statement

Illustrative example of subject matter classified in this group:



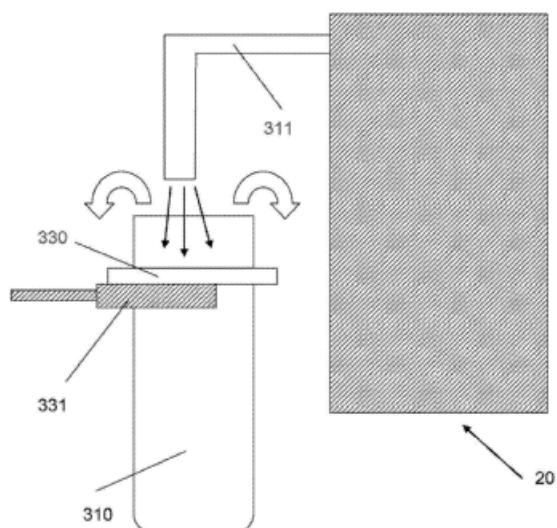
## B29C 49/42416

{Purging or cleaning the preforms}

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:



**B29C 49/4242**

{Means for deforming the parison prior to the blowing operation ([B29C 49/08](#) takes precedence)}

**Definition statement**

*This place covers:*

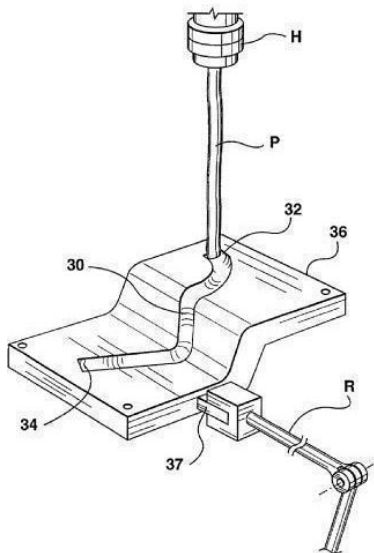
Pulling the extruded parison through the mould.

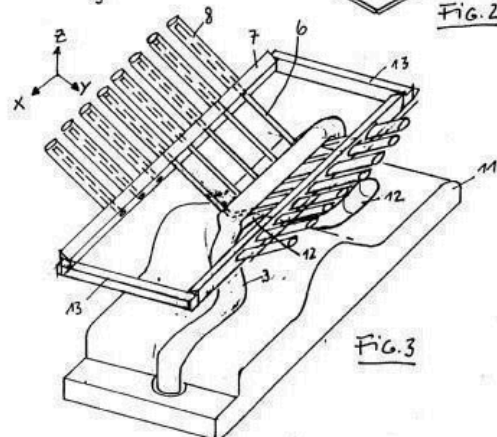
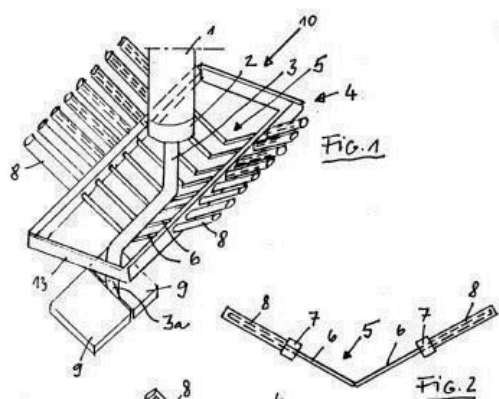
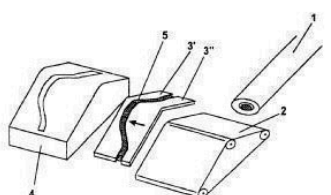
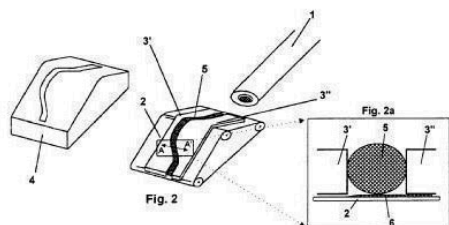
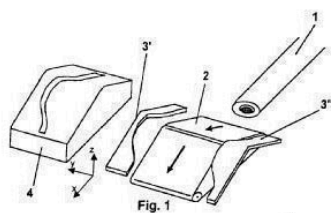
Moving the mould or the extruder head while extruding the parison.

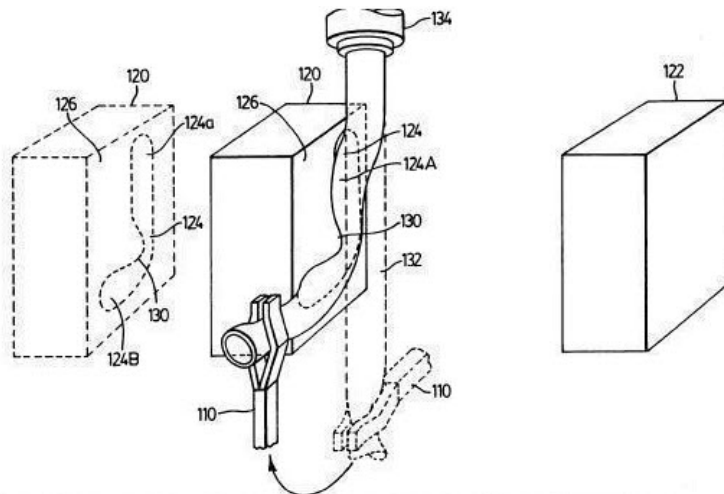
A floating for helping feeding of the parison through the mould.

Using grippers which deform the parison during extrusion or during transportation.

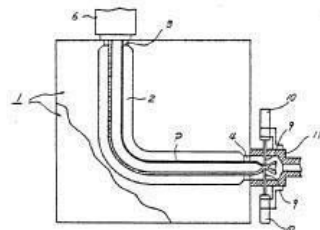
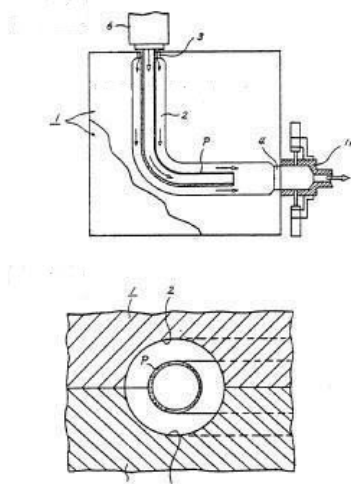
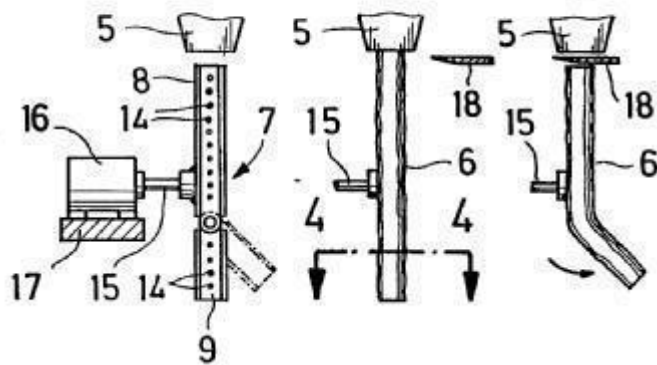
Illustrative example of subject matter classified in this group:







**Fig.2 Fig.3 Fig.5**



## References

### Limiting references

*This place does not cover:*

Biaxial stretching during blow-moulding	<a href="#">B29C 49/08</a>
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**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Bending of tubes	<a href="#">B29C 53/083</a>
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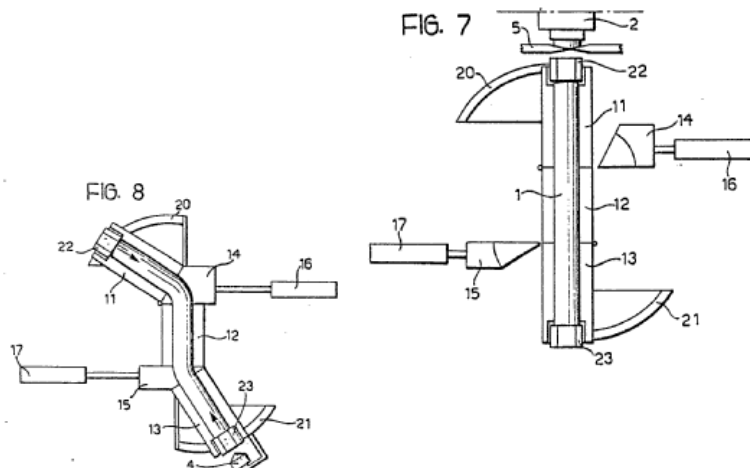
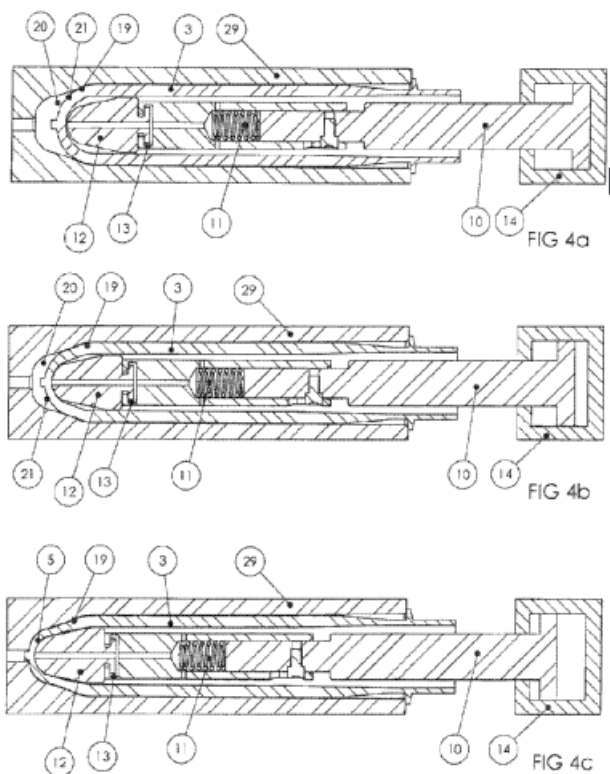
**B29C 49/4241**

{before laying into the mould}

**Definition statement**

This place covers:

Illustrative example of subject matter classified in this group:



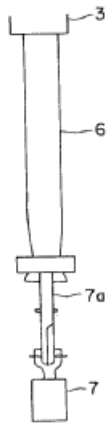
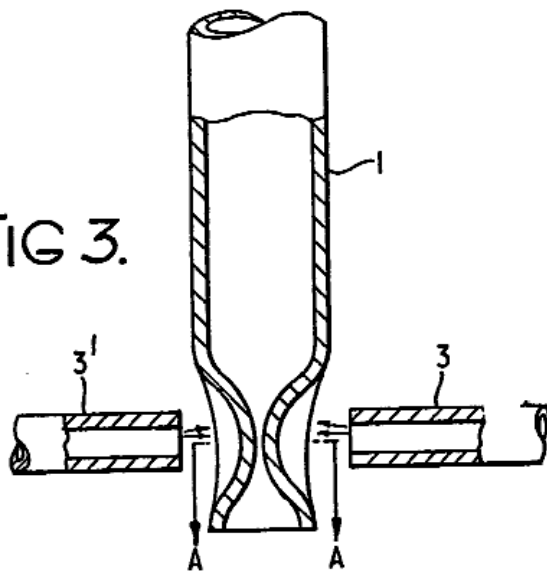


FIG 3.





**B29C 49/42422**

{by the preform transporting means}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:

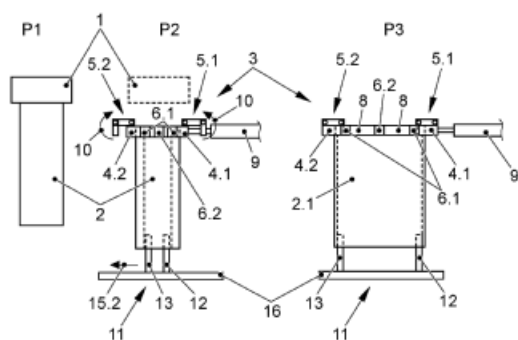


FIG. 1a

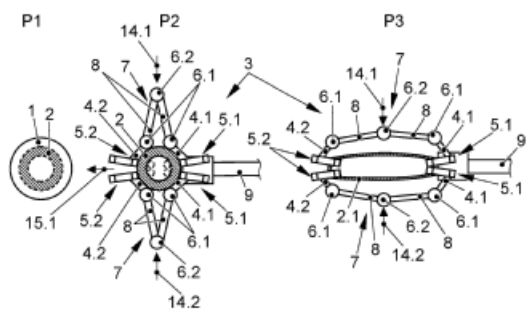


FIG. 1b

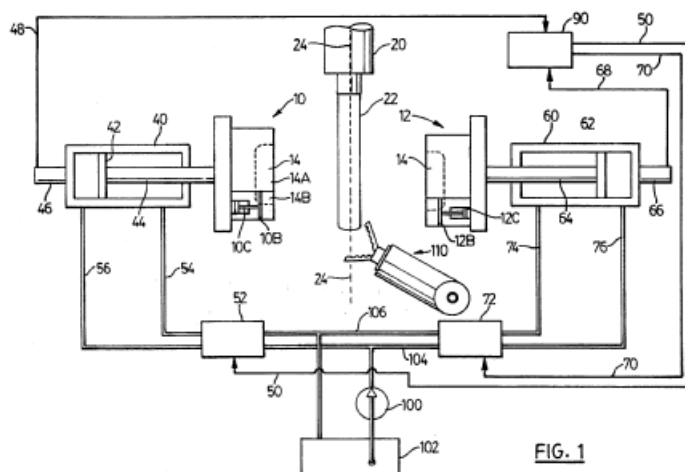


FIG. 1

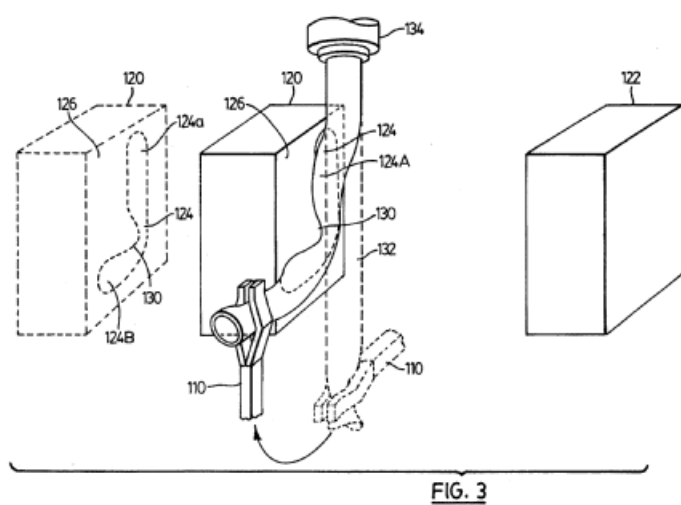
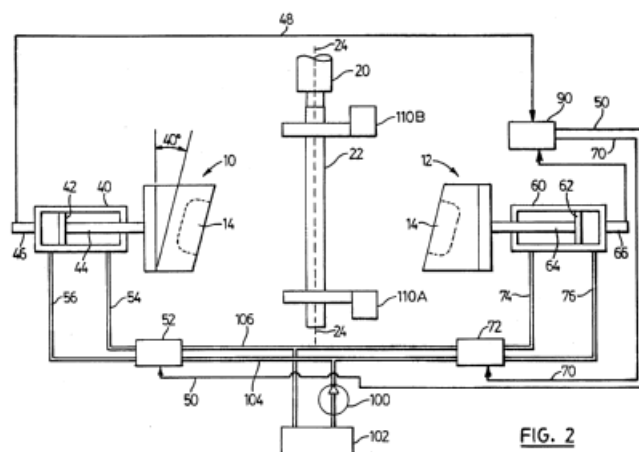


FIG. 1

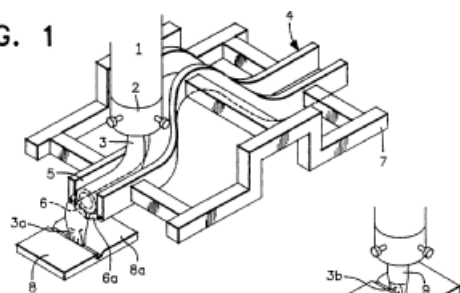


FIG. 2

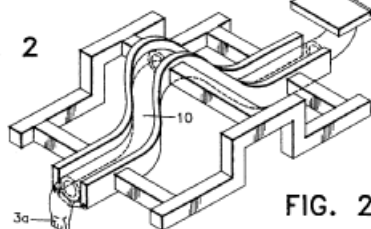
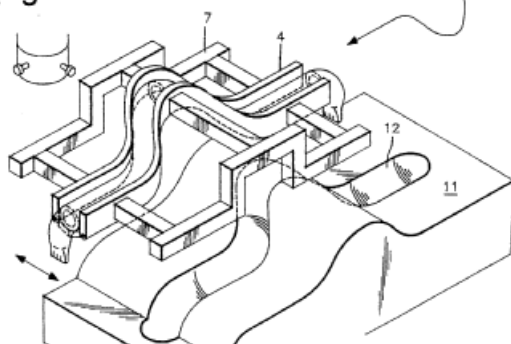


FIG. 2a



FIG. 3



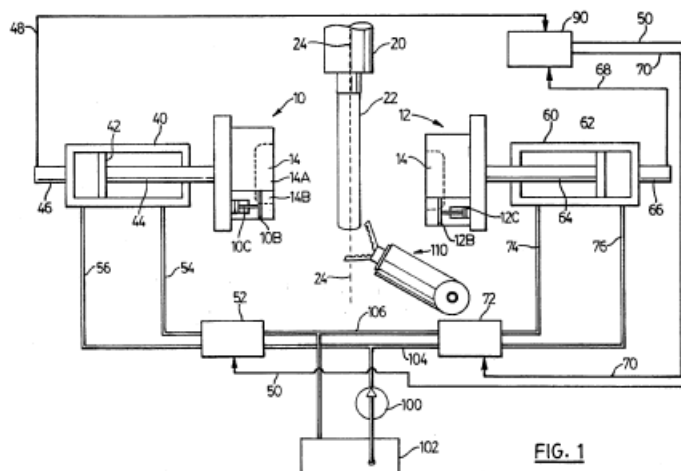
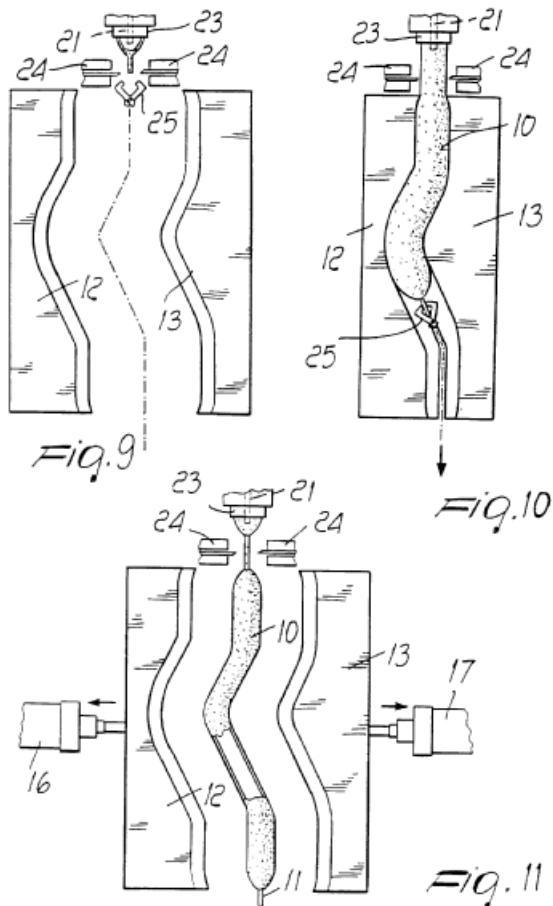
**B29C 49/42424**

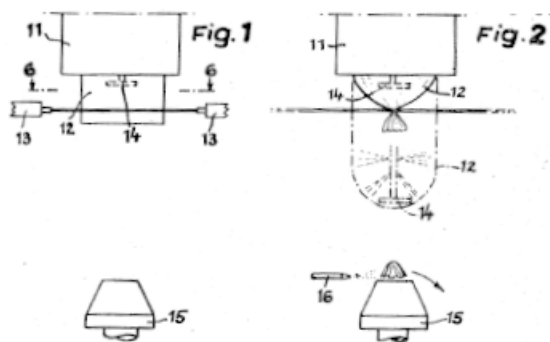
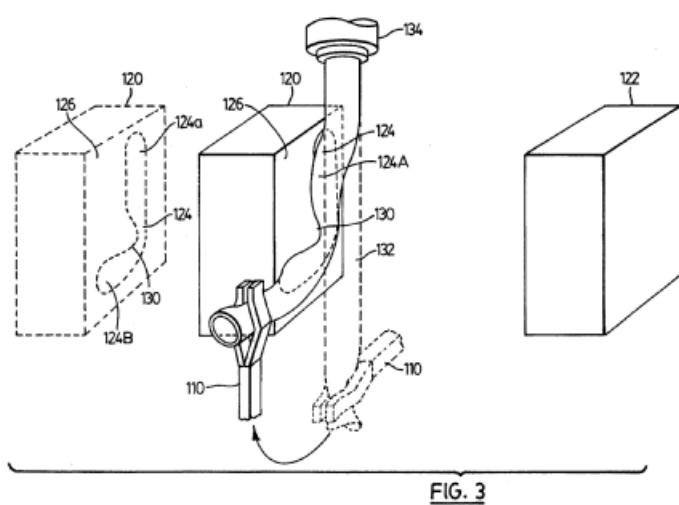
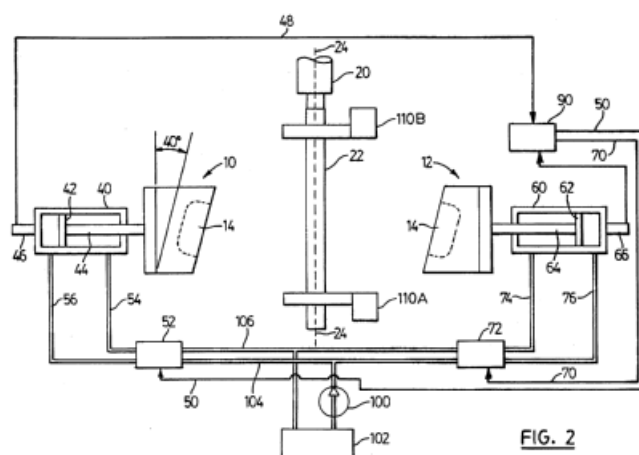
**{Deforming or closing the preform ends, e.g. pinching and welding}**

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:





## Definition statement

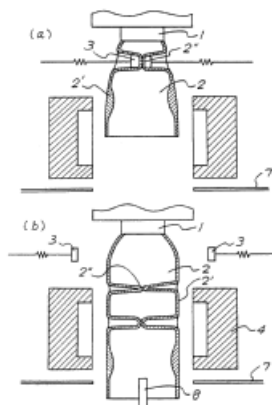


FIG. 1

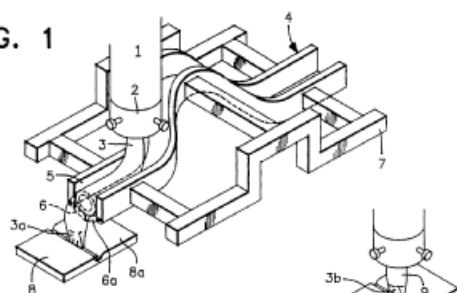


FIG. 2

**B29C 49/42426**

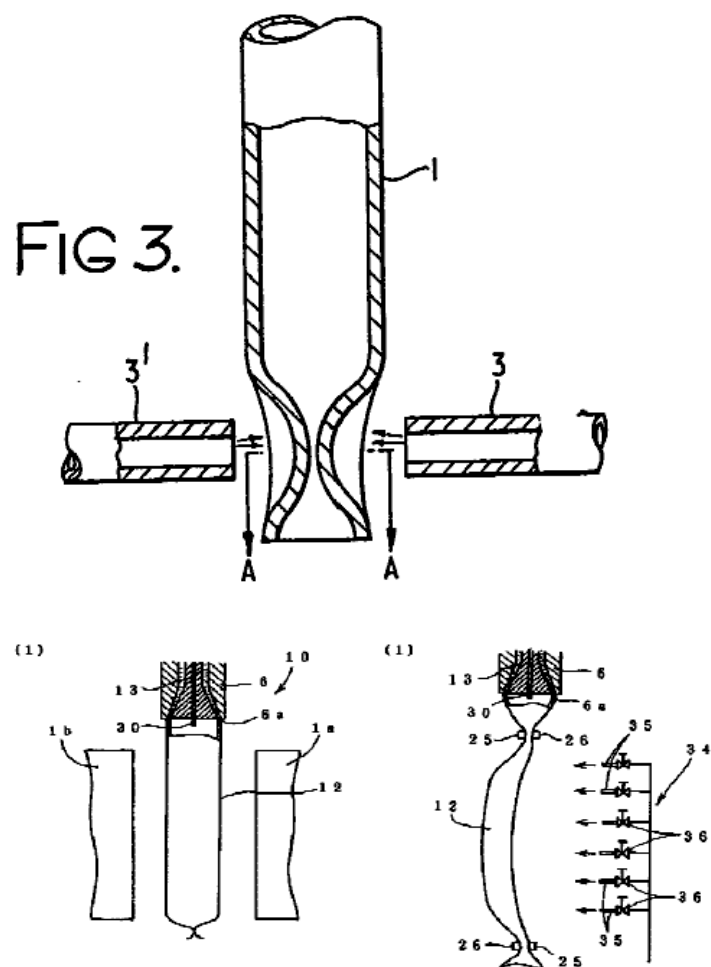
{by pressure difference deforming parts of the preform}

**Definition statement**

*This place covers:*

Devices where the pressure differential is pneumatic (e.g. vacuum, pressurized gas, ducted air, etc.) in nature.

Illustrative example of subject matter classified in this group:



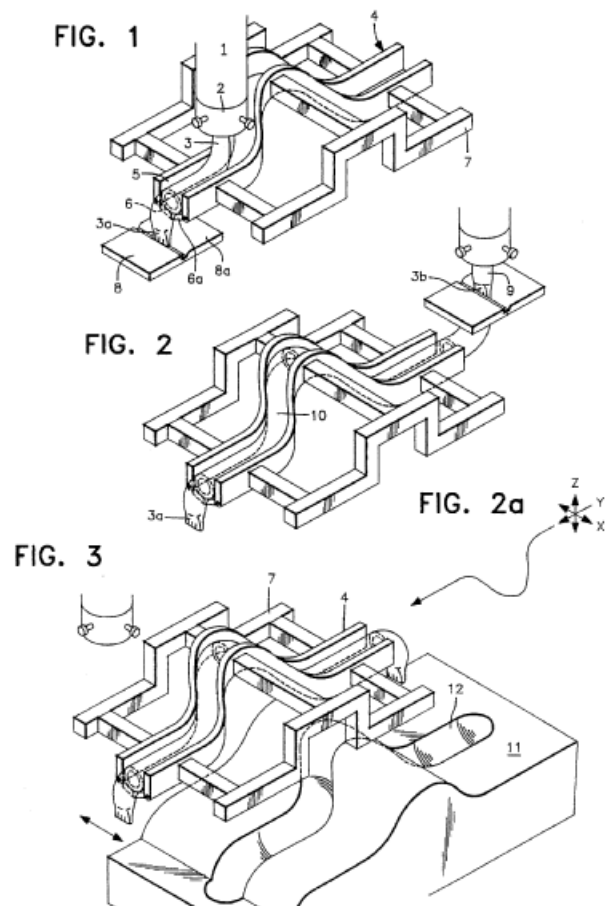
**B29C 49/42428**

**{in a separate pre-moulding station}**

### Definition statement

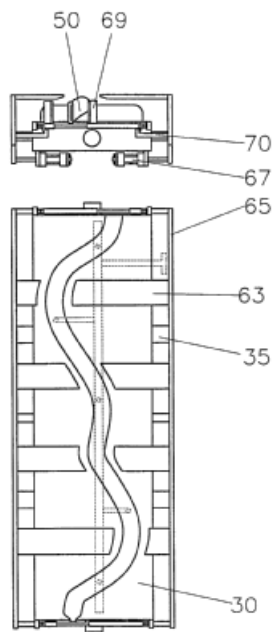
*This place covers:*

Illustrative example of subject matter classified in this group:





Definition statement

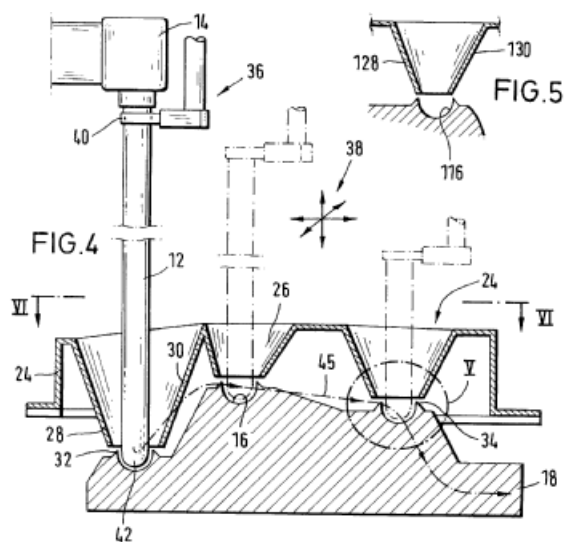
**B29C 49/42442**

{by moving the extruder head}

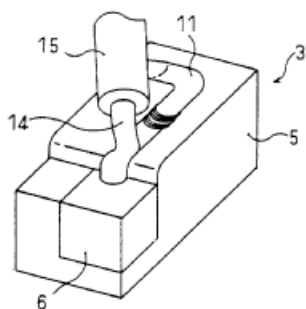
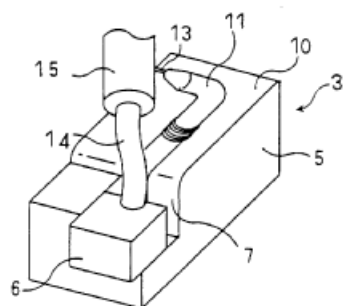
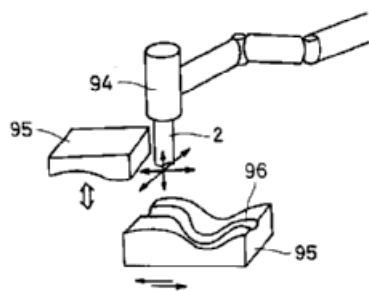
**Definition statement***This place covers:*

Devices where the deformation is caused by the extruder head movement.

Illustrative example of subject matter classified in this group:



## Definition statement

**B29C 49/42444**

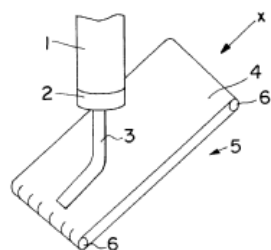
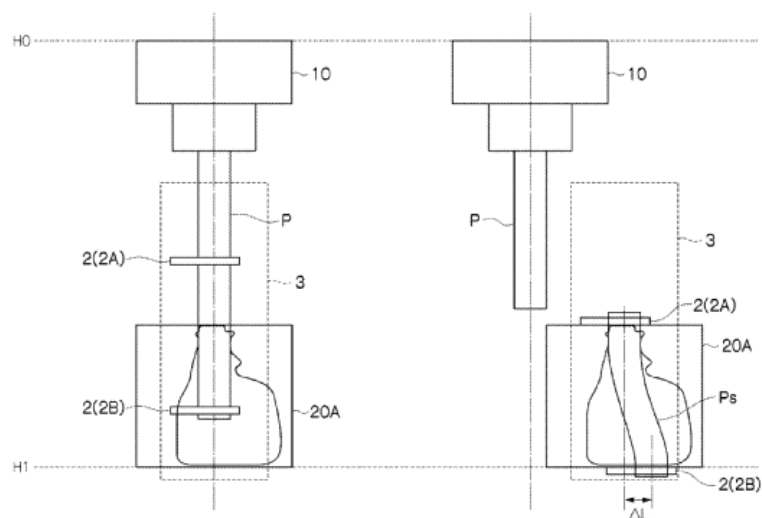
{by moving the transport means}

**Definition statement**

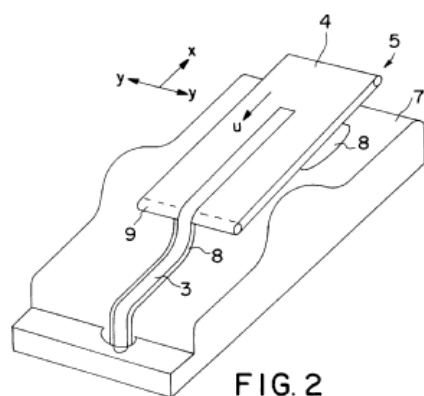
*This place covers:*

Devices where the deformation is caused by the transport means.

Illustrative example of subject matter classified in this group:



**FIG. 1**



**FIG. 2**

## Definition statement

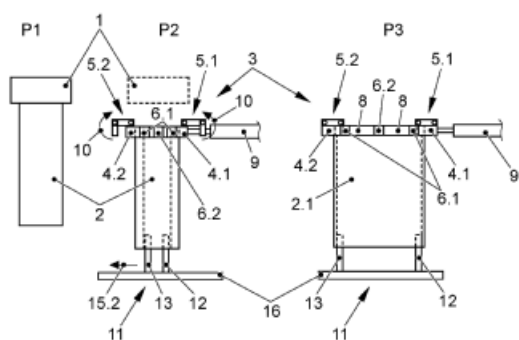


FIG. 1a

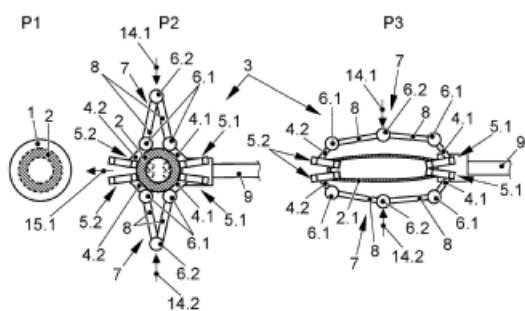


FIG. 1b

**B29C 49/42446****{by using a robot arm or similar actuator}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

Fig. 5

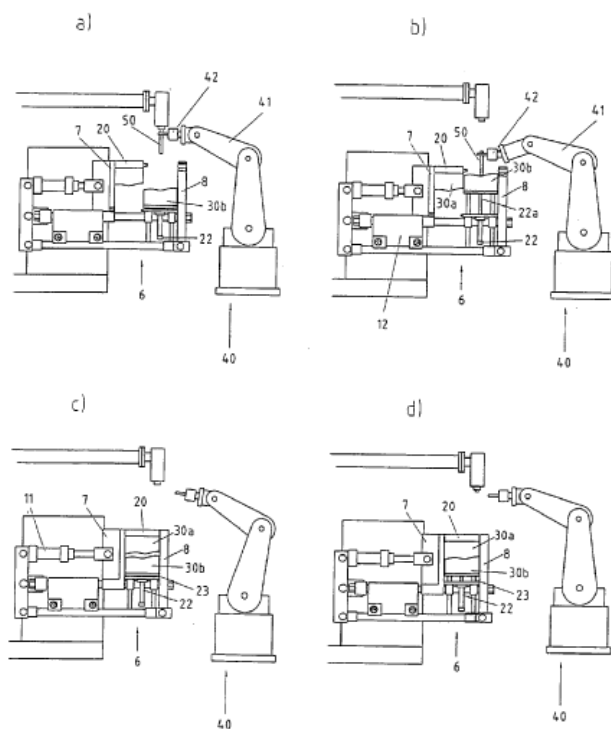


Fig. 8

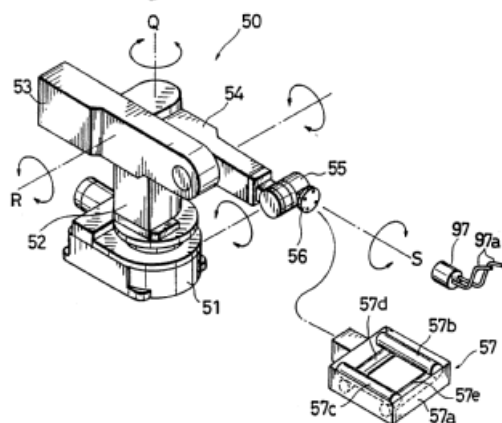


Fig. 15a

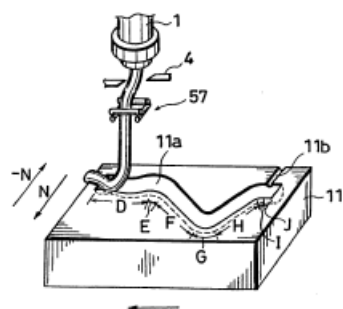


Fig. 15b

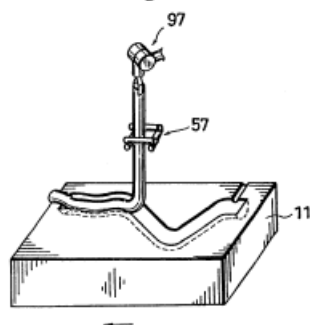


Fig. 15c

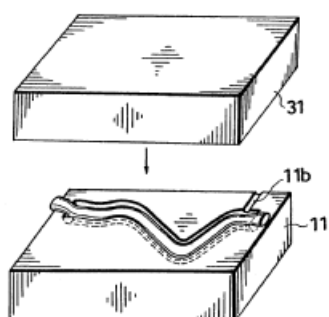
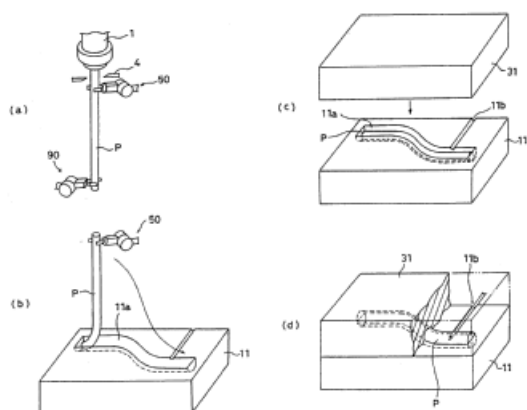
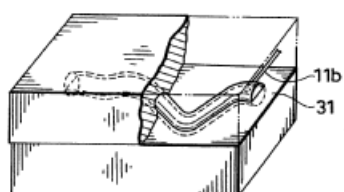
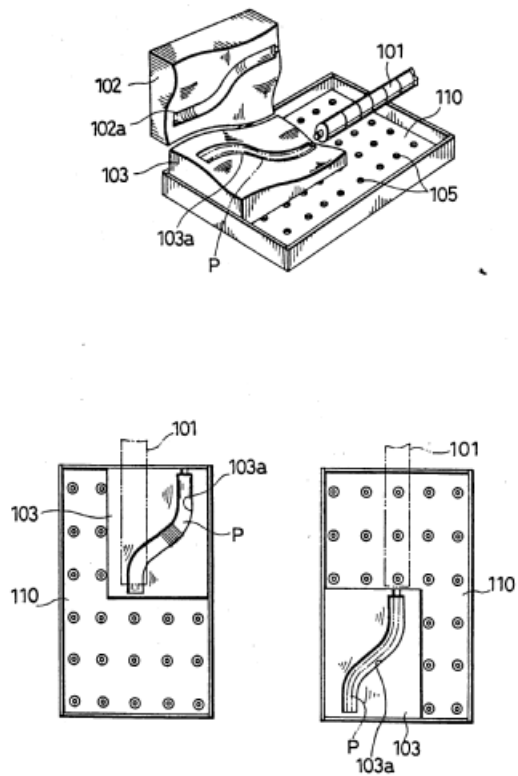


Fig. 15d



**B29C 49/42448****{by moving the mould}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:



Definition statement

FIG.5A

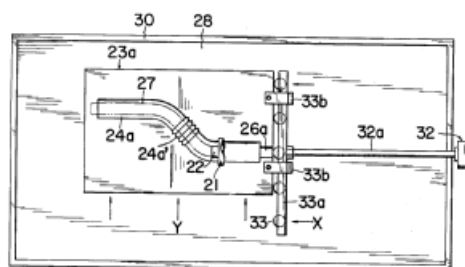
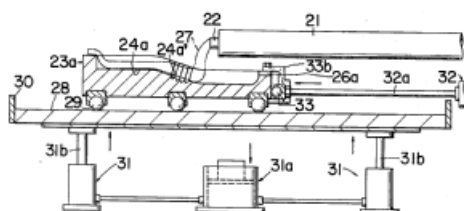


FIG.5B

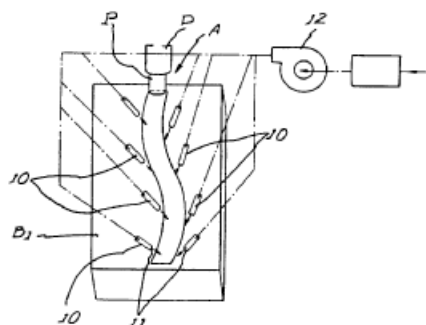
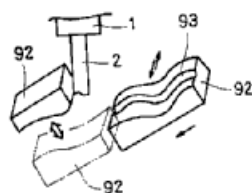
**B29C 49/4245**

{aided by air floating}

**Definition statement***This place covers:*

Devices that use air to float/lift the parison while in the mould prior to the blow-moulding step.

Illustrative example of subject matter classified in this group:





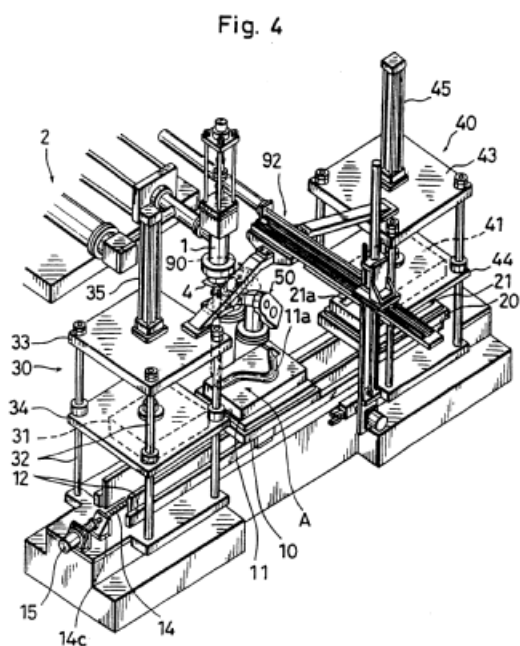
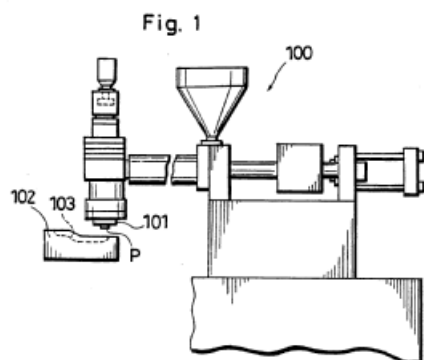
**B29C 49/42452**

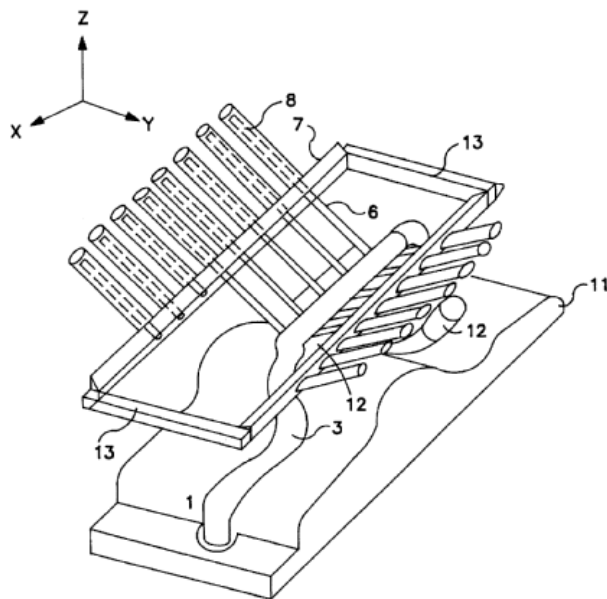
{The mould opening plane being horizontal}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:





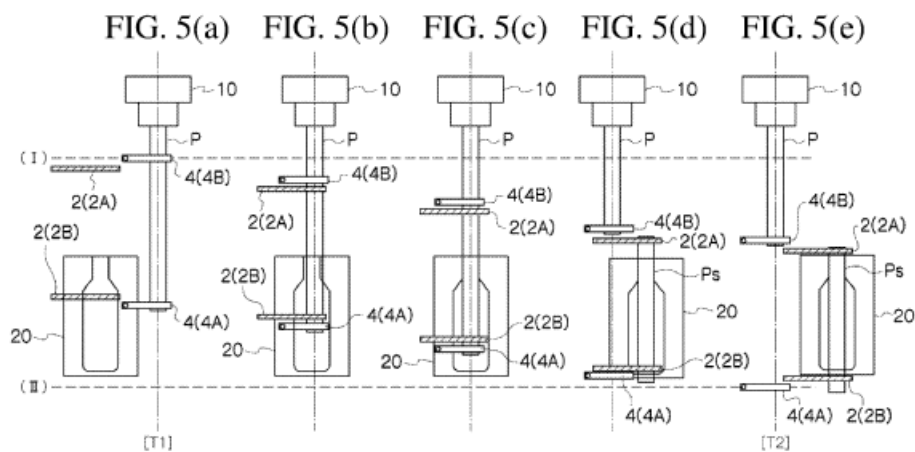
## B29C 49/42454

{The mould opening plane being vertical}

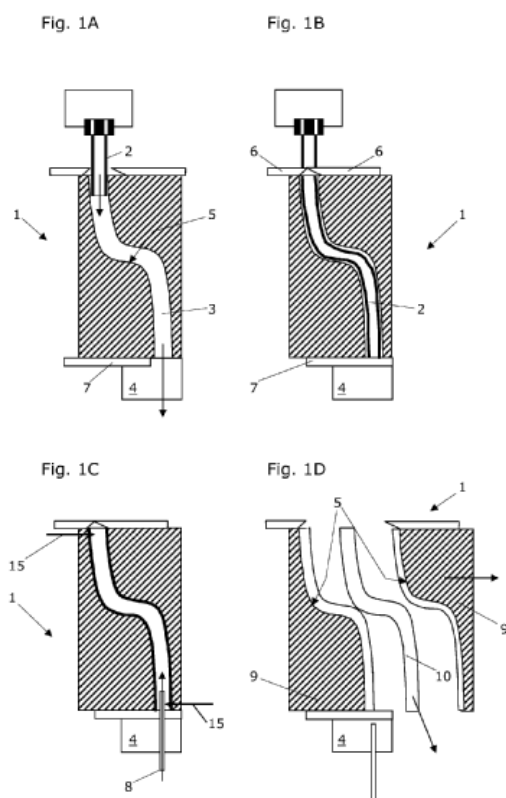
### Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:



## Definition statement

**B29C 49/4247**

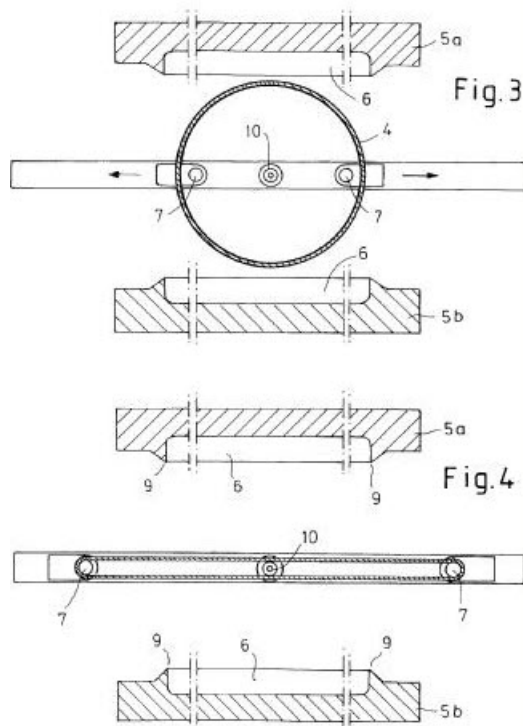
{using spreading or extending means}

**Definition statement***This place covers:*

Spreading the open end or other parts of the preform or parison by mechanical means or vacuum grippers before blow-moulding.

## Definition statement

Illustrative example of subject matter classified in this group:



## References

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping of tube ends	<a href="#">B29C 57/00</a>
----------------------	----------------------------

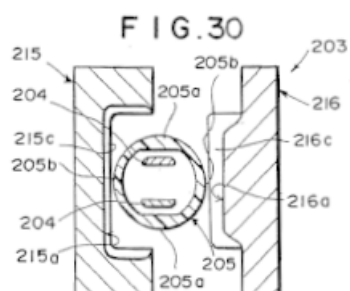
## B29C 49/425

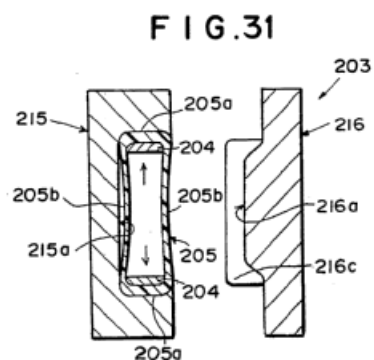
{rods or bars entering the preform}

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:





## B29C 49/4251

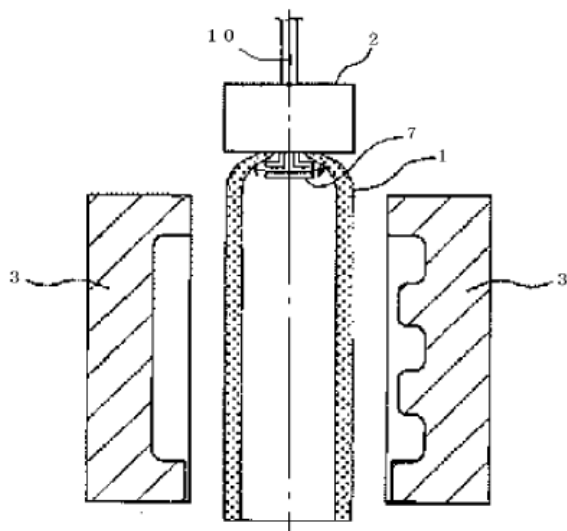
{by foaming}

### Definition statement

*This place covers:*

Deformation caused by activation of blowing/foaming agents (which can include the depressurization of pressurized gases when the preform/parison leaves the extruder) in the preform/parison prior to the blow-moulding step.

Illustrative example of subject matter classified in this group:



## B29C 49/427

{Auxiliary deformation, i.e. not caused by pre-stretching or blowing not otherwise provided for}

### Definition statement

*This place covers:*

Deformation that occurs during the blow-moulding process caused by mould elements that activate after the mould closes and prior to the end of the blowing process.

Illustrative example of subject matter classified in this group:

FIG.3

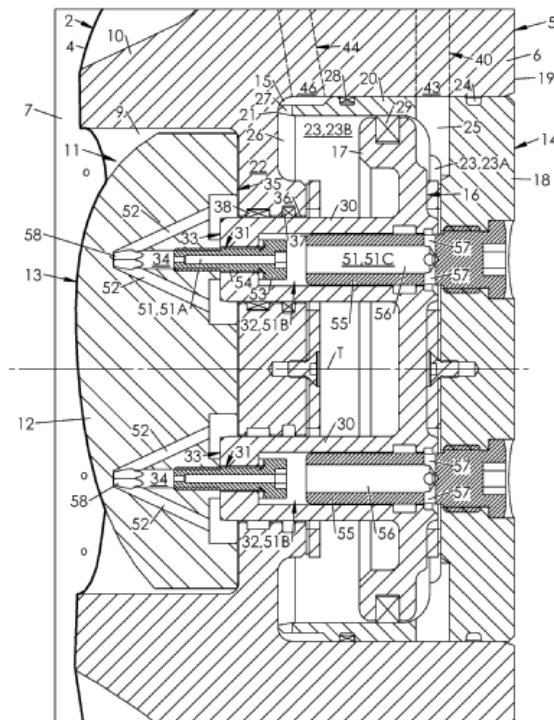
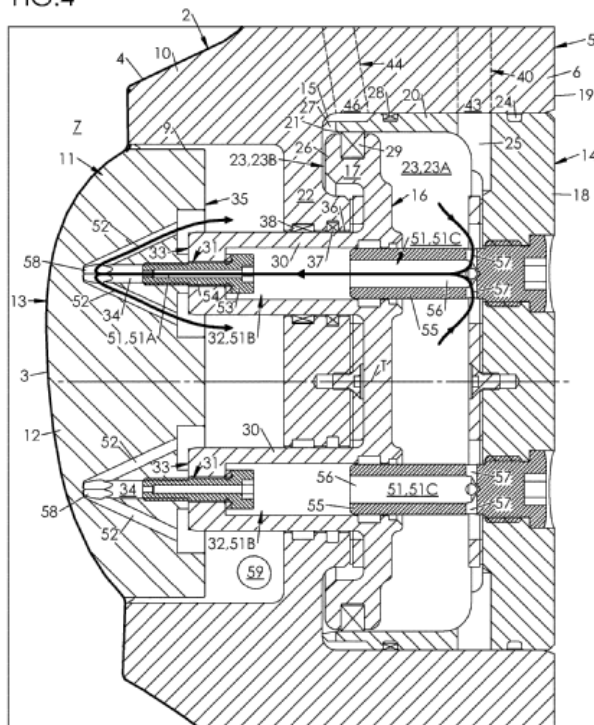
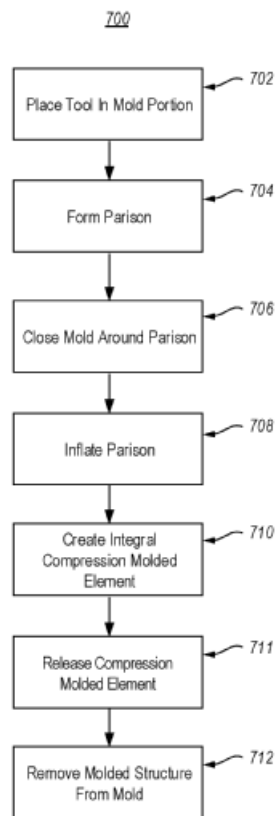


FIG.4





**Fig. 24**

## **B29C 49/42802**

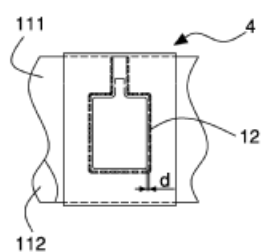
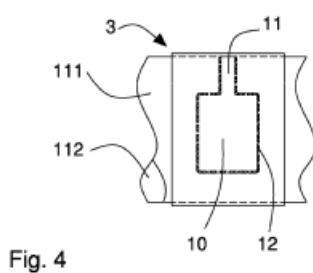
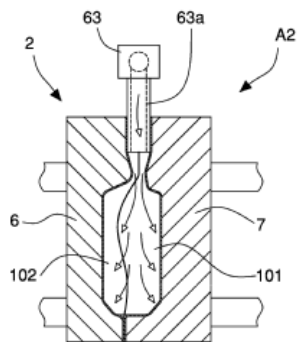
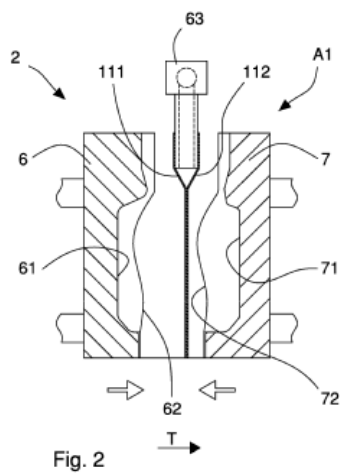
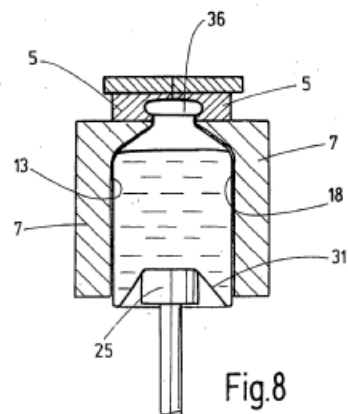
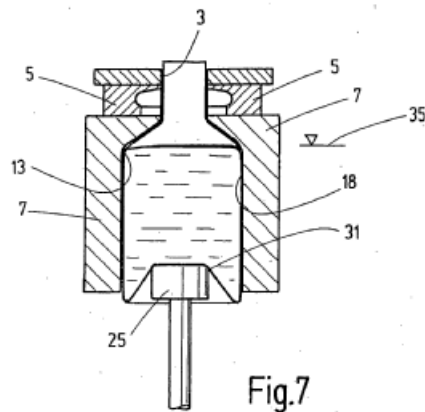
**{a closure or a sealing foil to the article or pinching the opening}**

### **Definition statement**

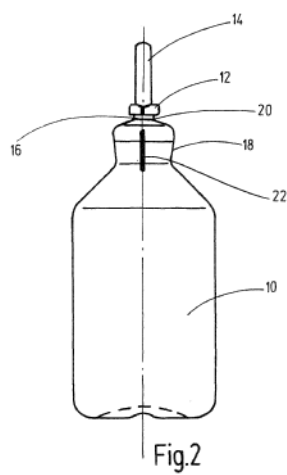
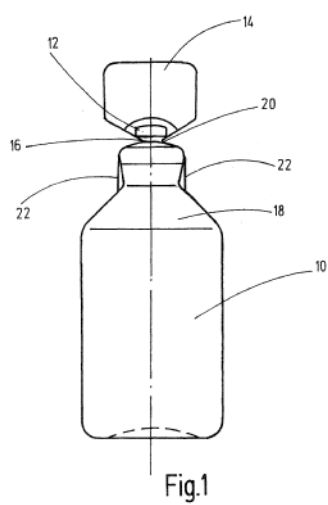
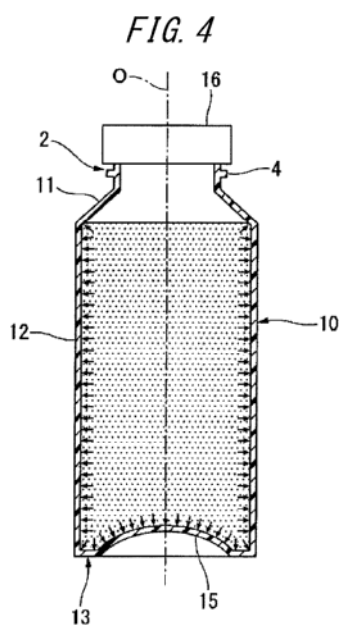
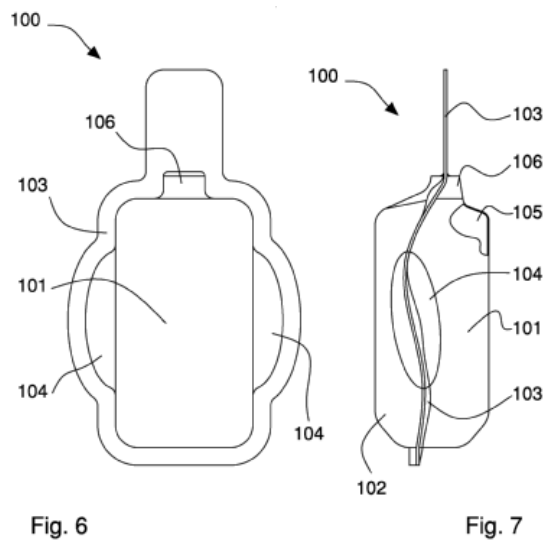
*This place covers:*

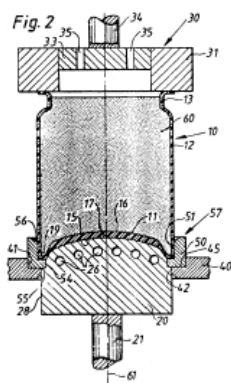
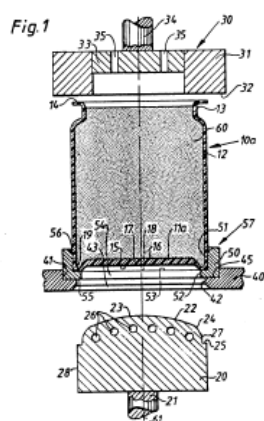
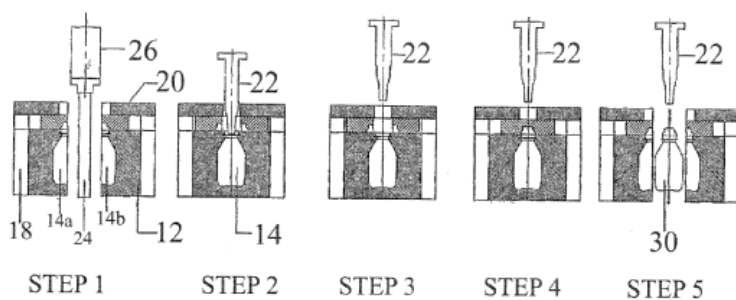
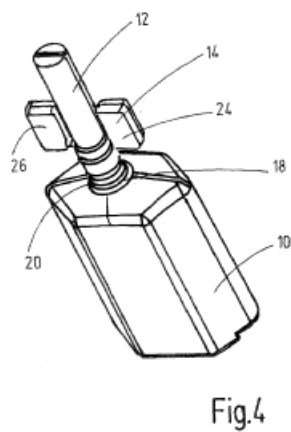
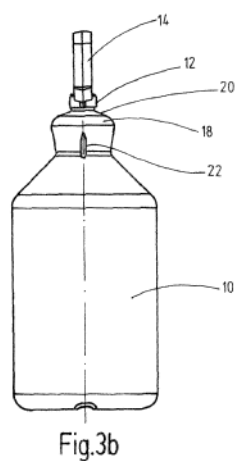
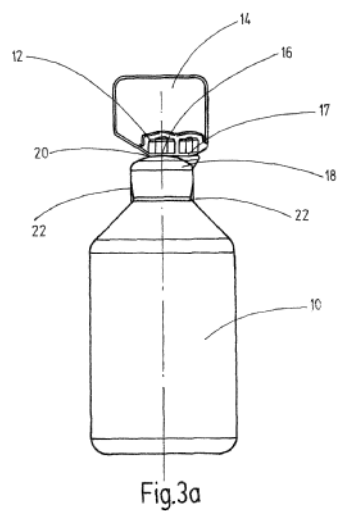
Where the closure or sealing foil is added after the blow-moulding process.

Illustrative example of subject matter classified in this group:









## Definition statement

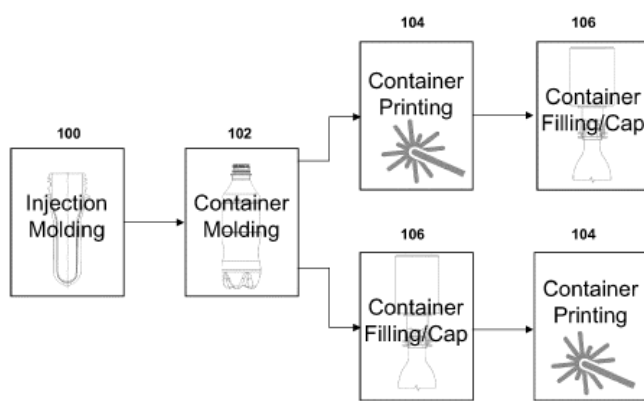
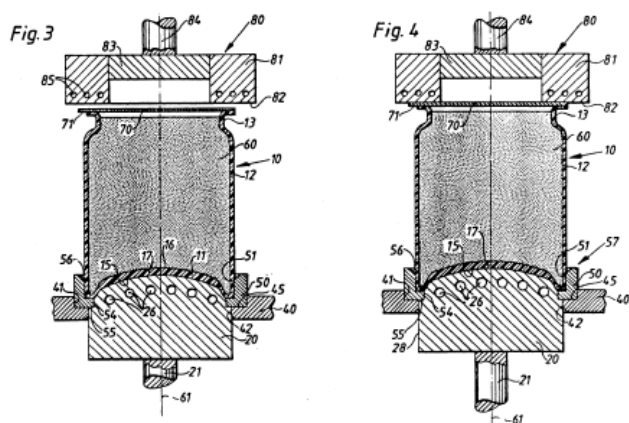


FIG. 4

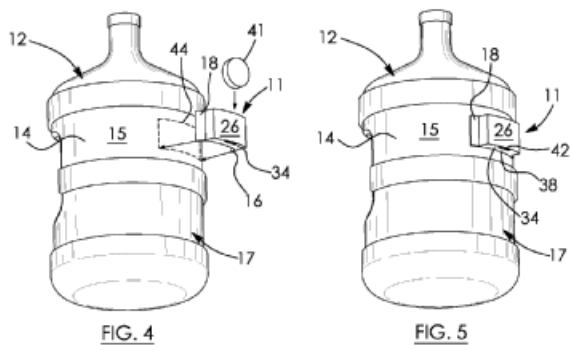
## B29C 49/42806

{auxiliary parts to the article, e.g. handle ([B29C 49/42802](#) takes precedence)}

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:



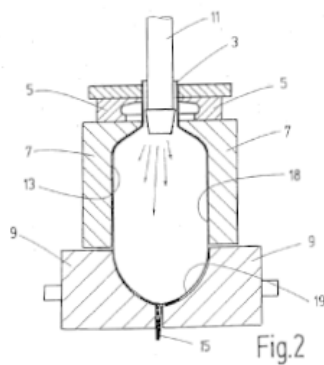
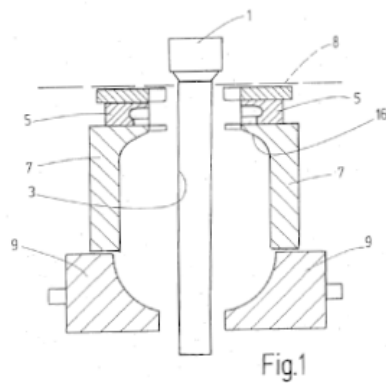
**B29C 49/42809**

{while in the mould, i.e. with other material than the blowing fluid}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:



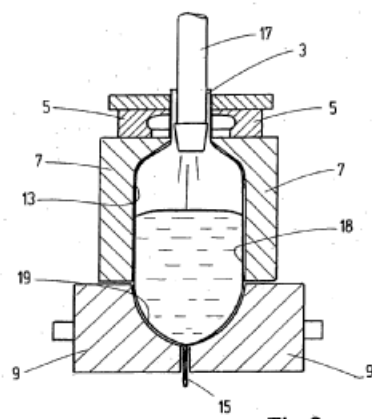


Fig.3.

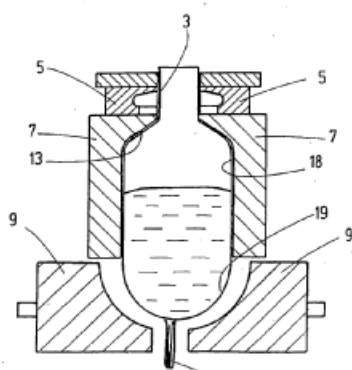


Fig.4

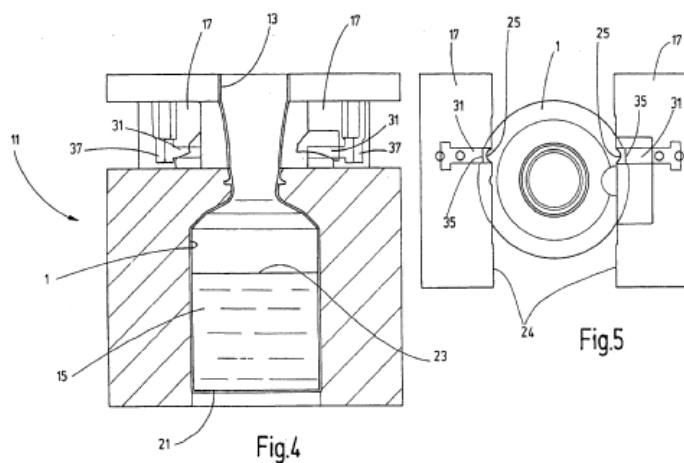


Fig.5

Definition statement

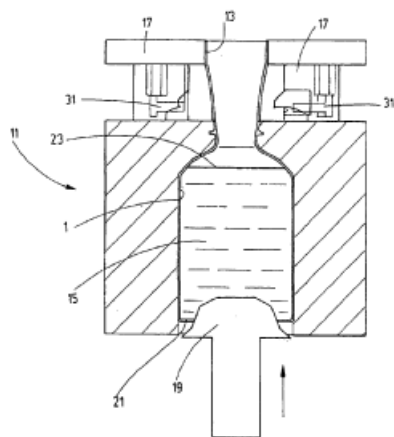


Fig.6

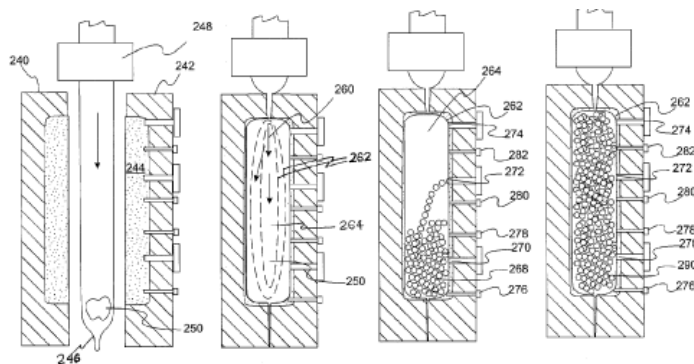


Fig. 13A

Fig. 13B

Fig. 13C

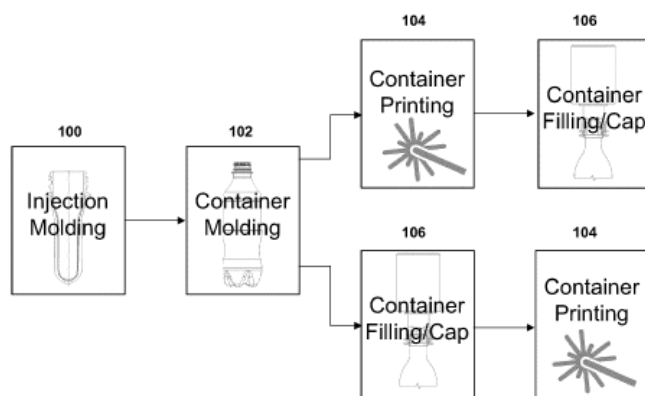
Fig. 13D

**B29C 49/4281**

{outside the mould}

**Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

**FIG. 4**

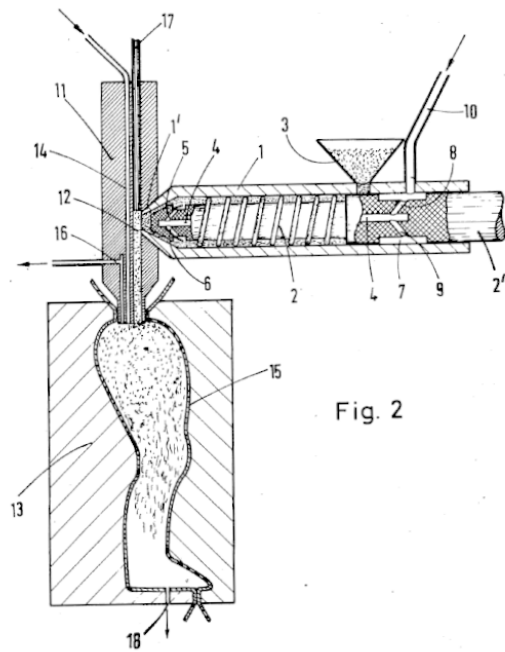
**B29C 49/42815**

{Emptying the article, e.g. emptying hydraulic blowing fluid}

**Definition statement**

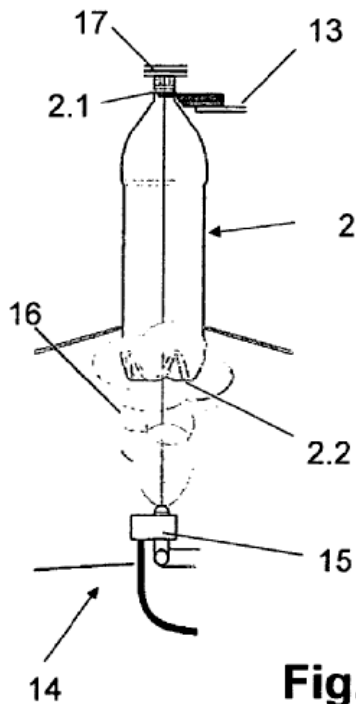
*This place covers:*

Illustrative example of subject matter classified in this group:



**B29C 49/42824****{Cooling the article outside the mould}****Definition statement***This place covers:*

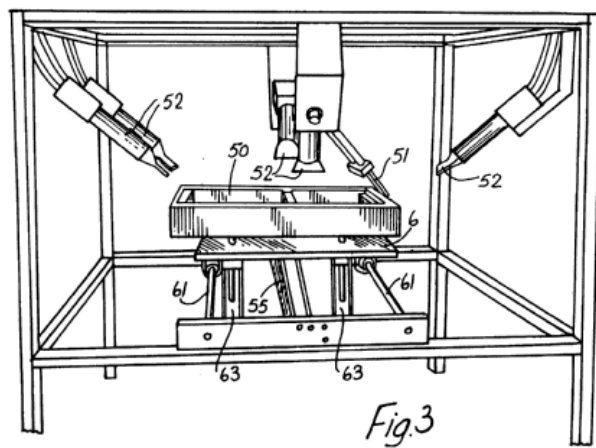
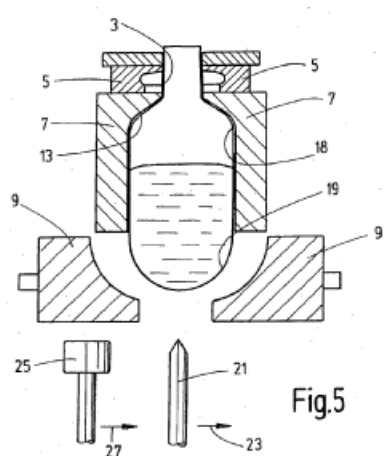
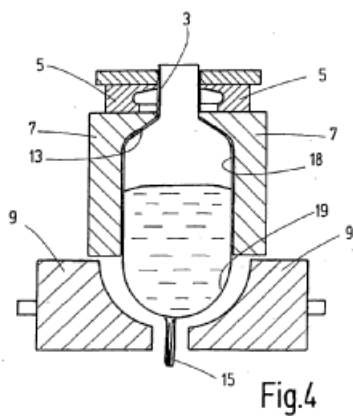
Illustrative example of subject matter classified in this group:

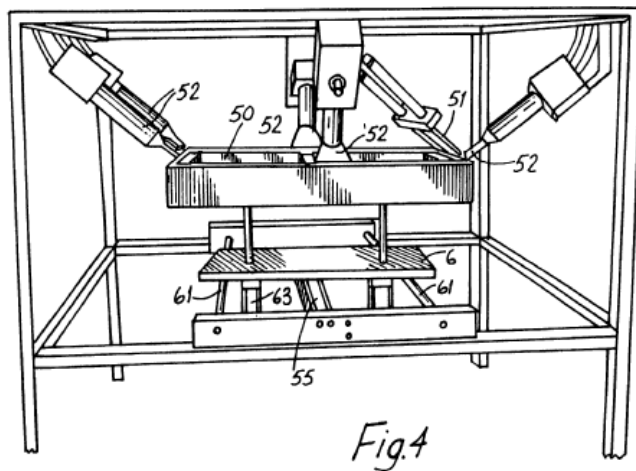
**B29C 49/42826****{Separating burr or other part from the article, e.g. using mechanical means}****Definition statement***This place covers:*

Removal of burrs, flash, or other unwanted moulding effects caused by the interaction of the blown article and the mould during the blowing process.



Illustrative example of subject matter classified in this group:





## B29C 49/42828

{Coating or painting the article}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:

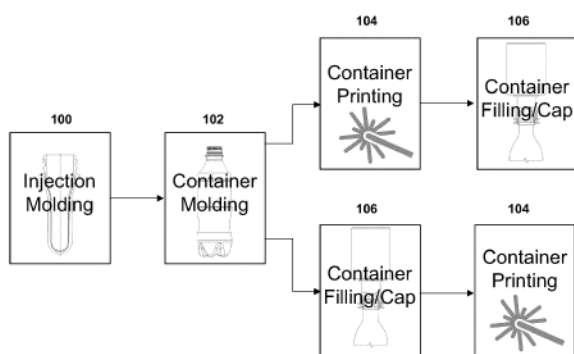
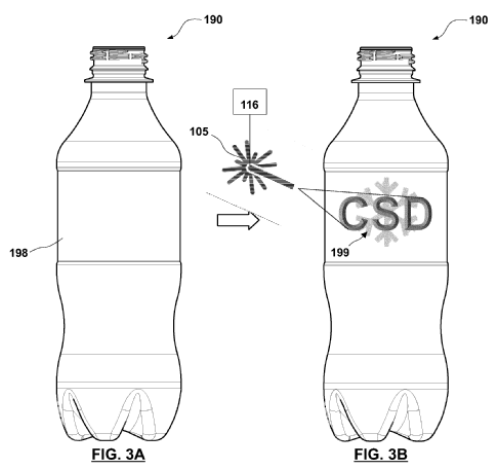


FIG. 4

**B29C 49/4283**

### {Deforming the finished article}

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in this group:

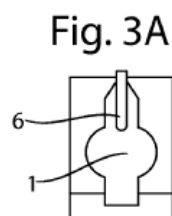


Fig. 3A



Fig. 3B

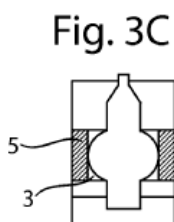


Fig. 3C

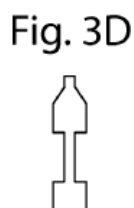
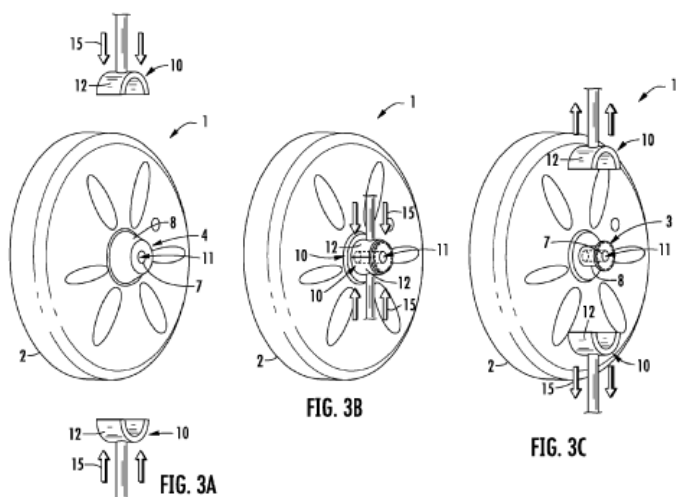
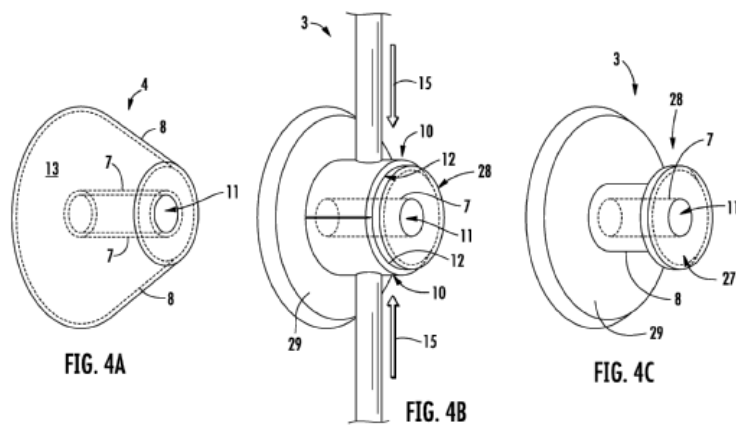


Fig. 3D



Definition statement

**B29C 49/42832**

{Moving or inverting sections, e.g. inverting bottom as vacuum panel}

**Definition statement***This place covers:*

Deformation that occurs after the blow-moulding process that moves a blown article surface to a new final location.

Illustrative example of subject matter classified in this group:

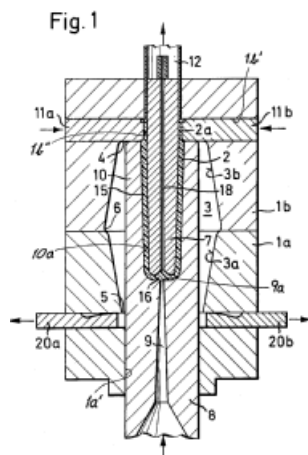


Fig. 2

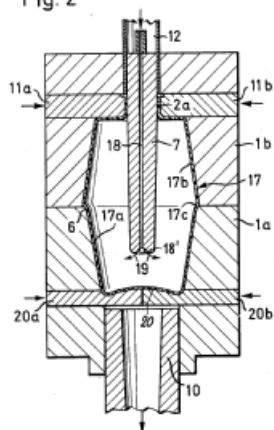


Fig. 3

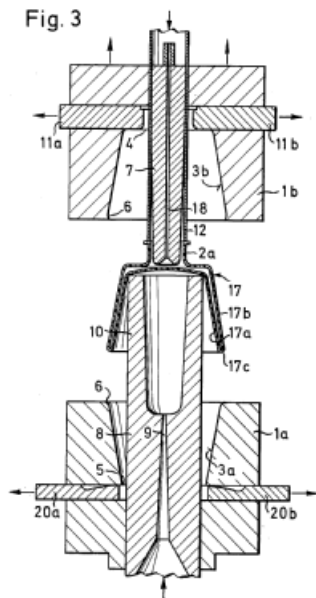


Fig. 4a

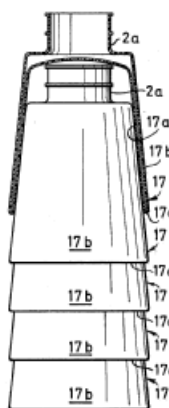
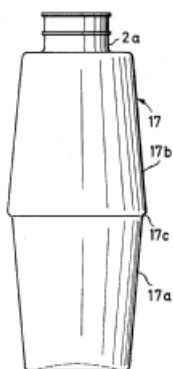
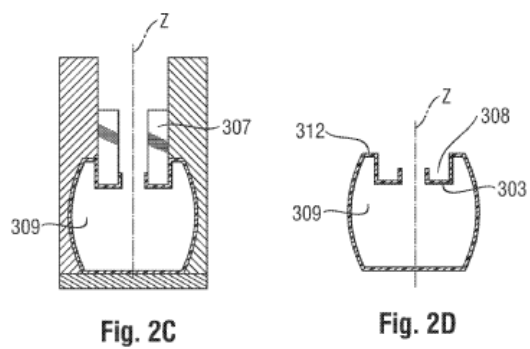
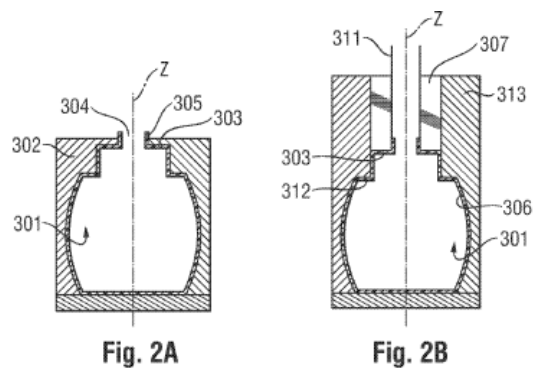
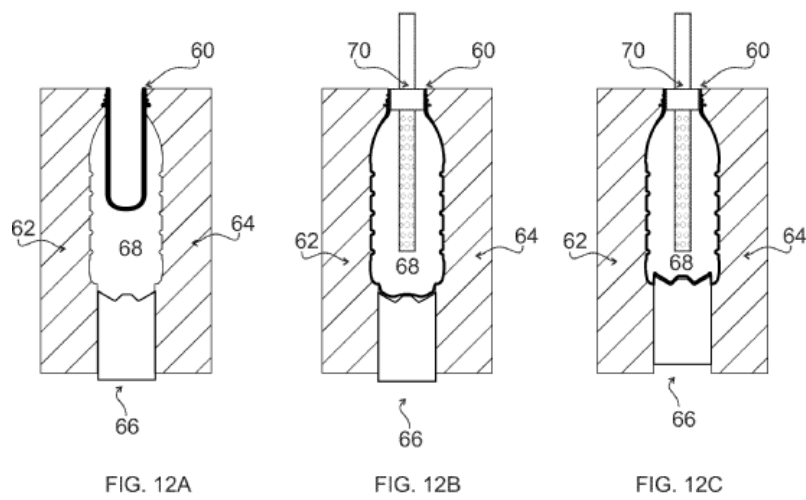
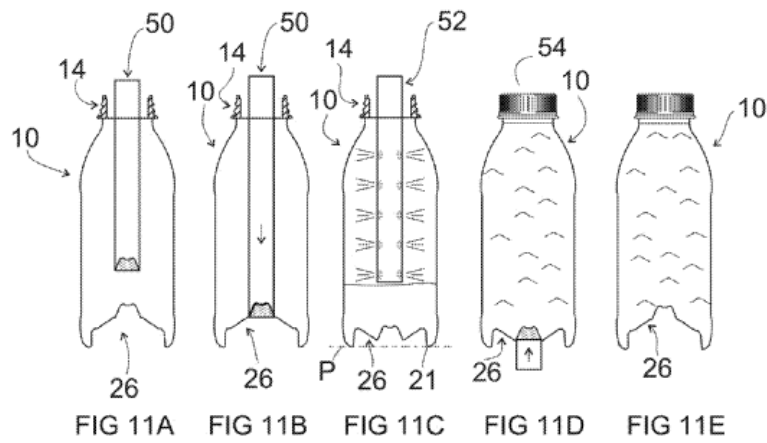


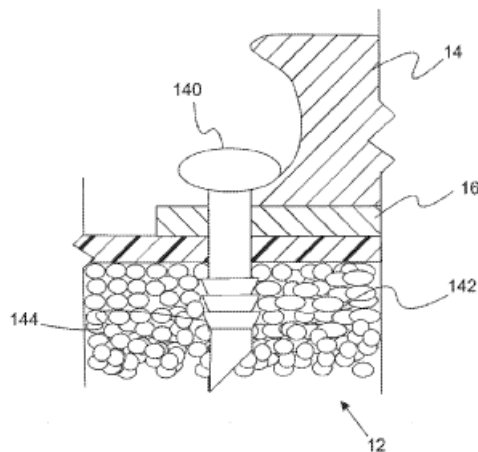
Fig. 4b



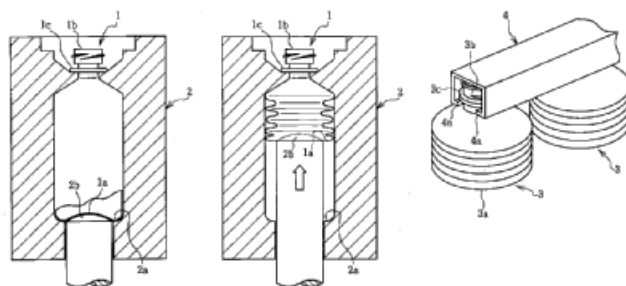


**B29C 49/42834****{Foaming, expanding or stretching the article}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

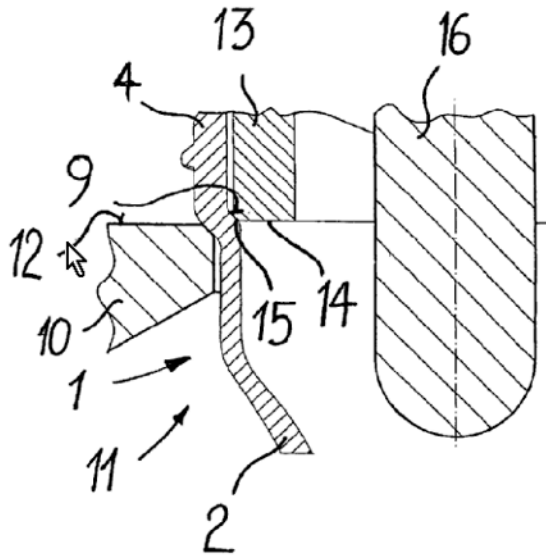
*Fig. 7***B29C 49/42836****{Collapsing or folding the article, e.g. to save space for transport}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

**B29C 2049/4296****{for avoiding blowing fluid from leaking, e.g. between the blowing means and the preform neck}****Definition statement***This place covers:*

Structures and operations associated with the sealing means that prevent blowing fluid from leaking.

Illustrative example of subject matter classified in this group:



**Fig. 2**

The applied pressure force of the blow nozzle 13 is selected such that the outside edge 15 of the blow nozzle 13 sinks somewhat into the conical surface 9. This improves sealing.

## **B29C 2049/4298**

{for sealing clean or sterile room or volume}

### **Definition statement**

*This place covers:*

Structures associated with sealing spaces to avoid contamination.

## **B29C 2049/431**

{for sealing moulds, e.g. for vacuum air floating}

### **Definition statement**

*This place covers:*

Structures associated with the sealing means that reduce or prevent air from entering the mould.



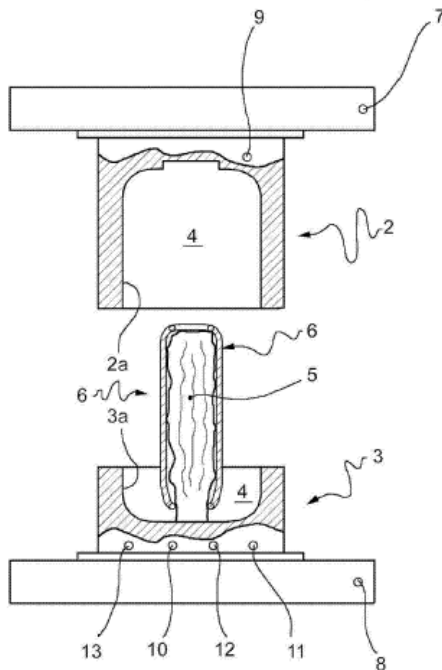
**B29C 49/44**

**for applying pressure through the walls of an inflated bag**

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:

**B29C 49/46**

**characterised by using particular environment or blow fluids other than air**

**Definition statement**

*This place covers:*

- Inert gas as blowing fluid
- Reactive gas as a blowing fluid
- Sterile gas as a blowing fluid
- Hot gas as a blowing fluid
- Filtered air as a blowing fluid
- Explosive gas mixture as a blowing fluid
- Incompressible blowing fluids, e.g. filling liquid is used as blowing fluid
- Clean rooms

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Cleaning in general	<a href="#">B08B 1/00</a>
Concurrent cleaning, filling and closing of bottles without a blow-moulding operation	<a href="#">B67C 7/00</a>

## Special rules of classification

Incompressible blowing fluids which stay in the formed container after blow-moulding have to be also classified in [B65B 3/022](#).

## B29C 2049/4698

{Pressure difference, e.g. over pressure in room}

### Definition statement

*This place covers:*

Methods and apparatus that create a pressure difference.

## B29C 49/48

### Moulds

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds characterised by the material or the manufacturing process in general	<a href="#">B29C 33/38</a> - <a href="#">B29C 33/405</a>
--	---

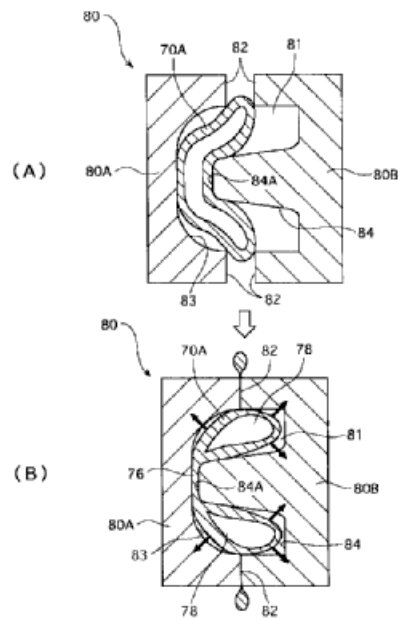
**B29C 49/4802**

{with means for locally compressing part(s) of the parison in the main blowing cavity}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:

**B29C 49/4812**

{and welding opposite wall parts of the parisons or preforms to each other}

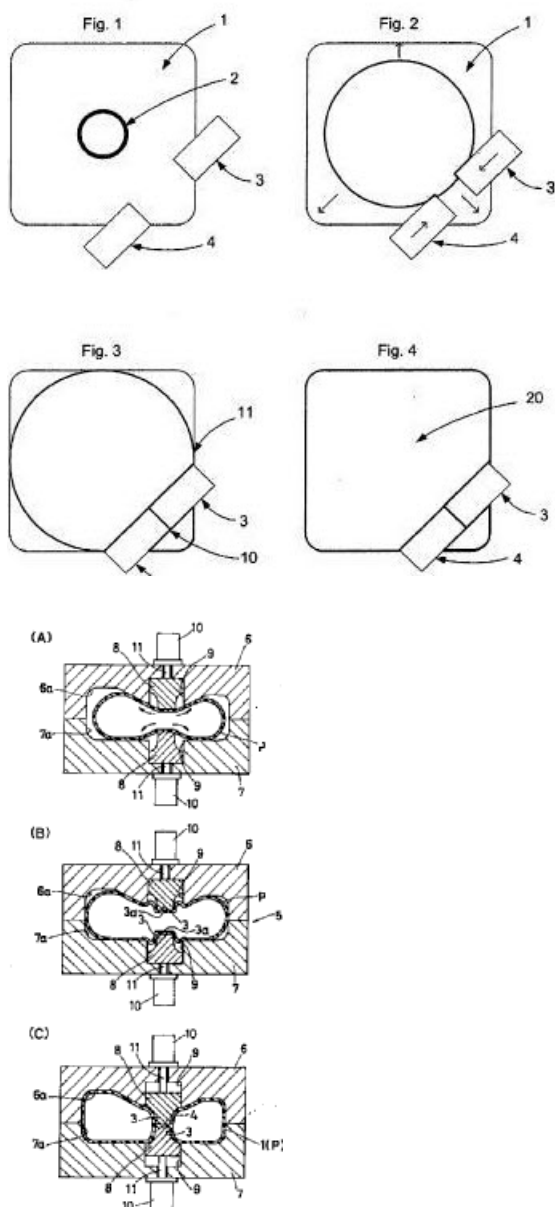
**Definition statement**

*This place covers:*

Where opposing wall parts of the parisons or preforms are joined to each other.

**B29C 49/4815****{by means of movable mould parts}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:



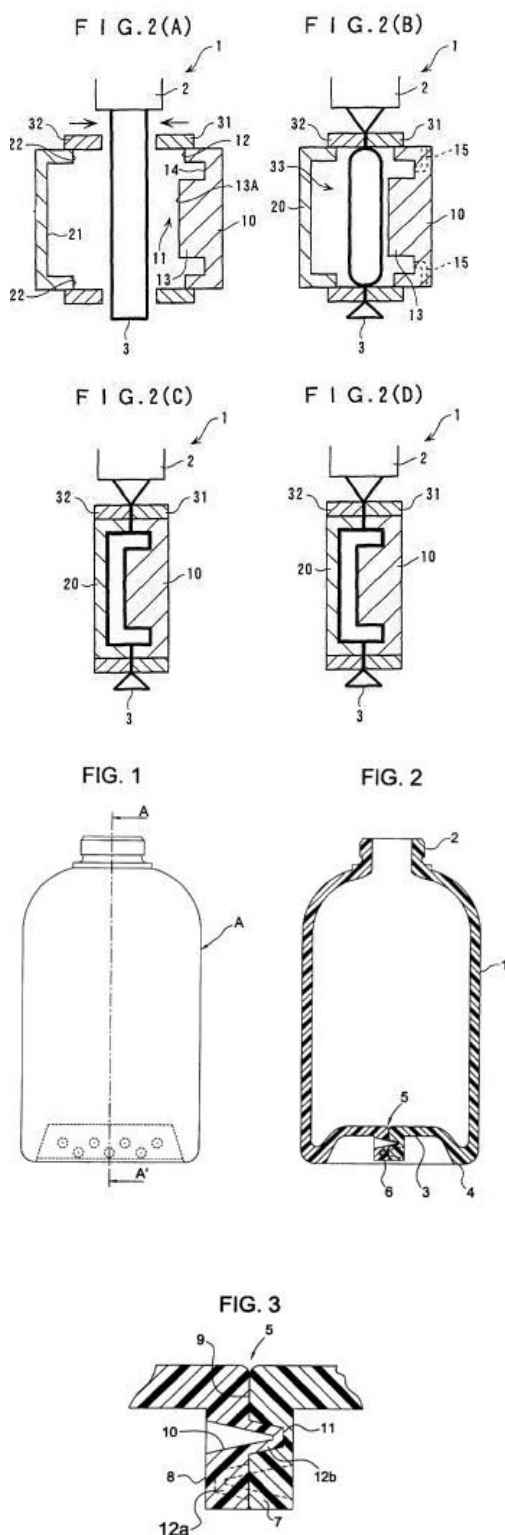
**B29C 49/4817**

{with means for closing off parison ends}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:



**B29C 49/48185****{with more than one separate mould cavity}****Definition statement***This place covers:*

With a plurality of mould cavities.

**B29C 49/4819****{having different sizes or shapes of the mould cavities}****Definition statement***This place covers:*

Having a plurality of mould cavities with different shapes or sizes.

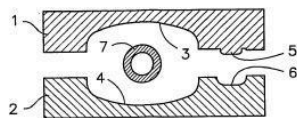
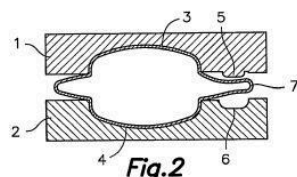
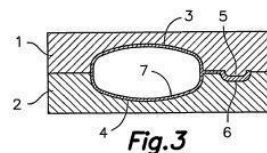
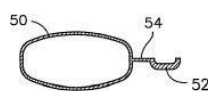
**B29C 49/482****{with means for moulding parts of the parisons in an auxiliary cavity, e.g. moulding a handle}****Definition statement***This place covers:*

- WO2007063155

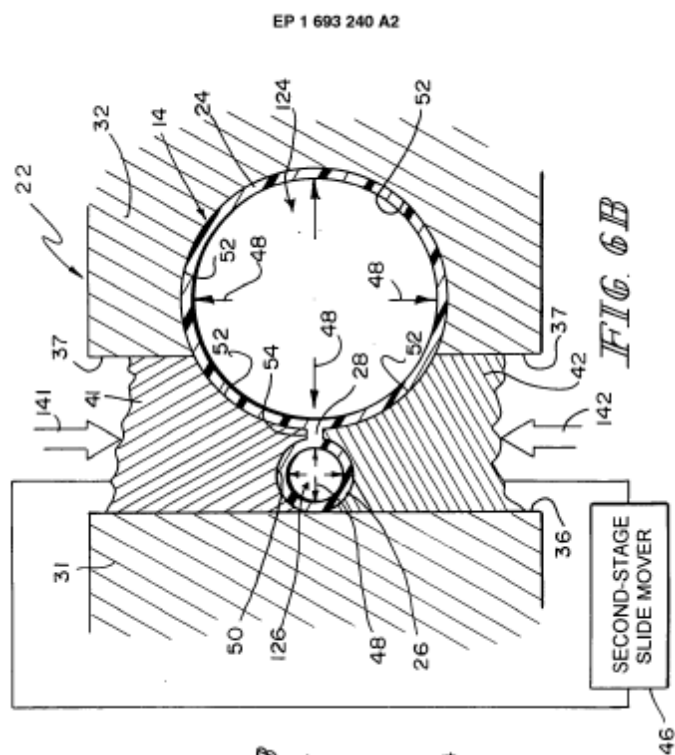
WO 2007/063155

PCT/ES2006/000656

- 1/2 -

**Fig. 1****Fig. 2****Fig. 3****Fig. 4**

- EP1693240



**B29C 49/4823****{with incorporated heating or cooling means}****Definition statement***This place covers:*

- WO2005025835

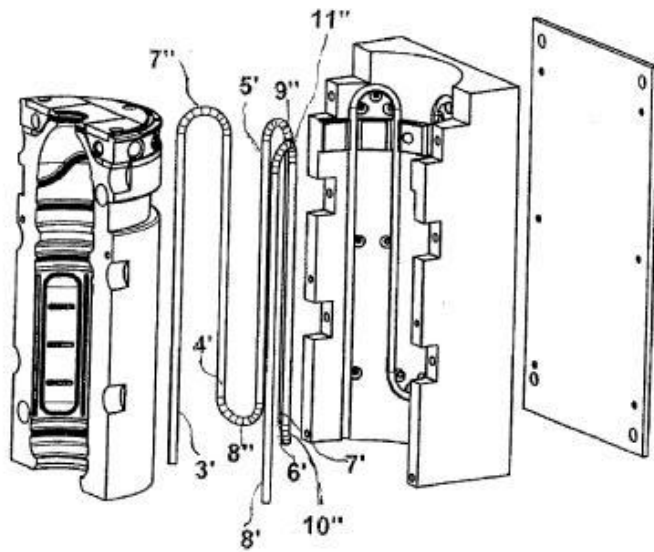


Fig. 2

- WO03033242

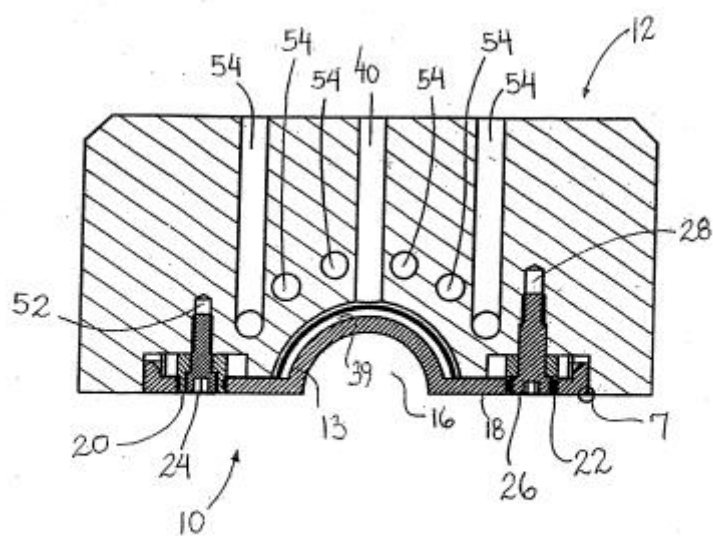
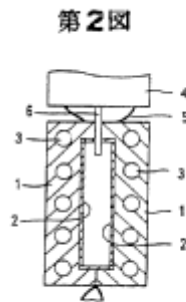


FIGURE 6



JP2289328



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heating or cooling of moulds in general	<a href="#">B29C 33/02</a>
---	----------------------------

## Special rules of classification

When details of the heating or cooling means are indicated, then it is highly desirable to allocate additionally the following corresponding Indexing Codes for additional information:

- [B29C 35/02](#), [B29C 35/04](#) - [B29C 2035/0883](#)
- [B29C 35/16](#), [B29C 2035/1616](#) - [B29C 2035/1691](#)

## B29C 2049/4854

{Heating or cooling from the inside of the cavity, e.g. using flames or other means}

### Definition statement

*This place covers:*

Having means for heating or cooling from inside the mould cavity.

## B29C 2049/48615

{Aligning the mould assembly position e.g. adapting center to the extruded parison}

### Definition statement

*This place covers:*

With means or methods for aligning neck portions of bottle producing moulds.

**B29C 2049/4862****{Aligning the mould part position e.g. left half to right half}****Definition statement***This place covers:*

Means or methods for aligning mould part positions.

**B29C 2049/4863****{Mould identification, e.g. chip on mould with ID and process data}****Definition statement***This place covers:*

With mould identification means.

**B29C 49/487105****{characterised by the manufacturing process}****Definition statement***This place covers:*

Where the mould is characterised by the manufacturing process of the mould.

**B29C 2049/4881****{having a mandrel or core e.g. two mould halves with a core in-between}****Definition statement***This place covers:*

Moulds having a mandrel or core between the mould halves.

**B29C 2049/48825****{Asymmetric moulds, i.e. the parison is not in the center of the mould}****Definition statement***This place covers:*

Moulds that are asymmetric allowing the parison to be off center.

**B29C 2049/4883****{having cavity parts avoiding preform contact, e.g. partial free blow}****Definition statement***This place covers:*

Moulds having cavity portions which do not contact the preform.

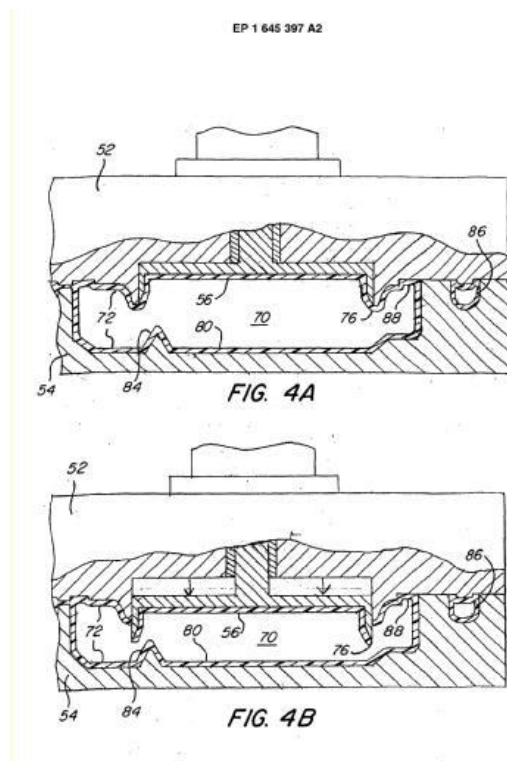
**B29C 49/50**

having cutting or deflashing means

**Definition statement**

*This place covers:*

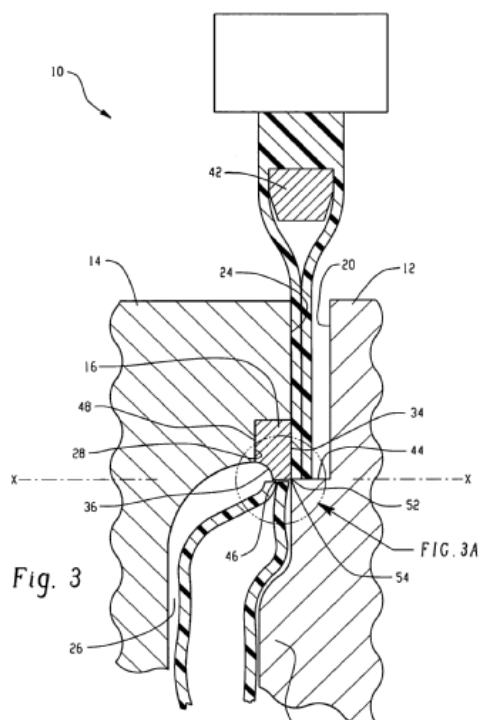
-EP1645397



Patent Application Publication Sep. 15, 2005 Sheet 3 of 27 US 2005/0199577 A1

Fig. 1 is a perspective view of a container assembly 100. The assembly includes a container 101 (101b) with a neck 102 and a base 103. A cap 104 is shown in a partially open position, revealing a seal 105 and a gasket 106. A dashed line A indicates a cross-sectional view.

Patent Application Publication Aug. 10, 2006 Sheet 3 of 14 US 2006/0175737 A1



**B29C 49/52**

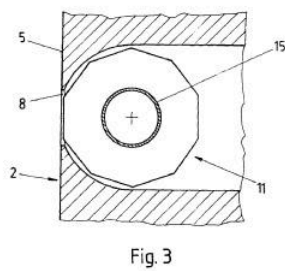
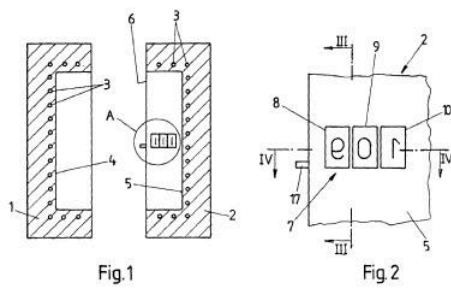
having decorating or printing means

**Definition statement**

*This place covers:*

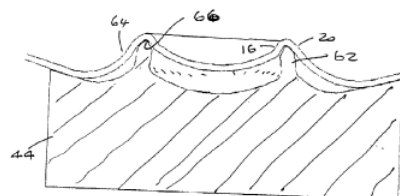
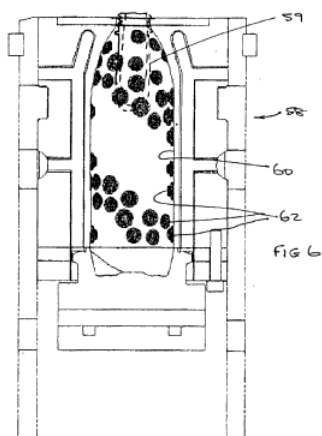
- EP1005975

EP 1 005 975 A2



US2004026355

Patent Application Publication Feb. 12, 2004 Sheet 3 of 5 US 2004/0026355 A1



## References

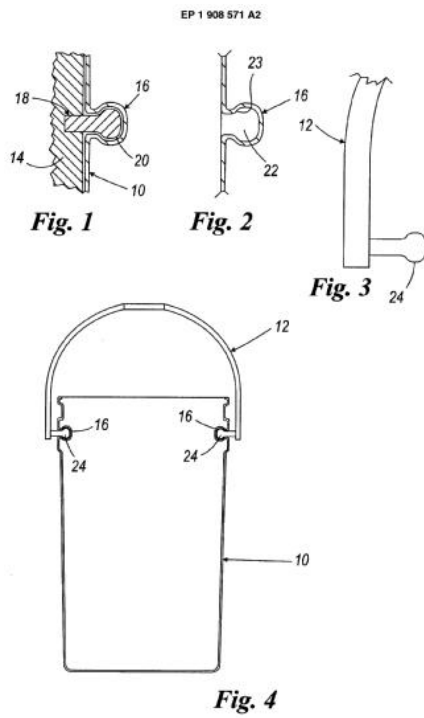
### Informative references

Attention is drawn to the following places, which may be of interest for search:

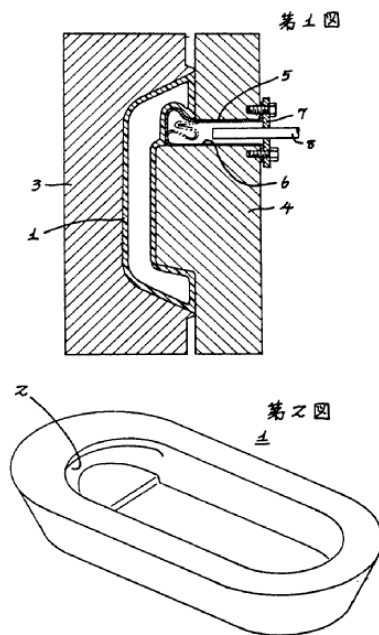
Moulds characterised by the shape of the moulding surface in general	<a href="#">B29C 33/42</a>
--	----------------------------

**B29C 49/54****for undercut articles****Definition statement***This place covers:*

- EP1908571



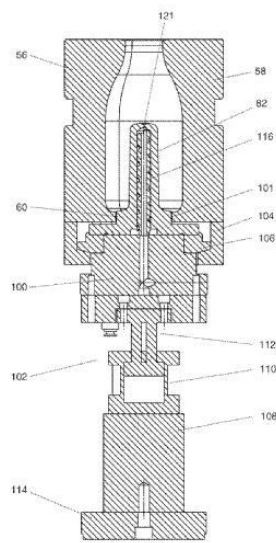
- JP63221020



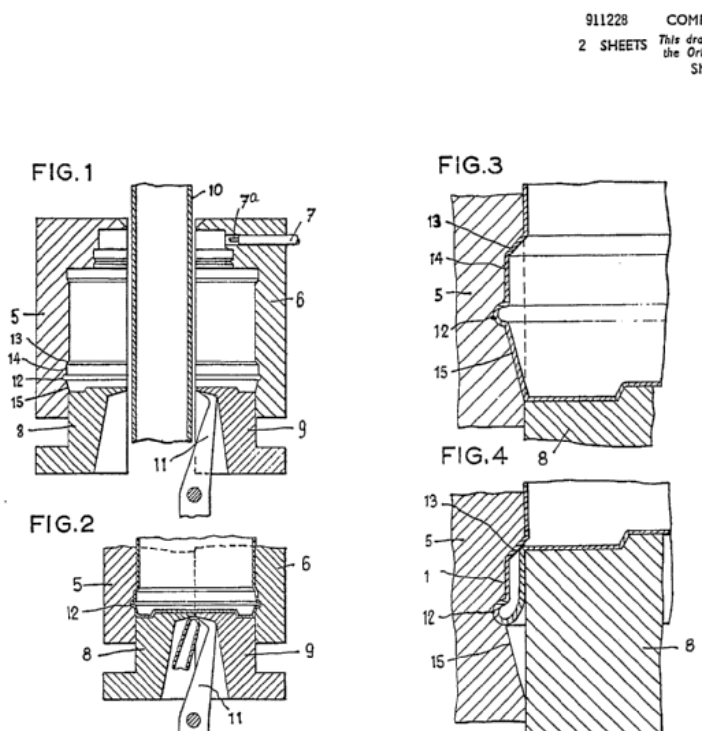


**B29C 49/541****{having a recessed undersurface}****Definition statement***This place covers:***-US2008283533**

, 2008 Sheet 2 of 5 US 2008/0283533 A1

**Figure 8**

- DE1479563



## B29C 2049/542

{having means to facilitate the removal of the blow moulded articles}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds with means for, or specially constructed to facilitate, the removal of articles, e.g. of undercut articles	<a href="#">B29C 33/44</a>
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## B29C 49/56

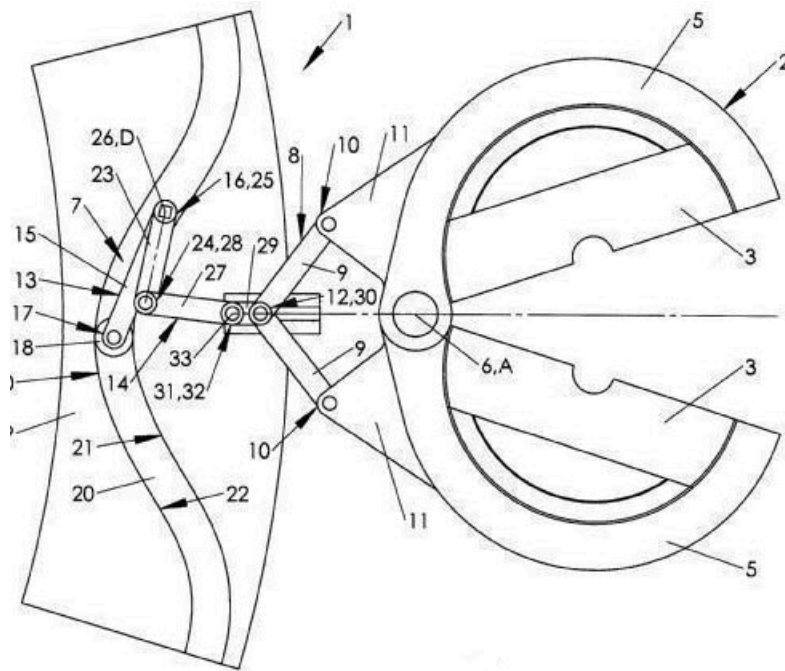
Opening, closing or clamping means

### Definition statement

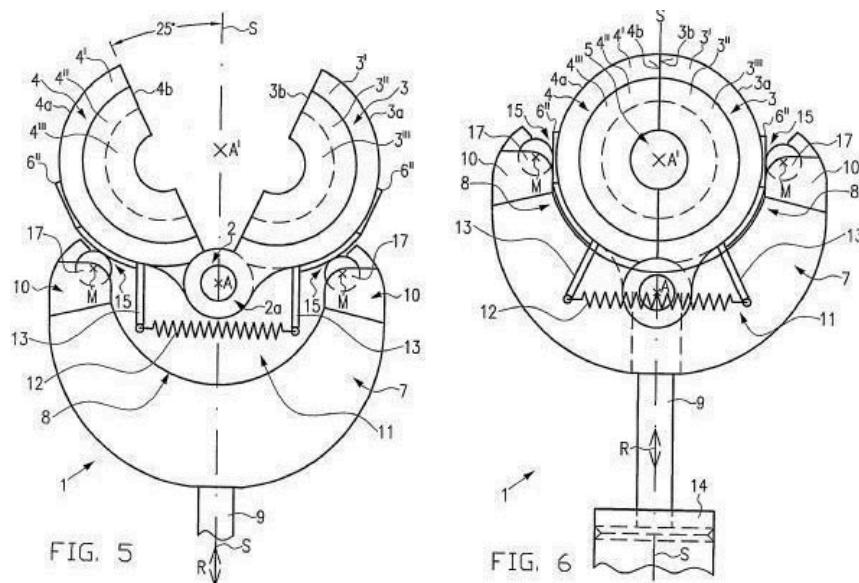
*This place covers:*

Illustrative example of subject matter classified in this group:

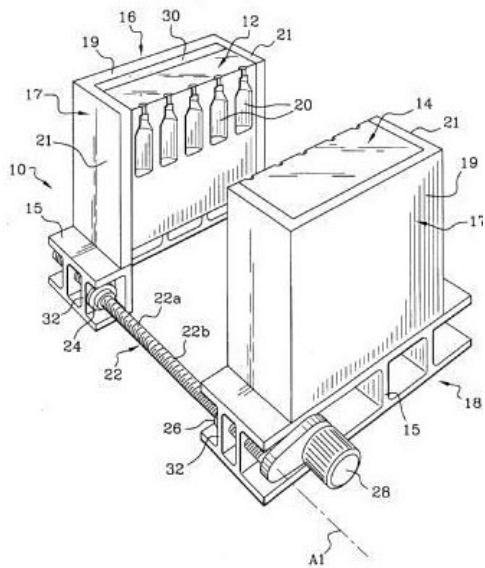
Cam driven opening and closing means



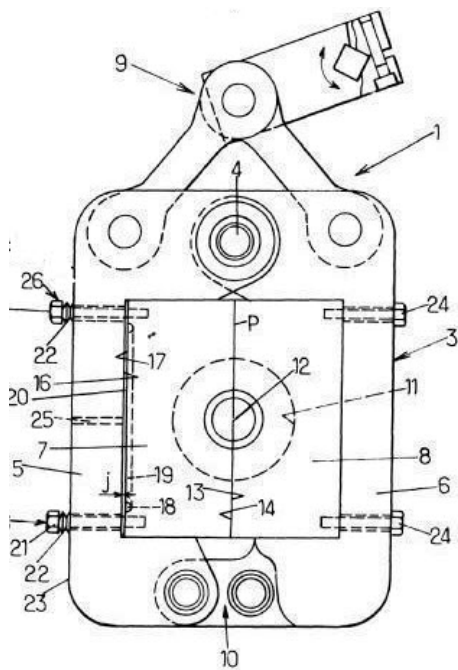
Mechanical opening closing mechanism



Spindle driven (screw driven) opening closing mechanism

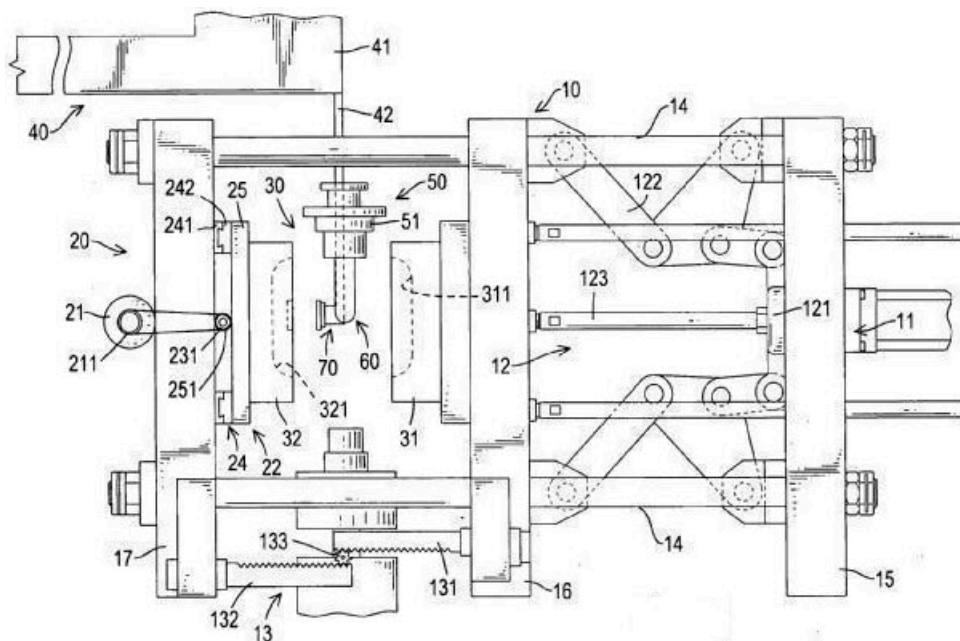


Fluid driven clamping means via channel 25

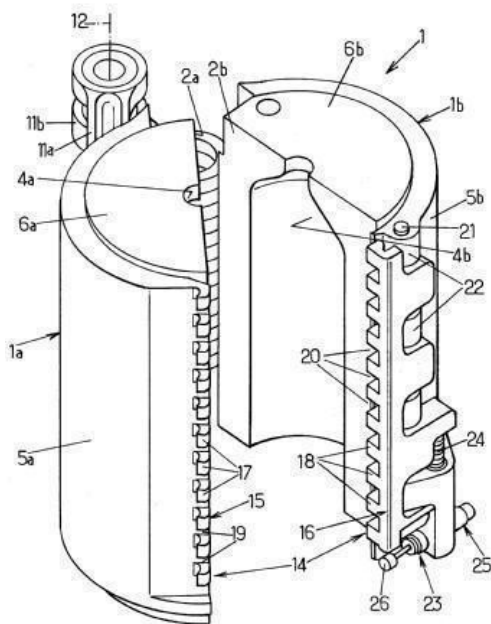


## Definition statement

## Closing and clamping toggle mechanism



## Locking mechanism



## References

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Opening, closing or clamping of moulds in general

[B29C 33/20](#) - [B29C 33/28](#)

**B29C 49/5602****{using cams}****Definition statement***This place covers:*

Opening or closing the mould with the use of cams.

**B29C 49/5603****{using toggle mechanism}****Definition statement***This place covers:*

Opening or closing the mould with the use of a toggle mechanism.

**B29C 49/5604****{using spindle nut mechanism}****Definition statement***This place covers:*

Opening or closing the mould with the use of a spindle nut mechanism.

**B29C 49/5605****{Hydraulically operated, i.e. closing or opening of the mould parts is done by hydraulic means}****Definition statement***This place covers:*

Opening or closing the mould hydraulically.

**B29C 49/5606****{Pneumatically operated, i.e. closing or opening of the mould parts is done by hydraulic means}****Definition statement***This place covers:*

Opening or closing the mould pneumatically.

**B29C 49/5607****{Electrically operated, e.g. the closing or opening is done with an electrical motor direct drive}****Definition statement***This place covers:*

Opening or closing the mould electrically.

**B29C 49/5608**

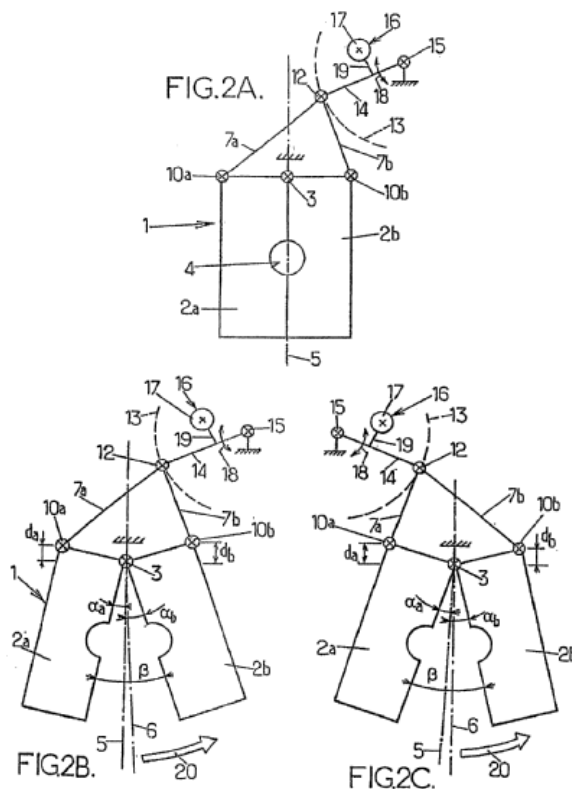
{Asymmetric movement of mould parts, e.g. by moving only one mould part}

**Definition statement**

*This place covers:*

Opening or closing the mould by asymmetric movement of the mould parts.

Illustrative example of subject matter classified in this group:

**B29C 49/561**

{Characterised by speed, e.g. variable opening closing speed}

**Definition statement**

*This place covers:*

Opening or closing of the mould is characterised by the opening or closing speed.

**B29C 49/5611**

{Tilting movement, e.g. changing angle of the mould parts towards the vertical direction}

**Definition statement**

*This place covers:*

Opening or closing the mould by tilting movement of a mould part.

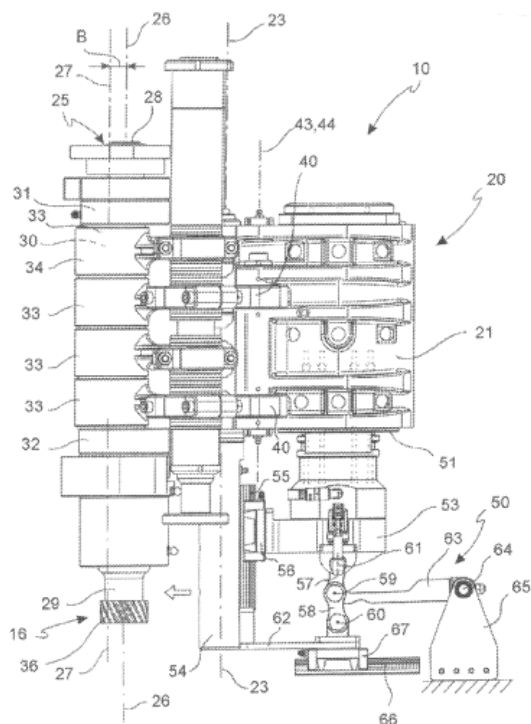
**B29C 49/5612****{characterised by bottom part movement}****Definition statement***This place covers:*

Opening or closing the mould by movement of a bottom portion of the mould.

**B29C 49/5613****{characterised by connected mould part movement, e.g. bottom part movement is linked to mould half movement}****Definition statement***This place covers:*

Opening or closing the mould by movement of a connected mould part.

Illustrative example of subject matter classified in this group:

**FIG. 6****B29C 49/5614****{Safety means, e.g. during ejection or locking failure}****Definition statement***This place covers:*

Safety devices for use during opening or closing of the mould.



**B29C 2049/5631****{Hydraulic}****Definition statement***This place covers:*

Hydraulically operated clamping means.

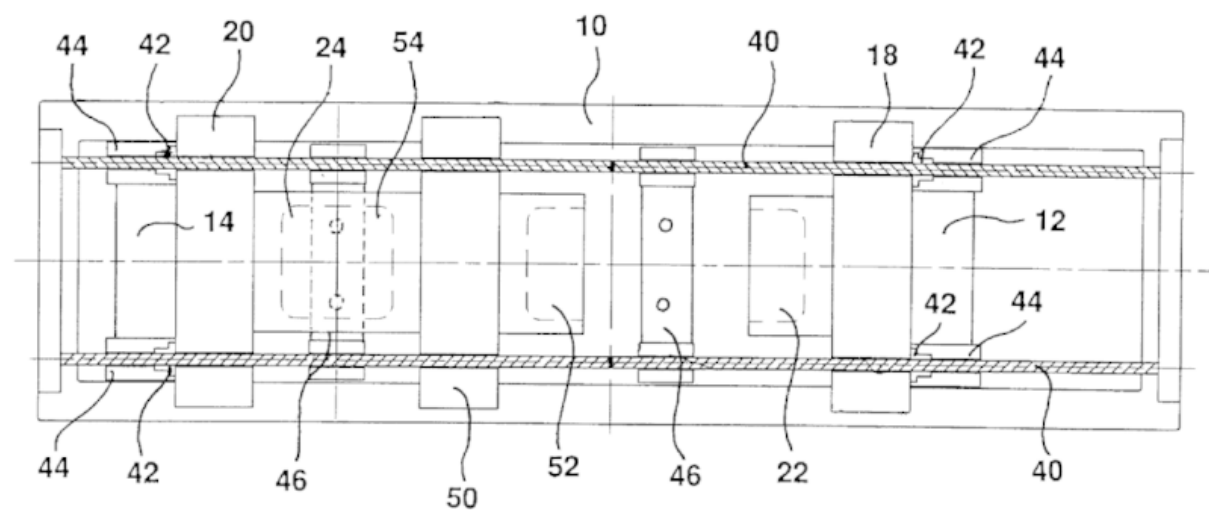
**B29C 2049/5633****{Pneumatic}****Definition statement***This place covers:*

Pneumatically operated clamping means.

**B29C 2049/5634****{Electric, e.g. electric motor}****Definition statement***This place covers:*

Electrically operated clamping means.

Illustrative example of subject matter classified in this group:

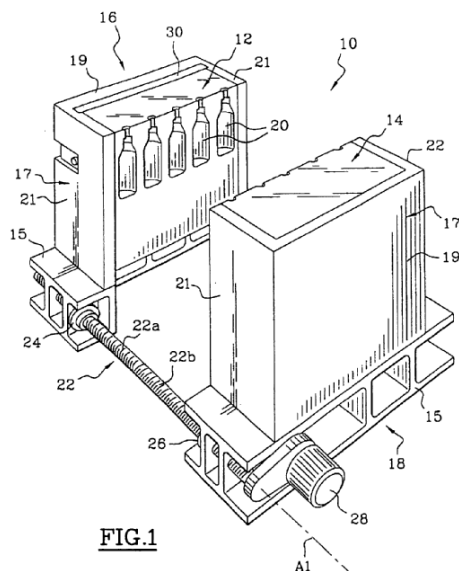
**FIG. 2**

The machine wherein the coupling means (36) is constructed as a rack, threaded rod (40), link chain, toothed belt, V-belt or corresponding means, and the rotating engagement member is constructed as a toothed wheel, threaded wheel (42) or corresponding turning means, and the motor (38) is constructed as an electrically driven motor (44).

**B29C 2049/5635****{Avoiding mould deformation}****Definition statement***This place covers:*

Mould apparatus clamping elements which function in a manner that avoids or prevents deforming the mould.

Illustrative example of subject matter classified in this group:



As seen in Figure 1, Element 30 is a cushion which can be inflated such that it projects slightly past the rear face of the mould-half, at least on three sides. Thus, by inflating the cushion 30 with a fluid at a pressure substantially equal to or greater than that of the blow-moulding fluid, the resulting action of these two fluids on the mould-half is an action that pushes toward the other mould-half 14.

In the extrusion-blow-moulding process, pressures on the order of 10 bars are generally used. Also, when the mould has a large cavity or several cavities, the forces exerted by the fluid pressures can be quite large. However, the use of a flexible cushion makes it possible to ensure that the compensating pressure is distributed uniformly over the entire rear face of the mould-half. In this way, the force of the first mould-half 12 applied against the second 14 is uniformly distributed over the entire joint plane of the mould, without the need to use particularly rigid mould-halves or mould clamping units, which allows costs to be decreased.

**B29C 2049/5636****{using closing means as clamping means}****Definition statement***This place covers:*

A mould closing feature which also functions as the mould clamping feature.

Illustrative example of subject matter classified in this group:

To close the blow-mould and to hold it closed with a high force for a blow-moulding process, the electric motor is activated to drive the push mechanism. The push mechanism, preferably designed as a spindle drive, moves the push rod out of the push mechanism and the electric motor reaches

## Definition statement

the required torque. Directly after the blow-mould has been closed with high force by an elastic deformation, the braking device is activated to hold the push rod in a state of constantly maintained tension in its instantaneous position and to hold the blowing mould closed with a required closing force.

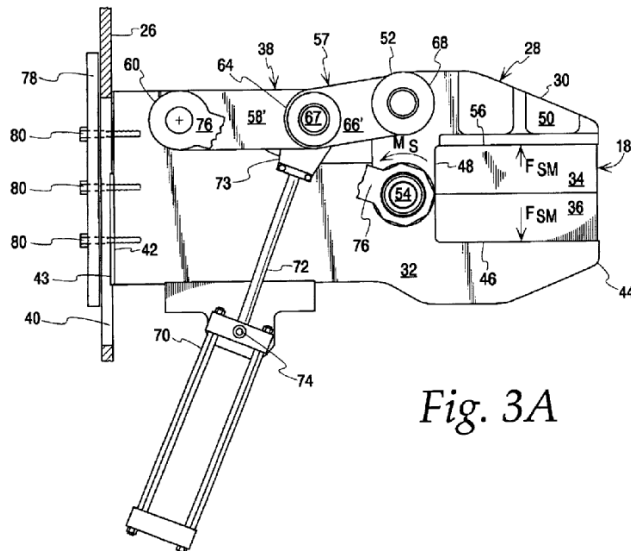


Fig. 3A

## B29C 2049/5661

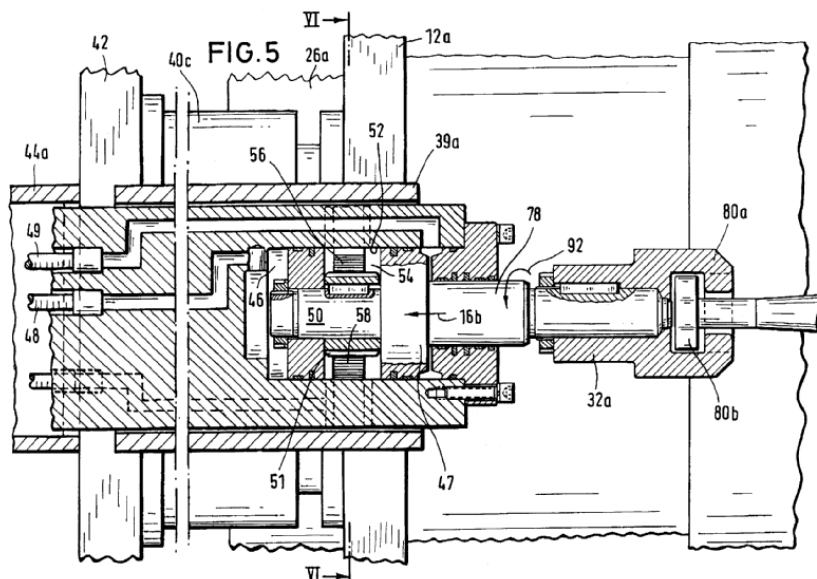
## {Mechanical}

## Definition statement

*This place covers:*

A mould locking element which is operated mechanically.

Illustrative example of subject matter classified in this group:



The cross-section of the coupling member 80b which is to be introduced into and co-operate with the receiving coupling member 80a is so adapted to the cross-sectional shape of the opening in the receiving coupling member 80a so that, when the receiving coupling member 80a is in the appropriate angular position, the coupling member 80b can be introduced into the coupling member 80a through

### Definition statement

the opening therein, in the course of the mould-closing movement. Thereafter, the receiving coupling member 80a is rotated about its longitudinal axis or about the longitudinal axis of the locking portion, thus providing a positively locking connection between the two coupling members. That position is shown in FIG. 5.

**B29C 2049/5662**

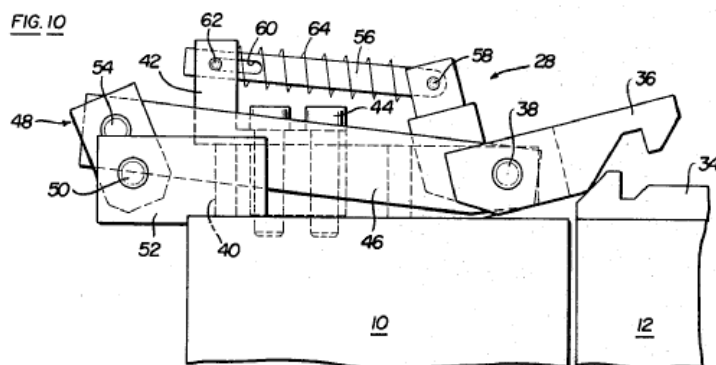
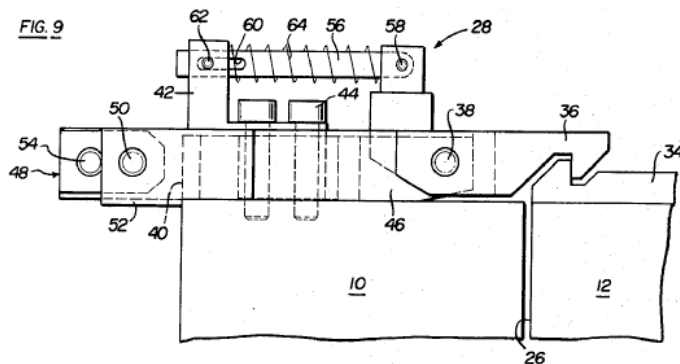
**{Latch}**

### Definition statement

*This place covers:*

A mould locking element which includes a mechanically-operated latch feature.

Illustrative example of subject matter classified in this group:



**B29C 2049/5663**

**{Rotating locking pin}**

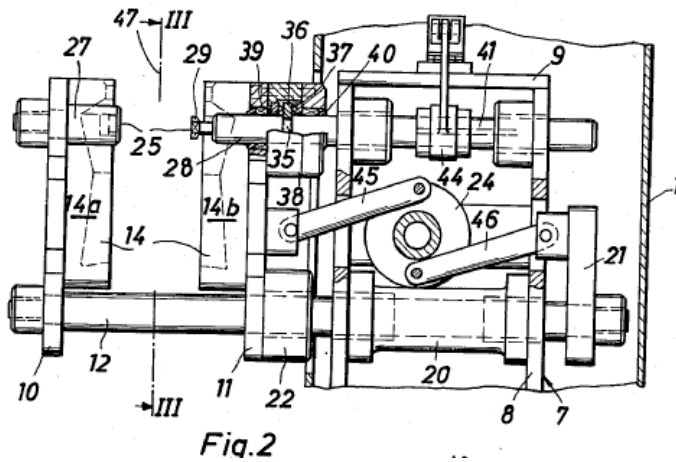
### Definition statement

*This place covers:*

A mould locking element which is a mechanically-operated rotating pin.

## Definition statement

Illustrative example of subject matter classified in this group:



Locking mechanism 25 is actuated by piston and cylinder unit as soon as mould platens 10, 11 are butted to each other and hollow mould 14 is closed. Since locking bush 27 is firmly screwed to mould platen 10 and locking rod 28 is rotatable in mould platen 11 but axially fixed relative thereto, with platens 10, 11 abutting, lock head 29 penetrates into opening 31 of locking bush 27, the mechanism being adjusted so as to always insure an alignment of lock head 29 with opening 31.

## B29C 2049/5664

### {Translating locking pin}

#### Definition statement

*This place covers:*

A mould locking element which is a mechanically-operated translating pin.

Illustrative example of subject matter classified in this group:

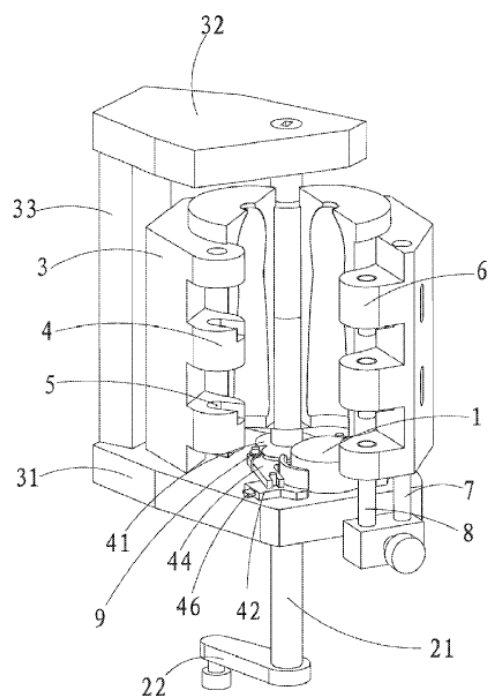


fig. 2

See reference sign 8

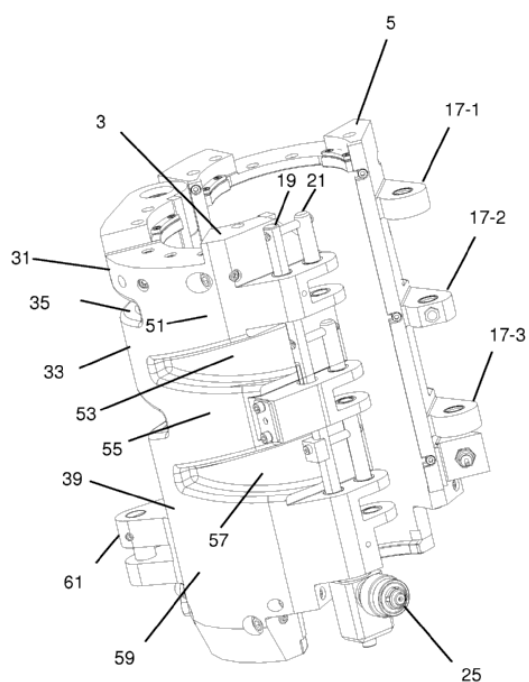


Figure 4

See reference sign 21

## B29C 2049/5665

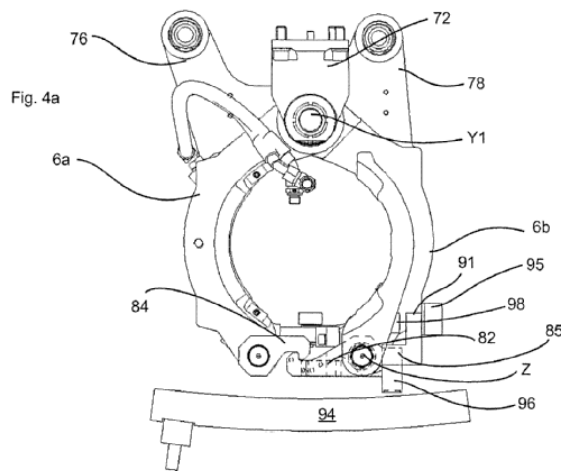
{Magnetic}

### Definition statement

*This place covers:*

A mould locking element which is magnetically operated.

Illustrative example of subject matter classified in this group:



This figure shows a corresponding closed state of the blow-moulding station, i.e. a state in which the first locking element 82 engages in the second locking element 84. The reference number 95 designates a holding magnet which cooperates with a magnetizable element 91, which is likewise arranged in a fixed manner on the locking element 82, and in this way holds the first locking element in the locking position with a pre-set magnetic force. This holding magnet 95 thus constitutes the second magnetic element.

## B29C 2049/5666

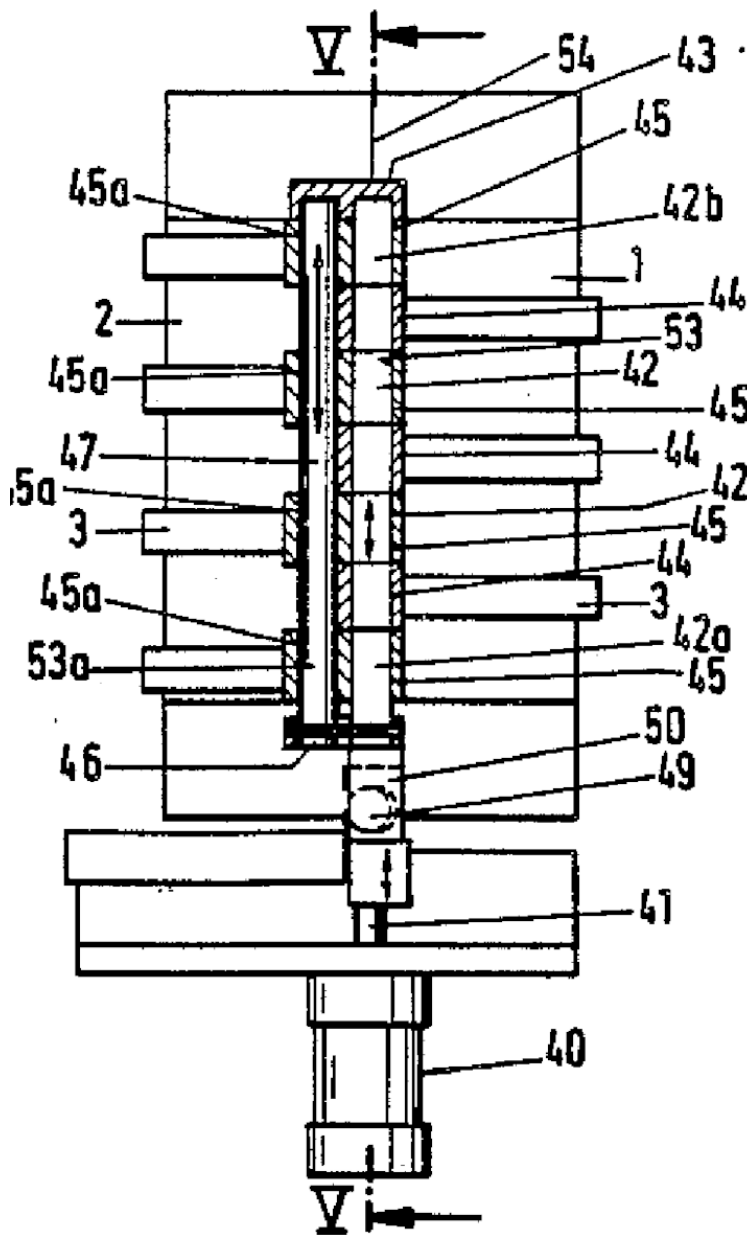
{Pneumatic}

### Definition statement

*This place covers:*

A mould locking element which is pneumatically operated.

Illustrative example of subject matter classified in this group:



The locking and unlocking of the mould halves when the mould is in its closed state is effected utilising a locking arrangement which will be described. The locking arrangement comprises a pneumatic piston and cylinder arrangement 40. The piston rod 41 of the arrangement 40, when moved upwardly, engages with the underside of the lowermost locking section 42a of a series of end-abutting locking members 42 which are in the form of locking bars. The mould halves 1 and 2 are provided with clamps 3.



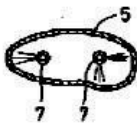
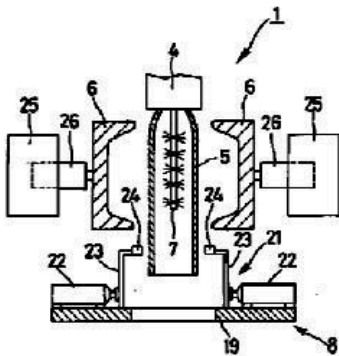
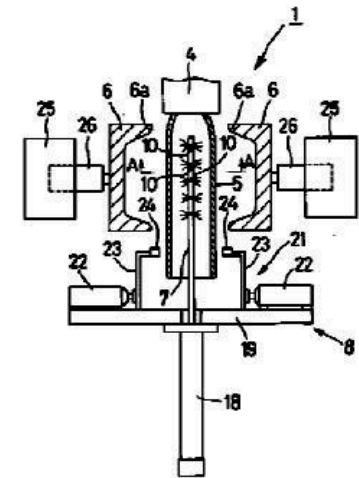
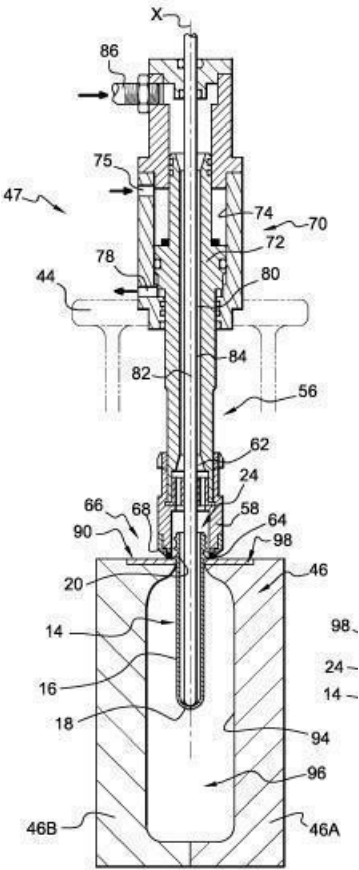
B29C 49/58

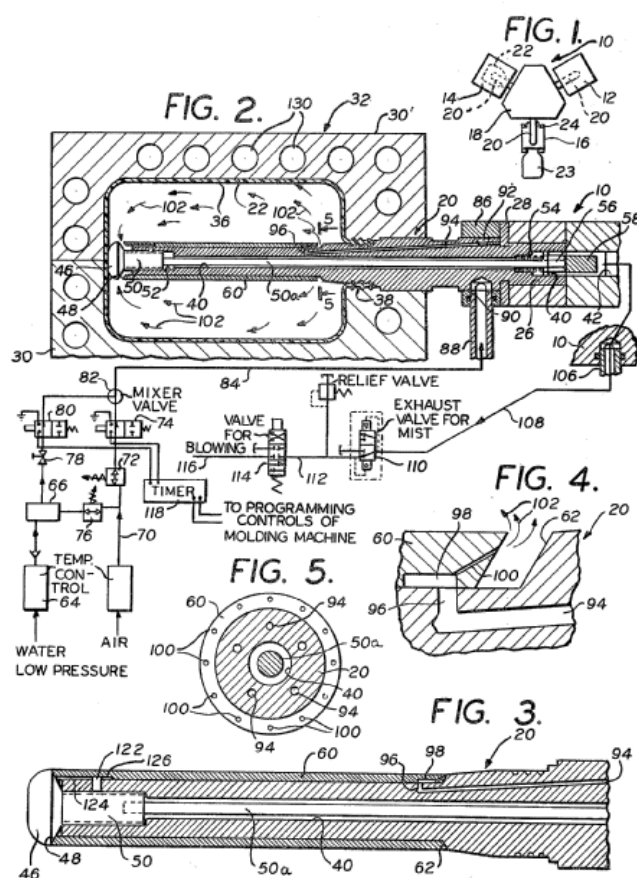
Blowing means

Definition statement

This place covers:

Illustrative example of subject matter classified in this group:





## Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "blowing means", "blow pin", "blowing nozzle" and "blowing mandrel"

## B29C 2049/5898

{Regulation of the blowing means clamp force}

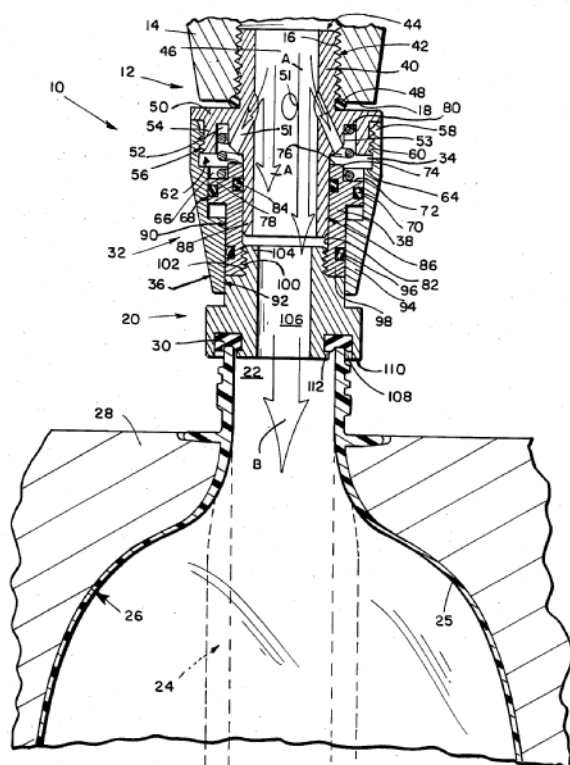
## Definition statement

This place covers:

Control of the force of the attachment, or clamp applied, between the blowing element and the preform/parison.

## Definition statement

Illustrative example of subject matter classified in this group:

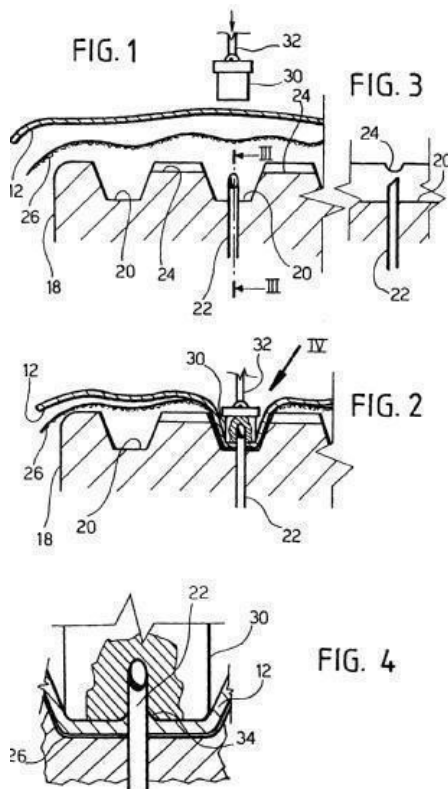


After the seal 30 has contacted the upper lip of the parison 24 and the piston 38 moved upward against the biasing force of spring 80, a gaseous blowing medium, typically air, is quickly injected through outlet 14 and into axial passageway 46. The downwardly angled ports 51 extending from the axial passageway 46 through the inner wall 53 of chamber 34 causes a quick increase in pressure within the chamber 34. This increase in pressure within chamber 34 exerts a force on the annular pressure surface 72 of piston 38 causing it to press downwardly to ensure a complete and full seal by the sealing means 30 on the upper lip of opening 22.

**B29C 49/60****Blow-needles****Definition statement**

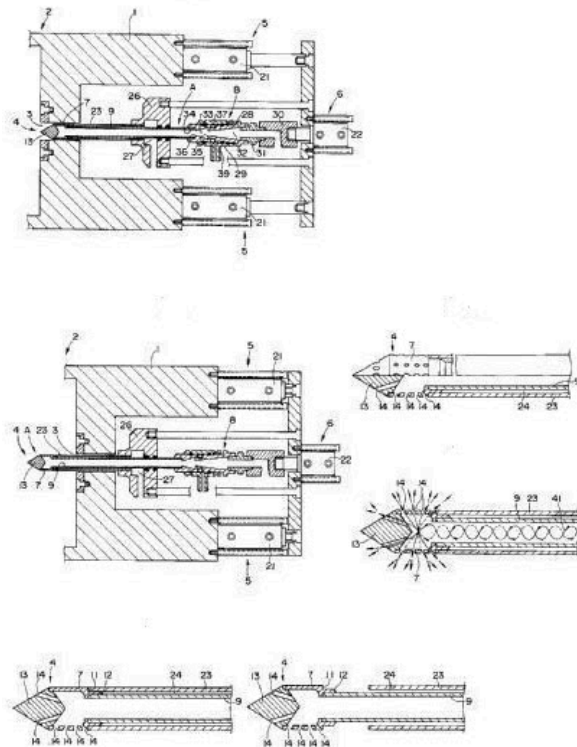
*This place covers:*

Illustrative example of subject matter classified in this group:

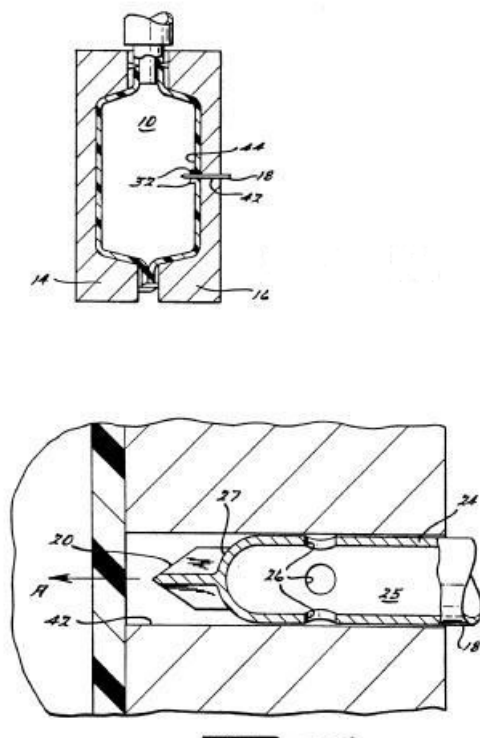


Support 30 facilitates the piercing of the parison

Retractable blow needle, the blow needle has special blow openings



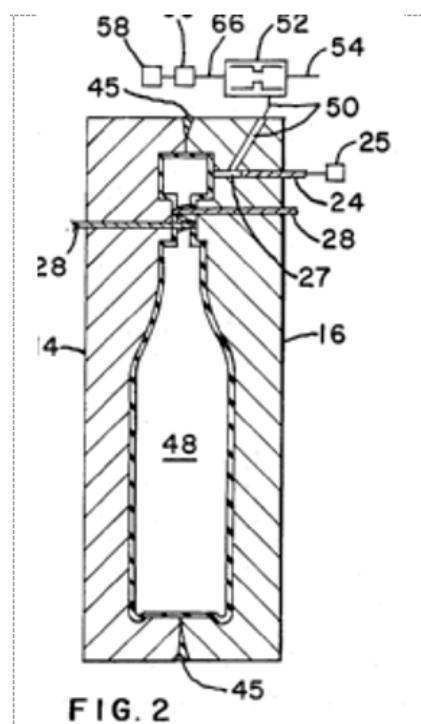
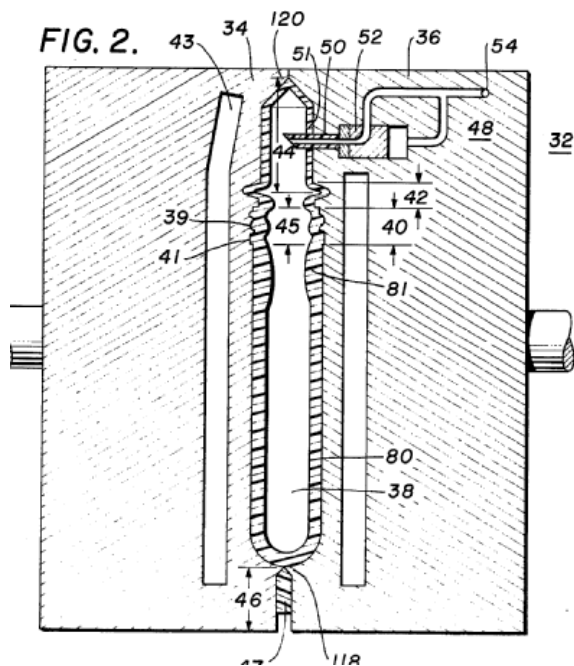
Blow needle has special means to facilitate the piercing



**B29C 2049/6091****{Avoiding needle marks, e.g. insertion in sprue}****Definition statement***This place covers:*

Blow needle placement such that any needle marks are avoided. This could include needle insertion in a sprue or other area apart from the article.

Illustrative example of subject matter classified in this group:

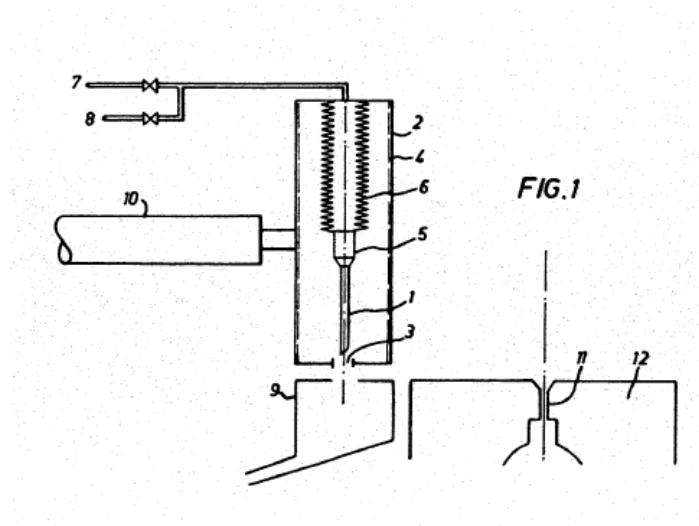


**B29C 2049/6092****{Blow needle sterilization}****Definition statement**

*This place covers:*

Processes or apparatus which include sterilizing the blowing needle.

Illustrative example of subject matter classified in this group:

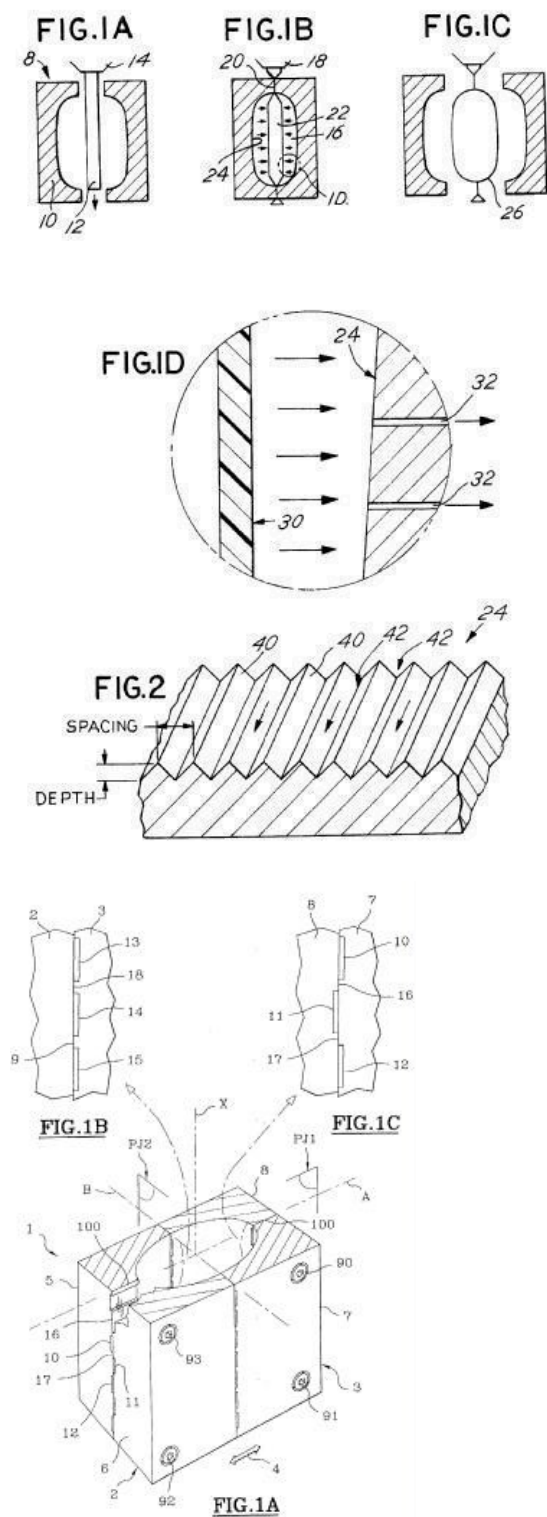


An apparatus including an element for passing steam through said needle in the sterilization position before the sterile gas is passed through the needle. In operation, the needle 1 is retracted into chamber 2 and is initially connected to the steam system 8 in the position shown in FIG. 1 so as to sterilize the entire blowing circuit.

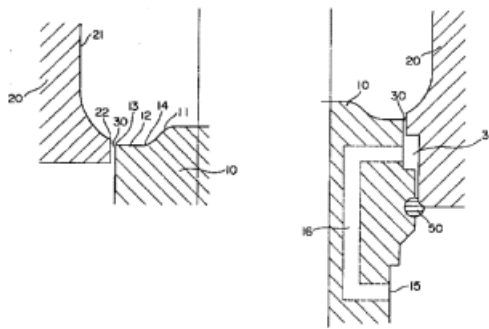
**B29C 49/62****Venting means****Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:







## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Venting means for moulds in general:	<a href="#">B29C 33/10</a>
--------------------------------------	----------------------------

## B29C 2049/6271

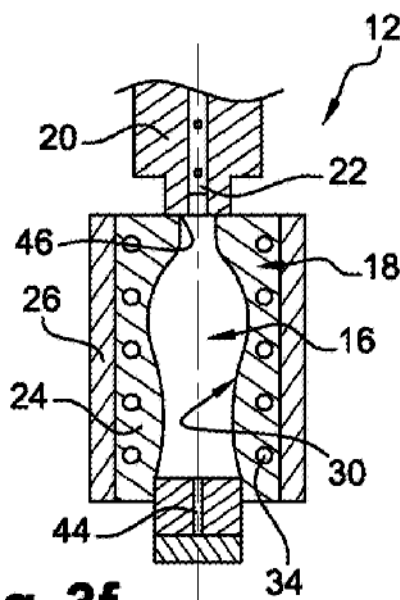
{for venting blowing medium, e.g. using damper or silencer}

### Definition statement

This place covers:

Mould venting element which vents the blowing means, possibly including use of a damper or silencer.

Illustrative example of subject matter classified in this group:



**Fig. 3f**

As illustrated in FIG. 3f, during and after the step for cooling the mould 18, the cooling fluid—when it is formed by the compressed air escapes through said opening 46 to be evacuated through an exhaust device (not shown) that the blow-moulding means 20 comprise and that commonly comprises a sound suppressor. Noise linked to the expansion of compressed air and then to its evacuation is thus limited.

Advantageously, the evacuation of the cooling air from the mould 18 through such a sound suppressor makes it possible to control the pressure inside the moulding cavity 16, which makes it possible to raise the blow-moulding means 20 to the upper position and then to open again the moulding unit 12.

## B29C 2049/6272

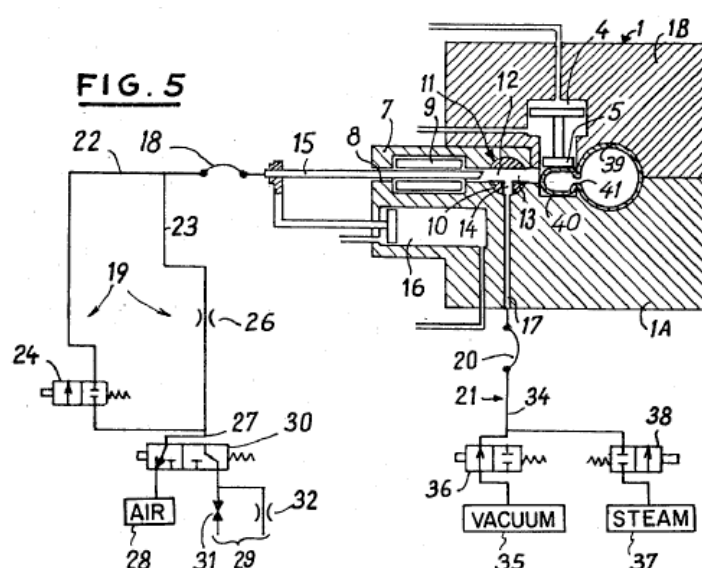
{using vacuum means}

### Definition statement

*This place covers:*

Mould venting element which vents the blowing means using vacuum pressure.

Illustrative example of subject matter classified in this group:



After blowing the receptacle, the supply of high pressure sterile air is interrupted by switching distributor 30. The pressurized sterile blowing air in the receptacle is then evacuated through distributor 24 and valve 31. After evacuation distributor 24 is closed, the needle is withdrawn from the mould cavity by jack 16, distributor 30 is reversed and distributor 36 is opened. The coupling of the vacuum source 35 ensures complete evacuation.

## B29C 49/64

### Heating or cooling preforms, parisons or blown articles

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heating, cooling or curing in general	<a href="#">B29C 35/00</a>
Cooling of preforms after an injection moulding process, said cooled preforms being used in a following blow-moulding process	<a href="#">B29C 45/7207</a>
Heating of preforms in general	<a href="#">B29B 13/023</a>

## Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "glass transition temperature", "T<sub>g</sub>" and "vitreous transition temperature"

## B29C 49/6409

{Thermal conditioning of preforms ([B29C 49/68](#) takes precedence)}

### Definition statement

*This place covers:*

Heating and cooling preforms before the blow-moulding operation.

### References

#### Limiting references

*This place does not cover:*

Ovens specially adapted for heating preforms or parisons	<a href="#">B29C 49/68</a>
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## B29C 49/6418

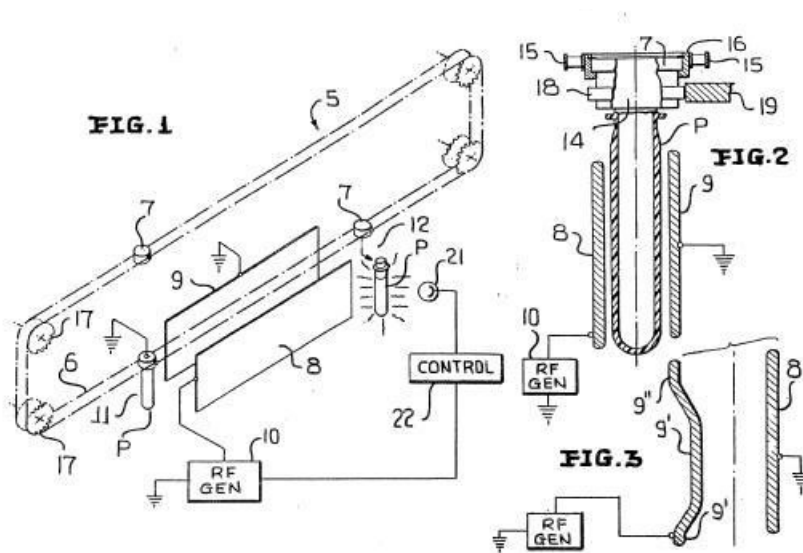
{Heating of preforms}

### Definition statement

*This place covers:*

Heating cold preforms in one continuous uninterrupted heating phase.

Illustrative example of subject matter classified in this group:



Definition statement

Row of preforms are transported through a heating oven

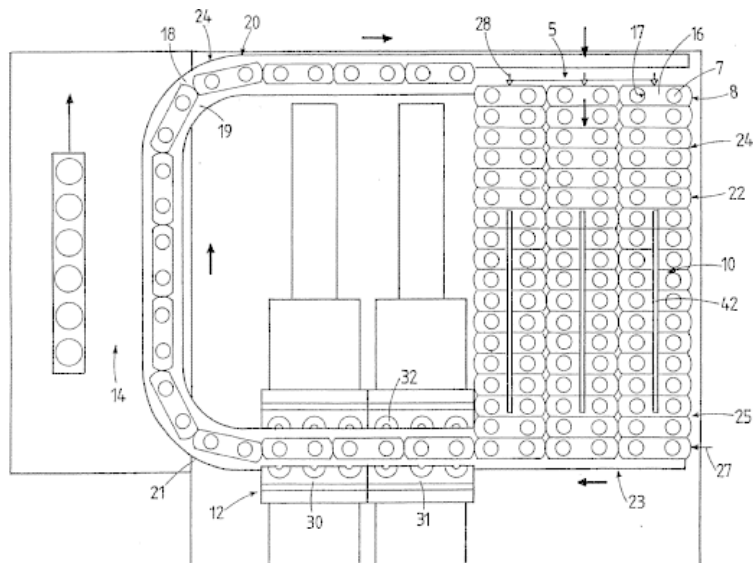


FIG. 2

**B29C 49/6419**

{from the inside}

**Definition statement***This place covers:*

Heating the preforms from the inside using media such as hot air or interior heating element.

Illustrative example of subject matter classified in this group:

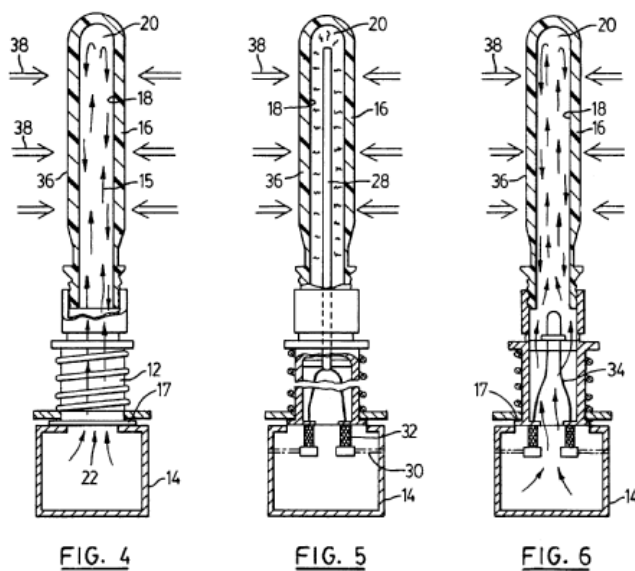


FIG. 4

FIG. 5

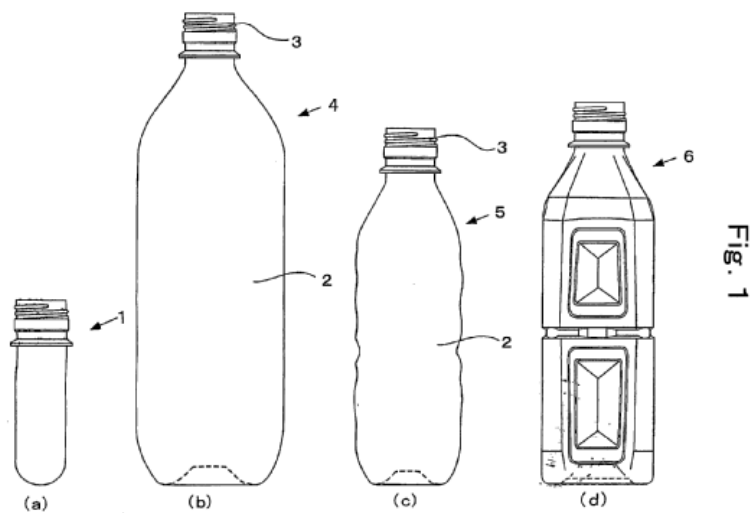
FIG. 6

**B29C 49/64195****{Heated by the mould}****Definition statement***This place covers:*

Heating the preforms via a heated mould.

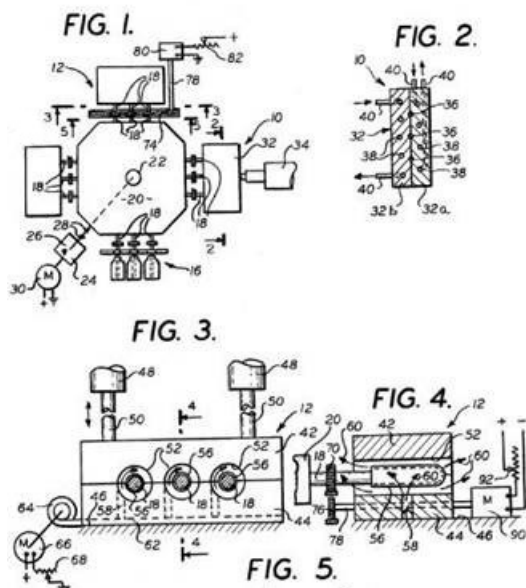
**B29C 49/642****{and shrinking of the preform}****Definition statement***This place covers:*

Heating preforms to shrink them into an intermediate product.

**Fig. 1****B29C 49/6427****{Cooling of preforms}****Definition statement***This place covers:*

Cooling hot or molten preforms in one continuous uninterrupted cooling phase (mainly for injection moulded preforms who do not have the correct blow-moulding temperature yet).

Illustrative example of subject matter classified in this group:



## B29C 49/643

{from the inside}

### Definition statement

*This place covers:*

Cooling preforms from the inside using media such as cool air or fluid.

Illustrative example of subject matter classified in this group:

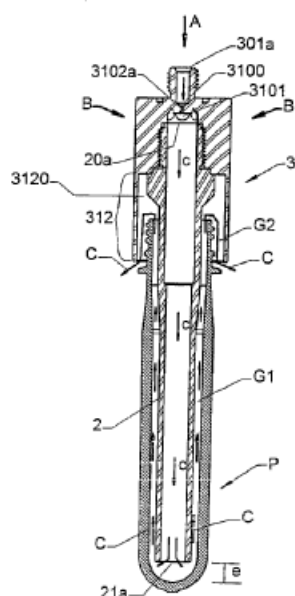


FIG.2

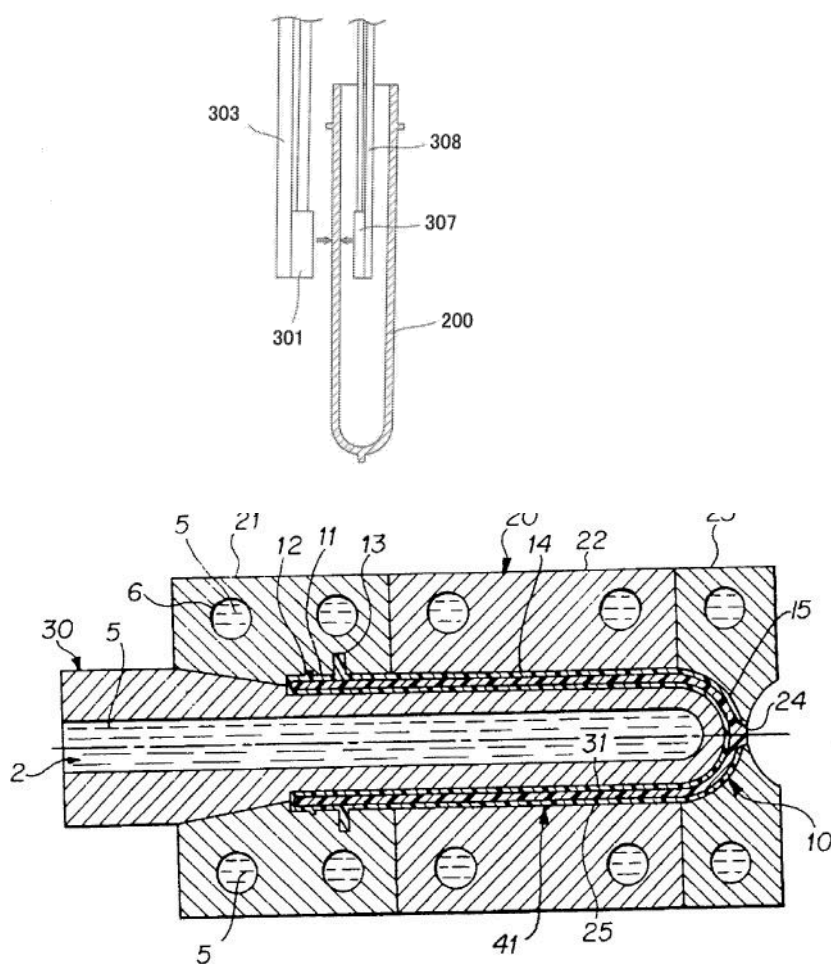
**B29C 49/6435**

{from the outside}

**Definition statement***This place covers:*

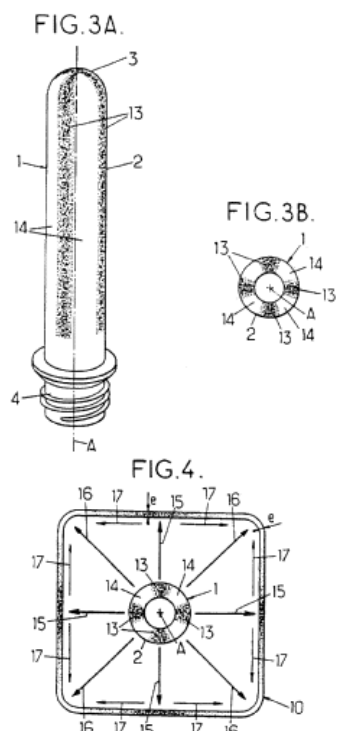
Cooling preforms from the outside using media cool air or fluid in mould channels.

Illustrative example of subject matter classified in this group:

**FIG. 5**

**B29C 49/6436****{characterised by temperature differential}****Definition statement***This place covers:*

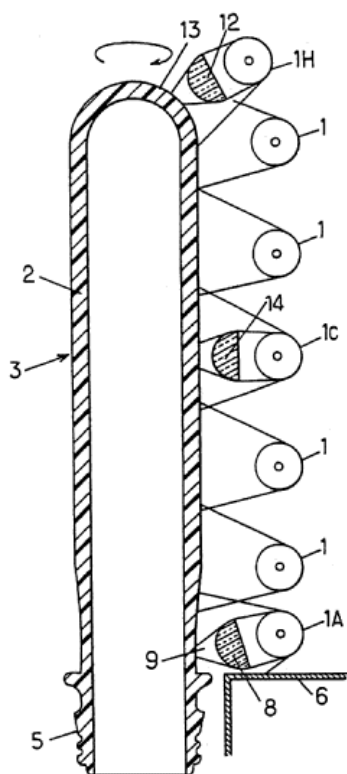
Illustrative example of subject matter classified in this group:





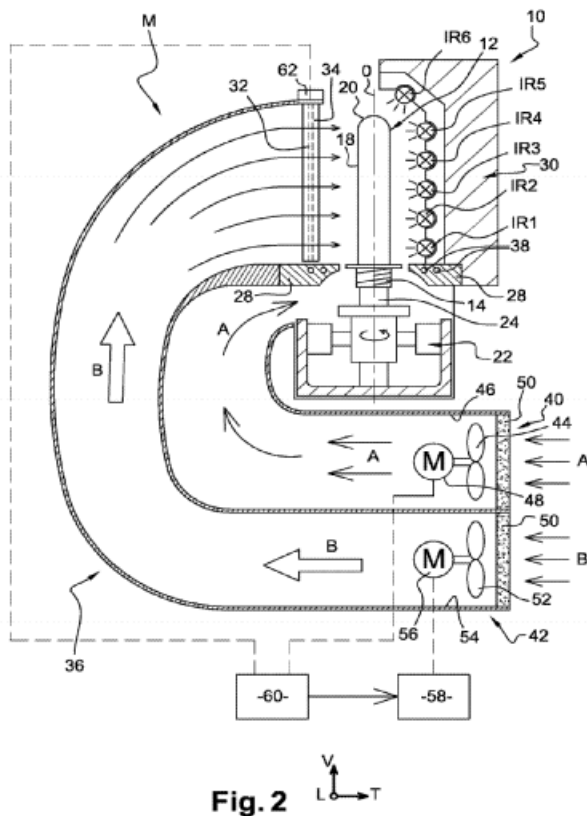
**B29C 49/6445****{through the preform length}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

**B29C 49/645****{by cooling the neck}****Definition statement***This place covers:*

Cooling preform neck region.

Illustrative example of subject matter classified in this group:



## B29C 49/6452

{by heating the neck}

### Definition statement

*This place covers:*

Heating preform neck region.

Illustrative example of subject matter classified in this group:

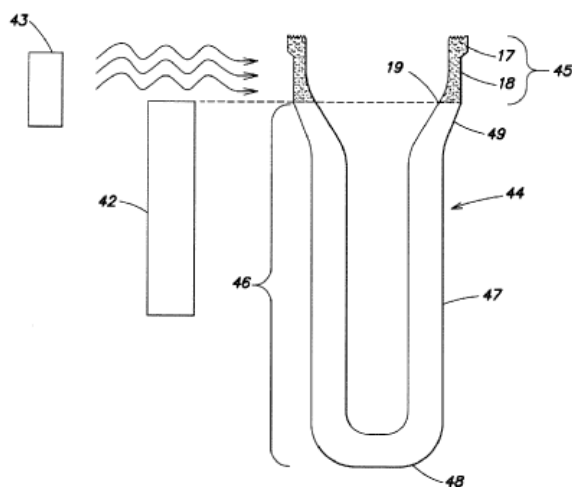


FIG. 4

## B29C 49/6454

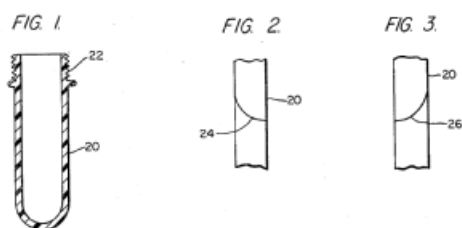
{through the preform thickness}

### Definition statement

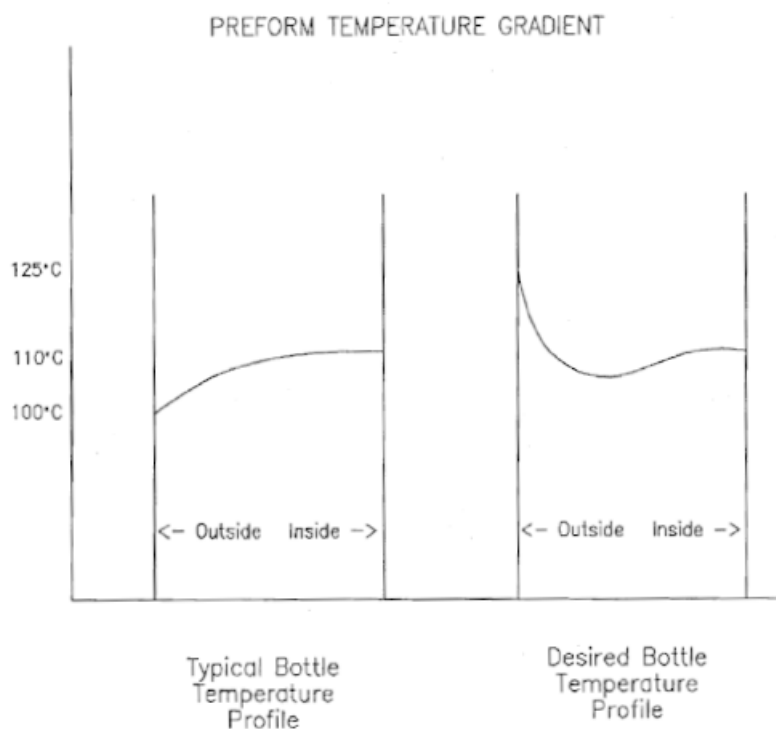
*This place covers:*

Illustrative example of subject matter classified in this group:

Heating apparatus or method that creates a desired temperature profile through a preform.



## Definition statement

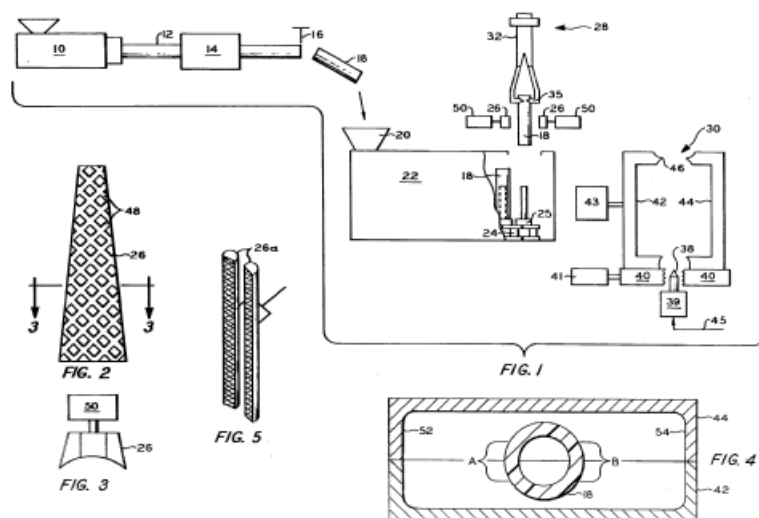
**B29C 49/6458**

{tangentially, i.e. along circumference}

**Definition statement***This place covers:*

Heating system/process for preforms such that there is a difference in temperature through the circumference of the preform, e.g. one radial location of the preform would be heated to a temperature that would differ from a temperature of second radial location.

Illustrative example of subject matter classified in this group:



**B29C 49/6462**

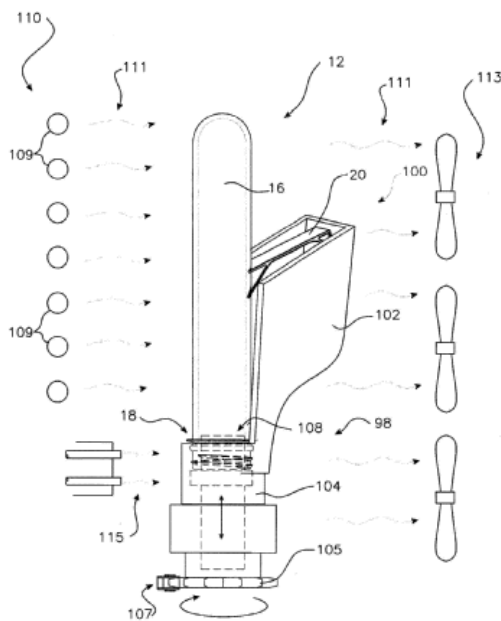
**{by masking}**

### Definition statement

*This place covers:*

Heating including providing a heat shield of some sort which protects desired sections of the preform during heating, e.g. a handle or neck.

Illustrative example of subject matter classified in this group:



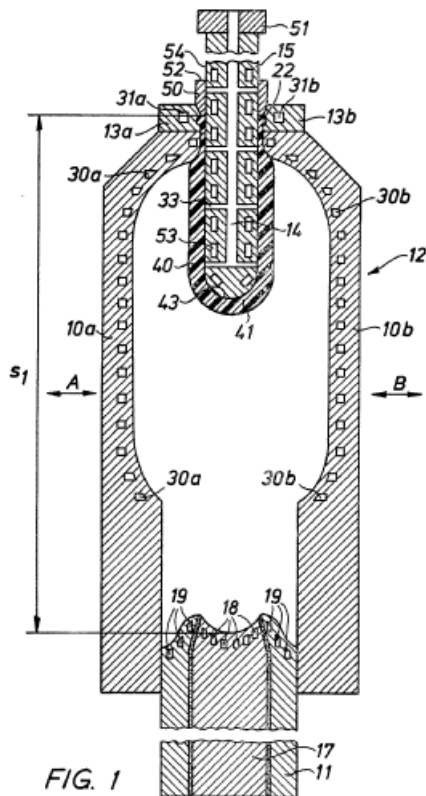
**B29C 49/6463**

{by contact heating or cooling, e.g. mandrels or cores specially adapted for heating or cooling preforms}

**Definition statement**

*This place covers:*

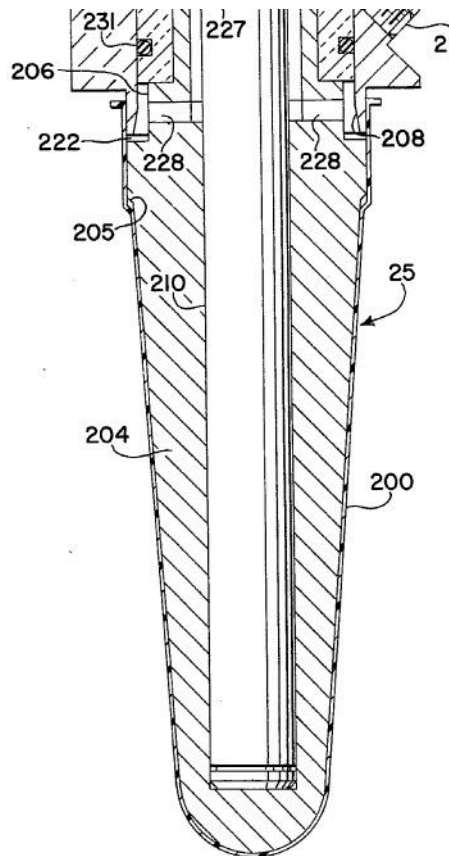
Illustrative example of subject matter classified in this group:



**B29C 49/6464****{Heating}****Definition statement**

*This place covers:*

Heating a preform including using an element which is adapted to engage in contact with a surface of the preform to transfer heat thereto.

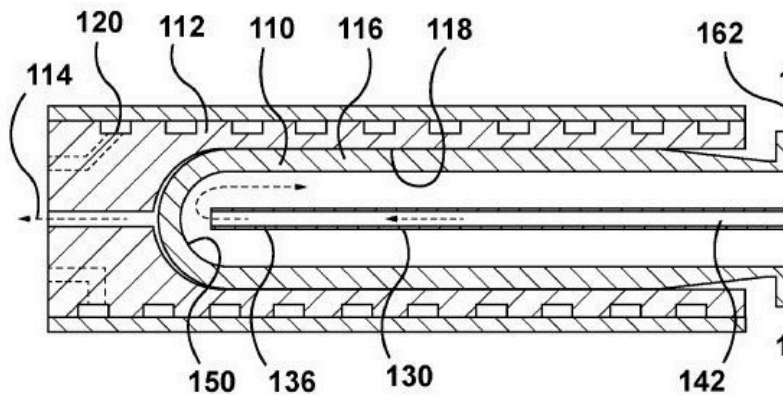
**B29C 49/6465****{Cooling}****Definition statement**

*This place covers:*

Cooling preforms including maintaining contact of a surface of the preform with interior corresponding surface of a cooling sleeve.

## Definition statement

Illustrative example of subject matter classified in this group:



## B29C 49/6466

{on the inside}

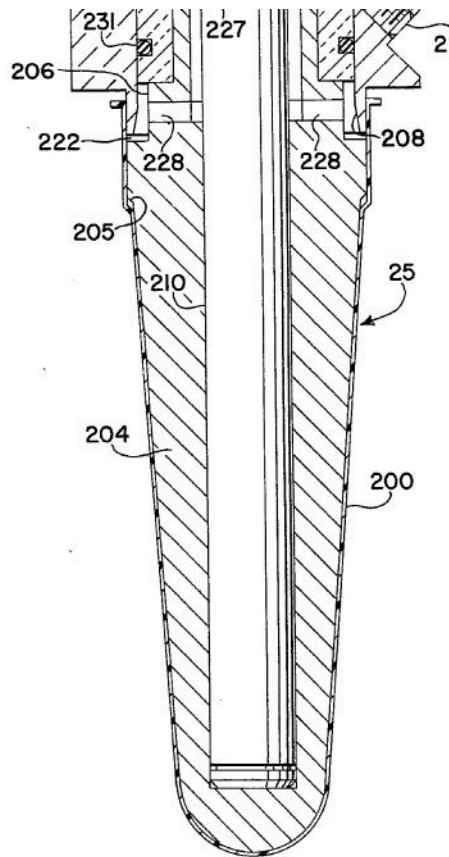
### Definition statement

*This place covers:*

Temperature conditioning of preforms via contact on the preform interior with a heating or cooling mandrel.



Illustrative example of subject matter classified in this group:



## B29C 49/6467

{on the outside}

### Definition statement

*This place covers:*

Temperature conditioning of preforms via contact on the preform exterior with a corresponding heating or cooling element.

## B29C 49/6472

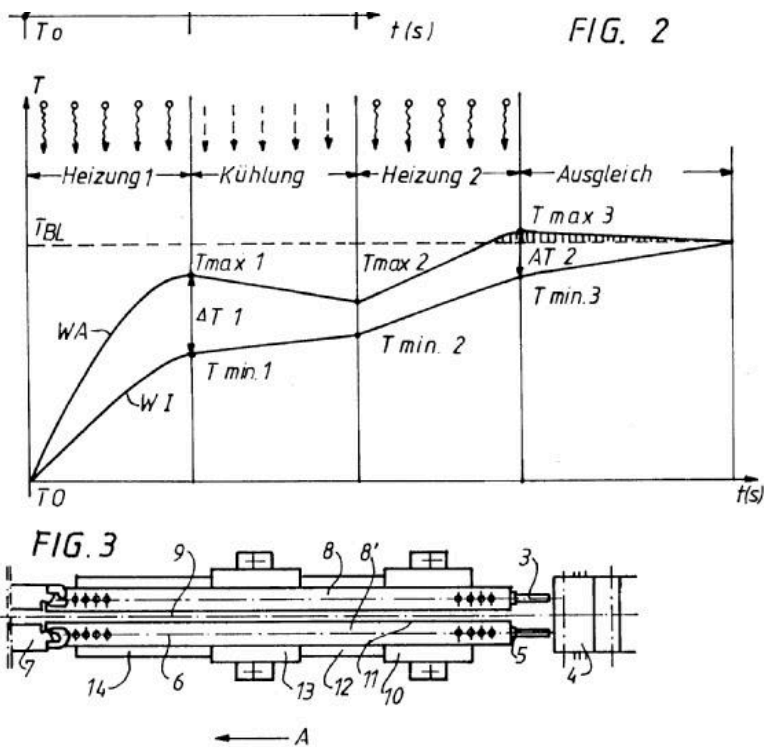
{in several stages}

### Definition statement

*This place covers:*

- Discontinuous heating having at least one additional phase where the preform is not heated, or even shortly cooled before the next heating phases starts

- DE3908219

**B29C 49/648**

{of preforms or parisons}

**Definition statement***This place covers:*

Temperature control/adjustment of preforms in parisons which occurs throughout more than one stage or process.

Illustrative example of subject matter classified in this group:

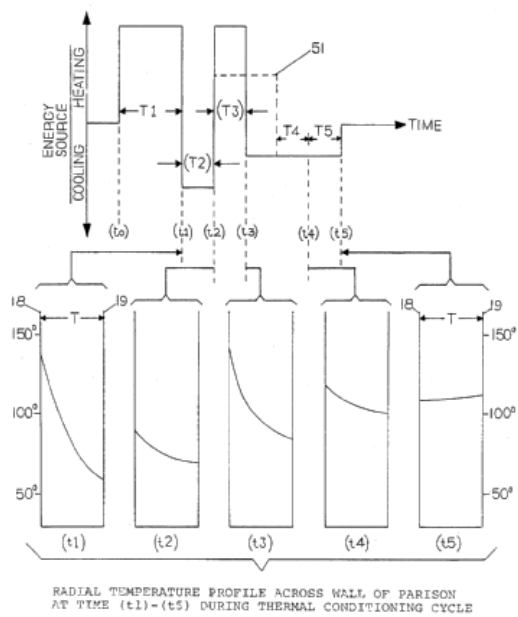


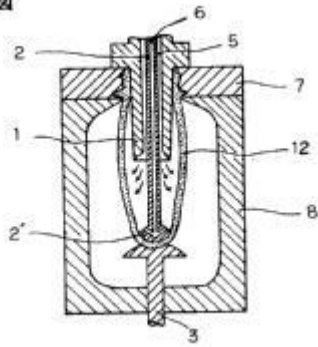
FIG. 5

**B29C 49/66****Cooling by refrigerant introduced into the blown article****Definition statement**

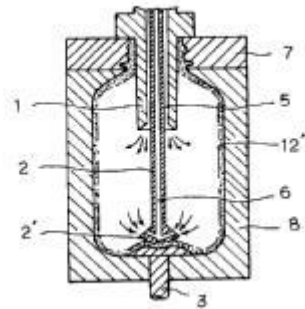
*This place covers:*

- JP56013141

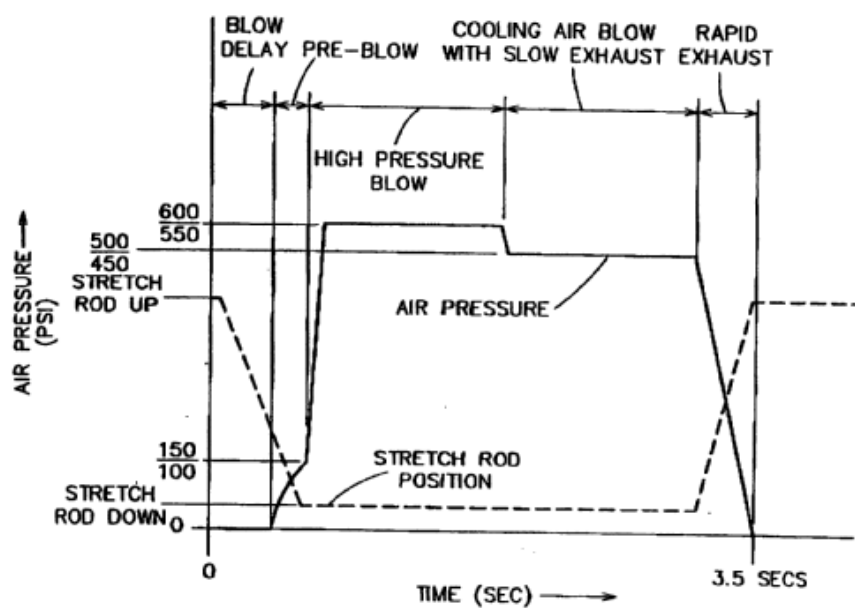
第 2 圖



第 3 圖



- EP1314535



**FIG. 2**

EP 1 314 535 A1

**B29C 49/6605****{Heating the article, e.g. for hot fill}****Definition statement***This place covers:*

Heating the article after a moulding step, e.g. in preparation for hot fill or post-processing steps.

**B29C 49/66055****{using special pressurizing during the heating, e.g. in order to control the shrinking}****Definition statement***This place covers:*

Heating a blow-moulded article including controlling the pressure during heating, which could function to avoid shrinkage or to induce particular article features.

**B29C 2049/6606****{Cooling the article}****Definition statement***This place covers:*

Cooling a blow-moulded article, e.g. using a water bath or spray, cooled air, refrigerated cabinet.

**B29C 2049/671****{Conditioning the blown article outside the mould, e.g. while transporting it out of the mould}****Definition statement***This place covers:*

Thermally conditioning a blow-moulded article including affecting its temperature outside of the mould during transport or further processing.

**B29C 49/68****Ovens specially adapted for heating preforms or parisons****Definition statement***This place covers:*

the heating device (oven) functioning as a whole

**Special rules of classification**Details of ovens specially adapted for heating preforms or parisons are classified in [B29C 49/64](#)

**B29C 49/681**

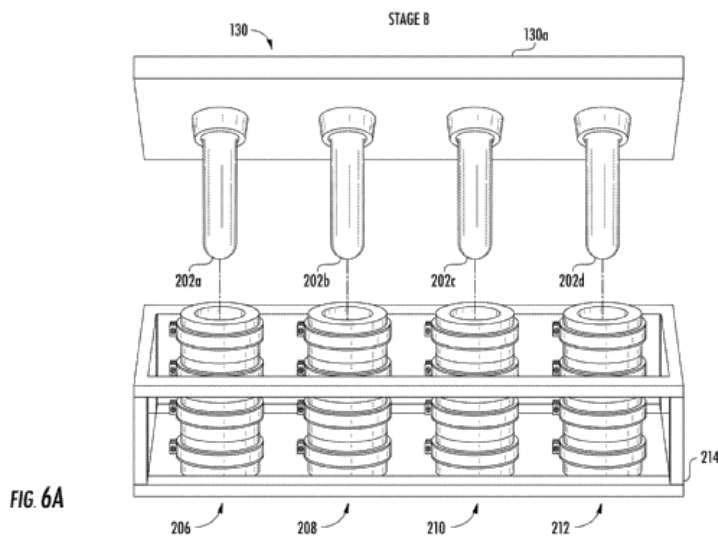
{using a conditioning receptacle, e.g. a cavity, e.g. having heated or cooled regions}

**Definition statement**

*This place covers:*

An oven which includes a cavity designed to receive and heat a preform/parison. Such a cavity could also have locations which are designed to cool or not heat specific locations of the preform/parison.

Illustrative example of subject matter classified in this group:

**B29C 49/682**

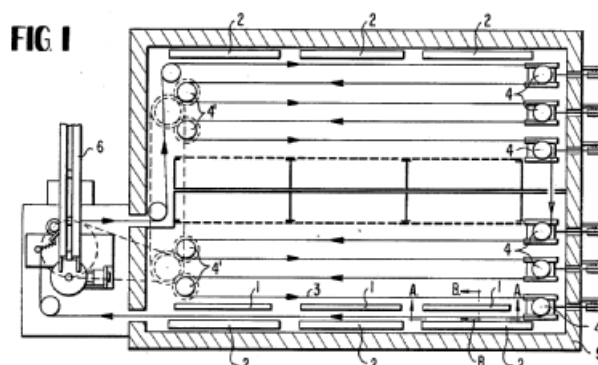
{characterised by the path, e.g. sinusoidal path}

**Definition statement**

*This place covers:*

An oven designed to thermally condition preforms/parisons which includes a distinctive conveyance path for such thermal conditioning, e.g. sinusoidal.

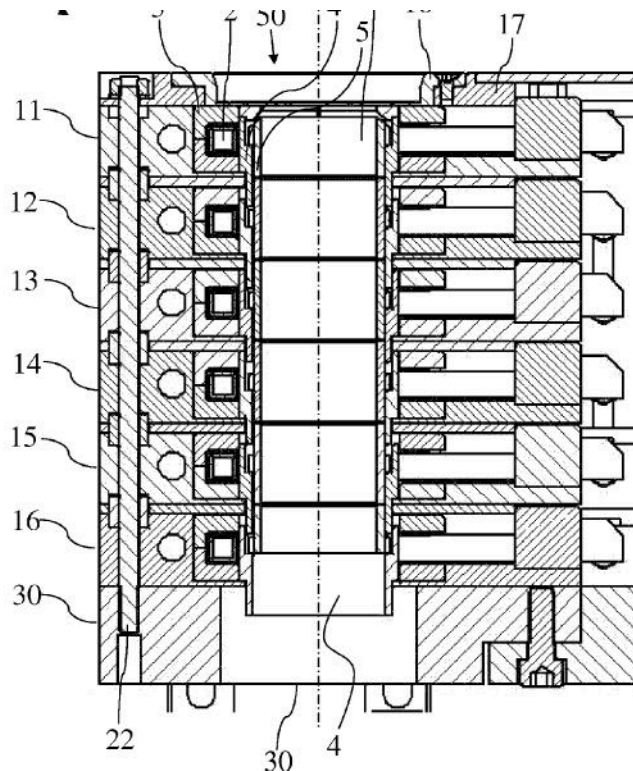
Illustrative example of subject matter classified in this group:



**B29C 49/6825****{Mounting exchanging or centering ovens or parts thereof}****Definition statement***This place covers:*

An oven designed to thermally condition preforms/parisons which includes elements which are exchangeable, and the process of mounting, exchanging, or centering the oven parts.

Illustrative example of subject matter classified in this group:



Heating modules which are exchangeable or interchangeable (elements 11-16 in Figure).

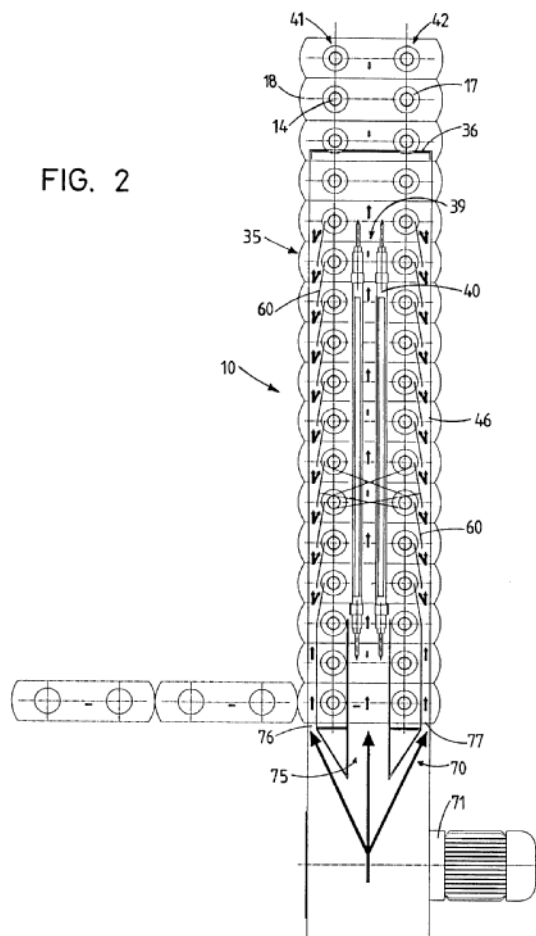
**B29C 49/683****{Adjustable or modular conditioning means, e.g. position and number of heating elements}****Definition statement***This place covers:*

An oven designed to thermally condition preforms/parisons which includes elements which are adjustable in quantity, position, or other ways.

**B29C 49/6835****{using reflectors}****Definition statement***This place covers:*

An oven designed to thermally condition preforms/parisons which includes elements which are reflective.

Illustrative example of subject matter classified in this group:



A device that comprises reflectors (60) arranged in an external position relative to the heating tubes (40) and to the preforms (14) and so shaped as to reflect the heating radiation emitted by the heating tubes (40) disposed nearest the reflectors (60) in the direction of the preforms (14) of the farthest row of preforms through the free space between two successive preforms of the nearest row.

**B29C 49/684****{using masking}****Definition statement***This place covers:*

Heating in an oven which includes masking elements that shield desired parts of a preform therein.



Illustrative example of subject matter classified in this group:

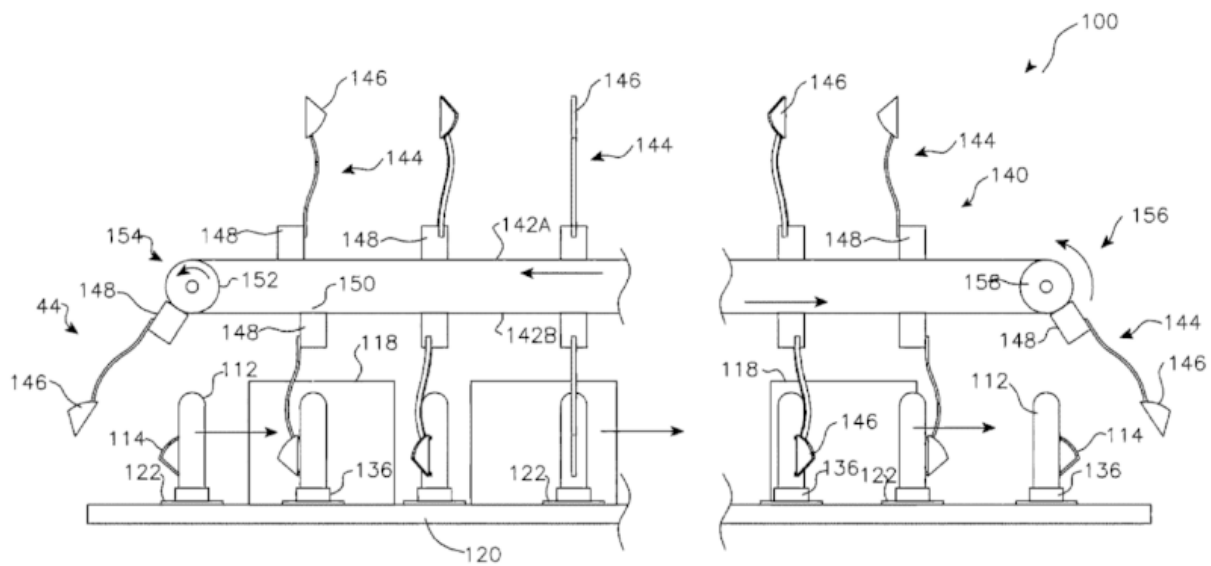


Fig. 3

## B29C 49/6845

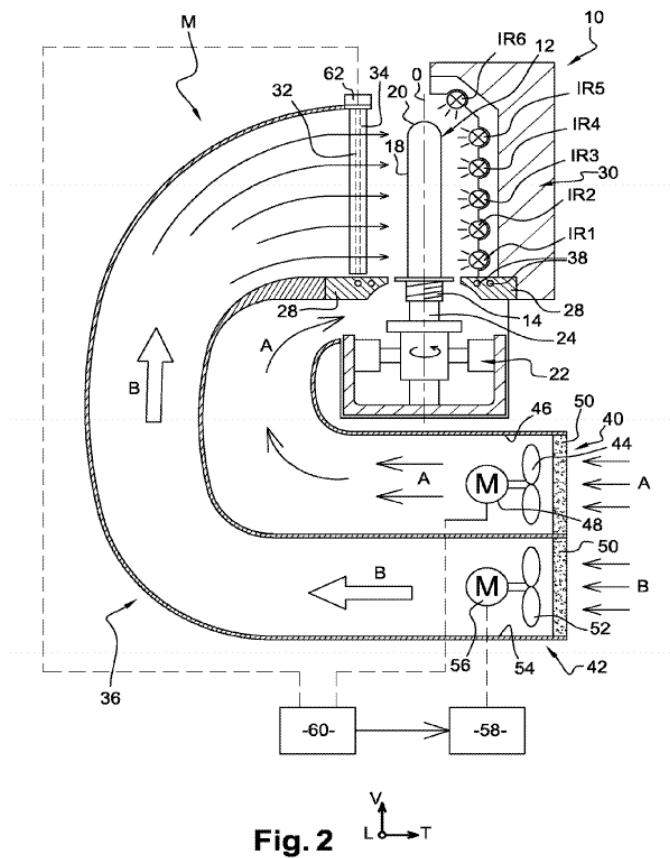
{using ventilation, e.g. a fan}

### Definition statement

*This place covers:*

Heating in an oven which includes ventilation elements.

Illustrative example of subject matter classified in this group:



Oven (10) for the heat treatment of thermoplastic preforms (12) each respectively comprising a first part (14, 16) in its definitive shape and a second part (18, 20) intended to be heated by heating means (30) arranged along at least part of a determined heating path followed by the preforms (12) travelling through the oven, the said oven (10) comprising a cooling system (36) capable respectively of cooling the first parts (14, 16) and the second parts (18, 20) of the preforms. The cooling system (36) comprises at least one cooling device (42) capable of air-cooling at least the second part (18, 20) of the preforms (12), the said cooling device (42) comprising at least ventilation means (52) capable of delivering a given flow rate of cooling air and means (58, 64) for selectively varying, along the heating

## Definition statement

path of the preforms (12), at least the cooling airflow rate delivered by the said ventilation means (52) for cooling the said second parts (18,20) of the preforms (12).

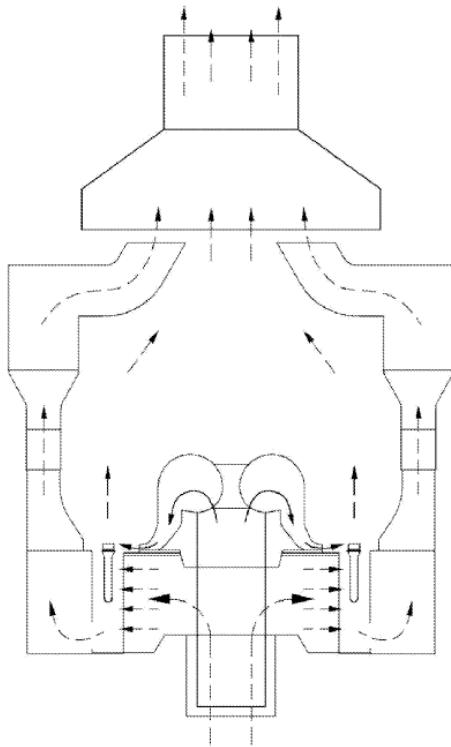


Fig. 3

A bottle blank heating air channel for a bottle blowing machine, wherein a heating box is provided, wherein the heating box is set on the opposite side of the bottle body air channel air outlet, wherein a space for the bottle plank is formed between the heating box and opposite side of the bottle body air channel air outlet, wherein a ventilating channel is provided on the heating box, and wherein the air outlet of the ventilating channel is connected to the air inlet of the bottle body air outlet channel.

## B29C 49/685

{Rotating the preform in relation to heating means}

### Definition statement

*This place covers:*

Heating in an oven which includes preform rotation relative to the heating elements.

## Definition statement

Illustrative example of subject matter classified in this group:

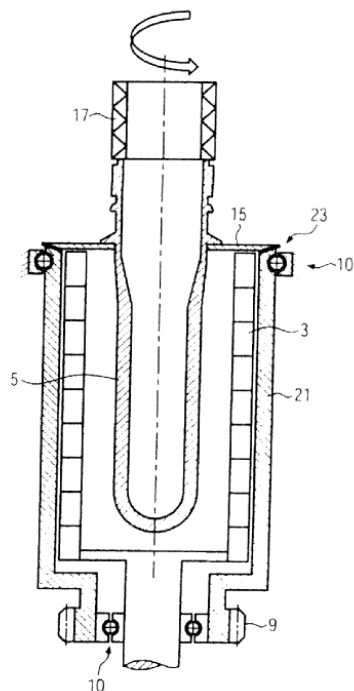


FIG. 4

Furnace for conditioning preforms, in particular for stretch blow-moulding plastic containers, comprising a plurality of heating chambers rotating in a circle for heating one preform each with infrared radiation, holding devices for holding the preforms during heating such that a section of the preform to be conditioned is arranged in a heating chamber, and a section of the preform not to be conditioned is arranged outside the heating chamber.

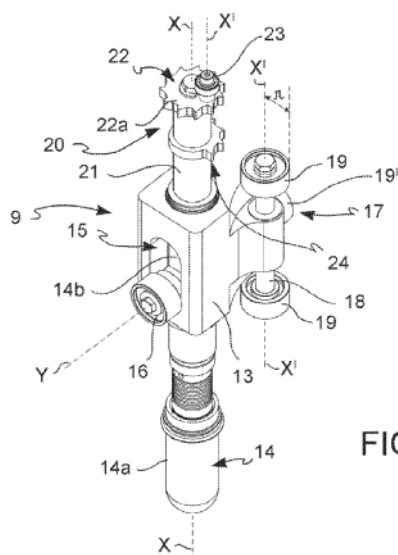


FIG. 3

An oven for blowing or stretch-blowing preforms to provide containers with oval section, comprising a path for the preforms, a transfer system of the preforms from an upstream transport system upstream of the oven and a transfer system of the heated preforms from the oven to a downstream transport system, wherein a plurality of mandrels are slidingly carried along the path, the mandrels configured to temporarily engage with the preforms to conduct the preforms along the path, the oven comprising at least one first heating module and at least one second heating module, wherein the oven comprises

## Definition statement

a rotator for rotating said preforms by 180°, said rotator being in median position of said at least one second heating module.

**B29C 49/6855**

{Cooling of heating means, e.g. avoiding overheating}

**Definition statement**

*This place covers:*

Heating in an oven which includes the features of cooling the heating elements so as to prevent overheating of the apparatus or element to be heated.

Illustrative example of subject matter classified in this group:

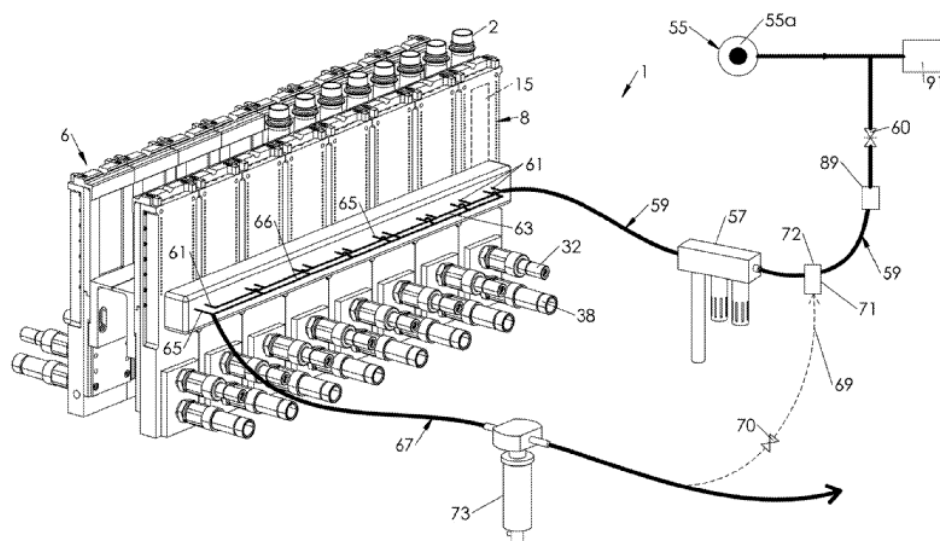
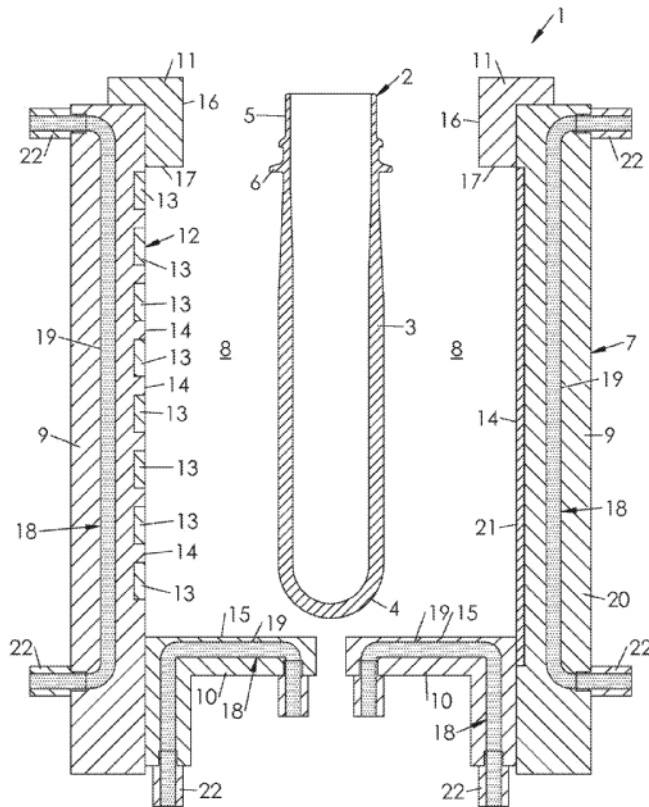


FIG. 5A

## Definition statement



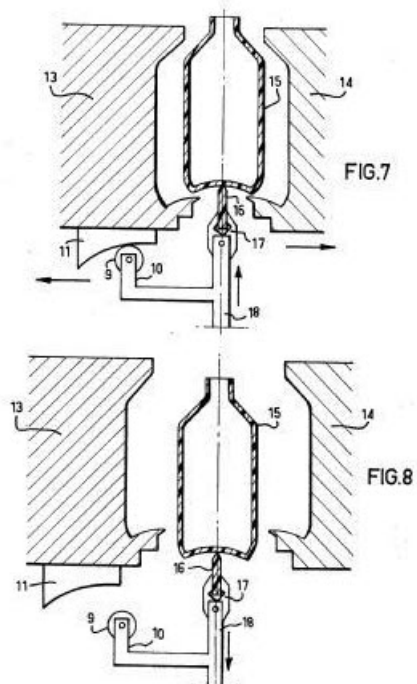
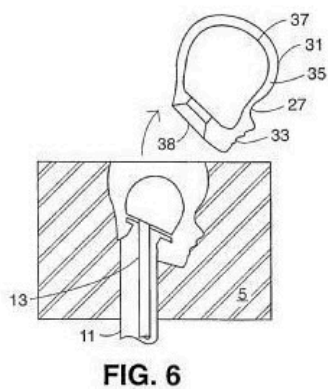
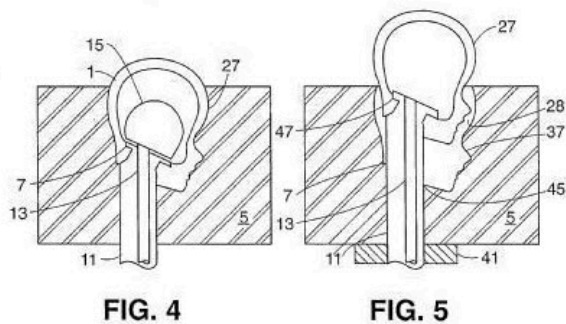
The unit 1 includes a plurality of heaters 13, and a cooling circuit 18 inside a frame 7. The cooling circuit 18 limits the amount of heat produced by the heaters 13.

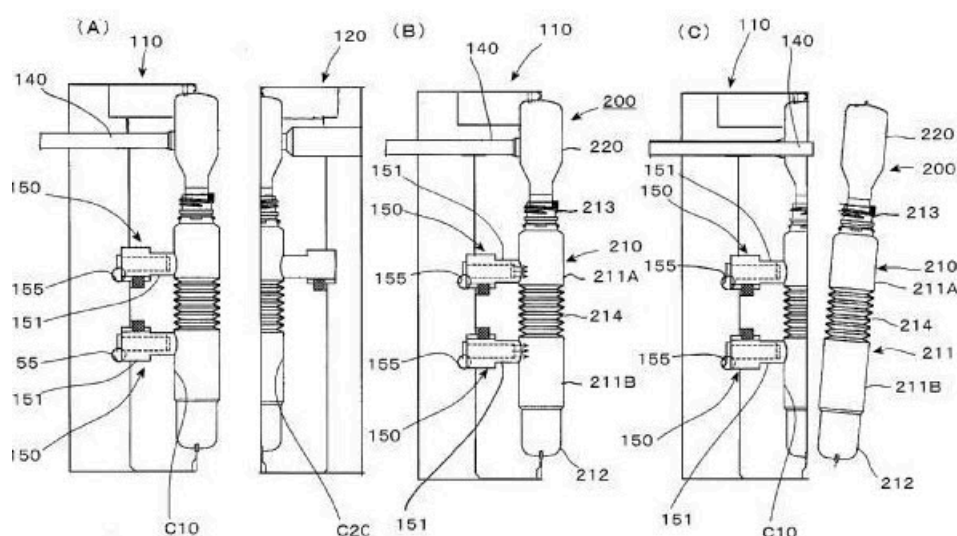
**B29C 49/70****Removing or ejecting blown articles from the mould****Definition statement**

*This place covers:*

Means to facilitate the removing or ejecting of blown articles from the mould. These ejecting means are typically located in the mould.

Illustrative example of subject matter classified in this group:





## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds in general with means for to facilitate the removal of articles	<a href="#">B29C 33/44</a>
Means explicitly adapted for transporting blown articles	<a href="#">B29C 49/42069</a>

## Glossary of terms

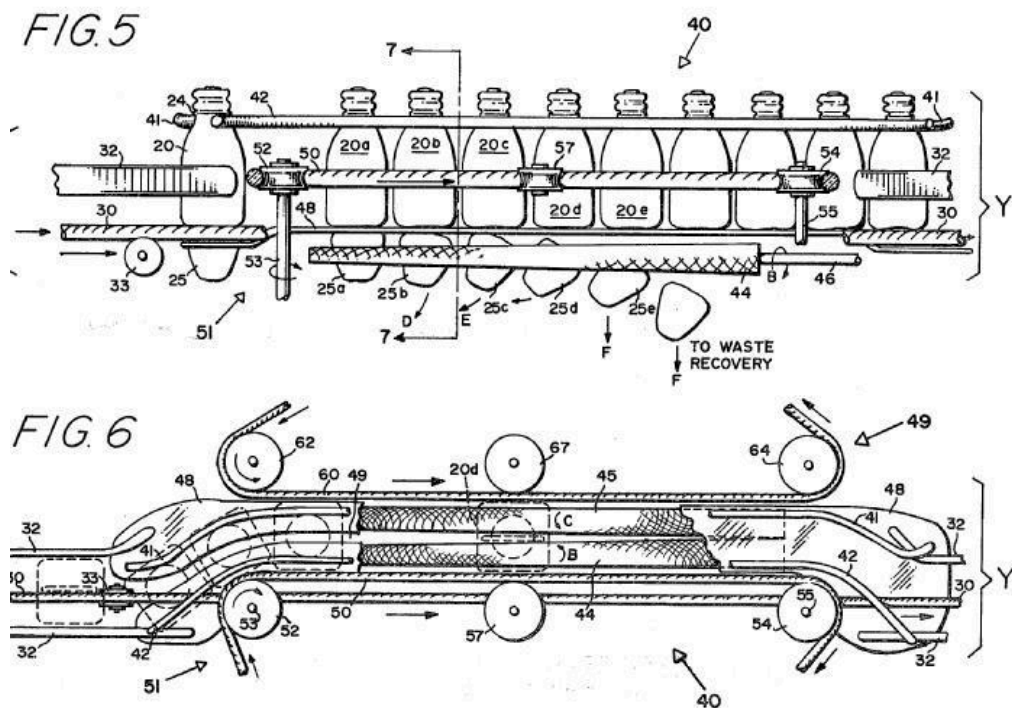
In this place, the following terms or expressions are used with the meaning indicated:

ejecting	separating moulded products from the mould cavity
----------	---



**B29C 49/72****Deflashing outside the mould****Definition statement**

*This place covers:*



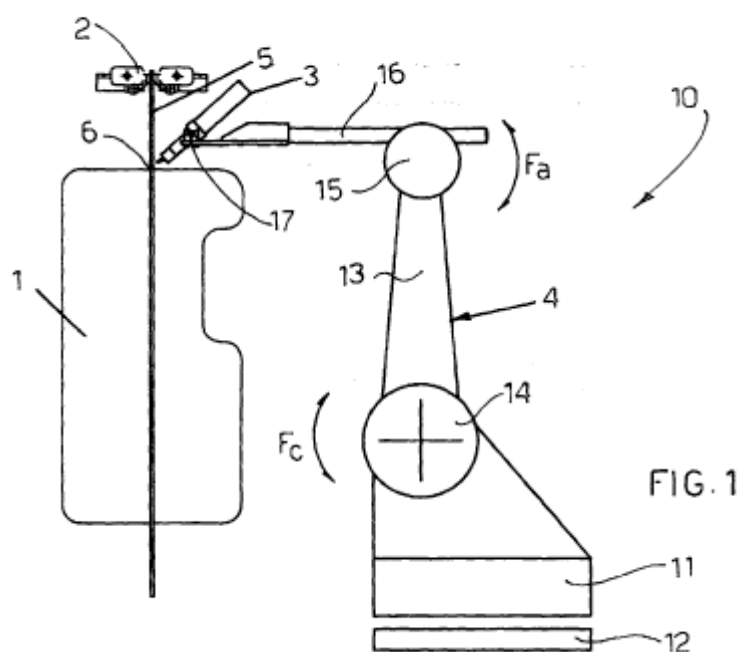
U.S. Patent Nov. 30, 1982

Sheet 3 of 4

4,361,531

- EP1050394

EP 1 050 394 A1



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Deflashing in general	<a href="#">B29C 37/02</a>
-----------------------	----------------------------

## B29C 49/74

### Deflashing the neck portion

### Definition statement

This place covers:

- US2005284275

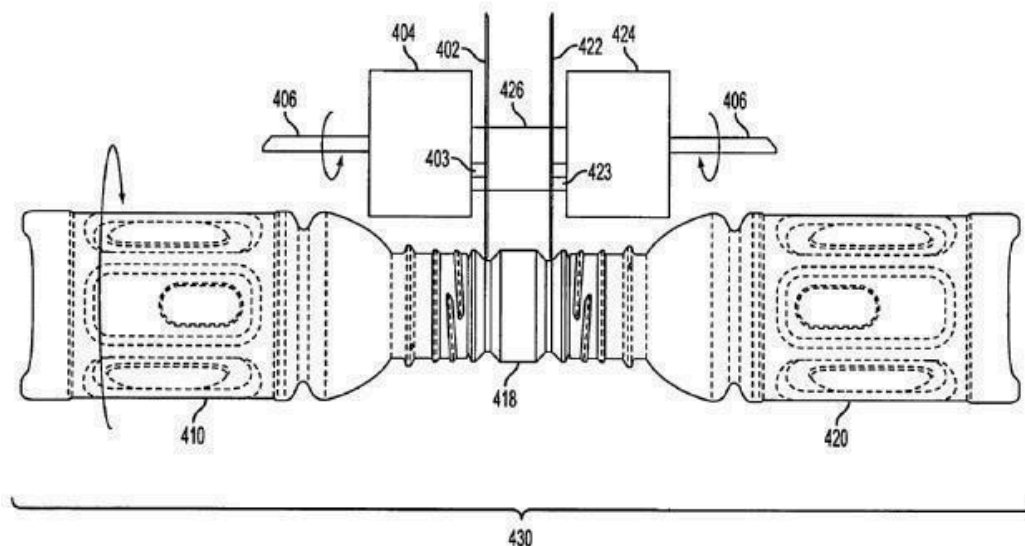


FIG. 4

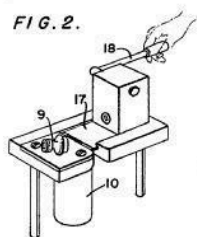
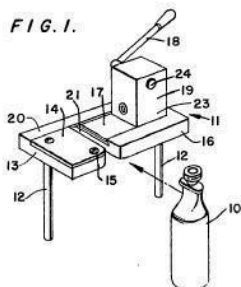
Patent Application Publication Dec. 29, 2005 Sheet 7 of 7

US 2005/0284275 A1

Definition statement

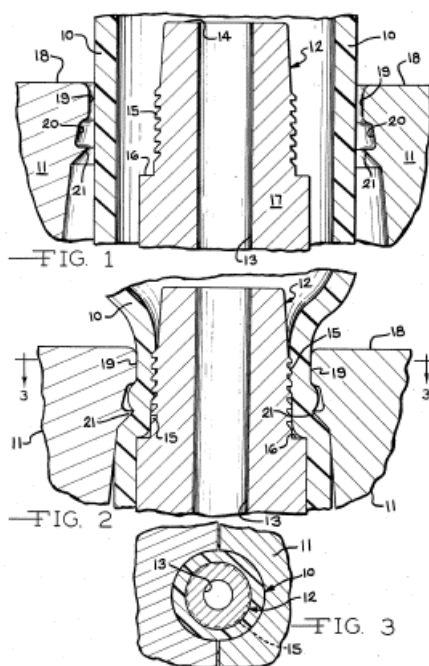
- GB1483712

1483712 COMPLETE SPECIFICATION  
 4 SHEETS This drawing is a reproduction of  
 the Original on a reduced scale  
 Sheet 1

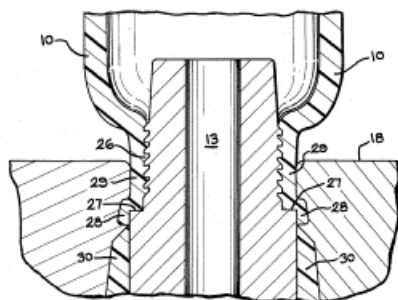
**B29C 49/76****Neck calibration****Definition statement**

*This place covers:*

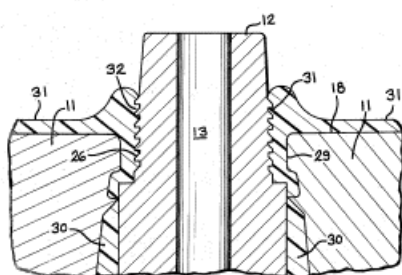
Illustrative example of subject matter classified in this group:



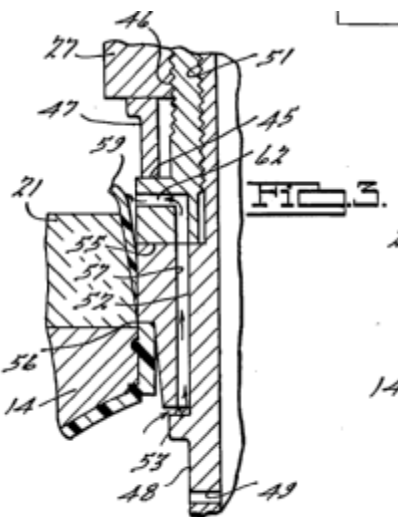
Illustrative example of subject matter classified in this group:



—FIG. 4



—FIG. 5



## B29C 49/783

{blowing pressure}

### References

#### Informative references

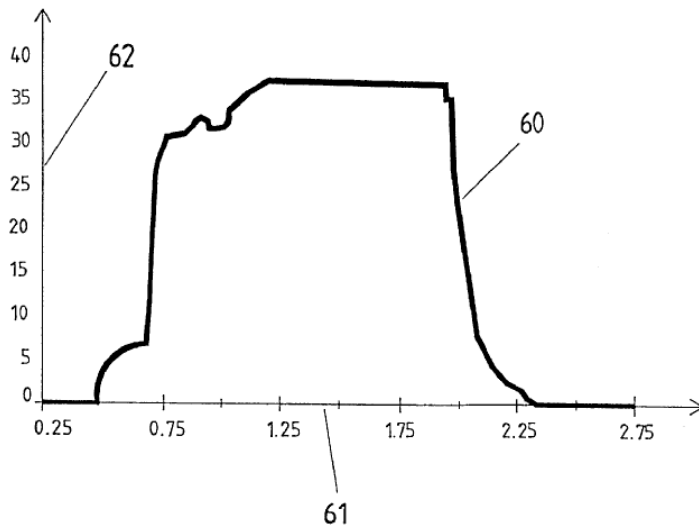
Attention is drawn to the following places, which may be of interest for search:

Control of fluid pressure in general	<a href="#">G05D 16/00</a>
--------------------------------------	----------------------------

**B29C 2049/7831****{characterised by pressure values or ranges}****Definition statement***This place covers:*

Control of a material-shaping process including controlling blowing pressure values/ranges.

Illustrative example of subject matter classified in this group:

Fig. 8

A process wherein the pressure during the preliminary blowing phase has a value in the interval of 10 bar to 25 bar and wherein the pressure during the primary blowing phase has a value in the interval of 25 bar to 40 bar.

**B29C 2049/7832****{Blowing with two or more pressure levels}****Definition statement***This place covers:*

Control of a material-shaping process including controlling blowing pressure of two or more levels.

Illustrative example of subject matter classified in this group:

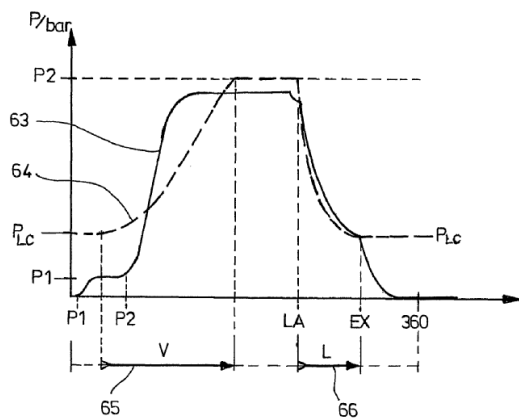
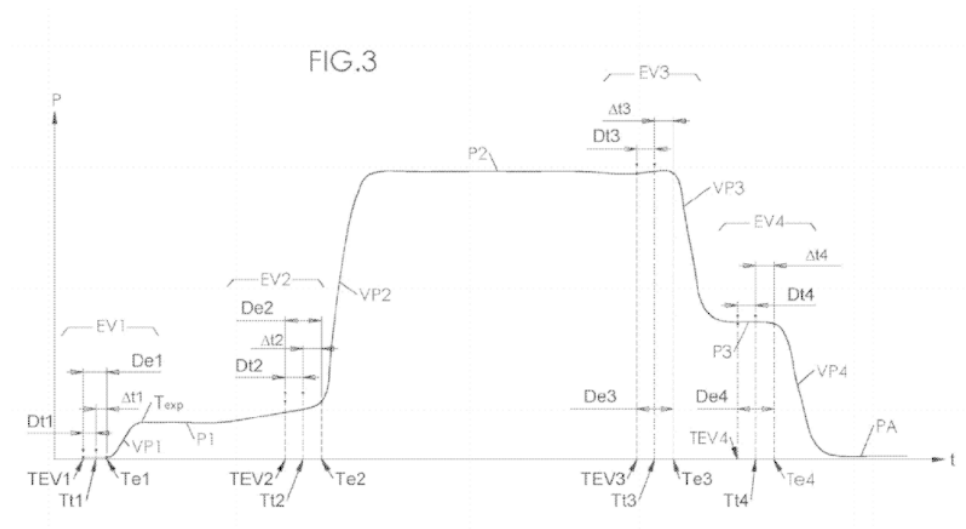


FIG.6

## B29C 2049/7833

{Blowing with three or more pressure levels}

### Definition statement

*This place covers:*

Control of a material-shaping process including controlling blowing pressure of three or more levels.

## Definition statement

Illustrative example of subject matter classified in this group:

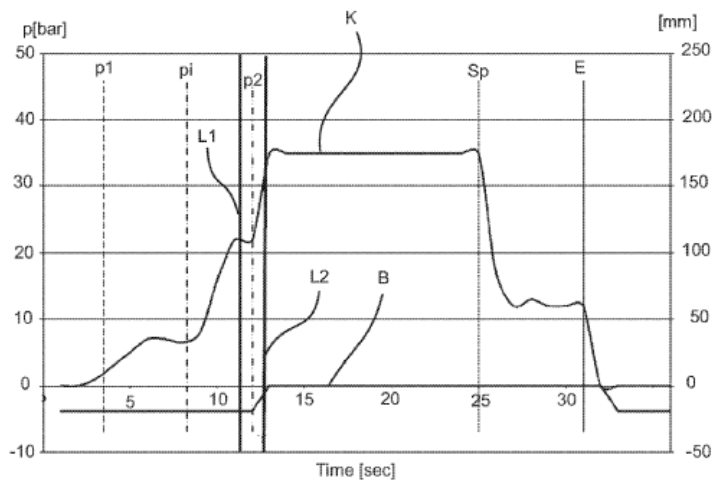


Fig. 7

## B29C 2049/7834

{Pressure increase speed, e.g. dependent on stretch or position}

## Definition statement

*This place covers:*

Control of a material-shaping process including controlling blowing pressure in terms of how fast/slow the pressure increases. This may depend on preform stretch or position.

Illustrative example of subject matter classified in this group:

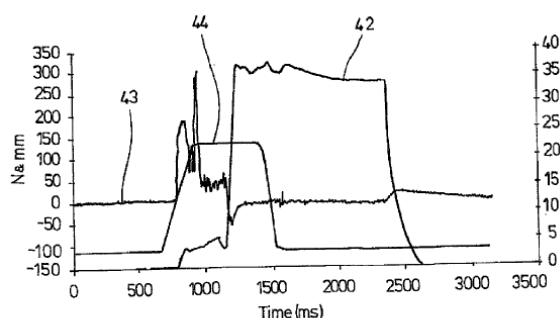


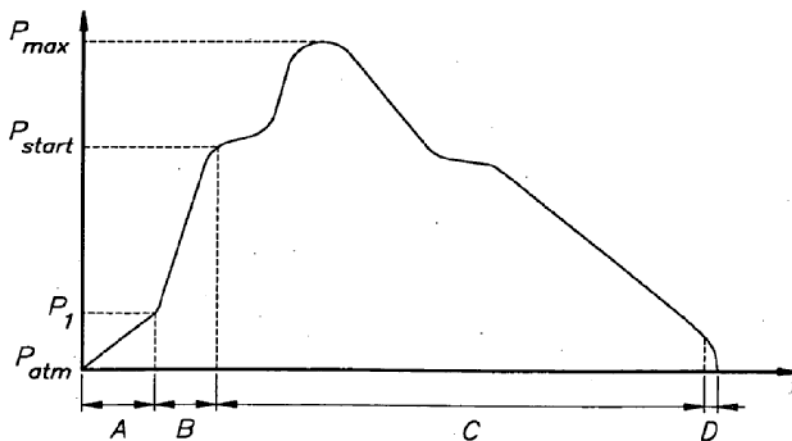
FIG.6

FIG. 6 illustrates in a diagram the relation of a chronological blow pressure pattern 42, a stretching force development 43 as well as a stretching rod positioning 44. The scale of the time axis takes place in this case in milliseconds and the amplitude values are scaled in bar, Newton or millimeter. FIG. 6 illustrates that with respect to the positioning of the stretching rod 11, this stretching rod is initially moved essentially without development of a stretching force into the preform 1. After a contact of the stretching rod 11 at the bottom of the preform 1, the latter is stretched and a relatively great development of the stretching force takes place. After the longitudinal stretching is concluded, the remaining stretching force results from the stabilization of the preform in the stretched position while taking into consideration elastic restoring forces within the material of the preform. The blowing pressure sequence 42 shows the division into a pre-blowing phase during the carrying out of the stretching process and a principal blowing phase after a significant conclusion of the stretching procedure.

**B29C 2049/7835****{Pressure reduction speed}****Definition statement***This place covers:*

Control of a material-shaping process including controlling blowing pressure in terms of how fast/slow the pressure decreases. This may depend on preform stretch or position.

Illustrative example of subject matter classified in this group:

***Fig.8***

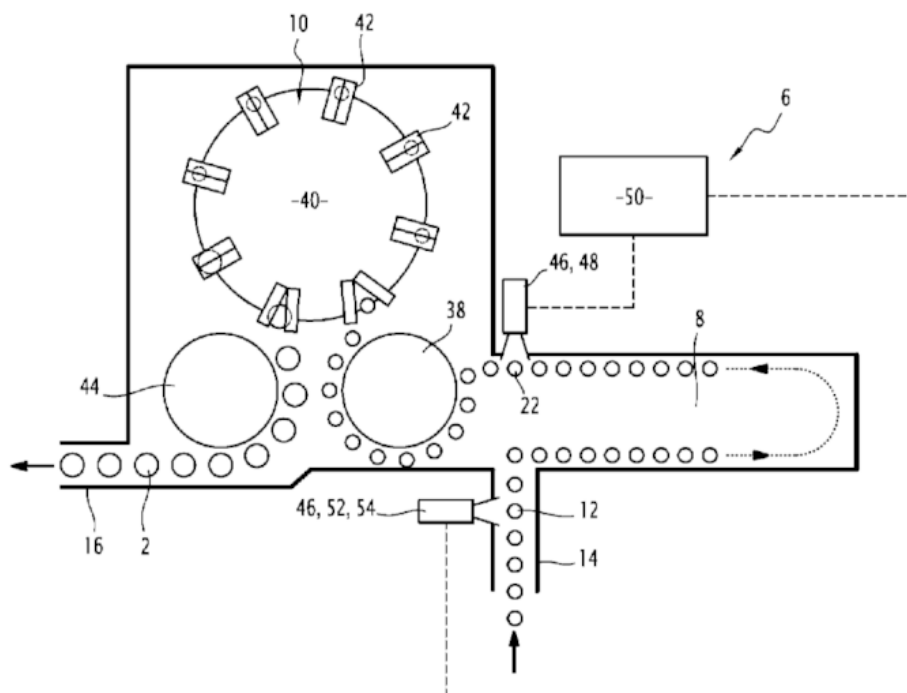
While blowing, the compressed air itself is preferably cooled to an adjustable temperature as well, which may be either higher or lower than zero degrees Celsius. Thus, the decrease of pressure can be faster, since the blown object has to cool less long, and the de-aeration time D thus decreases, and the production speed and the output of the blowing process increase. The decrease of pressure in area C can be obtained by successively going through more than one adjustable discrete pressure value or, when using an unlimited number of such adjustable pressure values, by running through a continuously adjustable curve, whereby the last set pressure value can amount to zero bar relative pressure in relation to the atmospheric pressure.

**B29C 2049/7861****{of the preform}****Definition statement***This place covers:*

Control of a material-shaping process including controlling temperature of a preform.



Illustrative example of subject matter classified in this group:



**FIG.1**

Figure 1 depicts the outlet of the heating station 8, the heated preforms 22 are at a temperature comprised between the glass transition temperature of the material of the preform and its crystallization temperature, in order to obtain, at the outlet of the heating station 8, soft heated preforms 22 able to be deformed under the influence of a pressure injected inside the heated preforms 22, i.e. malleable preforms. The temperature is such that the preforms however still maintain their shape at the atmospheric pressure, meaning that they do not tend to be deformed without any pressure applied on them. As an example, for a preform made of PET in the dimensions range mentioned previously, the preform is heated at a temperature comprised between 100° C. and 140° C. It should however be noted that the more the preform has to be subjected to a greater expansion along an axial direction and/or along radial directions, the more the preform is heated at a temperature over the glass transition temperature, but without reaching the crystallization temperature, for example around 135° C. for a preform made of PET in the dimensions range mentioned previously. Consequently, for preforms having a high bi-orientation rate, defining the cumulated axial elongation and radial expansion to which the preform has to be subjected, one wants to work at the highest possible temperatures, but without crystallizing the material of the preform, in order to allow the preform to be deformed easily enough to reach the wanted shape of the container without the appearance of an overstretching of the material, possible with a temperature not high enough and/or of an high stretching rate.

The acquired images or film are then transferred to the control unit 50 and compared to the reference gauge. Furthermore, a sensor for sensing the temperature of the heated preform 22 could be provided and a formula for correcting the acceptable retraction depending on the temperature of the heated preform 22 could be applied. If one of the acquired images or one of the images of the film shows a profile of the preform radially diverging more than the reference gauge, then it is determined that the analyzed preform is unsatisfactory.

**B29C 2049/7862****{characterised by temperature values or ranges}****Definition statement***This place covers:*

Control of a material-shaping process including controlling temperature of a preform in terms of temperature values or ranges.

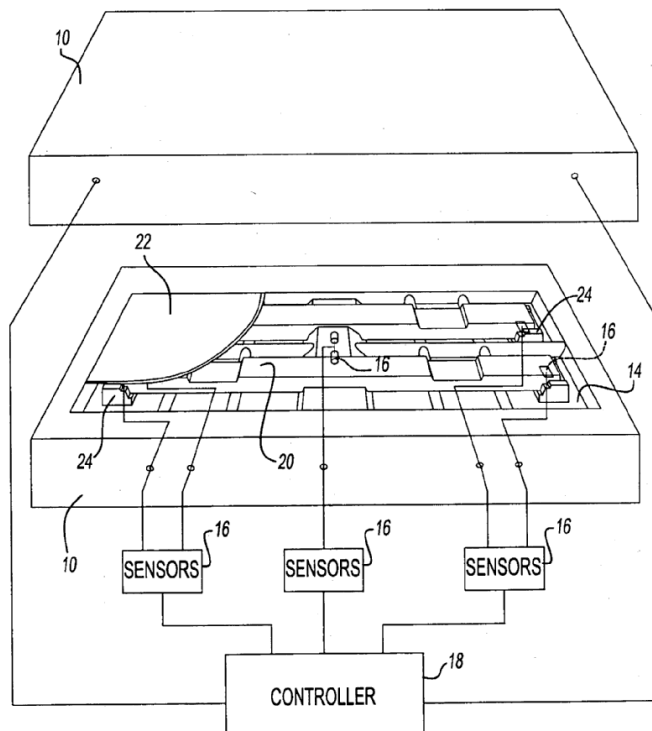
**B29C 2049/7863****{Cold blow-moulding, e.g. below  $T_g$ }****Definition statement***This place covers:*

Control of a material-shaping process including controlling temperature of a preform which includes cold blow-moulding processes, e.g. below the glass transition temperature of the preform material.

**B29C 2049/7864****{of the mould}****Definition statement***This place covers:*

Control of a material-shaping process including controlling temperature of a mould.

Illustrative example of subject matter classified in this group:

**Fig-2**

A moulding machine, wherein a sensor comprises a temperature sensor for sensing the temperature of the mould.

## **B29C 2049/78645**

**{characterised by temperature values or ranges}**

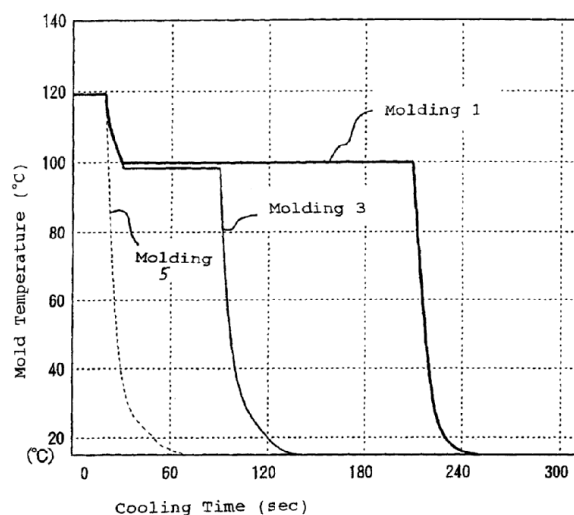
### **Definition statement**

*This place covers:*

Control of a material-shaping process including controlling temperature of a mould in terms of temperature values or ranges.

Illustrative example of subject matter classified in this group:

Fig. 2



## **B29C 2049/7865**

**{of the stretching means, e.g. stretch rod}**

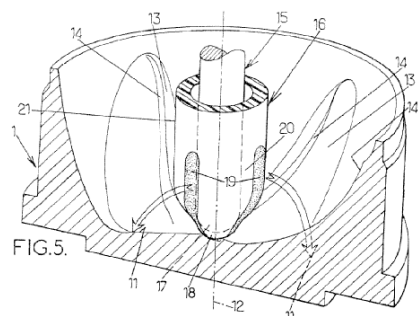
### **Definition statement**

*This place covers:*

Control of a material-shaping process including controlling temperature of stretching elements, e.g. stretch rod.

## Definition statement

Illustrative example of subject matter classified in this group:



The drawing rod 15, which is made of metal, is brought into contact sequentially with the bottoms of successive hot preforms and its temperature undoubtedly rises because of these repetitive contacts; however, these contacts being only intermittent, the rod remains at all times at an average temperature substantially lower than that of the hot preforms. To give a concrete idea of this, the preforms are typically heated to a temperature of the order of 100° C. whereas the average temperature of the drawing rod remains of the order of 85° C.

## B29C 2049/7867

{of the heating or cooling means}

### Definition statement

*This place covers:*

Control of a material-shaping process including controlling temperature of the elements which provide heating or cooling.

## B29C 2049/78675

{of the heating means}

### Definition statement

*This place covers:*

Control of a material-shaping process including controlling temperature of elements which provide heating.

Illustrative example of subject matter classified in this group:

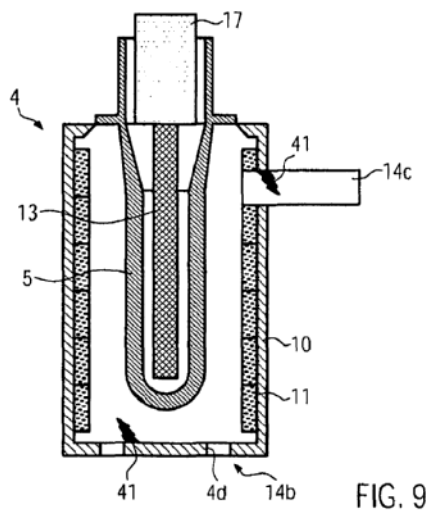


FIG. 9

FIG. 9 shows a heating chamber 4 in which temperature probes 41 are additionally provided. These can, for example, be provided in the vicinity of the recesses 4d of the feed line 14b or on the discharge line 14c of the cooling air 14. With the temperature probes 41 it is possible to monitor the temperature within the heating chambers 4. Similarly, it is conceivable that with the aid of the temperature probes 41 and a suitable control device the amount of cooling air introduced into the heating chamber 4 can be controlled, in particular with convection driven by a blower. However, this would also be possible with free convection. A temperature control can also be used to stabilise the heat distribution in the preform and/or to compensate differences between individual heating chambers 4 or preforms 5. It is also conceivable to regulate the amount of air to be introduced in dependence of a measured final temperature after heating the preform and/or to mix discharged cooling air 14 for temperature control at least partly with the cooling air 14 to be fed in and/or to pass the discharged cooling air 14 to a heat exchanger for heat extraction in another process.

With the aid of temperature probes 41 the temperature in the heating chambers 4, in particular after closing the lid 21 with the heating chamber 4 uncharged, can be set to a constant value or to a uniform output temperature for heating the preforms 5.

## **B29C 2049/7868**

**{of the articles}**

### **Definition statement**

*This place covers:*

Control of a material-shaping process including controlling temperature of the formed article.

## **B29C 2049/78705**

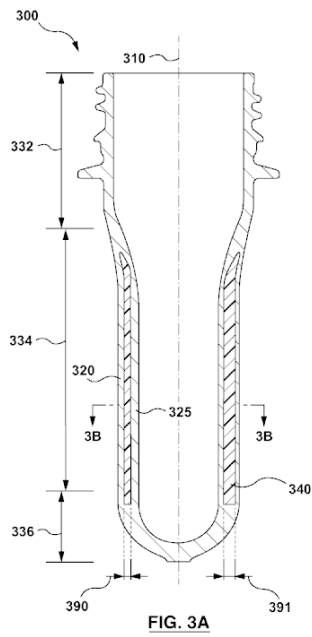
**{of a layer, e.g. intermediate layer}**

### **Definition statement**

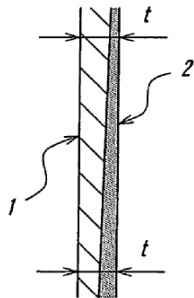
*This place covers:*

Control of a material-shaping process including controlling thickness of a preform in terms of the particular thickness of a layer within the preform.

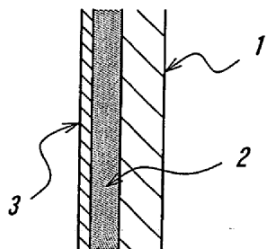
Illustrative example of subject matter classified in this group:



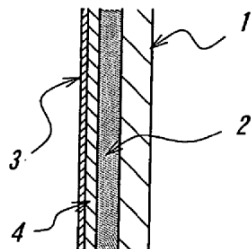
**FIG. 2**



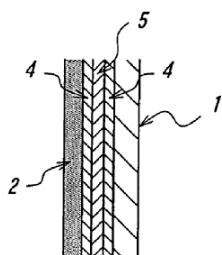
**FIG. 3**



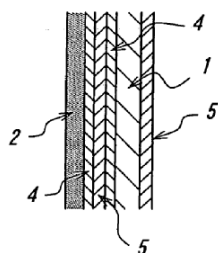
**FIG. 4**



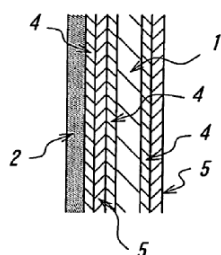
**FIG. 5**



**FIG. 6**



**FIG. 7**



As seen in Figures 2-7, a laminated and moulded body obtained by coextruding and moulding at least two kinds of resin materials. At least one layer of said laminated and moulded body comprises a coloured layer having a thickness continuously or intermittently varied in a predetermined direction with respect to the extruding direction of the resin material of said coloured layer, wherein the predetermined direction preferably is a direction parallel to the extruding direction of said at least one layer of said laminated and moulded body or preferably the predetermined direction is a direction intersecting the extruding direction of said at least one layer of said laminated and moulded body or preferably the predetermined direction comprises a direction parallel to the extruding direction of said at least one layer of said laminated and moulded body and another direction intersecting the extruding direction, wherein preferably the full thickness of said laminated and moulded body is substantially constant along said predetermined direction, wherein preferably said coloured layer has a thickness varied within a range of 50% of the full thickness of said laminated and moulded body.

**B29C 2049/7871****{of the extruded preform thickness}****Definition statement***This place covers:*

Control of a material-shaping process including controlling thickness of a preform in terms of the thickness of the preform as-extruded.

**B29C 2049/78715****{of the blown article thickness}****Definition statement***This place covers:*

Control of a material-shaping process including controlling thickness of a preform in terms of the thickness of the blown article.

Illustrative example of subject matter classified in this group:

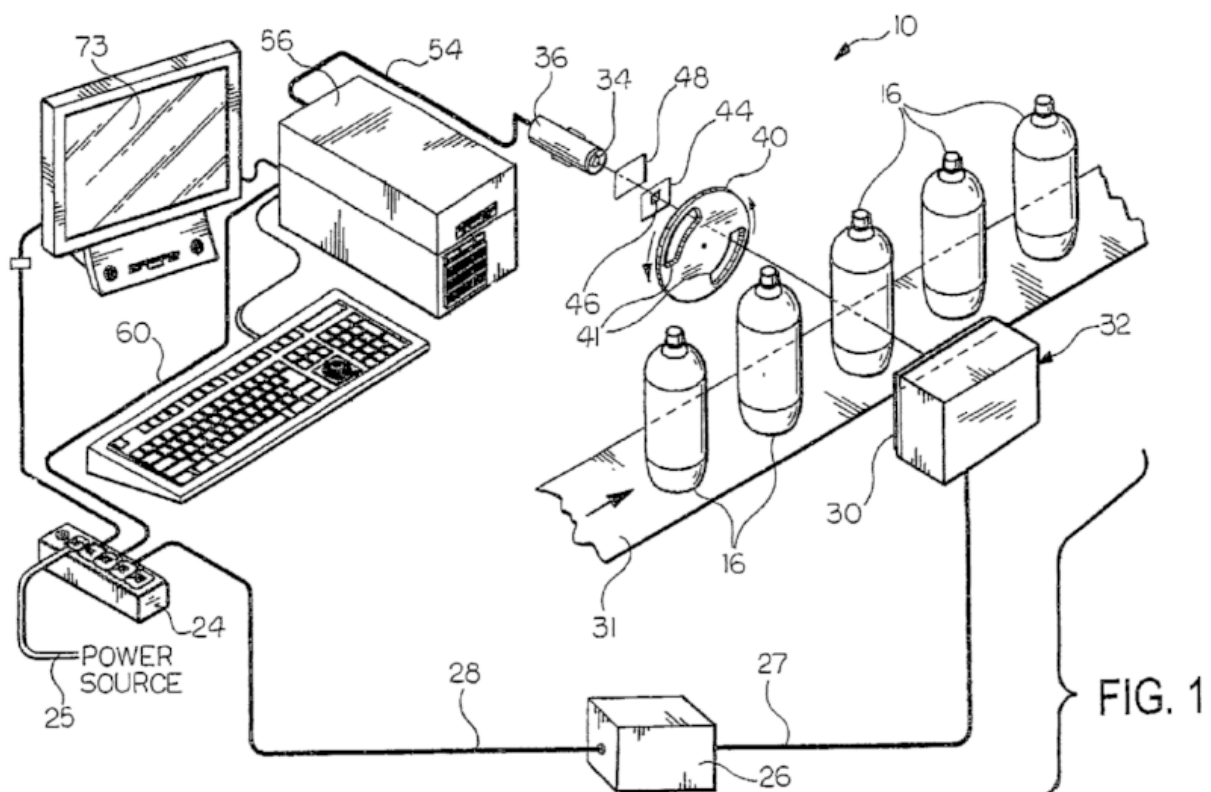


Figure 1 shows machine control features connected to moulding devices for a thickness monitor that generates a thickness signal representing an average wall thickness of the container; and a system control connected to said thickness monitor and being responsive to said thickness signal for generating a control signal, a control signal for adjusting operation of the moulding devices based upon average wall thickness, such that the system control responds to feedback signals generated by the moulding devices by adjusting operation of the moulding devices.



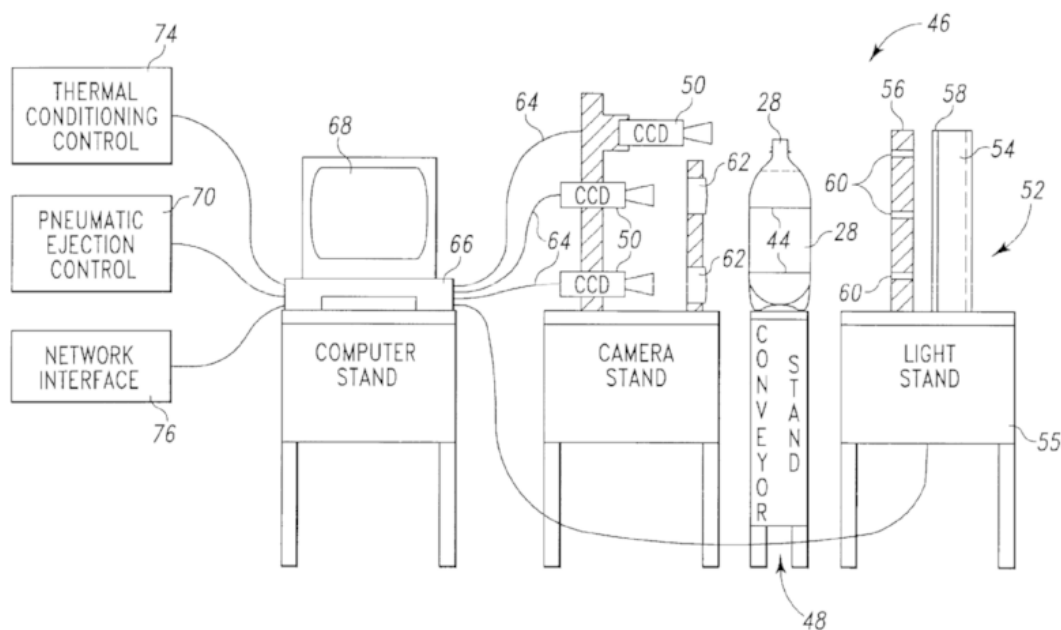
**B29C 2049/7873****{Extrusion speed; Extruded preform position or length; Extrusion fall speed}****Definition statement***This place covers:*

Control of a material-shaping process including controlling extrusion speed, such as extrudate position, length, or fall speed.

**B29C 2049/7874****{Preform or article shape, weight, defect or presence}****Definition statement***This place covers:*

Control of a material-shaping process including controlling preform attributes of shape, weight, or presence of defect.

Illustrative example of subject matter classified in this group:



This figure depicts detecting, from at least some of the blow-moulded containers in the production process, the axial location of the indicator relative to a control location; determining for the at least some blow-moulded containers a material distribution outcome based on the detected axial locations of each indicator accumulating data representative of the material distribution outcome for a group of containers; computing an average material distribution characteristic for the group of containers; classifying the average material distribution characteristic for the group of containers in one of a pre-defined set of classes; and providing a signal based on the classification.

**B29C 2049/78745****{Weight or density}****Definition statement***This place covers:*

Control of a material-shaping process including controlling preform attributes of weight or density.

**B29C 2049/7875****{Size or shape}****Definition statement***This place covers:*

Control of a material-shaping process including controlling preform attributes of size or shape.

**B29C 2049/7876****{Defects}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

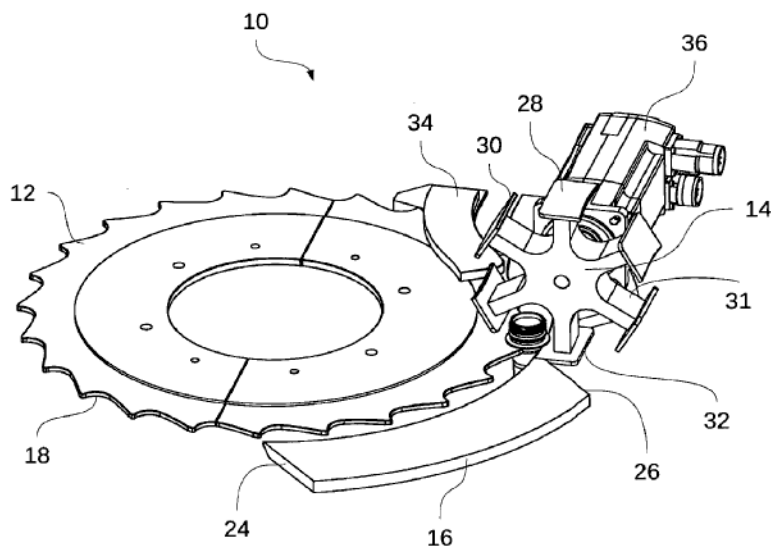


Fig. 1

**B29C 2049/78765**

**{Presence, e.g. of the preform in the mould}**

## Definition statement

*This place covers:*

Control of a material-shaping process including controlling preform attributes of a presence of a defect in the preform.

**B29C 2049/7878**

**{Preform or article handling, e.g. flow from station to station}**

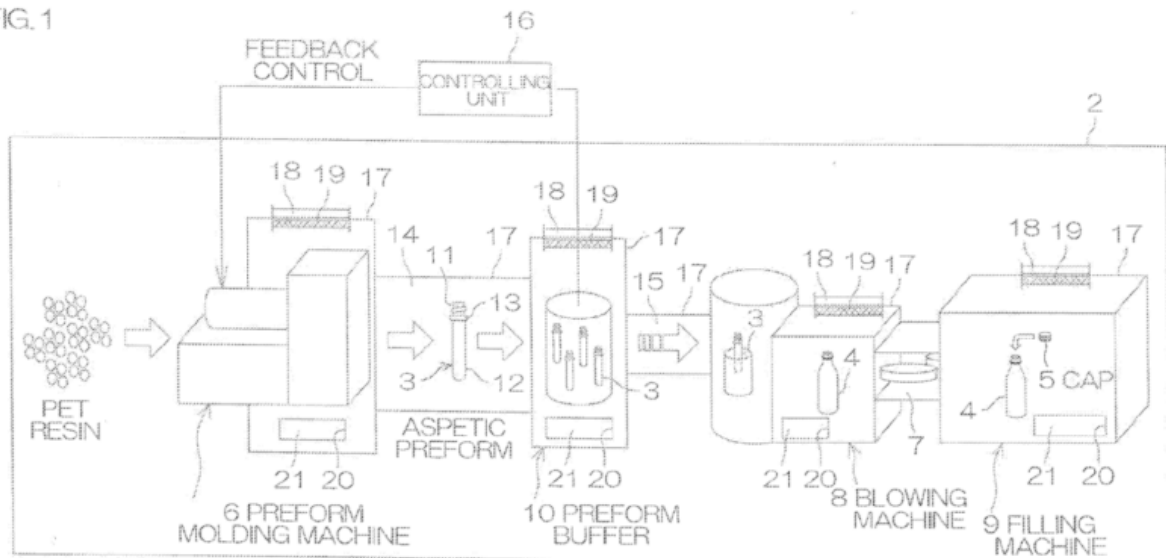
## Definition statement

*This place covers:*

Measuring, controlling, or regulating the movement and/or handling or preforms, parisons, or articles from one location to another location along a process flow direction.

Illustrative example of subject matter classified in this group:

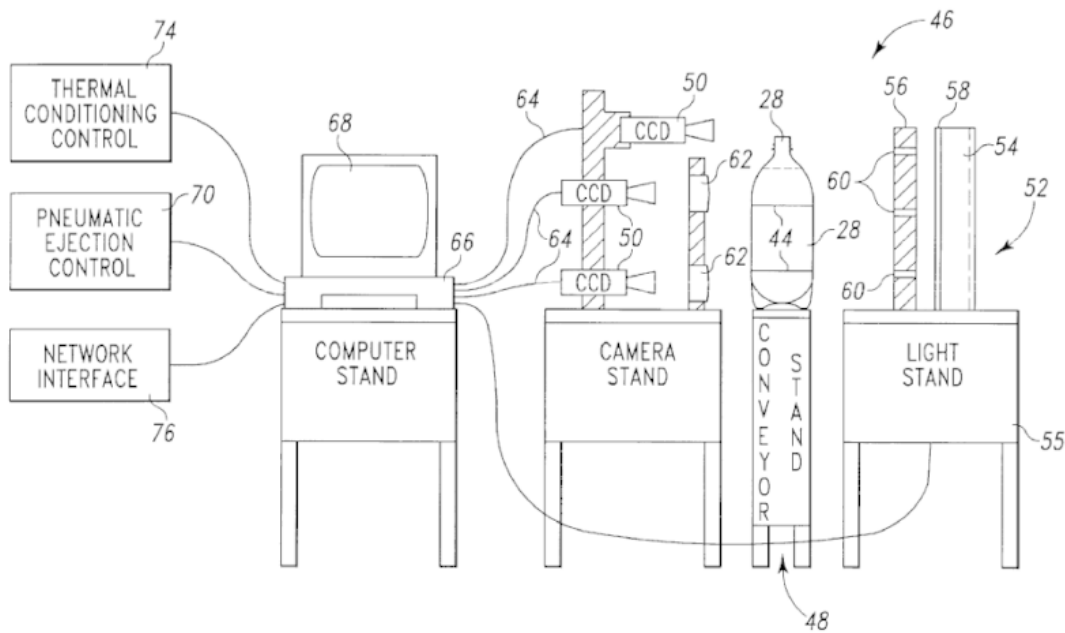
FIG. 1



1

**B29C 2049/78805****{Computer or PLC control}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

**Fig. 7**

**B29C 2049/7881**

**{Mechanical control}**

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in this group:

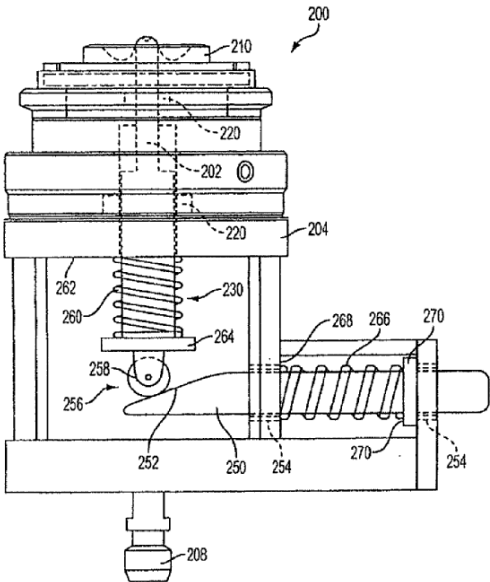


FIG. 3A

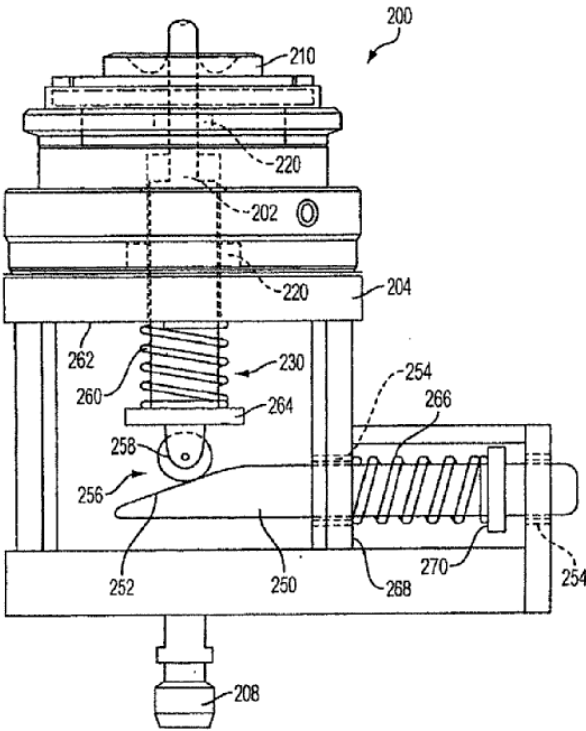


FIG. 3B

**B29C 2049/78815****{using wireless transmission}****Definition statement***This place covers:*

Where the controller type or interface uses wireless transmission.

Illustrative example of subject matter classified in this group:

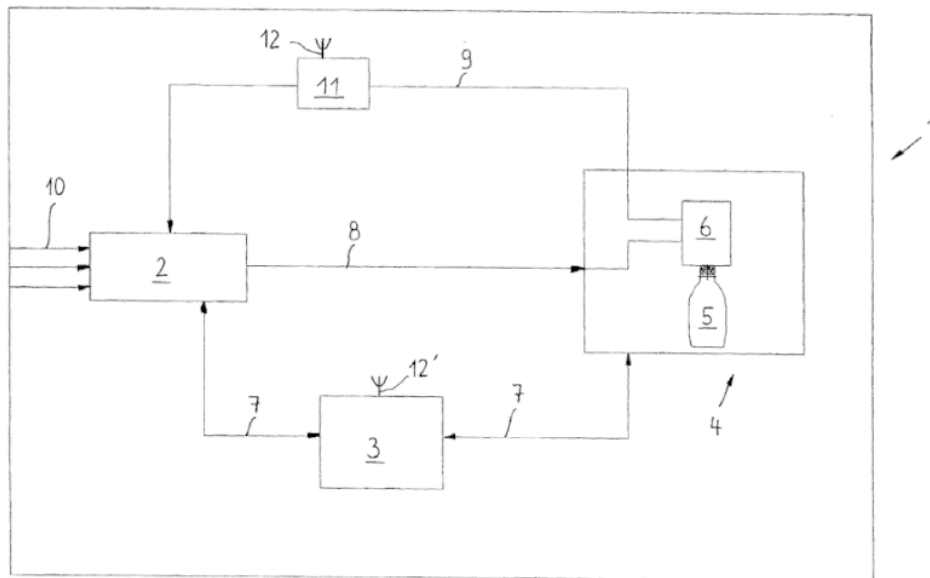
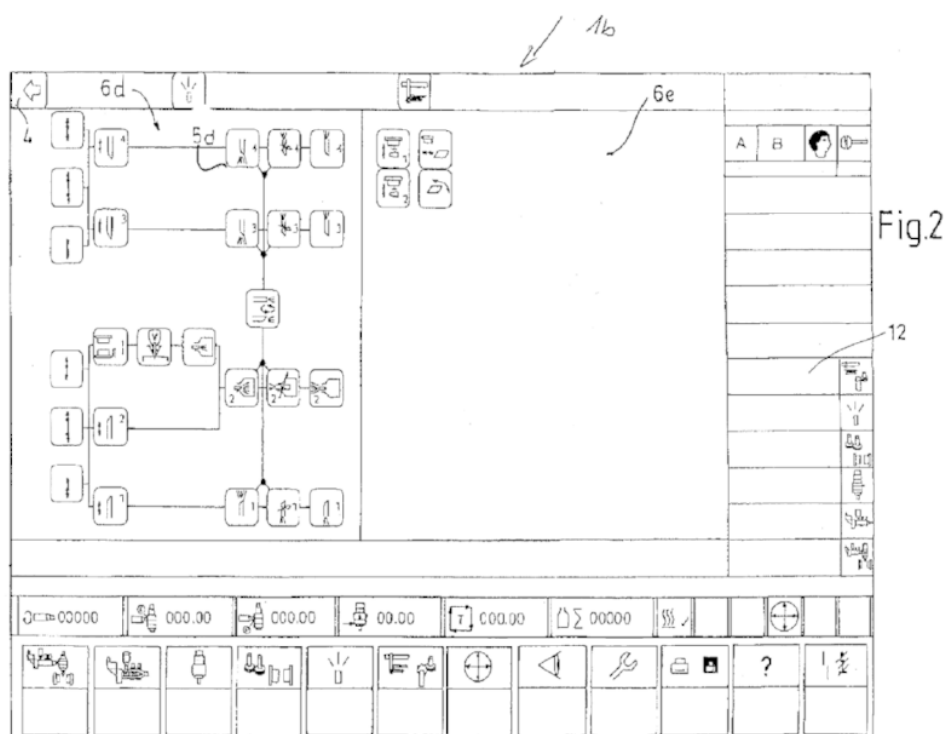
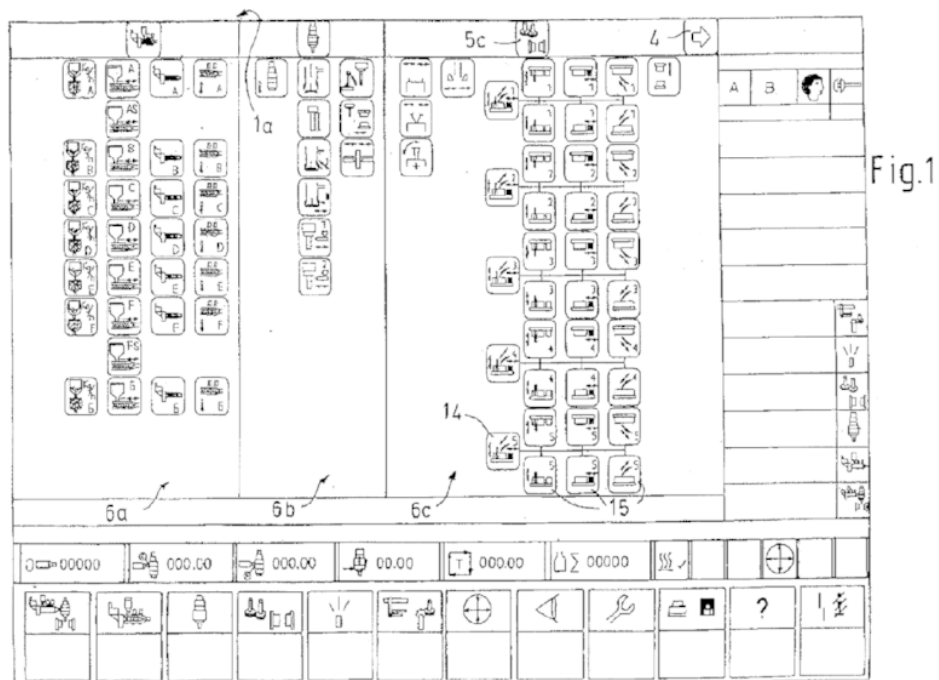


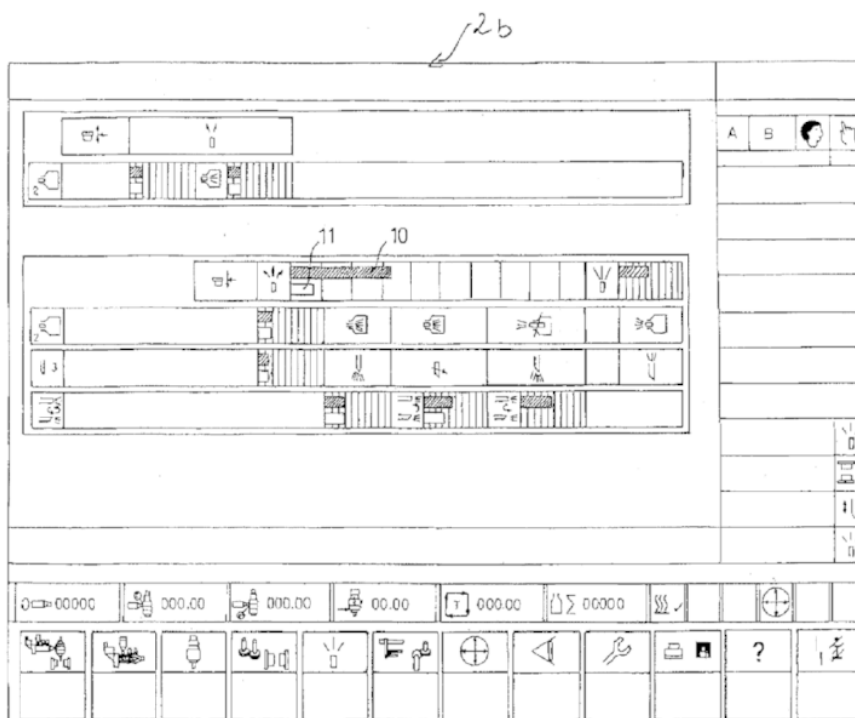
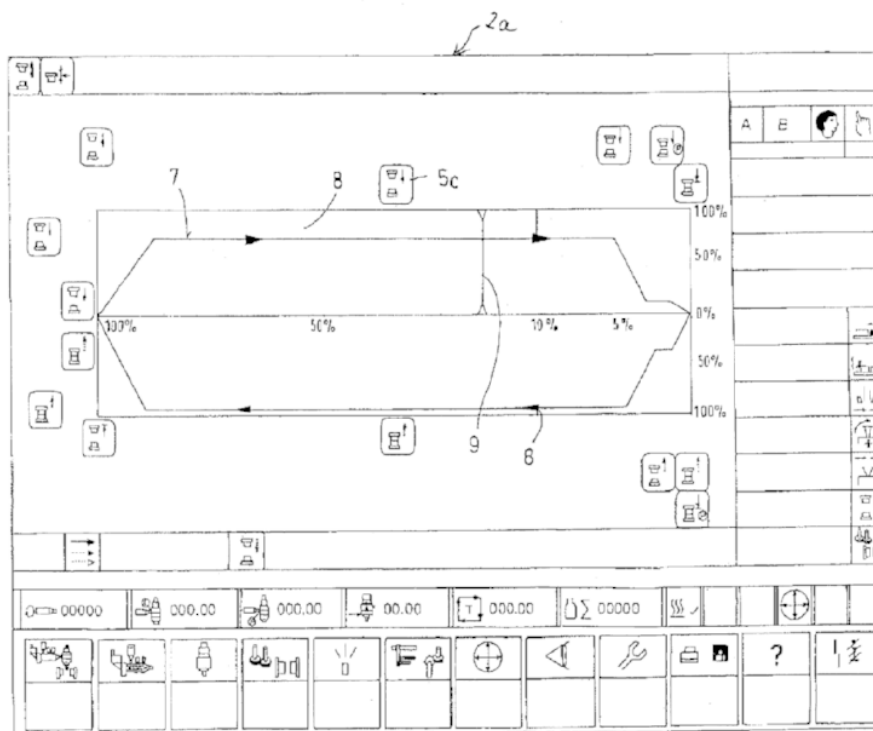
FIG. 1

Figure 1 illustrates the air recirculation 9 equipped with a pressure sensor 11 which monitors the pressure conditions of the blow-moulding air to be recirculated out of the container 5. This data is sent from the pressure sensor 11 to the transmitting and receiving unit 12 of the control unit 3 via a transmitting/receiving unit 12' by wireless transmission. With the help of these results as well as other results, the control unit 3 is able to optimally regulate the compressor 2 in order to optimise and/or reduce the power consumption by the entire hollow body manufacturing unit 1.

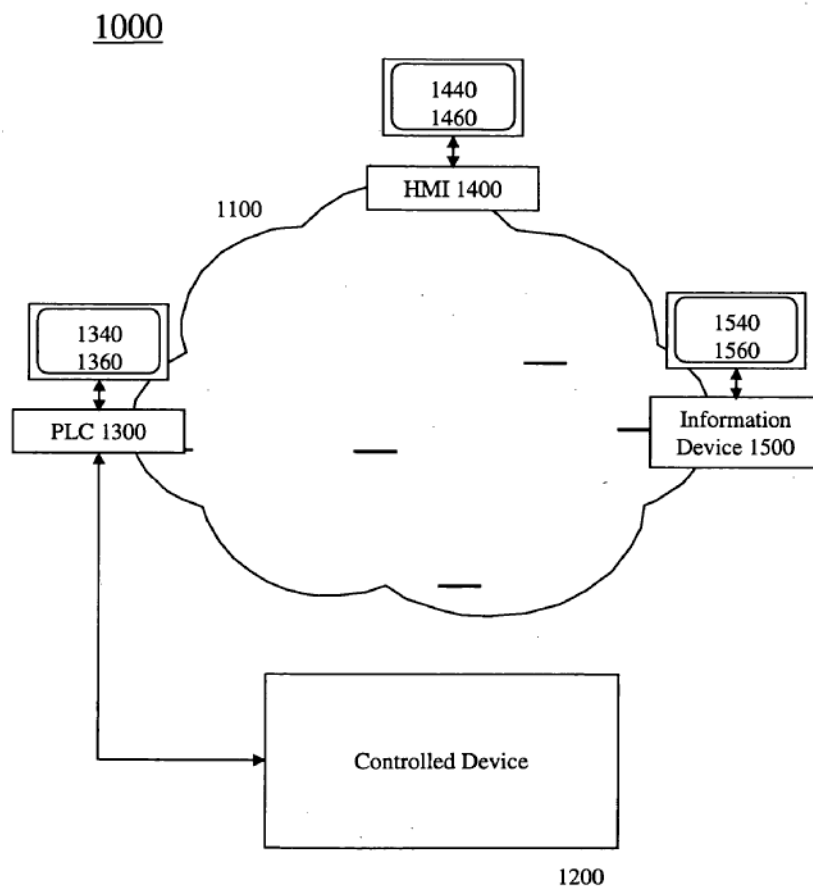
**B29C 2049/7882****{Control interface, e.g. display}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:





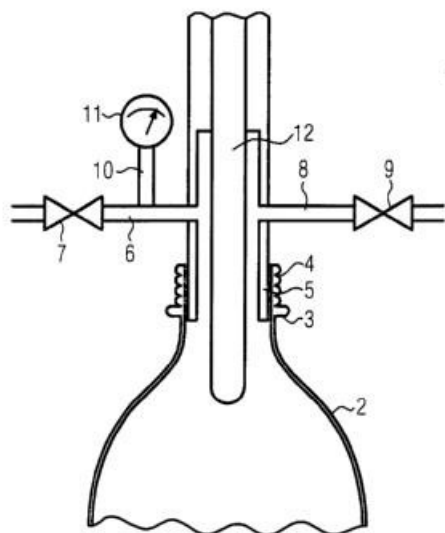




**Fig. 1**

**B29C 49/80****Testing, e.g. for leaks****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:

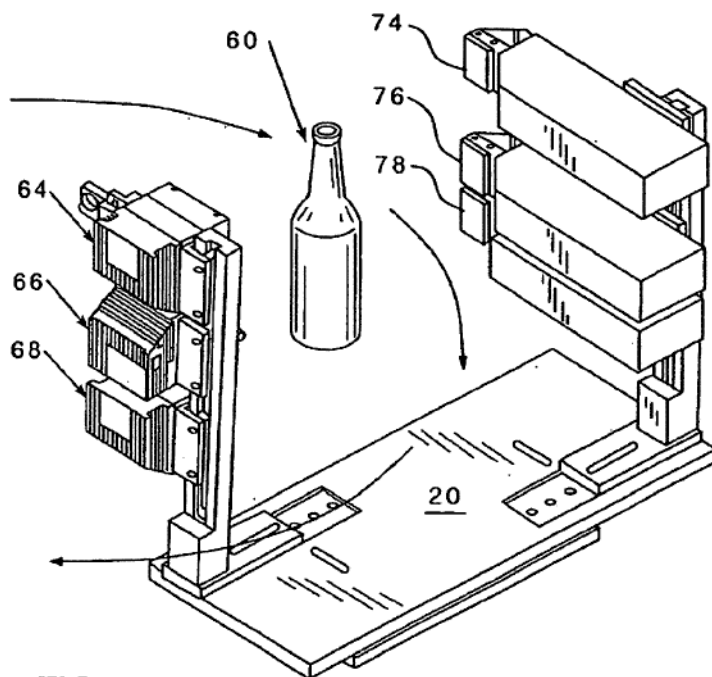
**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Investigating fluid-tightness of structures	<a href="#">G01M 3/02</a>
---	---------------------------

**B29C 2049/801****{Taking preform or article samples, e.g. by cutting out pieces for analysis}****Definition statement***This place covers:*

Testing by taking preform or article samples.

Illustrative example of subject matter classified in this group:



**FIG. 2**

## B29C 51/00

**Shaping by thermoforming {, i.e. shaping sheets or sheet like preforms after heating}, e.g. shaping sheets in matched moulds or by deep-drawing; Apparatus therefor {(blow moulding of tubular preforms [B29C 49/00](#), deforming of tubular or hollow preforms [B29C 67/0014](#))}**

### Definition statement

*This place covers:*

- shaping of materials in a plastic state by thermoforming
- simulation of thermoforming
- honeycomb structures sheets which are thermoformed with thermoplastic sheets surrounding it as long as the thermoplastic sheets are plastically deformed,
- plates or sheets which are clamped in such a way that they can at least partially slide into the mould when thermoformed

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Surface shaping	<a href="#">B29C 59/00</a>
Cold deforming of thermoplastics material	<a href="#">B29C 67/0029</a>
Self-reinforcing plastics	<a href="#">B29C 70/04</a>
Metal deep-drawing	<a href="#">B21D 22/00</a>

Packaging individual articles in containers or receptacles whereby the machines incorporate means for making the containers	<a href="#">B65B 3/022</a>
Blister packaging	<a href="#">B65B 9/042</a>
Blister packages	<a href="#">B65D 81/03</a>

### Special rules of classification

- For articles and materials, as much as possible additional classification by adding the Indexing Codes of [B29K](#) and [B29L](#) is recommended.
- If more than 4 different thermoplastic materials are described in the disclosure then the Indexing Code [B29K 2101/12](#) should be allocated. In addition only up to 4 of the disclosed uncommon thermoplastic materials are classified (common thermoplastics for thermoforming are PET, PE, PP) by allocating the appropriate Indexing Code as provided in [B29K 2001/00](#) - [B29K 2101/00](#).
- Inventive and additional information disclosed in documents to be classified should be identified by allocation the appropriate classification codes of [B29C 51/00](#) - [B29C 51/46](#). In particular attention should be paid to the so called break down Indexing Codes, which are only present at additional information level, but should be allocated if disclosed in the document to be classified.
- If during thermoforming a vacuum, a vacuum and pressure or a pressure is used then one or both of the following classification codes should additionally be allocated: [B29C 2791/006](#) and/or [B29C 2791/007](#).

## B29C 51/002

{characterised by the choice of material}

### Definition statement

*This place covers:*

- Thermoforming processes, whereby their disclosure focuses on the materials or material parameters

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Compositions of macromolecular compounds in general	<a href="#">C08L 1/00</a> - <a href="#">C08L 101/10</a>
---	---

### Special rules of classification

If reinforcing material is comprised in the material to be thermoformed, then the following Indexing Codes should additionally be allocated: [B29K 2201/00](#) - [B29K 2313/02](#)

## B29C 51/004

{Textile or other fibrous material made from plastics fibres (combined with plastic layers [B29C 51/145](#); compression moulding of reinforced plastic articles in matched moulds [B29C 70/46](#); using pressure difference [B29C 70/44](#))}

### Definition statement

*This place covers:*

- Thermoforming of fabrics or textiles made of thermoplastic material. Fabrics or textiles can be woven or non woven.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping composites	<a href="#">B29C 70/00</a>
Self-reinforcing plastics	<a href="#">B29C 70/04</a>
Helmets	<a href="#">B29L 2031/48</a>
Brassieres	<a href="#">B29L 2031/4885</a>
Non-woven fabrics formed wholly or mainly of staple fibres or like relatively short fibres; Making three- dimensional articles by consolidation	<a href="#">D04H 1/005</a>
Processes for the fixation or treatment of textile materials in three-dimensional forms	<a href="#">D06M 23/14</a>

## B29C 51/006

{for making articles having hollow walls}

### Definition statement

This place covers:

-US2003026929

in Publication Feb. 6, 2003 Sheet 1 of 7 US 2003/0026929 A1

#### DRAWINGS

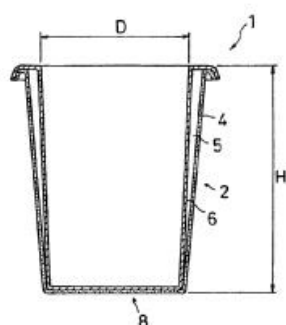
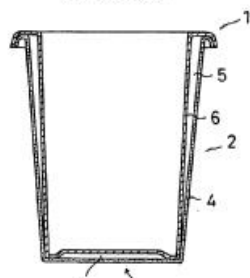


Figure 1 (a)



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Hollow walled articles	<a href="#">B29L 2024/00</a>
------------------------	------------------------------

**B29C 51/008**

{without using a mould, e.g. ballooning (as prestretching step [B29C 51/06](#))}

**Definition statement**

*This place covers:*

DE 10 2008 052 149 A1 2010.04.22

Anhängende Zeichnungen

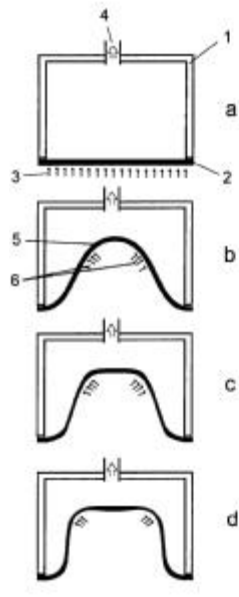


Fig. 1

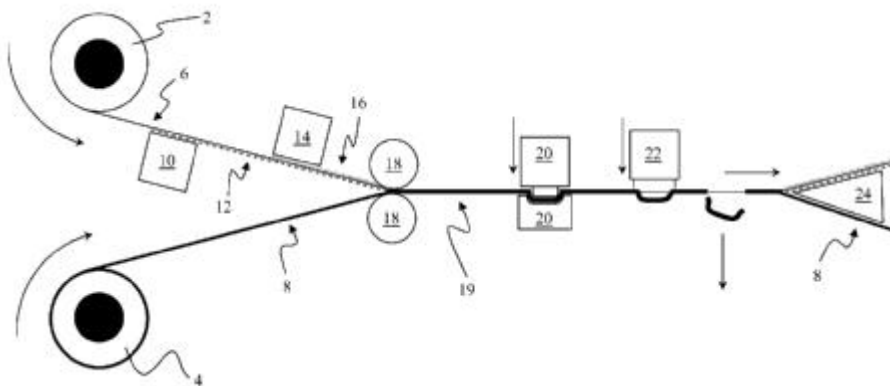
**B29C 51/02**

Combined thermoforming and manufacture of the preform

**Definition statement**

*This place covers:*

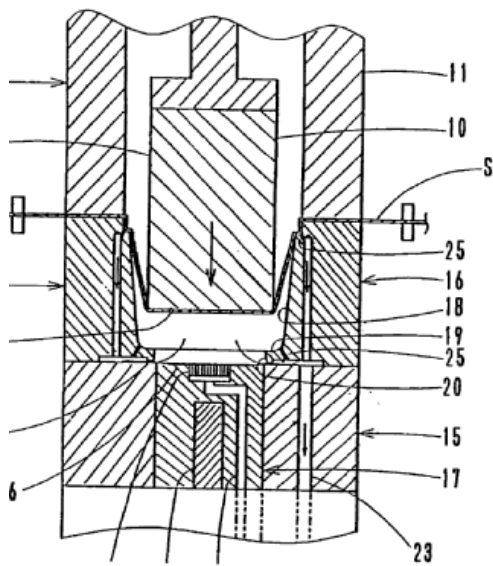
- EP2226181



**B29C 51/04****Combined thermoforming and prestretching, e.g. biaxial stretching****Definition statement***This place covers:*

Publication May 22, 2008 Sheet 3 of 9

US 2008/0118597 A1

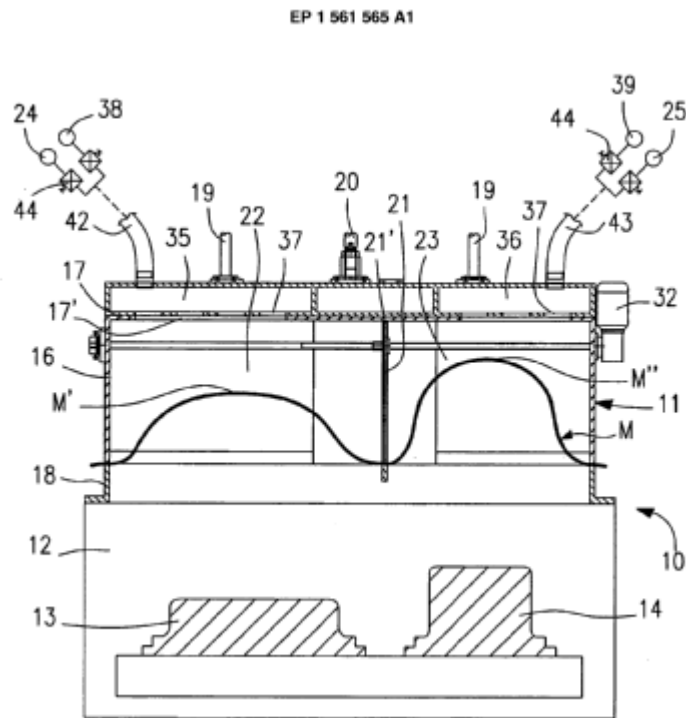
**FIG. 3**

**B29C 51/06**

**using pressure difference {for prestretching}**

## Definition statement

*This place covers:*



**B29C 51/08**

**Deep drawing or matched-mould forming, i.e. using mechanical means only**

### Definition statement

*This place covers:*

- moulds without counter mould

Top of Form

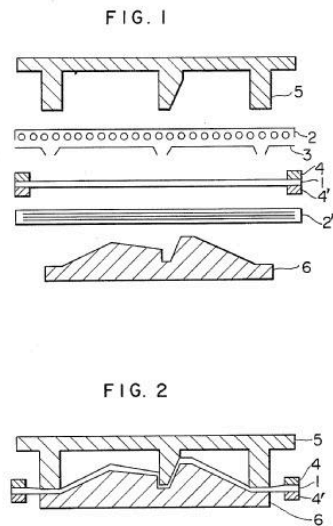
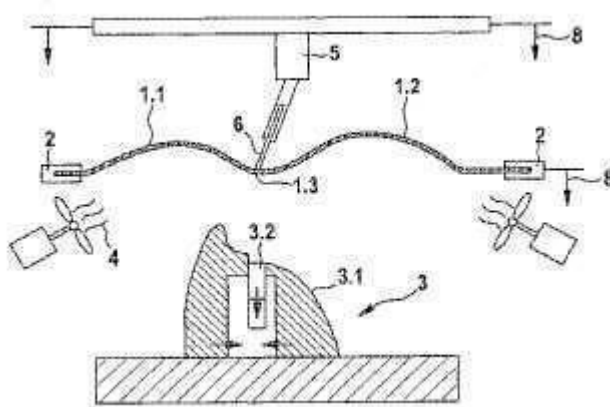


DE102008025084

U.S. Patent

Feb. 3, 1981

4,248,651



## References

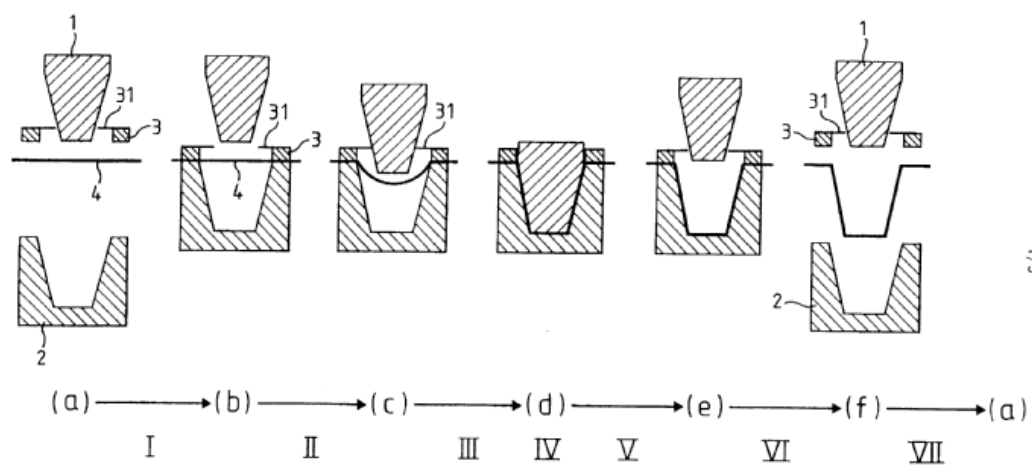
### Limiting references

*This place does not cover:*

Mechanical deformation of paper or cardboard, e.g. deep drawing techniques	<a href="#">B31F 1/00</a>
--	---------------------------

**B29C 51/082****{by shaping between complementary mould parts}****Definition statement***This place covers:*

- WO9728942



WO 97/28942

1/3

PCT

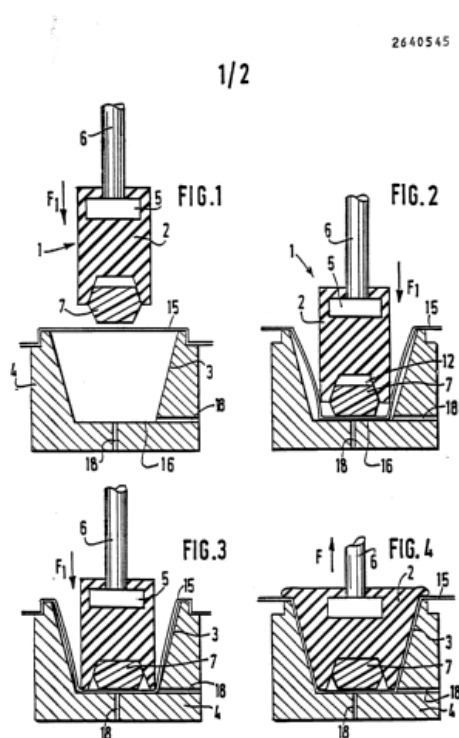
**B29C 51/085**

{with at least one of the shaping surfaces being made of resilient material, e.g. rubber}

**Definition statement**

*This place covers:*

- FR2640545

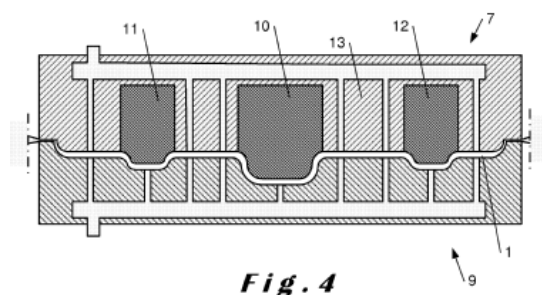
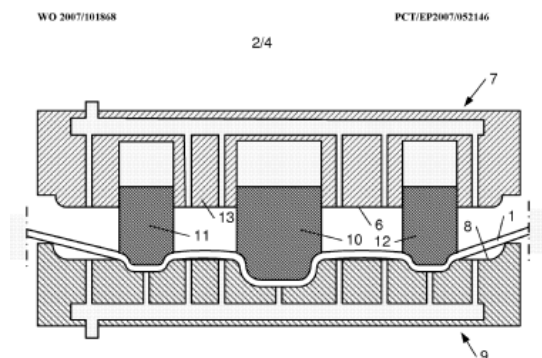


**B29C 51/087**

{with at least one of the mould parts comprising independently movable sections ([B29C 51/32](#) and [B29C 51/34](#) take precedence)}

**Definition statement**

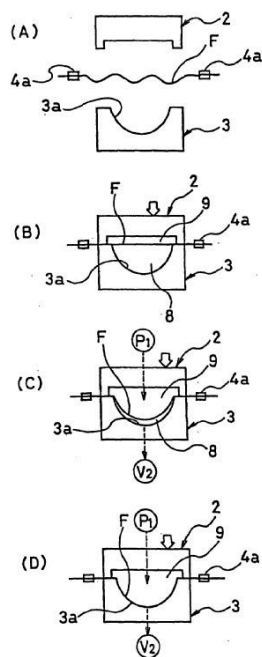
*This place covers:*



**B29C 51/10****Forming by pressure difference, e.g. vacuum****Definition statement***This place covers:*

EP 1 236 561 A1

FIG. 2



EP 1 114 715 A1

FIG. 1

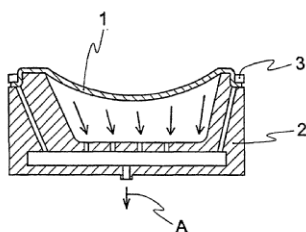
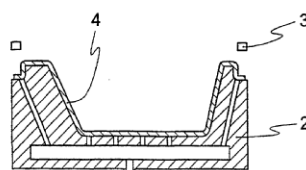


FIG. 2





## Special rules of classification

- Thermoformed articles which are decorated with paint or sheets with a paint layer are additionally classified by adding the Indexing Code: [B29L 2031/722](#)

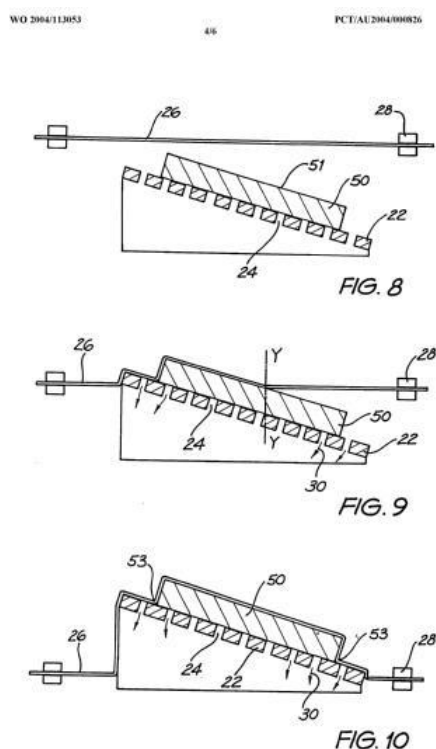
## B29C 51/16

### Lining or labelling

#### Definition statement

*This place covers:*

Thermoforming process whereby the lining must be heated and deformed during the lining operation.



## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Lining or sheathing in general	<a href="#">B29C 63/00</a>
Producing of labels	<a href="#">B31D 1/02</a>
Labelling in general, other then flat surfaces	<a href="#">B65C 3/00</a>
In mould labelled containers	<a href="#">B65D 23/0864</a>
Labels in general e.g. for thermo adhesion	<a href="#">G09F 3/04</a>

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Lining	Covering the whole outer and/or inner surface of articles with a heated thermoplastic sheet. The heated sheet is stretched and three dimensionally deformed.
Labelling	Connecting a label, which is for example on the inside of a mould cavity, to a heated preform or sheet while the preform or sheet is thermoformed. Often also called "in mould labelling

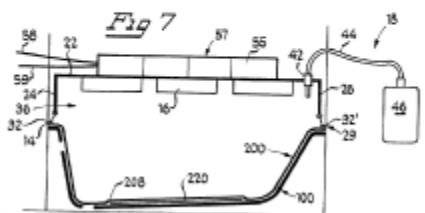
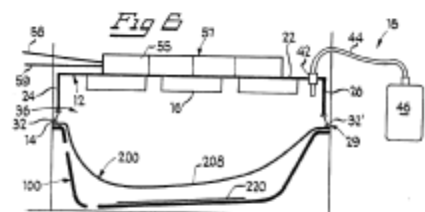
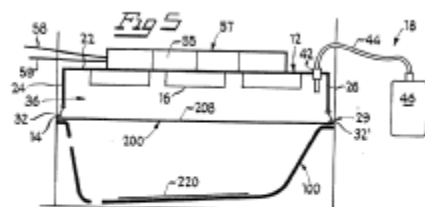
## B29C 51/162

{of deep containers or boxes}

## Definition statement

*This place covers:*

Patent Application Publication Oct. 31, 2002 Sheet 2 of 3 US 2002/0157763 A1





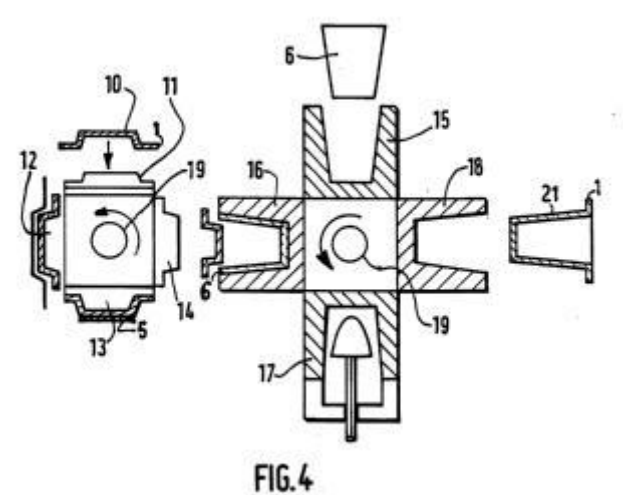
B29C 51/165

{combined with the feeding or the shaping of the lining or the labels (by injection moulding [B29C 45/14008](#), [B29C 45/1418](#))}

Definition statement

*This place covers:*

- FR2613982



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Label feeding in general	<a href="#">B65C 9/08</a>
--------------------------	---------------------------

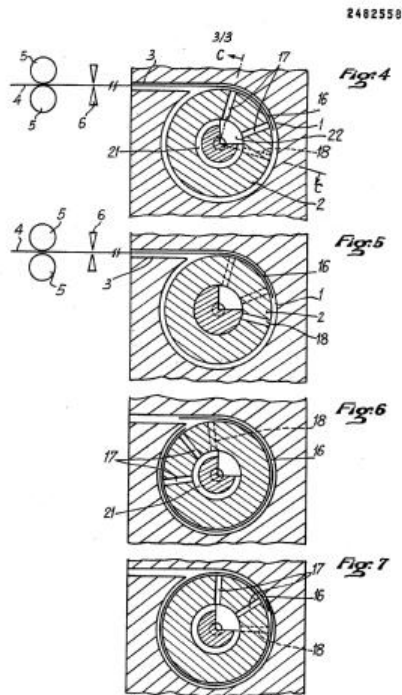
**B29C 51/167**

**{of a continuous strip}**

## Definition statement

*This place covers:*

- US2482558



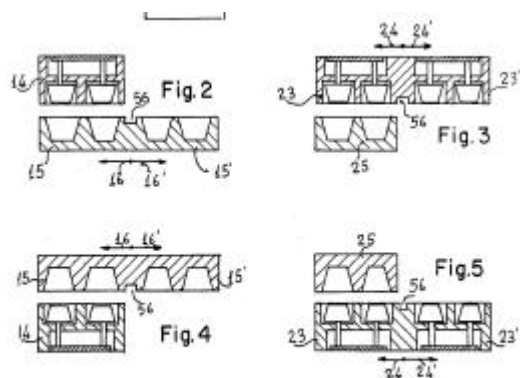
**B29C 51/20**

**having movable moulds or mould parts**

### Definition statement

*This place covers:*

US4105736



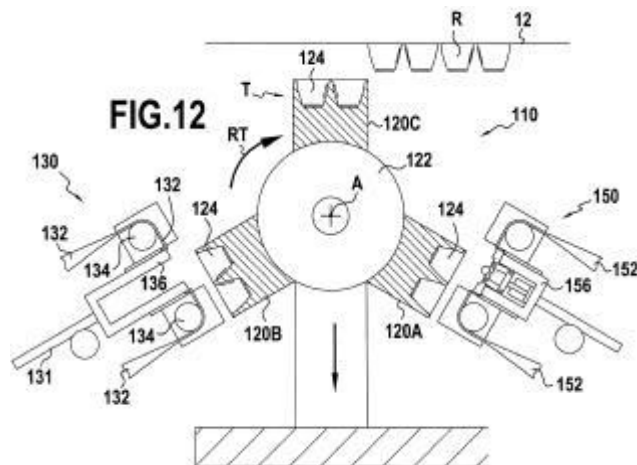
**B29C 51/22**

**rotatable about an axis**

## Definition statement

*This place covers:*

- FR2911537



**B29C 51/225**

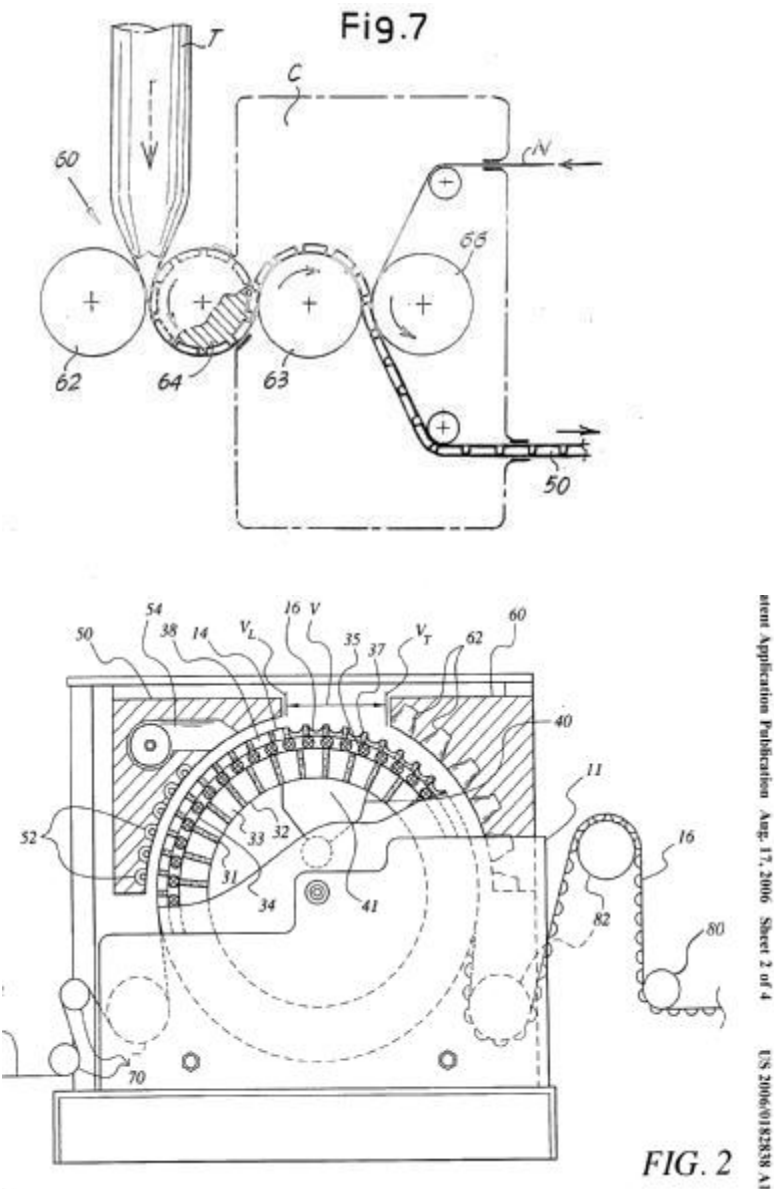
**{mounted on a vacuum drum (for surface shaping [B29C 59/06](#))}**

### Definition statement

*This place covers:*

- Vacuum, pressure or match mould deforming as long as it is mounted on a drum

-WO2004113073



B29C 51/26

Component parts, details or accessories; Auxiliary operations

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Handling of moulds between a mould store and a moulding machine in general	<a href="#">B29C 31/006</a>
Mounting, exchanging or centering of moulds	<a href="#">B29C 33/30</a>
Maintenance of moulds namely cleaning	<a href="#">B29C 33/72</a>
Disinfection or sterilisation of materials or objects, in general; Accessories therefor	<a href="#">A61L 2/00</a>

**B29C 51/261**

{Handling means, e.g. transfer means, feeding means (**B29C 51/44** takes precedence)}

**Definition statement**

*This place covers:*

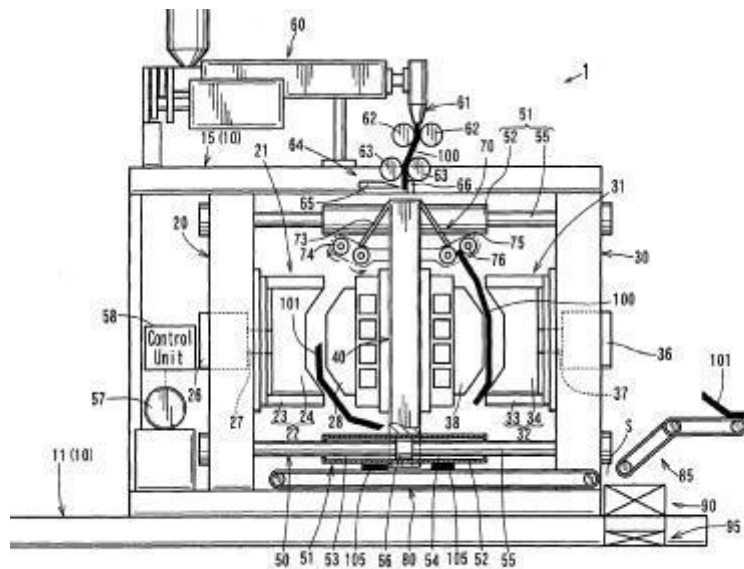
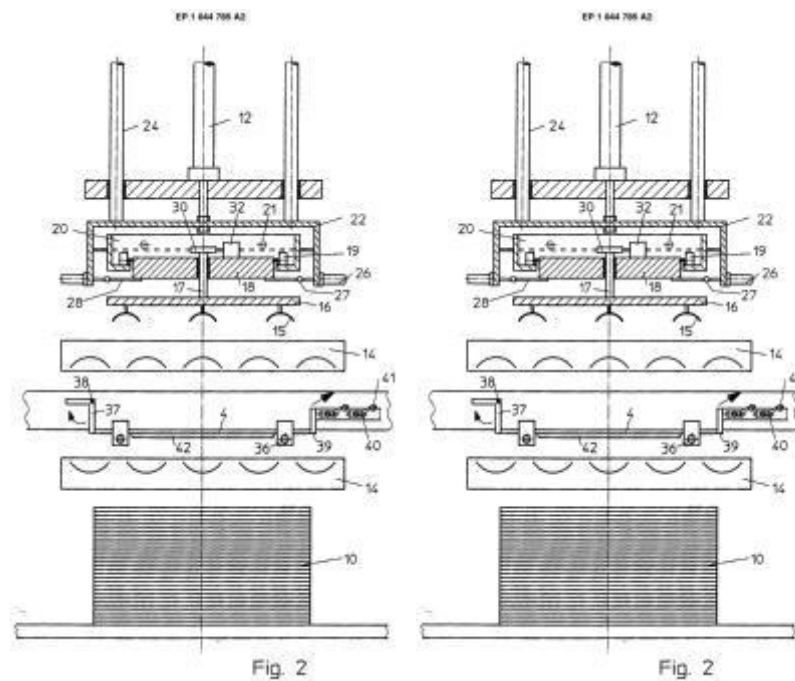
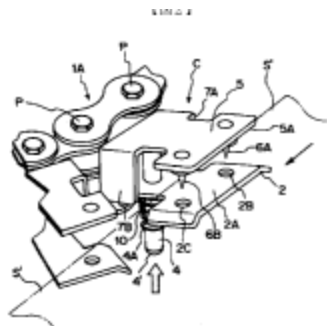
**FIG. 6**

Fig. 2

Fig. 2

- JP10305480



**B29C 51/263**

{characterised by using a particular environment, e.g. sterile}

**Definition statement**

*This place covers:*

e.g.:

- thermoforming in clean rooms
- using an incompressible fluid for thermoforming

**References*****Informative references***

*Attention is drawn to the following places, which may be of interest for search:*

Cleaning in general	<a href="#">B08B 1/00</a>
---------------------	---------------------------

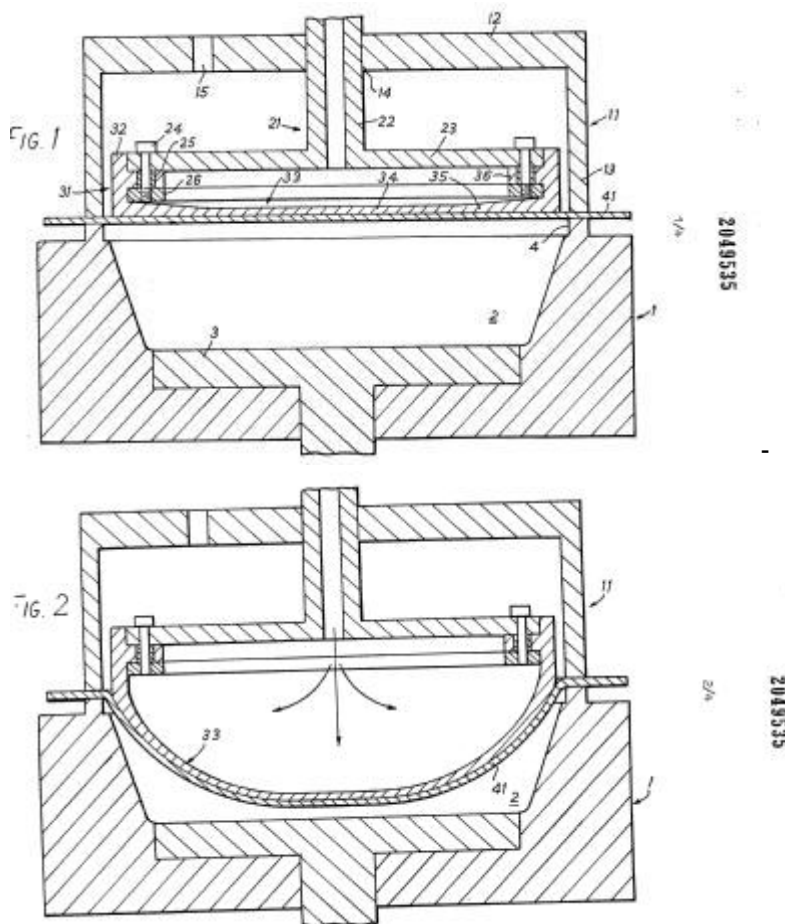
**B29C 51/28**

for applying pressure through the wall of an inflated bag or diaphragm

**Definition statement**

*This place covers:*

- GB2049535

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Isostatic pressing in compression moulding	<a href="#">B29C 43/10</a>
--	----------------------------



**B29C 51/30****Moulds****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Moulds in general characterised by the material or the manufacturing process	<a href="#">B29C 33/38</a> - <a href="#">B29C 33/405</a>
--	---

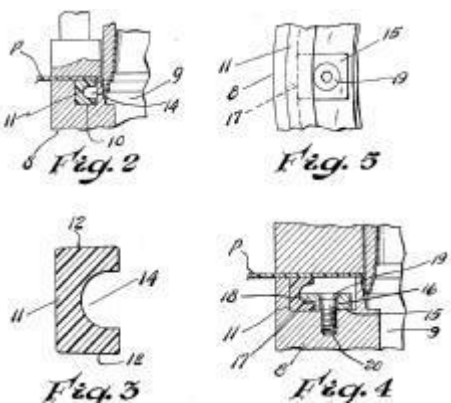
**B29C 51/303**

{with sealing means or the like}

**Definition statement**

This place covers:

- US3238566

**B29C 51/306**

{with means for forming a rim (combined with cutting [B29C 51/325](#); rim rolling per se [B29C 53/34](#))}

**Definition statement**

This place covers:

Top of Form

4184129

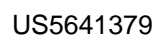
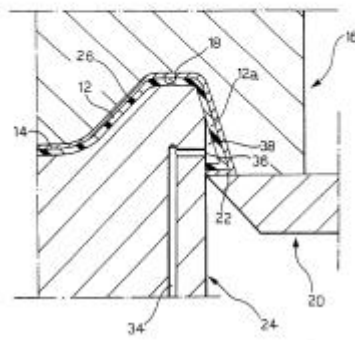
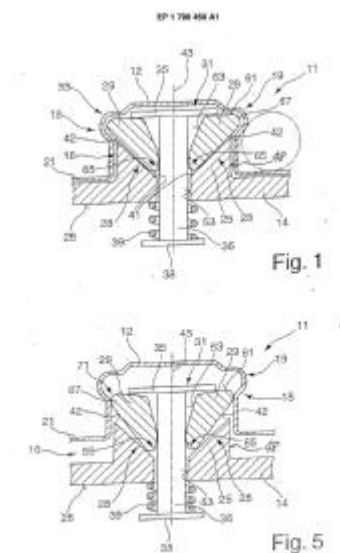


FIG. 6



**B29C 51/34**

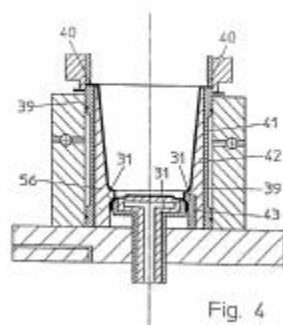
for undercut articles

**Definition statement***This place covers:***B29C 51/343**

{having recessed undersurfaces}

**Definition statement***This place covers:*

Patent Application Publication Mar. 7, 2002 Sheet 4 of 5 US 2002/0027305 A1



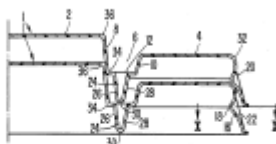
**B29C 51/346**

{specially adapted to facilitate the destacking of nestable containers}

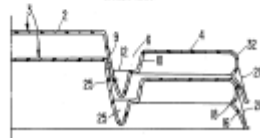
**Definition statement**

*This place covers:*

U.S. Patent Oct. 31, 1989 Sheet 2 of 5 4,877,151

**FIG. 3.****FIG. 4.**

(PRIOR ART)

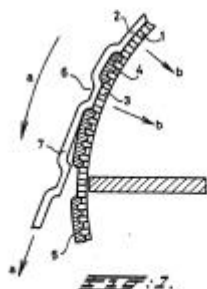
**B29C 51/36**

specially adapted for vacuum forming {, Manufacture thereof}

**Definition statement**

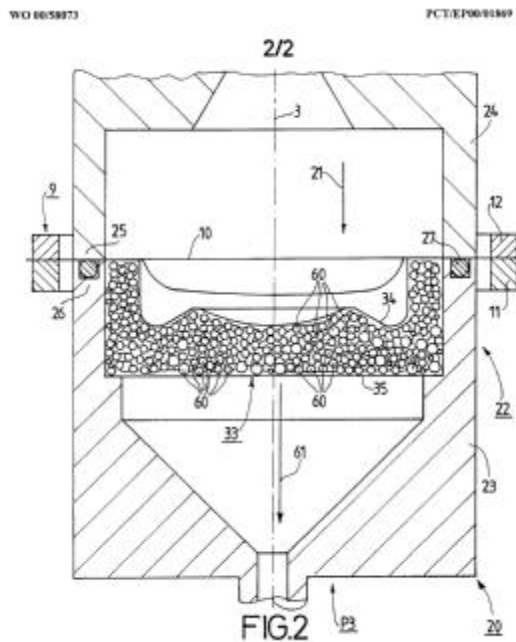
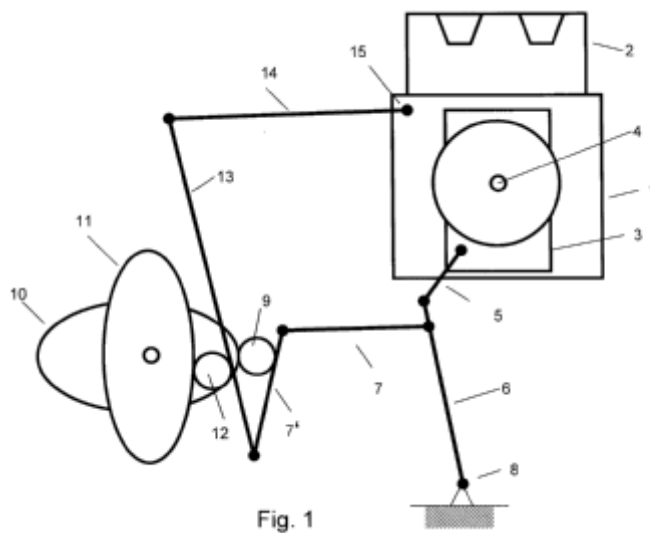
*This place covers:*

EP 0 389 031 A1



**B29C 51/365****{Porous moulds}****Definition statement***This place covers:*

- Microporous or sintered moulds

**B29C 51/38****Opening, closing or clamping means****Definition statement***This place covers:*

DE 10 2006 003 851 A1 2007.08.02  
Anhängende Zeichnungen

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Opening, closing or clamping of moulds in general	<a href="#">B29C 33/20</a> - <a href="#">B29C 33/28</a>
---	---

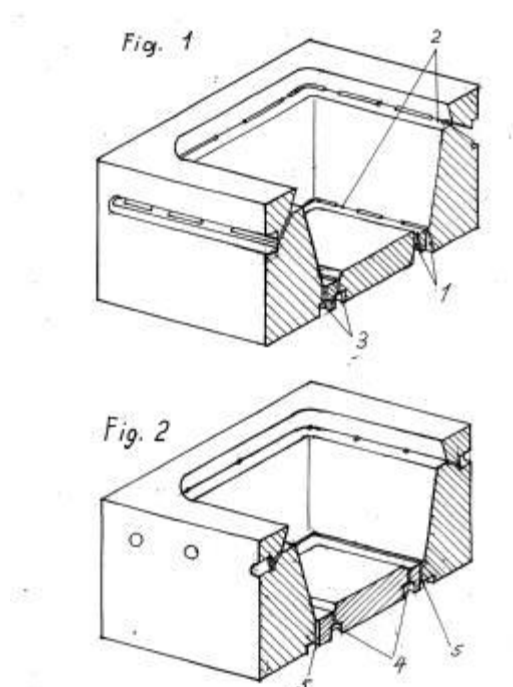
## B29C 51/40

### Venting means

### Definition statement

This place covers:

- DE29908024U



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Venting means for moulds in general	<a href="#">B29C 33/10</a>
-------------------------------------	----------------------------

## B29C 51/42

### Heating or cooling

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heating, cooling or curing in general	<a href="#">B29C 35/00</a>
---------------------------------------	----------------------------

Heating of preforms in general

[B29B 13/023](#)

### Special rules of classification

When details of the heating or cooling means are indicated, then it is highly desirable to allocate additionally the following corresponding Indexing Codes for additional information:

- [B29C 35/02](#), [B29C 35/04](#) - [B29C 2035/0883](#)

- [B29C 35/16](#), [B29C 2035/1616](#) - [B29C 2035/1691](#)

### Synonyms and Keywords

*In patent documents, the following words/expressions are often used as synonyms:*

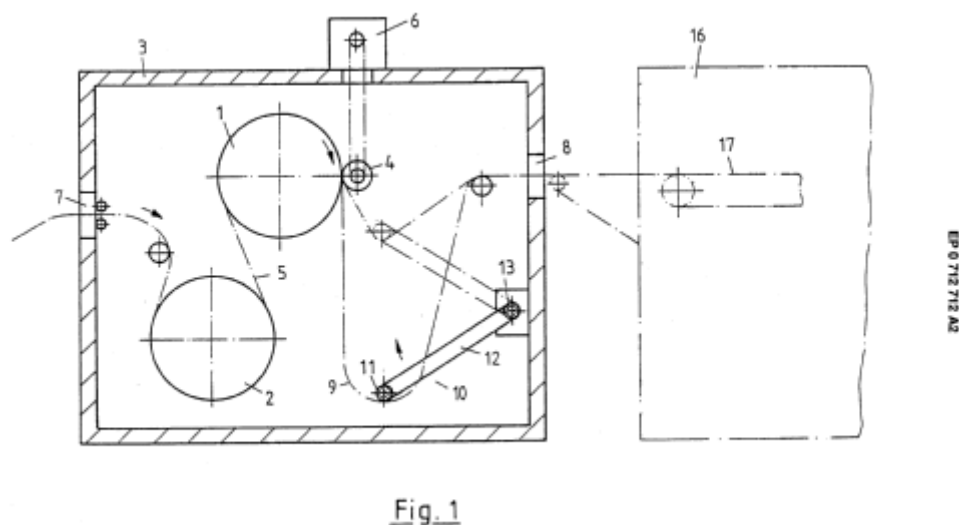
- "glass transition temperature", "T<sub>g</sub>" and "vitreous transition temperature"

## B29C 51/421

{of preforms, specially adapted for thermoforming (preheating sheets in general [B29B 13/023](#); [B29C 51/427](#) takes precedence)}

### Definition statement

*This place covers:*

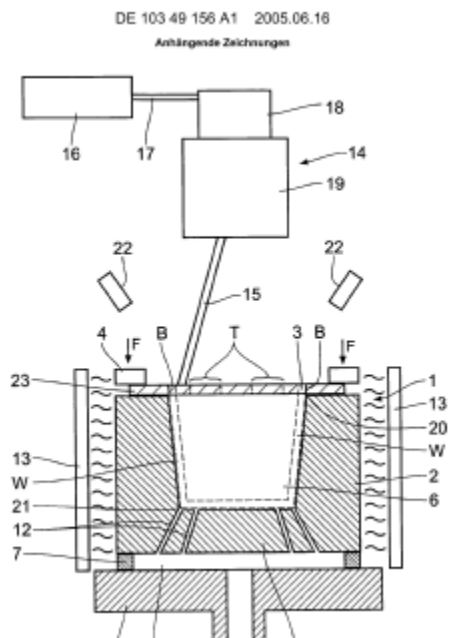


**B29C 51/422**

{to produce a temperature differential ([B29C 51/426](#) takes precedence)}

**Definition statement**

*This place covers:*



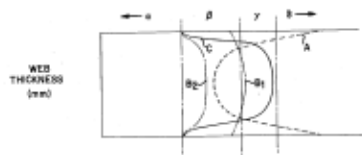
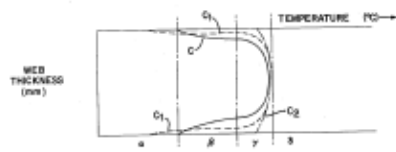
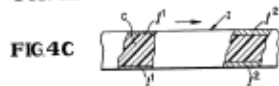
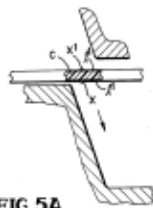
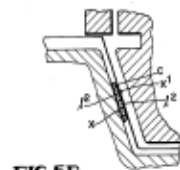


**B29C 51/423**

{through the thickness of the preform}

**Definition statement***This place covers:*

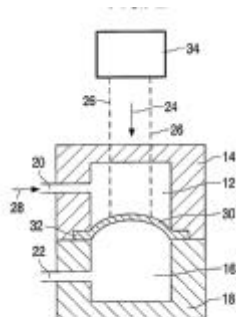
U.S. Patent Aug. 2, 1977 Sheet 3 of 16 4,039,609

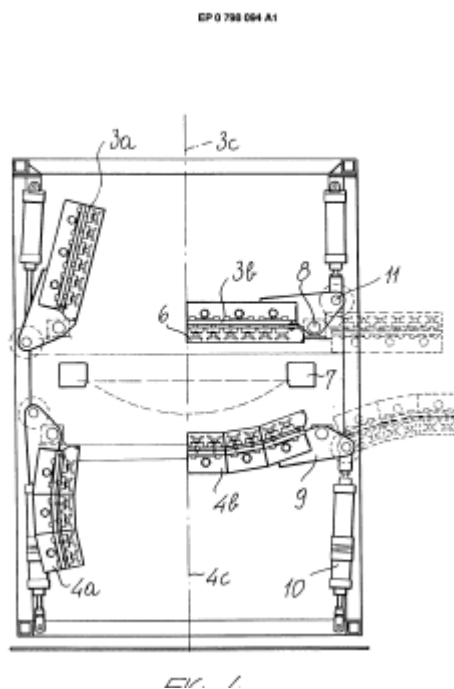
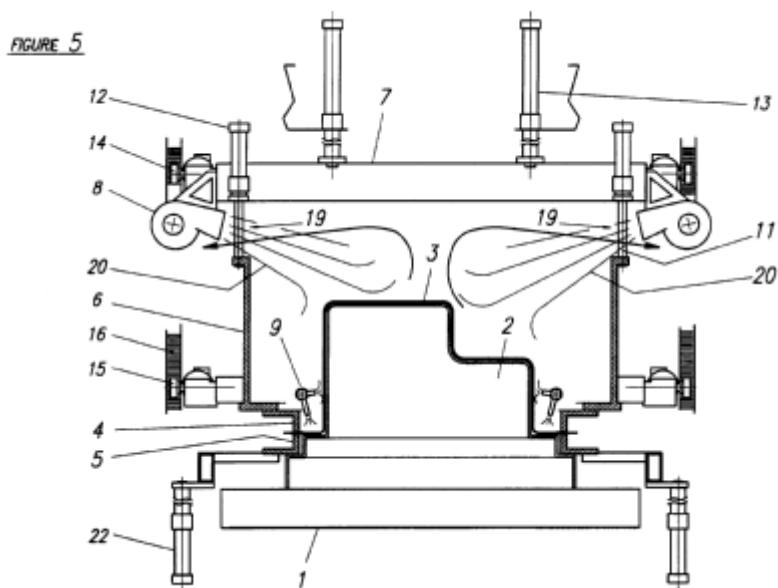
**FIG 4A****FIG 4B****FIG 4C****FIG 5A****FIG 5B****B29C 51/424**

{using a heated fluid}

**Definition statement***This place covers:*

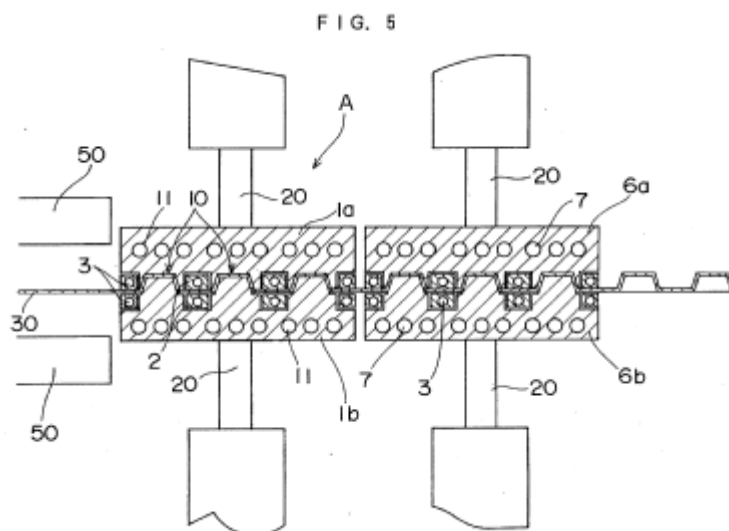
- WO2005007386

**FIG. 3**

**B29C 51/425****{using movable heating devices}****Definition statement***This place covers:***B29C 51/427****{Cooling of the material with a fluid blast}****Definition statement***This place covers:*

**B29C 51/428**

{of moulds or mould parts}

**Definition statement***This place covers:*

U.S. Patent

Apr. 8, 1997

Sheet 6 of 12

5,618,486

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Heating or cooling of moulds in general

[B29C 33/02](#) - [B29C 33/08](#)**Special rules of classification**

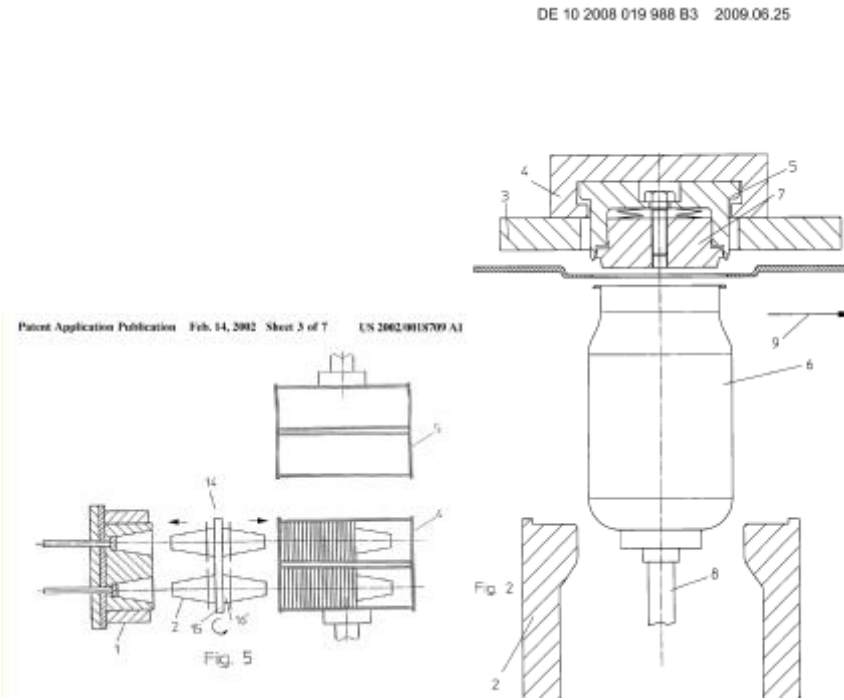
- If the heating or cooling system applied in the thermoforming mould is of general interest, then additional classification in the general groups [B29C 33/02](#) - [B29C 33/08](#) is recommended.

B29C 51/44

Removing or ejecting moulded articles

Definition statement

This place covers:  
Contains also stacking of articles



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

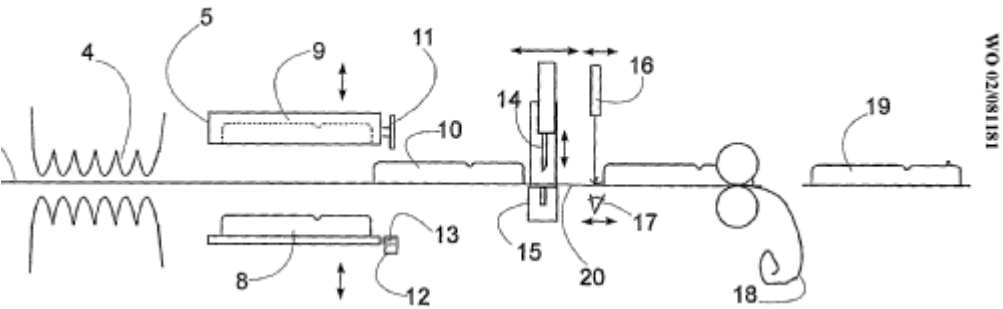
Moulds with means for to facilitate the removal of articles	<a href="#">B29C 33/44</a>
Stacking of nested articles	<a href="#">B65G 57/165</a>

**B29C 51/445**

{from a support after moulding, e.g. by cutting}

**Definition statement**

*This place covers:*



**B29C 53/00**

Shaping by bending, folding, twisting, straightening or flattening; Apparatus therefor ([B29C 61/10](#) takes precedence)

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Lining or sheathing by winding sheet or web-like material helically	<a href="#">B29C 63/08</a>
Lining or sheathing by winding sheet or web-like material spirally	<a href="#">B29C 63/12</a>
Covering or wrapping cores by winding webs, tapes or filamentary material	<a href="#">B65H 81/00</a>

**B29C 53/18**

of plates or sheets

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Apparatus for taking-out curl from webs	<a href="#">B65H 23/34</a>
---	----------------------------

**B29C 53/56**

Winding and joining, e.g. winding spirally {(winding in general [B65H](#))}

**Glossary of terms**

*In this place, the following terms or expressions are used with the meaning indicated:*

Spirally	the successive turns are completely overlapping each other
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Helically	the successive turns are partially overlapping each other
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## **B29C 55/00**

**Shaping by stretching, e.g. drawing through a die; Apparatus therefor**  
([B29C 61/08](#) takes precedence)

### **Definition statement**

*This place covers:*

Documents describing shaping by stretching, drawing, orienting polymeric articles like films, sheets, webs, tapes, ribbons, bands, strips, slabs, plates, plaques, boards, tubes, hoses etc.

The subgroups define the mechanical and geometrical ways in which stretching is performed.

### **References**

#### **Limiting references**

*This place does not cover:*

Manufacture of films or sheets characterised by the chemical composition	<a href="#">C08J 5/18</a>
Stretching of fibres, filaments, threads and the like and of textile fabrics	<a href="#">D01D</a> , <a href="#">D06C</a>

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Membranes produced by stretching	<a href="#">B01D 67/0025</a>
Producing films characterised by special physical or application properties (e.g. translucent films for light diffusion)	<a href="#">B29D 7/01</a>
Film laminates	<a href="#">B32B 27/00</a>
Stretch wrapping	<a href="#">B65B 11/00</a>

## **B29C 57/00**

**Shaping of tube ends, e.g. flanging, bellling or closing; Apparatus therefor {, e.g. collapsible mandrels}**

### **References**

#### **Limiting references**

*This place does not cover:*

Shaping a tube locally and then cutting in the deformed area, so that two tubes with shaped ends are obtained	<a href="#">B29C 67/0014</a>
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#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Forming the tip of catheters	<a href="#">A61M 25/001</a>
Altering the diameter of tube ends	<a href="#">B21D 41/00</a>

Shaping paper or cardboard tube ends	<a href="#">B31F 1/008</a>
--------------------------------------	----------------------------

## B29C 59/00

Surface shaping {of articles}, e.g. embossing; Apparatus therefor {(in-mould printing [B29C 37/0025](#); by using liquids [B29C 71/0009](#); by using gases without chemical reaction [B29C 71/009](#); for decorating in general [B44](#); abrasive blasting [B24C](#); chemical aspects [C08J 7/00](#))}

### References

#### Limiting references

*This place does not cover:*

Photomechanical, e.g. photolithographic, production of textured or patterned surfaces, e.g. printing surfaces, lithographic processes using patterning methods other than those involving the exposure to radiation, e.g. by stamping	<a href="#">G03F 7/0002</a>
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#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Moulding articles characterized by the shape of the surface	<a href="#">B29C 37/0053</a>
Shapping composites, comprising fillers only, the filler influencing the surface characteristics of the material, e.g. by concentrating near the surface or by incorporating in the surface by force	<a href="#">B29C 70/64</a>
Absorbent pads, characterised by the outer layer being three-dimensional, e.g. embossed, textured	<a href="#">A61F 13/51476</a>
Producing rollers or cylinders having an axial length of several times the diameter, e.g. for embossing, pressing or printing	<a href="#">B29D 99/0035</a>
Basic electric elements such as spark gaps; overvoltage arresters using spark gaps; sparking plugs; corona devices	<a href="#">H01T</a>
Plasma technique	<a href="#">H05H</a>

## B29C 59/002

{Component parts, details or accessories; Auxiliary operations}

### References

#### Limiting references

*This place does not cover:*

incorporation of release agents in the material to be embossed	<a href="#">B29C 59/005</a>
--	-----------------------------

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

using lubricants during embossing	<a href="#">B29C 2037/92</a>
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**B29C 59/005**

{characterised by the choice of material}

**Definition statement**

*This place covers:*

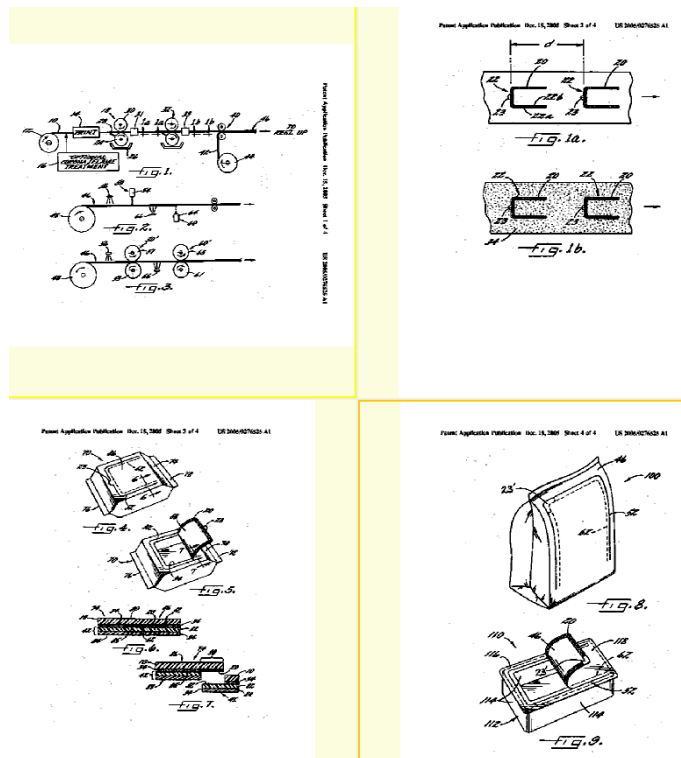
incorporation of release agents in the material to be embossed

**B29C 59/007**

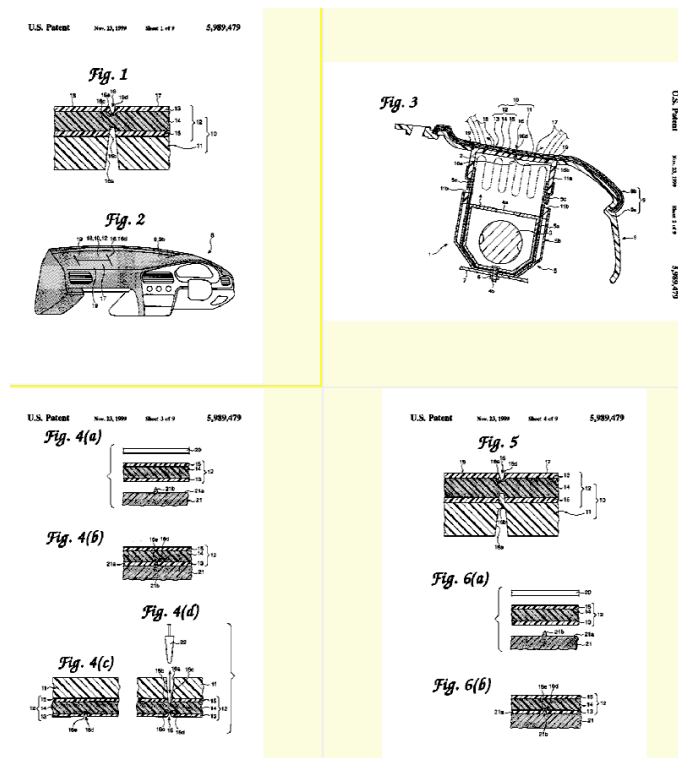
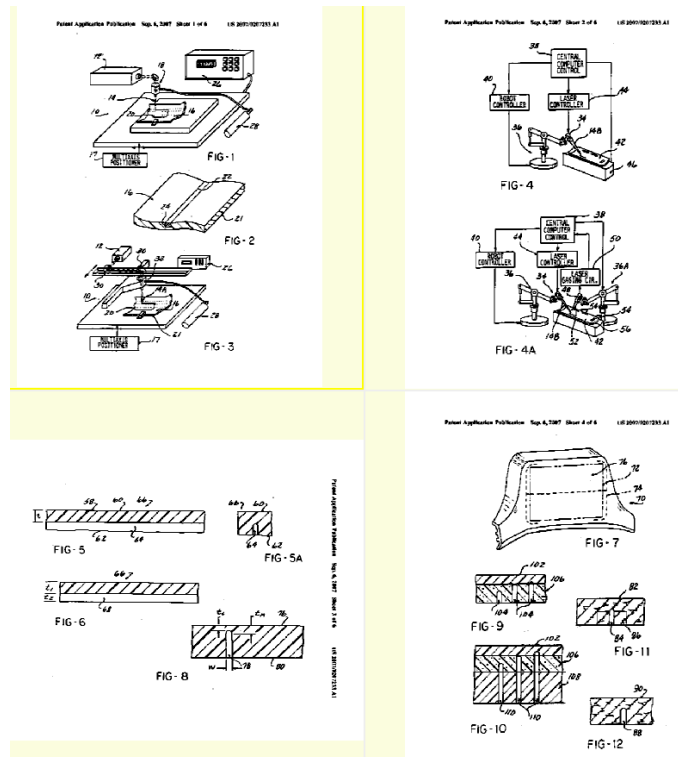
{Forming single grooves or ribs, e.g. tear lines, weak spots (by moulding [B29C 37/0057](#); folding lines [B29C 53/06](#); in metal articles [B21D 17/00](#); by cutting [B26D 3/08](#))}

**Definition statement**

*This place covers:*







U.S. Patent Nov. 23, 1999 Sheet 5 of 9 5,989,479

Fig. 6(c)

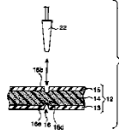
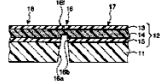


Fig. 7



U.S. Patent Nov. 23, 1999 Sheet 6 of 9 5,989,479

Fig. 8(a)

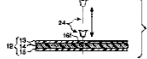


Fig. 8(b)

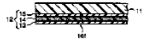
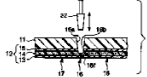


Fig. 8(c)



U.S. Patent Nov. 23, 1999 Sheet 7 of 9 5,989,479

Fig. 9

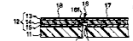


Fig. 10

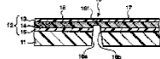
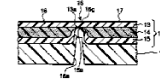


Fig. 11



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Fig. 12(a)

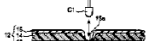
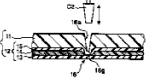


Fig. 12(b)



Fig. 12(c)



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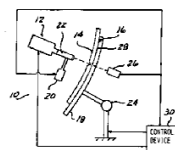


FIG. 1

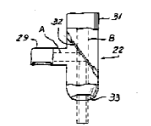


FIG. 2

Patent Application Publication Oct. 7, 2004 Sheet 2 of 4 US 2004/019210 A1

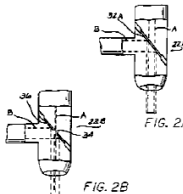


FIG. 2A

FIG. 2B



FIG. 3

Patent Application Publication Oct. 7, 2004 Sheet 3 of 4 US 2004/019210 A1

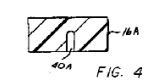


FIG. 4

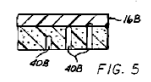


FIG. 5

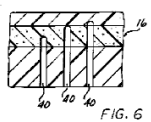


FIG. 6

Patent Application Publication Oct. 7, 2004 Sheet 4 of 4 US 2004/019210 A1

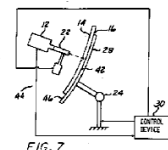


FIG. 7

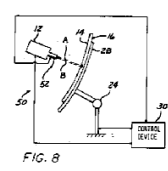
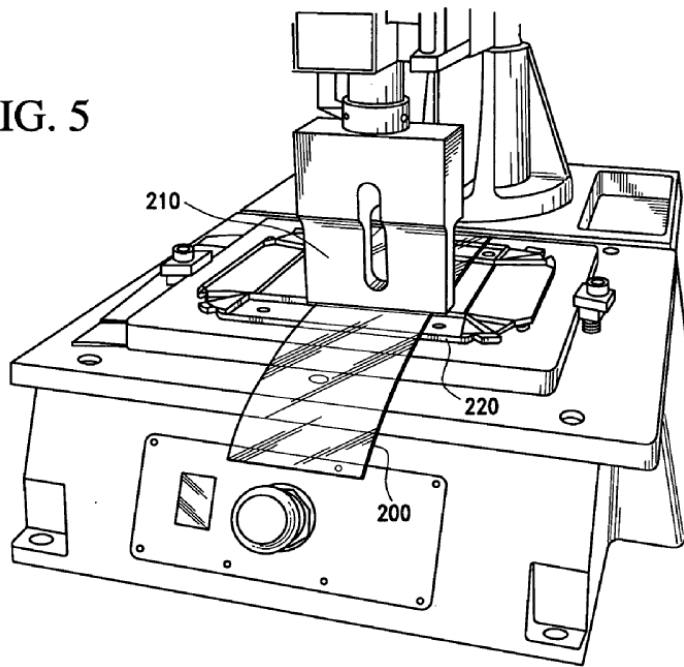


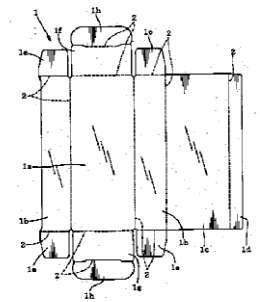
FIG. 8

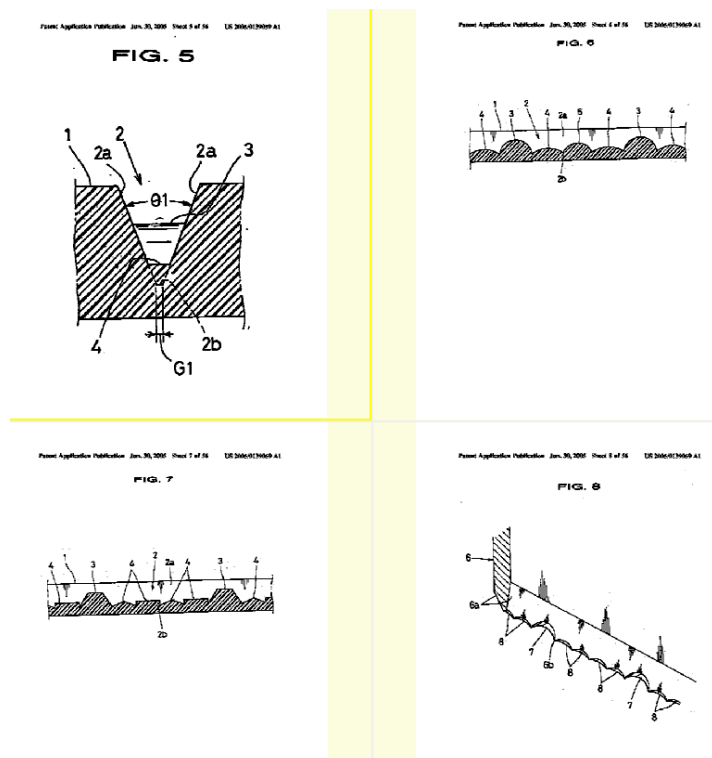
FIG. 5



Patent Application Publication Aug. 23, 2007 Sheet 5 of 5 US 2007/0197363 A1

FIG. 1





## References

### Limiting references

*This place does not cover:*

Working by laser beam, removal material, plastics	<a href="#">B23K 26/402</a>
Cutting work, making a superficial cut in the surface of the work without removal of material, e.g. scoring, incising	<a href="#">B26D 3/085</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Moulding articles characterised by the shape of the surface; moulding single grooves or ribs, e.g. tear lines	<a href="#">B29C 37/0057</a>
Vehicles, arrangements for storing air bag modules, characterised by a tear line for defining a deployment opening	<a href="#">B60R 21/2165</a>
Packages comprising tear-lines provided in a wall portion	<a href="#">B65D 75/5827</a>

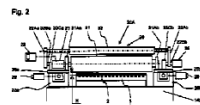
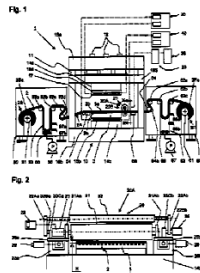
**B29C 59/02**

by mechanical means, e.g. pressing {(B29C 59/007 takes precedence;  
embossing expanded porous articles B29C 44/5627)}

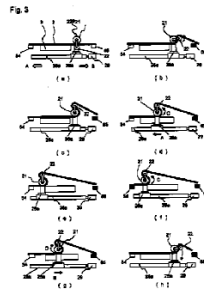
**Definition statement**

*This place covers:*

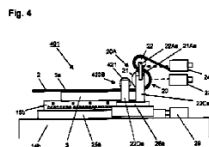
Patent Application Publication Jan. 6, 2013 Sheet 1 of 7 US 2012/0061366 A1



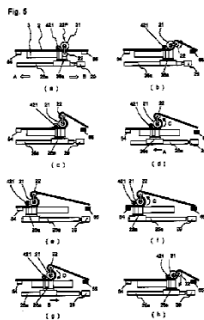
Patent Application Publication Jan. 6, 2013 Sheet 2 of 7 US 2012/0061366 A1



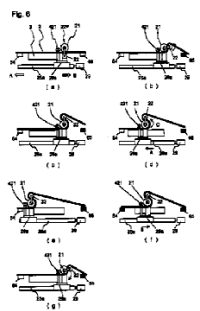
Patent Application Publication Jan. 6, 2013 Sheet 3 of 7 US 2012/0061366 A1



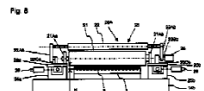
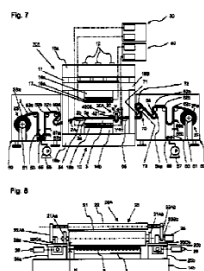
Patent Application Publication Jan. 6, 2013 Sheet 4 of 7 US 2012/0061366 A1



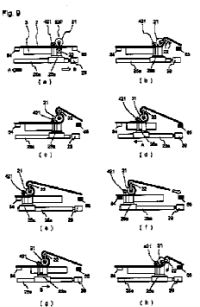
Patent Application Publication Jan. 6, 2013 Sheet 5 of 7 US 2012/0061366 A1

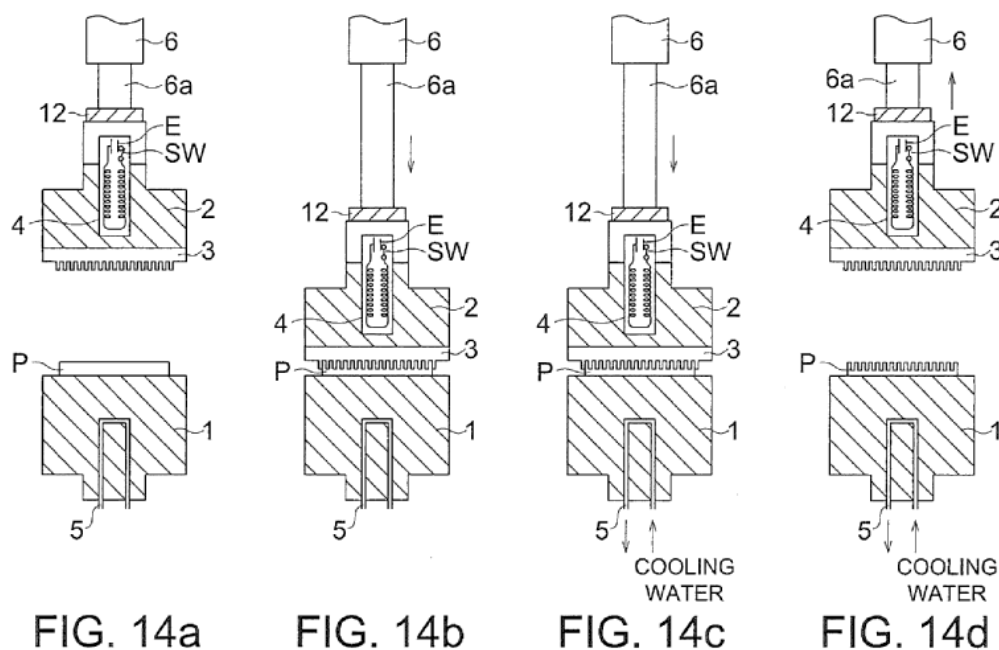


Patent Application Publication Jan. 6, 2013 Sheet 6 of 7 US 2012/0061366 A1



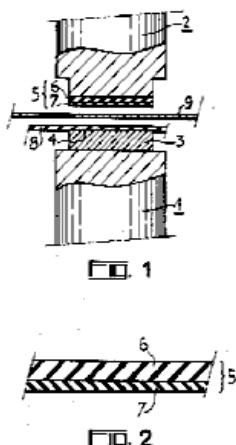
Patent Application Publication Jan. 6, 2013 Sheet 7 of 7 US 2012/0061366 A1



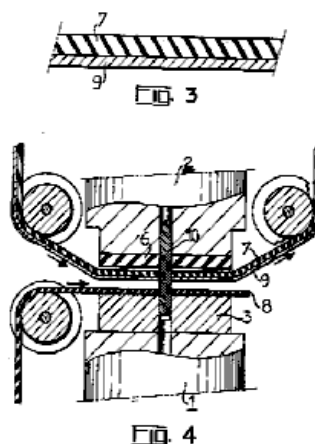


Patent Application Publication Feb. 25, 2010 Sheet 10 of 10 US 2010/0044898 A1

U.S. Patent March 23, 1976 Sheet 1 of 2 3,945,790



U.S. Patent March 23, 1976 Sheet 2 of 2 3,945,790



## References

### Limiting references

This place does not cover:

Apparatus or machines for carrying out printing operations with other operations, with embossing	<a href="#">B41F 19/02</a>
Inking and printing with a printer's forme combined with embossing	<a href="#">B41M 1/24</a>
Machines or apparatus for embossing decorations or marks, dies	<a href="#">B44B 5/026</a>
Machines or apparatus for embossing decorations or marks, heated dies	<a href="#">B44B 5/028</a>
Artists' hand tool for embossing	<a href="#">B44B 11/04</a>

Processes for producing decorative surface effects, pressing or stamping ornamental designs on surfaces	<a href="#">B44C 1/24</a>
Processes for producing ornamental structures, stamping	<a href="#">B44C 3/08</a>

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

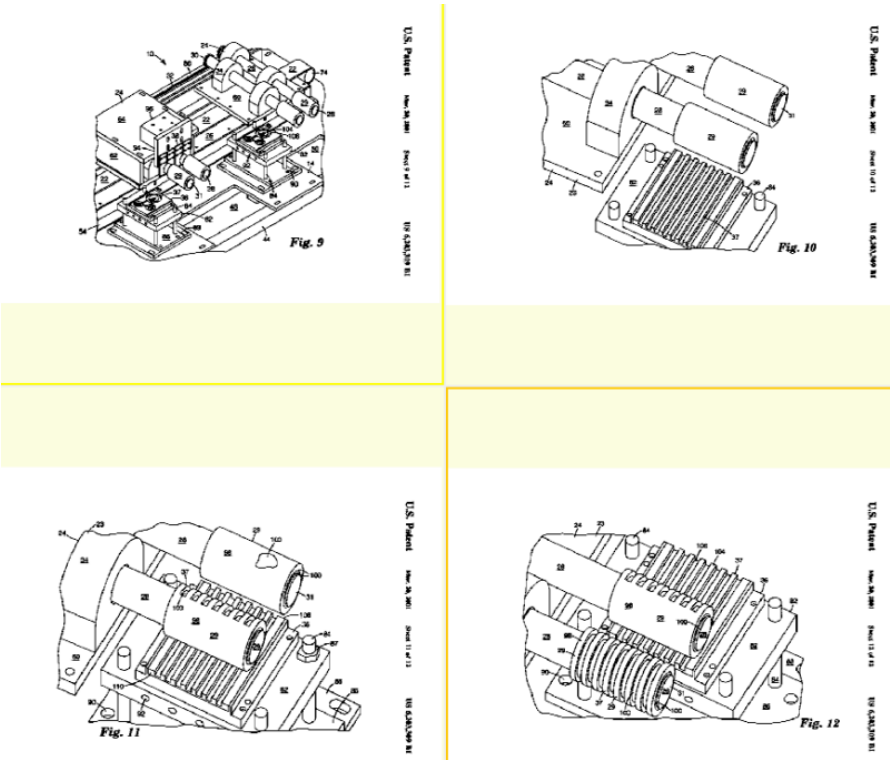
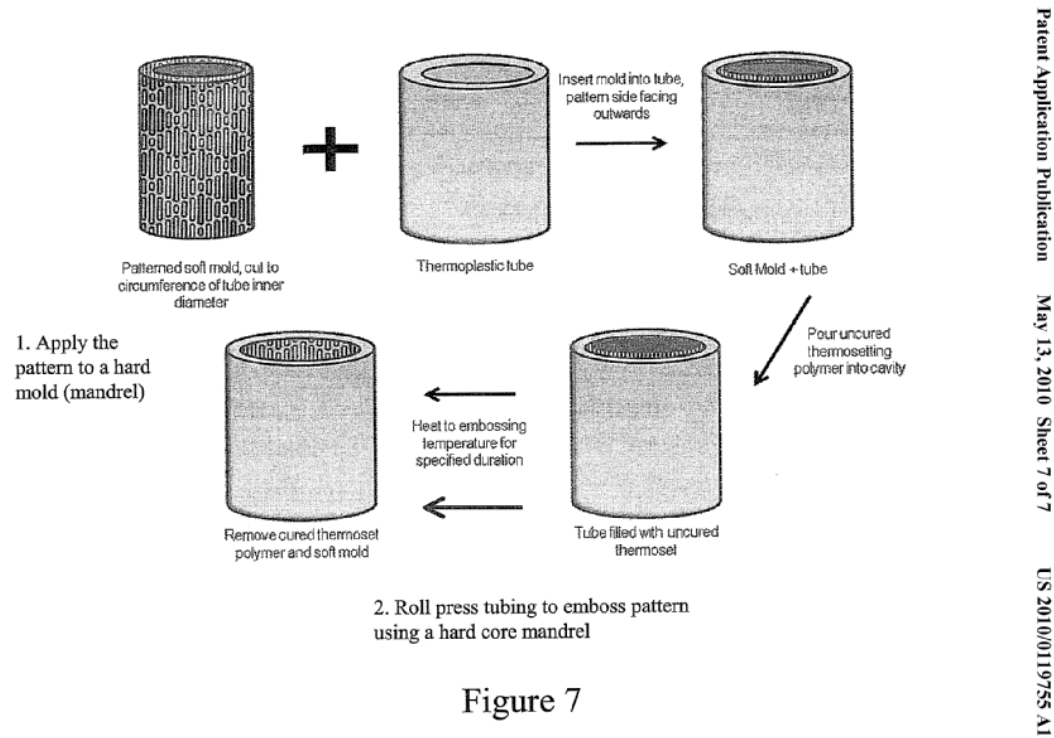
Moulds or cores characterized by the shape of the moulding surface, e.g. ribs, grooves	<a href="#">B29C 33/42</a>
Shaping by casting, making articles of definite length characterised by the shape of the surface	<a href="#">B29C 39/026</a>
Compression moulding of article of definite length characterised by the shape of the surface	<a href="#">B29C 43/021</a>
Shaping by swelling, foaming, after-treatment of articles, by mechanical deformation, e.g. embossing	<a href="#">B29C 44/5627</a>
Injection moulding, mould cavity walls provided with means for marking or patterning	<a href="#">B29C 45/372</a>
Blow moulding moulds having decorating or printing means	<a href="#">B29C 49/52</a>
Processes for manufacturing semi-permeable membranes; after-treatment of organic or inorganic membranes; mechanical after-treatment	<a href="#">B01D 67/0086</a>
Mechanical deformation of paper or cardboard, embossing	<a href="#">B31F 1/07</a>

B29C 59/021

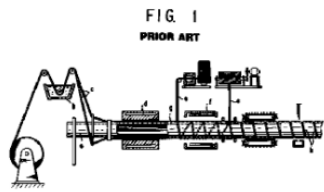
{of profiled articles, e.g. hollow or tubular articles, beams}

Definition statement

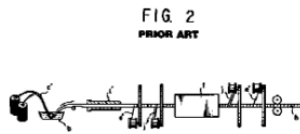
This place covers:







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Sheet 1 of 18  
5,811,051



U.S. Patent  
Apr. 22, 1998  
Sheet 2 of 18  
5,811,051

U.S. Patent  
Apr. 22, 1998  
Sheet 3 of 18  
5,811,051

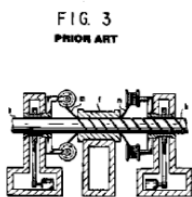
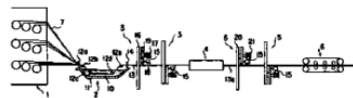


FIG. 4



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5,811,051

U.S. Patent  
Apr. 22, 1998  
Sheet 7 of 18  
5,811,051

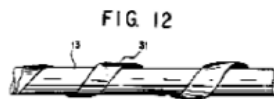


FIG. 13



FIG. 14

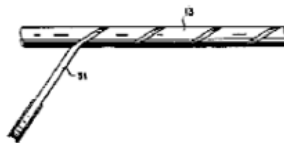


FIG. 15A



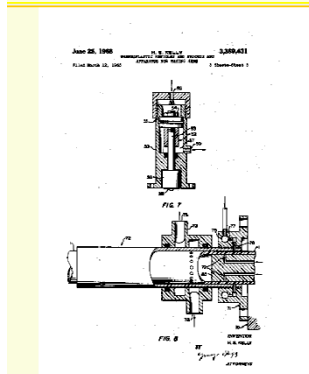
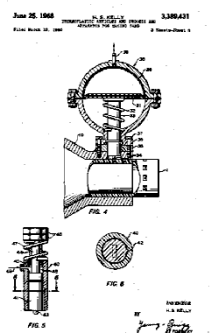
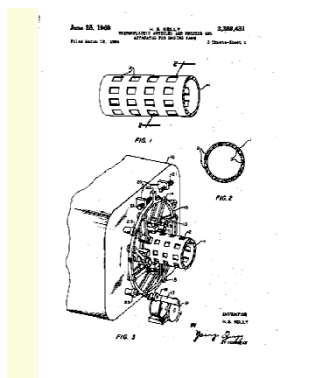
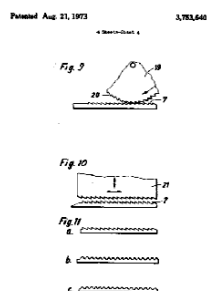
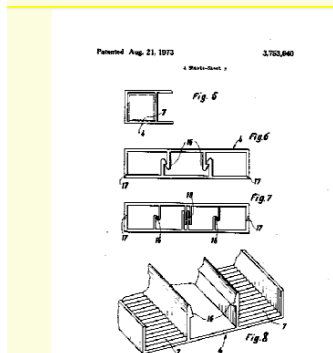
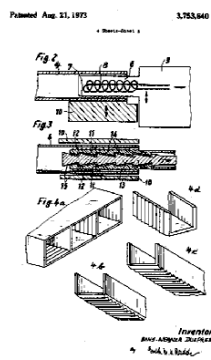
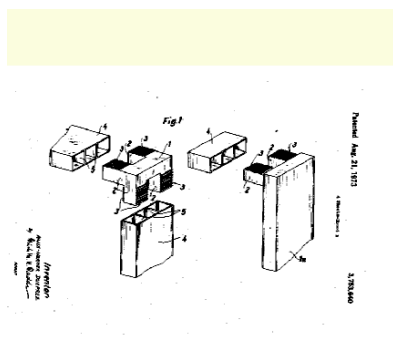
FIG. 15B



FIG. 15C



U.S. Patent  
Apr. 22, 1998  
Sheet 10 of 18  
5,811,051



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Extrusion moulding, producing hollow articles characterised by the shape of the surface, e.g. rough, irregular

[B29C 48/002](#)

**B29C 59/022**

{characterised by the disposition or the configuration, e.g. dimensions, of the embossments or the shaping tools therefor}

**Definition statement**

*This place covers:*

Patent Application Publication: Dec. 15, 2011 Sheet 1 of 13 US 2011/0145999 A1

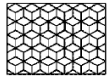


Fig. 1

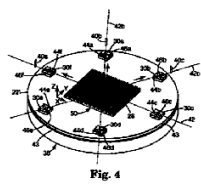


Fig. 4

Patent Application Publication: Dec. 15, 2011 Sheet 1 of 13 US 2011/0145999 A1

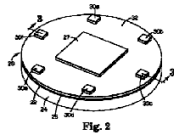


Fig. 2

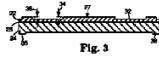


Fig. 3

Patent Application Publication: Dec. 15, 2011 Sheet 3 of 13 US 2011/0145999 A1

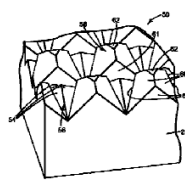


Fig. 5

Patent Application Publication: Dec. 15, 2011 Sheet 4 of 13 US 2011/0145999 A1

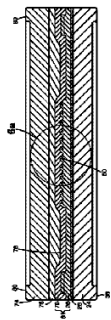


Fig. 6

Patent Application Publication: Oct. 1, 2009 Sheet 1 of 8 US 2009/0243193 A1

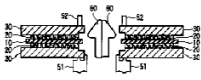


FIG. 1A

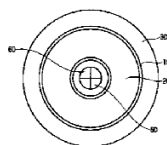


FIG. 1B

Patent Application Publication: Oct. 1, 2009 Sheet 1 of 8 US 2009/0243193 A1

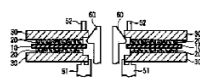


FIG. 2A

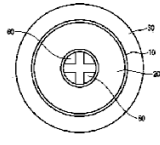


FIG. 2B

Patent Application Publication: Oct. 1, 2009 Sheet 3 of 8 US 2009/0243193 A1

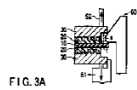


FIG. 3A

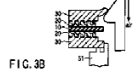


FIG. 3B

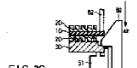


FIG. 3C

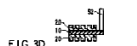


FIG. 3D

Patent Application Publication: Oct. 1, 2009 Sheet 4 of 8 US 2009/0243193 A1

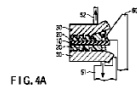


FIG. 4A

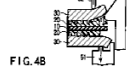


FIG. 4B

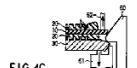


FIG. 4C

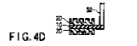
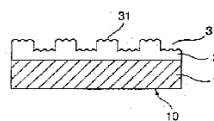


FIG. 4D

Patent Application Publication Apr. 18, 2008 Sheet 1 of 4 US 2006/0096771 A1

FIG. 1



Patent Application Publication Apr. 18, 2008 Sheet 1 of 4 US 2006/0096771 A1

FIG. 2A

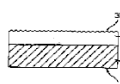


FIG. 2B

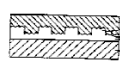
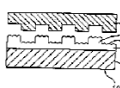


FIG. 2C



Patent Application Publication Apr. 18, 2008 Sheet 3 of 4 US 2006/0096771 A1

FIG. 3A

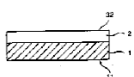
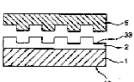


FIG. 3B



FIG. 3C



Patent Application Publication Apr. 18, 2008 Sheet 1 of 4 US 2006/0096771 A1

FIG. 4A

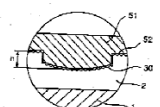
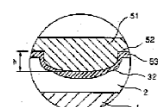


FIG. 4B



Patent Application Publication Jan. 4, 2006 Sheet 1 of 10 US 2006/000366 A1

FIG. 1



FIG. 2a



FIG. 2b



FIG. 2c



FIG. 2d



FIG. 2e



FIG. 2f



Patent Application Publication Jan. 4, 2006 Sheet 3 of 10 US 2006/000366 A1

FIG. 3a



FIG. 3b



FIG. 3c



FIG. 3d



FIG. 3e



FIG. 3f



FIG. 3g



Patent Application Publication Jan. 4, 2006 Sheet 7 of 10 US 2006/000366 A1

FIG. 7a

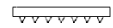


FIG. 7b

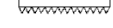


FIG. 7c

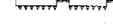


FIG. 7d

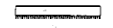


FIG. 7e



FIG. 7f

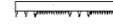


FIG. 7g



Patent Application Publication Jan. 4, 2006 Sheet 8 of 10 US 2006/000366 A1

FIG. 7h

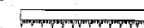


FIG. 7i

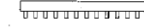


FIG. 7j

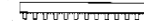


FIG. 7k

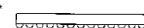


FIG. 7l

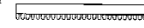


FIG. 7m

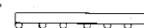
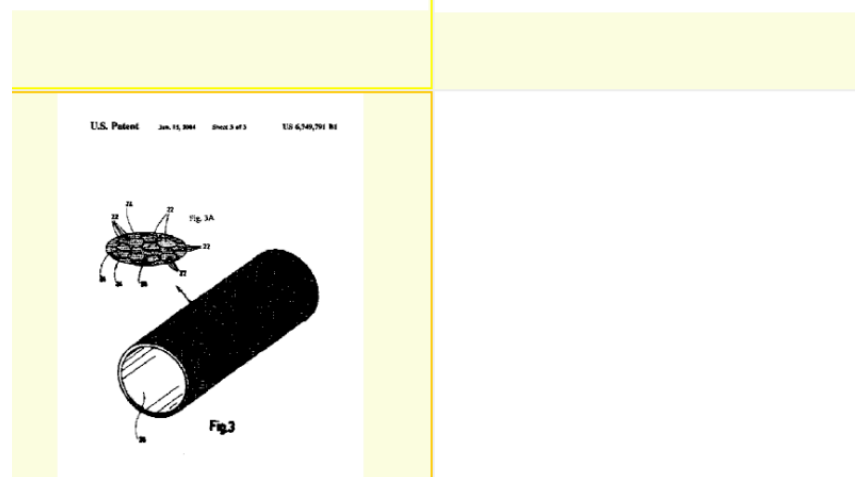
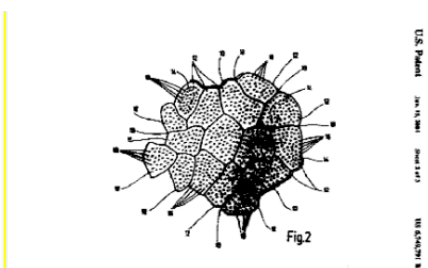
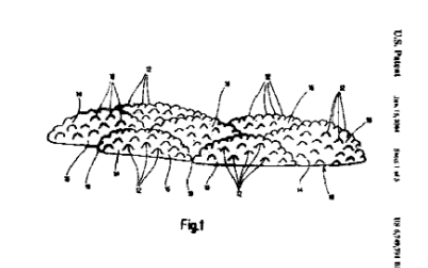
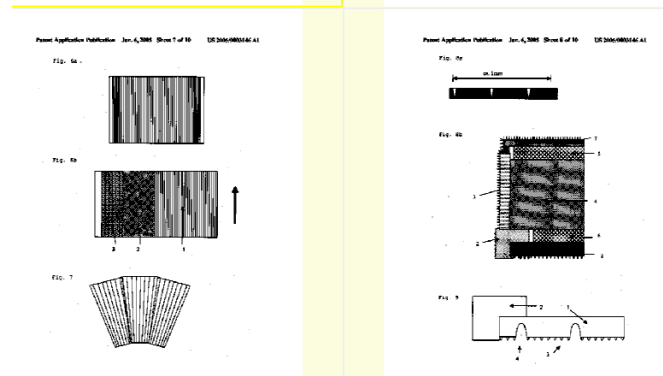
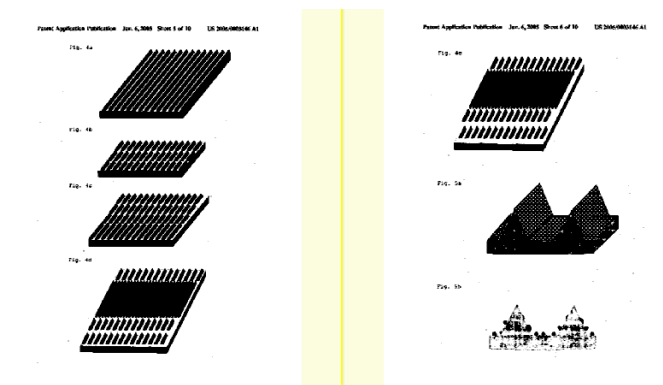
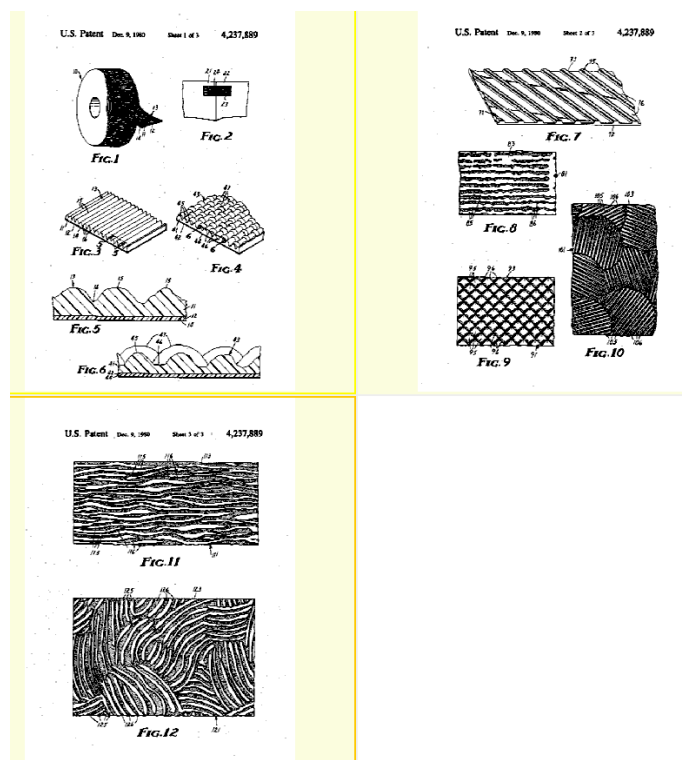


FIG. 7n





## Definition statement



## References

## Limiting references

*This place does not cover:*

Apparatus or processes specially adapted for the manufacture of record carriers, preparing and using a stamper, e.g. pressing or injection moulding substrates	<a href="#">G11B 7/263</a>
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## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

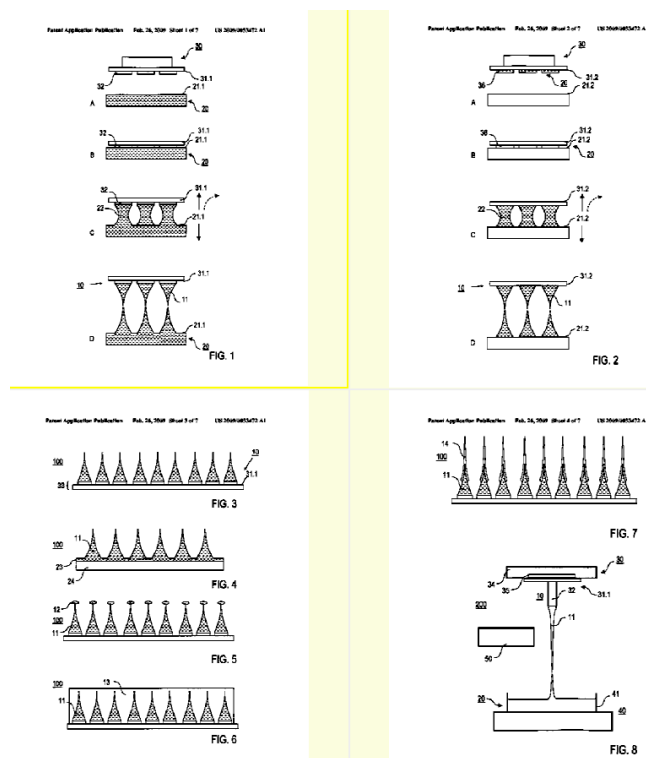
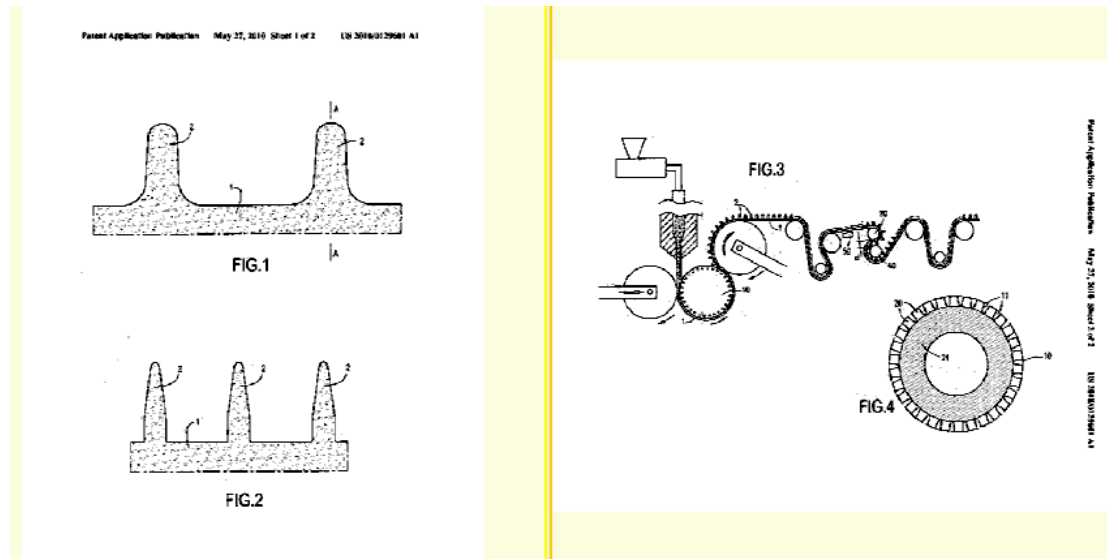
Apparatus or processes for manufacturing absorbent pads, mechanical treatment of webs, e.g. for giving them a fibre like appearance, e.g. by embossing	<a href="#">A61F 13/15731</a>
Methods preventing deposition of fouling or of dust, by giving articles subject to fouling a special shape or arrangement (e.g. lotus effect)	<a href="#">B08B 17/06</a>
Producing optical elements, e.g. lenses, prisms; optical laminates	<a href="#">B29D 11/0073</a>
Producing carriers of records containing fine grooves or impressions, producing optically read record carriers, e.g. optical discs	<a href="#">B29D 17/007</a>
Curable composition for imprints	<a href="#">C08F 2/48</a>
Holographic processes or apparatus	<a href="#">G03H 1/00</a>

**B29C 59/025**

{Fibrous surfaces with piles or similar fibres substantially perpendicular to the surface}

**Definition statement**

*This place covers:*



Patent Application Publication Feb. 24, 2005

US 2005/0039313 A1

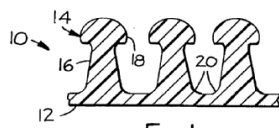


FIG. 1

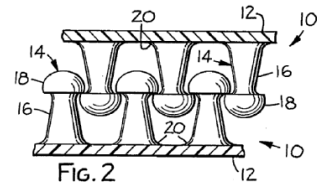


FIG. 2

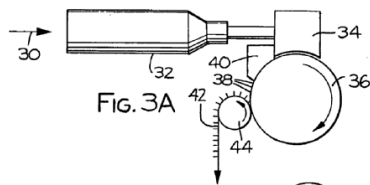


FIG. 3A

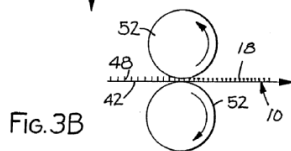


FIG. 3B

U.S. Patent Apr. 26, 1996 Sheet 1 of 4 5,744,080

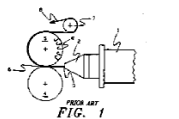


FIG. 1

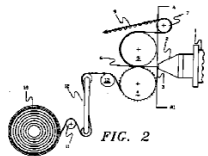


FIG. 2

U.S. Patent Apr. 26, 1996 Sheet 2 of 4 5,744,080

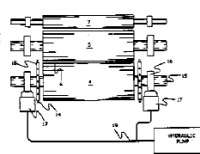


FIG. 3

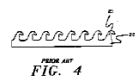
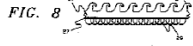
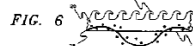


FIG. 4

U.S. Patent Apr. 26, 1996 Sheet 3 of 4 5,744,080



U.S. Patent Apr. 26, 1996 Sheet 4 of 4 5,744,080



FIG. 9

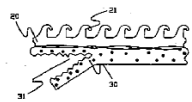
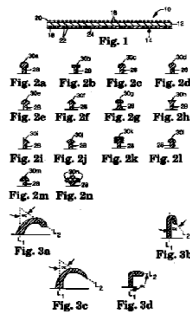


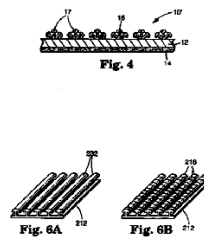
FIG. 9A



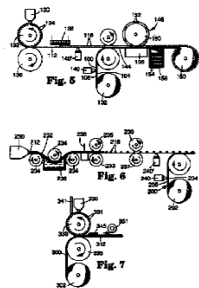
U.S. Patent Sep. 28, 1997 Sheet 1 of 3 5,672,186



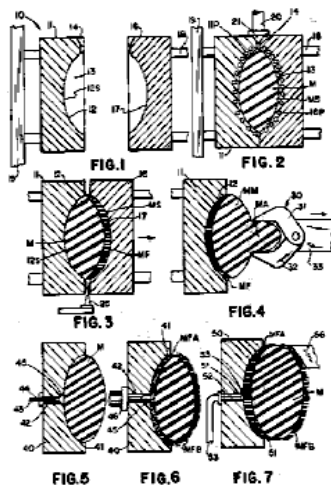
U.S. Patent Sep. 28, 1997 Sheet 2 of 3 5,672,186



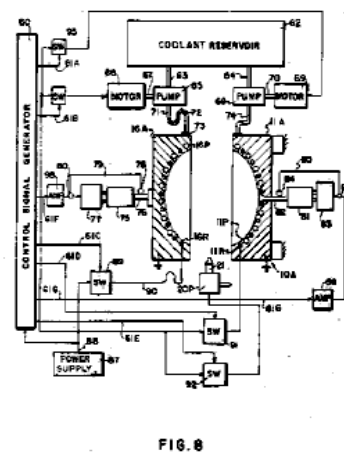
U.S. Patent Sep. 28, 1997 Sheet 3 of 3 5,672,186

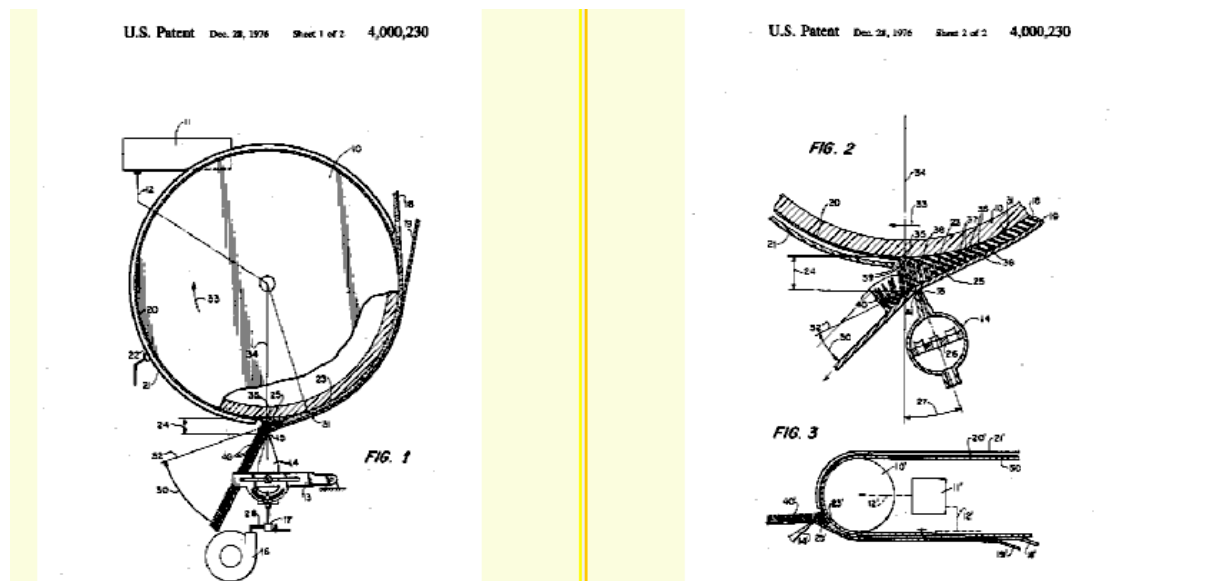


U.S. Patent Mar. 24, 1981 Sheet 1 of 2 4,257,755



U.S. Patent Mar. 24, 1981 Sheet 2 of 2 4,257,755





## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Compression moulding of articles of indefinite length, characterised by the shape of the surface	<a href="#">B29C 43/222</a>
Fasteners of the touch-and-close type; making such fasteners made integrally of plastics, obtained by moulding processes	<a href="#">A44B 18/0049</a>
Absorbent pads, topsheet characterised by its apertures, e.g. perforations	<a href="#">A61F 13/512</a>

**B29C 59/026**

**{of layered or coated substantially flat surfaces}**

## Definition statement

*This place covers:*

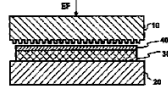
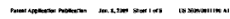


Fig 1a (Prior Art)

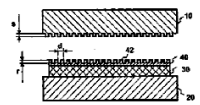


Fig 1b (Prior Art)

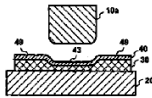
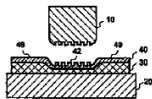
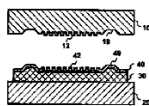


Fig 4



**Fig 5**



**Fig 8**

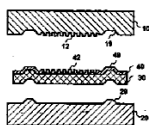
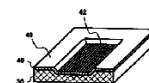


Fig 9



**Fig 12**

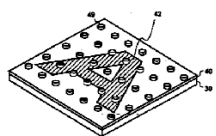


Fig 13

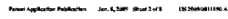
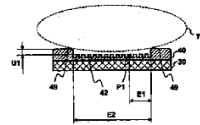
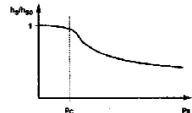
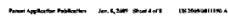


Fig 2 (Prior Art)



**Fig 3**



**Fig 6**

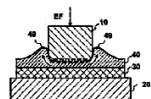
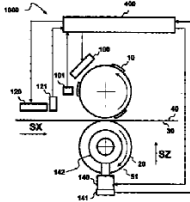


Fig 7



**Fig 10**



Fig 11

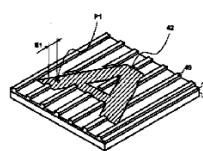


Fig 14

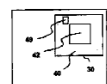
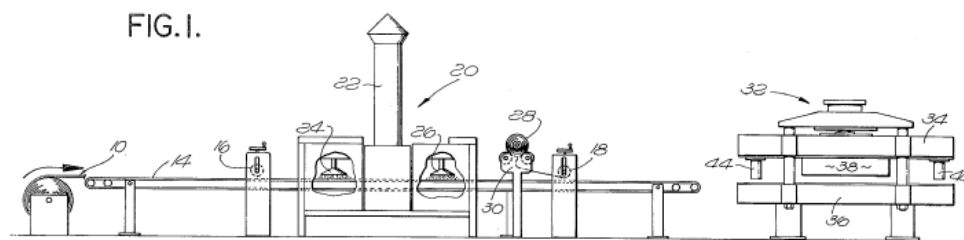


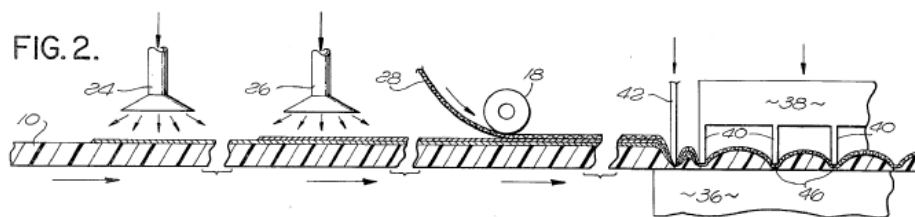
Fig 15



U.S. Patent

Apr. 22, 1980

4,199,390



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Floor covering on textile basis, e.g. PVC coatings on fibrous felt, characterised by their relief structure obtained by mechanical embossing

[D06N 7/001](#)

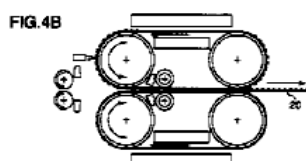
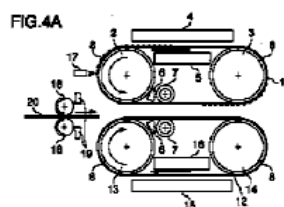
## B29C 59/04

using rollers or endless belts

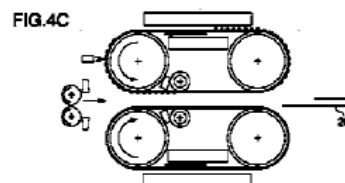
## Definition statement

This place covers:

Patent Application Publication May 11, 2011 Sheet 5 of 8 US 2011/0109011 A1



Patent Application Publication May 11, 2011 Sheet 6 of 8 US 2011/0109011 A1



Patent Application Publication Mar. 25, 2015 Sheet 1 of 5 US 2015/0070284 A1

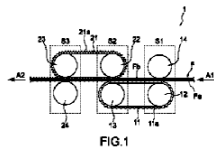


FIG. 1

Patent Application Publication Mar. 25, 2015 Sheet 2 of 5 US 2015/0070284 A1

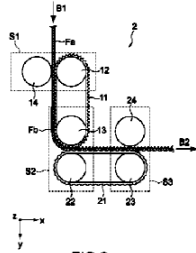


FIG. 2

Patent Application Publication Mar. 25, 2015 Sheet 3 of 5 US 2015/0070284 A1

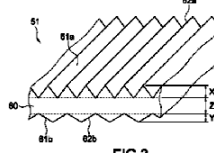


FIG. 3

Patent Application Publication Mar. 25, 2015 Sheet 4 of 5 US 2015/0070284 A1

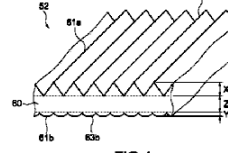


FIG. 4

Patent Application Publication Sep. 25, 2008 Sheet 1 of 7 US 2008/025961 A1

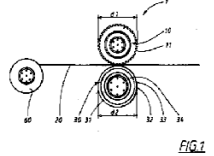


FIG. 1

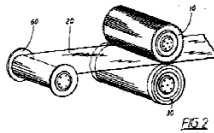


FIG. 2

Patent Application Publication Sep. 25, 2008 Sheet 2 of 7 US 2008/025961 A1

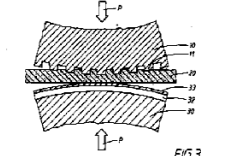


FIG. 3

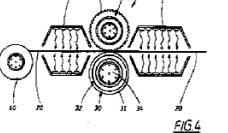


FIG. 4

Patent Application Publication Sep. 25, 2008 Sheet 3 of 7 US 2008/025961 A1

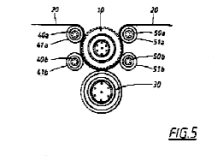


FIG. 5

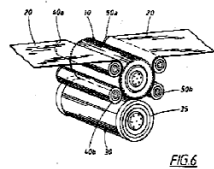


FIG. 6

Patent Application Publication Sep. 25, 2008 Sheet 4 of 7 US 2008/025961 A1

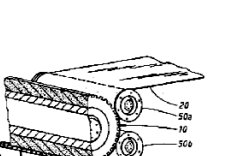


FIG. 7

Patent Application Publication Nov. 3, 2005 Sheet 5 of 7 US 2005/0244614 A1

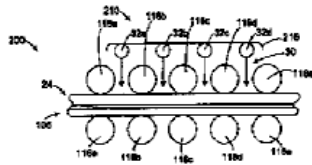


FIG. 8

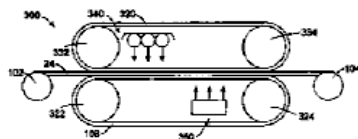


FIG. 9

Patent Application Publication Nov. 3, 2005 Sheet 6 of 7 US 2005/0244614 A1

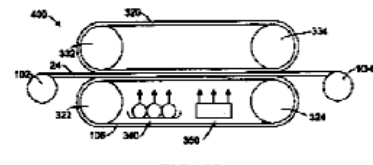


FIG. 10

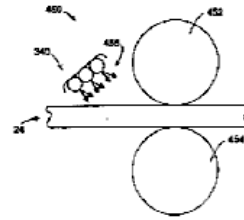


FIG. 10A

Patent Application Publication Nov. 3, 2005 Sheet 10 of 11 US 2005/0244614 A1

FIG. 12

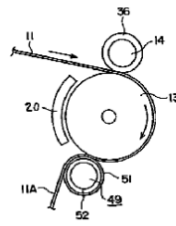


FIG. 11

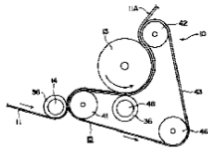


FIG. 13

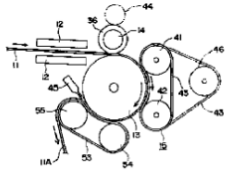
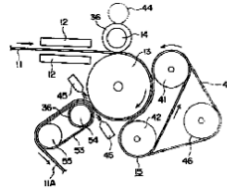
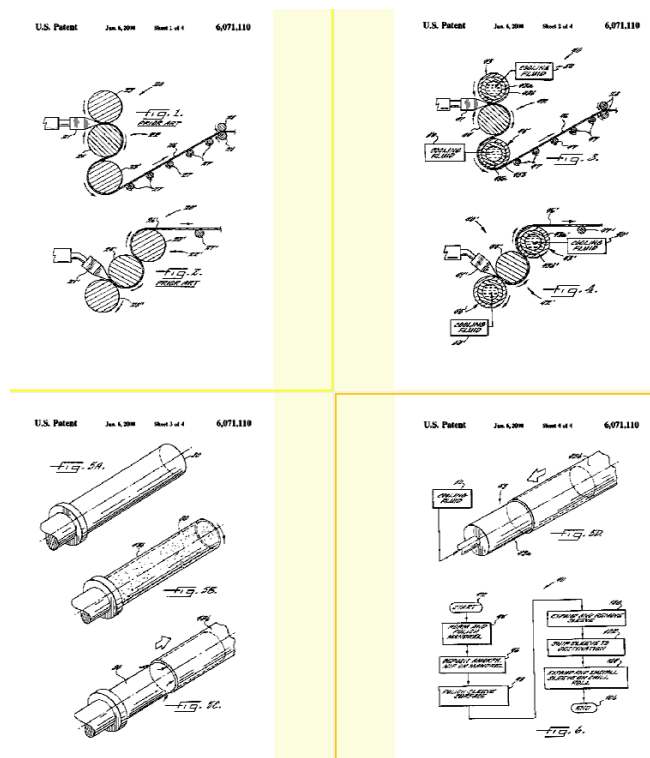


FIG. 14





## References

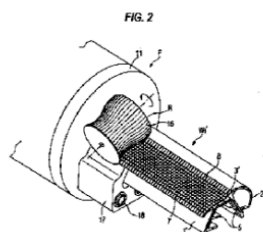
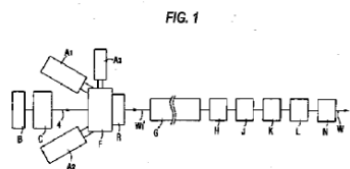
### Informative references

Attention is drawn to the following places, which may be of interest for search:

Compression moulding of articles of indefinite length, characterised by the shape of the surface	<a href="#">B29C 43/222</a>
Fasteners of the touch-and-close type; making such fasteners made integrally of plastics, obtained by moulding processes	<a href="#">A44B 18/0049</a>
Absorbent pads, topsheet characterised by its apertures, e.g. perforations	<a href="#">A61F 13/512</a>

**B29C 59/043**

{for profiled articles}

**Definition statement***This place covers:*

Patent Application Publication Aug. 26, 2009 Sheet 3 of 10 10 2009/0156000 A1

FIG. 3

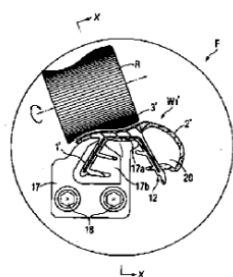
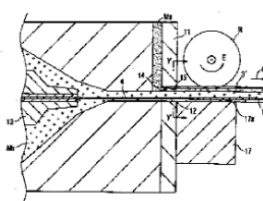
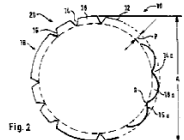
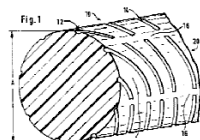


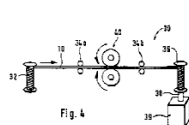
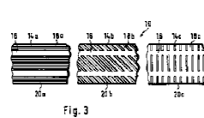
FIG. 4



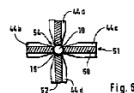
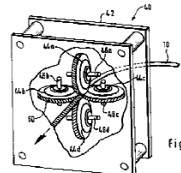
U.S. Patent Dec. 12, 2009 Sheet 1 of 2 6,117,363



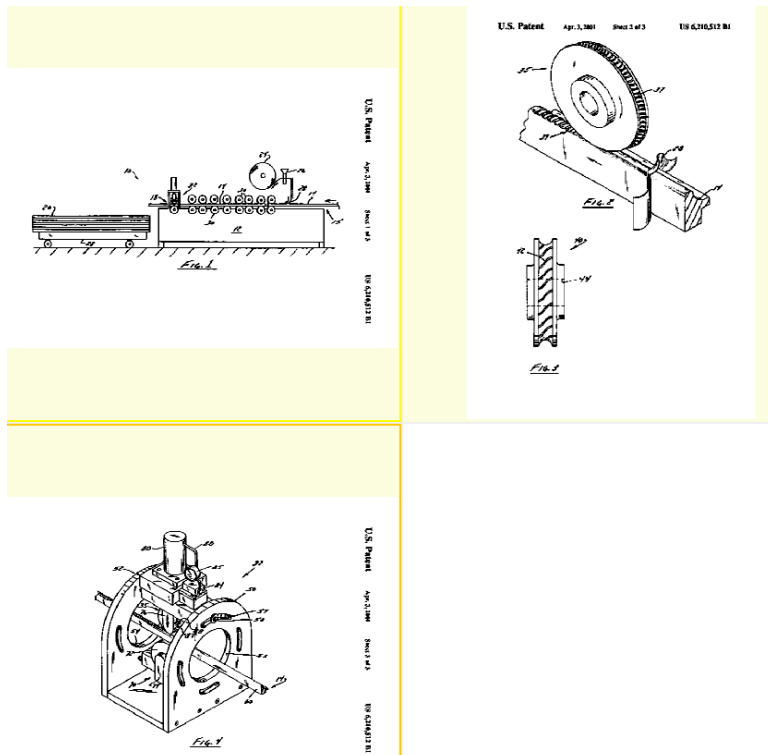
U.S. Patent Dec. 12, 2009 Sheet 1 of 2 6,117,363



U.S. Patent Dec. 12, 2009 Sheet 3 of 3 6,117,363





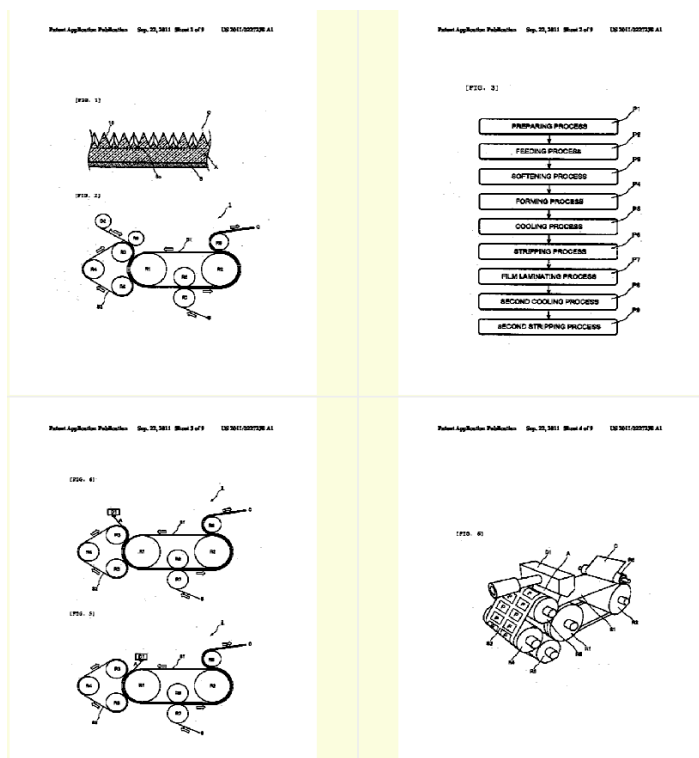


## B29C 59/046

{for layered or coated substantially flat surfaces}

### Definition statement

This place covers:



Patent Application Publication No. 14, 2009 Sheet 13 of 14 US 2009/017330 A1

FIG. 21



FIG. 22

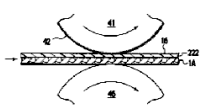
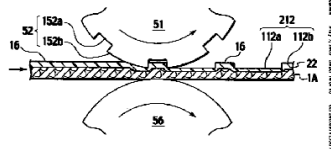


FIG. 23



Patent Application Publication No. 14, 2009 Sheet 14 of 14 US 2009/017330 A1

FIG. 24



FIG. 25

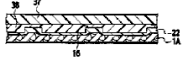
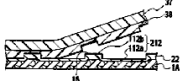


FIG. 26



Patent Application Publication No. 14, 2009 Sheet 15 of 14 US 2009/017330 A1

FIG. 27

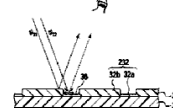


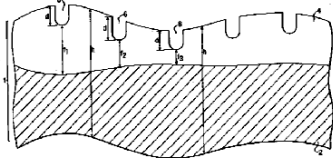
FIG. 28

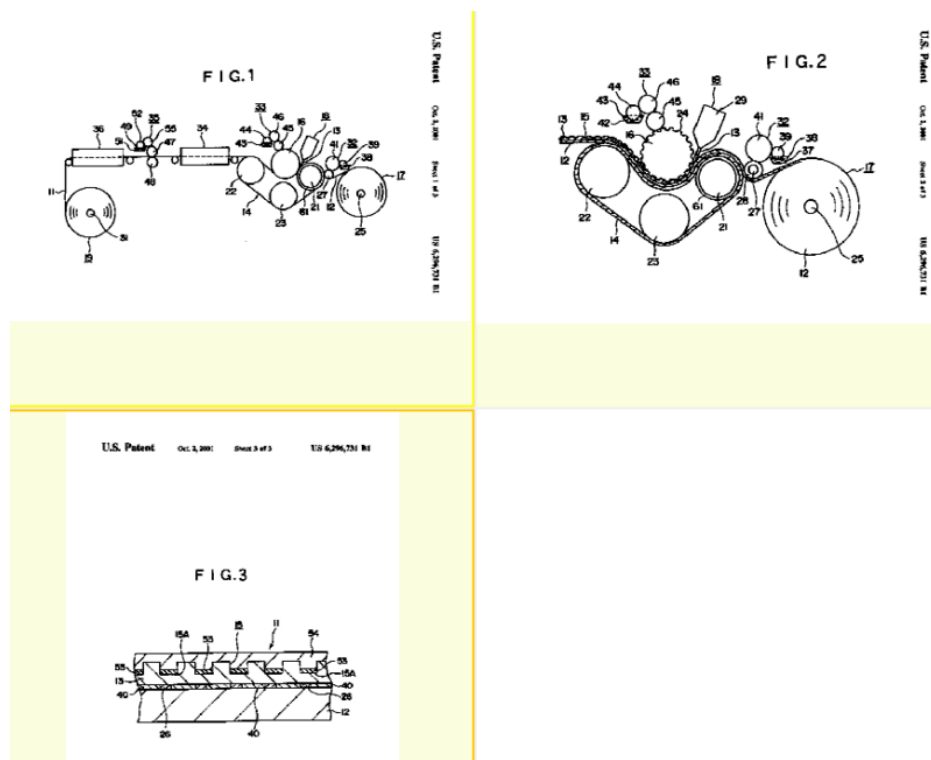


FIG. 29



Fig.1





## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

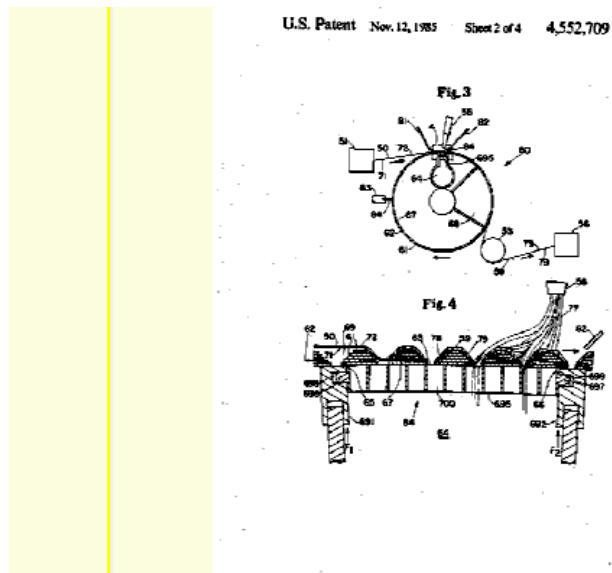
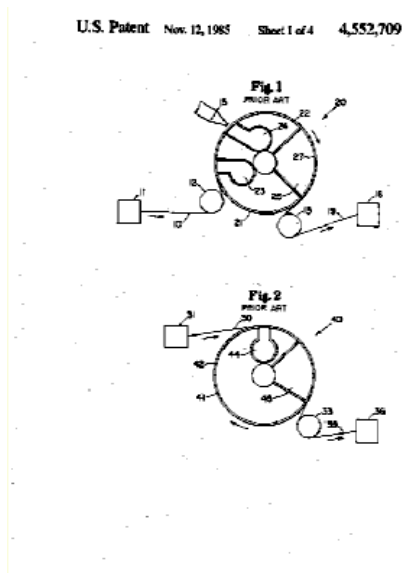
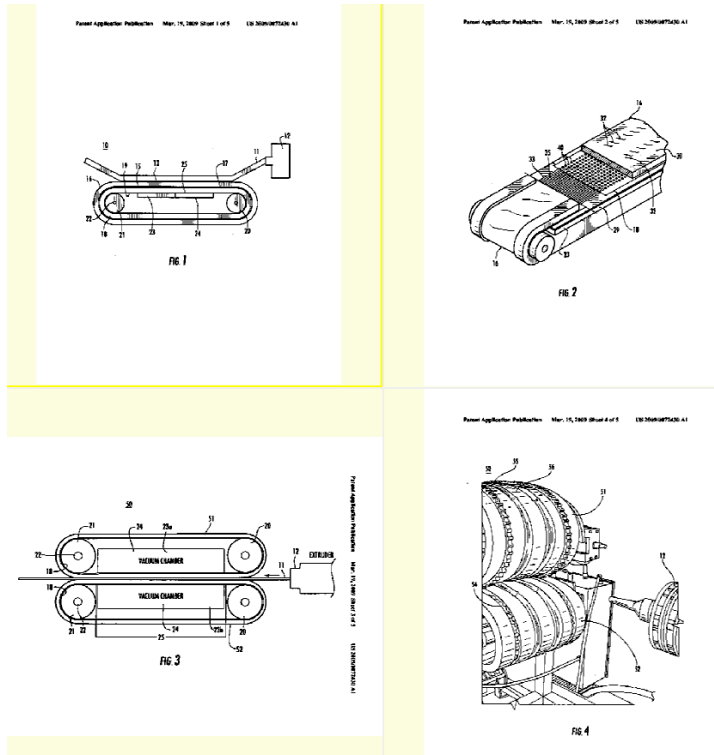
Producing optical elements, e.g. lenses, prisms; optical laminates	<a href="#">B29D 11/0073</a>
Ancillary operations in connection with laminating processes, embossing	<a href="#">B32B 38/06</a>

**B29C 59/06**

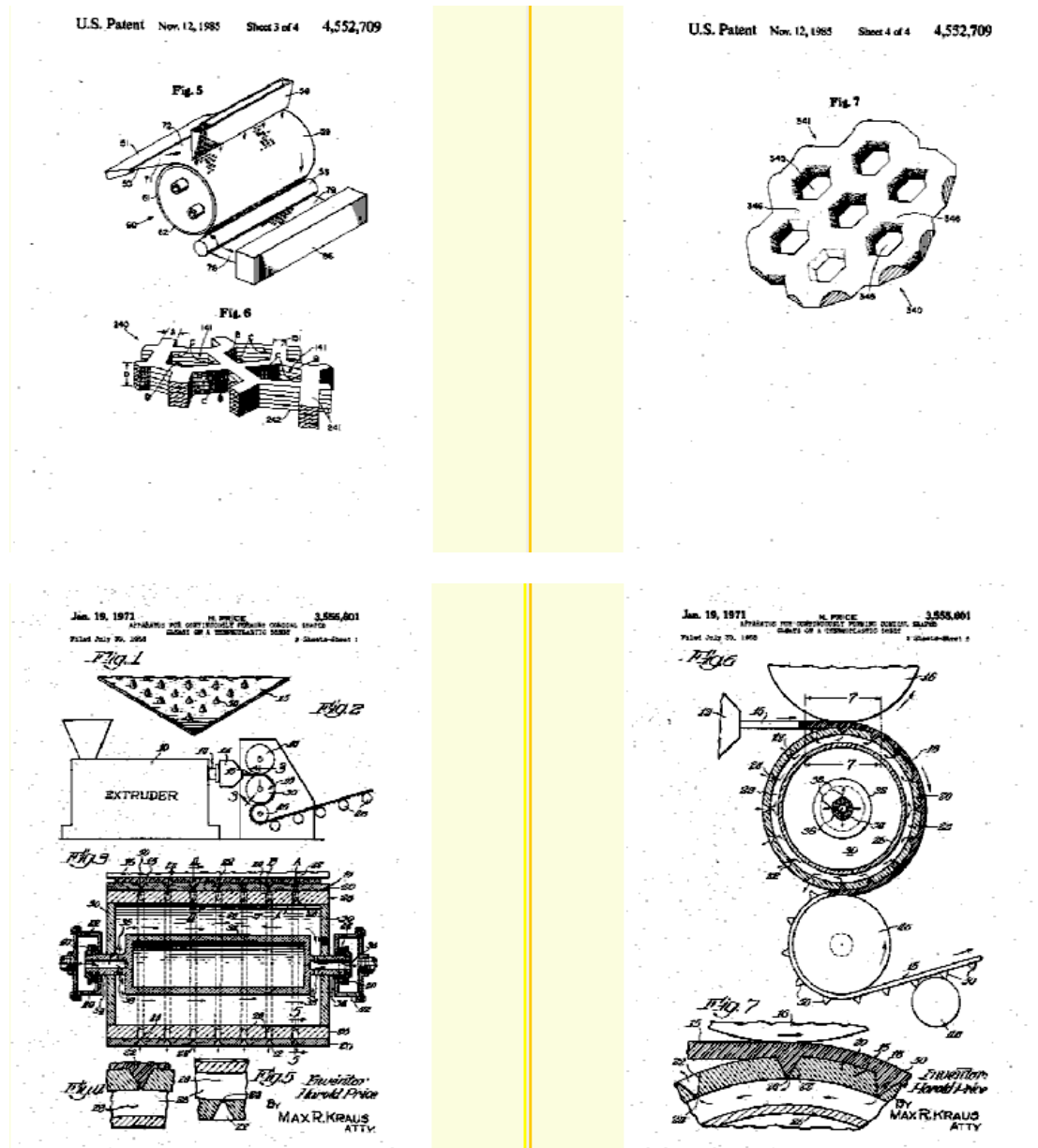
using vacuum drums {(for thermoforming [B29C 51/225](#))}

**Definition statement**

*This place covers:*



### Definition statement



## References

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

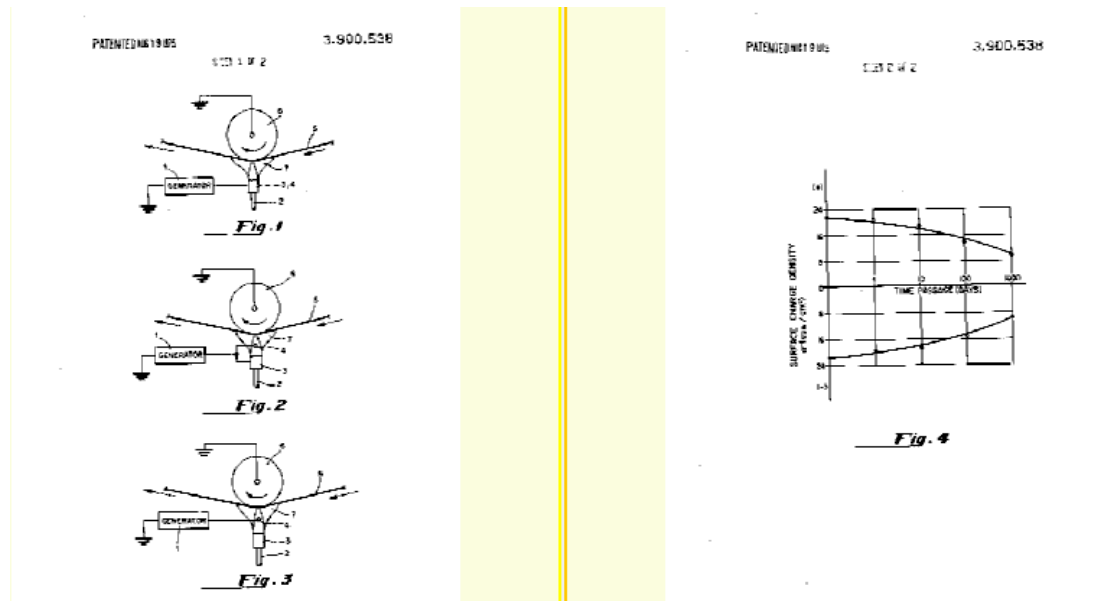
Apparatus or processes for manufacturing absorbent pads, mechanical treatment of webs, e.g. for giving them a fibre like appearance, e.g. by embossing	<a href="#">A61F 13/15731</a>
Perforating by non-mechanical means, e.g. by fluid jet	<a href="#">B26F 1/26</a>

**B29C 59/08**

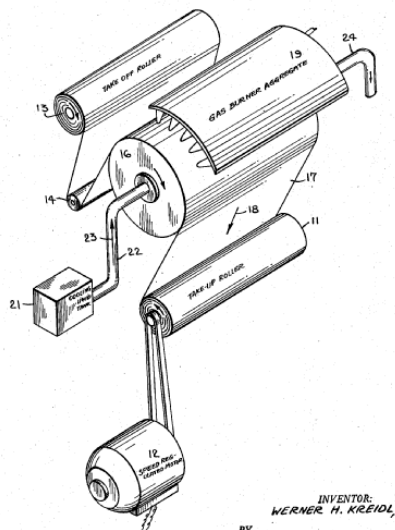
**by flame treatment {; using hot gases}**

## Definition statement

*This place covers:*



March 31, 1953 W. H. KREIDL 2,632,921  
METHOD FOR IMPROVING THE BONDING PROPERTIES  
OF POLYETHYLENE PLASTICS  
Filed Jan. 18, 1949



## References

### Limiting references

*This place does not cover:*

Pretreatment of surfaces to which liquids or fluent materials are to be applied; by flame	<a href="#">B05D 3/08</a>
---	---------------------------

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

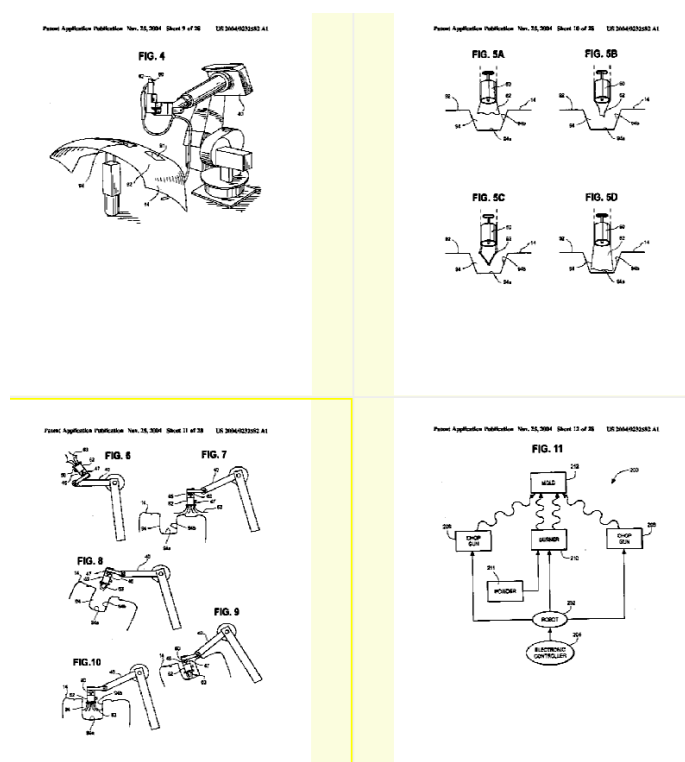
Inking and printing with a printer's forme; printing on plastics, using mechanical, physical or chemical means, e.g. corona discharge, etching or organic solvents, to improve ink retention	<a href="#">B41M 1/305</a>
--	----------------------------

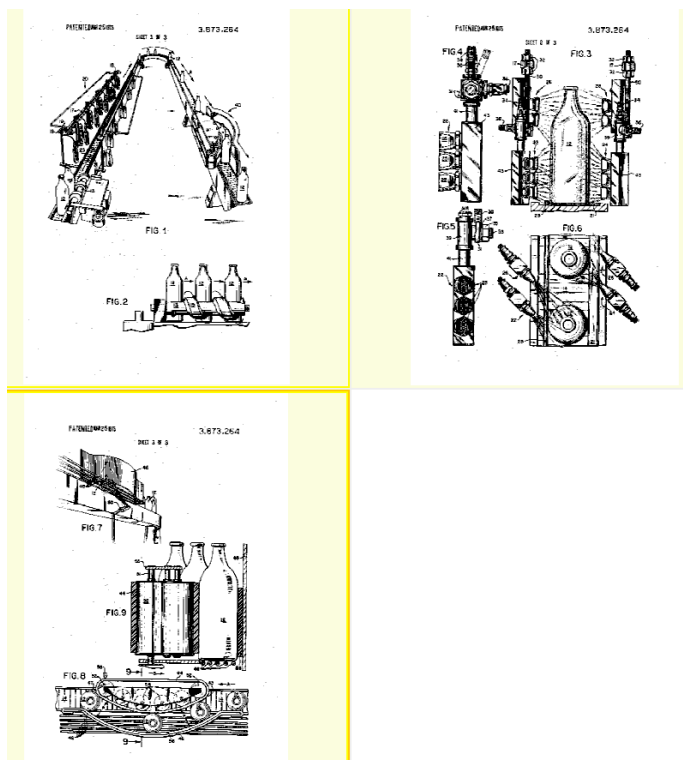
## B29C 59/085

{of profiled articles, e.g. hollow or tubular articles}

### Definition statement

*This place covers:*



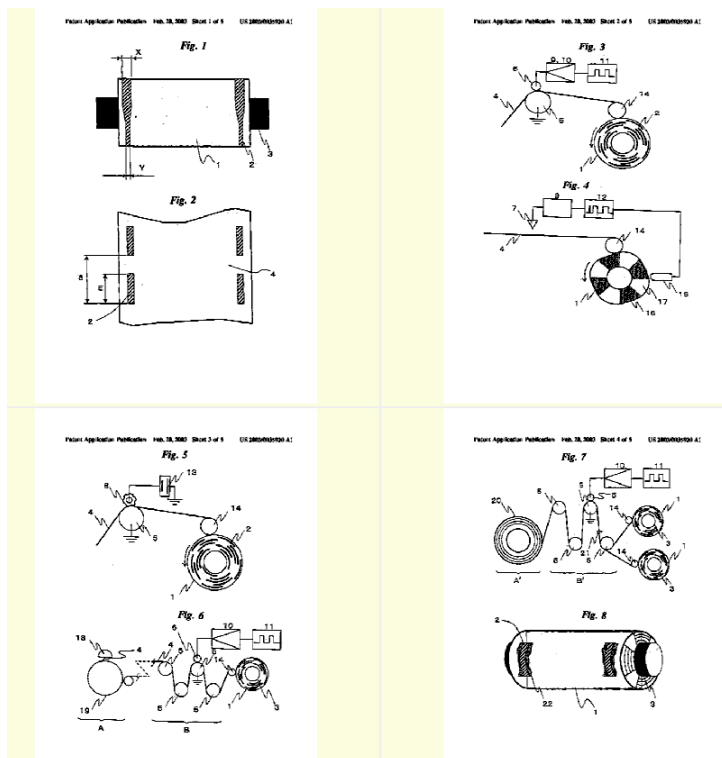


## B29C 59/10

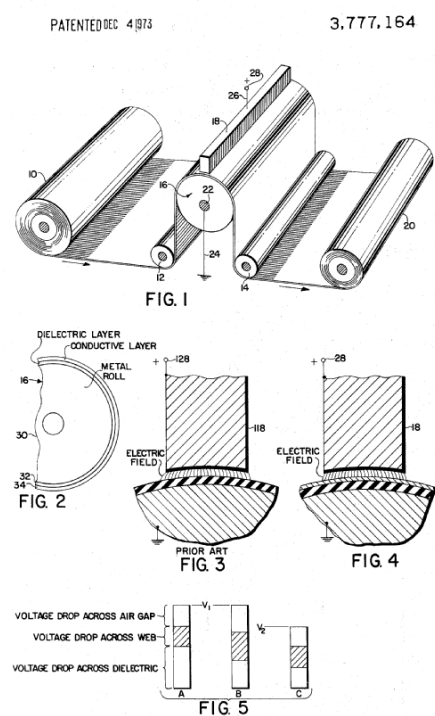
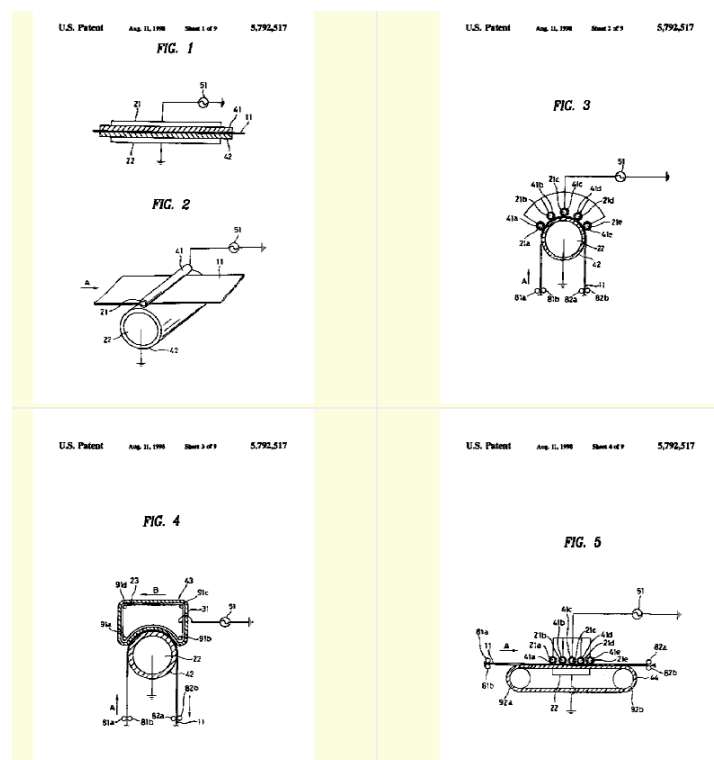
by electric discharge treatment

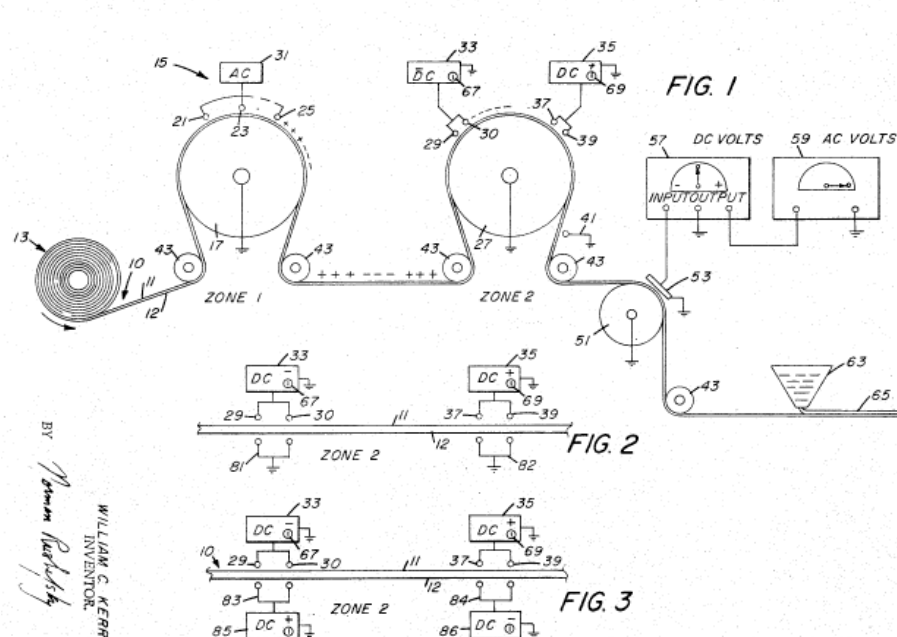
### Definition statement

*This place covers:*









May 1, 1973

W. C. KERR  
METHOD FOR TREATING A WEB  
Filed July 30, 1971

3,730,753

## References

### Limiting references

This place does not cover:

Pretreatment of surfaces to which liquids or fluent materials are to be applied; by electrical means	<a href="#">B05D 3/14</a>
Inking and printing with a printer's forme; printing on plastics, using mechanical, physical or chemical means, e.g. corona discharge, etching or organic solvents, to improve ink retention	<a href="#">B41M 1/305</a>

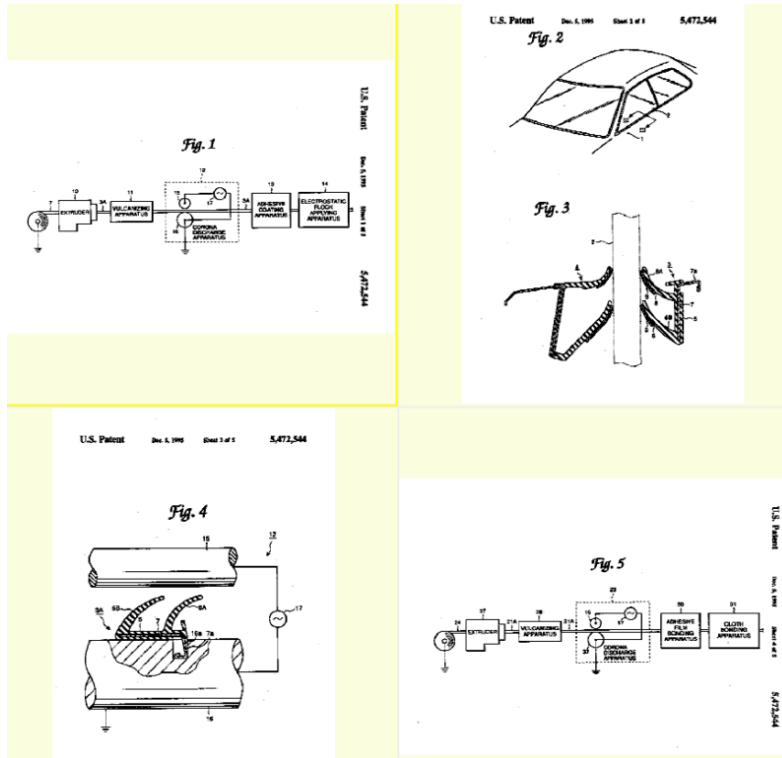
### Informative references

Attention is drawn to the following places, which may be of interest for search:

Physical treatment of fibres, threads, yarns, fabrics, of fibrous goods; corona discharge, low temperature plasma	<a href="#">D06M 10/025</a>
Devices providing for corona discharge	<a href="#">H01T 19/00</a>
Devices providing for corona discharge, corona rings	<a href="#">H01T 19/02</a>
Devices providing for corona discharge, having pointed electrodes	<a href="#">H01T 19/04</a>

**B29C 59/103**

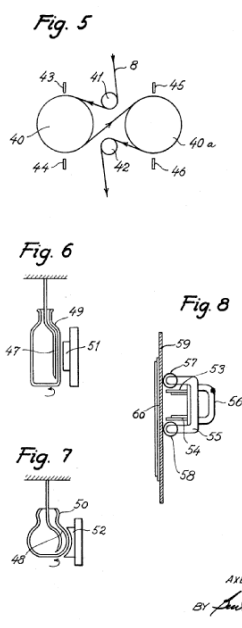
{of profiled articles, e.g. hollow or tubular articles}

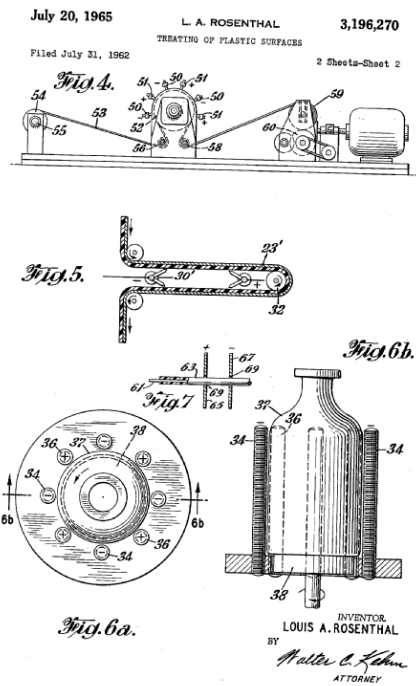
**Definition statement***This place covers:*

PATENTED JUN 6 1972

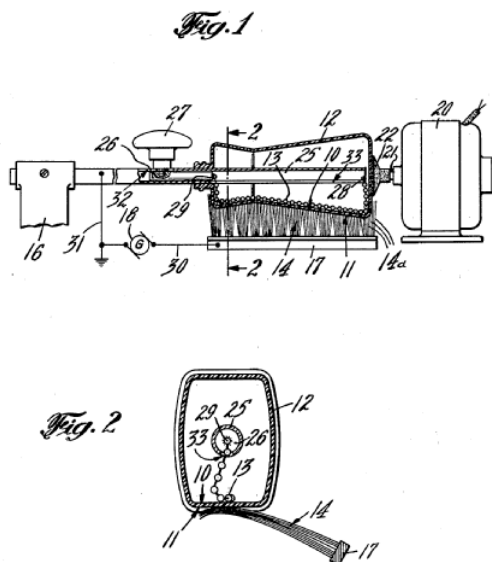
SHEET 3 OF 3

3,668,097





May 11, 1965 R. BRANDT ETAL 3,183,352  
CORONA TREATING OF SHAPED ARTICLES  
Filed Nov. 23, 1960

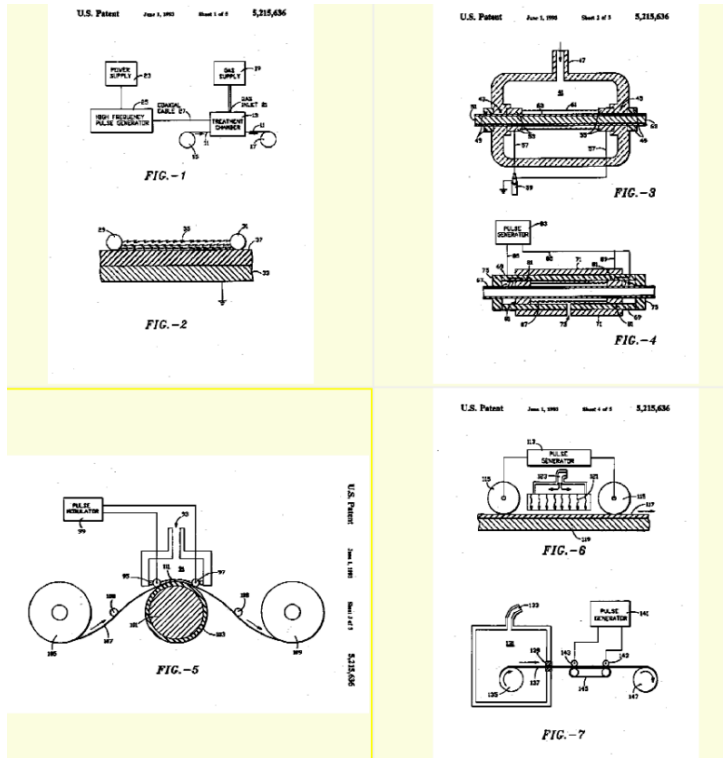


**B29C 59/106**

{the electrodes being placed on the same side of the material to be treated}

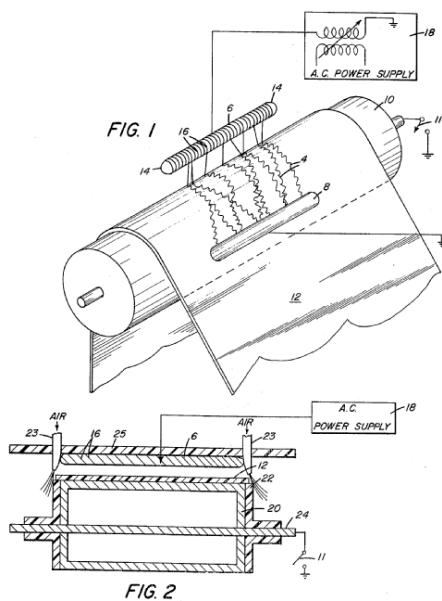
**Definition statement**

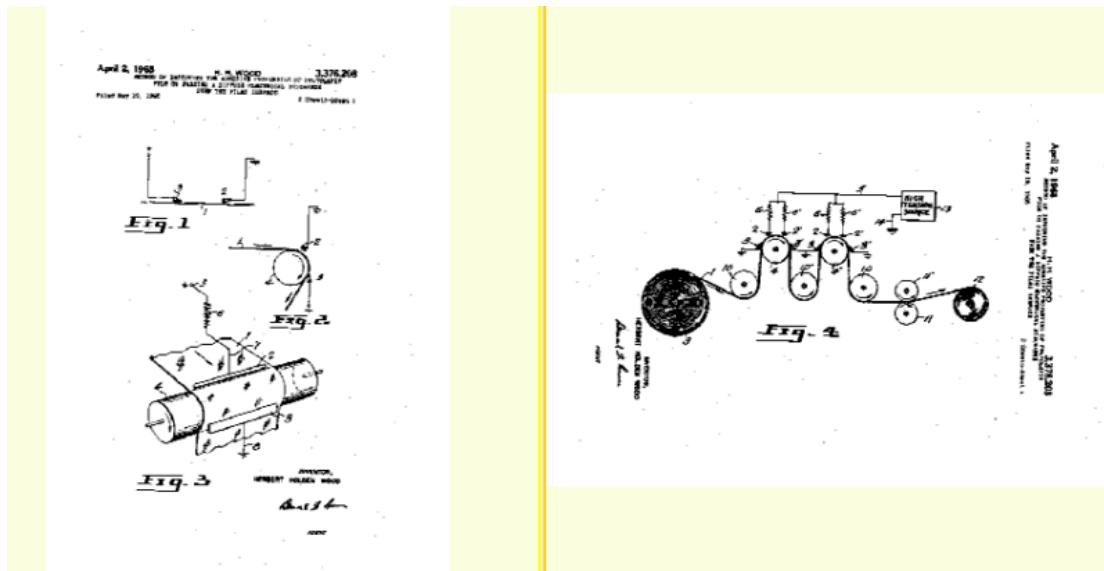
This place covers:



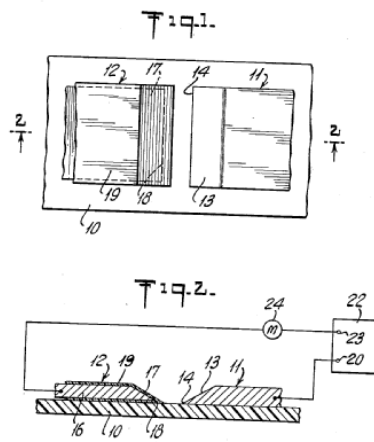
PATENTED JUN 10 1975

3,888,753





June 2, 1964  
F. N. ROTHACKER  
3,135,676  
MATERIAL TREATMENT METHOD AND APPARATUS  
Filed Nov. 8, 1960



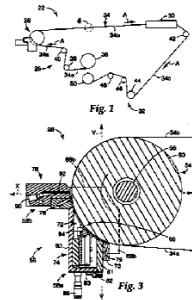
**B29C 59/12**

in an environment other than air

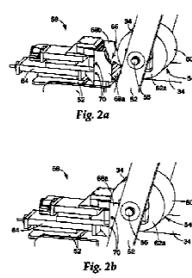
**Definition statement**

*This place covers:*

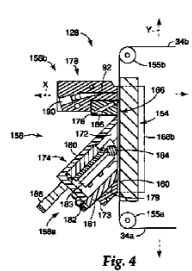
Patent Application Publication: US 2007/0130877 Sheet 1 of 4 1:0 2007/0130877 A1



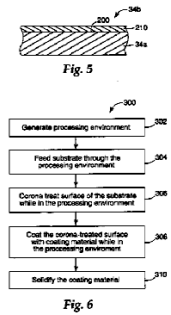
Patent Application Publication: US 2007/0130877 Sheet 2 of 4 1:0 2007/0130877 A1



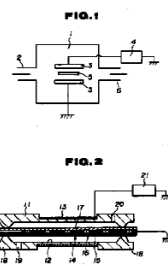
Patent Application Publication: US 2007/0130877 Sheet 3 of 4 1:0 2007/0130877 A1



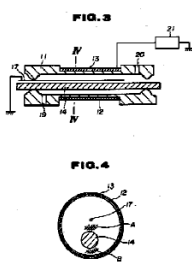
Patent Application Publication: US 2007/0130877 Sheet 4 of 4 1:0 2007/0130877 A1



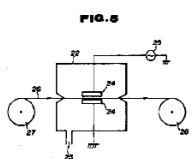
U.S. Patent: June 30, 1999 Sheet 1 of 4 5,425,832



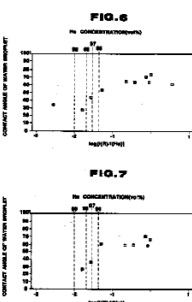
U.S. Patent: June 30, 1999 Sheet 1 of 4 5,425,832



U.S. Patent: June 30, 1999 Sheet 2 of 4 5,425,832



U.S. Patent: June 30, 1999 Sheet 4 of 4 5,425,832

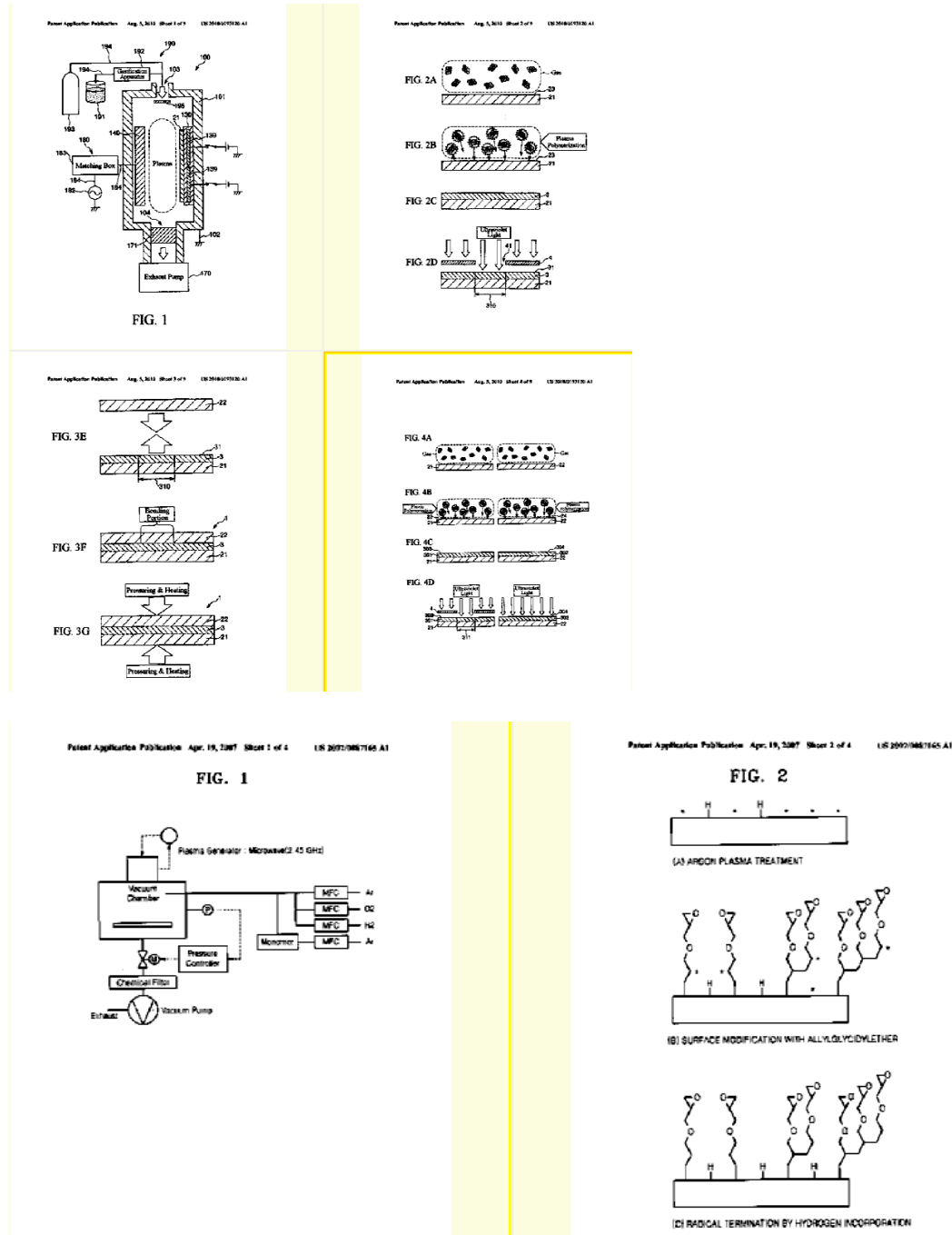


**B29C 59/14**

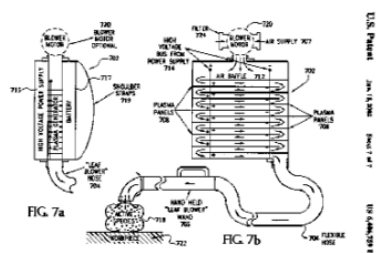
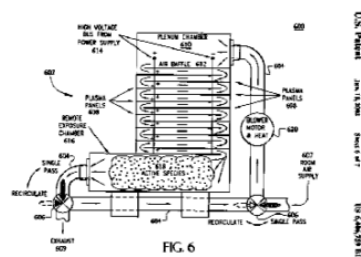
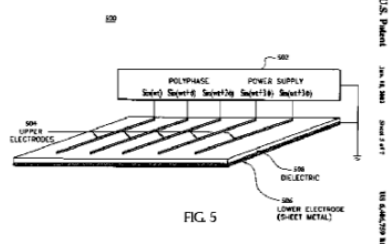
by plasma treatment {(plasma tubes per se [H01J](#))}

**Definition statement**

*This place covers:*







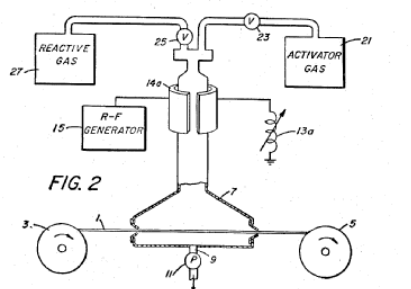
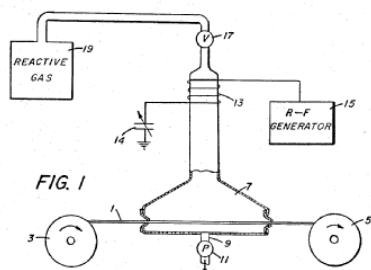
Sept. 25, 1973

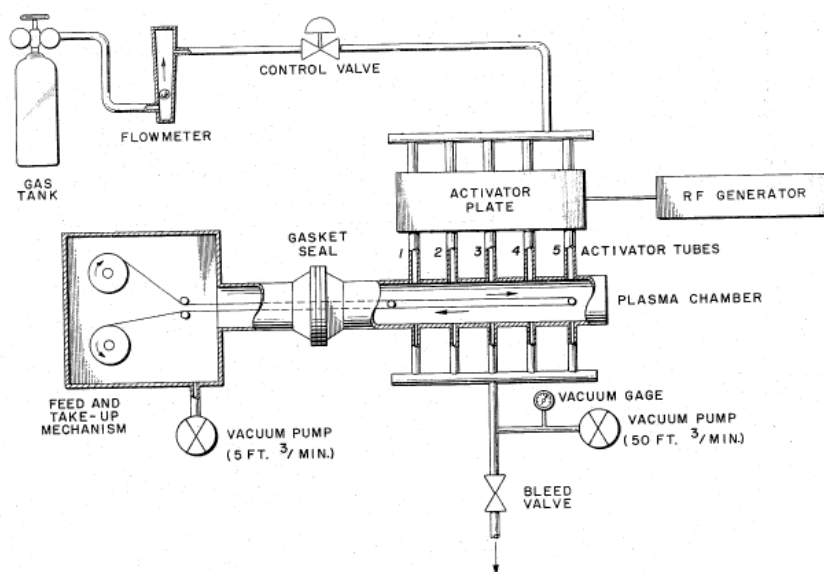
D. D. LIDEL

**3,761,299**

TREATING POLYMERIC SURFACES

Filed Oct. 13, 1970





PATENTED DEC 10 1974

3,853,657

## References

### Limiting references

*This place does not cover:*

Processes, other than flocking for applying particular liquids or other fluent materials; plasma deposition of organic layers	<a href="#">B05D 1/62</a>
Pretreatment of surfaces to which liquids or fluent materials are to be applied; plasma treatment, pretreatment of polymeric substrates	<a href="#">B05D 3/144</a>
Apparatus or processes for manufacturing printed circuits; etching the insulating substrate by plasma etching	<a href="#">H05K 3/0041</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

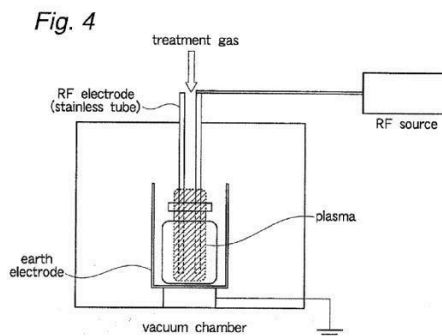
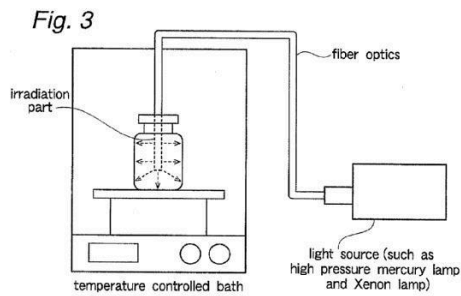
Processes for manufacturing semi-permeable membranes; after-treatment of organic or inorganic membranes; with wave-energy, particle radiation or plasma	<a href="#">B01D 67/009</a>
Physical treatment of fibres, threads, yarns, fabrics, of fibrous goods; corona discharge, low temperature plasma	<a href="#">D06M 10/025</a>

**B29C 59/142**

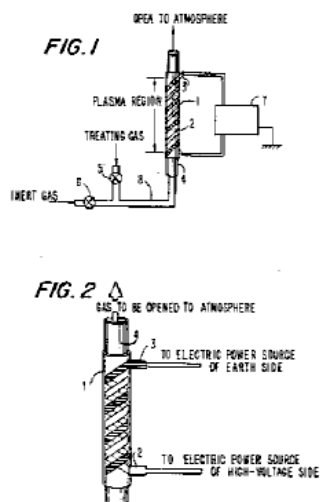
{of profiled articles, e.g. hollow or tubular articles}

**Definition statement***This place covers:*

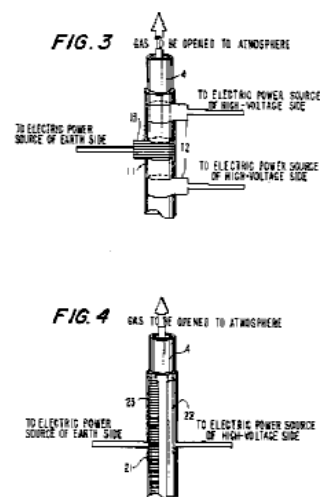
Patent Application Publication May 15, 2008 Sheet 2 of 2 US 2008/0110852 A1

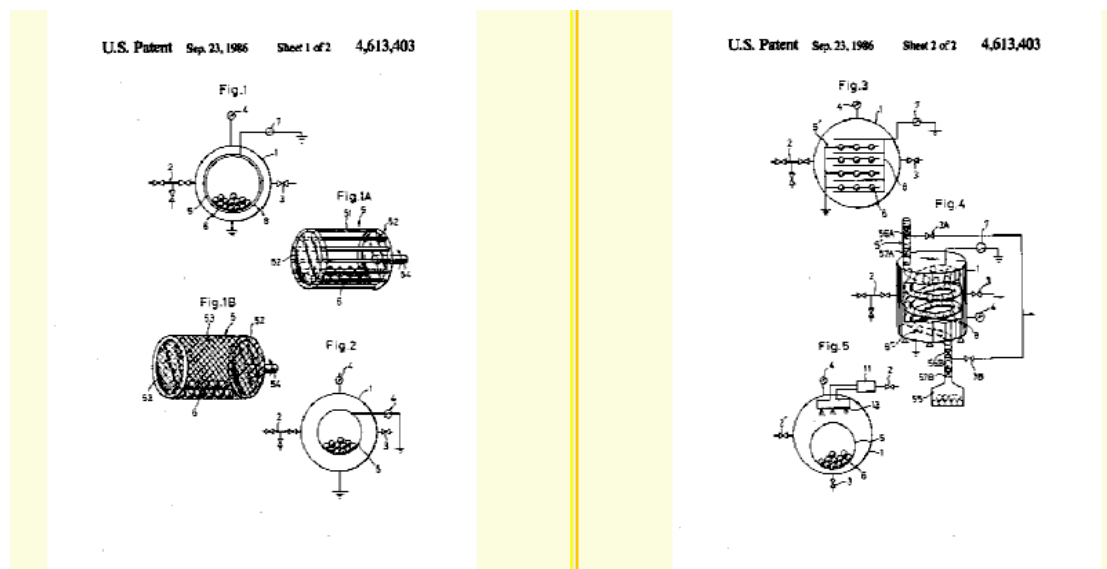
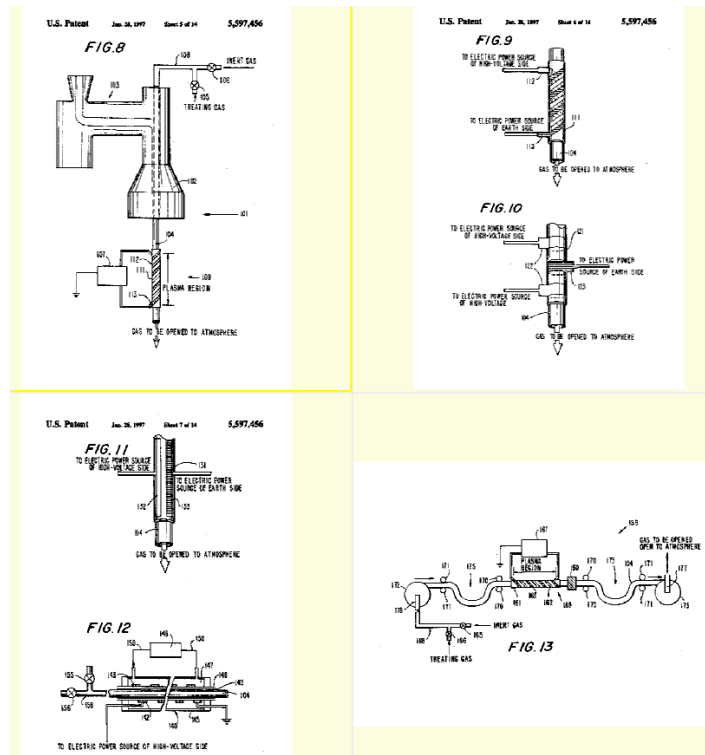


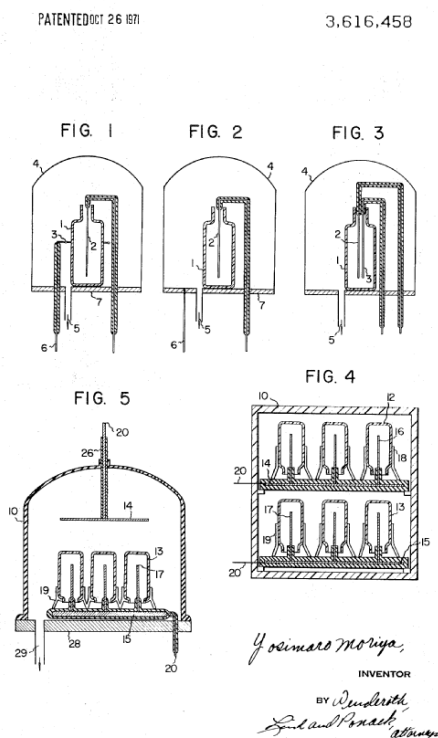
U.S. Patent Jan. 28, 1997 Sheet 1 of 14 5,597,456



U.S. Patent Jan. 28, 1997 Sheet 2 of 14 5,597,456





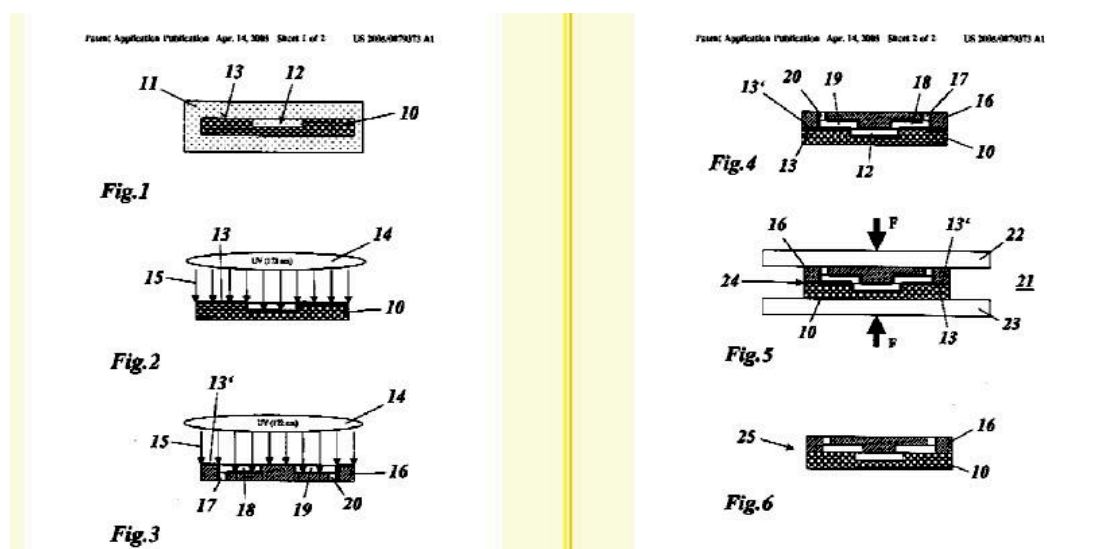


## B29C 59/16

by wave energy or particle radiation {, e.g. infrared heating ([B29C 59/007](#) takes precedence)}

## Definition statement

This place covers:



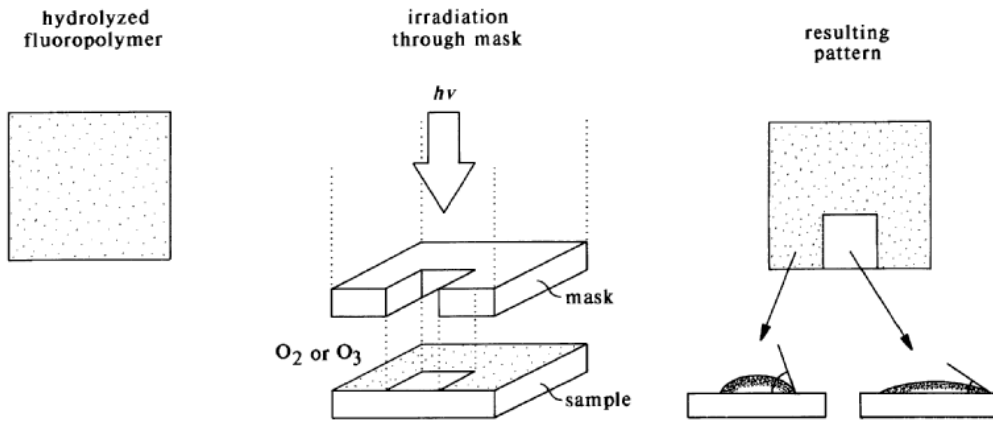


FIG. 6

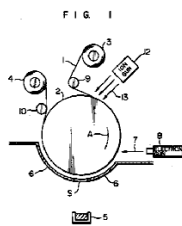
U.S. Patent

Jan. 12, 1999

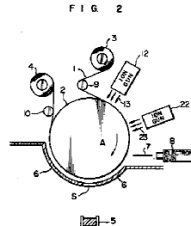
Sheet 6 of 9

5,859,086

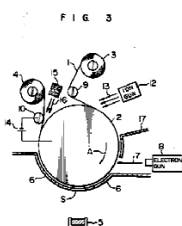
U.S. Patent Pat. 11, 1997 Sheet 1 of 5 5,087,476



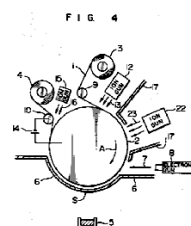
U.S. Patent Pat. 11, 1997 Sheet 2 of 5 5,087,476



U.S. Patent Pat. 11, 1997 Sheet 3 of 5 5,087,476



U.S. Patent Pat. 11, 1997 Sheet 4 of 5 5,087,476



U.S. Patent

Nov. 29, 1983

4,417,948

FIG. 1

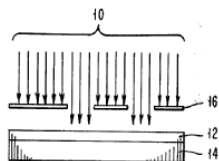
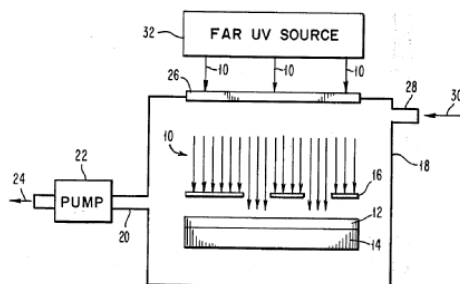


FIG. 2



June 2, 1970

YOICHI OKADA ET AL

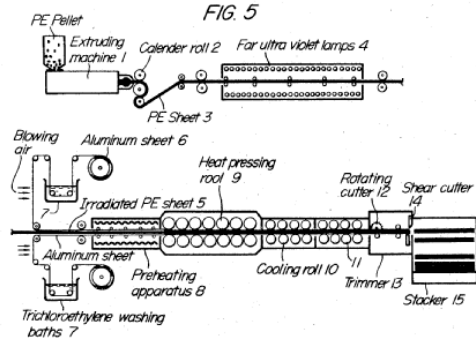
3,515,615

METHOD FOR BONDING SYNTHETIC RESIN SHEETS AND METAL SHEETS

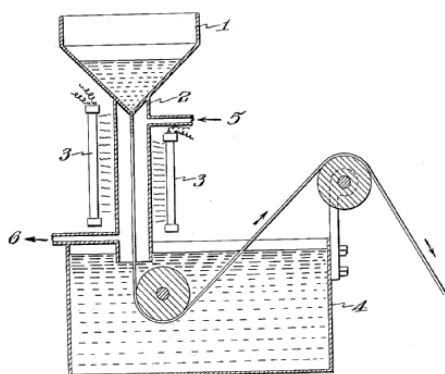
Filed Aug. 30, 1965

3 Sheets-Sheet 3

FIG. 5



Sept. 10, 1957 L. E. WOLINSKI 2,805,960  
 PROCESS FOR TREATING POLYETHYLENE STRUCTURES  
 AND ARTICLES RESULTING THEREFROM  
 Filed Nov. 29, 1952



## References

### Limiting references

*This place does not cover:*

Pretreatment of surfaces to which liquids or fluent materials are to be applied; by exposure to radiation, using U.V., pretreatment of polymeric substrates	<a href="#">B05D 3/063</a>
Pretreatment of surfaces to which liquids or fluent materials are to be applied; by exposure to radiation, using U.V., after-treatment	<a href="#">B05D 3/065</a>
Pretreatment of surfaces to which liquids or fluent materials are to be applied; by exposure to radiation, using ionising radiations (gamma, X, electrons)	<a href="#">B05D 3/068</a>
Working by laser beam, removal material, plastics	<a href="#">B23K 26/402</a>
Duplicating or marking methods; thermography; marking of plastic artifacts, e.g. with laser	<a href="#">B41M 5/267</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Coating by vacuum evaporation; pre-treatment of the material to be coated; cleaning or etching treatment by means of bombardment with energetic particles or radiation	<a href="#">C23C 14/022</a>
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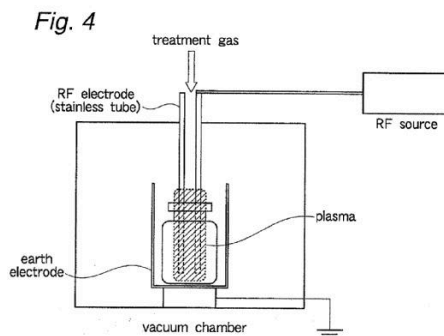
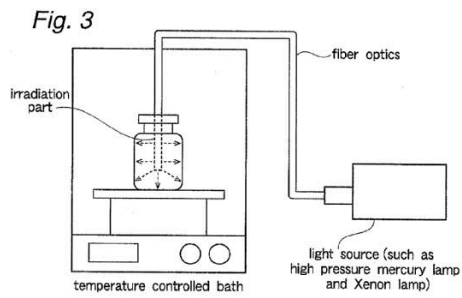


**B29C 59/165**

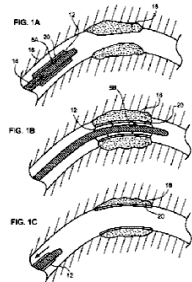
{of profiled articles, e.g. hollow or tubular articles}

**Definition statement***This place covers:*

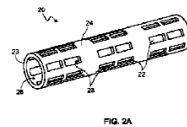
Patent Application Publication May 15, 2008 Sheet 2 of 2 US 2008/0110852 A1



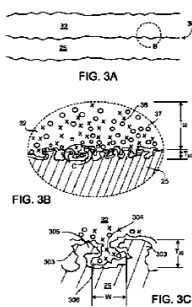
Patent Application Publication May 15, 2008 Sheet 1 of 5 US 2008/0067584 A1



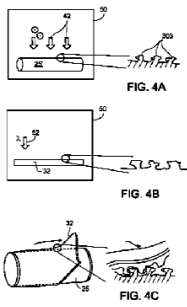
Patent Application Publication May 15, 2008 Sheet 2 of 5 US 2008/0067584 A1

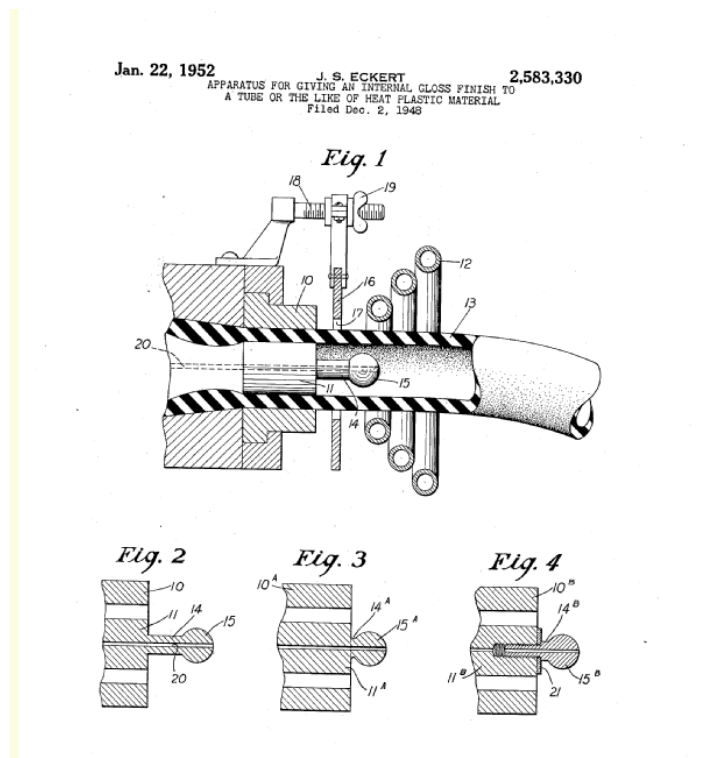


Patent Application Publication May 15, 2008 Sheet 3 of 5 US 2008/0067584 A1



Patent Application Publication May 15, 2008 Sheet 4 of 5 US 2008/0067584 A1



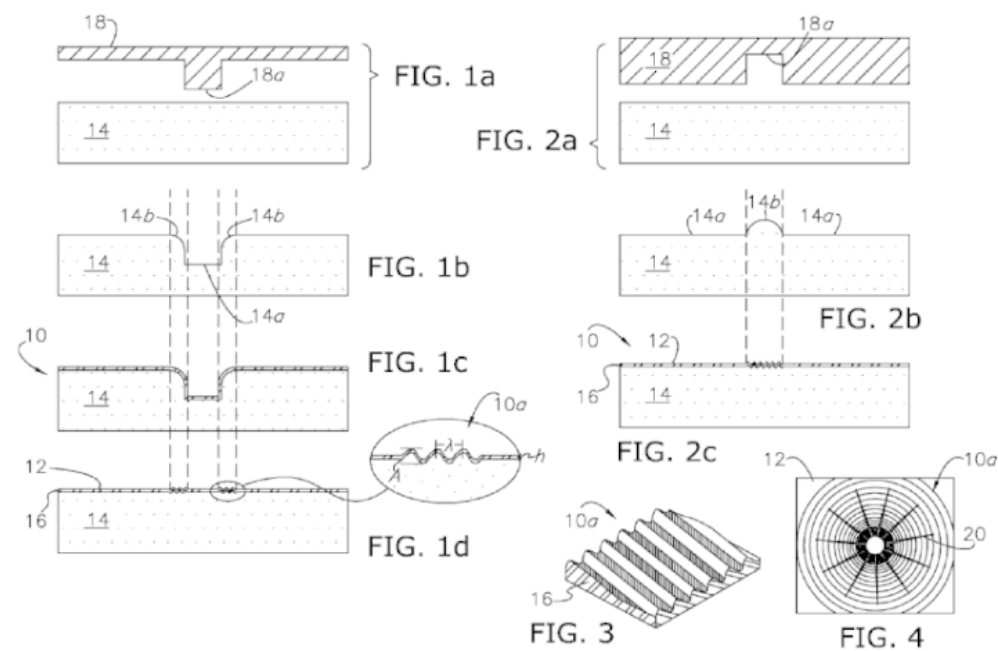


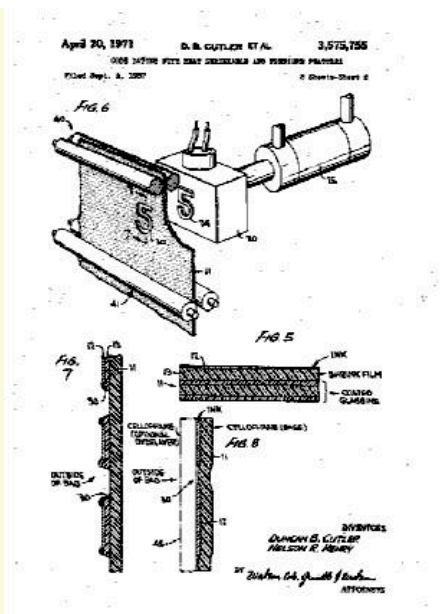
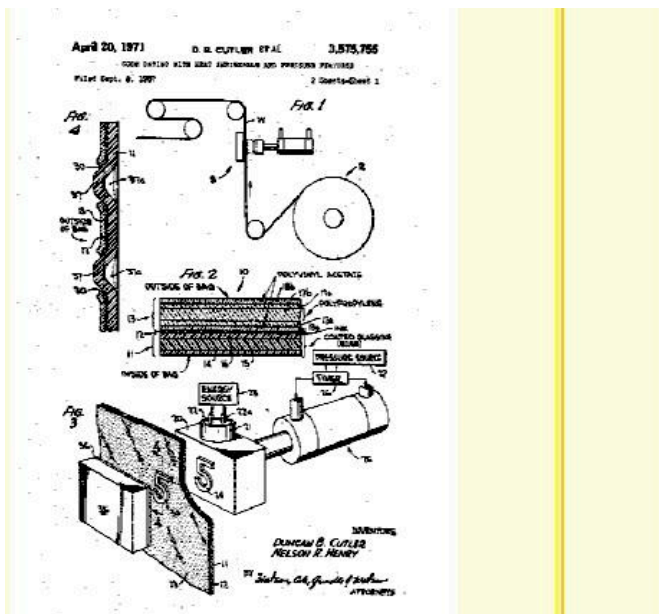
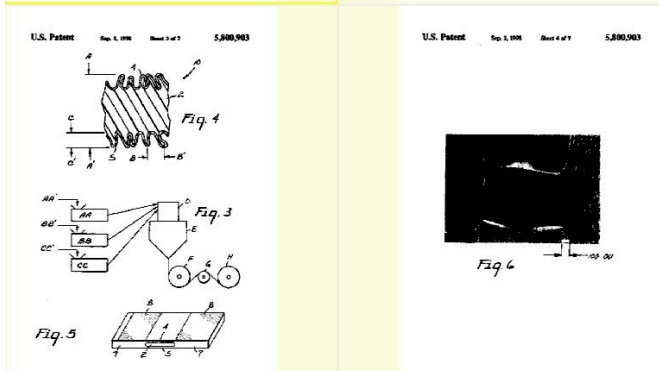
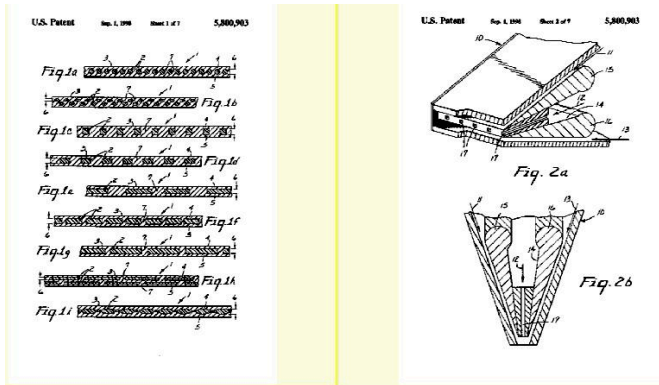
## B29C 59/18

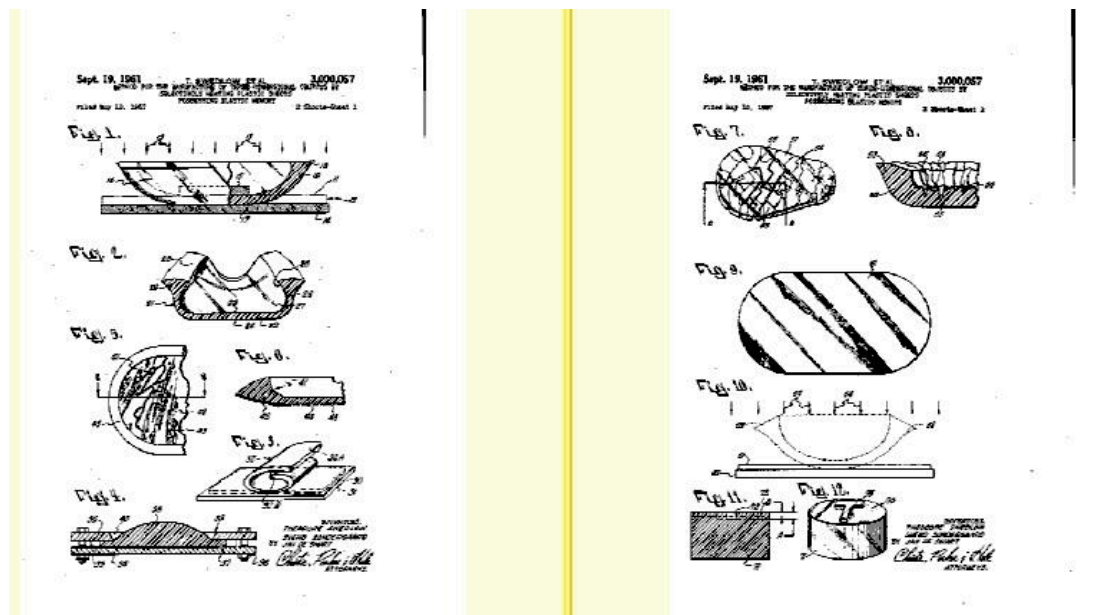
by liberation of internal stresses, e.g. plastic memory

### Definition statement

This place covers:







## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping by liberation of internal stresses; thermal shrinking	<a href="#">B29C 61/02</a>
---	----------------------------

## B29C 61/00

Shaping by liberation of internal stresses; Making preforms having internal stresses; Apparatus therefor (for surface shaping [B29C 59/18](#); for lining articles [B29C 63/38](#); for joining preformed parts [B29C 65/66](#) {; for packaging [B65B 53/00](#); connecting arrangements or other fittings for plastics pipes using shrink-down material [F16L 47/22](#), electrical connections insulated using heat shrinking insulating sleeves [H01R 4/72](#); cable junctions protected by sleeves [H02G 15/18](#)})

## Definition statement

This place covers:

Methods or apparatus for liberation of internal stresses, typically for heat-shrinking

Methods or apparatus for making preforms having internal stresses, typically heat-shrinkable articles

Heating devices specially designed for thermal shrinking.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Mechanical power produced by shape memory element	<a href="#">F03G 7/0614</a>
Shrinkage connections	<a href="#">F16B 4/006</a>

## Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "shrink", "recover" and "shape memory"

## B29C 63/00

**Lining or sheathing, i.e. applying preformed layers or sheathings of plastics; Apparatus therefor ([B29C 73/00](#) takes precedence; by blowing [B29C 49/00](#); by thermoforming [B29C 51/00](#))**

## References

### Limiting references

This place does not cover:

Extrusion coating	<a href="#">B29C 48/00</a>
Applying liquid or other fluent coatings	<a href="#">B05D</a>

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Inserting a flexible liner inside a pipe for covering leaks	<a href="#">F16L 55/165</a>
---	-----------------------------

## B29C 64/00

**Additive manufacturing, i.e. manufacturing of three-dimensional [3D] objects by additive deposition, additive agglomeration or additive layering, e.g. by 3D printing, stereolithography or selective laser sintering**

## Definition statement

This place covers:

Technologies involving the use or application of processes or apparatus that produce three-dimensionally shaped structures by selectively depositing successive layers of material one upon another. In particular it covers processes, apparatus and other aspects of additive manufacturing, i.e., making, repairing, or modifying articles of manufacture by the selective application of multiple layers of material. The applied layers may be applied directly, as in a printing process, or by selective solidification of material onto a substrate or previously developed layers, for example, by selective sintering of a particulate.

## Relationships with other classification places

This group [B29C 64/00](#) covers additive manufacturing of plastics or materials in a plastic state, not otherwise provided for.

The subclass [B33Y](#) covers additive manufacturing, irrespective of the process or material used. Furthermore, the subclass [B33Y](#) is for obligatory supplementary classification of subject matter containing an aspect of additive manufacturing already classified as such in other classification places.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Shaping by coating a mould, core or other substrate, i.e. by depositing material and stripping-off the shaped article	<a href="#">B29C 41/00</a>
Moulding by agglomeration	<a href="#">B29C 67/02</a>
Preparation of cocoa products	<a href="#">A23G</a>
Preparation of food or foodstuffs	<a href="#">A23L 5/00</a>
Making of dental prostheses	<a href="#">A61C 13/00</a>
Coating apparatus, in general	<a href="#">B05C</a>
Coating processes, in general	<a href="#">B05D</a>
Manufacture of workpieces or articles from metallic powder characterised by the manner of compacting or sintering	<a href="#">B22F 3/00</a>
Milling, in general	<a href="#">B23C</a>
Build-up welding	<a href="#">B23K 9/04</a> , <a href="#">B23K 26/342</a>
Producing shaped articles from ceramic or cementitious material	<a href="#">B28B 1/00</a>
Methods or apparatus for laminating, e.g. by curing or by ultrasonic bonding	<a href="#">B32B 37/00</a>
Forme preparation	<a href="#">B41C 1/00</a>
Typewriters or selective printers	<a href="#">B41J 2/00</a>
Braille printing	<a href="#">B41M 3/16</a>
Superimposing layers to produce ornamental structures	<a href="#">B44C 3/02</a>
Sintering of ceramic materials	<a href="#">C04B 35/64</a>
Culture of undifferentiated human, animal or plant cells	<a href="#">C12N 5/00</a>
Coating by vacuum evaporation, by sputtering or by ion implantation of the coating forming material	<a href="#">C23C 14/00</a>
Photosensitive materials	<a href="#">G03C</a> , <a href="#">G03F 7/004</a>
Photomechanical production of patterned surfaces	<a href="#">G03F 7/00</a>
Electrographic processes using a charge pattern	<a href="#">G03G 13/00</a>
Programme-control systems for surface or curve machining, making 3D objects, e.g. desktop manufacturing	<a href="#">G05B 19/4099</a>
General purpose image data processing	<a href="#">G06T 1/00</a>
Image enhancement for 2D or 3D images	<a href="#">G06T 5/00</a>
Image analysis for 2D or 3D images	<a href="#">G06T 7/00</a>
Image coding, e.g. from bit-mapped to non bit-mapped	<a href="#">G06T 9/00</a>
3D [Three-dimensional] image rendering	<a href="#">G06T 15/00</a>
3D [Three-dimensional] modelling, e.g. data description of 3D objects	<a href="#">G06T 17/00</a>
Manipulating 3D models or images for computer graphics	<a href="#">G06T 19/00</a>
Geography, e.g. relief models	<a href="#">G09B 25/06</a>
Electron-beam or ion-beam tubes for localised application of thin layers on objects	<a href="#">H01J 37/317</a>

Manufacturing printed circuits by printing of conductive patterns	<a href="#">H05K 3/12</a>
Manufacture of semiconductor or otherwise not provided for electric solid state devices	<a href="#">H10P</a>

## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

3D printing	Additive manufacturing where the buildup of successive layers of material includes the use of a printer-like device having a motor controlled head for dispensing materials that form the layers.
Stereolithography	Additive manufacturing technique where the successive layers of material are formed by selectively hardening regions of polymeric material successively applied to the structure, typically by the use of laser light.

## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

SLS	Selective laser sintering
DTM	Desktop manufacturing
LOM	Laminated Object Modelling
3DP, 3D-printing	Three-dimensional printing
SFF	Solid Freeform Fabrication
FDM	Fused Deposition Modelling
3DD	Three-dimensional deposition
SDM	Selective Deposition Modelling
LDM	Layered deposition modelling
3DM	Three-dimensional modelling
BPM	Ballistic Particle Modelling

## B29C 64/10

### Processes of additive manufacturing

### Relationships with other classification places

Additive manufacturing should obligatorily be further be classified in subclass [B33Y](#) irrespective of the process or material used.

B29C 64/106

using only liquids or viscous materials, e.g. depositing a continuous bead of viscous material

Definition statement

This place covers:  
e.g. extruding thermoplastic material.

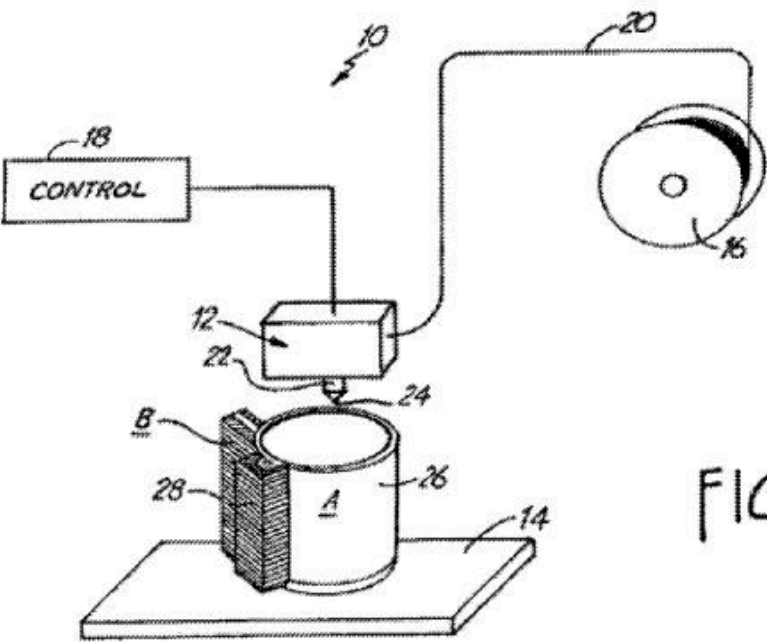


FIG. 1

Patent Application Publication Mar. 10, 2011 Sheet 1 of 2 US 2011/0060445 A1

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Dispensing heads	<a href="#">B29C 31/042</a>
Moving heads for distributing liquid or viscous material into moulds	<a href="#">B29C 31/044</a>
Moving along predetermined circuits or distributing according to patterns	<a href="#">B29C 31/045</a>



**B29C 64/124**

using layers of liquid which are selectively solidified

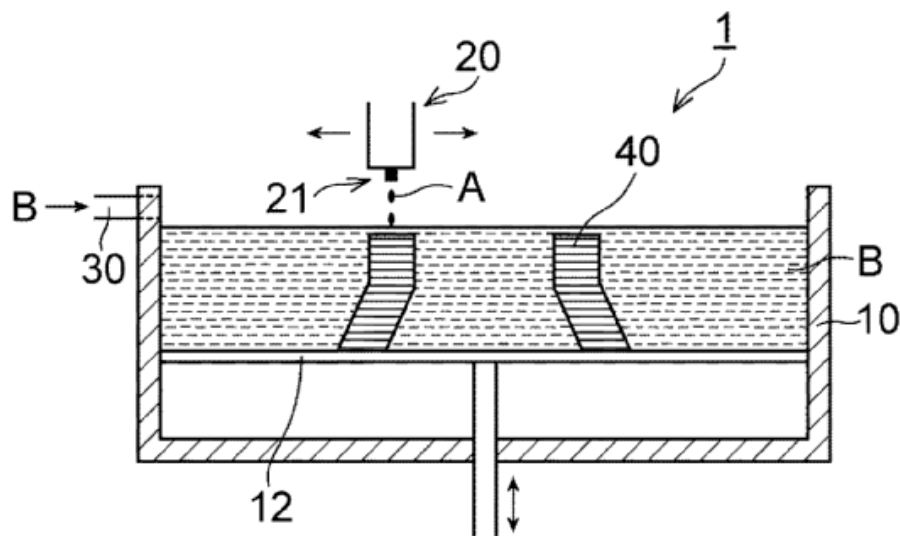
**Definition statement**

*This place covers:*

WO 2009/139395

PCT/JP2009/05

[図1]



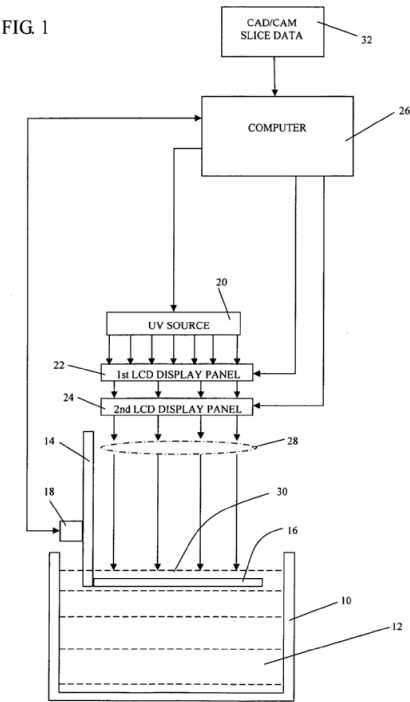
B29C 64/129

characterised by the energy source therefor, e.g. by global irradiation combined with a mask

Definition statement

This place covers:

Patent Application Publication Jul. 20, 2006 Sheet 1 of 2 US 2006/0161287 A1



Synonyms and Keywords

In patent documents, the following abbreviations are often used:

LCD	Liquid Crystal Display
MMD	Micromirror Devices

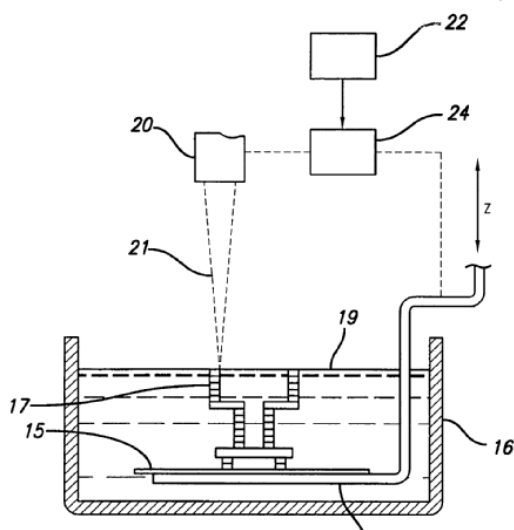
**B29C 64/135**

the energy source being concentrated, e.g. scanning lasers or focused light sources

**Definition statement**

*This place covers:*

EP 1 645 402 A1



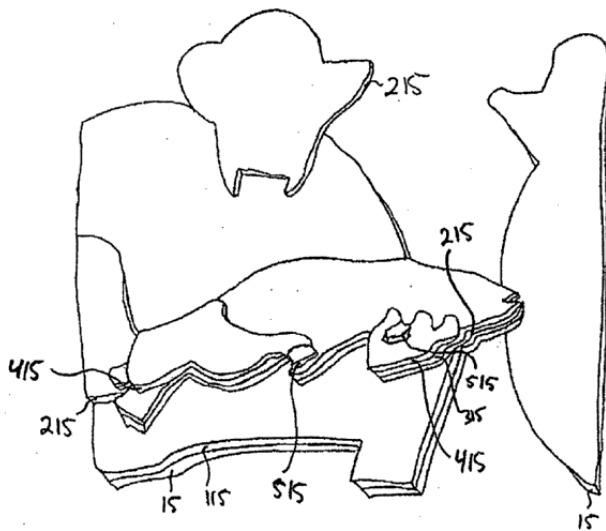
## B29C 64/141

using only solid materials

### Definition statement

*This place covers:*

Patent Application Publication Oct. 1, 2009 Sheet 10 of 10 US 2009/0246436 A1



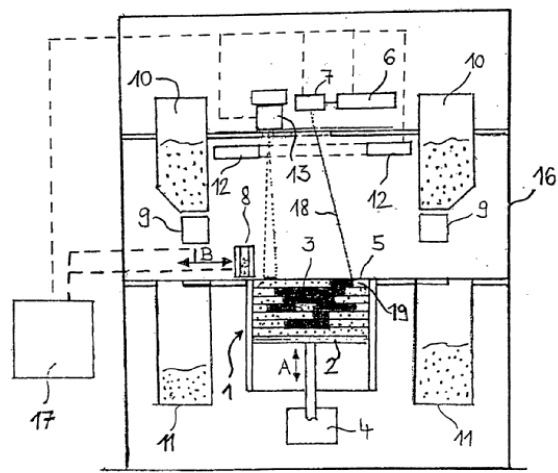
**B29C 64/153**

using layers of powder being selectively joined, e.g. by selective laser sintering or melting

**Definition statement**

*This place covers:*

DE 10 2005 022 308 A1    2006.11.23  
Anhängende Zeichnungen



**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

laser sintering of metallic powder	<a href="#">B22F 10/20</a>
laser sintering of ceramic powder	<a href="#">C04B 35/64</a> and <a href="#">C04B 35/65</a>

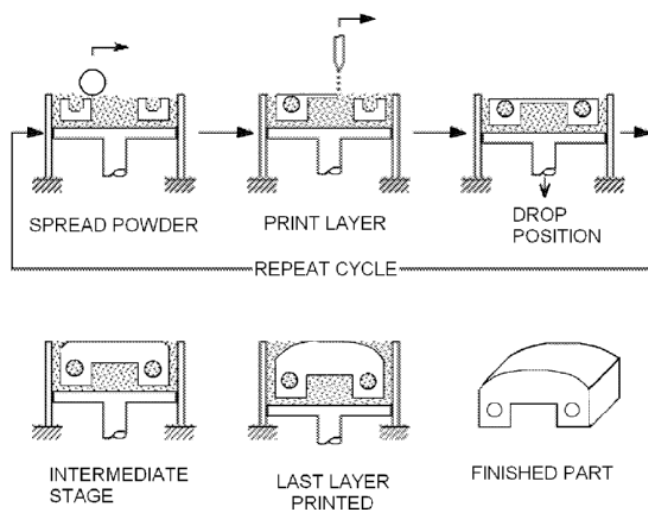
**B29C 64/165**

using a combination of solid and fluid materials, e.g. a powder selectively bound by a liquid binder, catalyst, inhibitor or energy absorber

**Definition statement**

*This place covers:*

Patent Application Publication    Feb. 25, 2010    Sheet 1 of 4    US 2010/0044903 A1

**B29C 64/20**

**Apparatus for additive manufacturing; Details thereof or accessories therefor**

**Definition statement**

*This place covers:*

- Machines and systems for carrying out additive manufacturing methods to produce objects
- Subcombinations of machines that carry out additive manufacturing methods to produce objects
- Accessories for machines that carry out additive manufacturing methods. Accessories include things attachable to or used in conjunction with an additive manufacturing machine that have a direct association with the additive manufacturing machine, per se.

**Relationships with other classification places**

Auxiliary operations or equipment, e.g. for treating or handling the raw materials for additively manufacturing objects, are classified in [B29C 64/30](#).

Additive manufacturing should obligatorily be further be classified in subclass [B33Y](#) irrespective of the process or material used.

B29C 64/30

Auxiliary operations or equipment

Definition statement

*This place covers:*

The handling or treating of materials used in an additive manufacturing process, or the subsequent treating or handling of objects produced by an additive manufacturing process. Also covered are ancillary components or process steps not directly involving the additive manufacturing process or apparatus, per se, such as cleaning raw materials used in the additive manufacturing process, or recycling residual material from the manufacturing process.

Relationships with other classification places

Additive manufacturing should obligatorily be further be classified in subclass [B33Y](#) irrespective of the process or material used.

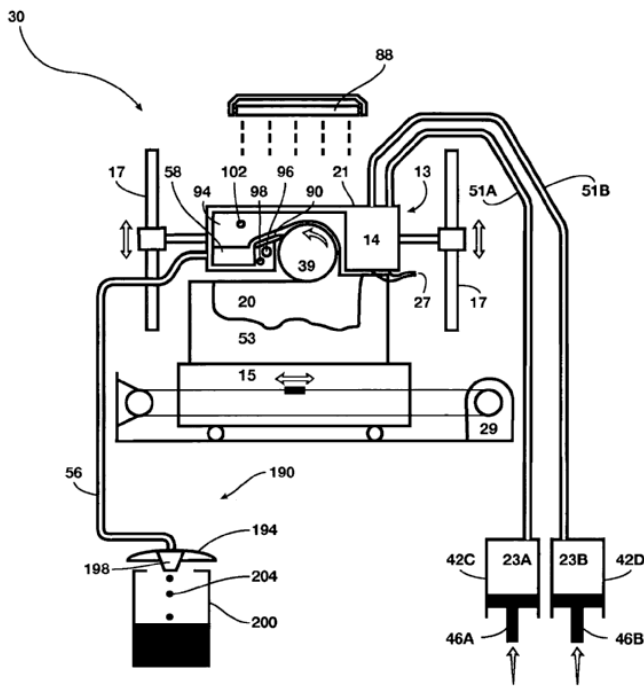
B29C 64/35

Cleaning

Definition statement

*This place covers:*

Patent Application Publication Mar. 22, 2007 Sheet 3 of 3 US 2007/0063366 A1



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Deburring or deflashing	<a href="#">B29C 37/02</a>
Surface shaping	<a href="#">B29C 59/00</a>

After treatment	<a href="#">B29C 71/00</a>
Repairing	<a href="#">B29C 73/00</a>
Coating	<a href="#">B05D</a>
Cleaning by brushing in general	<a href="#">B08B 1/00</a>
Cleaning by jet rinsing in general	<a href="#">B08B 3/02</a>
Cleaning by immersion in general	<a href="#">B08B 3/04</a>
Cleaning by blowing in general	<a href="#">B08B 5/02</a>
Cleaning by vacuum in general	<a href="#">B08B 5/04</a>

## B29C 64/386

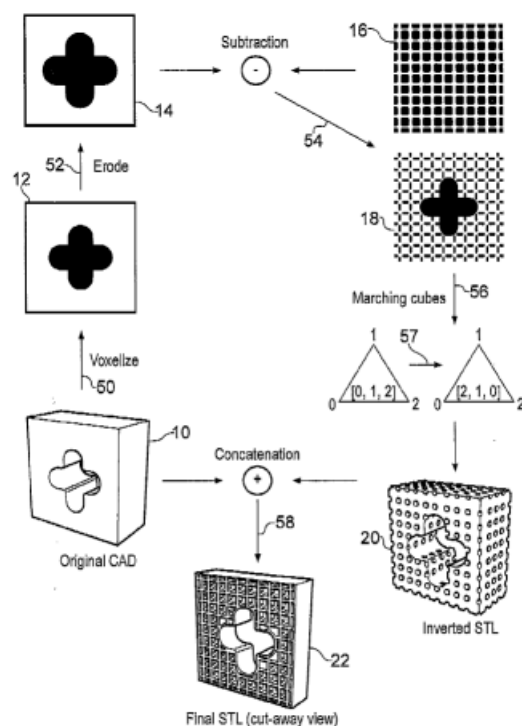
### Data acquisition or data processing for additive manufacturing

#### Definition statement

*This place covers:*

- Data processing aspects related to an object to be manufactured in an additive manufacturing process, specially adapted for processing of plastics or materials in a plastic state, not otherwise provided for, for example, combining together data from different sources to produce composite production data for said object to be made.
- Acquiring, sending, or receiving data that will be used in additive manufacturing, either internal or external to the additive manufacturing apparatus, specially adapted for processing of plastics or materials in a plastic state, not otherwise provided for.

Illustrative example of subject matter classified in this group:



#### Relationships with other classification places

Additive manufacturing should obligatorily be further be classified in subclass [B33Y](#) irrespective of the process or material used.



**B29C 64/393**

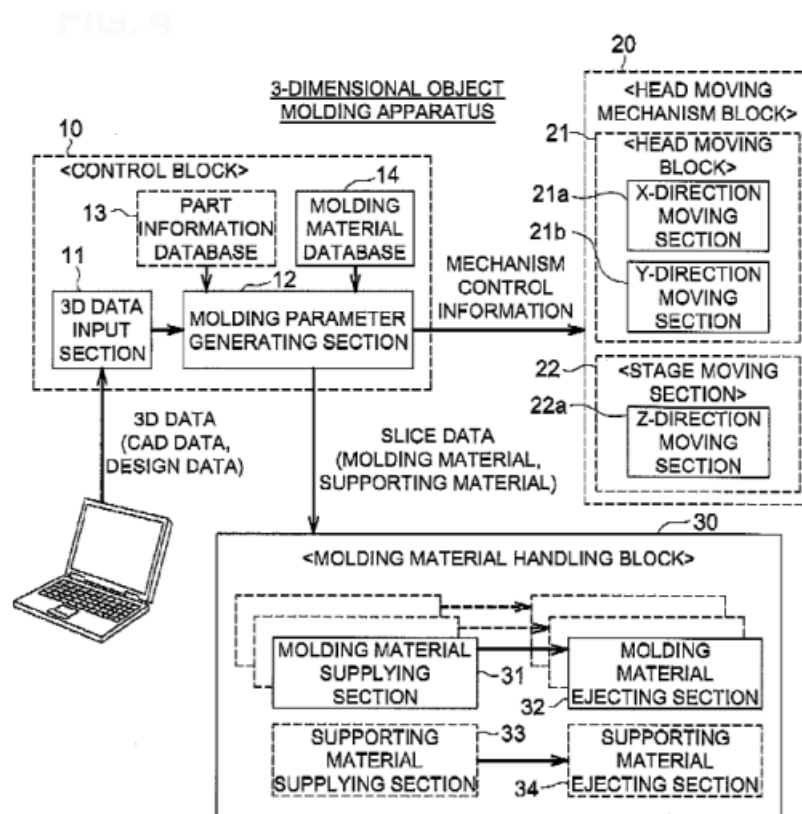
**for controlling or regulating additive manufacturing processes**

**Definition statement**

*This place covers:*

Data processing specially adapted for managing the additive manufacturing process performed by one or more additive manufacturing apparatuses, specially adapted for processing of plastics or materials in a plastic state, not otherwise provided for.

Illustrative example of subject matter classified in this group:

**Relationships with other classification places**

Additive manufacturing should obligatorily be further be classified in subclass [B33Y](#) irrespective of the process or material used.

**B29C 64/40**

**Structures for supporting 3D objects during manufacture and intended to be sacrificed after completion thereof**

**Definition statement**

*This place covers:*

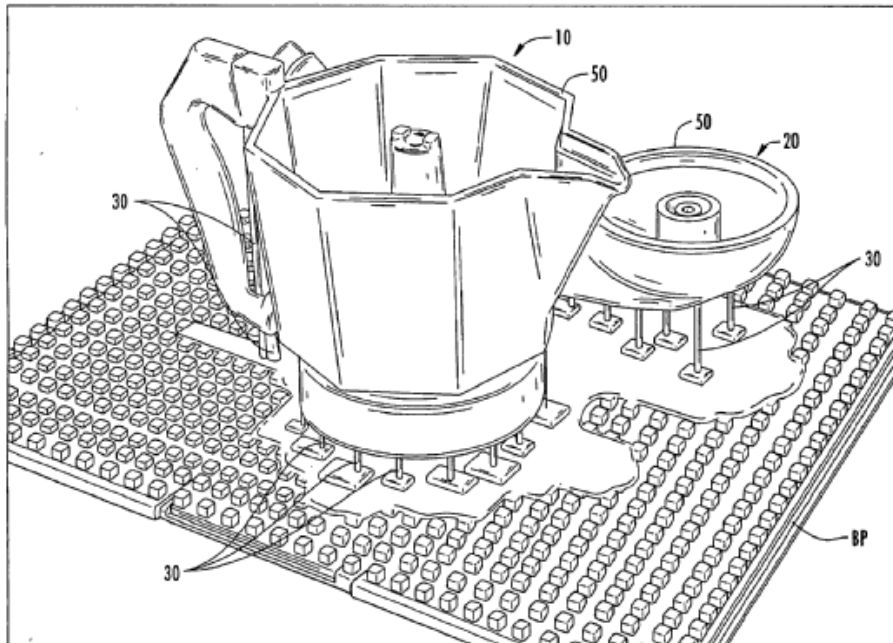


FIG. 2

Patent Application Publication Mar. 19, 2009 Sheet 2 of 28 US 2009/0072447 A1

**B29C 65/00**

**Joining {or sealing} of preformed parts {, e.g. welding of plastics materials}; Apparatus therefor {(general aspects of processes or apparatus for joining preformed parts [B29C 66/00](#); using porous material formed by internal pressure generated therein for joining preformed parts [B29C 44/1228](#), [B29C 44/326](#))}**

**Definition statement**

*This place covers:*

Joining by heating (cf. [B29C 65/02](#) and subgroups);

Joining using adhesives (cf. [B29C 65/48](#) and subgroups);

Joining using mechanical means (cf. [B29C 65/56](#) and subgroups);

Joining and severing (cf. [B29C 65/74](#) and subgroups);

Means for handling the parts to be joined (cf. [B29C 65/78](#) and subgroups);

Testing the joints obtained by processes as foreseen in this main group (cf. [B29C 65/82](#) and subgroups).

## References

### Limiting references

*This place does not cover:*

General aspects of processes or apparatus for joining preformed parts	<a href="#">B29C 66/00</a>
---	----------------------------

### Application-oriented references

*Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:*

Devices or methods of sealing or securing package folds or closures	<a href="#">B65B 51/00</a>
---	----------------------------

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Manufacture of lost patterns, made from expanded plastic materials, by assembling preformed parts	<a href="#">B22C 7/026</a>
Making preforms by assembling performed material	<a href="#">B29B 11/04</a>
Making of boxes, cartons, envelopes, or bags	<a href="#">B31B</a>
Assembling of microstructural devices by bonding of two components	<a href="#">B81C 3/00</a>
Chemical aspects of bonding of a preformed macromolecular material to the same or other solid material	<a href="#">C08J 5/12</a>
Adhesive processes in general	<a href="#">C09J 5/00</a>
Devices for fastening or securing constructional elements or machine parts together	<a href="#">F16B</a>
Splicing of light guides	<a href="#">G02B 6/255</a>

## Special rules of classification

Patent literature (e.g. patent applications, patent specifications):

Claims / claimed subject-matter:

Independent claims: compulsory invention information;

Dependent claims: at least compulsory additional information (or compulsory invention information if appropriate).

Figures - depicted subject-matter: at least compulsory additional information (or compulsory invention information if appropriate).

Description - described subject-matter: at least desirable additional (or compulsory invention information if appropriate).

Tables: at least compulsory additional information.

Non-patent literature (e.g. scientific non-patent publications):

Figures - depicted subject-matter: compulsory invention information;

Abstract: compulsory invention information;

Description: at least desirable additional information (or compulsory invention information if appropriate).

N.B.: in this main group, it is compulsory that any disclosed aspect relating to the invention is identified by the corresponding classification code(s).

## **B29C 65/004**

**{Cold joining}**

### **References**

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Cold vulcanisation	<a href="#">B29C 35/18</a>
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## **B29C 65/008**

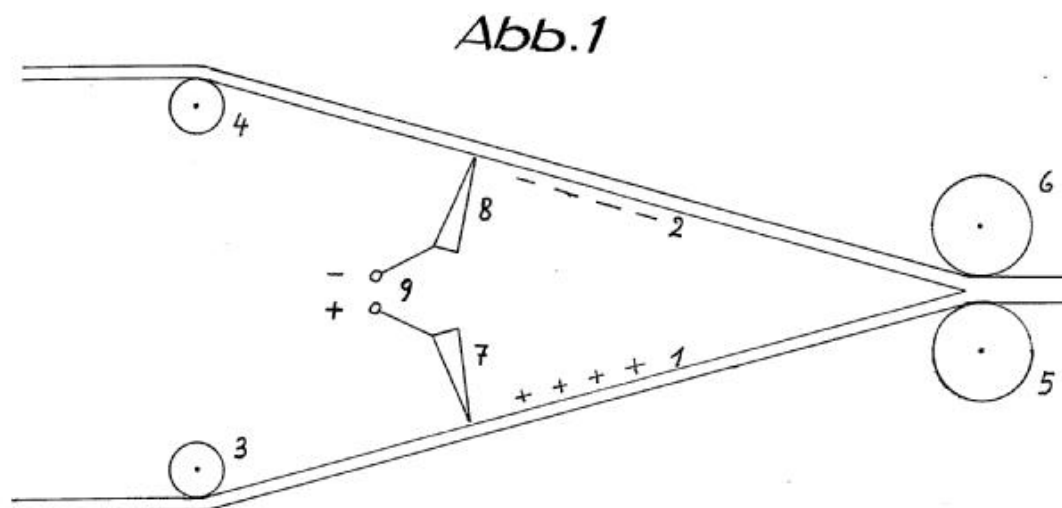
**{making use of electrostatic charges (holding means using electrostatic forces to hold at least one of the parts to be joined [B29C 65/7852](#))}**

### **Definition statement**

*This place covers:*

Example 1, from

DE1104679:



**B29C 65/02****by heating, with or without pressure****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Attachments of seat coverings by thermal welding	<a href="#">B60N 2/5866</a>
Attachments of removable protective seat coverings by thermal welding	<a href="#">B60N 2/6072</a>
Closing containers or receptacles after filling, by applying separate preformed closures, e.g. lids, covers, securing said closures on said containers by heat-sealing	<a href="#">B65B 7/2878</a>
Securing ends of binding material by welding or heat-sealing	<a href="#">B65B 13/32</a>
Devices for, or methods of, sealing or securing package folds or closures, by applying or generating heat or pressure or combinations thereof	<a href="#">B65B 51/10</a>
Devices, e.g. jaws, for applying pressure and heat, specially adapted for producing longitudinal or transverse seams in package web or tubes, e.g. for subdividing filled tubes	<a href="#">B65B 51/30</a>
Chemical aspects of bonding of a preformed macromolecular material to the same or other solid material by heating	<a href="#">C08J 5/121</a>
Joining multiple sections together by welding, for assembling air intake systems	<a href="#">F02M 35/1036</a>

**B29C 65/04****Dielectric heating, e.g. high-frequency welding {, i.e. radio frequency welding of plastic materials having dielectric properties, e.g. PVC}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Curing by dielectric heating	<a href="#">B29C 35/12</a>
Non-woven fabrics formed from fleeces or layers composed of fibres by welding together the fibres by radio-frequency heating	<a href="#">D04H 1/554</a>

**B29C 65/06****using friction, e.g. spin welding {(non-plastics elements to plastic elements [B29C 65/645](#))}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Heating or curing using friction	<a href="#">B29C 35/0255</a>
Friction welding of metals	<a href="#">B23K 20/12</a>

Attaching together paper or cardboard sheets, strips, or webs by friction	<a href="#">B31F 5/008</a>
Securing ends of binding material by friction welding	<a href="#">B65B 13/322</a>
Devices for, or methods of, sealing or securing package folds or closures by friction welding	<a href="#">B65B 51/222</a>

## B29C 65/0618

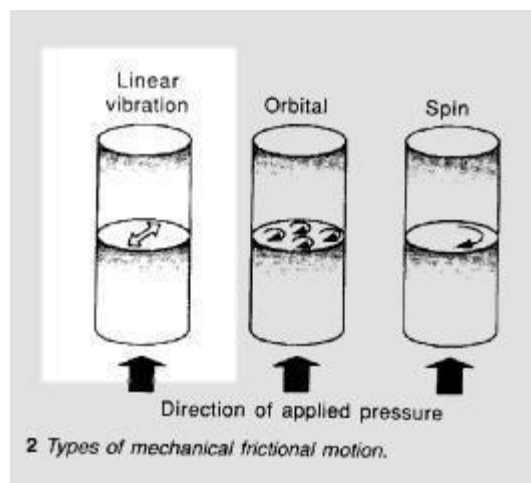
{Linear}

### Definition statement

*This place covers:*

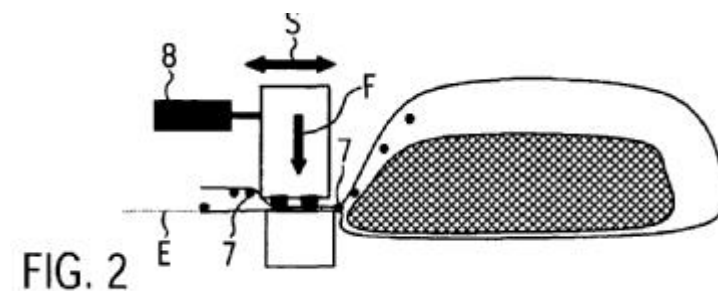
Example 1, from

XP001177273:



Example 2, from

EP2380726:



## B29C 65/0627

{Angular, i.e. torsional ([B29C 65/082](#) takes precedence)}

### Definition statement

*This place covers:*

Example 1, from

EP2380726:

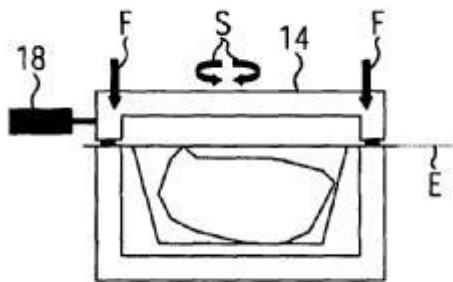


FIG. 6

## B29C 65/0636

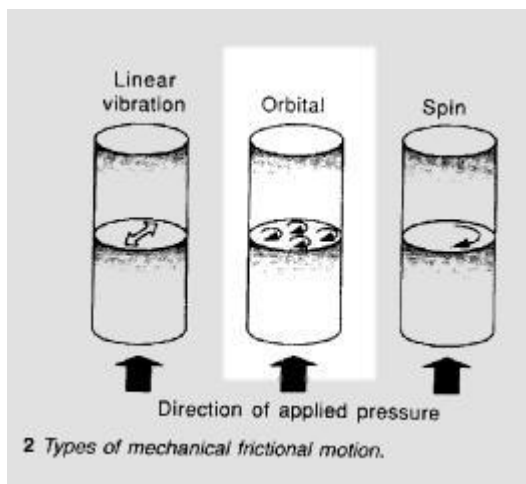
{Orbital}

### Definition statement

*This place covers:*

Example 1, from

XP001177273:



## B29C 65/0672

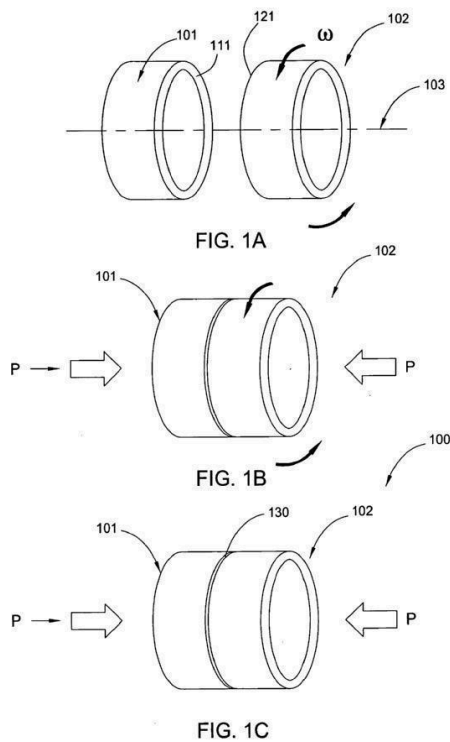
{Spin welding}

### Definition statement

*This place covers:*

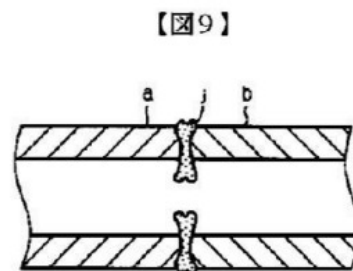
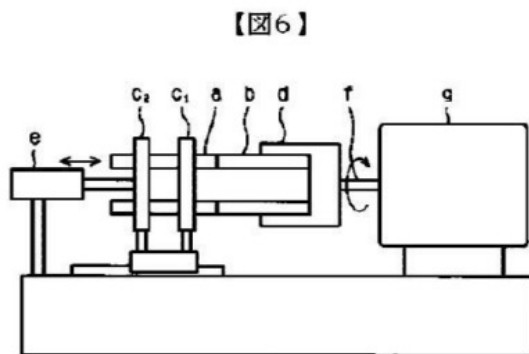
Example 1, from

US2007262488:



Example 2, from

JP10193461:



## B29C 65/0681

{created by a tool}

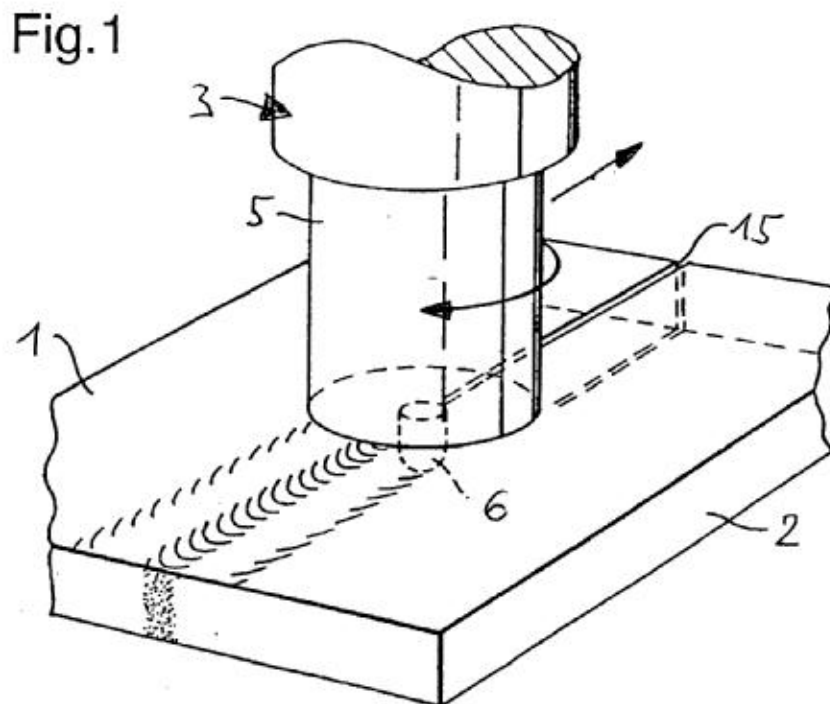
### Definition statement

*This place covers:*

Example 1, from



DE10238550:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Friction stir welding of metals	<a href="#">B23K 20/122</a>
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## B29C 65/069

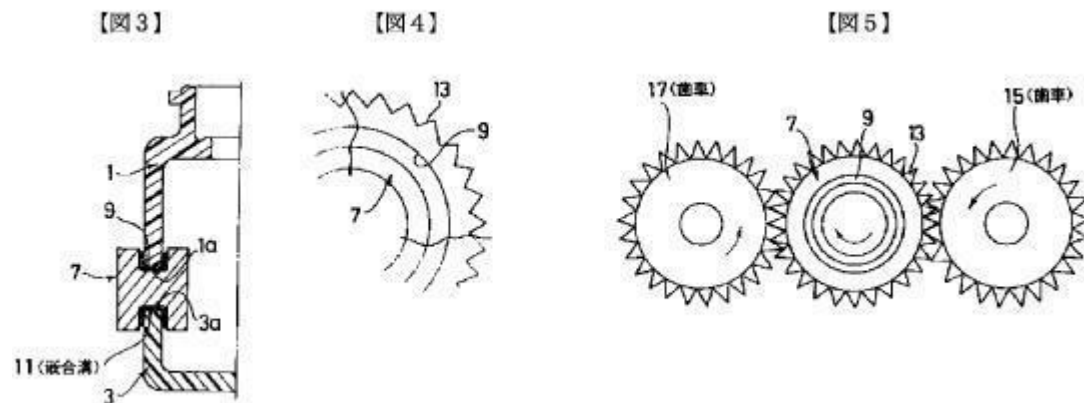
{the welding tool cooperating with specially formed features of at least one of the parts to be joined, e.g. cooperating with holes or ribs of at least one of the parts to be joined}

## Definition statement

This place covers:

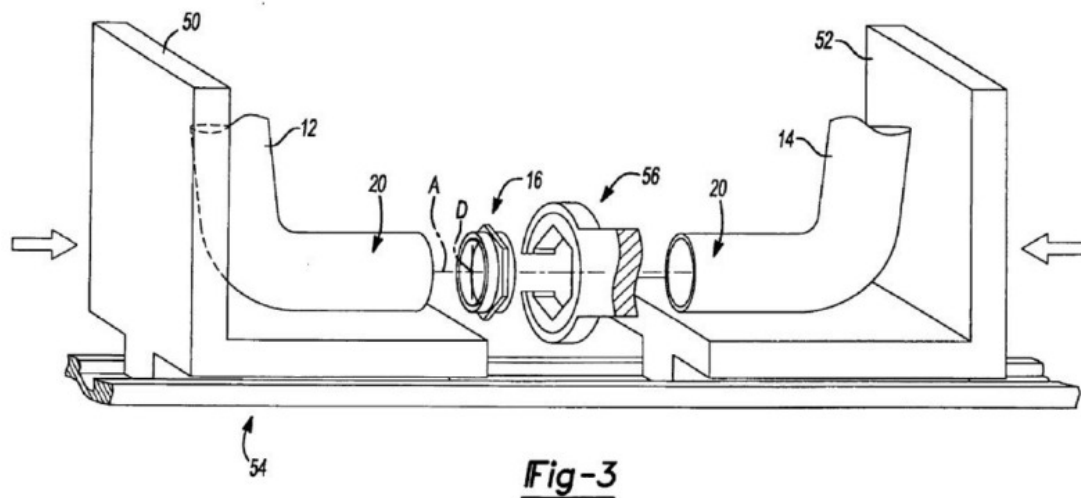
Example 1, from

JP5024114:



Example 2, from

US2006255590:



## B29C 65/08

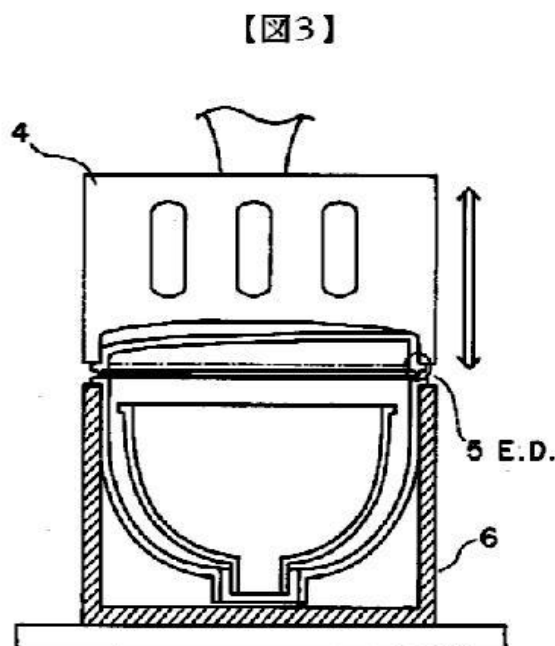
using ultrasonic vibrations {(non-plastics element to plastics elements  
[B29C 65/645](#))}

### Definition statement

*This place covers:*

Example 1, from

JP11348132:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heating or curing using ultrasonic or sonic vibrations	<a href="#">B29C 35/0261</a>
Methods or apparatus for generating or transmitting mechanical vibrations of ultrasonic frequency	<a href="#">B06B</a>
Ultrasonic welding of metals	<a href="#">B23K 20/10</a>
Attaching together paper or cardboard sheets, strips, or webs by ultrasonic vibrations	<a href="#">B31F 5/008</a>
Securing ends of binding material by ultrasonic welding	<a href="#">B65B 13/325</a>
Devices for, or methods of, sealing or securing package folds or closures by ultrasonic welding	<a href="#">B65B 51/225</a>
Methods of, or devices for, interconnecting successive lengths of filamentary material by welding using ultrasonic means	<a href="#">B65H 69/085</a>
Non-woven fabrics formed from fleeces or layers composed of fibres by welding together the fibres by ultrasonic heating	<a href="#">D04H 1/555</a>

## B29C 65/081

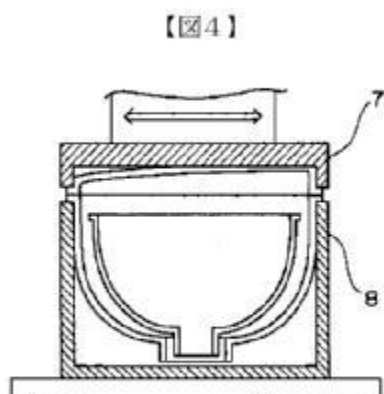
{having a component of vibration not perpendicular to the welding surface}

### Definition statement

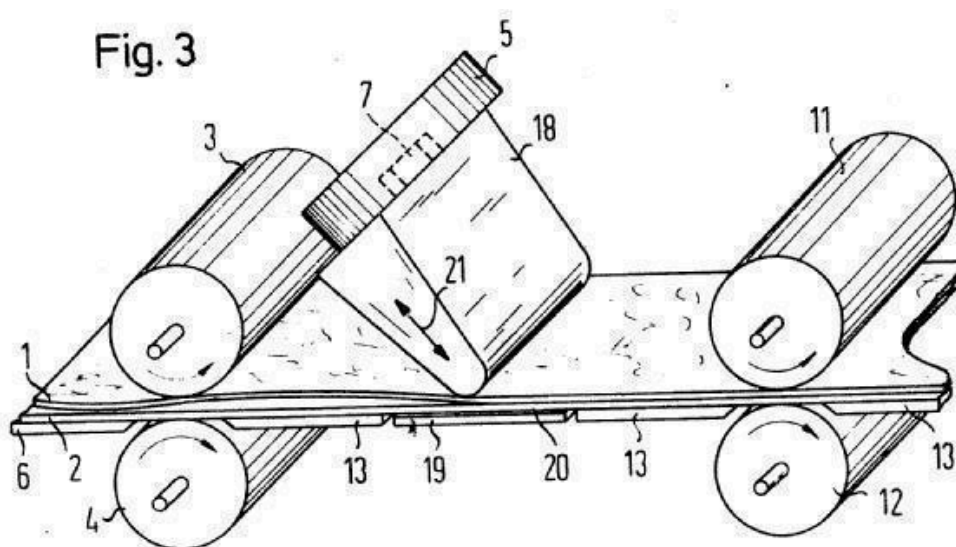
*This place covers:*

Example 1, from

JP11348132:

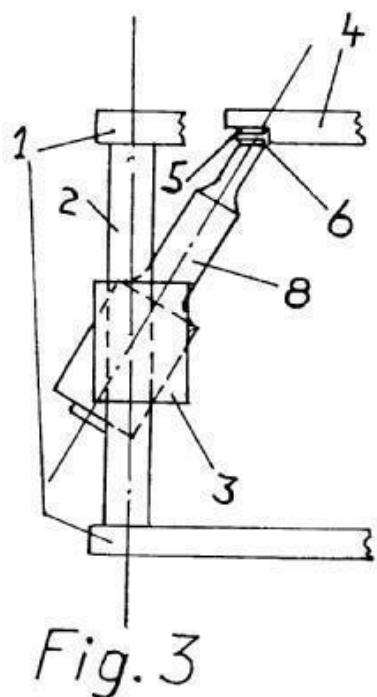


Example 2, from  
DE1957216:



Example 3, from

DE3911634:



## **B29C 65/082**

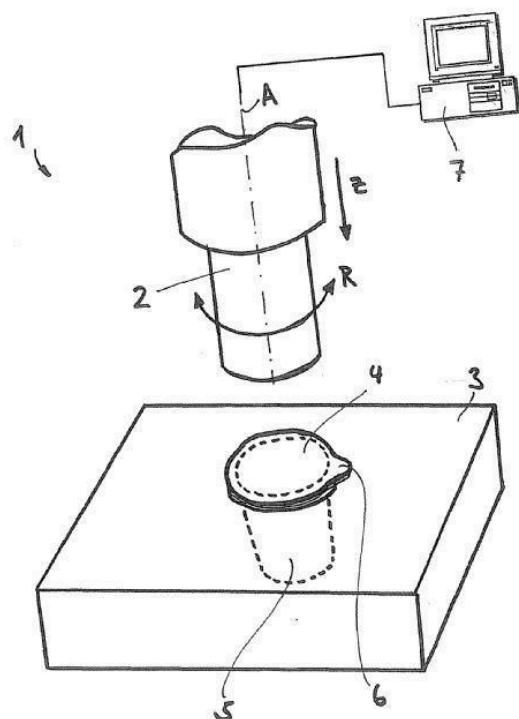
{Angular, i.e. torsional ultrasonic welding}

### **Definition statement**

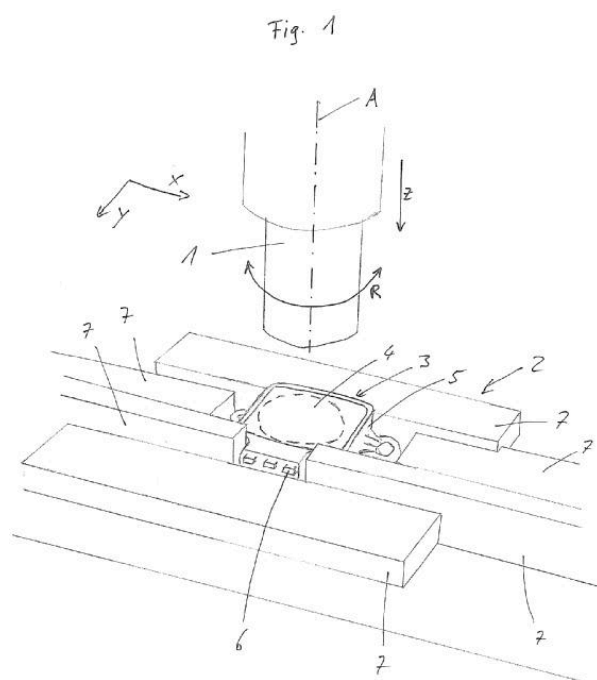
*This place covers:*

Example 1, from

EP2269807:



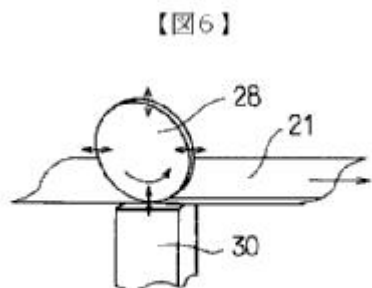
Example 2, from  
EP1930148:



**B29C 65/085****{using a rotary sonotrode}****Definition statement***This place covers:*

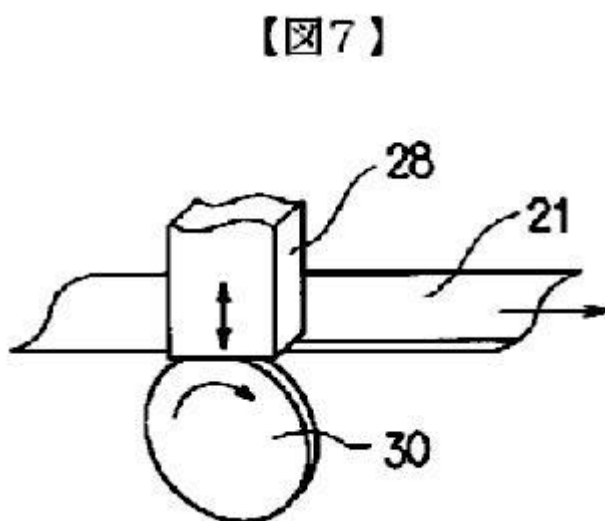
Example 1, from

JP11170404:

**B29C 65/086****{using a rotary anvil}****Definition statement***This place covers:*

Example 1, from

JP11170404:



**B29C 65/087**

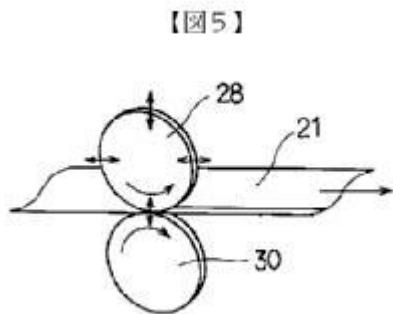
{using both a rotary sonotrode and a rotary anvil}

**Definition statement**

*This place covers:*

Example 1, from

JP11170404:

**B29C 65/088**

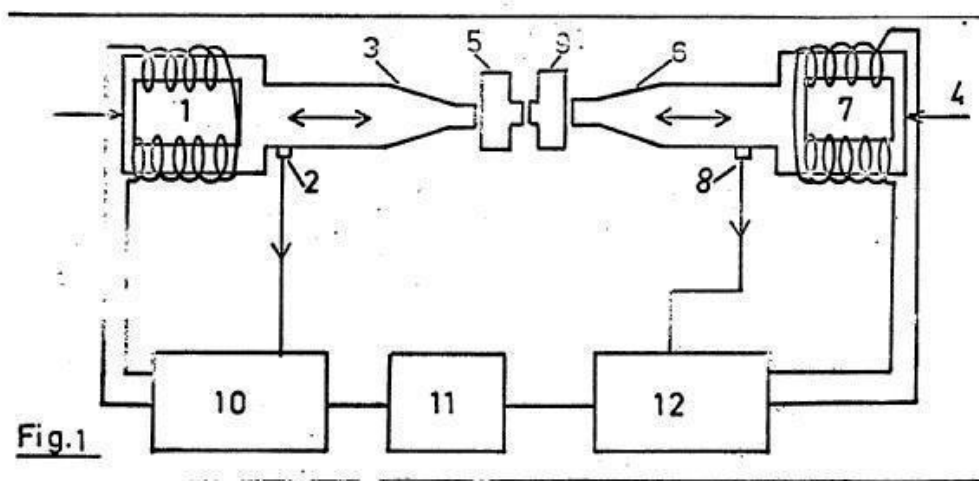
{using several cooperating sonotrodes, i.e. interacting with each other, e.g. for realising the same joint}

**Definition statement**

*This place covers:*

Example 1, from

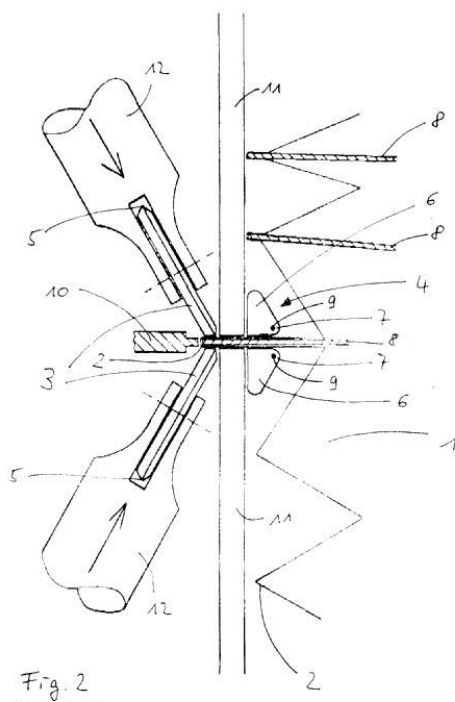
DE2251521:



Example 2, from



DE3929770:



## B29C 65/10

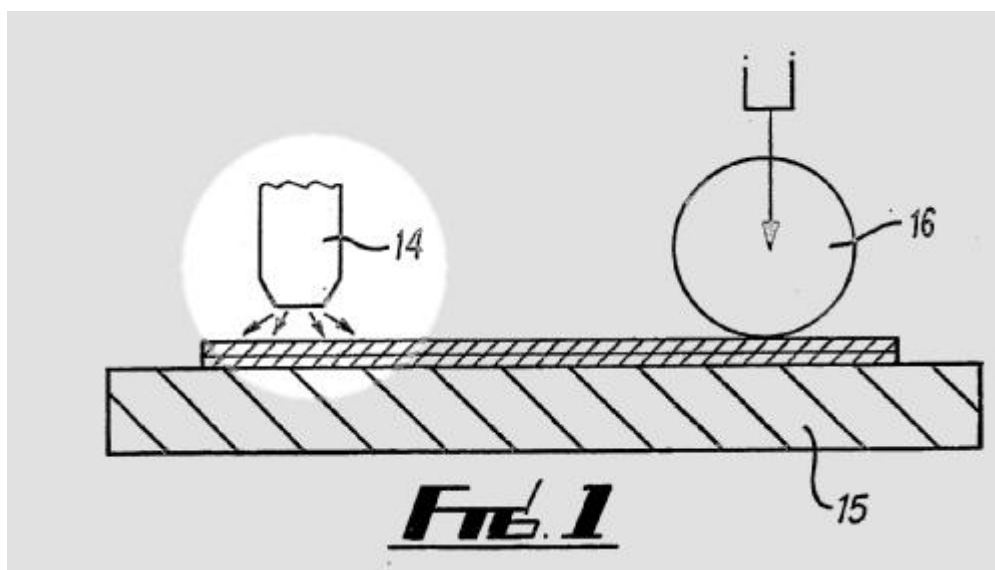
using hot gases {(e.g. combustion gases) or flames coming in contact with at least one of the parts to be joined}

### Definition statement

*This place covers:*

Example 1, from

WO2004099488:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heating or curing using gas or flames	<a href="#">B29C 35/045</a>
Soldering with the use of hot gas	<a href="#">B23K 1/00</a>
Gas flame welding of metals	<a href="#">B23K 5/00</a>
Device for, or methods of, sealing or securing package folds or closures by applying heat using fluids, e.g. hot-air jets	<a href="#">B65B 51/20</a>

## B29C 65/103

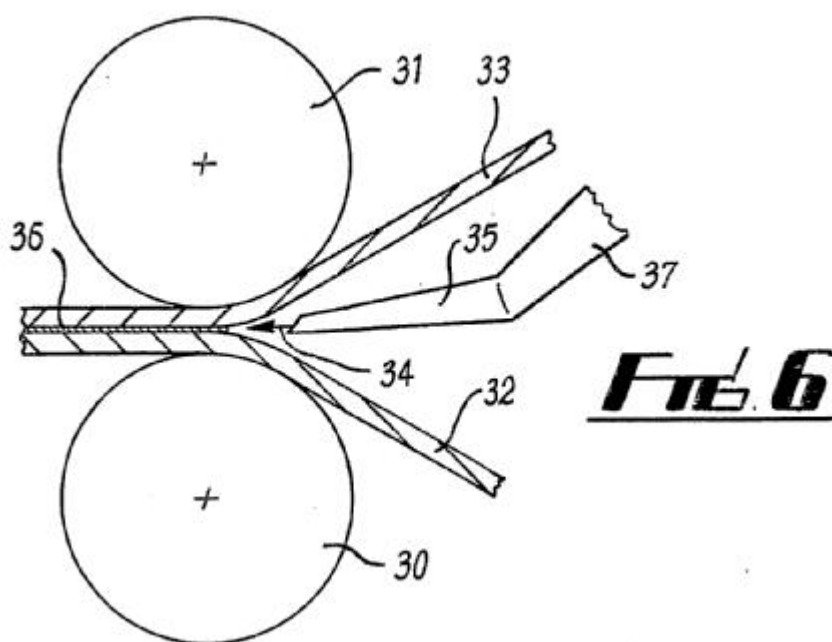
{direct heating both surfaces to be joined}

### Definition statement

*This place covers:*

Example 1, from

WO2004099488:



## B29C 65/106

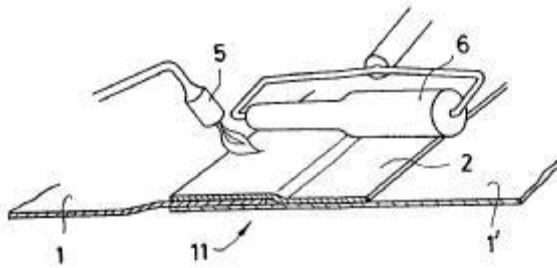
{using flames coming in contact with at least one of the parts to be joined}

### Definition statement

*This place covers:*

Example 1, from

JP60048331:



## B29C 65/12

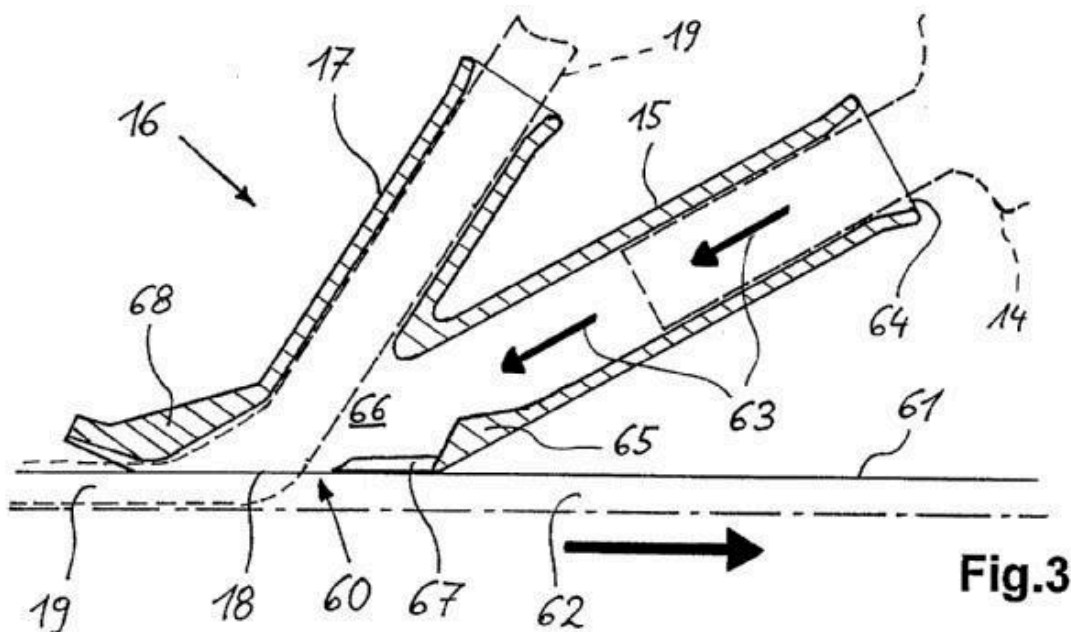
and welding bar

### Definition statement

*This place covers:*

Example 1, from

DE29713474U:



## B29C 65/14

using wave energy {, i.e. electromagnetic radiation,} or particle radiation  
{(using mechanical waves [B29C 65/06](#); using ultrasonic waves [B29C 65/08](#);  
pressing means transparent to electromagnetic radiation [B29C 66/81267](#))}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heating or curing by wave energy or particle radiation	<a href="#">B29C 35/08</a>
--	----------------------------

Medical tube couplings for connecting tubes having sealed ends, both tube ends being sealed by meltable membranes pierced after connection by use of heat, e.g. using radiant energy	<a href="#">A61M 39/143</a>
Soldering by means of radiant energy	<a href="#">B23K 1/005</a>
Soldering by means of beams, e.g. E.B.	<a href="#">B23K 1/0056</a>

## B29C 65/1412

{Infrared [IR] radiation}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Soldering by means of I.R.	<a href="#">B23K 1/005</a>
Non-woven fabrics formed from fleeces or layers composed of fibres by welding together the fibres by infrared heating	<a href="#">D04H 1/556</a>

## B29C 65/1432

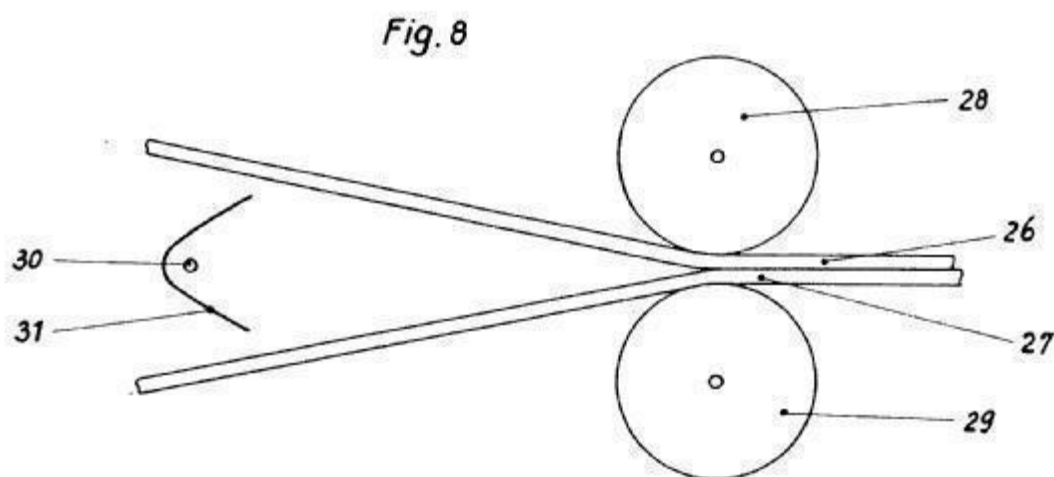
{direct heating of the surfaces to be joined}

### Definition statement

This place covers:

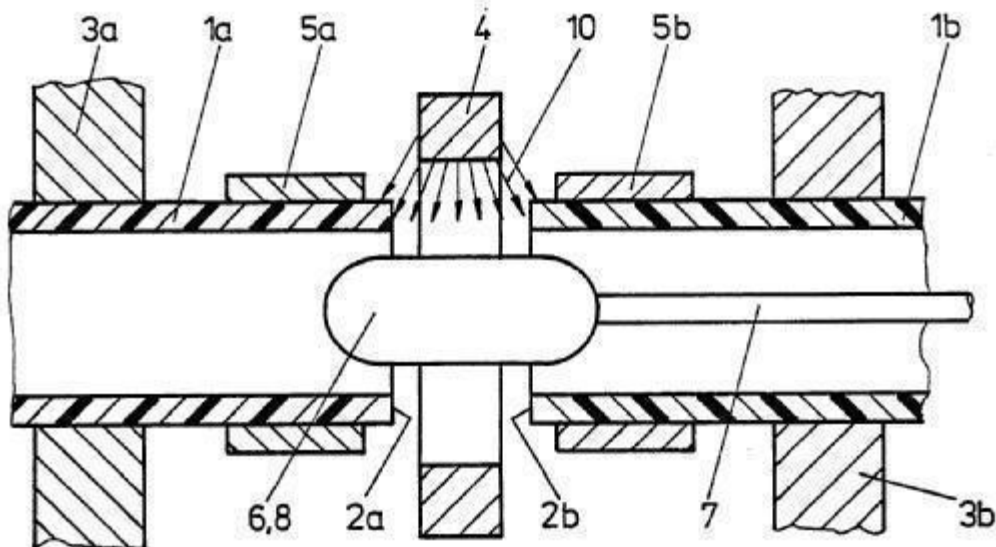
Example 1, from

DE845564:



Example 2, from

EP0313731:



## B29C 65/1435

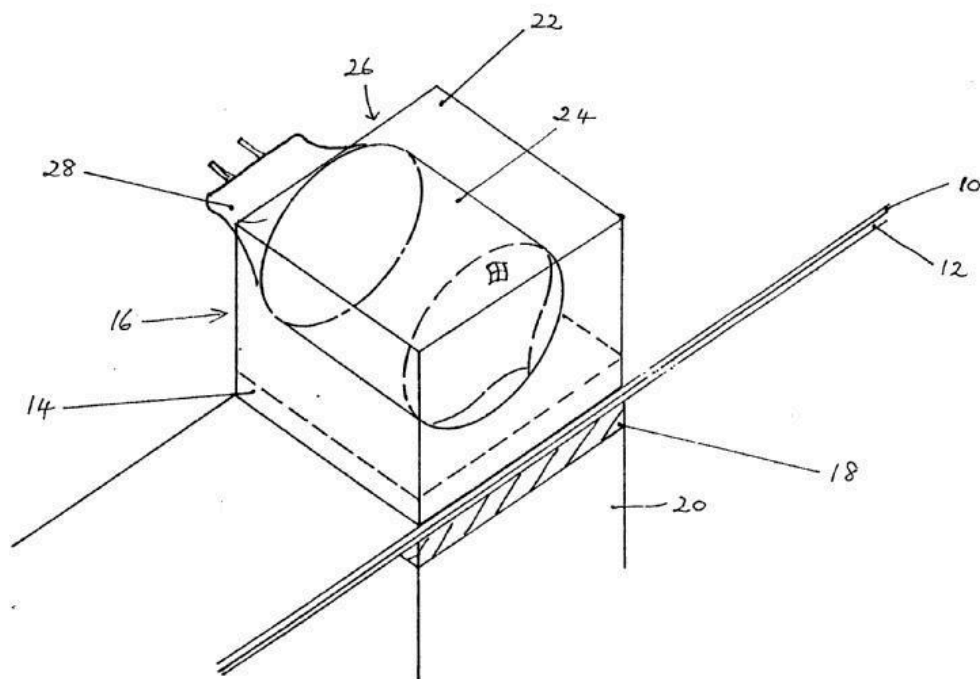
{at least passing through one of the parts to be joined, i.e. transmission welding}

### Definition statement

*This place covers:*

Example 1, from

GB2103147:



**B29C 65/1438**

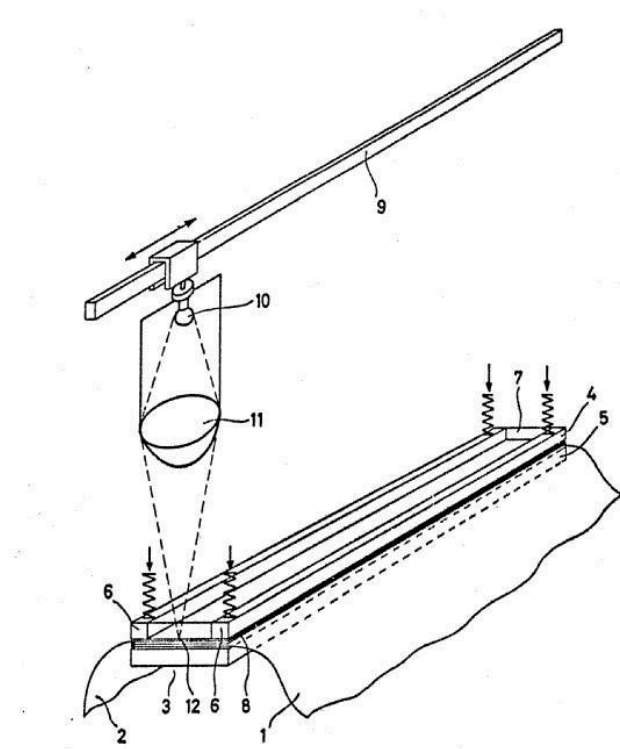
{focusing the wave energy or particle radiation on the interface}

**Definition statement**

*This place covers:*

Example 1, from

BE629609:

**B29C 65/1441**

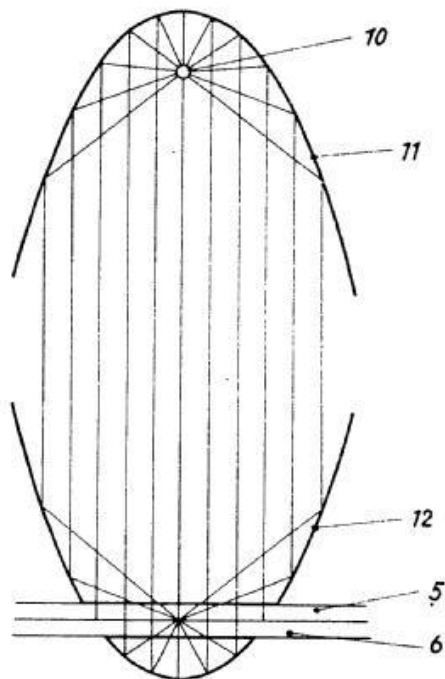
{making use of a reflector on the opposite side, e.g. a polished mandrel or a mirror (pressing means reflective to electromagnetic radiation [B29C 66/81268](#))}

**Definition statement**

*This place covers:*

Example 1, from

DE845564:



## **B29C 65/1445**

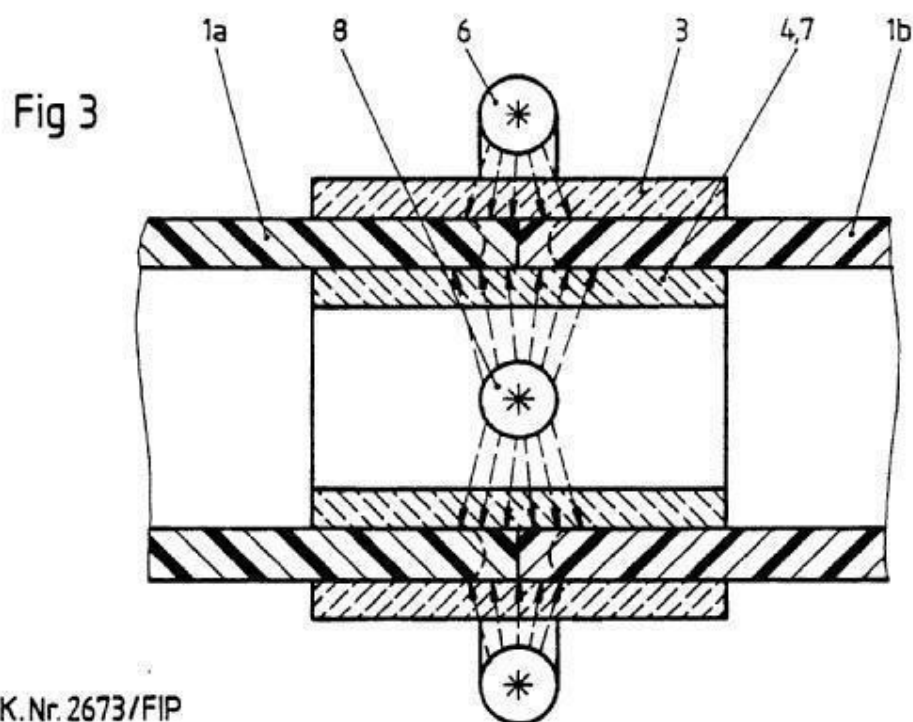
{heating both sides of the joint}

### **Definition statement**

*This place covers:*

Example 1, from

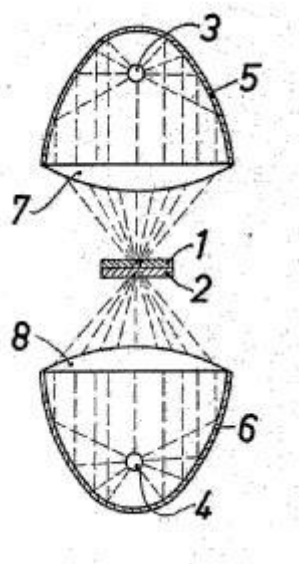
EP0415068:



K.Nr. 2673/FIP

Example 2, from

DE938499:





**B29C 65/1448**

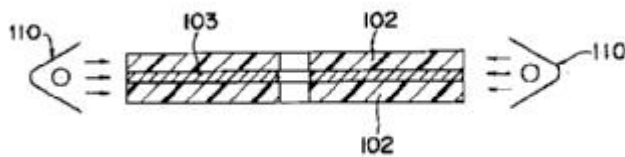
{radiating the edges of the parts to be joined, e.g. for curing a layer of adhesive placed between two flat parts to be joined, e.g. for making CDs or DVDs}

**Definition statement**

*This place covers:*

Example 1, from

JP11053778:

**B29C 65/1451**

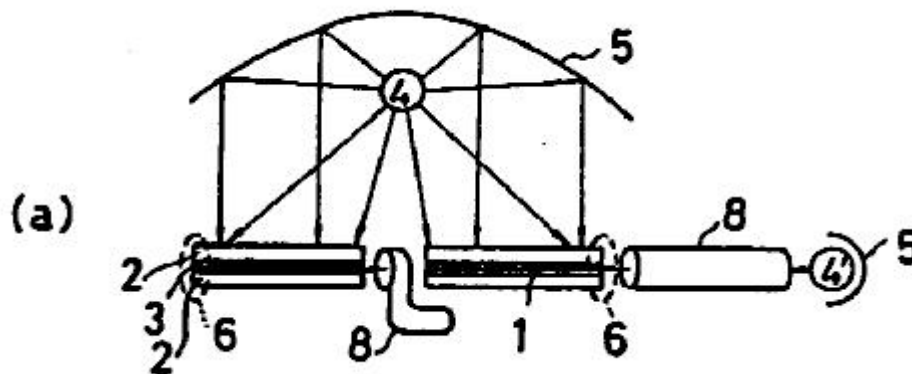
{radiating the edges of holes or perforations}

**Definition statement**

*This place covers:*

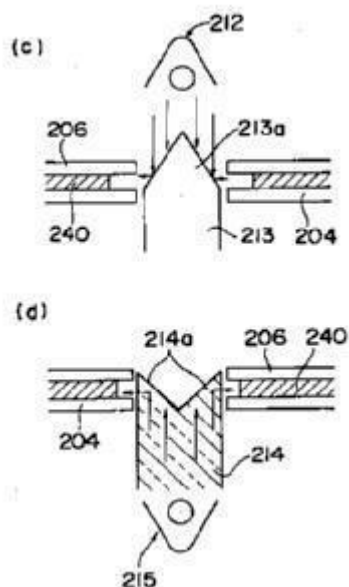
Example 1, from

JP63275052:



Example 2, from

JP11053778:



**B29C 65/1464**

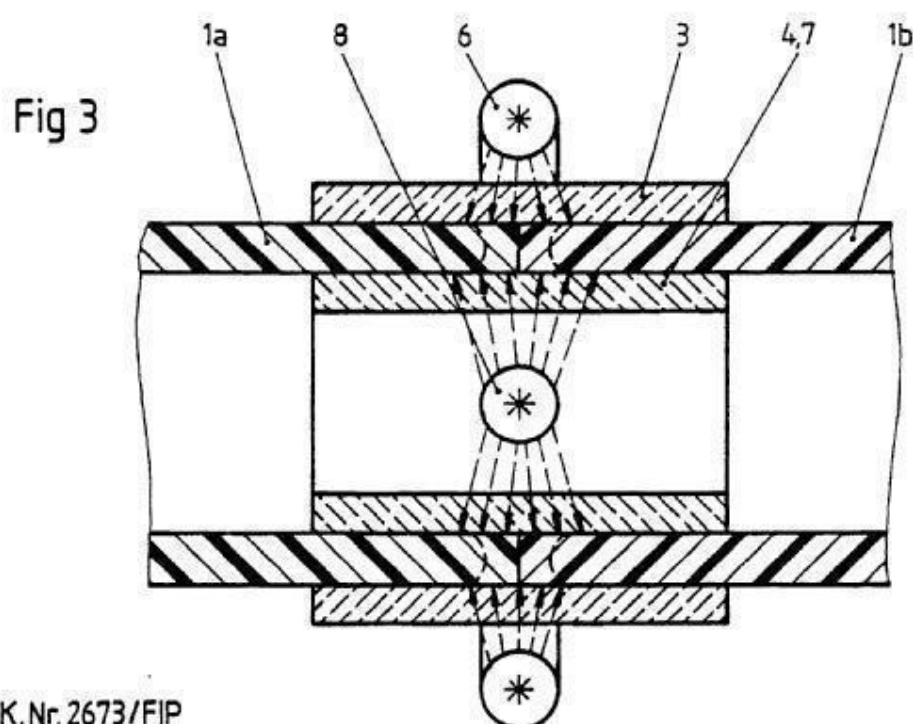
**{making use of several radiators}**

### Definition statement

*This place covers:*

Example 1, from

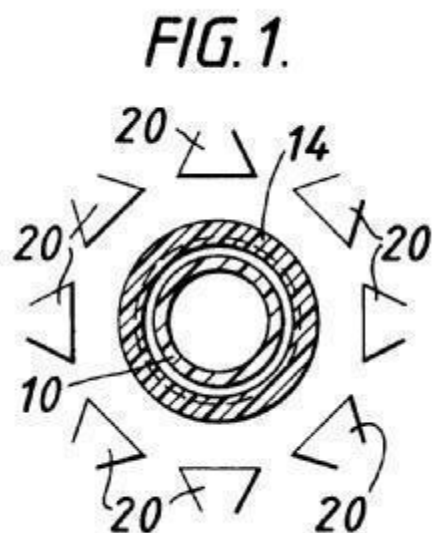
EP0415068



K.Nr. 2673/FIP

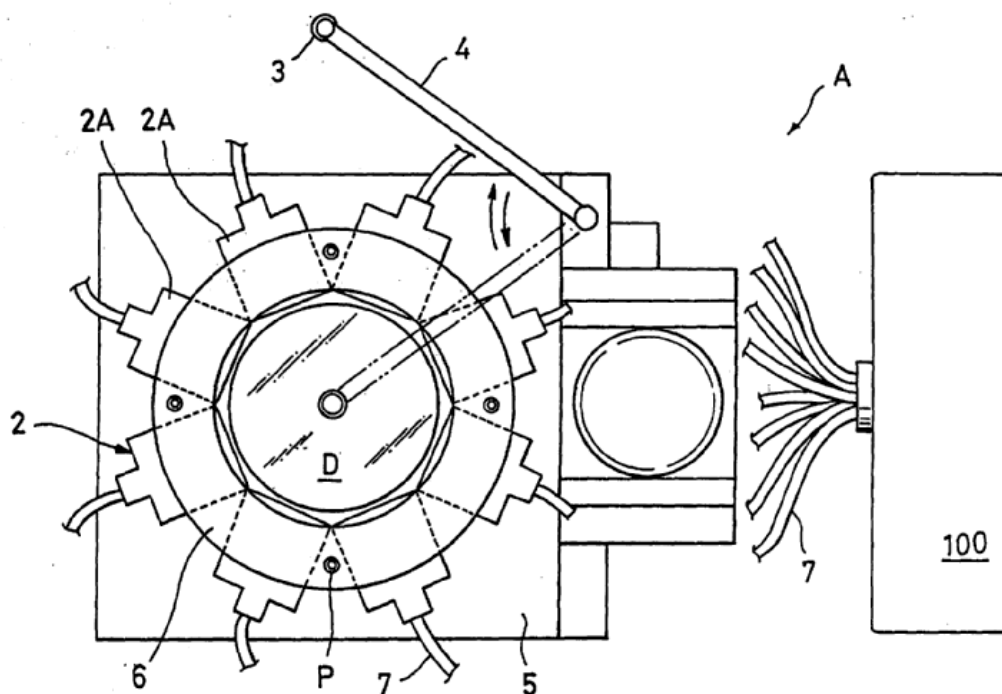
Example 2, from

EP0510804:



Example 3, from

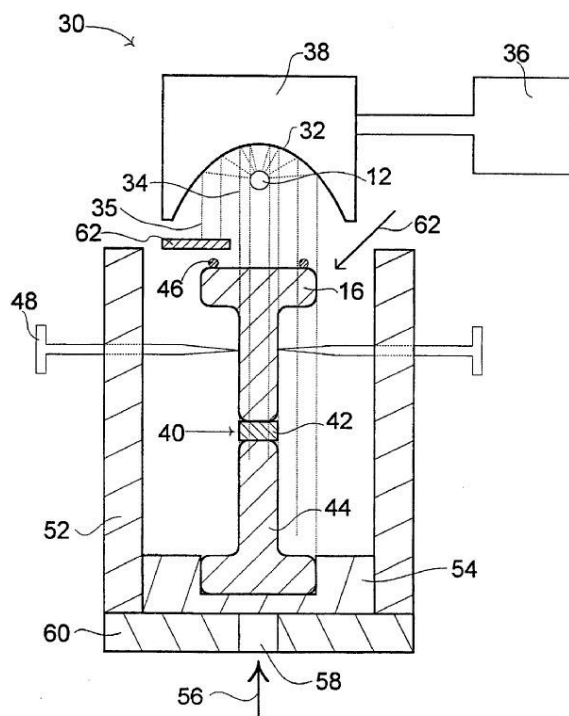
EP1059344:



**B29C 65/148****{placed at the interface}****Definition statement***This place covers:*

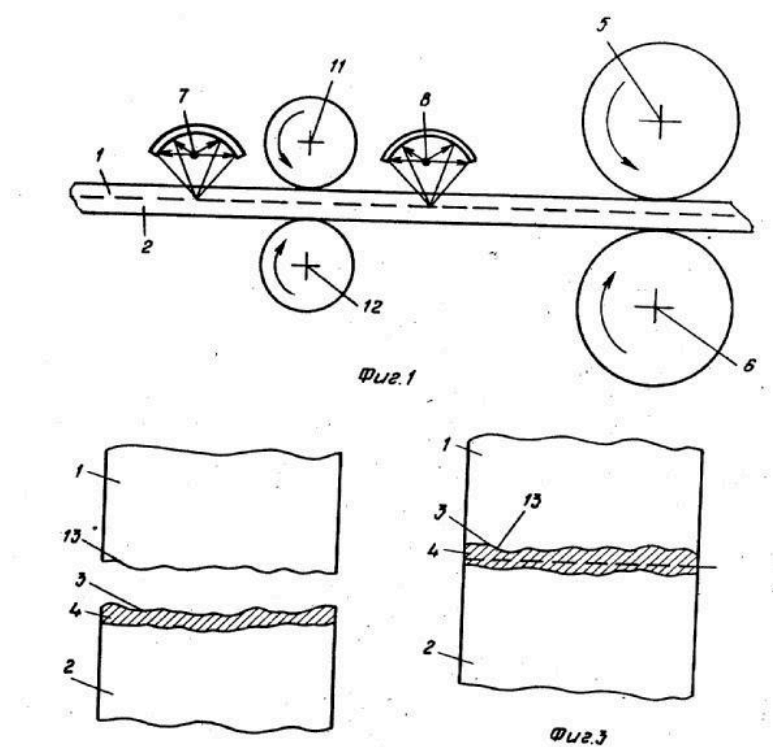
Example 1, from

US5843265:

**B29C 65/1483****{coated on the article}****Definition statement***This place covers:*

Example 1, from

SU1502396:



## **B29C 65/1487**

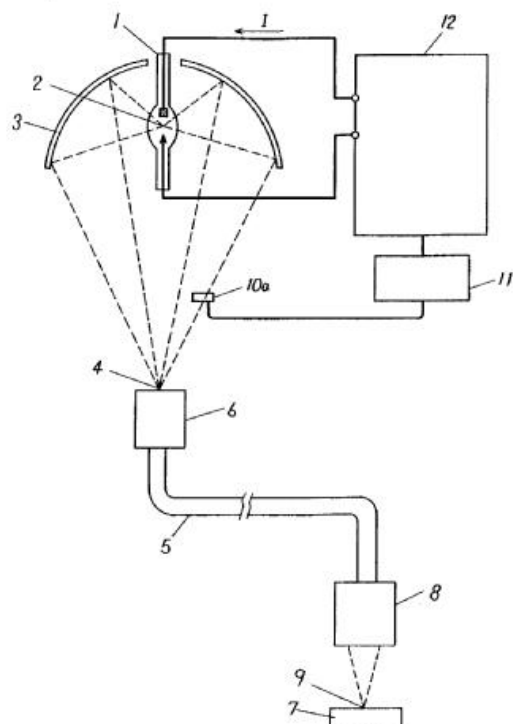
{making use of light guides ([B29C 65/1687](#) takes precedence)}

### **Definition statement**

*This place covers:*

Example 1, from

JP3238185:



## **B29C 65/1496**

{making use of masks ([B29C 65/1696](#) takes precedence)}

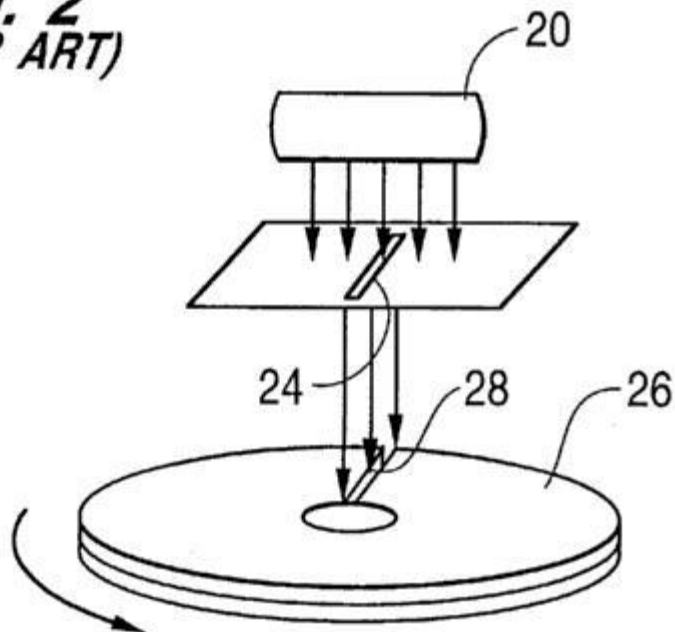
### **Definition statement**

*This place covers:*

Example 1, from

US5968305:

**FIG. 2**  
(PRIOR ART)



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heating or curing by wave energy or particle radiation using transparent moulds provided with masks or diaphragms	<a href="#">B29C 35/0894</a>
---	------------------------------

## B29C 65/16

### Laser beams

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Soldering by means of lasers	<a href="#">B23K 1/0056</a>
Bonding, e.g. welding, of materials in general, e.g. metals, by laser beam	<a href="#">B23K 26/20</a>
Lasers	<a href="#">H01S 3/00</a>

## B29C 65/1632

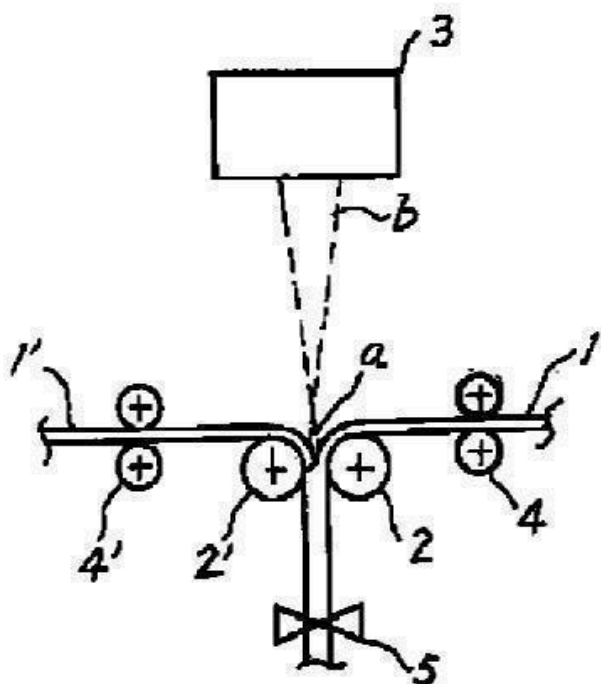
{direct heating the surfaces to be joined}

## Definition statement

This place covers:

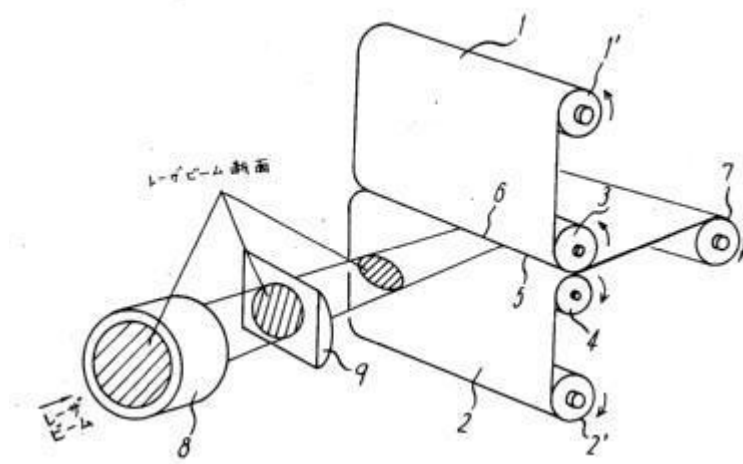
Example 1, from

JP4249134:



Example 2, from

JP50138066:



## B29C 65/1635

{at least passing through one of the parts to be joined, i.e. laser transmission welding}

### Definition statement

*This place covers:*

Example 1, from



DE19814298:

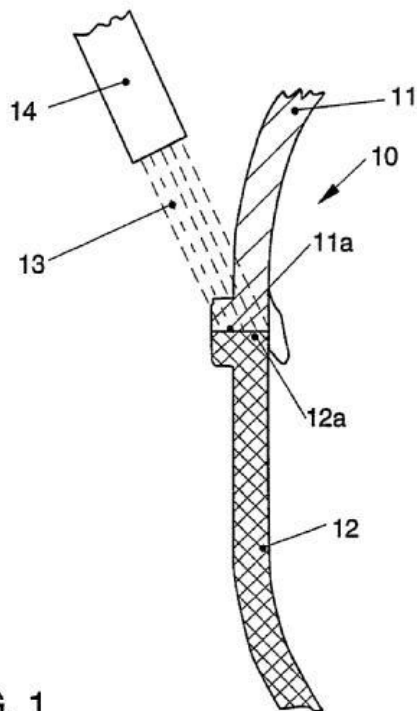


FIG. 1

## B29C 65/1638

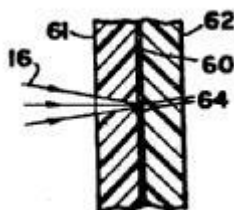
{focusing the laser beam on the interface}

### Definition statement

*This place covers:*

Example 1, from

DE1479686:



## B29C 65/1641

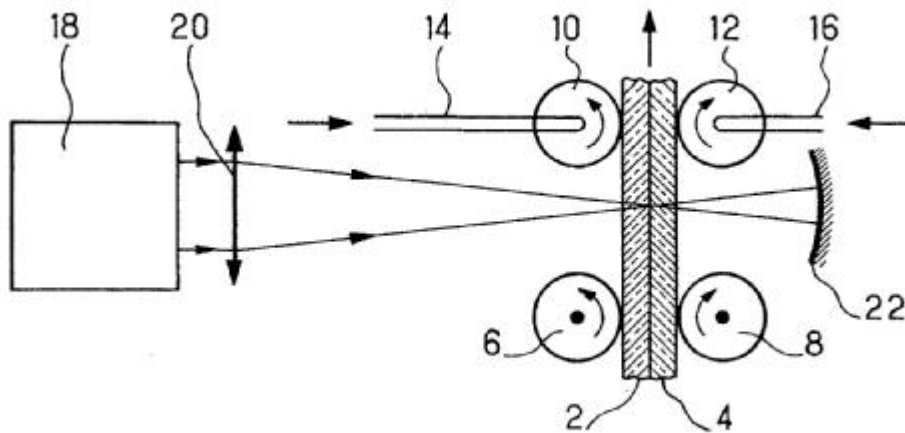
{making use of a reflector on the opposite side, e.g. a polished mandrel or a mirror (pressing means reflective to electromagnetic radiation [B29C 66/81268](#))}

### Definition statement

*This place covers:*

Example 1, from

FR1576435:



## B29C 65/1645

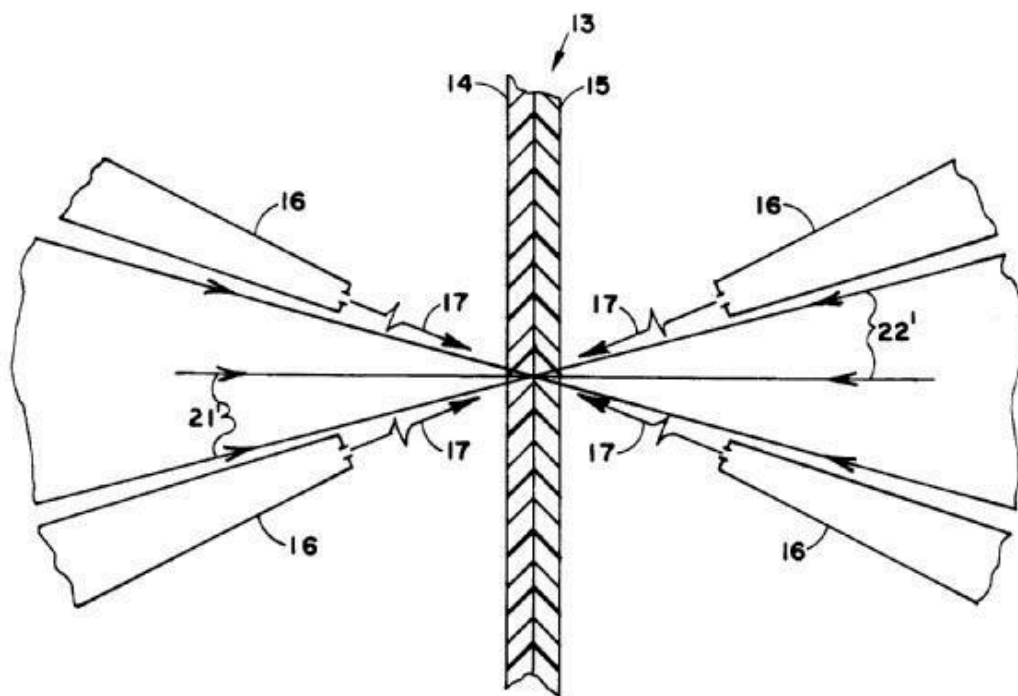
{heating both sides of the joint, e.g. by using two lasers or a split beam}

### Definition statement

*This place covers:*

Example 1, from

DE2725463:



**B29C 65/1661**

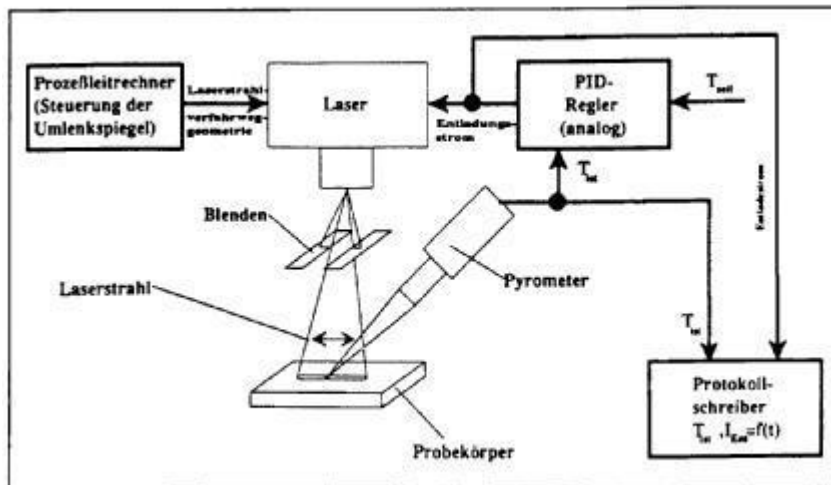
{scanning repeatedly, e.g. quasi-simultaneous laser welding}

**Definition statement**

*This place covers:*

Example 1, from

XP000535361:

**B29C 65/1664**

{making use of several radiators}

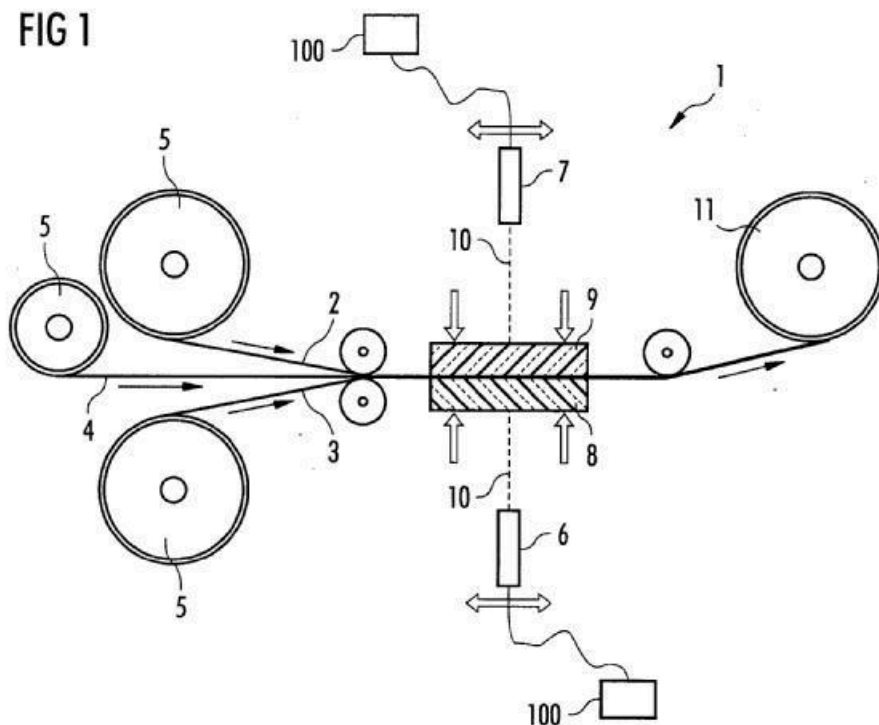
**Definition statement**

*This place covers:*

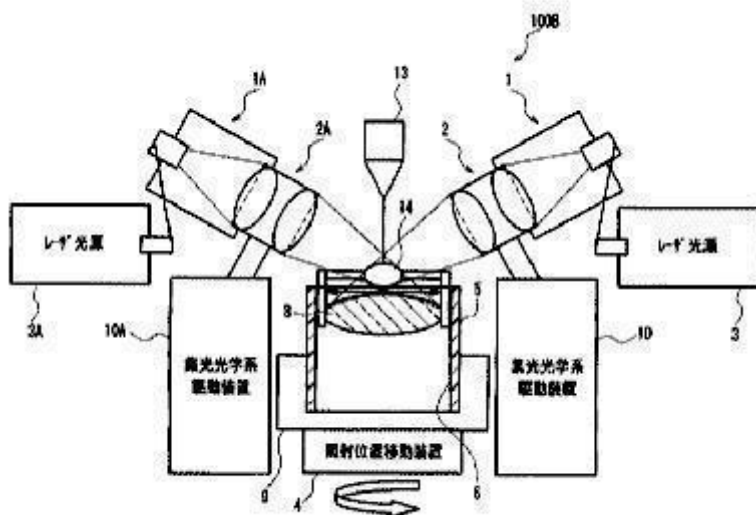
Example 1, from

DE10338732:

FIG 1



Example 2, from  
JP2004333946:



## B29C 65/1677

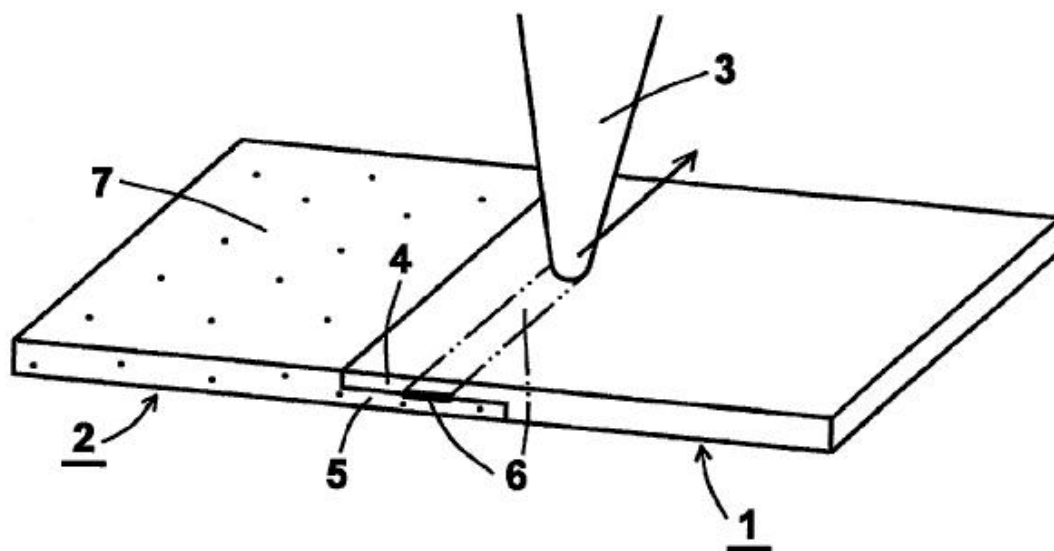
{making use of an absorber or impact modifier}

### Definition statement

This place covers:

Example 1, from

WO2005021244:



## B29C 65/168

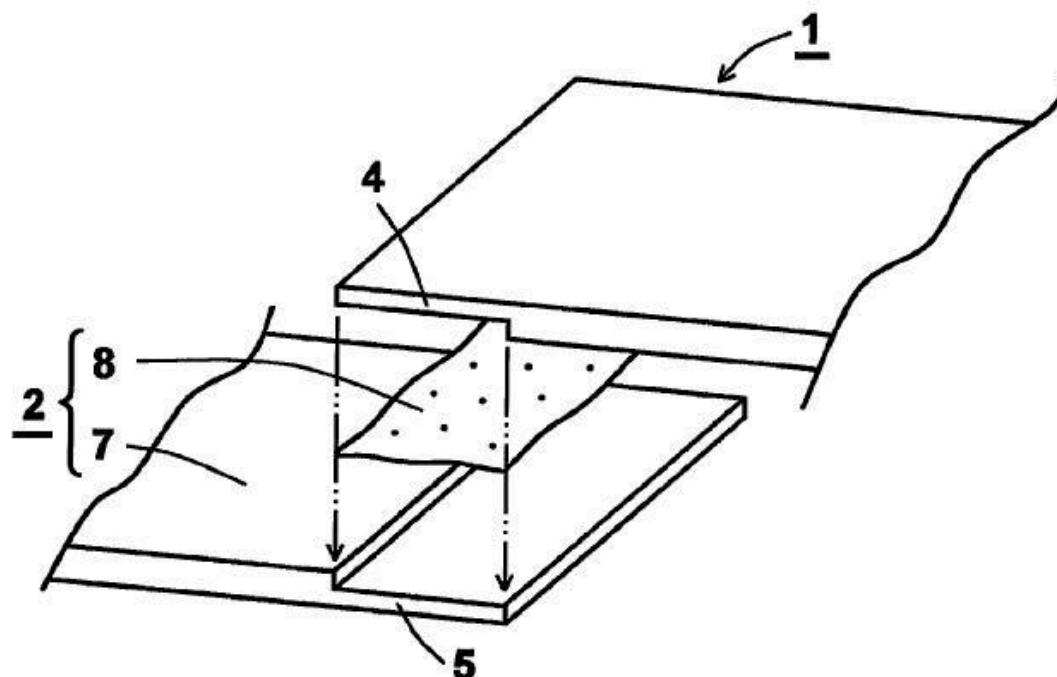
{placed at the interface}

### Definition statement

*This place covers:*

Example 1, from

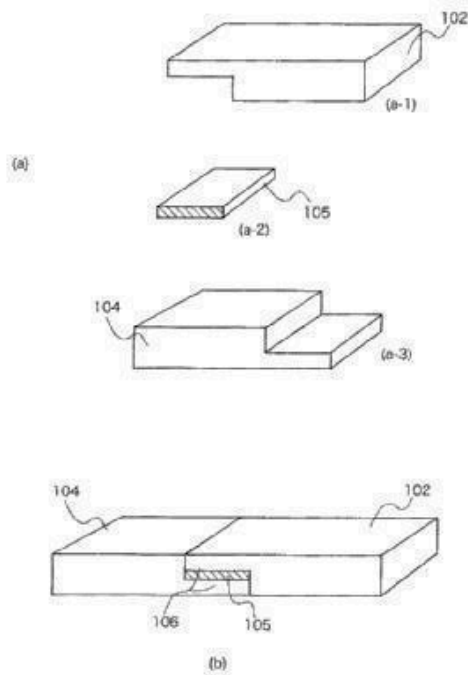
WO2005021244:



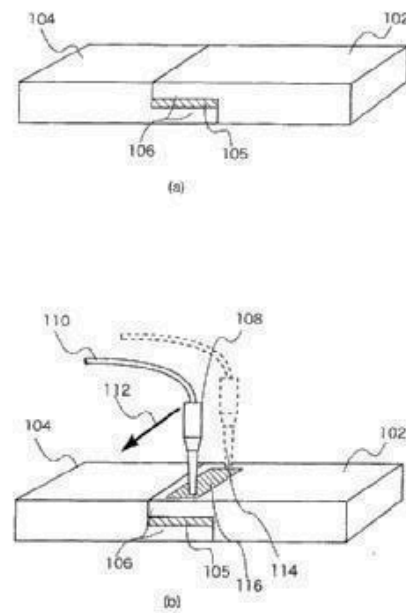
Example 2, from

JP2007111961:

【図1】



【図2】



## B29C 65/1683

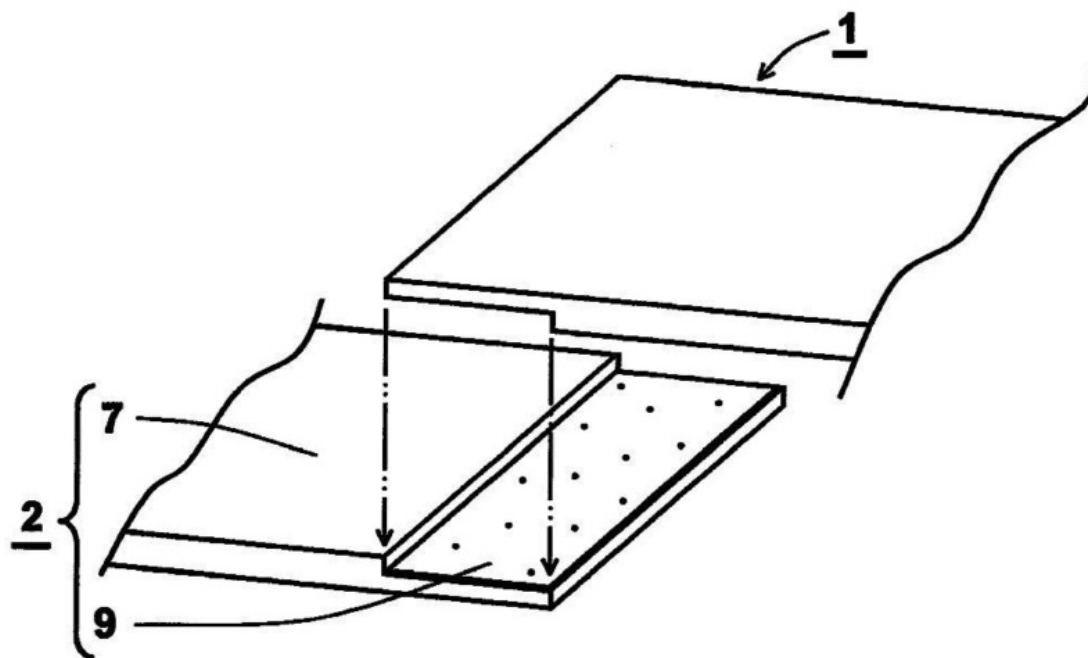
{coated on the article}

### Definition statement

*This place covers:*

Example 1, from

WO2005021244:



## B29C 65/1687

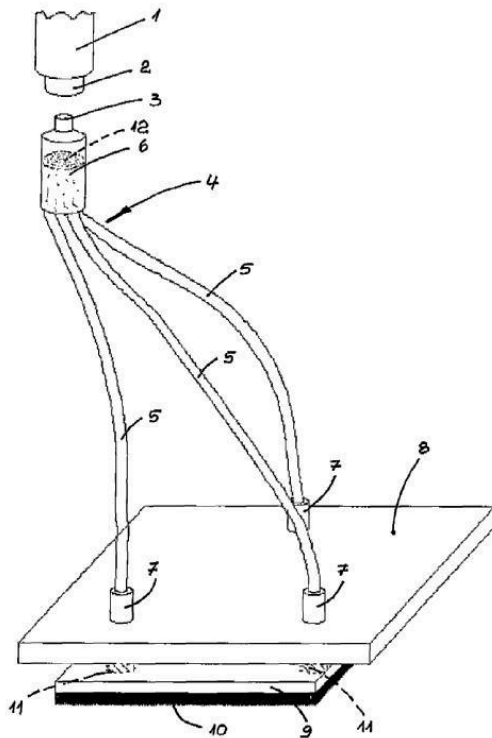
{making use of light guides}

### Definition statement

*This place covers:*

Example 1, from

EP1393848:



## B29C 65/169

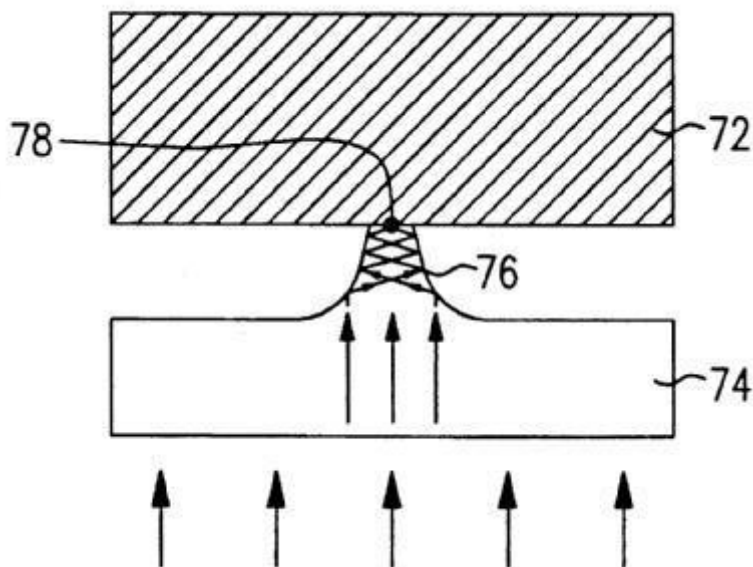
{being a part of the joined article}

### Definition statement

*This place covers:*

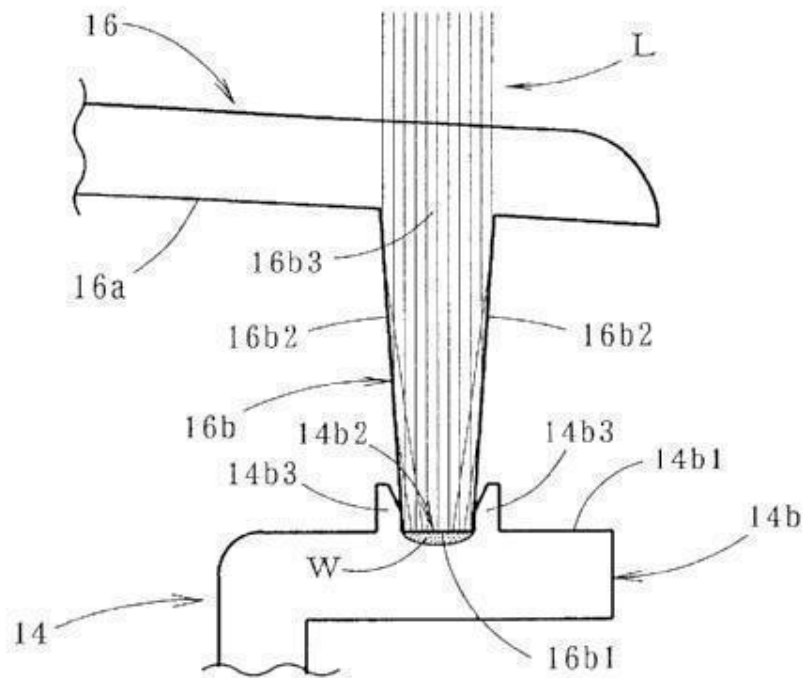
Example 1, from

US5276303:





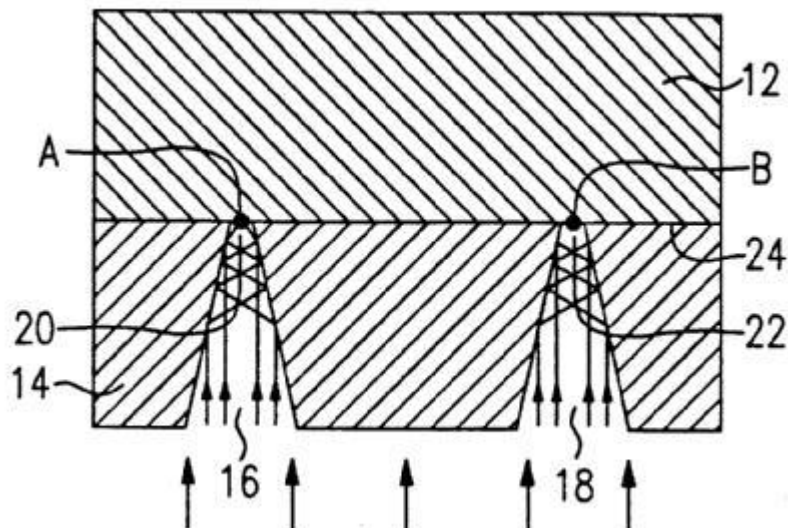
US6592239:



**{in the form of a cavity}**

*This place covers:*

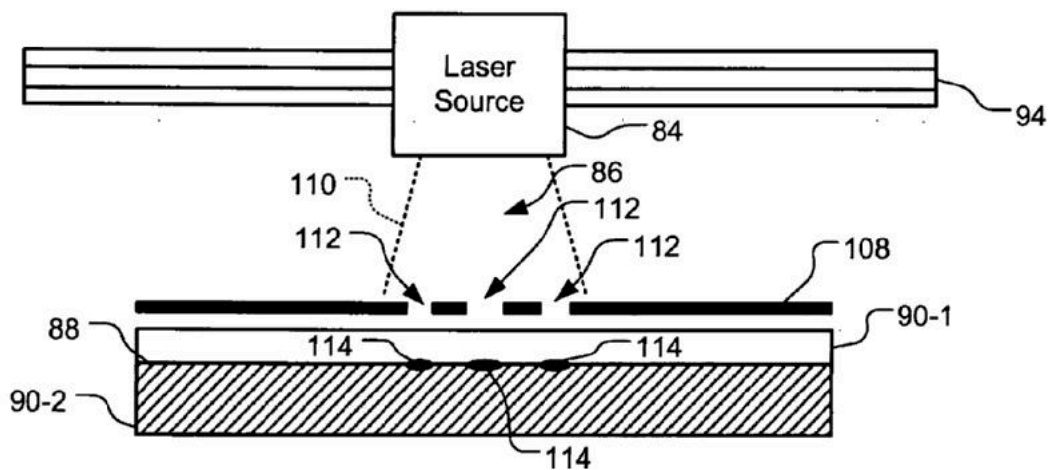
US5276303:



**B29C 65/1696****{making use of masks}****Definition statement***This place covers:*

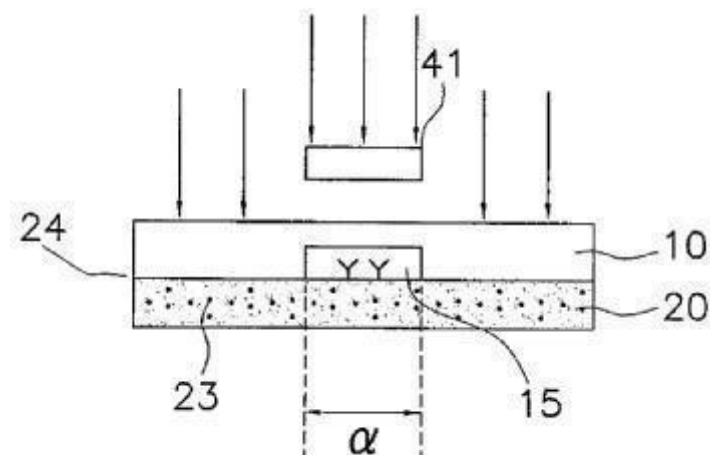
Example 1, from

US2006278617:



Example 2, from

EP1864784:

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Heating or curing by wave energy or particle radiation using transparent moulds provided with masks or diaphragms	<a href="#">B29C 35/0894</a>
---	------------------------------

**B29C 65/20**

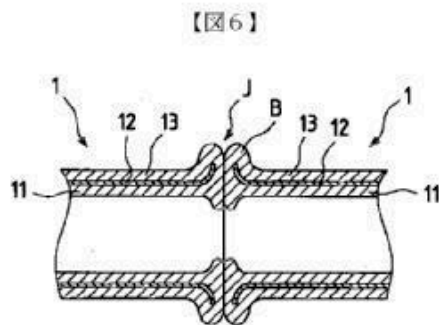
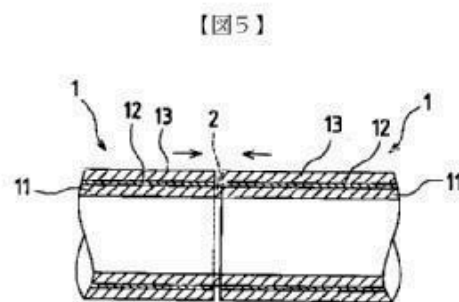
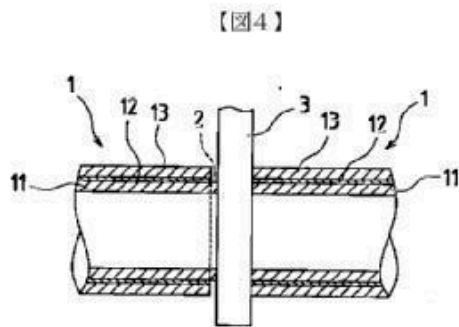
with direct contact, e.g. using "mirror"

**Definition statement**

*This place covers:*

Example 1, from

JP2003080601:

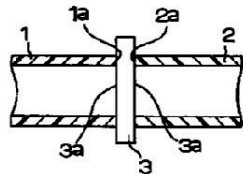


Example 2, from

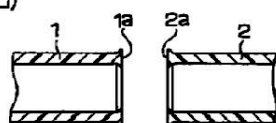
JP11325374:

【図8】

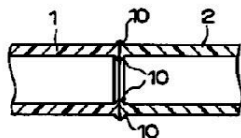
(1)



(□)



(11)

**B29C 65/2015**

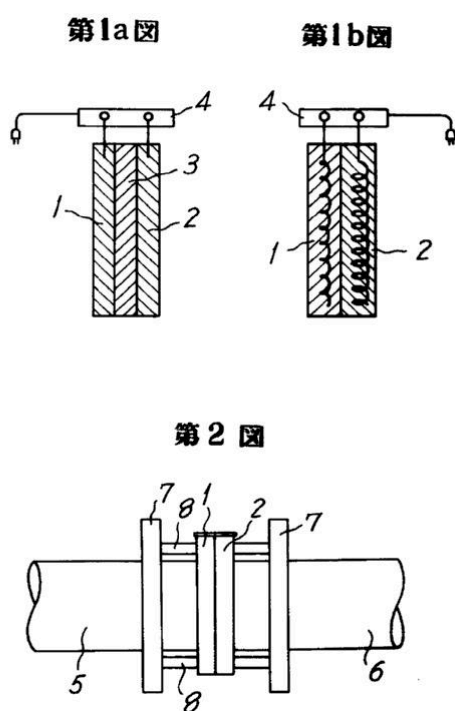
{being a single welding mirror comprising several separate heating surfaces in different planes, e.g. said heating surfaces having different temperatures}

**Definition statement**

*This place covers:*

Example 1, from

JP52168967U:



## B29C 65/2023

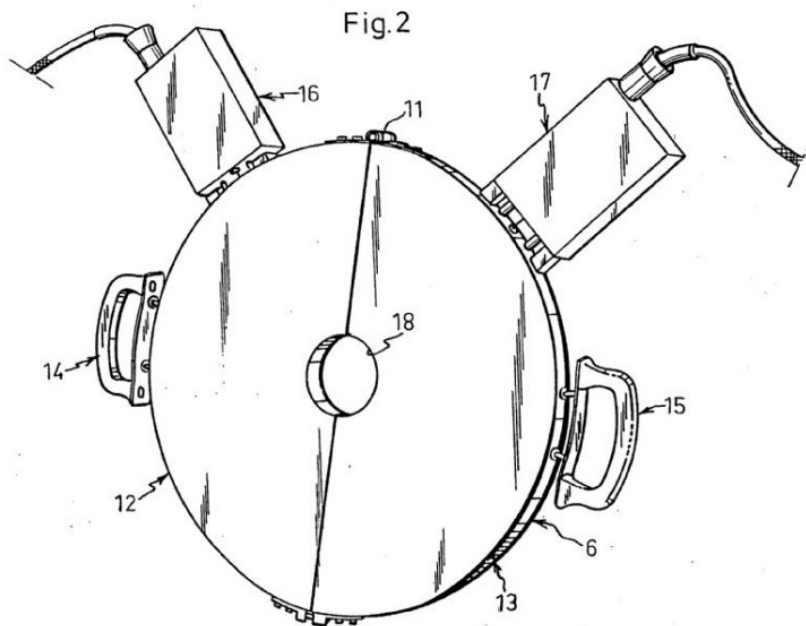
{said welding mirror comprising several sectors}

### Definition statement

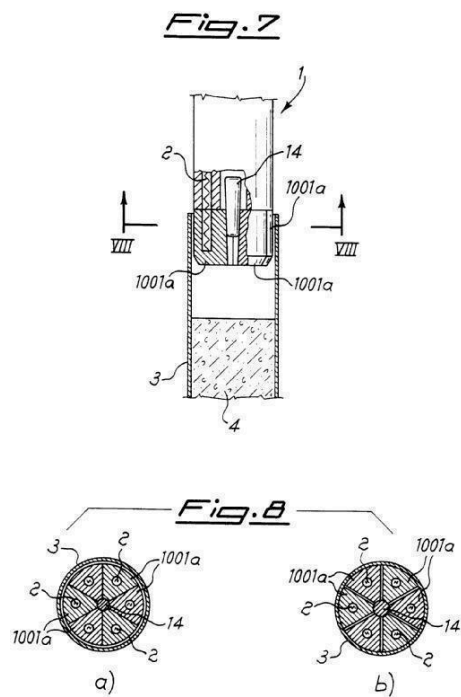
*This place covers:*

Example 1, from

WO8803245:

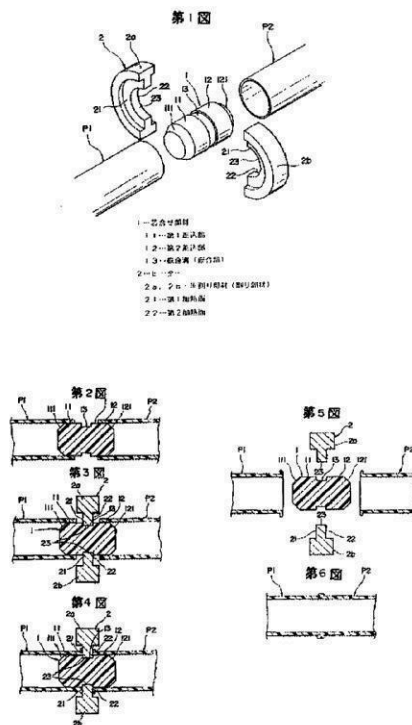


Example 2, from  
EP0667285:



Example 3, from

JP4044831:



## B29C 65/2038

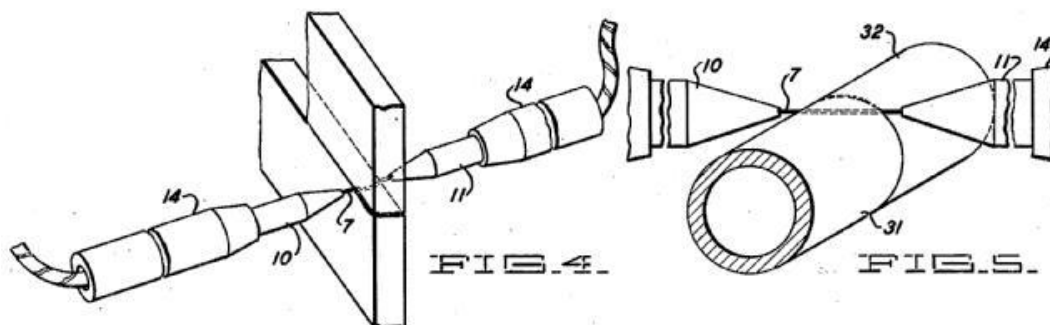
{being a wire}

### Definition statement

*This place covers:*

Example 1, from

US2546164:



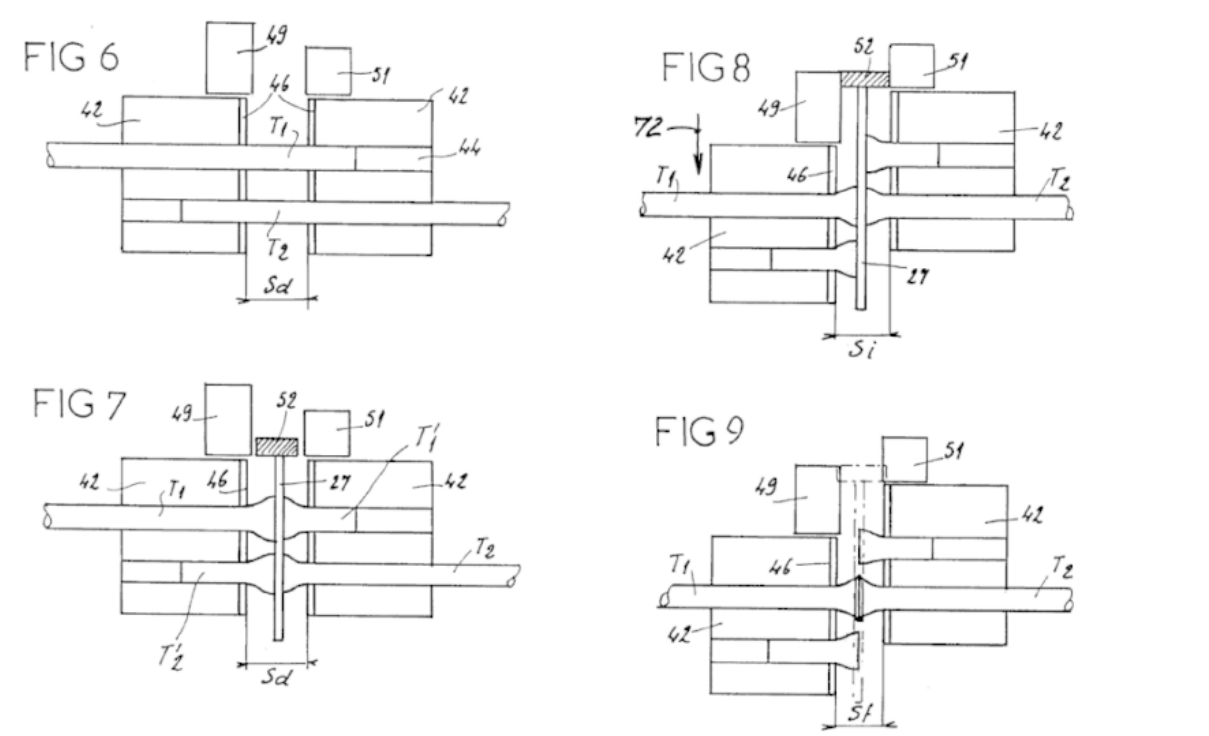
**B29C 65/2046**

{using a welding mirror which also cuts the parts to be joined, e.g. for sterile welding}

**Definition statement**

*This place covers:*

Example 1, from



**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Methods or apparatus for connecting medical tubes under sterile conditions, i.e. sterile docking	<a href="#">A61M 39/18</a>
--	----------------------------

**B29C 65/2061**

{by sliding}

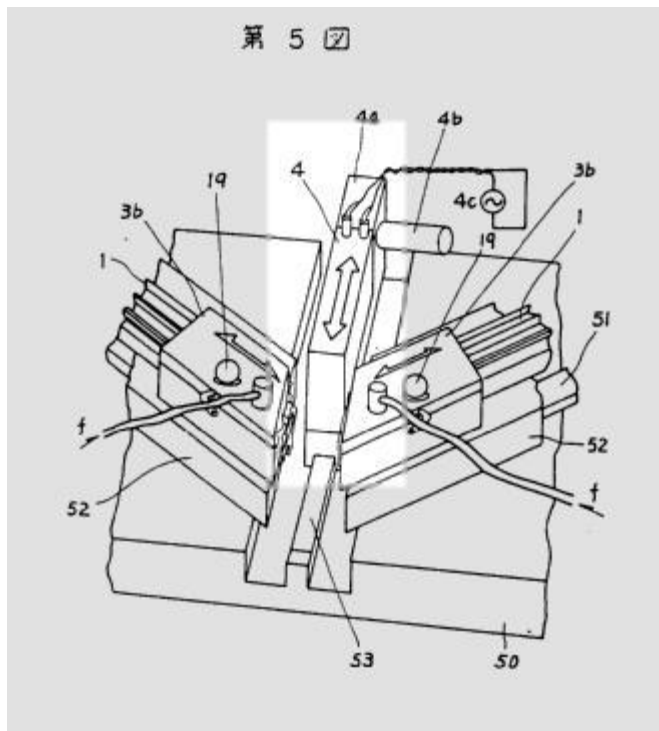
**Definition statement**

*This place covers:*

Example 1, from



JP1285328:



## **B29C 65/2069**

{with an angle with respect to the plane comprising the parts to be joined}

### **Definition statement**

*This place covers:*

Example 1, from

EP1889708:

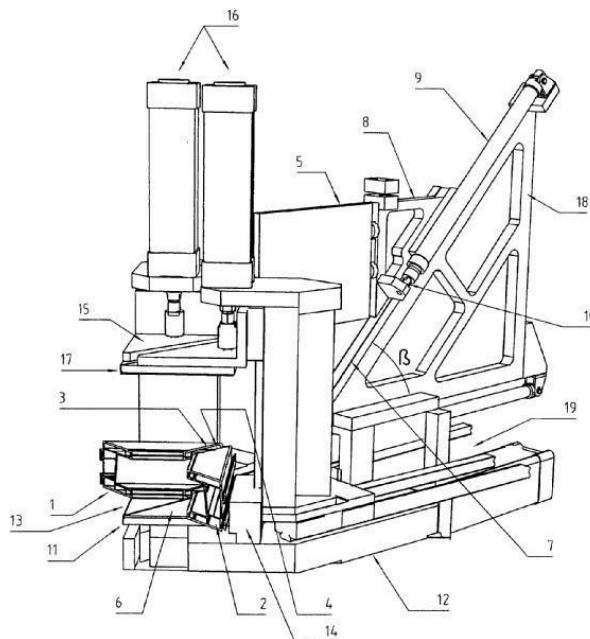


Fig. 1

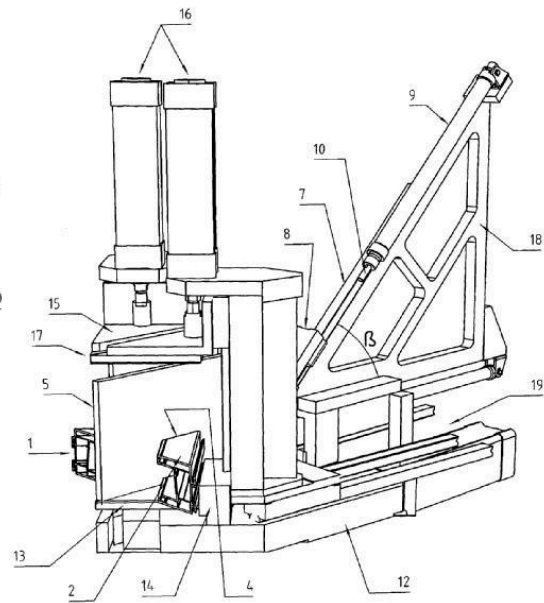


Fig. 2

## **B29C 65/2076**

{perpendicularly to the plane comprising the parts to be joined}

### **Definition statement**

*This place covers:*

Example 1, from

Fig.1

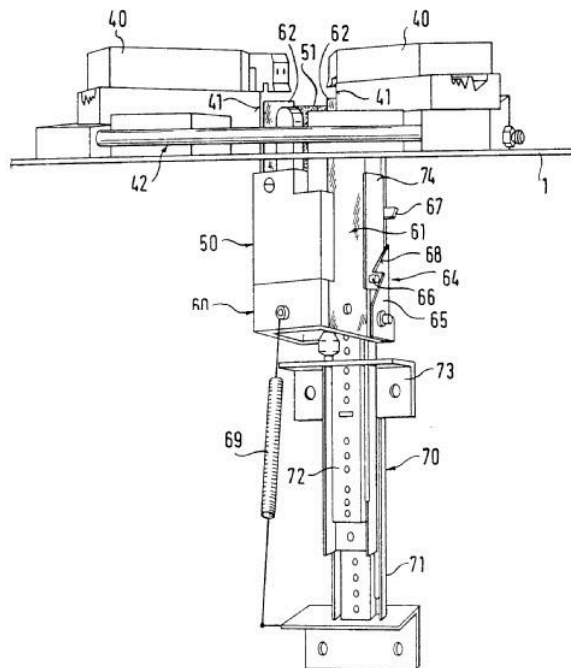


Fig. 3

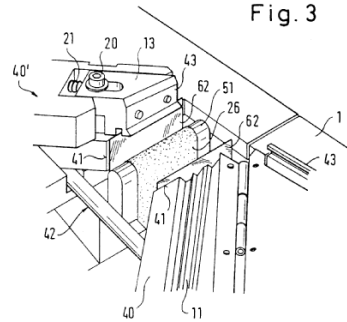
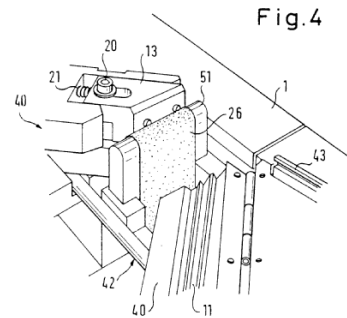


Fig.4

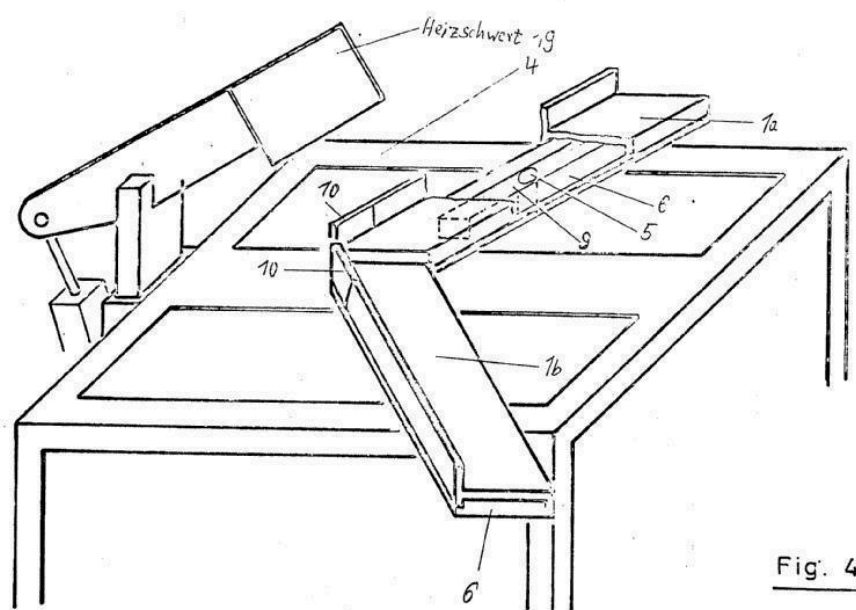


**{by pivoting}**

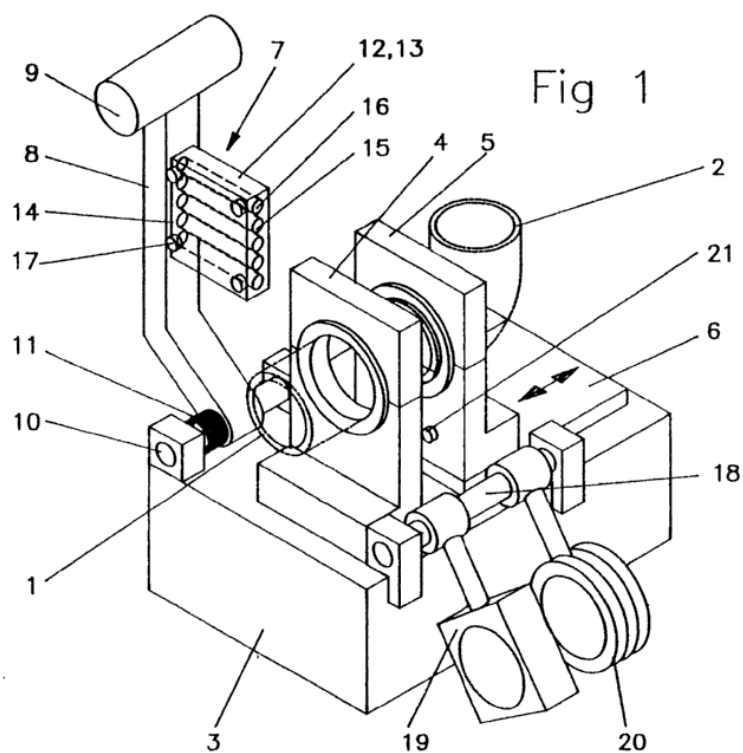
### Definition statement

Example 1, from

DE2300626:



Example 2, from  
EP0453903:



**B29C 65/2092**

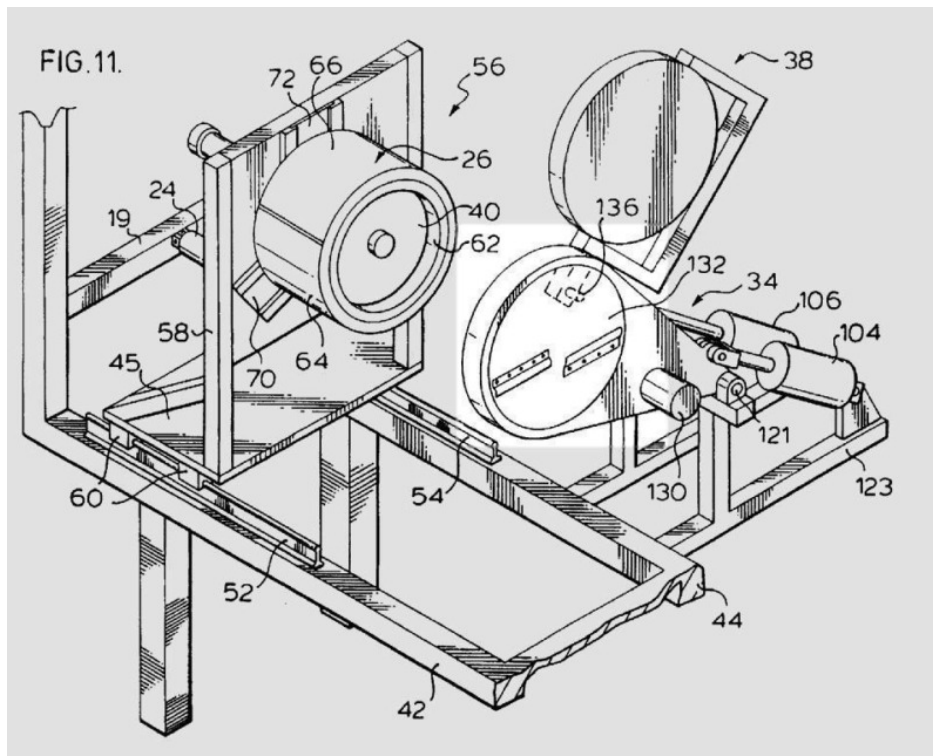
**{and involving the use of a facer}**

### Definition statement

*This place covers:*

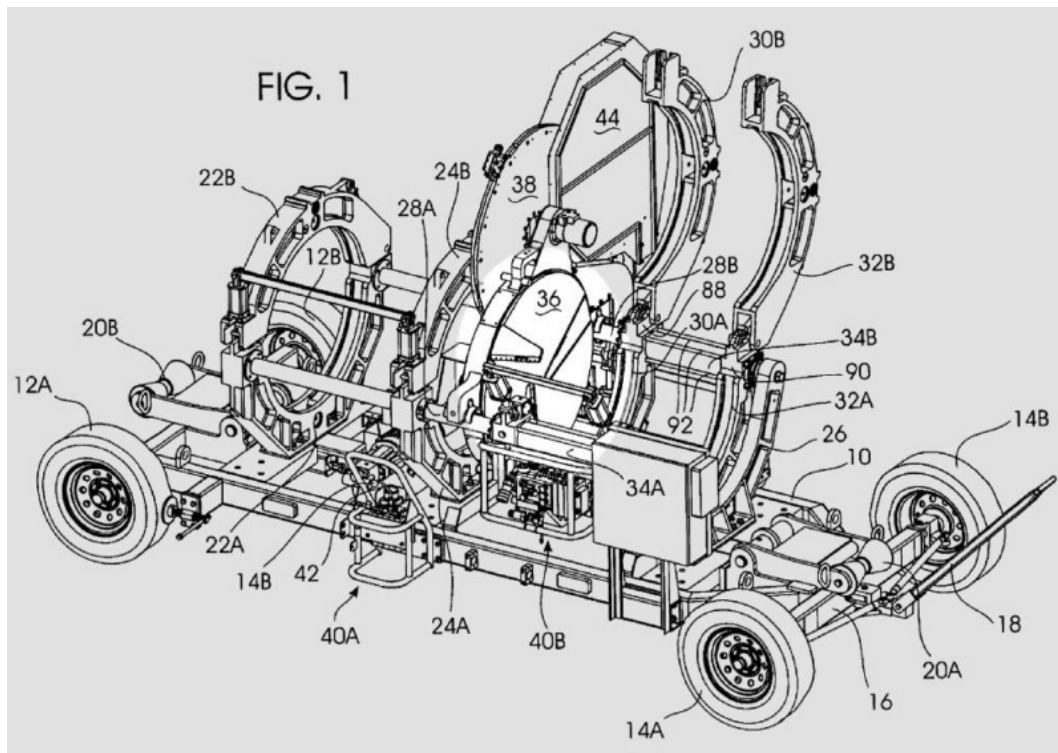
Example 1, from

US5893961:



Example 2, from

US6550514:



**B29C 65/222**

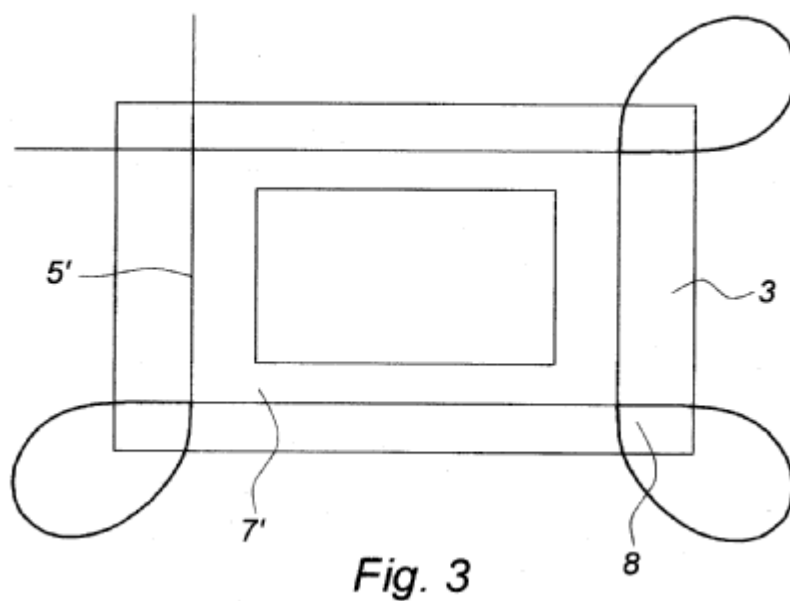
**{comprising at least a single heated wire}**

### Definition statement

*This place covers:*

Example 1, from

FR2840247:



## B29C 65/223

{comprising several heated wires}

### Definition statement

*This place covers:*

Example 1, from

US2009250440:

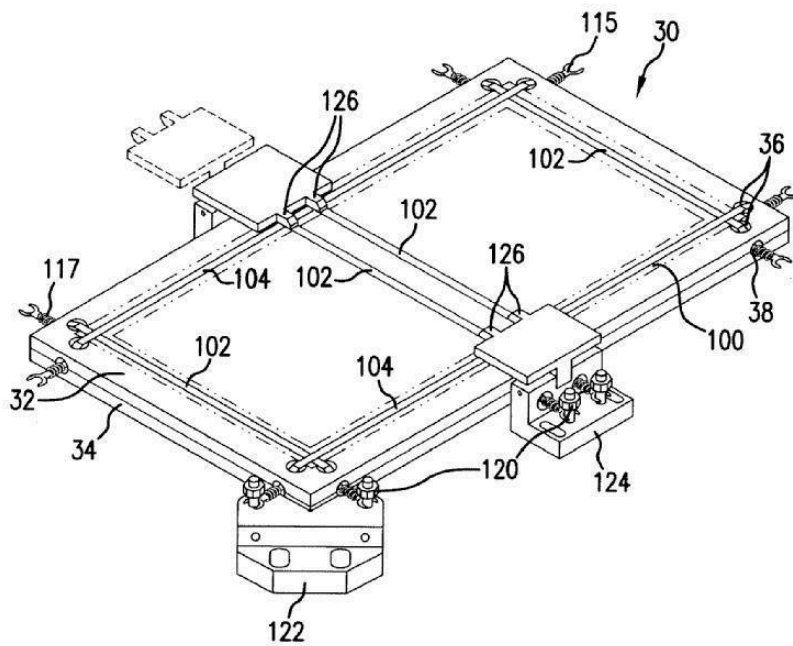


FIG. 2

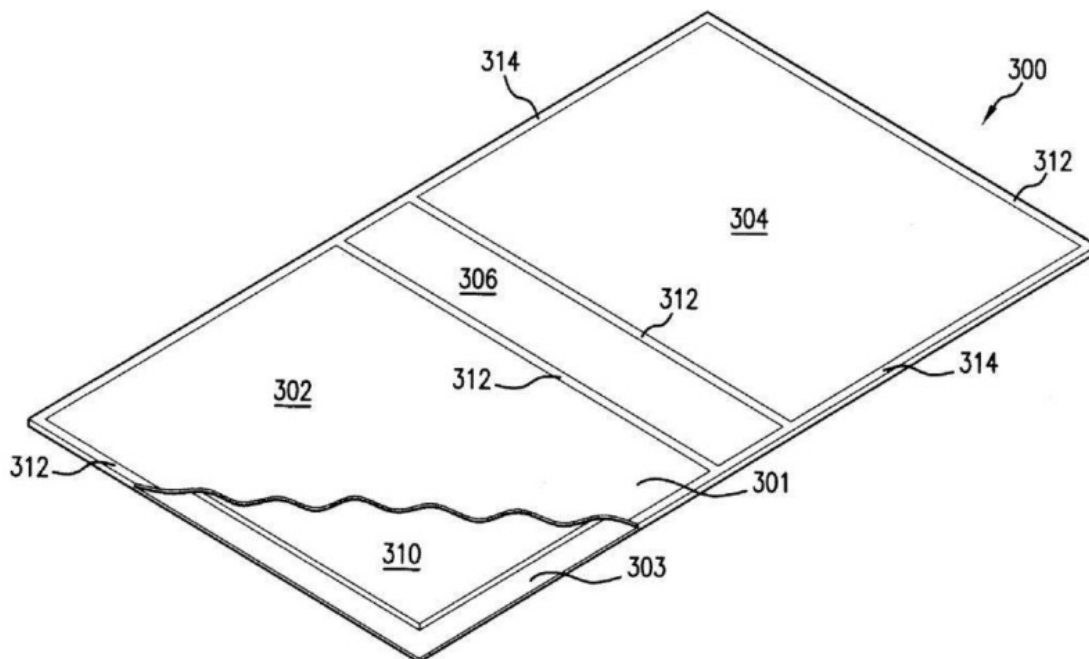


FIG. 8

Example 2, from



FR2840247

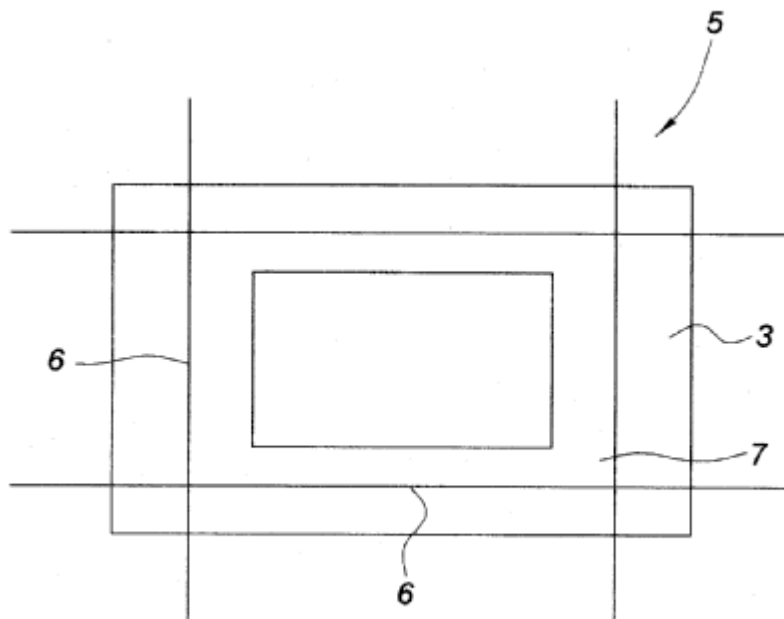


Fig. 2

## B29C 65/224

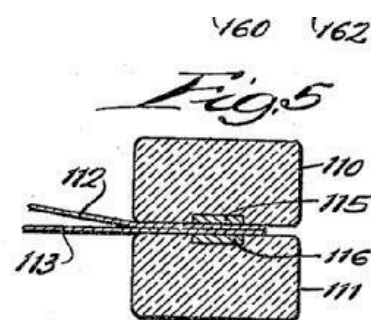
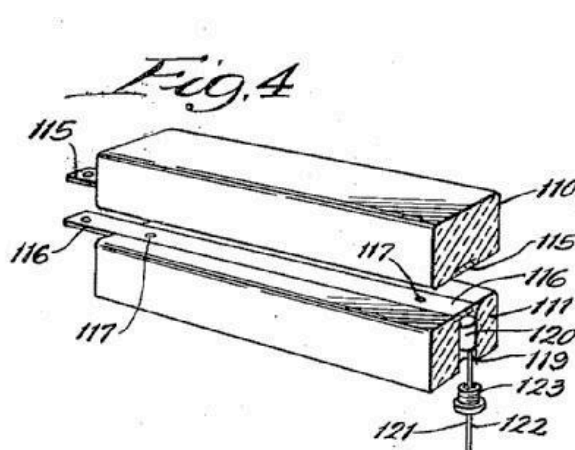
{being a resistive ribbon, a resistive band or a resistive strip}

### Definition statement

This place covers:

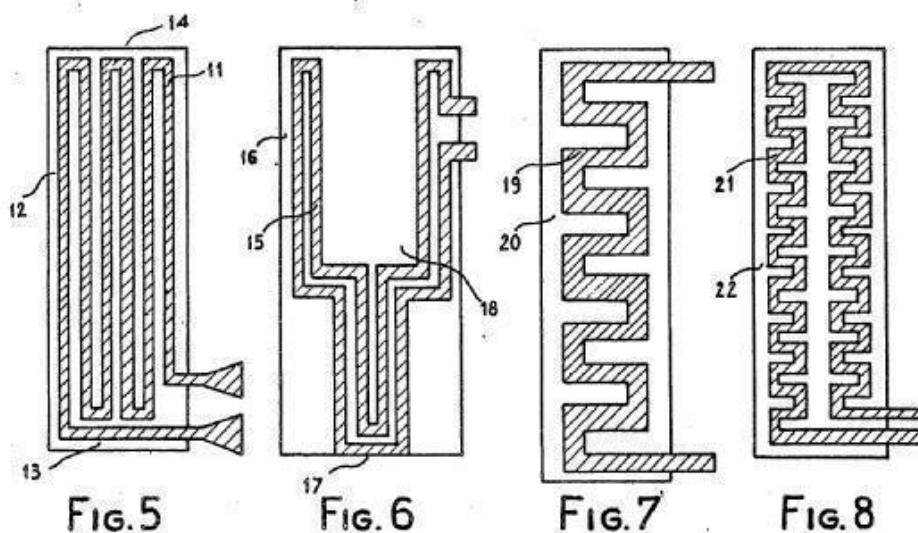
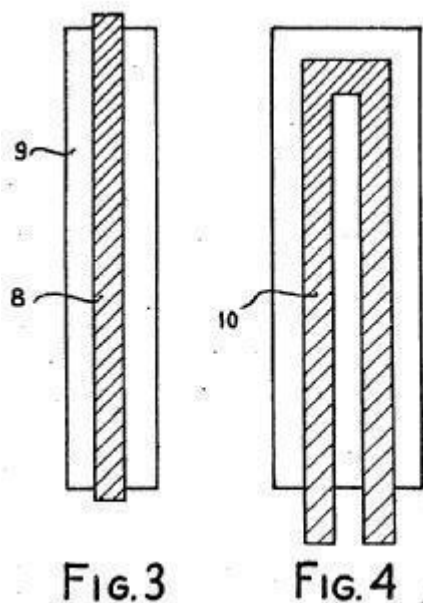
Example 1, from

US2581977:



Example 2, from

BE556713:



## B29C 65/226

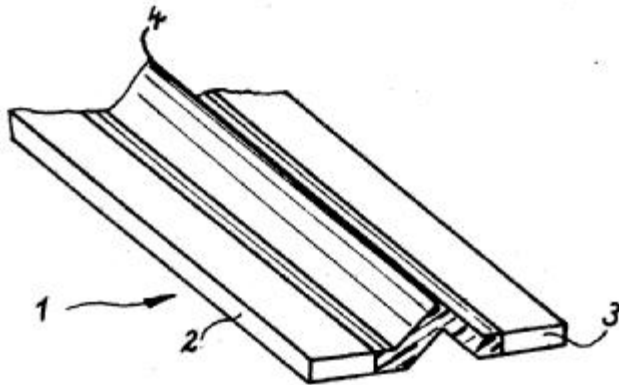
{characterised by the cross-section of said heated wire, resistive ribbon, resistive band or resistive strip, e.g. being triangular}

### Definition statement

*This place covers:*

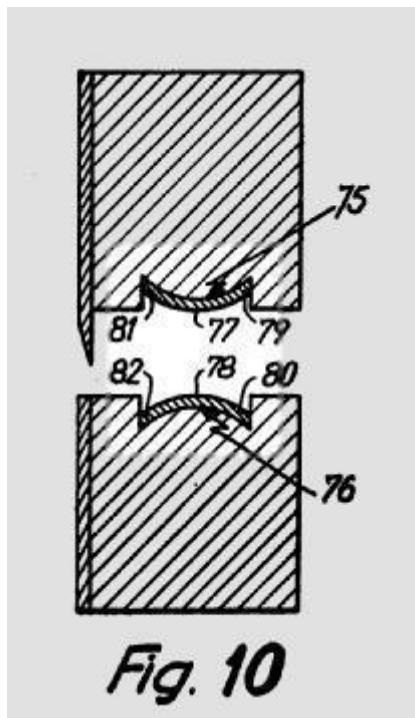
Example 1, from

DE1936611:



Example 2, from

DE1268360:



## B29C 65/227

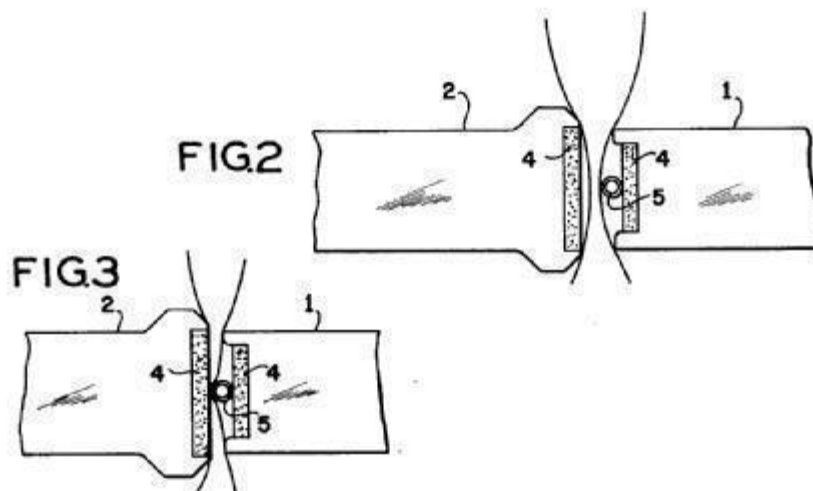
{said cross-section being hollow}

### Definition statement

*This place covers:*

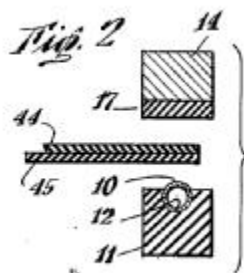
Example 1, from

FR2105312:



Example 2, from

US2621704:



## B29C 65/228

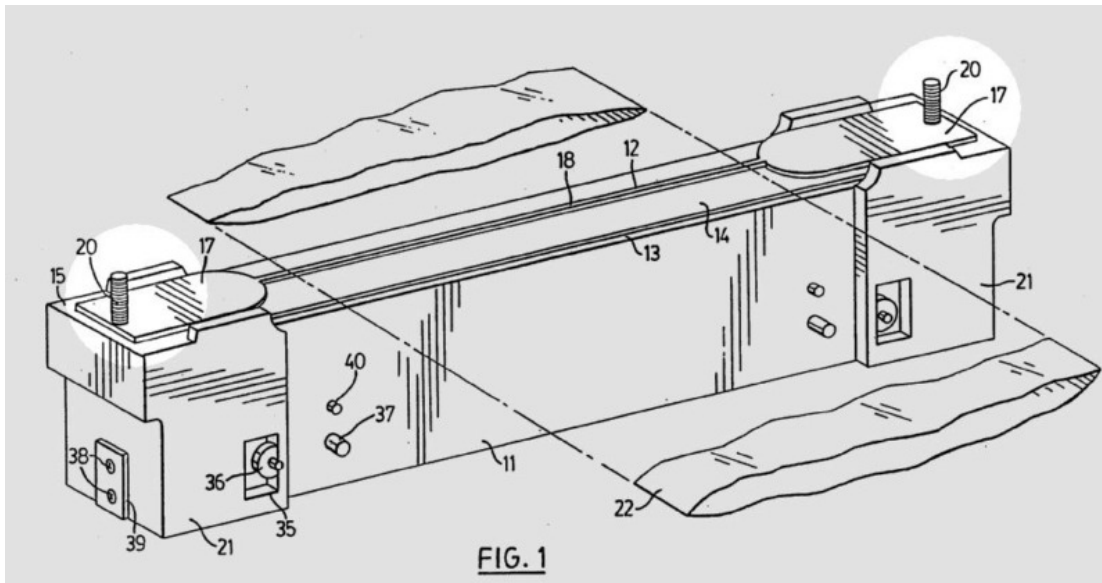
{characterised by the means for electrically connecting the ends of said heated wire, resistive ribbon, resistive band or resistive strip}

### Definition statement

*This place covers:*

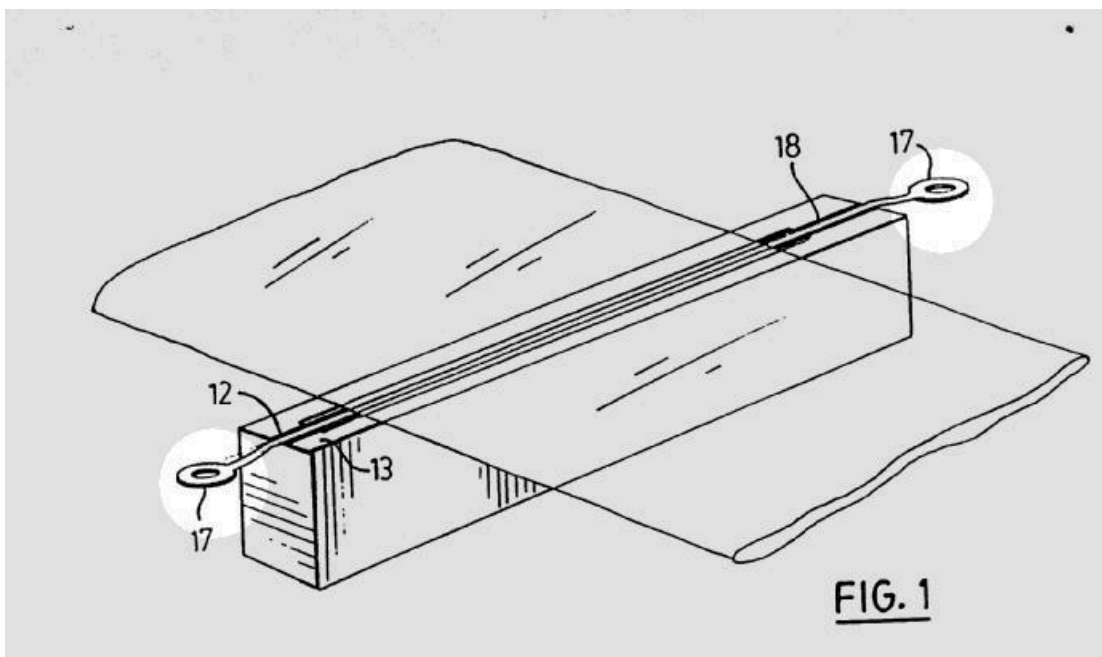
Example 1, from

WO9323235:



Example 2, from

WO9214601:



**B29C 65/229**

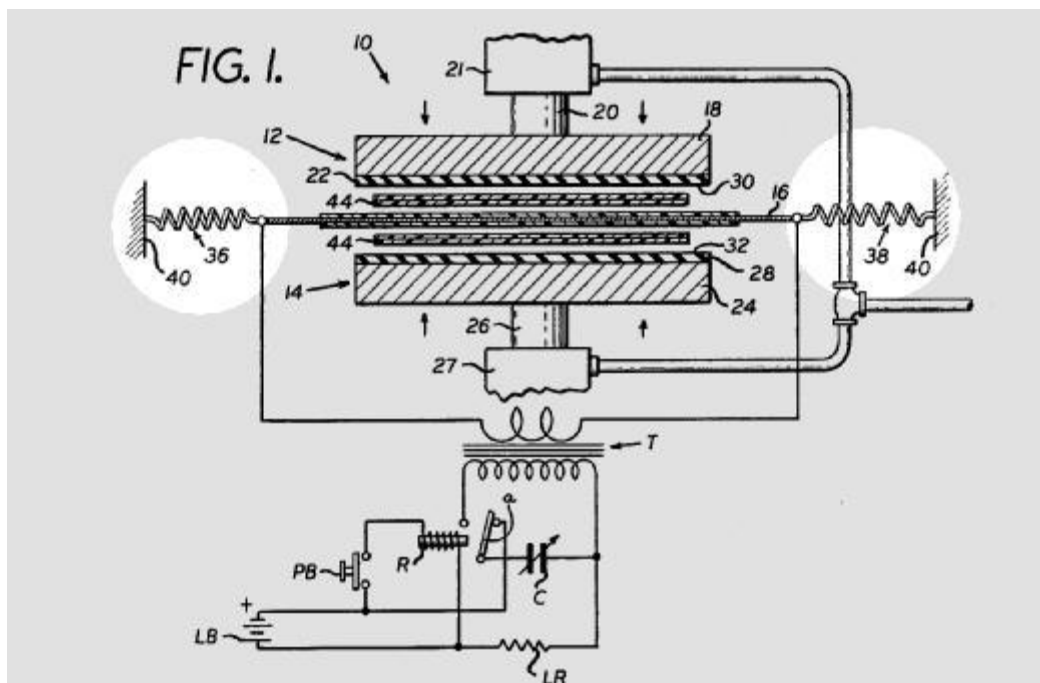
{characterised by the means for tensioning said heated wire, resistive ribbon, resistive band or resistive strip (means for compensating for the thermal expansion of welding jaws in general [B29C 66/8185](#))}

## Definition statement

*This place covers:*

Example 1, from

US3005402:



## B29C 65/242

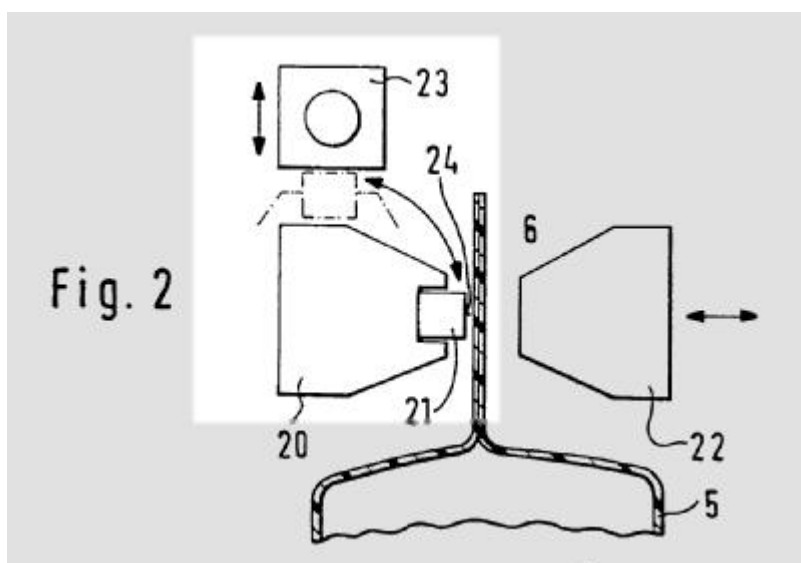
{the heat transfer being achieved by contact, i.e. a heated tool being brought into contact with the welding tool and afterwards withdrawn from it}

### Definition statement

*This place covers:*

Example 1, from

EP0538636:



**B29C 65/245**

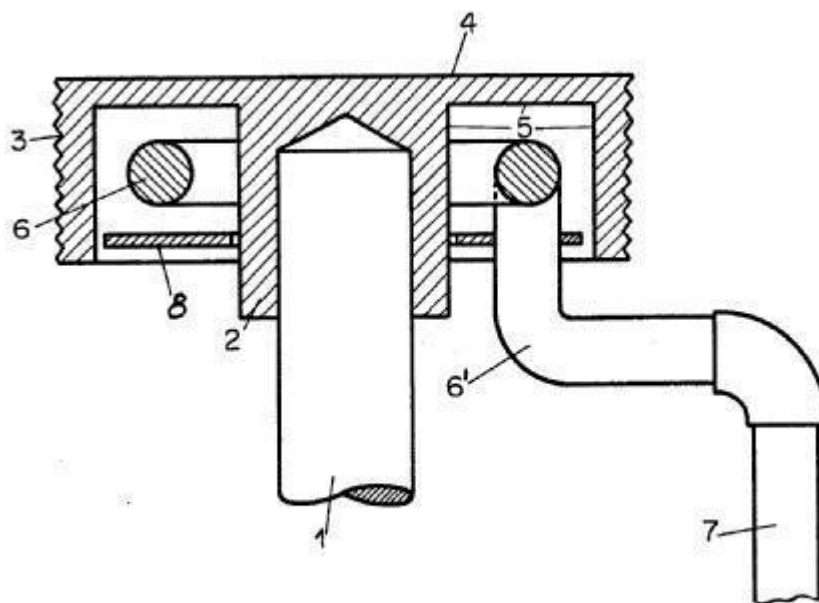
{the heat transfer being achieved contactless, e.g. by radiation ([B29C 65/32](#) takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

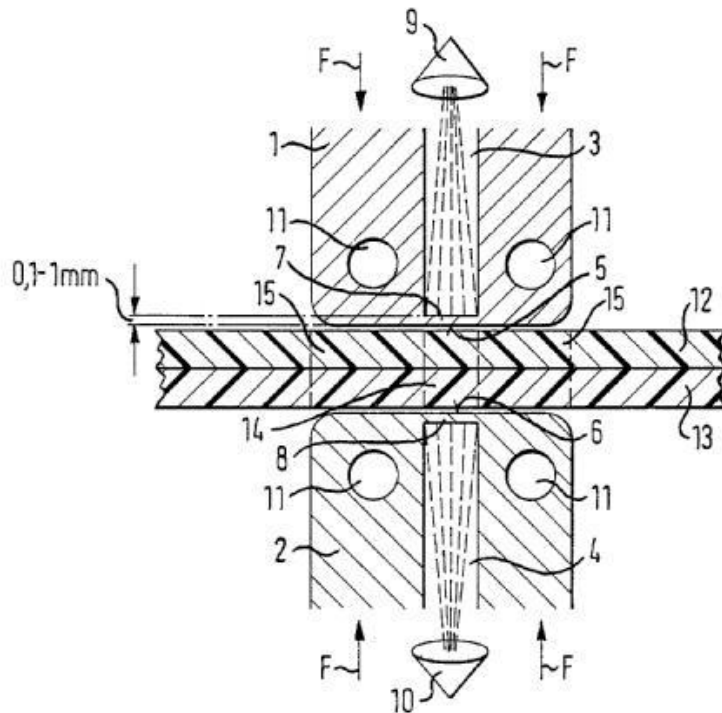
CH362216:



Example 2, from



DE19746402:



## B29C 65/26

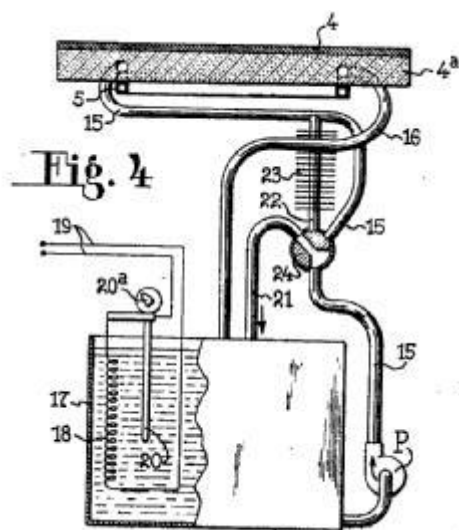
### Hot fluid

#### Definition statement

*This place covers:*

Example 1, from

FR1151122:





**B29C 65/28**

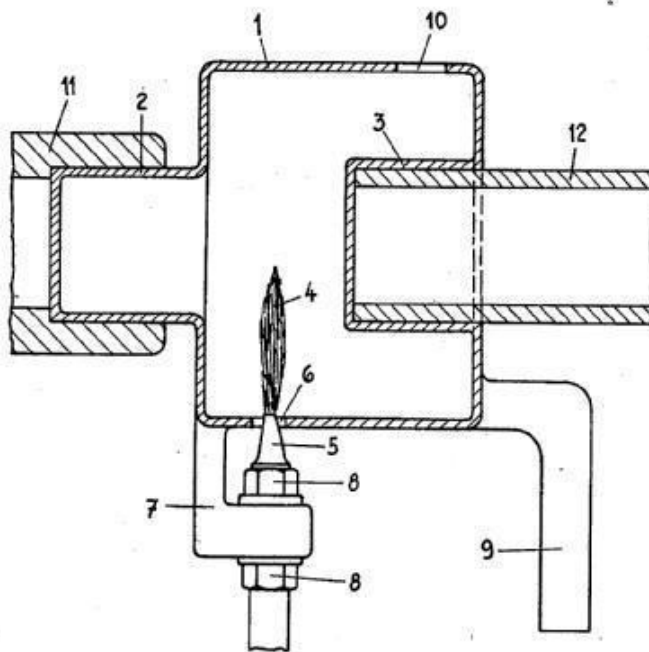
## Flame or combustible material

### Definition statement

*This place covers:*

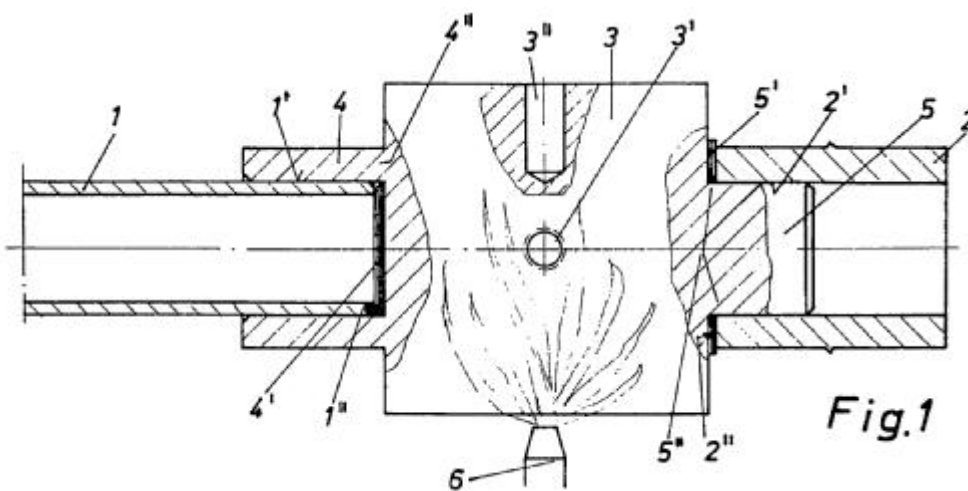
Example 1, from

CH334038:



Example 2, from

DE2241657:



**B29C 65/30**

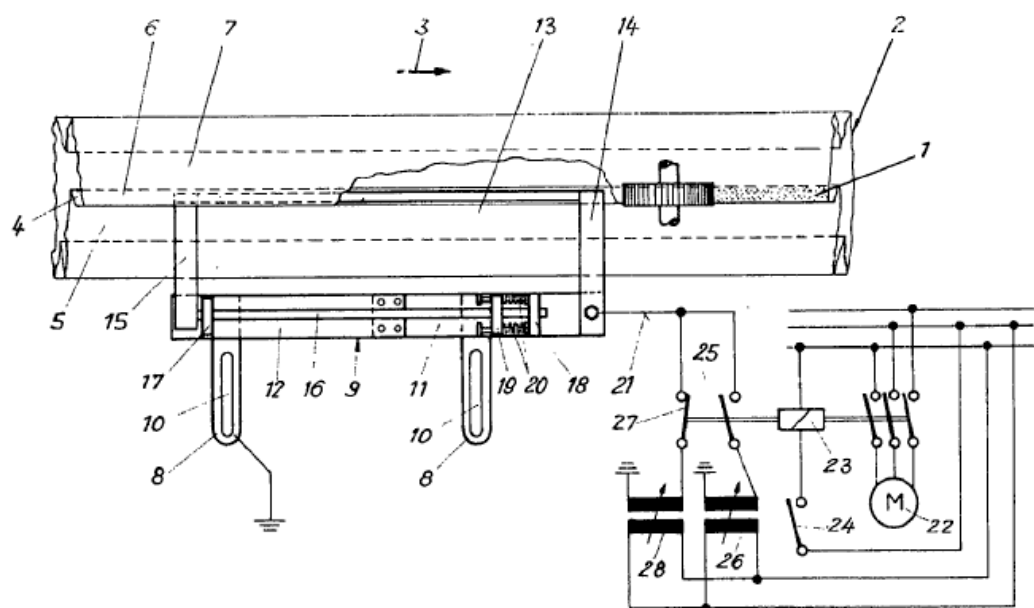
Electrical means {(B29C 65/38 takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

FR1422754:

**B29C 65/305**

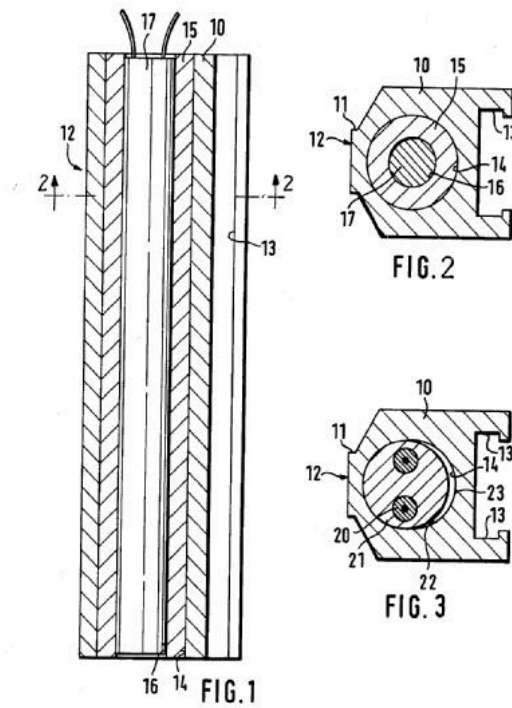
{involving the use of cartridge heaters}

**Definition statement**

*This place covers:*

Example 1, from

US4451325:



## B29C 65/32

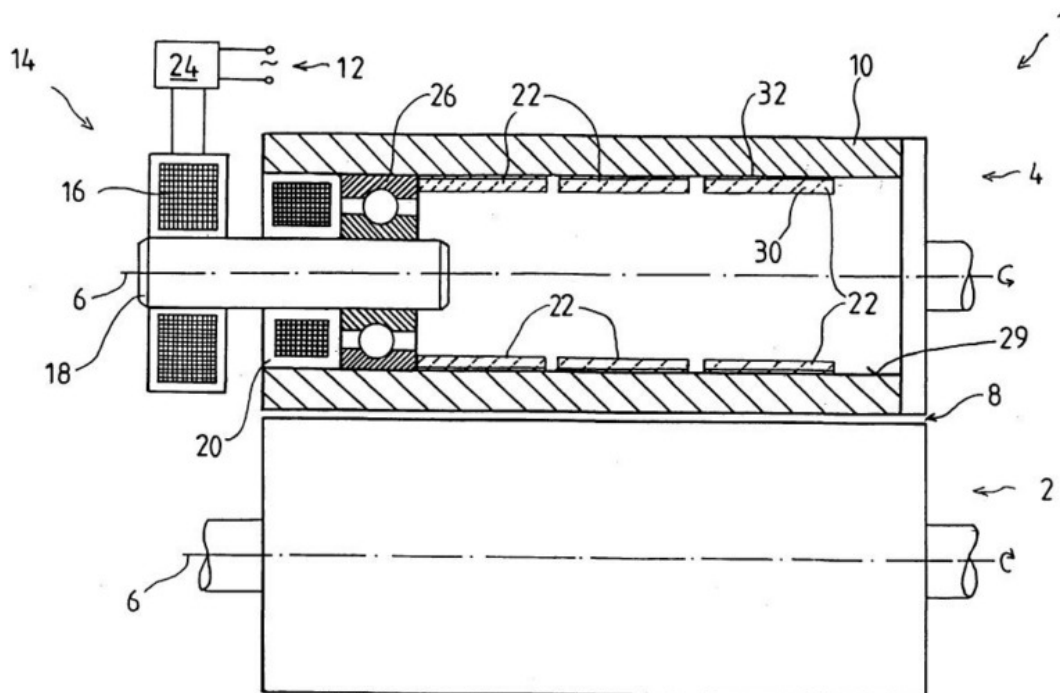
### Induction

### Definition statement

*This place covers:*

Example 1, from

DE19921546:

**B29C 65/34**

using heated elements which remain in the joint, e.g. "verlorenes Schweisselement"

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Heating or curing using lost heating elements, i.e. heating means incorporated and remaining in the formed article	<a href="#">B29C 35/0272</a>
Multistep processes for producing pipe joints provided with electrical wiring	<a href="#">B29D 23/005</a>
Plastic pipe welded joints with an electrical resistance incorporated in the joint	<a href="#">F16L 47/03</a>

**B29C 65/342**

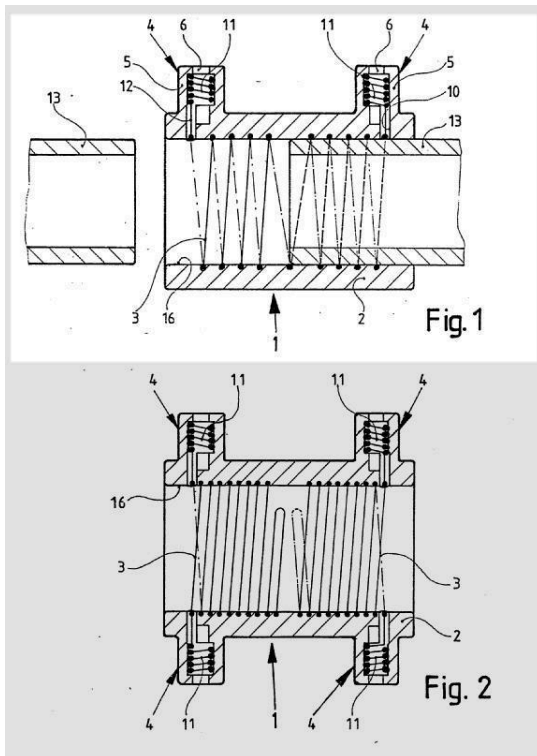
{comprising at least a single wire, e.g. in the form of a winding}

**Definition statement**

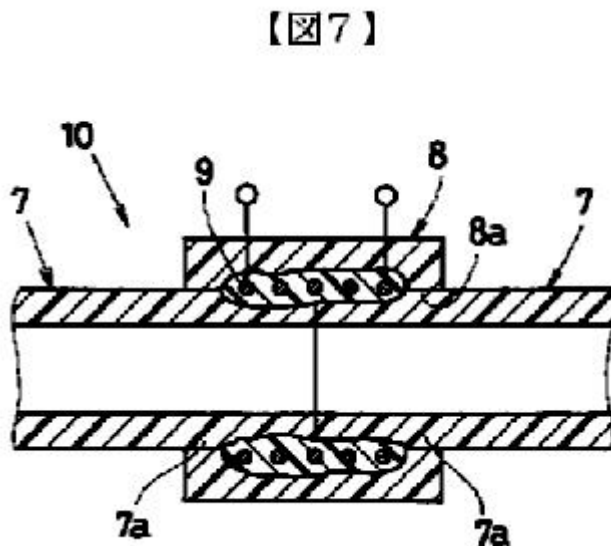
This place covers:

Example 1, from

DE3411179:



Example 2, from  
JP6074386:



## B29C 65/3424

{said at least a single wire having the form of a coil spring}

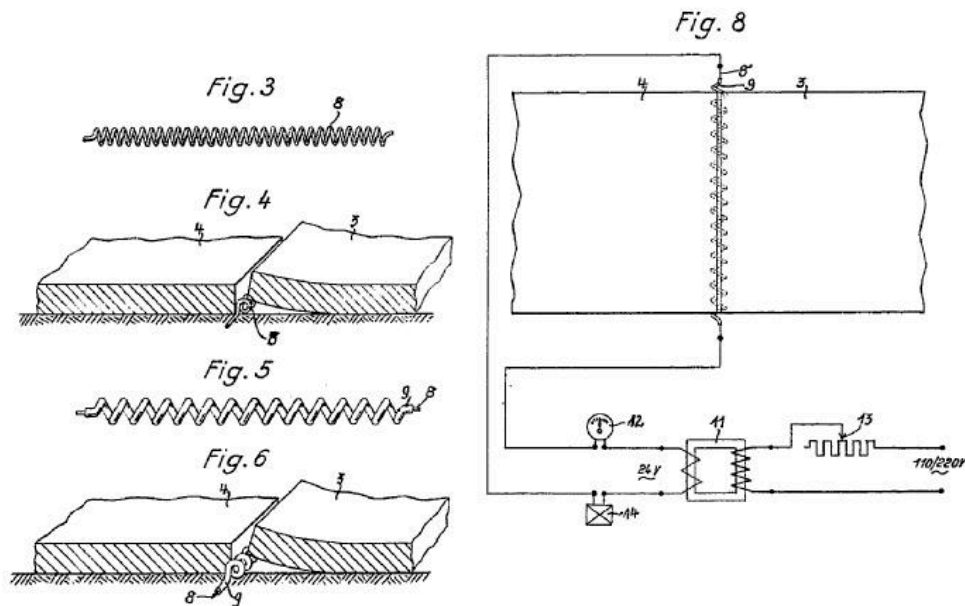
### Definition statement

*This place covers:*

Example 1, from

Definition statement

FR1049710:

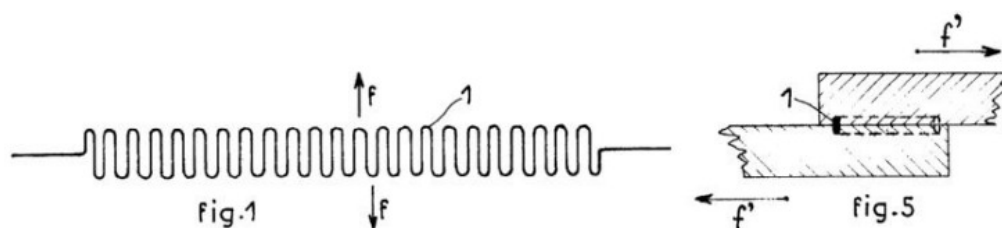
**B29C 65/3428**

{said at least a single wire having a waveform, e.g. a sinusoidal form}

**Definition statement***This place covers:*

Example 1, from

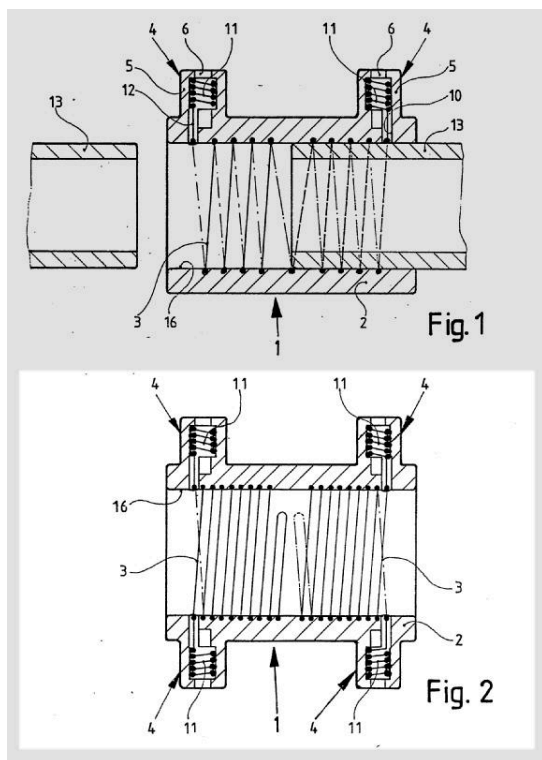
FR2182587:

**B29C 65/3432**{comprising several wires, e.g. in the form of several independent windings  
([B29C 65/3436](#), [B29C 65/344](#) take precedence)}**Definition statement***This place covers:*

Example 1, from

Definition statement

DE3411179:

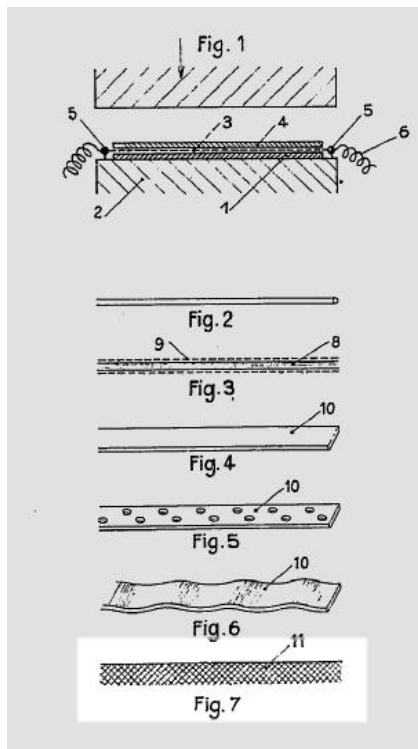
**B29C 65/344**

{being a woven or non-woven fabric or being a mesh}

**Definition statement***This place covers:*

Example 1, from

FR1072800:



## **B29C 65/344**

{being a ribbon, band or strip}

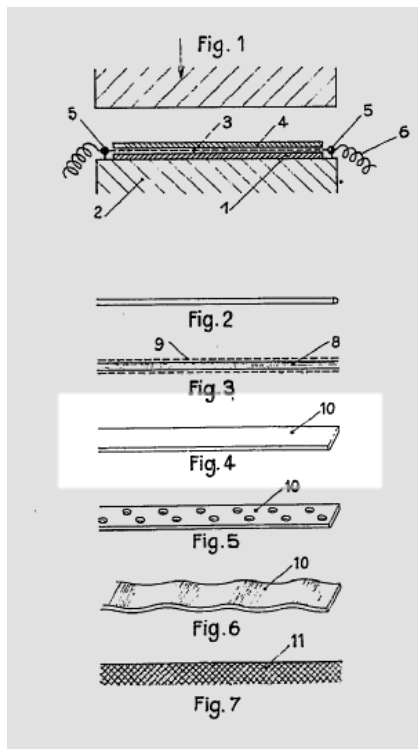
### **Definition statement**

*This place covers:*

Example 1, from



FR1072800:



## **B29C 65/3448**

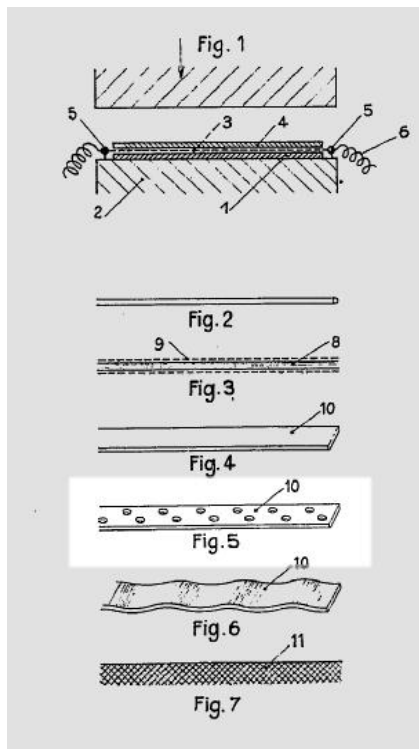
{said ribbon, band or strip being perforated}

### **Definition statement**

*This place covers:*

Example 1, from

FR1072800:



## B29C 65/3452

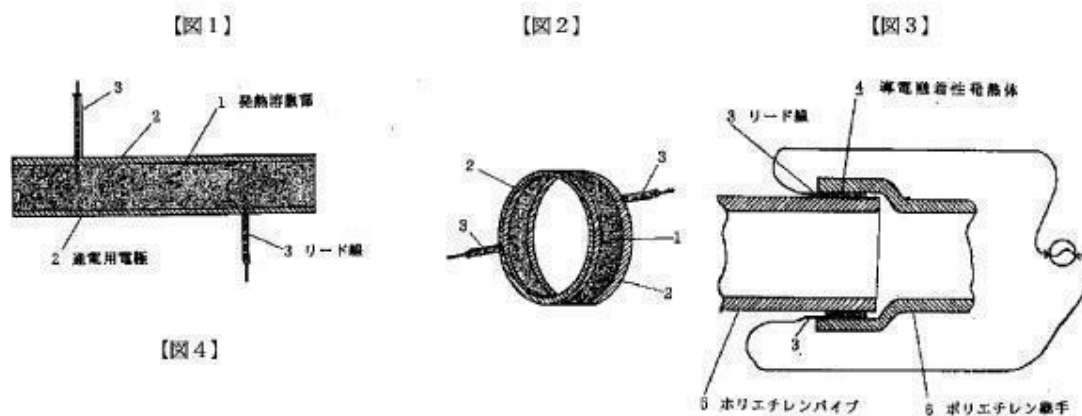
{forming a sleeve, e.g. a wrap-around sleeve}

### Definition statement

*This place covers:*

Example 1, from

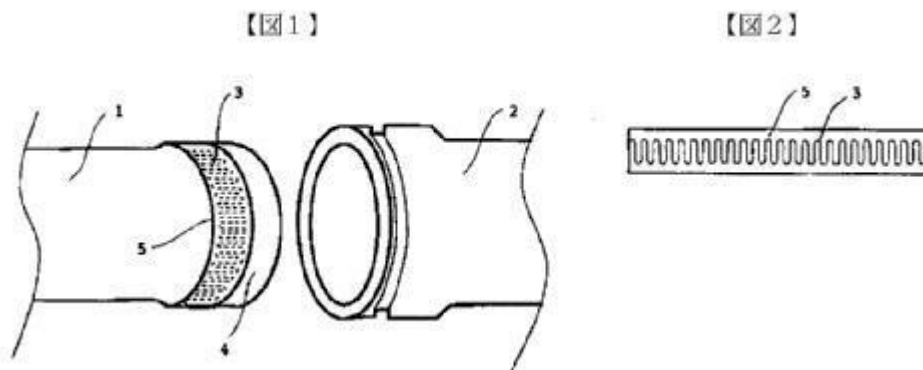
JP4308729:



Example 2, from

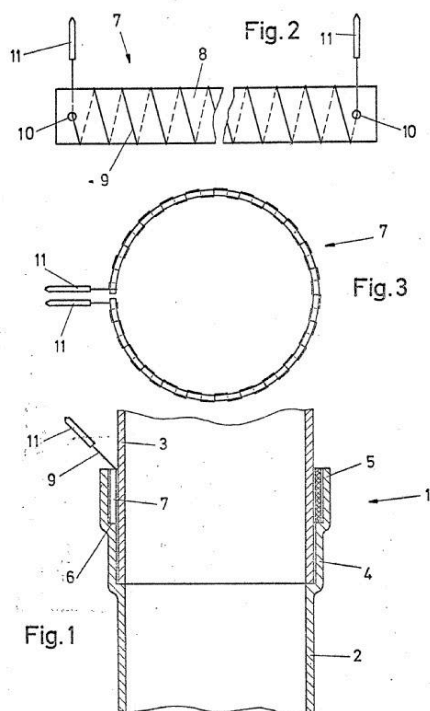
Definition statement

JP2001214994:



Example 3, from

NL7004944:

**B29C 65/3464**

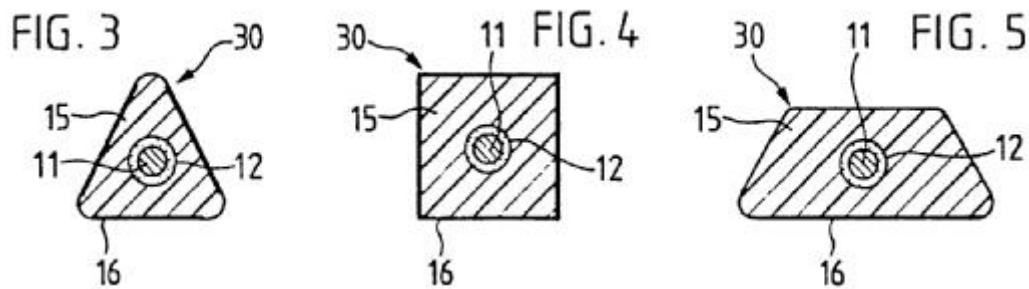
{characterised by the cross-section of said heated elements which remain in the joint or by the cross-section of their coating, e.g. being triangular}

**Definition statement**

*This place covers:*

Example 1, from

EP0183188:



## B29C 65/3468

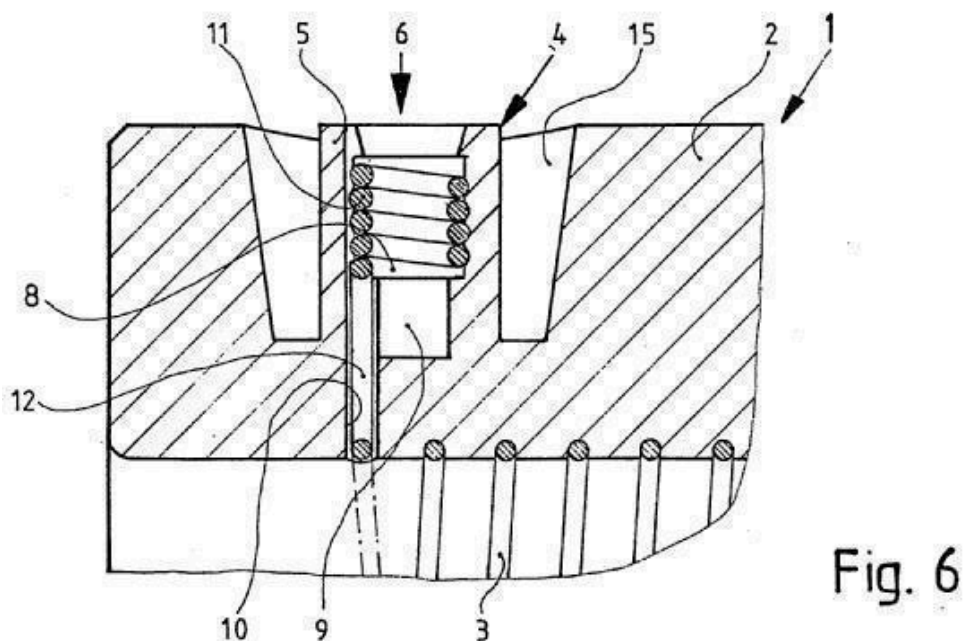
{characterised by the means for supplying heat to said heated elements which remain in the join, e.g. special electrical connectors of windings ([B29C 65/3668](#) takes precedence)}

### Definition statement

*This place covers:*

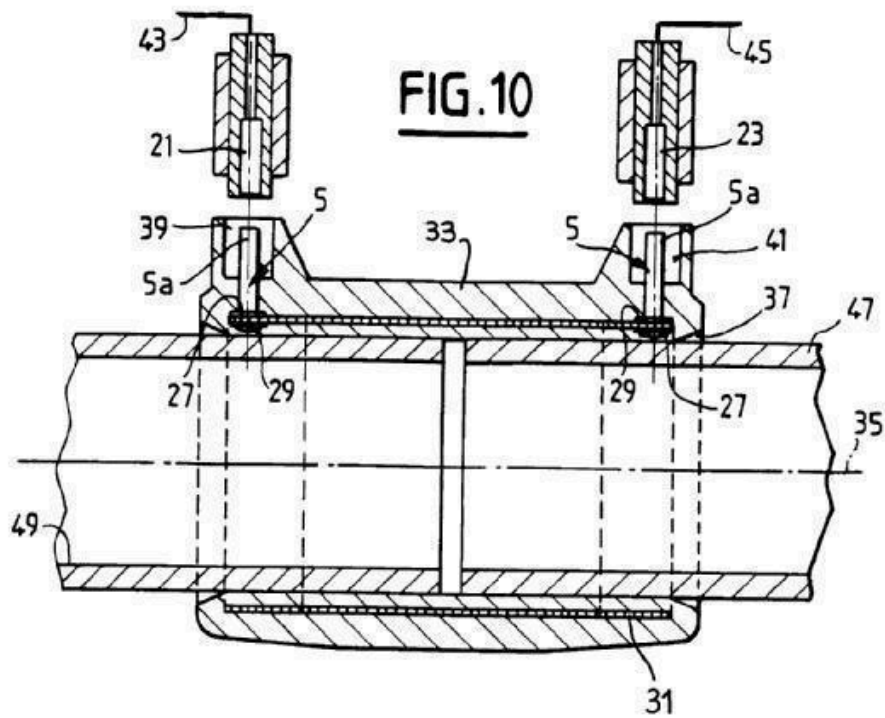
Example 1, from

DE3411179:

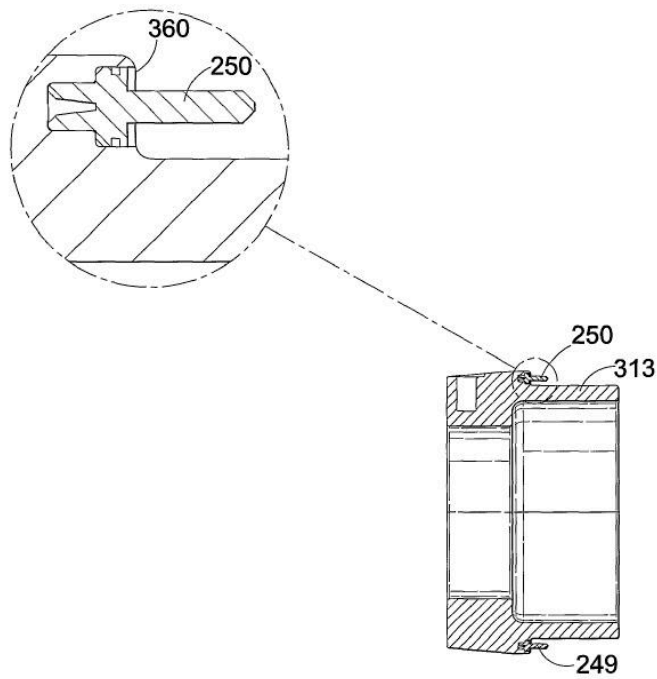


Example 2, from

EP0586283:



Example 3, from  
WO03029717:



**Fig.15B**

**B29C 65/36**

**heated by induction**

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Devices for, or methods of, sealing or securing package folds or closures by induction welding	<a href="#">B65B 51/227</a>
Induction heating	<a href="#">H05B 6/02</a>

**B29C 65/3608**

**{comprising single particles, e.g. fillers or discontinuous fibre-reinforcements}**

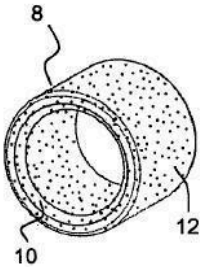
**Definition statement**

*This place covers:*

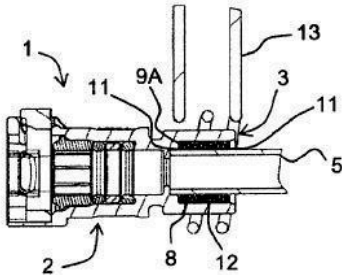
Example 1, from

WO2010083942:

Fig\_2



Fig\_4



Example 2, from

Definition statement

US5124203:

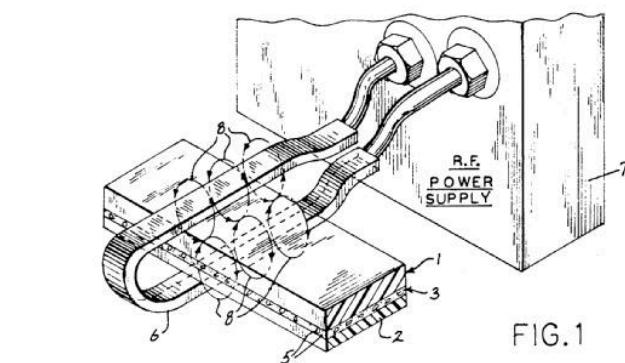


FIG. 1

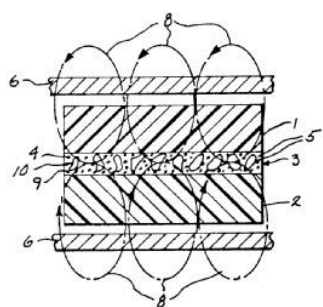


FIG. 2

**B29C 65/362**

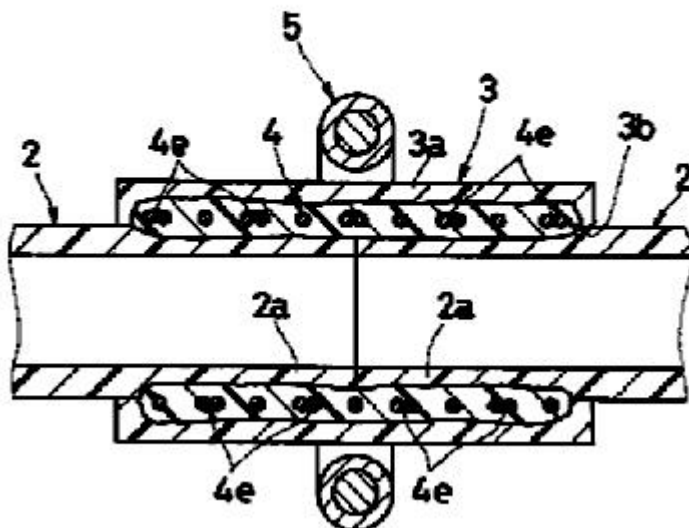
{comprising at least a single wire, e.g. in the form of a winding}

**Definition statement***This place covers:*

Example 1, from

JP6074386:

【図5】



## B29C 65/364

{being a woven or non-woven fabric or being a mesh}

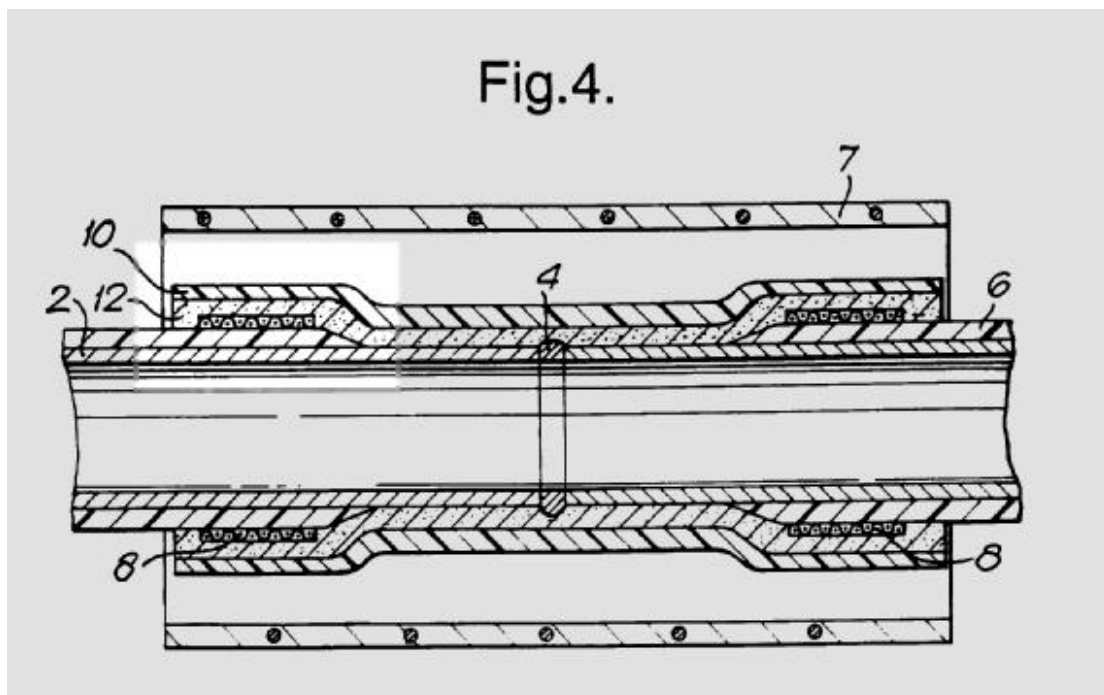
### Definition statement

*This place covers:*

Example 1, from



WO9628683:



## B29C 65/3656

{being a layer of a multilayer part to be joined, e.g. for joining plastic-metal laminates}

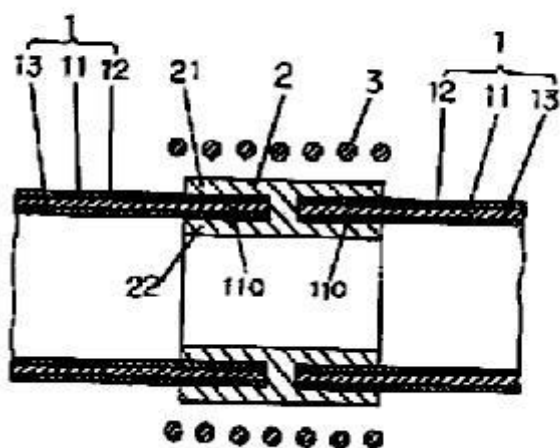
### Definition statement

*This place covers:*

Example 1, from

JP5196187

【図1】



**B29C 65/40**

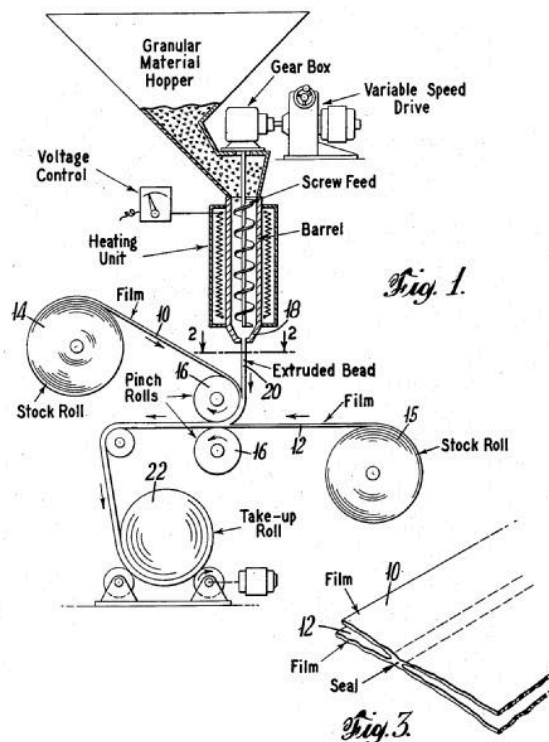
Applying molten plastics, e.g. hot melt (using welding bar {combined with hot gases} [B29C 65/12](#); by moulding [B29C 65/70](#))

**Definition statement**

*This place covers:*

Example 1, from

US3008862:

**B29C 65/42**

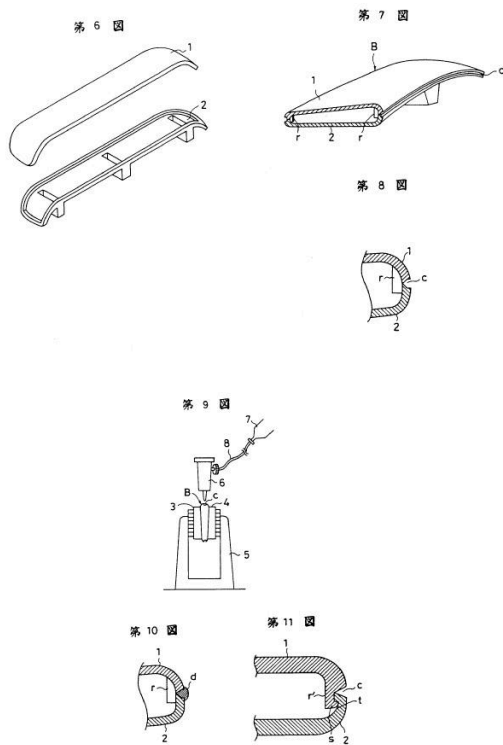
between pre-assembled parts {([B29C 65/605](#) takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

JP3180331:



## **B29C 65/44**

**Joining a heated non plastics element to a plastics element**

### **Definition statement**

*This place covers:*

Example 1, from

US2007284040:

Fig. 1

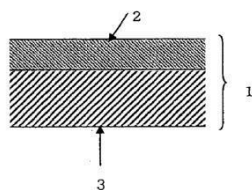
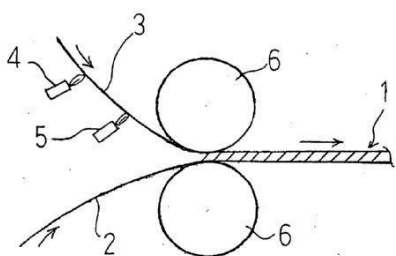


Fig. 2



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Vehicle superstructures characterised by the material thereof, characterised by combining metal and synthetic material, preformed metal and synthetic material elements being joined together	<a href="#">B62D 29/005</a>
---	-----------------------------

## B29C 65/46

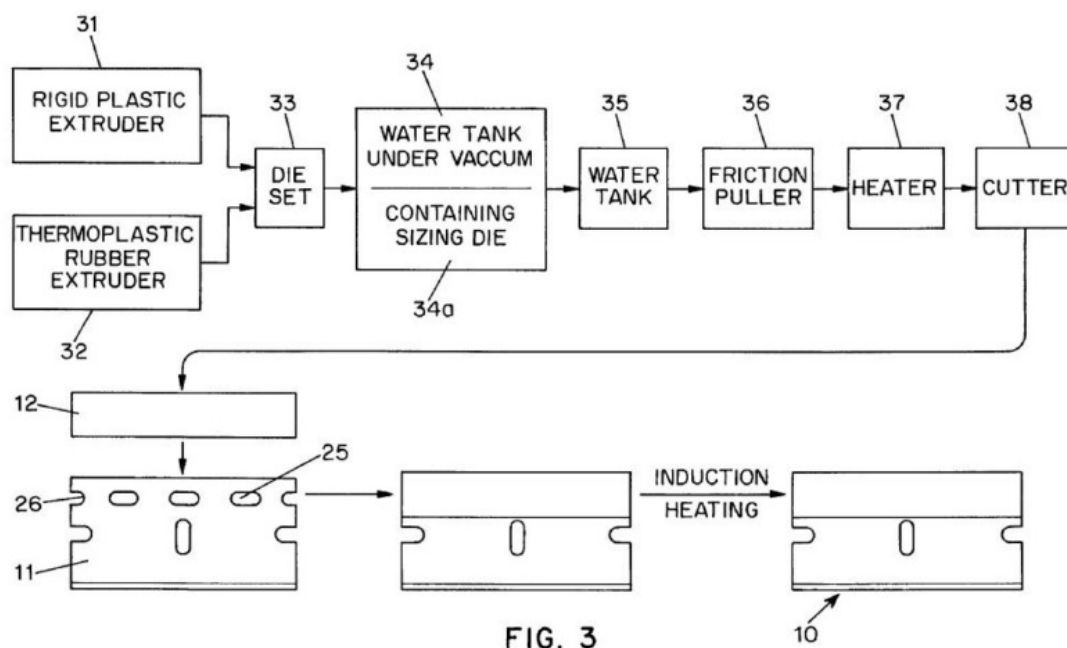
heated by induction

### Definition statement

*This place covers:*

Example 1, from

US5771589:



### Special rules of classification

The joining of metal-plastic laminates by induction is to be classified in [B29C 65/3656](#), [B29C 65/368](#) and [B29C 66/72321](#).

### B29C 65/48

using adhesives {, i.e. using supplementary joining material; solvent bonding}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Garment hems or seams made by gluing	<a href="#">A41D 27/245</a>
Joining garments parts or blanks by gluing	<a href="#">A41H 43/04</a>
Applying glue or adhesive peculiar to bookbinding by fusing, welding sheets together	<a href="#">B42C 9/0093</a>
Closing containers or receptacles after filling, by applying separate preformed closures, e.g. lids, covers, securing said closures on said containers by gluing	<a href="#">B65B 7/2871</a>
Securing ends of binding material by applying adhesive	<a href="#">B65B 13/32</a>
Chemical aspects of bonding of preformed macromolecular material to the same or other solid material, e.g. using adhesives	<a href="#">C08J 5/12</a>
Adhesive processes in general	<a href="#">C09J 5/00</a>
Connecting constructional elements or machine parts by gluing	<a href="#">F16B 11/006</a>
Connecting constructional elements or machine parts by gluing of tubular elements or rods in coaxial engagement	<a href="#">F16B 11/008</a>

## Special rules of classification

When classifying in this group, techniques for heating heat-activated adhesives are additionally classified in [B29C 65/02](#) and subgroups

## B29C 65/4825

### {Pressure sensitive adhesives}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Adhesives in the form of films or foils, on paper or textile fabric, characterised by pressure-sensitive adhesive	<a href="#">C09J 7/21</a> , <a href="#">C09J 7/38</a>
Adhesives in the form of films or foils, on carriers other than paper or textile fabrics, characterised by pressure-sensitive adhesive	<a href="#">C09J 7/22</a> , <a href="#">C09J 7/38</a>
Adhesives in the form of films or foils, on carriers, characterised by pressure-sensitive adhesive	<a href="#">C09J 7/38</a>

## B29C 65/4835

### {Heat curing adhesives}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Adhesives in the form of films or foils, on paper or textile fabric, characterised by heat-curable adhesive	<a href="#">C09J 7/21</a> , <a href="#">C09J 7/35</a>
Adhesives in the form of films or foils, on carriers other than paper or textile fabrics, essentially based on heat-curable adhesive	<a href="#">C09J 7/22</a> , <a href="#">C09J 7/35</a>
Adhesives in the form of films or foils, on carriers, essentially based on heat-curable adhesive	<a href="#">C09J 7/35</a>

## B29C 65/484

### {Moisture curing adhesives}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Adhesive in the form of films or foils, on paper or textile fabrics, characterised by water-activable adhesive	<a href="#">C09J 7/21</a>
--	---------------------------

**B29C 65/4855**

{characterised by their physical properties, e.g. being electrically-conductive}

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Adhesives characterised by their physical nature, in general	<a href="#">C09J 9/00</a>
Electrically-conducting adhesives, in general	<a href="#">C09J 9/02</a>

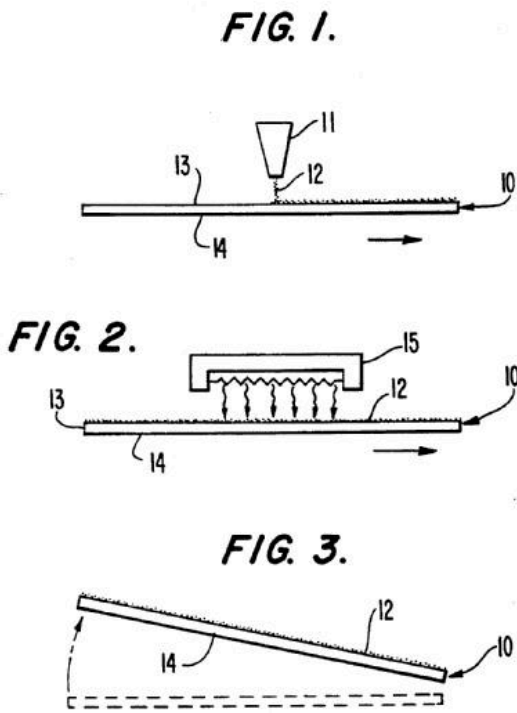
**B29C 65/486**

{characterised by their physical form being non-liquid, e.g. in the form of granules or powders ([B29C 65/50](#) takes precedence)}

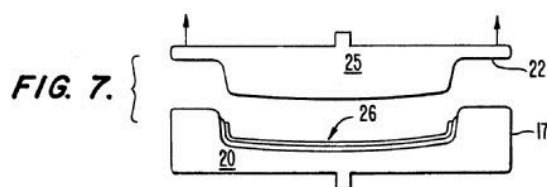
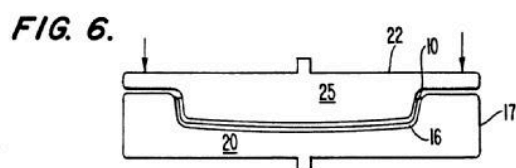
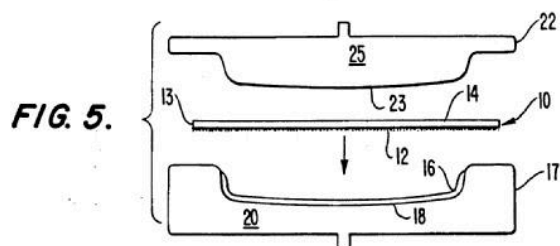
**Definition statement**

This place covers:

Example 1, from



US5087311



## B29C 65/4865

{containing additives ([C09J 11/00](#) and subgroups take precedence)}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Adhesive additives, in general	<a href="#">C09J 11/00</a>
--------------------------------	----------------------------

## B29C 65/4875

{being spherical, e.g. particles or powders}

### Definition statement

This place covers:

Example 1, from



US2010276065:

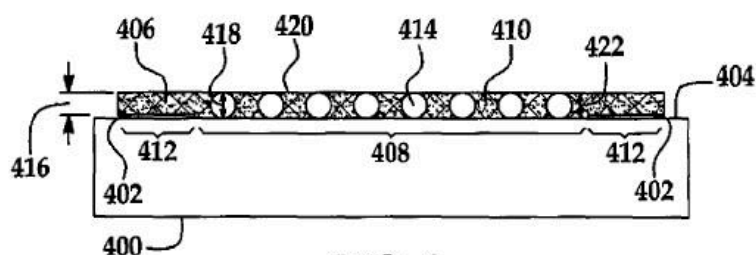


FIG. 4

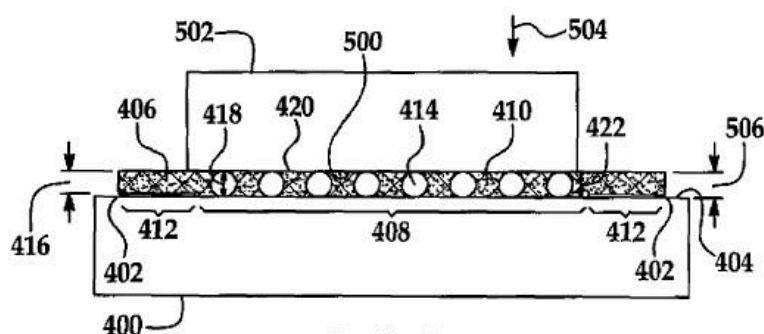


FIG. 5

**B29C 65/4885**

{characterised by their composition being non-plastics}

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Non-macromolecular adhesive additives, in general	<a href="#">C09J 11/02</a>
---	----------------------------

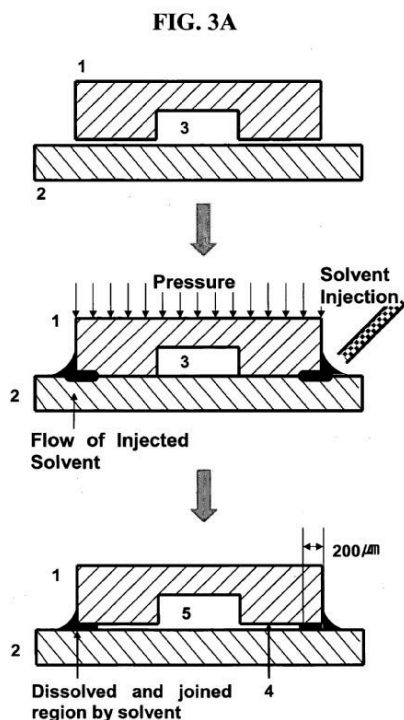
**B29C 65/4895**

{Solvent bonding, i.e. the surfaces of the parts to be joined being treated with solvents, swelling or softening agents, without adhesives}

**Definition statement***This place covers:*

Example 1, from

WO2009125997:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Bonding of a preformed macromolecular material using low molecular chemically inert solvents, swelling or softening agents	<a href="#">C08J 5/122</a>
Non-woven fabrics formed from fleeces or layers composed of fibres by welding together the fibres by applying solvents	<a href="#">D04H 1/552</a>

## B29C 65/50

using adhesive tape {, e.g. thermoplastic tape; using threads or the like  
([B29C 65/3444](#) takes precedence)}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Closing containers or receptacles after filling, by applying separate preformed closures, e.g. lids, covers, securing said closures on said containers by adhesive tape	<a href="#">B65B 7/2864</a>
Adhesives in the form of films or foils	<a href="#">C09J 7/00</a>

**B29C 65/5035**

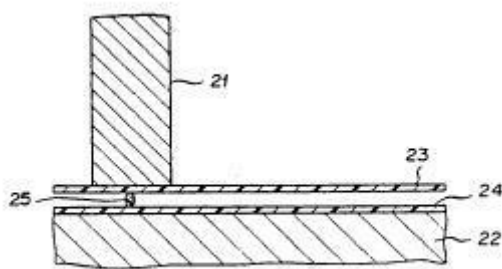
{being in thread form, i.e. in the form of a single filament, e.g. in the form of a single coated filament}

**Definition statement**

*This place covers:*

Example 1, from

JP1027928:

**B29C 65/5042**

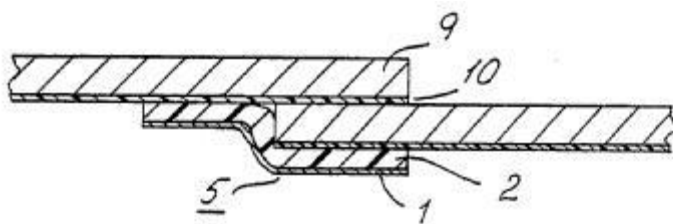
{covering both elements to be joined}

**Definition statement**

*This place covers:*

Example 1, from

WO8404486:



**Fig. 3**

**B29C 65/505**

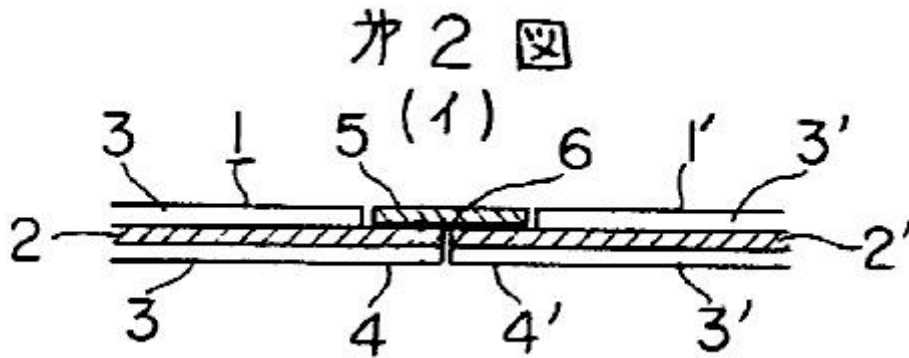
{and placed in a recess formed in the parts to be joined, e.g. in order to obtain a continuous surface}

**Definition statement**

*This place covers:*

Example 1, from

JP58028345:



## B29C 65/5057

{positioned between the surfaces to be joined ([B29C 65/5035](#) takes precedence)}

### Definition statement

*This place covers:*

Example 1, from

WO8404486:

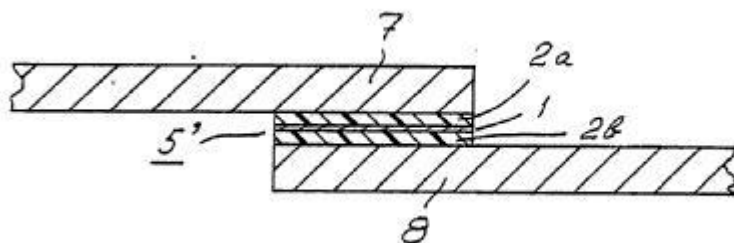


Fig. 2

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Adhesive processes in general; Joining materials by welding overlapping edges with an insertion of plastic material

[C09J 5/10](#)

## B29C 65/5071

{and being composed by one single element}

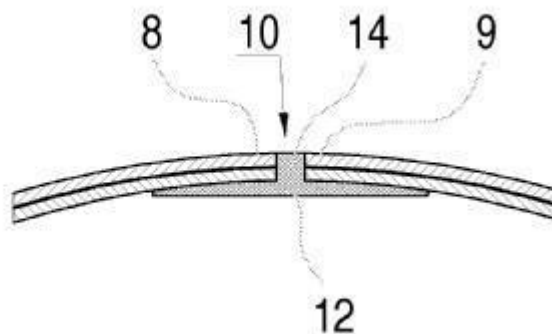
### Definition statement

*This place covers:*

Example 1, from

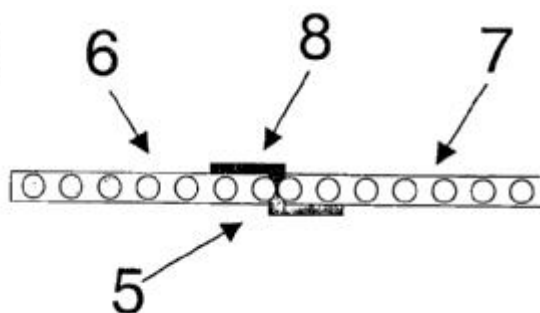
EP1905570:

Fig. 8

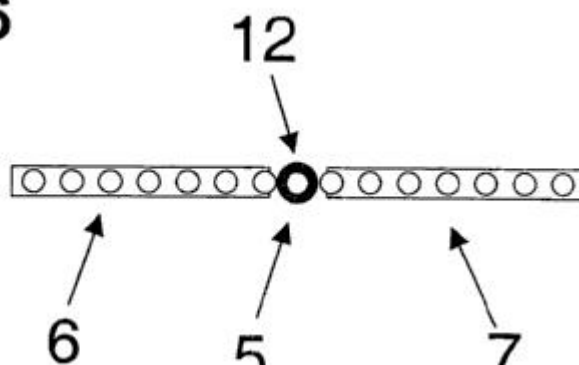


Example 2, from  
DE102005010467:

**FIG. 2**



**FIG. 6**



## B29C 65/5078

{and being composed by several elements}

### Definition statement

*This place covers:*

Example 1, from

US2009317580:

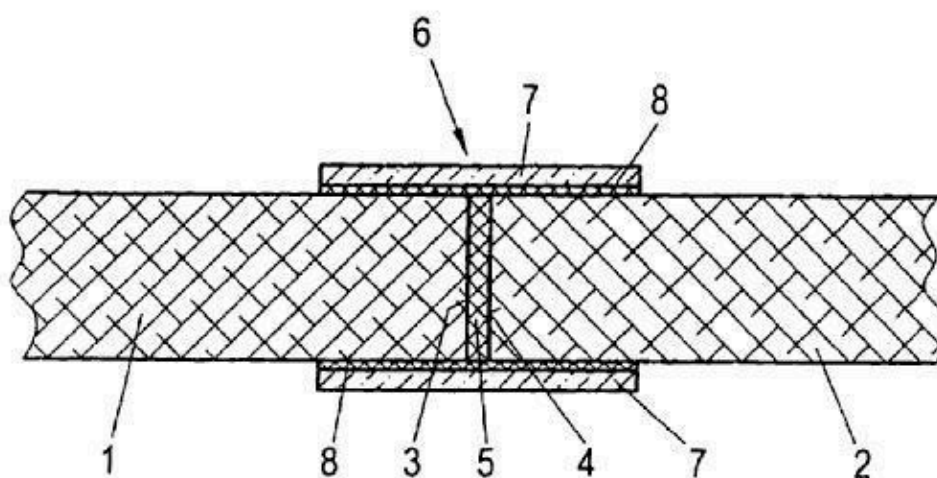
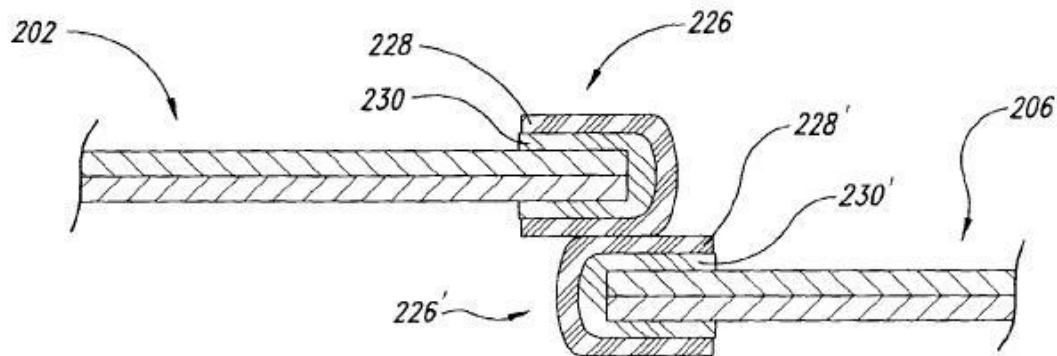


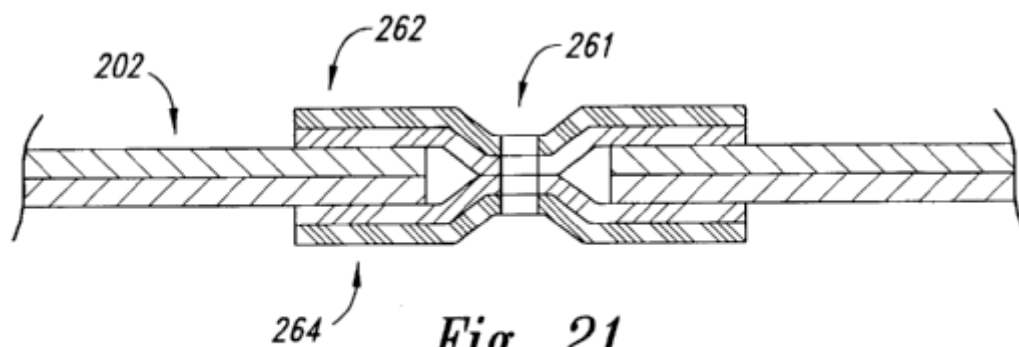
Fig. 1

Example 2, from

US2003138586:



*Fig. 10*



*Fig. 21*

## B29C 65/5085

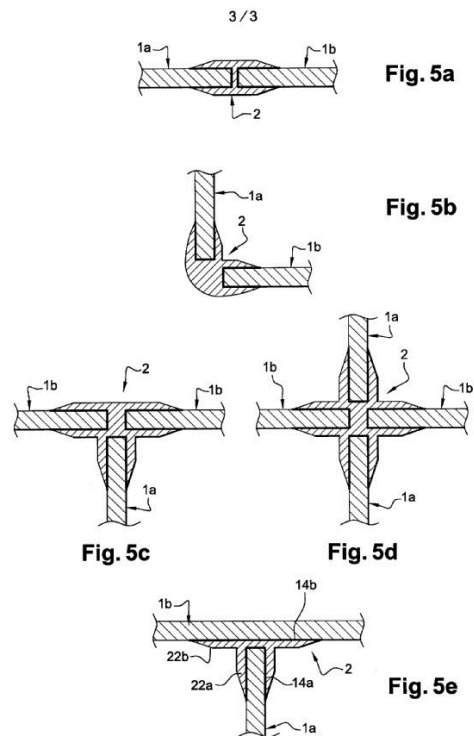
{and comprising grooves, e.g. being E-shaped, H-shaped}

### Definition statement

*This place covers:*

Example 1, from

FR2919819:



## **B29C 65/5092**

{characterised by the tape handling mechanisms, e.g. using vacuum}

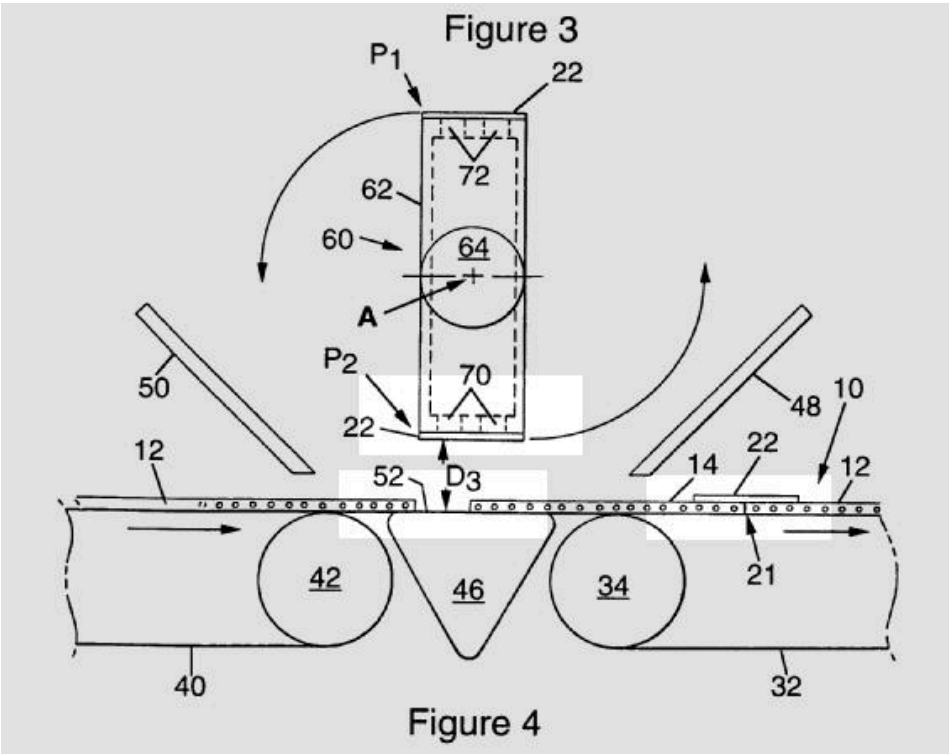
### **Definition statement**

*This place covers:*

Example 1, from



WO0046013:



B29C 65/52

{characterised by the way of} applying the adhesive {(B29C 65/50 takes precedence; apparatus for applying liquids in general B05C; processes for applying liquids in general B05D)}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for, or methods of, sealing or securing package folds or closures applying adhesives or sealing liquids	<a href="#">B65B 51/02</a>
Devices for, or methods of, sealing or securing package folds or closures applying adhesives or sealing liquids using applicator nozzles	<a href="#">B65B 51/023</a>
Devices for, or methods of, sealing or securing package folds or closures applying adhesives or sealing liquids using rotating applicators	<a href="#">B65B 51/026</a>

B29C 65/521

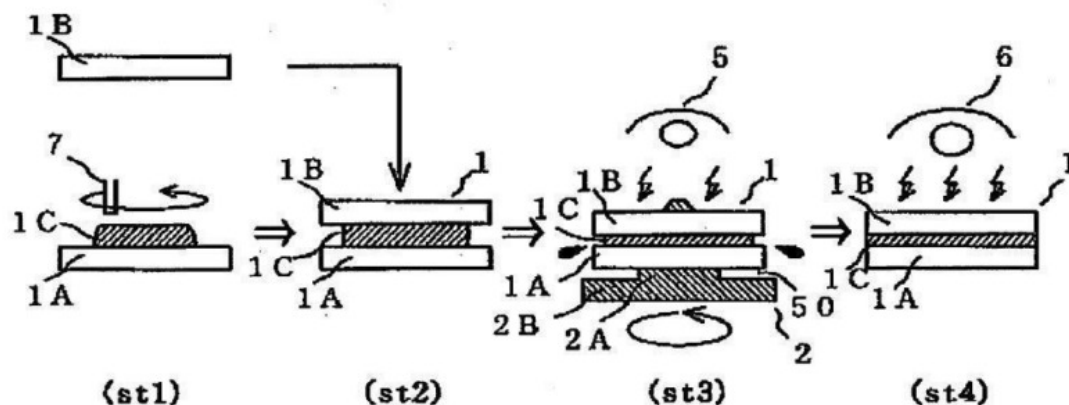
{by spin coating}

Definition statement

This place covers:

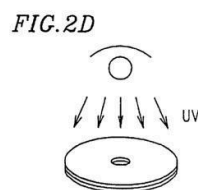
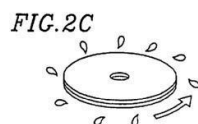
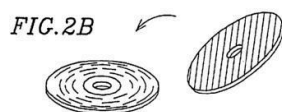
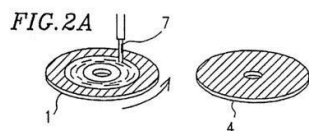
Example 1, from

US2009040913:



Example 2, from

US6263939:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

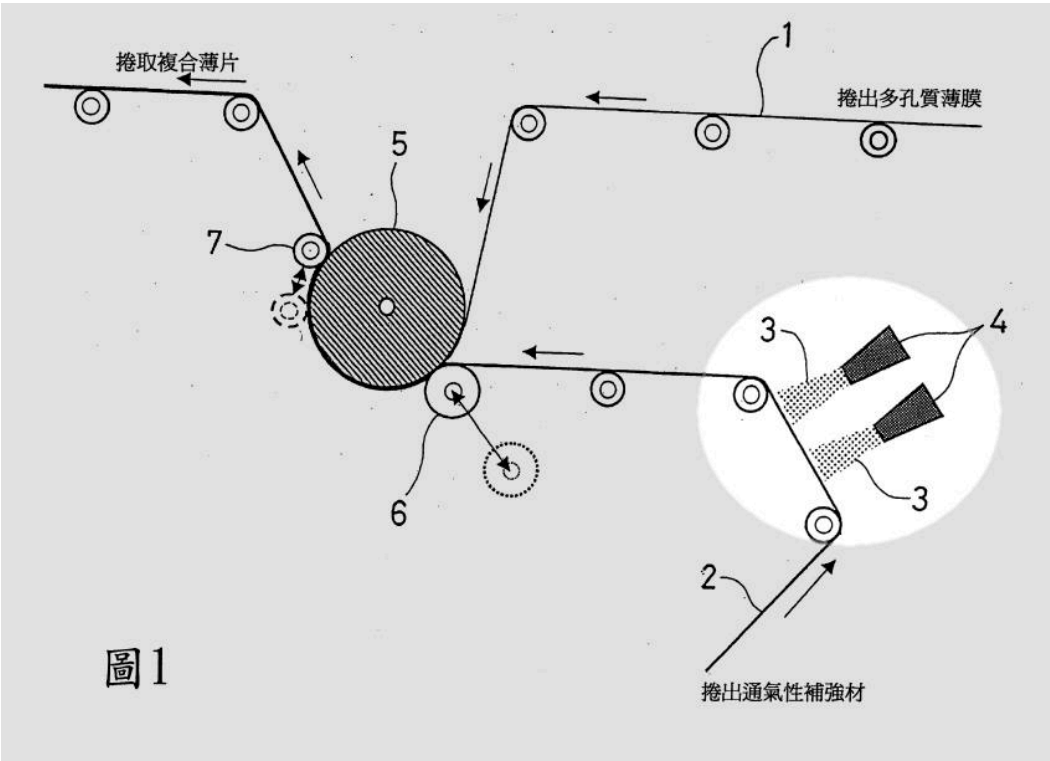
Applying liquids to surfaces by spin coating	<a href="#">B05D 1/005</a>
--	----------------------------

B29C 65/522

{by spraying, e.g. by flame spraying}

Definition statement

This place covers:  
Example 1, from  
JP2008114530:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Spraying apparatus in general	<a href="#">B05B</a>
Applying liquids to surfaces by spraying	<a href="#">B05D 1/02</a>
Applying liquids to surfaces by flame spraying	<a href="#">B05D 1/08</a>

B29C 65/523

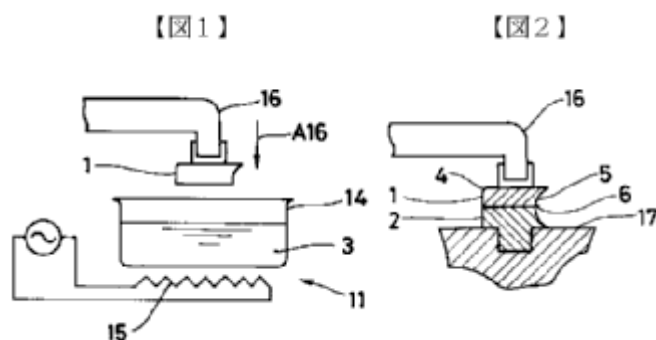
{by dipping}

Definition statement

This place covers:  
Example 1, from

Definition statement

JP5261821:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Applying liquids to surfaces by dipping	<a href="#">B05D 1/18</a>
---	---------------------------

## B29C 65/524

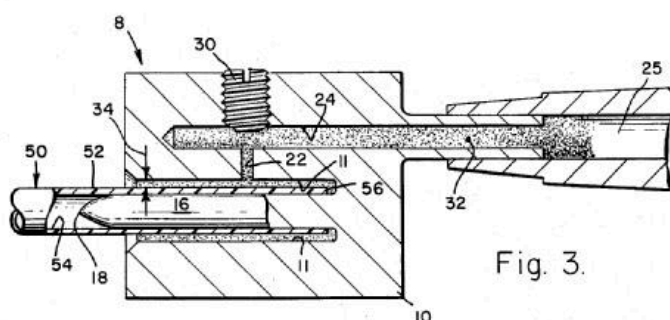
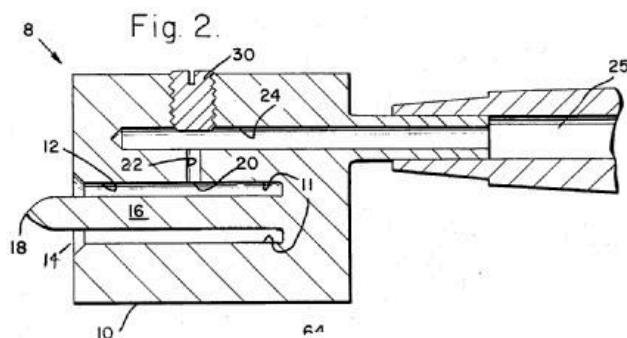
{by applying the adhesive from an outlet device in contact with, or almost in contact with, the surface of the part to be joined}

## Definition statement

This place covers:

Example 1, from

US4512947:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Applying liquids to surfaces by applying the liquid from an outlet device in contact with, or almost in contact with, the surface
---

<a href="#">B05D 1/26</a>
---------------------------

## B29C 65/525

{by extrusion coating}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Applying liquids to surfaces by extrusion coating
---

<a href="#">B05D 1/265</a>
----------------------------

## B29C 65/526

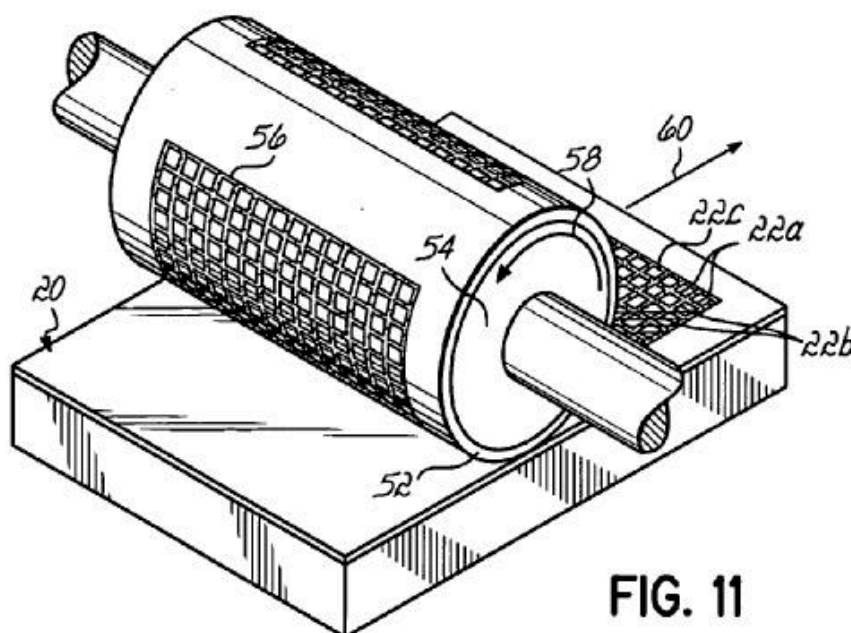
{by printing or by transfer from the surfaces of elements carrying the adhesive, e.g. using brushes, pads, rollers, stencils or silk screens}

## Definition statement

This place covers:

Example 1, from

US2005173059:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Applying liquids to surfaces by transfer from the surfaces of elements carrying the liquid, e.g. brushes, pads, rollers	<a href="#">B05D 1/28</a>
---	---------------------------

## B29C 65/527

{by gravity only, e.g. by pouring}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Applying liquids to surfaces by gravity only	<a href="#">B05D 1/30</a>
--	---------------------------

## B29C 65/528

{by CVD or by PVD, i.e. by chemical vapour deposition or by physical vapour deposition}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Applying liquids to surfaces by vapo-deposition of organic layers	<a href="#">B05D 1/60</a>
---	---------------------------

Applying liquids to surfaces by plasma-deposition of organic layers

[B05D 1/62](#)

## B29C 65/561

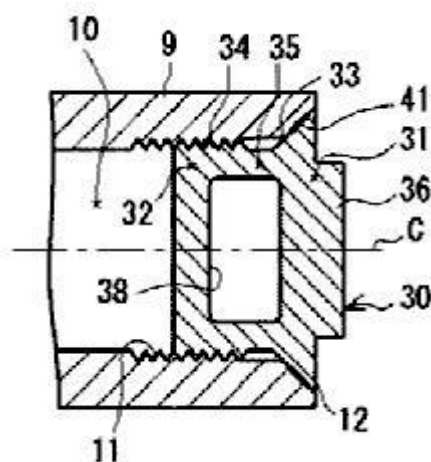
{using screw-threads being integral at least to one of the parts to be joined}

### Definition statement

*This place covers:*

Example 1, from

JP2010247350:



## B29C 65/562

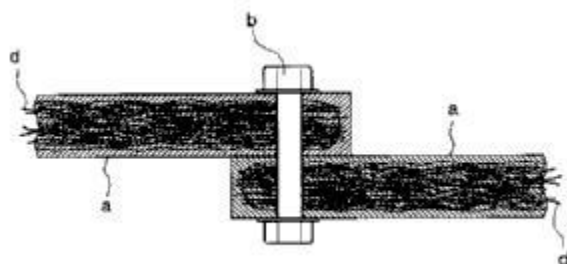
{using extra joining elements, i.e. which are not integral with the parts to be joined (using plastic snap elements [B29C 65/58](#); using plastic rivets [B29C 65/601](#))}

### Definition statement

*This place covers:*

Example 1, from

JP11090986:



**B29C 65/564**

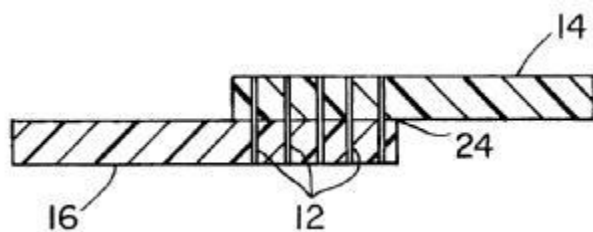
{hidden in the joint, e.g. dowels or Z-pins ([B29C 65/603](#) takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

WO9829243:

**B29C 65/565**

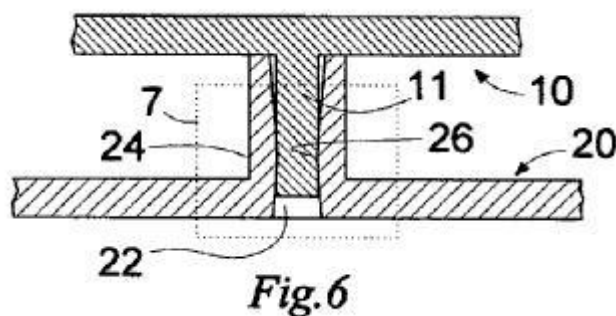
{involving interference fits, e.g. force-fits or press-fits ([B29C 65/66](#) takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

US2007258756:

**B29C 65/567**

{using a tamping or a swaging operation, i.e. at least partially deforming the edge or the rim of a first part to be joined to clamp a second part to be joined}

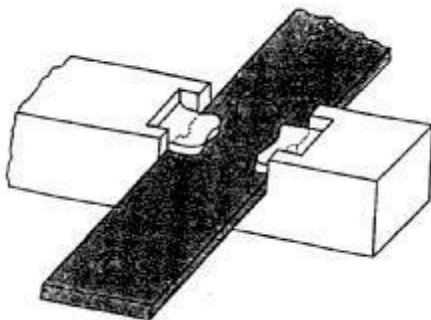
**Definition statement**

*This place covers:*

Example 1, from



XP000362330:



## **B29C 65/568**

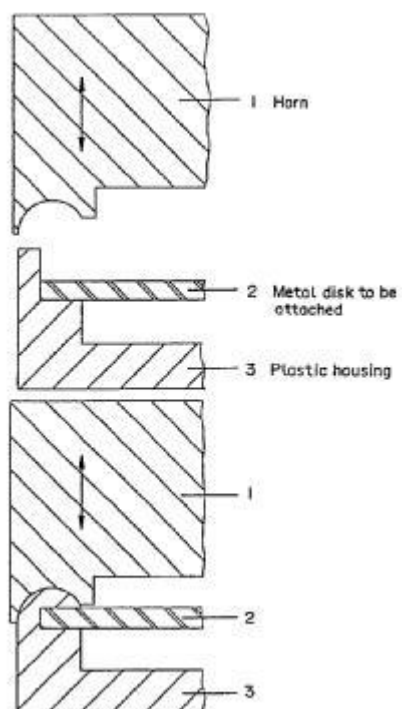
{using a swaging operation, i.e. totally deforming the edge or the rim of a first part to be joined to clamp a second part to be joined}

### **Definition statement**

*This place covers:*

Example 1, from

XP000362330:



**B29C 65/601**

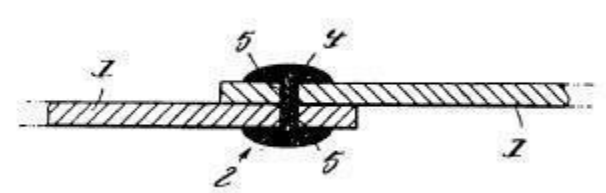
{using extra riveting elements, i.e. the rivets being non-integral with the parts to be joined}

**Definition statement**

*This place covers:*

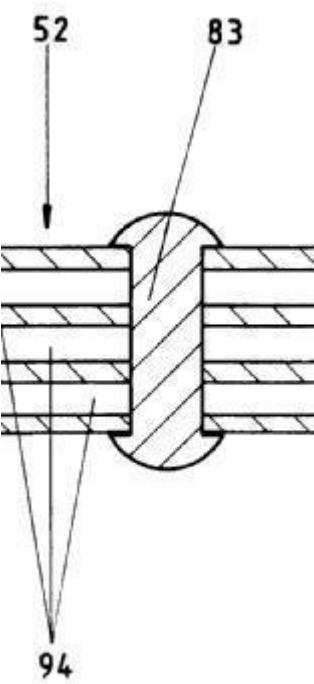
Example 1, from

JP3205132:



Example 2, from

DE3835027:



**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Joining sheets or plates, in general, by means of riveting	<a href="#">F16B 5/04</a>
Rivets	<a href="#">F16B 19/04</a>
Riveting of metal parts	

**B29C 65/602**

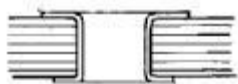
{using hollow rivets ([B29C 65/607](#) takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

JP8127185:

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Riveting of metal parts by riveting hollow rivets mechanically	<a href="#">B21J 5/04</a>
Riveting of metal parts by riveting hollow rivets by means of hydraulic, liquid, or gas pressure	<a href="#">B21J 15/06</a>
Hollow rivets	<a href="#">F16B 19/08</a>

**B29C 65/603**

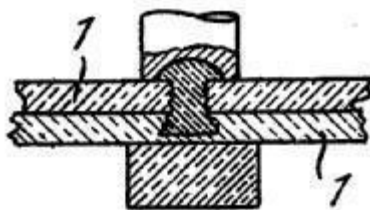
{the rivets being pushed in blind holes}

**Definition statement**

*This place covers:*

Example 1, from

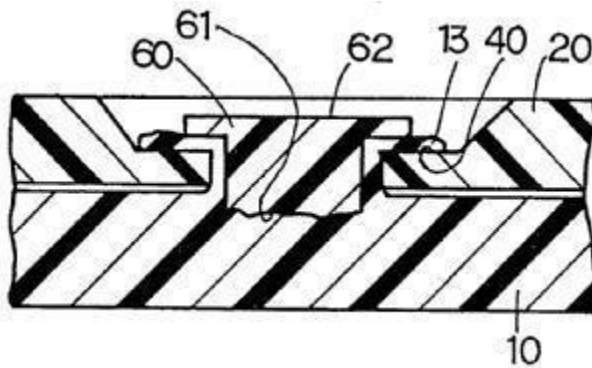
DE623911:



Example 2, from

Definition statement

EP0160425:

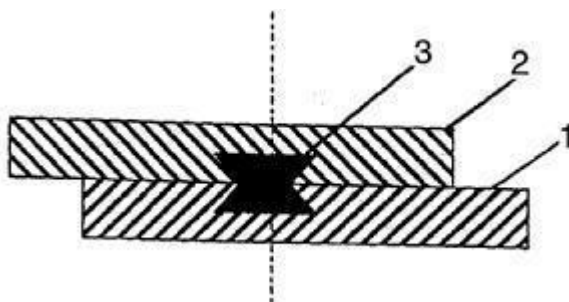
**B29C 65/604**

{in both parts}

**Definition statement***This place covers:*

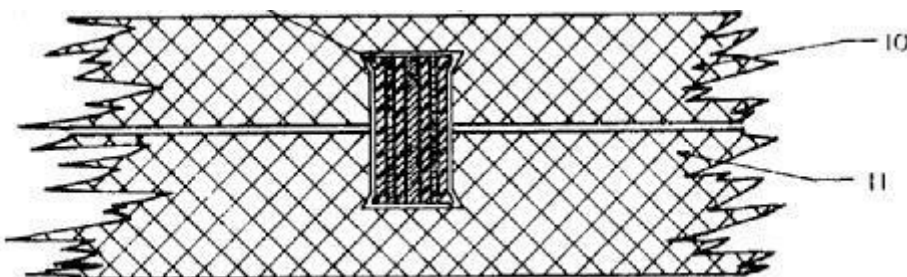
Example 1, from

FR2831229:



Example 2, from

US3612803:

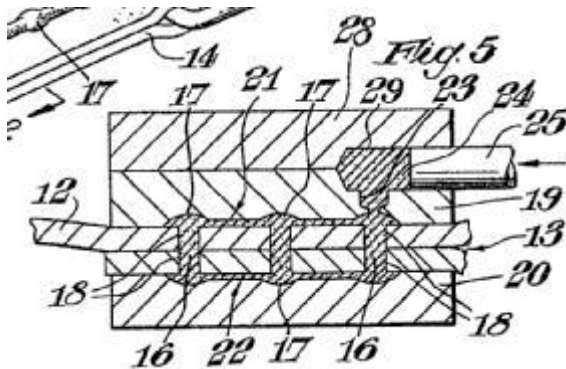
**B29C 65/605**

{the rivets being molded in place, e.g. by injection}

**Definition statement***This place covers:*

Example 1, from

GB893375:



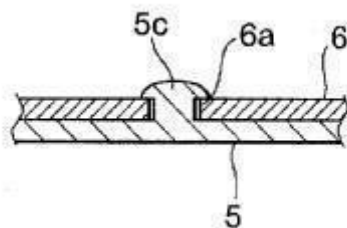
## B29C 65/606

{the rivets being integral with one of the parts to be joined, i.e. staking}

### Definition statement

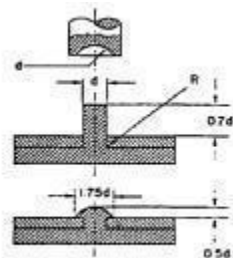
*This place covers:*

Example 1, from EP1488913:



Example 2, from

XP000362330:



## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Joining superposed metal plates by locally deforming without slitting or piercing	<a href="#">B21D 39/031</a>
Joining superposed metal plates by locally deforming, by fitting a projecting part integral with one plate in a hole of the other plate	<a href="#">B21D 39/032</a>

Joining sheets or plates, in general, by means of riveting, without the use of separate rivets

[F16B 5/045](#)

## B29C 65/607

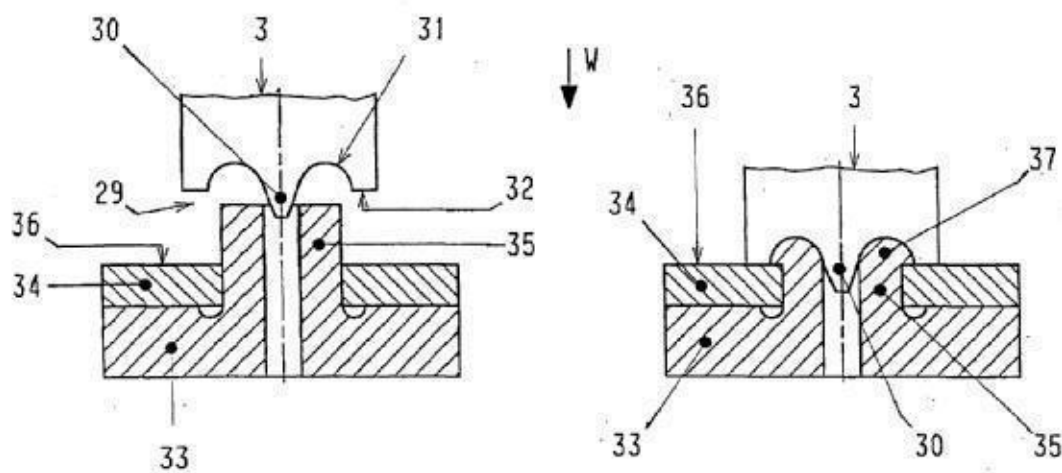
{the integral rivets being hollow}

### Definition statement

*This place covers:*

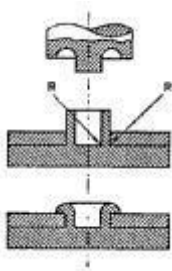
Example 1, from

EP1190804:



Example 2, from

XP000362330:



## B29C 65/609

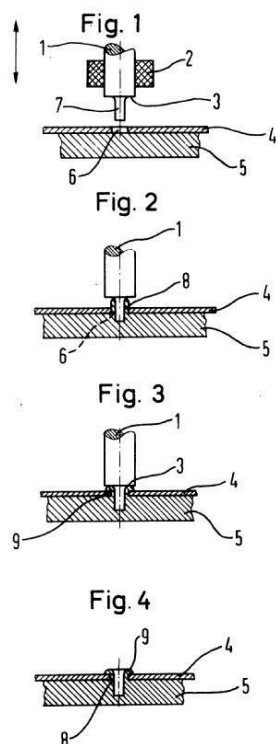
{the integral rivets being plunge-formed}

### Definition statement

*This place covers:*

Example 1, from

DE1294647:



## **B29C 65/62**

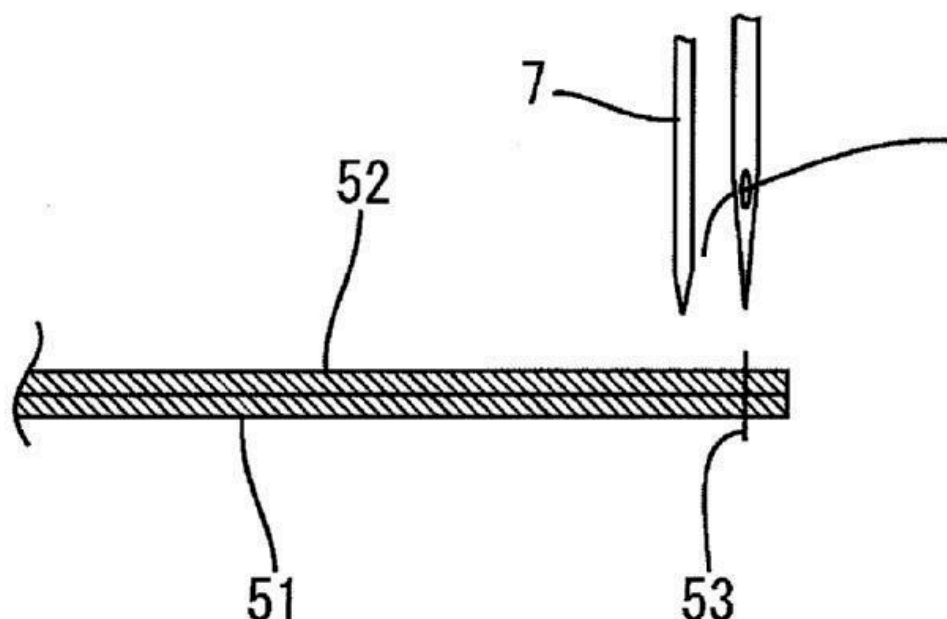
### **Stitching**

#### **Definition statement**

*This place covers:*

Example 1, from

US2010193108:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Hems or seams of garments	<a href="#">A41D 27/24</a>
Sewing in general	<a href="#">D05B</a>
Joining belts by sewing	<a href="#">F16G 3/10</a>

## B29C 65/64

**Joining a non-plastics element to a plastics element, e.g. by force ([B29C 65/44](#) takes precedence)**

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Vehicle superstructures characterised by the material thereof, characterised by combining metal and synthetic material, preformed metal and synthetic material elements being joined together	<a href="#">B62D 29/005</a>
---	-----------------------------



**B29C 65/66**

by liberation of internal stresses, e.g. shrinking of one of the parts to be joined

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Shaping by liberation of internal stresses	<a href="#">B29C 61/00</a>
--	----------------------------

**B29C 65/74**

by welding and severing {, or by joining and severing, the severing being performed in the area to be joined, next to the area to be joined, in the joint area or next to the joint area}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Medical tube couplings for connecting tubes having sealed ends by cutting and welding	<a href="#">A61M 39/146</a>
---	-----------------------------

**Special rules of classification**

When classifying in this group, joining techniques are additionally classified in the relevant groups, e.g. in [B29C 65/02](#) and subgroups.

**B29C 65/7433**

{the tool being a wire}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Severing with heated wires	<a href="#">B26F 3/12</a>
----------------------------	---------------------------

**B29C 65/7435**

{the tool being a roller}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Severing with heated rollers or discs	<a href="#">B26F 3/10</a>
---------------------------------------	---------------------------

**B29C 65/7441****{for making welds and cuts of other than simple rectilinear form}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Closing semi-rigid or rigid containers or receptacles after filling, by feeding web material to securing means and securing by heat-sealing	<a href="#">B65B 7/164</a>
---	----------------------------

**B29C 65/7443****{by means of ultrasonic vibrations}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Details of apparatus for cutting, cutting-out, stamping-out, punching, perforating, or severing by vibrating, e.g. ultrasonically	<a href="#">B26D 7/086</a>
---	----------------------------

**B29C 65/7457****{comprising a perforating tool}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Perforating strips of completed packages	<a href="#">B65B 61/007</a>
--	-----------------------------

**B29C 65/7461****{for making welds and cuts of other than simple rectilinear form}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Closing semi-rigid or rigid containers or receptacles after filling, by feeding web material to securing means and securing by heat-sealing	<a href="#">B65B 7/164</a>
---	----------------------------

**B29C 65/76****Making non-permanent or releasable joints****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Layered products permitting easy separation	<a href="#">B32B 7/06</a>
---	---------------------------

**B29C 65/7841**

{Holding or clamping means for handling purposes (clamping means for the purpose of applying pressure on the parts to be joined, in the area to be joined [B29C 66/81](#); work holders in general [B25B](#); devices for holding or positioning work for welding metal [B23K 37/04](#))}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Clamps for holding or positioning work for welding metal	<a href="#">B23K 37/0435</a>
Jigs for positioning work for welding metal	<a href="#">B23K 37/0443</a>
Clamps for plates in general	<a href="#">B25B 5/145</a>
Clamps for pipes in general	<a href="#">B25B 5/147</a>

**B29C 65/7861**

{In-line machines, i.e. feeding, joining and discharging are in one production line ([B29C 65/7879](#), [B29C 65/7888](#) take precedence)}

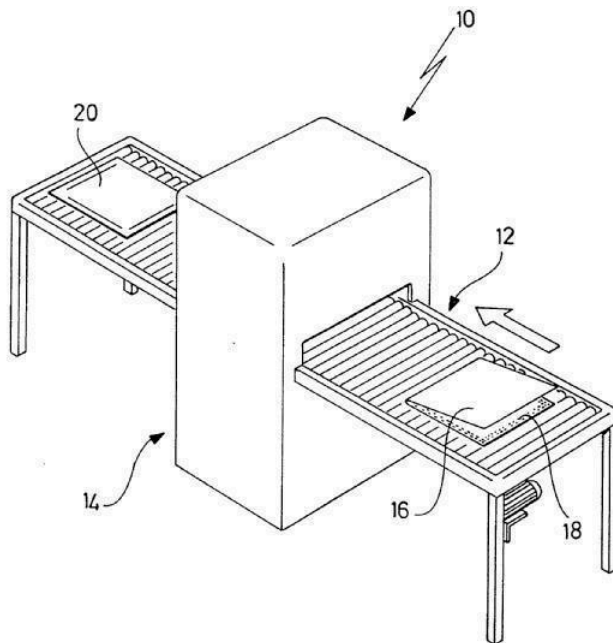
**Definition statement**

*This place covers:*

Example 1, from

DE4336274:

FIG.1



## B29C 65/7864

{using a feeding table which moves to and fro (oscillating around an axis  
[B29C 65/7876](#))}

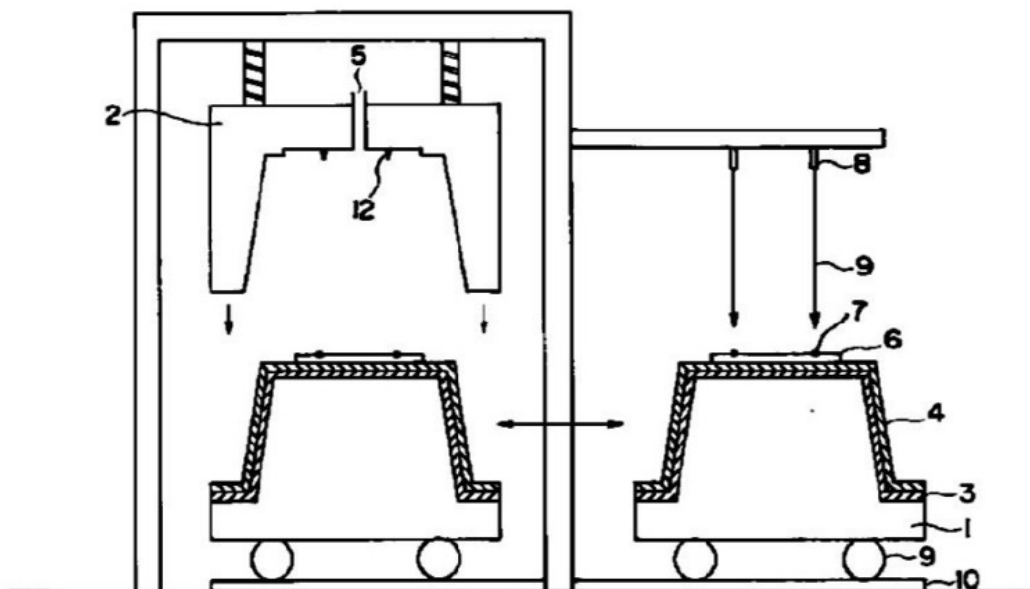
### Definition statement

*This place covers:*

Example 1, from

JP11240025:

【図1】



## B29C 65/7867

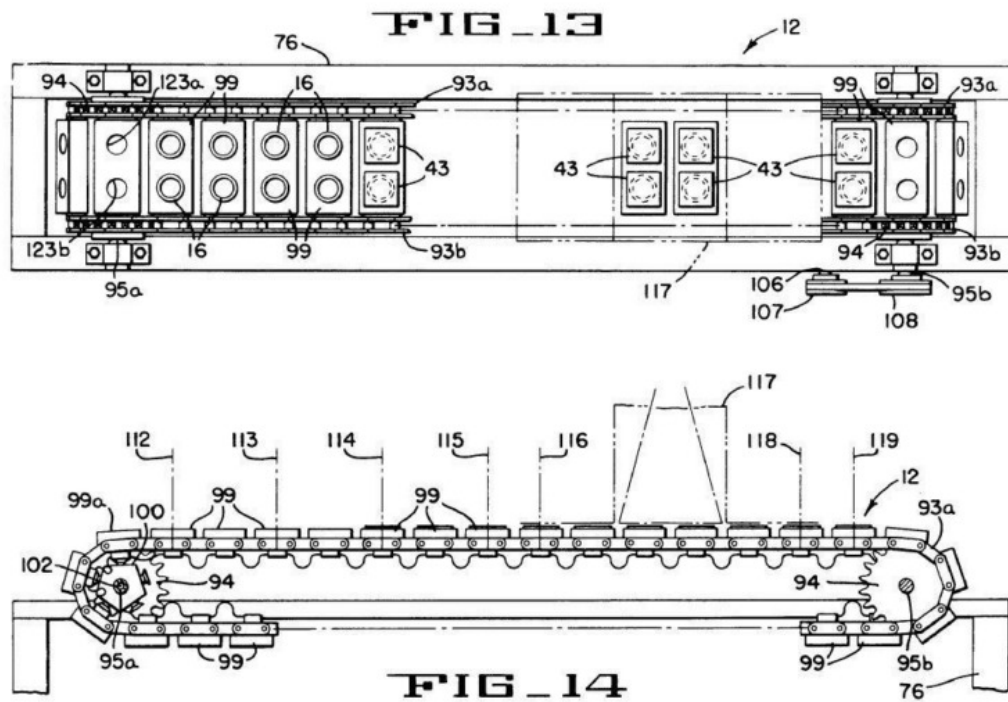
{using carriers, provided with holding means, said carriers moving in a closed path}

### Definition statement

*This place covers:*

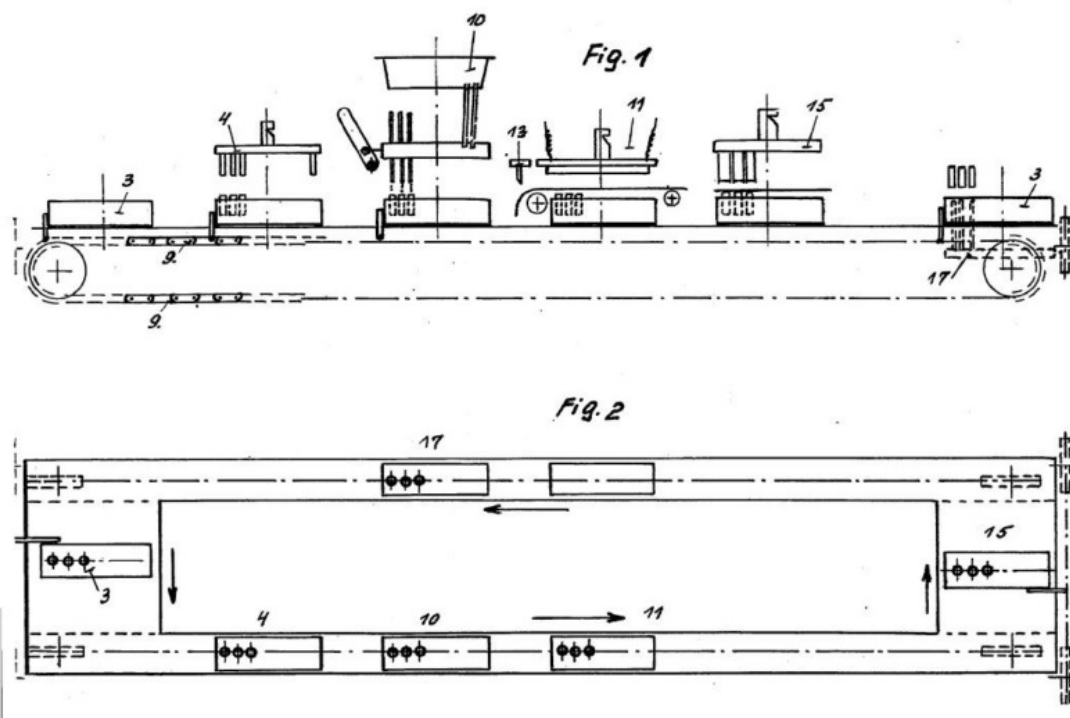
Example 1, from

EP0483569:



Example 2, from

DE1058426:



**B29C 65/787**

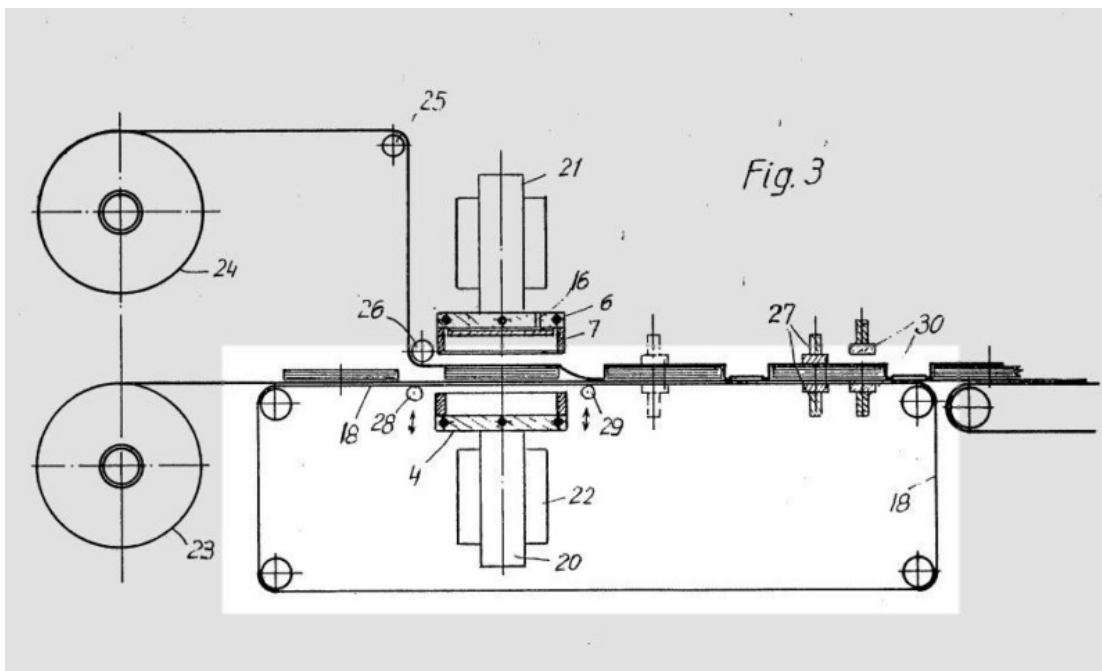
{using conveyor belts or conveyor chains ([B29C 66/83421](#), [B29C 66/83521](#), [B29C 66/83531](#) take precedence)}

**Definition statement**

*This place covers:*

Example 1, from

DE3807164:

**B29C 65/7879**

{said parts to be joined moving in a closed path, e.g. a rectangular path ([B29C 65/7888](#) takes precedence)}

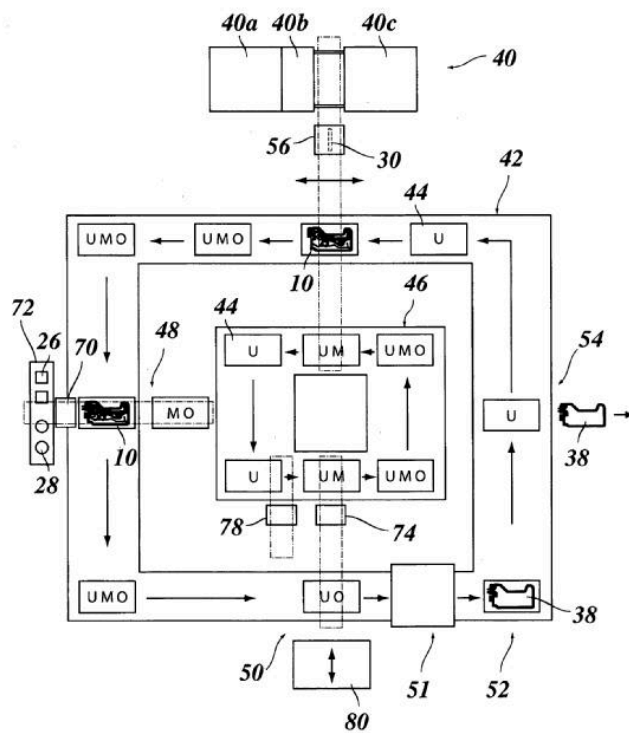
**Definition statement**

*This place covers:*

Example 1, from

Definition statement

DE102009037662:

**B29C 65/7882**

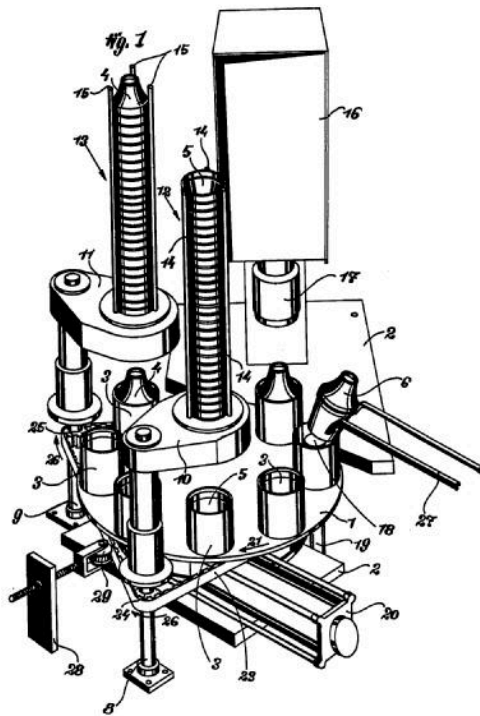
{said parts to be joined moving in a circular path}

**Definition statement***This place covers:*

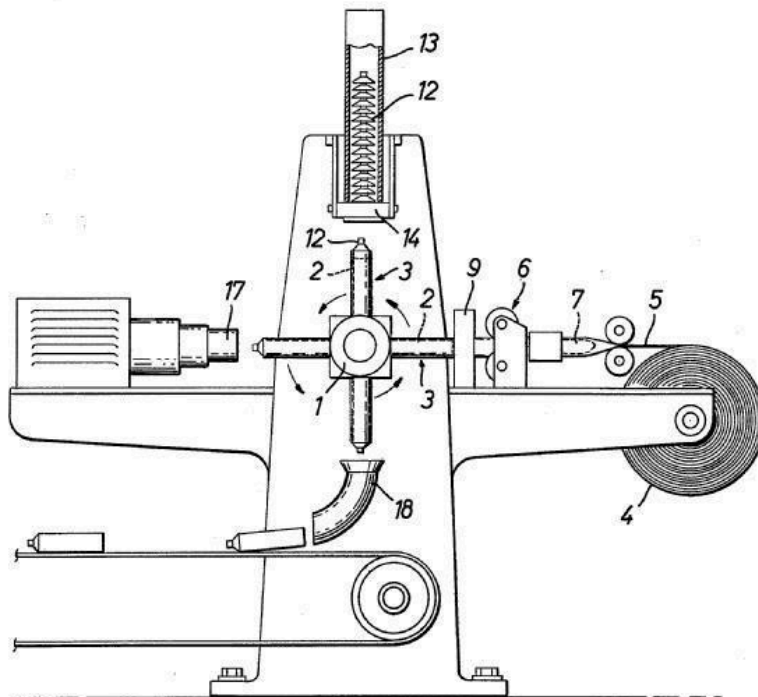
Example 1, from



CH537834:



Example 2, from  
DE1143630:



**B29C 65/7885**

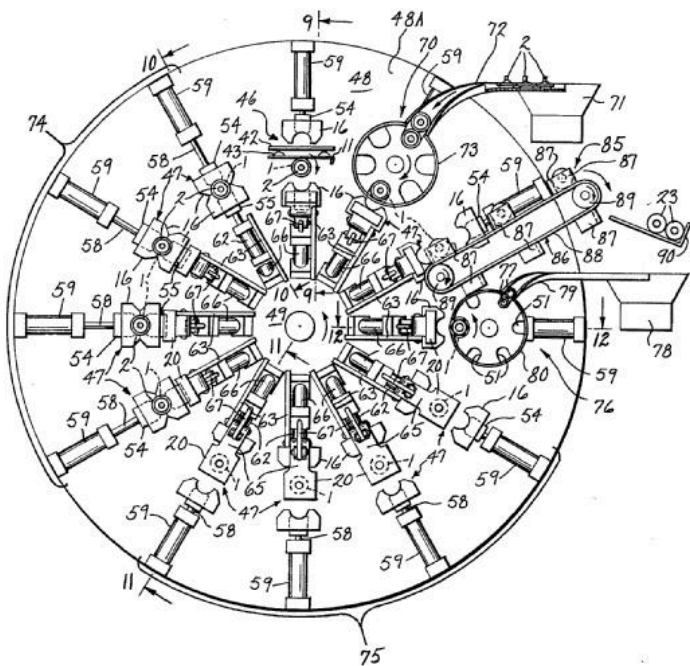
{Rotary turret joining machines, i.e. having several joining tools moving around an axis}

**Definition statement**

*This place covers:*

Example 1, from

FR2167559:



**B29C 65/8207**

{by mechanical methods}

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Investigating strength properties of welds by application of mechanical stress	<a href="#">G01N 2203/0296</a>
--	--------------------------------

**B29C 65/8215****{Tensile tests}****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Investigating strength properties of solid materials by applying steady tensile forces	<a href="#">G01N 3/08</a>
--	---------------------------

**B29C 65/8223****{Peel tests}****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Investigating strength properties of solid materials by applying steady shearing forces	<a href="#">G01N 3/24</a>
---	---------------------------

**B29C 65/823****{Bend tests}****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Investigating strength properties of solid materials by applying steady bending forces	<a href="#">G01N 3/20</a>
--	---------------------------

**B29C 65/8238****{Impact tests}****References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Investigating strength properties of solid materials by applying a single impulsive force	<a href="#">G01N 3/30</a>
---	---------------------------

**B29C 65/8246****{Pressure tests, e.g. hydrostatic pressure tests}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Investigating fluid-tightness of structures	<a href="#">G01M 3/00</a>
---	---------------------------

**B29C 65/8253****{by the use of waves or particle radiation, e.g. visual examination, scanning electron microscopy, or X-rays ([B29C 65/8292](#) takes precedence)}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Investigating materials by the use of wave or particle radiation	<a href="#">G01N 21/00</a> - <a href="#">G01N 23/00</a>
--	--

**B29C 65/8261****{by the use of thermal means}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Investigating materials by the use of thermal means	<a href="#">G01N 25/00</a>
---	----------------------------

**B29C 65/8269****{by the use of electric or magnetic means}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Investigating materials by the use of electric or magnetic means	<a href="#">G01N 27/00</a>
--	----------------------------

**B29C 65/8292****{by the use of ultrasonic, sonic or infrasonic waves}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Investigating materials by the use of ultrasonic, sonic or infrasonic waves	<a href="#">G01N 29/00</a>
---	----------------------------

**B29C 66/00****{General aspects of processes or apparatus for joining preformed parts (means for handling the parts to be joined [B29C 65/78](#); testing the joint [B29C 65/82](#))}****Definition statement***This place covers:*General aspects dealing with the joint area (cf. [B29C 66/01](#) and subgroups), e.g.:pre-treatments (cf. [B29C 66/02](#) and subgroups);post-treatments (cf. [B29C 66/03](#) and subgroups);particular design of joint configurations (cf. [B29C 66/05](#) and subgroups);General aspects of joining substantially flat articles (cf. [B29C 66/40](#) and subgroups);General aspects of joining tubular articles; General aspects of joining hollow-preforms to form hollow articles (cf. [B29C 66/50](#) and subgroups);Specific composition, properties or structure of the material to be joined (cf. [B29C 66/70](#) and subgroups);General aspects of machine constructions (cf. [B29C 66/80](#) and subgroups), e.g.:constructional aspects of the welding jaw (cf. [B29C 66/81](#) and subgroups);transmission or actuating mechanisms for joining tools (cf. [B29C 66/82](#) and subgroups);specific movements of the joining tools (cf. [B29C 66/83](#) and subgroups);Measuring or controlling the joining process (cf. [B29C 66/90](#) and subgroups).**References****Limiting references***This place does not cover:*

Joining methods; means for handling the parts to be joined; testing the joint	<a href="#">B29C 65/002</a> - <a href="#">B29C 65/76</a> ; <a href="#">B29C 65/78</a> ; <a href="#">B29C 65/82</a>
---	--

**Special rules of classification**

Patent literature (e.g. patent applications, patent specifications):

Claims / claimed subject-matter:

Independent claims: compulsory invention information;

Dependent claims: at least compulsory additional information (or compulsory invention information if appropriate).

Figures - depicted subject-matter: at least compulsory additional information (or compulsory invention information if appropriate).

Description - described subject-matter: at least desirable additional (or compulsory invention information if appropriate).

Tables: at least compulsory additional information.

Non-patent literature (e.g. scientific non-patent publications):

Figures - depicted subject-matter: compulsory invention information;

Abstract: compulsory invention information;

Description: at least desirable additional information (or compulsory invention information if appropriate).

N.B.: in this main group, it is compulsory that any disclosed aspect relating to the invention is identified by the corresponding classification code(s).

## **B29C 66/001**

**{Joining in special atmospheres}**

### **References**

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Closing containers in chambers maintained under vacuum or super-atmospheric pressure or containing a special atmosphere, e.g. of inert gas	<a href="#">B65B 31/02</a>
--	----------------------------

## **B29C 66/0016**

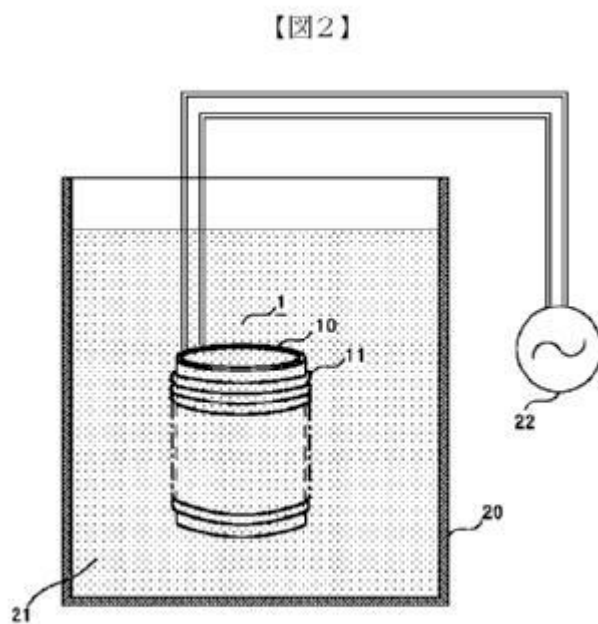
**{Liquid environments, i.e. the parts to be joined being submerged in a liquid}**

### **Definition statement**

*This place covers:*

Example 1, from

JP7080941:



## **B29C 66/0044**

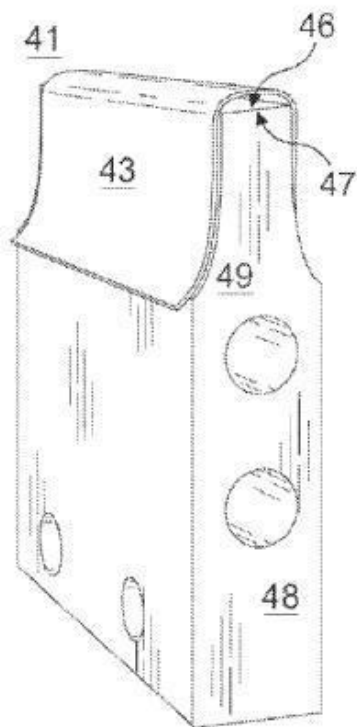
{using a separating sheet, e.g. fixed on the joining tool}

### **Definition statement**

*This place covers:*

Example 1, from

WO2010129569:



## **B29C 66/00441**

{movable, e.g. mounted on reels}

### **Definition statement**

*This place covers:*

Example 1, from



WO2008005882:

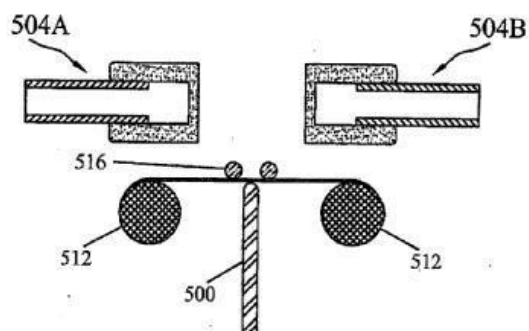


Figure 5A

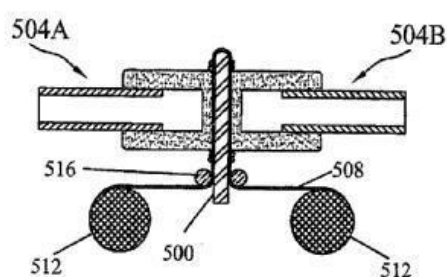


Figure 5B

## B29C 66/02

{Preparation of the material, in the area to be joined, prior to joining or welding  
([B29C 66/32](#) takes precedence)}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Conditioning or physical treatment of the material to be shaped, in general	<a href="#">B29B 13/00</a>
Adhesive processes in general involving pretreatment of the surfaces to be joined	<a href="#">C09J 5/02</a>

## B29C 66/02242

{Perforating or boring}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Perforating material prior to packaging	<a href="#">B65B 61/02</a>
---	----------------------------

**B29C 66/02245****{Abrading, e.g. grinding, sanding, sandblasting or scraping}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Conditioning or physical treatment of the material to be shaped, by grinding, in general	<a href="#">B29B 13/10</a>
--	----------------------------

**B29C 66/0242****{Heating, or preheating, e.g. drying ([B29C 66/3464](#) takes precedence)}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Conditioning of the material to be shaped, by heating, in general	<a href="#">B29B 13/02</a>
Conditioning of the material to be shaped, by drying, in general	<a href="#">B29B 13/04</a>

**B29C 66/0244****{Cooling}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Conditioning of the material to be shaped, by cooling, in general	<a href="#">B29B 13/04</a>
---	----------------------------

**B29C 66/026****{Chemical pre-treatments ([B29C 66/028](#) takes precedence)}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Chemical treatment of shaped articles made of macromolecular substances	<a href="#">C08J 7/00</a>
---	---------------------------

**B29C 66/028**

{Non-mechanical surface pre-treatments, i.e. by flame treatment, electric discharge treatment, plasma treatment, wave energy or particle radiation ([B29C 65/14](#) takes precedence; non-mechanical surface treatment of plastics in general [B29C 59/08](#) - [B29C 59/16](#))}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Conditioning or physical treatment of the material to be shaped, by using wave energy or particle radiation, in general	<a href="#">B29B 13/08</a>
Chemical modification of shaped articles made of macromolecular substances by wave energy or particle radiation treatment	<a href="#">C08J 7/123</a>

**B29C 66/03**

{After-treatments in the joint area ([B29C 66/3262](#) takes precedence)}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

After-treatment, in general, of articles without altering their shape	<a href="#">B29C 71/00</a>
After-treatment, in general, of articles without altering their shape, by wave energy or particle radiation	<a href="#">B29C 71/04</a>

**B29C 66/03241**

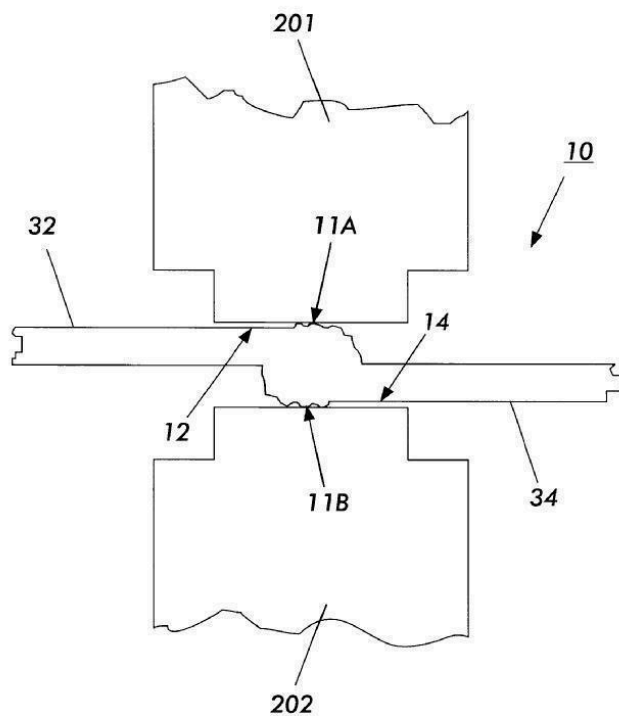
{Flattening}

**Definition statement**

*This place covers:*

Example 1, from

USRE38248E:



### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Flattening	e.g. flat ironing or smoothing an e.g. overlap joint
------------	--

### B29C 66/03242

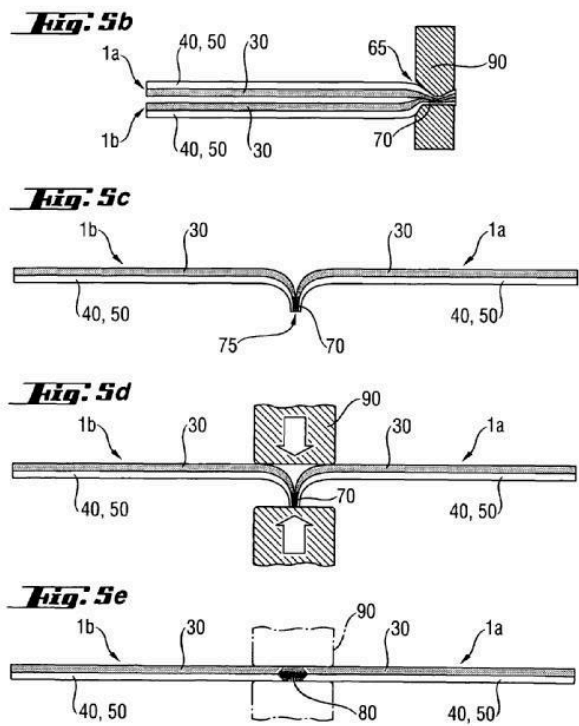
{of sheets being positioned in abutment, e.g. after folding open of an overlap joint}

### Definition statement

*This place covers:*

Example 1, from

EP1491105:



**B29C 66/034**

{Thermal after-treatments}

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Thermal after-treatment, in general, of articles without altering their shape	<a href="#">B29C 71/02</a>
---	----------------------------

**B29C 66/0342**

{Cooling, e.g. transporting through welding and cooling zone}

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Cooling	<a href="#">B29C 35/16</a>
Cooling, or cooling and pressing, package closures after heat-sealing	<a href="#">B65B 51/32</a>

**B29C 66/0384**

{the coating material being in tape, strip or band form (joining using adhesive tapes covering both elements to be joined [B29C 65/5042](#))}

**Definition statement**

*This place covers:*

Example 1, from

US2010151176:

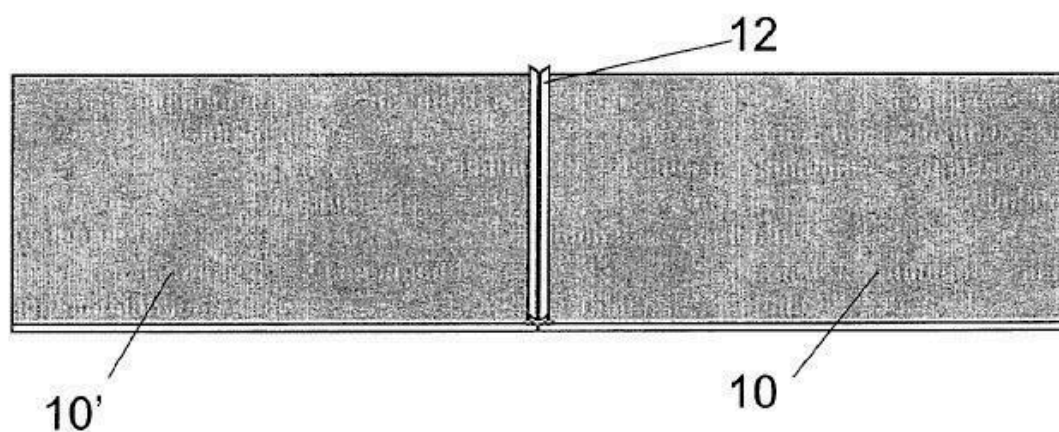


FIG. 3

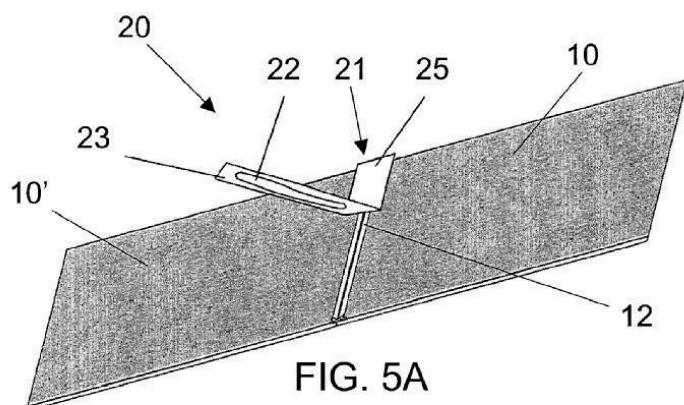


FIG. 5A

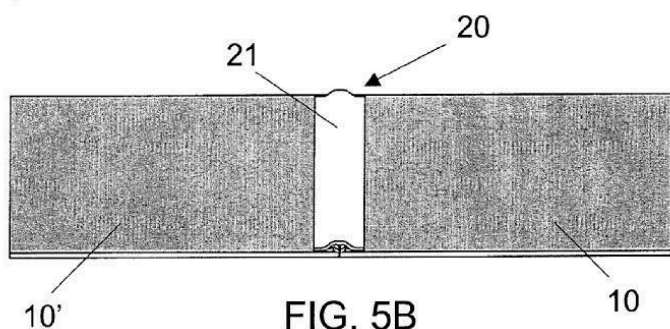


FIG. 5B

## B29C 66/05

### {Particular design of joint configurations}

#### Special rules of classification

In this group the possible supplementary joining material (e.g. adhesive, adhesive tapes or extra joining elements, e.g. extra riveting elements) is not taken into account for the joint configuration. The use of supplementary joining material (e.g. adhesive, adhesive tapes or extra joining elements, e.g. extra riveting elements) has to be additionally classified as such (e.g. in [B29C 65/48](#) and subgroups, [B29C 65/50](#) and subgroups, [B29C 65/562](#) and subgroups or [B29C 65/601](#) and subgroups).

## B29C 66/10

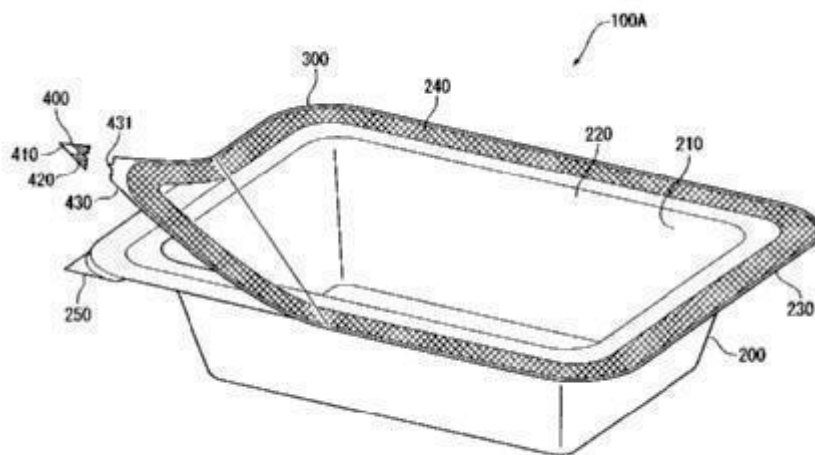
### {particular design of the joint cross-sections}

#### Definition statement

*This place covers:*

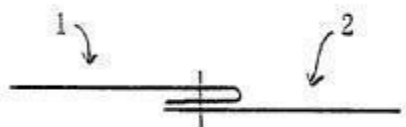
Example 1, [B29C 66/112](#) (single lapped joint) and [B29C 66/131](#) (single flanged joint), from

JP2009202894:



Example 2, [B29C 66/135](#) (single hemmed joint) and [B29C 66/112](#) (single lapped joint), from

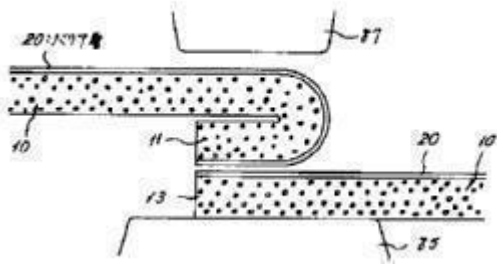
EP0721745:



Example 3, [B29C 66/135](#) (single hemmed joint) and [B29C 66/112](#) (single lapped joint), from

Definition statement

JP8118499:

**B29C 66/11**

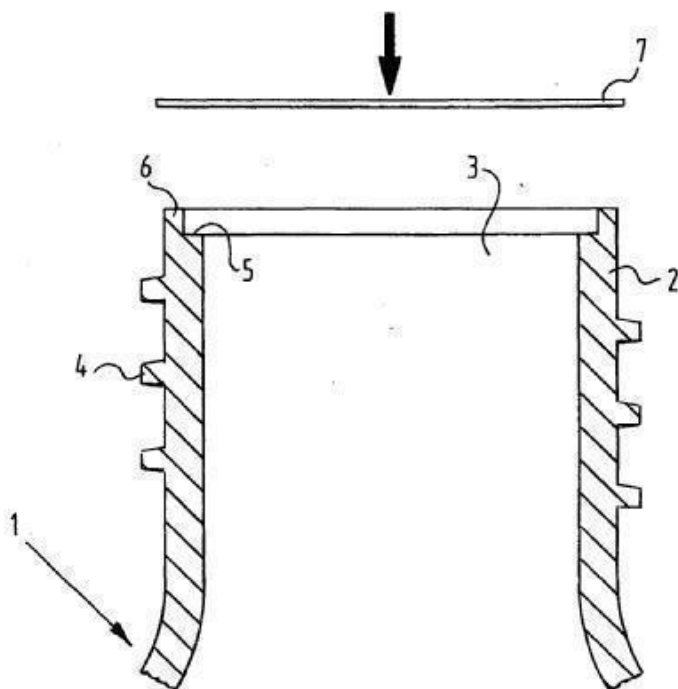
{Joint cross-sections comprising a single joint-segment, i.e. one of the parts to be joined comprising a single joint-segment in the joint cross-section ([B29C 66/12](#) and subgroups take precedence)}

**Definition statement**

*This place covers:*

Example 2, [B29C 66/112](#) (single lapped joint) and [B29C 66/114](#) (single butt joint), from

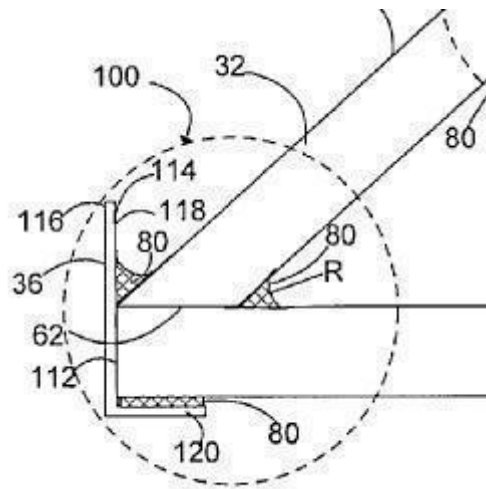
NL1028543C:



Example 3, [B29C 66/116](#) (single bevelled joint) and [B29C 66/112](#) (single lapped joint), from



US2009307995:



**B29C 66/1122**

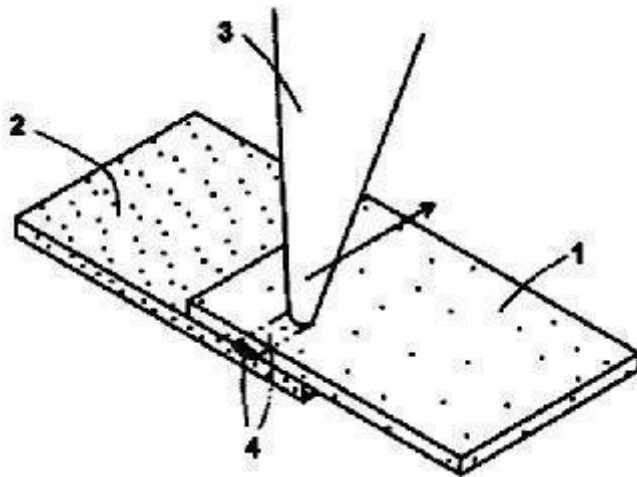
**{Single lap to lap joints, i.e. overlap joints ([B29C 66/45](#), [B29C 66/472](#), [B29C 66/52272](#) take precedence)}**

### Definition statement

*This place covers:*

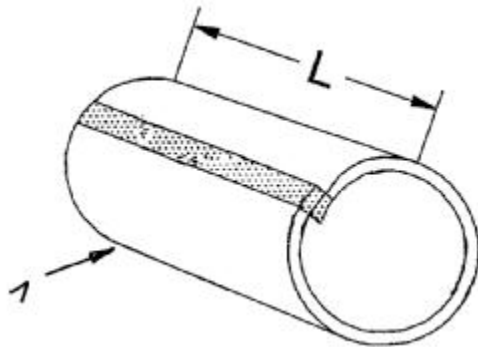
Example 1, from

JP2007112127:



Example 2, from

DE19813387



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Overlap laser welding of metal parts	<a href="#">B23K 26/244</a>
--------------------------------------	-----------------------------

## B29C 66/1142

{Single butt to butt joints}

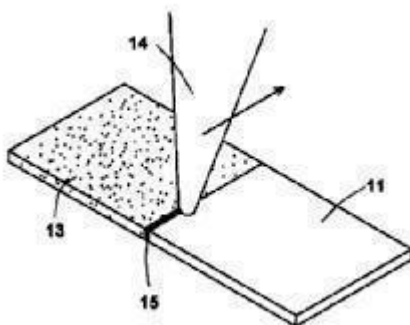
### Definition statement

*This place covers:*

Example 1,

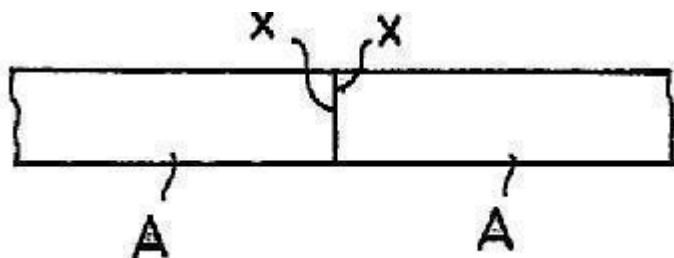
from

JP2007296857:



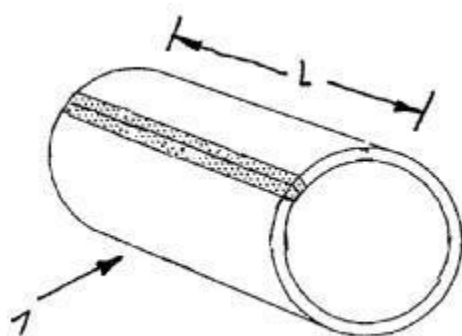
Example 2, from

JP2011008277:



Example 3, from

DE19813387:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Joining sheets, plates or panels in abutting relationship, relating to finishing work on buildings
--

<a href="#">E04F 2201/01</a>
------------------------------

## B29C 66/1162

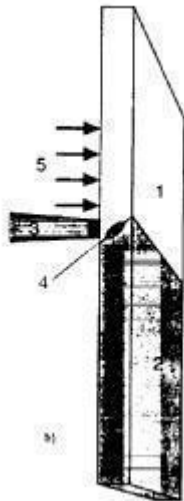
{Single bevel to bevel joints, e.g. mitre joints}

### Definition statement

*This place covers:*

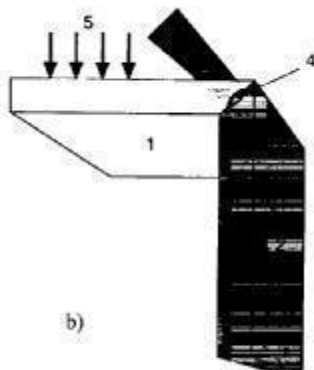
Example 1, from

XP000831529:



Example 2, from

XP000831529:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Welded mitre corner joints for windows, doors, or the like frames or wings	<a href="#">E06B 3/9608</a>
--	-----------------------------

## B29C 66/118

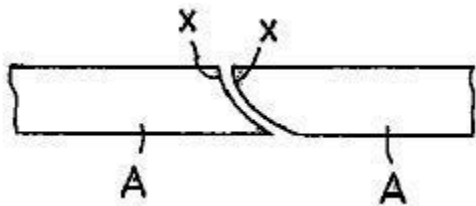
{Single monotone curved joints}

### Definition statement

*This place covers:*

Example 1, from

JP2011008277:



## B29C 66/1182

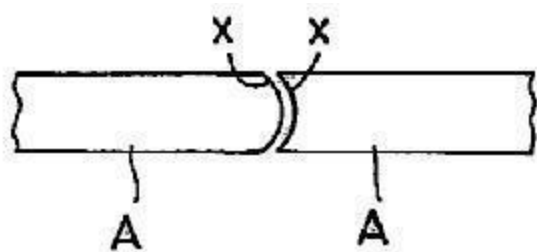
{the joint being C-shaped}

### Definition statement

*This place covers:*

Example 1, from

JP2011008277:



## B29C 66/122

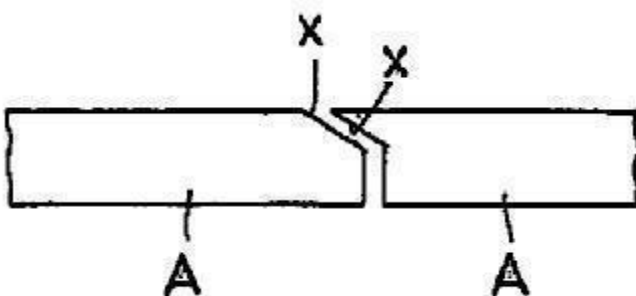
{Joint cross-sections combining only two joint-segments, i.e. one of the parts to be joined comprising only two joint-segments in the joint cross-section ([B29C 66/124](#) takes precedence)}

### Definition statement

*This place covers:*

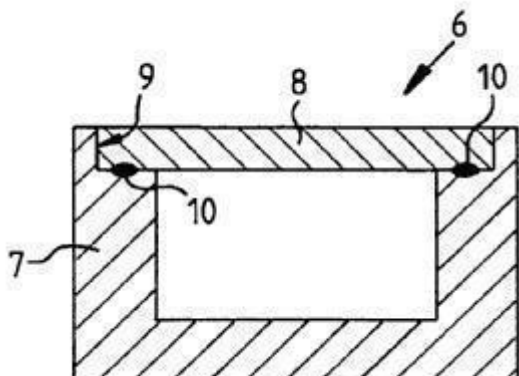
Example 1, [B29C 66/1224](#) (comprising at least a butt joint-segment) and [B29C 66/1226](#) (comprising at least one bevelled joint-segment), from

JP2011008277:



Example 2, [B29C 66/1224](#) (comprising at least a butt joint-segment) and [B29C 66/1222](#) (comprising at least a lapped joint-segment), from

DE19510493:



Example 3, [B29C 66/1224](#) (comprising at least a butt joint-segment) and [B29C 66/1222](#) (comprising at least a lapped joint-segment), from

DE19510493:

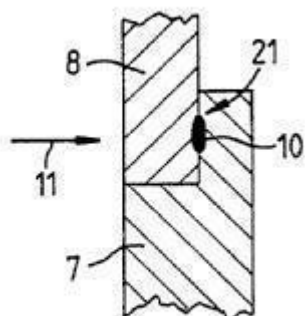
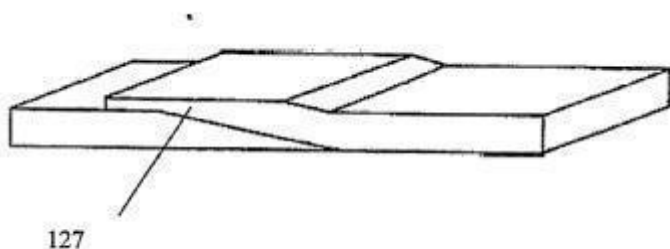


Fig.7

Example 4, [B29C 66/1222](#) (comprising at least a lapped joint-segment) and [B29C 66/1226](#) (comprising at least one bevelled joint-segment), from

WO2005095828:



**B29C 66/12261**

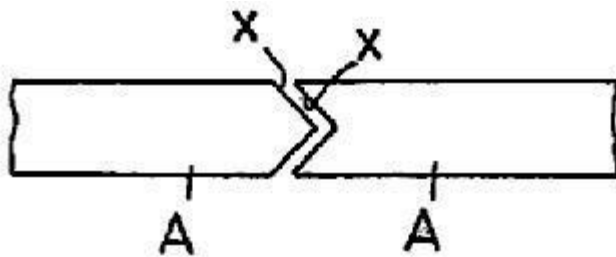
{the two joint-segments being bevelled, e.g. the two joint-segments forming a V}

**Definition statement**

*This place covers:*

Example 1, from

JP2011008277:

**B29C 66/1228**

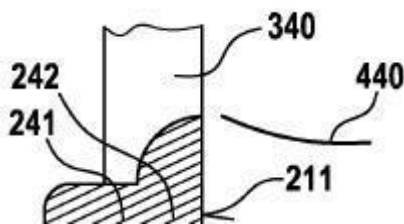
{comprising at least one monotone curved joint-segment}

**Definition statement**

*This place covers:*

Example 1, from

EP2402145:

**B29C 66/124**

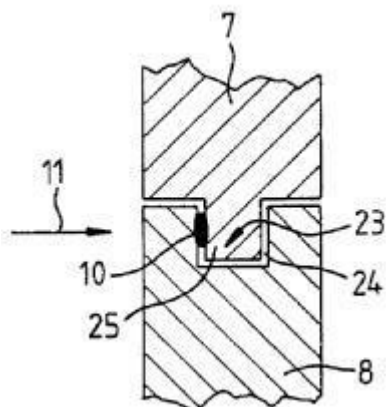
{Tongue and groove joints}

**Definition statement**

*This place covers:*

Example 1, from

DE19510493:



## **B29C 66/12421**

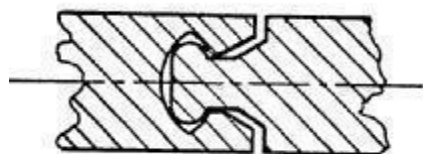
**{Teardrop-like, waterdrop-like or mushroom-like interlocking undercuts}**

### **Definition statement**

*This place covers:*

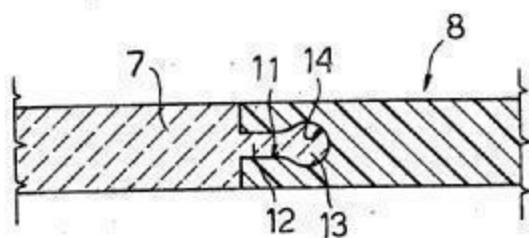
Example 1, from

DE2645771:



Example 2, from

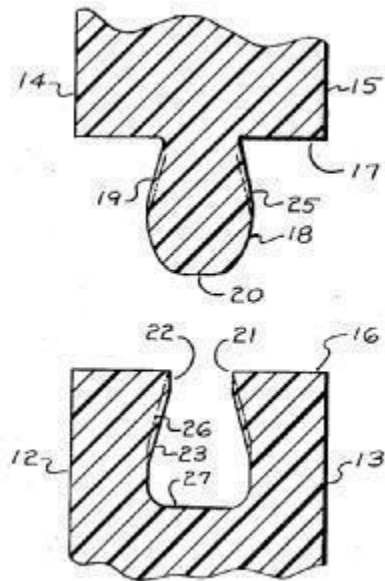
FR2575804:



Example 3, from



US3695340:



## B29C 66/12423

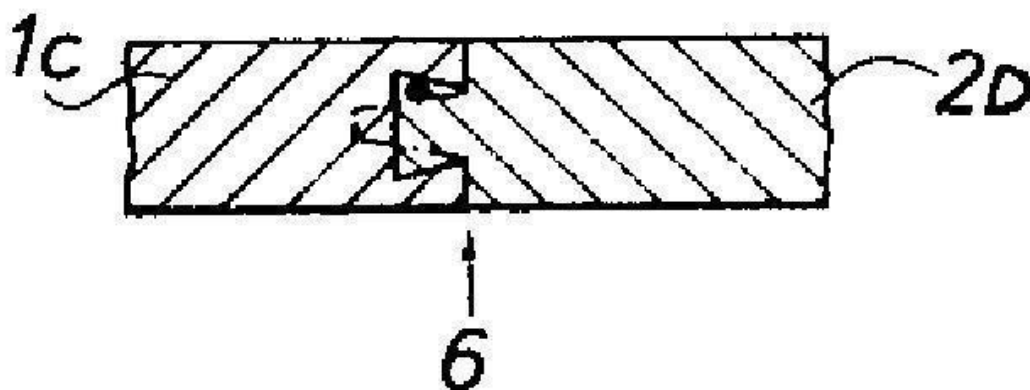
{Dovetailed interlocking undercuts}

### Definition statement

*This place covers:*

Example 1, from

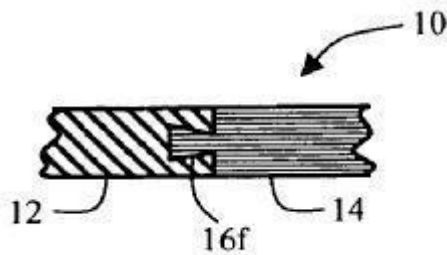
JP55051527:



Example 2, from

Definition statement

US2005067084:

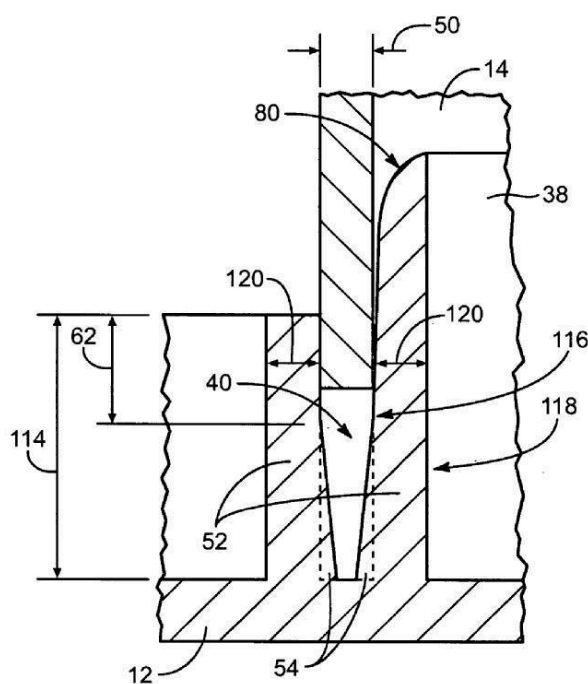
**B29C 66/12441**

{being a single wall}

**Definition statement***This place covers:*

Example 1, from

US2005284559:

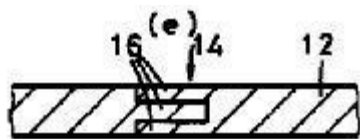
**B29C 66/12443**

{having the tongue substantially in the middle}

**Definition statement***This place covers:*

Example 1, from

JP11291347:



## B29C 66/12445

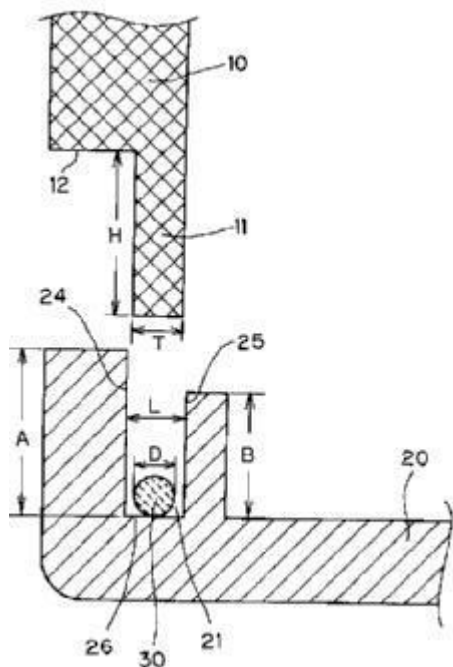
{having the tongue on the side}

### Definition statement

*This place covers:*

Example 1, from

JP2977035B1:



## B29C 66/12449

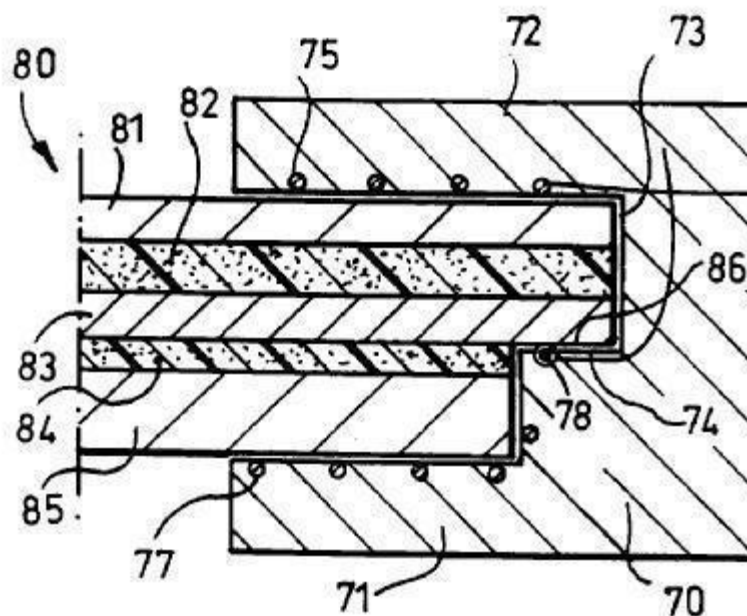
{being asymmetric ([B29C 66/12445](#) takes precedence)}

### Definition statement

*This place covers:*

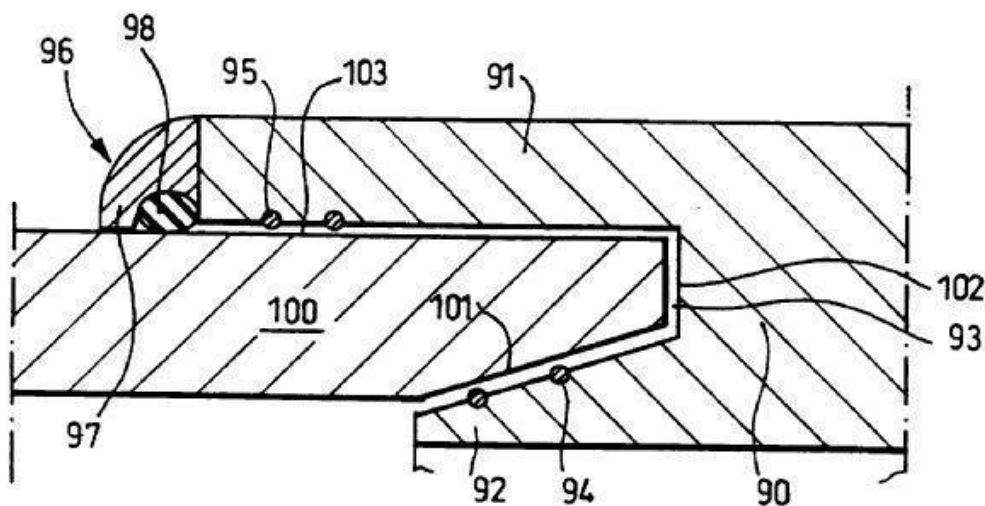
Example 1, from

GB2314597:



Example 2, from

GB2314597:



## B29C 66/12461

{being rounded, i.e. U-shaped or C-shaped}

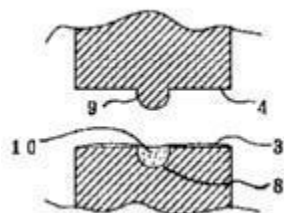
### Definition statement

*This place covers:*

Example 1, from

Definition statement

JP7125074:

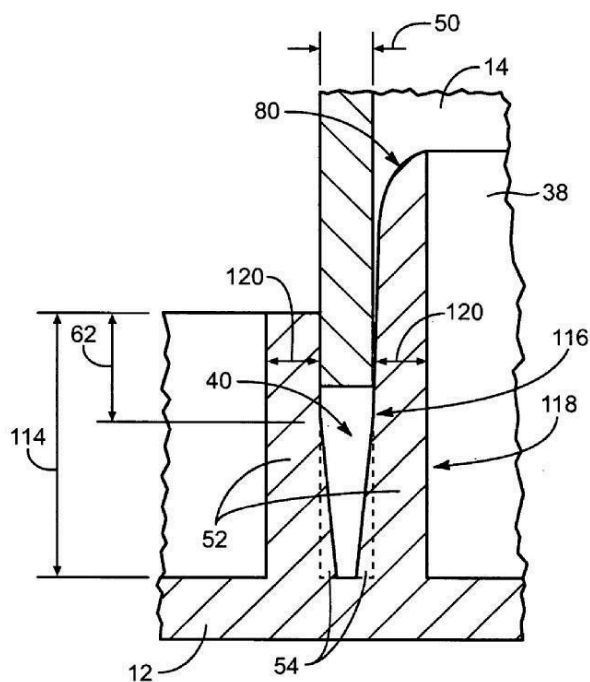
**B29C 66/12463**

{being tapered}

**Definition statement***This place covers:*

Example 1, from

US2005284559:

**B29C 66/12464**

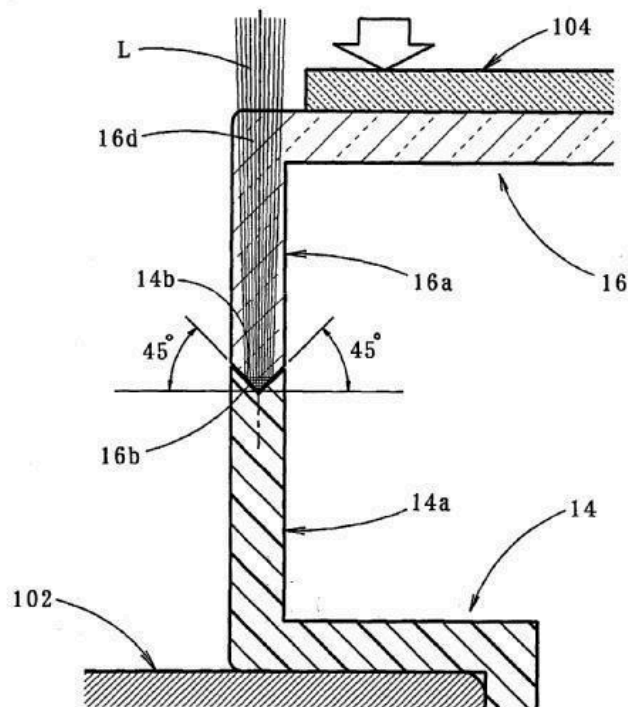
{being V-shaped}

**Definition statement***This place covers:*

Example 1, from

### Definition statement

DE10109594:



**B29C 66/12469**

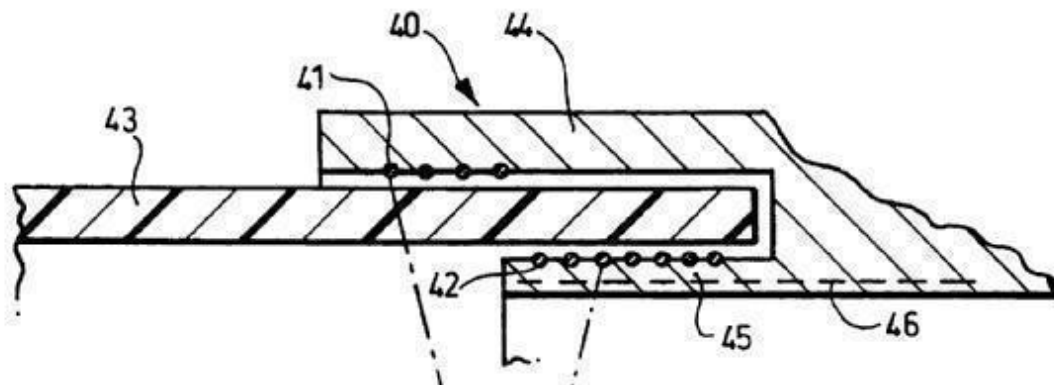
**{being asymmetric}**

### Definition statement

*This place covers:*

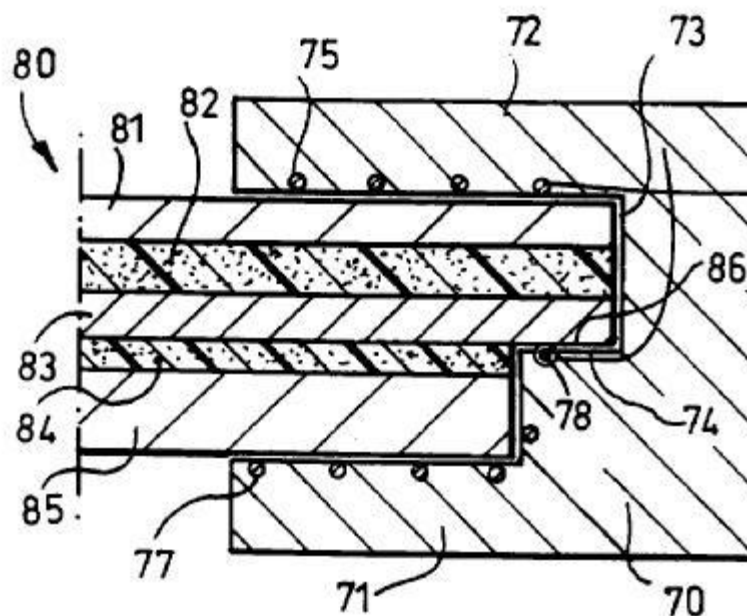
Example 1, from

GB2314597:



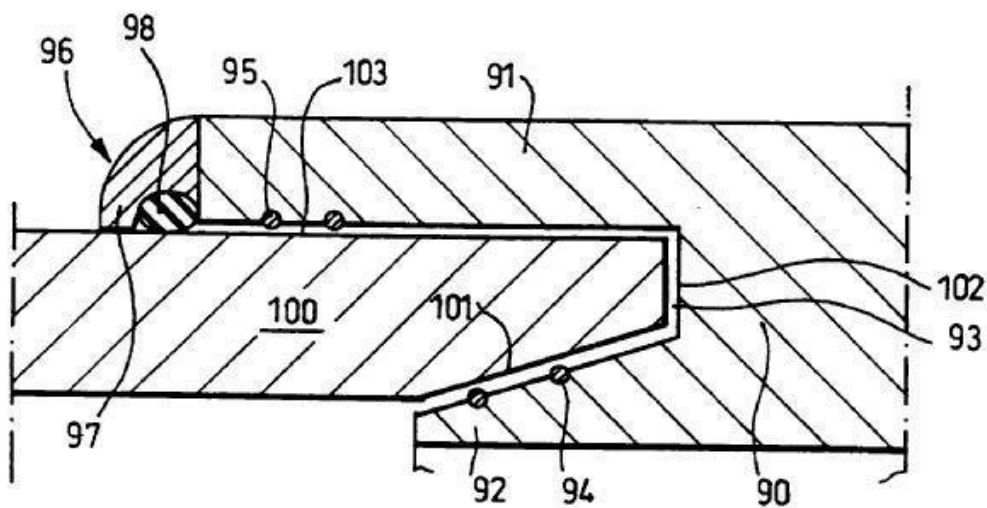
Example 2, from

GB2314597:



Example 3, from

GB2314597:



## B29C 66/1248

{Interpenetrating groove joints (interpenetrating fingered joints [B29C 66/139](#))}

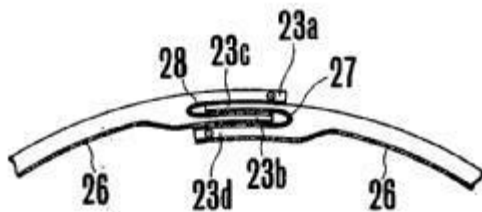
### Definition statement

*This place covers:*

Example 1, from



US4252849:



## **B29C 66/126**

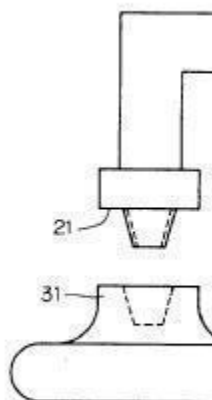
{Tenon and mortise joints (tenons and mortises for positioning purposes [B29C 65/7814](#))}

### **Definition statement**

*This place covers:*

Example 1, from

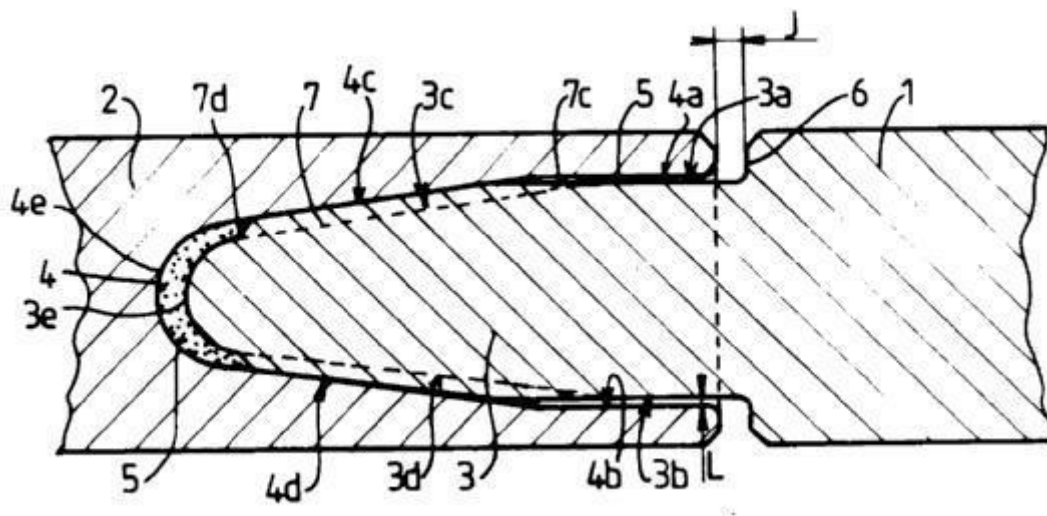
JP3254332:



Example 2, from



FR2714123:



## B29C 66/128

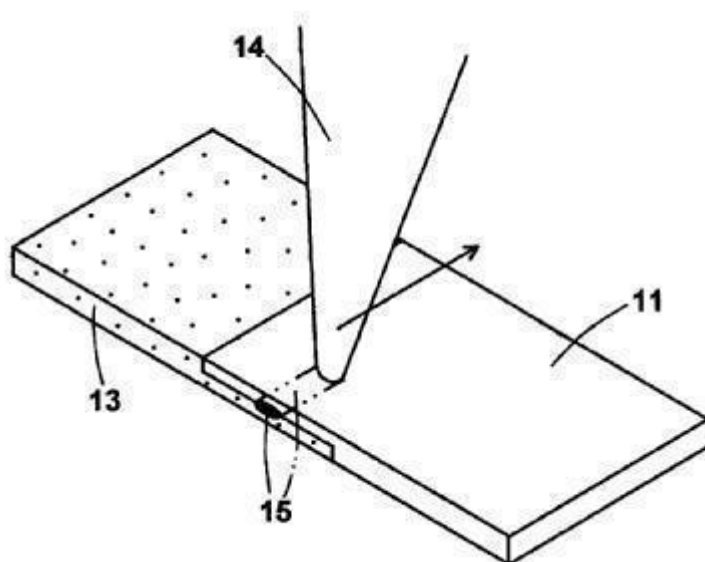
{Stepped joint cross-sections}

### Definition statement

*This place covers:*

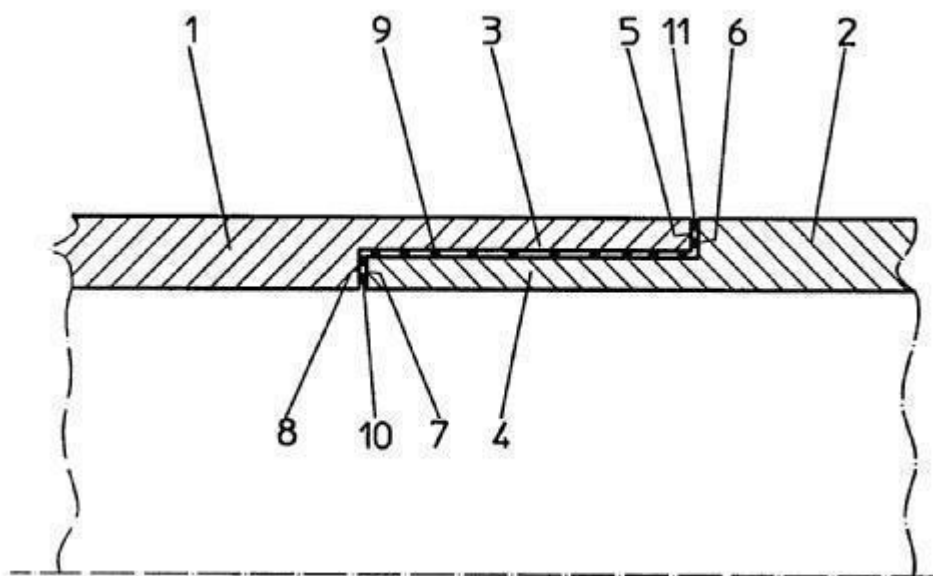
Example 1, [B29C 66/12841](#) (two butt joint-segments) and [B29C 66/1282](#) (one overlap joint-segment), from

EP1935618:



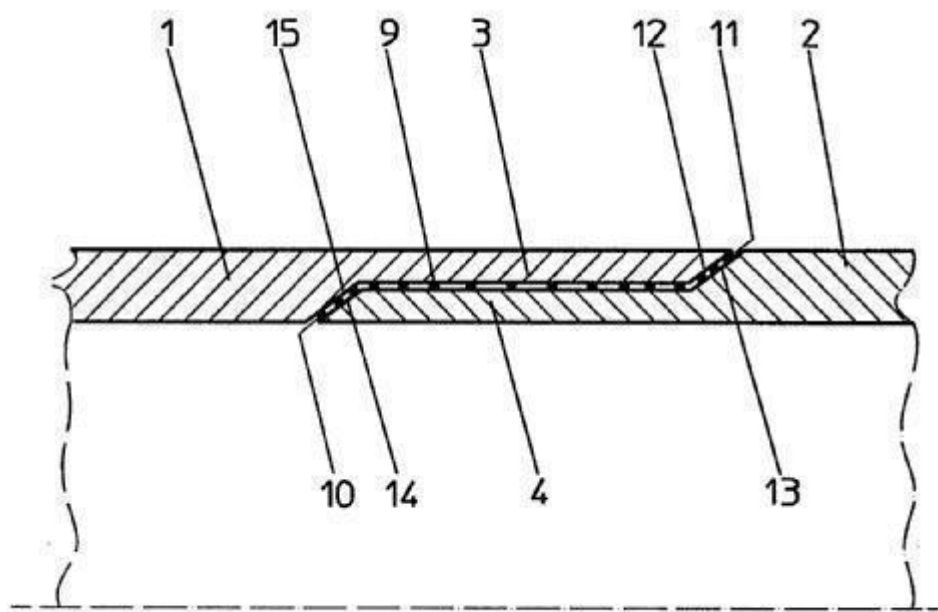
## Definition statement

Example 2, [B29C 66/12841](#) (two butt joint-segments) and [B29C 66/1282](#) (one overlap joint-segment), from DE19718790:



Example 3, [B29C 66/12861](#) (two bevelled joint-segments) and [B29C 66/1282](#) (one overlap joint segment), from

DE19718790:



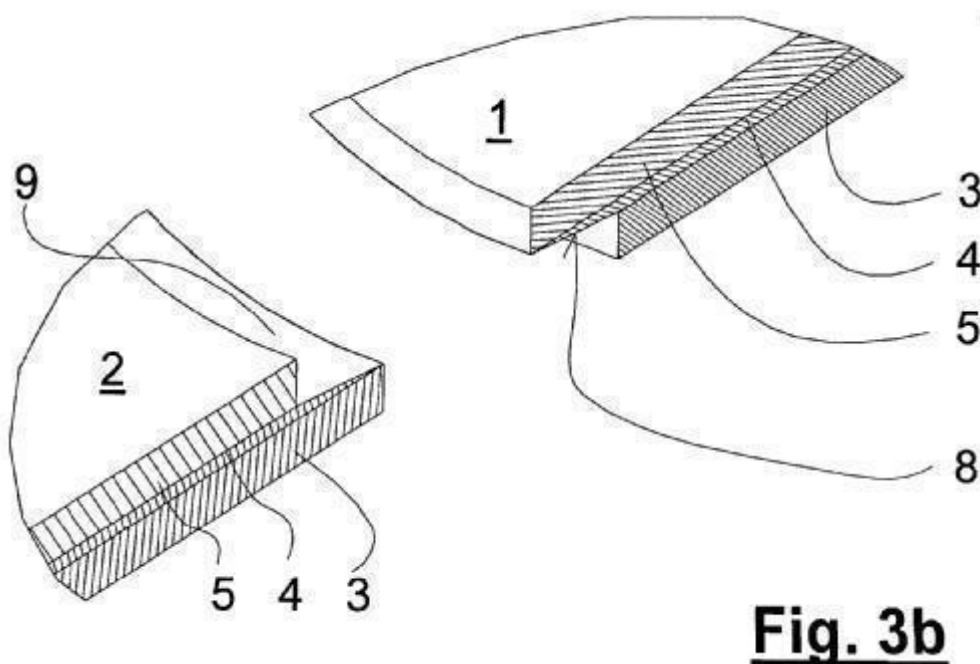
Example 4, [B29C 66/12841](#) (two butt joint-segments) and [B29C 66/1286](#) (one bevelled joint-segment), from

JP11291347:



Example 5, [B29C 66/12841](#) (two butt joint-segments) and [B29C 66/1286](#) (one bevelled joint-segment), from

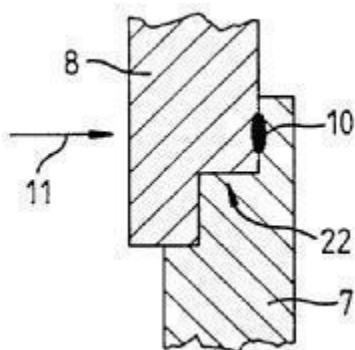
DE102008010384:



**Fig. 3b**

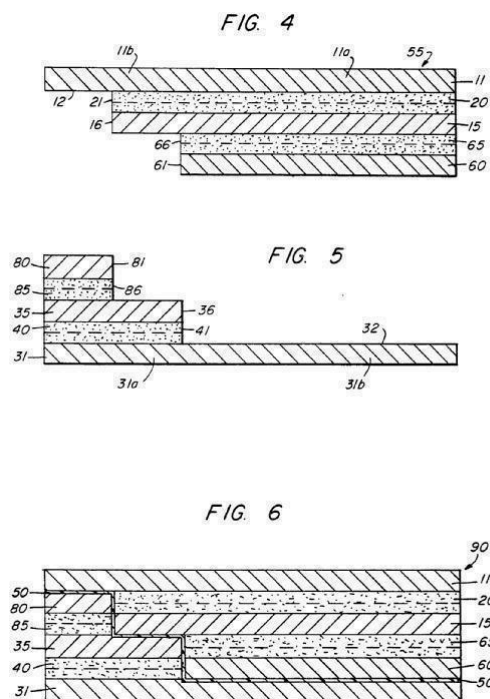
Example 6, [B29C 66/12821](#) (two overlap joint-segments) and [B29C 66/12841](#) (two butt joint-segments), from

DE19510493:



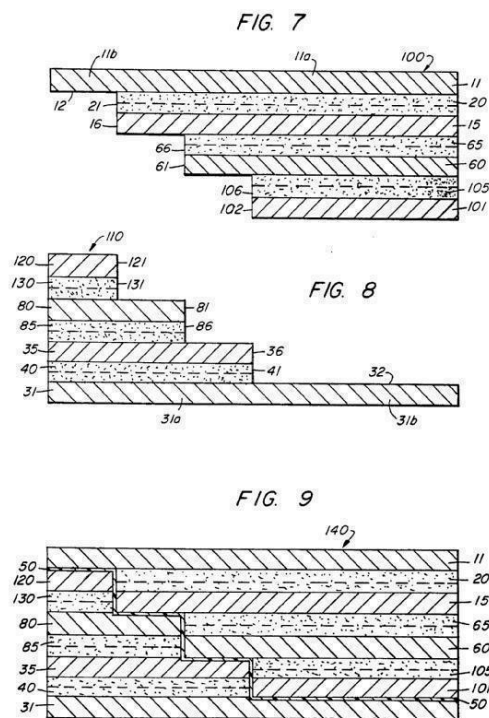
Example 7, [B29C 66/12822](#) (three overlap joint-segments) and [B29C 66/12841](#) (two butt joint-segments), from

US5160771:



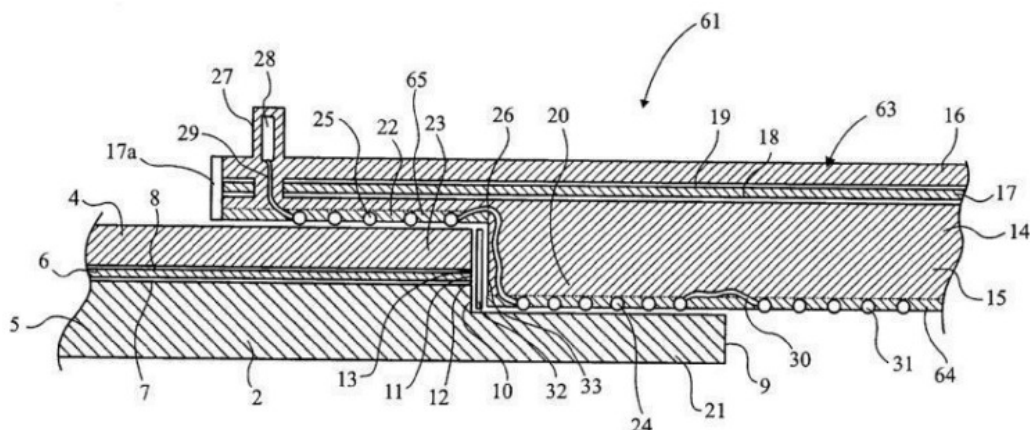
Example 8, [B29C 66/12822](#) (at least three overlap joint-segments) and [B29C 66/12842](#) (three butt joint-segments), from

US5160771:



Example 9, [B29C 66/12821](#) (two overlap joint-segments) and [B29C 66/1284](#) (one butt joint-segment), from

GB2425337:



## B29C 66/12862

{comprising at least three bevelled joint-segments}

### Definition statement

*This place covers:*

Example 1, from

BE640458:



## B29C 66/12881

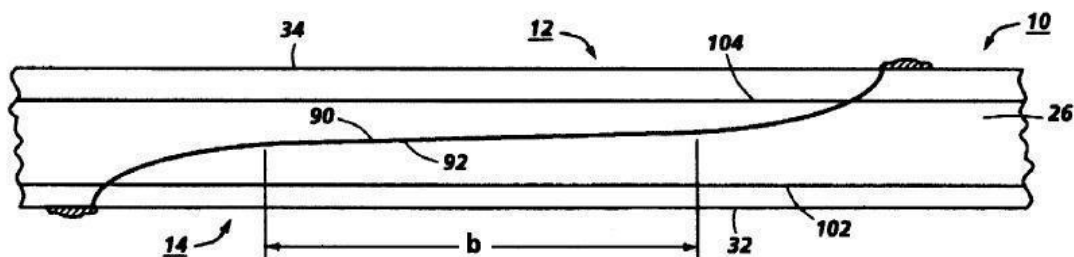
{comprising at least two monotone curved joint-segments}

### Definition statement

*This place covers:*

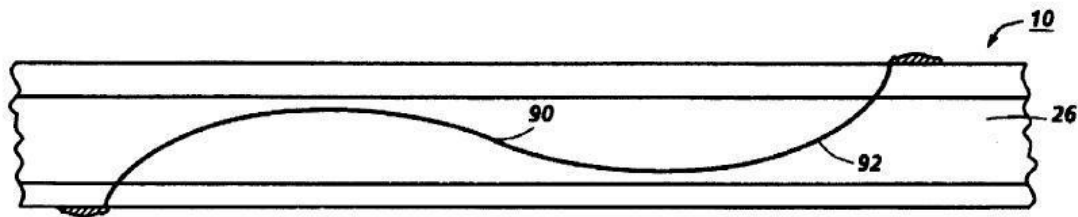
Example 1, from

US5698358:



Example 2, from

US5698358:



## B29C 66/1312

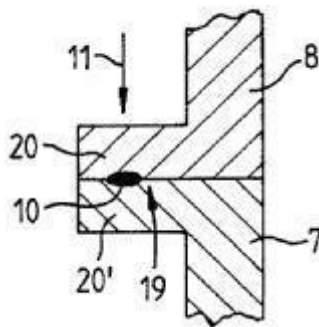
{Single flange to flange joints, the parts to be joined being rigid (the parts to be joined being flexible [B29C 66/133](#))}

### Definition statement

*This place covers:*

Example 1, from

DE19510493:



## B29C 66/133

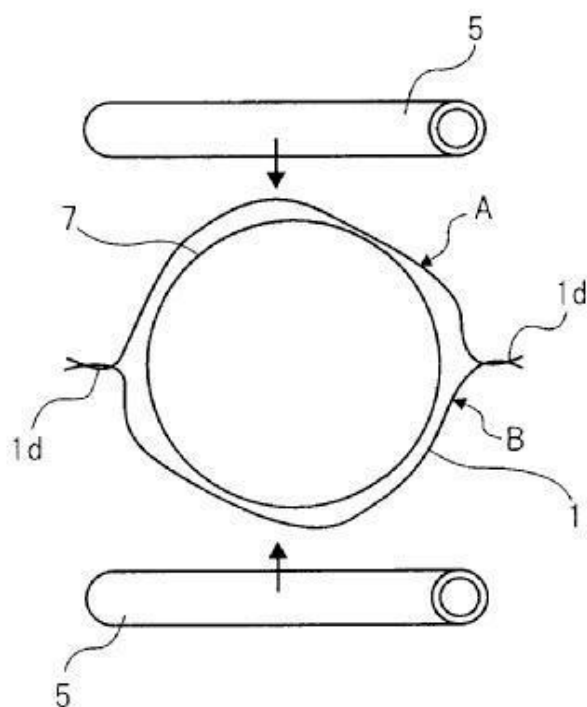
{Fin-type joints, the parts to be joined being flexible (the parts to be joined being rigid [B29C 66/1312](#))}

### Definition statement

*This place covers:*

Example 1, from

WO2011001528:



## **B29C 66/1352**

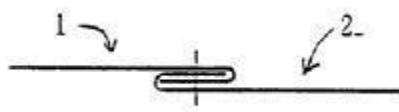
**{Single hem to hem joints}**

### **Definition statement**

*This place covers:*

Example 1, from

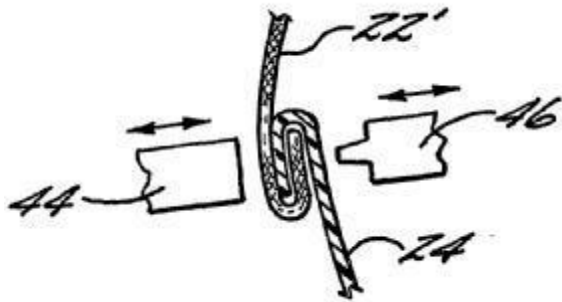
EP0721745:



Example 2, from



WO0228210:



## B29C 66/137

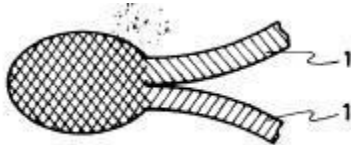
{Beaded-edge joints or bead seals (for sealing or securing package folds or closures [B65B 51/24](#))}

### Definition statement

*This place covers:*

Example 1, from

JP49045179:



## References

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Making brushes by welding together bristles made e.g. of plastic materials	<a href="#">A46B 3/06</a>
--	---------------------------

## B29C 66/14

{the joint having the same thickness as the thickness of the parts to be joined ([B29C 66/1142](#) takes precedence)}

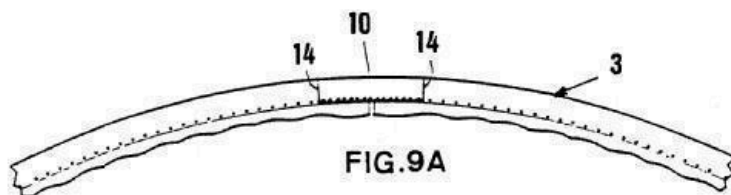
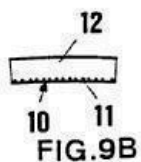
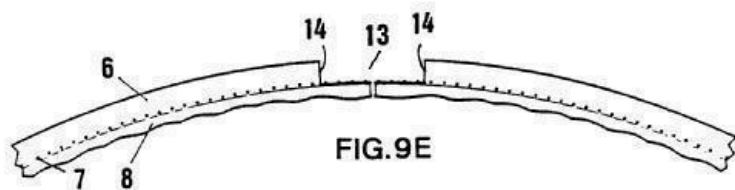
### Definition statement

*This place covers:*

Example 1, from

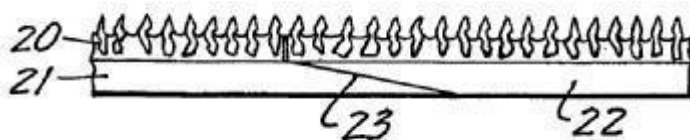


WO9215817:



Example 2, from

CH403537:



## B29C 66/21

{said joint lines being formed by a single dot or dash or by several dots or dashes, i.e. spot joining or spot welding}

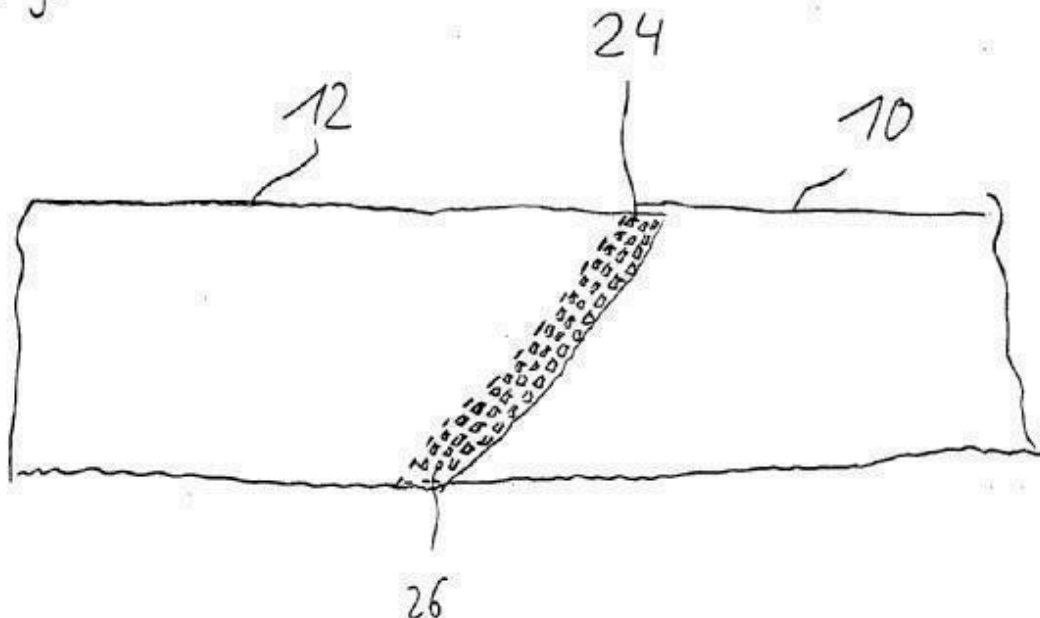
### Definition statement

*This place covers:*

Example 1, from

EP1258557:

Fig. 5



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Non-woven fabrics formed from fleeces or layers composed of fibres by welding together the fibres at spaced points or locations
---

<a href="#">D04H 1/5405</a>
-----------------------------

## B29C 66/221

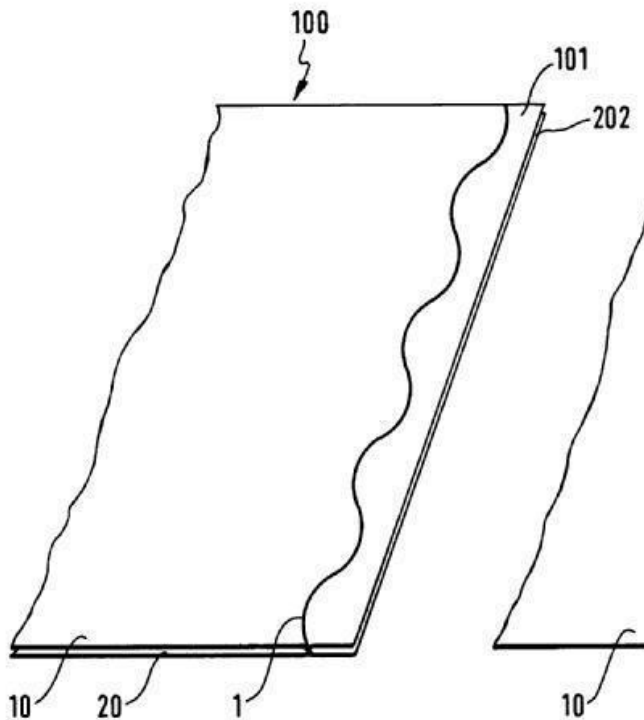
{being in the form of a sinusoidal wave ([B29C 66/2272](#) takes precedence)}

## Definition statement

*This place covers:*

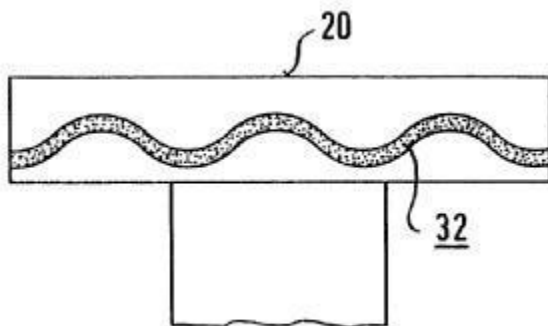
Example 1, from

DE9213273U:



Example 2, from

EP0343629:



## **B29C 66/223**

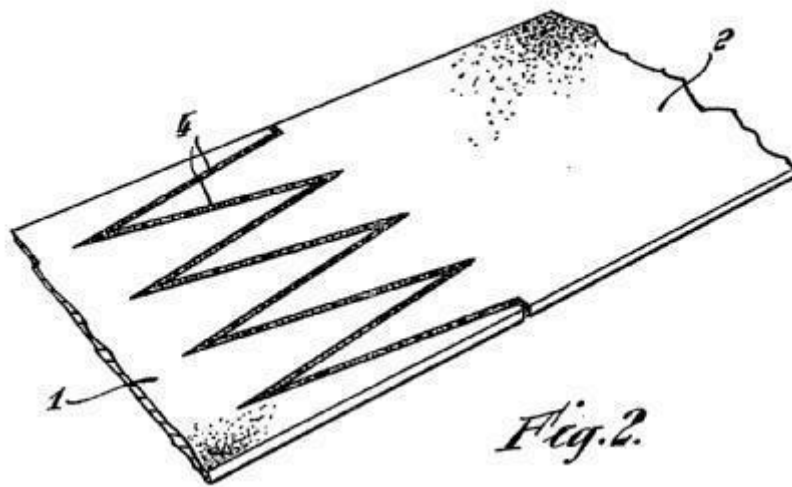
{being in the form of a triangle wave or of a sawtooth wave, e.g. zigzagged}

### **Definition statement**

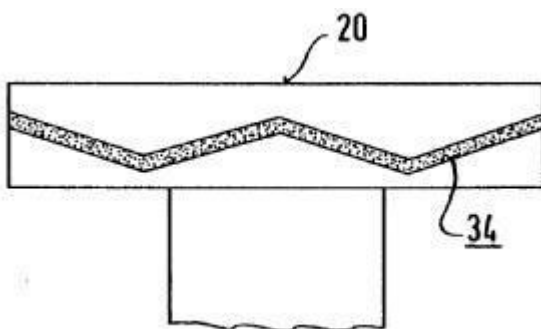
*This place covers:*

Example 1, from

GB705303:



Example 2, from  
EP0343629:



## B29C 66/225

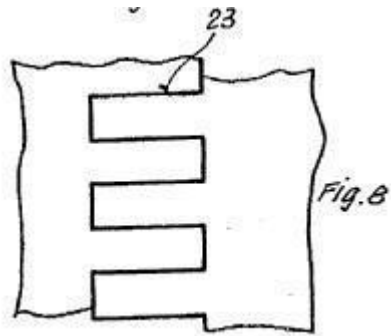
{being castellated, e.g. in the form of a square wave or of a rectangular wave  
(B29C 66/2276 takes precedence)}

### Definition statement

*This place covers:*

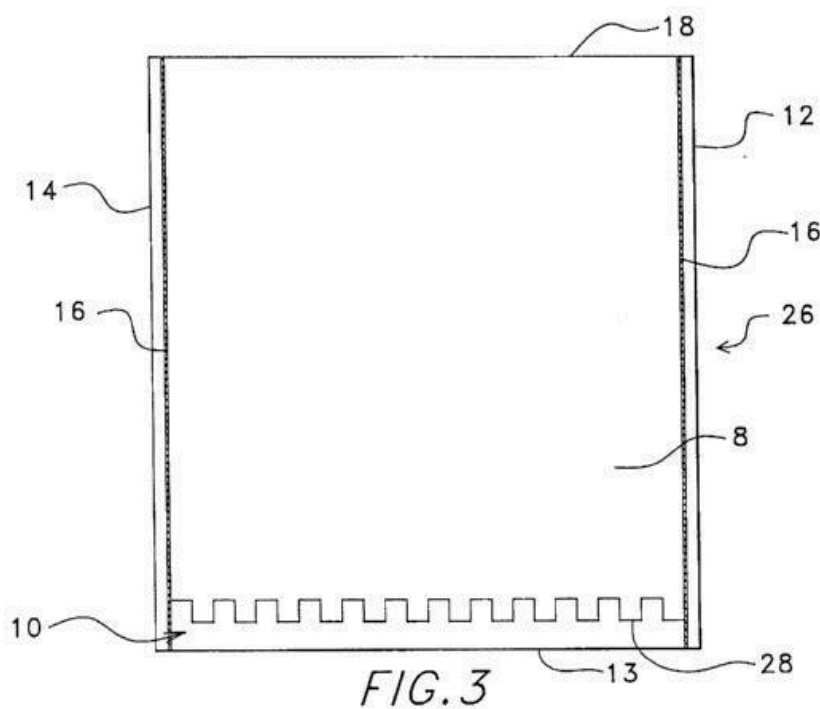
Example 1, from

DE3809907:



Example 2, from

US5922162:



## B29C 66/2272

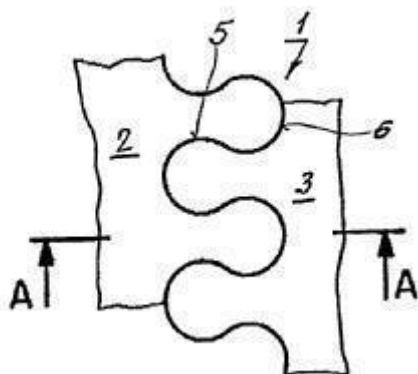
{Teardrop-like, waterdrop-like or mushroom-like interlocking undercuts (tongue and groove joints or tenon and mortise joints comprising teardrop-like, waterdrop-like or mushroom-like interlocking undercuts [B29C 66/12421](#))}

### Definition statement

*This place covers:*

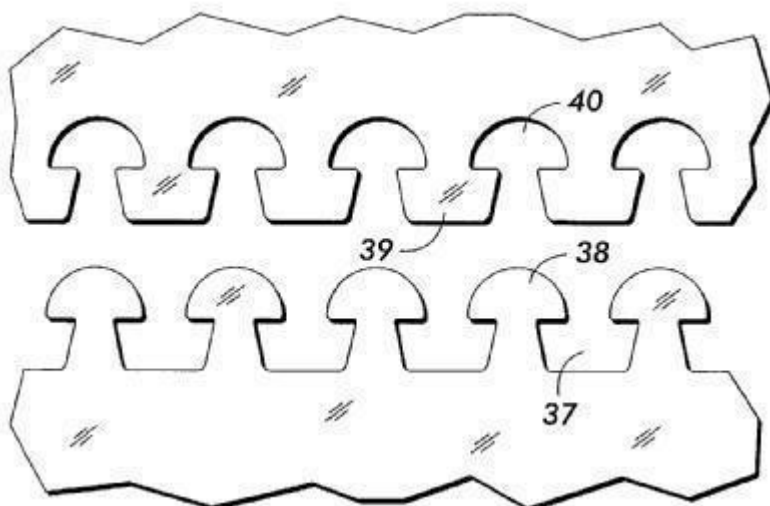
Example 1, from

DE3809907:



Example 2, from

EP1318327:



## B29C 66/2274

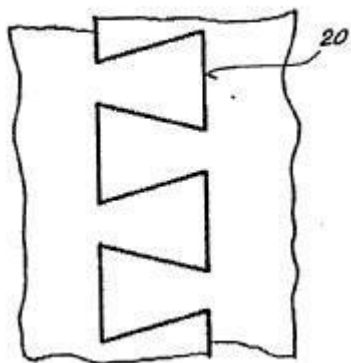
{Dovetailed interlocking undercuts (tongue and groove joints or tenon and mortise joints comprising dovetailed interlocking undercuts [B29C 66/12423](#))}

### Definition statement

*This place covers:*

Example 1, from

DE3809907:



### B29C 66/232

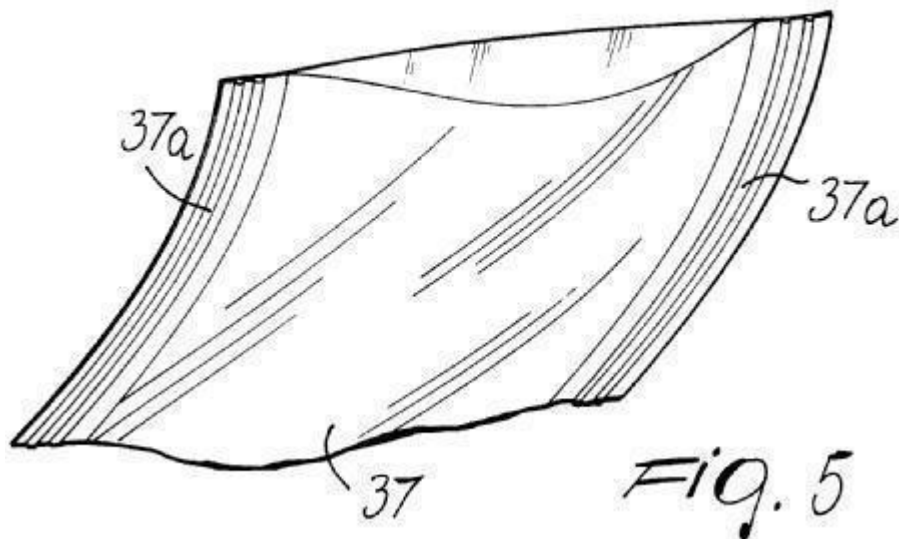
{said joint lines being multiple and parallel, i.e. the joint being formed by several parallel joint lines}

#### Definition statement

*This place covers:*

Example 1, from

EP0783956:



### B29C 66/234

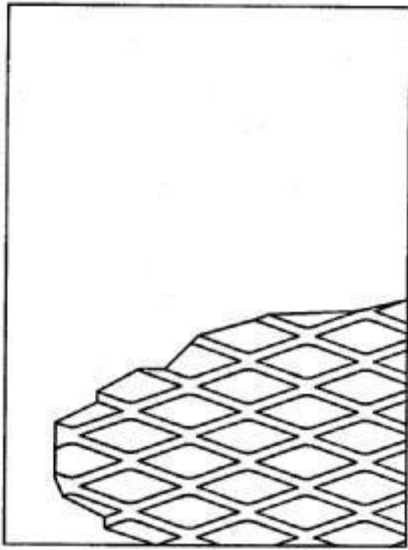
{said joint lines being in the form of tessellations}

#### Definition statement

*This place covers:*

Example 1, from

US4265954:



## B29C 66/24221

{being circular ([B29C 66/51](#) takes precedence)}

### Definition statement

*This place covers:*

Example 1, from

EP2364836:

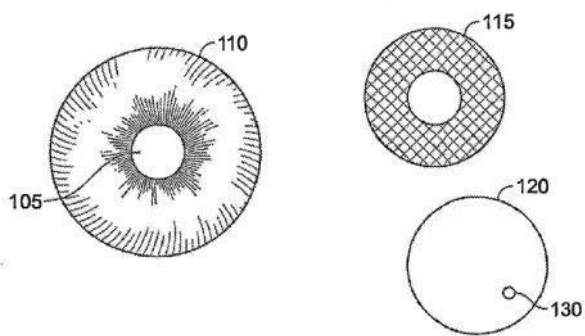


FIG. 2A

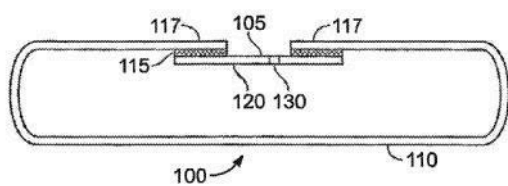


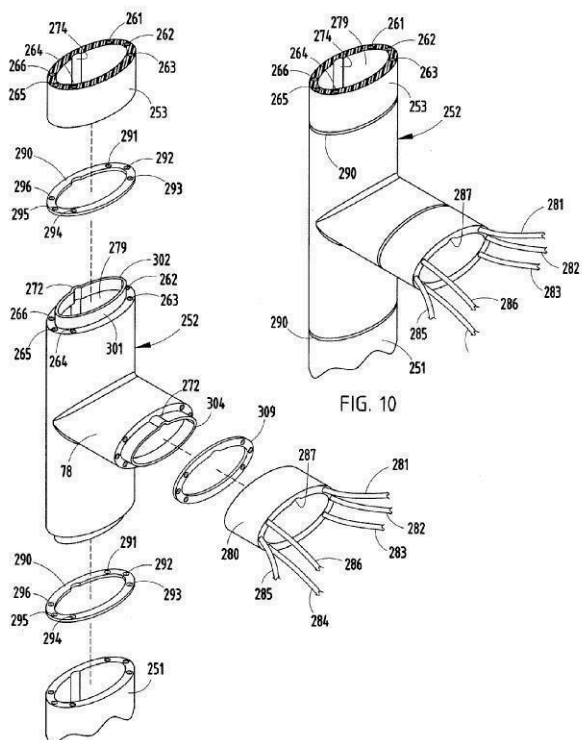
FIG. 2B



**B29C 66/24223****{being oval}****Definition statement***This place covers:*

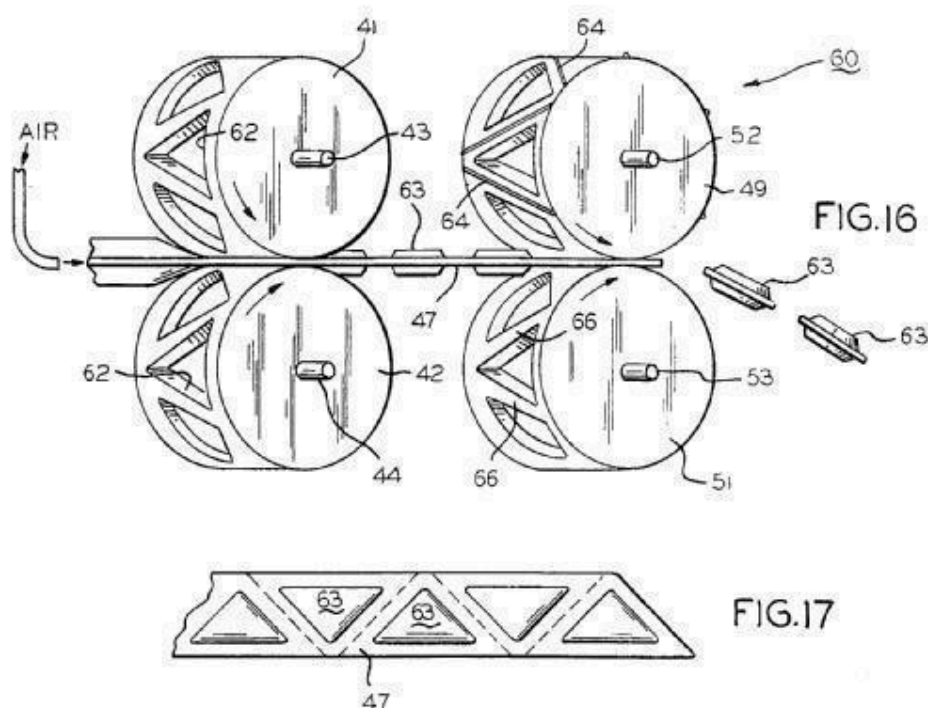
Example 1, from

US2010326113:

**B29C 66/24241****{forming a triangle}****Definition statement***This place covers:*

Example 1, from

US3667593:



## B29C 66/24244

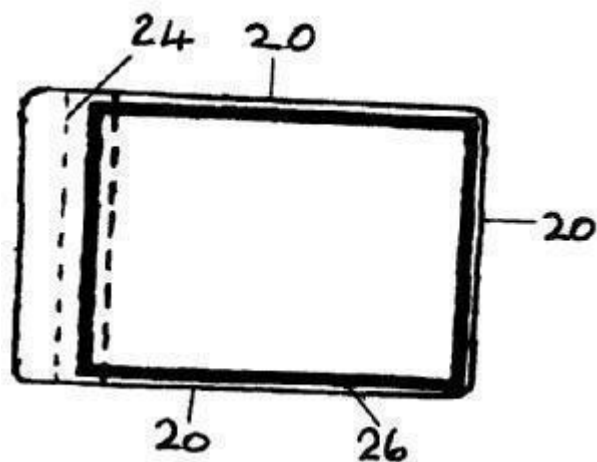
{forming a rectangle}

### Definition statement

*This place covers:*

Example 1, from

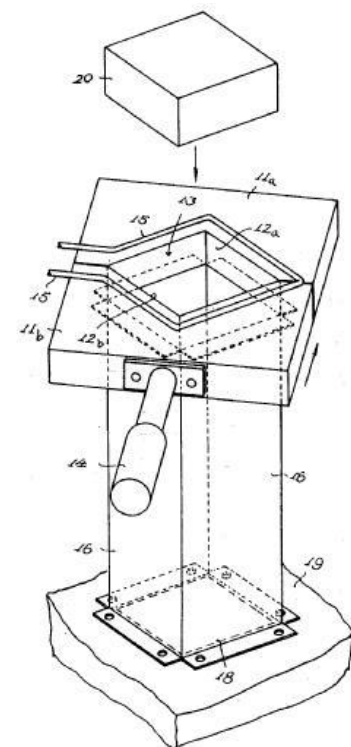
GB2394690:



**B29C 66/24245****{forming a square}****Definition statement***This place covers:*

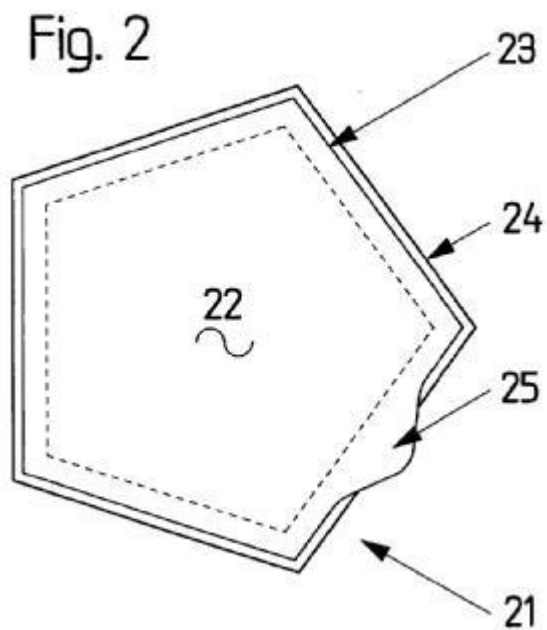
Example 1, from

JP60137630:

**B29C 66/24249****{forming a specific polygon not provided for in [B29C 66/24241](#) - [B29C 66/24243](#)}****Definition statement***This place covers:*

Example 1, from

EP1516816:



## B29C 66/244

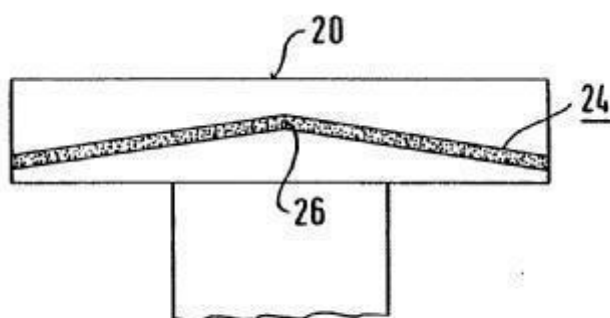
{said joint lines being non-straight, e.g. forming non-closed contours}

### Definition statement

*This place covers:*

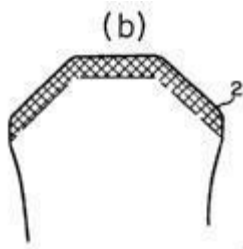
Example 1, from

EP0343629:



Example 2, from

JP52098783:



## **B29C 66/2442**

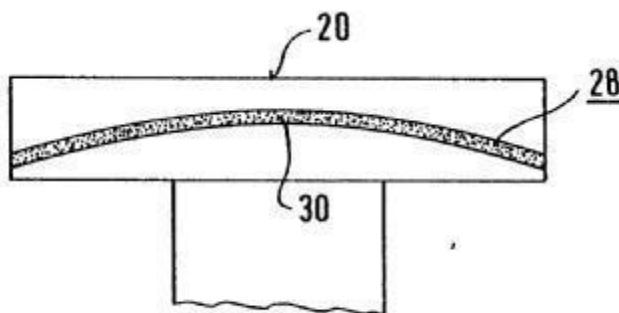
{in the form of a single arc of circle}

### **Definition statement**

*This place covers:*

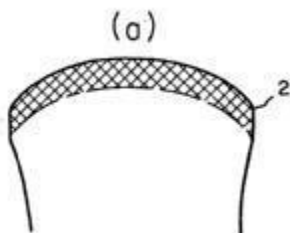
Example 1, from

EP0343629:



Example 2, from

JP52098783:



## **B29C 66/246**

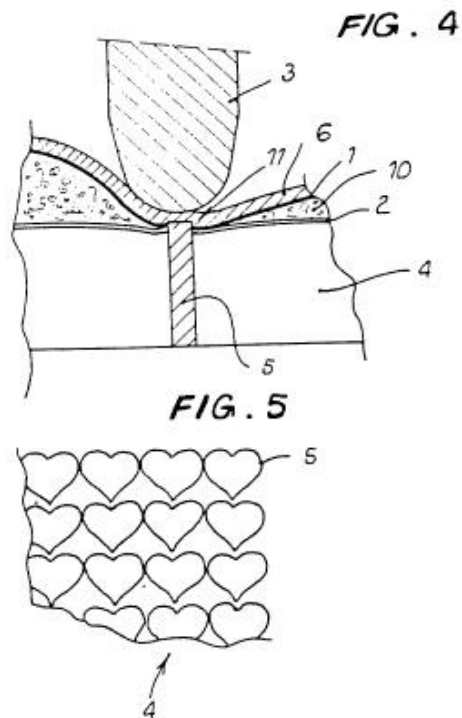
{said joint lines forming figures, e.g. animals, flowers, hearts}

### **Definition statement**

*This place covers:*

Example 1, from

JP62023728:



## **B29C 66/301**

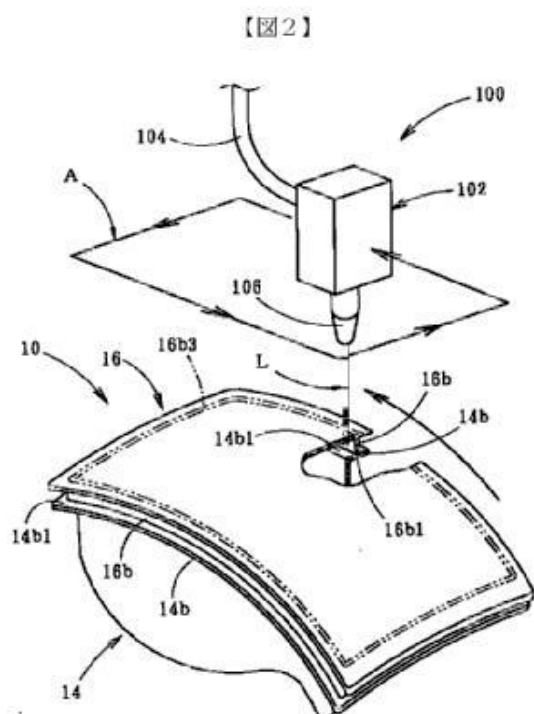
{Three-dimensional joints, i.e. the joined area being substantially non-flat  
([B29C 66/5223](#), [B29C 66/5224](#), [B29C 66/5225](#) take precedence)}

### **Definition statement**

*This place covers:*

Example 1, from

JP2000294012:



## B29C 66/30221

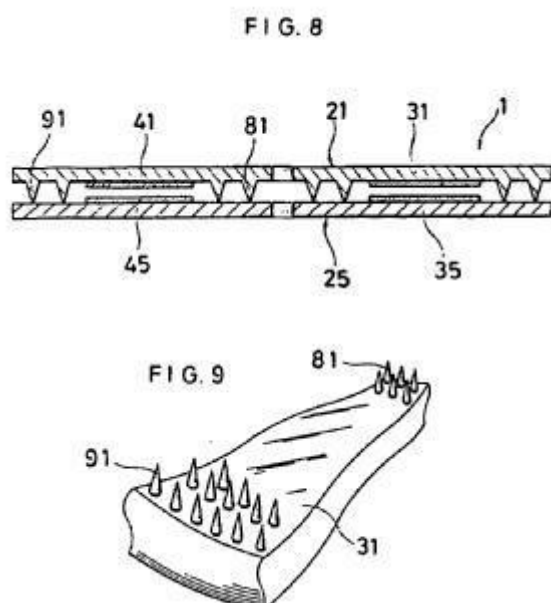
{said melt initiators being point-like}

### Definition statement

*This place covers:*

Example 1, from

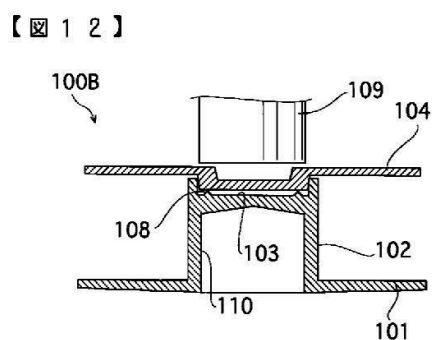
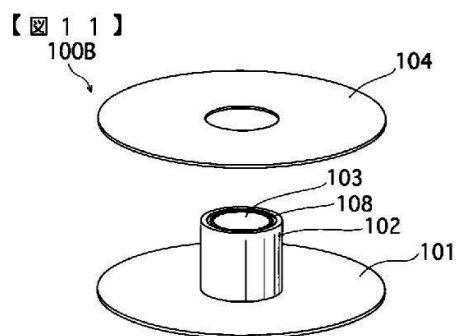
JP63023237:



**B29C 66/30223****{said melt initiators being rib-like}****Definition statement***This place covers:*

Example 1, from

JP2004202828:

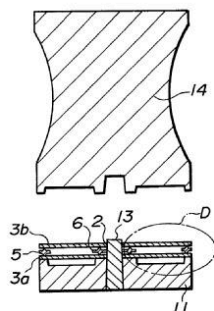
**B29C 66/3024****{said melt initiators being non-integral with the parts to be joined}****Definition statement***This place covers:*

Example 1, from

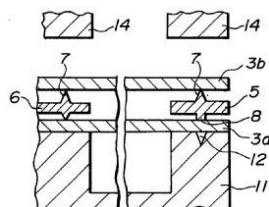


EP0301831:

**FIG. 11**



**FIG. 13**



## B29C 66/303

{the joint involving an anchoring effect ([B29C 66/341](#), [B29C 65/56](#) and subgroups take precedence)}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Measures or configurations in general for obtaining anchoring effects in the contact areas between layers	<a href="#">B29C 37/0078</a>
---	------------------------------

## B29C 66/30321

{making use of protrusions belonging to at least one of the parts to be joined}

### Definition statement

*This place covers:*

Example 1, from

Definition statement

CH493325:

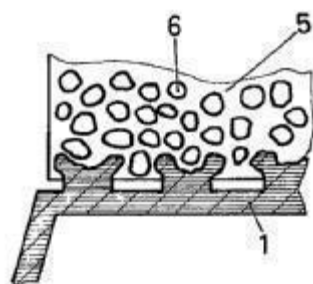
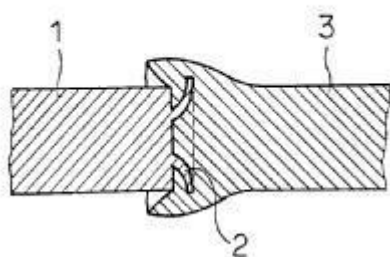


Fig. 7

Example 2, from

JP59127982:

第2図

**B29C 66/30325**

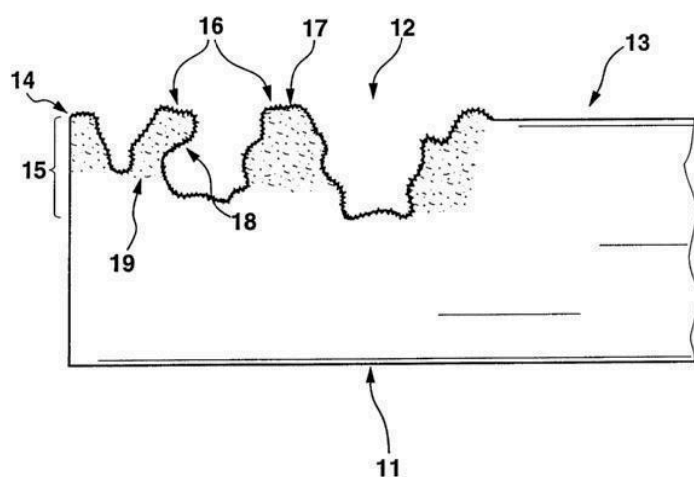
{making use of cavities belonging to at least one of the parts to be joined}

**Definition statement***This place covers:*

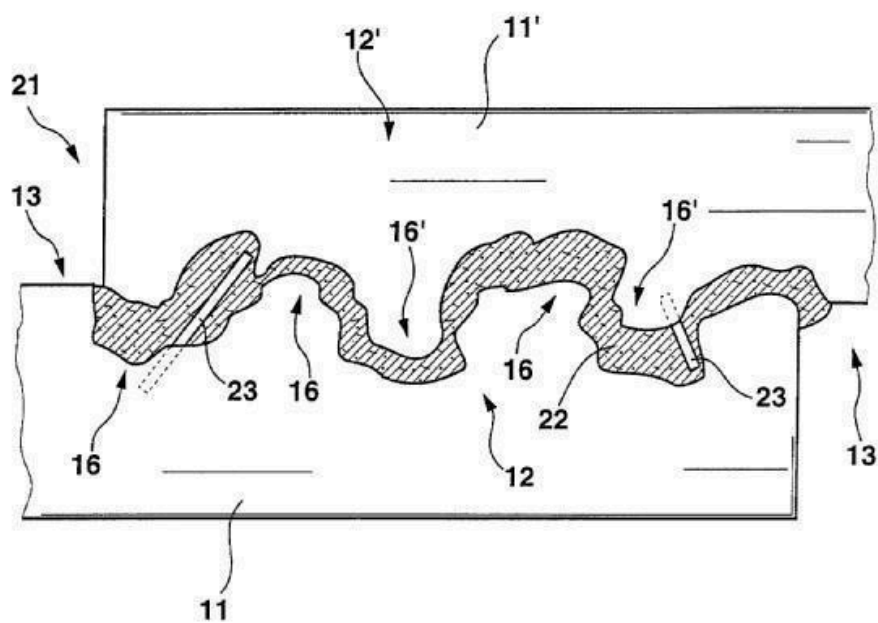
Example 1, from

DE19523900:

**Fig. 1**



**Fig. 2**



**B29C 66/3034**

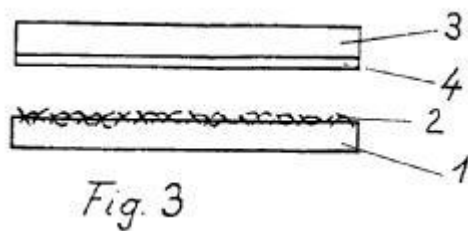
{making use of additional elements, e.g. meshes}

**Definition statement**

*This place covers:*

Example 1, from

DE2746544:

**B29C 66/30341**

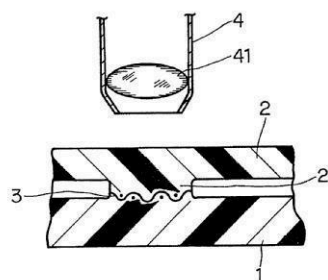
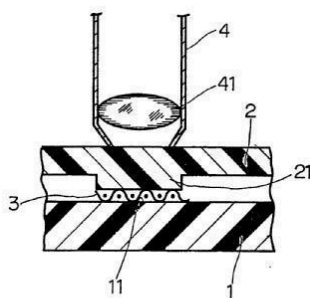
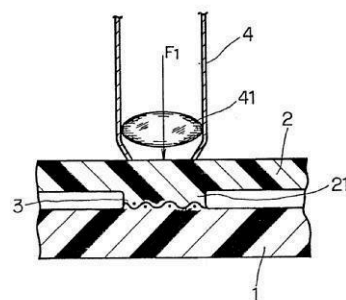
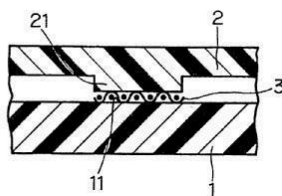
{non-integral with the parts to be joined, e.g. making use of extra elements  
([B29C 65/562](#) takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

EP0158528:



**B29C 66/304**

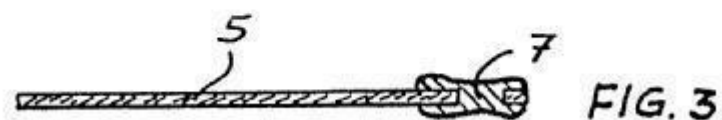
{Joining through openings in an intermediate part of the article ([B29C 66/3034](#) takes precedence)}

**Definition statement**

*This place covers:*

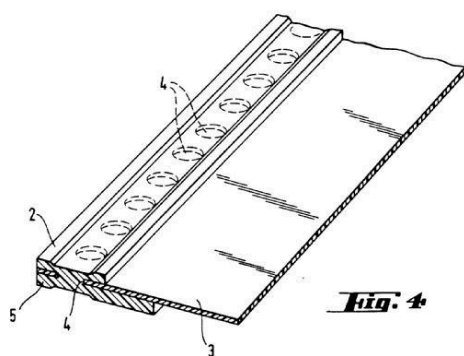
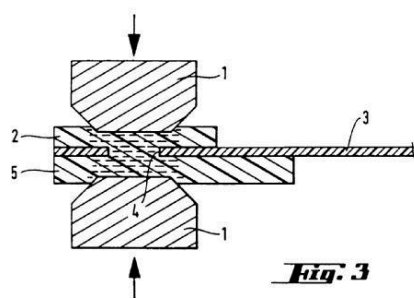
Example 1, from

CH644411:



Example 2, from

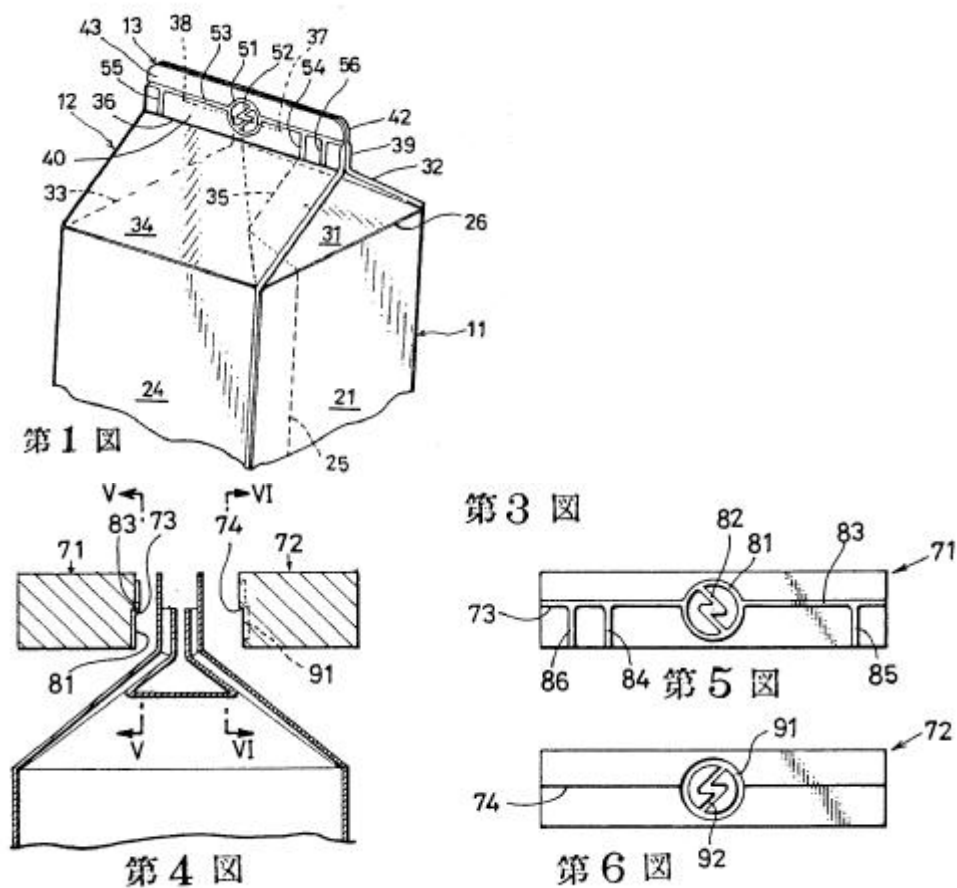
DE4428938:



**B29C 66/306****{Applying a mark during joining}****Definition statement***This place covers:*

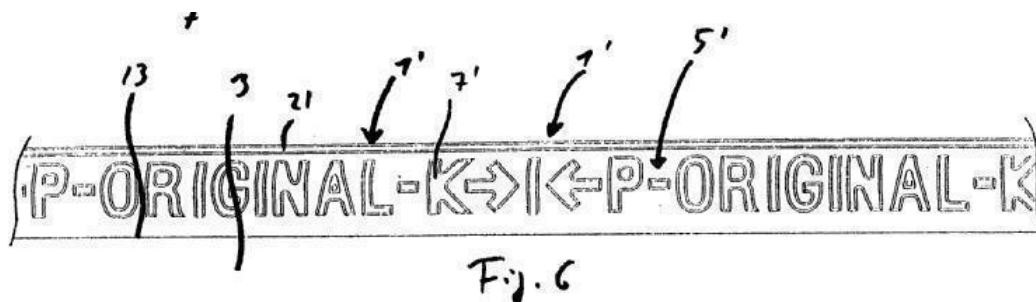
Example 1, from

JP1199845:

**B29C 66/30621****{in the form of letters}****Definition statement***This place covers:*

Example 1, from

DE20212606U:



## B29C 66/30623

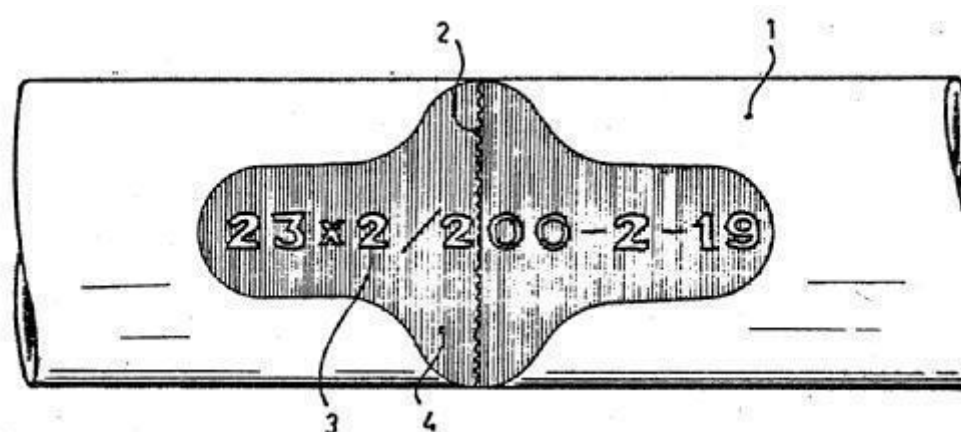
{in the form of numbers}

### Definition statement

*This place covers:*

Example 1, from

FR2207812:



## B29C 66/322

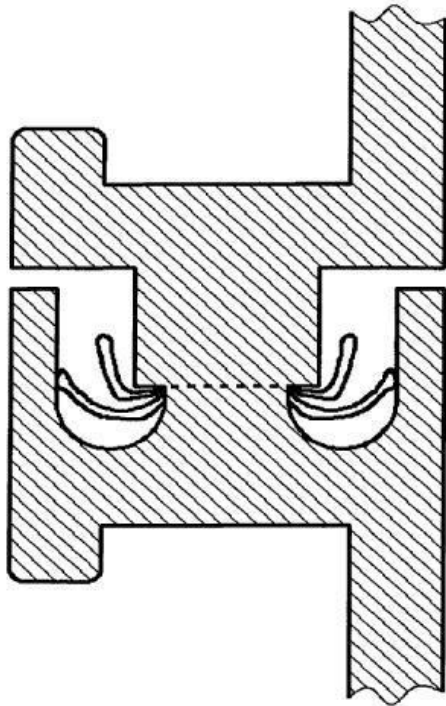
{Providing cavities in the joined article to collect the burr}

### Definition statement

*This place covers:*

Example 1, from

WO0147691:



This group also covers providing cavities in the joined article to collect adhesive.

## **B29C 66/324**

**{Avoiding burr formation}**

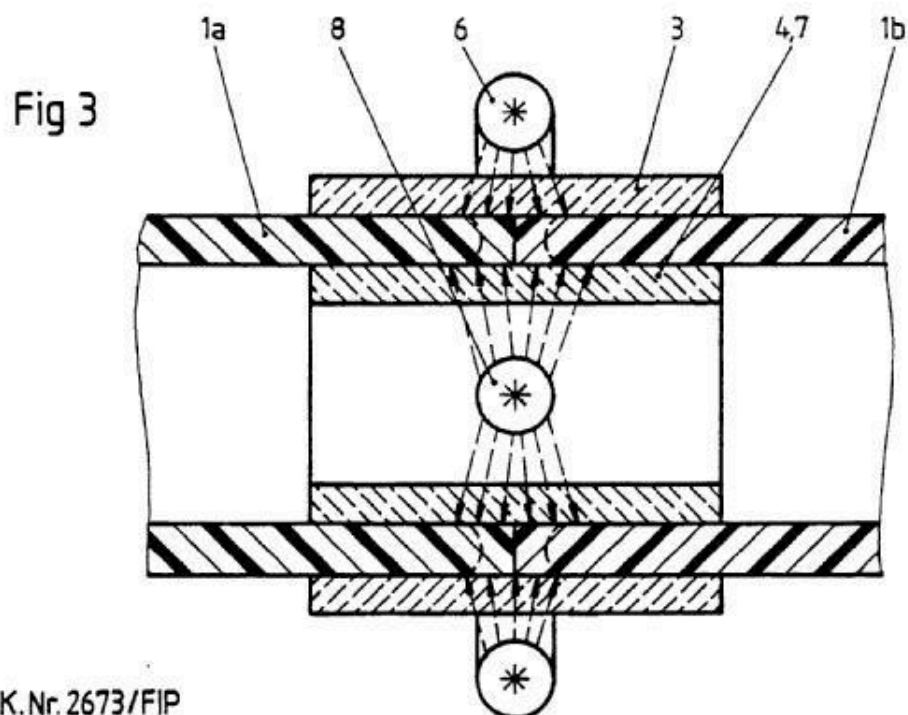
### **Definition statement**

*This place covers:*

Example 1, from



EP0415068:



## B29C 66/3242

{on the inside of a tubular or hollow article}

### Definition statement

*This place covers:*

Example 1, from

WO2010086164:

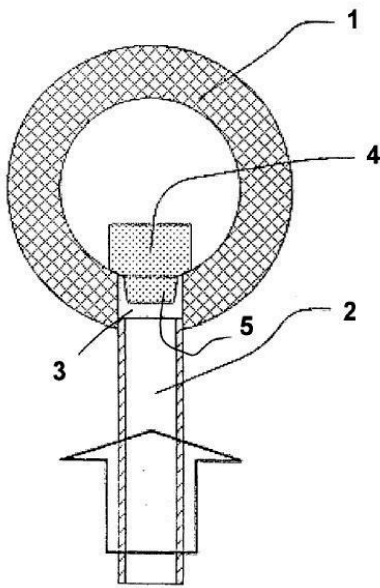


Fig. 1a

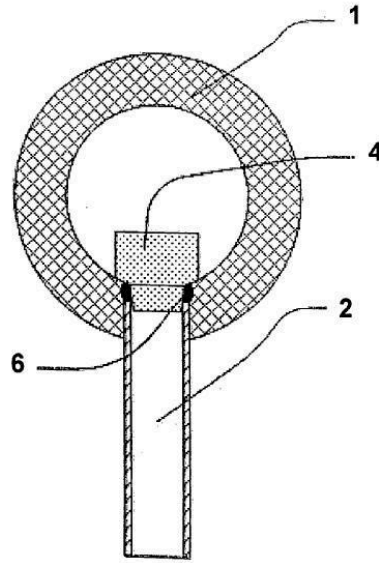


Fig. 1b

## B29C 66/326

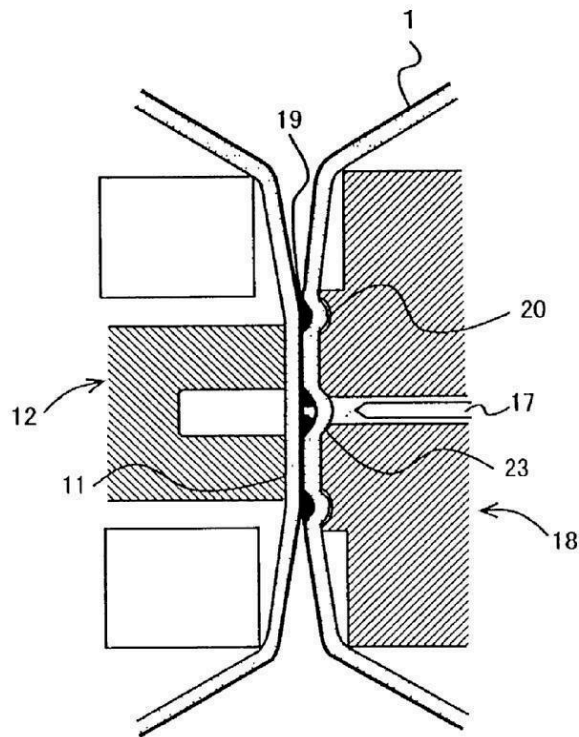
{Shaping the burr, e.g. by the joining tool}

### Definition statement

*This place covers:*

Example 1, from

US2003046906:



## **B29C 66/3262**

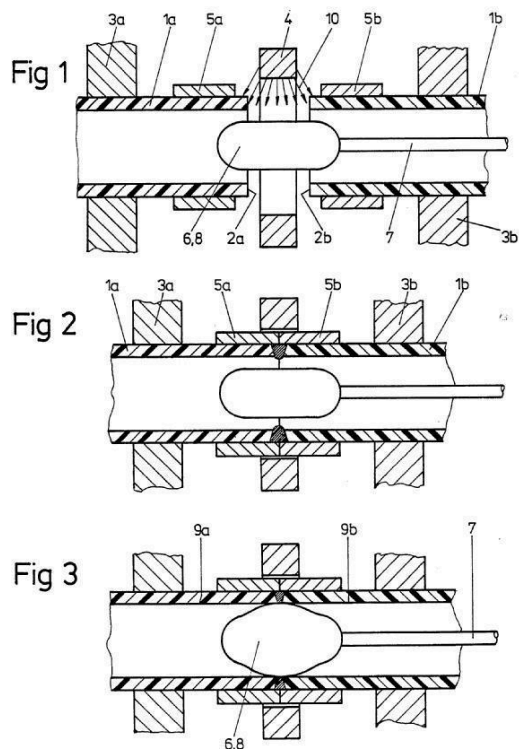
{as after-treatment, e.g. by a separate tool}

### **Definition statement**

*This place covers:*

Example 1, from

EP0313731:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Treating the weld bead of metal tubes	<a href="#">B21C 37/0811</a>
---------------------------------------	------------------------------

## B29C 66/344

{Stretching or tensioning the joint area during joining}

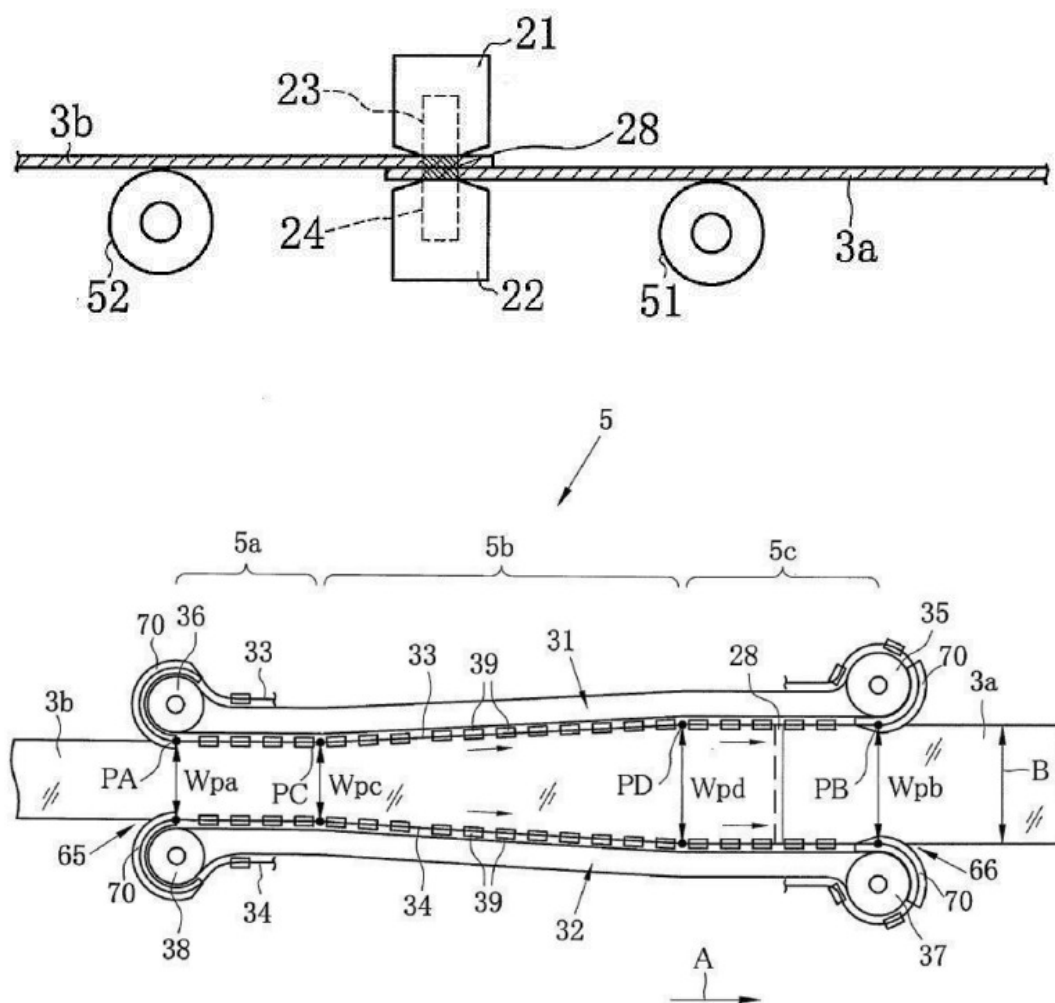
### Definition statement

This place covers:

Example 1, from

US2009032166:

FIG.4D



## B29C 66/345

{Progressively making the joint, e.g. starting from the middle ([B29C 66/8341](#), [B29C 65/12](#), [B29C 65/14](#), [B29C 65/16](#) take precedence)}

### Definition statement

*This place covers:*

Example 1, from

WO2011065827:

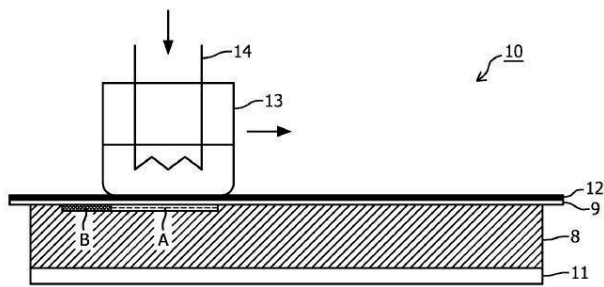


FIG. 2C

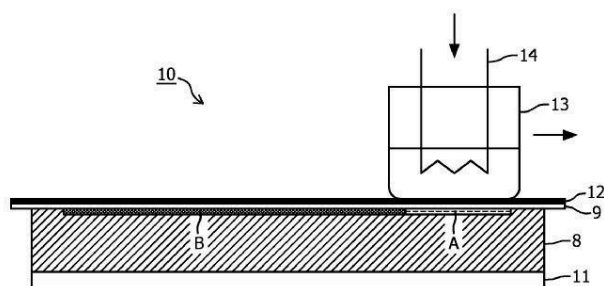


FIG. 2D

## **B29C 66/3452**

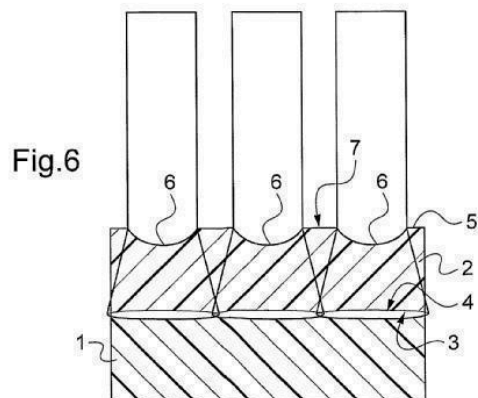
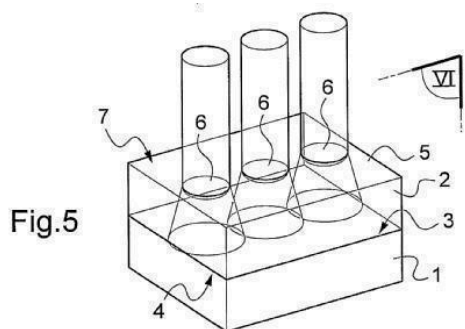
{Making complete joints by combining partial joints}

### **Definition statement**

*This place covers:*

Example 1, from

EP2323804:



## **B29C 66/346**

{Making joints having variable thicknesses in the joint area, e.g. by using jaws having an adapted configuration}

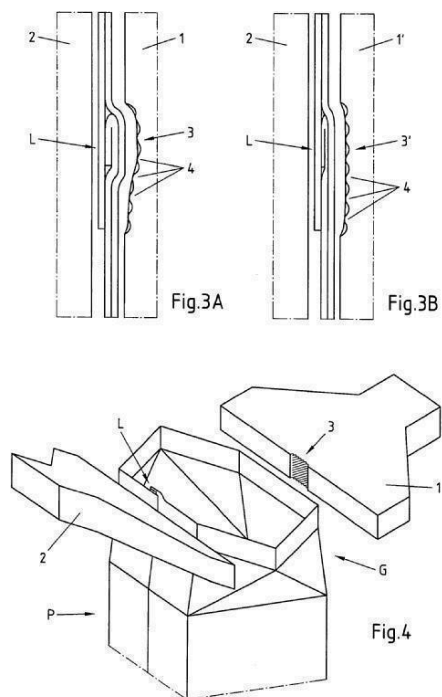
### **Definition statement**

*This place covers:*

Example 1, from

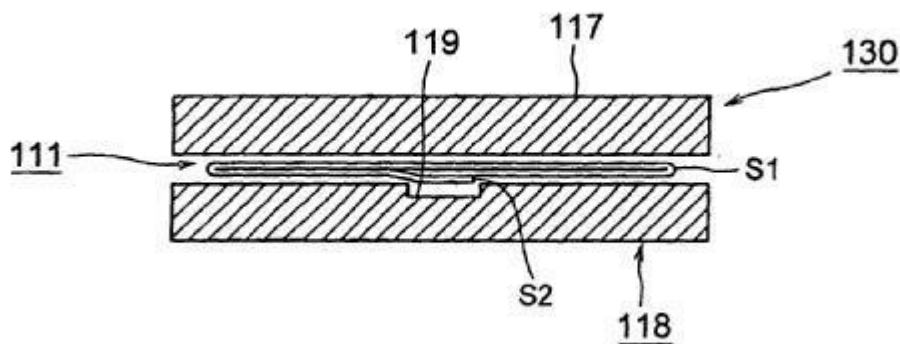
## Definition statement

DE102006045338:



Example 2, from

EP1468914:

**B29C 66/3462**

{by differentially heating the zones of different thickness}

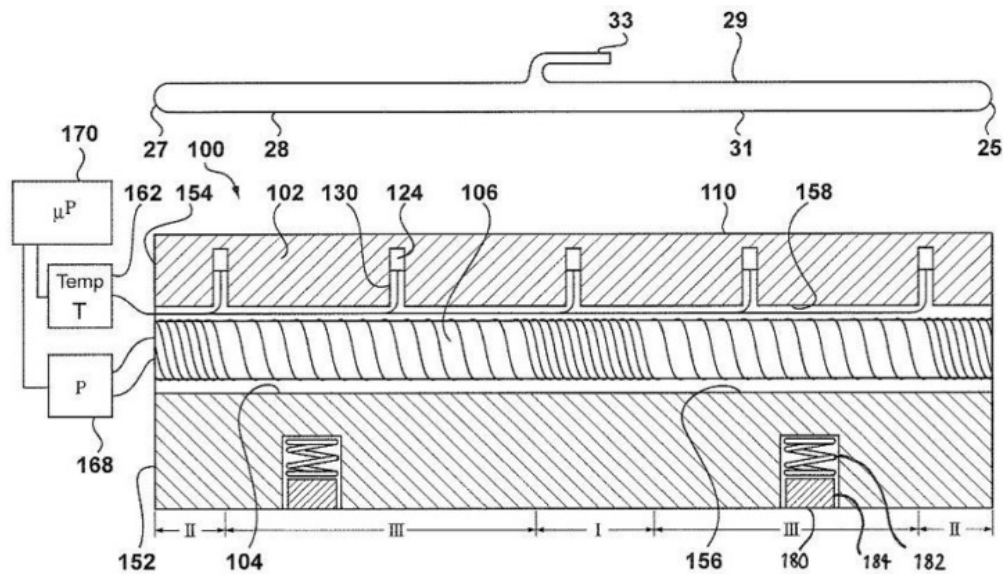
**Definition statement***This place covers:*

Example 1, from



Definition statement

EP1837161:

**B29C 66/3472**

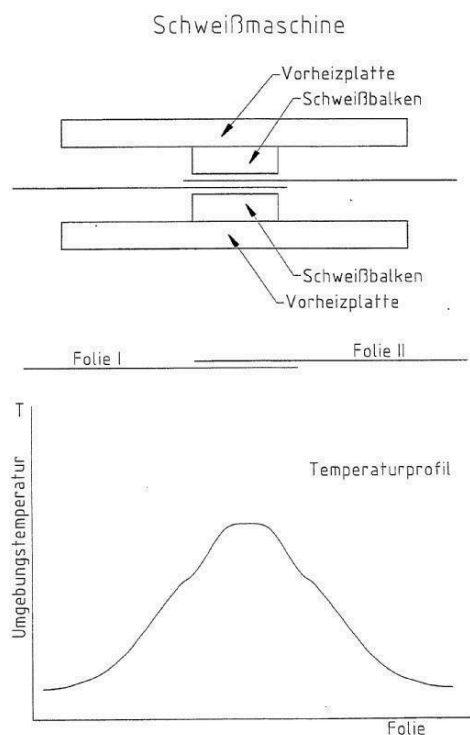
{in the plane of the joint, e.g. along the joint line in the plane of the joint or perpendicular to the joint line in the plane of the joint}

**Definition statement**

*This place covers:*

Example 1, from

DE19624625:



**B29C 66/3474**

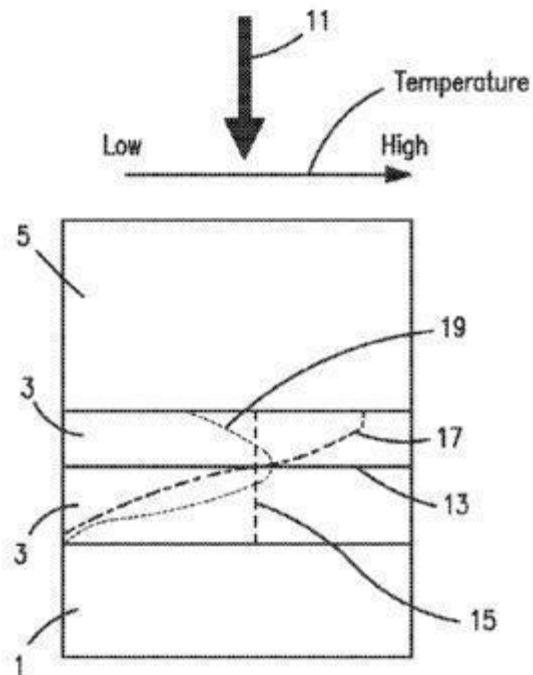
{perpendicular to the plane of the joint}

**Definition statement**

*This place covers:*

Example 1, from

US2009294047:

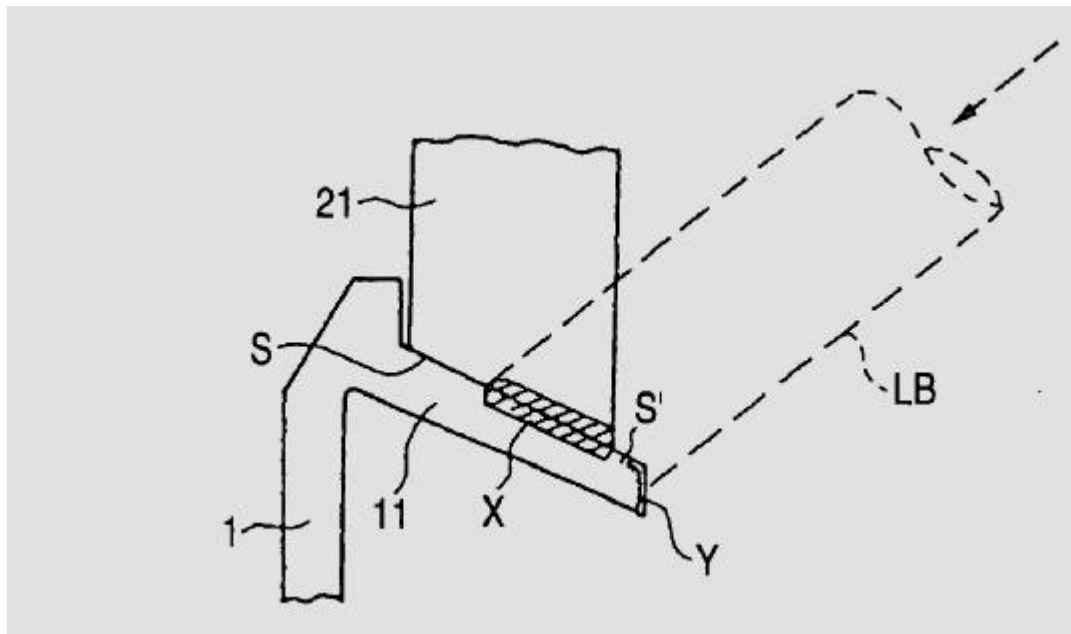
**B29C 66/348**

{Avoiding melting or weakening of the zone directly next to the joint area, e.g. by cooling}

**Definition statement**

*This place covers:*

Example 1, from

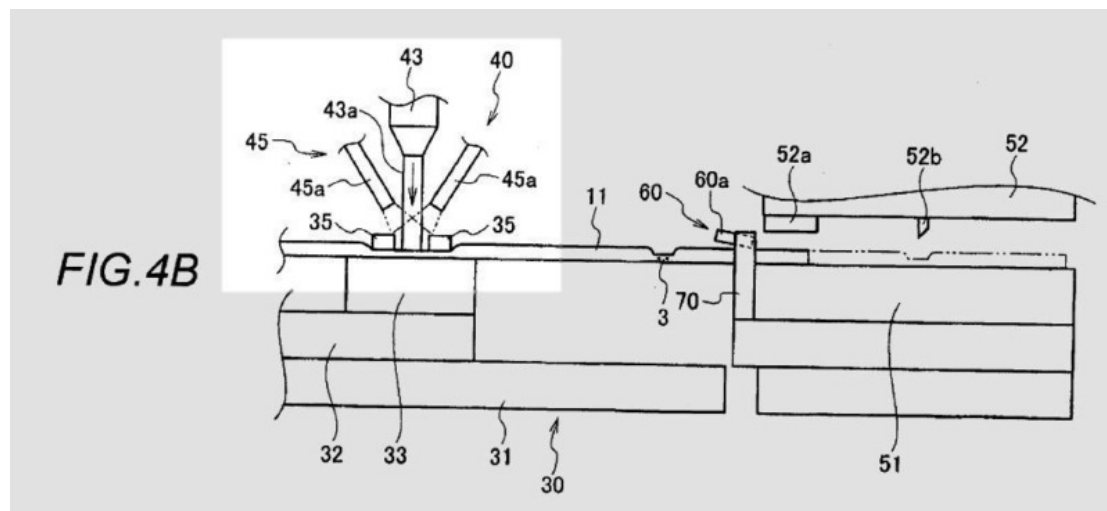


**{Cooling the welding zone on the welding spot}**

*This place covers:*

Example 1, from

WO2010074348:



## B29C 66/3492

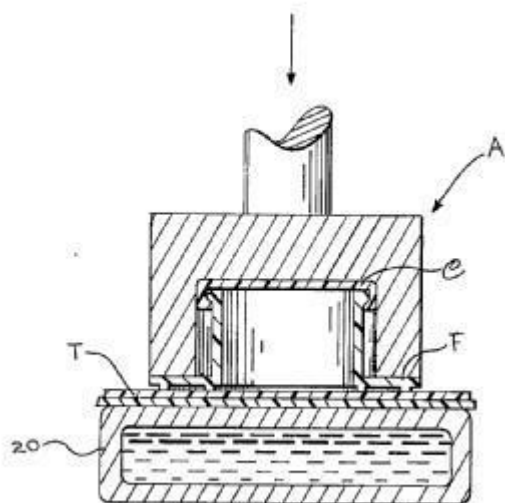
{by means placed on the side opposed to the welding tool}

### Definition statement

*This place covers:*

Example 1, from

US3231444:



**B29C 66/40**

{General aspects of joining substantially flat articles, e.g. plates, sheets or web-like materials; Making flat seams in tubular or hollow articles; Joining single elements to substantially flat surfaces}

**References**

*Informative references*

Attention is drawn to the following places, which may be of interest for search:

Joining sheets or plates in general	<a href="#">F16B 5/00</a>
Joining sheets or plates in general, by means of welds	<a href="#">F16B 5/08</a>

**B29C 66/43**

{Joining a relatively small portion of the surface of said articles ([B29C 66/45](#) takes precedence)}

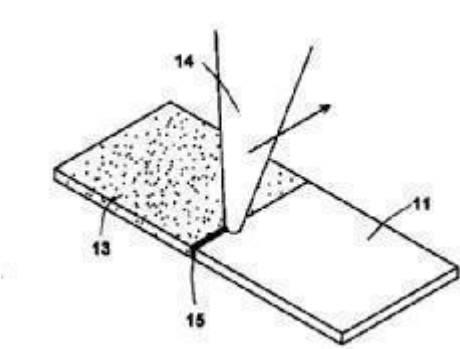
**Definition statement**

*This place covers:*

Example 1,

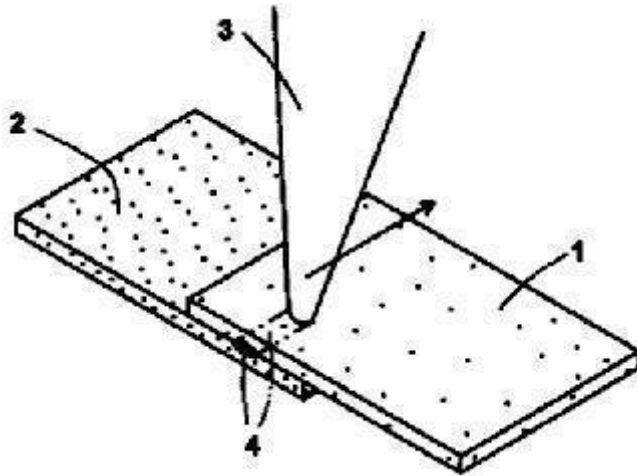
from

JP2007296857:



Example 1, from

JP2007112127:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Joining sheets, plates or panels, relating to finishing work on buildings	<a href="#">E04F 2201/00</a>
---	------------------------------

## B29C 66/431

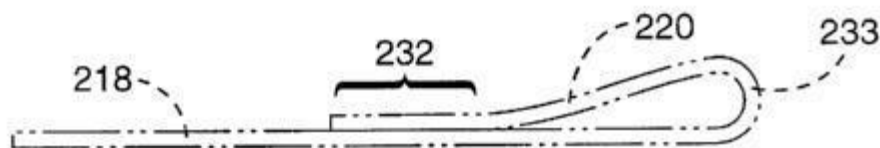
{Joining the articles to themselves ([B29C 66/4322](#) and [B29C 66/4332](#) take precedence)}

### Definition statement

*This place covers:*

Example 1, from

US6213184:



## B29C 66/4312

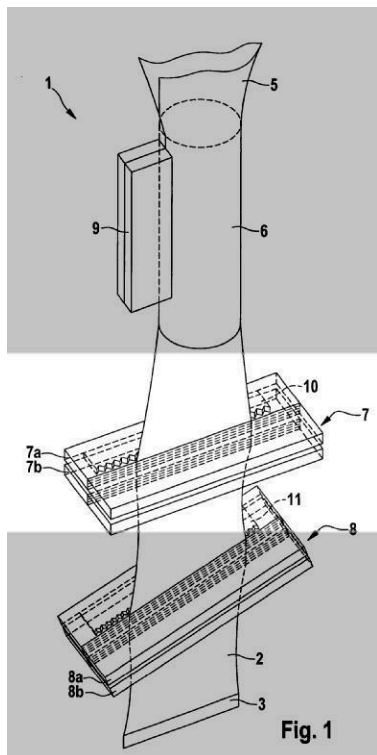
{for making flat seams in tubular or hollow articles, e.g. transversal seams}

### Definition statement

*This place covers:*

Example 1, from

DE102009003029:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Rollers for producing longitudinal and transverse seams simultaneously in package webs or tubes	<a href="#">B65B 51/28</a>
Device specially adapted for producing transverse seams in package webs or tubes, e.g. for subdividing filled tubes, by applying pressure and heat	<a href="#">B65B 51/30</a>

## B29C 66/43121

{Closing the ends of tubular or hollow single articles, e.g. closing the ends of bags (closing tube ends [B29C 57/10](#))}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Closing bags by reciprocating or oscillating members applying or generating heat or pressure or combinations thereof	<a href="#">B65B 51/146</a>
--	-----------------------------

**B29C 66/43122**

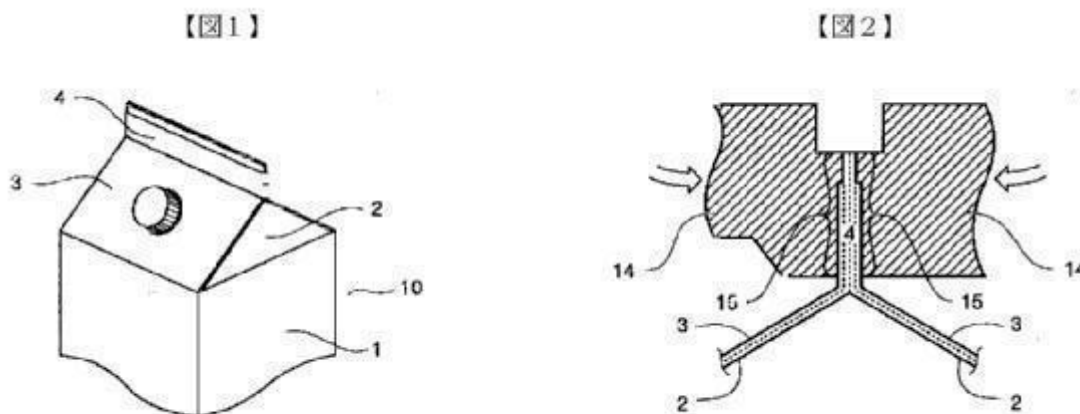
{Closing the top of gable top containers (gable top containers [B65D 5/067](#))}

**Definition statement**

*This place covers:*

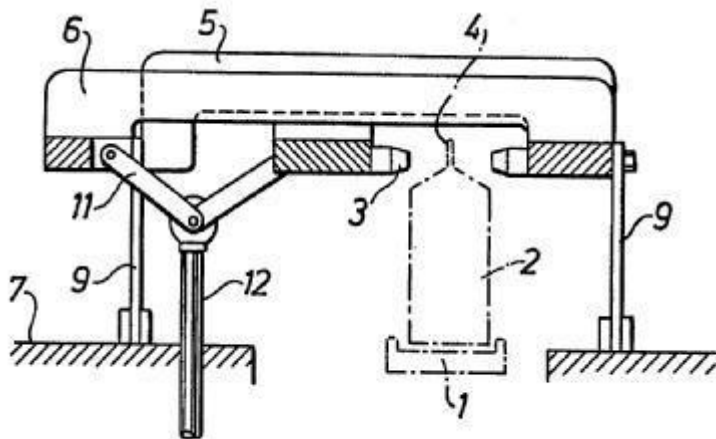
Example 1, from

JP9142441:



Example 2, from

EP0097984:





**B29C 66/43123**

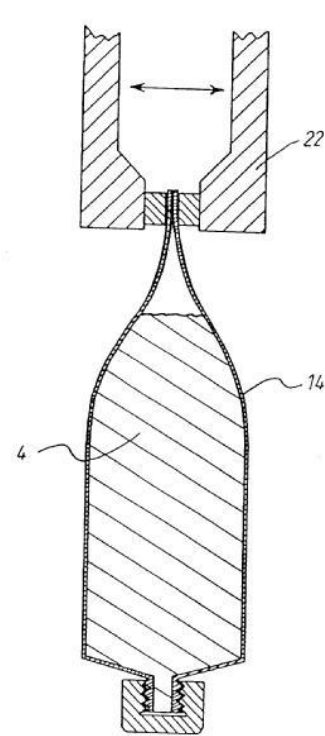
{Closing the ends of squeeze tubes, e.g. for toothpaste or cosmetics  
(producing flexible squeeze tubes by combined operations [B29D 23/20](#);  
collapsible tubes [B65D 35/00](#))}

**Definition statement**

*This place covers:*

Example 1, from

DE29905766U



**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Heating tube ends	<a href="#">B29B 13/025</a>
Closing collapsible or resilient tubes, e.g. for tooth paste, after filling	<a href="#">B65B 7/14</a>

**B29C 66/43129**

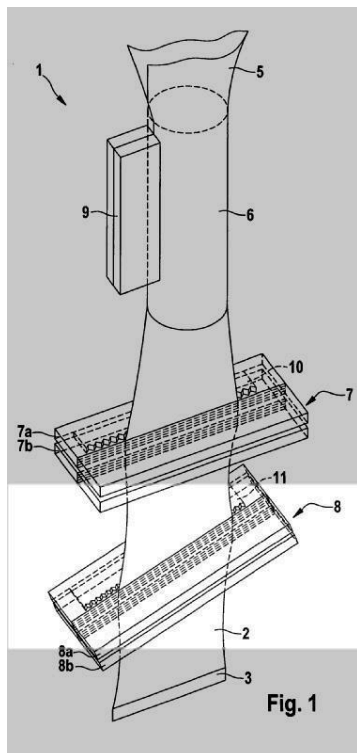
{said flat seams being transversal but non-orthogonal with respect to the  
tubular or hollow articles, i.e. oblique}

**Definition statement**

*This place covers:*

Example 1, from

DE102009003029:



## **B29C 66/432**

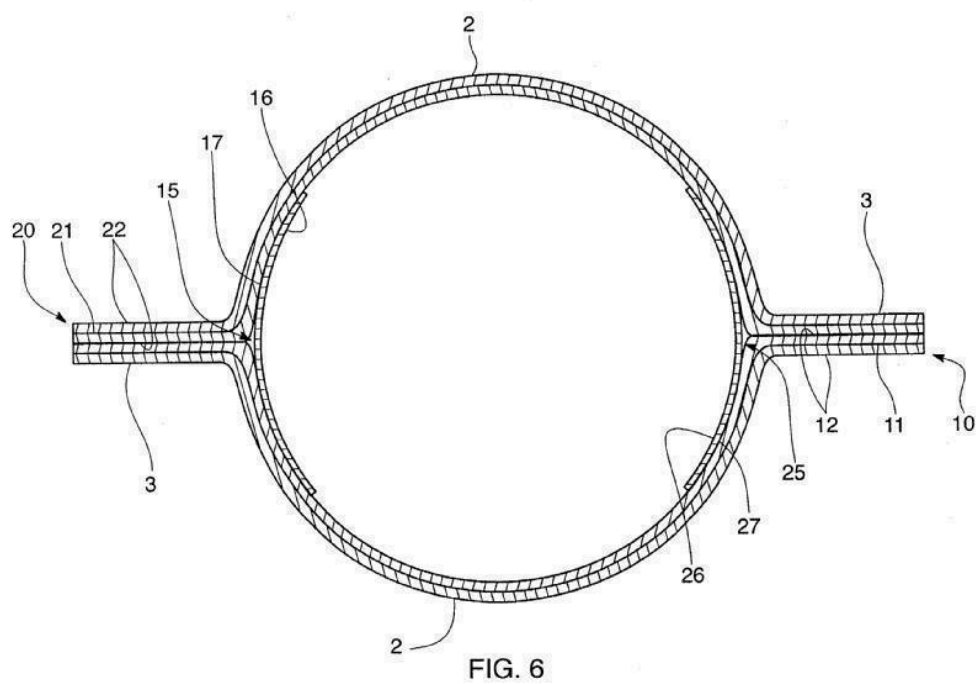
{for making tubular articles or closed loops, e.g. by joining several sheets ([B29C 66/547](#) takes precedence; bending and joining sheets at right angles to the longitudinal axis of the article being formed and joining the edges [B29C 53/38](#)); for making hollow articles or hollow preforms}

### **Definition statement**

*This place covers:*

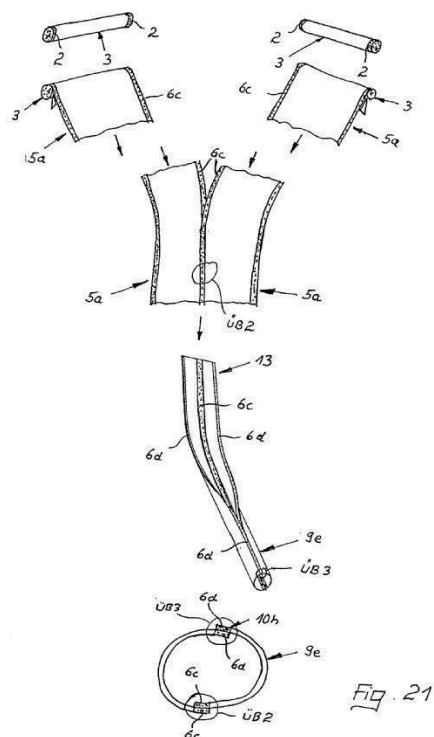
Example 1, from

FR2856008:



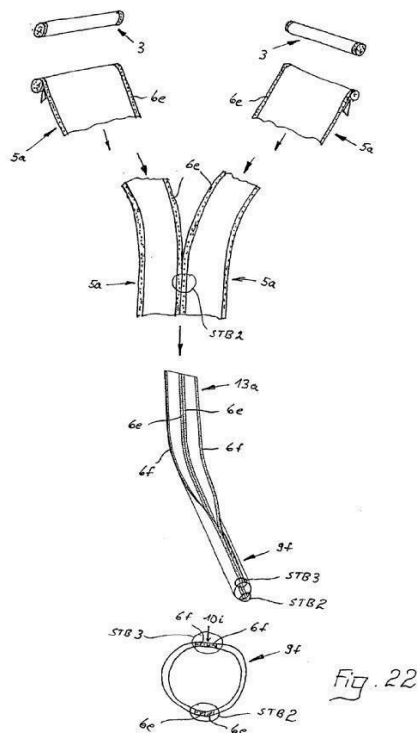
Example 2, from

DE19813387:



Example 3, from

DE19813387:



## B29C 66/4322

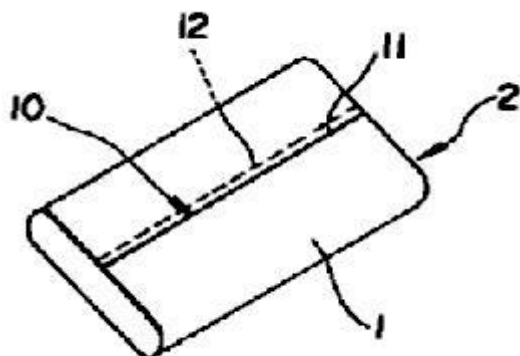
{by joining a single sheet to itself ([B29C 66/4332](#) takes precedence)}

### Definition statement

*This place covers:*

Example 1, from

JP10016058:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Tube advancing means combined with longitudinal welding devices, for enclosing successive articles, or quantities of material, in webs formed into tubes in situ around filling nozzles
---

<a href="#">B65B 9/2021</a>
-----------------------------

## B29C 66/4324

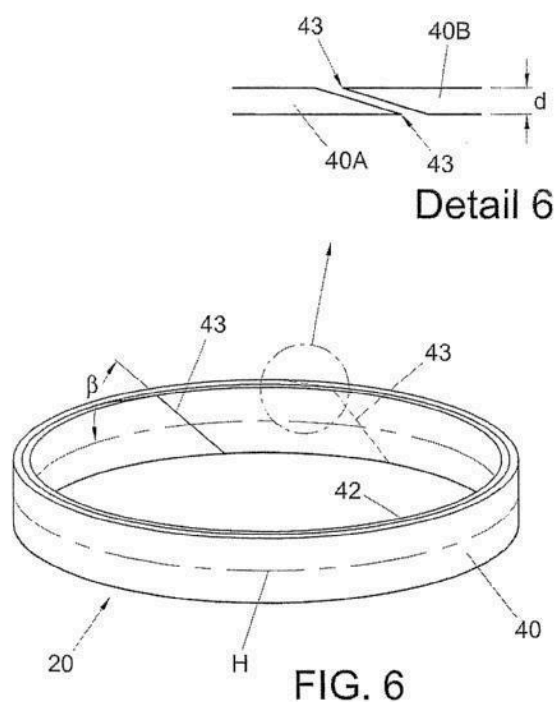
{for making closed loops, e.g. belts}

### Definition statement

This place covers:

Example 1, from

WO2006003524:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Joining belts by sewing, sticking, vulcanishing, or the like; Constructional adaptations of the belt ends for this purpose
--

<a href="#">F16G 3/10</a>
---------------------------

**B29C 66/4329**

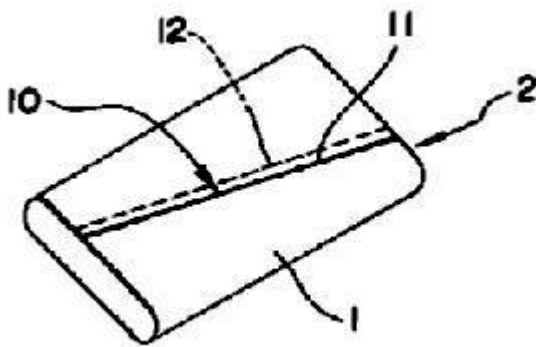
{the joint lines being transversal but non-orthogonal with respect to the axis of said tubular articles, i.e. being oblique}

**Definition statement**

*This place covers:*

Example 1, from

JP10016058:

**B29C 66/433**

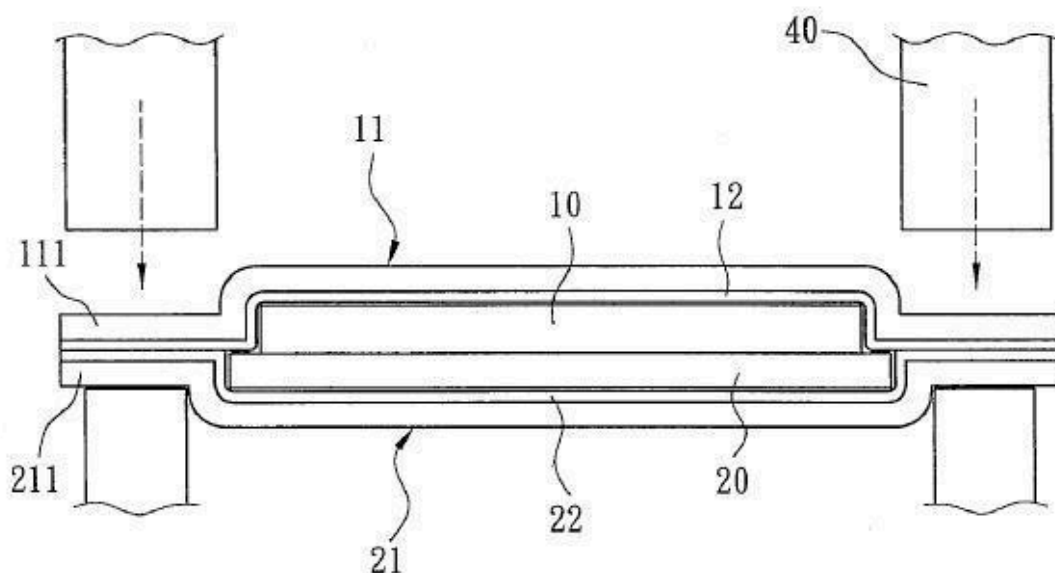
{Casing-in, i.e. enclosing an element between two sheets by an outlined seam (for bookbinding [B42C 11/06](#); for packaging [B65B](#); by laminating [B32B 37/00](#); enclosing tubular articles between substantially flat elements [B29C 66/53261](#))}

**Definition statement**

*This place covers:*

Example 1, from

US2010037564:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Articles or materials enclosed between two opposed sheets or blanks having their margins united, e.g. by heat-sealing or welding	<a href="#">B65D 75/30</a>
Flat or ribbon cables comprising parallel wires, sandwiched between two insulating layers	<a href="#">H01B 7/0838</a>

## B29C 66/4332

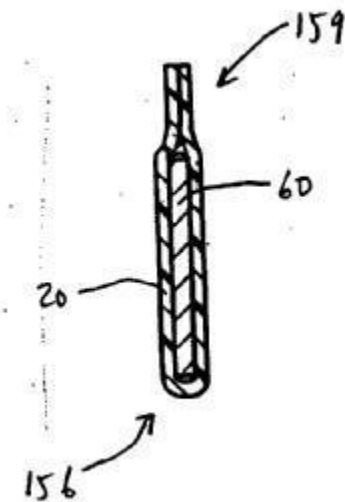
{by folding a sheet over}

### Definition statement

This place covers:

Example 1, from

EP1240995:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Articles or materials wholly enclosed in sheets or blanks doubled around contents and having their opposed free margins united, e.g. by heat-sealing or welding	<a href="#">B65D 75/20</a>
---	----------------------------

## B29C 66/4342

{Joining substantially flat articles for forming corner connections, e.g. for making V-shaped pieces}

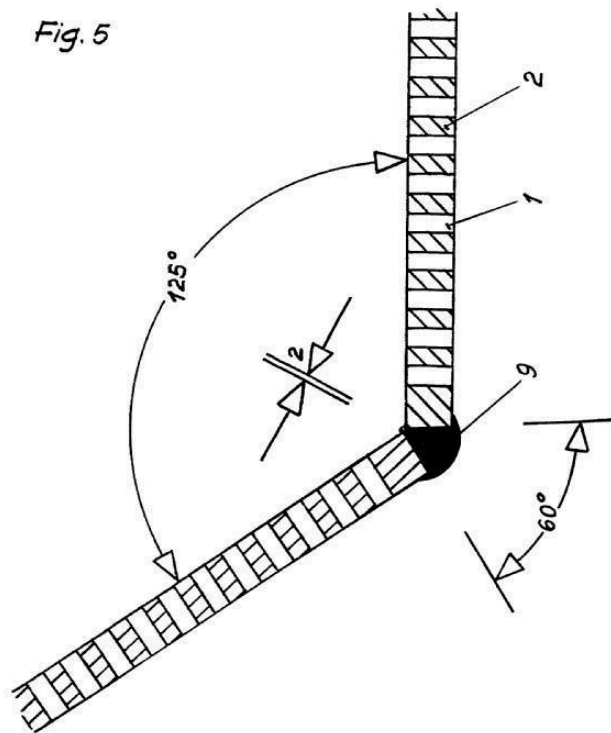
### Definition statement

*This place covers:*

Example 1, from



DE19748616:



## B29C 66/43421

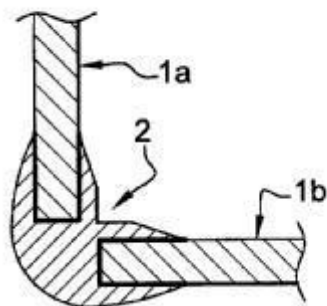
{with a right angle, e.g. for making L-shaped pieces}

### Definition statement

*This place covers:*

Example 1, from

FR2919819:



**Fig. 5b**

**B29C 66/4344**

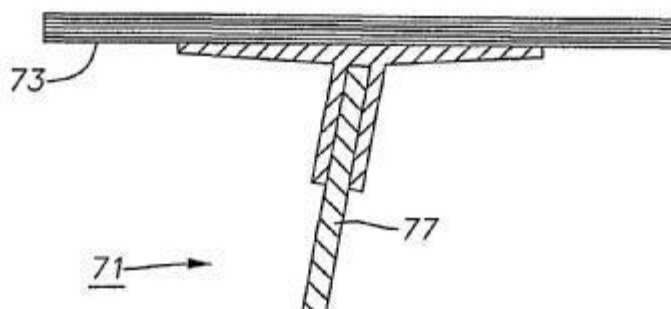
{Joining substantially flat articles for forming fork connections, e.g. for making Y-shaped pieces}

**Definition statement**

*This place covers:*

Example 1, from

WO0216784:

**Fig. 8****B29C 66/43441**

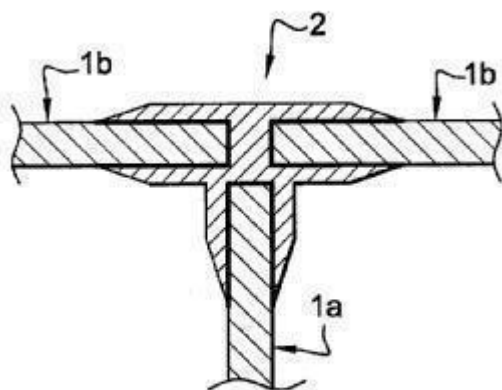
{with two right angles, e.g. for making T-shaped pieces, H-shaped pieces}

**Definition statement**

*This place covers:*

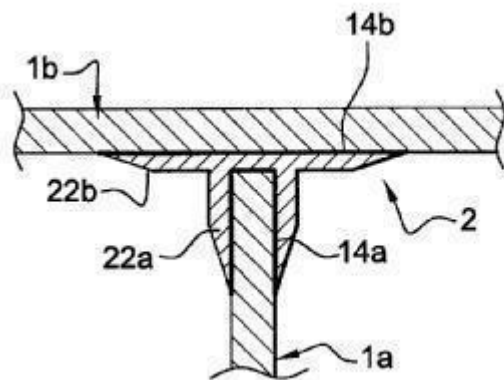
Example 1, from

FR2919819:

**Fig. 5c**

Example 2, from

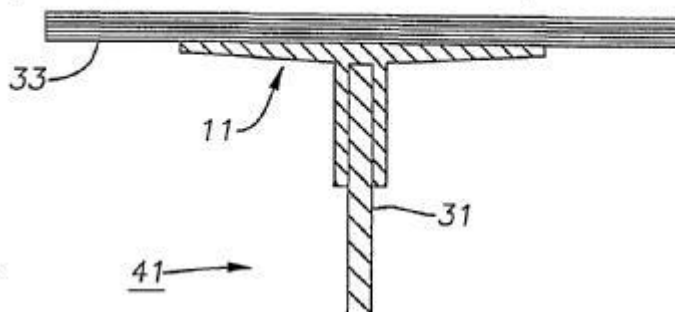
FR2919819:



**Fig. 5e**

Example 3, from  
WO0216784:

**Fig. 7**



## B29C 66/43461

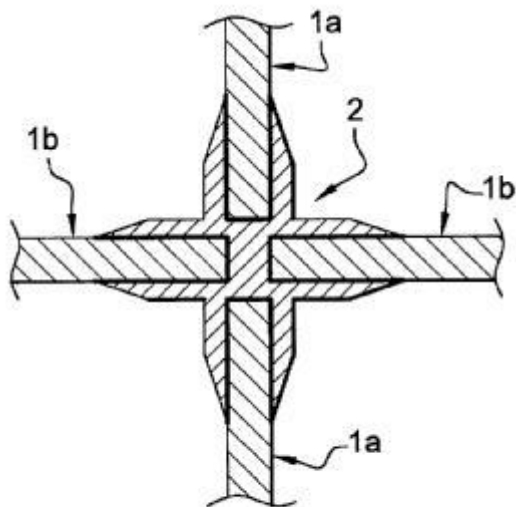
{with four right angles, e.g. for making +-shaped pieces}

### Definition statement

*This place covers:*

Example 1, from

FR2919819:



**Fig. 5d**

## B29C 66/435

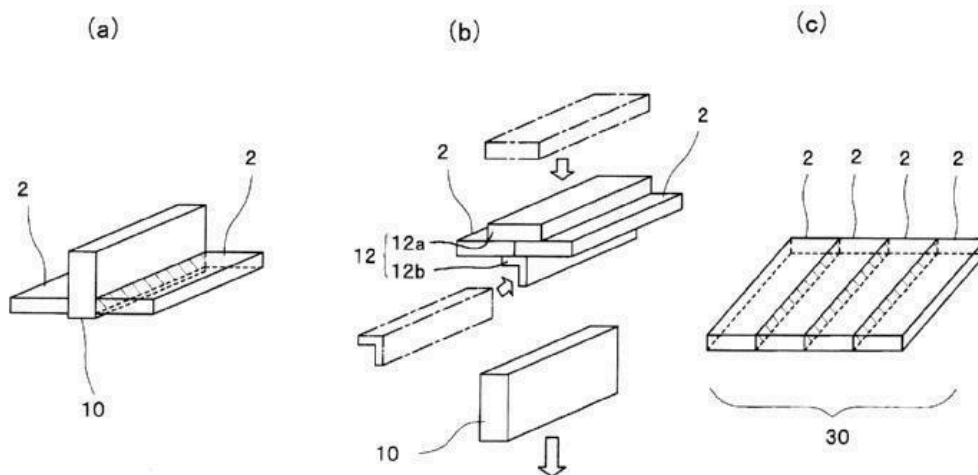
{Making large sheets by joining smaller ones or strips together}

### Definition statement

*This place covers:*

Example 1, from

EP2123515:



**B29C 66/436**

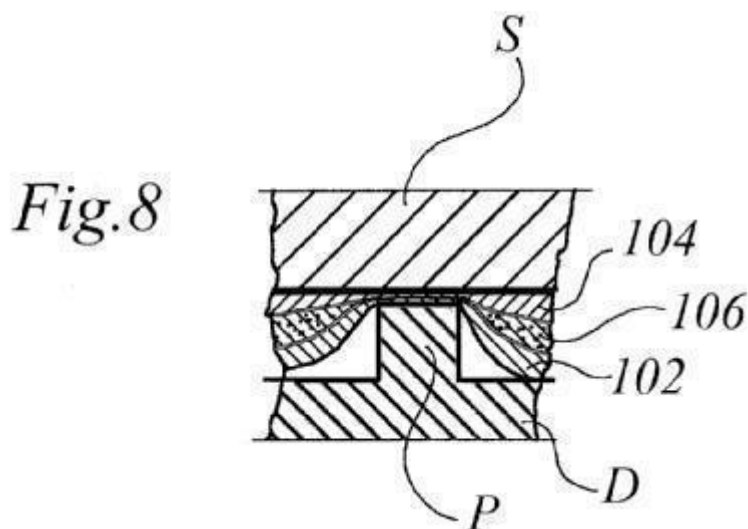
{Joining sheets for making articles comprising cushioning or padding materials, the weld being performed through the cushioning material, e.g. car seats (joining through openings [B29C 66/304](#))}

**Definition statement**

*This place covers:*

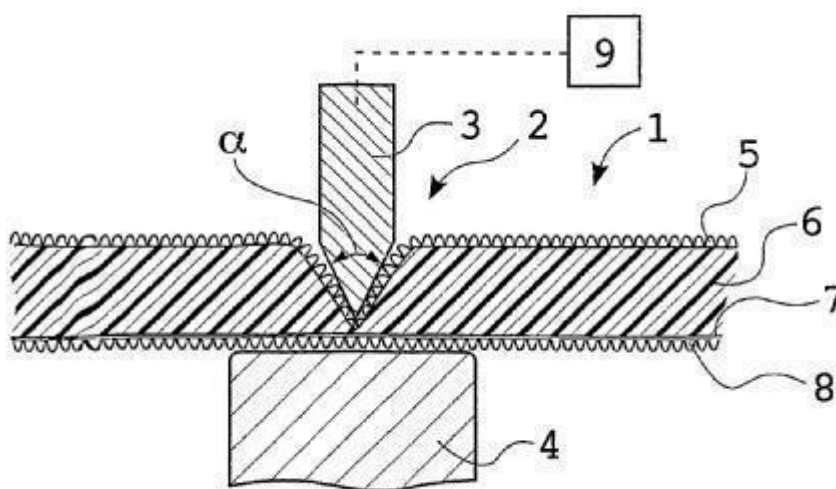
Example 1, from

WO2009133508:



Example 2, from

WO2005097474:



Example 3, from

GB2389560:

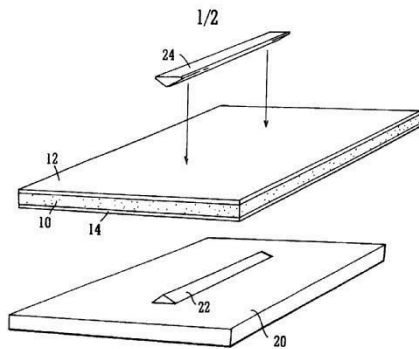


FIG. 1

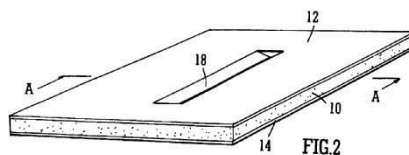


FIG. 2

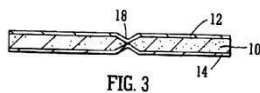


FIG. 3

## **B29C 66/437**

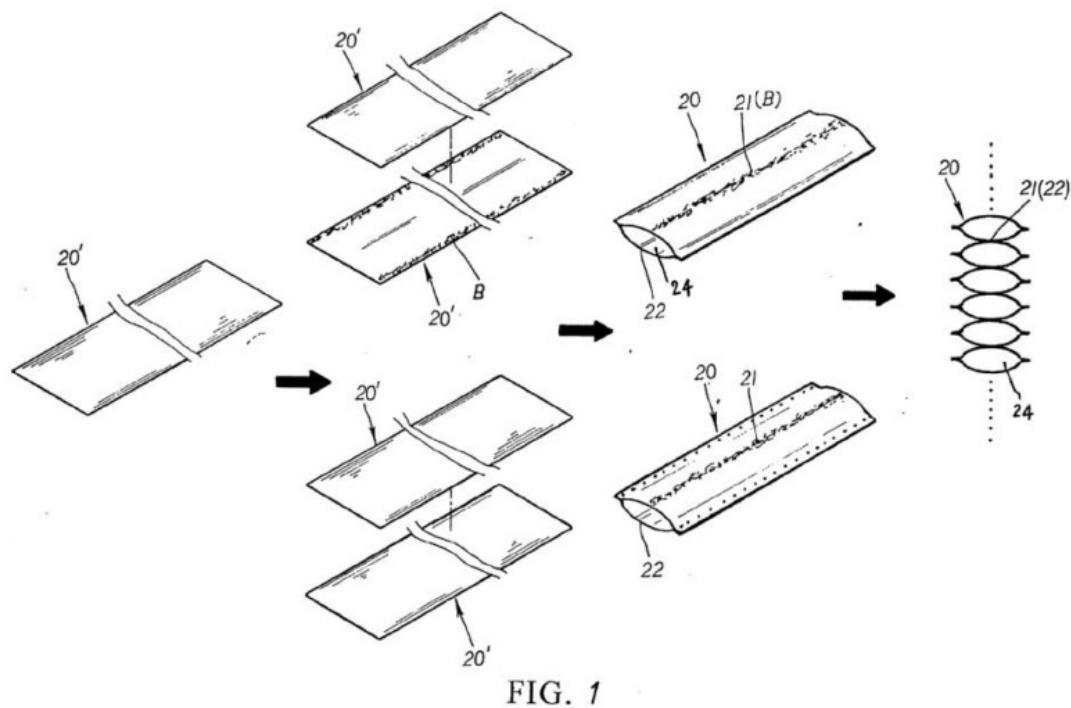
{Joining plastics plates for making venetian blinds (making venetian blinds in general [E06B 9/266](#))}

### **Definition statement**

*This place covers:*

Example 1, from

DE19753716:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Making honeycombed structures for window coverings
--

<a href="#">B31D 3/0215</a>
-----------------------------

## B29C 66/438

{Joining sheets for making hollow-walled, channelled structures or multi-tubular articles}

### Definition statement

This place covers:

Example 1, from

FR2929549:

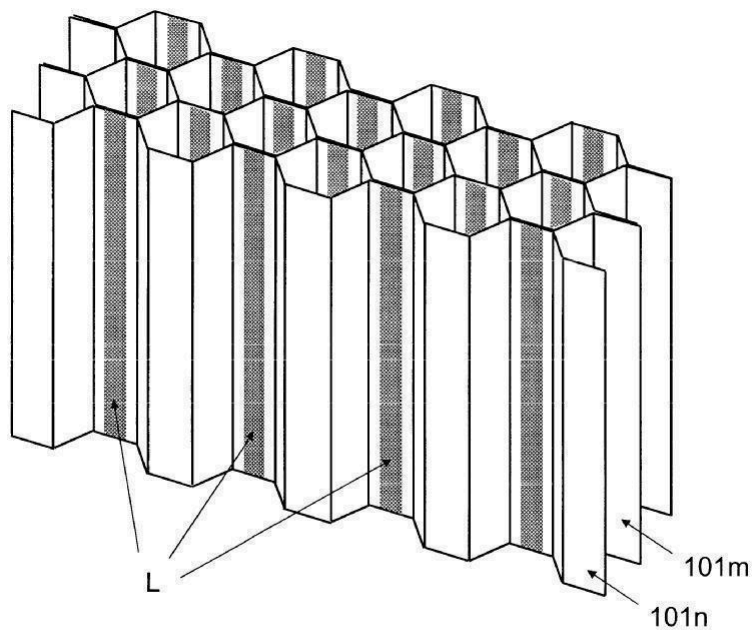


FIG. 13

Example 2, from  
DE4426097:

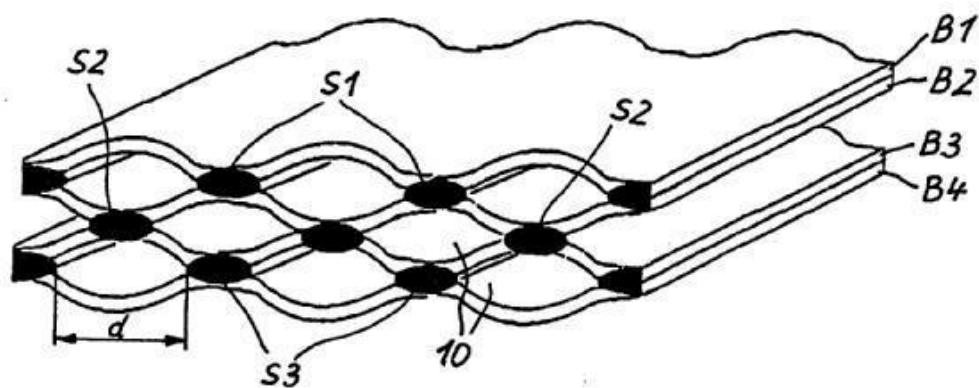


FIG. 4b

## B29C 66/439

{Joining sheets for making inflated articles without using a mould}

### Definition statement

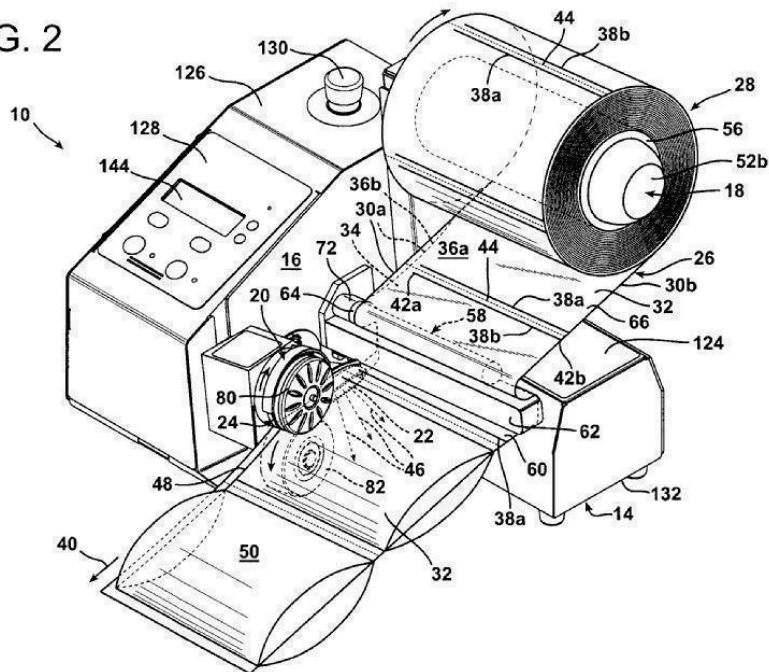
*This place covers:*

Example 1, from



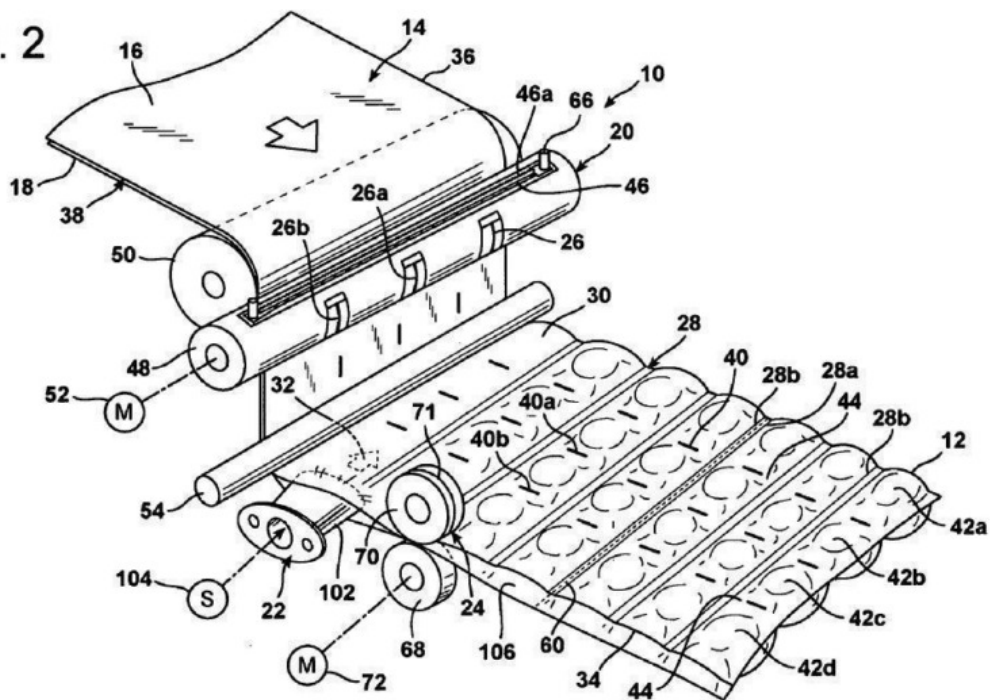
CA2654675:

FIG. 2



Example 2, from  
US2008250753:

FIG. 2



Example 3, from

**{Joining of substantially the whole surface of the articles (methods or apparatus for laminating [B32B 37/00](#))}**

*This place covers:*

Example 1, from

A cross-sectional view of a device 100. The device consists of a top rectangular layer 106, a central neck-like structure 104, a middle rectangular layer 20, a bottom rectangular layer 10, and a base 30. The base 30 is shown with a hatched pattern. The middle layer 20 and bottom layer 10 are separated by a series of small circles, possibly representing a solder or adhesive layer. The neck 104 is wider at the top and bottom and tapers in the middle. The top layer 106 is wider than the neck 104. The bottom layer 10 is wider than the neck 104. The middle layer 20 is wider than the neck 104. The base 30 is wider than the neck 104.

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Forming webs by bringing together several webs for manufacturing absorbent pads	<a href="#">A61F 13/15699</a>
---	-------------------------------

## B29C 66/452

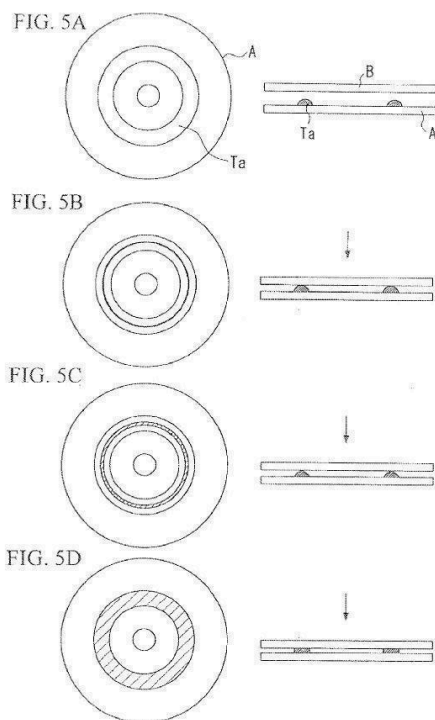
{the article having a disc form, e.g. making CDs or DVDs}

### Definition statement

This place covers:

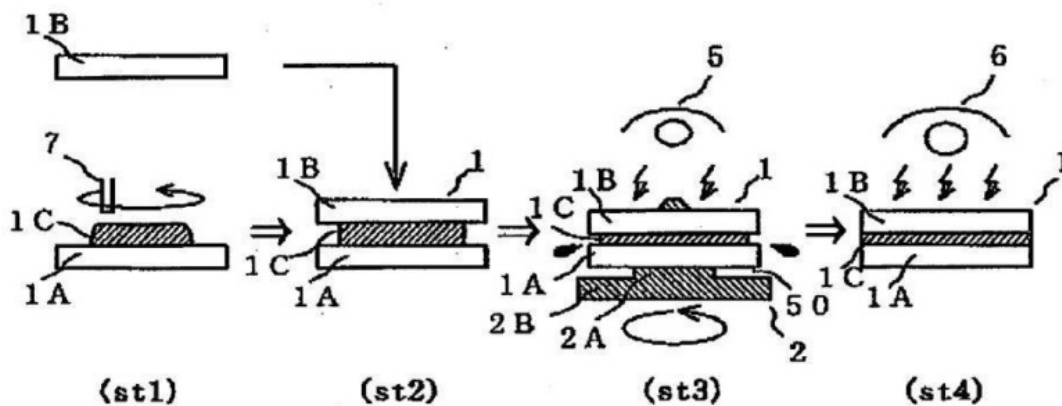
Example 1, from

US2008283192:



Example 2, from

US2009040913:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Producing carriers of records containing fine grooves or impressions, e.g. disc records, by combined operations	<a href="#">B29D 17/00</a>
Producing optically read record carriers, e.g. optical discs by combined operations	<a href="#">B29D 17/005</a>
Apparatus or processes specially adapted for the manufacture of record carriers	<a href="#">G11B 7/26</a>

## B29C 66/47

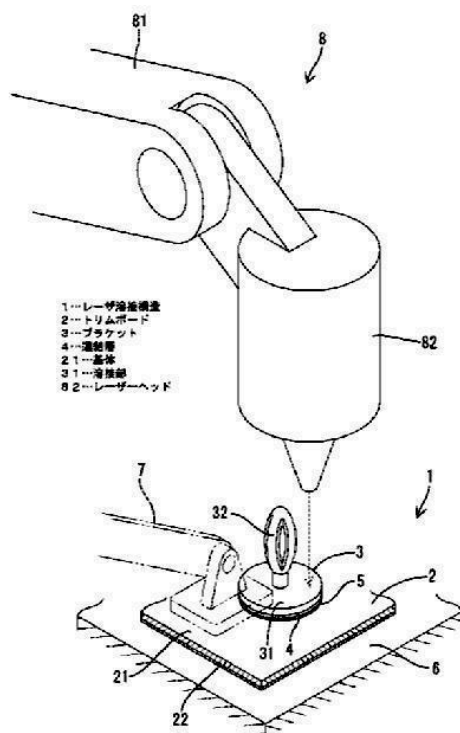
{Joining single elements to sheets, plates or other substantially flat surfaces  
([B29C 66/5326](#) takes precedence)}

### Definition statement

*This place covers:*

Example 1, from

JP2005279990:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for fastening nuts to surfaces, e.g. sheets, plates, by means of welding or riveting

[F16B 37/06](#)

## B29C 66/472

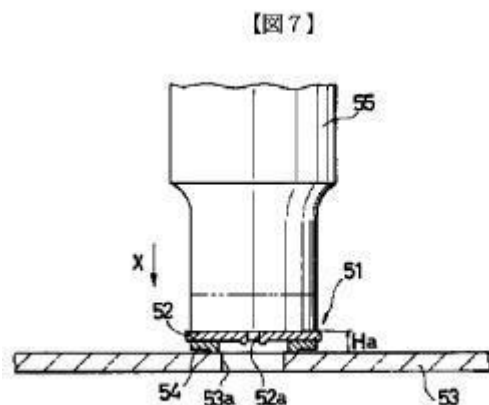
{said single elements being substantially flat}

### Definition statement

*This place covers:*

Example 1, from

JP4216382:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for applying ribbons to babies' napkins, e.g. diapers
---

<a href="#">A61F 13/15593</a>
-------------------------------

## B29C 66/4722

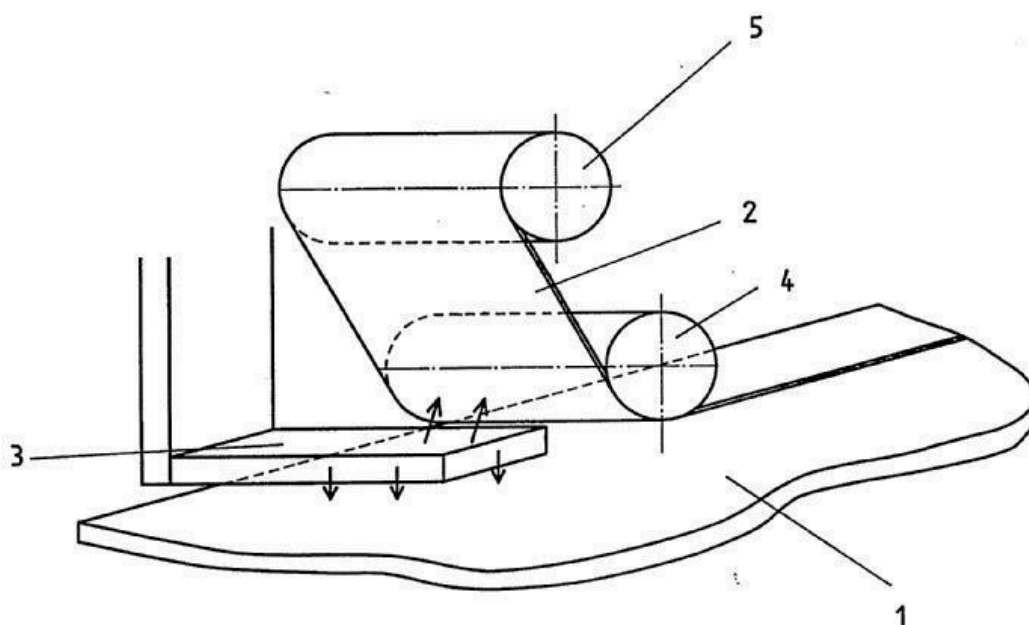
{Fixing strips to surfaces other than edge faces (fixing strips to edge faces  
[B29C 63/0026](#))}

### Definition statement

*This place covers:*

Example 1, from

EP0395836:



## B29C 66/4724

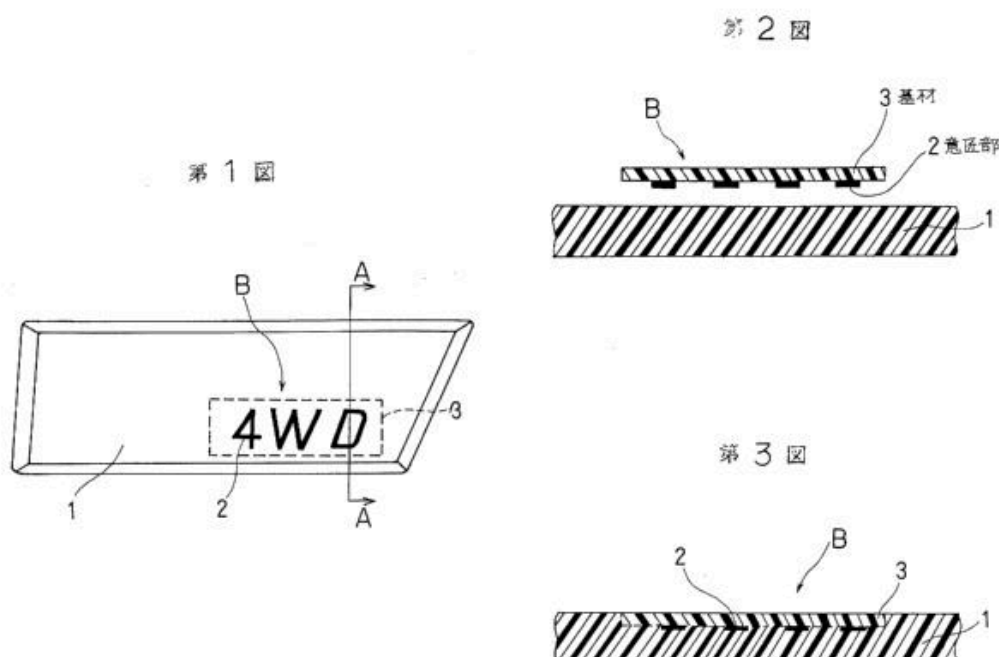
{said single elements being appliques, e.g. in the form of a text or drawing}

### Definition statement

*This place covers:*

Example 1, from

JP2233230:





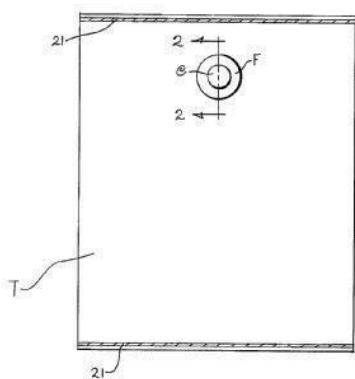
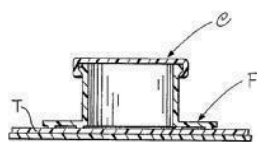
**B29C 66/4742****{said single elements being spouts}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Non-integral spouts connected to a planar surface of the wall of packages, said packages comprising articles or materials enclosed in strips, sheets, blanks, tubes, or webs of flexible sheet material	<a href="#">B65D 75/5877</a>
---	------------------------------

**B29C 66/47421****{said spouts comprising flanges}****Definition statement***This place covers:*

Example 1, from

US3231444:

**Fig. 1****Fig. 2**

**B29C 66/49**

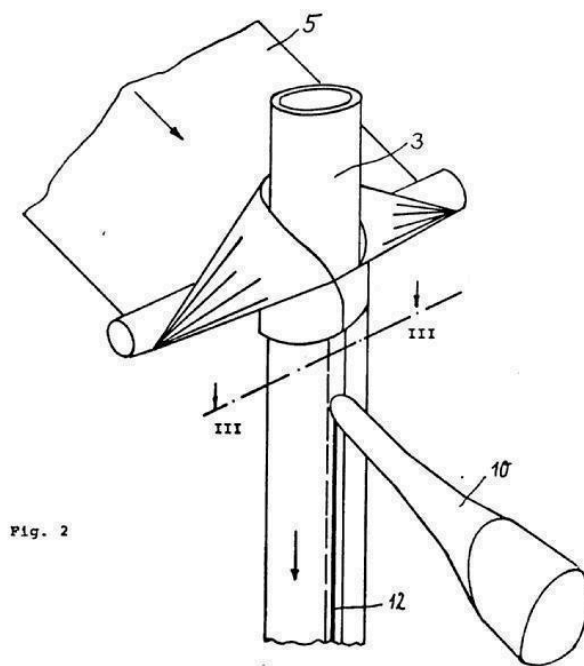
{Internally supporting the, e.g. tubular, article during joining ([B29C 66/63](#) takes precedence)}

**Definition statement**

*This place covers:*

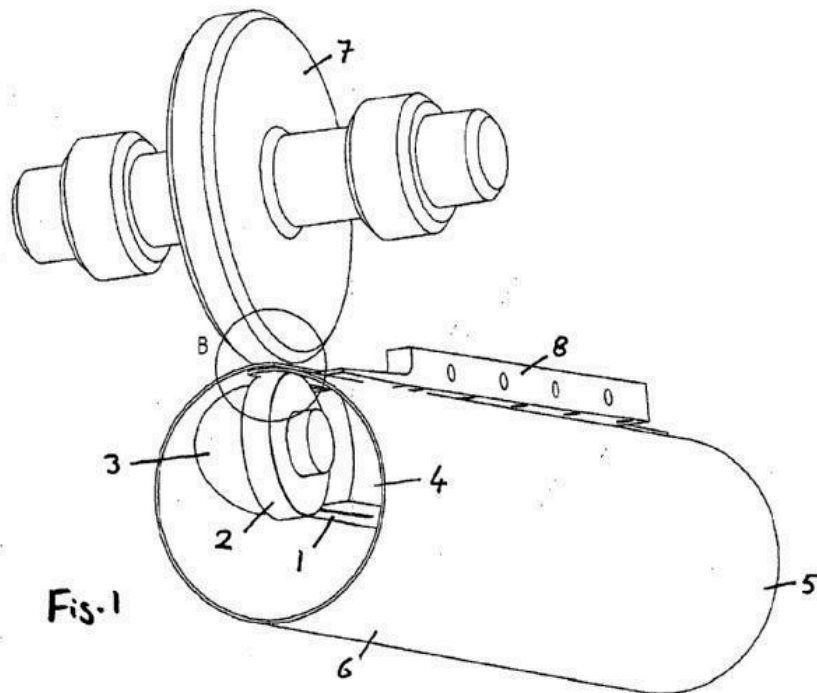
Example 1, from

DE2922834:



Example 2, from

EP2360007:



## B29C 66/492

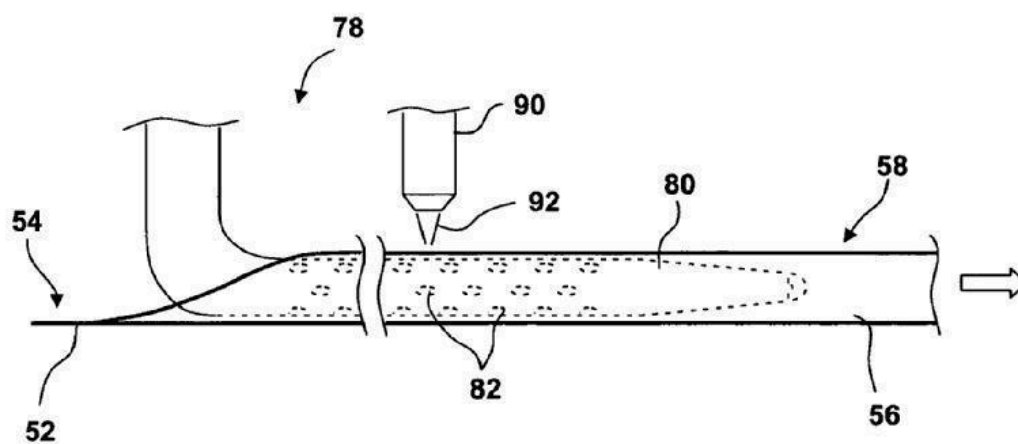
{using a fluid}

### Definition statement

*This place covers:*

Example 1, from

US2007079924:



**B29C 66/50**

{General aspects of joining tubular articles; General aspects of joining long products, i.e. bars or profiled elements; General aspects of joining single elements to tubular articles, hollow articles or bars; General aspects of joining several hollow-preforms to form hollow or tubular articles}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Connections of rods or tubes in general	<a href="#">F16B 7/00</a>
Non-disconnectable couplings for attachment of a member on a shaft or on a shaft-end involving gluing, welding or the like	<a href="#">F16D 1/068</a>

**B29C 66/522**

{Joining tubular articles ([B29C 66/53241](#) takes precedence)}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Connecting a tube to a hub for making catheters or medical or surgical tubes	<a href="#">A61M 25/0014</a>
Plastic pipe welded joints; Plastic pipe adhesive joints	<a href="#">F16L 47/02</a>

**B29C 66/5221**

{for forming coaxial connections, i.e. the tubular articles to be joined forming a zero angle relative to each other}

**Definition statement**

*This place covers:*

Example 1, from

WO9415137:

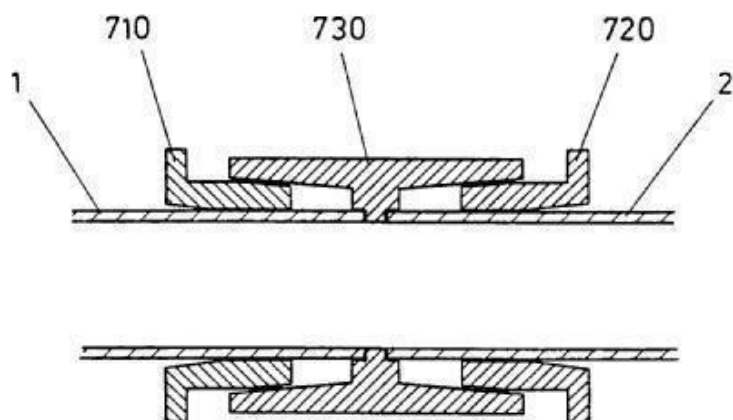


FIG. 10

Example 2, from  
US5793017:

FIG. 20 (a)

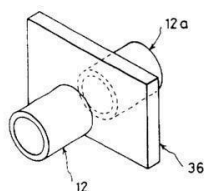


FIG. 20 (b)

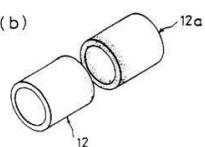
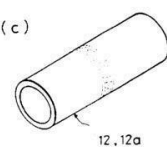


FIG. 20 (c)



**B29C 66/5223**

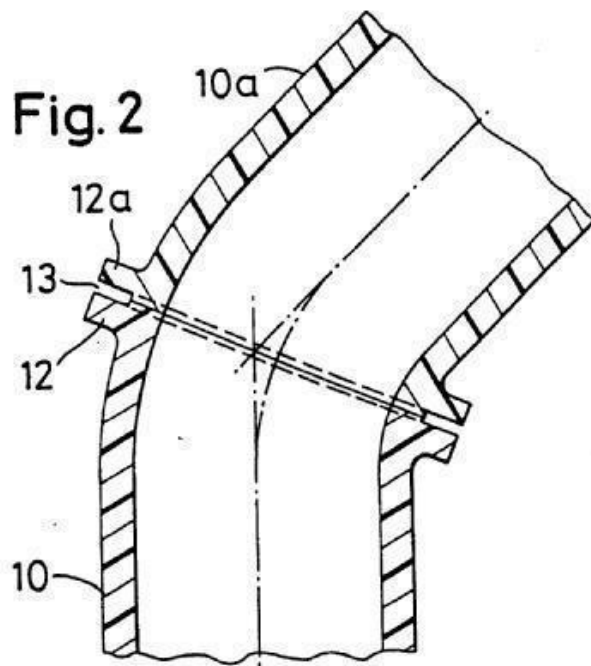
{for forming corner connections or elbows, e.g. for making V-shaped pieces}

**Definition statement**

*This place covers:*

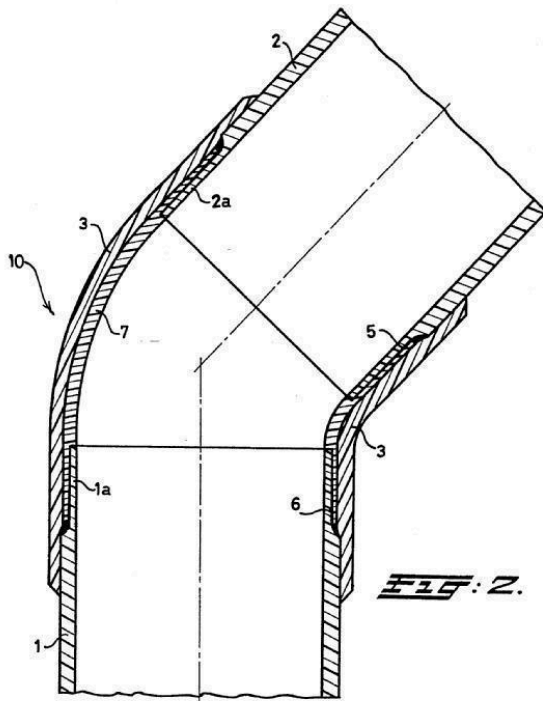
Example 1, from

EP0382971:



Example 2, from

EP0141450:



## **B29C 66/52231**

{with a right angle, e.g. for making L-shaped pieces}

### **Definition statement**

*This place covers:*

Example 1, from

WO9415137:

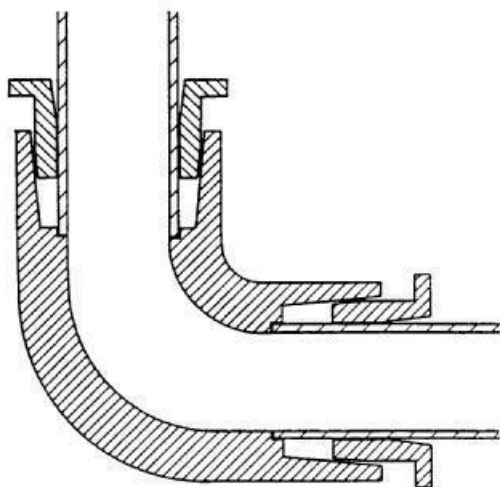


FIG. 12

Example 2, from  
EP0141450:

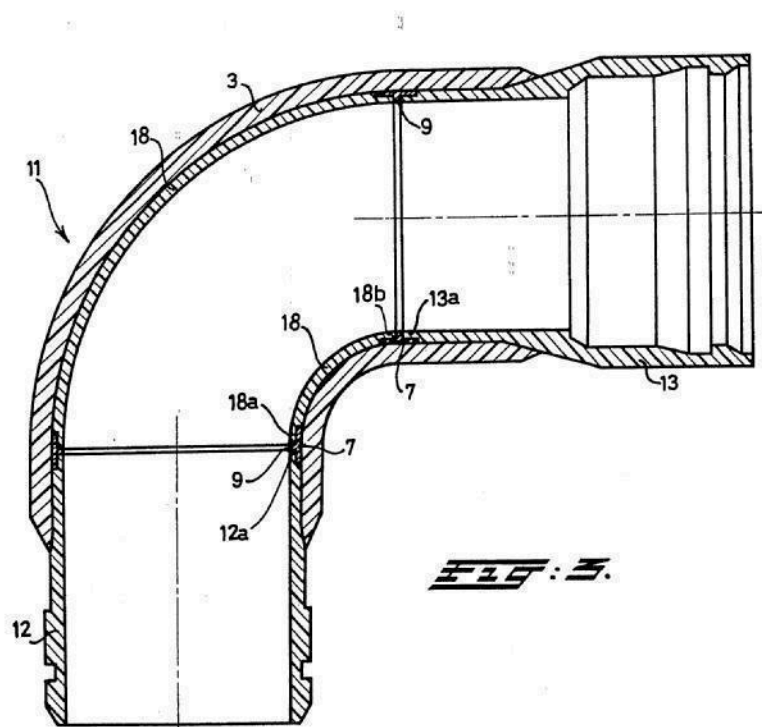


FIG. 3.



**B29C 66/5224**

{for forming fork-shaped connections, e.g. for making Y-shaped pieces}

**Definition statement**

*This place covers:*

Example 1, from

WO9415137:

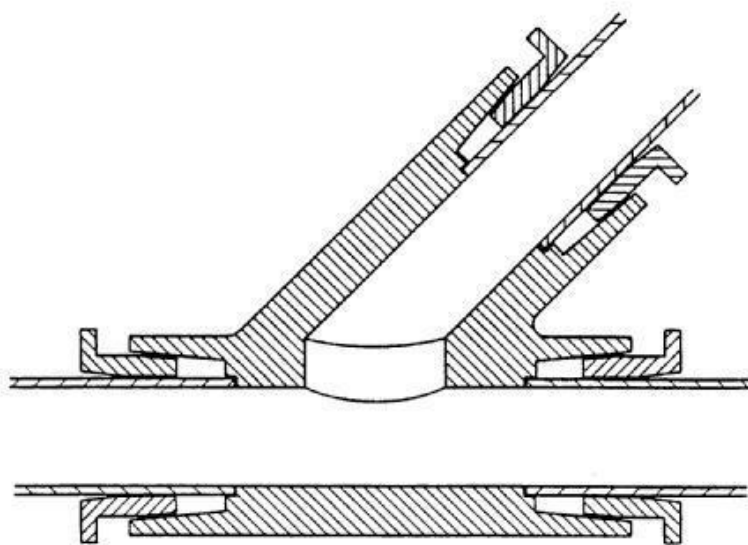
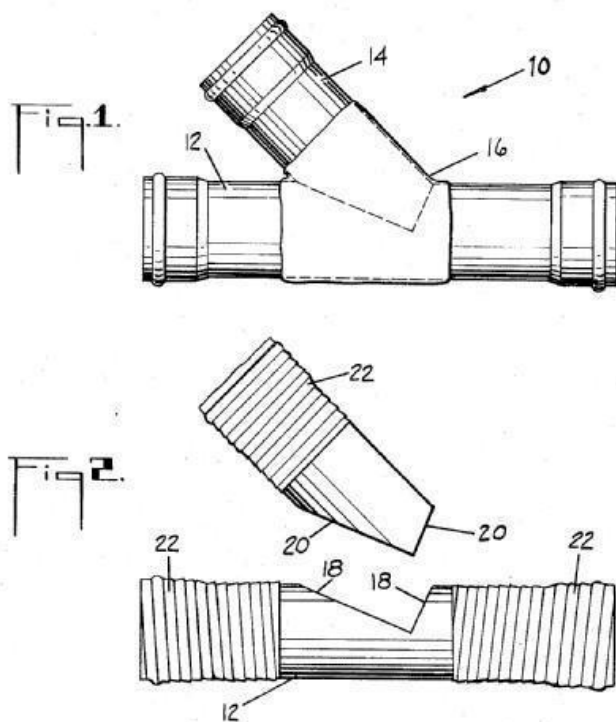


FIG. 14

Example 2, from

US3873391:



## B29C 66/52241

{with two right angles, e.g. for making T-shaped pieces}

### Definition statement

*This place covers:*

Example 1, from

WO9415137:

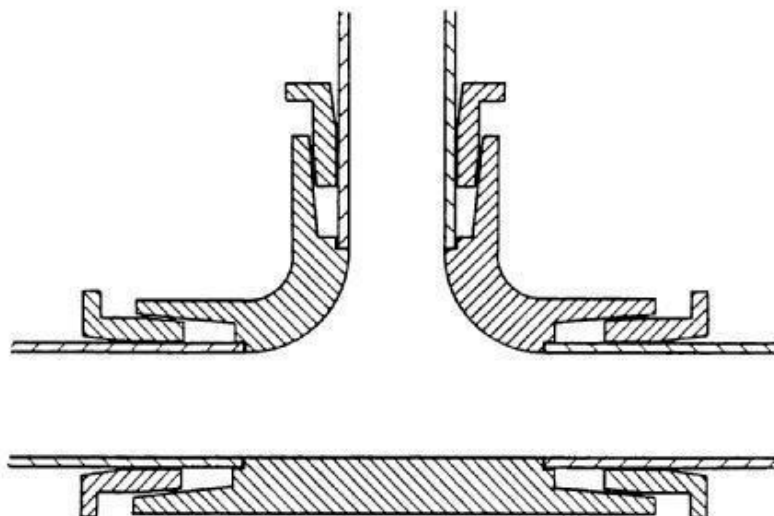
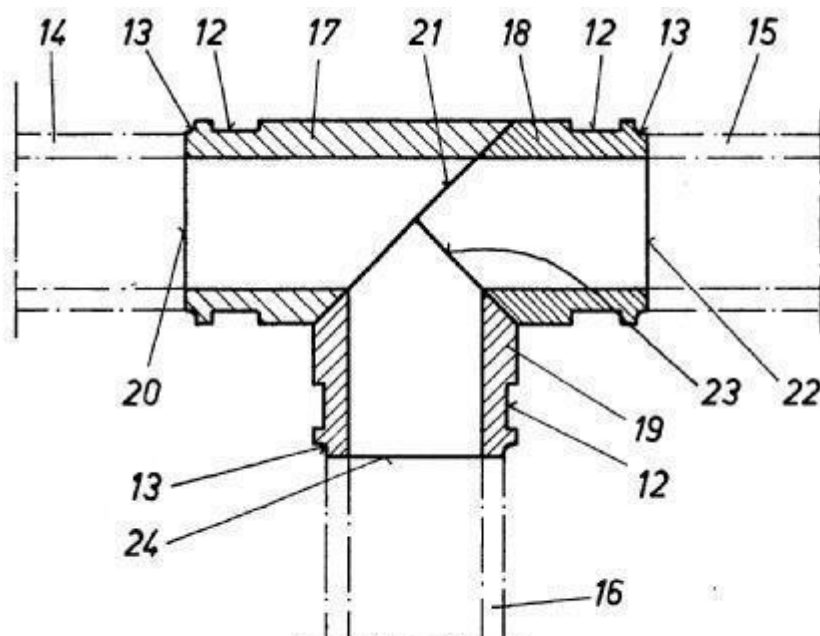


FIG. 13

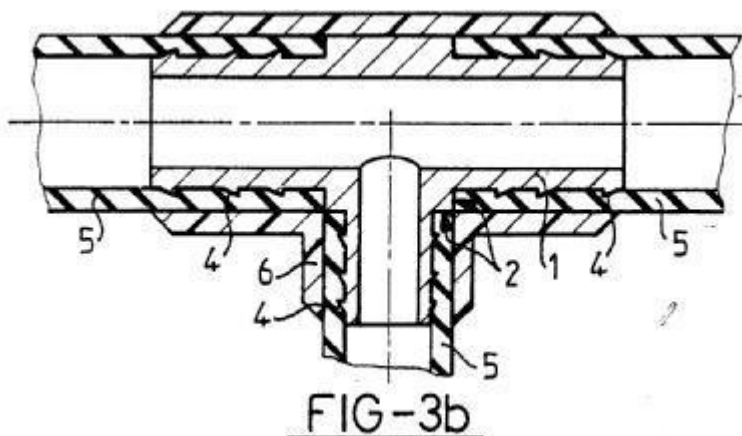
Example 2, from

CH398211:



Example 3, from

FR2596133:



## B29C 66/5225

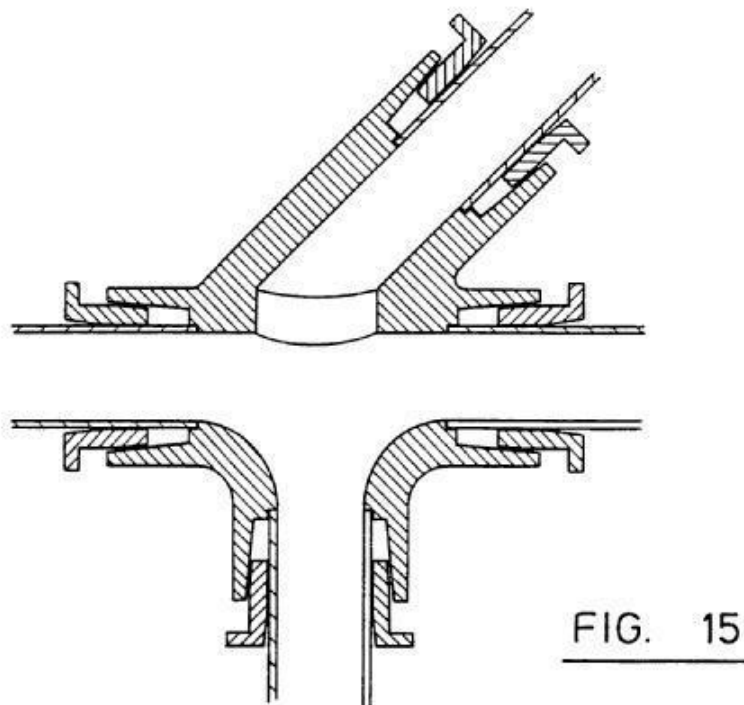
{for forming cross-shaped connections, e.g. for making X-shaped pieces}

### Definition statement

*This place covers:*

Example 1, from

WO9415137:



**B29C 66/52251**

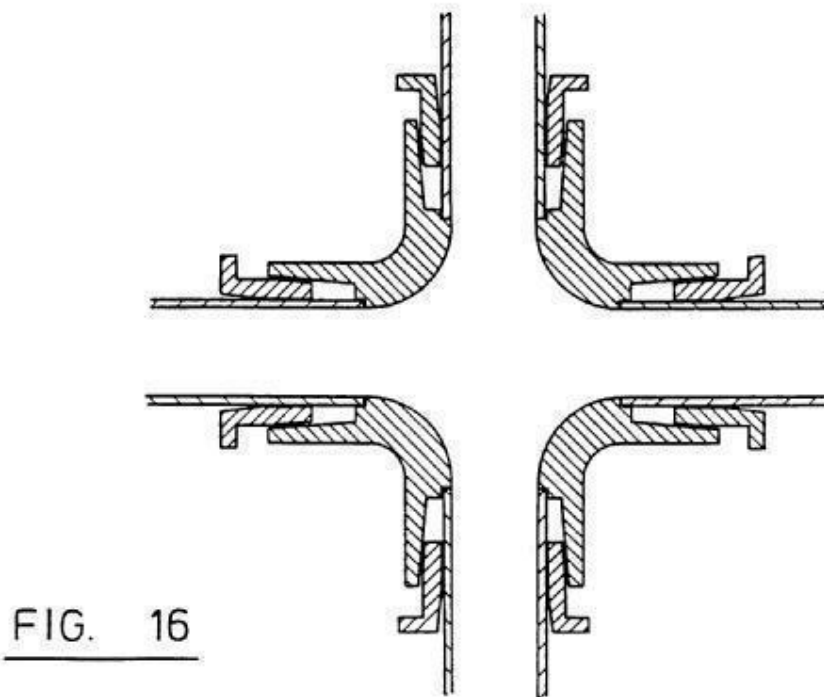
{with four right angles, e.g. for making +-shaped pieces}

**Definition statement**

*This place covers:*

Example 1, from

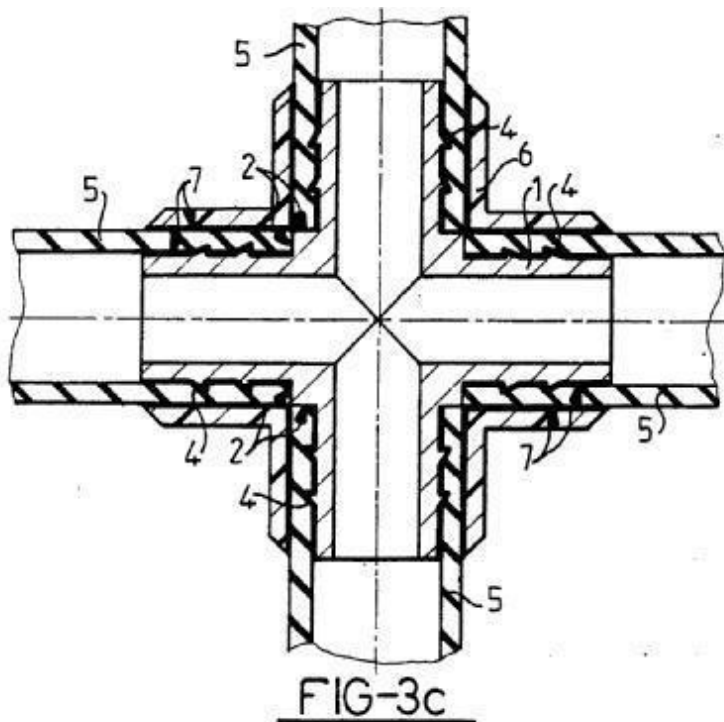
WO9415137:



Example 2, from

Definition statement

FR2596133:

**B29C 66/5227**

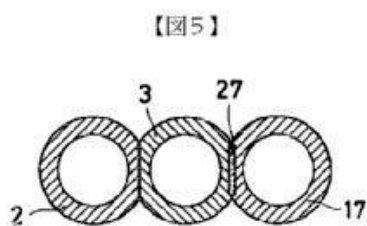
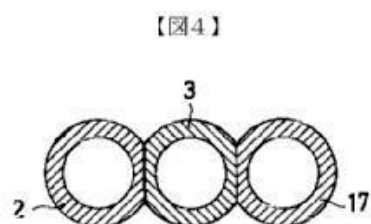
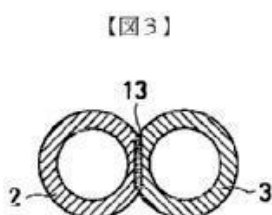
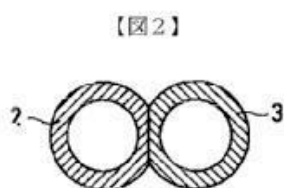
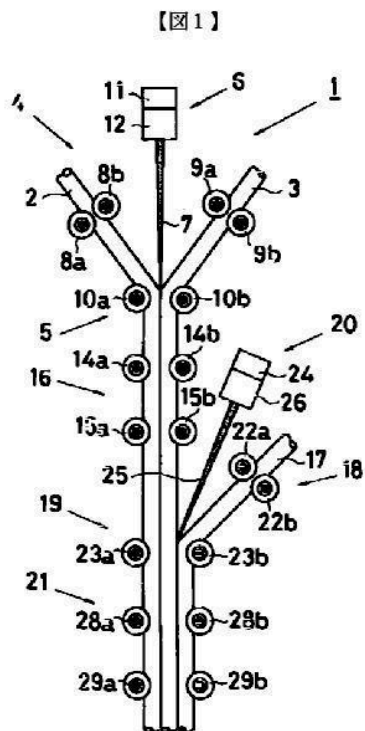
{for forming multi-tubular articles by longitudinally joining elementary tubular articles wall-to-wall (e.g. joining the wall of a first tubular article to the wall of a second tubular article) or for forming multilayer tubular articles}

**Definition statement**

*This place covers:*

Example 1, from

JP2001179839:



## B29C 66/52271

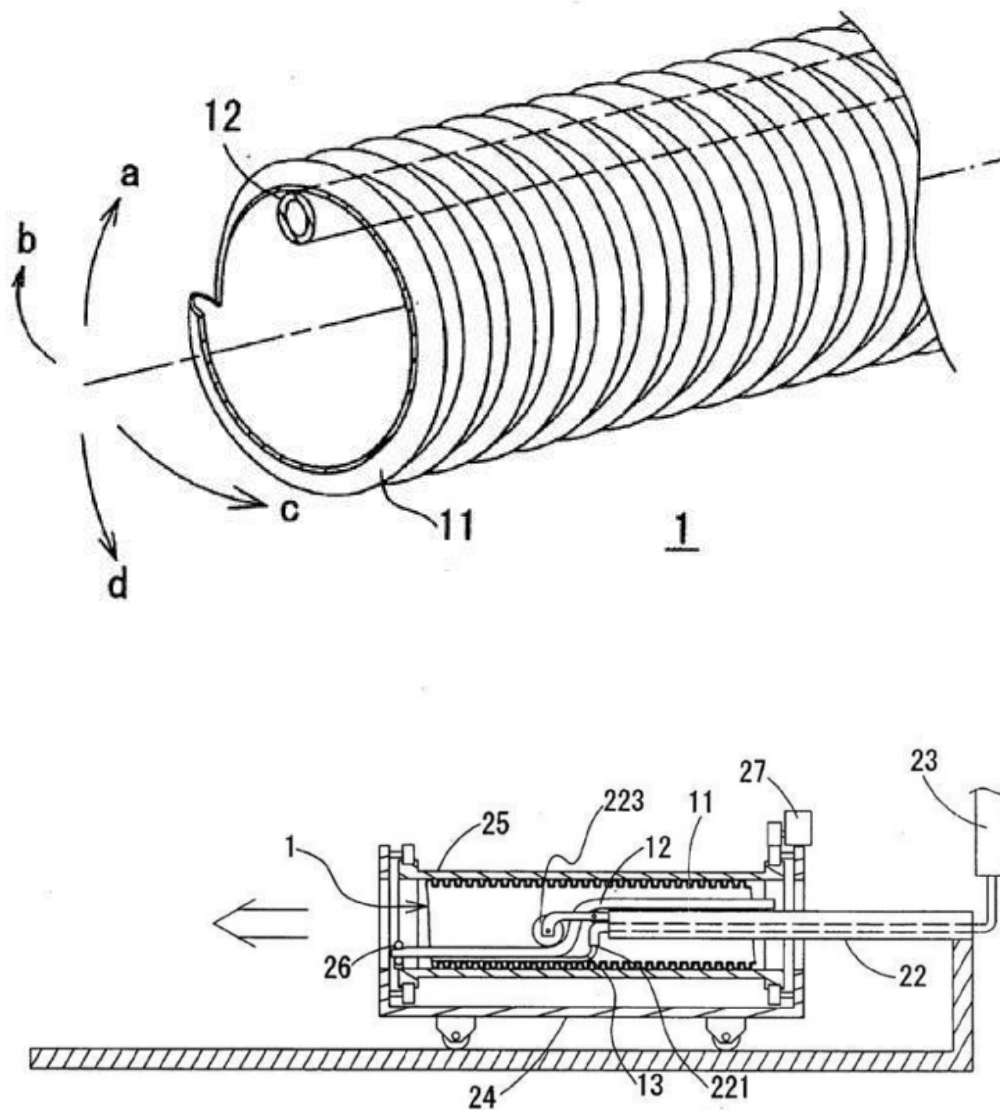
{one tubular article being placed inside the other}

### Definition statement

*This place covers:*

Example 1, from

EP2065168:



## B29C 66/52272

{concentrically, e.g. for forming multilayer tubular articles}

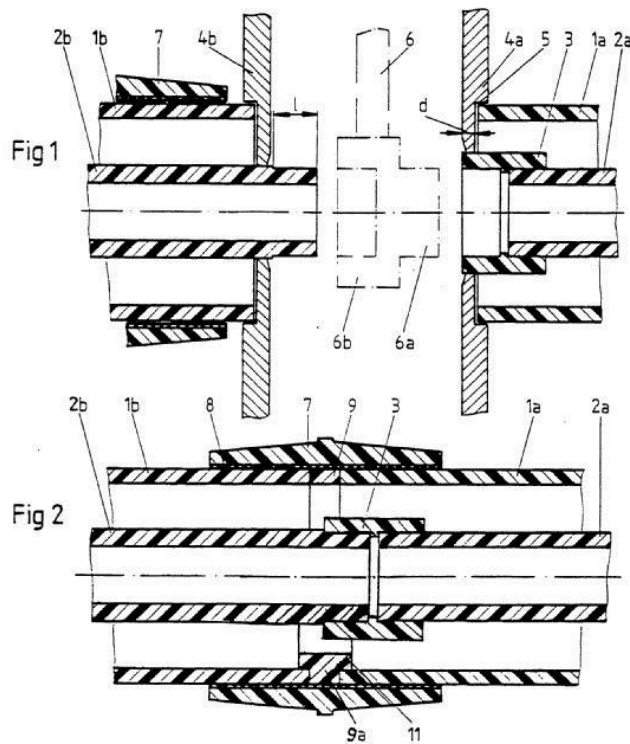
### Definition statement

*This place covers:*

Example 1, from



EP0406818:



## **B29C 66/5229**

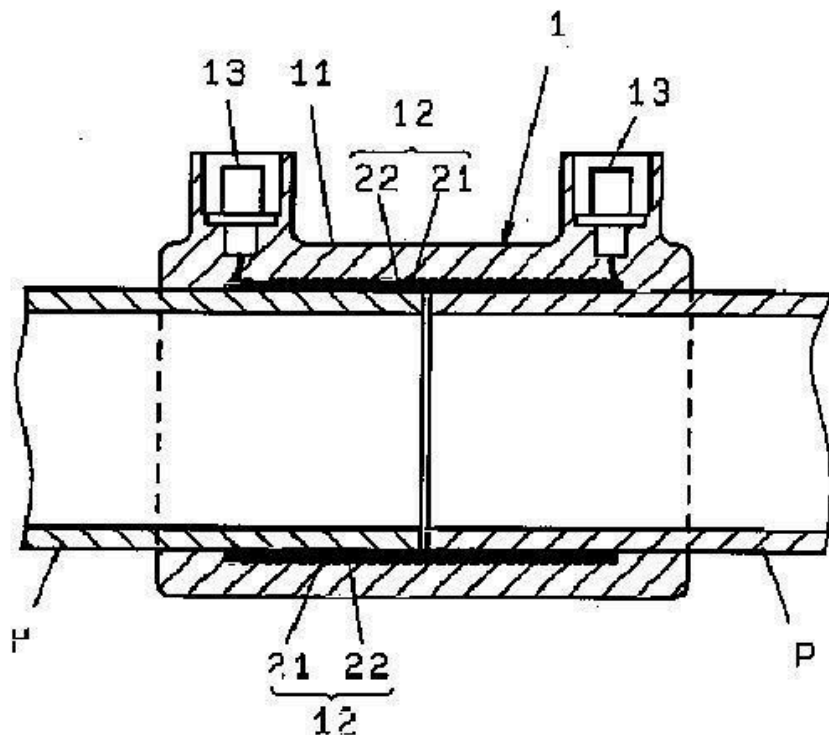
{involving the use of a socket}

### **Definition statement**

*This place covers:*

Example 1, from

JP2001050464:



## B29C 66/52292

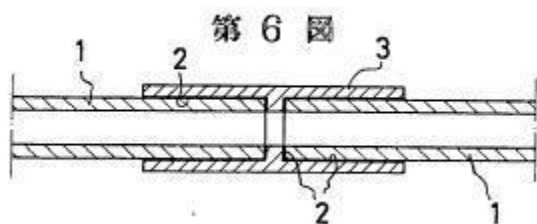
{said stop being internal}

### Definition statement

*This place covers:*

Example 1, from

JP55093411:



## B29C 66/52293

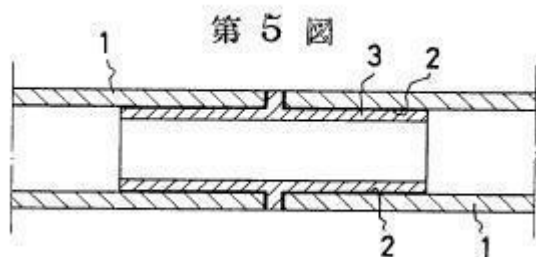
{said stop being external}

### Definition statement

*This place covers:*

Example 2, from

JP55093411:



## B29C 66/52294

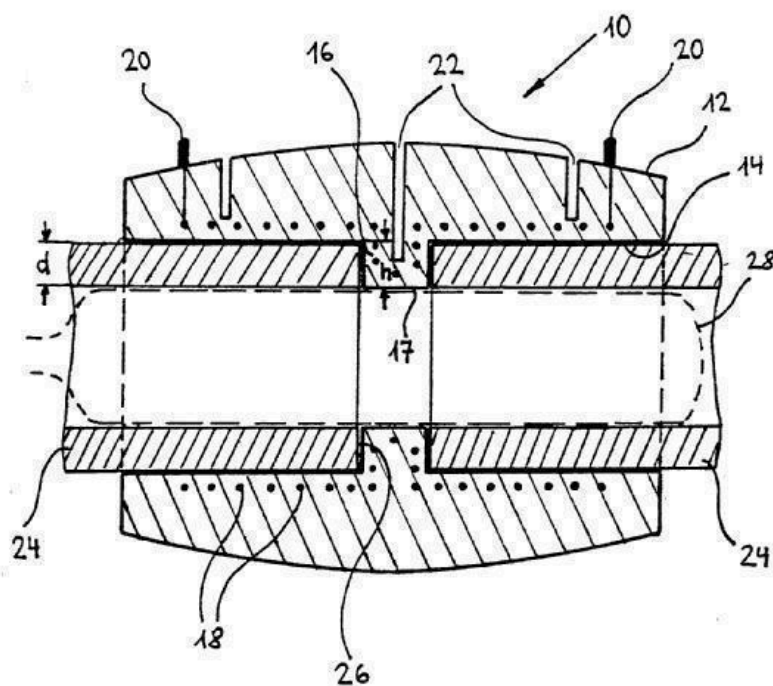
{said stop being heated}

### Definition statement

*This place covers:*

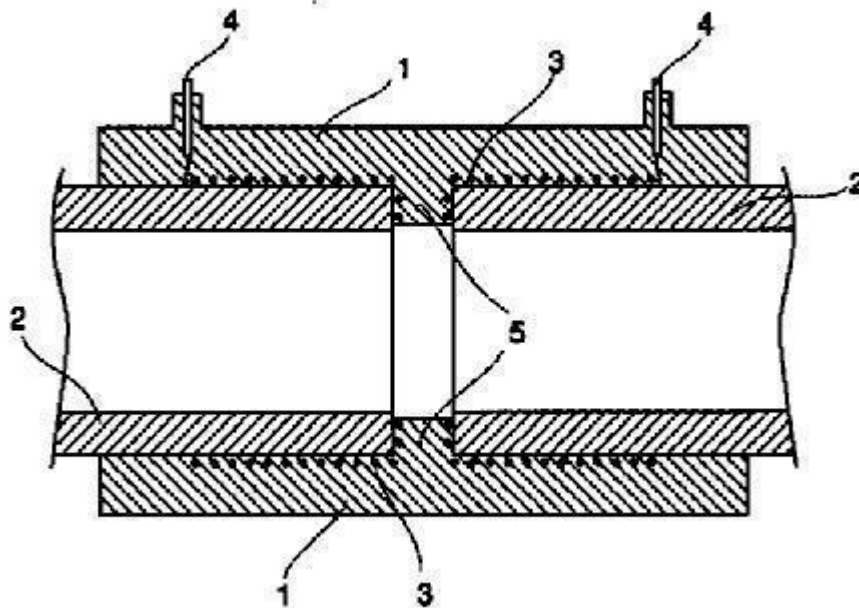
Example 1, from

DE19628916:



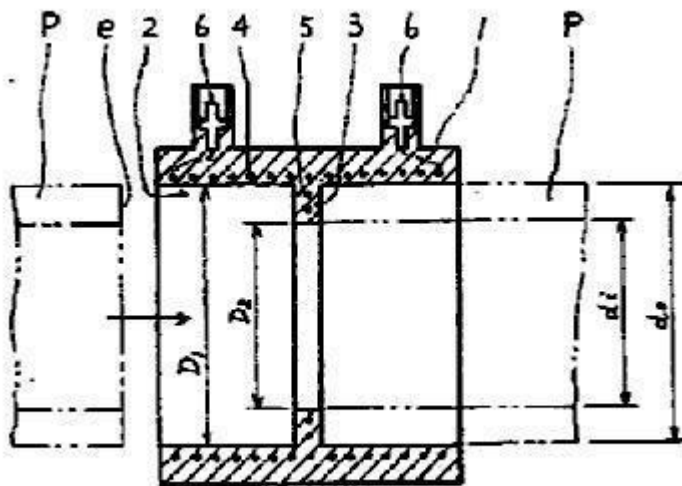
Example 2, from

JP10281383:



Example 3, from

JP5318596:



## B29C 66/52295

{said socket comprising reinforcements}

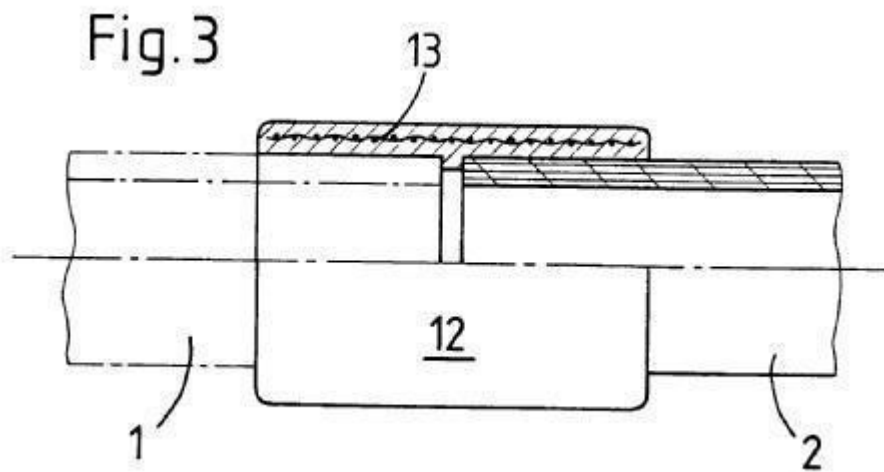
### Definition statement

*This place covers:*

Example 1, from

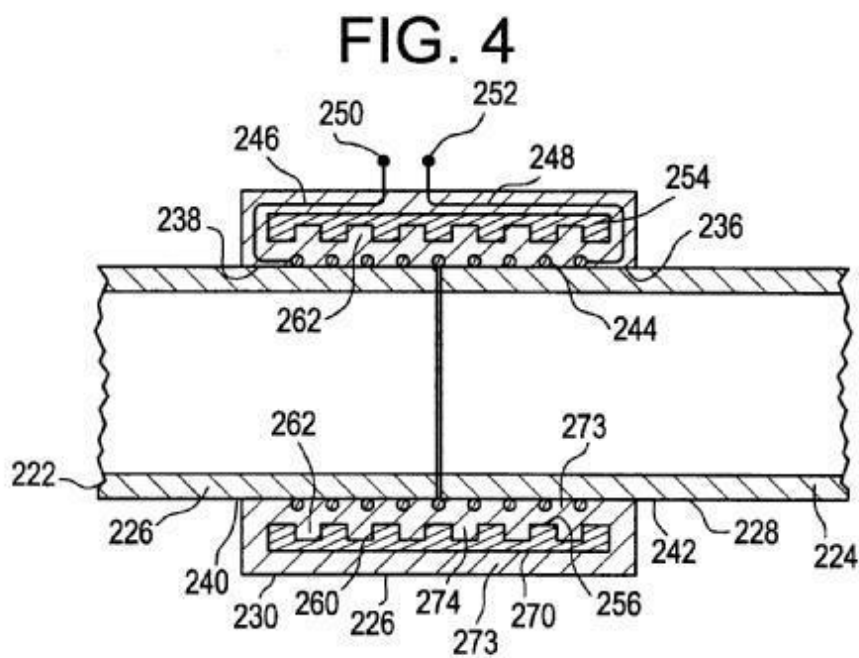
Definition statement

DE9208024U:



Example 2, from

WO0106168:

**B29C 66/52296**

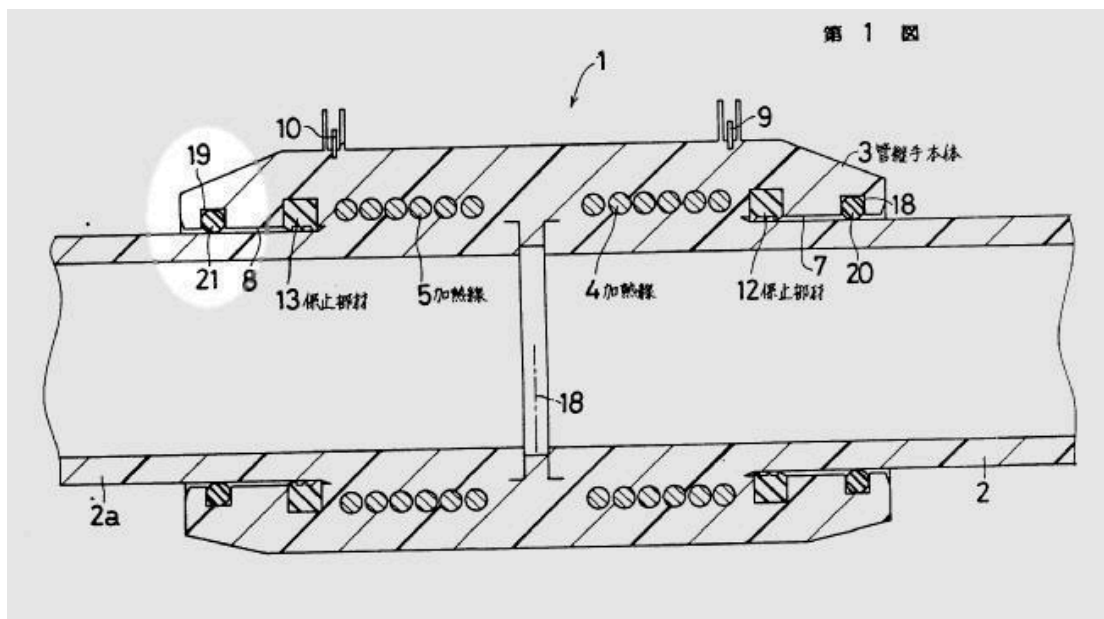
{said socket comprising sealing elements, e.g. gaskets}

**Definition statement***This place covers:*

Example 1, from

Definition statement

JP4171392:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Sealing elements in general	<a href="#">F16J 15/00</a>
-----------------------------	----------------------------

## B29C 66/52297

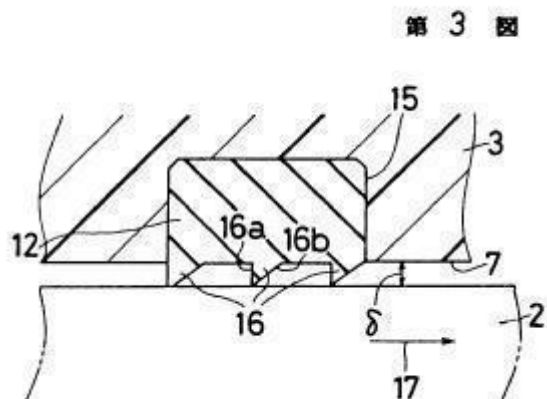
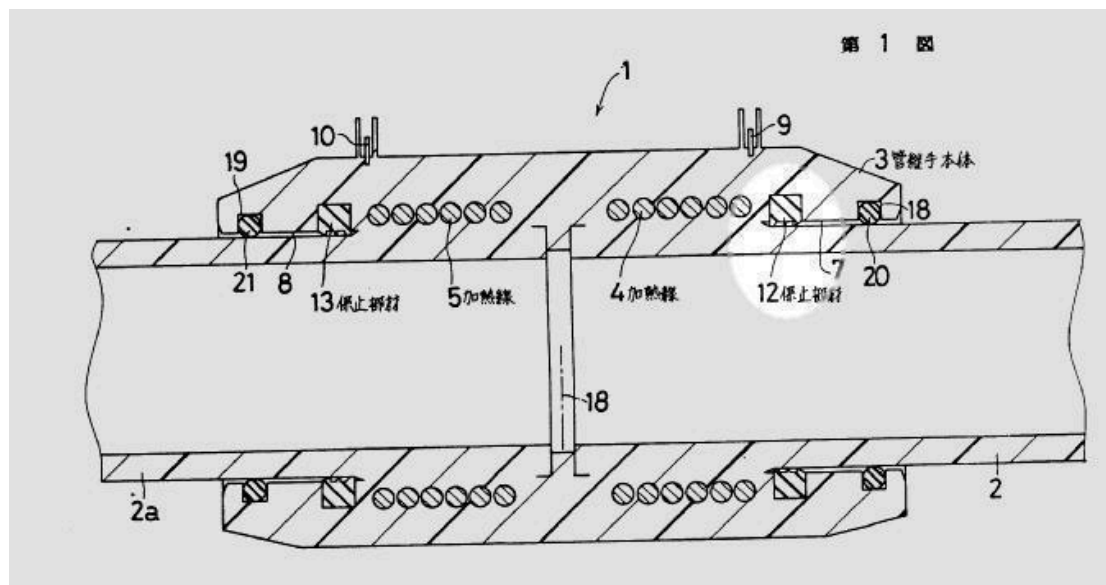
{said socket comprising slip-off prevention means ([B29C 66/52296](#) takes precedence)}

## Definition statement

This place covers:

Example 1, from

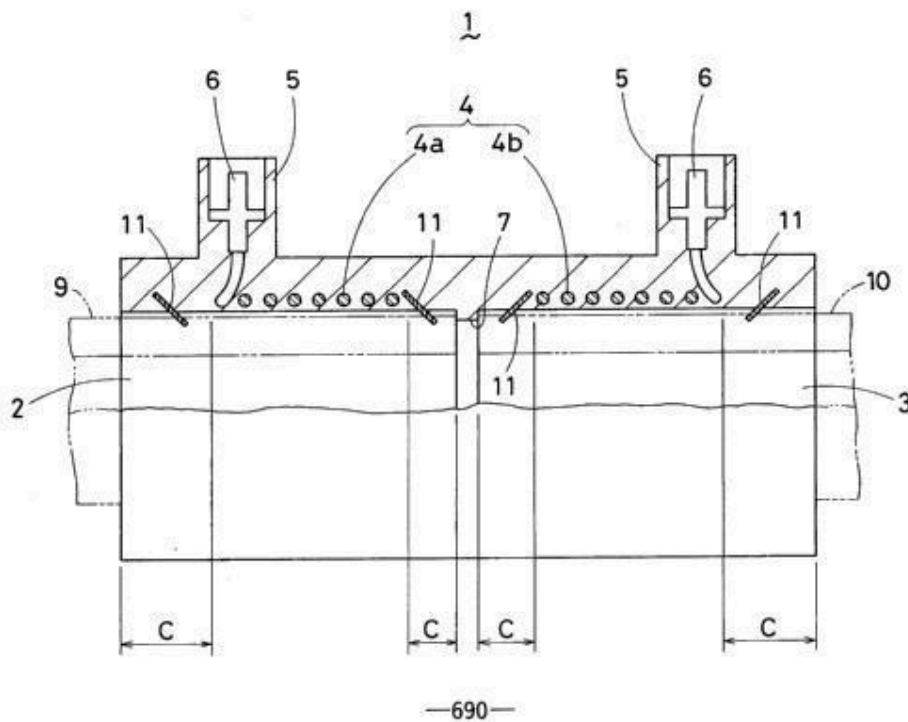
JP4171392:



Example 2, from

Definition statement

JP4191592:

**B29C 66/52298**

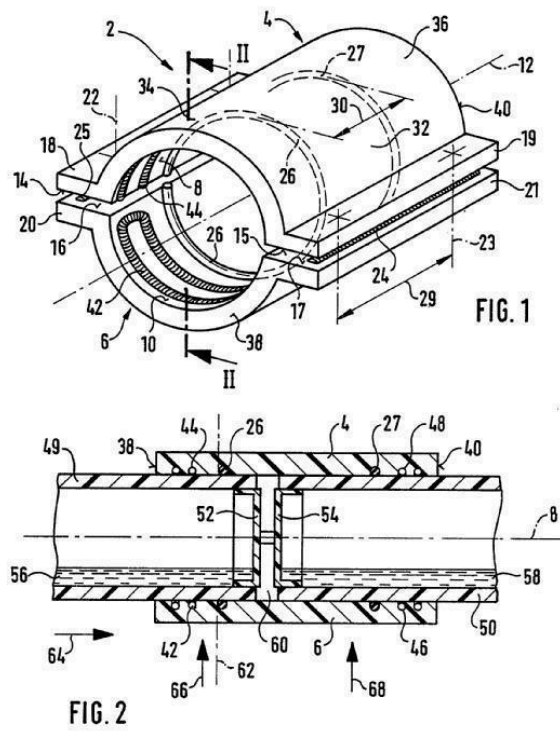
{said socket being composed by several elements}

**Definition statement***This place covers:*

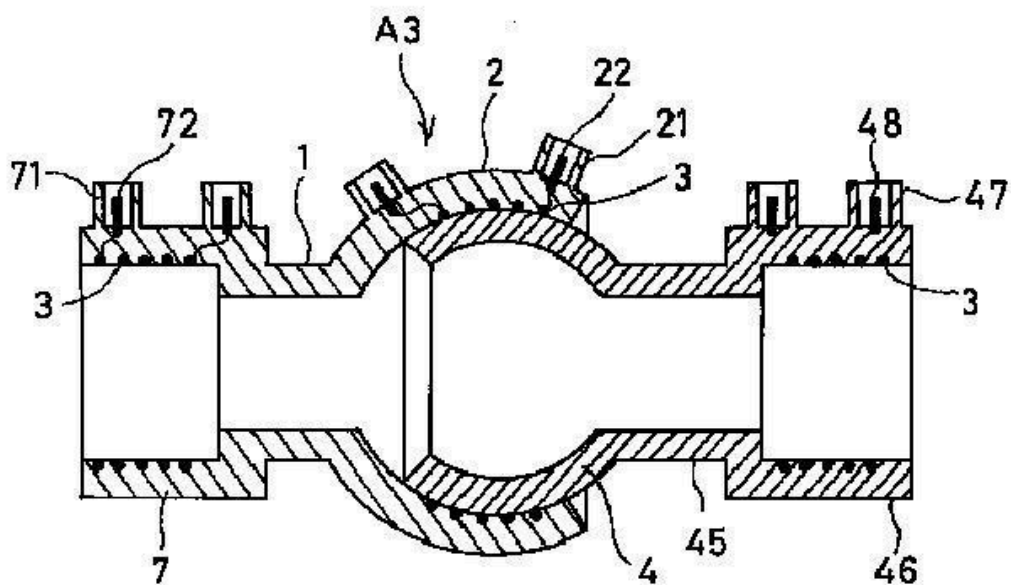
Example 1, from



DE19519341:



Example 2, from  
JP5240394:



**B29C 66/5241**

{for forming coaxial connections, i.e. the profiled elements to be joined forming a zero angle relative to each other}

**Definition statement**

*This place covers:*

Example 1, from

WO0189811:

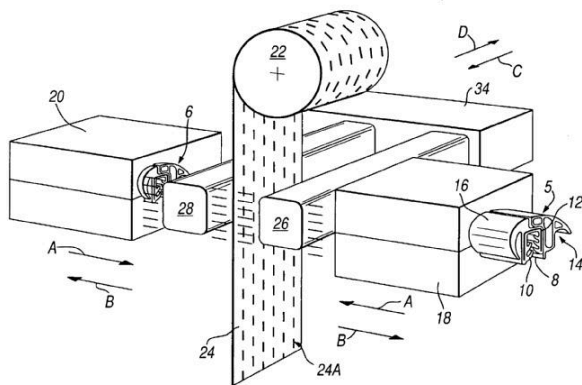


Fig. 1

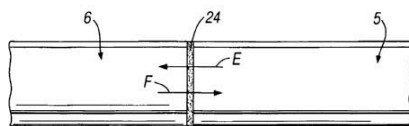


Fig. 2

**B29C 66/5243**

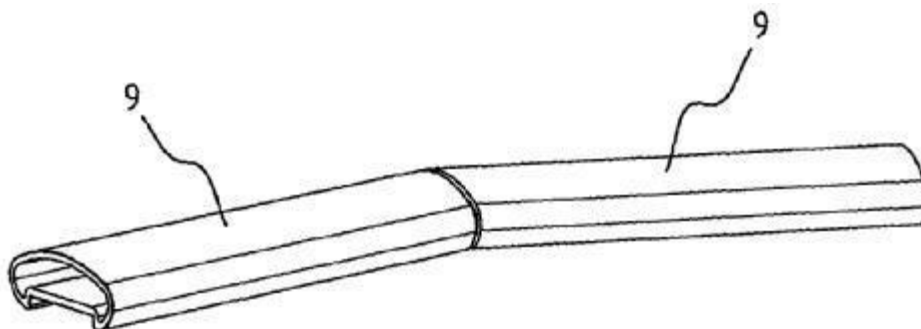
{for forming corner connections, e.g. for making window frames or V-shaped pieces (welded corner joints for window frames [E06B 3/9604](#))}

**Definition statement**

*This place covers:*

Example 1, from

EP2233391:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Welded corner joints for windows, doors, or the like frames or wings	<a href="#">E06B 3/9604</a>
--	-----------------------------

## B29C 66/52431

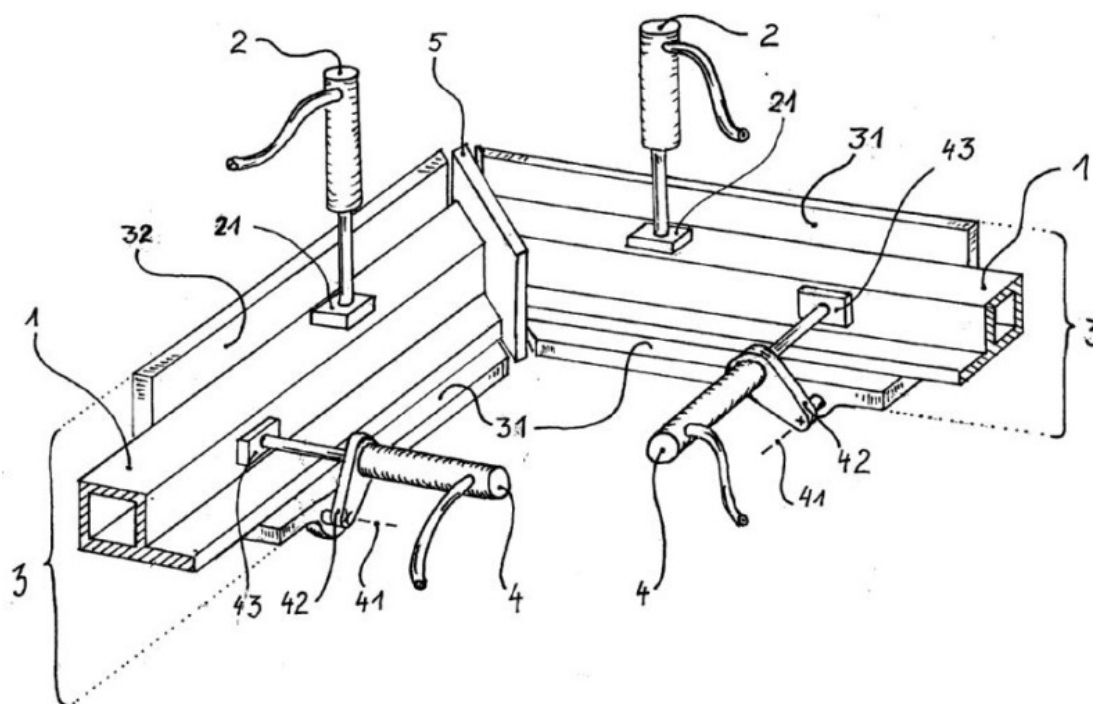
{with a right angle, e.g. for making L-shaped pieces}

### Definition statement

This place covers:

Example 1, from

DE102007055393:



**B29C 66/5244**

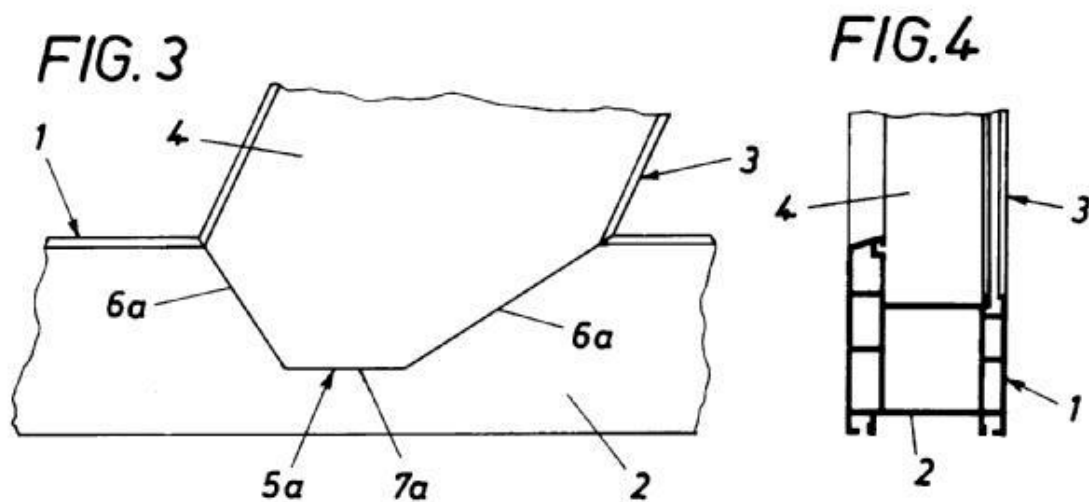
{for forming fork-shaped connections, e.g. for making window frames or Y-shaped pieces}

**Definition statement**

*This place covers:*

Example 1, from

FR2712345:

**B29C 66/52441**

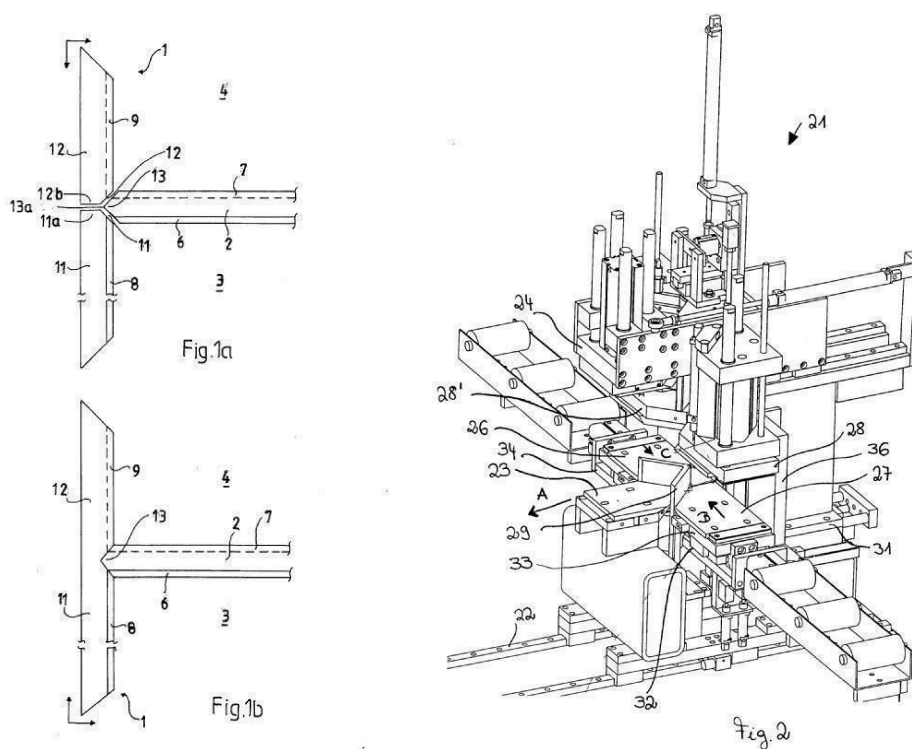
{with two right angles, e.g. for making T-shaped pieces}

**Definition statement**

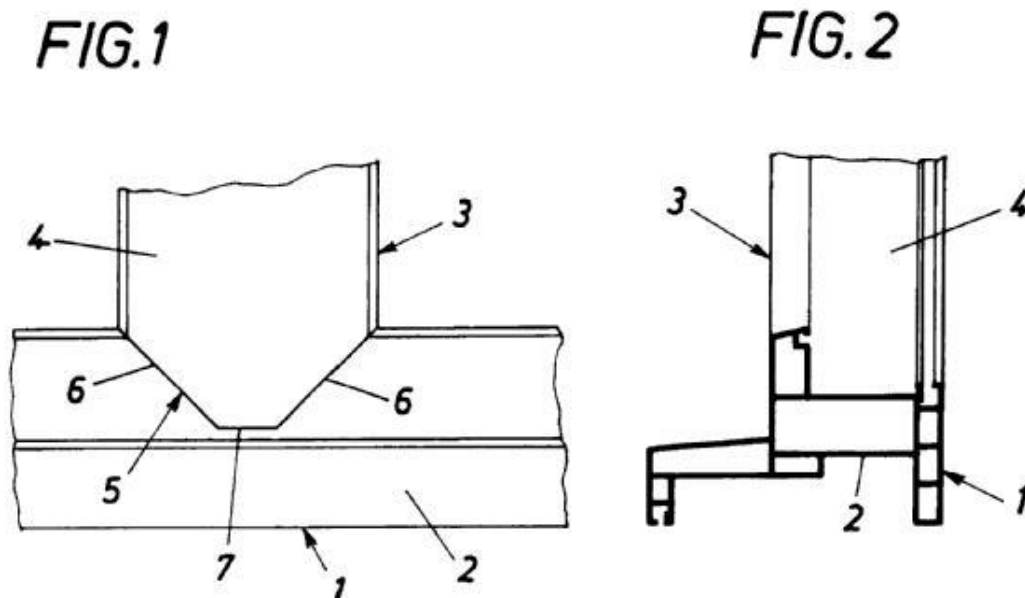
*This place covers:*

Example 1, from

DE20206377U:



Example 2, from  
FR2712345:



**B29C 66/52451**

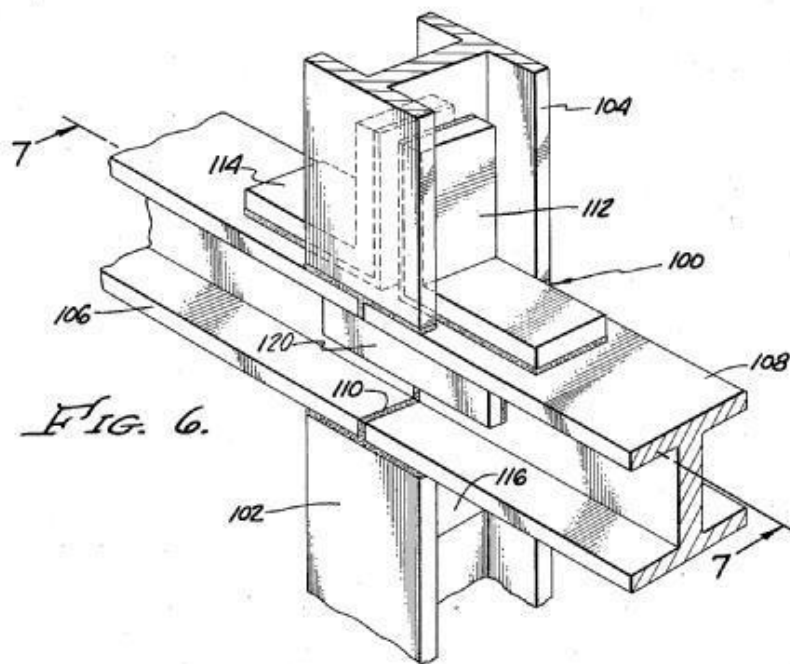
**{with four right angles, e.g. for making +-shaped pieces}**

## Definition statement

*This place covers:*

Example 1, from

US3707062:



**B29C 66/53243**

**{said spouts comprising flanges}**

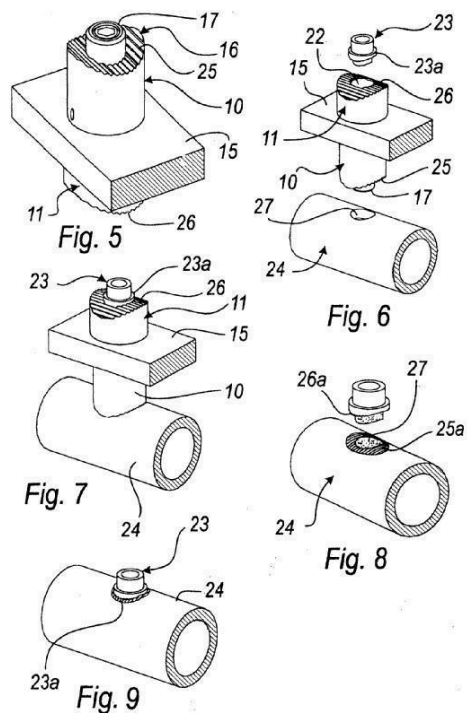
### Definition statement

*This place covers:*

Example 1, from

Definition statement

EP1314539:

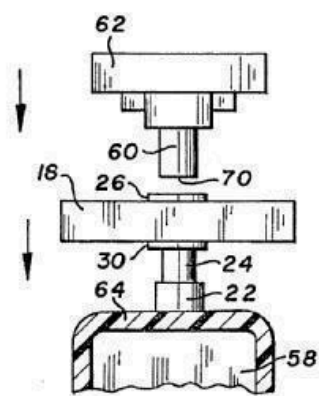
**B29C 66/53246**

{said single elements being spouts, e.g. joining spouts to containers}

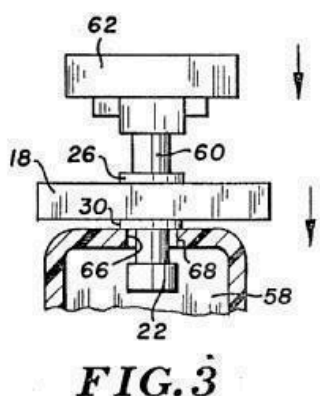
**Definition statement***This place covers:*

Example 1, from

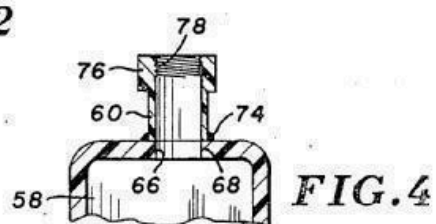
US4872935:



**FIG. 2**



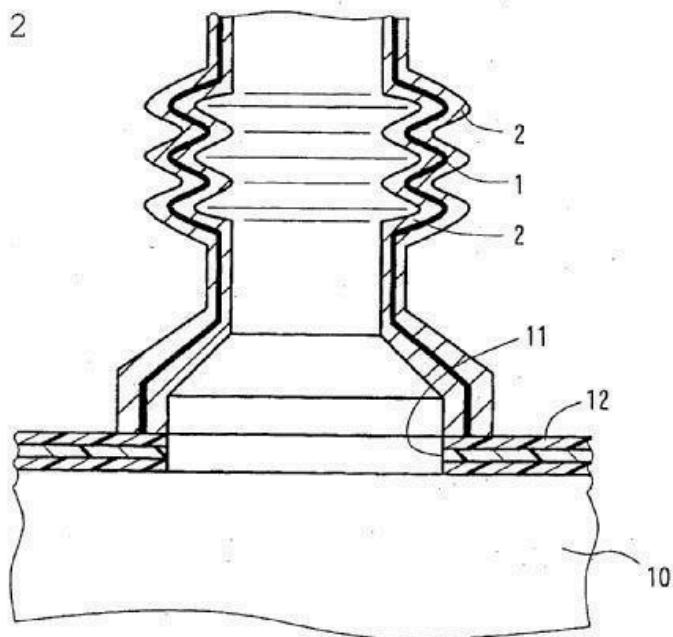
**FIG. 3**



**FIG. 4**

Example 2, from  
EP1939509:

Fig. 2





## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Applying rigid valves, spouts, filling tubes to box, carton, envelope or bag	<a href="#">B31B 50/84</a> , <a href="#">B31B 70/844</a>
Fuel tank inlets	<a href="#">B60K 15/04</a>
Applying or incorporating rigid fittings, e.g. discharge spouts, to containers or packages	<a href="#">B65B 61/186</a>
Spouts for containers of polygonal cross-section, said spouts being formed separately from the container	<a href="#">B65D 5/746</a>

## B29C 66/53247

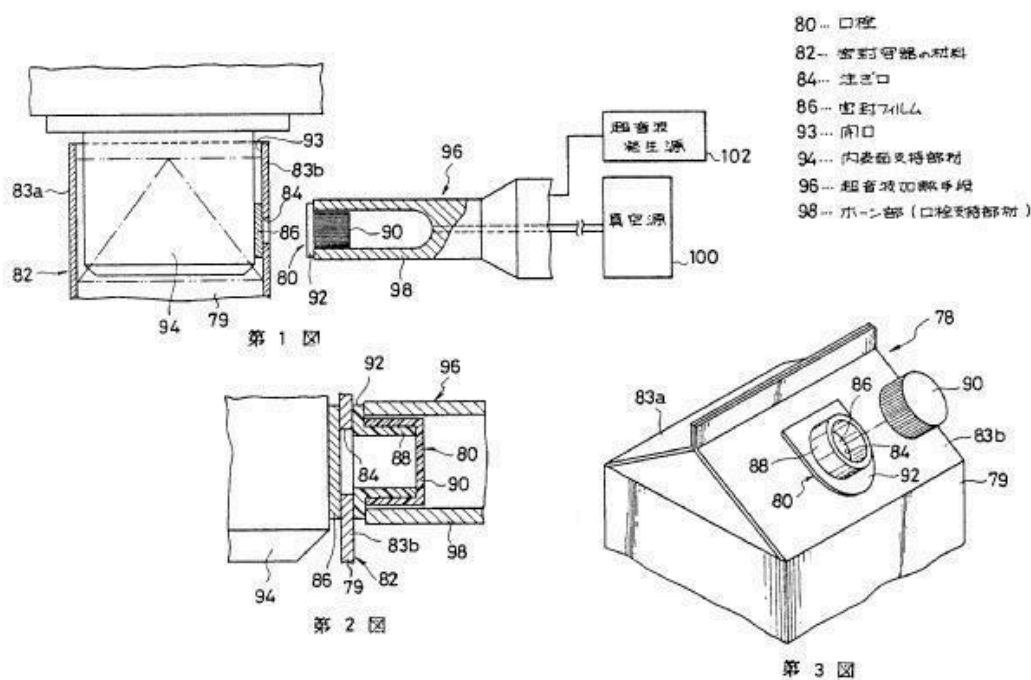
{said spouts comprising flanges}

### Definition statement

This place covers:

Example 1, from

JP63237935:



## B29C 66/53261

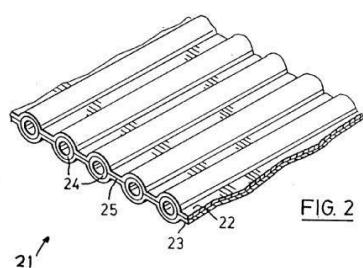
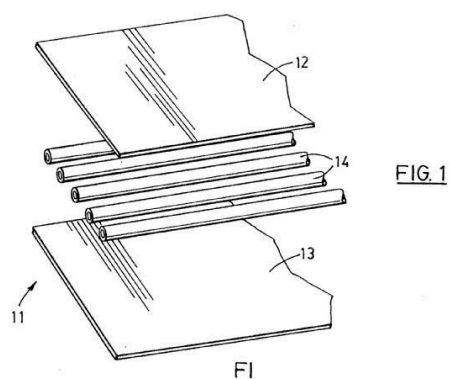
{Enclosing tubular articles between substantially flat elements}

### Definition statement

This place covers:

Example 1, from

EP0572187:



## **B29C 66/53262**

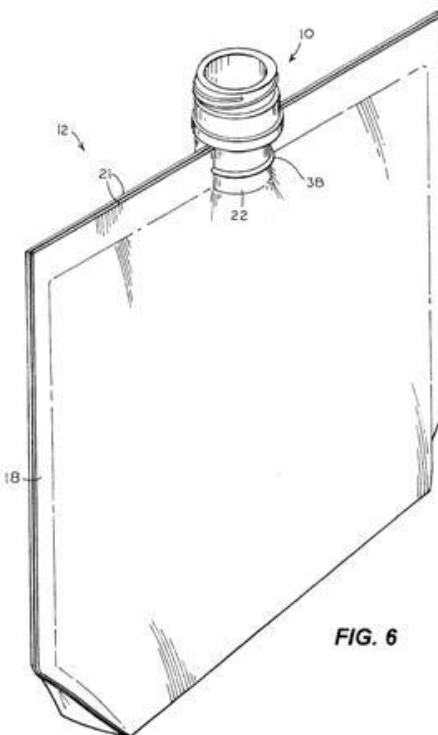
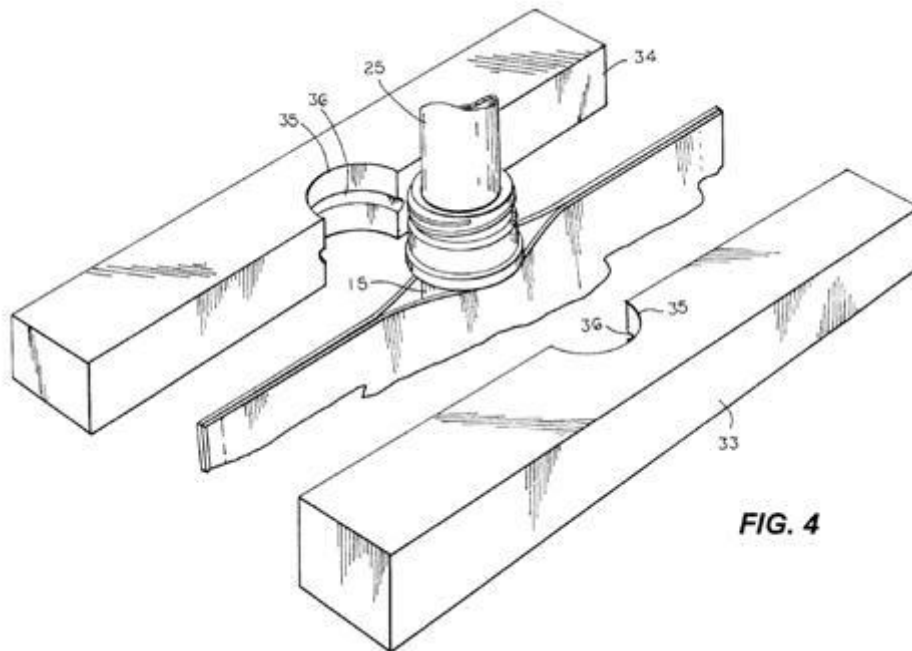
{Enclosing spouts between the walls of bags, e.g. of medical bags}

### **Definition statement**

*This place covers:*

Example 1, from

US5855544



## B29C 66/53263

{said spouts comprising wings, e.g. said spouts being of ship-like or canoe-like form to avoid leaks in the corners}

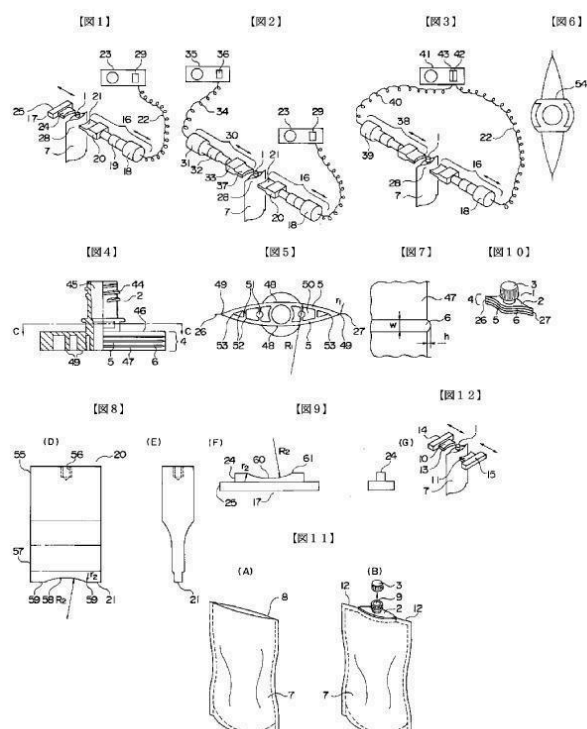
### Definition statement

*This place covers:*

Example 1, from

## Definition statement

JP7323478:

**B29C 66/534**

{Joining single elements to open ends of tubular or hollow articles or to the ends of bars}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Joining a shaft and a balloon for making balloon catheters	<a href="#">A61M 25/1034</a>
--	------------------------------

**B29C 66/5344**

{said single elements being substantially annular, i.e. of finite length, e.g. joining flanges to tube ends ([B29C 66/5346](#) takes precedence)}

**Definition statement**

This place covers:

Example 1, from

CH701363:

FIG. 4

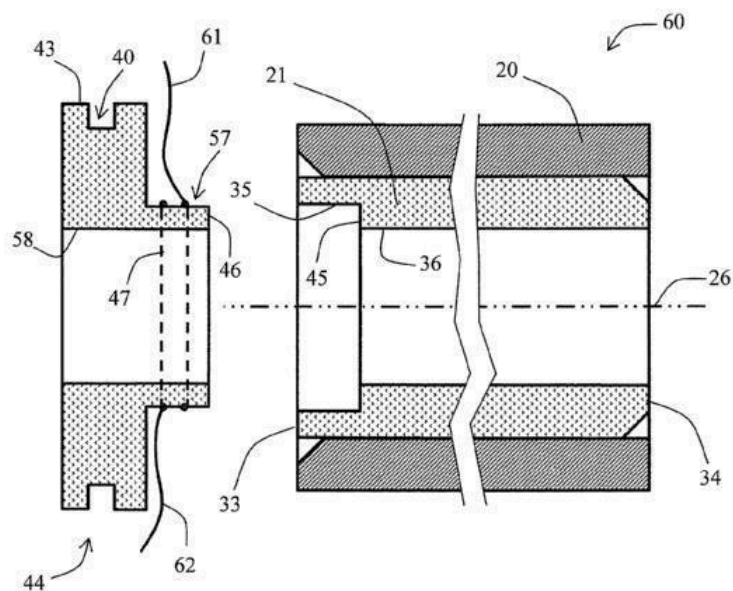
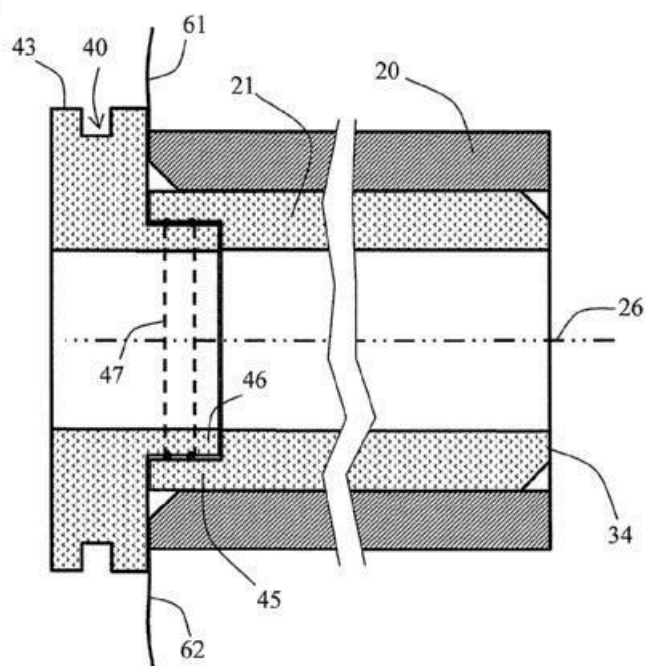


FIG. 5



**B29C 66/53461**

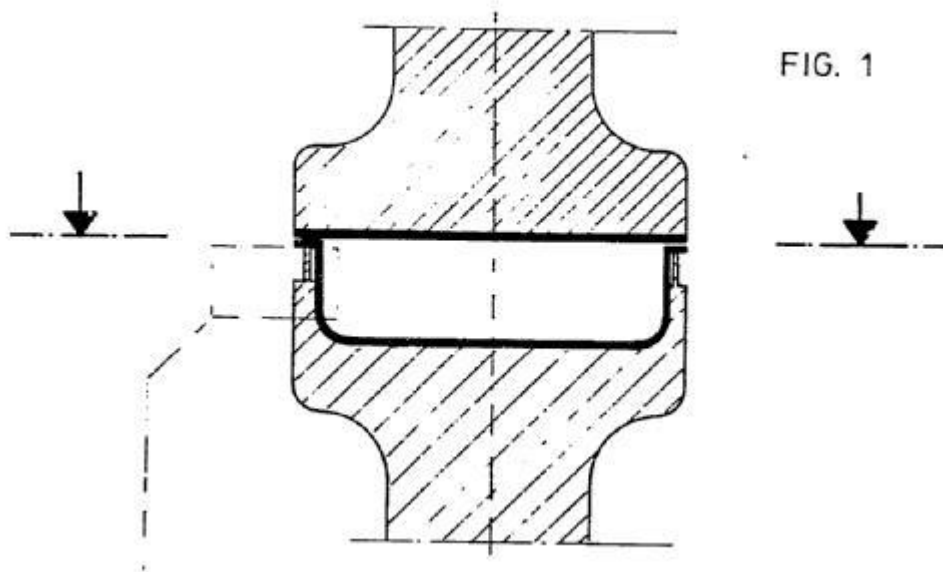
{joining substantially flat covers and/or substantially flat bottoms to open ends of container bodies}

**Definition statement**

*This place covers:*

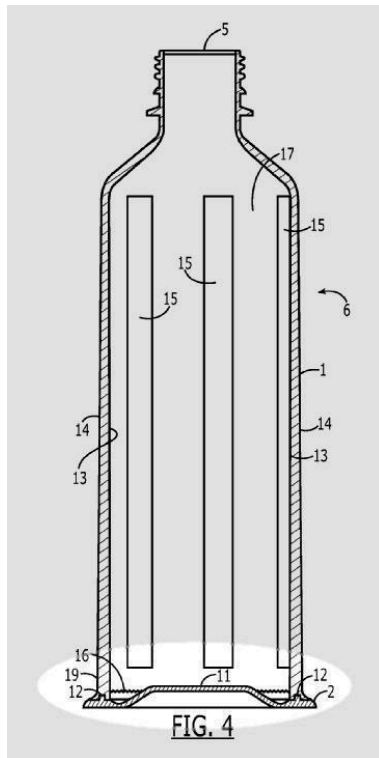
Example 1, from

DE8716157U:



Example 2, from

WO2010105076:



## References

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Closing semi-rigid or rigid containers or receptacles after filling, by feeding web material to securing means and securing by heat-sealing	<a href="#">B65B 7/164</a>
Closing semi-rigid or rigid containers or receptacles after filling, by applying separate preformed closures, e.g. lids, covers, securing said closures on said containers by heat-sealing	<a href="#">B65B 7/2878</a>

**B29C 66/53462**

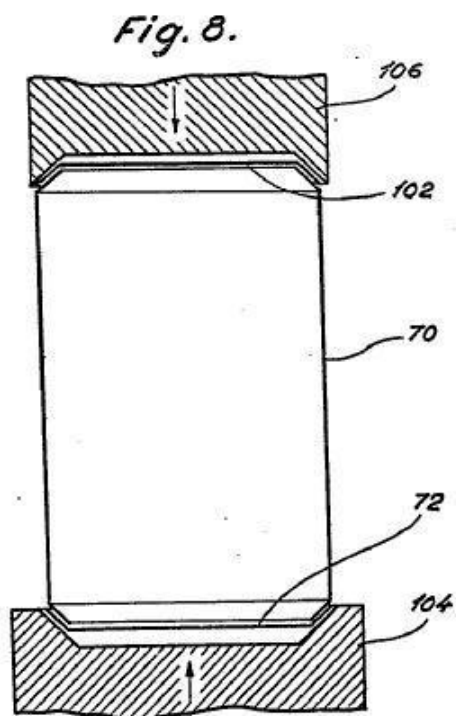
**{joining substantially flat covers and substantially flat bottoms to open ends of container bodies}**

### Definition statement

*This place covers:*

Example 1, from

GB998124:



## B29C 66/53465

{said single flat elements being provided with holes facing the tube ends, e.g. for making heat-exchangers}

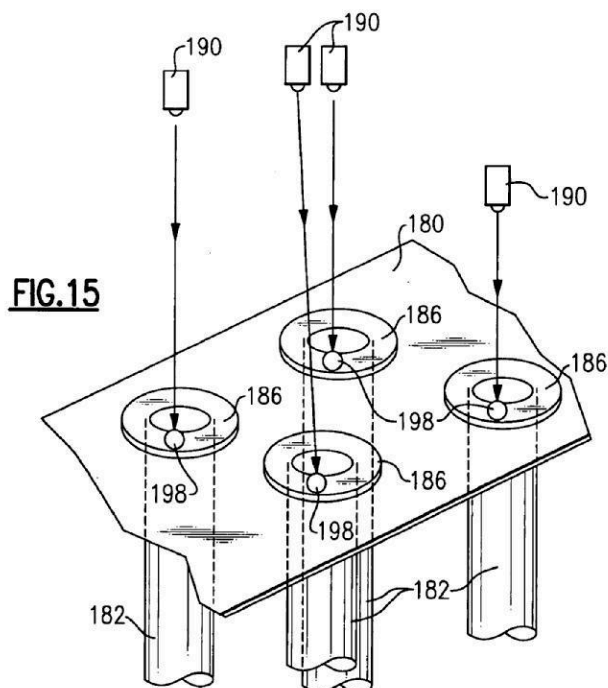
### Definition statement

*This place covers:*

Example 1, from



US2007131401:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Heat-exchanger arrangements for sealing elements into end plates by welding, at least one of the parts being non-metallic, e.g. heat-sealing plastic elements
---

<a href="#">F28F 9/187</a>
----------------------------

## B29C 66/54

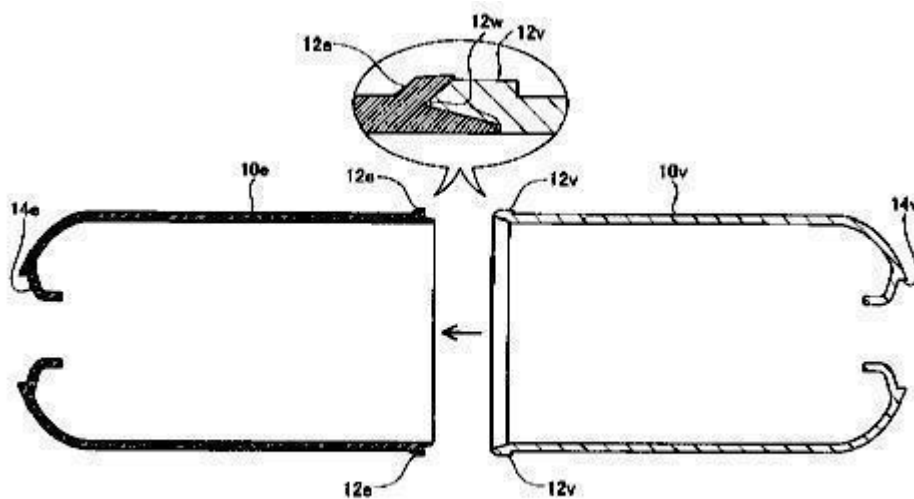
{Joining several hollow-preforms, e.g. half-shells, to form hollow articles, e.g. for making balls, containers; Joining several hollow-preforms, e.g. half-cylinders, to form tubular articles}

## Definition statement

This place covers:

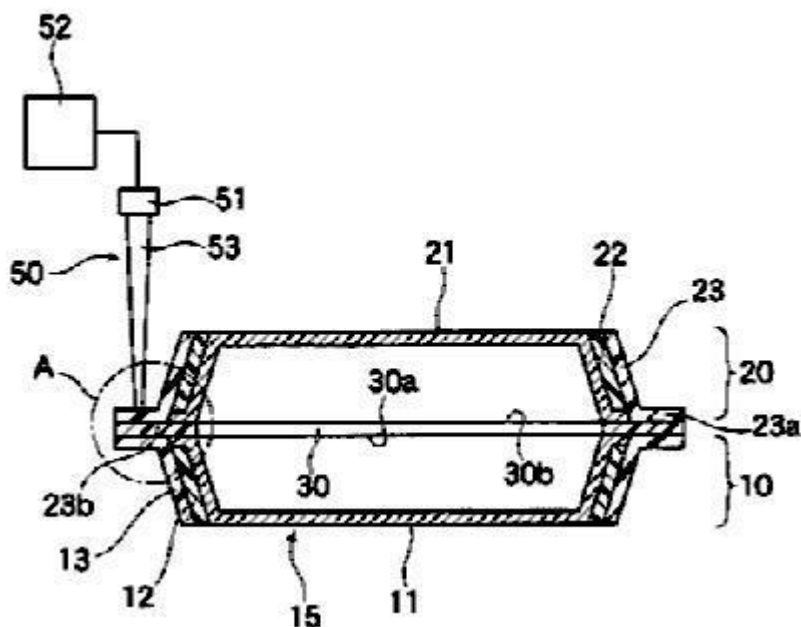
Example 1, from

JP2010111036:



Example 2, from

JP2009285929:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Manufacturing and assembling intake systems, by joining multiple sections together by welding, bonding or the like

[F02M 35/1036](#)

**B29C 66/5412**

{said substantially flat extra element being flexible, e.g. a membrane  
([B29C 66/5416](#) takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

US2009212460:

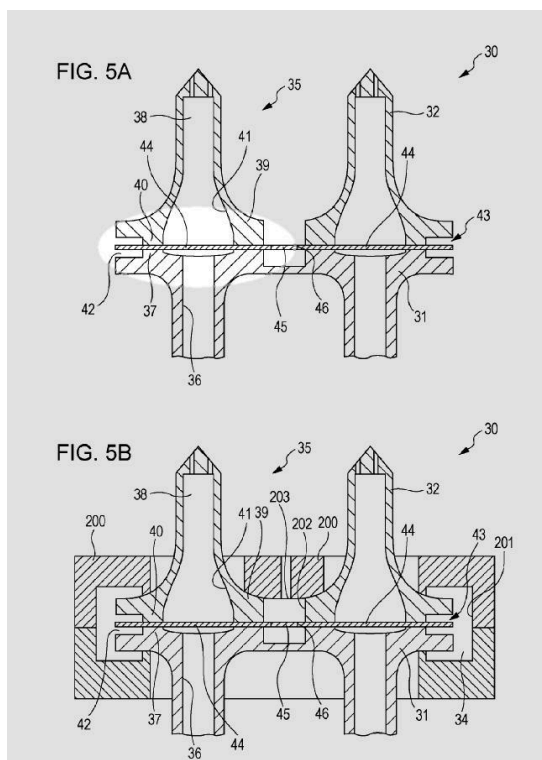
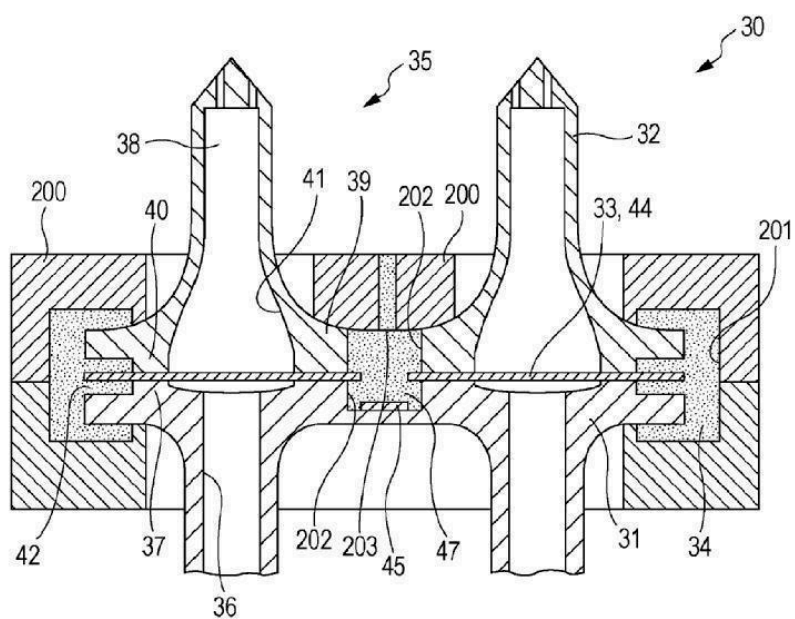


FIG. 6



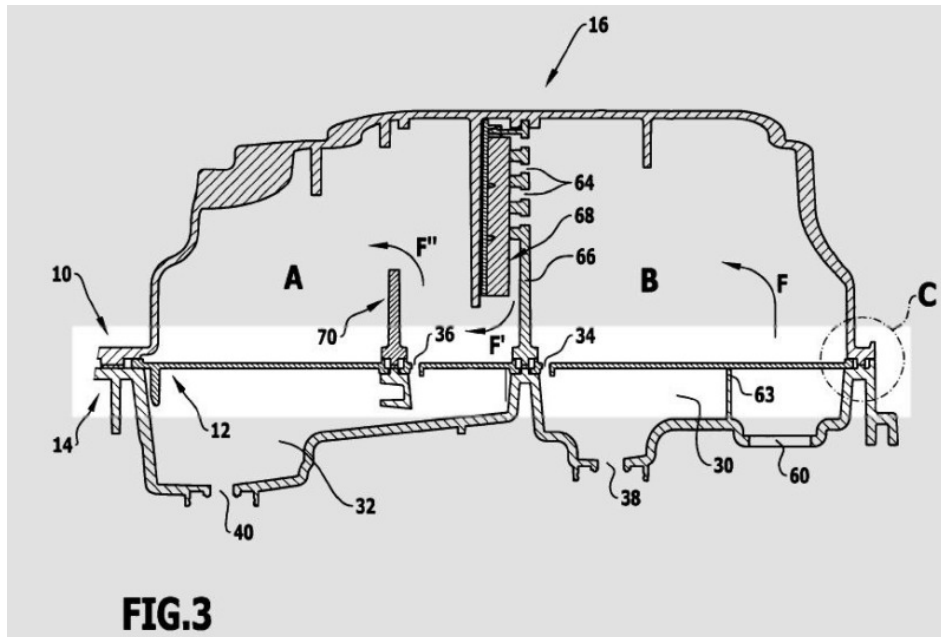
**B29C 66/5414**

{said substantially flat extra element being rigid, e.g. a plate ([B29C 66/5416](#) takes precedence)}

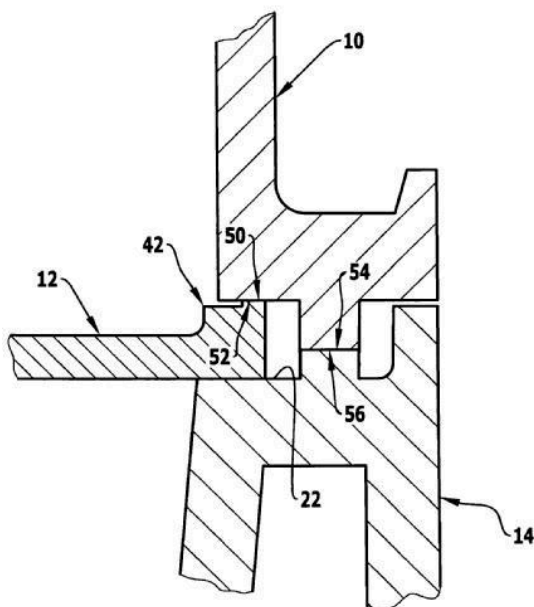
**Definition statement**

*This place covers:*

Example 1, from



EP2153977:



**B29C 66/5416**

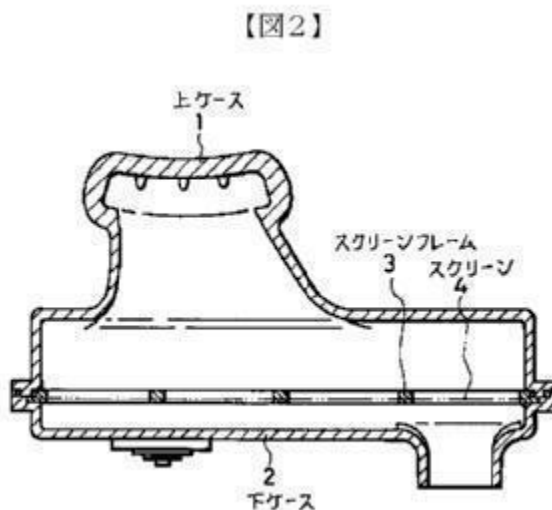
{said substantially flat extra element being perforated, e.g. a screen}

**Definition statement**

*This place covers:*

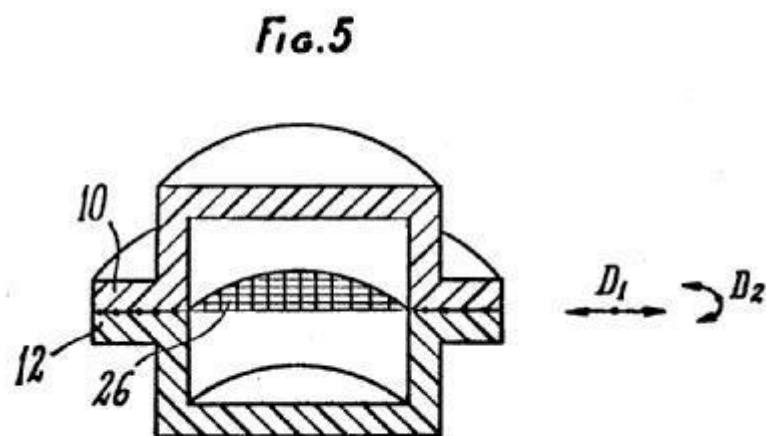
Example 1, from

JP5212795:



Example 2, from

FR2276160:



**B29C 66/543**

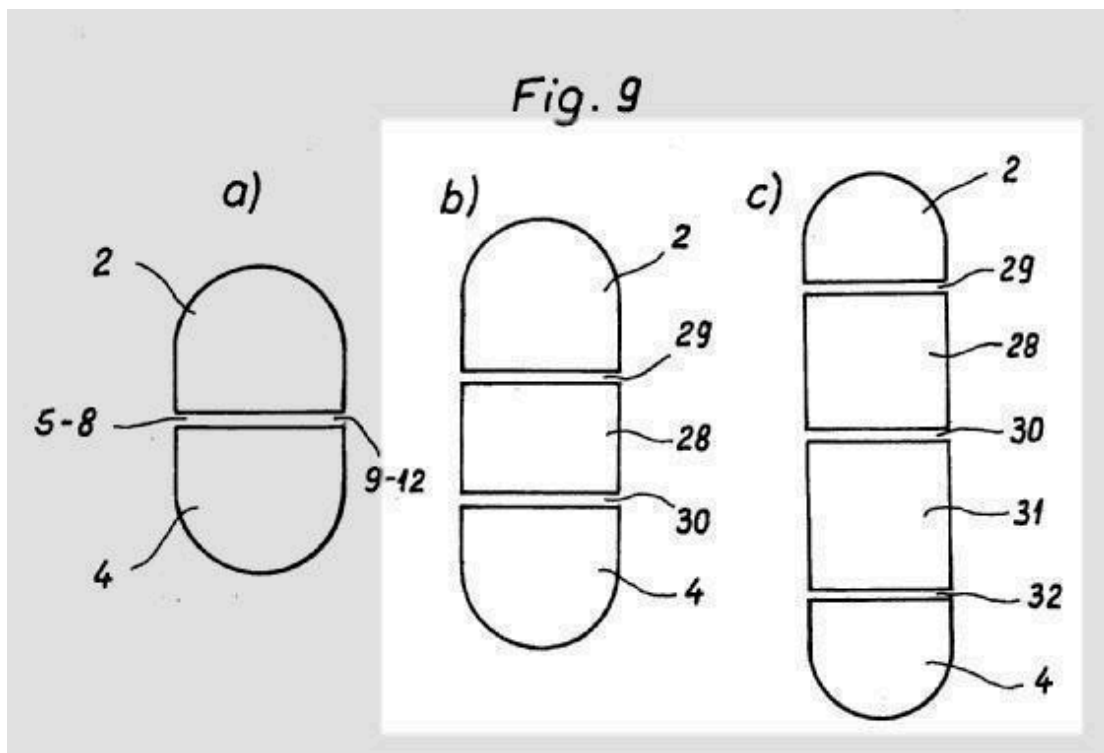
{joining more than two hollow-preforms to form said hollow articles}

**Definition statement**

*This place covers:*

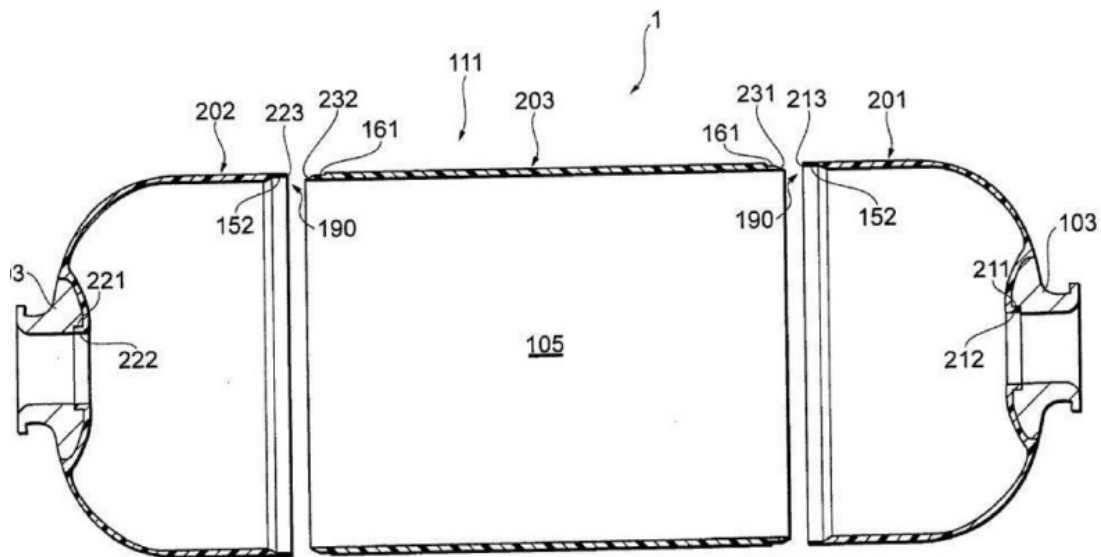
Example 1, from

DE10216175:



Example 2, from

US2008187697:



## B29C 66/545

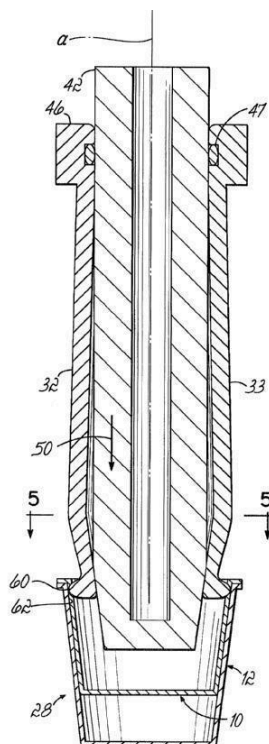
{one hollow-preform being placed inside the other}

### Definition statement

*This place covers:*

Example 1, from

US2009173043:





**B29C 66/547**

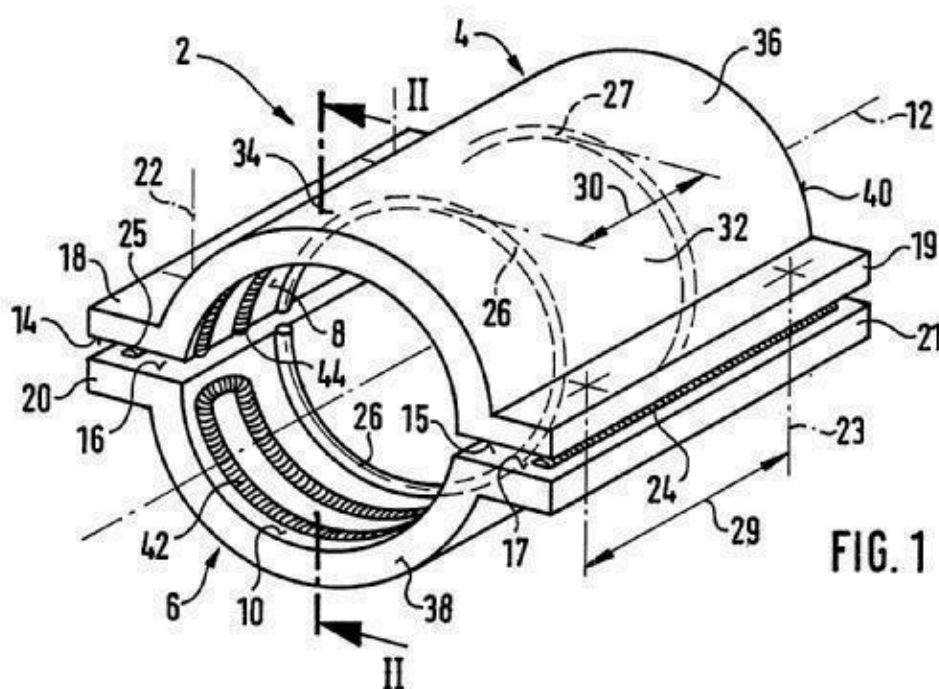
{Joining several hollow-preforms, e.g. half-cylinders, to form tubular articles, e.g. endless tubes}

**Definition statement**

*This place covers:*

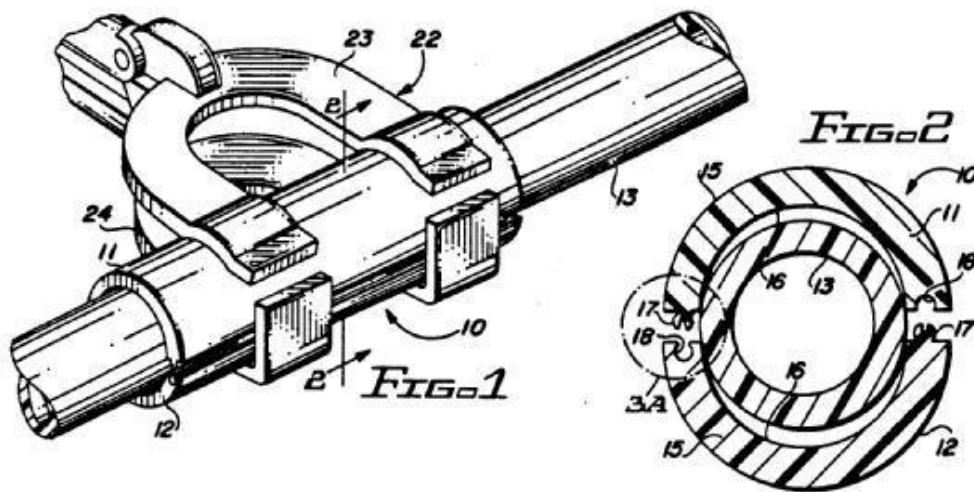
Example 1, from

DE19519341:



Example 2, from

US5007666:



## B29C 66/54721

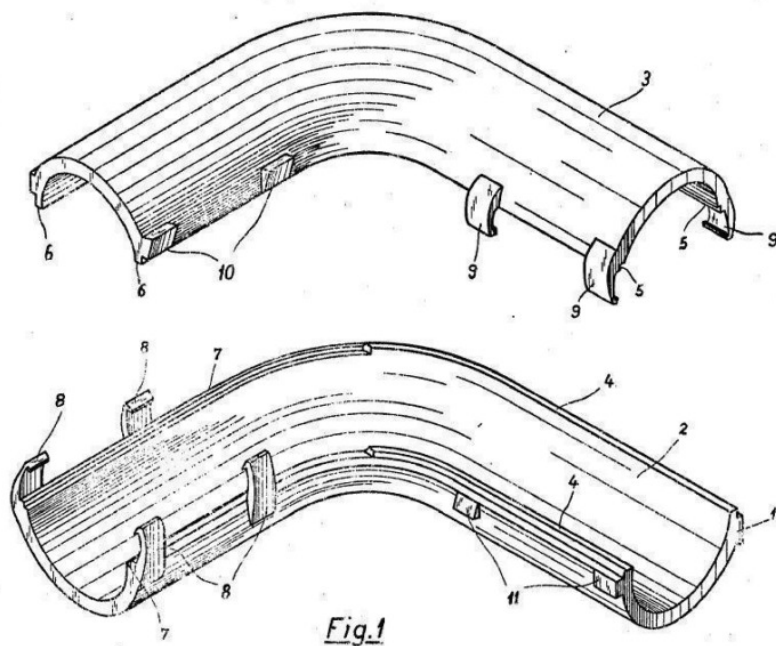
{for making L-shaped pieces}

### Definition statement

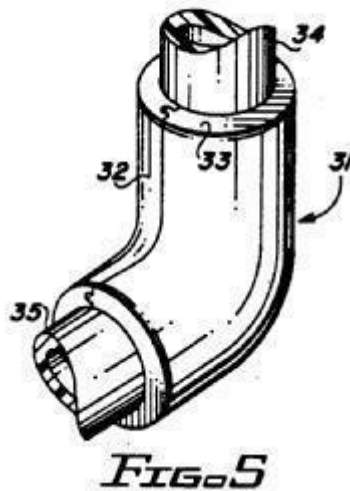
*This place covers:*

Example 1, from

FR2328315:



Example 2, from

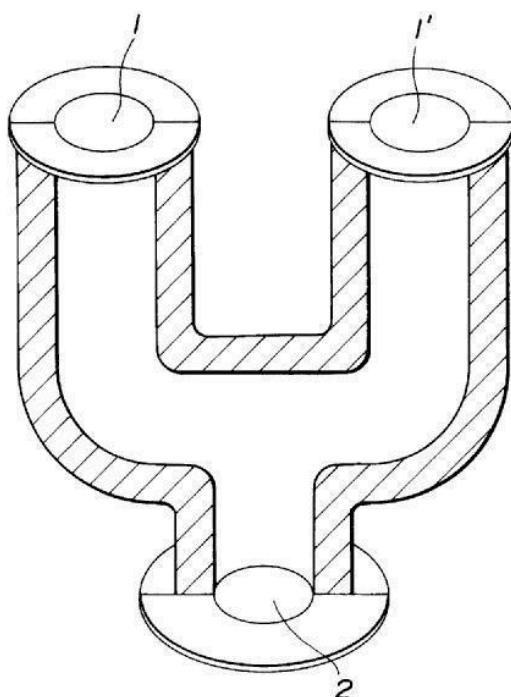


**{for making fork-shaped pieces, i.e. with 3 branches, e.g. Y-shaped pieces}**

*This place covers:*

Example 1, from

US5853831:



## B29C 66/54741

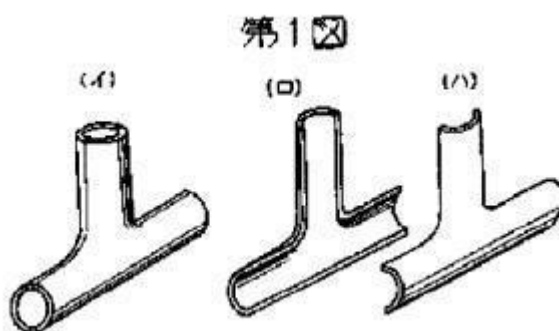
{for making T-shaped pieces}

### Definition statement

*This place covers:*

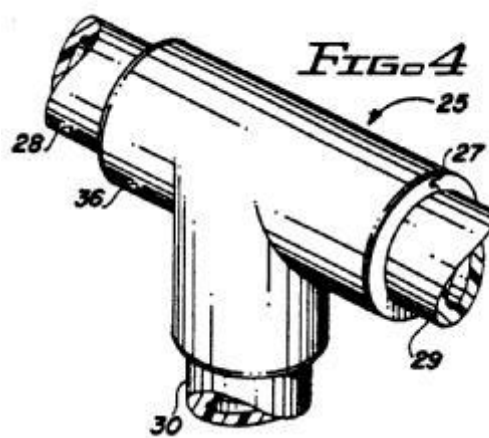
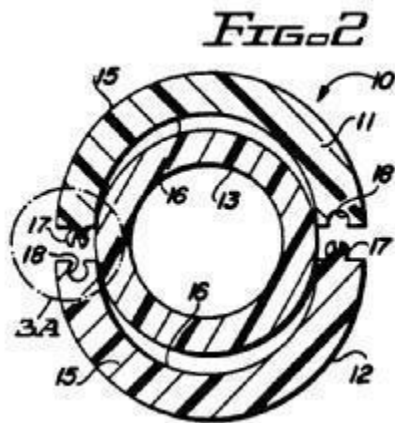
Example 1, from

JP49003836B:



Example 2, from

US5007666:



## B29C 66/54761

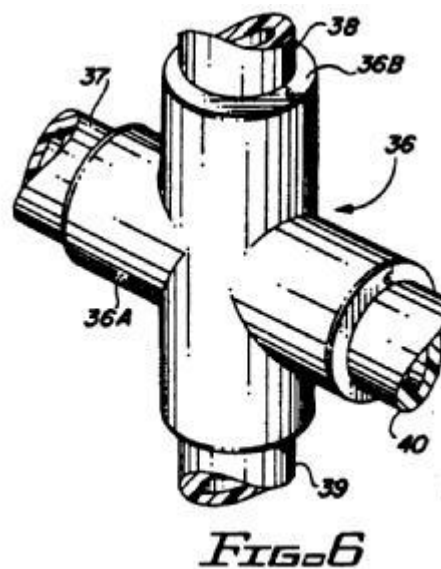
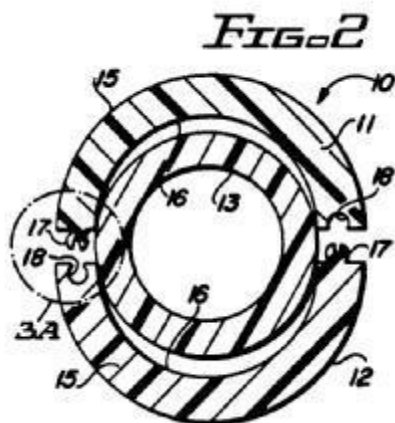
{for making +-shaped pieces}

### Definition statement

This place covers:

Example 1, from

US5007666:



**B29C 66/549**

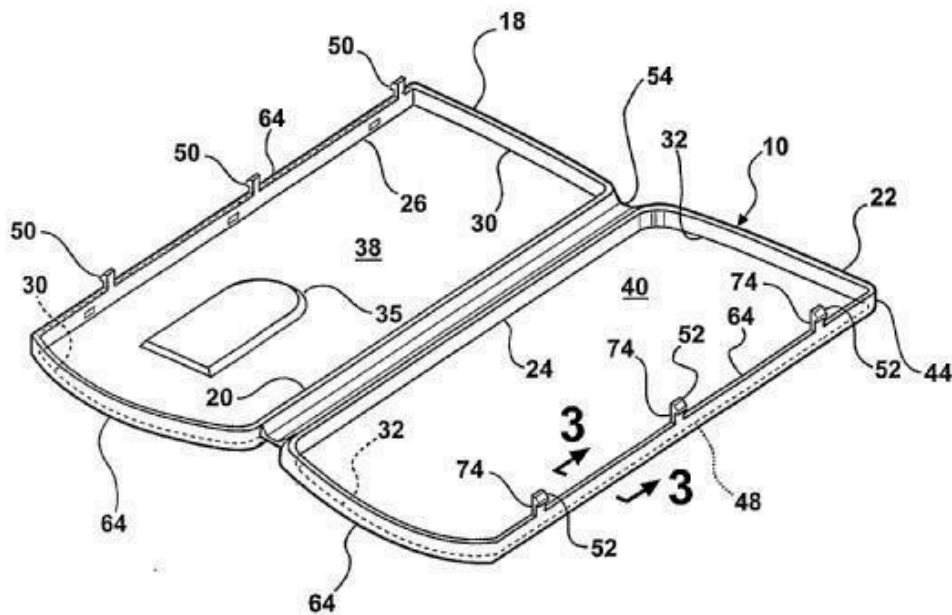
{said hollow-preforms being interconnected during their moulding process, e.g. by a hinge}

**Definition statement**

*This place covers:*

Example 1, from

WO03033286:



**FIG - 2**

**B29C 66/55**

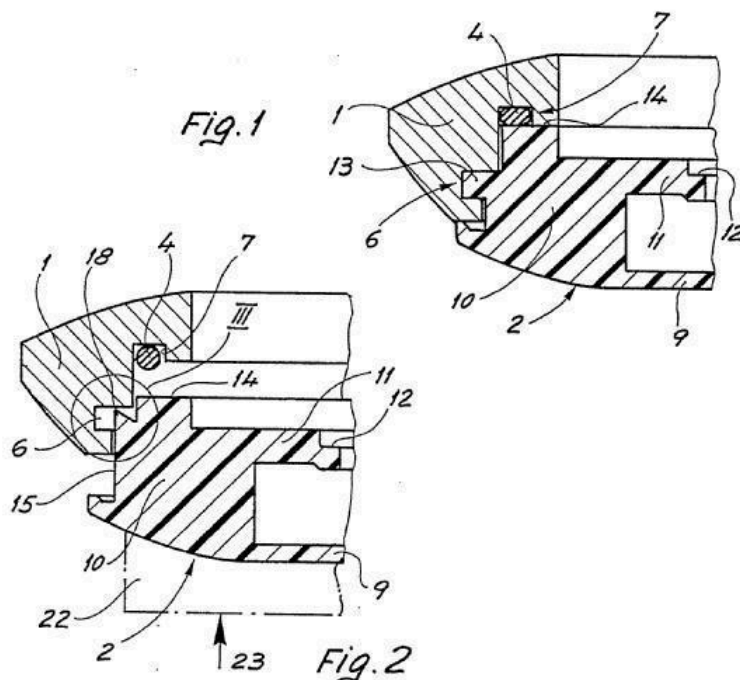
{sealing elements being incorporated into the joints, e.g. gaskets  
([B29C 66/52296](#) takes precedence)}

**Definition statement**

*This place covers:*

Example 1, from

EP0284899:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Sealing elements in general	<a href="#">F16J 15/00</a>
-----------------------------	----------------------------

## B29C 66/61

{Joining from or joining on the inside (for making tubes by bending sheets and joining from the inside [B29C 53/387](#))}

## Definition statement

This place covers:

Example 1, from



FR2944780:

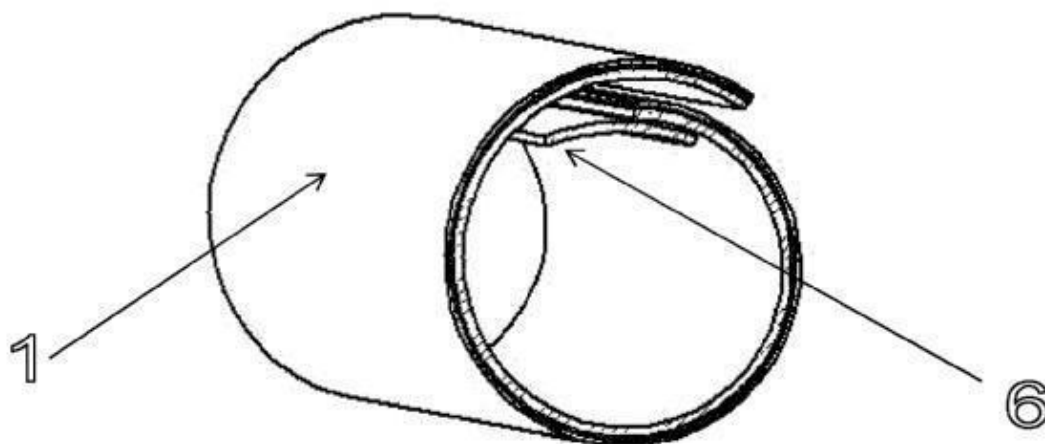
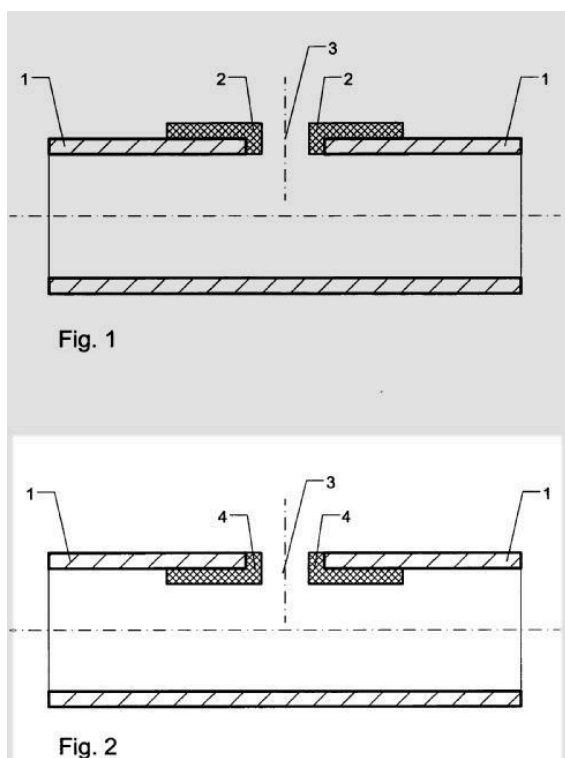


FIG. 2

Example 2, from  
EP2253876:



## References

### Informative references

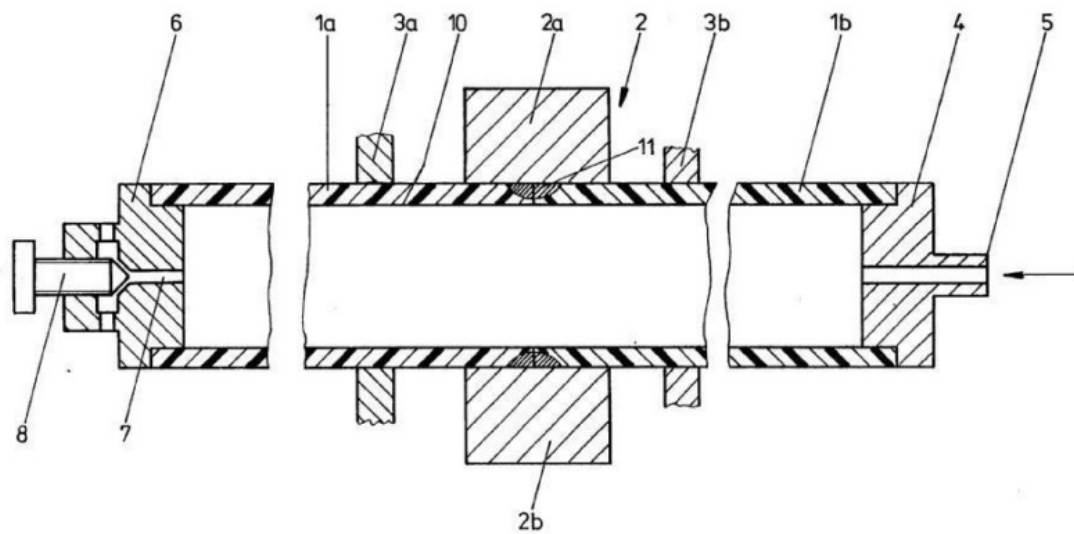
Attention is drawn to the following places, which may be of interest for search:

Lining of internal surfaces	<a href="#">B29C 63/26</a>
-----------------------------	----------------------------





EP0313732:



## B29C 66/634

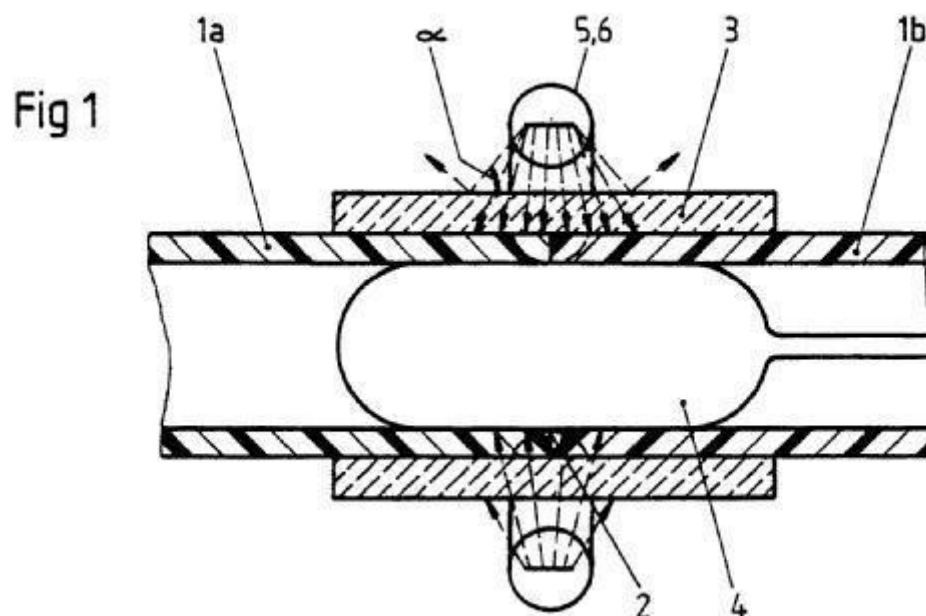
{using an inflatable core}

### Definition statement

*This place covers:*

Example 1, from

EP0415068:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Inflatable cores or mandrels	<a href="#">B29C 33/505</a>
Collapsible, e.g. inflatable, mandrels especially adapted for winding and joining	<a href="#">B29C 53/824</a>

## B29C 66/636

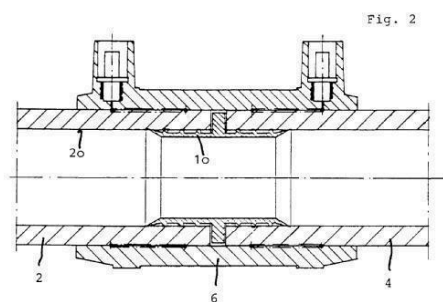
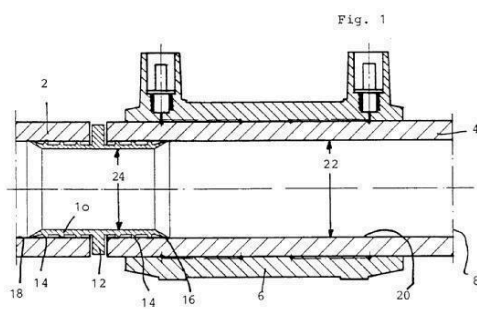
{using a support which remains in the joined object}

### Definition statement

This place covers:

Example 1, from

DE4123383:



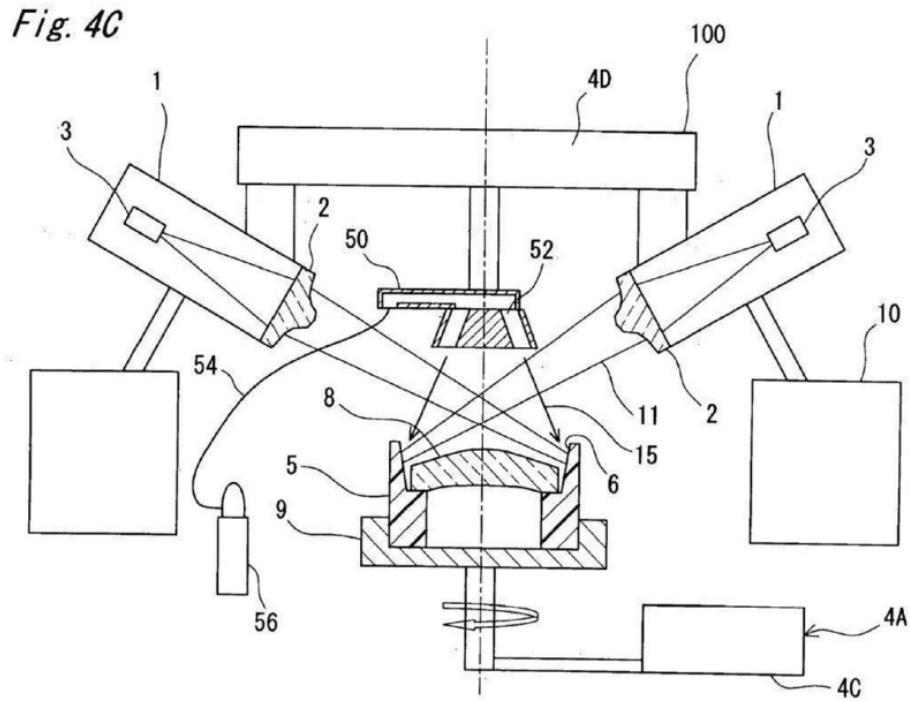
**B29C 66/65**

{with a relative motion between the article and the welding tool ([B29C 65/10](#), [B29C 65/12](#) take precedence)}

### Definition statement

*This place covers:*

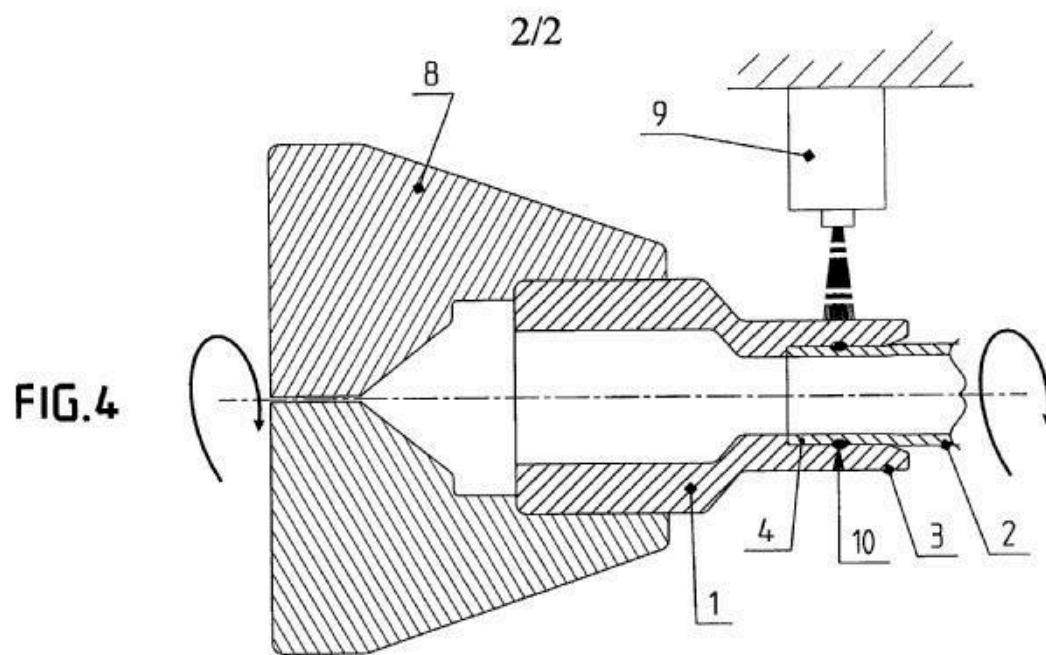
Example 1, from



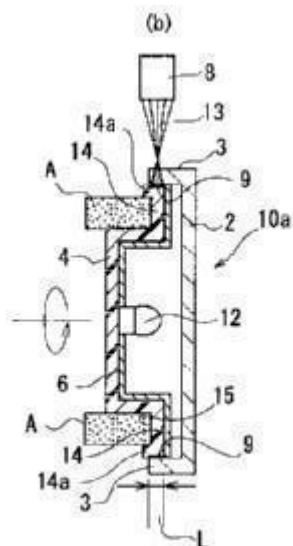
US2006043622:

Example 2, from

FR2812372:



Example 3, from  
JP2003123512:



**B29C 66/652**

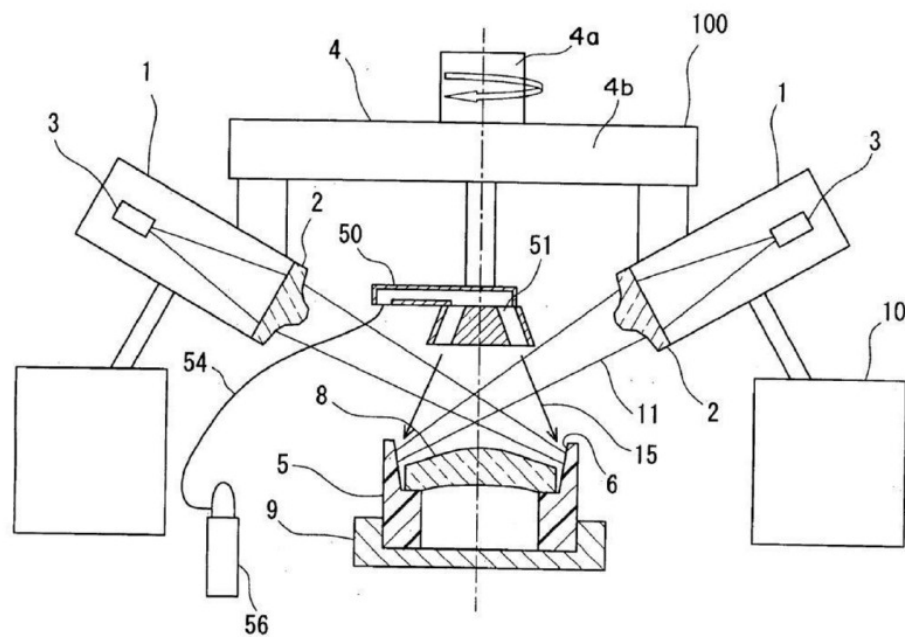
{moving the welding tool around the fixed article}

**Definition statement**

*This place covers:*

Example 1, from

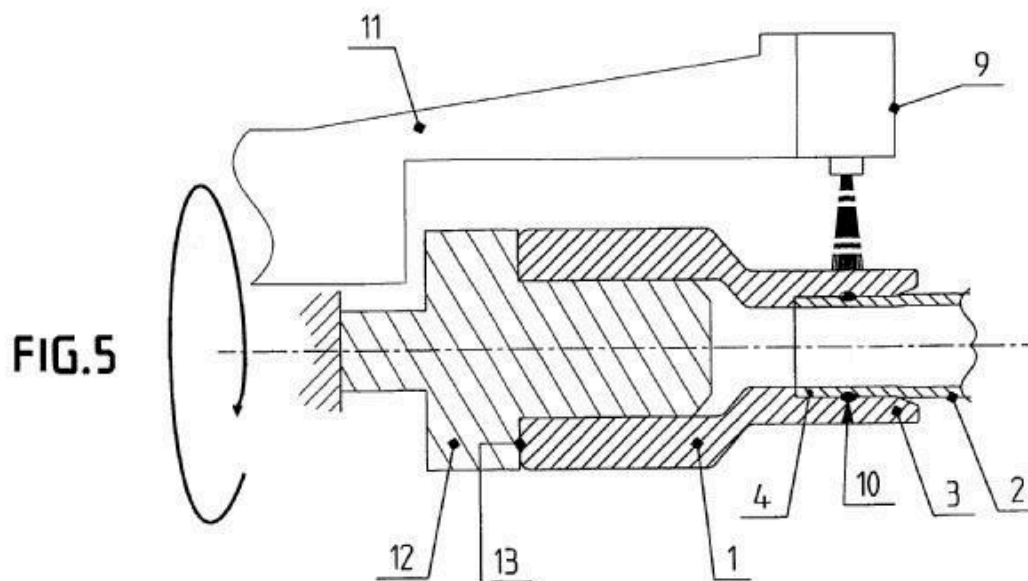
*Fig. 4A*



US2006043622:

Example 2, from

FR2812372:



## B29C 66/69

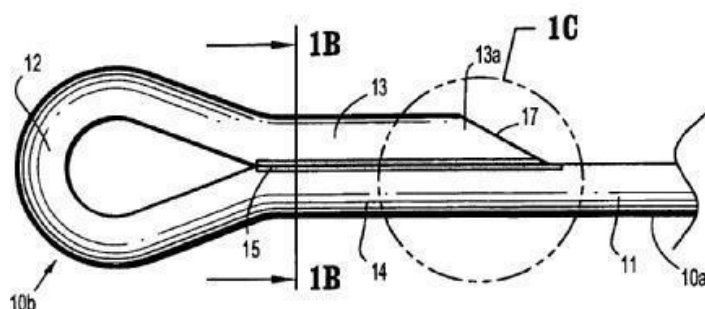
{General aspects of joining filaments (bundling articles [B65B 13/00](#); interconnecting successive lengths of material [B65H 69/00](#))}

### Definition statement

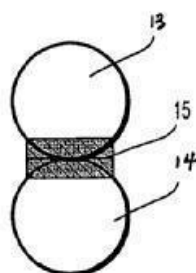
*This place covers:*

Example 1, from

EP2168755:



**FIG. 1A**



**FIG. 1B**

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Making brushes by welding together bristles made of plastic materials	<a href="#">A46B 3/06</a>
Securing filiform haptic to lens body	<a href="#">A61F 2002/1686</a>
Methods of, or devices for, Interconnecting successive lengths of filamentary material by welding	<a href="#">B65H 69/08</a>
Non-woven fabrics formed wholly or mainly of staple fibres or like relatively short fibres, from fleece or layers composed of fibres without existing or potential cohesive properties, by welding together the fibres, e.g. by partially melting or dissolving	<a href="#">D04H 1/54</a>

## B29C 66/71

{characterised by the composition of the plastics material of the parts to be joined (welding bar compositions [B29C 65/125](#))}

### Special rules of classification

Combination of [B29C 66/71](#) with the relevant composition index from [B29K 2001/00](#) - [B29K 2095/00](#) is compulsory.

For instance, "characterised by the composition of the plastics material of the parts to be joined being PTFE" has to be classified as: [B29C 66/71](#); [B29K 2027/18](#).



**B29C 66/721**

{Fibre-reinforced materials ([B29C 66/729](#) takes precedence)}

**Special rules of classification**

Indexing with [B29K 2105/06](#) is optional.

**B29C 66/7212**

{characterised by the composition of the fibres}

**Special rules of classification**

Combination of [B29C 66/7212](#) with the relevant reinforcement composition index from [B29K 2201/00](#) - [B29K 2311/14](#) is compulsory.

For instance, "characterised by the composition of the fibres being carbon" has to be classified as: [B29C 66/7212](#); [B29K 2307/04](#).

**B29C 66/72141**

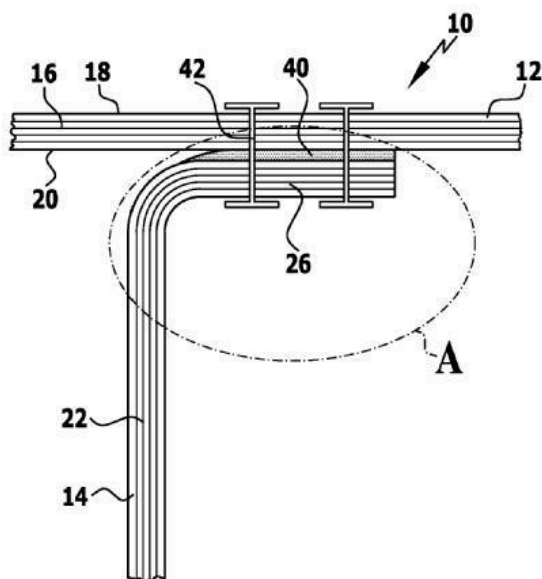
{Fibres of continuous length}

**Definition statement**

*This place covers:*

Example 1, from

EP1892079:

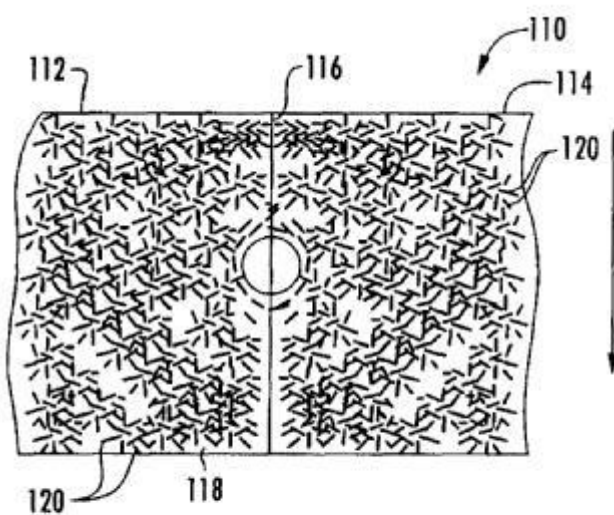
**FIG.1****Special rules of classification**

Indexing from [B29K 2105/08](#) - [B29K 2105/10](#) is optional

**B29C 66/72143****{Fibres of discontinuous lengths}****Definition statement***This place covers:*

Example 1, from

EP1941987:

**FIG. 3****Special rules of classification**Indexing from [B29K 2105/12](#) - [B29K 2105/14](#) is optional**B29C 66/723****{being multi-layered ([B29C 66/7292](#), [B29C 66/72941](#) take precedence)}****Definition statement***This place covers:*

Example 1, from

EP2092231:

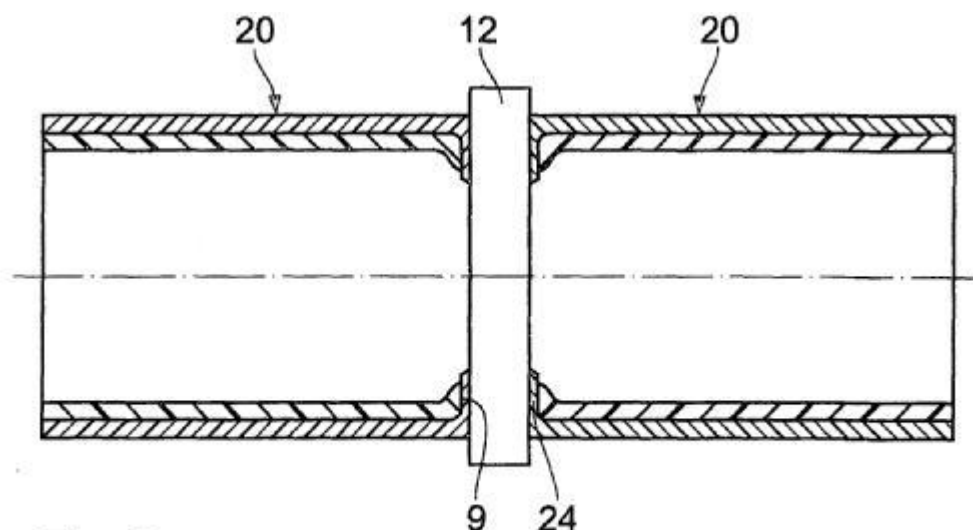


Fig. 9

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Layered products essentially comprising natural or synthetic rubber	<a href="#">B32B 25/00</a>
Layered products essentially comprising natural or synthetic rubber comprising rubber as the main or only constituent of a layer, next to another layer of synthetic resin	<a href="#">B32B 25/08</a>
Layered products essentially comprising synthetic resin	<a href="#">B32B 27/00</a>
Layered products essentially comprising synthetic resin as the main or only constituent of a layer next to another layer of synthetic resin of a different kind	<a href="#">B32B 27/08</a>

## Special rules of classification

Indexing with [B29L 2009/00](#) is optional.

## B29C 66/72321

{consisting of metals or their alloys}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Layered products essentially comprising metal as the main or only constituent of a layer, next to another layer of rubber	<a href="#">B32B 15/06</a>
Layered products essentially comprising metal as the main or only constituent of a layer, next to another layer of synthetic resin	<a href="#">B32B 15/08</a>

**B29C 66/72326****{Glass}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Layered products essentially comprising glass at the main or only constituent of a layer, next to another layer of synthetic resin	<a href="#">B32B 17/10</a>
--	----------------------------

**B29C 66/72328****{Paper}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Layered products essentially comprising natural or synthetic rubber comprising rubber as the main or only constituent of a layer, next to another layer of paper or cardboard	<a href="#">B32B 25/06</a>
Layered products essentially comprising synthetic resin as the main or only constituent of a layer next to another layer of paper or cardboard	<a href="#">B32B 27/10</a>

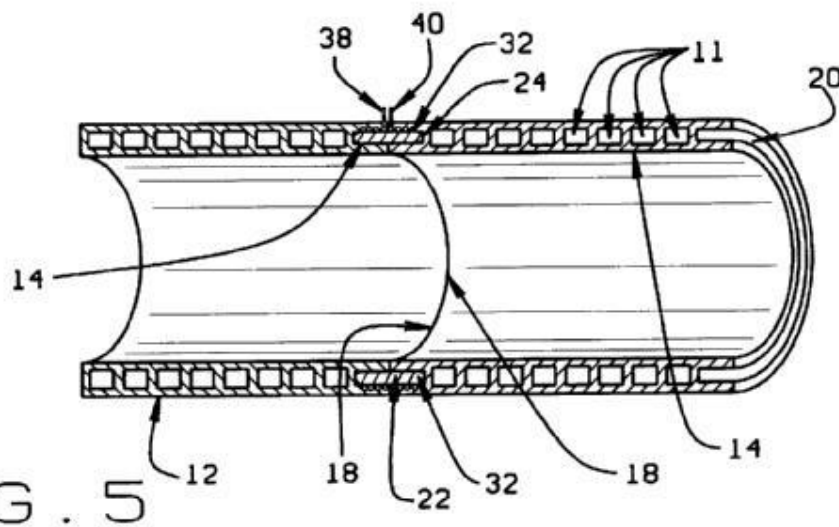
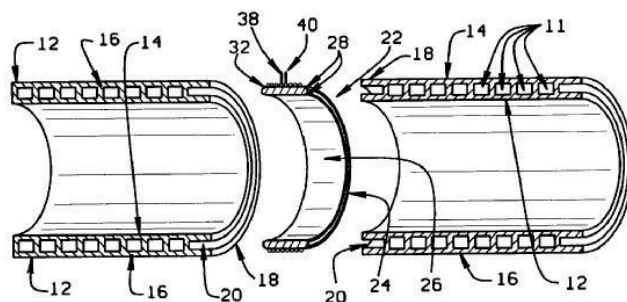
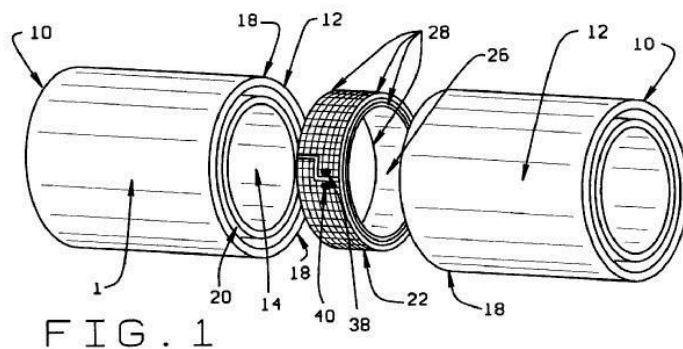
**B29C 66/72329****{Wood}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Layered products essentially comprising wood as the main or only constituent of a layer, next to another layer of synthetic resin or fibre-reinforced resin	<a href="#">B32B 21/08</a>
---	----------------------------

**B29C 66/7252****{hollow-walled}****Definition statement***This place covers:*

Example 1, from

US6521072:

**B29C 66/72523**

{multi-channelled or multi-tubular ([B29C 66/438](#), [B29C 66/5227](#) take precedence)}

**Definition statement**

*This place covers:*

Example 1, from

Definition statement

US5965238:

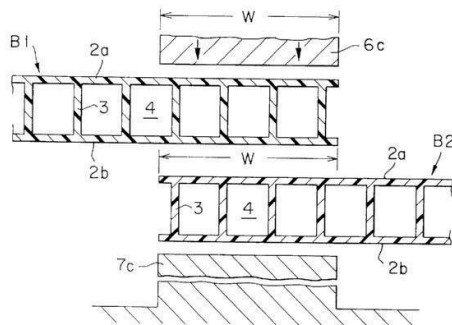


FIG. 15

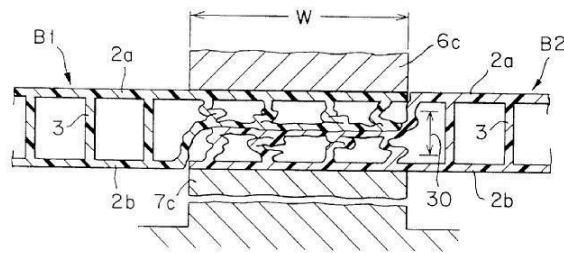


FIG. 17

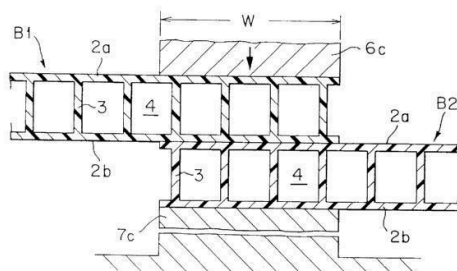


FIG. 16

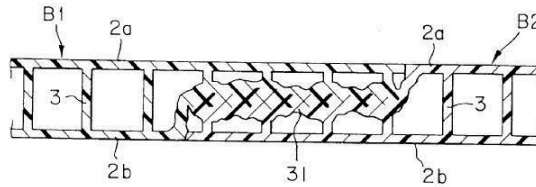


FIG. 18

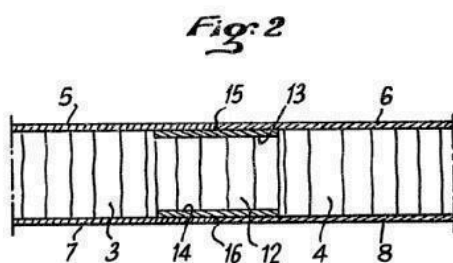
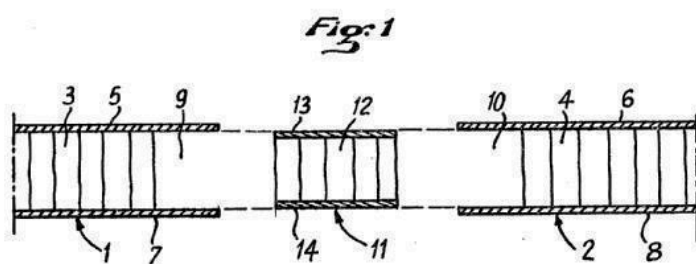
**B29C 66/72525**

{comprising honeycomb cores}

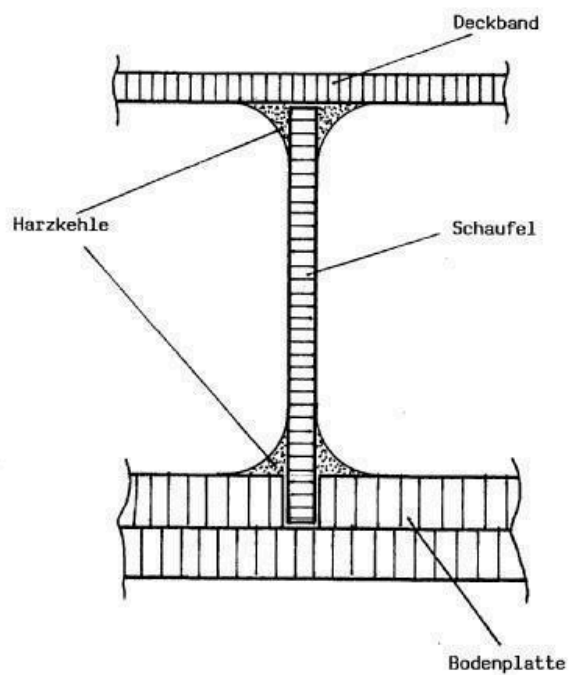
**Definition statement***This place covers:*

Example 1, from

FR2557932:



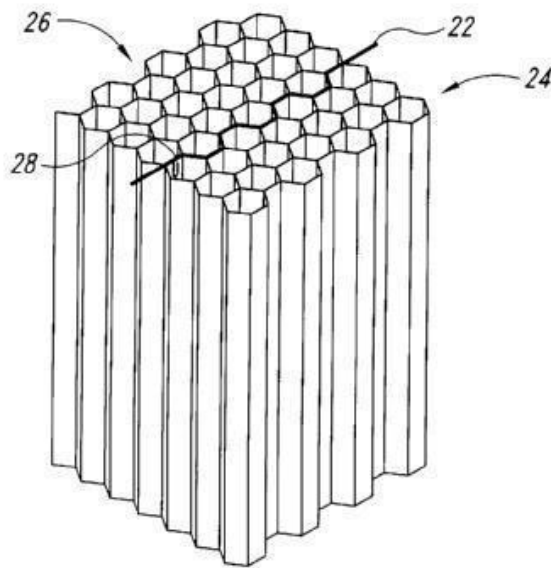
Example 2, from  
DE29713027U:



**B29C 66/7254****{honeycomb structures}****Definition statement***This place covers:*

Example 1, from

US6017413:

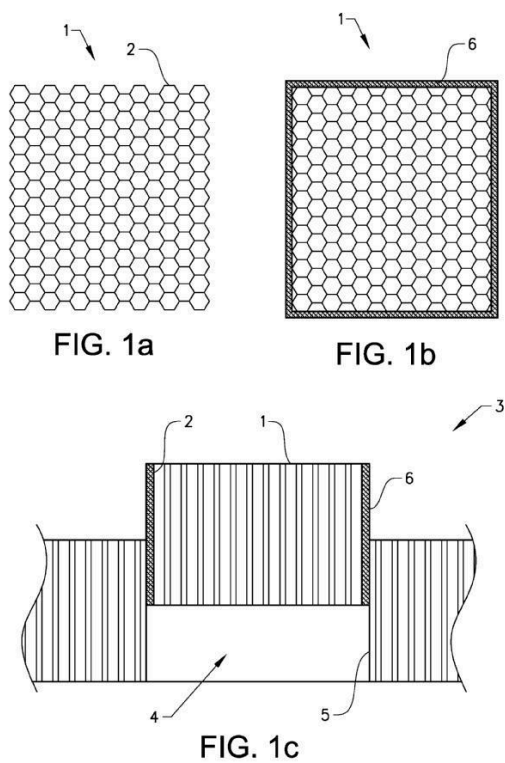
*Fig. 1B*

Example 2, from



Definition statement

WO2010071525:

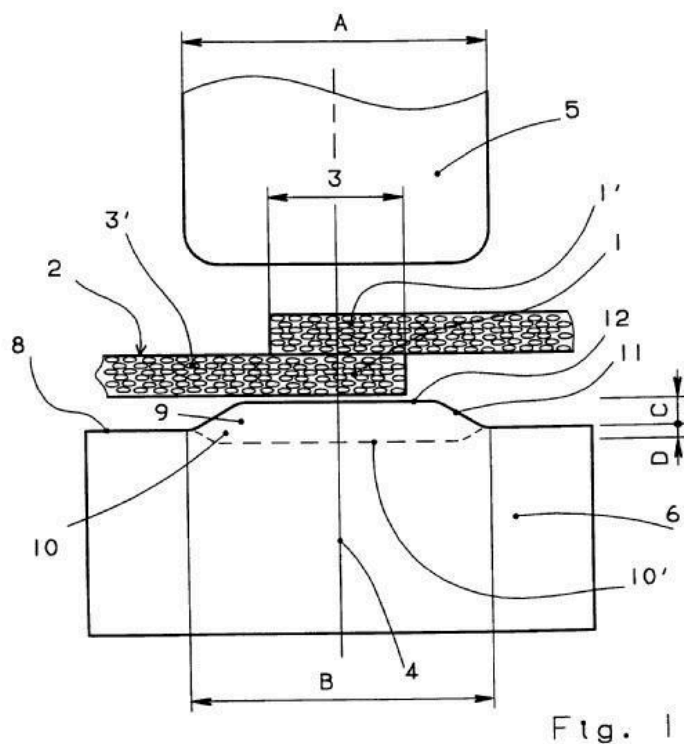
**B29C 66/727**

{being porous, e.g. foam}

**Definition statement***This place covers:*

Example 1, from

WO9614201:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Making filtering elements	<a href="#">B01D 29/012</a> , <a href="#">B01D 29/111</a>
---------------------------	--

## Special rules of classification

Indexing with [B29K 2105/04](#) is optional.

## B29C 66/729

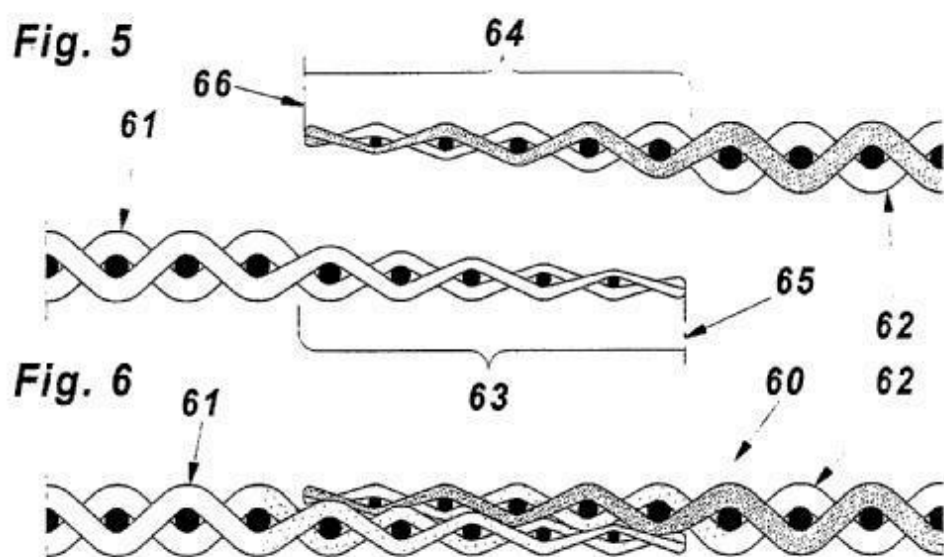
{Textile or other fibrous material made from plastics}

## Definition statement

*This place covers:*

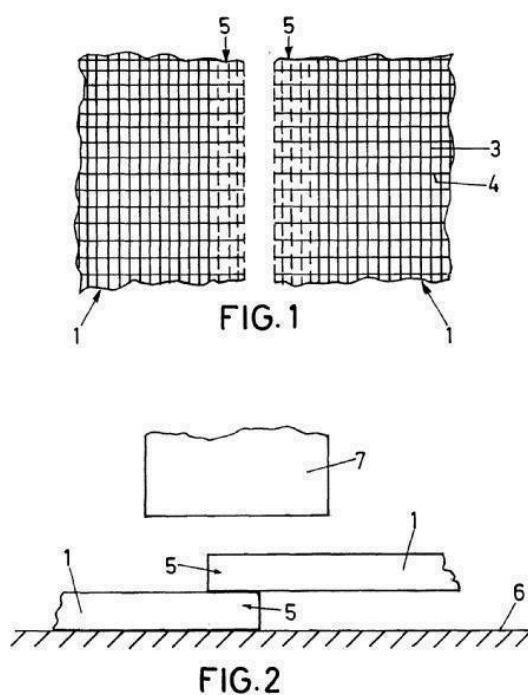
Example 1, from

DE19602575:



Example 2, from

EP1145657:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Garment hems or seams made by welding or gluing	<a href="#">A41D 27/245</a>
Joining garments or blanks by gluing or welding	<a href="#">A41H 43/04</a>

Seaming textile materials

[D06H 5/00](#)

## B29C 66/7294

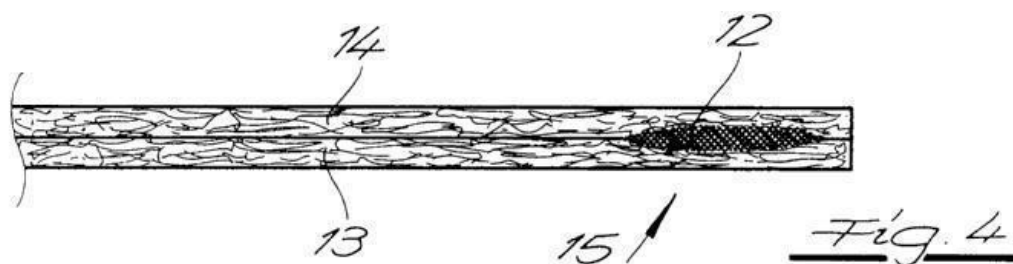
{Non woven mats, e.g. felt}

### Definition statement

*This place covers:*

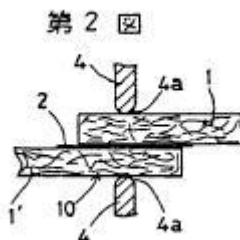
Example 1, from

DE4024252:



Example 2, from

JP2264065:



### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Non-woven fabrics formed wholly or mainly of staple fibres or like relatively short fibres, from fleece or layers composed of fibres without existing or potential cohesive properties, by welding together the fibres, e.g. by partially melting or dissolving

[D04H 1/54](#)

**B29C 66/73**

{characterised by the intensive physical properties of the material of the parts to be joined, by the optical properties of the material of the parts to be joined, by the extensive physical properties of the parts to be joined, by the state of the material of the parts to be joined or by the material of the parts to be joined being a thermoplastic or a thermoset}

**Special rules of classification**

Indexing in [B29K 2995/00](#) is optional.

**B29C 66/73341**

{at least one of the parts to be joined being glossy or reflective}

**Special rules of classification**

Indexing with [B29K 2995/0022](#) & [B29K 2995/003](#) is optional.

**B29C 66/73361**

{at least one of the parts to be joined being opaque to visible light}

**Special rules of classification**

Indexing with [B29K 2995/0025](#) is optional.

**B29C 66/73365**

{at least one of the parts to be joined being transparent or translucent to visible light}

**Special rules of classification**

Indexing with [B29K 2995/0026](#) & [B29K 2995/0029](#) is optional.

**B29C 66/73715**

{heat-shrinkable}

**Special rules of classification**

Indexing with [B29K 2995/0049](#) is optional.

**B29C 66/7375**

{uncured, partially cured or fully cured}

**Special rules of classification**

Indexing with [B29K 2105/24](#), [B29K 2105/243](#), [B29K 2105/246](#) is optional.

**B29C 66/739**

{characterised by the material of the parts to be joined being a thermoplastic or a thermoset}

**Special rules of classification**

Joining a thermoplastic part to a thermoset part is to be classified both in [B29C 66/7392](#) and in [B29C 66/7394](#).

**B29C 66/742**

{to metals or their alloys}

**References****Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Vehicle superstructures characterised by the material thereof, characterised by combining metal and synthetic material, preformed metal and synthetic material elements being joined together	<a href="#">B62D 29/005</a>
Connecting arrangements or other fittings specially adapted to be made of plastics or to be used with pipes made of plastics, for joints between metal and plastic pipes	<a href="#">F16L 47/24</a>

**Special rules of classification**

Indexing from [B29K 2705/00](#) - [B29K 2705/14](#) is optional.

**B29C 66/7428**

{Transition metals or their alloys}

**Definition statement**

*This place covers:*

This group covers e.g. Titanium.

**B29C 66/744**

{to elements other than metals}

**Special rules of classification**

Indexing from [B29K 2707/00](#) - [B29K 2707/04](#) is optional.

**B29C 66/746**

{to inorganic materials not provided for in groups [B29C 66/742](#) - [B29C 66/744](#)}

**Special rules of classification**

Indexing from [B29K 2709/00](#) - [B29K 2709/12](#) is optional.

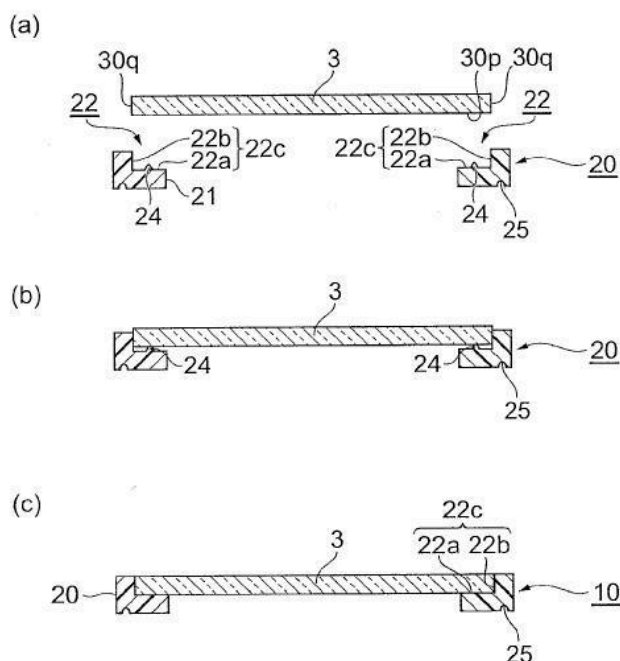
**B29C 66/7465**

{Glass}

**Definition statement***This place covers:*

Example 1, from

US2010227175:

**Fig.2****B29C 66/748**

{to natural products or their composites, not provided for in groups  
[B29C 66/742](#) - [B29C 66/746](#)}

**Special rules of classification**Indexing from [B29K 2711/00](#) - [B29K 2711/14](#) is optional.**B29C 66/7487**

{Wood}

**Definition statement***This place covers:*

Example 1, from

WO9601377:

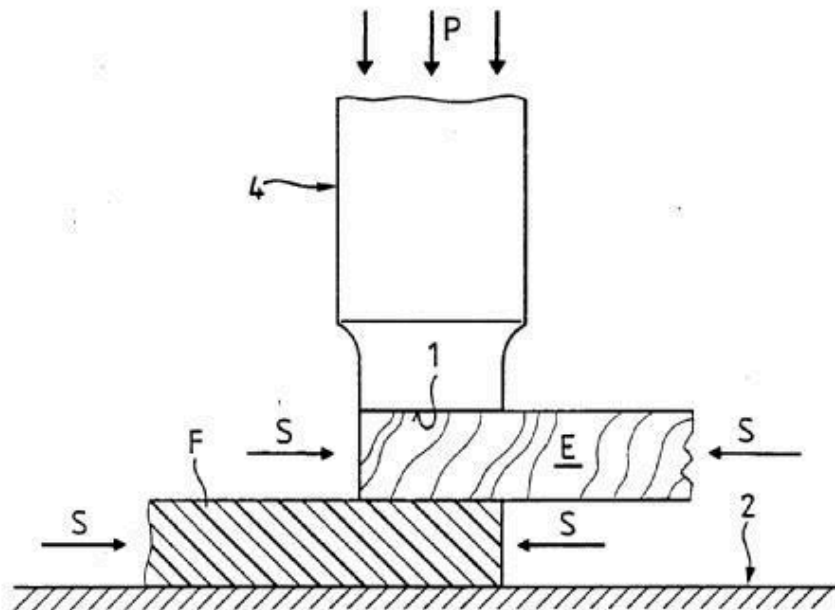


FIG. 3

## B29C 66/8122

{characterised by the composition of the material constituting the pressing elements, e.g. constituting the welding jaws or clamps}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds or cores in general, characterised by the material	<a href="#">B29C 33/38</a>
---	----------------------------

### Special rules of classification

Combination of [B29C 66/8122](#) with the relevant composition index from [B29K 2801/00](#) - [B29K 2911/14](#) is compulsory.

For instance, "characterised by the composition of the material constituting the welding jaws being PTFE" has to be classified as: [B29C 66/8122](#); [B29K 2827/18](#).

## B29C 66/81241

{being porous or sintered}

### Definition statement

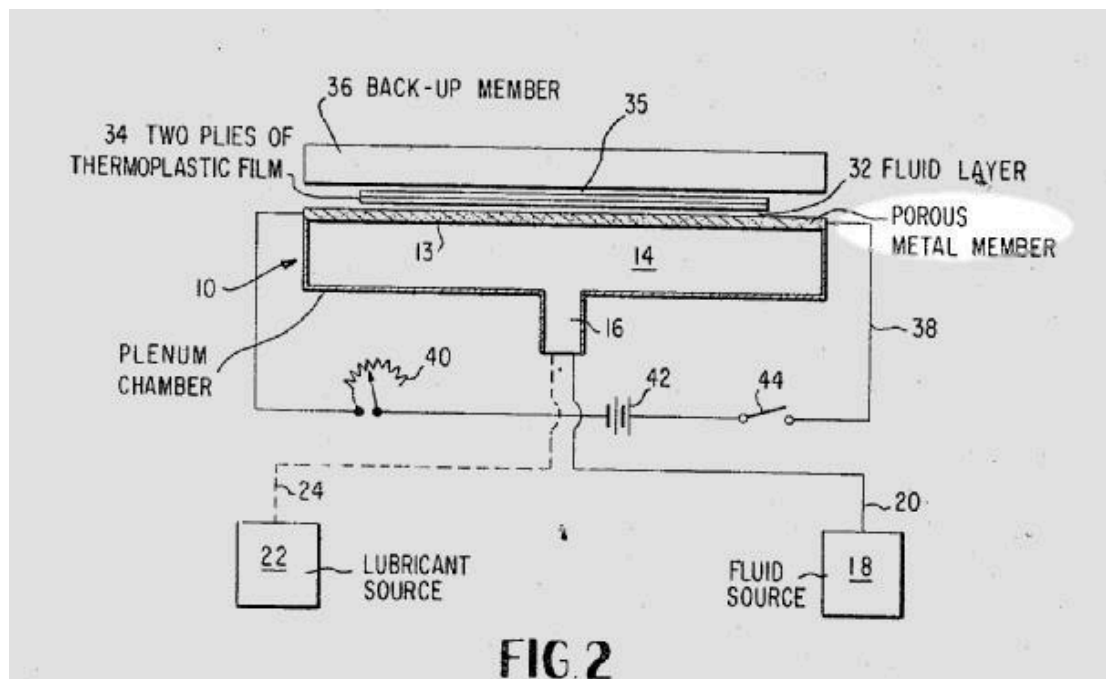
This place covers:

Example 1, from



Definition statement

US3311525:

**B29C 66/8126**

{characterised by the intensive physical properties or by the optical properties of the material constituting the pressing elements, e.g. constituting the welding jaws or clamps}

**Special rules of classification**

Indexing in [B29K 2995/00](#) is optional.

**B29C 66/81267**

{Transparent to electromagnetic radiation, e.g. to visible light}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Heating or curing by wave energy or particle radiation using transparent moulds	<a href="#">B29C 35/0888</a>
---	------------------------------

**B29C 66/81415**

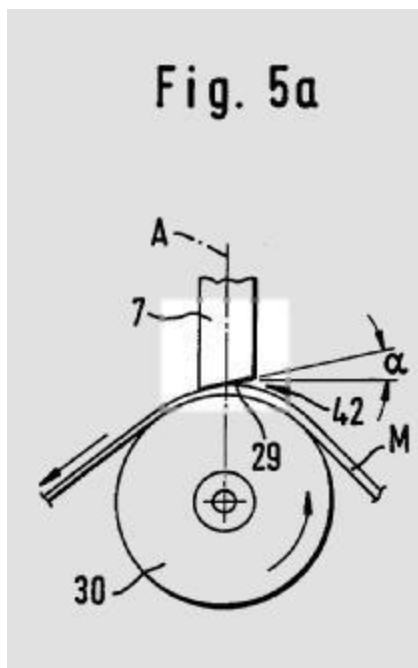
{being bevelled}

**Definition statement**

*This place covers:*

Example 1, from

DE19813121:



## B29C 66/81417

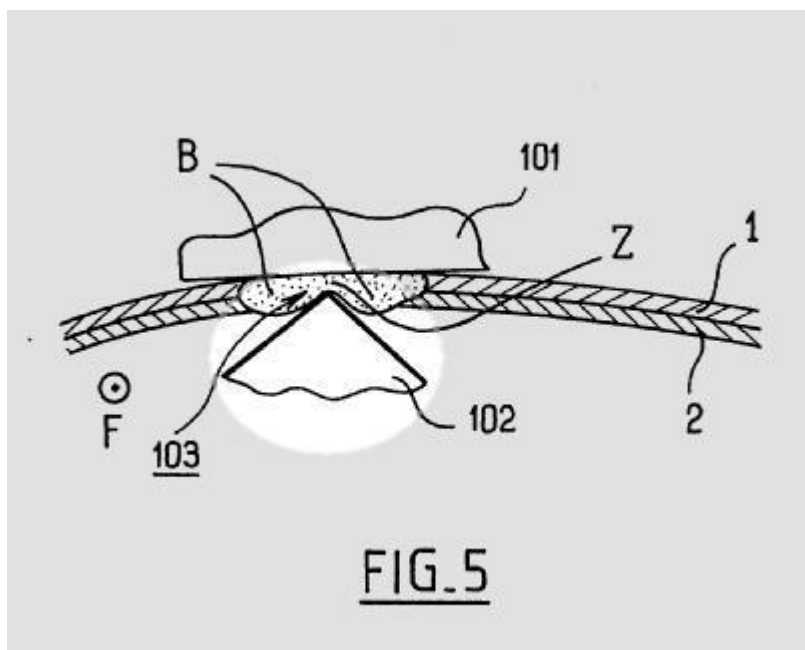
{being V-shaped}

### Definition statement

*This place covers:*

Example 1, from

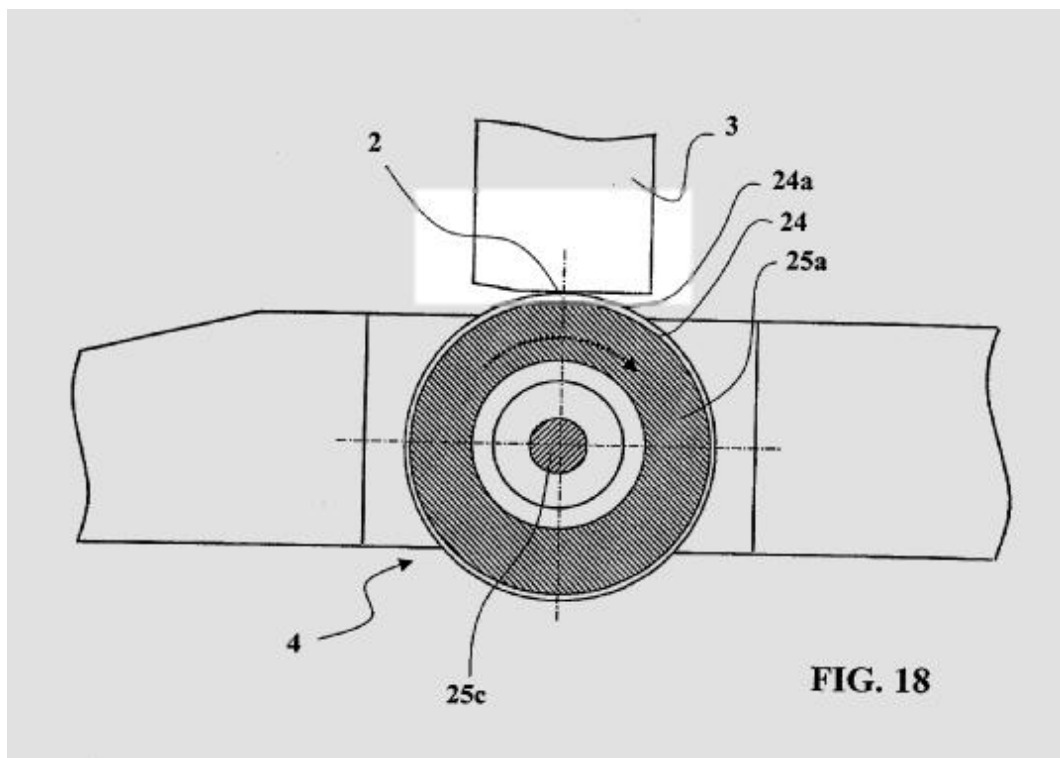
FR2807392:



**B29C 66/81419****{and flat}****Definition statement***This place covers:*

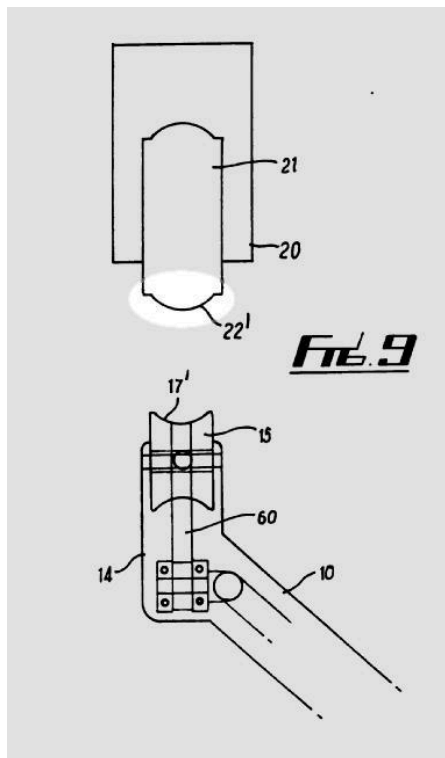
Example 1, from

FR2874188:

**B29C 66/81422****{being convex}****Definition statement***This place covers:*

Example 1, from

GB2305391:



### Special rules of classification

N.B.: the convexity of the transverse cross-section of a roller, cylinder or drum (i.e. the cross-section transversal to its axis) is not considered to correspond to inventive subject-matter and as such is not covered by this group.

### **B29C 66/81423**

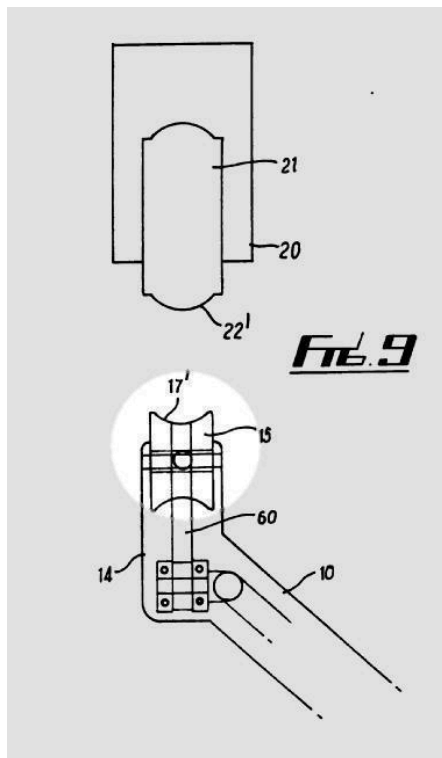
**{being concave}**

### Definition statement

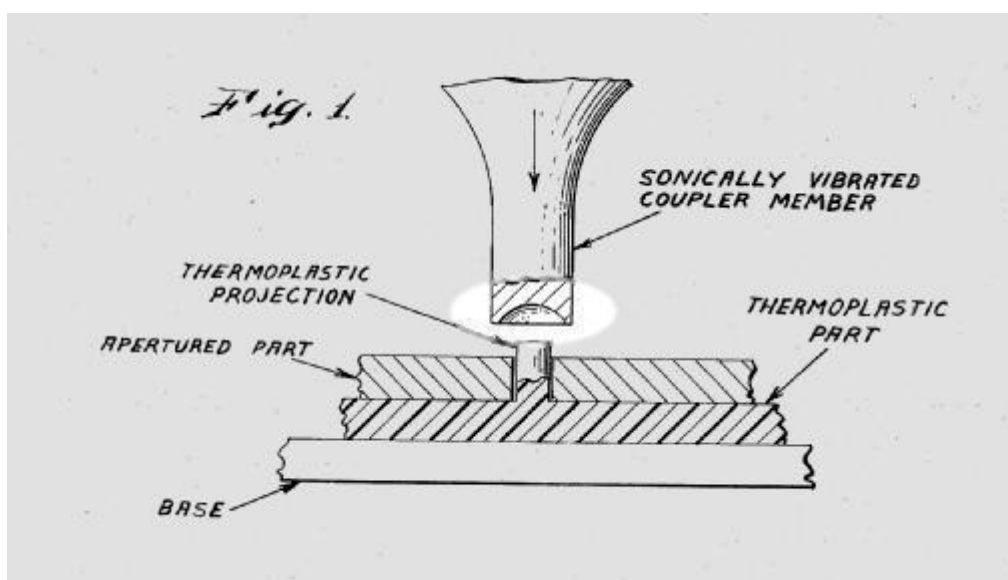
*This place covers:*

Example 1, from

GB2305391:



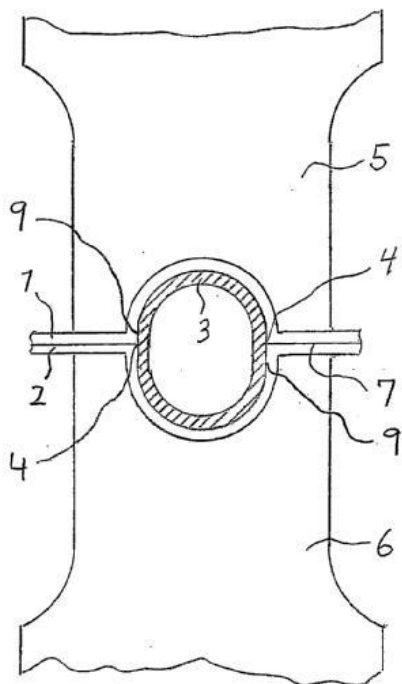
Example 2, from  
US3367809:



Example 3, from

Definition statement

WO2005042232:

**B29C 66/81433**

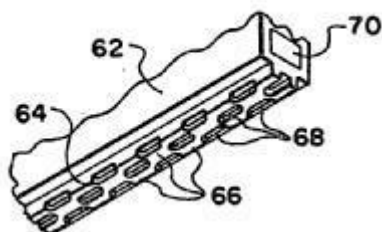
{being toothed, i.e. comprising several teeth or pins (comprising a single tooth [B29C 66/81429](#)), or being patterned}

**Definition statement**

*This place covers:*

Example 1, from

US4398986:



**B29C 66/81435**

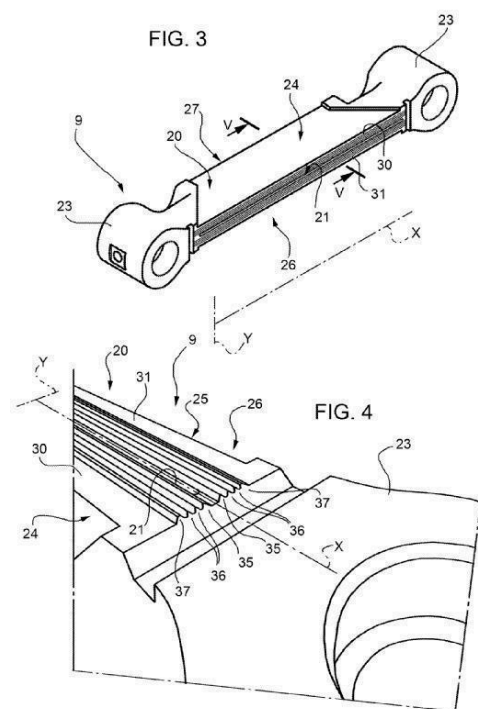
**{comprising several parallel ridges, e.g. for crimping (comprising a single ridge [B29C 66/81427](#))}**

### Definition statement

*This place covers:*

Example 1, from

EP2113371:



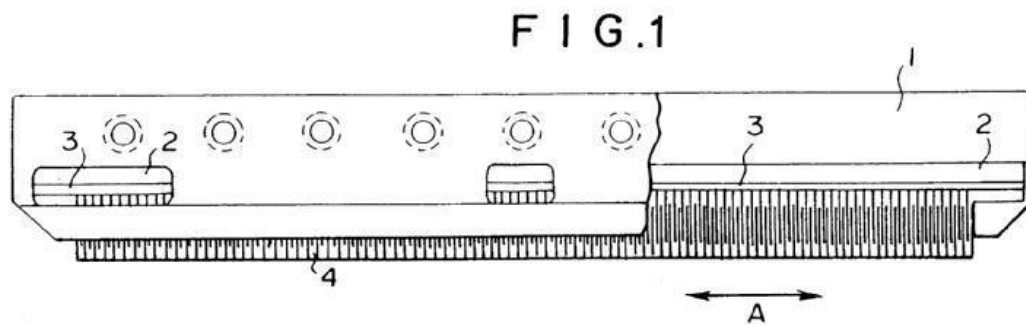
Example 2, from



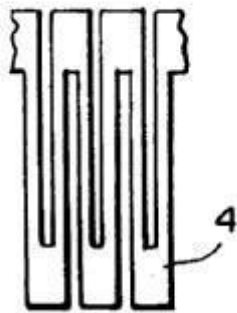


Definition statement

DE3912198:



F I G . 5

**B29C 66/81455**

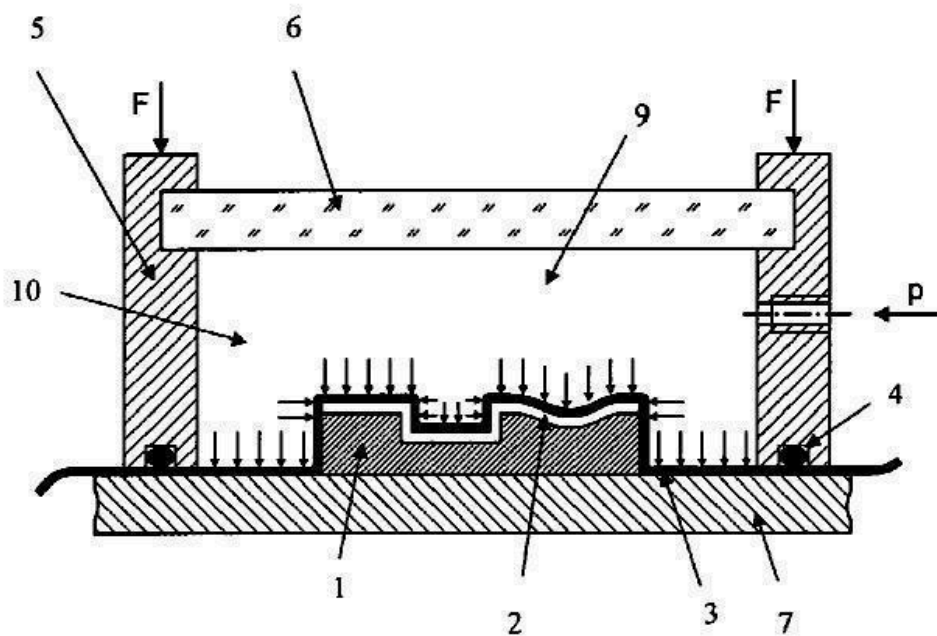
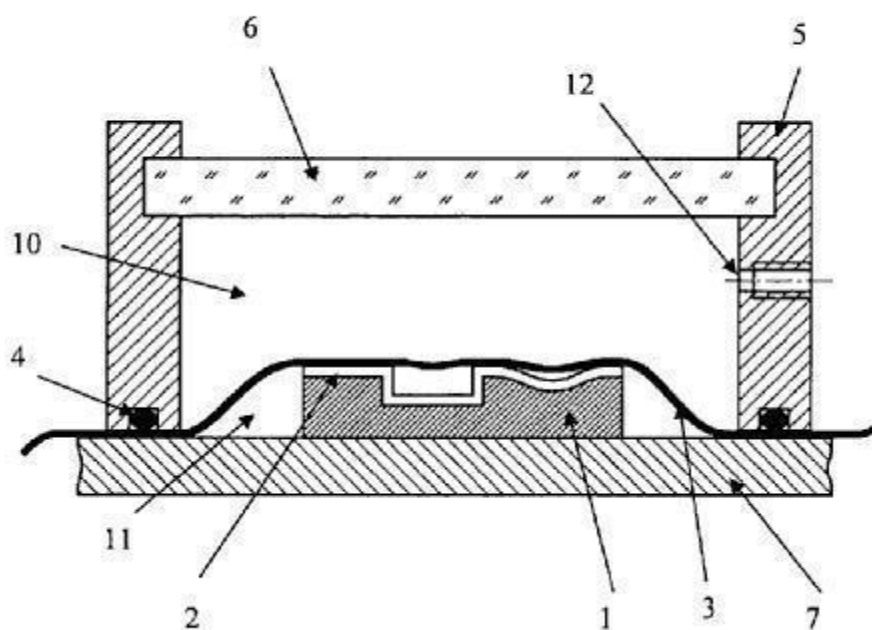
{being a fluid inflatable bag or bladder, a diaphragm or a vacuum bag for applying isostatic pressure (inflatable element positioned between the joining tool and a backing-up part [B29C 66/82421](#))}

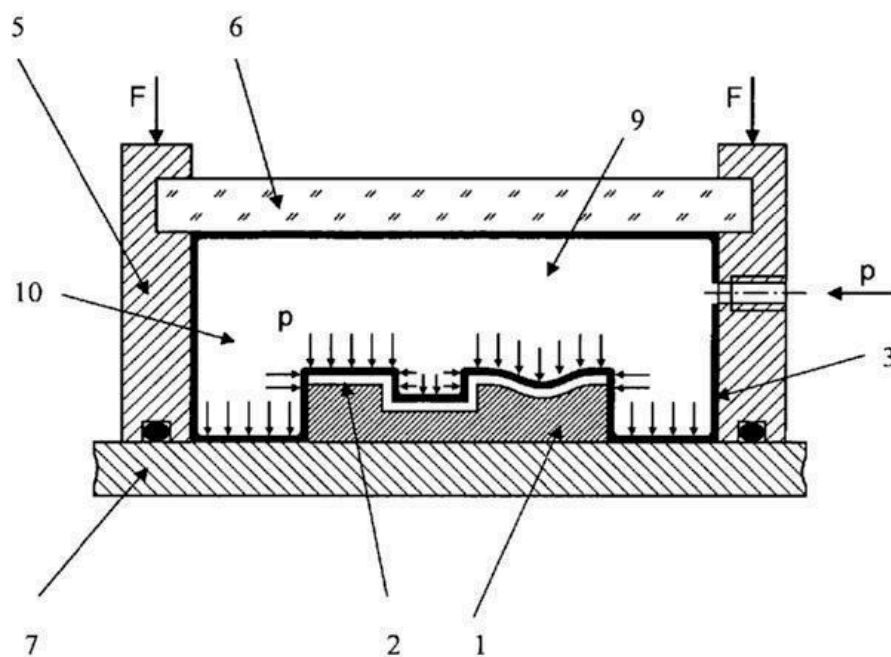
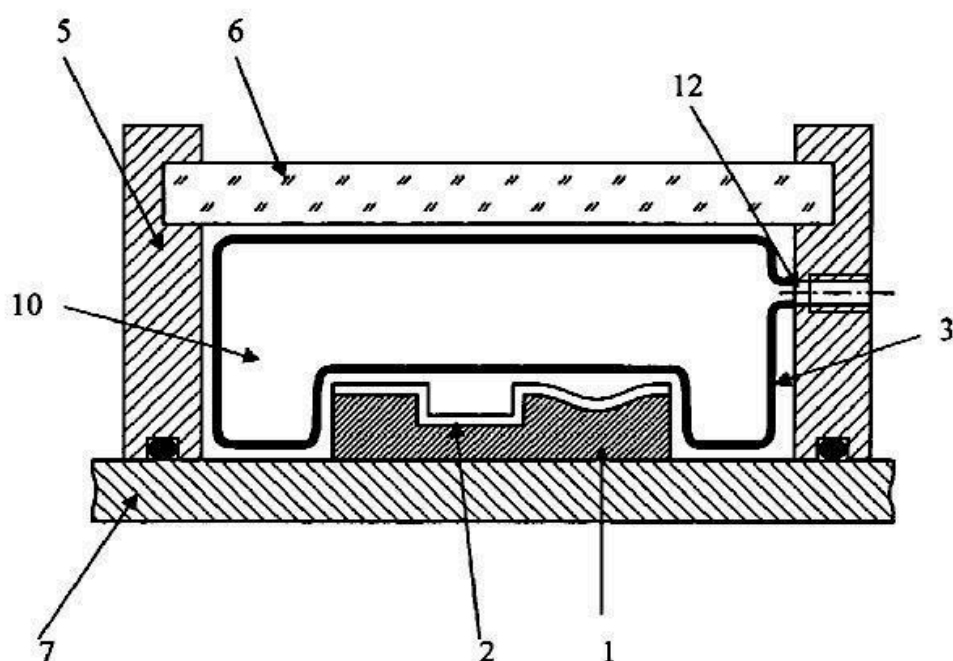
**Definition statement**

*This place covers:*

Example 1, from

WO2010069599:





Example 2, from

EP1306196:

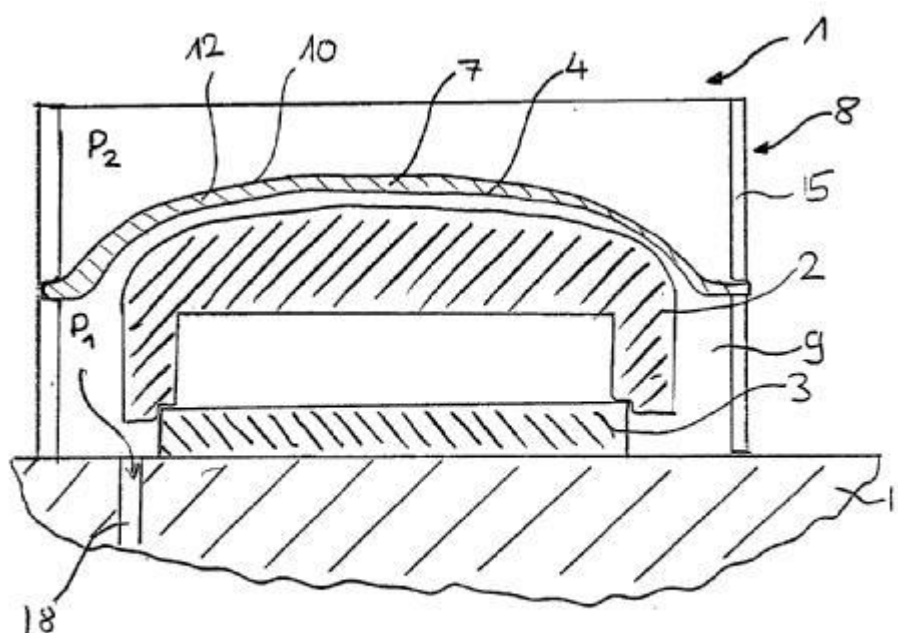


FIG. 5

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Bags for isostatic pressing, for compression moulding	<a href="#">B29C 43/3642</a>
Applying pressure through the wall of an inflated bag or diaphragm, for thermoforming	<a href="#">B29C 51/28</a>
Lining or sheathing using sheet or web-like material applied by "rubber" bag or diaphragm	<a href="#">B29C 63/16</a>
Devices for gluing soles on shoe bottoms using flexible diaphragm pressing devices	<a href="#">A43D 25/07</a>
Pressing means in the form of a flexible element, e.g. diaphragm, urged by fluid pressure	<a href="#">B30B 5/02</a>
Vacuum pressing, for laminating	<a href="#">B32B 37/1018</a>

## B29C 66/81457

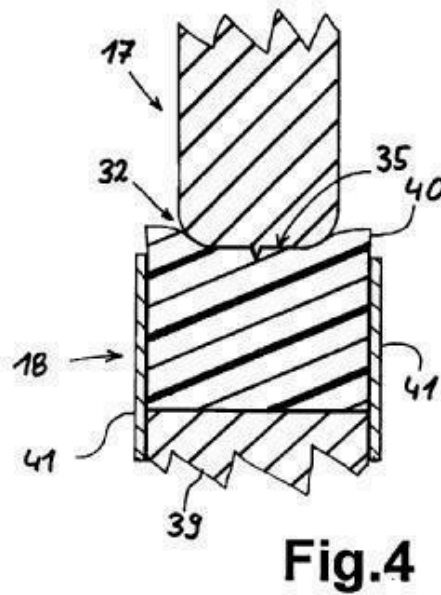
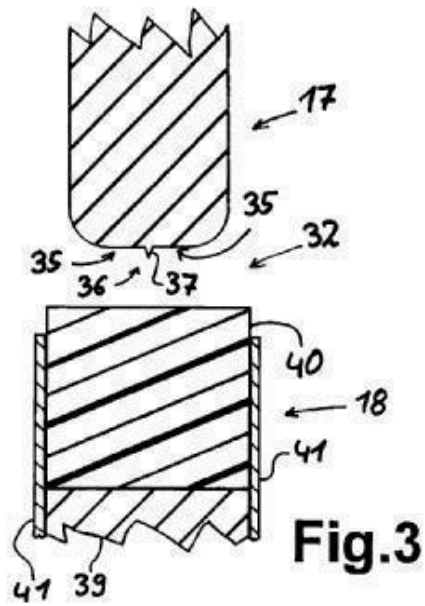
{comprising a block or layer of deformable material, e.g. sponge, foam, rubber (pressing elements supported or backed-up by resilient material [B29C 66/8161](#))}

## Definition statement

This place covers:

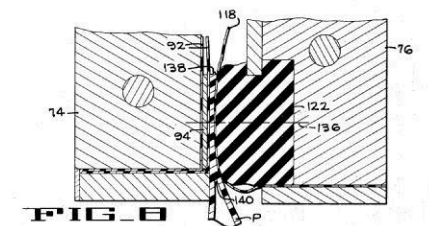
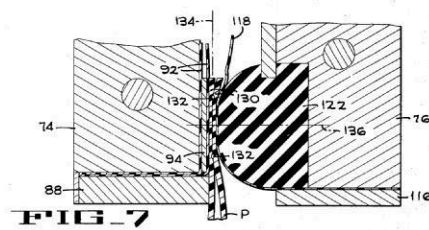
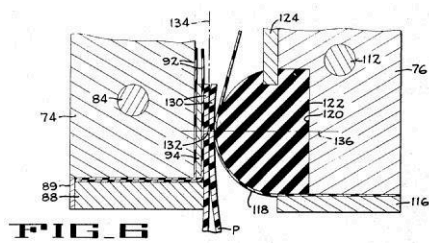
Example 1, from

EP1027981:



Example 2, from

US3830681:



**B29C 66/81459**

{being a filled deformable bladder, e.g. bladder filled with oil, with granules or with a meltable solid material ([B29C 66/81455](#) takes precedence)}

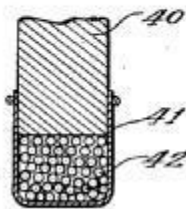
**Definition statement**

*This place covers:*

Example 1, from

US2806116:

FIG. 3

**B29C 66/81461**

{being multi-lamellar or segmented, i.e. comprising a plurality of strips, plates or stacked elements}

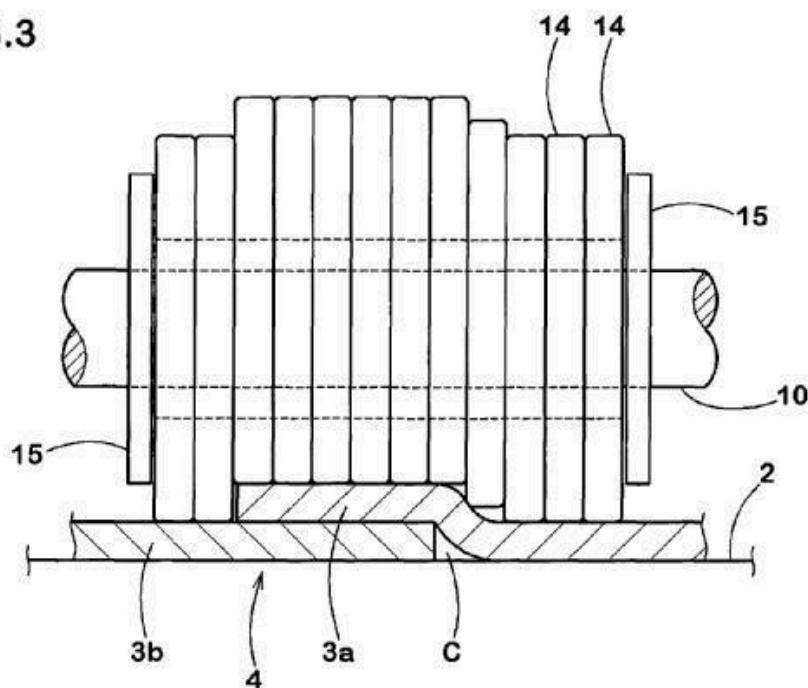
**Definition statement**

*This place covers:*

Example 1, from

EP2286986:

**FIG.3**



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Vice jaws being composed of a plurality of parts adapting to the shape of the workpiece, the parts having a linear movement
---

<a href="#">B25B 1/2421</a>
-----------------------------

## B29C 66/81465

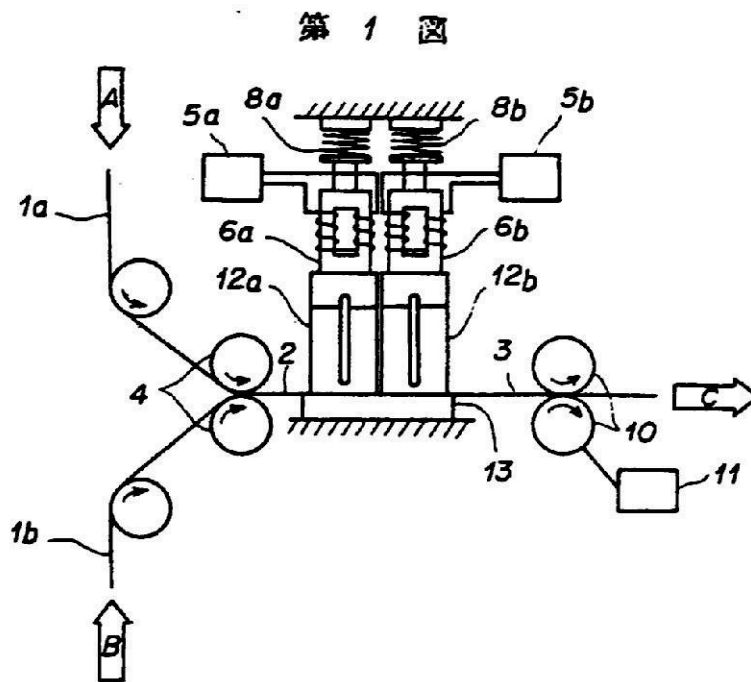
{one placed behind the other in a single row in the feed direction}

### Definition statement

*This place covers:*

Example 1, from

JP1061228:



**B29C 66/81467**

**{arranged in an offset pattern}**

### Definition statement

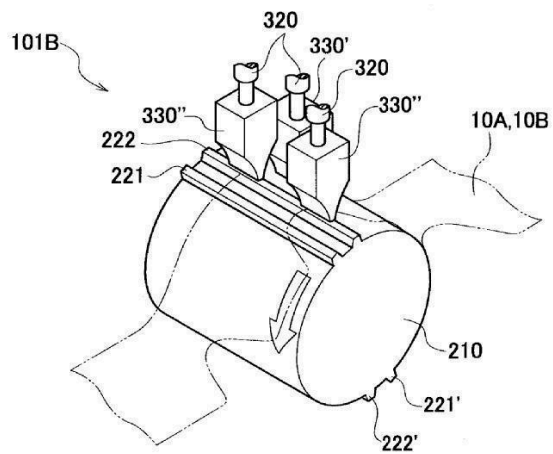
*This place covers:*

Example 1, from



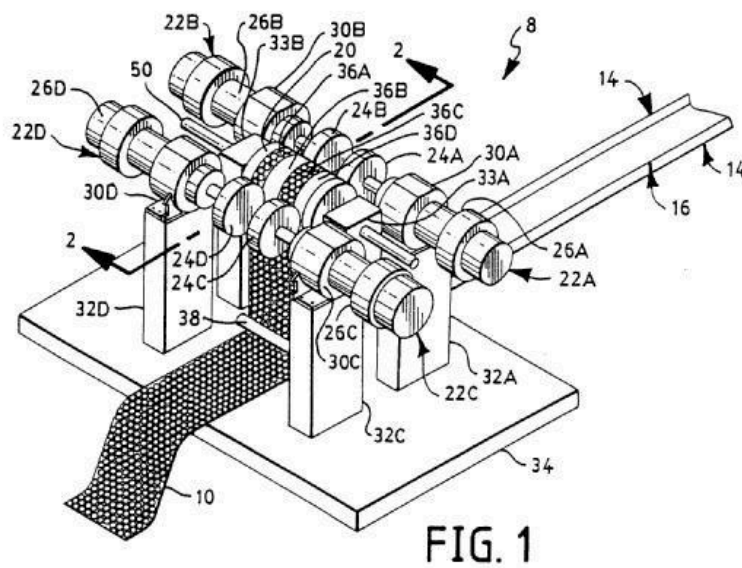
US2010116409:

FIG. 11



Example 2, from

WO9828123:



**B29C 66/81469**

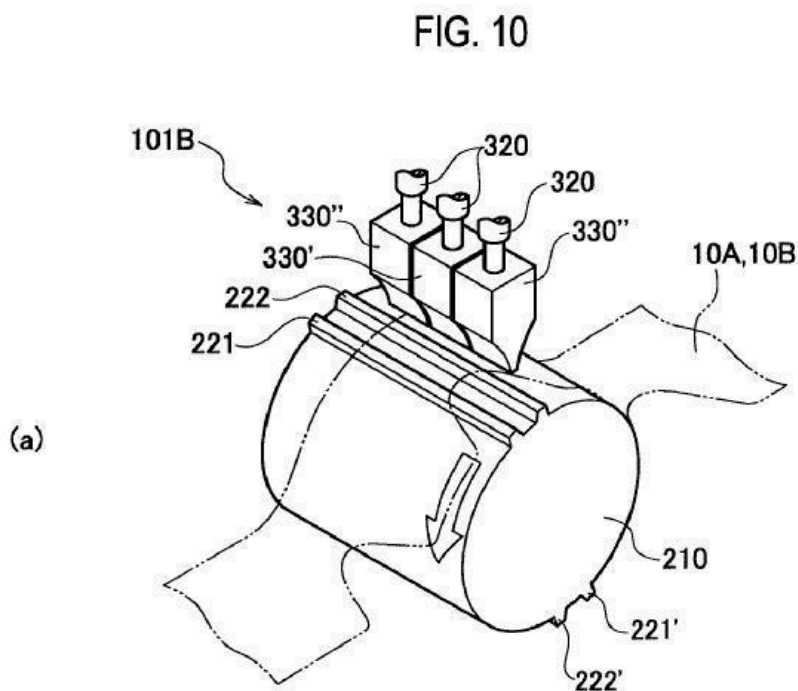
{one placed next to the other in a single line transverse to the feed direction,  
e.g. shoulder to shoulder sonotrodes}

**Definition statement**

*This place covers:*

Example 1, from

US2010116409:

**B29C 66/8161**

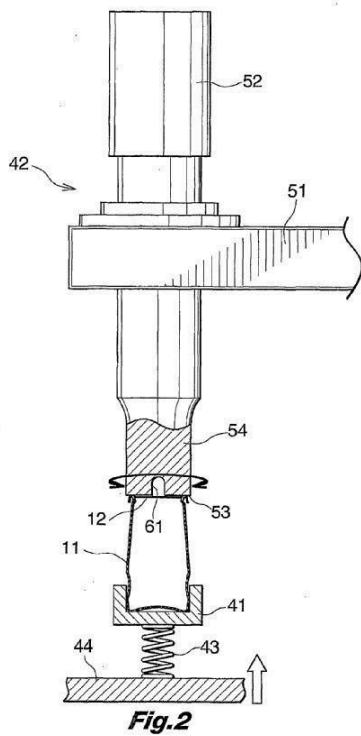
{said pressing elements being supported or backed-up by springs or by  
resilient material}

**Definition statement**

*This place covers:*

Example 1, from

EP1410988:



## **B29C 66/81611**

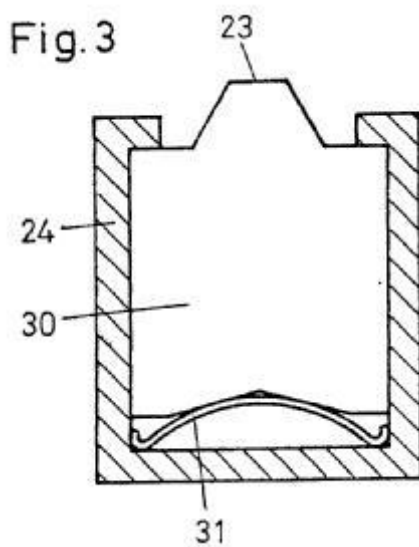
{by resilient material}

### **Definition statement**

*This place covers:*

Example 1, from

DE3236164:



**B29C 66/8163**

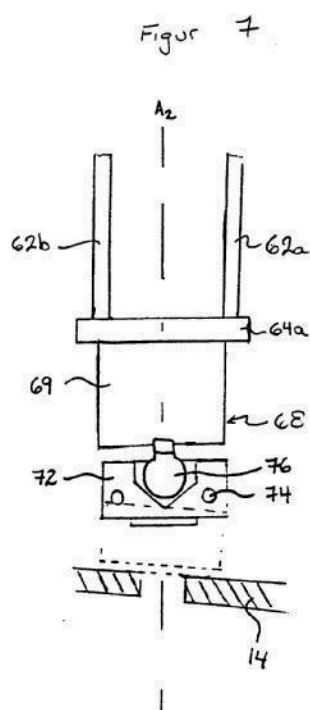
{Self-aligning to the joining plane, e.g. mounted on a ball and socket}

**Definition statement**

*This place covers:*

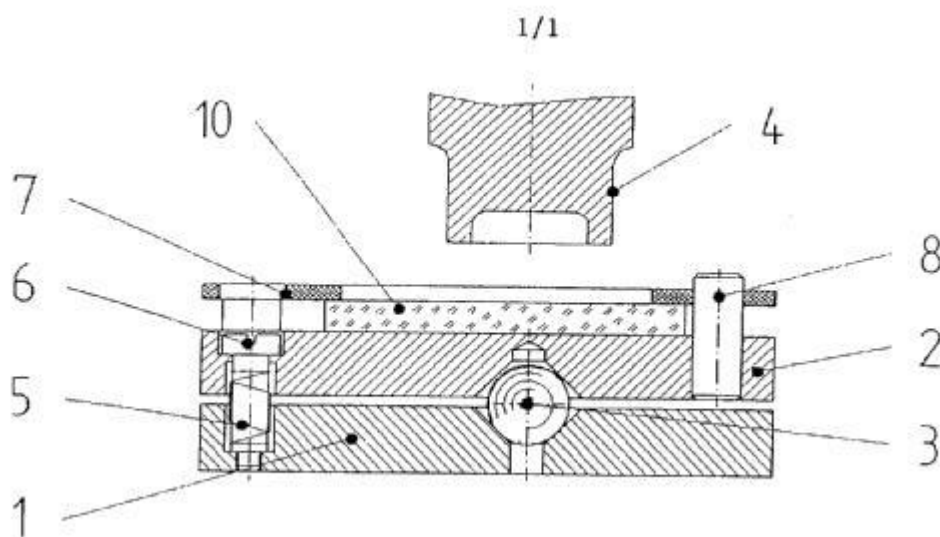
Example 1, from

DE19540119:



Example 2, from

FR2829962:



**B29C 66/8165**

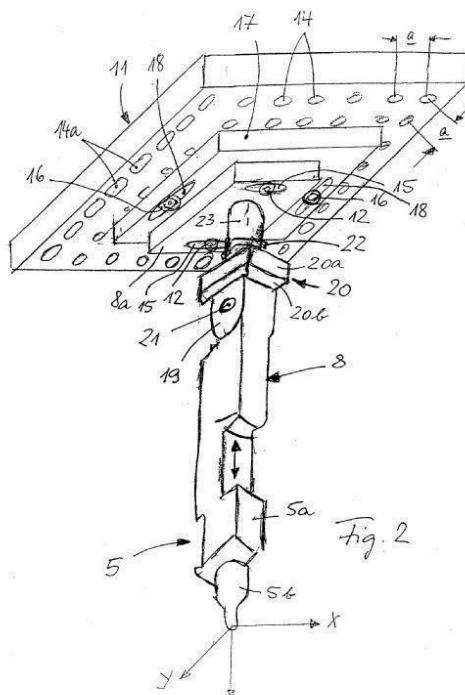
{Carrier plates for mounting joining tool parts, e.g. for re-arranging the tool parts to make other forms}

**Definition statement**

*This place covers:*

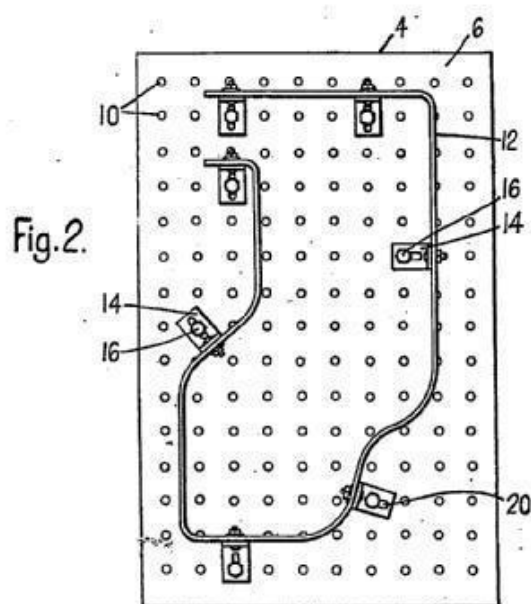
Example 1, from

DE20019000U:



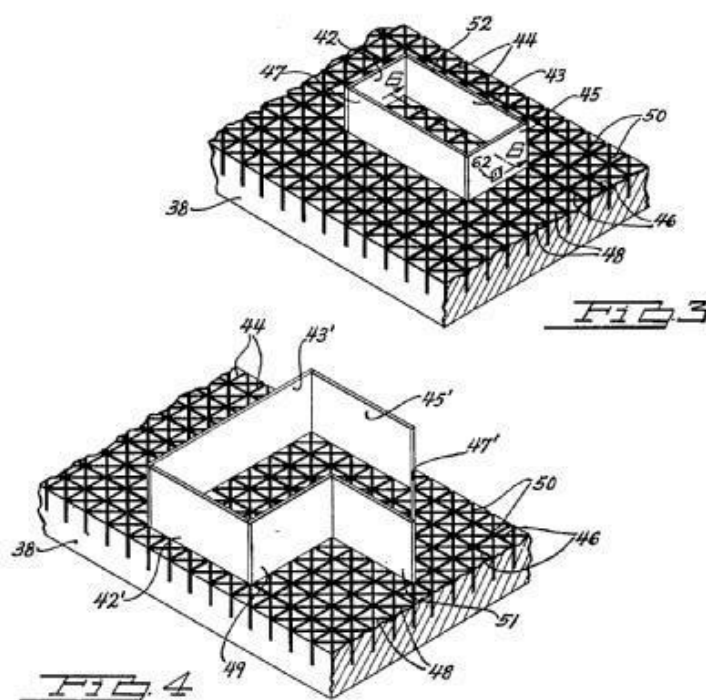
Example 2, from

GB885309:



Example 3, from

FR1310917:



**B29C 66/8167**

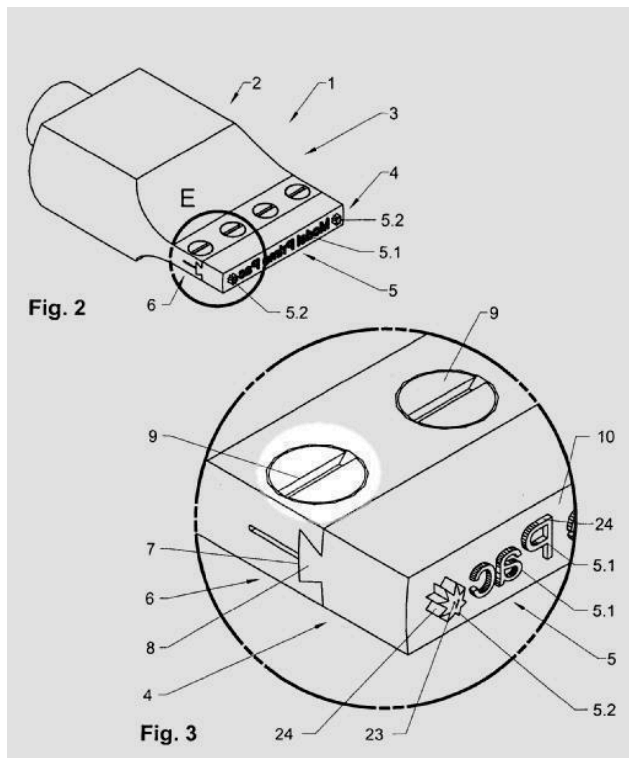
**{Quick change joining tools or surfaces}**

### Definition statement

*This place covers:*

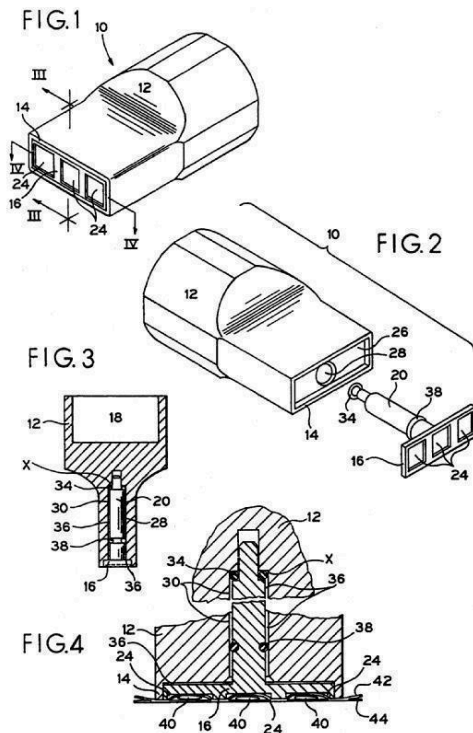
Example 1, from

DE20317289U:



Example 2, from

US5421923:



Example 3, from

US3426951:

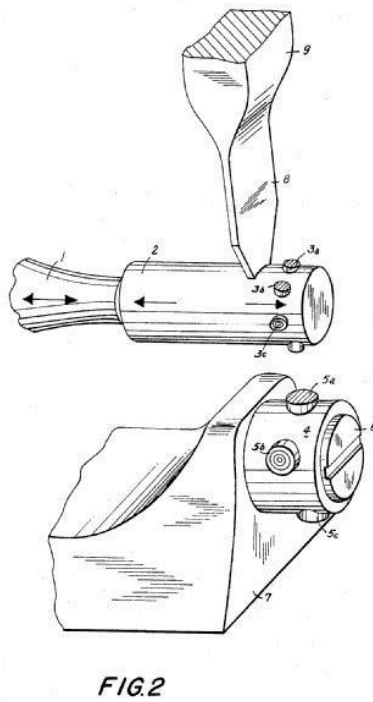


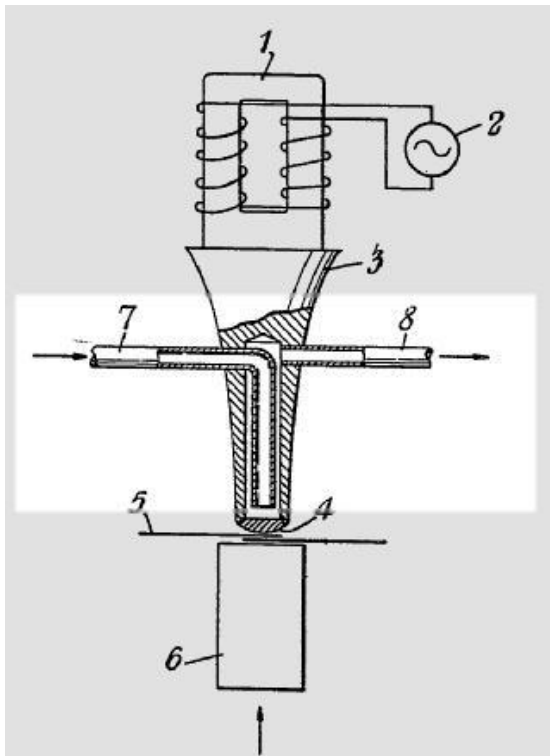
FIG. 2



**B29C 66/81811****{of the welding jaws}****Definition statement***This place covers:*

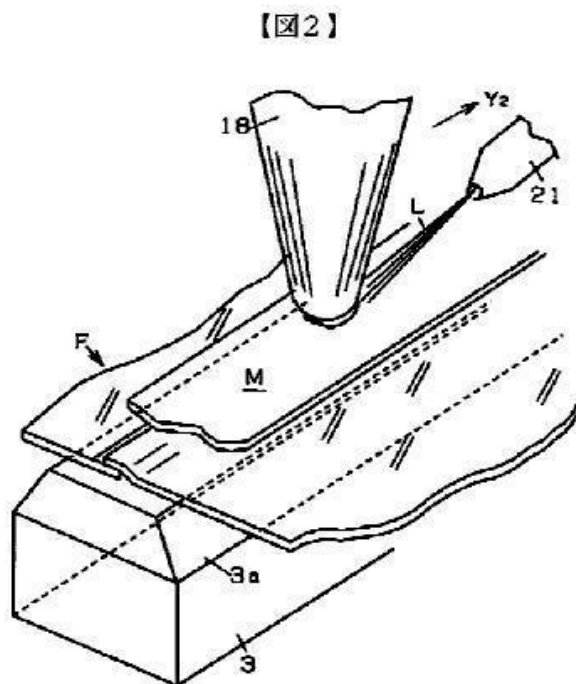
Example 1, from

GB952042:

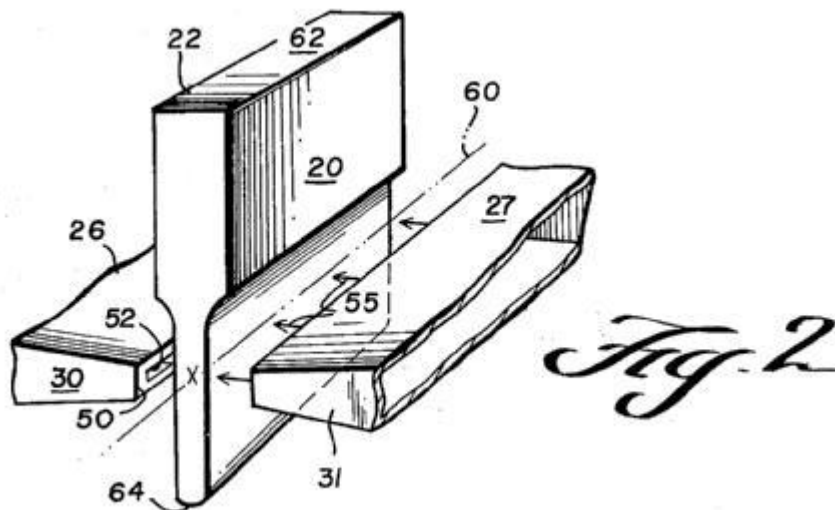
**B29C 66/81812****{the welding jaws being cooled from the outside, e.g. by blowing a gas or spraying a liquid}****Definition statement***This place covers:*

Example 1, from

JP6008330:



Example 2, from  
US4426244:



## B29C 66/81815

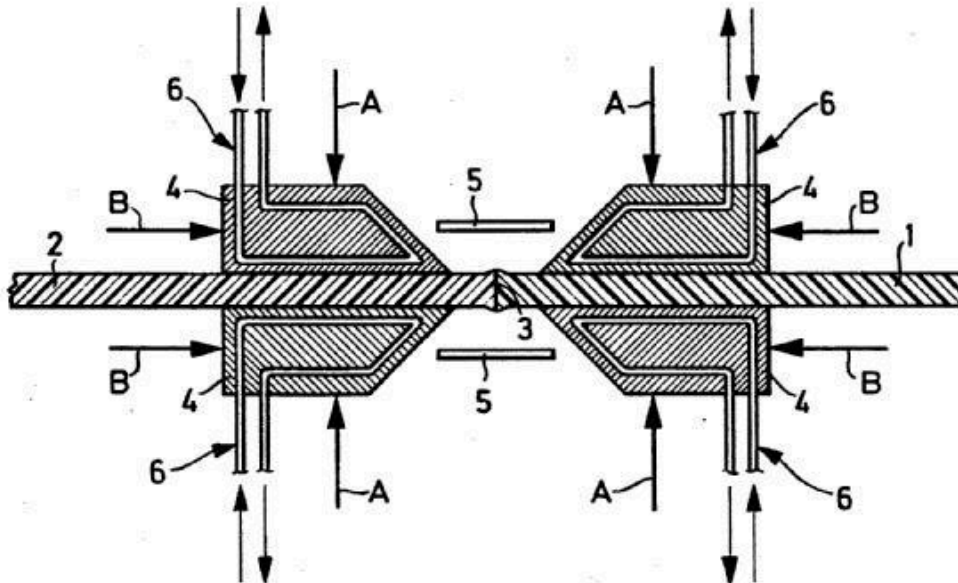
{of the clamps}

### Definition statement

*This place covers:*

Example 1, from

FR2330518:



## B29C 66/81821

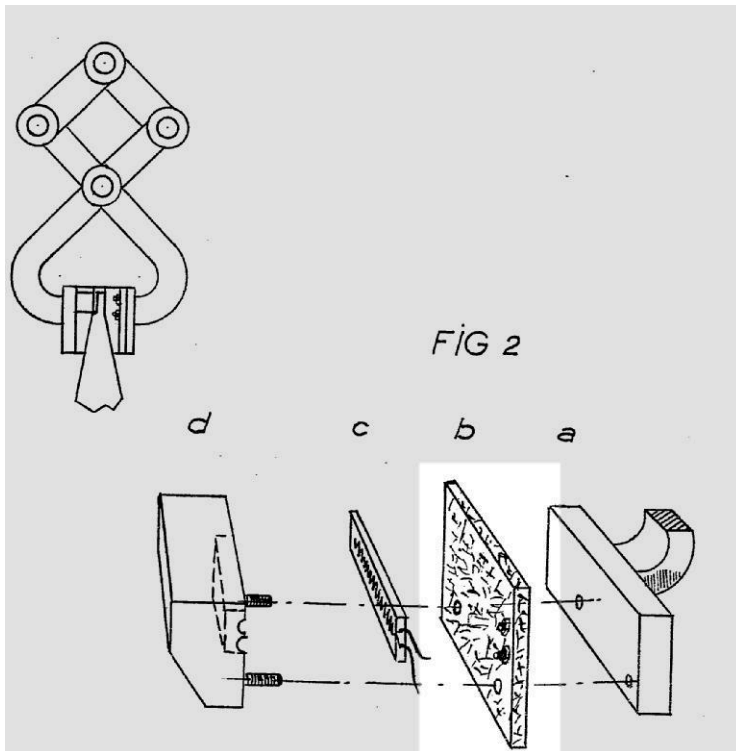
{of the welding jaws}

### Definition statement

*This place covers:*

Example 1, from

FR1098132:



## B29C 66/8222

{Pinion or rack mechanisms}

### Definition statement

*This place covers:*

Example 1, from

WO9738905:

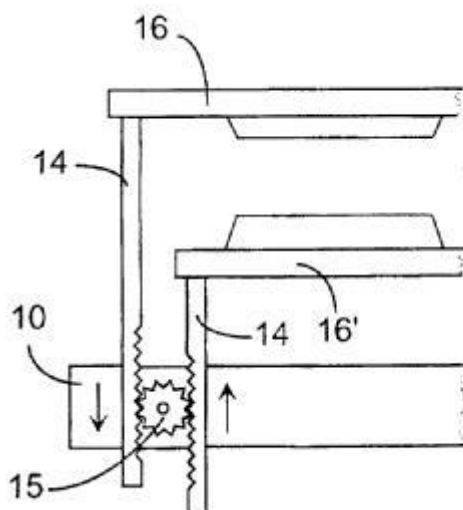
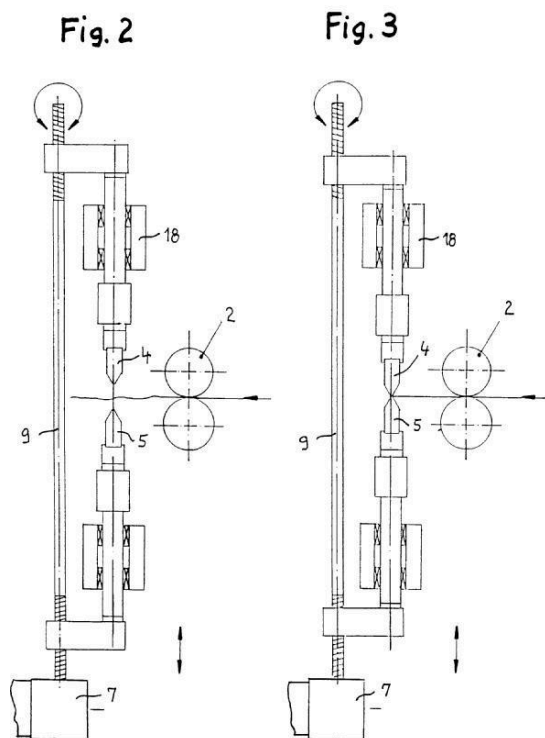


Fig.3

**B29C 66/8223****{Worm or spindle mechanisms}****Definition statement***This place covers:*

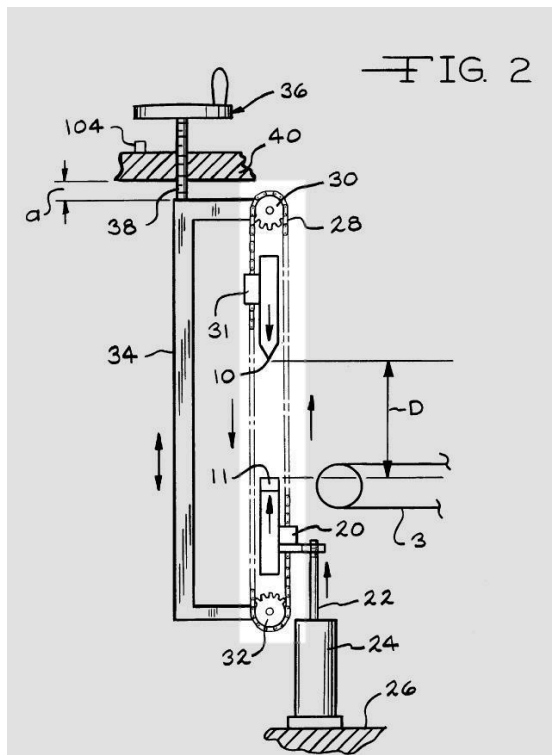
Example 1, from

DE4241974:

**B29C 66/8224****{Chain or sprocket drives}****Definition statement***This place covers:*

Example 1, from

US6308493:



## B29C 66/8225

{Crank mechanisms}

### Definition statement

*This place covers:*

Example 1, from

DE4425207:

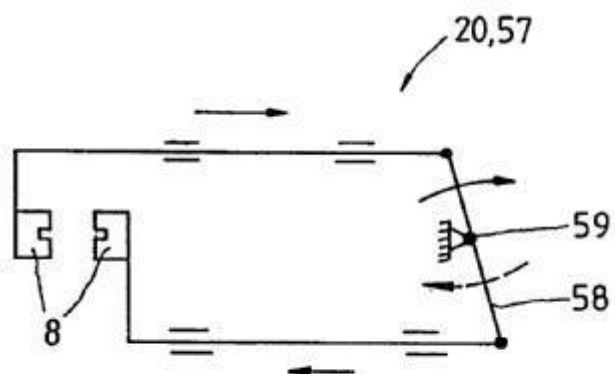


Fig. 21

Example 1, from

DE4425207:

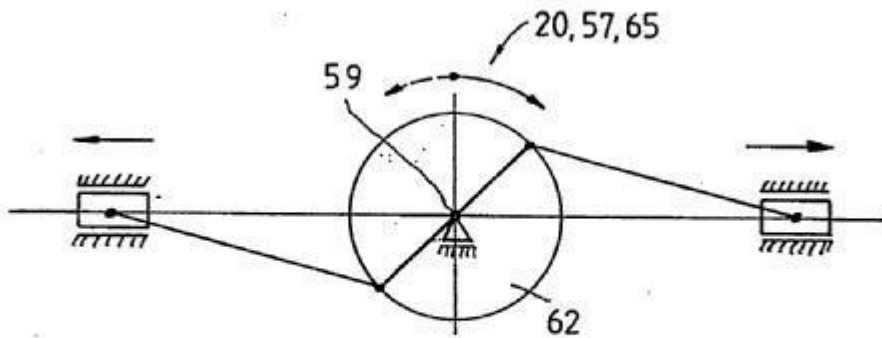


Fig. 29

## B29C 66/8226

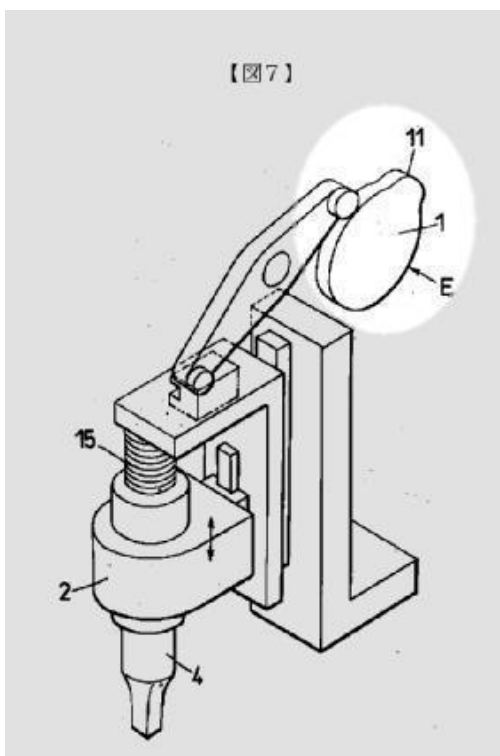
{Cam mechanisms; Wedges; Eccentric mechanisms}

### Definition statement

*This place covers:*

Example 1, from

JP2002144434:



**B29C 66/82261**

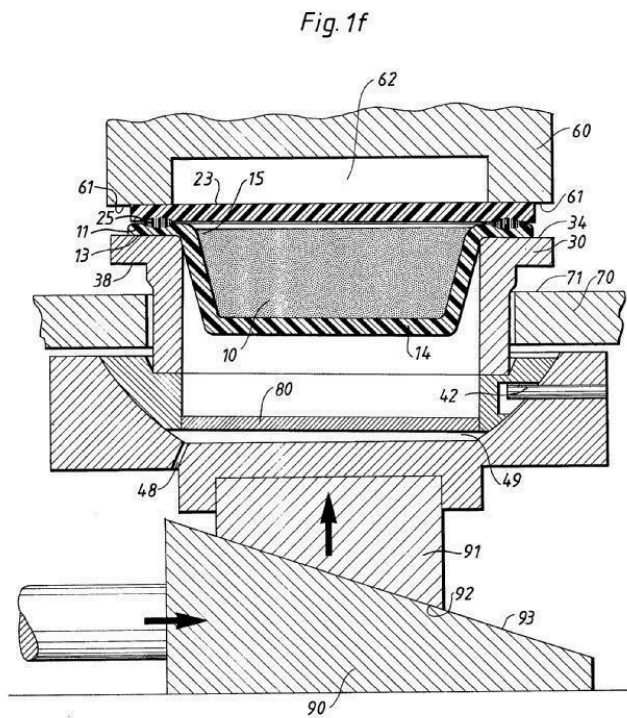
**{Wedges}**

### Definition statement

*This place covers:*

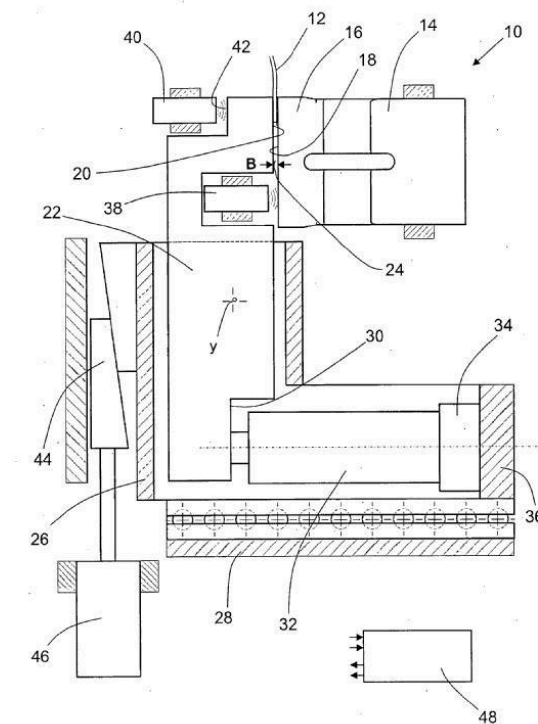
Example 1, from

EP0344137:





DE102008004880:



## **B29C 66/82263**

**{Follower pin or roller cooperating with a groove}**

### **Definition statement**

*This place covers:*

Example 1, from

EP0368095:

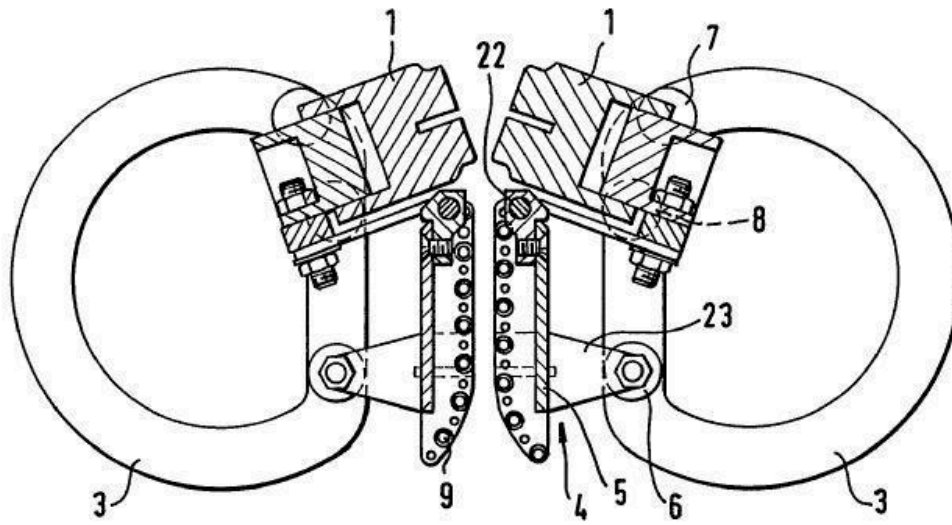


FIG. 4

**B29C 66/82265**

### {Eccentric mechanisms}

### Definition statement

*This place covers:*

Example 1, from

FR2338858:

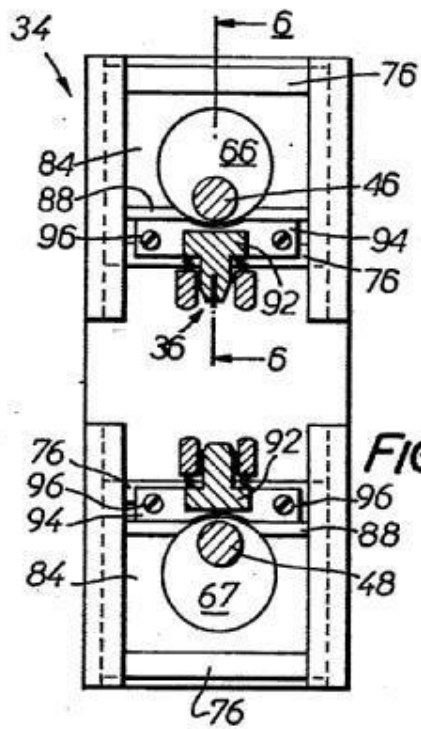


FIG. 4.

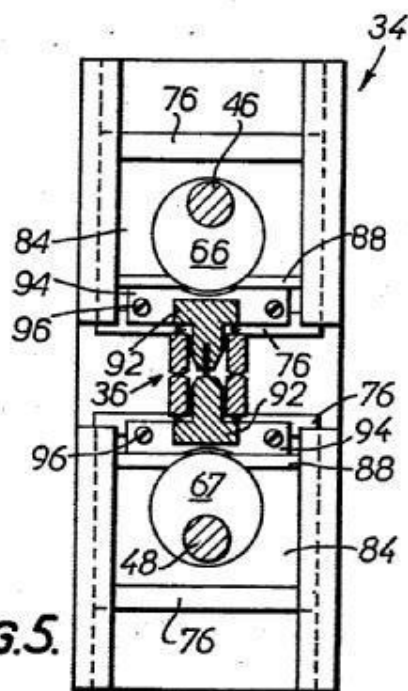
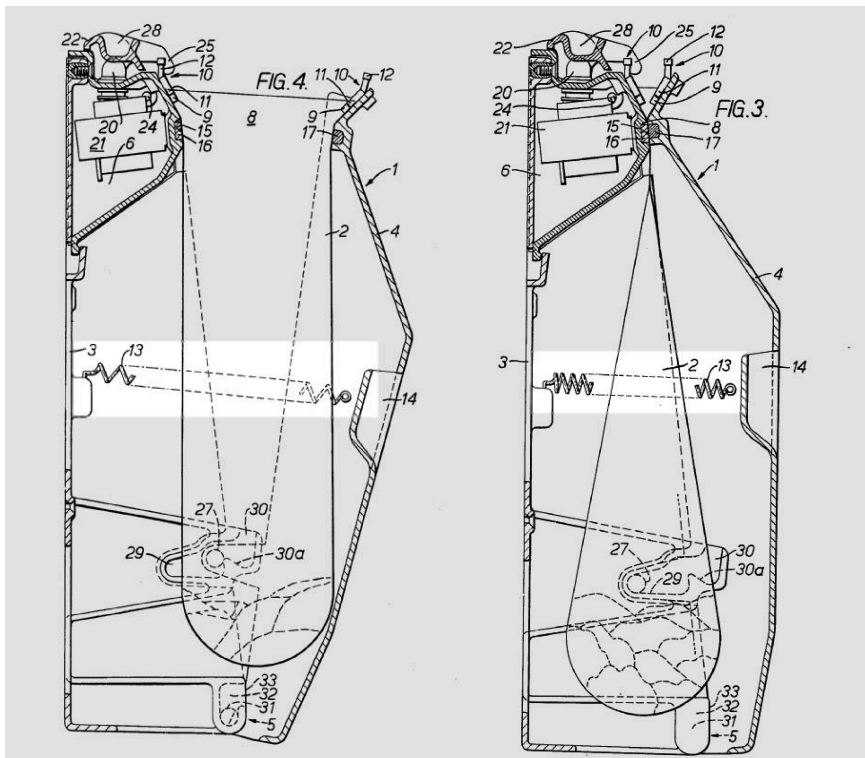


FIG. 5.

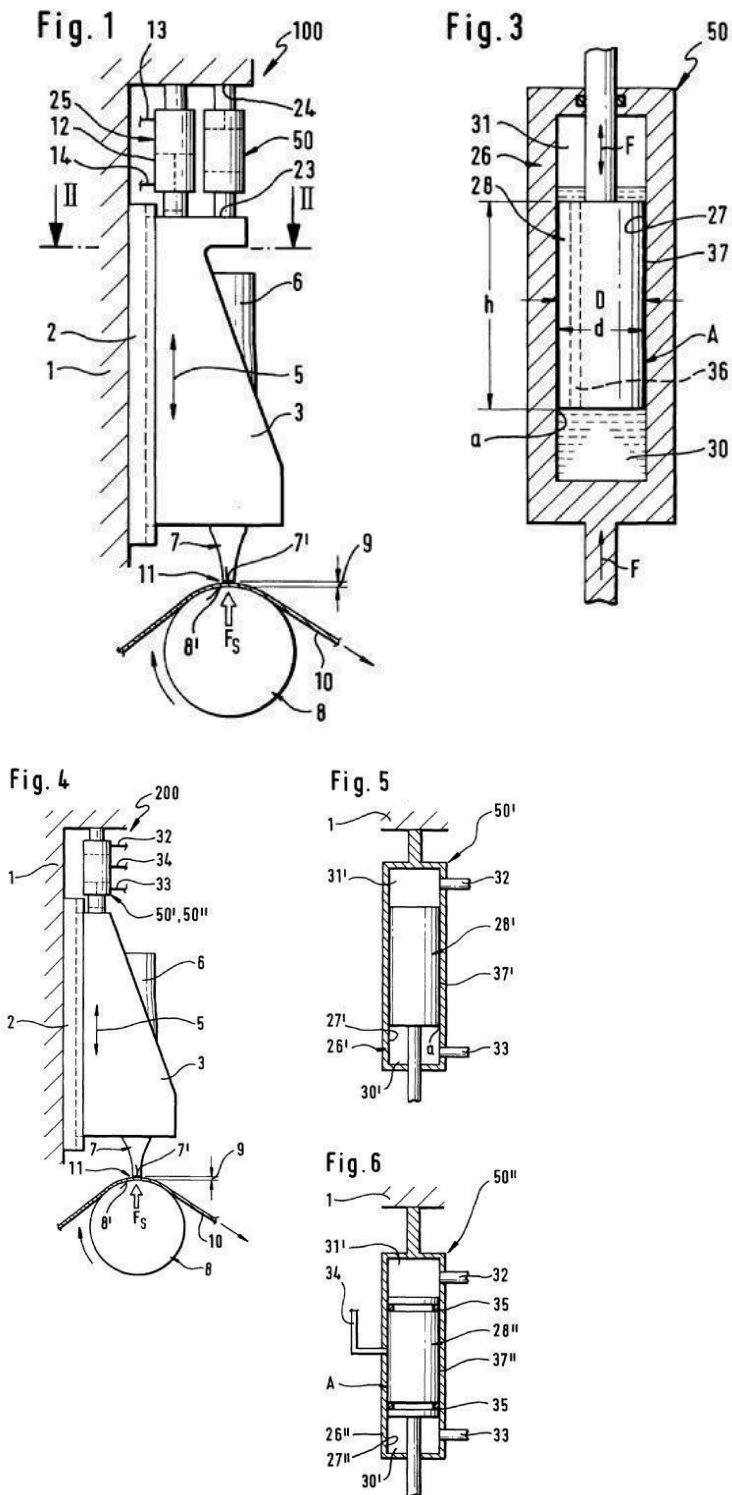
**B29C 66/8227****{using springs}****Definition statement***This place covers:*

Example 1, from

**B29C 66/8242****{Pneumatic or hydraulic drives (using fluid pressure directly acting on the parts to be joined [B29C 66/8266](#))}****Definition statement***This place covers:*

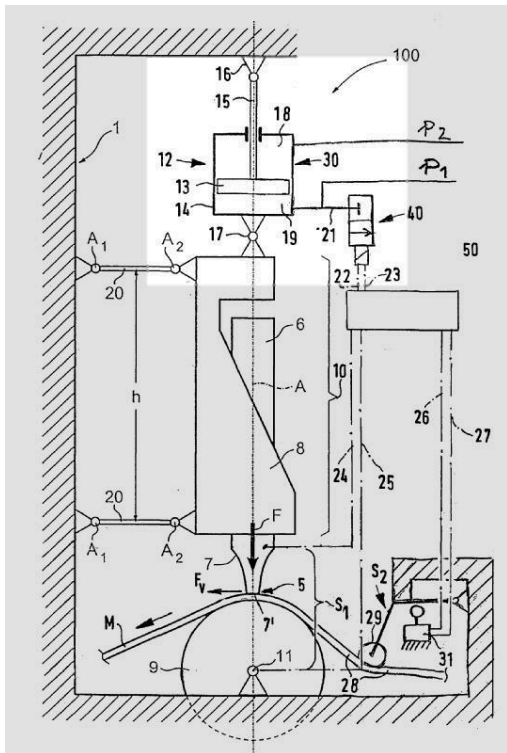
Example 1, from

DE29917831U:



Example 2, from

DE10024036:



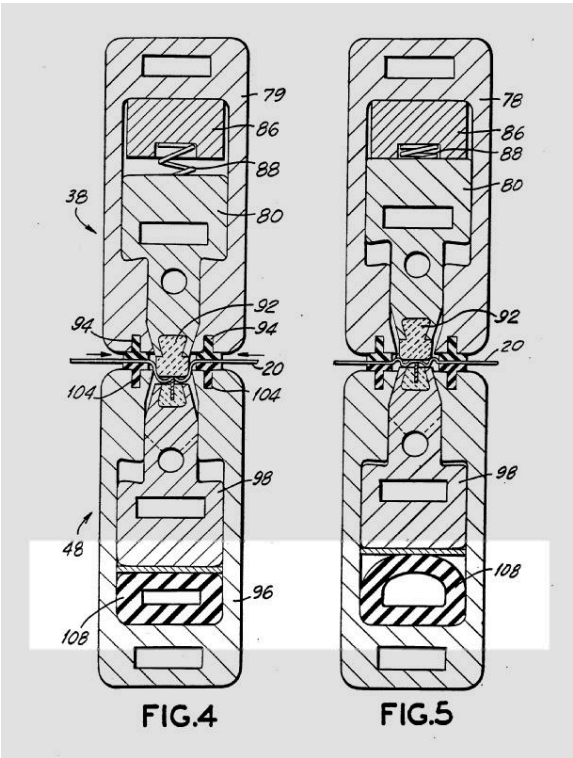
**B29C 66/82421**

{using an inflatable element positioned between the joining tool and a backing-up part}

**Definition statement**

*This place covers:*

Example 1, from



WO9208613

**References**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Presses characterised by an elastic bag or diaphragm expanded by fluid pressure	<a href="#">B30B 1/003</a>
Presses using a fluid connecting unit between drive shaft and press ram	<a href="#">B30B 1/265</a>

**B29C 66/8248**

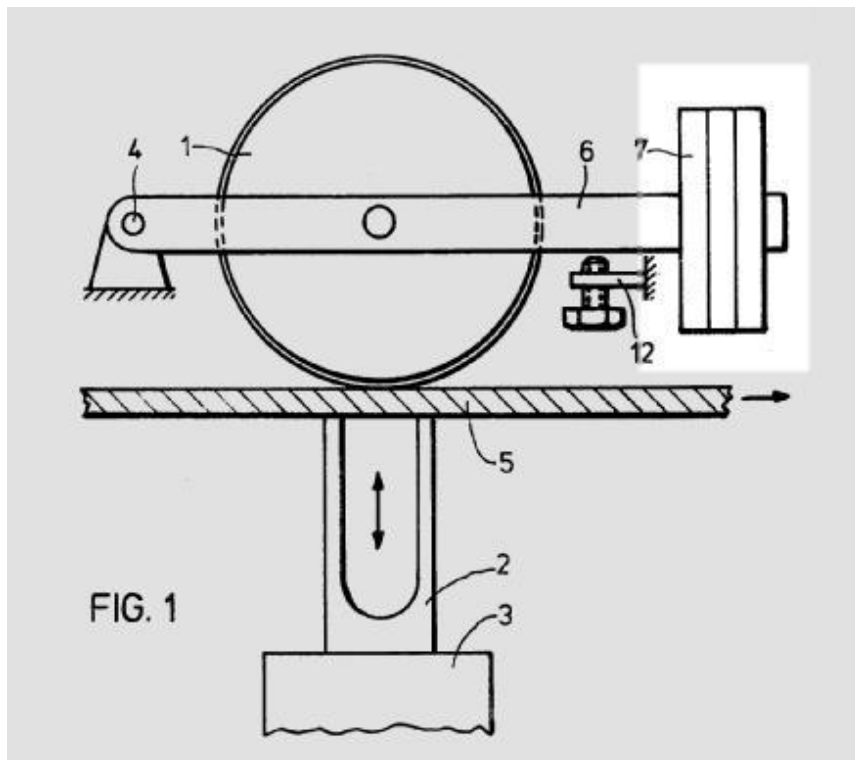
{Pressure application by weights (by the own weight of the joining tool [B29C 66/8282](#))}

**Definition statement**

*This place covers:*

Example 1, from

US4247273:



## B29C 66/8262

{using "pressure means" which are associated with at least one of the parts to be joined and remain in or on it}

### Definition statement

*This place covers:*

Example 1, from



EP2159037:

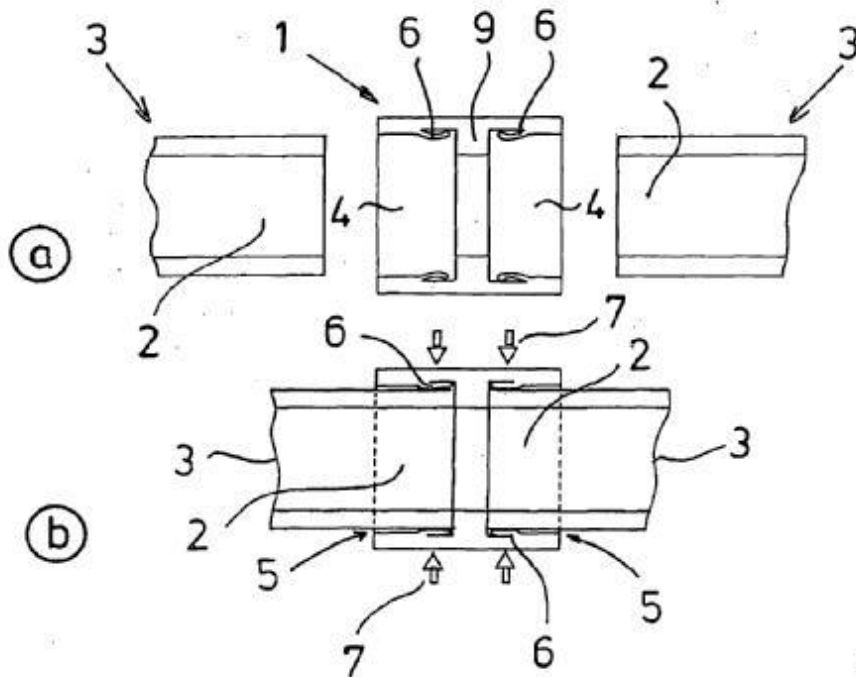


Fig. 2

## B29C 66/8264

{using the thermal expansion of the parts to be joined}

### Definition statement

*This place covers:*

Example 1, from

FR2535337:

FIG. 8

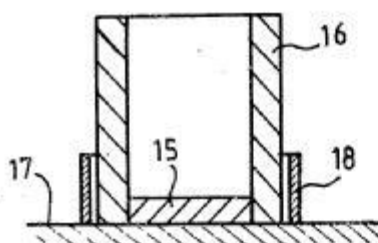
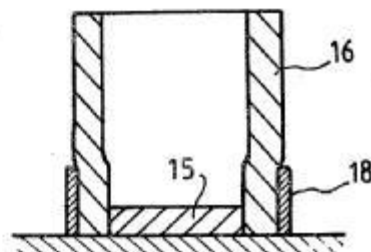


FIG. 9



**B29C 66/8266**

{using fluid pressure directly acting on the parts to be joined}

**Definition statement**

*This place covers:*

Example 1, from

DE19715779:

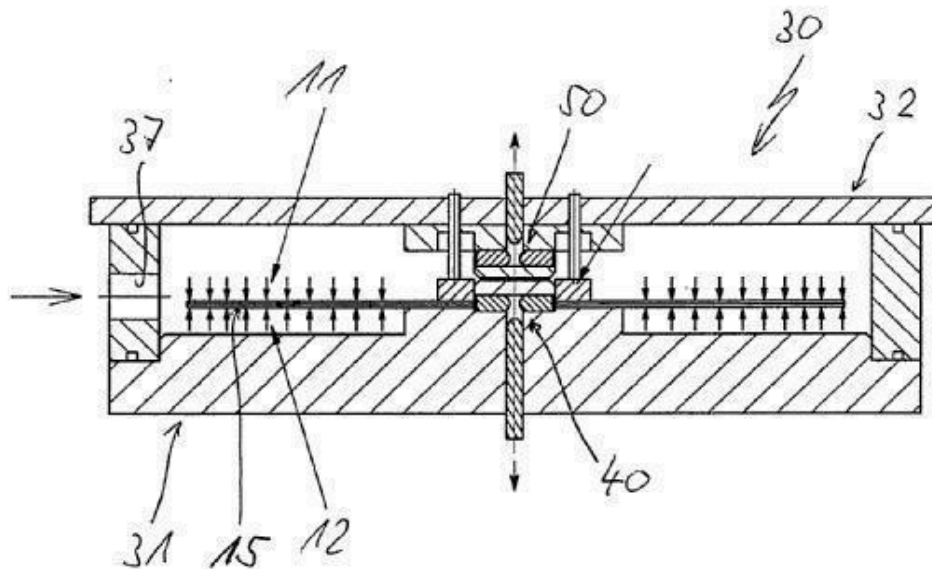
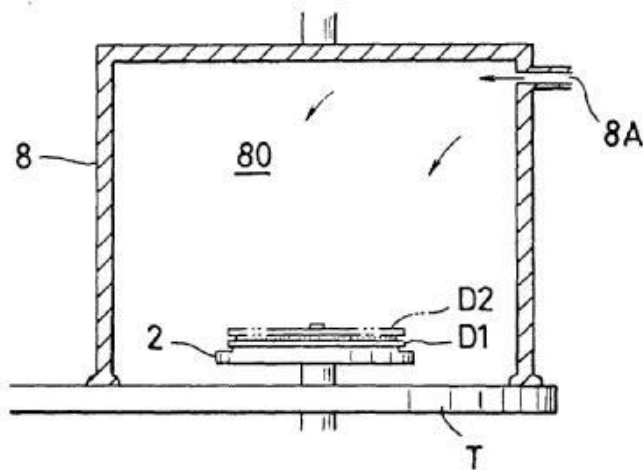


Fig. 7

Example 2, from

EP1167021:

FIG.9



**B29C 66/82661**

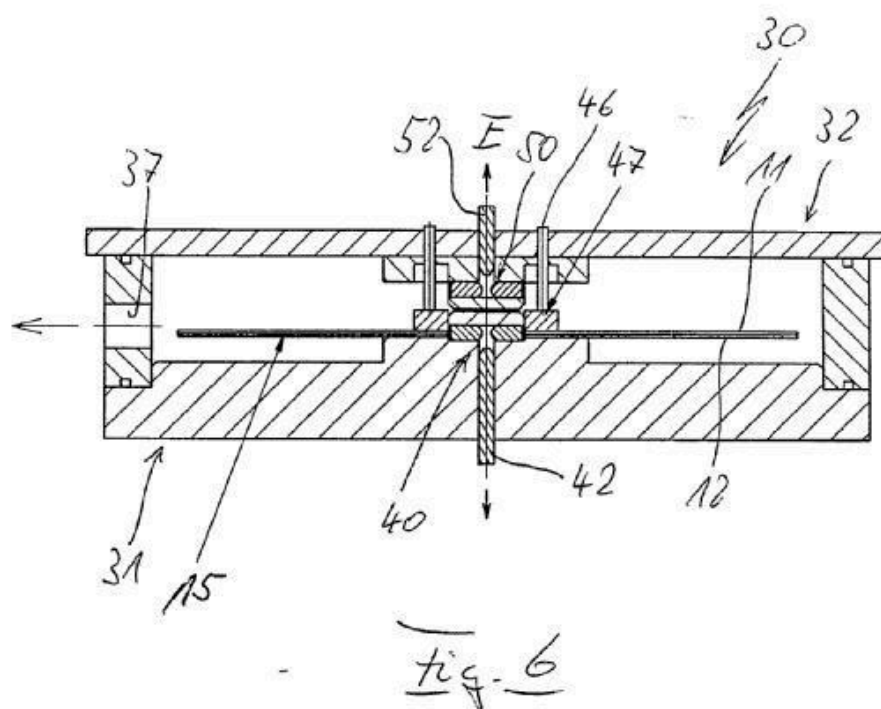
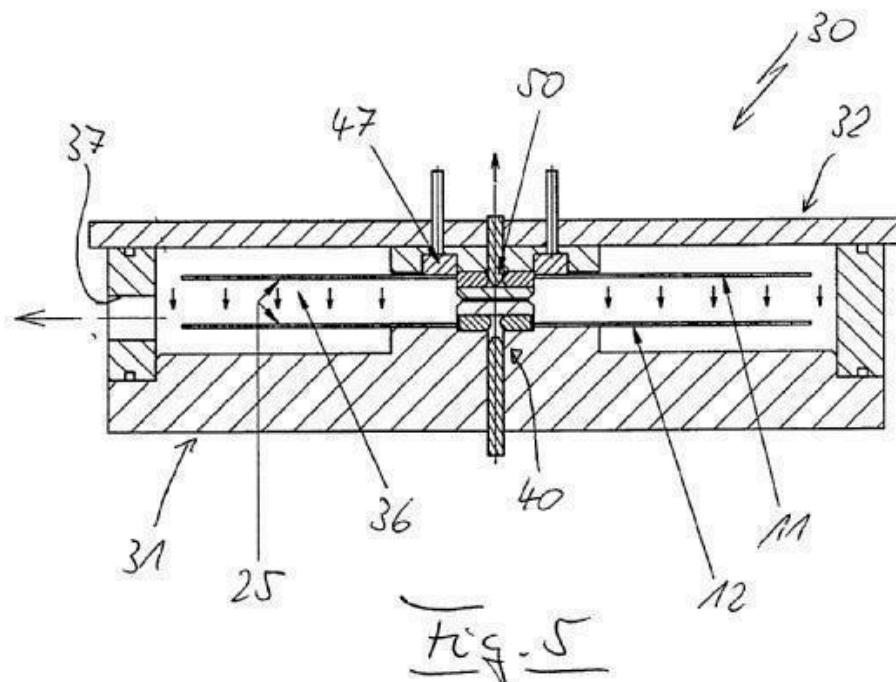
{by means of vacuum}

**Definition statement**

*This place covers:*

Example 1, from

DE19715779:



**B29C 66/832**

{Reciprocating joining or pressing tools ([B29C 66/834](#) takes precedence)}

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Applying or generating heat by reciprocating members for sealing package folds or closures	<a href="#">B65B 51/14</a>
Device specially adapted for producing transverse or longitudinal seams in webs or tubes, by applying pressure and heat, reciprocating along only one axis	<a href="#">B65B 51/303</a>

**B29C 66/83221**

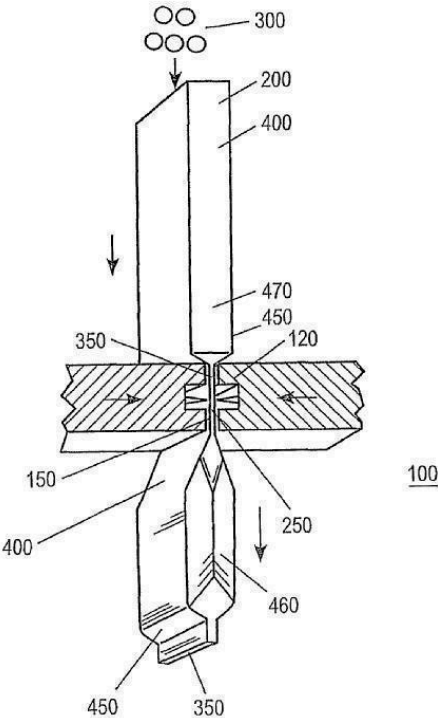
{cooperating reciprocating tools, each tool reciprocating along one axis}

**Definition statement**

This place covers:

Example 1, from

WO2008146160:



Example 2, from

WO03080447:

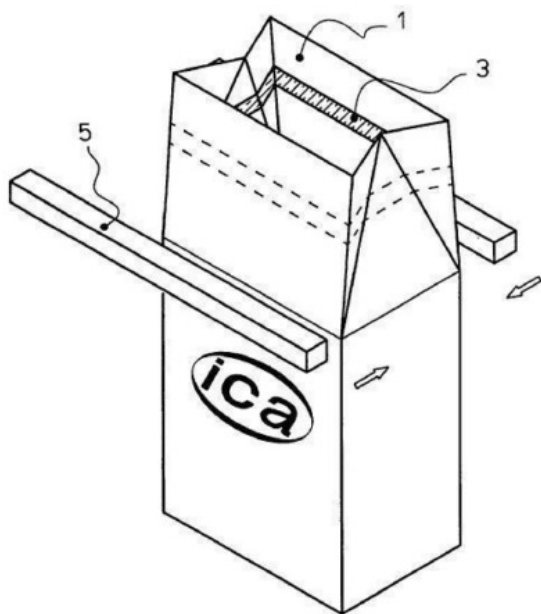


FIG. 5

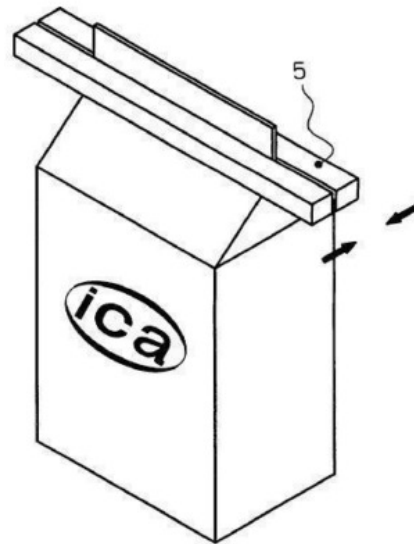


FIG. 6

## B29C 66/8324

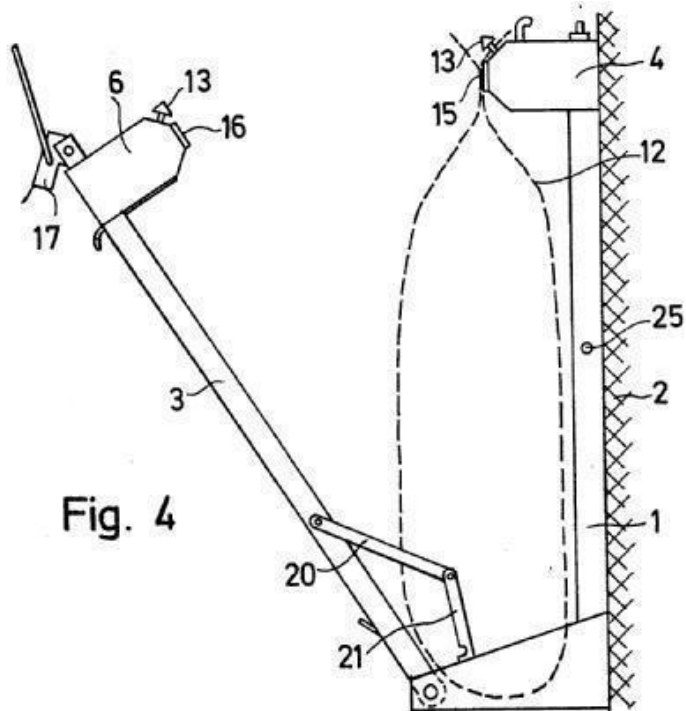
{Joining or pressing tools pivoting around one axis (scissor or lever transmission mechanisms [B29C 66/8221](#); tools self-aligning to the joining plane [B29C 66/8163](#))}

### Definition statement

*This place covers:*

Example 1, from

FR2198872:



## **B29C 66/83241**

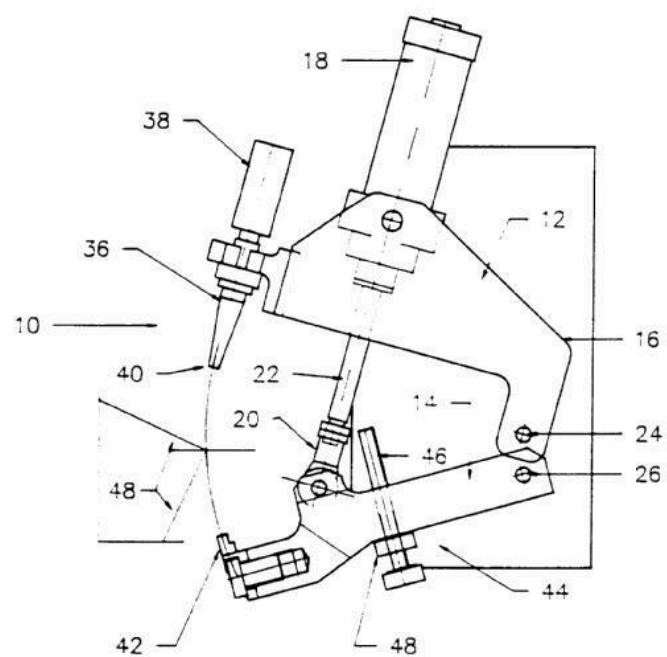
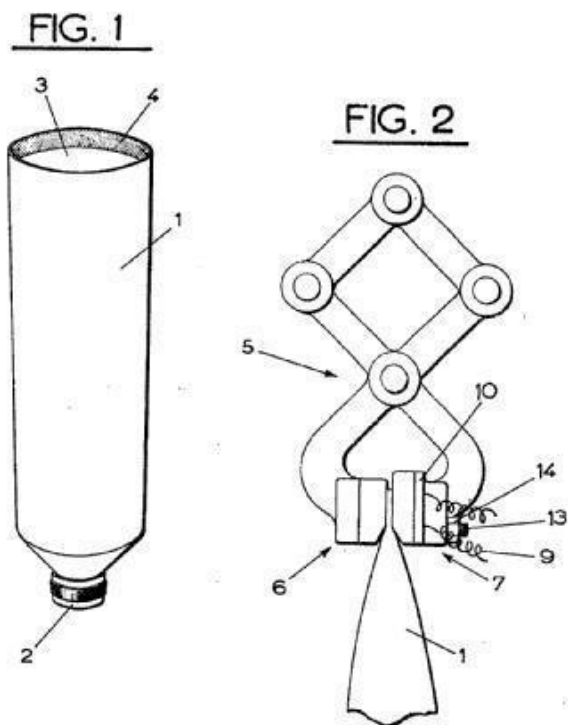
**{cooperating pivoting tools}**

### **Definition statement**

*This place covers:*

Example 1, from

Example 2, from  
FR2732264:

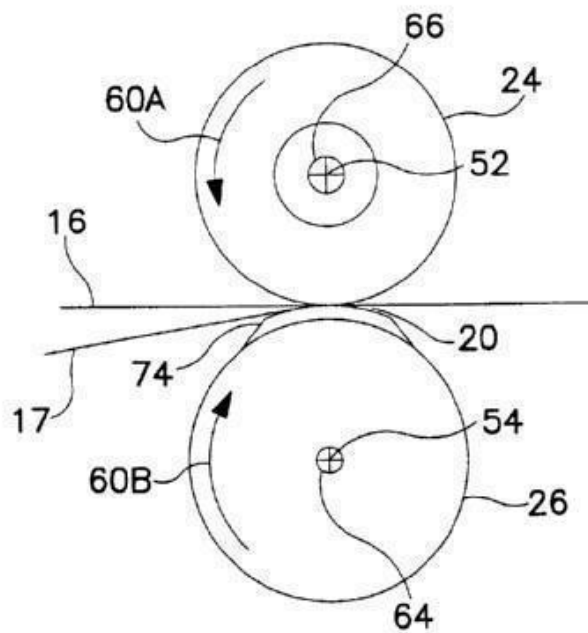




**B29C 66/834****{moving with the parts to be joined}****Definition statement***This place covers:*

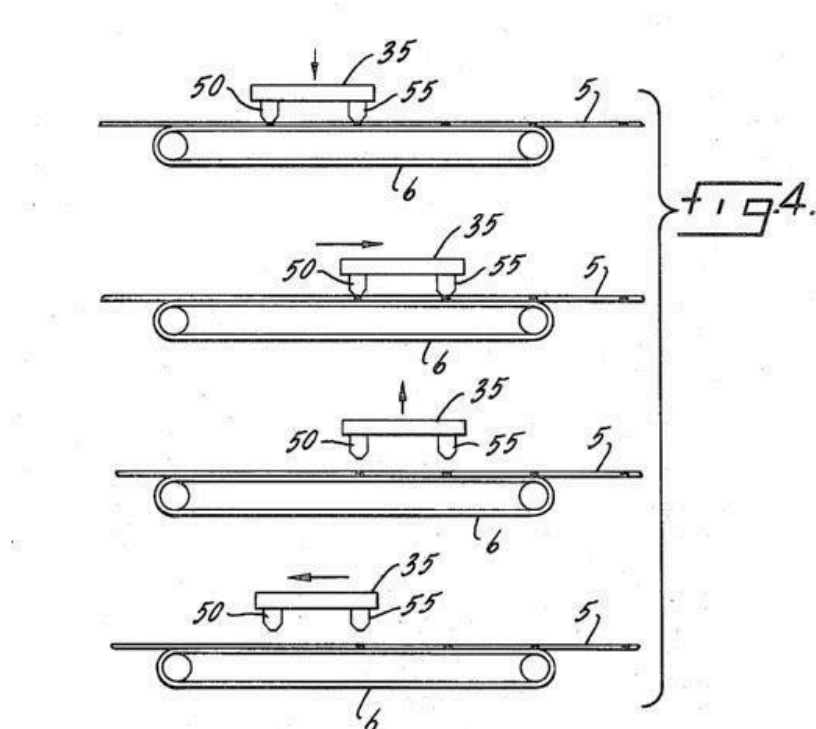
Example 1, [B29C 66/83411](#) (roller, cylinder or drum types) and [B29C 66/83511](#) (jaws mounted on rollers, cylinders or drums), from

US6454890:

**FIG. 5B**

Example 2, [B29C 66/83541](#) (flying jaws) and [B29C 66/83421](#) (band or belt types), from

US3692608:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Ultrasonic welding of metals using a roller	<a href="#">B23K 20/103</a>
Applying or generating heat by rotary members for sealing package folds or closures	<a href="#">B65B 51/16</a>
Applying or generating heat by endless bands or chains for sealing package folds or closures	<a href="#">B65B 51/18</a>
Rollers for producing longitudinal and transverse seams simultaneously in package webs or tubes	<a href="#">B65B 51/28</a>
Counter-rotating devices for producing transverse or longitudinal seams in package webs or tubes by applying pressure and heat	<a href="#">B65B 51/306</a>
Heated rollers for induction heating	<a href="#">H05B 6/145</a>

## B29C 66/83413

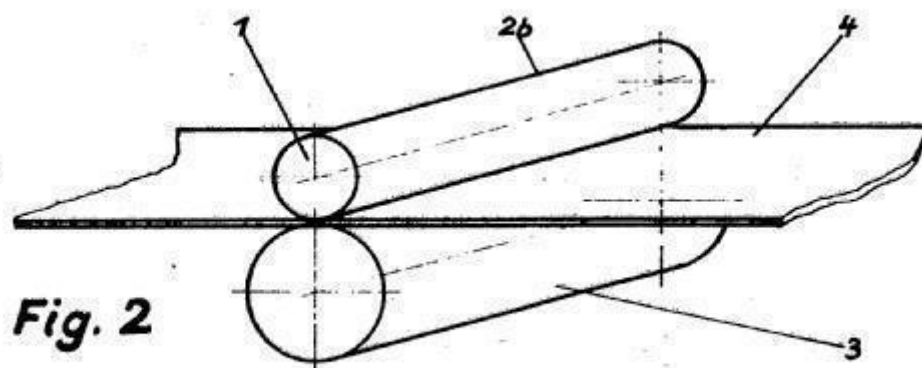
{cooperating rollers, cylinders or drums}

### Definition statement

This place covers:

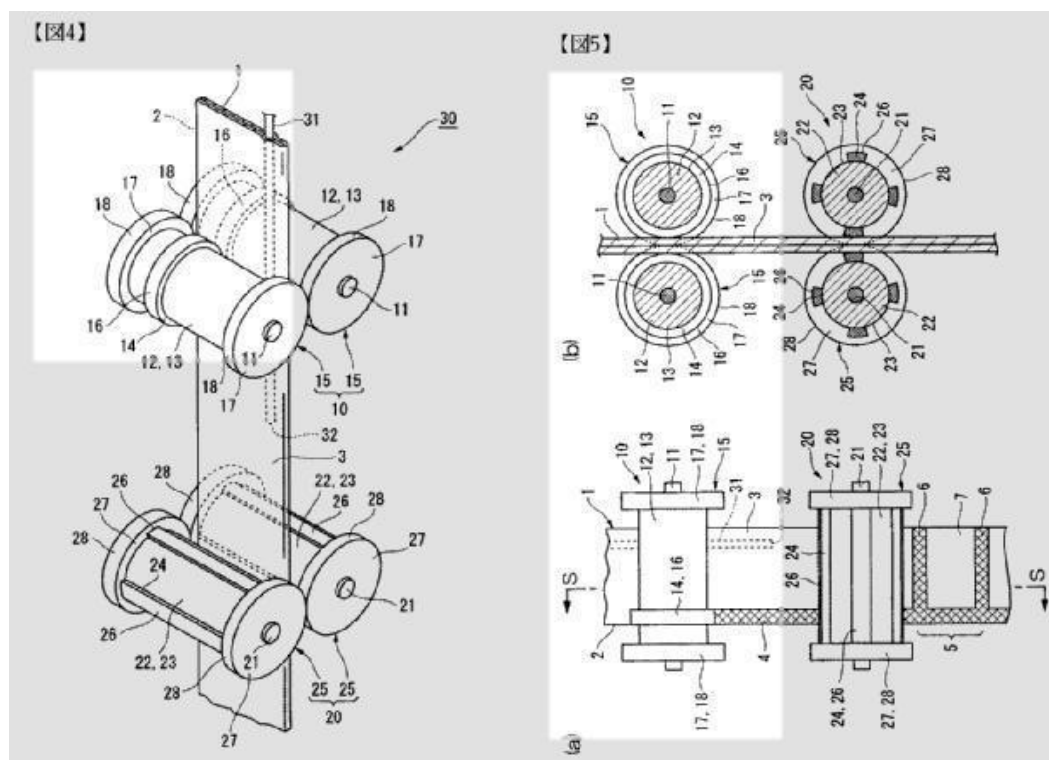
Example 1, from

DE2259203:



Example 2, from

JP2006027671:



Example 3, from

US6454890:

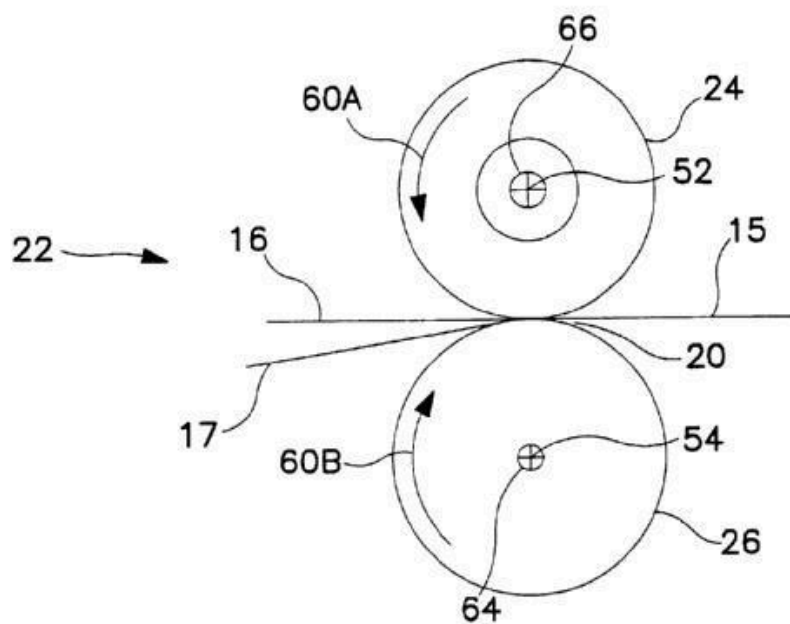


FIG. 5A

## B29C 66/83415

{the contact angle between said rollers, cylinders or drums and said parts to be joined being a non-zero angle ([B29C 66/83433](#) takes precedence)}

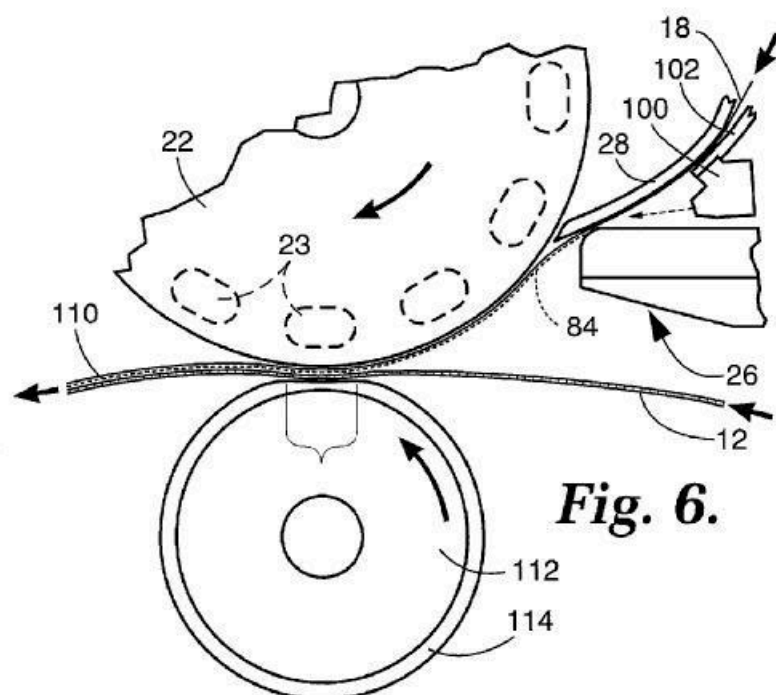
### Definition statement

*This place covers:*

Example 1, from

Definition statement

US2003010439:

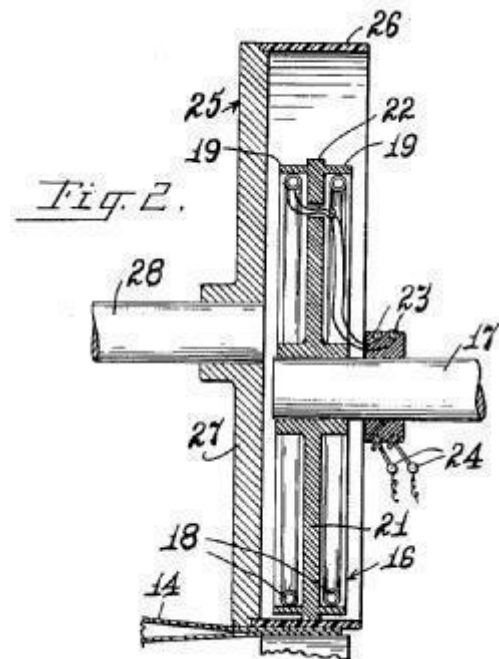
**Fig. 6.****B29C 66/83417**

{said rollers, cylinders or drums being hollow}

**Definition statement***This place covers:*

Example 1, from

US3059690:



## B29C 66/83421

{band or belt types ([B29C 66/83431](#) takes precedence)}

### References

#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for, or methods of, sealing or securing package folds or closures, by applying or generating heat by endless bands	<a href="#">B65B 51/18</a>
--	----------------------------

## B29C 66/83423

{cooperating bands or belts}

### Definition statement

*This place covers:*

Example 1, from

Definition statement

US4411310:

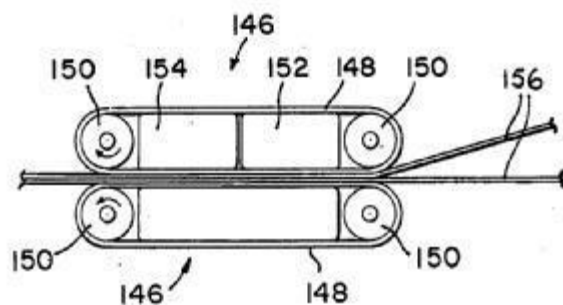


FIG. 18

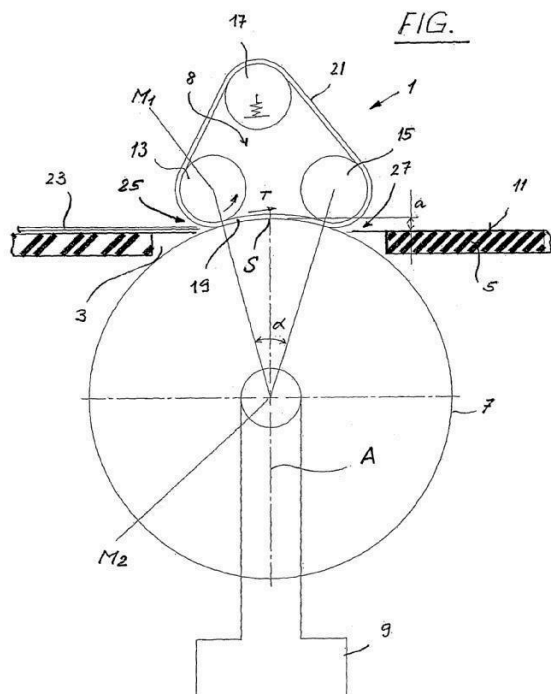
**B29C 66/83431**

{rollers, cylinders or drums cooperating with bands or belts}

**Definition statement***This place covers:*

Example 1, from

WO2006087224:



**B29C 66/83433**

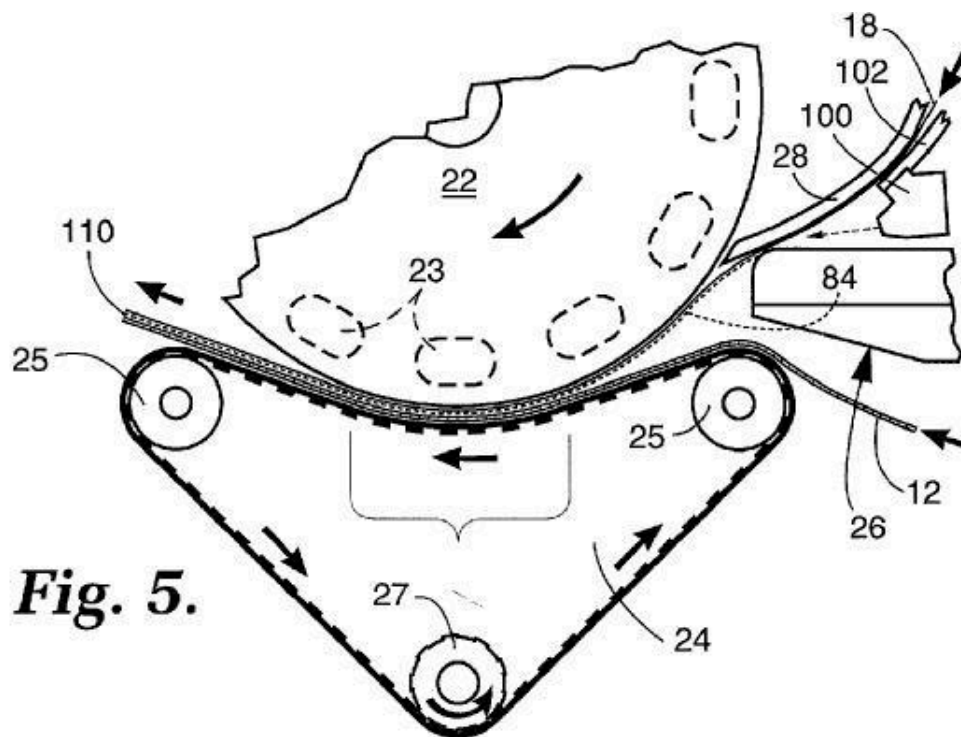
{the contact angle between said rollers, cylinders or drums and said bands or belts being a non-zero angle}

**Definition statement**

*This place covers:*

Example 1, from

US2003010439:

**B29C 66/83435**

{said rollers, cylinders or drums being hollow}

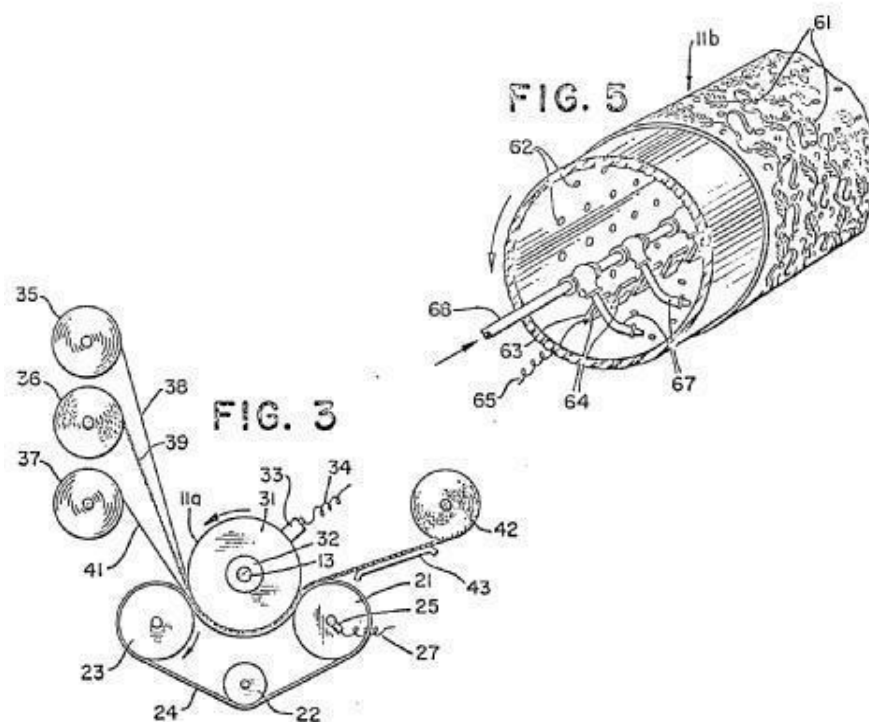
**Definition statement**

*This place covers:*

Example 2, from



LU41236:



## B29C 66/83441

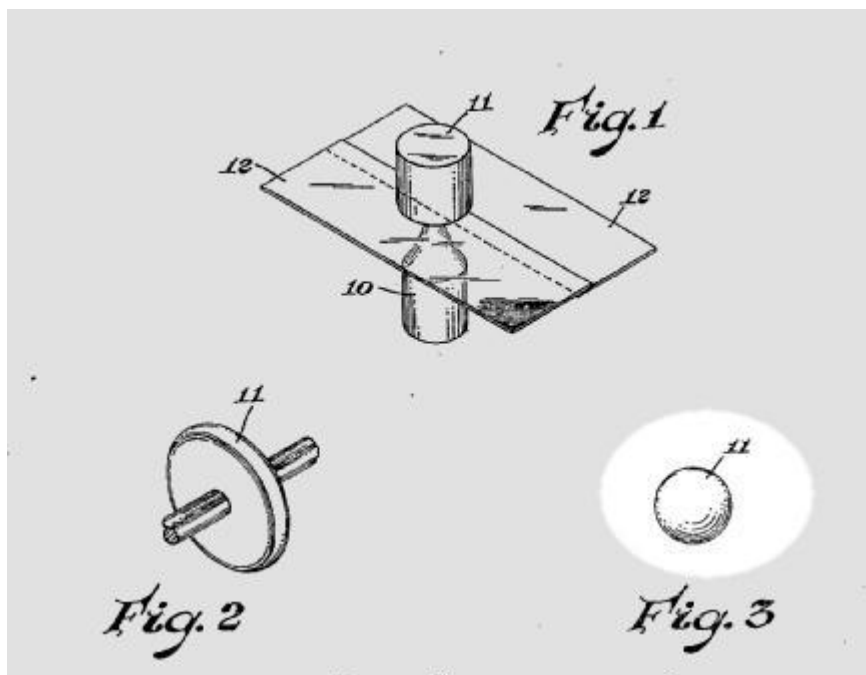
{Ball types}

### Definition statement

*This place covers:*

Example 1, from

FR1264171:



## B29C 66/83511

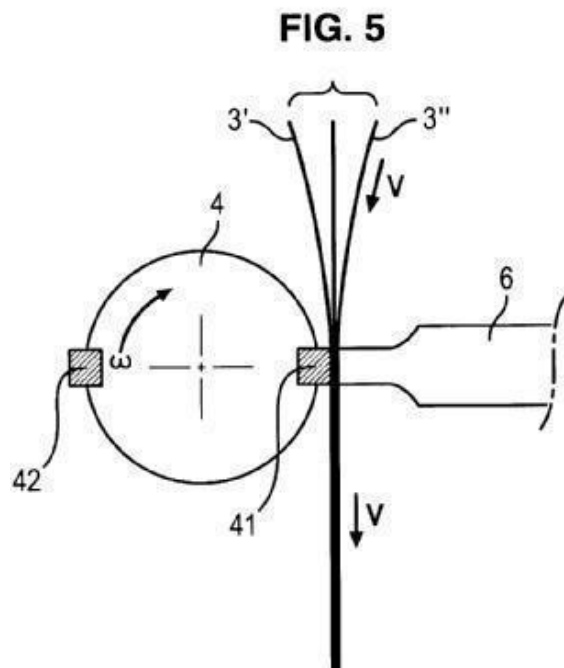
{jaws mounted on rollers, cylinders or drums}

### Definition statement

*This place covers:*

Example 1, from

FR2953200:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Rollers for producing longitudinal and transverse seams simultaneously in package webs or tubes	<a href="#">B65B 51/28</a>
---	----------------------------

## B29C 66/83513

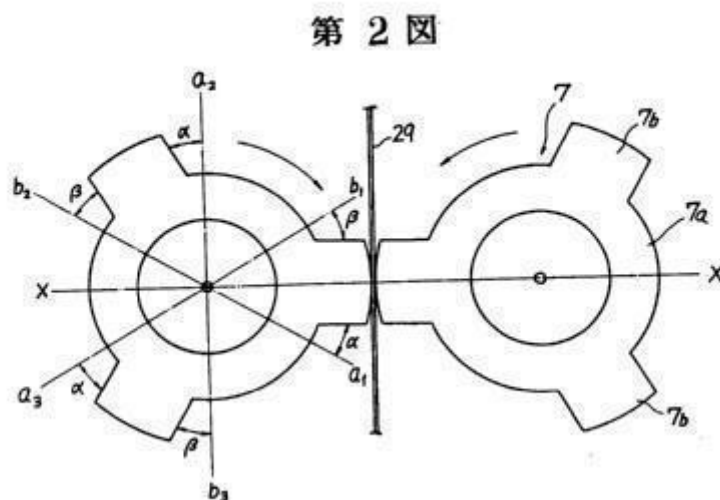
{cooperating jaws mounted on rollers, cylinders or drums and moving in a closed path}

### Definition statement

This place covers:

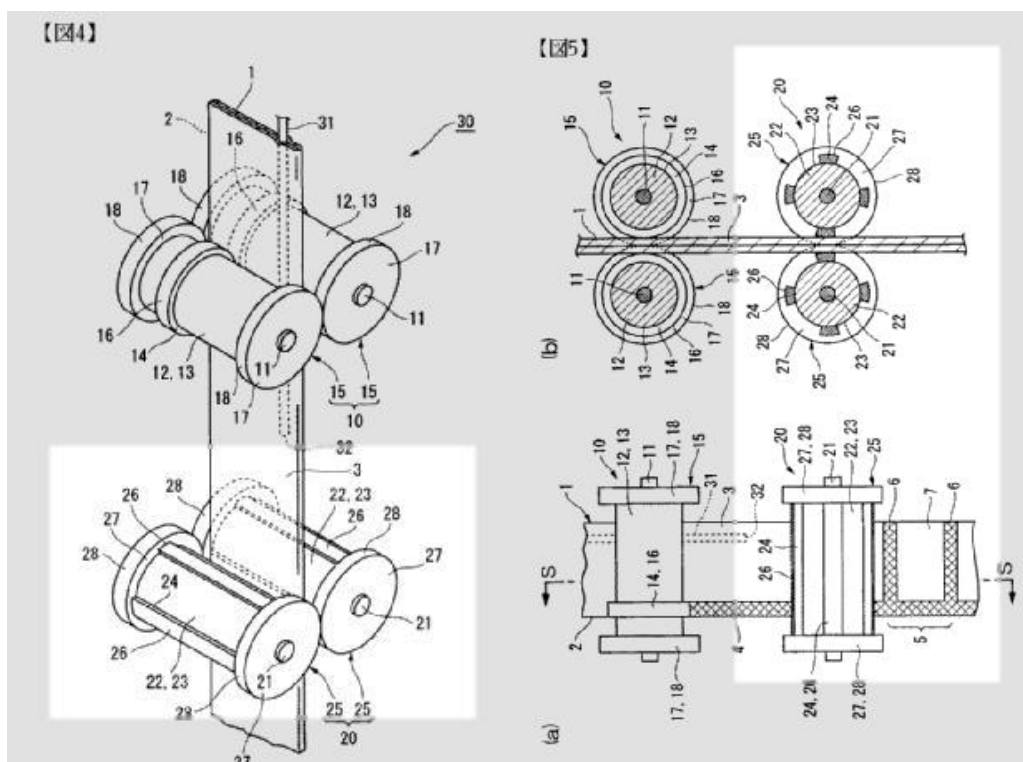
Example 1, from

JP61142105:



Example 2, from

JP2006027671:



## B29C 66/83521

{jaws mounted on bands or belts}

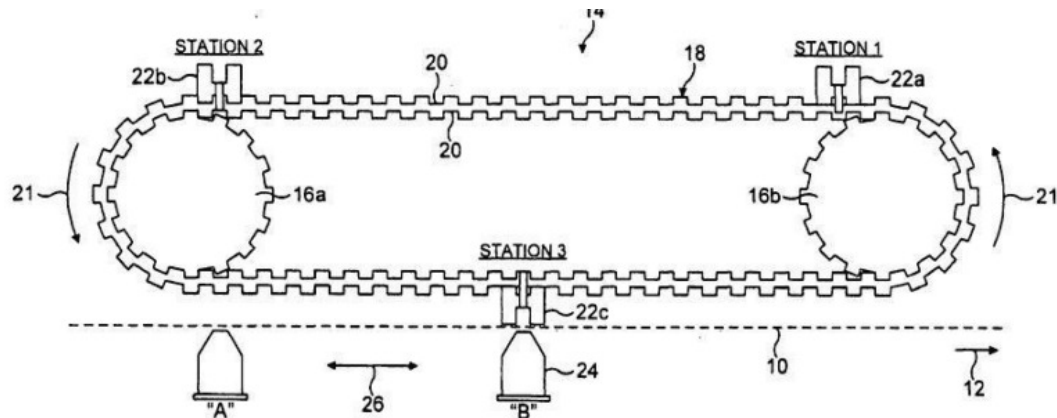
### Definition statement

*This place covers:*

Example 1, from

Definition statement

WO03097341:

**B29C 66/83523**

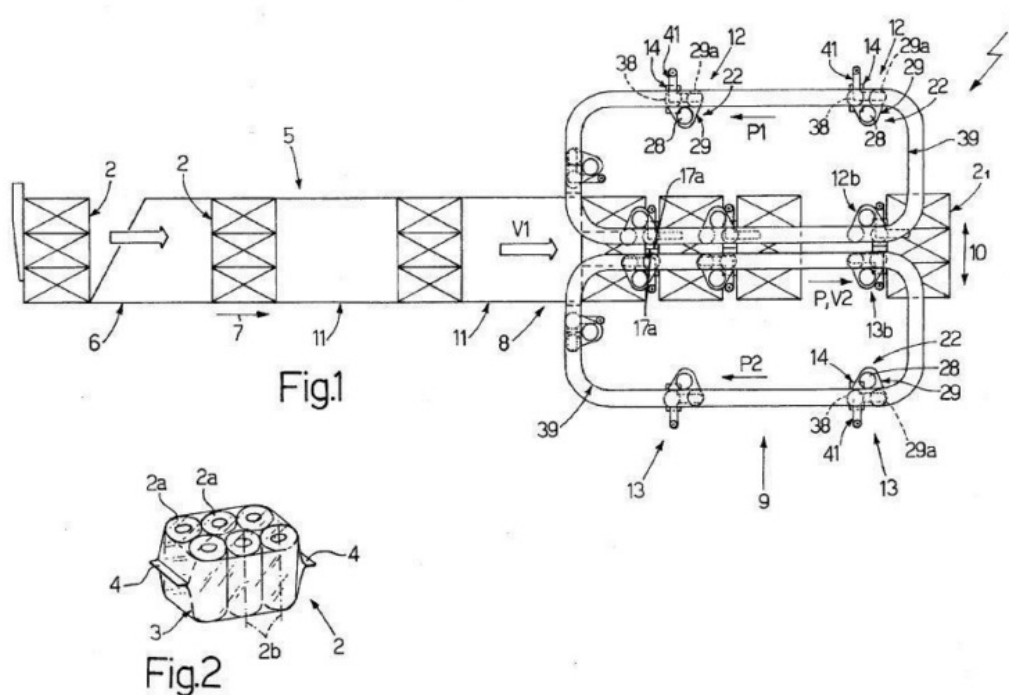
{Cooperating jaws mounted on cooperating bands or belts and moving in a closed path}

**Definition statement**

*This place covers:*

Example 1, from

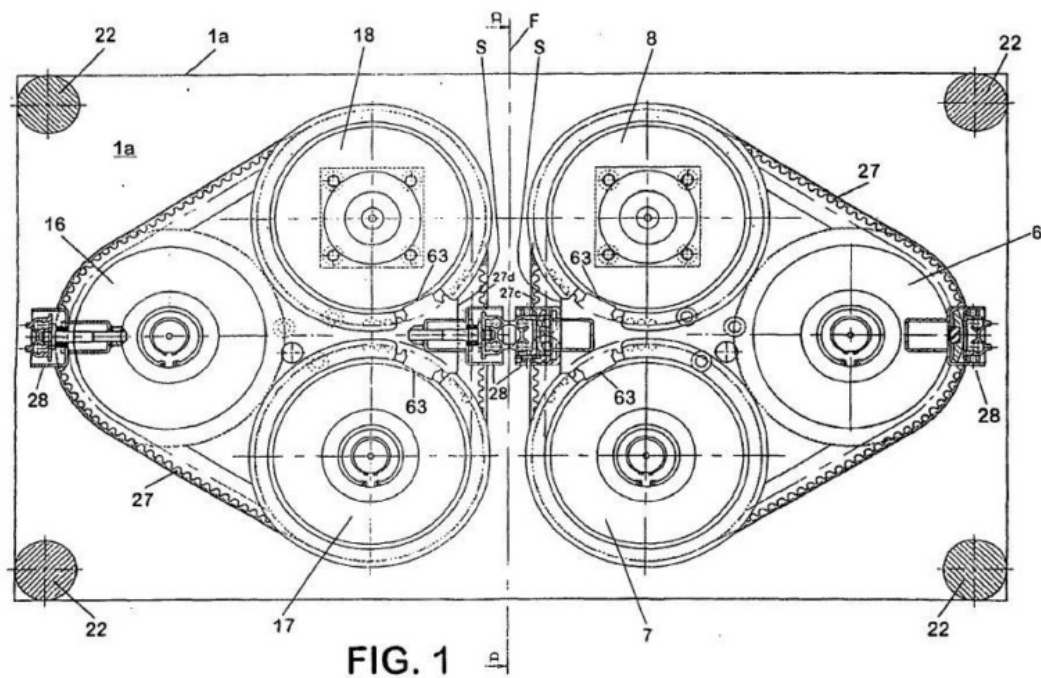
EP1442984:



Example 2, from

Definition statement

WO0026010:

**B29C 66/83533**

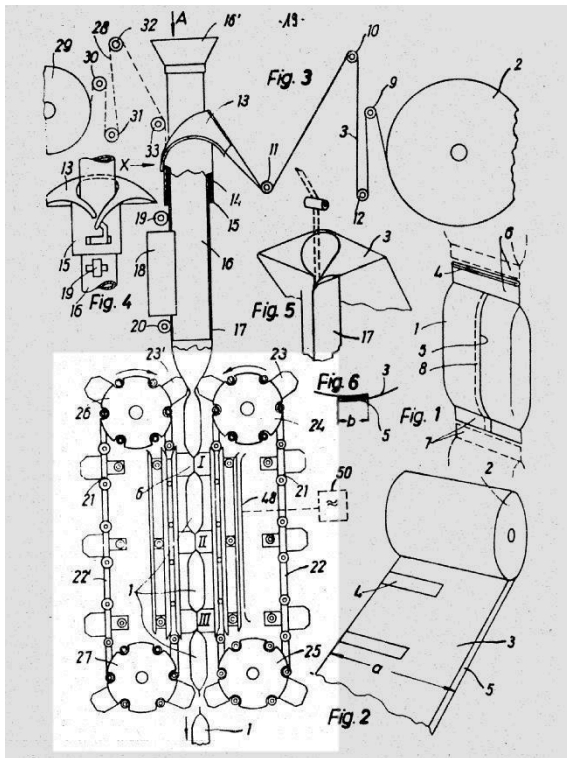
{Cooperating jaws mounted on cooperating chains and moving in a closed path}

**Definition statement**

*This place covers:*

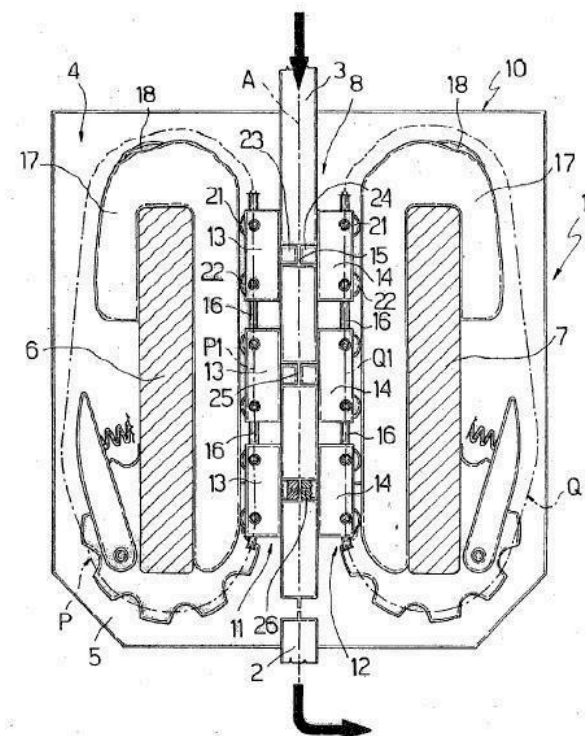
Example 1, from

DE4314637:



Example 2, from

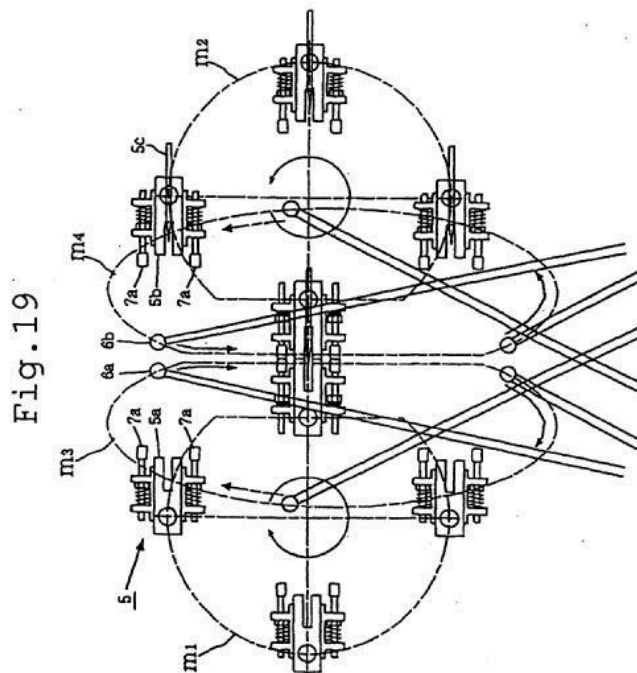
EP1234772:



**B29C 66/83543****{cooperating flying jaws}****Definition statement***This place covers:*

Example 1, from

EP0915015:

**B29C 66/836**

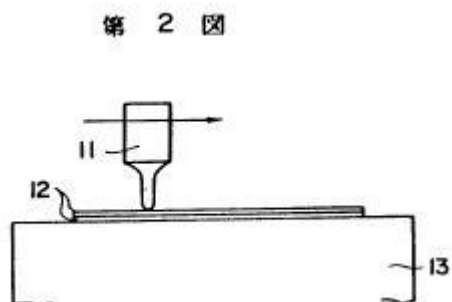
**{Moving relative to and tangentially to the parts to be joined, e.g. transversely to the displacement of the parts to be joined, e.g. using a X-Y table ([B29C 66/65](#) takes precedence)}**

**Definition statement***This place covers:*

Example 1, from



JP58042049:



Example 2, from

WO2011065827:

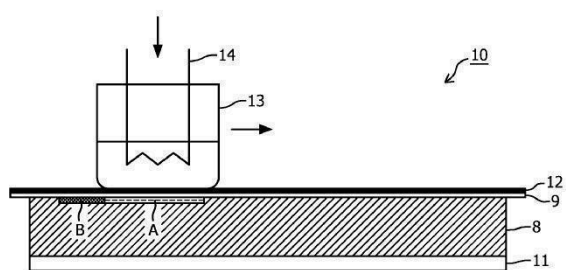


FIG. 2C

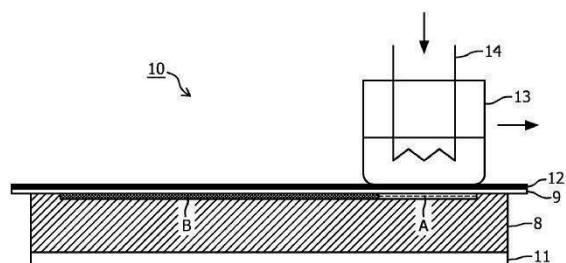
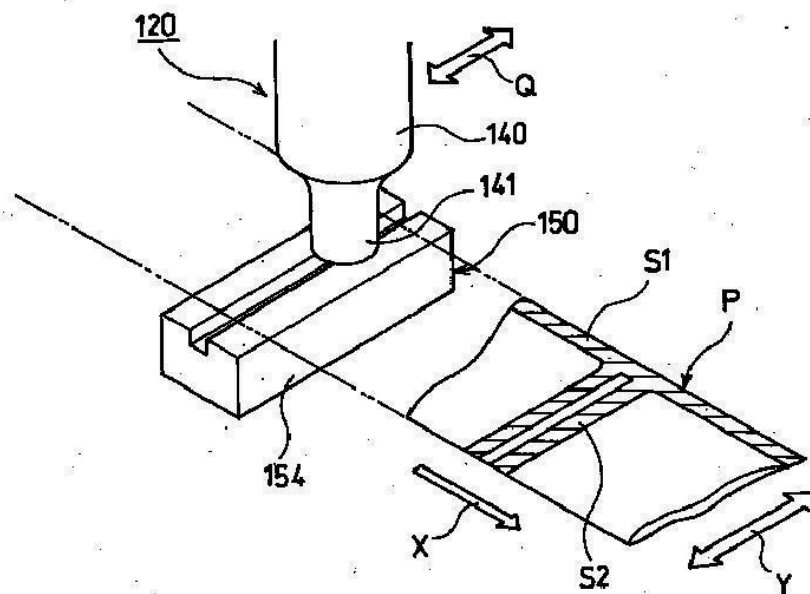


FIG. 2D

Example 3, from

JP2000272612:



## B29C 66/8362

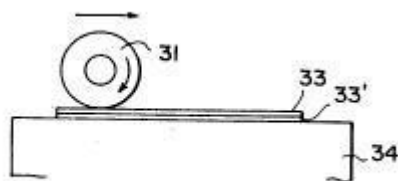
{Rollers, cylinders or drums moving relative to and tangentially to the parts to be joined}

### Definition statement

*This place covers:*

Example 1, from

JP58042049:



**B29C 66/841**

{Machines or tools adaptable for making articles of different dimensions or shapes or for making joints of different dimensions}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Arrangements to enable machines to produce packages of different sizes	<a href="#">B65B 59/00</a>
--	----------------------------

**B29C 66/8414**

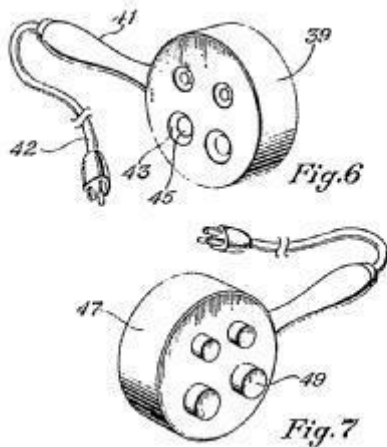
{of different diameter}

**Definition statement**

*This place covers:*

Example 1, from

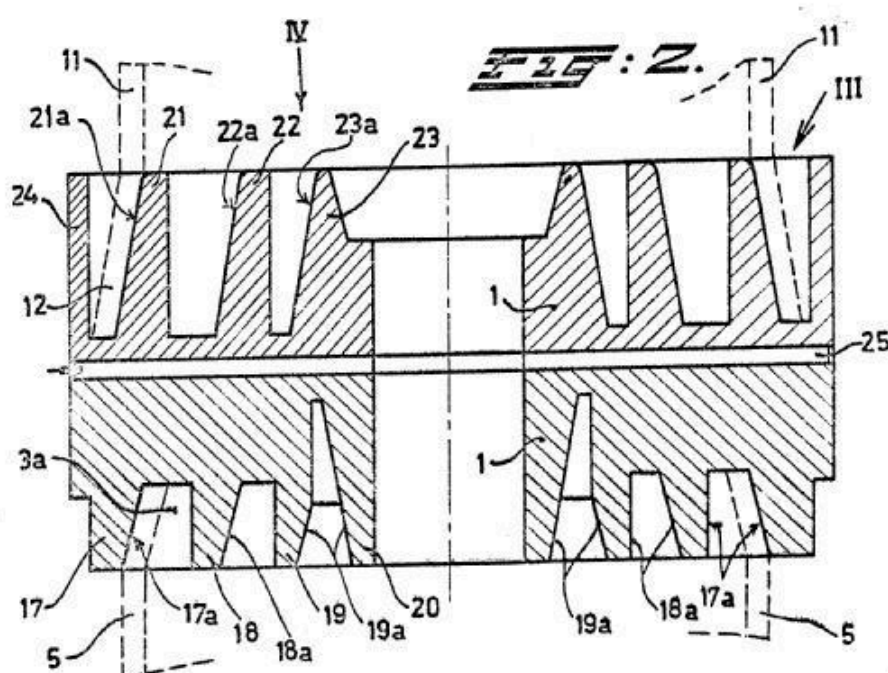
DE2654342:



Example 2, from

Definition statement

NL7802257:

**B29C 66/843**

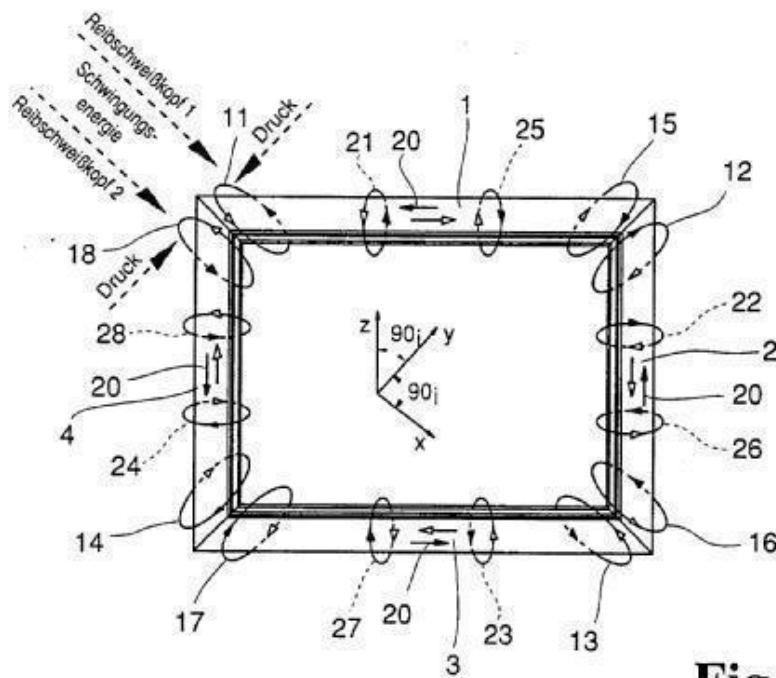
{Machines for making separate joints at the same time in different planes;  
Machines for making separate joints at the same time mounted in parallel or in  
series}

**Definition statement**

*This place covers:*

Example 1, from

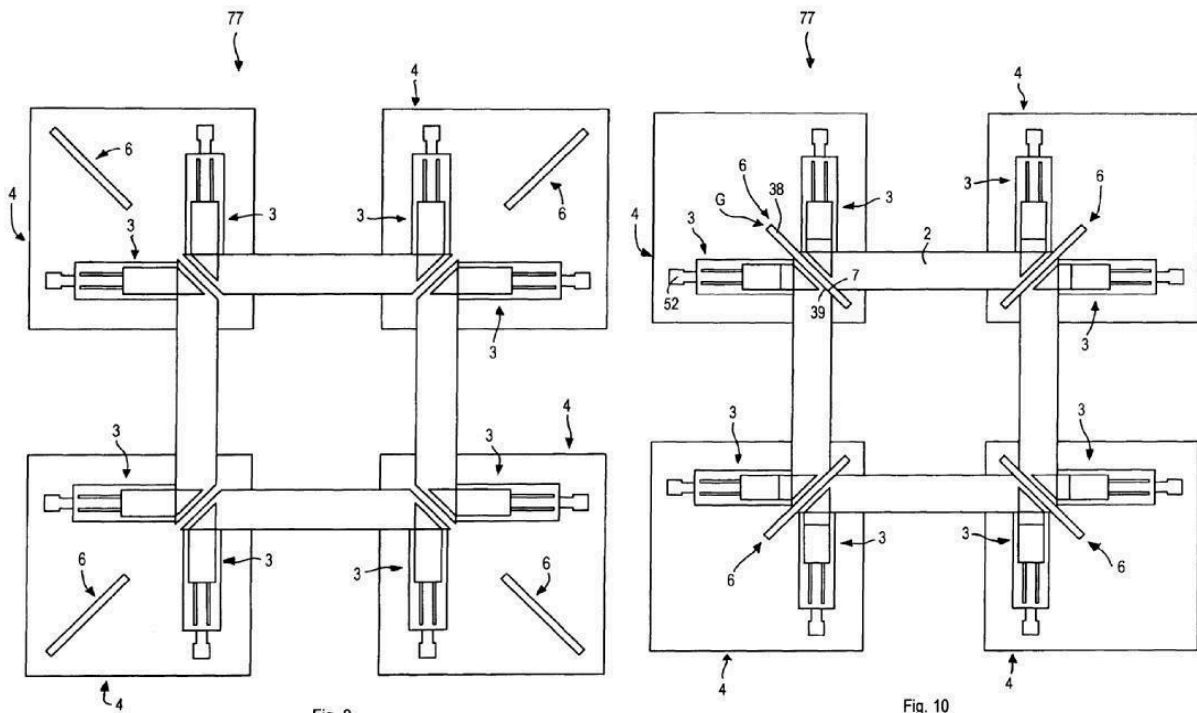
DE19938100:



**Fig. 1**

Example 2, from

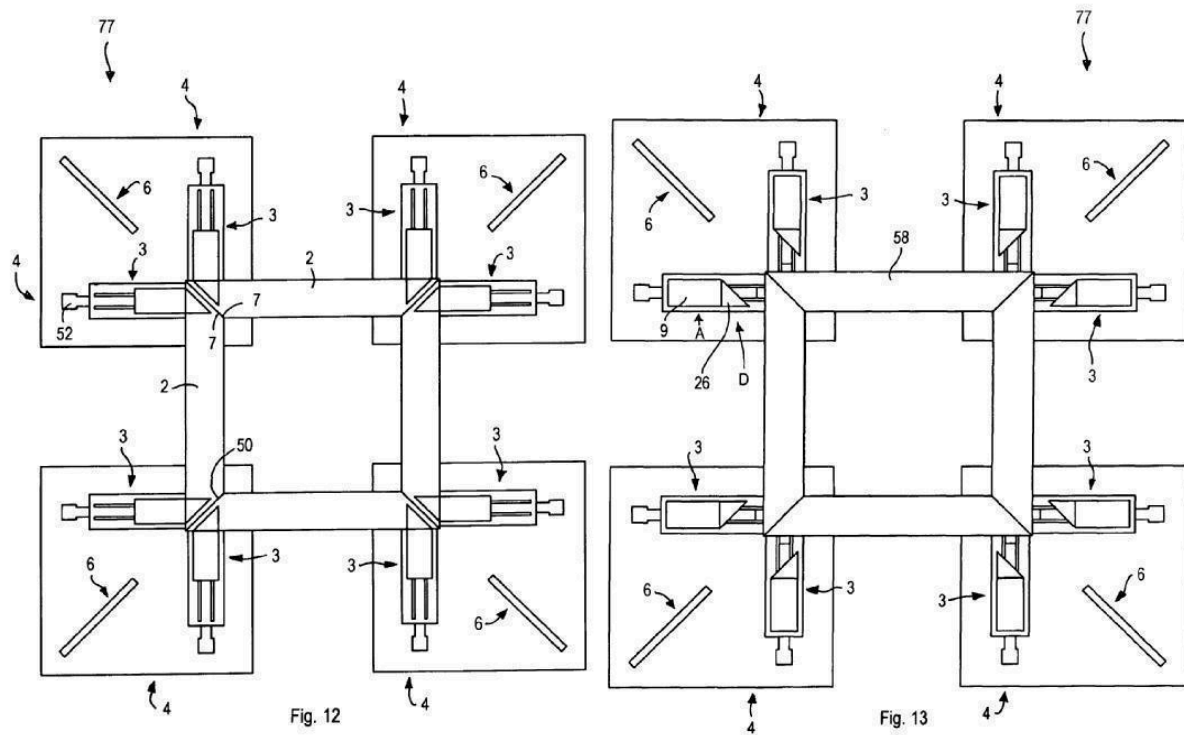
EP1837163:



**Fig. 9**

**Fig. 10**

## Definition statement

**B29C 66/8432**

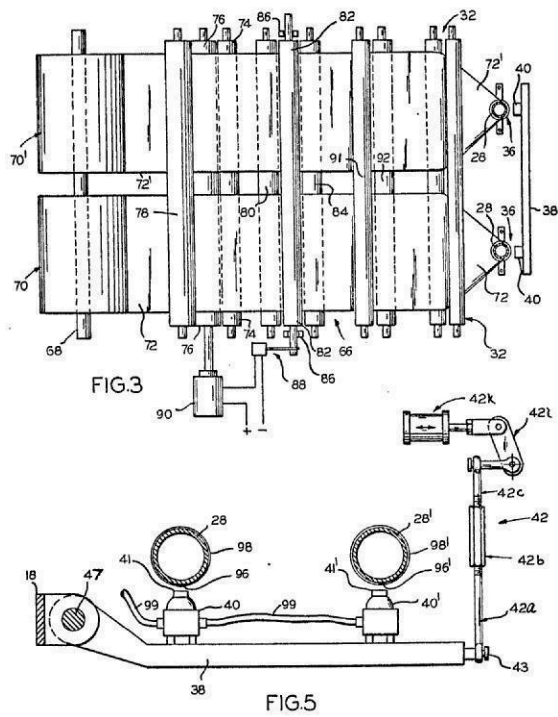
{Machines for making separate joints at the same time mounted in parallel or in series}

**Definition statement**

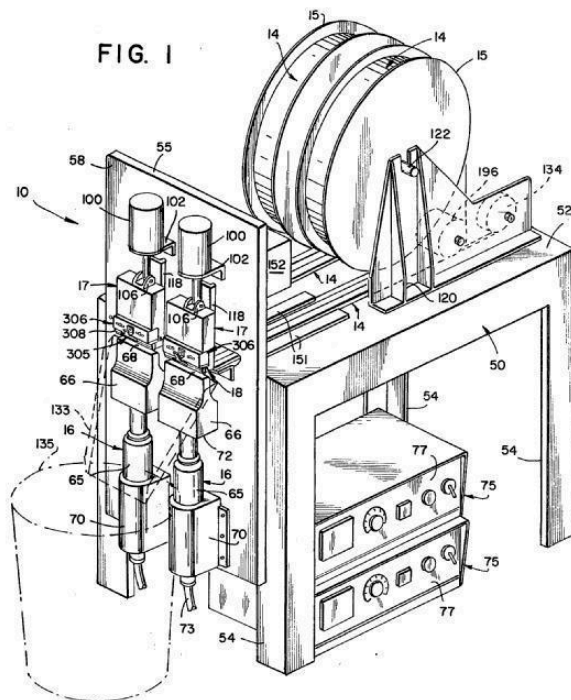
*This place covers:*

Example 1, from

GB1189906:



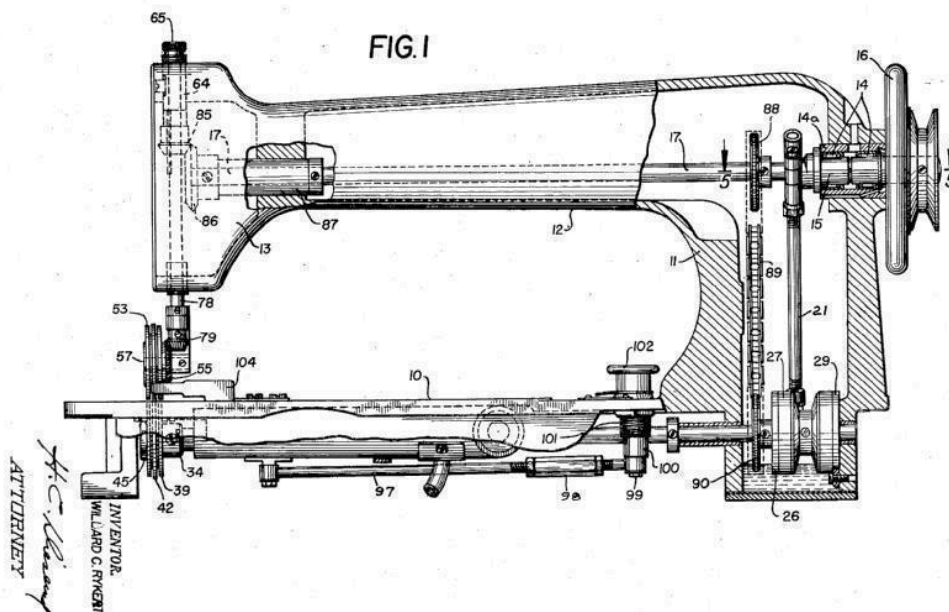
Example 2, from  
US4158584:



**B29C 66/845****{C-clamp type or sewing machine type}****Definition statement***This place covers:*

Example 1, from

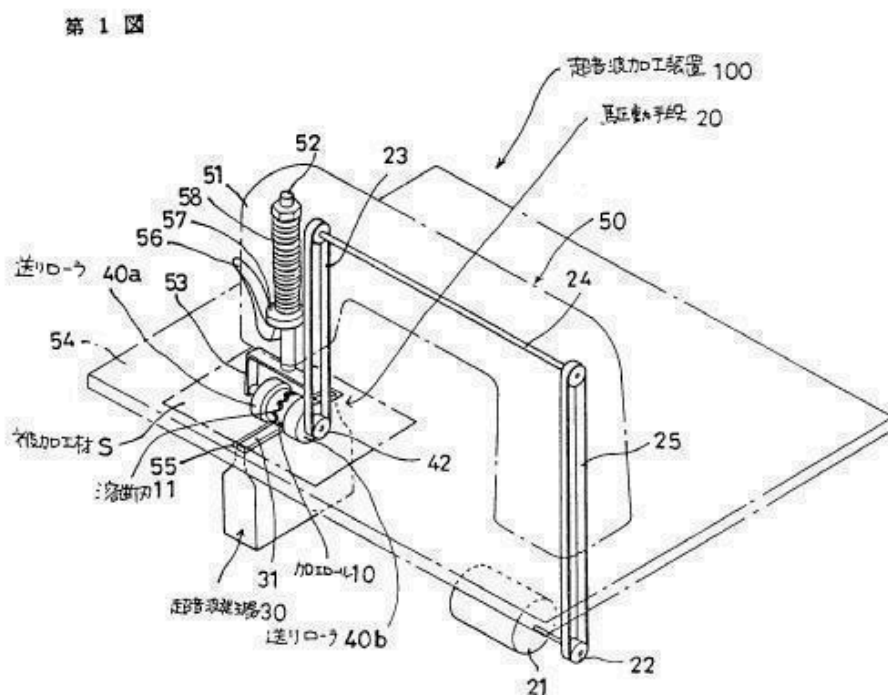
US2583709:



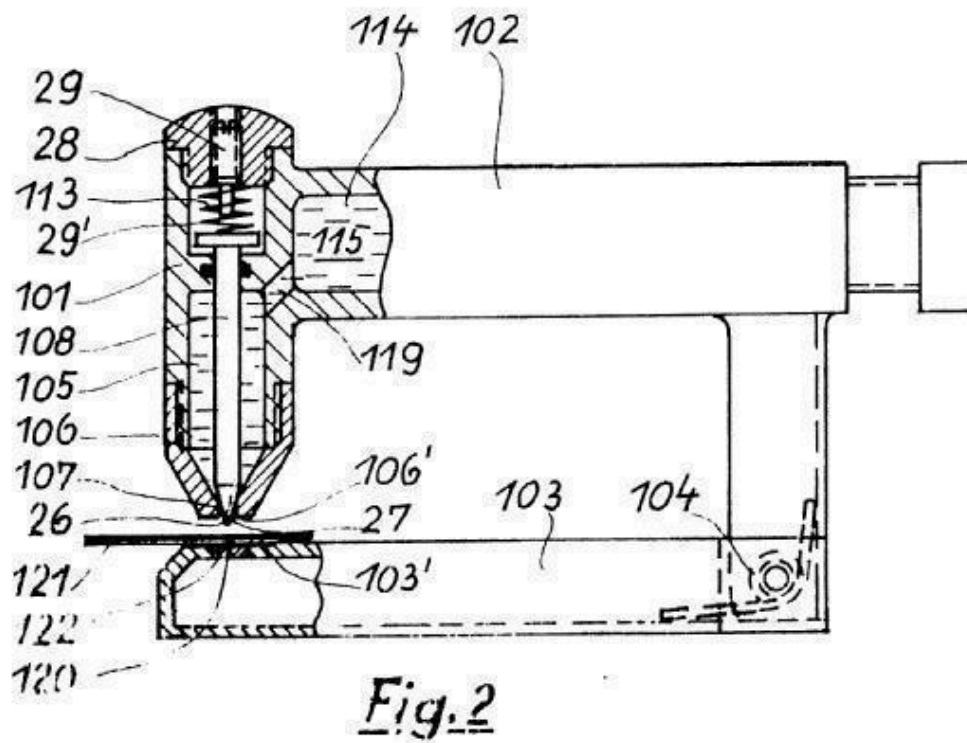
Example 2, from



JP3126529:

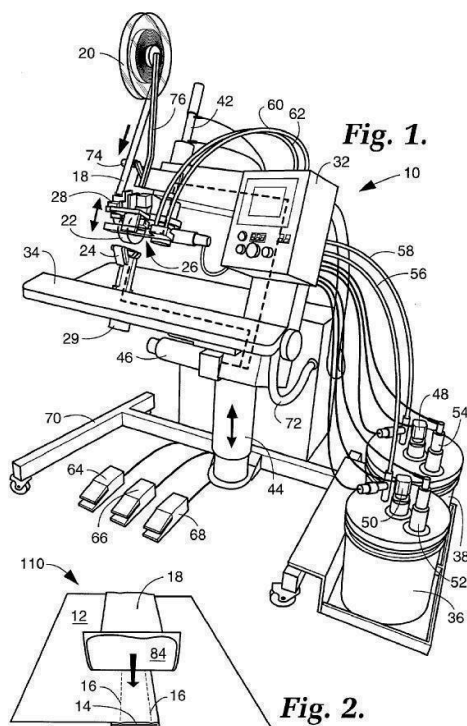


DE2055127:



Example 5, from

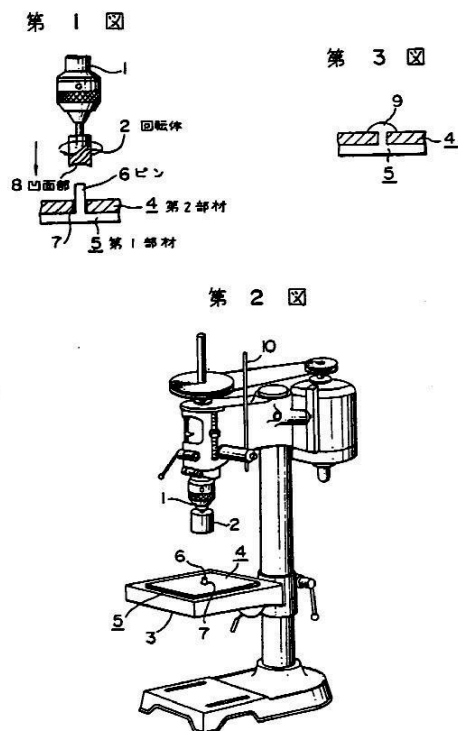
US2003010439:



**B29C 66/847****{Drilling standard machine type}****Definition statement***This place covers:*

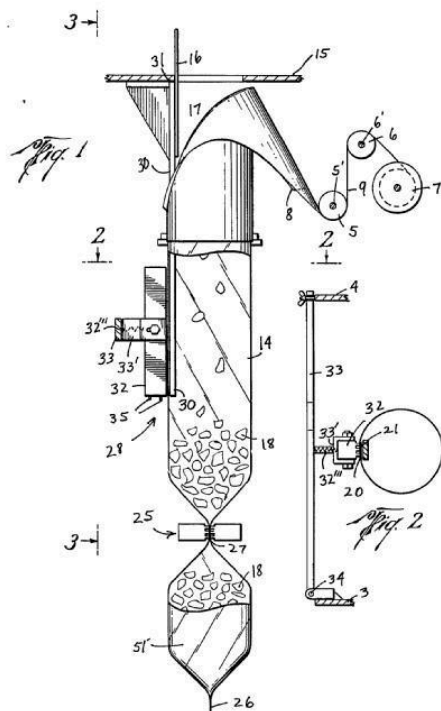
Example 1, from

JP61189925:

**B29C 66/849****{Packaging machines}****Definition statement***This place covers:*

Example 1, from

CH373305:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Machines, apparatus or devices for, or methods of, packaging articles or materials, in general	<a href="#">B65B</a>
--	----------------------

## B29C 66/8491

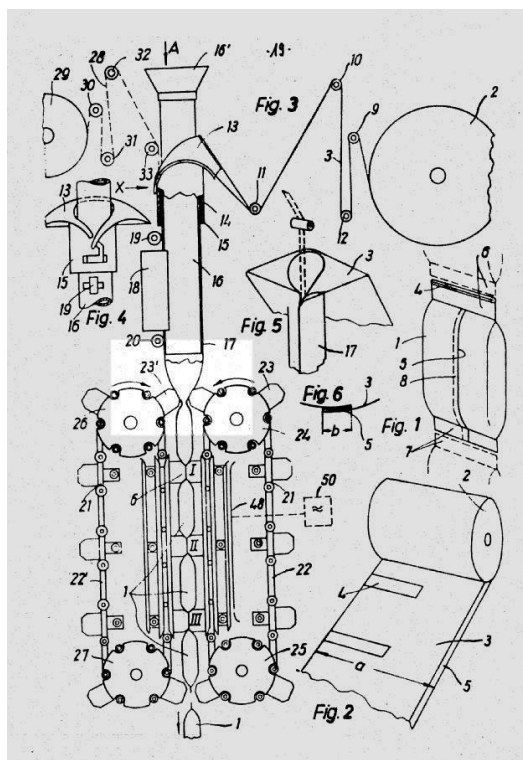
{welding through a filled container, e.g. tube or bag}

### Definition statement

This place covers:

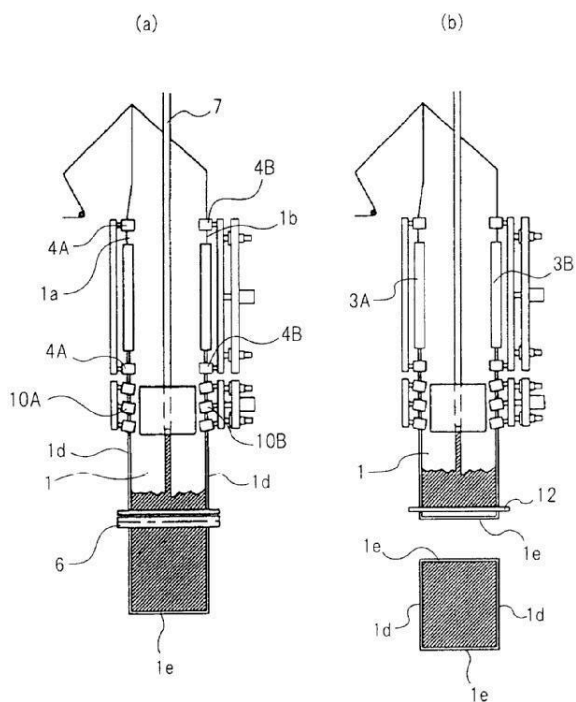
Example 1, from

DE1511540:



Example 2, from

WO2011001528:



## References

### ***Informative references***

*Attention is drawn to the following places, which may be of interest for search:*

Subdividing filled tubes to form two or more packages by sealing involving displacement of contents	<a href="#">B65B 9/12</a>
---	---------------------------

**B29C 66/851**

**{Bag or container making machines}**

## References

### ***Informative references***

*Attention is drawn to the following places, which may be of interest for search:*

Making boxes, cartons, envelopes, or bags, in general	<a href="#">B31B</a>
---	----------------------

**B29C 66/8511**

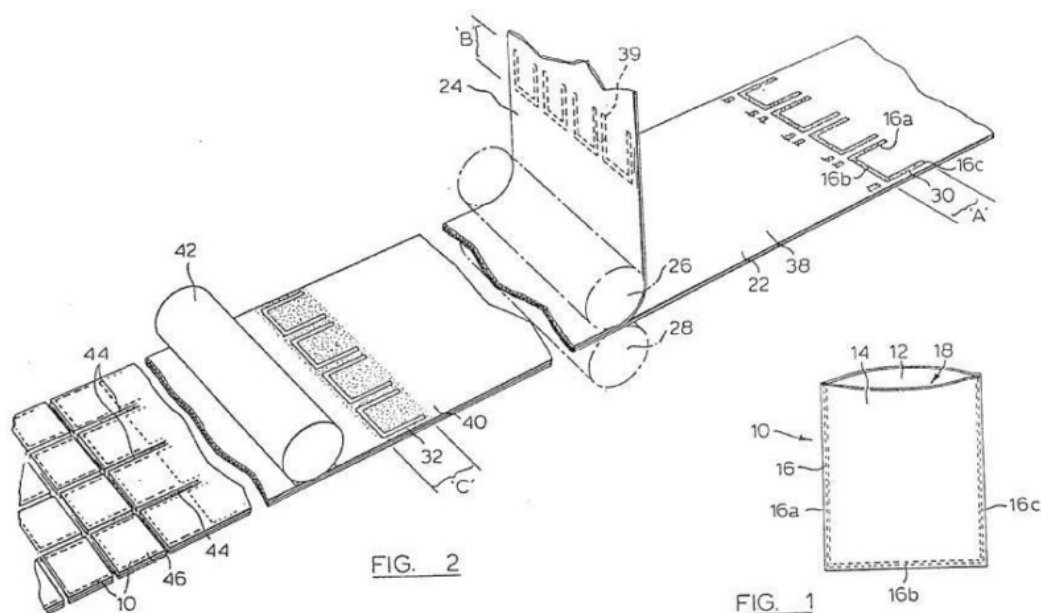
**{Bag making machines}**

### Definition statement

*This place covers:*

Example 1, from

CA1196848:



**B29C 66/853**

{Machines for changing web rolls or filaments, e.g. for joining a replacement web to an expiring web}

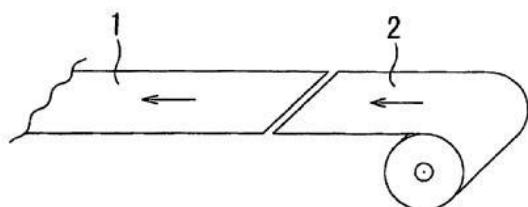
**Definition statement**

*This place covers:*

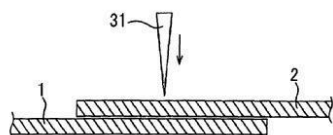
Example 1, from

EP2204274:

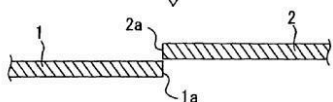
F I G . 1



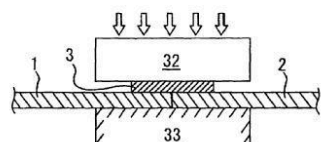
F I G . 2A



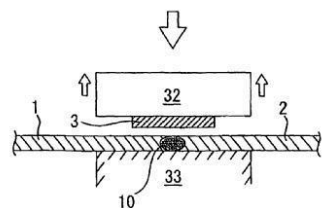
F I G . 2B



F I G . 2C



F I G . 2D



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Changing web rolls in general, by attaching, e.g. pasting, the replacement web to the expiring web	<a href="#">B65H 19/18</a>
--	----------------------------

## B29C 66/855

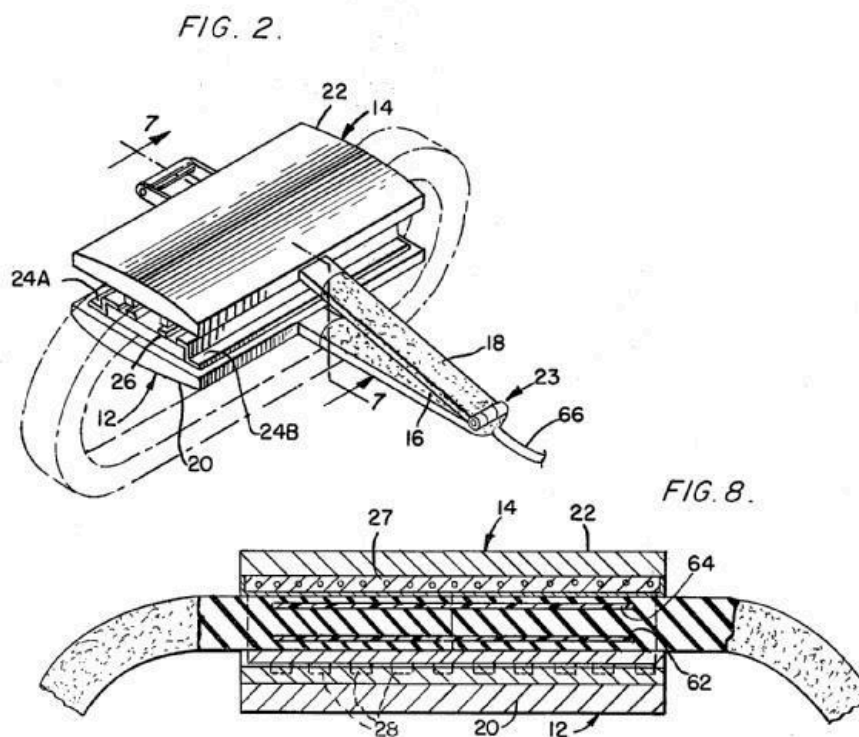
### {Belt splicing machines}

### Definition statement

This place covers:

Example 1, from

US4376668:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

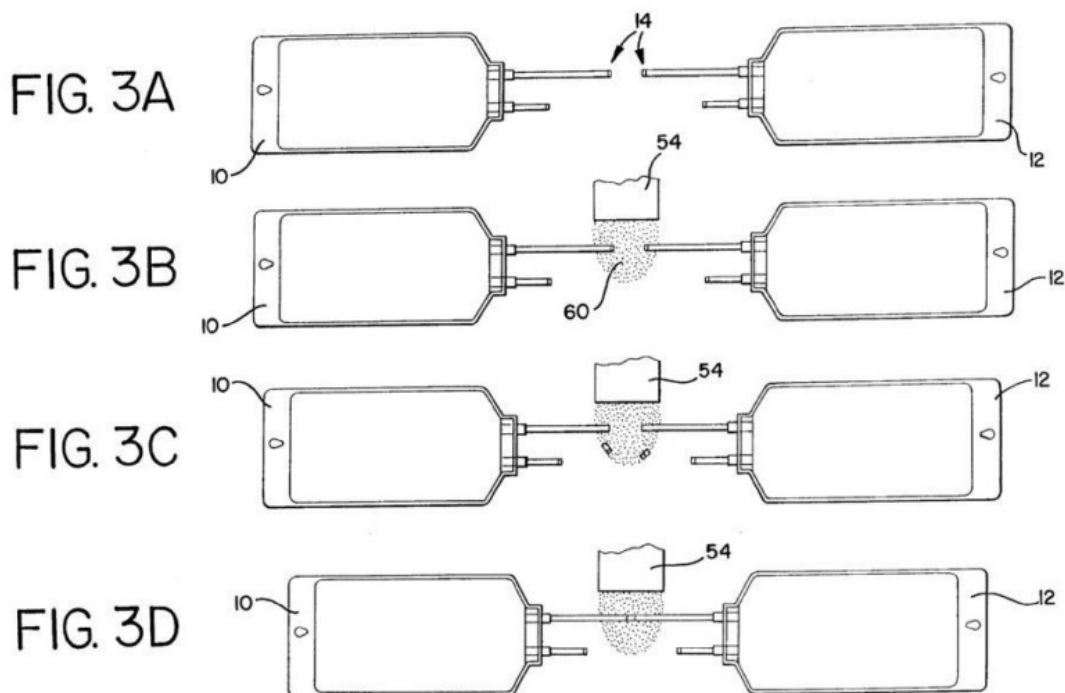
Apparatus or tools for joining belts in general	<a href="#">F16G 3/003</a>
Joining belts by sewing, sticking, vulcanising, or the like	<a href="#">F16G 3/10</a>



**B29C 66/857****{Medical tube welding machines}****Definition statement***This place covers:*

Example 1, from

WO0062820:

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

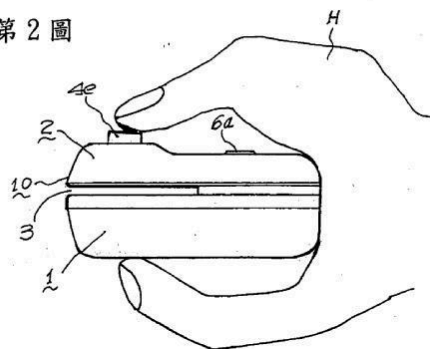
Medical tube connectors, for connecting tubes having sealed ends, by cutting and welding	<a href="#">A61M 39/146</a>
--	-----------------------------

**B29C 66/861****{Hand-held tools}****Definition statement***This place covers:*

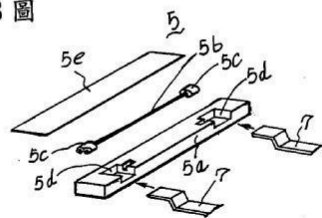
Example 1, from

TW467845B:

第 2 圖



第 3 圖



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hand tools in general	<a href="#">B25</a>
Hand tools for securing ends of binding material by welding, or heat-sealing or by applying adhesive	<a href="#">B65B 13/327</a>
Devices for, or methods of, sealing or securing package folds or closures, by applying or generating heat by reciprocating or oscillating hand-operated members	<a href="#">B65B 51/148</a>

B29C 66/8612

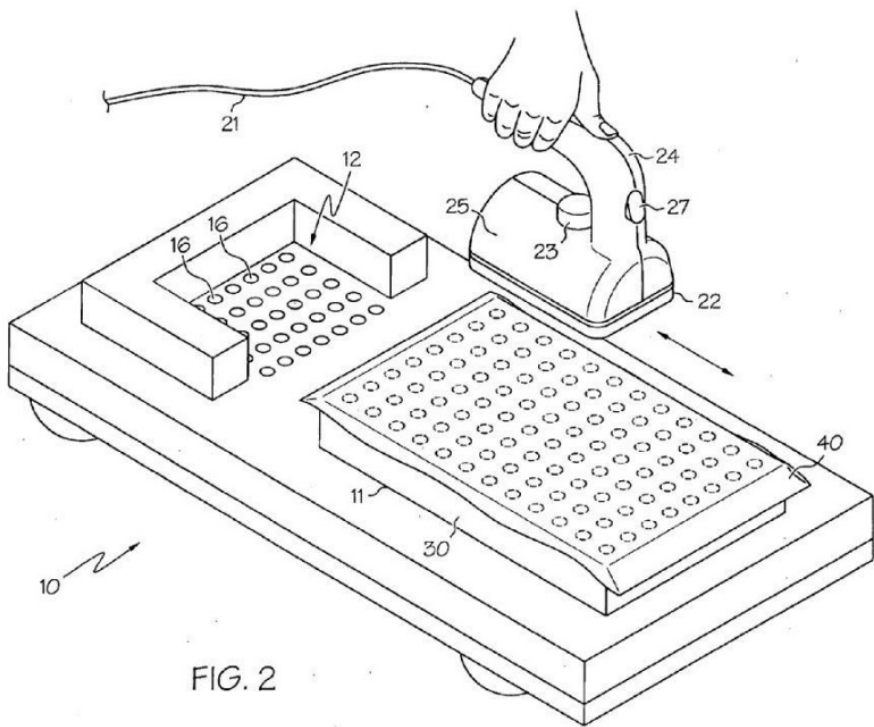
{Ironing tool type}

Definition statement

This place covers:

Example 1, from

US2008115885:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Irons for laying carpeting by using hot-melt adhesives	<a href="#">A47G 27/0443</a>
Hand irons	<a href="#">D06F 75/00</a>

B29C 66/8614

{Tongs, pincers or scissors}

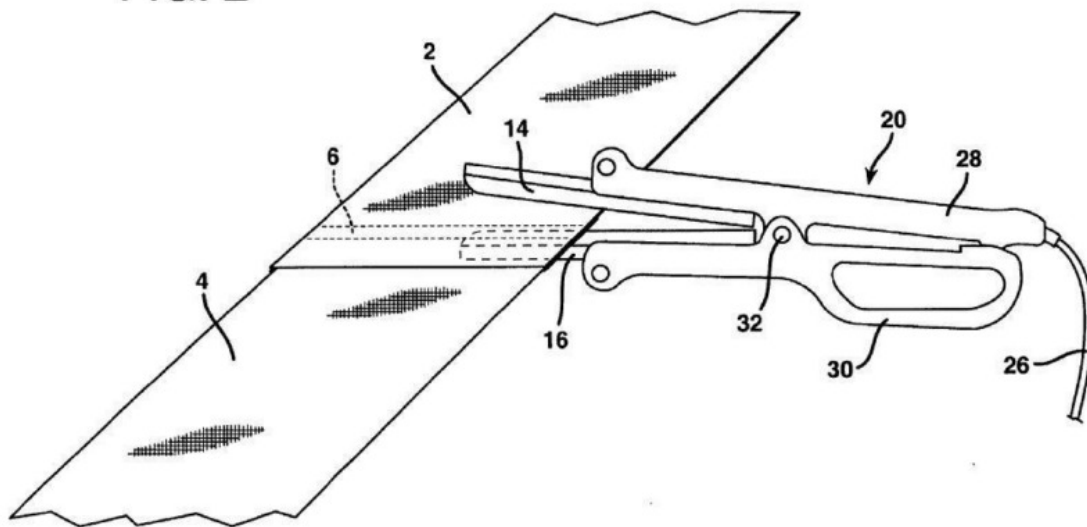
Definition statement

This place covers:

Example 1, from

US2003127177:

FIG. 2



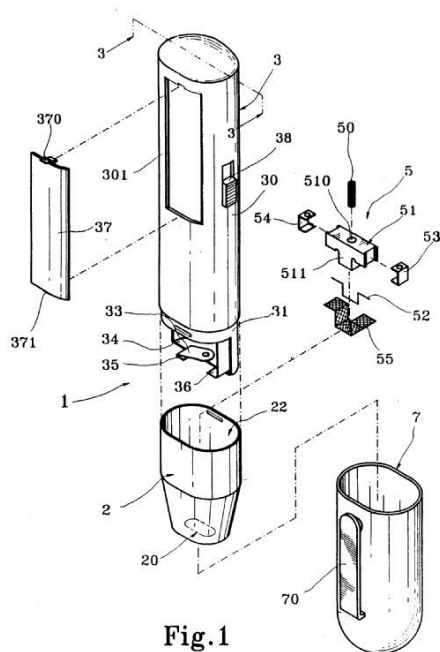
## B29C 66/8616

{Pen or pencil like}

### Definition statement

*This place covers:*

Example 1, from



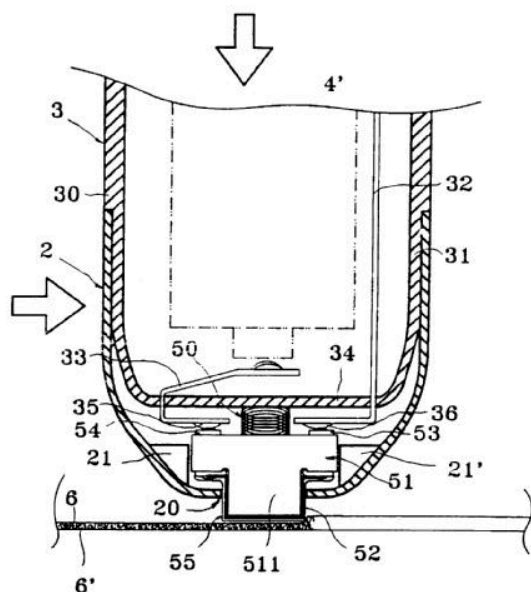


Fig5

## B29C 66/863

{Robotised, e.g. mounted on a robot arm}

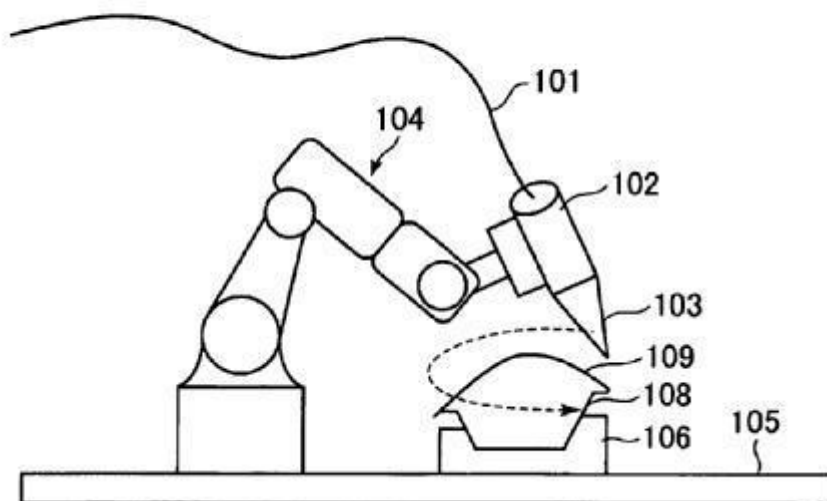
### Definition statement

*This place covers:*

Example 1, from

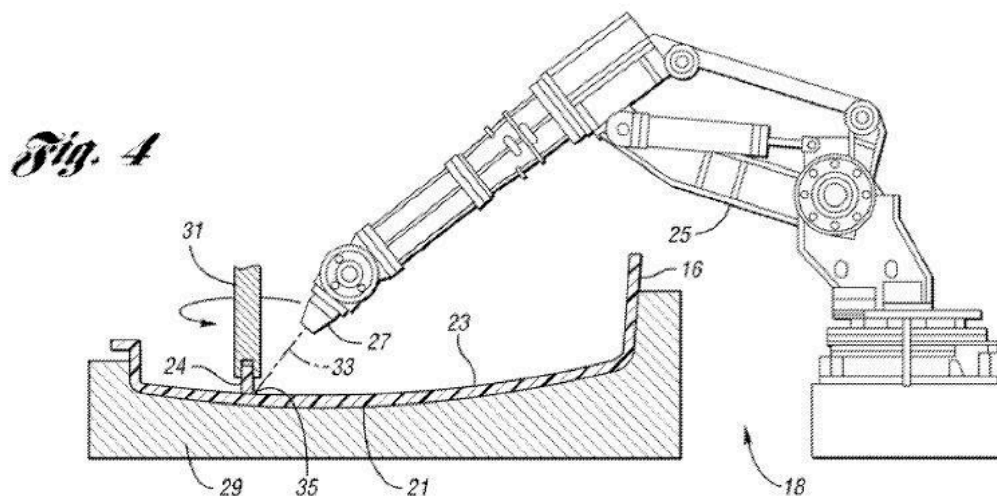
EP2255952:

## FIG. 4A



Example 2, from

EP2006066:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Manipulators in general	<a href="#">B25J</a>
-------------------------	----------------------

## B29C 66/8652

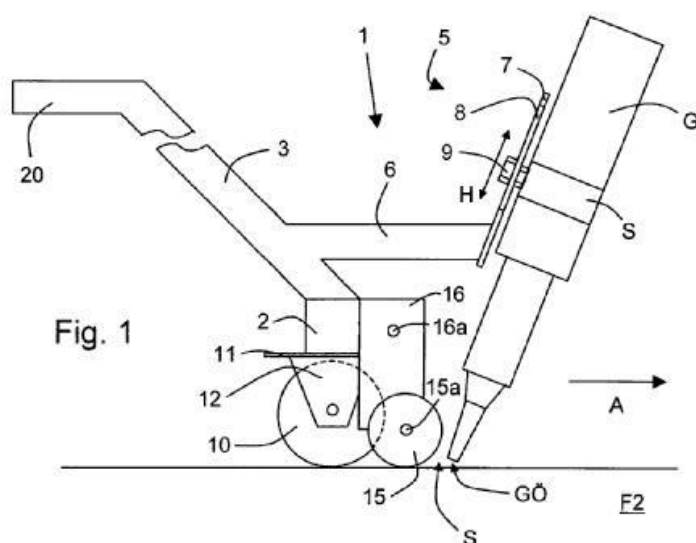
{being pushed by hand or being self-propelling}

## Definition statement

This place covers:

Example 1, from

DE202008008145U:



## B29C 66/86521

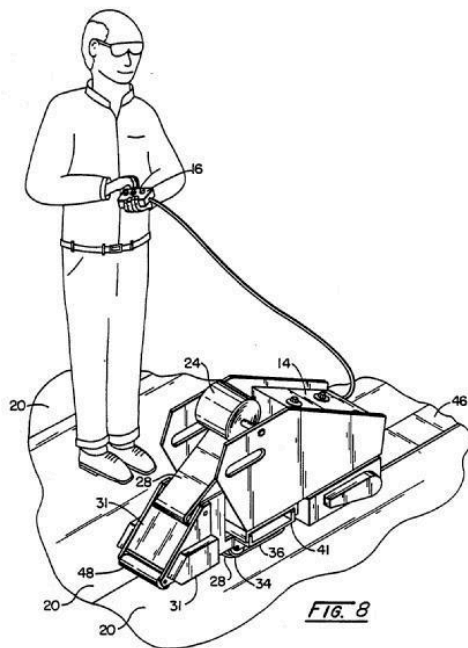
{being self-propelling}

### Definition statement

*This place covers:*

Example 1, from

US4913772:



**B29C 66/86523**

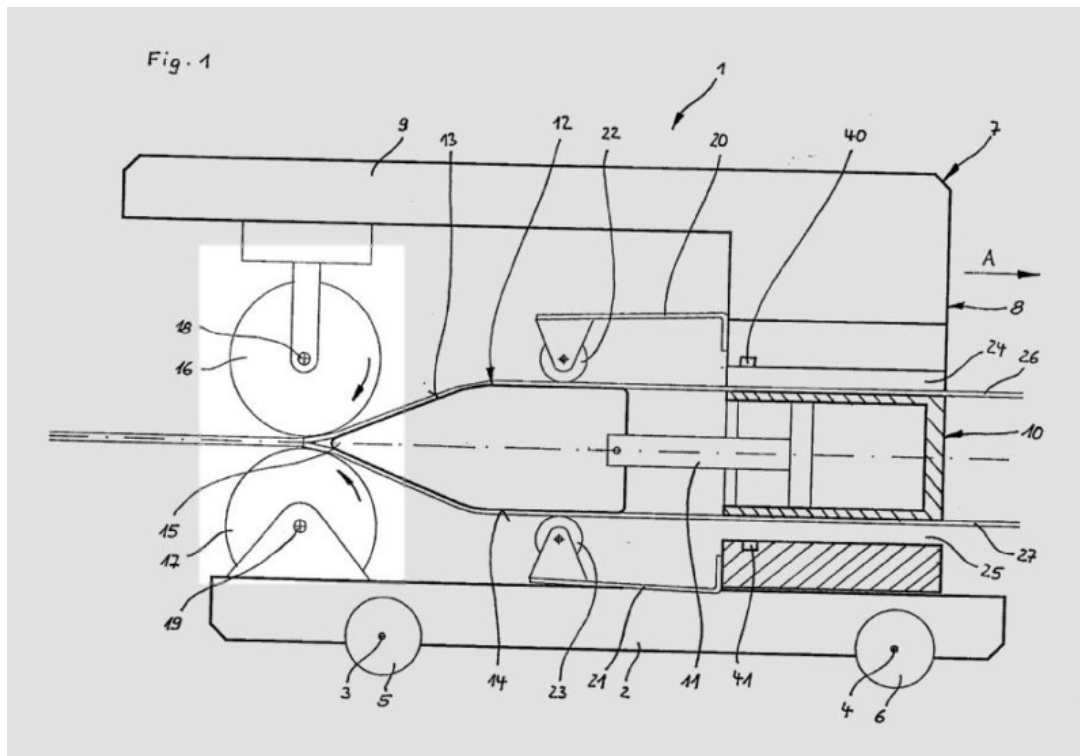
**{the traction being made on the seam}**

### Definition statement

*This place covers:*

Example 1, from

DE9317104U:



**B29C 66/86533**

**{by rails}**

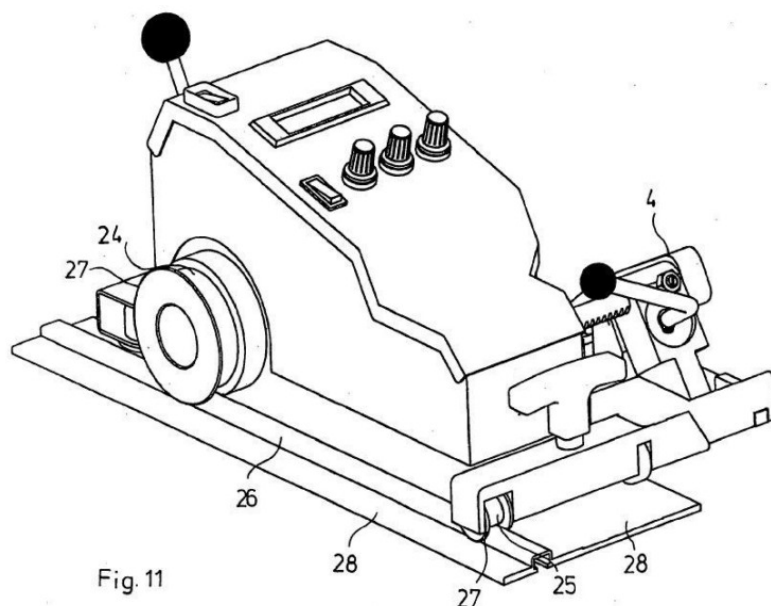
### Definition statement

*This place covers:*

Exempel 1, from



EP1464471:



## B29C 66/86535

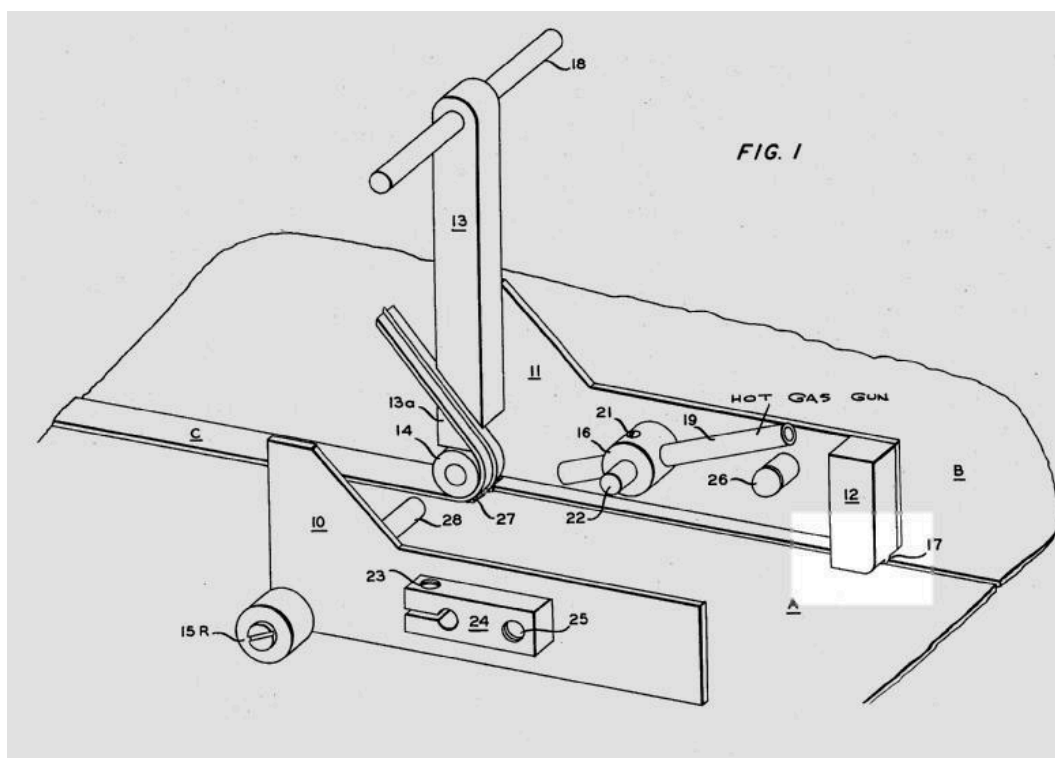
{by the edge of one of the parts to be joined or by a groove between the parts to be joined, e.g. using a roller}

### Definition statement

*This place covers:*

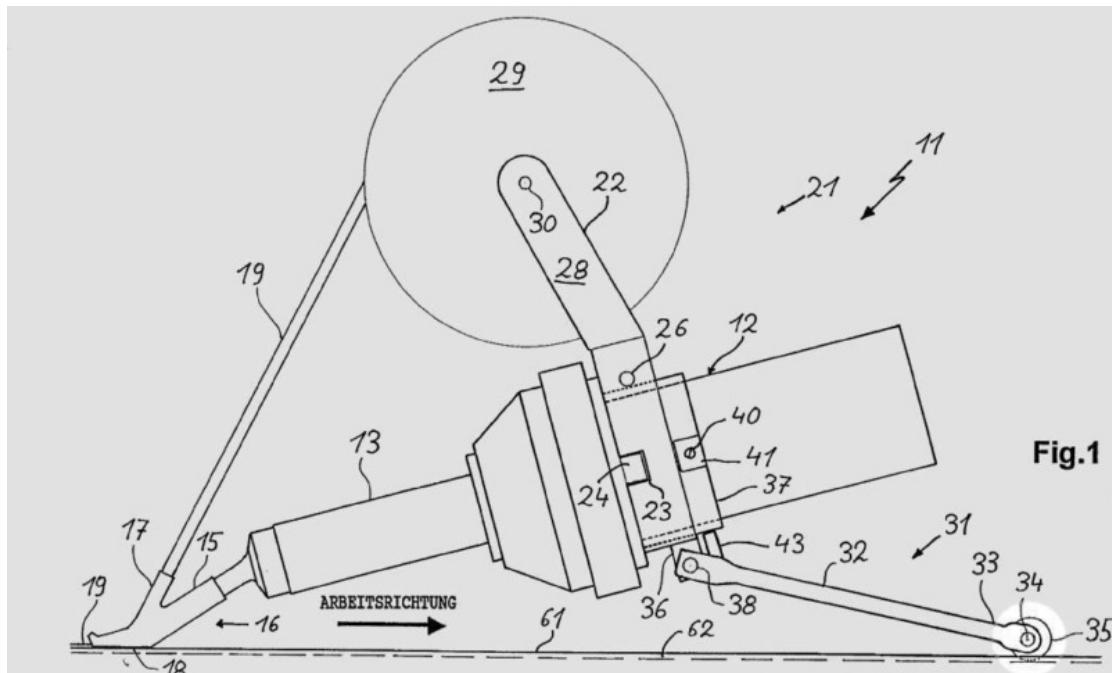
Example 1, from

US3080910:



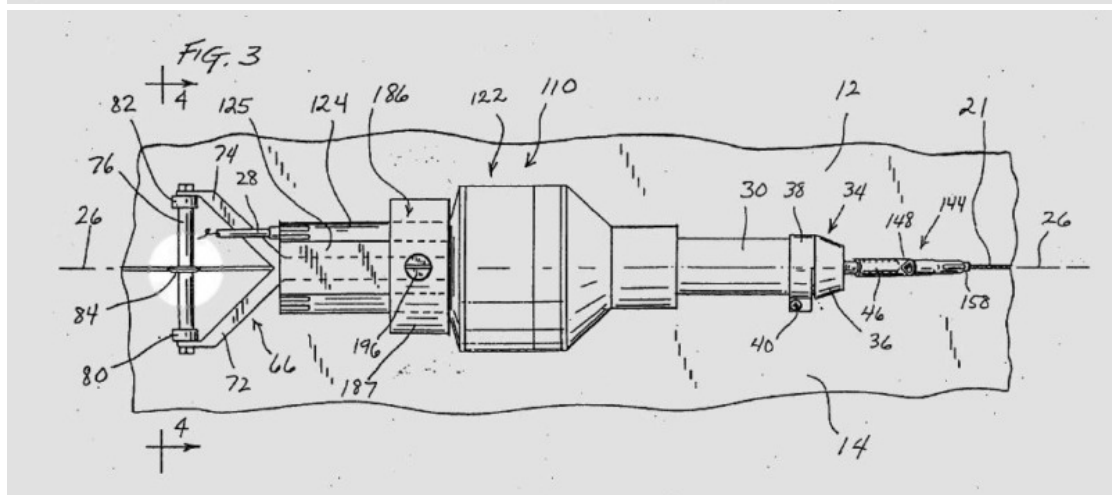
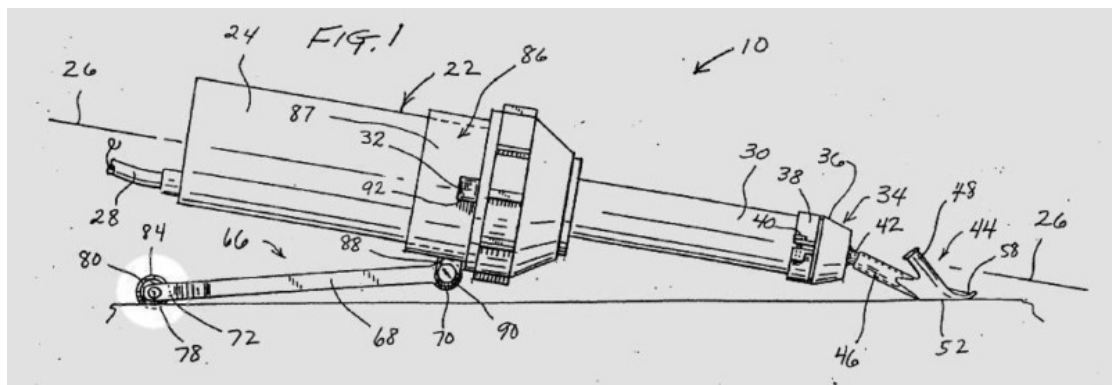
Example 2, from

DE29713474U:



Example 3, from

EP0787572:



**B29C 66/872****{Starting or stopping procedures}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Trouble-shooting during starting or stopping moulding or shaping apparatus	<a href="#">B29C 37/0096</a>
--	------------------------------

**B29C 66/874****{Safety measures or devices}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Safety-devices for packaging machines	<a href="#">B65B 57/005</a>
Safety devices specially designed for welding in general	<a href="#">F16P 1/06</a>

**B29C 66/8742****{for operators ([B29C 66/002](#) takes precedence)}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Masks, shields or hoods for welders	<a href="#">A61F 9/06</a>
-------------------------------------	---------------------------

**B29C 66/8748****{involving the use of warnings}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Audible or visible alarm signals for packaging machines	<a href="#">B65B 57/18</a>
---	----------------------------

**B29C 66/9121**

{by measuring the temperature}

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

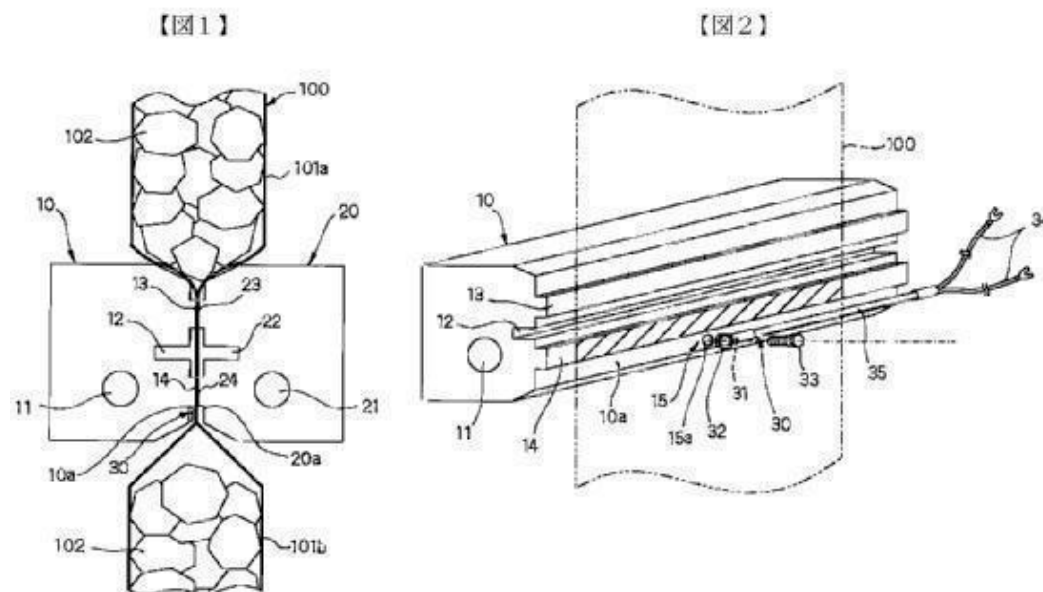
Measuring temperature	<a href="#">G01K</a>
-----------------------	----------------------

**B29C 66/91212**

{involving measurement means being part of the welding jaws, e.g. integrated in the welding jaws}

**Definition statement***This place covers:*Example 1 (to be also classified in [B29C 66/91231](#)), from

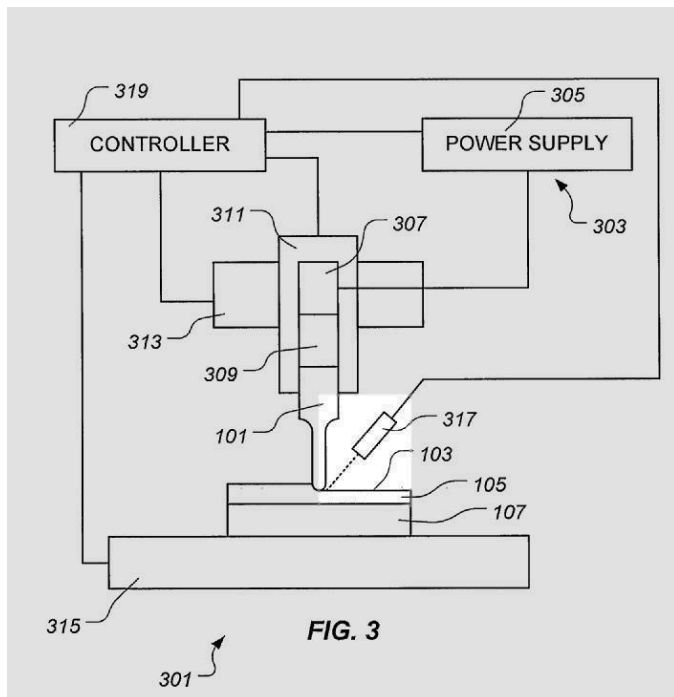
JP2002104311:

**B29C 66/91216**

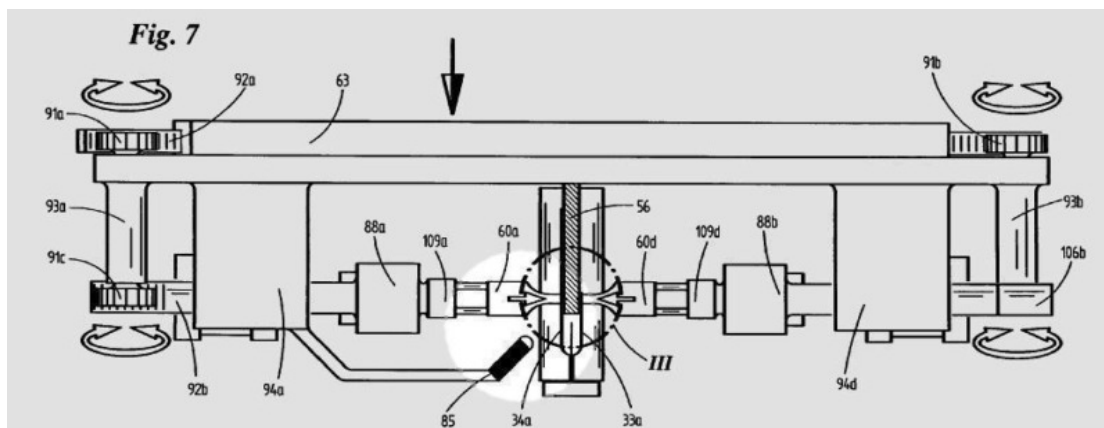
{enabling contactless temperature measurements, e.g. using a pyrometer}

**Definition statement***This place covers:*Example 1 (to be also classified in [B29C 66/91221](#)), from

WO2006042251:



Example 2 (to be also classified in [B29C 66/91231](#)), from  
EP2216167:



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Radiation pyrometry	<a href="#">G01J 5/00</a>
---------------------	---------------------------

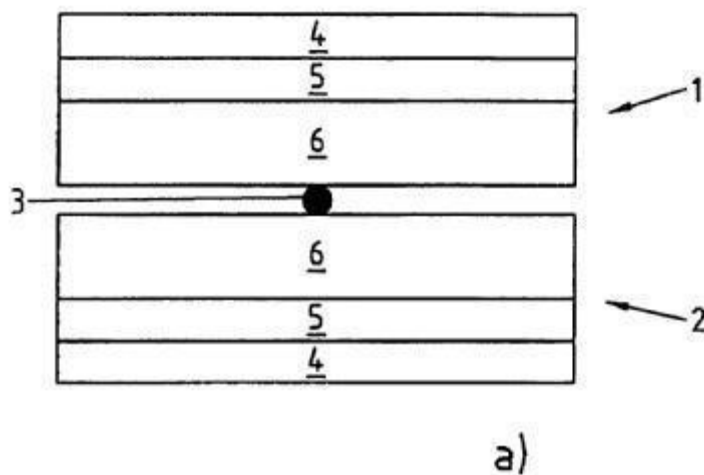
**B29C 66/91218****{using colour change, e.g. using separate colour indicators}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Measuring temperature using change of colour or translucency

[G01K 11/12](#)**B29C 66/91221****{of the parts to be joined}****Definition statement***This place covers:*

Example 1, from

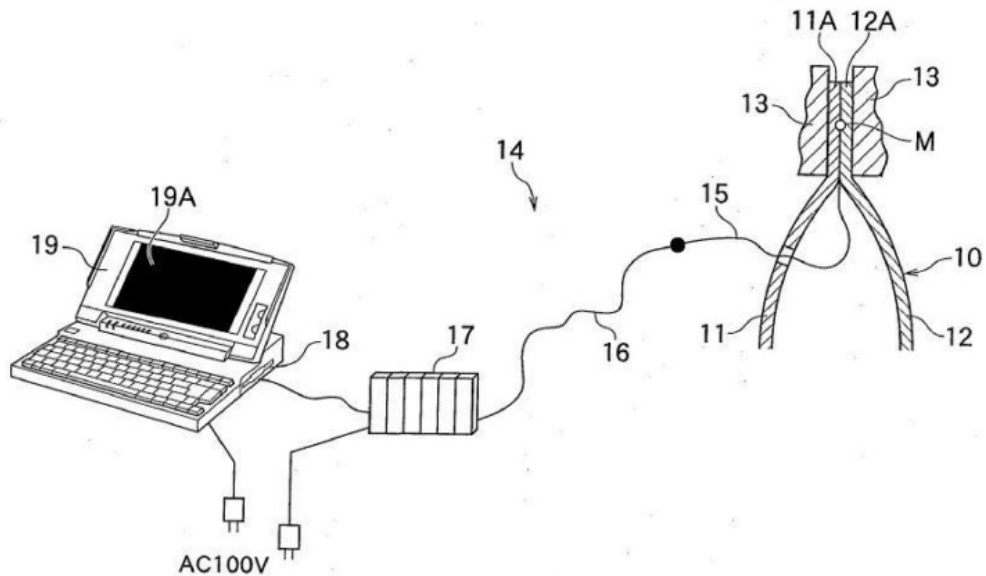
EP1225028:



Example 2, from

WO0181070:

FIG. 7



## B29C 66/91231

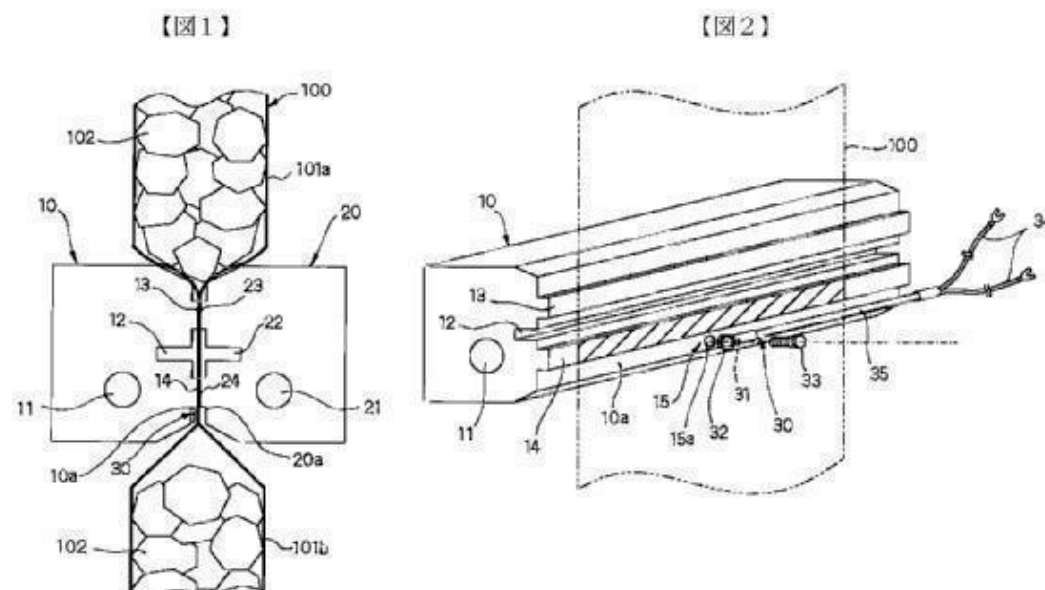
{of the joining tool}

### Definition statement

*This place covers:*

Example 1 (to be also classified by [B29C 66/91212](#)), from

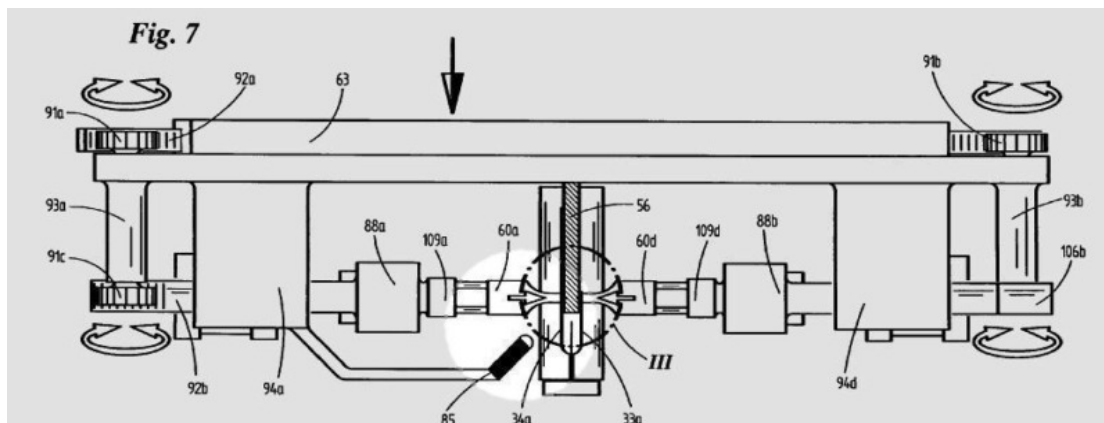
JP2002104311:



Definition statement

Example 2 (to be also classified by [B29C 66/91216](#)), from

EP2216167:

**B29C 66/9131**

{by measuring the heat or the thermal flux, i.e. the heat flux}

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Measuring quantity of heat	<a href="#">G01K 17/00</a>
----------------------------	----------------------------

**B29C 66/9141**

{by controlling or regulating the temperature}

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Heat seal temperature control of devices for, or method of, sealing or securing package folds or closures by applying or generating heat	<a href="#">B65B 2051/105</a>
--	-------------------------------

**B29C 66/91423**

{using joining tools having different temperature zones or using several joining tools with different temperatures}

**Definition statement***This place covers:*

Example 1, from



WO9706205:

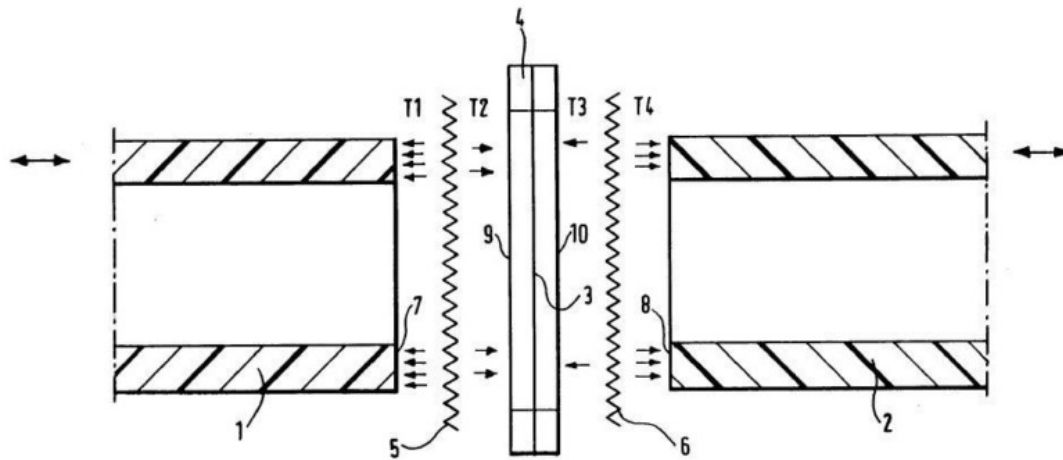


FIG.1.

## B29C 66/91445

{by steps}

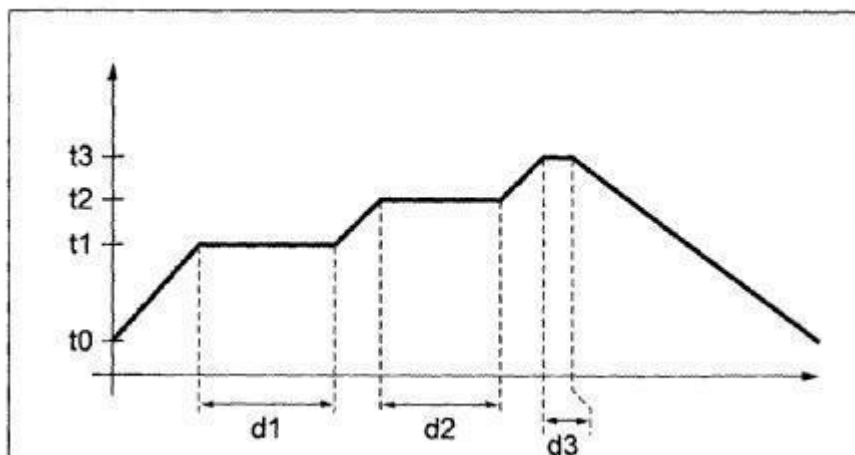
### Definition statement

*This place covers:*

Example 1, from

EP2018088:

Fig.4





**B29C 66/91653**

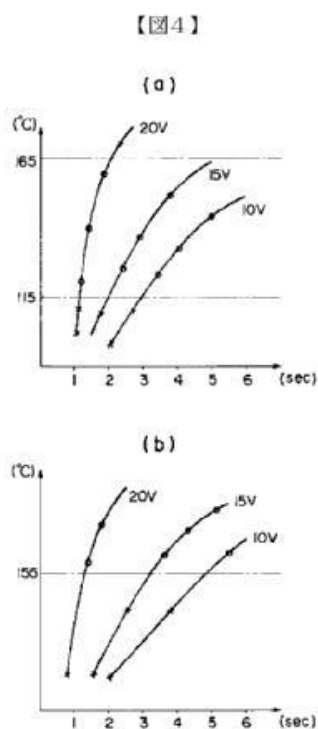
{by controlling or regulating the voltage, i.e. the electric potential difference or electric tension}

**Definition statement**

*This place covers:*

Example 1, from

JPH0581103U:

**B29C 66/91655**

{by controlling or regulating the current intensity}

**Definition statement**

*This place covers:*

Example 1, from

Definition statement

WO9516557:

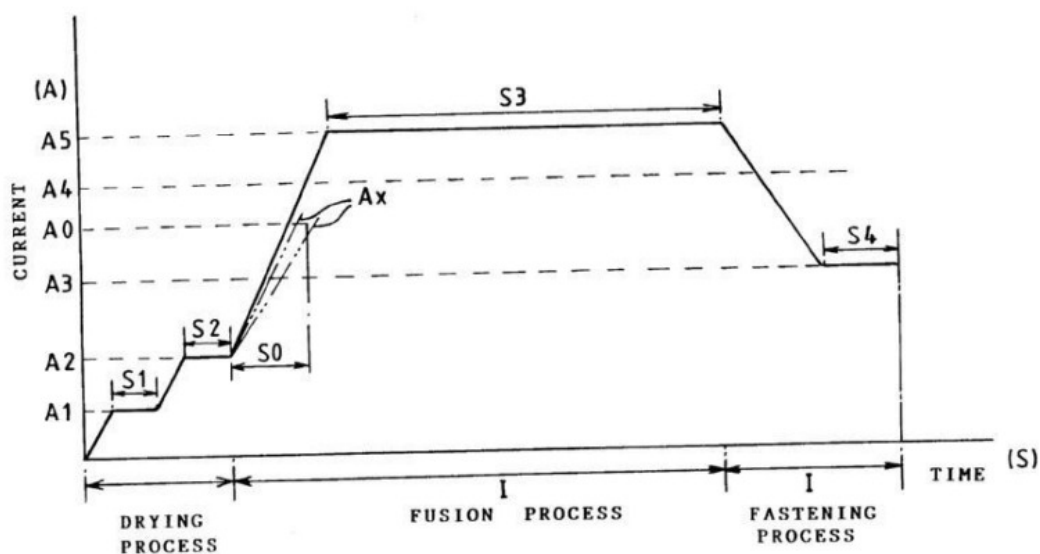


FIG. 1.

**B29C 66/91933**

{higher than said fusion temperature}

**Special rules of classification**

Documents merely stating that the welding occurs above the melting temperature of the parts to be joined do not belong to this class.

Documents specifying the welding temperature by giving actual values, e.g. absolute or in relation to the melting temperature, do belong to this class

**B29C 67/00**

Shaping techniques not covered by groups [B29C 39/00](#) - [B29C 65/00](#), [B29C 70/00](#) or [B29C 73/00](#)

**Definition statement**

*This place covers:*

e.g. plants for moulding, curing or finishing articles, e.g. disposable plants, plants mounted on vehicles; e.g. lay-out of plants or machines, e.g. arrangement, sequence or exchange of machines, machine parts or tools not otherwise provided for; e.g. modular plants or machines, i.e. plants or machines build up from modular parts

## B29C 69/00

**Combinations of shaping techniques not provided for in a single one of main groups [B29C 39/00](#) - [B29C 67/00](#), e.g. associations of moulding and joining techniques; Apparatus therefore {([B29C 48/001](#) takes precedence)}**

### Relationships with other classification places

The group [B29C 69/00](#) and its subgroups cover combination(s) of shaping techniques not otherwise provided for in [B29C](#), where the invention lies in the combination of techniques - not in the single technique as such - and wherein the invention is related to a shaping problem.

Documents not relating to a shaping problem do not belong to this group. For instance, documents relating to combined operations for making a particular article, which involves a mere combination of moulding steps, but failing to relate to a moulding problem as such, do not belong to this group; such documents do belong to the relevant [B29D](#) entry, if such entry exists, and if not then to the relevant product/article entry.

### References

#### Limiting references

*This place does not cover:*

Injection moulding combined with a final shaping operation	<a href="#">B29C 45/0053</a>
Extrusion moulding combined with other shaping operations	<a href="#">B29C 48/001</a>
Auxiliary operations prior to blow moulding	<a href="#">B29C 49/4252</a>
Auxiliary operations after blow moulding	<a href="#">B29C 49/4273</a>
Auxiliary operations prior to thermoforming	<a href="#">B29C 51/264</a>
Auxiliary operations after thermoforming	<a href="#">B29C 51/266</a>

## B29C 69/004

**{making articles by joining parts moulded in separate cavities, said parts being in said separate cavities during said joining ([B29C 45/006](#), [B29C 51/267](#) take precedence)}**

### Relationships with other classification places

Documents classified in this group relate to a joining problem. Documents not relating to a joining problem do not belong to this group. For instance, documents relating to combined operations for making a particular article, which involves a mere combination of the step of moulding parts in separate cavities and the step of joining said parts, but failing to relate to a joining problem as such, do not belong to this group; such documents do belong to the relevant [B29D](#) entry, if such entry exists, and if not then to the relevant product/article entry.

## B29C 69/005

**{cutting-off or cutting-out a part of a strip-like or sheet-like material, transferring that part and fixing it to an article (if labeling see [B65C](#), in combination with box-making [B31B 50/81](#); labelling in general [B65C](#))}**

### Relationships with other classification places

Documents classified in this group relate to a joining problem. Documents not relating to a joining problem do not belong to this group. For instance, documents relating to combined operations for making a particular article, which involves a mere combination of the step of cutting-off or cutting-out a part of a strip-like or sheet-like material, the step of transferring said part and the step of fixing said part to an article, but failing to relate to a joining problem as such, do not belong to this group; such documents do belong to the relevant [B29D](#) entry, if such entry exists, and if not then to the relevant product/article entry.

## B29C 70/00

**Shaping composites, i.e. plastics material comprising reinforcements, fillers or preformed parts, e.g. inserts**

### References

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Nanotechnology for materials or surface science, e.g. nanocomposites	<a href="#">B82Y 30/00</a>
Fibre reinforced ceramics	<a href="#">C04B 35/80</a>
Carbon-Carbon composites	<a href="#">C04B 35/83</a>
Chemical aspects of manufacture of articles or shaped materials containing macromolecular substances	<a href="#">C08J 5/00</a>
Alloys containing metallic or non-metallic fibres or filaments	<a href="#">C22C 49/00</a>
Testing of composites	<a href="#">G01N 25/72</a>
CAD/CAM	<a href="#">G06F 30/00</a>

### Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Fibre or fiber	General expression for a reinforcement in the form of a bundle of filaments.
Filament	Single reinforcing body of high aspect ratio, typically produced artificially by pressing a fluid through a small diameter orifice (spinneret) and allowing the fluid to solidify after leaving the spinneret and being subjected to cooling, drying or a chemical reaction. The filament can also come from a natural source (single filament of a plant or animal fibre).
Roving	Bundle of fibres or collection of a large number of filaments resulting in a bundle of substantially higher cross section than that of a single fibre.
Whisker	Typically a short length filament.

## B29C 70/02

comprising combinations of reinforcements, {e.g. non-specified reinforcements, fibrous reinforcing inserts} and fillers, {e.g. particulate fillers}, incorporated in matrix material, forming one or more layers and with or without non-reinforced or non-filled layers {(combinations of fibrous reinforcement only [B29C 70/04](#); combinations of fillers only [B29C 70/58](#); combinations with non reinforcing inserts, e.g. foam blocks, [B29C 70/68](#))}

### References

#### Limiting references

*This place does not cover:*

Shaping composites of combinations of different types of fibres	<a href="#">B29C 70/08</a>
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### Further details of subgroups

#### [B29C 70/023](#)

Reinforcing inserts, e.g. bars, profiles, local reinforcements other than fibrous

#### [B29C 70/025](#)

combinations of fibrous reinforcements and filler

## B29C 70/04

comprising reinforcements only, e.g. self-reinforcing plastics

### Definition statement

*This place covers:*

heating and fusing of thermoplastic fibres or high aspect ratio elements with high molecular orientation, without the use of a matrix material or with matrix material of the same thermoplastic material as the fibres, yielding a plastic product with anisotropic properties.

Example: heating and compressing of HDPE or PP fibres.

## B29C 70/06

**Fibrous reinforcements only**

### Definition statement

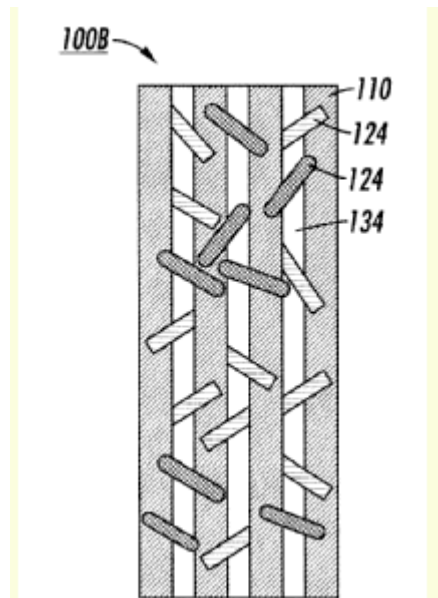
*This place covers:*

This is not a subgroup of self reinforced plastics unlike the title of [B29C 70/04](#) suggests.

This is in fact the head group of fibre reinforced polymers where there is a distinct fibrous reinforcement and a polymer matrix material.

### Special rules of classification

Illustrative example of subject matter classified in [B29C 70/081](#):

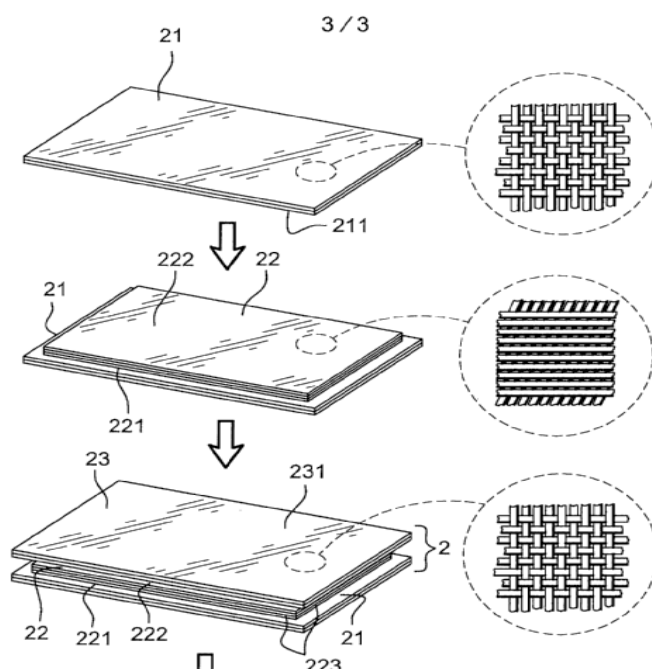


EP2112192

Illustrative example of subject matter classified in [B29C 70/083](#):

WO 2009/071824

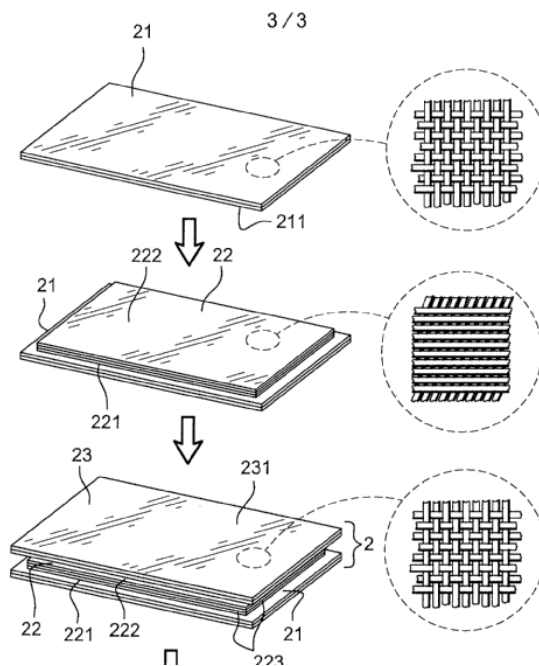
PCT/FR2008/052111





WO 2009/071824

PCT/FR2008/052111

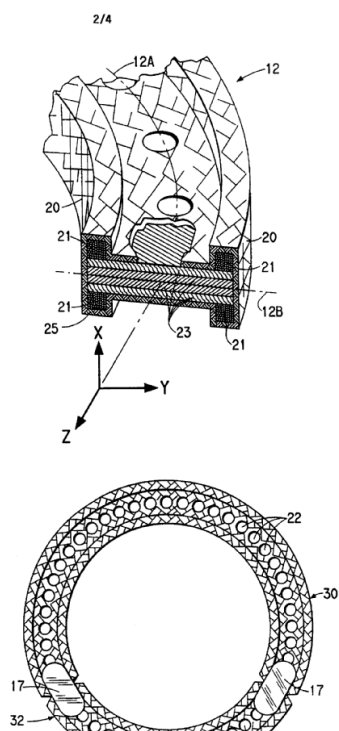


Illustrative example of subject matter classified in [B29C 70/085](#):

WO 97/38651

PCT/US97/02250

FIG. 2



**B29C 70/086**

{and with one or more layers of pure plastics material, e.g. foam layers  
(applying a non-preformed coating, e.g. a gel-coat, [B29C 37/0025](#); with foam  
blocks [B29C 70/86](#))}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Use of gel coats	<a href="#">B29C 37/0032</a>
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**Special rules of classification**

Illustrative example of subject matter classified in [B29C 70/086](#)

WO 2011/012587

4/5

PCT/EP2010/060824

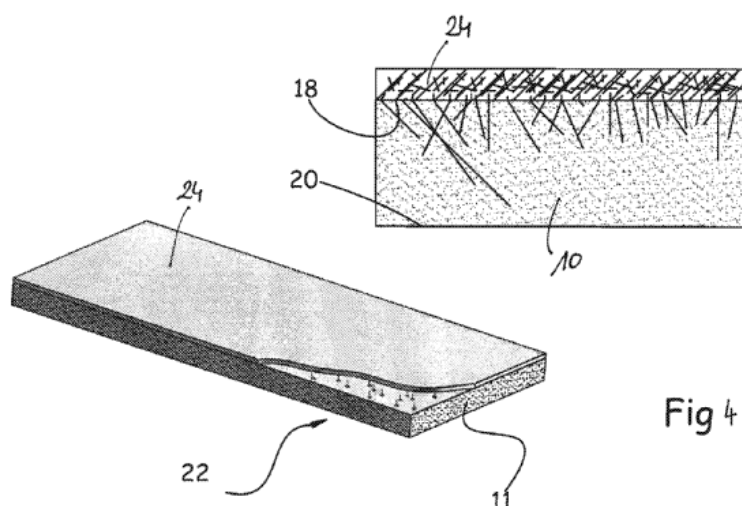


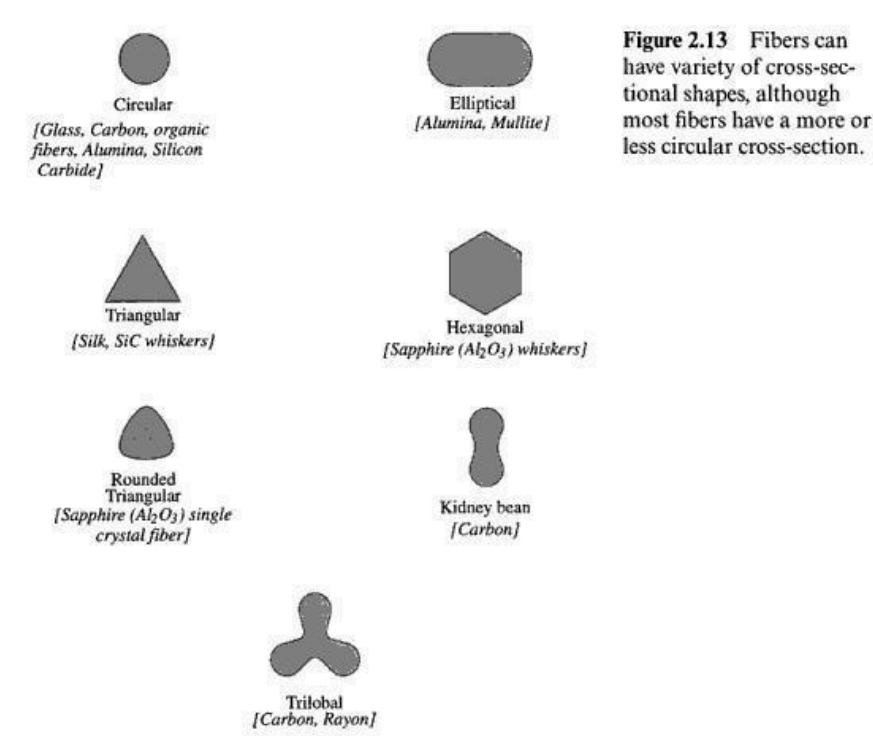
Fig 4 A

B29C 70/10

characterised by the structure of fibrous reinforcements {, e.g. hollow fibres}

Definition statement

This place covers:  
technical details of a filaments or fibres, e.g. by cross sectional shape, surface treatment, molecular orientation



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Reinforcement yarns or threads for specific use in general industrial applications	<a href="#">D02G 3/447</a>
--	----------------------------

B29C 70/12

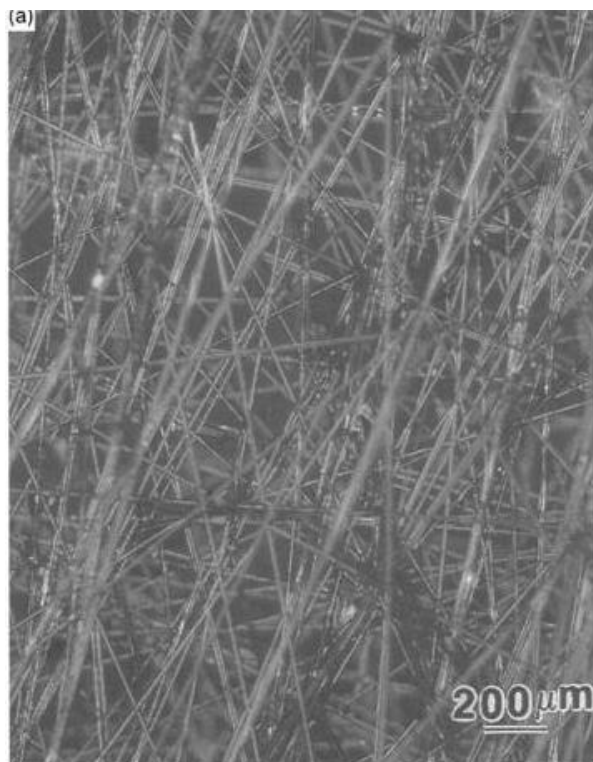
using fibres of short length, e.g. in the form of a mat {(non-woven fabrics per se [D04H 1/00](#))}

Definition statement

This place covers:  
fibrous structures. Note that polymers containing short fibres without mutual connection are not considered fibrous structures and [B29C 70/00](#). If the short fibres are connected, e.g. by bonding, it is considered a fibrous structure.

### Relationships with other classification places

Use of short fibres as additive to a polymer are to be classified in the specific moulding technique.  
e.g. [B29C 45/0005](#) (injection moulding using fibre reinforcements), [B29C 48/0011](#) (extrusion moulding using fibre reinforcements)



### Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

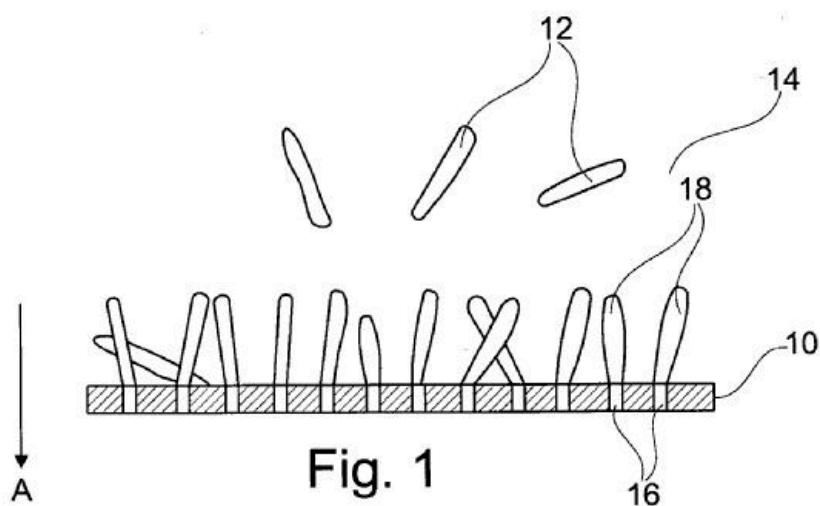
Mat	non-woven
-----	-----------

**B29C 70/14****oriented****Definition statement***This place covers:*

use of short fibres which are not randomly oriented:

DE 10 2009 020 452 A1 2010.11.25

Anhängende Zeichnungen



U.S. Patent Feb. 11, 2008 Sheet 1 of 6 US 6,617,744 B1

Fig. 1

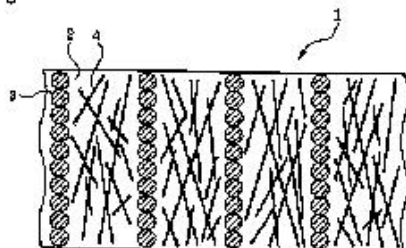
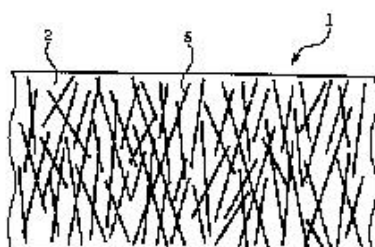


Fig. 2



## B29C 70/18

in the form of a mat, e.g. sheet moulding compound [SMC]

### Definition statement

*This place covers:*

Sheet Molding Compound

SMC is a combination of chopped strands and filled resin in the form of a sheet. Processing SMC by compression molding produces bodywork or structural automotive components and electrical or electronic machine housings in large industrial volumes. The process is also used for other products such as sanitary ware (baths) and urban furniture (stadium and cinema seating). The SMC contains all the components needed to mould the final part (resin, reinforcement, filler, catalyst, low profile additives, etc.) in a malleable and non-tacky sheet. SMC is made from chopped strands sandwiched between two layers of film, onto which the resin paste has already been applied. The SMC passes through a compaction system that ensures complete strand impregnation before being wound into rolls. These are stored for a few days before molding to allow the prepreg to thicken to a moldable viscosity.



**B29C 70/20**

oriented in a single direction, e.g. roofing or other parallel fibres {([B29C 70/083](#), [B29C 70/226](#) take precedence)}

**Definition statement**

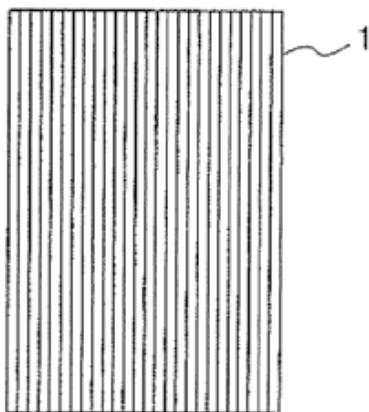
*This place covers:*

Examples:

unidirectional preregs, moulding compounds with unidirectional fibres.

Feb. 19, 2009 Sheet 1 of 5

US 2009/0047483 A



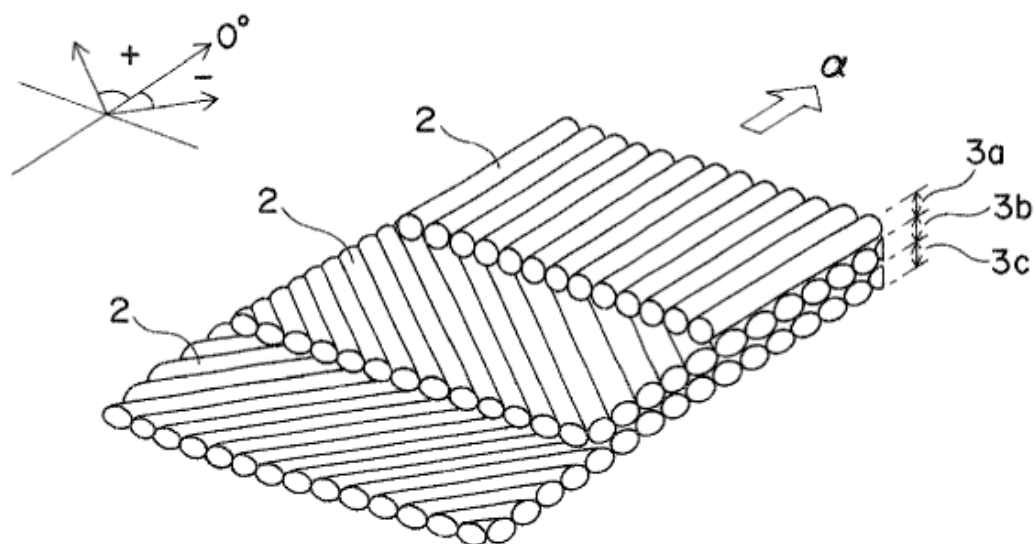
## Special rules of classification

Illustrative example of subject matter classified in [B29C 70/202](#)

WO 2007/018096

PCT/JP2006/3153

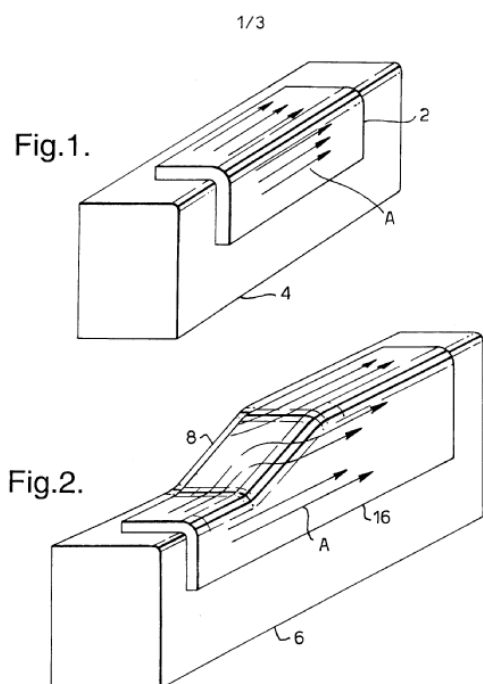
[図1]



Illustrative example of subject matter classified in [B29C 70/205](#)

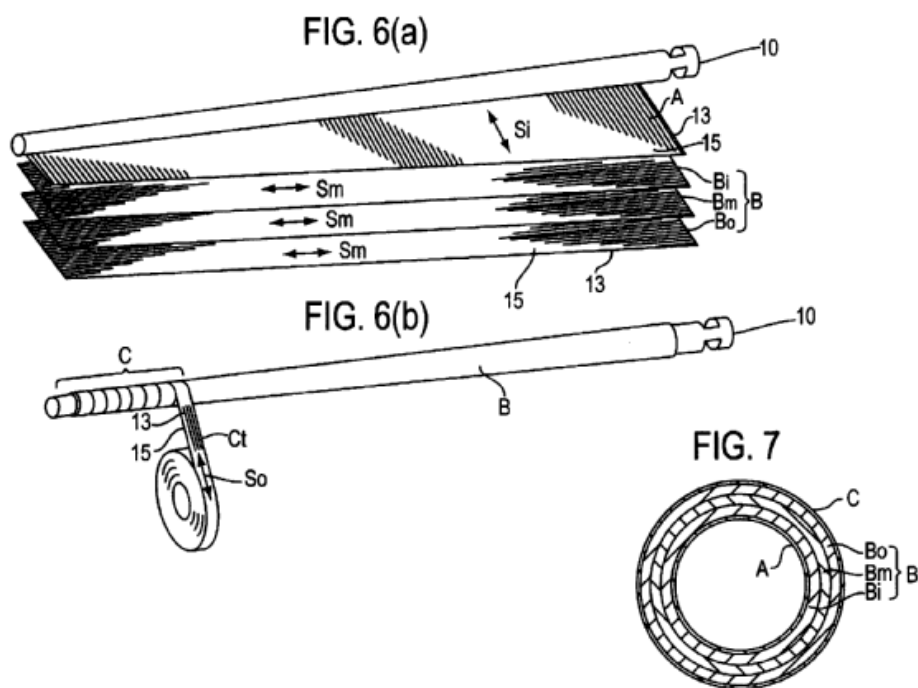
WO 00/37244

PCT/GB99/04293





Illustrative example of subject matter classified in [B29C 70/207](#)



U.S. Patent

Feb. 24, 1998

Sheet 4 of 5

5,721,030

**B29C 70/22**

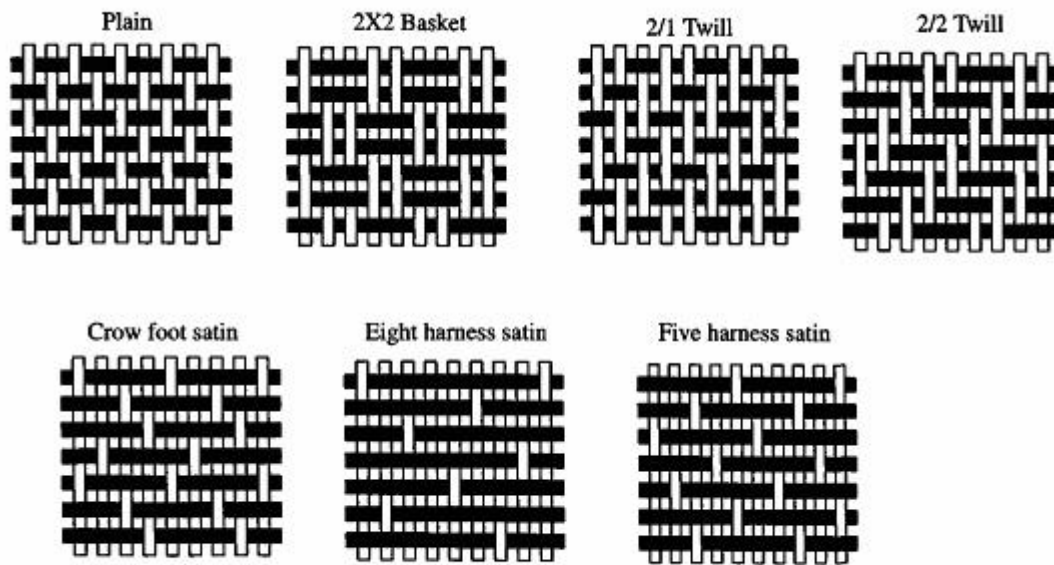
oriented in at least two directions forming a two-dimensional [2D] structure

**Definition statement**

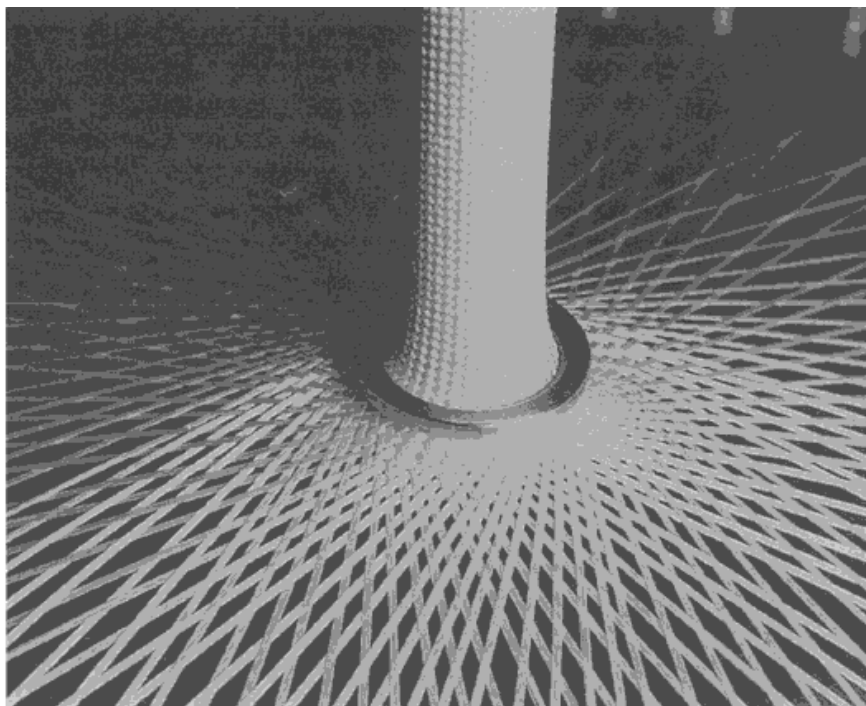
*This place covers:*

Illustrative examples of subject matter classified in this group:

Typical fabric structures:



**Figure 2.3** Basic weaves.

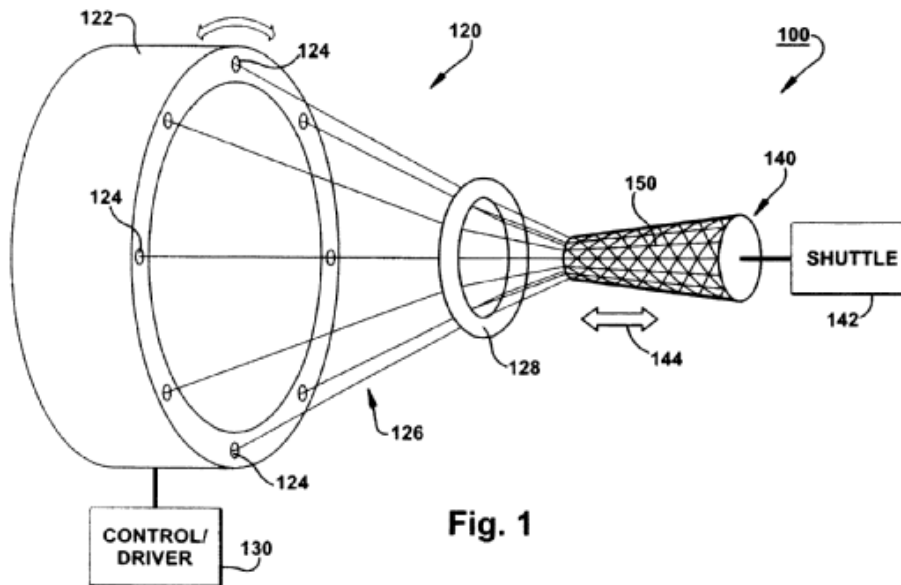


**Figure 2.7** Braiding of a sleeve in progress (courtesy of Atkins & Pierce Co.).

Braid

### Special rules of classification

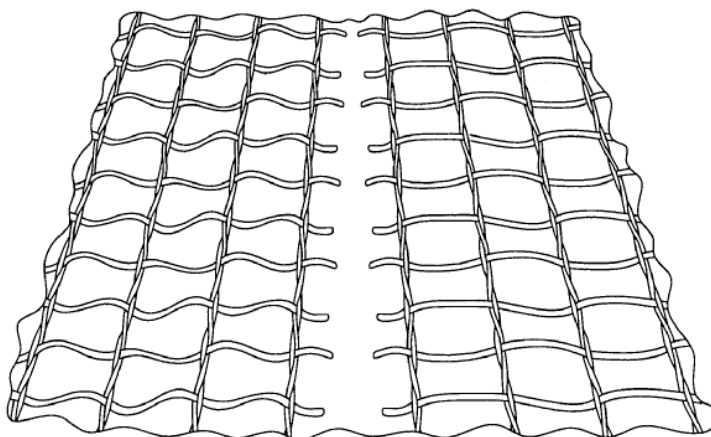
Illustrative example of subject matter classified in [B29C 70/22](#)



EP 2 206 597 A2

Illustrative example of subject matter classified in [B29C 70/22](#)

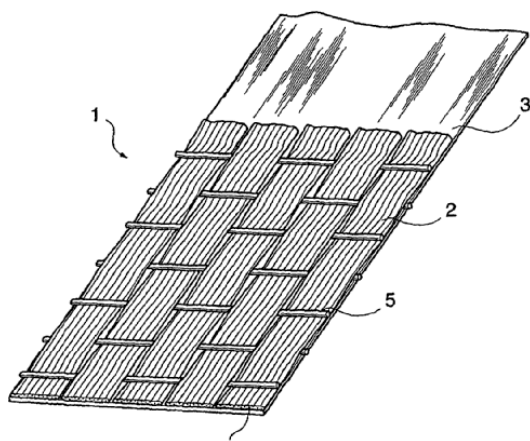
CA 02574144 2007-01-16



Illustrative example of subject matter classified in [B29C 70/226](#)

EP 1 125 728 A1

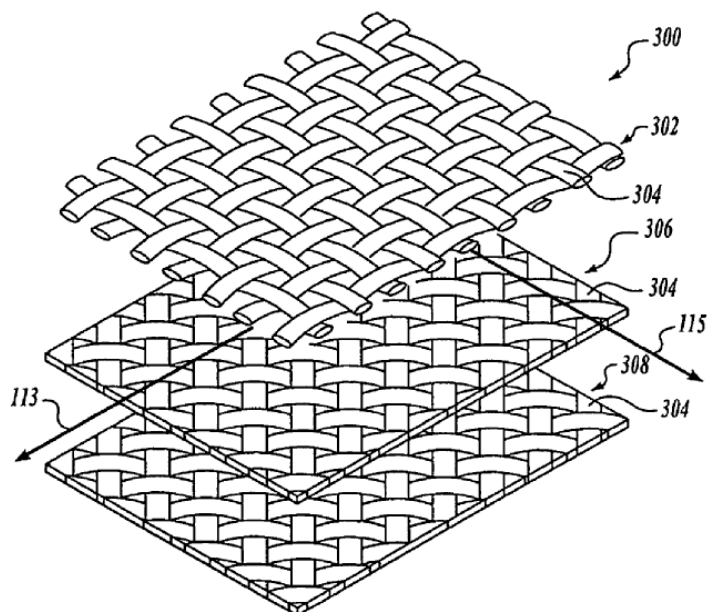
**FIG. 3**



Illustrative example of subject matter classified in [B29C 70/228](#)

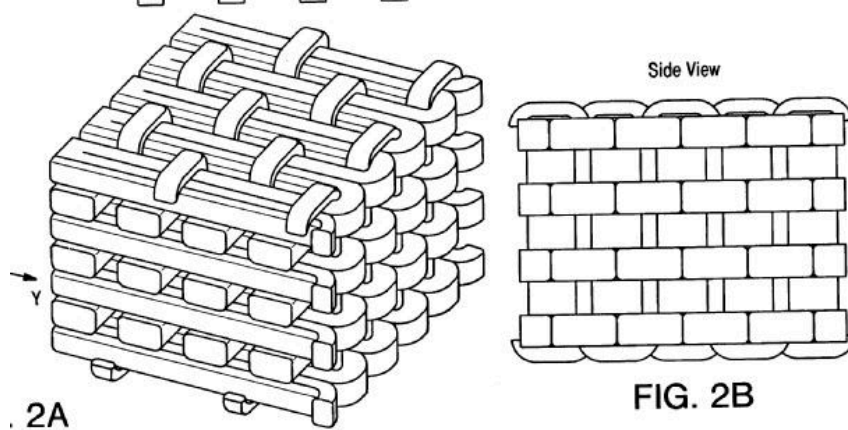
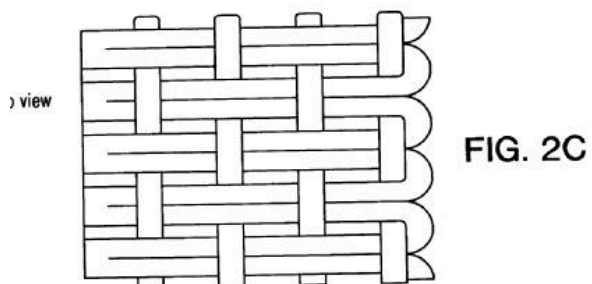
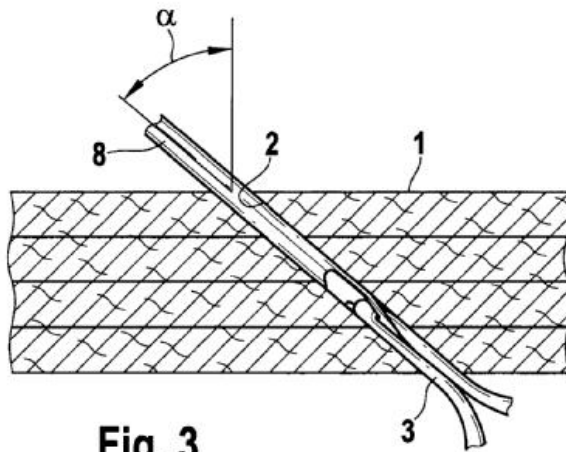
Patent Application Publication Oct. 5, 2006 Sheet 3 of 5

US 2006/0222837 A



Illustrative example of subject matter classified in [B29C 70/24](#)

DE 10 2007 033 869 A1 2009.01.29



WO 01/12430

2 / 9

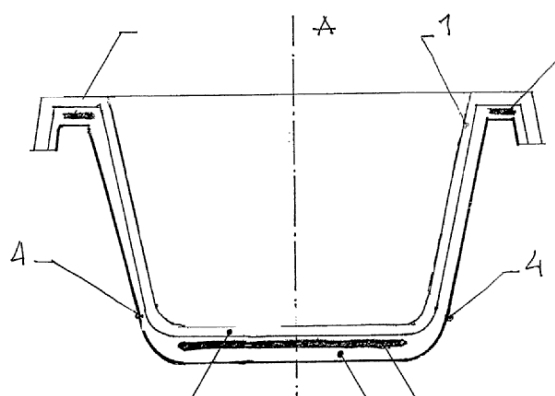
PCT/US00/15167

Illustrative example of subject matter classified in [B29C 70/26](#)

WO 2008/052227

PCT

FIG. 1



## Glossary of terms

*In this place, the following terms or expressions are used with the meaning indicated:*

Warp	collection of fibres in a fabric in the lengthwise machine direction
Tex	indication of the linear weight of a roving, fibre or yarn, 1 Tex = 1 gram/kilometer
Weft or woof fibres	in the transverse direction of the warp fibres, these fibres are shot between warp fibres during the weaving process.

## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

Weft = Woof	Fill fibres
-------------	-------------

## B29C 70/30

**Shaping by lay-up, i.e. applying fibres, tape or broadsheet on a mould, former or core; Shaping by spray-up, i.e. spraying of fibres on a mould, former or core**

## Definition statement

*This place covers:*

[B29C 70/30](#) deals with lay-up specific details. Lay-up is the positioning of reinforcements in or on a mould, former, core or substrate taking into account the anisotropy of the material.

Example: the specific lay-up in terms of sequence and or fibre orientation of fibrous reinforcing layers prior to a moulding process.

## References

### Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Producing fibrous preforms for subsequent moulding	<a href="#">B29B 11/16</a>
--	----------------------------

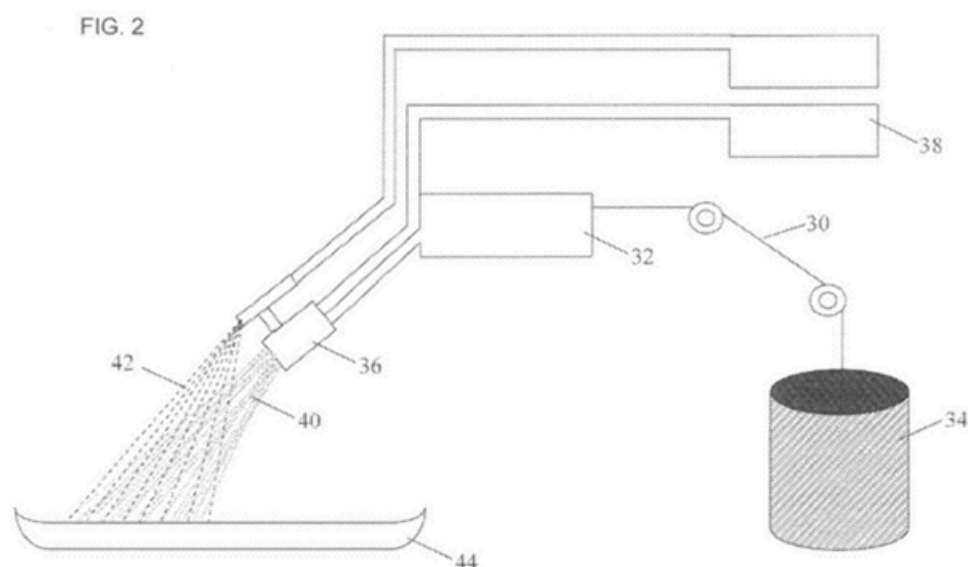
### Informative references

Attention is drawn to the following places, which may be of interest for search:

Specific details of the moulding process	<a href="#">B29C 70/40</a> - <a href="#">B29C 70/56</a>
--	---

## Special rules of classification

Illustrative example of subject matter classified in [B29C 70/305](#)



## B29C 70/32

on a rotating mould, former or core

### Definition statement

*This place covers:*

Winding of fibres reinforcements where the layup of the winding is of importance.

## References

### Informative references

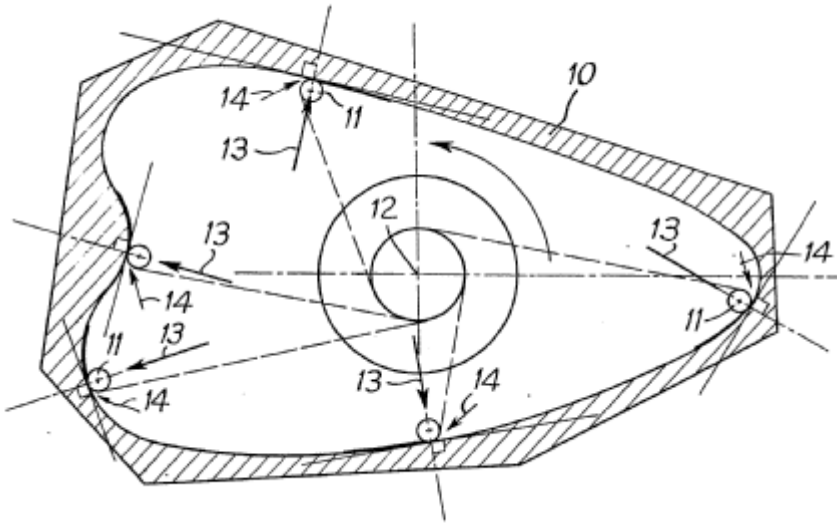
Attention is drawn to the following places, which may be of interest for search:

Shaping by helically winding	<a href="#">B29C 53/58</a>
------------------------------	----------------------------



## Special rules of classification

Illustrative example of subject matter classified in [B29C 70/323](#)



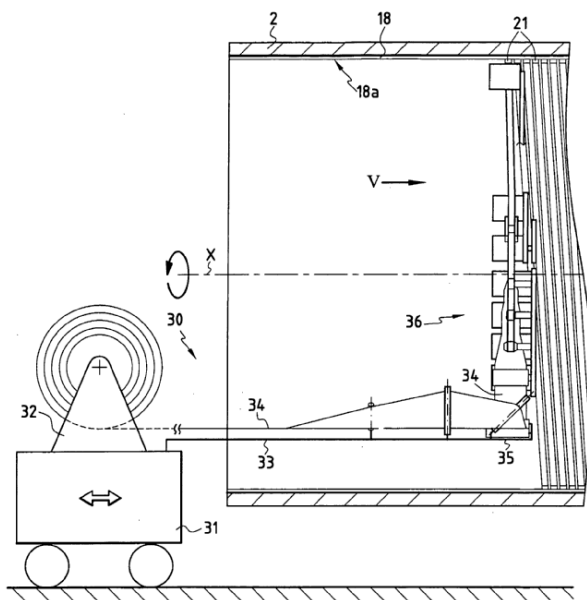
EP0198744

Illustrative example of subject matter classified in [B29C 70/326](#)

WO 03/049927

PCT/FR02/04248

4/5





**B29C 70/34**

and shaping or impregnating by compression {, i.e. combined with compressing after the lay-up operation}

**Definition statement**

*This place covers:*

moulding where the layup of the reinforcements (i.e. orientation, position, fibre type) is of importance and the moulding technique has no particular relevance.

**Special rules of classification****B29C 70/342**

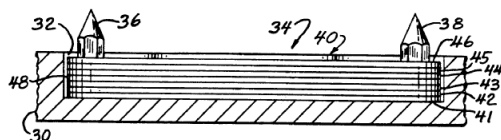
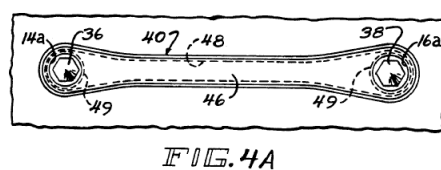
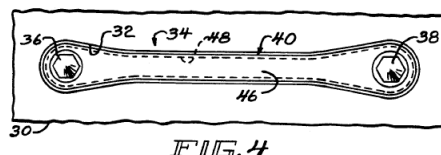
Moulding using isostatic pressing means, e.g. using vacuum bag, silicone core, expanding bags or balloons to apply moulding pressure.

**B29C 70/345**

moulding where the composite material is moulded by 'hard' or 'stiff' moulding surfaces (e.g. a male and a female metal mould)

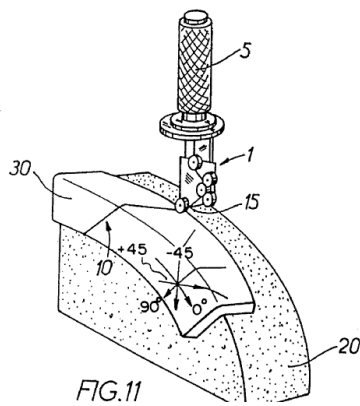
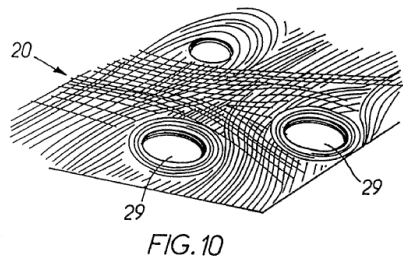
Illustrative example of subject matter classified in [B29C 70/347](#)

U.S. Patent      Dec. 21, 1993      Sheet 2 of 9      5,271,300



Illustrative example of subject matter classified in [B29C 70/382](#)

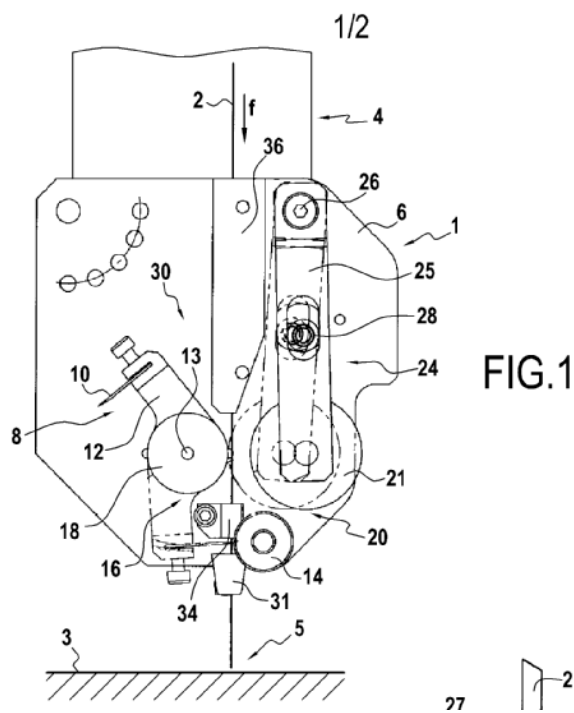
U.S. Patent May 21, 1996 Sheet 4 of 6 5,518,564



Illustrative example of subject matter classified in [B29C 70/384](#)

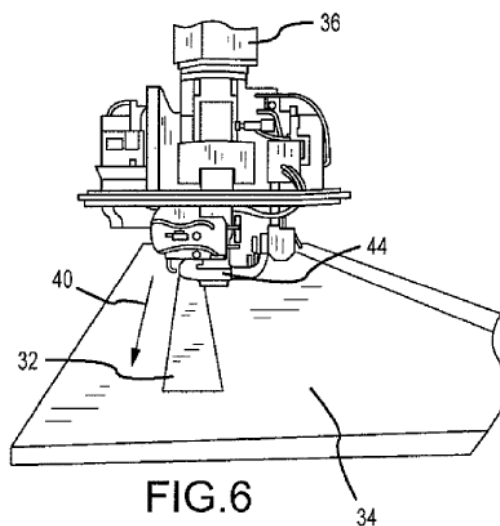
WO 2010/070245

PCT/FR2009/052623

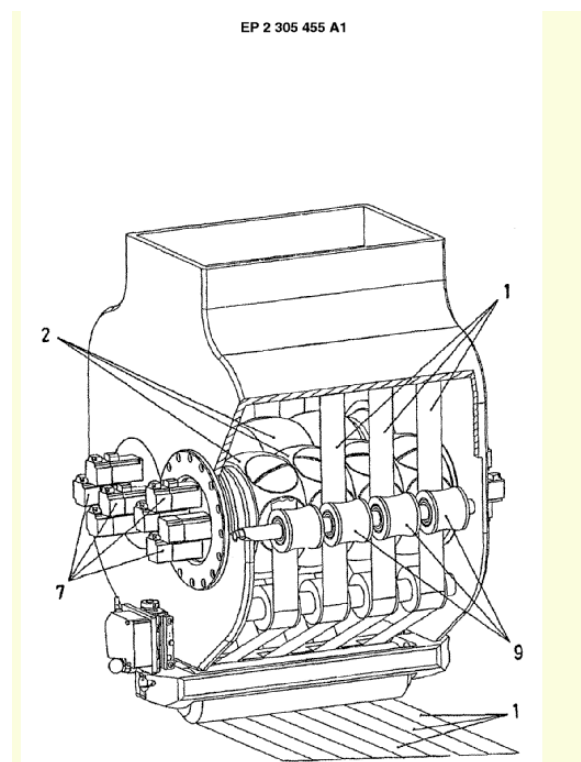


Illustrative example of subject matter classified in [B29C 70/386](#)

Patent Application Publication    Oct. 15, 2009    Sheet 4 of 5    US 2009/0258220 A1



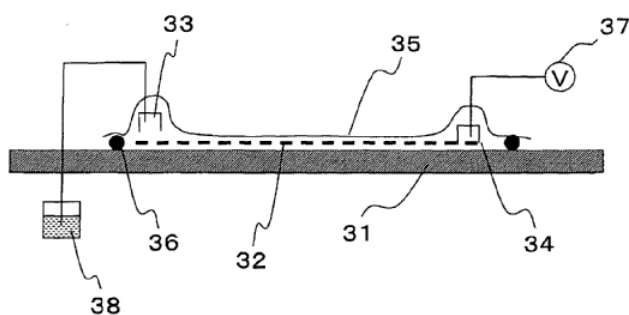
Illustrative example of subject matter classified in [B29C 70/388](#)





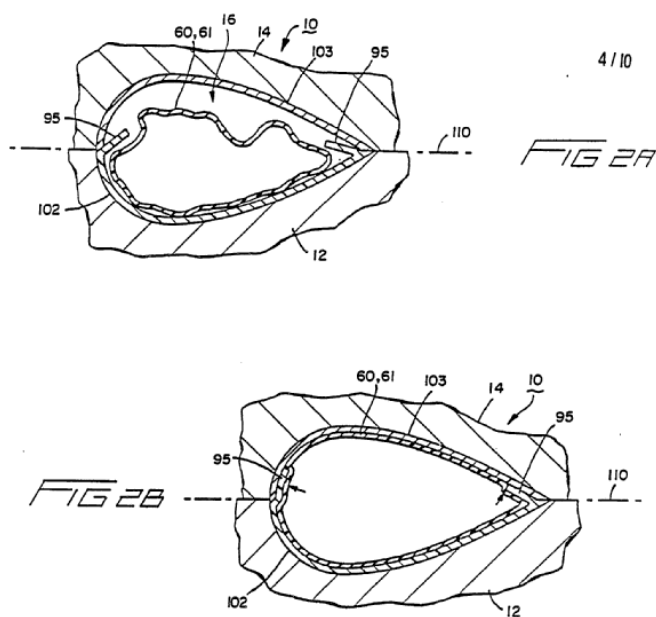
**B29C 70/443****{and impregnating by vacuum or injection}****Special rules of classification**Illustrative example of subject matter classified in [B29C 70/443](#)

EP 2 149 441 A1

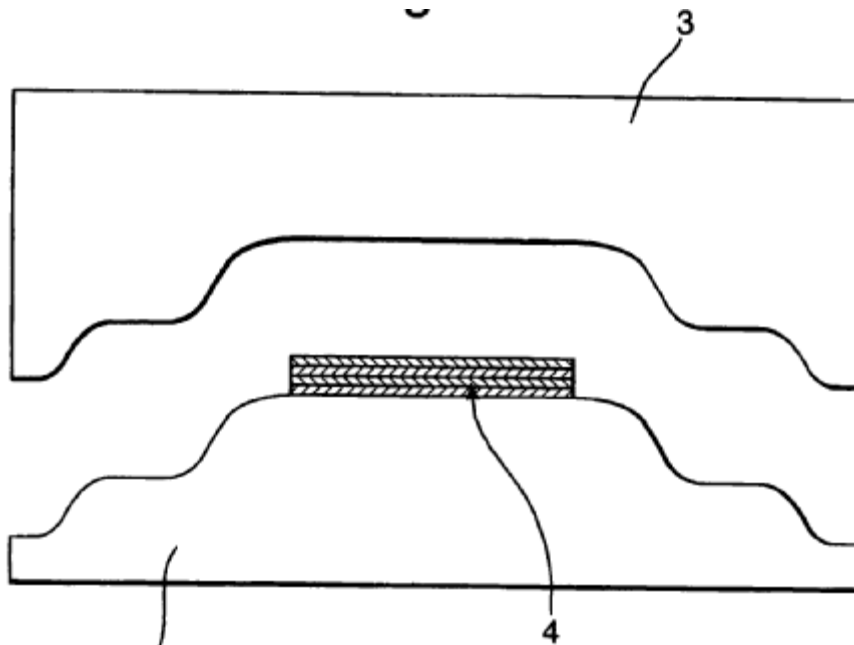
**FIG. 4**Illustrative example of subject matter classified in [B29C 70/446](#)

WO 89/04789

PCT/US88/04006

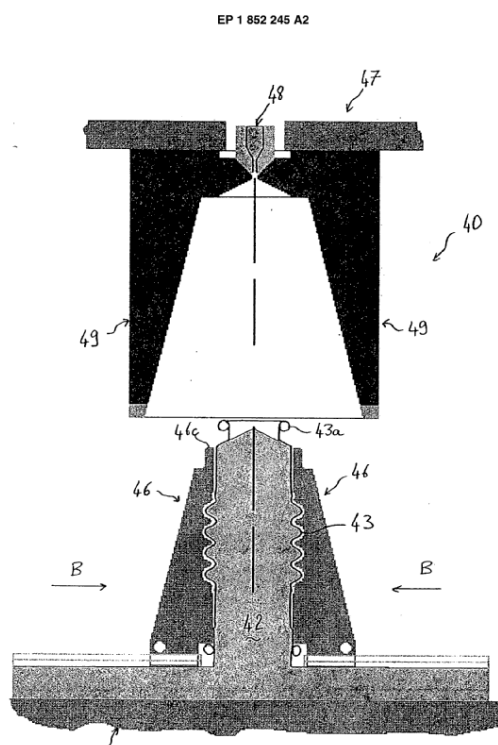


Illustrative example of subject matter classified in [B29C 70/46](#)



GB2453308

Illustrative example of subject matter classified in [B29C 70/462](#)



## Synonyms and Keywords

*In patent documents, the following abbreviations are often used:*

RTM	resin transfer moulding
CIRTM	co-injection RTM

VI	vacuum infusion
DRDF	double resin infusion under flexible tooling
LRI	liquid resin infusion
MVI	modified vacuum infusion
RFI	resin film infusion
RIRM	resin injection recirculation moulding
SCRIMP	Seeman Composites Resin Infusion Moulding Process
VAIM	vacuum assisted injection moulding
VAP	vacuum assisted processing
VARI	vacuum assisted resin injection system
VARIM	vacuum assisted resin injection moulding
V(A)RTM	vacuum (assisted) resin transfer moulding
VIM	vacuum infusion moulding
VIMP	vacuum infusion moulding process
VM/RTM light	a hybrid RIFT/RTM
VIP	vacuum infusion process

## **B29C 70/465**

**{and impregnating by melting a solid material, e.g. sheets, powders of fibres}**

### **References**

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Impregnating per se	<a href="#">B29B 15/105</a> - <a href="#">B29B 15/14</a>
Vitreous materials in general	<a href="#">D21H 13/40</a>

## Special rules of classification

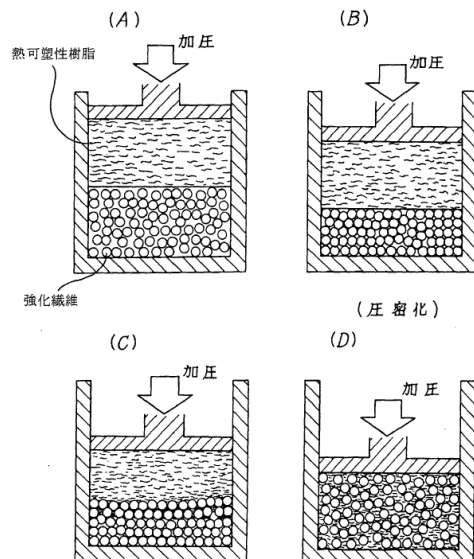
Illustrative example of subject matter classified in **B29C79/46B**:

WO 03/046057

PCT/JP02/12419

1 / 6

図 1



## B29C 70/467

{and impregnating the reinforcements during mould closing ([B29C 70/465](#) takes precedence)}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Impregnating of fibrous material per se	<a href="#">B29B 15/105</a> - <a href="#">B29B 15/14</a>
---	---



## Special rules of classification

Illustrative example of subject matter classified in **B29C79/46C**:

WO 02/072676

1/21

PCT/IB02/01813

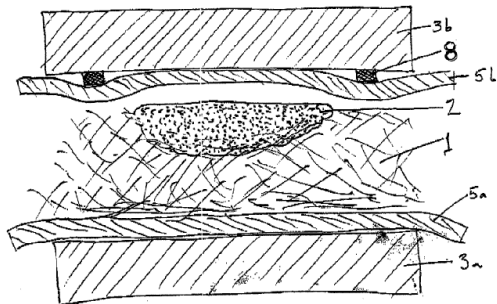
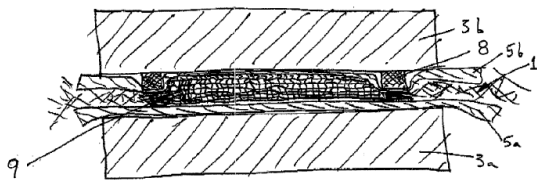


Fig. 1a



## B29C 70/48

and impregnating the reinforcements in the closed mould, e.g. resin transfer moulding [RTM] {, e.g. by vacuum}

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Impregnating of fibrous reinforcement per se	<a href="#">B29B 15/105</a> - <a href="#">B29B 15/14</a>
--	---

### Special rules of classification

Illustrative example of subject matter classified in **B29C79/48**:

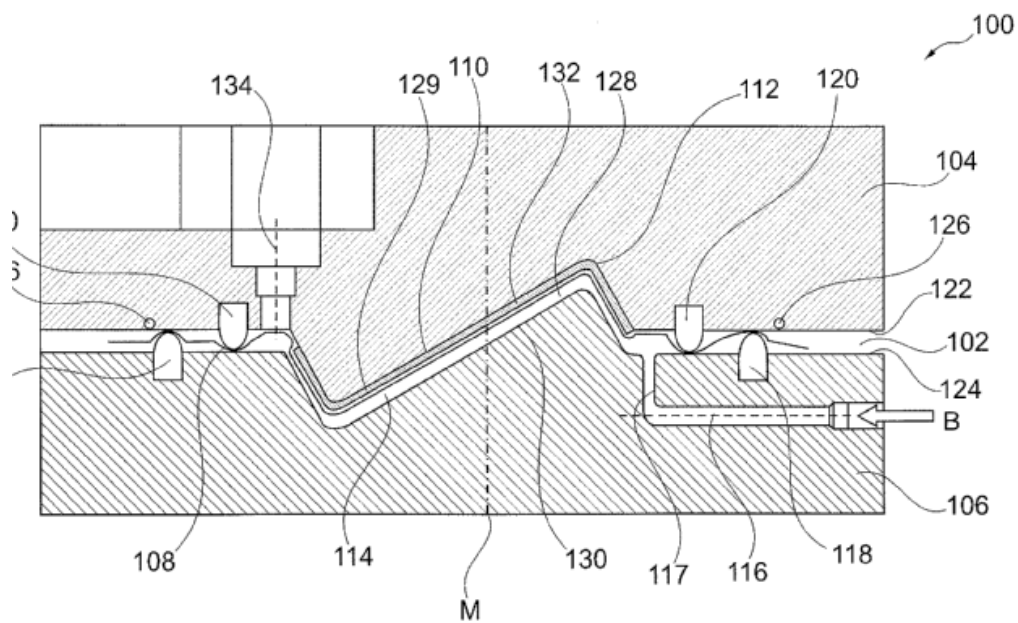


Fig 1

WO 2010/118923

1/3

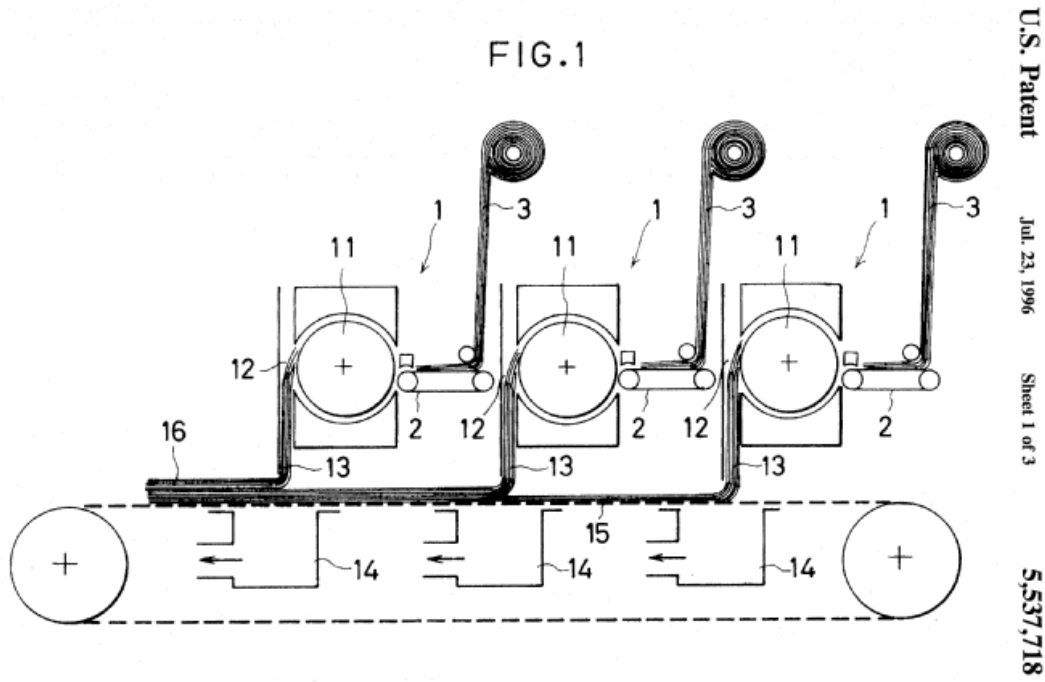
PCT/EP2010/053199

**B29C 70/50**

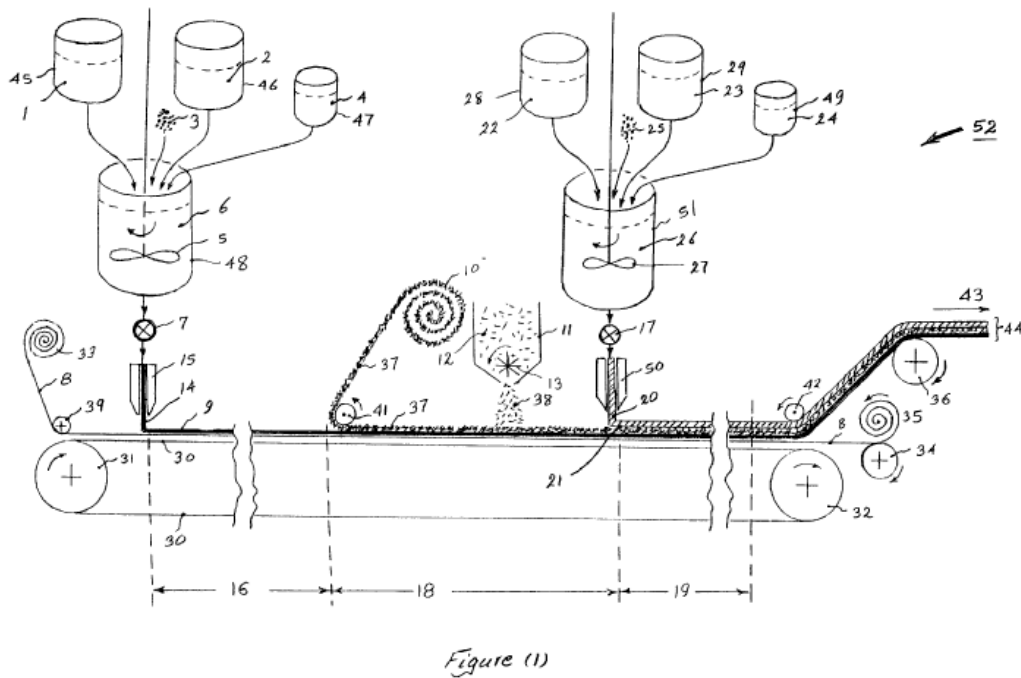
for producing articles of indefinite length, e.g. prepregs, sheet moulding compounds [SMC] or cross moulding compounds [XMC]

**Special rules of classification**

Illustrative example of subject matter classified in **B29C79/50**:

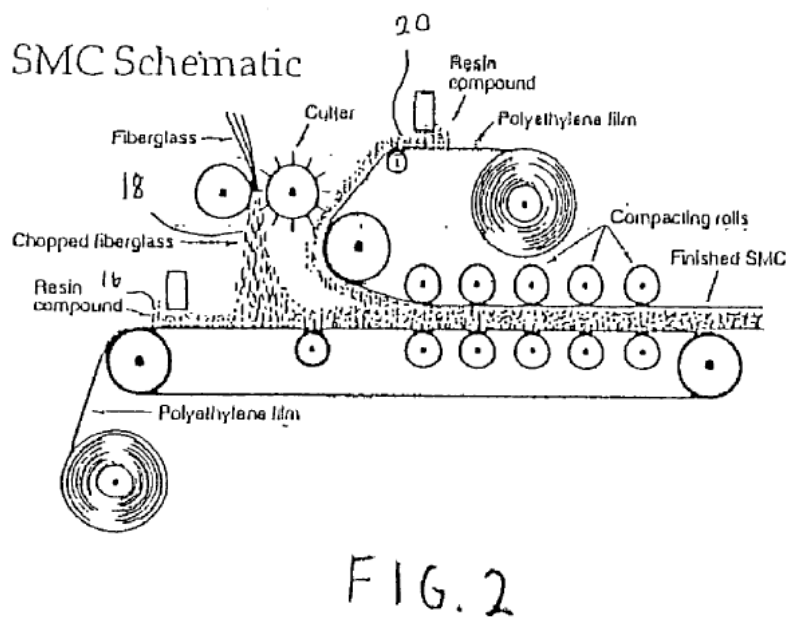


Illustrative example of subject matter classified in [B29C 70/502](#):



U.S. Patent Dec. 24, 2002 Sheet 1 of 5 US 6,497,833 B1

Illustrative example of subject matter classified in [B29C 70/504](#):



ation Publication May 1, 2003 Sheet 2 of 2 US 2003/0083414 A1

**B29C 70/506**

{and impregnating by melting a solid material, e.g. sheet, powder, fibres  
([B29C 70/508](#) takes precedence)}

**References****Limiting references**

*This place does not cover:*

Pulp or paper, comprising vitreous materials	<a href="#">D21H 13/40</a>
--	----------------------------

**B29C 70/52**

Pultrusion, i.e. forming and compressing by continuously pulling through a die

**Definition statement**

*This place covers:*

Continuous fibres or fibrous structures are pulled with matrix material through a die.

**References****Limiting references**

*This place does not cover:*

Extrusion moulding compounds comprising short fibres which are pressed through a die	<a href="#">B29C 48/0011</a>
--	------------------------------

**Special rules of classification**

Illustrative example of subject matter classified in [B29C 70/521](#):

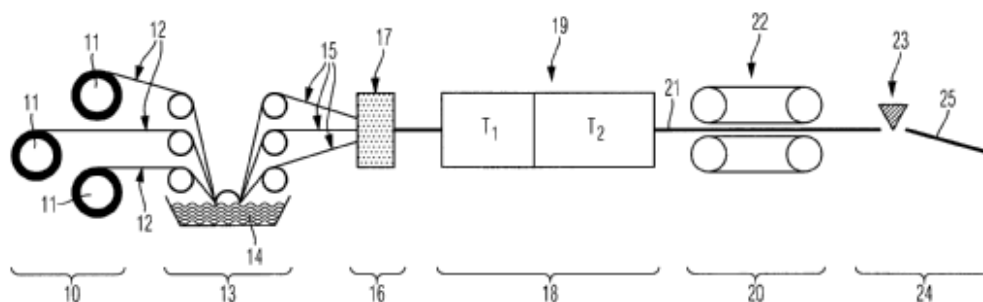
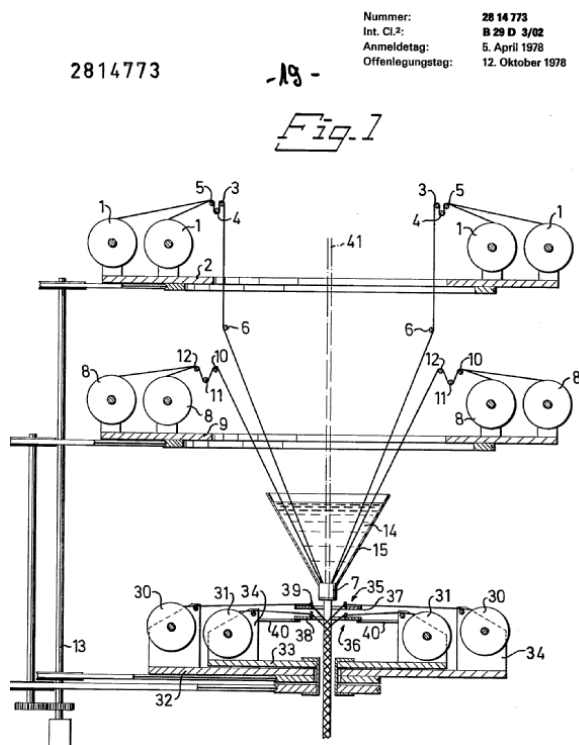


Fig. 1  
Stand der Technik

DE 10 2009 053 967 A1 2011.05.26  
Anhängende Zeichnungen

Illustrative example of subject matter classified in [B29C 70/522](#):



## B29C 70/523

{and impregnating the reinforcement in the die}

## References

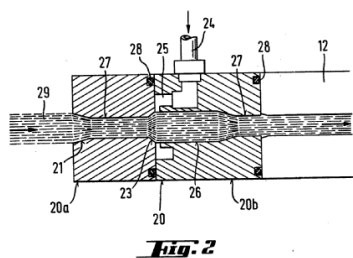
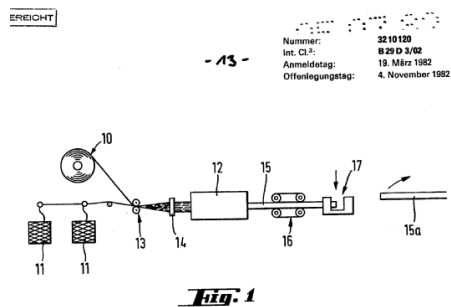
### Informative references

Attention is drawn to the following places, which may be of interest for search:

Impregnating per se	<a href="#">B29B 15/14</a> - <a href="#">B29B 15/105</a>
---------------------	---

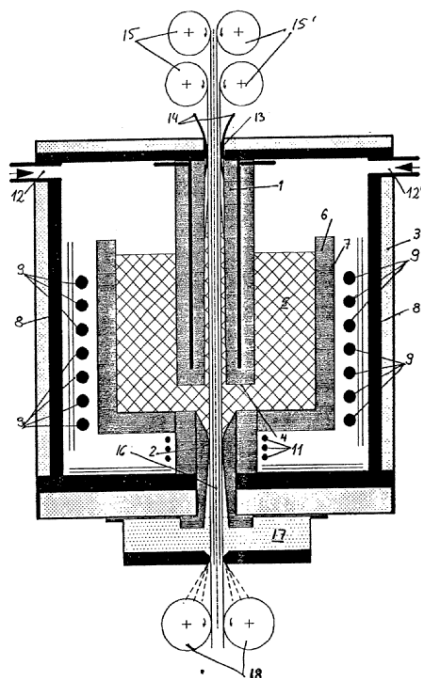
## Special rules of classification

Illustrative example of subject matter classified in this group:



Illustrative example of subject matter classified in [B29C 70/524](#):

EP 0 436 807 A1



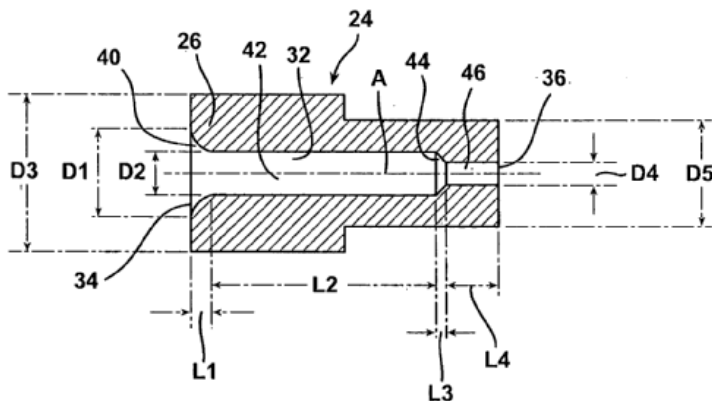
Illustrative example of subject matter classified in [B29C 70/526](#):

WO 2009/045190

PCT/US2007/021204

4/4

FIG. 4



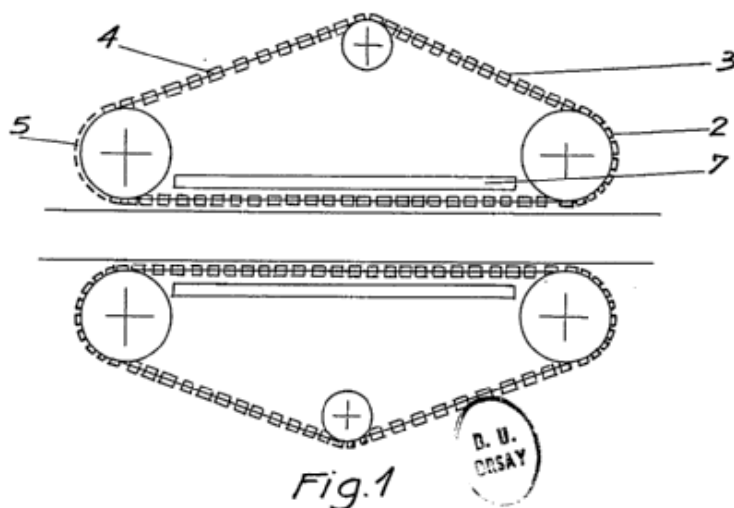
Illustrative example of subject matter classified in [B29C 70/527](#):

N° 1.485.281

Organisme dit :

2 planches. - Pl. I

Deutsche Akademie der Wissenschaften zu Berlin





**B29C 70/528****{Heating or cooling}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Heating, cooling during moulding in general	<a href="#">B29C 35/00</a>
---	----------------------------

**B29C 70/54****Component parts, details or accessories; Auxiliary operations {, e.g. feeding or storage of prepregs or SMC after impregnation or during ageing}****Definition statement***This place covers:*

All details and auxiliary operations related to shaping of composites consisting of reinforcements only, e.g. sensing means to control curing, impregnation, positioning reinforcements in a mould, perforating, cutting or machining during or after moulding.

**References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Releasing articles from moulds or removal of cores	<a href="#">B29C 33/44</a> - <a href="#">B29C 33/54</a>
Heating and curing during moulding in general	<a href="#">B29C 35/00</a>
Using release agents	<a href="#">B29C 37/0067</a>
Pre-treatment, e.g. impregnation, of reinforcements	<a href="#">B29B 15/08</a>
Testing	<a href="#">G01N</a>

## Special rules of classification

Illustrative example of subject matter classified in [B29C 70/541](#):

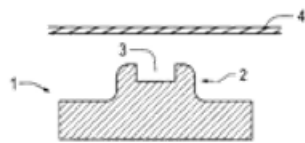


Fig. 1

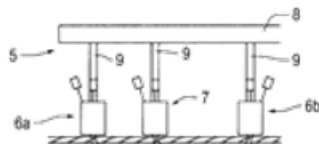


Fig. 2

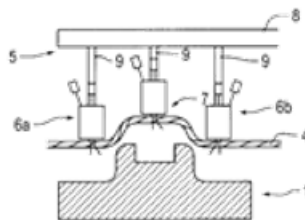


Fig. 3

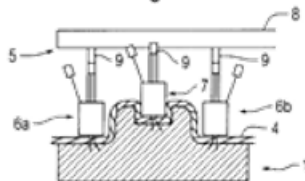
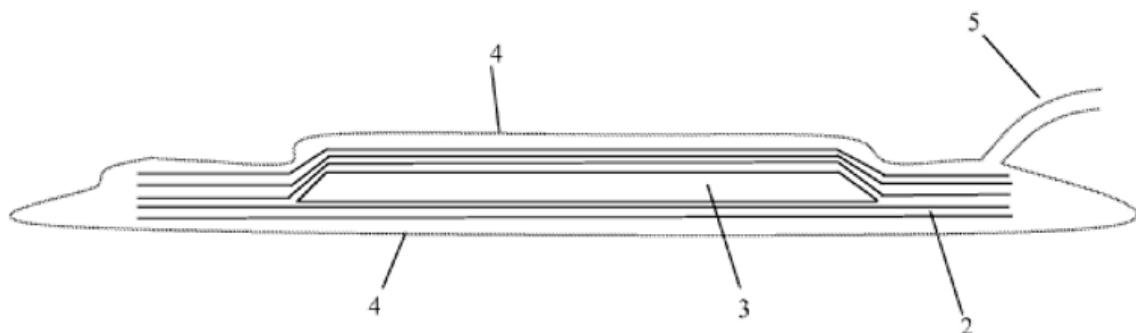


Fig. 4

Illustrative example of subject matter classified in [B29C 70/542](#):



### [B29C 70/543](#)

Documents that teach, e.g. local stitching, bonding, or curing to avoid fibrous reinforcement from misaligning during moulding belong here.

### [B29C 70/545](#)

If a document teaches mechanical post treatment that would be obvious to one of ordinary skill in the art, such as deburring, sanding or removal of mould flash, the document should not be classified here. A document should be classified here only if the process teaches treatment that is not obvious to one

of ordinary skill in the art, and is taught as part of the invention or as indispensable for the moulding method presented.

## **B29C 70/546**

**{Measures for feeding or distributing the matrix material in the reinforcing structure}**

### **Definition statement**

*This place covers:*

methods to improve impregnation of fibrous material, e.g. by modifying surface tension or viscosity of moulding materials (e.g. by heating) and thereby reducing void content of the moulded composite material

### **References**

#### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Impregnating of fibrous material per se	<a href="#">B29B 15/105</a> - <a href="#">B29B 15/14</a>
---	---

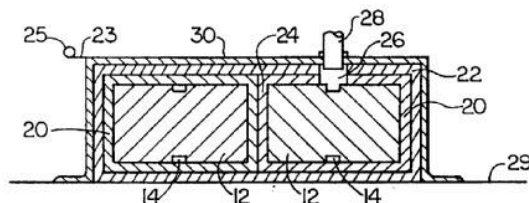
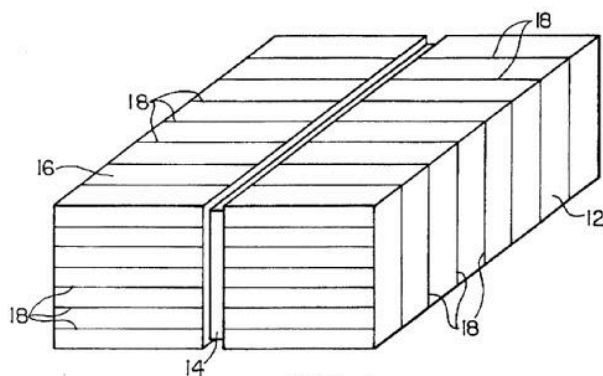
### **Special rules of classification**

Illustrative example of subject matter classified in [B29C 70/547](#):

After curing of the resin, the channels remain in the product.

Porous layers can be peeled off if they are separated from the product by a peel ply or perforated film.

**U.S. Patent**      **Feb. 24, 1998**      **Sheet 1 of 4**      **5,721,034**



Illustrative example of subject matter classified in [B29C 70/548](#):

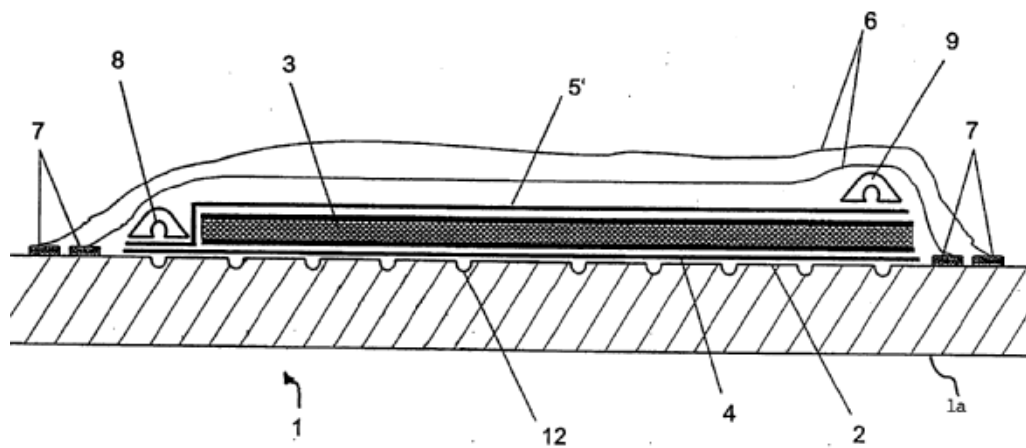


Fig. 1B

Patent Application Publication Feb. 21, 2008 Sheet 2 of 7 US 2008/0044506 A1

## B29C 70/56

### Tensioning reinforcements before or during shaping

#### Definition statement

*This place covers:*

Methods and apparatuses to apply tension on fibrous reinforcement before or during moulding. Fibrous reinforcements in their dry state are often crimped (not straight) and mechanical properties (tensile and compressive strength and modulus) suffer. Predominantly used to improve the straightness of fibres and thereby impart improved mechanical properties.

## B29C 70/58

comprising fillers only {, e.g. particles, powder, beads, flakes, spheres ([B29C 70/025](#) takes precedence, agglomerating hollow spheres to produce synthetic foam [B29C 70/66](#); compounding ingredients per se [C08K](#))}

#### References

##### Informative references

Attention is drawn to the following places, which may be of interest for search:

Moulds from resin bonded particles	<a href="#">B29C 33/3807</a>
------------------------------------	------------------------------

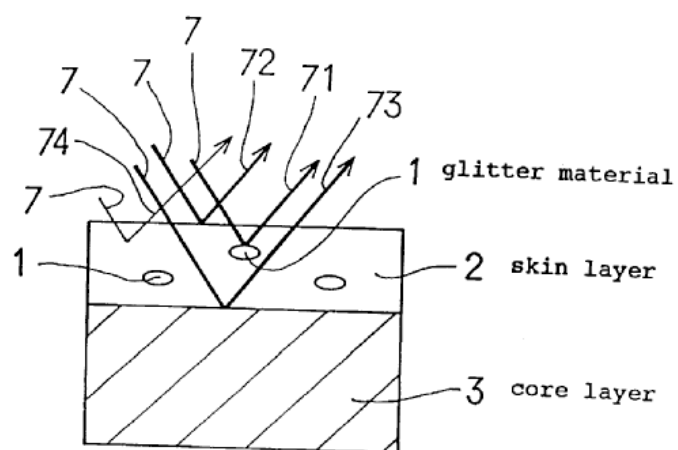
**Special rules of classification**

Illustrative example of subject matter classified in [B29C 70/585](#):

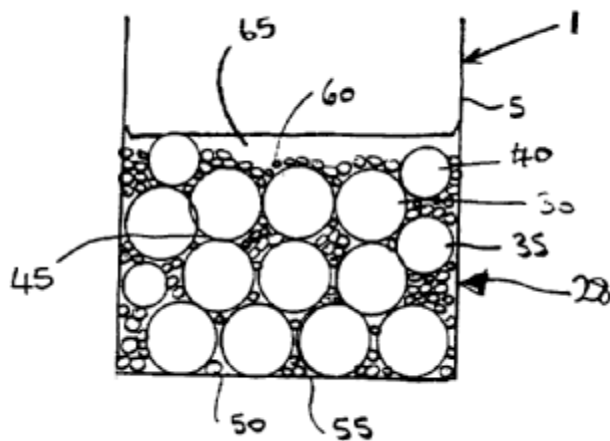
**U.S. Patent**

Apr. 3, 2001

Sheet 2 of 5

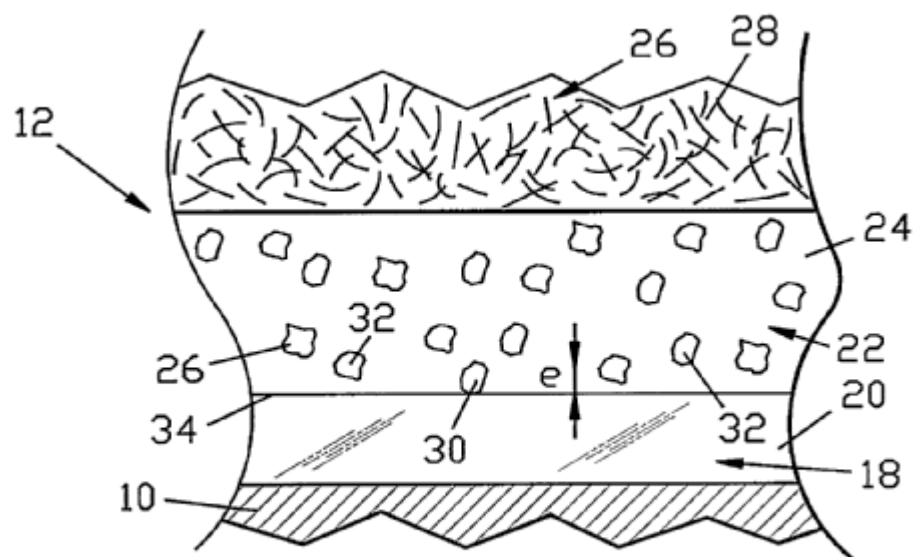
**US 6,210,782 B1****FIG. 2**

Illustrative example of subject matter classified in [B29C 70/60](#):



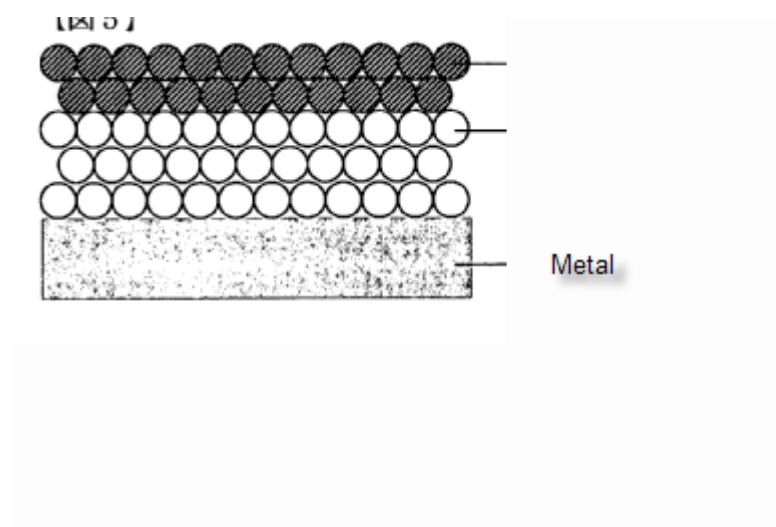
EP11003063

Illustrative example of subject matter classified in [B29C 70/603](#):

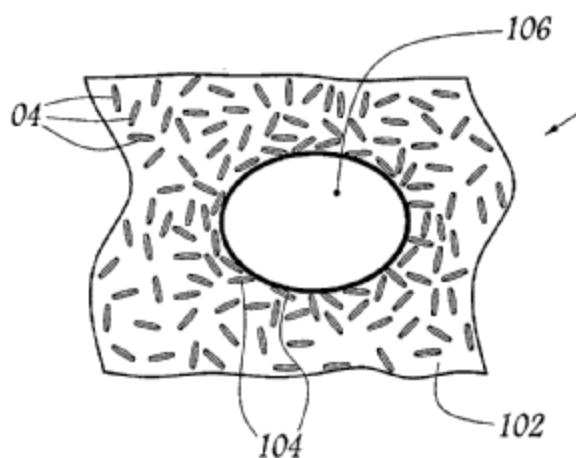


FR2703623

Illustrative example of subject matter classified in [B29C 70/606](#):



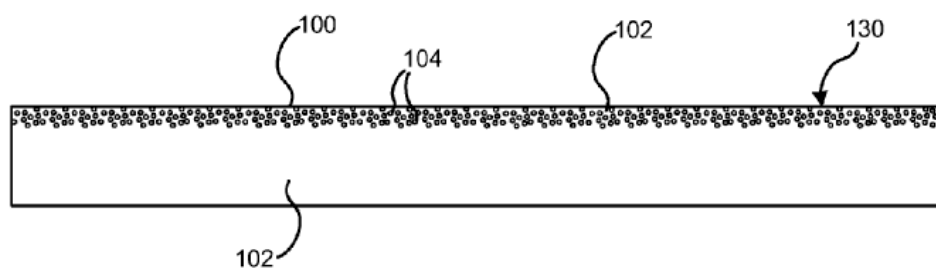
Illustrative example of subject matter classified in [B29C 70/62](#):



FR2850634

Illustrative example of subject matter classified in [B29C 70/64](#):

Patent Application Publication Nov. 26, 2009 Sheet 2 of 6 US 2009/0288259 A1



**FIG. 3**

**B29C 70/66**

the filler comprising hollow constituents, e.g. syntactic foam

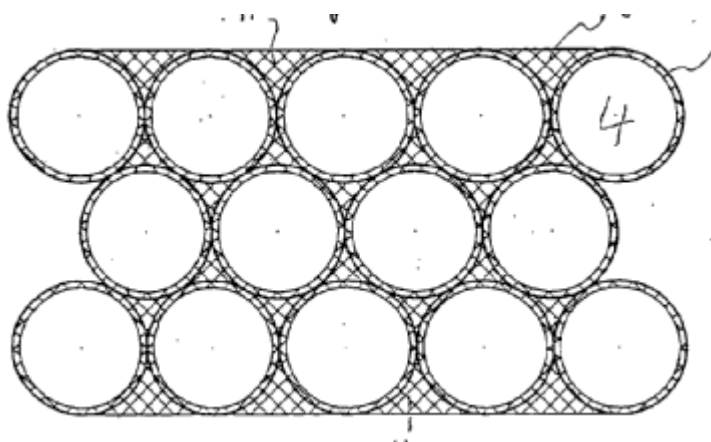
**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Making or treating expandable particles	<a href="#">B29C 44/3461</a>
---	------------------------------

**Special rules of classification**

Illustrative example of subject matter classified in [B29C 70/66](#):



EP1502726 EP

**B29C 70/68**

by incorporating or moulding on preformed parts, e.g. inserts or layers {, e.g. foam blocks (mould constructions therefor [B29C 33/12](#); joining preformed parts by moulding [B29C 65/70](#))}

**Relationships with other classification places**

Positioning inserts in moulds	<a href="#">B29C 33/12</a> - <a href="#">B29C 33/18</a>
Casting around inserts	<a href="#">B29C 39/18</a>
Coating a mould with inserts	<a href="#">B29C 41/30</a>
Compression moulding with inserts	<a href="#">B29C 43/18</a>
Foaming with inserts	<a href="#">B29C 44/12</a> - <a href="#">B29C 44/16</a>
Injection moulding with inserts	<a href="#">B29C 45/14</a>
Extrusion moulding with inserts	<a href="#">B29C 48/15</a>
Blow moulding with labels	<a href="#">B29C 49/24</a> - <a href="#">B29C 49/26</a>



**B29C 70/682**

{Preformed parts characterised by their structure, e.g. form}

**References**

**Informative references**

Attention is drawn to the following places, which may be of interest for search:

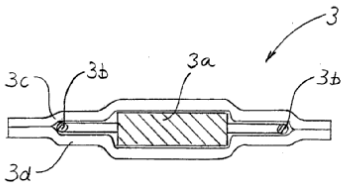
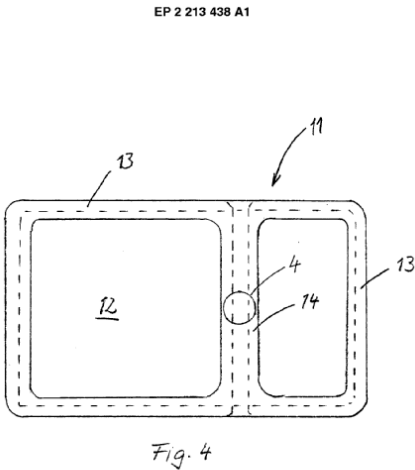
Measures or configurations for obtaining anchoring effects in the contact areas between layers by mechanical anchoring	<a href="#">B29C 37/0078</a>
Measures or configurations for obtaining anchoring effects in the contact areas between layers by means of openings in the layers	<a href="#">B29C 37/0082</a>

**Special rules of classification**

[B29C 70/683](#)

Mainly to improve bonding with the plastic material in which it is embedded

Illustrative example of subject matter classified in [B29C 70/685](#):



Illustrative example of subject matter classified in [B29C 70/686](#):

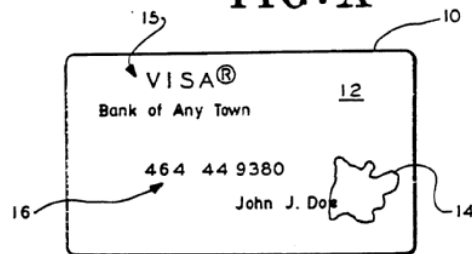
U.S. Patent

Mar. 12, 1991

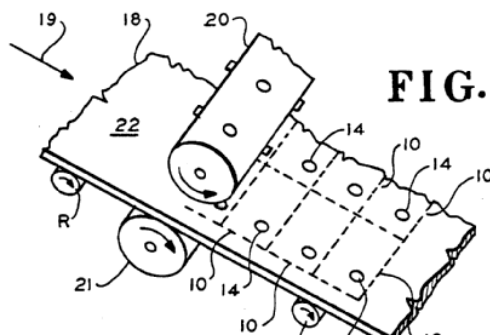
Sheet 1 of 5

4,999,075

**FIG. A**



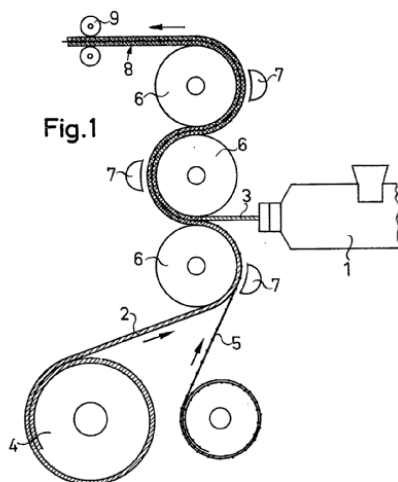
**FIG. 1**



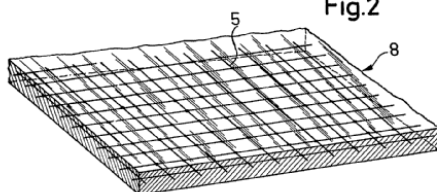
Illustrative example of subject matter classified in [B29C 70/687](#):

N° 1.437.768 Société dite : Continental Gummi-Werke Aktiengesellschaft Pl. unique

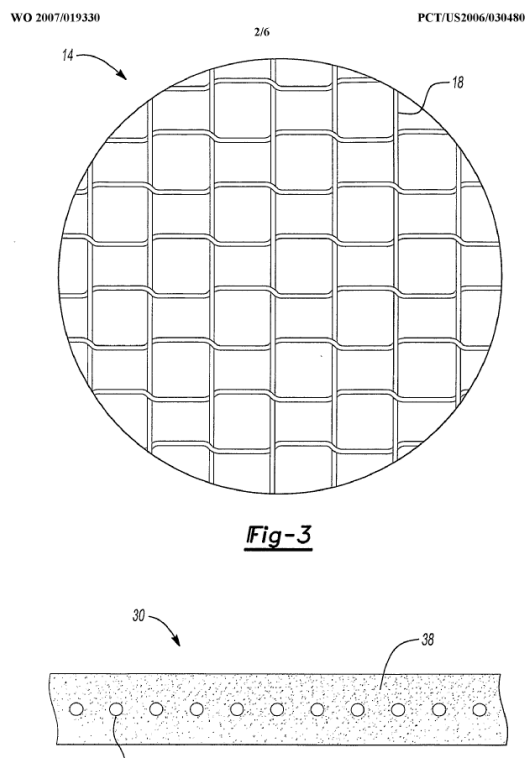
**Fig.1**



**Fig.2**



Illustrative example of subject matter classified in [B29C 70/688](#):



## B29C 70/70

Completely encapsulating inserts {([B29C 70/86](#) takes precedence)}

### References

#### Limiting references

*This place does not cover:*

Reinforced encapsulating material (e.g. by fibres)	<a href="#">B29C 70/865</a>
--	-----------------------------

#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Joining by foaming:	<a href="#">B29C 44/1223-</a> <a href="#">B29C 44/1247</a>
---------------------	---

## Special rules of classification

Illustrative example of subject matter classified in [B29C 70/70](#):

Patent Application Publication Oct. 21, 2004 Sheet 3 of 9 US 2004/0209707 A1

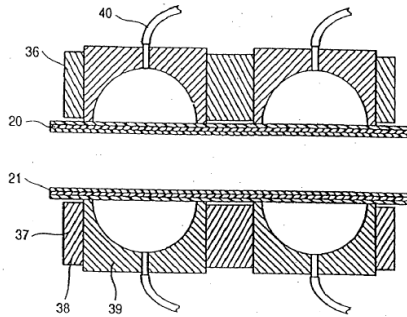
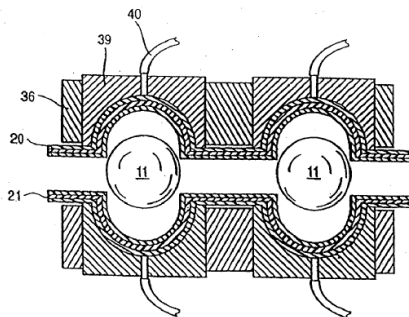


Fig. 5



Illustrative example of subject matter classified in [B29C 70/72](#):

WO 2005/058583

1/4

PCT/AU2004/001559

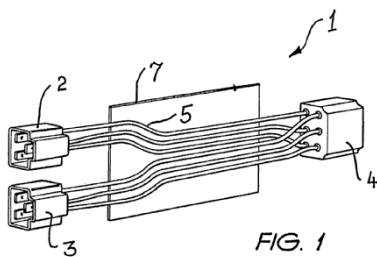
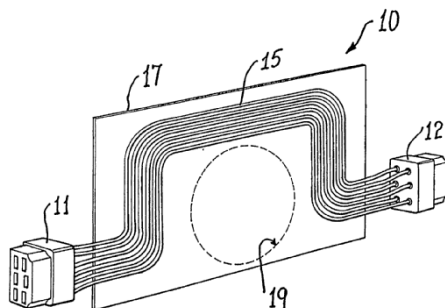
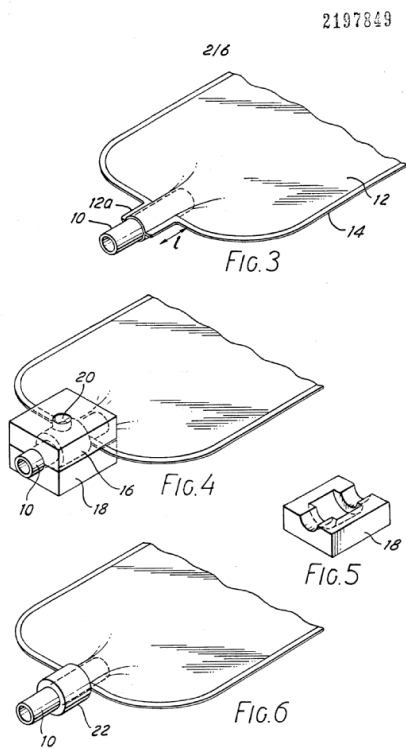


FIG. 1



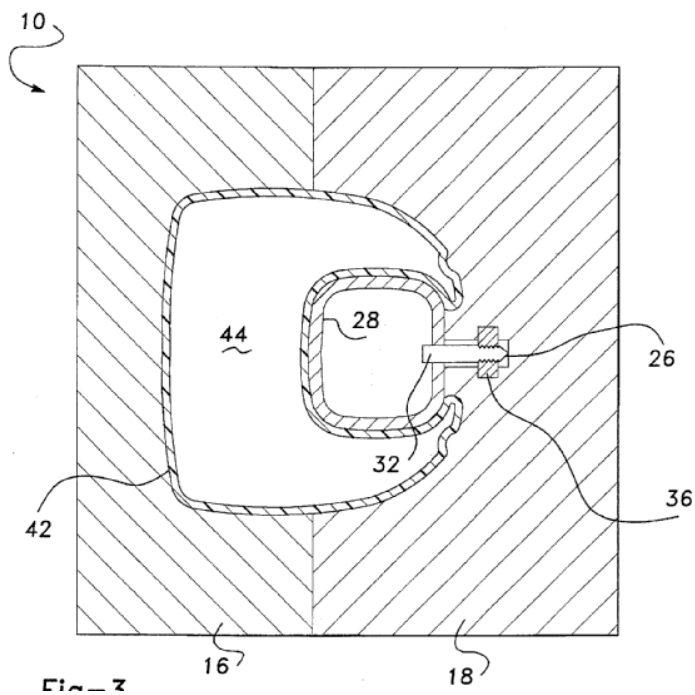
Illustrative example of subject matter classified in [B29C 70/74](#):



GB2197849

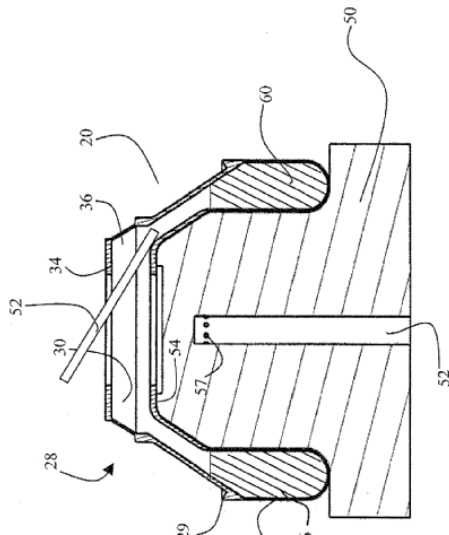
Illustrative example of subject matter classified in [B29C 70/742](#):

**U.S. Patent**      **Aug. 19, 1997**      **Sheet 2 of 3**      **5,658,027**



Illustrative example of subject matter classified in [B29C 70/745](#):

EP 1 946 901 A1



Illustrative example of subject matter classified in [B29C 70/747](#):

Patent Application Publication Apr. 13, 2006 Sheet 3 of 4 US 2006/0076107 A1

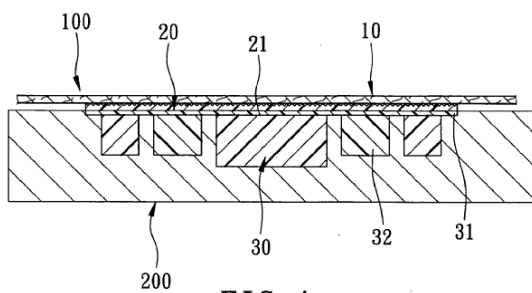
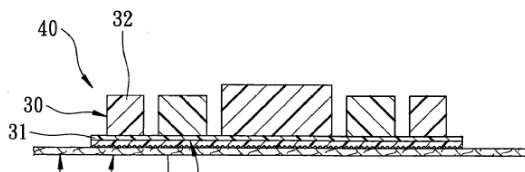


FIG. 4



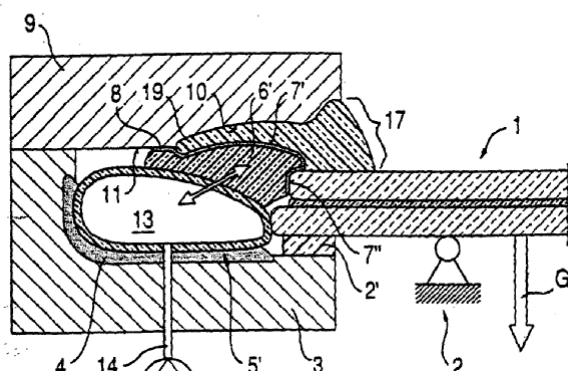
Illustrative example of subject matter classified in [B29C 70/763](#):

WO 03/039836

2/2

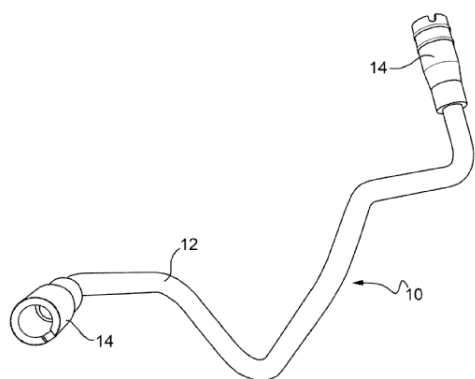
PCT/FR02/038

**Fig. 3**

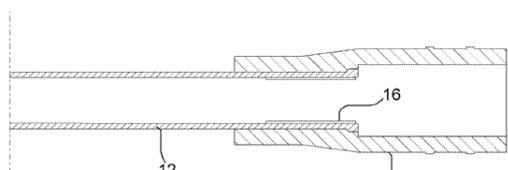


Illustrative example of subject matter classified in [B29C 70/766](#):

EP 2 127 844 A1



**FIG.1**



Illustrative example of subject matter classified in [B29C 70/78](#):

EP 0 600 187 A1

FIG. 6B

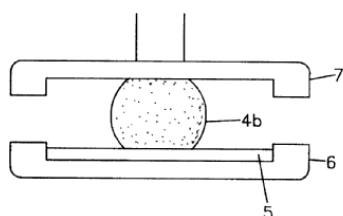
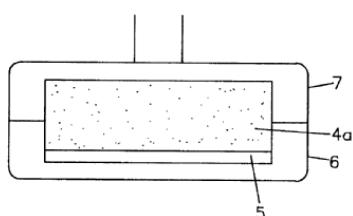


FIG. 7B



Illustrative example of subject matter classified in [B29C 70/80](#):

1/2

0021691

Fig. 1

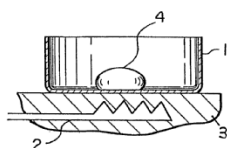


Fig. 2

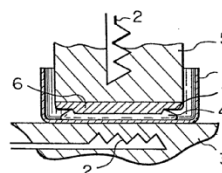
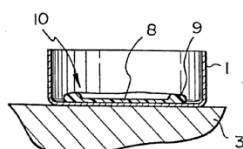


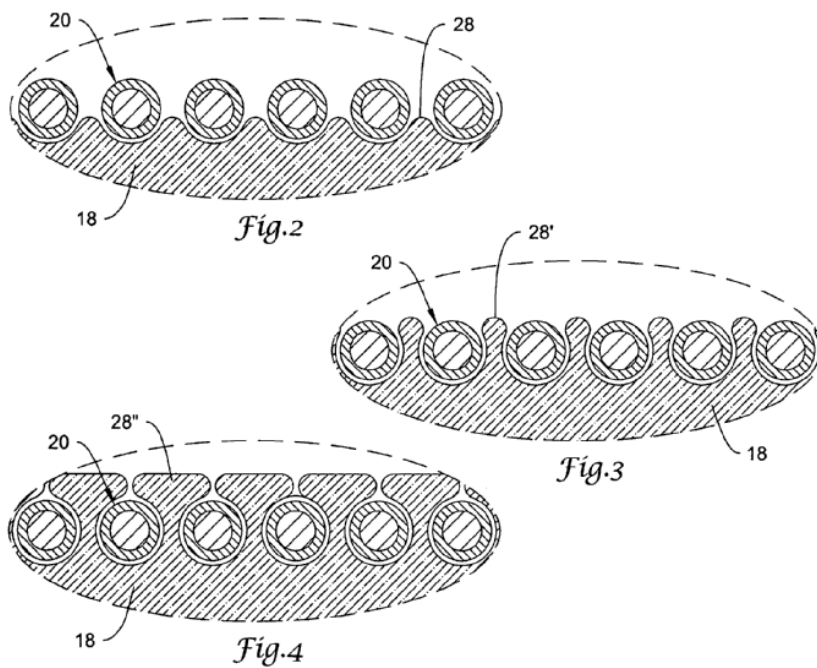
Fig. 3



EP0021691



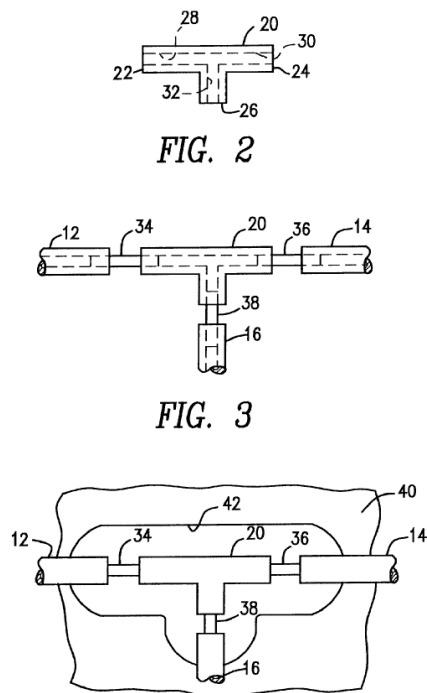
Illustrative example of subject matter classified in [B29C 70/82](#):



Patent Application Publication May 5, 2005 Sheet 2 of 4 US 2005/0096567 A1

Illustrative example of subject matter classified in [B29C 70/84](#):

U.S. Patent Aug. 13, 2002 Sheet 2 of 4 US 6,432,345 B1



Illustrative example of subject matter classified in [B29C 70/845](#):

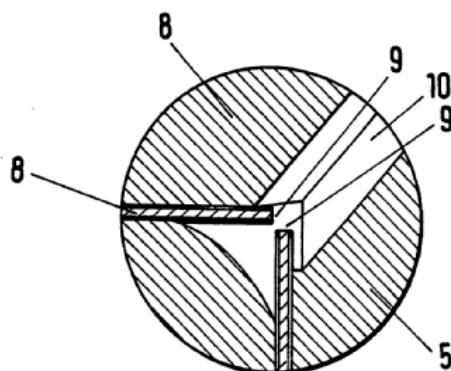
U.S. Patent

Jan. 31, 1995

Sheet 4 of 6

5,385,294

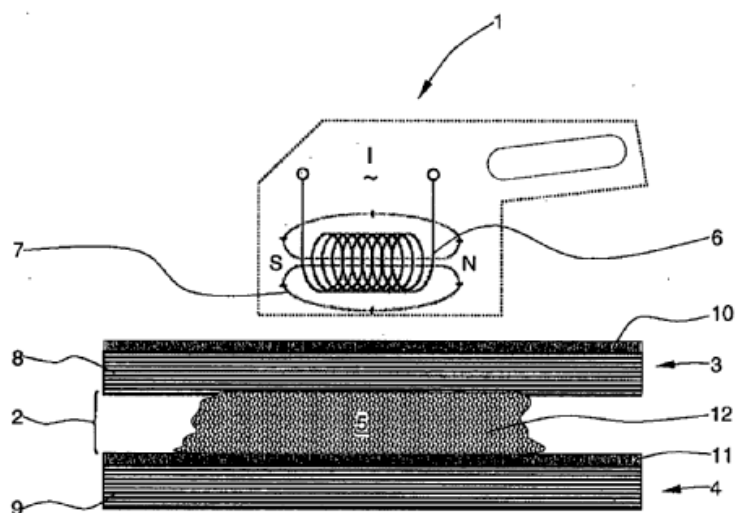
Fig.6



Illustrative example of subject matter classified in [B29C 70/882](#):

DE 10 2008 044 208 A1 2010.06.10

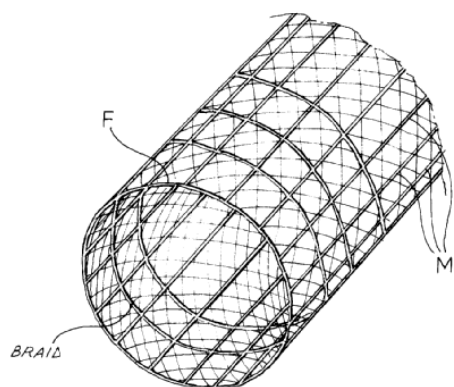
Anhängende Zeichnungen



Illustrative example of subject matter classified in [B29C 70/885](#):

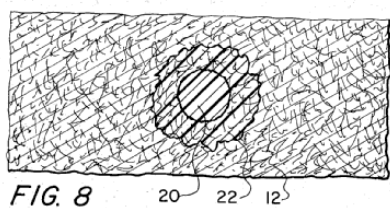
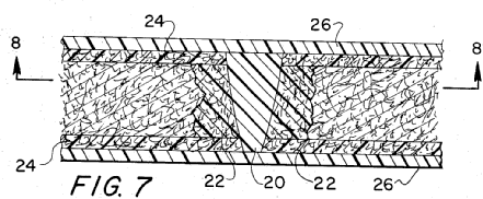
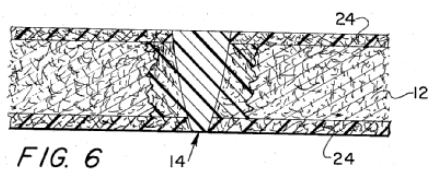
EP 1 584 451 A1

FIG. 4



Illustrative example of subject matter classified in [B29C 70/887](#):

Oct. 31, 1967 R. S. GREGOIRE 3,350,249  
METHOD OF MAKING IMPREGNATED PLASTIC RIVET  
REINFORCED LAMINATED FIBER SHEETS 2 Sheets-Sheet 2  
Filed Dec. 7, 1964



**B29C 71/00**

**After-treatment of articles without altering their shape; Apparatus therefor** ([B29C 44/56](#), [B29C 73/00](#) take precedence; surface shaping [B29C 59/00](#) {; for joined or sealed parts [B29C 66/03](#); after-treatment specially adapted for vulcanising tyres [B29D 30/0633](#)})

**Definition statement**

*This place covers:*

After-treatment of articles without altering their shape e.g. extracting undesirable components (unreacted monomers, solvents) from articles e.g. using vacuum or gases, supercritical fluid; absorbing ingredients (drugs, flavourings) in the wall of articles.

**References****Limiting references**

*This place does not cover:*

After-treatment of articles shaped by internal pressure generated in the material	<a href="#">B29C 44/56</a>
Surface shaping, e.g. embossing	<a href="#">B29C 59/00</a>
Repairing of articles	<a href="#">B29C 73/00</a>

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Chemical treatment or coating of shaped articles made of macromolecular substances	<a href="#">C08J 7/00</a>
--	---------------------------

**B29C 71/0009**

{using liquids, e.g. solvents, swelling agents (spectacle cases, e.g. for cleaning contact lenses [A45C 11/04](#); disinfecting or sterilising contact lenses [A61L 12/00](#), using liquid substances [A61L 2/20](#); cleaning involving the use of liquid in general [B08B 3/00](#); for hydrating contact lenses [B29D 11/00067](#))}

**References****Limiting references**

*This place does not cover:*

Cleaning by methods involving the use or presence of liquid or steam, cleaning involving contact with liquid	<a href="#">B08B 3/04</a>
Cleaning by liquid gases or supercritical fluids	<a href="#">B08B 7/0021</a>
Producing contact lenses; hydrating contact lenses	<a href="#">B29D 11/00067</a>
Chemical treatment or coating of shaped articles made of macromolecular substances; with solvents, e.g. swelling agents	<a href="#">C08J 7/02</a>

**B29C 2071/0027**

{Removing undesirable residual components, e.g. solvents, unreacted monomers}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Auxiliary treatment of granules	<a href="#">B29B 9/16</a>
Conditioning or physical treatment of the material to be shaped	<a href="#">B29B 13/00</a>

**B29C 71/0063**

{for changing crystallisation}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Producing flat articles; films or sheets	<a href="#">B29D 7/01</a>
Manufacture of articles or shaped materials containing macromolecular substances; manufacture of films or sheets	<a href="#">C08J 5/18</a>

**B29C 71/0072**

{for changing orientation}

**References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Heating or cooling the stream of extruded material	<a href="#">B29C 48/88</a>
Producing flat articles; films or sheets	<a href="#">B29D 7/01</a>
Manufacture of articles or shaped materials containing macromolecular substances; manufacture of films or sheets	<a href="#">C08J 5/18</a>

**B29C 71/009**

{using gases without chemical reaction ([C08J 7/12](#) takes precedence; in combination with blow-moulding [B29C 49/46](#); surface treatment using plasma [B29C 59/14](#), ionised gas [B29C 59/16](#))}

**References****Limiting references**

This place does not cover:

Cleaning by liquid gases or supercritical fluids	<a href="#">B08B 7/0021</a>
--	-----------------------------

**B29C 71/02**

**Thermal after-treatment** {([B29C 71/0063](#) and [B29C 71/0072](#) take precedence)}

**Definition statement**

*This place covers:*

annealing, i.e. reducing or eliminating tensions; quenching; tempering; stabilisation against shrinkage (by reducing tensions)

**References****Limiting references**

*This place does not cover:*

Heating or cooling the stream of extruded material	<a href="#">B29C 48/88</a>
Processes for manufacturing semi-permeable membranes; after-treatment of organic or inorganic membranes; thermal after-treatment	<a href="#">B01D 67/0083</a>

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Producing flat articles; films or sheets	<a href="#">B29D 7/01</a>
Manufacture of articles or shaped materials containing macromolecular substances; manufacture of films or sheets	<a href="#">C08J 5/18</a>

**B29C 71/04**

**by wave energy or particle radiation** {, e.g. for curing or vulcanising preformed articles (during moulding, e.g. in a mould [B29C 35/08](#))}

**References****Limiting references**

*This place does not cover:*

Processes of treating or compounding macromolecular substances; treatment by wave energy or particle radiation	<a href="#">C08J 3/28</a>
Chemical treatment or coating of shaped articles made of macromolecular substances; chemical modification; treatment by wave energy or particle radiation	<a href="#">C08J 7/123</a>
Apparatus or processes for manufacturing printed circuits; etching the insulating substrate by plasma etching	<a href="#">H05K 3/0041</a>

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Methods or apparatus for disinfecting or sterilising materials or objects using physical phenomena; radiation	<a href="#">A61L 2/08</a>
Irradiation devices	<a href="#">G21K 5/00</a>

B29C 73/00

Repairing of articles made from plastics or substances in a plastic state, e.g. of articles shaped or produced by using techniques covered by this subclass or subclass [B29D](#) ({linings for tyres acting locally [B60C 5/142](#);} retreading tyres [B29D 30/54](#); devices for covering leaks in pipes or hoses [F16L 55/16](#))

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

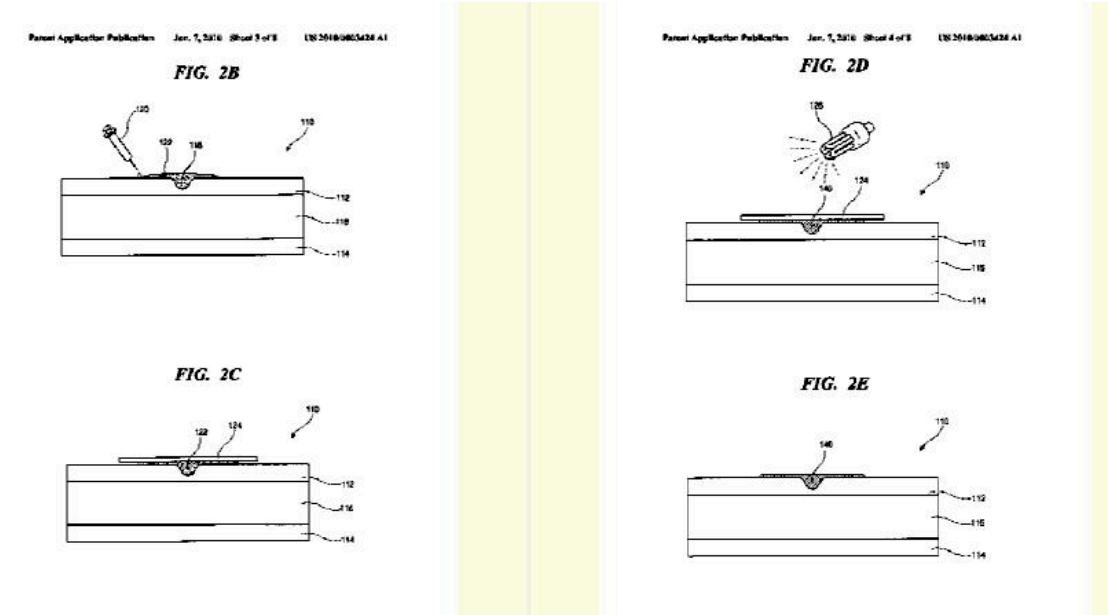
Sieving, screening; repairing of screening surfaces	<a href="#">B07B 1/4627</a>
Repairing fractures or cracked metal parts or products, e.g. castings	<a href="#">B23P 6/04</a>
Rebuilding ships, e.g. increasing tonnage	<a href="#">B63B 83/00</a>
Designing, manufacturing, assembling, cleaning, maintaining, or repairing aircraft	<a href="#">B64F 5/40</a>
Materials for sealing or packing joints or covers	<a href="#">C09K 3/10</a>
Blades, blades-carrying members; repairing methods or devices	<a href="#">F01D 5/005</a>

B29C 73/02

using liquid or paste-like material ([B29C 73/16](#) takes precedence)

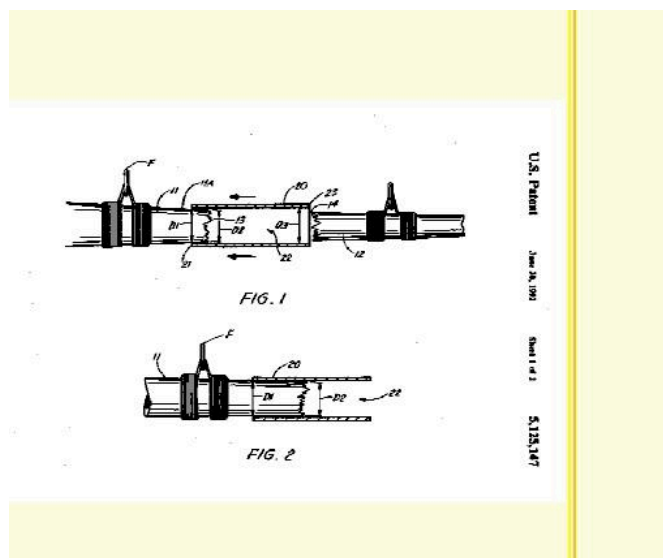
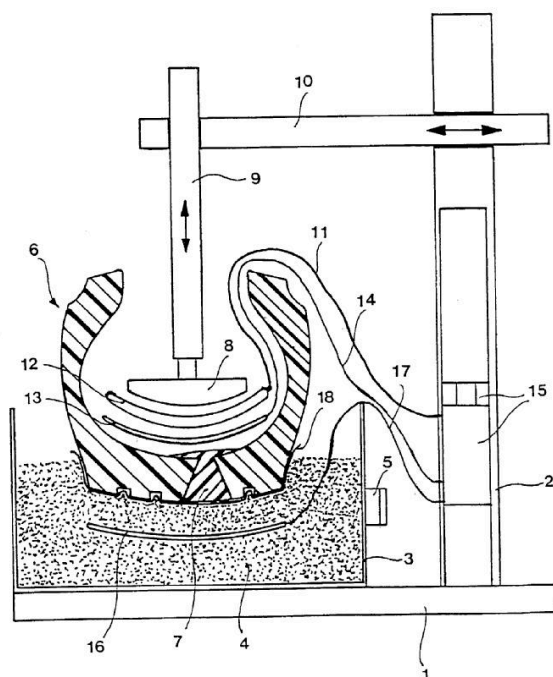
Definition statement

This place covers:



Patent Application Publication Mar. 20, 2003

US 2003/0054060 A1



U.S. Patent June 30, 1993 Sheet 2 of 2 5,125,147

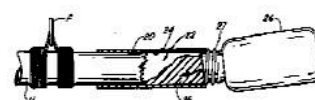


FIG. 3

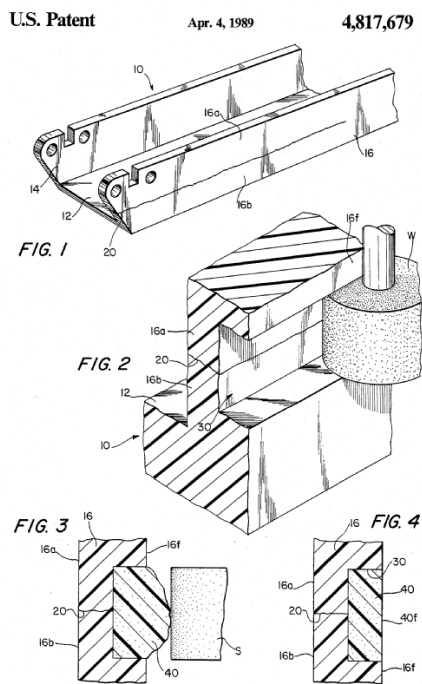


FIG. 4



FIG. 5





## References

### *Informative references*

Attention is drawn to the following places, which may be of interest for search:

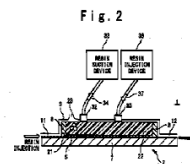
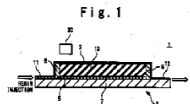
Repairing damaged coatings	<a href="#">B05D 5/005</a>
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**B29C 73/025**

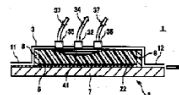
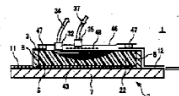
{fed under pressure}

**Definition statement***This place covers:*

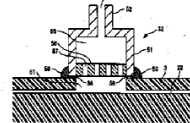
Patent Application Publication Aug. 26, 2011 Sheet 1 of 7 US 2011/0264254 A1



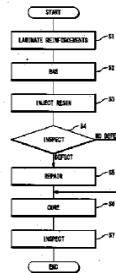
Patent Application Publication Aug. 26, 2011 Sheet 2 of 7 US 2011/0264254 A1

**Fig. 3****Fig. 4**

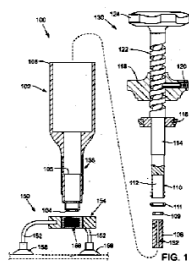
Patent Application Publication Aug. 26, 2011 Sheet 3 of 7 US 2011/0264254 A1

**Fig. 5****Fig. 6**

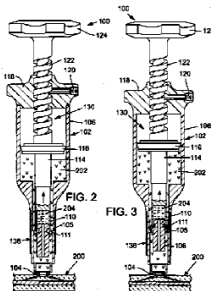
Patent Application Publication Aug. 26, 2011 Sheet 4 of 7 US 2011/0264254 A1

**Fig. 7**

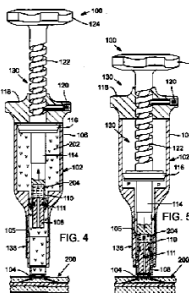
Patent Application Publication Apr. 26, 2007 Sheet 1 of 4 US 2006/0106462 A1



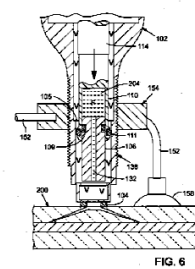
Patent Application Publication Apr. 26, 2007 Sheet 2 of 4 US 2006/0106462 A1

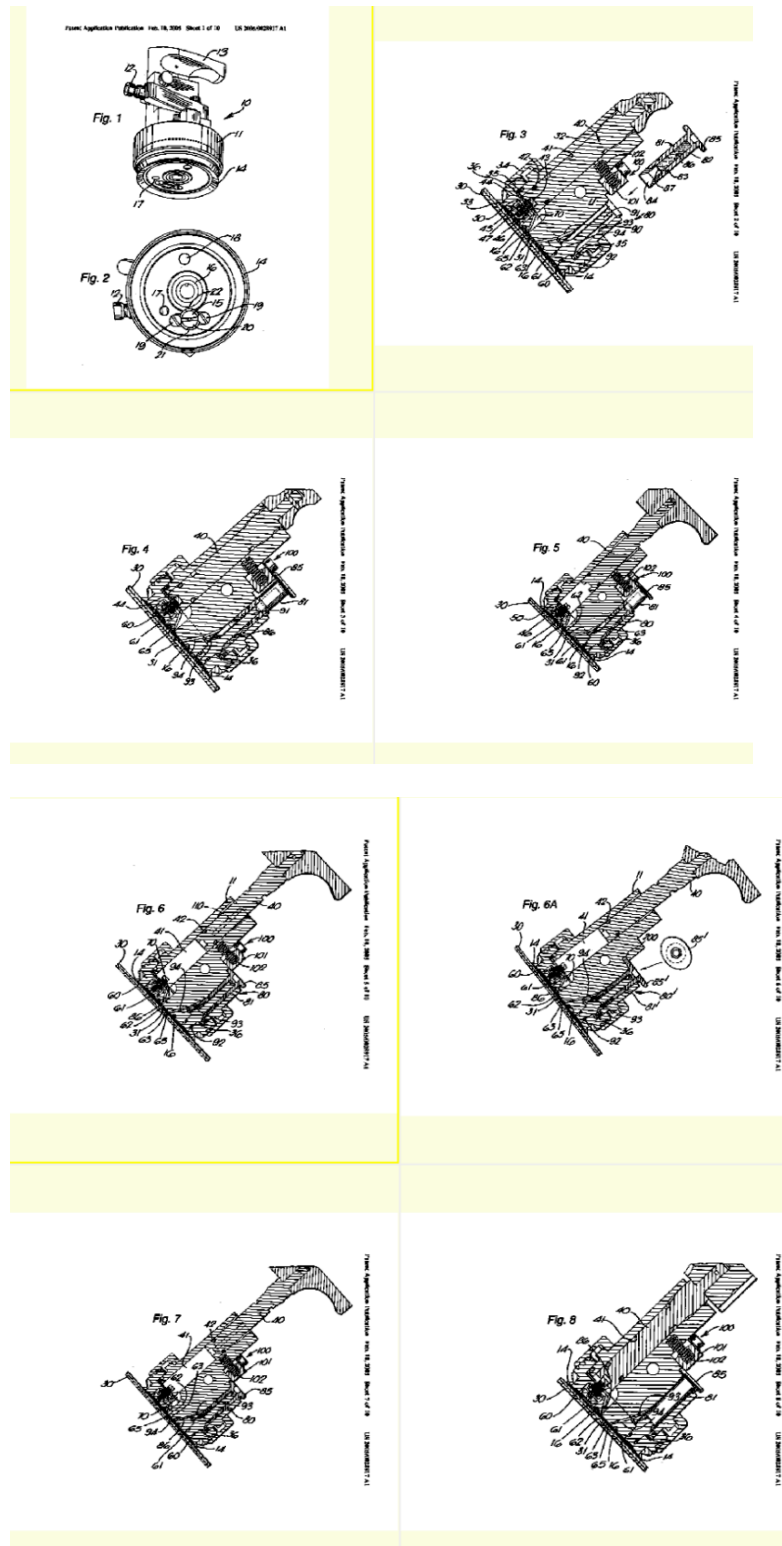


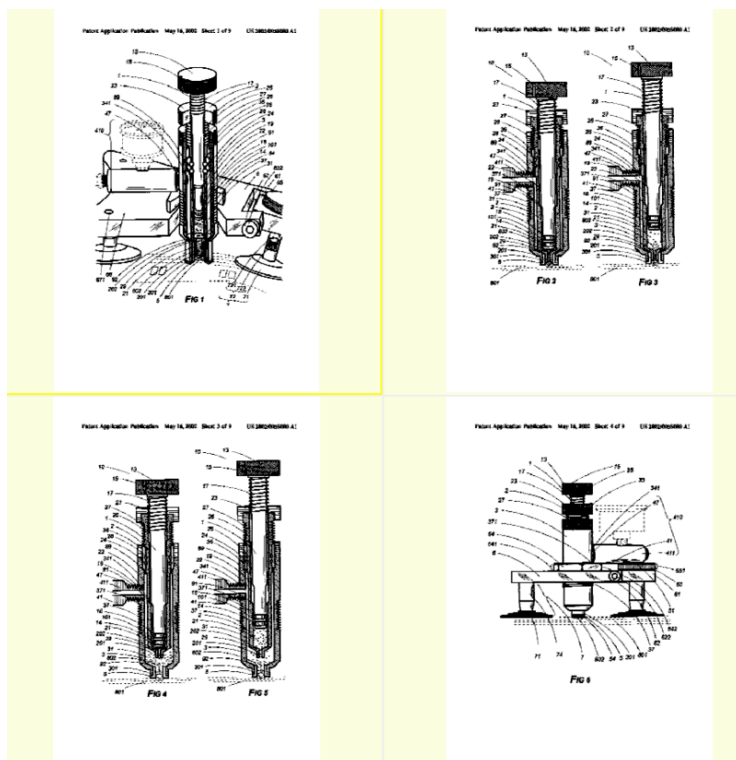
Patent Application Publication Apr. 26, 2007 Sheet 3 of 4 US 2006/0106462 A1



Patent Application Publication Apr. 26, 2007 Sheet 4 of 4 US 2006/0106462 A1







## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

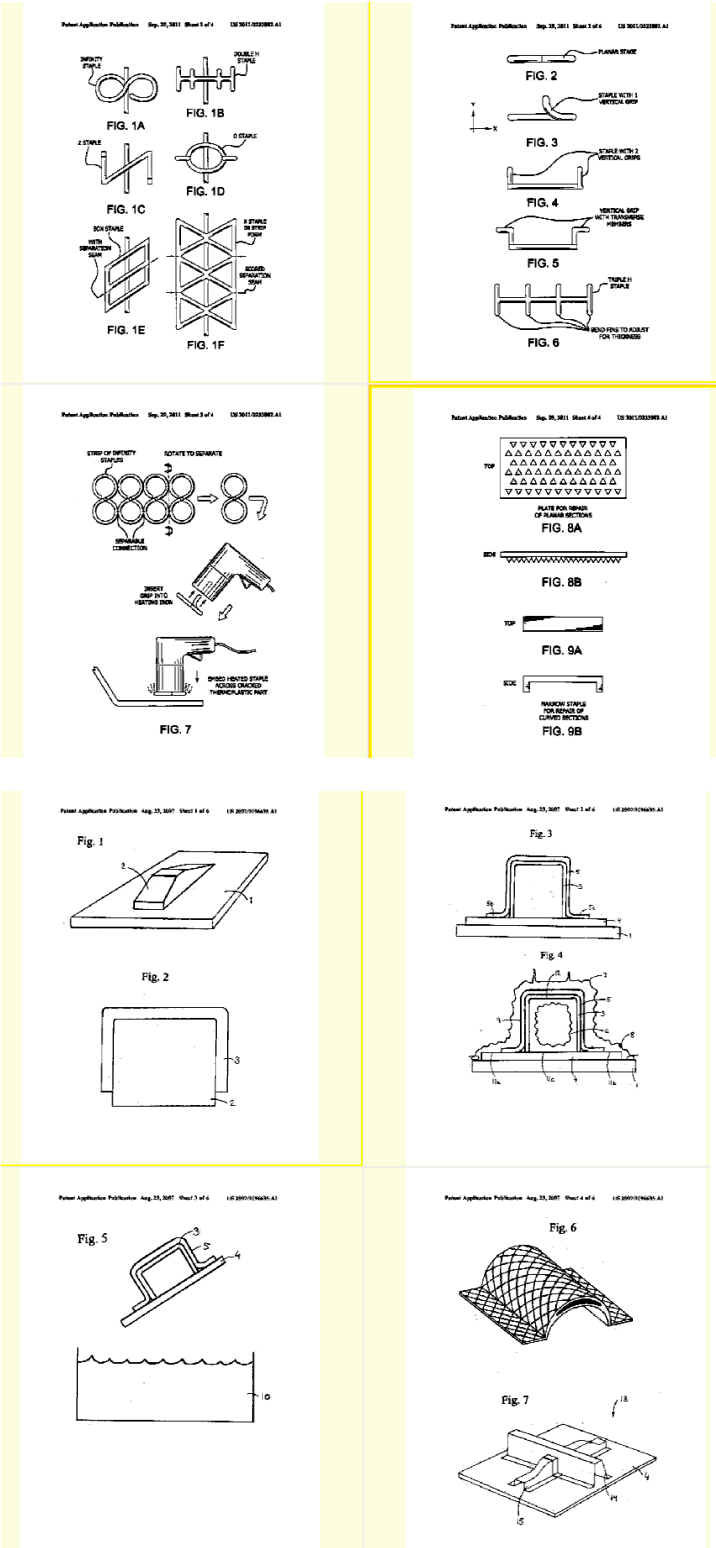
Layered products essentially comprising sheet glass; repairing layered products containing glass and synthetic resin layers (e.g. windshields)

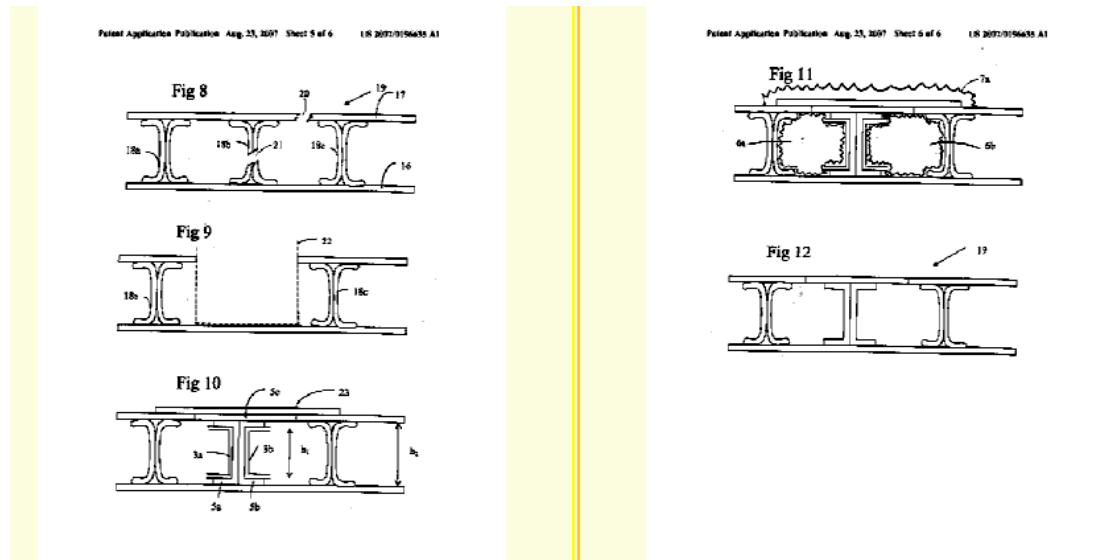
[B32B 17/10963](https://patents.google.com/patent/B32B17/10963)

**B29C 73/04**  
using preformed elements

**Definition statement**

*This place covers:*



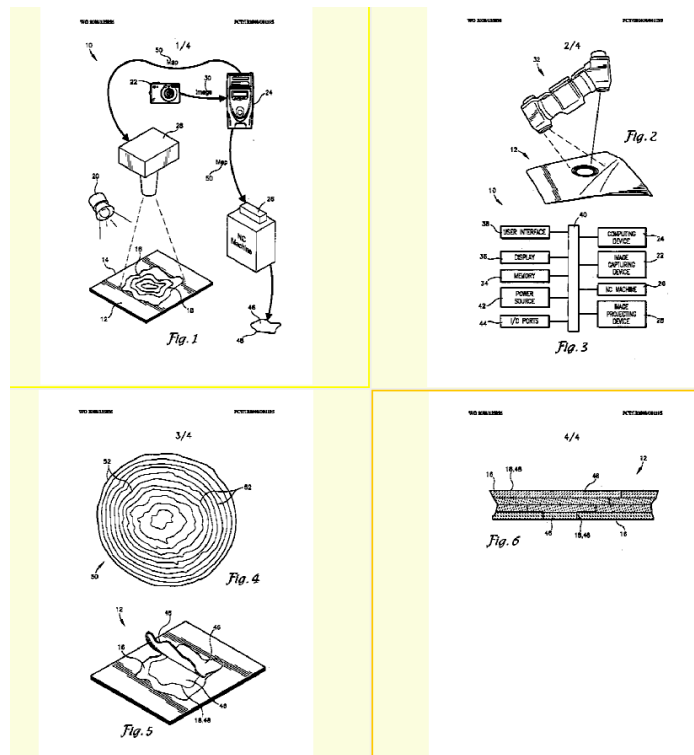


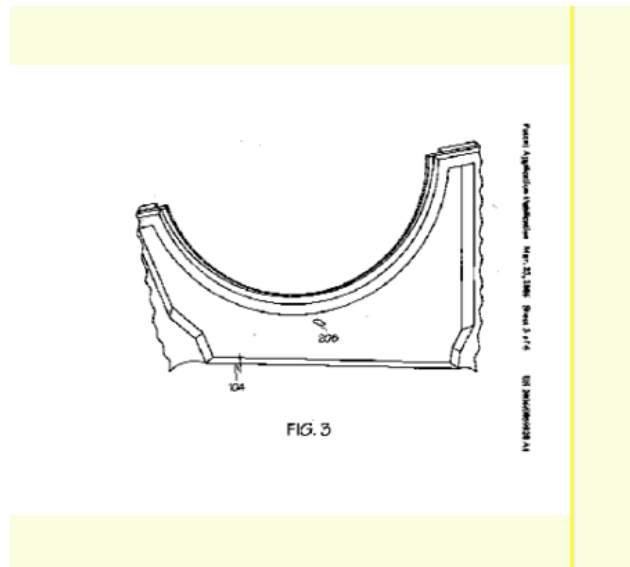
## B29C 73/06

using plugs sealing in the hole

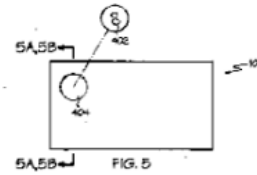
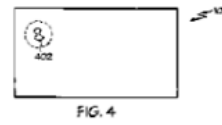
### Definition statement

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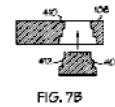
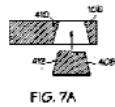
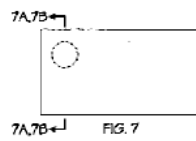
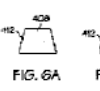
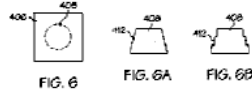




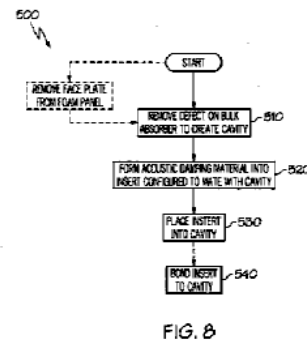
Patent Application Publication Mar. 23, 2006 Sheet 4 of 6 US 2004/0094028 A1



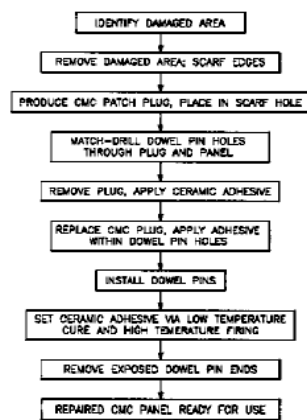
Patent Application Publication Mar. 23, 2006 Sheet 5 of 6 US 2004/0094028 A1



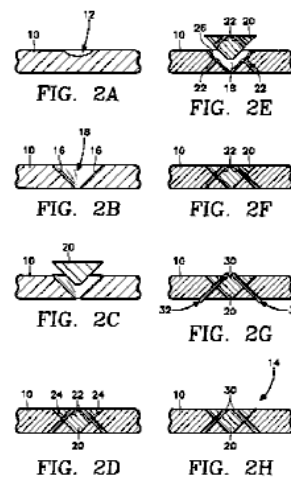
Patent Application Publication Mar. 23, 2006 Sheet 6 of 6 US 2004/0094028 A1



U.S. Patent Jul. 27, 1999 Sheet 1 of 2 5,928,448

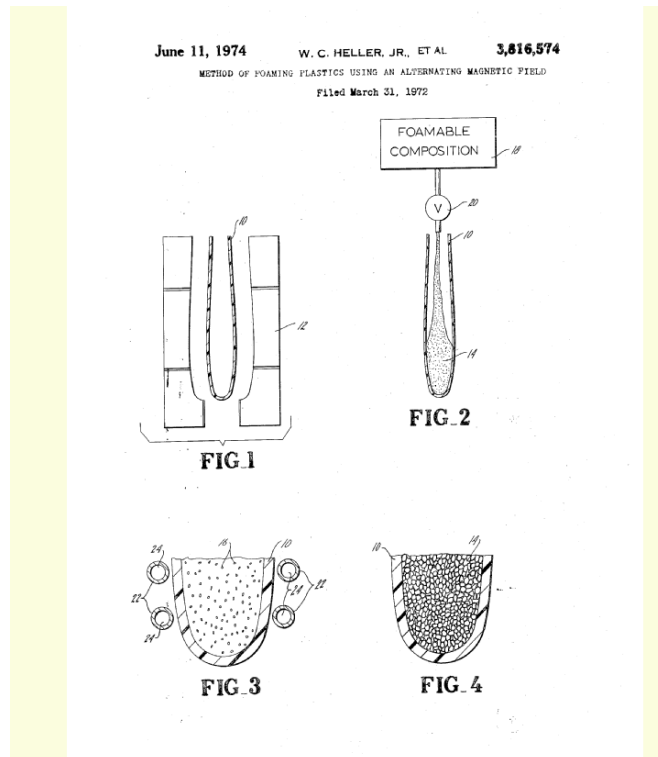


U.S. Patent Jul. 27, 1999 Sheet 2 of 2 5,928,448







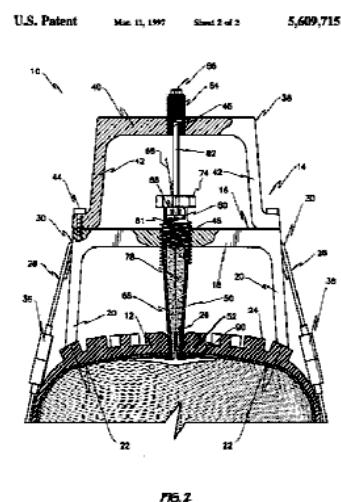
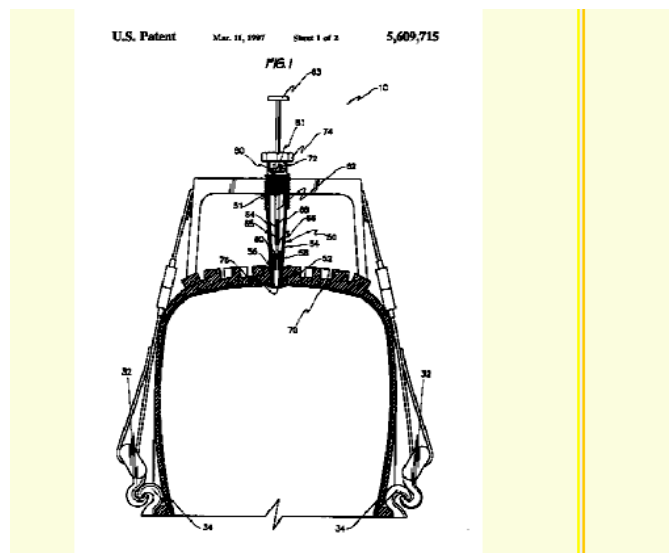


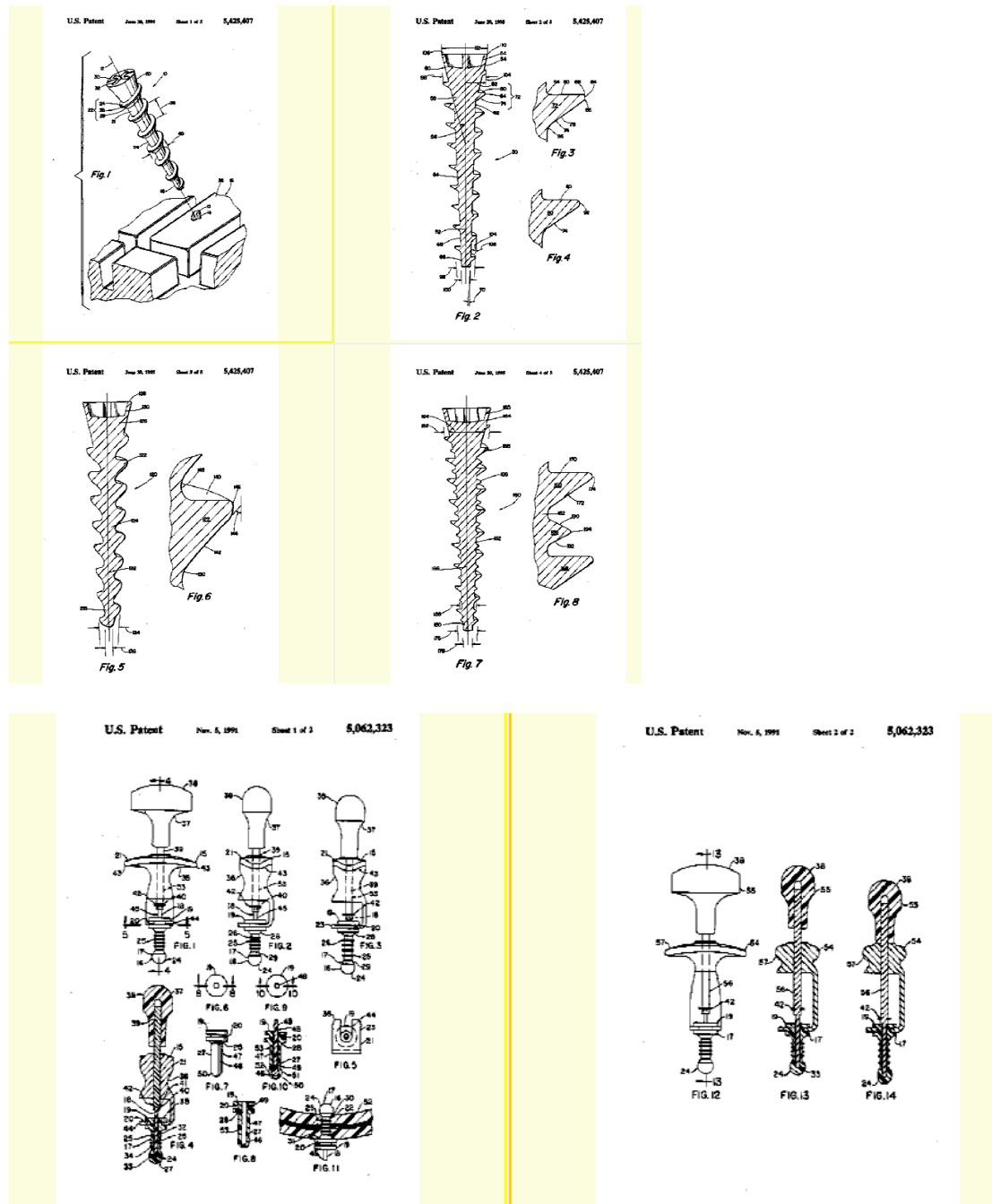
## B29C 73/066

{by mechanical means provided on the plug}

### Definition statement

This place covers:



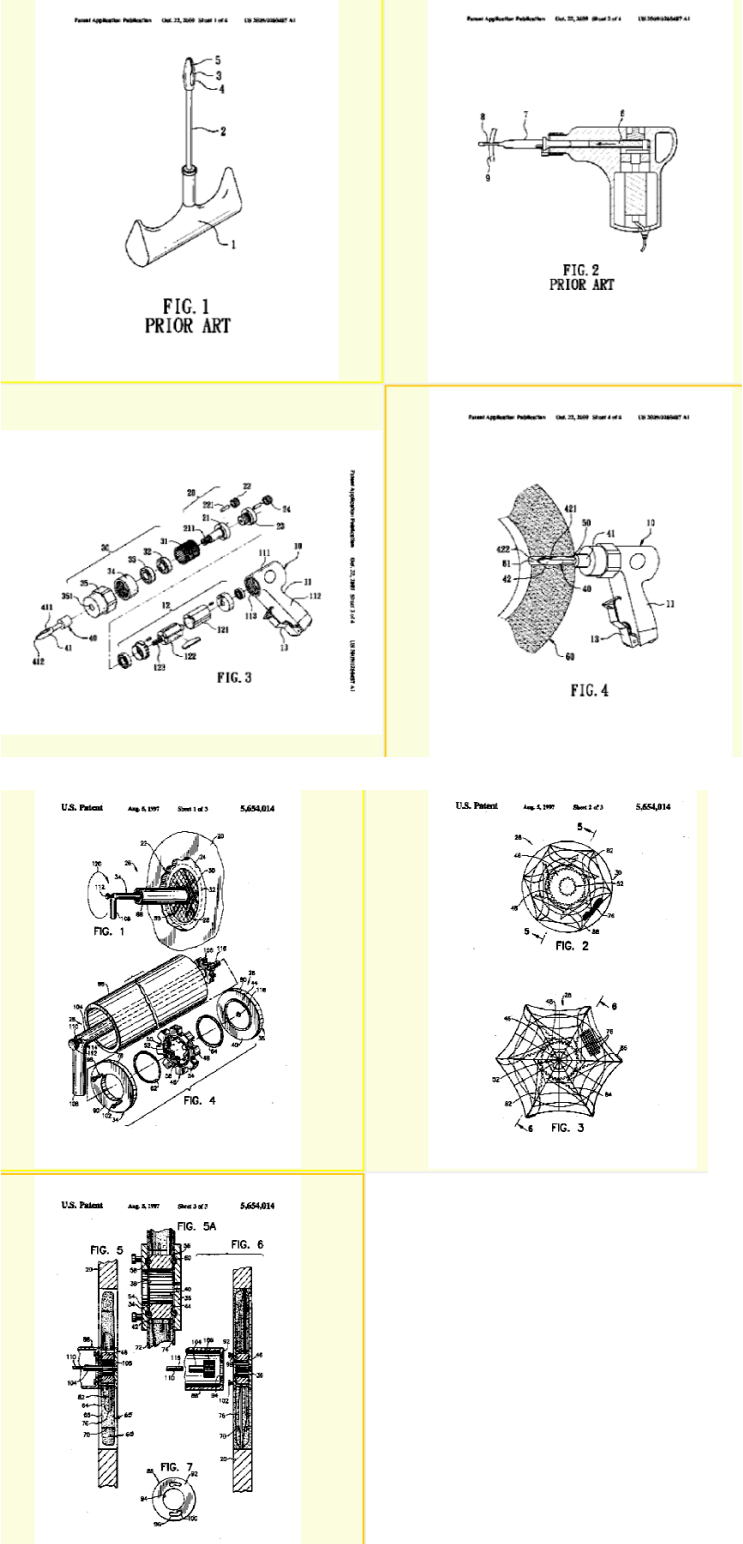


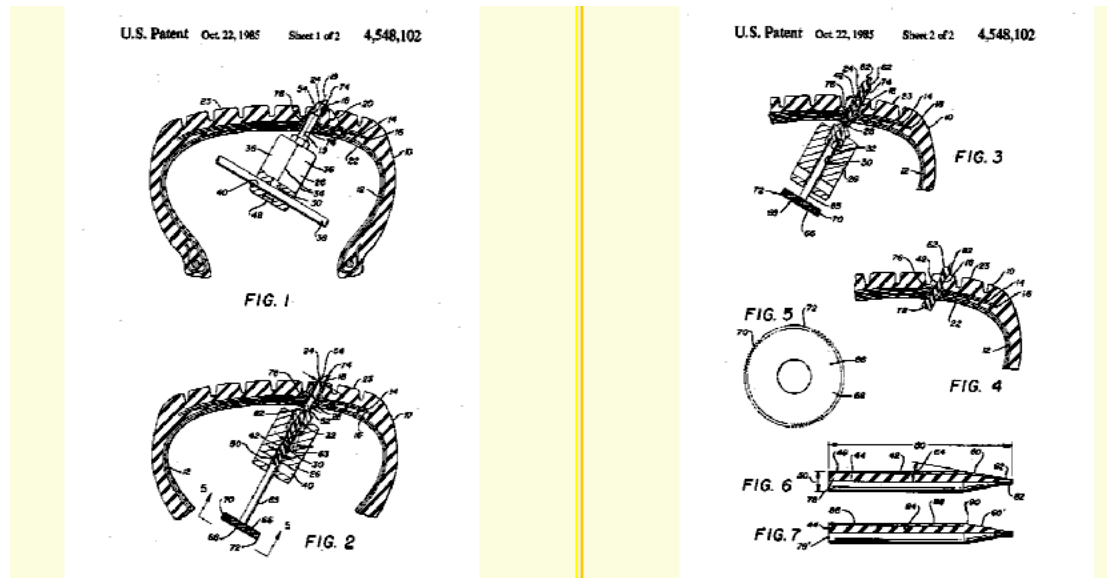
B29C 73/08

Apparatus therefor, e.g. for inserting

Definition statement

This place covers:



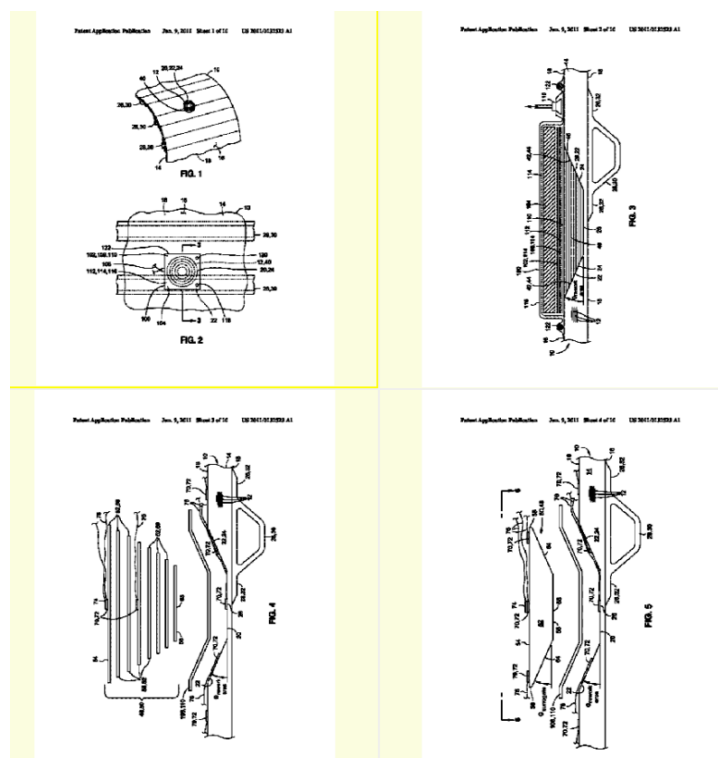


## B29C 73/10

using patches sealing on the surface of the article ([B29C 73/14](#) takes precedence)

### Definition statement

*This place covers:*



Patent Application Publication Pub. No. 2019/0100000 A1

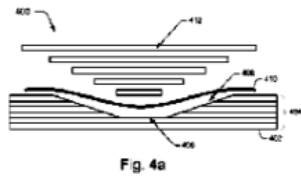


Fig. 4a

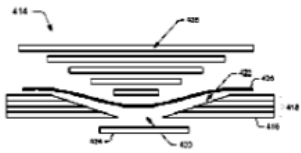


Fig. 4b

Patent Application Publication Pub. No. 2019/0100000 A1

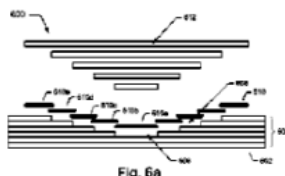


Fig. 6a

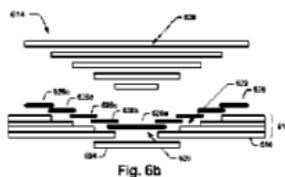


Fig. 6b

Patent Application Publication Pub. No. 2019/0100000 A1

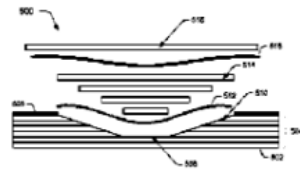


Fig. 5a

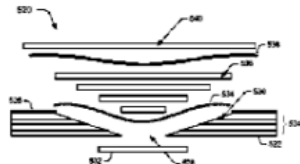


Fig. 5b

Patent Application Publication Pub. No. 2019/0100000 A1

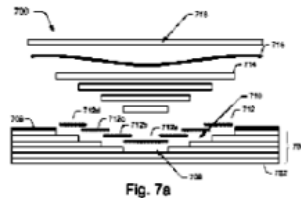


Fig. 7a

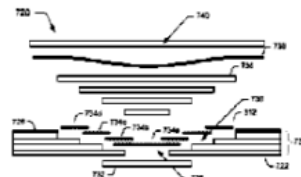
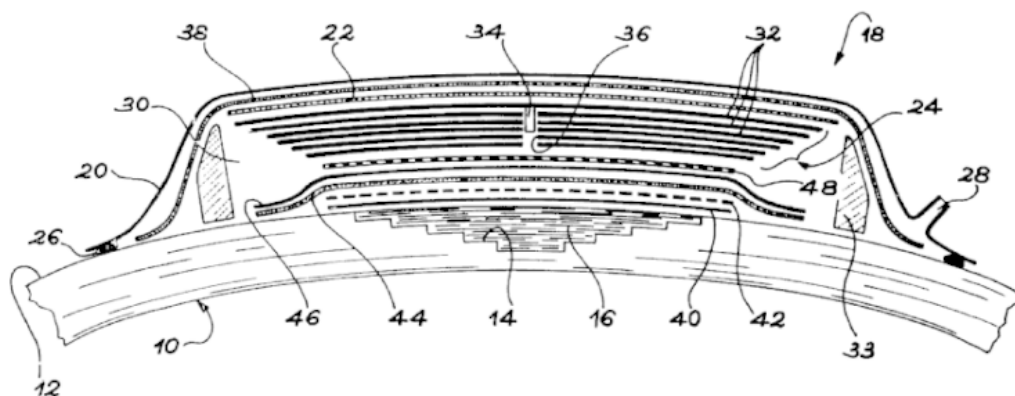
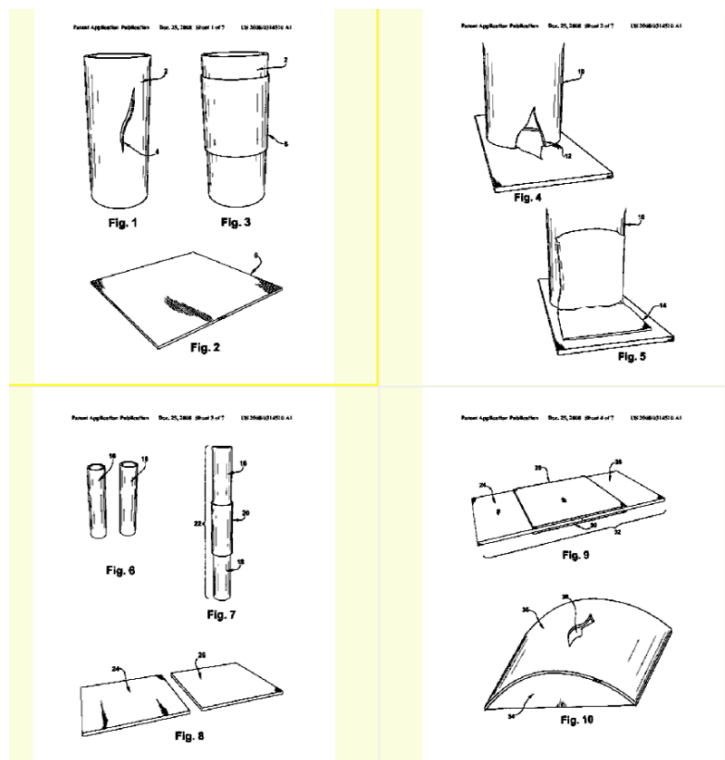


Fig. 7b



U.S. Patent

Mar. 27, 2001

US 6,206,067 B1

## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Designing, manufacturing, assembling, cleaning, maintaining, or repairing aircraft	<a href="#">B64F 5/40</a>
Working measures on existing buildings; repairing, e.g. filling cracks	<a href="#">E04G 23/02</a>

Working measures on existing buildings; repairing, e.g. filling cracks; arrangements for filling cracks or cavities in building constructions	<a href="#">E04G 23/0203</a>
Repairing or joining pipes on or under water	<a href="#">F16L 1/26</a>
Devices for recovering leaks in pipes or hoses	<a href="#">F16L 55/16</a>
Devices for recovering leaks in pipes or hoses; from outside the pipe	<a href="#">F16L 55/168</a>
Devices for recovering leaks in pipes or hoses; from outside the pipe; by means of a parch which is fixed on the wall of the pipe by means of an adhesive, a weld or the like	<a href="#">F16L 55/1683</a>

## B29C 73/105

{provided with a centering element}

### Definition statement

*This place covers:*

FIG. 1

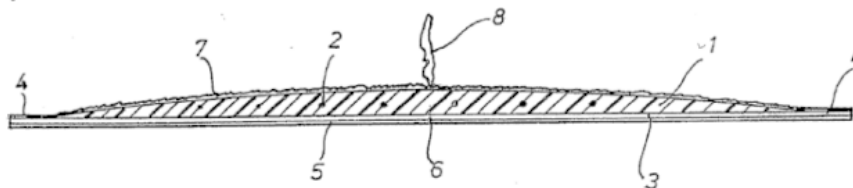
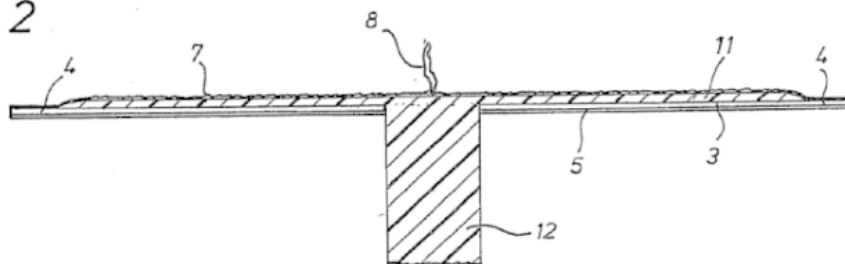


FIG. 2

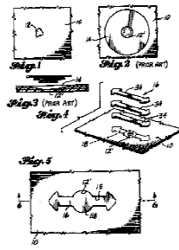


Patent Application Publication

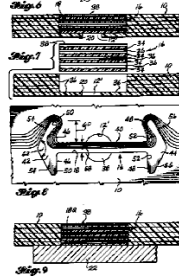
Jun. 19, 2008

US 2008/0142137 A1

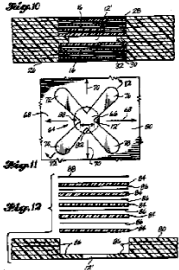
U.S. Patent Apr. 17, 1990 Sheet 1 of 5 4,916,880



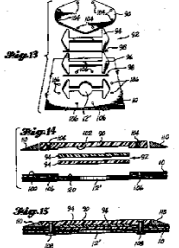
U.S. Patent Apr. 17, 1990 Sheet 2 of 5 4,916,880



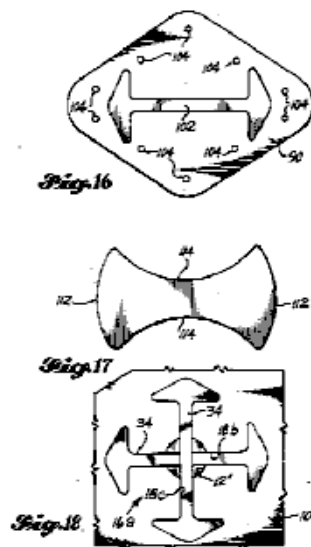
U.S. Patent Apr. 17, 1990 Sheet 3 of 5 4,916,880



U.S. Patent Apr. 17, 1990 Sheet 4 of 5 4,916,880



U.S. Patent Apr. 17, 1990 Sheet 5 of 5 4,916,880



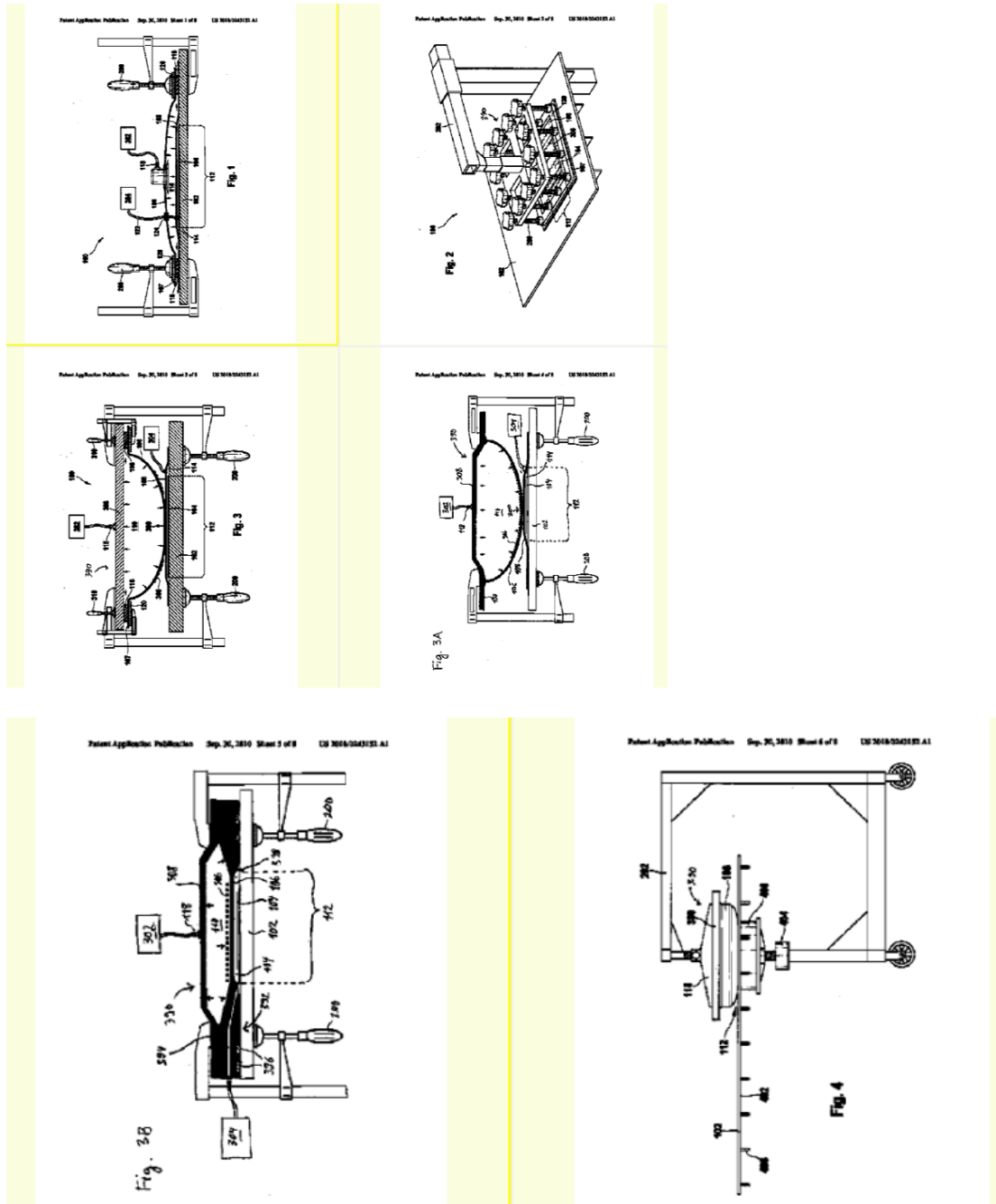


**B29C 73/12**

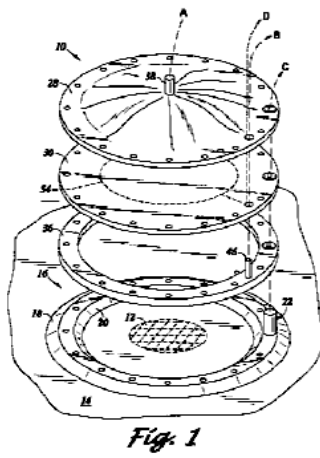
Apparatus therefor, e.g. for applying ([B29C 73/30](#) takes precedence)

**Definition statement**

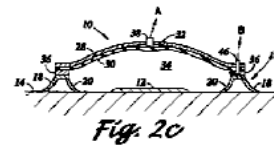
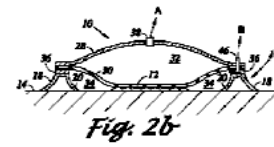
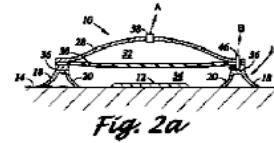
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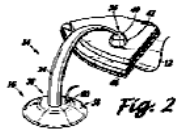
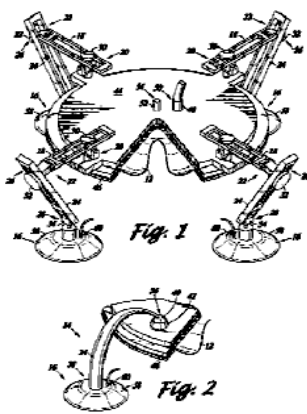
U.S. Patent Aug. 26, 2003 Sheet 1 of 3 US 6,435,242 B1



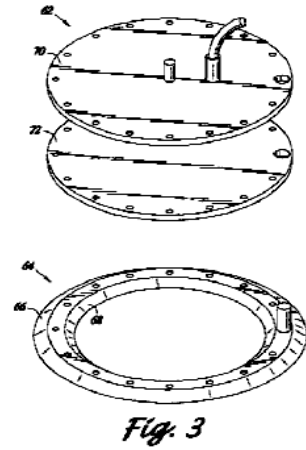
U.S. Patent Aug. 26, 2003 Sheet 2 of 3 US 6,435,242 B1



U.S. Patent Nov. 2, 1999 Sheet 1 of 2 5,975,183



U.S. Patent Nov. 2, 1999 Sheet 2 of 2 5,975,183

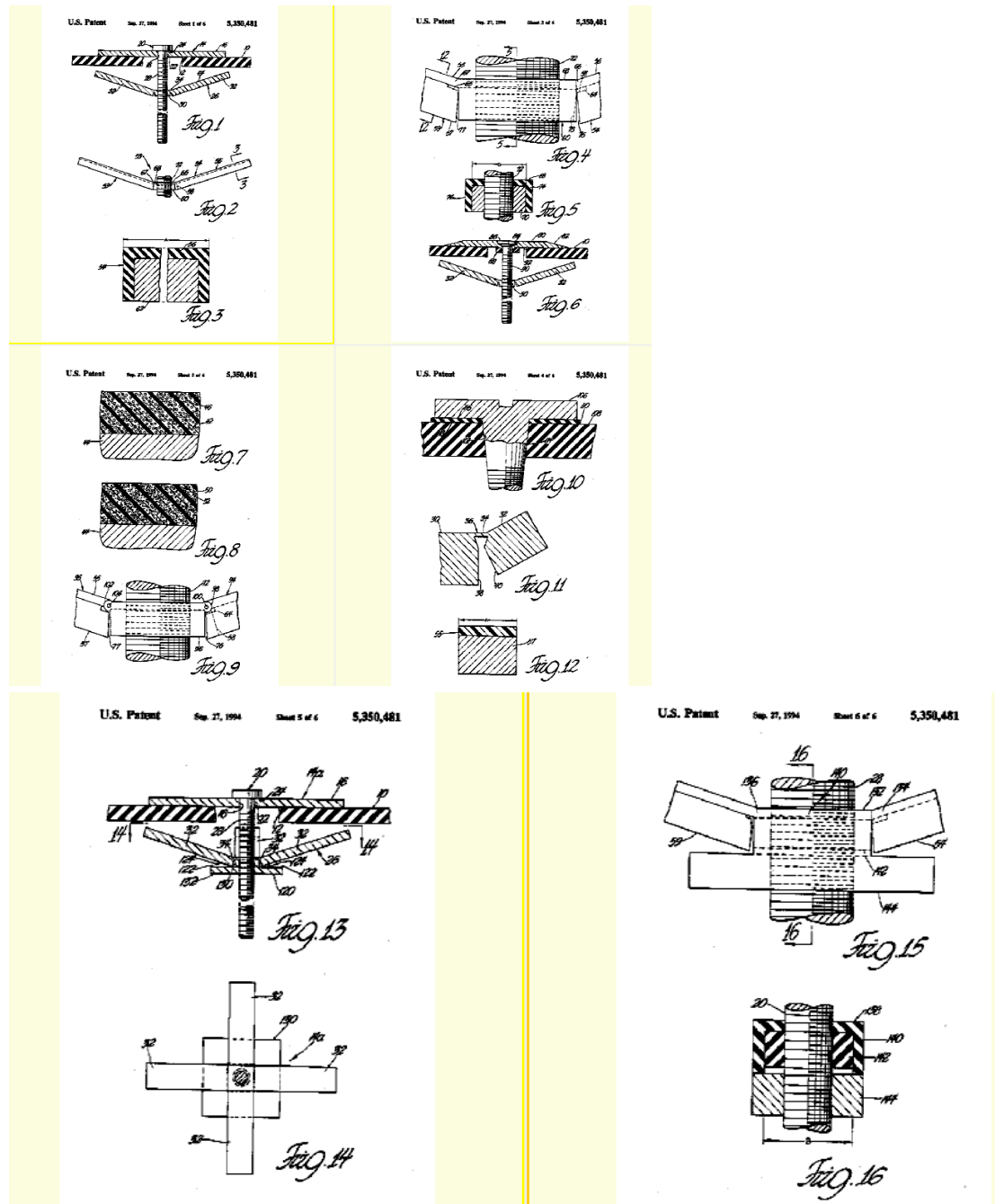


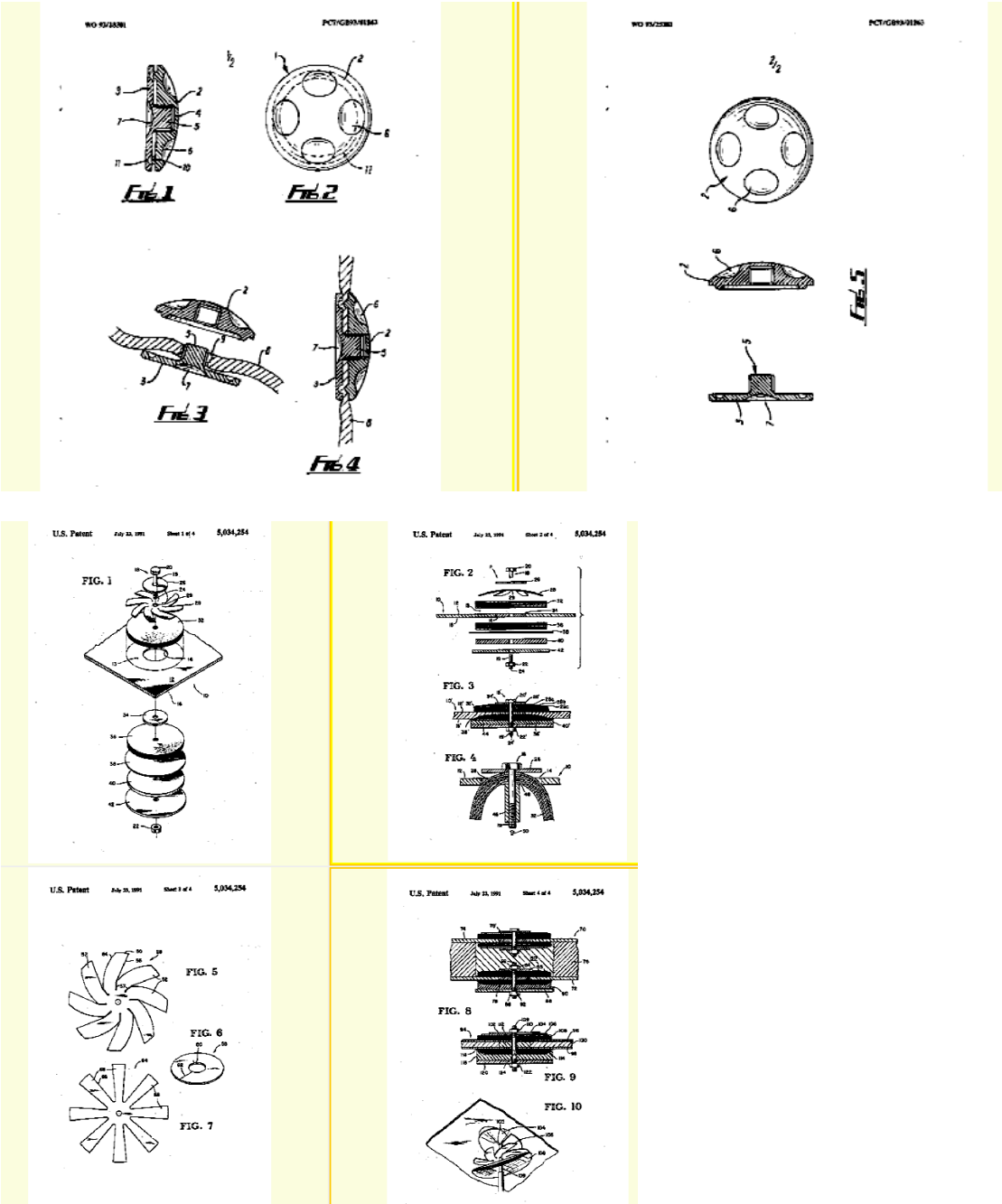
**B29C 73/14**

using elements composed of two parts joined together after having been placed one on each side of the article

**Definition statement**

*This place covers:*





B29C 73/16

Auto-repairing or self-sealing arrangements or agents {(incorporating auto-repairing or self-sealing arrangements or agents on or into tyres [B29D 30/0685](#))}

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Producing pneumatic or solid tyres; retreading	<a href="#">B29D 30/54</a>
Tyres characterised by the chemical composition or the physical arrangement or mixture of the composition; composition of the inner liner	<a href="#">B60C 1/0008</a>

Inflatable pneumatic tyres; without separate inflatable inserts; with impervious liner or coating on the inner wall of the tyre	<a href="#">B60C 5/14</a>
Linings therefor acting locally	<a href="#">B60C 5/142</a>
Tyres parts or constructions; puncture preventing arrangements	<a href="#">B60C 19/12</a>
Tyres parts or constructions; puncture preventing arrangements; disposed between the inner chamber and the tyre	<a href="#">B60C 19/122</a>
Tyres parts or constructions; puncture preventing arrangements; disposed removable on the tyre	<a href="#">B60C 19/125</a>

**B29C 73/163****{Sealing compositions or agents, e.g. combined with propellant agents}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

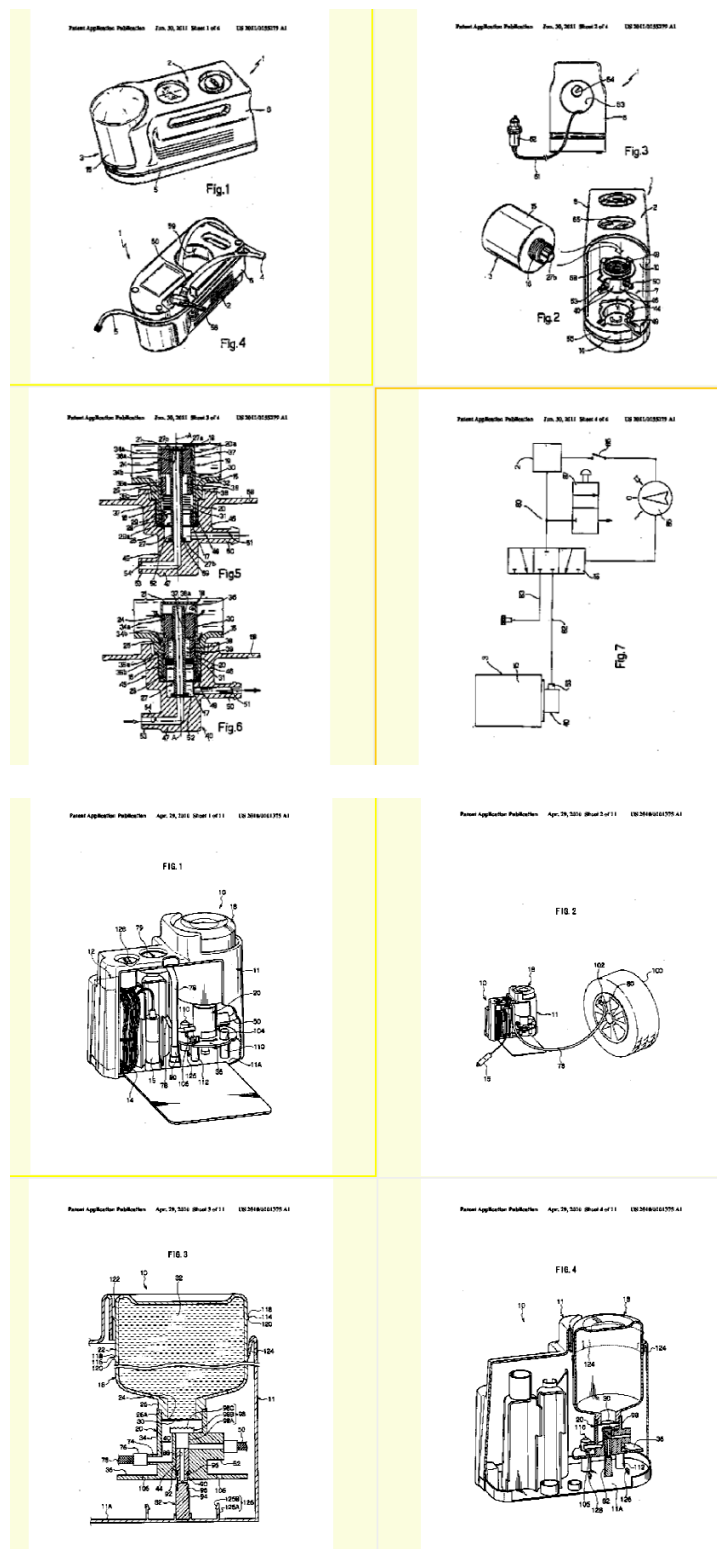
Tyres parts or constructions; puncture preventing arrangements	<a href="#">B60C 19/12</a>
Tyres parts or constructions; puncture preventing arrangements; disposed between the inner chamber and the tyre	<a href="#">B60C 19/122</a>
Tyres parts or constructions; puncture preventing arrangements; disposed removable on the tyre	<a href="#">B60C 19/125</a>
Materials for stopping leaks, e.g. in radiators, in tanks	<a href="#">C09K 3/12</a>

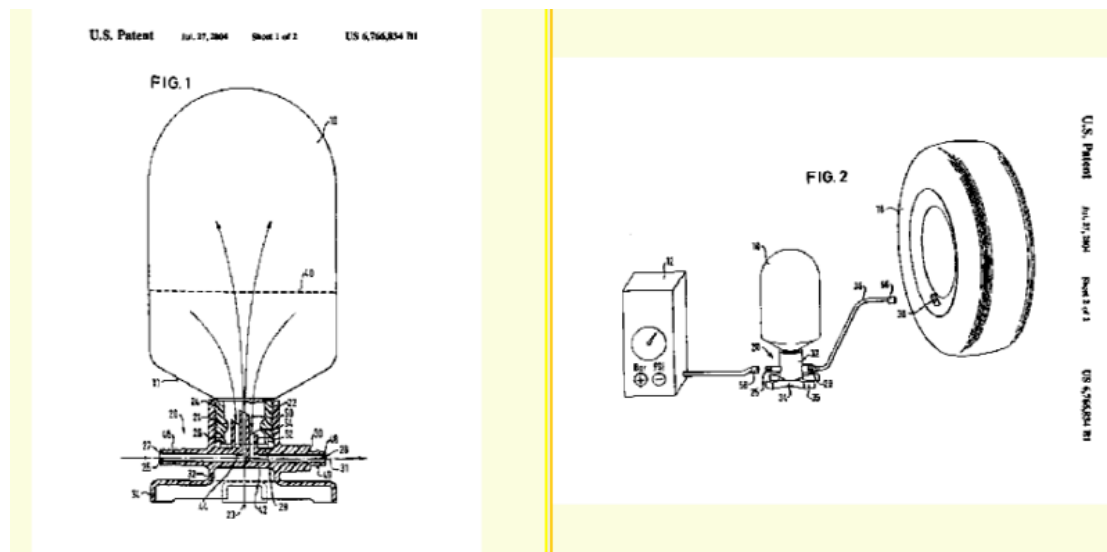
**B29C 73/166**

{Devices or methods for introducing sealing compositions into articles}

**Definition statement**

*This place covers:*





## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

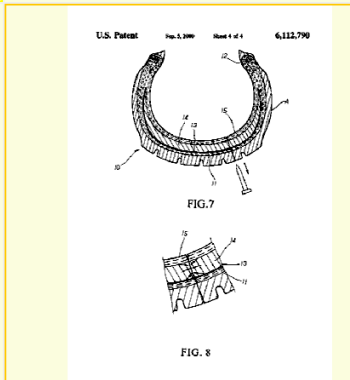
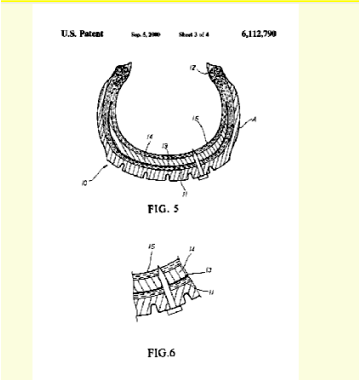
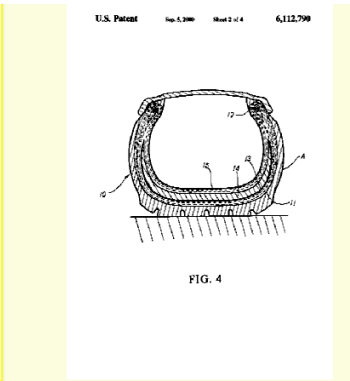
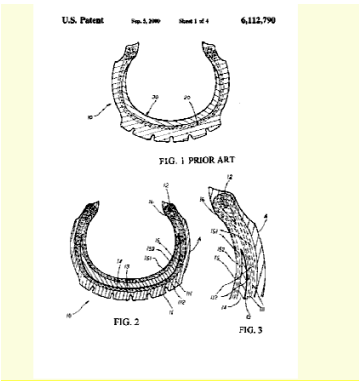
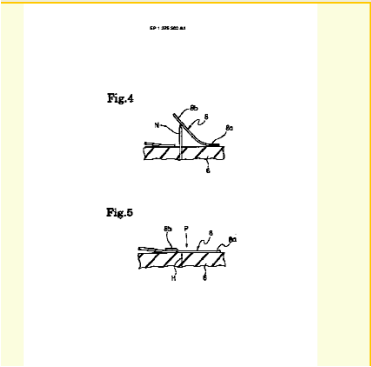
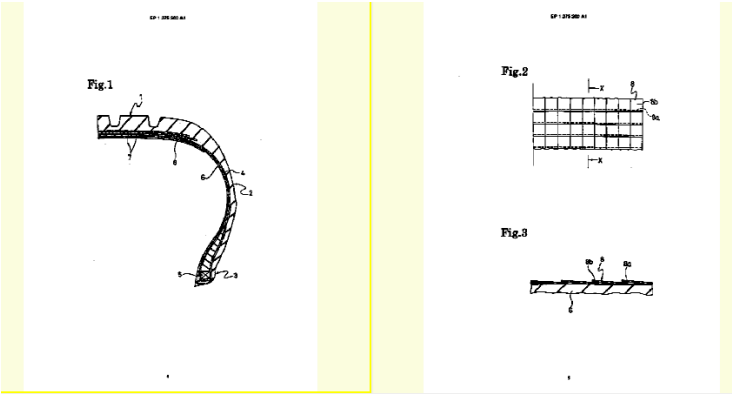
Arrangements for tyre-inflating valves to tyres or rims; accessories for tyre-inflating valves; for filling a tyre with, or removing from a tyre, particular materials, e.g. liquids	<a href="#">B60C 29/062</a>
Servicing, maintaining, repairing or refitting of vehicles; supplying air for tyre inflation	<a href="#">B60S 5/04</a>
Characterised by the inflation control means or the drive of the air pressure system	<a href="#">B60S 5/043</a>
Using electrical or electronical means	<a href="#">B60S 5/046</a>

B29C 73/18

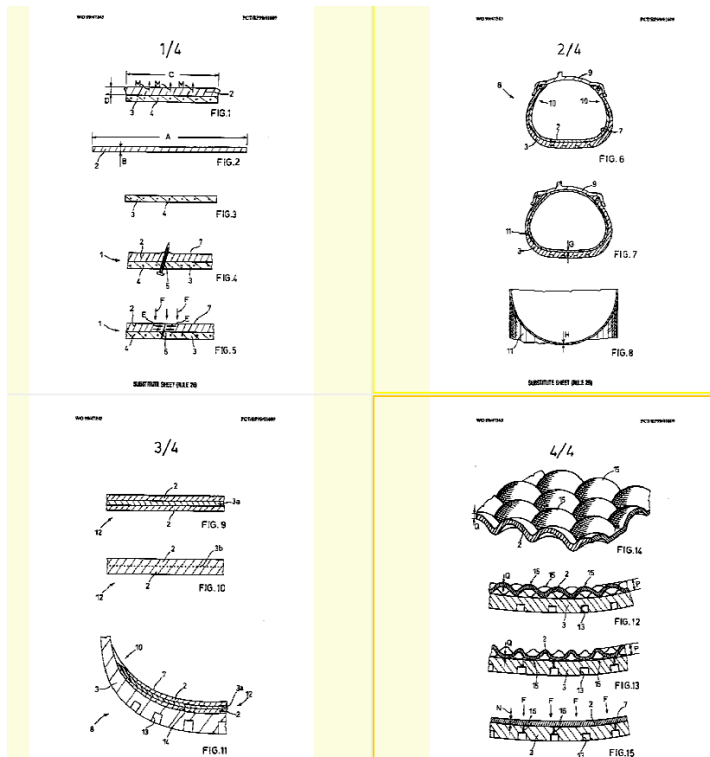
the article material itself being self-sealing, e.g. by compression

Definition statement

This place covers:





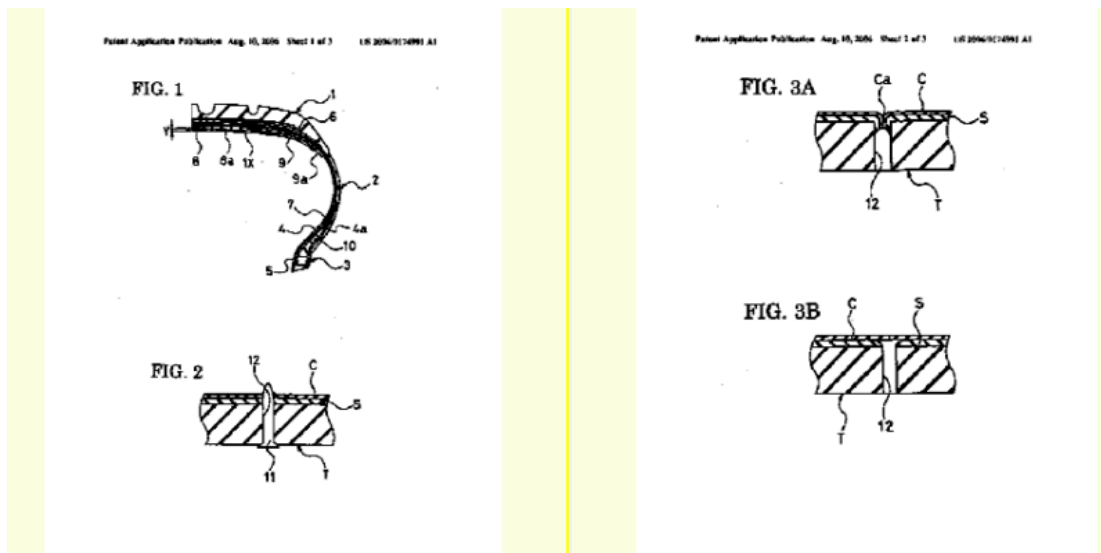


## B29C 73/20

the article material only consisting in part of a deformable sealing material

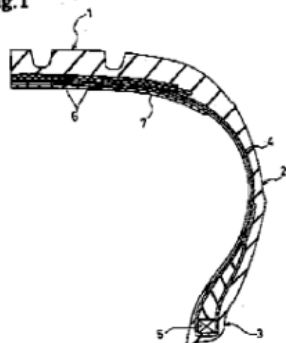
### Definition statement

*This place covers:*



Patent Application Publication Mar. 16, 2006 Sheet 1 of 2 US 2006/0062461 A1

Fig.1



Patent Application Publication Mar. 16, 2006 Sheet 2 of 2 US 2006/0062461 A1

Fig.2

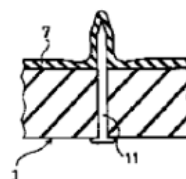
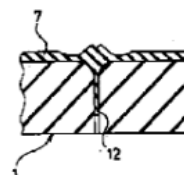
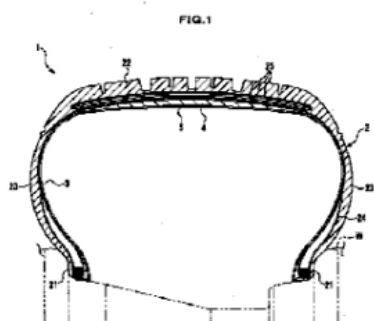
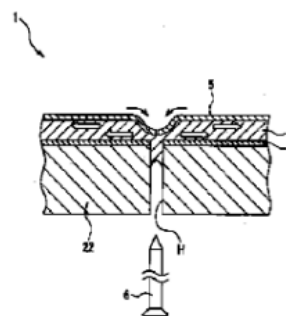


Fig.3

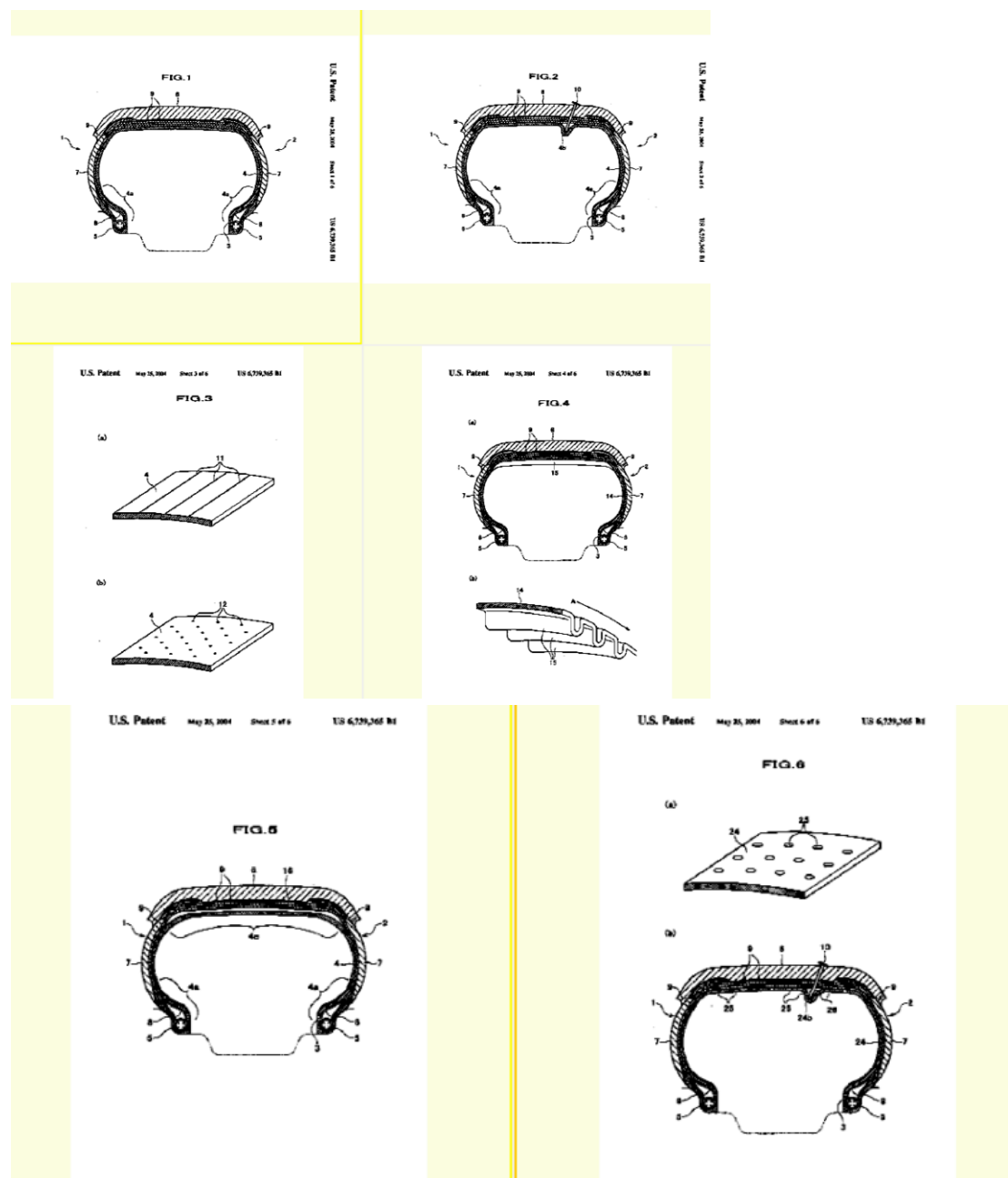


Patent Application Publication Aug. 7, 2004 Sheet 3 of 4 DE 10049140A6 A1

FIG.2



Patent Application Publication Aug. 7, 2004 Sheet 3 of 4 DE 10049140A6 A1

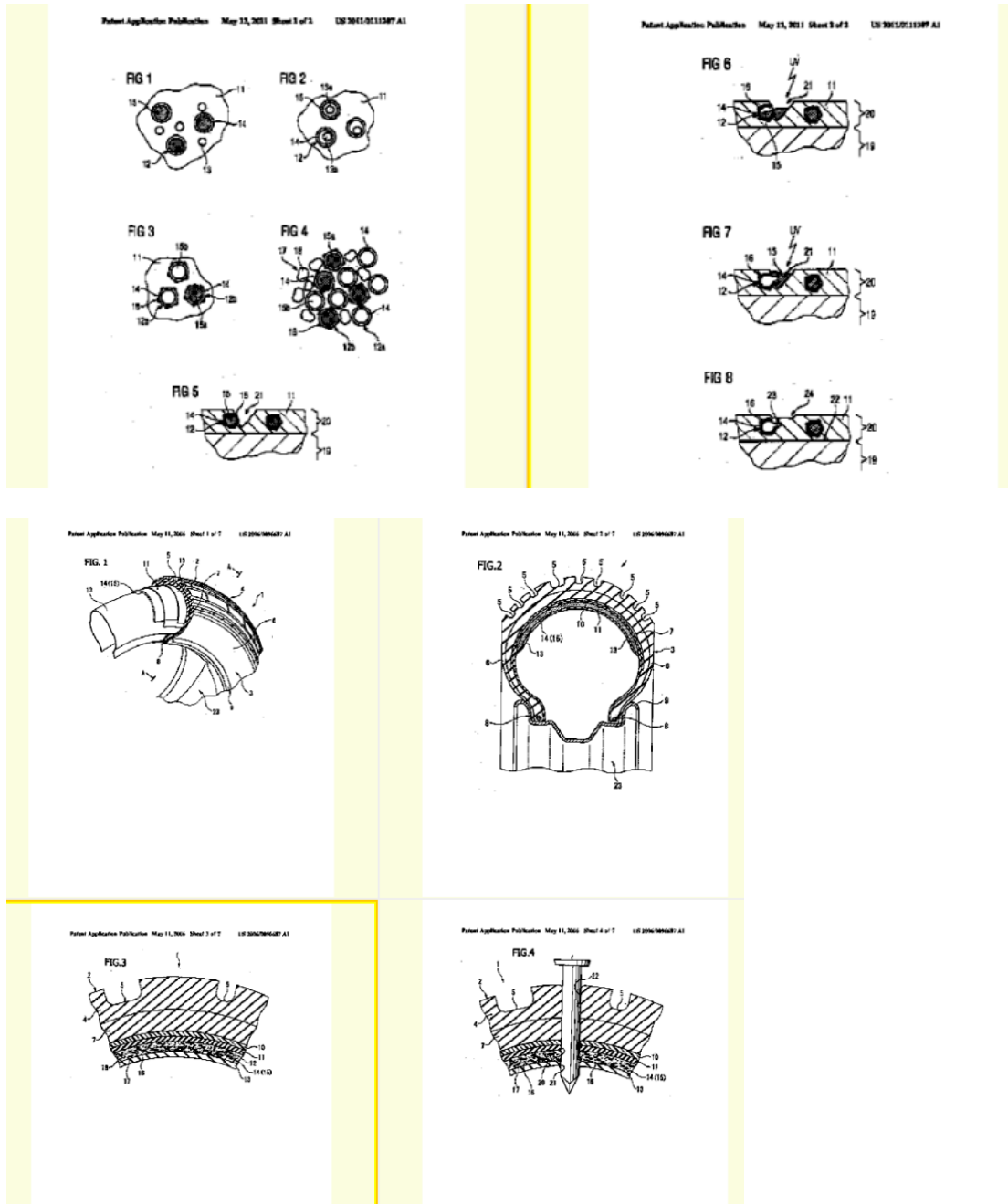


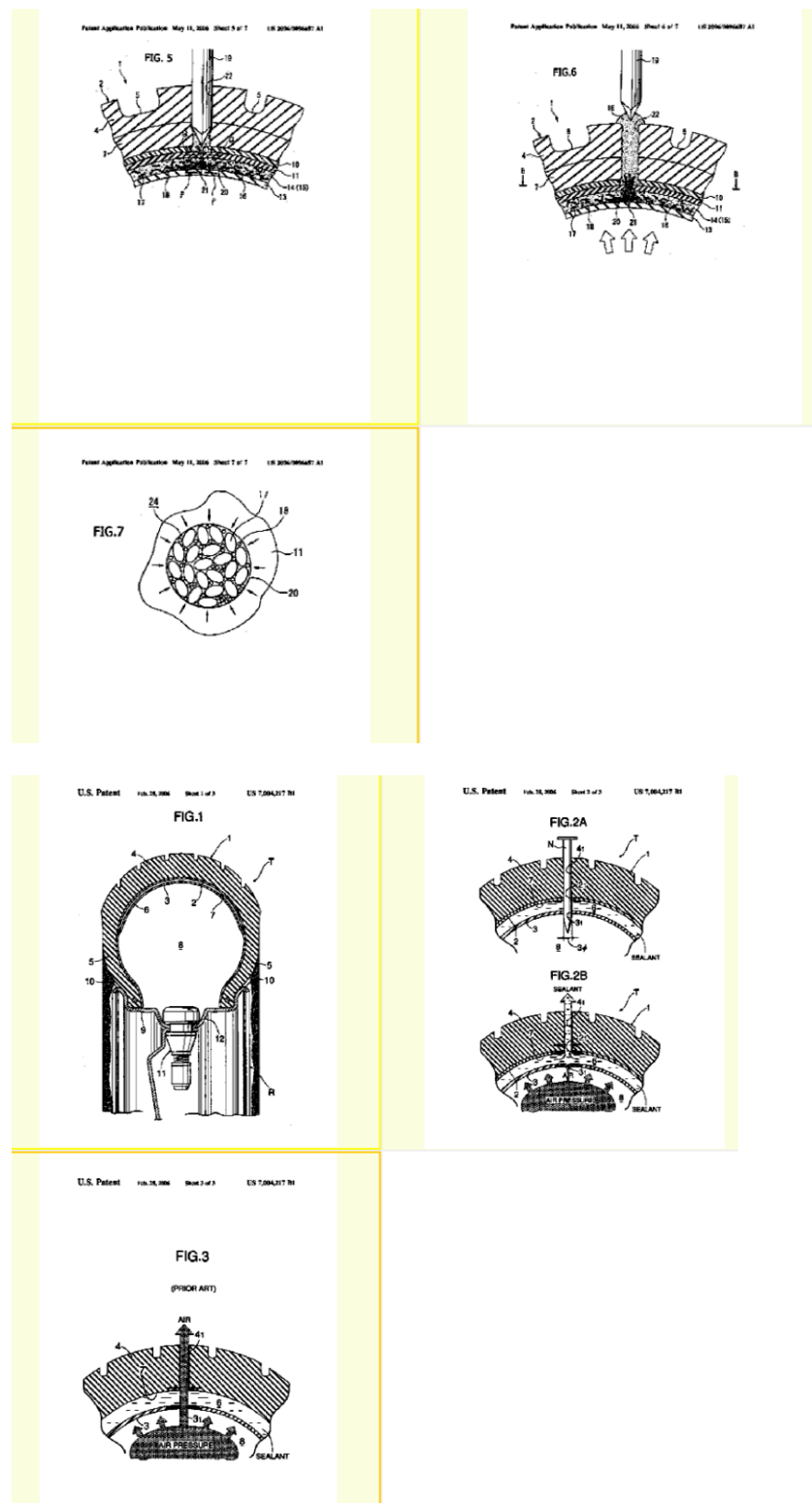
**B29C 73/22**

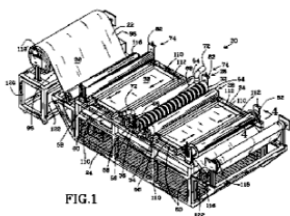
the article containing elements including a sealing composition, e.g. powder being liberated when the article is damaged

**Definition statement**

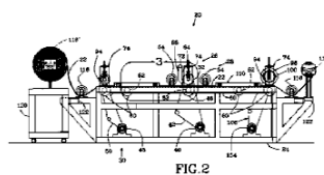
*This place covers:*





**B29C 73/26****for mechanical pretreatment****Definition statement***This place covers:*

U.S. Patent  
Apr. 1, 1980  
Sheet 1 of 4  
10,654,011 B1



U.S. Patent  
Apr. 1, 1980  
Sheet 1 of 4  
10,654,011 B1

U.S. Patent  
Apr. 1, 1980  
Sheet 3 of 4  
10,654,011 B1

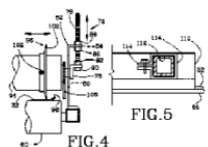
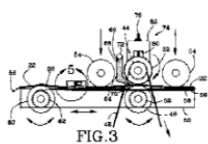
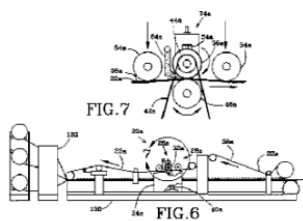
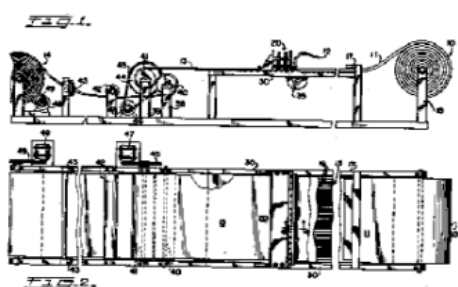


FIG. 5

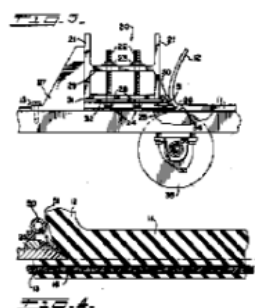


U.S. Patent  
Apr. 1, 1980  
Sheet 4 of 4  
10,654,011 B1



U.S. Patent  
Mar. 13, 1979  
Sheet 1 of 2  
4,143,565

U.S. Patent  
Mar. 13, 1979  
Sheet 2 of 2  
4,143,565

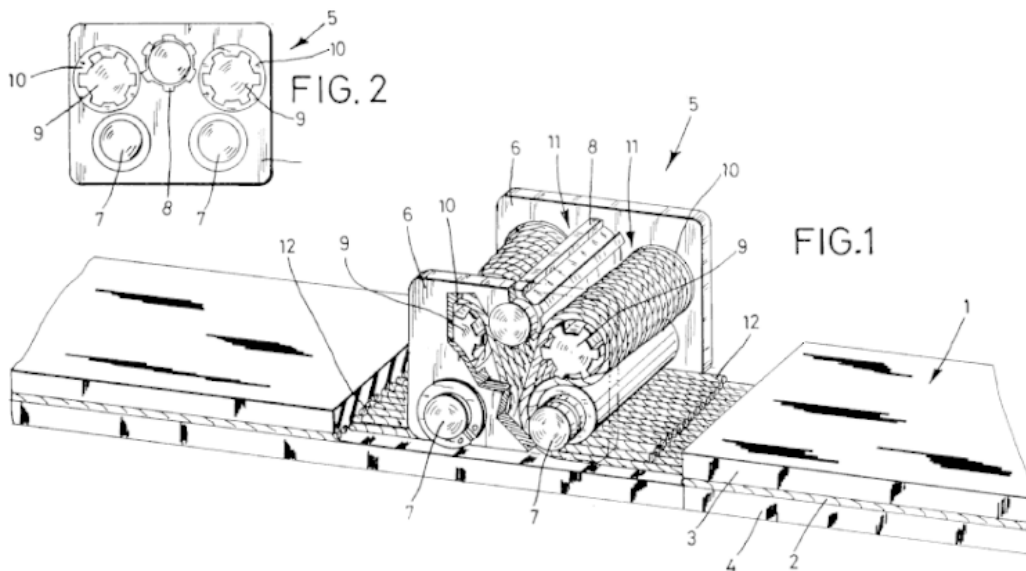


**B29C 73/28**

**for clamping and stretching flexible material, e.g. inner tubes**

### Definition statement

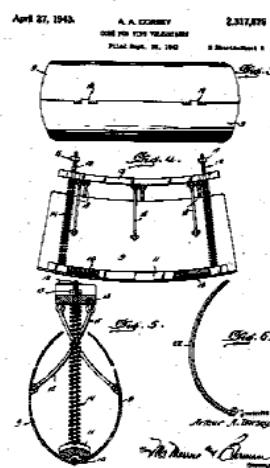
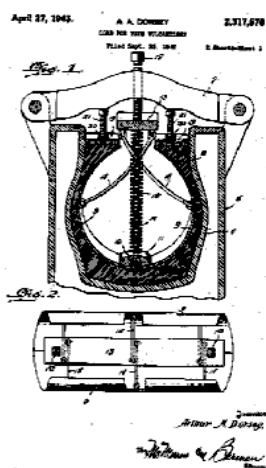
*This place covers:*



ZEICHNUNGEN SEITE 1

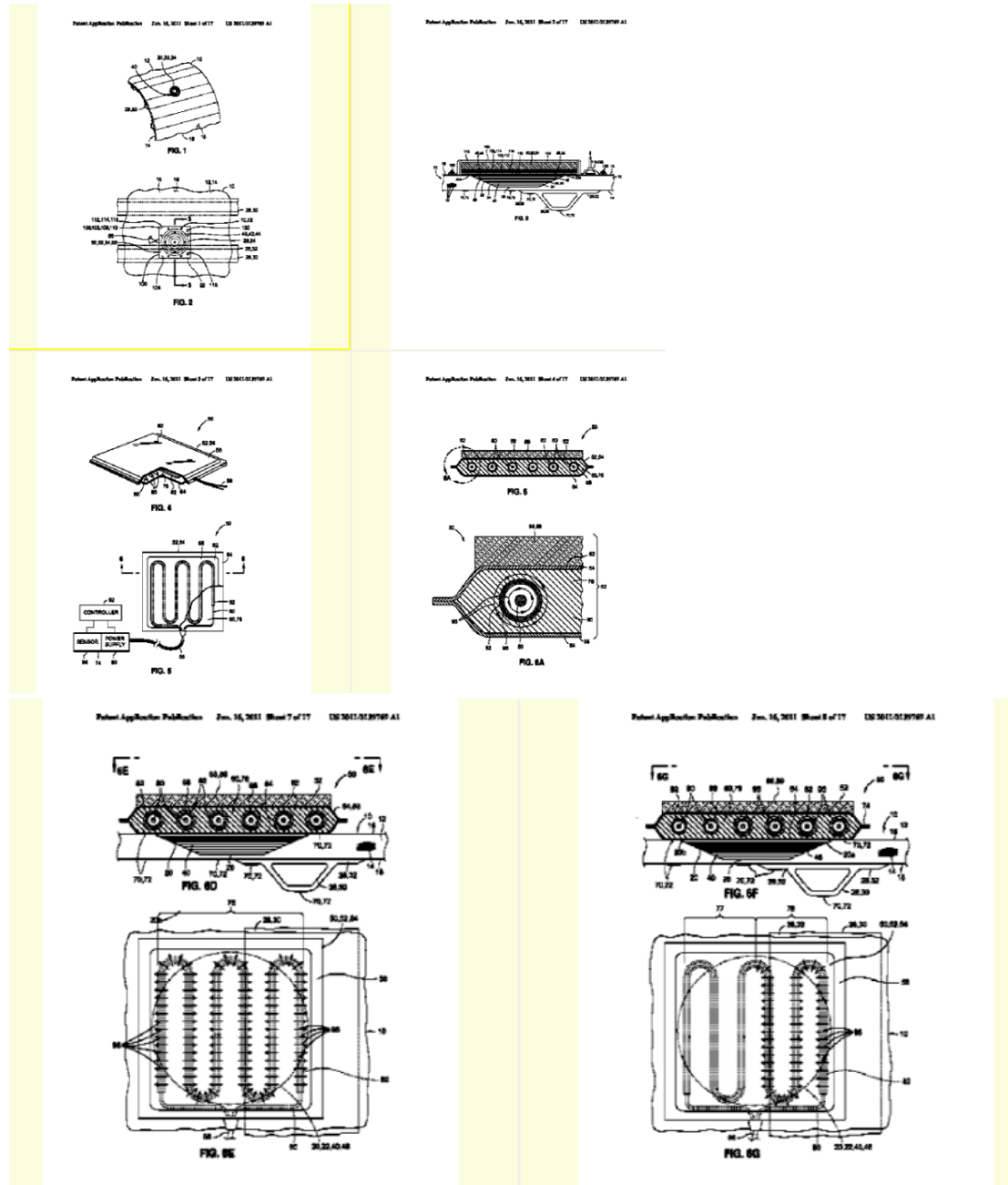
Nummer: DE 41 30 273 A1  
Int. Cl. 5: B 28 D 29/00  
Offenlegungstag: 25. März 1993

206 0812/36



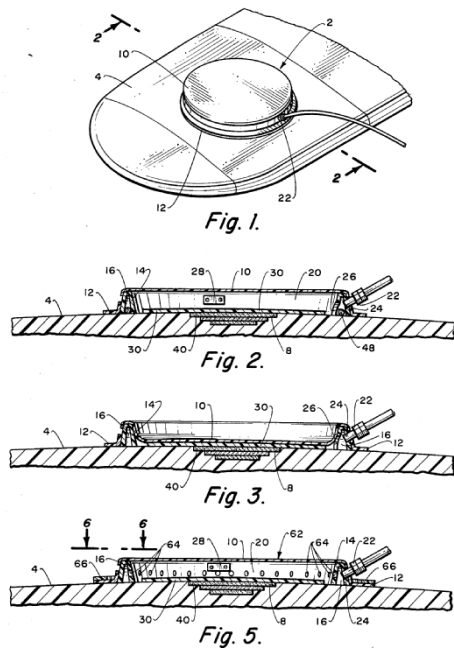
**B29C 73/30**

for local pressing or local heating

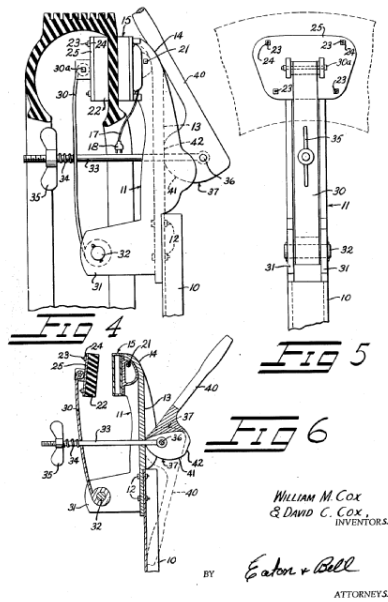
**Definition statement***This place covers:*



U.S. Patent Nov. 19, 1985 Sheet 1 of 3 4,554,036



Dec. 7, 1954 W. M. COX ET AL 2,696,021  
SPOT VULCANIZER FOR REPAIRING ARTICLES  
Filed Dec. 22, 1951 2 Sheets-Sheet 2

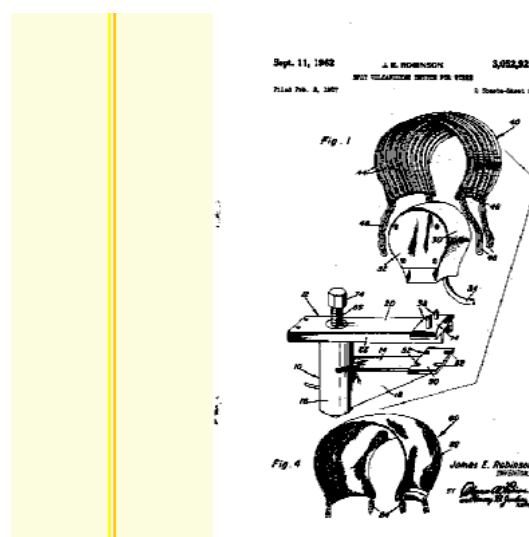
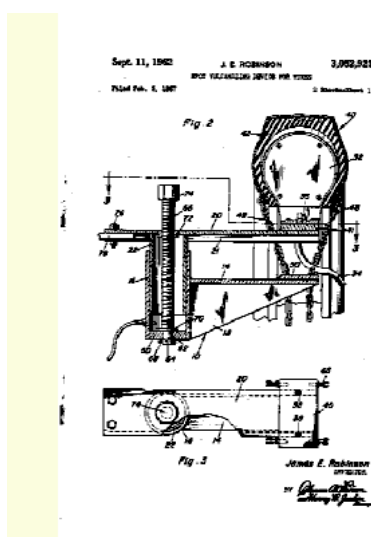
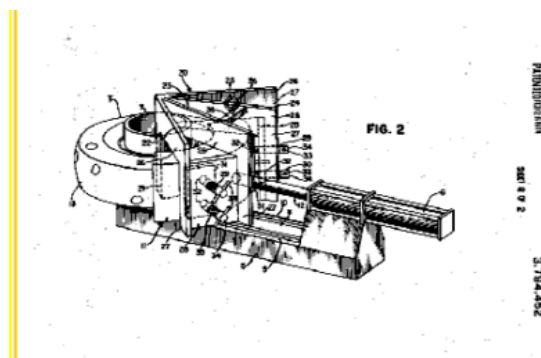
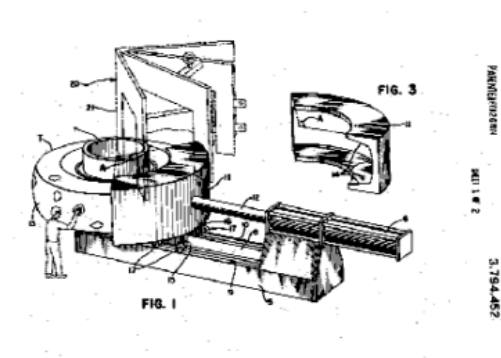
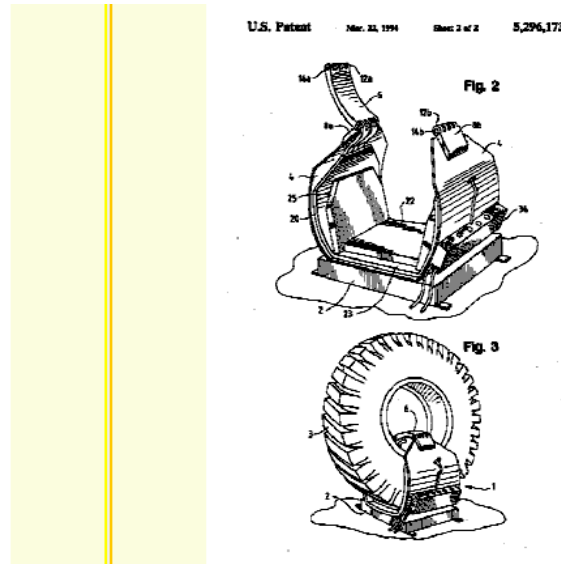
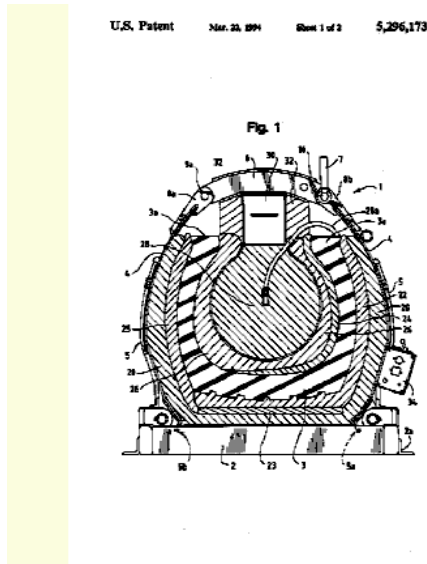


**B29C 73/305**

{specially adapted for toroidal articles, e.g. tyres ([B29C 73/325](#) takes precedence)}

**Definition statement**

*This place covers:*



## References

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Tools for repairing damaged tyres

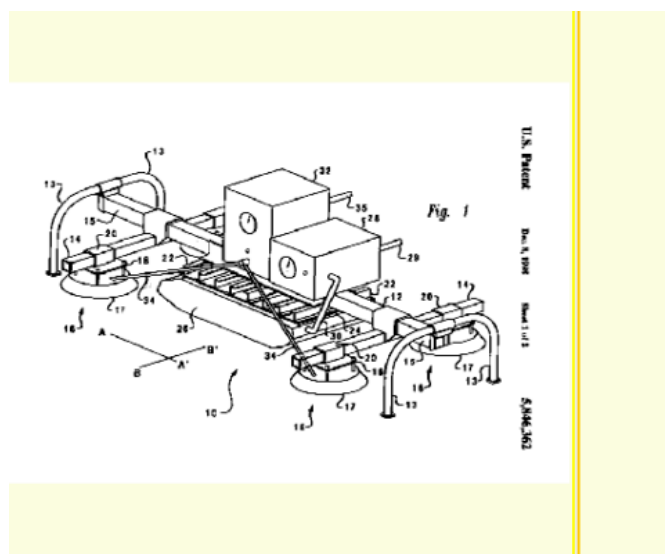
[B60C 25/16](#)

## B29C 73/32

using an elastic element, e.g. inflatable bag

## Definition statement

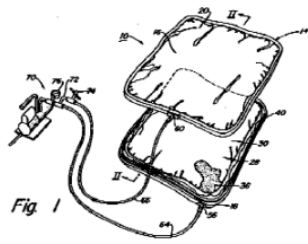
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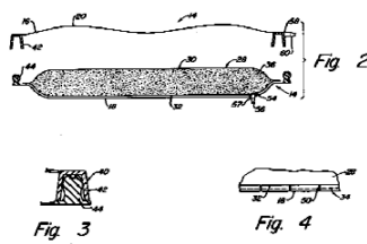
U.S. Patent Dec. 8, 1998 Sheet 2 of 2 5,846,362

FIGURE 2

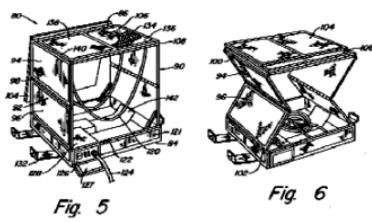
- 50 - Clean as necessary the surface area for application of the patch or doubler.
- 52 - Apply an adhesive to the surface area under the doubler or patch.
- 54 - Position the doubler patch over the surface area.
- 56 - Position the non-gravitational positive pressure generator over the doubler or patch.
- 58 - Adjust the vacuum assembly to position the non-gravitational positive pressure generator.
- 60 - Apply a vacuum to the vacuum assembly to secure the generator in the desired position.
- 62 - Position a collapsible diaphragm or bladder in contact with the doubler or patch.
- 64 - Inflate the diaphragm or bladder to apply pressure against the doubler or patch.
- 66 - Maintain the inflated diaphragm or bladder to allow the adhesive to cure.
- 68 - Deflate and remove the diaphragm or bladder.
- 70 - Remove the non-gravitational positive pressure generator.



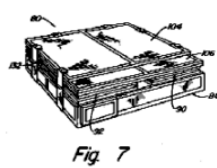
U.S. Patent  
No. 10,000,000  
Filed 10/1/19  
5,579,388



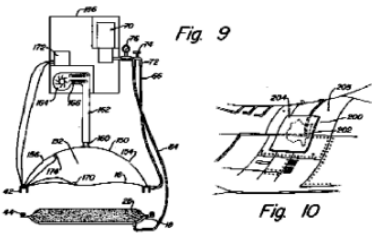
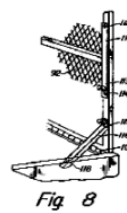
U.S. Patent  
No. 10,000,000  
Filed 10/1/19  
5,579,388



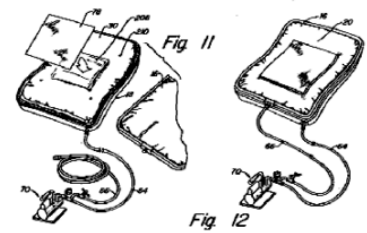
U.S. Patent  
No. 10,000,000  
Filed 10/1/19  
5,579,388



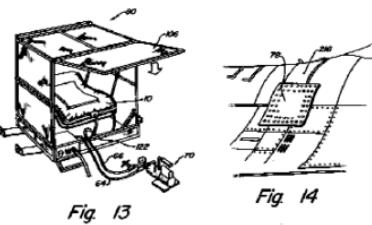
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No. 10,000,000  
Filed 10/1/19  
5,579,388



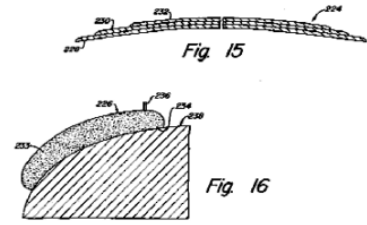
U.S. Patent  
No. 10,000,000  
Filed 10/1/19  
5,579,388



U.S. Patent  
No. 10,000,000  
Filed 10/1/19  
5,579,388



U.S. Patent  
No. 10,000,000  
Filed 10/1/19  
5,579,388



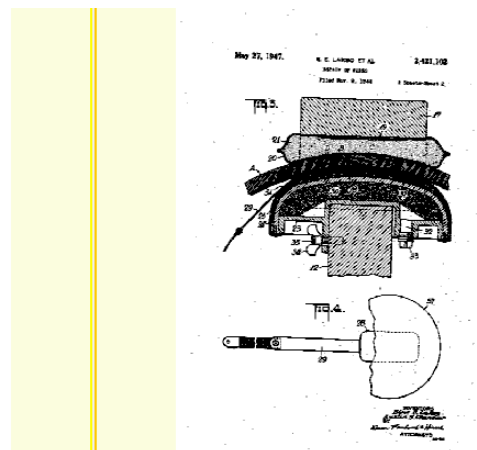
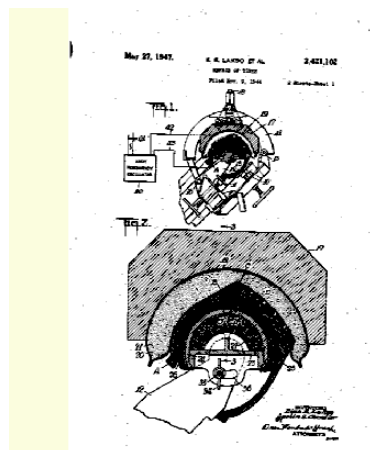
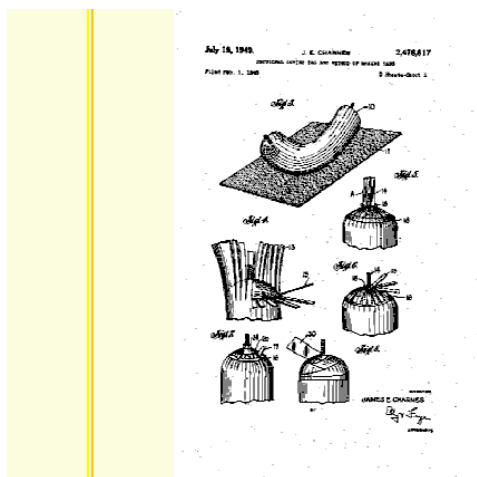
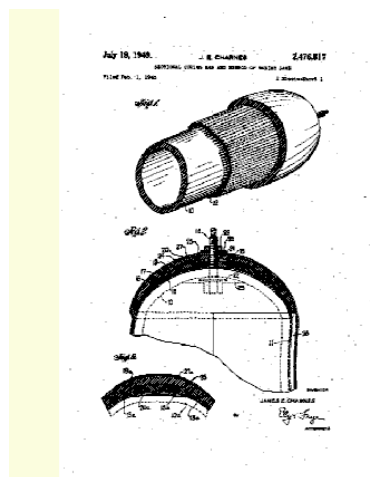
U.S. Patent  
No. 10,000,000  
Filed 10/1/19  
5,579,388

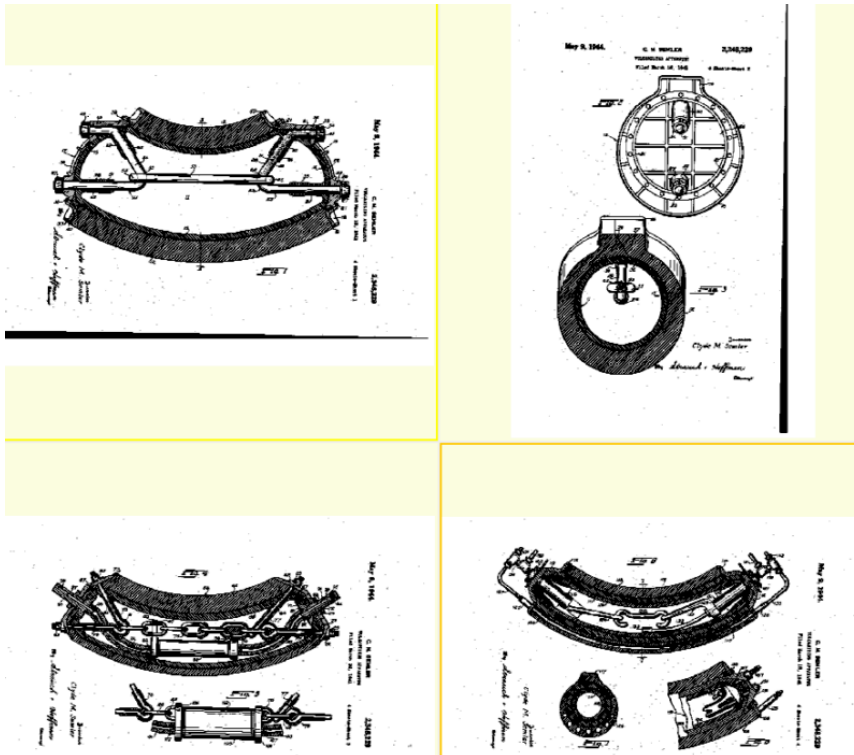
**B29C 73/325**

{specially adapted for toroidal articles, e.g. tyres}

**Definition statement**

*This place covers:*



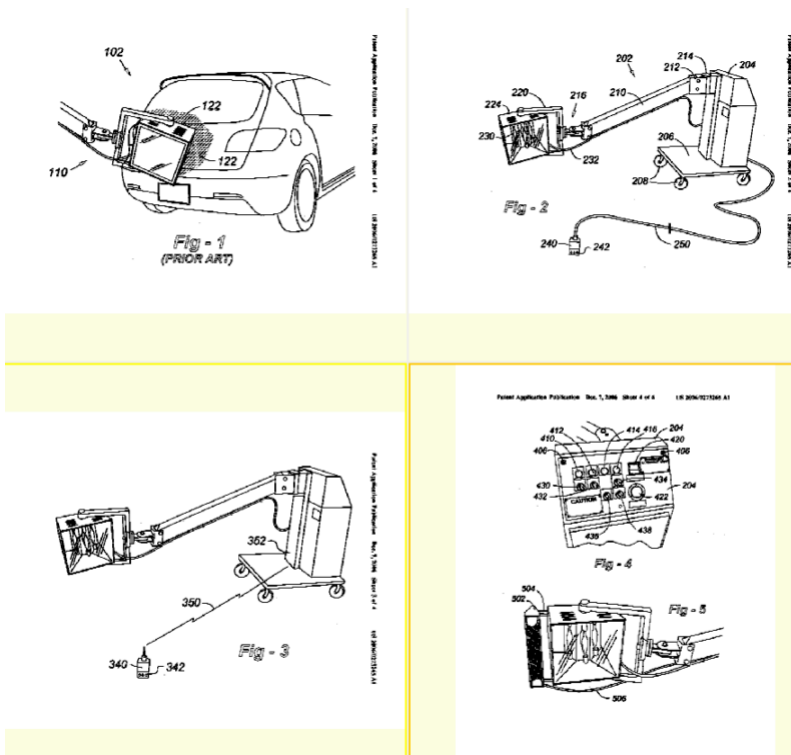


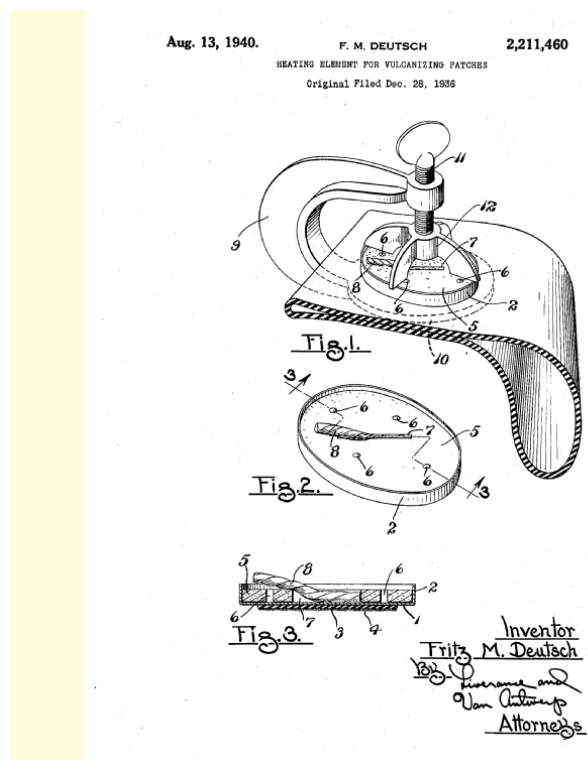
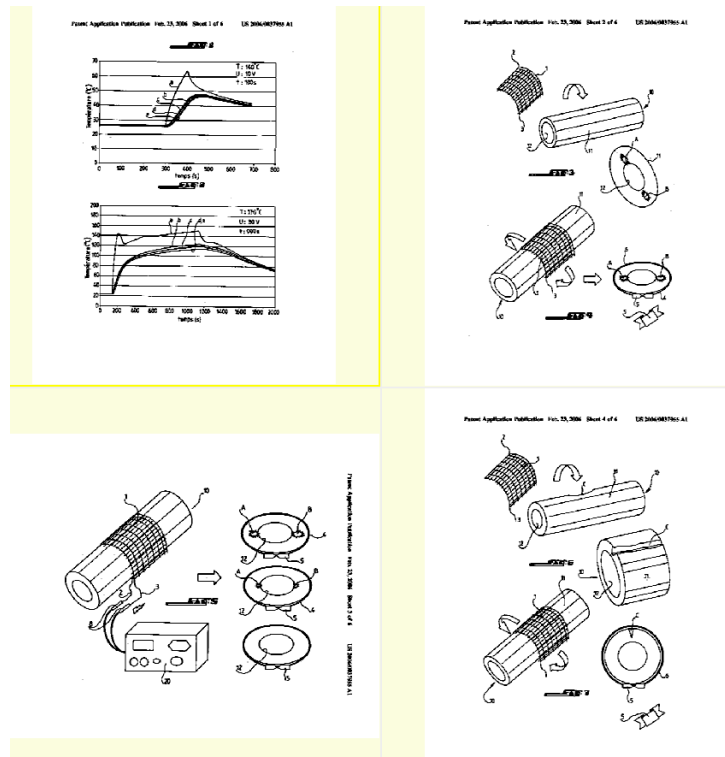
## B29C 73/34

for local heating

### Definition statement

This place covers:





**B29C 2791/009****Using laser****References*****Informative references***

*Attention is drawn to the following places, which may be of interest for search:*

Curing during moulding using laser	<a href="#">B29C 2035/0838</a>
Welding using laser beams	<a href="#">B29C 65/16</a>