

## F16D

### COUPLINGS FOR TRANSMITTING ROTATION; CLUTCHES; BRAKES

#### Definition statement

*This place covers:*

Systems of clutches or couplings for transmitting rotation used within a mechanism of general utility.

Combinations of clutches and brakes used within a mechanism of general utility.

Combinations couplings for transmitting rotation from one element to another and brakes used in conjunction with each other in a mechanism of general utility.

Combinations of couplings for transmitting rotation from one element to another and a clutch used in conjunction with each other in a mechanism of general utility.

Couplings per se for transmitting rotation of the following types:

- Rigid couplings (e.g. for connecting two coaxial shafts or for attaching a member on a shaft);
- Yielding couplings (e.g. Oldham couplings, Hooke's joints, cardan joints);
- Impulse couplings;
- Slip couplings;
- Safety couplings;
- Hydrostatic couplings;
- Hydrokinetic couplings.

Clutches per se of the following types:

- Friction clutches (e.g. disc clutches, multiple disc clutches);
- Freewheel clutches;
- Hydrostatic clutches;
- Hydrokinetic clutches;
- Visco clutches;
- Internally controlled automatic clutches, e.g. centrifugal clutches, torque limiting clutches;
- External control of clutches.

Clutch components or special features related to clutches:

- Actuation mechanisms;
- Clutch slack adjusters;
- Clutch cooling devices.

Brakes per se of the following types:

- Liquid- or air-resistant brakes, e.g. Föttinger brakes, retarder;
- Self-acting brakes;
- Drum brakes;
- Disc brakes.

Brake components or special features related to brakes:

- Brake shoes, pads or bands;
- Brake discs or drums;
- Actuation mechanisms;
- Brake slack adjusters;
- Brake cooling devices;

- Brake monitoring, e.g. wear indication.

Friction linings in general:

- Composition of linings;
- Attachment of linings.

Other types of couplings for transmitting rotation, clutches or brakes not provided for in another subclass of the CPC.

## Relationships with other classification places

[F16D](#) is a general function-orientated place.

Application-orientated places for this subject matter are provided elsewhere in the classification – see below.

## References

### Limiting references

*This place does not cover:*

Electrodynamic brake systems for vehicles in general	<a href="#">B60L 7/00</a>
Vehicle brake control systems	<a href="#">B60T</a>
Conjoint control of vehicle sub-units of different type or different function, e.g. when at least one sub-unit is a clutch or a brake	<a href="#">B60W</a>
Fluid gearings	<a href="#">F16H 39/00</a> , <a href="#">F16H 41/00</a> , <a href="#">F16H 43/00</a>
Combinations of fluid gearings with clutches or couplings	<a href="#">F16H 45/00</a>
Combinations of mechanical gearings with fluid clutches	<a href="#">F16H 47/00</a>
Differential gearings, e.g. with freewheels or other clutches	<a href="#">F16H 48/00</a>
Dynamo-electric brakes or clutches, e.g. of the Eddy-current hysteresis type	<a href="#">H02K 49/00</a>
Clutches or holding devices using electrostatic attraction, e.g. using Johnson-Rahbek effect	<a href="#">H02N 13/00</a>

### Informative references

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

Couplings:

Couplings for metal-rolling mills	<a href="#">B21B 35/14</a>
Attachment of wheels to axles for railway carriages	<a href="#">B60B</a>
Attachment of marine propellers on shafts	<a href="#">B63H 23/34</a>
Couplings for drilling rods	<a href="#">E21B 17/02</a>

Clutches:

Clutches of harvesters or mowers for grass, cereals or other crops	<a href="#">A01D 69/08</a>
Clutches in dental machines for boring or cutting	<a href="#">A61C 1/18</a>
Clutches specially adapted for presses	<a href="#">B30B 15/12</a>

Arrangement or location of clutches in vehicles	<a href="#">B60K 17/02</a>
Arrangement or mounting of control devices for main transmission clutches in vehicles	<a href="#">B60K 23/02</a>
Cycle brakes controlled by back-pedalling	<a href="#">B62L 5/00</a>
Details of rotary fluid gearing of the hydrokinetic type	<a href="#">F16H 41/24</a>
Combinations of mechanical gearings with fluid clutches	<a href="#">F16H 47/00</a>
Clutches for apparatus for transmitting or receiving coded digital information	<a href="#">H04L 13/04</a>

Brakes:

Brakes of harvesters or mowers for grass, cereals or other crops	<a href="#">A01D 69/10</a>
Brakes for threshing machines	<a href="#">A01F 12/58</a>
Brakes for swings	<a href="#">A63G 9/22</a>
Brakes specially adapted for presses	<a href="#">B30B 15/10</a>
Braking devices for ribbon-feed devices in selective printing mechanisms	<a href="#">B41J 33/52</a>
Electrodynamic brake systems for vehicles in general	<a href="#">B60L 7/00</a>
Vehicle brake control systems	<a href="#">B60T</a>
Brakes peculiar to rail vehicles	<a href="#">B61H</a>
Braking mechanisms for hand carts	<a href="#">B62B 5/04</a>
Braking mechanisms for children's carriages or perambulators	<a href="#">B62B 9/08</a>
Braking mechanisms for animal-drawn vehicles	<a href="#">B62C 7/00</a>
Cycle brakes	<a href="#">B62L</a>
Braking devices for lifting or hoisting gear	<a href="#">B66D 5/00</a>
Brakes for electric motors, generators, or dynamo-electric converters	<a href="#">H02P 3/04</a>

Couplings, clutches and/or brakes:

Conjoint control of vehicle sub-units of different type or different function, e.g. when at least one sub-unit is a clutch or a brake	<a href="#">B60W</a>
Fluid gearings	<a href="#">F16H 39/00</a> , <a href="#">F16H 41/00</a> , <a href="#">F16H 43/00</a>
Combinations of fluid gearings with clutches or couplings	<a href="#">F16H 45/00</a>

## Special rules of classification

For this subclass reference is made to the corresponding Indexing Code scheme: [F16D](#).

For clutches and couplings in [F16D 1/00](#) - [F16D 48/00](#) only: see [F16D 2300/00](#),  
[F16D 1/00](#) - [F16D 48/00](#) and [F16D 2500/00](#).

Special rules of classification for brakes, i.e. for groups [F16D 48/00](#) - [F16D 71/04](#):

Classification rules in groups [F16D 48/00](#) - [F16D 71/04](#) for brakes:

The CPC-guide refers to "invention information". This definition is not followed, since "the addition to the prior art" of most documents is not always clear. In subclass [F16D](#) the criteria for classification

## Special rules of classification

derive from the main rule that all relevant technical information of a document is classified to allow efficient retrieval. Most documents should preferably have two or more classification symbols. One symbol to describe the general configuration or overall construction and one or more further symbols to identify additional features should be assigned.

To avoid duplication of entries for the same subject matter, most of the existing subgroups relating to the type of operation force (e.g. hydraulic) are no longer used for classification. Instead the codes relating to brake actuation in groups [F16D 2121/00](#) - [F16D 2131/00](#) are given to each document.

Examples:

A hydraulically actuated band brake previously classified in IPC group [F16D 49/12](#) is classified according the rules in [F16D 49/08](#) and [F16D 2121/04](#).

A hydraulically and magnetically actuated band brake also classified in IPC group [F16D 49/12](#) is classified according the rules in [F16D 49/08](#), [F16D 2121/04](#), [F16D 2121/20](#) and [F16D 2123/00](#).

## Glossary of terms

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

actuator	a component of a mechanism that causes movement of a motion-conveying component or motion-inhibiting component but does not itself directly convey or inhibit motion.
brake	a mechanism with at least one component that is moved by an actuator to selectively or automatically engage or stop a member with respect to a stationary part.
clutch	a mechanism with at least two relatively movable components that are selectively or automatically engaged with each other by control means, e.g. an actuator, to transmit mechanical power or convey motion from a first member to a second member or disengaged by control means to stop transmitting mechanical power or conveying motion.
coupling for transmitting rotation	a mechanism that transmits torque or conveys rotary motion from a first shaft to a second shaft or other rotating member and that either does not include relatively moving components or, if it has relatively moving components, the components move without the use of control means.

## Synonyms and Keywords

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

Slack adjuster	Wear compensation mechanism, automatic adjuster, automatically adjusting device, automatic adjustment device, self-adjustment device
Freewheel clutch	One-way clutch

## F16D 1/00

**Couplings for rigidly connecting two coaxial shafts or other movable machine elements (attachment of wheels to axles for railway carriages [B60B](#); for attachment of cranks to their shafts [F16C 3/10](#))**

### References

#### Limiting references

*This place does not cover:*

Attachment of cranks to their shafts	<a href="#">F16C 3/10</a>
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### Glossary of terms

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

Rigidly	"rigidly" means that there is no play or clearance intended in the connection (DE:spiel, FR:jeu).
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## F16D 1/027

**non-disconnectable, e.g. involving gluing, welding or the like**

### Definition statement

*This place covers:*

Used for adhesive connection or welding, but not limited thereto. Rivets are also non-disconnectable therefore this type of connection would also be classified here. But bolts are usually disconnectable and would be classified rather in [F16D 1/033](#) when connecting two faces perpendicular to the axis of rotation.

## F16D 1/04

**with clamping hub; with hub and longitudinal key**

### Definition statement

*This place covers:*

Used for connecting two abutting shafts or the like by means of a clamping hub or hub with a longitudinal key. Examples of clamping hubs (radial clamping/loading) and keys can be found in the titles of the subgroups of [F16D 1/08](#).

## F16D 1/05

**with radial clamping due to axial loading of at least one pair of conical surfaces**

### Definition statement

*This place covers:*

Used for connecting two abutting shafts or the like by means of radial clamping due to axial loading of at least one pair of conical surfaces. Examples of this kind of clamping can be found in the subgroups of [F16D 1/09](#).

## F16D 1/08

**with clamping hub; with hub and longitudinal key**

### Definition statement

*This place covers:*

Used for attachment of a member on a shaft or on a shaft end by means of a clamping hub or a hub with a longitudinal key.

## F16D 1/0805

**{with radial clamping due to deformation of a resilient body or a body of fluid (F16D 1/091 takes precedence; elastic couplings F16D 3/80; fluid pressure clutches F16D 25/04)}**

### Definition statement

*This place covers:*

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to deformation of a resilient body or a body of fluid, e.g. used for hubs comprising cavities which can be pressurised by fluid, so that a wall of the hub can expand towards the shaft in order to radially clamp the shaft.

## F16D 1/0811

**{with radial clamping due to tilting of a hub part or ring about a diametral axis}**

### Definition statement

*This place covers:*

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to tilting of a hub part or ring about a diametral axis, meaning that radially clamping is achieved by means of tilting of a hub part or ring about an axis perpendicularly crossing the rotational axis.

## F16D 1/0817

**{with radial clamping due to rotation along an eccentric surface, e.g. arcuate wedging elements (similar clutches F16D 17/00; similar free-wheel clutches F16D 41/06)}**

### Definition statement

*This place covers:*

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to rotation along an eccentric surface, e.g. arcuate wedging elements on the inner surface of the hub and/or the mating outer surface of the shaft, whereby clamping is achieved when the shaft and hub are relatively rotated and the elements wedge.

**F16D 1/0823**

**{with radial clamping of a helical wrap spring on the shaft or in the hub bore (similar clutches [F16D 13/025](#), [F16D 13/08](#), [F16D 27/025](#), [F16D 27/105](#); similar slip couplings [F16D 7/022](#); similar free-wheel clutches [F16D 41/206](#))}**

**Definition statement**

*This place covers:*

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to clamping of a helical wrap spring on the shaft or in the hub bore, e.g. by expanding the wrap spring against the hub bore due to relative rotation of the spring ends around the rotational axis.

**F16D 1/0847**

**{with radial clamping due to a radial screw}**

**Definition statement**

*This place covers:*

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to clamping by a set screw, e.g. a screw screwed in the hub in a radial direction through the hub and ending in the hub bore and thereby hitting the shaft outer surface.

**F16D 1/0858**

**{due to the elasticity of the hub (including shrink fits)}**

**Definition statement**

*This place covers:*

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping between the mating surfaces of the hub and the shaft due to the elasticity of the hub, e.g. a hub is heated (to enlarge its bore), is then put on the shaft and subsequently cooled in order to crimp or e.g. a hub is press fit on a shaft.

**F16D 1/0864**

**{due to tangential loading of the hub, e.g. a split hub}**

**Definition statement**

*This place covers:*

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping between the mating surfaces of the hub and the shaft due to tangential loading of the hub, e.g. a split hub, meaning e.g. a hub which has a radial split in the direction of the rotational axis, whereby the parts of the hub adjacent to the split and facing each other are clamped together by e.g. a screw so that the bore of the hub clamps around the shaft.

F16D 1/09

with radial clamping due to axial loading of at least one pair of conical surfaces  
{(tapered keys [F16D 1/0882](#))}

References

Limiting references

This place does not cover:

Tapered keys	<a href="#">F16D 1/0882</a>
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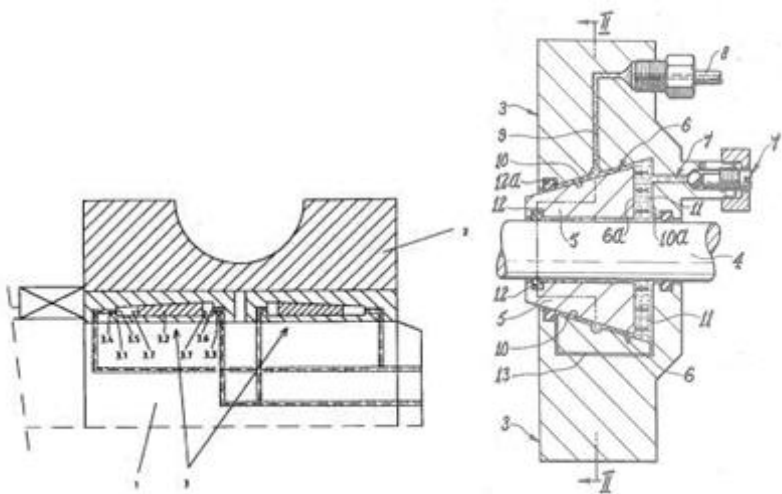
F16D 1/091

and comprising a chamber including a tapered piston moved axially by fluid pressure to effect clamping

Definition statement

This place covers:

Illustrative example of subject matter classified in [F16D 1/091](#).





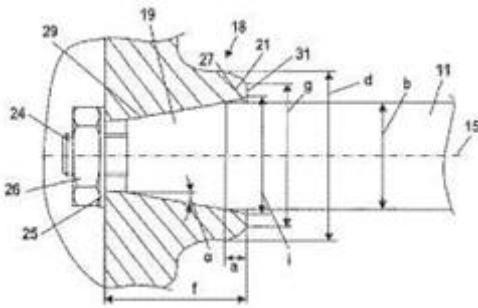
## F16D 1/092

the pair of conical mating surfaces being provided on the coupled hub and shaft

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 1/092](#).



## F16D 1/093

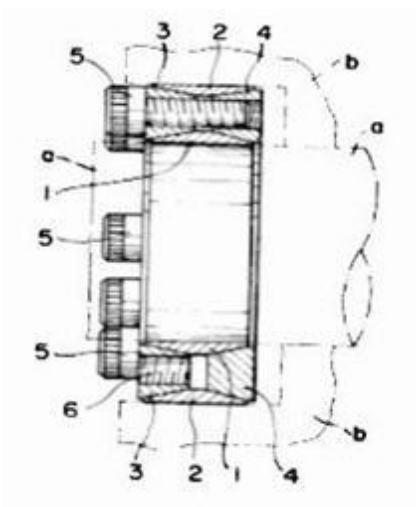
using one or more elastic segmented conical rings forming at least one of the conical surfaces, the rings being expanded or contracted to effect clamping ([F16D 1/091](#) takes precedence)

### References

#### Limiting references

*This place does not cover:*

Couplings comprising a chamber including a tapered piston moved axially by fluid pressure to effect clamping	<a href="#">F16D 1/091</a>
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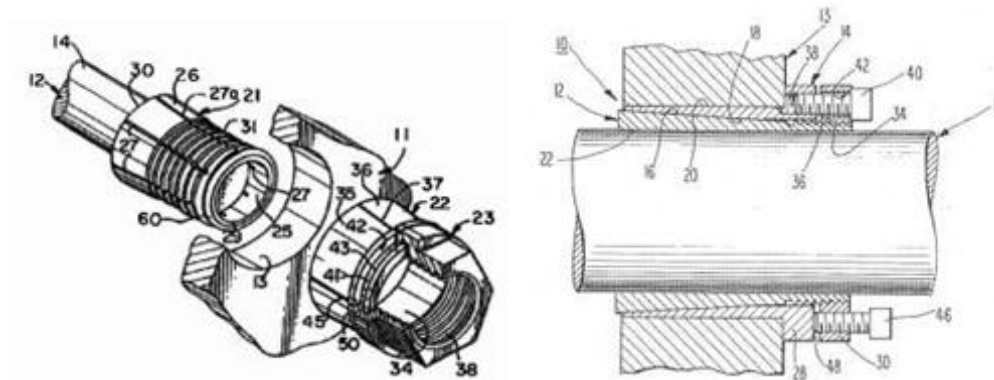
## F16D 1/094

using one or more pairs of elastic or segmented rings with mutually mating conical surfaces, one of the mating rings being contracted and the other being expanded

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 1/094](#).



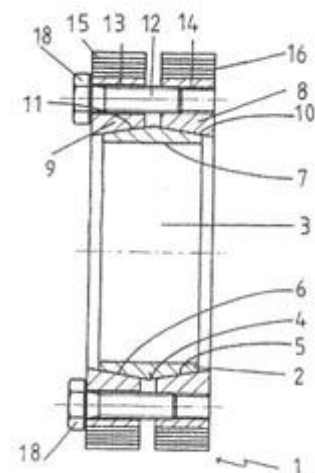
## F16D 1/095

with clamping effected by ring contraction only {(for connecting two abutting shafts [F16D 1/02](#))}

### Definition statement

*This place covers:*

Used for attachment of a member on a shaft or on a shaft-end with clamping hub, with radial clamping due to axial loading of at least one pair of conical surfaces, using one of more elastic segmented conical rings forming at least one of the conical surfaces, the rings being contracted to effect clamping, with clamping effected by ring contraction only, e.g. used for the following arrangements: see figure:



the rings 9,10 are stiff and the elastic ring 3 is contracted when the rings 9,10 are loaded (when the bolts are tightened).

## References

### Limiting references

*This place does not cover:*

Couplings for connecting two abutting shafts	<a href="#">F16D 1/02</a>
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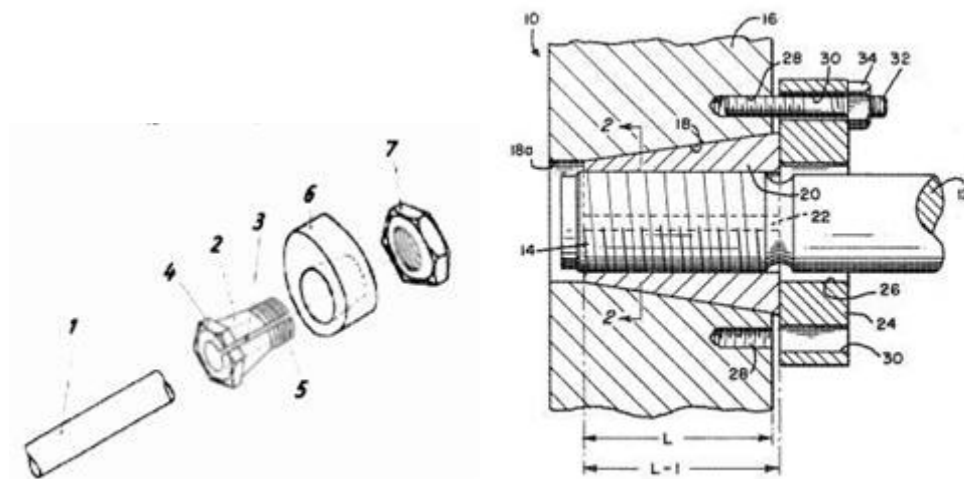
## F16D 1/096

the ring or rings being located between the shaft and the hub

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 1/096](#).



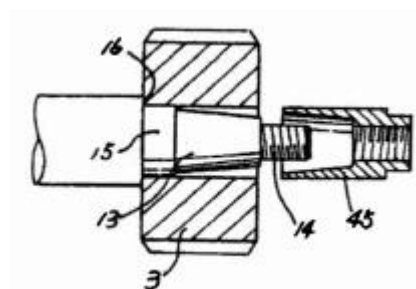
## F16D 1/097

with clamping effected by ring expansion only, e.g. with an expanded ring located between hub and shaft

### Definition statement

*This place covers:*

Used for attachment of a member on a shaft or on a shaft-end with clamping hub, with radial clamping due to axial loading of at least one pair of conical surfaces, using one of more elastic segmented conical rings forming at least one of the conical surfaces, the rings being expanded to effect clamping, with clamping effected by ring expansion only, e.g. used for the following arrangements: see figure (the elastic ring 45 is expanded between the shaft part 13 and the hub 3 when screwed on the shaft end 14):



## F16D 3/00

Yielding couplings, i.e. with means permitting movement between the connected parts during the drive (couplings disconnectable simply by axial movement [F16D 1/10](#); slip couplings [F16D 7/00](#))

### References

#### Limiting references

*This place does not cover:*

Couplings disconnectable simply by axial movement	<a href="#">F16D 1/10</a>
Slip couplings	<a href="#">F16D 7/00</a>

## F16D 3/02

adapted to specific functions

### References

#### Informative references

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

Other joints having more than one degree of angular freedom, i.e. universal joints	<a href="#">F16C 11/06</a>
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## F16D 3/223

the rolling members being guided in grooves in both coupling parts

### Definition statement

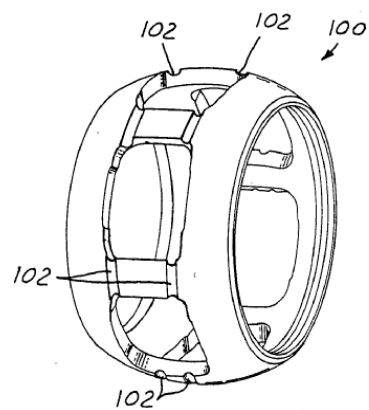
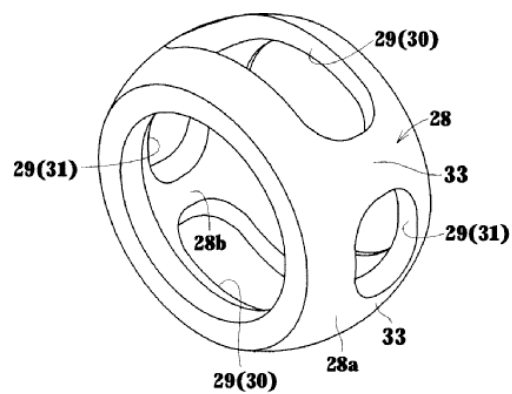
*This place covers:*

Universal joints in which flexibility is produced by means of rolling connecting parts, one coupling part entering a sleeve of the other coupling part and connected thereto by rolling members whereby the rolling members are being guided in grooves in both coupling parts.

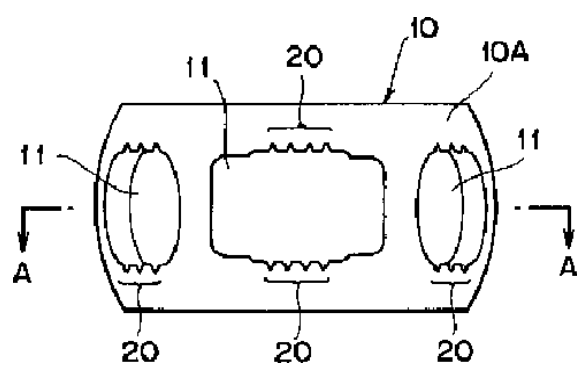
**F16D 2003/22303****{Details of ball cages}****Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 2003/22303](#).



**FIG. 6**



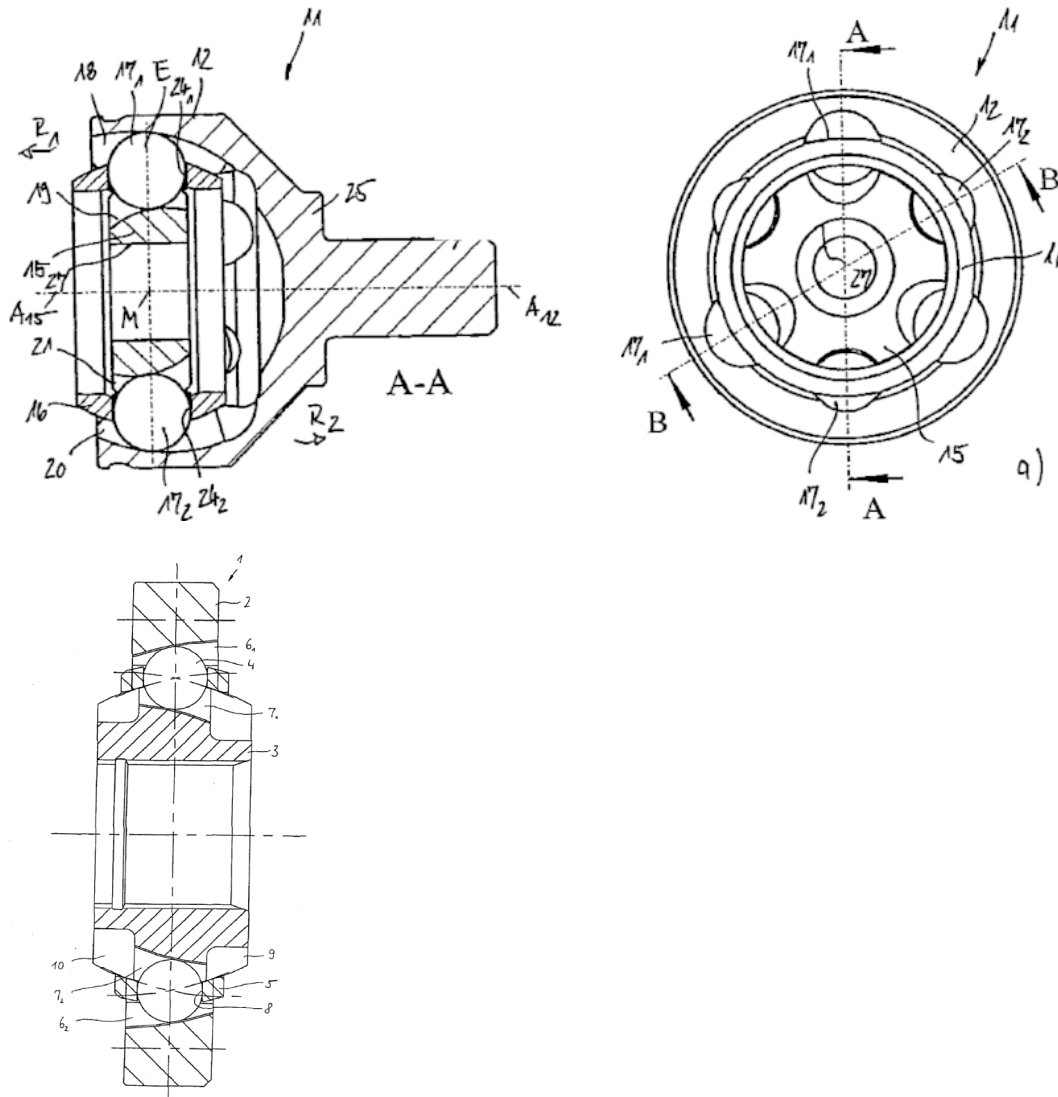
**F16D 2003/22306**

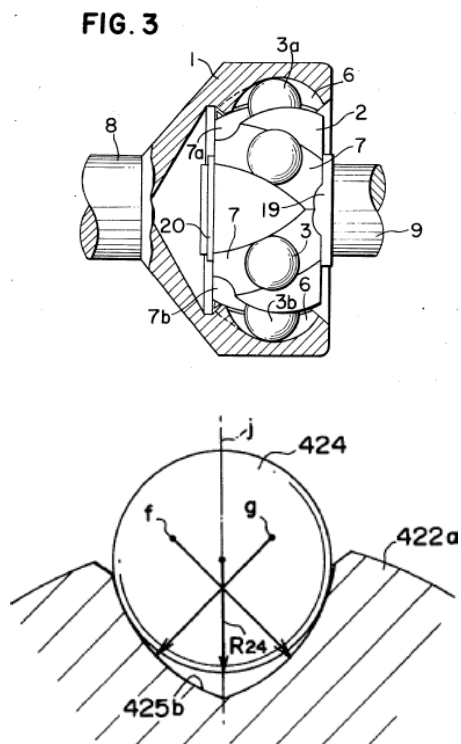
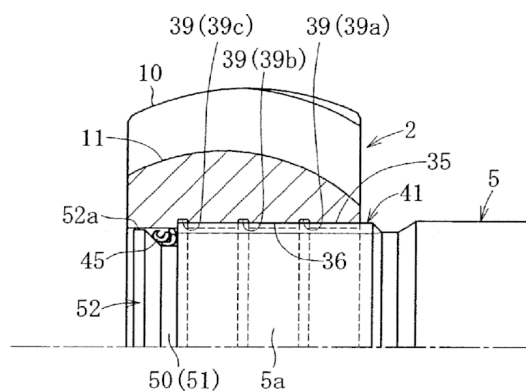
{having counter tracks, i.e. ball track surfaces which diverge in opposite directions}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 2003/22306](#).



**F16D 2003/22309****{Details of grooves}****Definition statement***This place covers:*Illustrative example of subject matter classified in [F16D 2003/22309](#).**F16D 2003/22313****{Details of the inner part of the core or means for attachment of the core on the shaft}****Definition statement***This place covers:*Illustrative example of subject matter classified in [F16D 2003/22313](#).

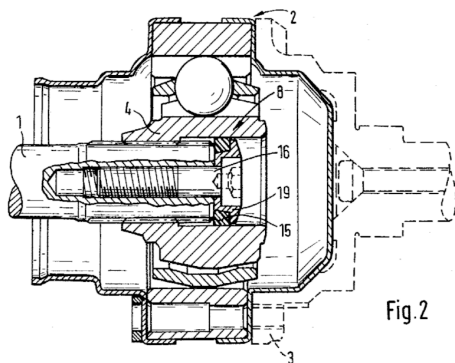
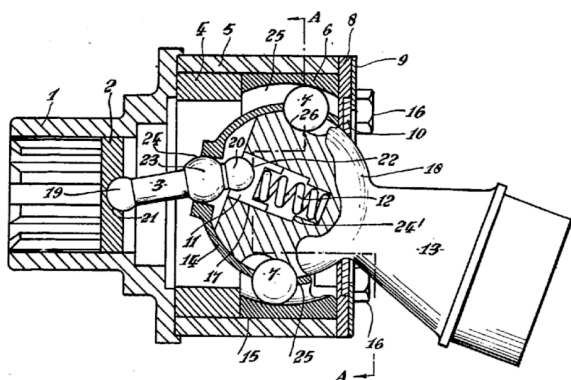


Fig. 2



## F16D 2003/22316

{Means for fastening or attaching the bellows or gaiters}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2003/22316](#).

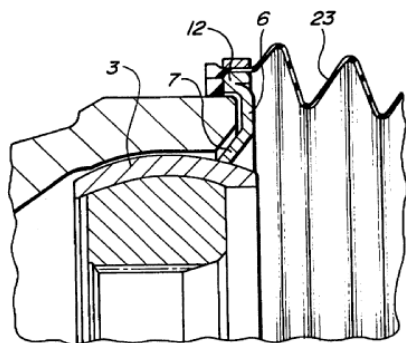
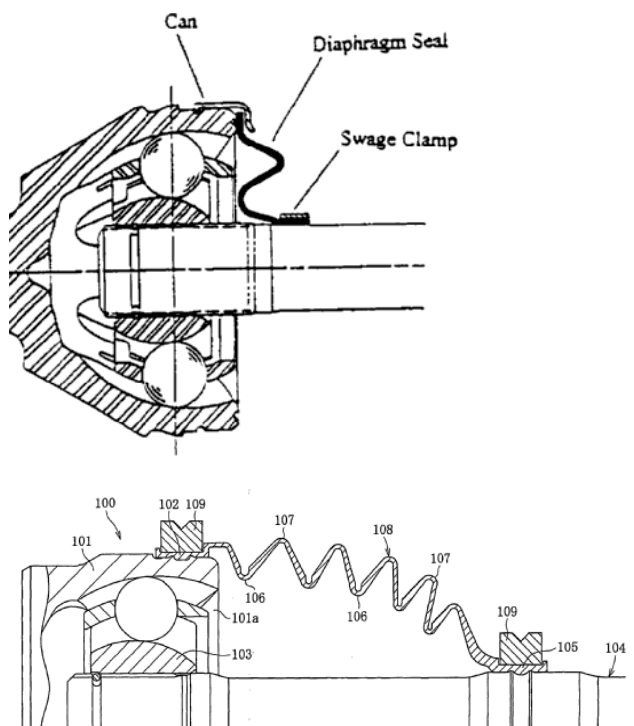


Fig-5





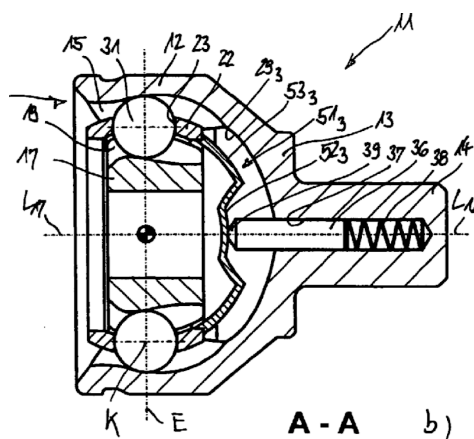
## F16D 2003/2232

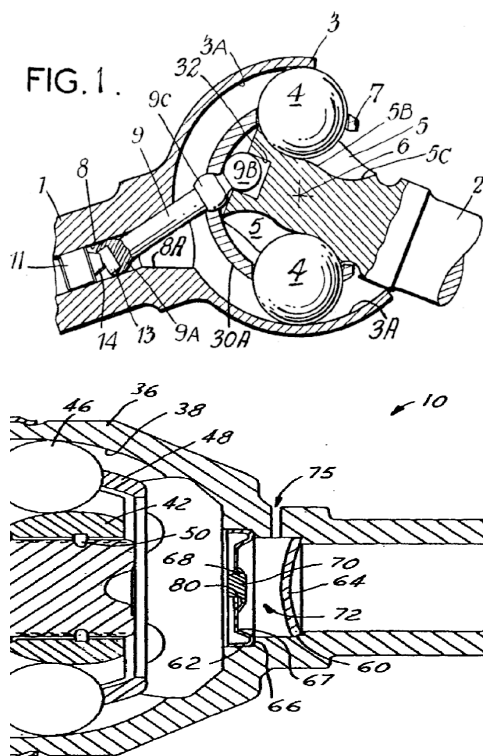
{Elements arranged in the hollow space between the end of the inner shaft and the outer joint member}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2003/2232](#).





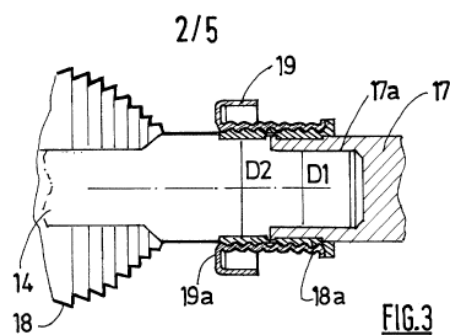
## F16D 2003/22323

{Attachments to the shaft of the inner joint member whereby the attachments are distanced from the core}

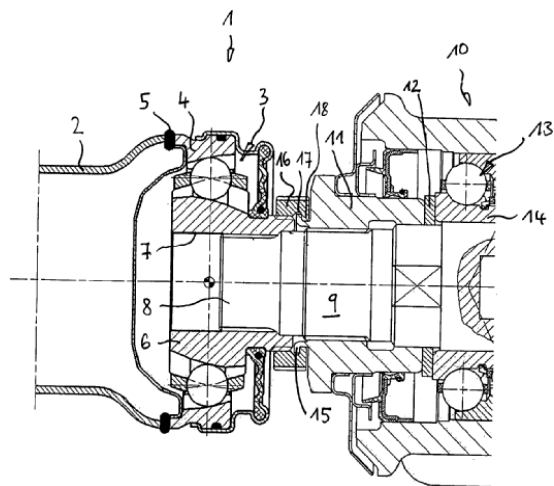
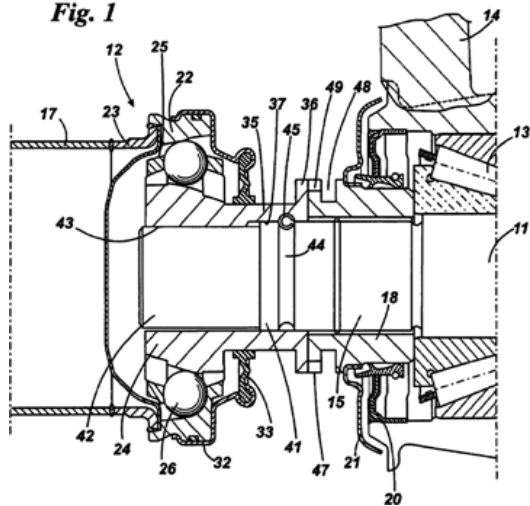
### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2003/22323](#).



**Fig. 1**



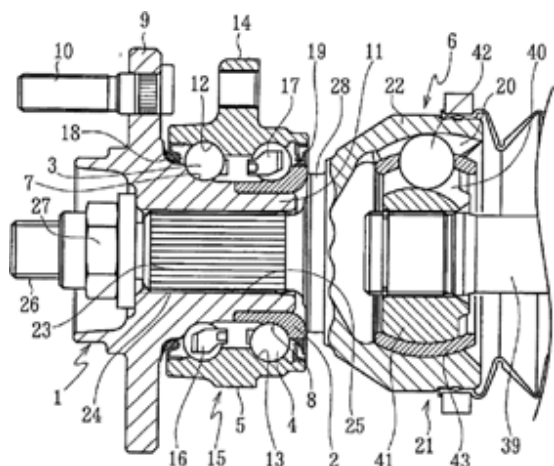
**F16D 2003/22326**

**{Attachments to the outer joint member, i.e. attachments to the exterior of the outer joint member or to the shaft of the outer joint member}**

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2003/22326](#).



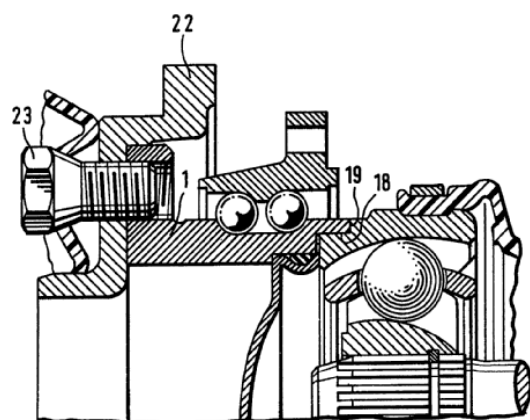
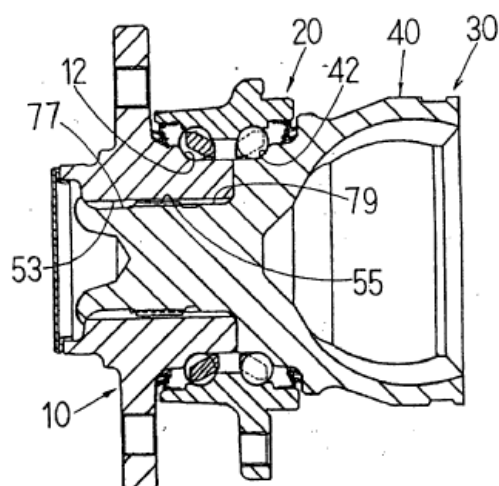
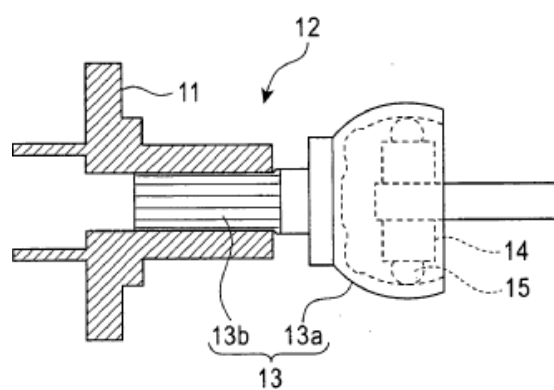


FIG.3



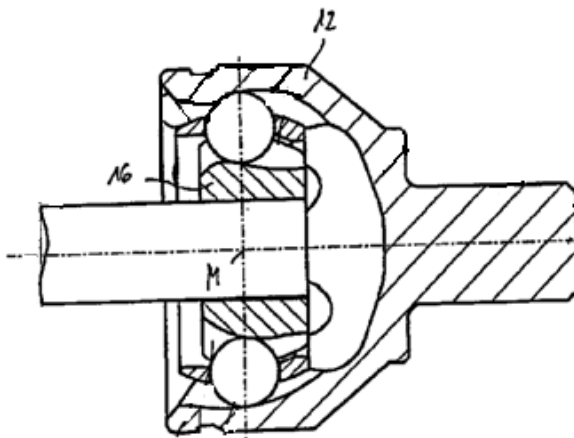
**F16D 3/2233**

where the track is made up of two curves with a point of inflexion in between, i.e. S-track joints

**Definition statement**

*This place covers:*

Universal joints where the rolling members are being guided in grooves on both coupling parts. The projection of the groove lines forming a S curve with an inflection point, see inner contour of part (12) and outer contour of part (16) in the figure.



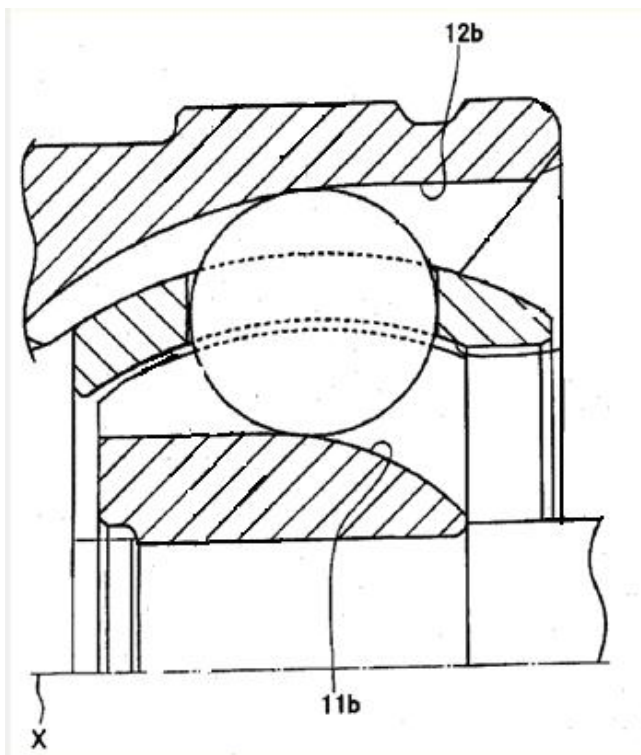
**F16D 3/2237**

where the grooves are composed of radii and adjoining straight lines, i.e. undercut free [UF] type joints

**Definition statement**

*This place covers:*

Universal joints where the rolling members are being guided in grooves on both coupling parts. In the projection these grooves are composed of radii and straight lines, see groove line (11b) and (12b) in the figure.



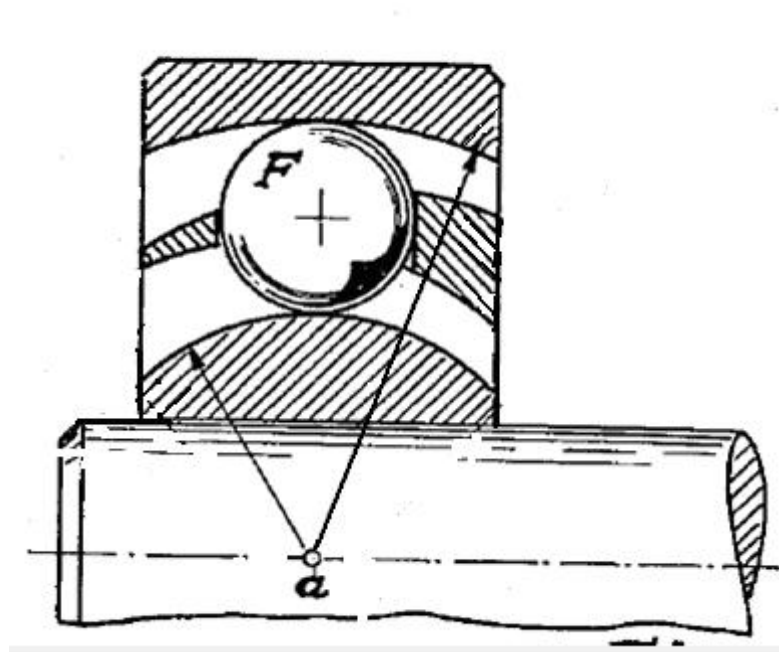
**F16D 3/224**

**the groove centre-lines in each coupling part lying on a sphere**

**Definition statement**

*This place covers:*

Universal joints where the rolling members are being guided in grooves in both coupling parts, and the groove centre-lines of each coupling part are lying on a sphere with the same centre.

**F16D 3/2245**

**where the groove centres are offset from the joint centre**

**Definition statement**

*This place covers:*

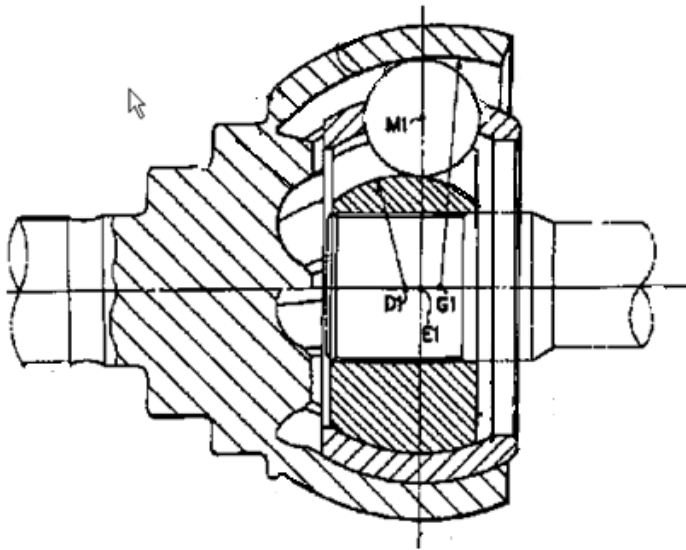
Universal joints where the rolling members are being guided in grooves in both coupling parts, the groove centre-lines are lying on spheres and the centres of these spheres (D1, G1) are offset from the joint centre (E1).

Each complete groove centre-line lying on (a part of) a single sphere.

**References****Limiting references**

*This place does not cover:*

In case the groove centre-lines are composed of combinations of parts of several spheres	<a href="#">F16D 3/223</a> .
--	------------------------------



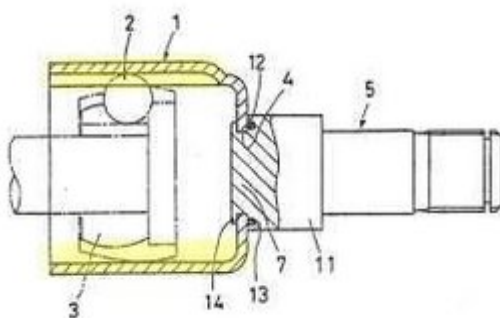
## F16D 3/226

the groove centre-lines in each coupling part lying on a cylinder co-axial with the respective coupling part

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 3/226](#).





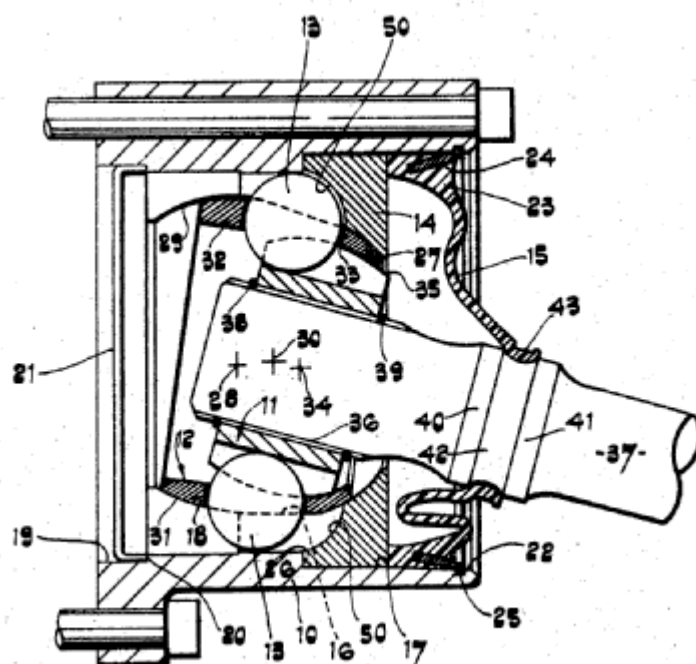
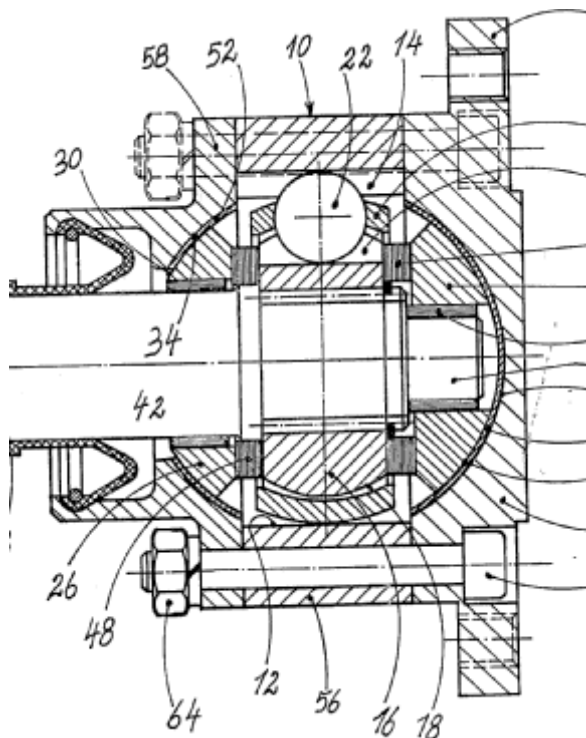
**F16D 3/2265**

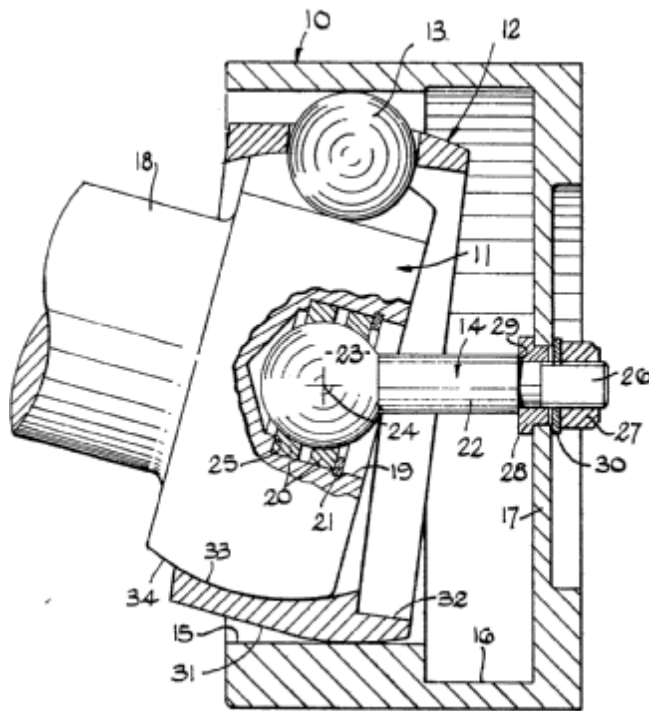
{the joints being non-telescopic}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 3/2265](#).





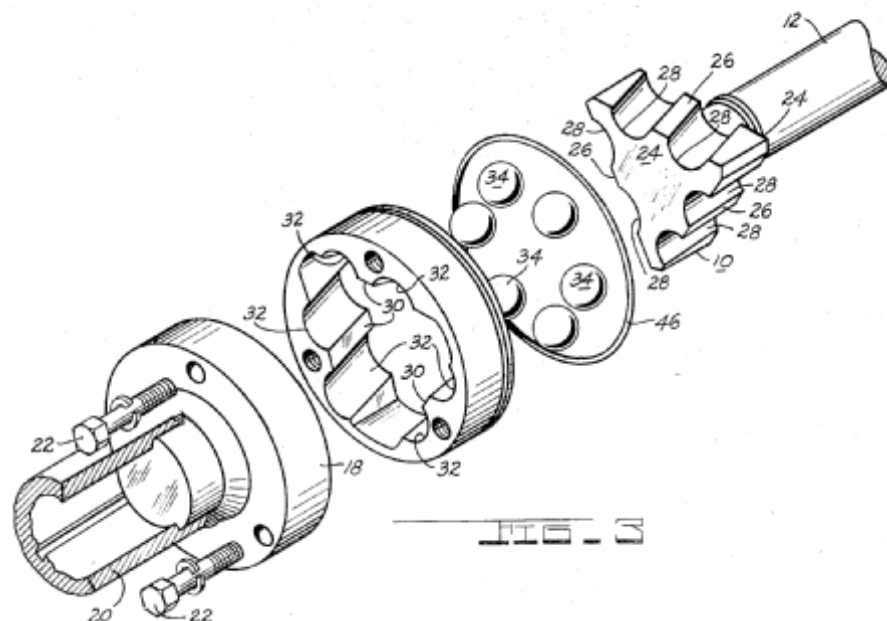
## F16D 3/229

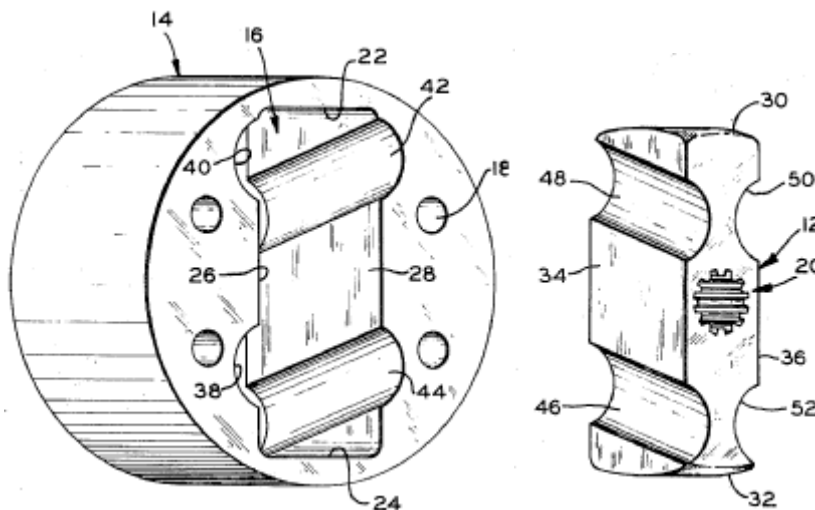
Prismatic coupling parts having each groove centre-line lying on planes parallel to the axis of the respective coupling part ([F16D 3/224](#), [F16D 3/226](#) take precedence)

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 3/229](#).





## F16D 3/82

with a coupling element in the form of a pneumatic tube (similar clutches [F16D 25/04](#))

### References

#### Informative references

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

Similar clutches	<a href="#">F16D 25/04</a>
------------------	----------------------------

## F16D 7/00

Slip couplings, e.g. slipping on overload, for absorbing shock (combined with yielding shaft couplings [F16D 3/14](#); fluid slip couplings [F16D 31/00](#) - [F16D 35/00](#))

### References

#### Informative references

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

Combined with yielding shaft couplings	<a href="#">F16D 3/14</a>
Fluid slip couplings	<a href="#">F16D 31/00</a> - <a href="#">F16D 35/00</a>
Gearings with arrangements or devices for absorbing overload or preventing damage by overload	<a href="#">F16H 35/10</a>

**F16D 7/02****of the friction type****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Couplings in which overload initiates a decrease of coupling pressure or a disconnection, see the relevant groups for clutches, e.g. for friction overload clutches	<a href="#">F16D 43/20</a> , <a href="#">F16D 43/21</a>
---	---

**F16D 7/04****of the ratchet type (similar gearings based on repeated accumulation and delivery of inertia-energy [F16H 33/08](#); {overload clutches of the ratchet type [F16D 43/202](#)})****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Overload clutches of the ratchet type	<a href="#">F16D 43/202</a>
---------------------------------------	-----------------------------

**F16D 11/00****Clutches in which the members have interengaging parts (arrangements for synchronisation [F16D 23/02](#))****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Arrangements for synchronisation	<a href="#">F16D 23/02</a>
----------------------------------	----------------------------

**F16D 13/00****Friction clutches (arrangements for synchronisation [F16D 23/02](#))****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Arrangements for synchronisation	<a href="#">F16D 23/02</a>
----------------------------------	----------------------------

## F16D 13/08

with a helical band or equivalent member, which may be built up from linked parts, with more than one turn embracing a drum or the like, with or without an additional clutch actuating the end of the band ([F16D 13/02](#) takes precedence; {similar slip couplings [F16D 7/022](#); similar clutches electromagnetically actuated [F16D 27/025](#), [F16D 27/105](#)} ; similar free-wheel clutches [F16D 41/20](#); similar brakes [F16D 49/02](#))

### References

#### Informative references

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

Similar clutches electromagnetically actuated	<a href="#">F16D 7/022</a> , <a href="#">F16D 27/105</a>
Similar slip clutches	<a href="#">F16D 7/022</a>
Similar freewheel clutches	<a href="#">F16D 41/206</a>
Similar brakes	<a href="#">F16D 49/02</a>

## F16D 13/10

with clutching members co-operating with the periphery of a drum, a wheel-rim, or the like ([F16D 13/02](#) - [F16D 13/08](#) take precedence; similar brakes [F16D 49/00](#))

### References

#### Informative references

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

Similar brakes	<a href="#">F16D 49/00</a>
----------------	----------------------------

## F16D 13/12

with an expansible band or coil co-operating with the inner surface of a drum or the like ([F16D 13/02](#) takes precedence; similar brakes [F16D 51/02](#))

### References

#### Informative references

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

Similar brakes	<a href="#">F16D 51/02</a>
----------------	----------------------------

**F16D 13/14**

with outwardly-movable clutching members co-operating with the inner surface of a drum or the like ([F16D 13/02](#), [F16D 13/06](#), [F16D 13/12](#) take precedence; similar brakes [F16D 51/00](#))

**References****Informative references**

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

Similar brakes	<a href="#">F16D 51/00</a>
----------------	----------------------------

**F16D 13/20**

with clutching members co-operating with both the periphery and the inner surface of a drum or wheel-rim (similar brakes [F16D 53/00](#))

**References****Informative references**

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

Similar brakes	<a href="#">F16D 53/00</a>
----------------	----------------------------

**F16D 13/22**

with axially-movable clutching members (similar brakes [F16D 55/00](#))

**References****Informative references**

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

Similar brakes	<a href="#">F16D 55/00</a>
----------------	----------------------------

**F16D 13/58**

Details {(tools for assembling or disassembling clutches [B25B 27/0064](#))}

**References****Limiting references**

*This place does not cover:*

Tools for assembling or disassembling clutches	<a href="#">B25B 27/0064</a>
--	------------------------------

**F16D 13/60****Clutching elements (friction lining or attachment thereof [F16D 69/00](#))****References****Limiting references***This place does not cover:*

Friction lining or attachment thereof	<a href="#">F16D 69/00</a>
---------------------------------------	----------------------------

**F16D 13/62****Clutch-bands; Clutch shoes; Clutch-drums (brake-bands, brake-shoes, brake-drums [F16D 65/00](#))****References****Limiting references***This place does not cover:*

Brake-bands, brake-shoes, brake-drums	<a href="#">F16D 65/00</a>
---------------------------------------	----------------------------

**F16D 13/64****Clutch-plates; Clutch-lamellae (brake-plates, brake-lamellae [F16D 65/12](#))****References****Limiting references***This place does not cover:*

Brake-plates, brake-lamellae	<a href="#">F16D 65/12</a>
------------------------------	----------------------------

**F16D 13/68****Attachments of plates or lamellae to their supports {(one or more discs connected to the linings transmitting torque to one or more discs connected to the hub by helical springs in windows in the discs, i.e. rotary vibration dampers [F16F 15/12](#))}****References****Limiting references***This place does not cover:*

One or more discs connected to the linings transmitting torque to one or more discs connected to the hub by helical springs in windows in the discs, i.e. rotary vibration dampers	<a href="#">F16F 15/12</a>
--	----------------------------

**F16D 13/70**

Pressure members, e.g. pressure plates, for clutch-plates or lamellae; Guiding arrangements for pressure members {(clutch flywheels comprising two or more masses with a rotational damper [F16F 15/12](#))}

**References****Limiting references**

*This place does not cover:*

Clutch flywheels comprising two or more masses with a rotational damper	<a href="#">F16F 15/12</a>
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**F16D 15/00**

Clutches with wedging balls or rollers or with other wedgeable separate clutching members (freewheels, freewheel clutches [F16D 41/00](#))

**References****Limiting references**

*This place does not cover:*

Freewheels, freewheel clutches	<a href="#">F16D 41/00</a>
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**F16D 21/00**

Systems comprising a plurality of actuated clutches (for synchronisation [F16D 23/04](#))

**References****Limiting references**

*This place does not cover:*

For synchronisation	<a href="#">F16D 23/04</a>
---------------------	----------------------------

**F16D 21/02**

for interconnecting three or more shafts or other transmission members in different ways (in endless-track vehicles [B62D](#))

**References****Informative references**

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

In endless-track vehicles	<a href="#">B62D</a>
---------------------------	----------------------



**F16D 21/06**

at least two driving shafts or two driven shafts being concentric

**Glossary of terms**

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

Mechanically actuated clutches	include also clutches other than mechanically actuated, e.g. electrically or hydraulically actuated
--------------------------------	---

**F16D 23/02**

Arrangements for synchronisation, also for power-operated clutches (shape or mounting of interengaging parts of clutch members to facilitate engagement [F16D 11/08](#))

**References****Limiting references**

*This place does not cover:*

Shape or mounting of interengaging parts of clutch members to facilitate engagement	<a href="#">F16D 11/08</a>
---	----------------------------

**F16D 23/08**

with a blocking mechanism that only releases the clutching member on synchronisation (in combination with an additional friction clutch [F16D 23/06](#))

**References****Limiting references**

*This place does not cover:*

In combination with an additional friction clutch	<a href="#">F16D 23/06</a>
---	----------------------------

**F16D 23/12**

Mechanical clutch-actuating mechanisms arranged outside the clutch as such (specific for combined clutches [F16D 21/00](#); mechanisms specific for synchronisation [F16D 23/02](#))

**References****Limiting references**

*This place does not cover:*

Specific for combined clutches	<a href="#">F16D 21/00</a>
Mechanisms specific for synchronisation	<a href="#">F16D 23/02</a>

F16D 25/00

Fluid-actuated clutches

References

Limiting references

This place does not cover:

Fluid actuated torque limiting clutches	<a href="#">F16D 43/28</a>
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Glossary of terms

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

Fluid	any gas or liquid, e.g. for pneumatic or hydraulic control
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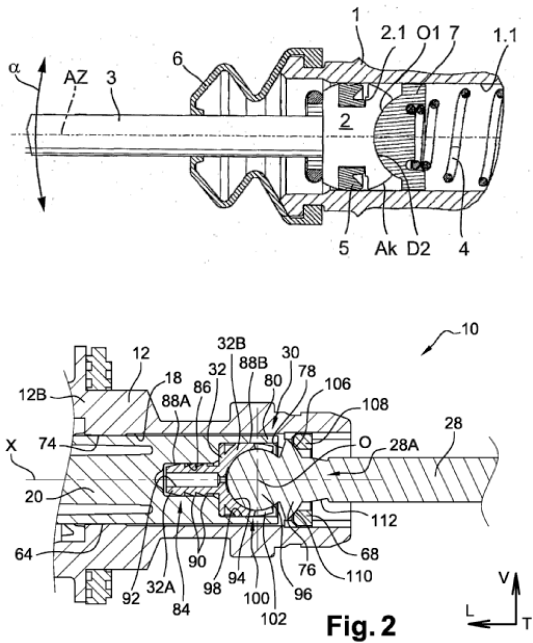
F16D 2025/081

{Hydraulic devices that initiate movement of pistons in secondary cylinders for actuating clutches, i.e. primary cylinders}

Definition statement

This place covers:

Illustrative example of subject matter classified in [F16D 2025/081](#).



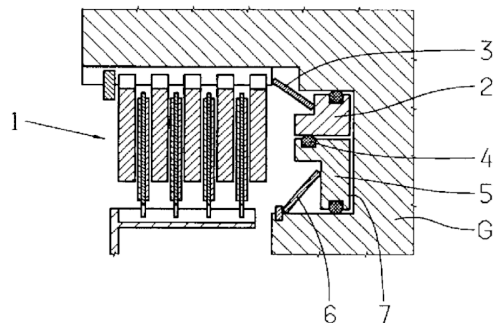
## F16D 25/082

{the line of action of the fluid-actuated members co-inciding with the axis of rotation}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 25/082](#).



## F16D 25/10

Clutch systems with a plurality of fluid-actuated clutches (arrangements or mounting of clutches in vehicles [B60K 17/00](#))

### References

#### Informative references

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

Arrangements or mounting of clutches in vehicles	<a href="#">B60K 17/02</a>
--	----------------------------

## F16D 27/00

Magnetically- {or electrically-} actuated clutches; Control or electric circuits therefor (clutches with magnetisable particles [F16D 37/02](#); {with electro-rheological fluids [F16D 37/008](#)})

### References

#### Limiting references

*This place does not cover:*

Clutches with electro-rheological fluids	<a href="#">F16D 37/008</a>
Clutches with magnetisable particles	<a href="#">F16D 37/02</a>
Magnetic clutches e.g. electrostatic or Eddy current clutches	<a href="#">H02K</a>

## F16D 28/00

Electrically-actuated clutches (arrangements for synchronisation [F16D 23/02](#); clutches actuated directly by means of an electromagnet [F16D 27/00](#); automatic clutches [F16D 43/00](#) - [F16D 45/00](#); external control [F16D 48/00](#))

### References

#### Limiting references

*This place does not cover:*

Clutches actuated directly by means of an electromagnet	<a href="#">F16D 27/02</a> - <a href="#">F16D 27/12</a>
Clutches with electro-rheological fluids	<a href="#">F16D 37/008</a>
Clutches with magnetisable particles	<a href="#">F16D 37/02</a>
Magnetic clutches e.g. electrostatic or Eddy current clutches	<a href="#">H02K</a>

## F16D 33/00

Rotary fluid couplings or clutches of the hydrokinetic type

### References

#### Limiting references

*This place does not cover:*

Retarders	<a href="#">B60T</a>
Torque converters	<a href="#">F16H 41/00</a>

## F16D 33/16

by means arranged externally of the coupling or clutch (mounting of such means in vehicles [B60K 23/00](#), e.g. [B60K 23/02](#))

### References

#### Informative references

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

Mounting of such means in vehicles	<a href="#">B60K 23/02</a>
------------------------------------	----------------------------

## F16D 33/18

Details (applicable also to fluid gearing [F16H 41/24](#))

### References

#### Informative references

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

Applicable also to fluid gearing	<a href="#">F16H 41/24</a>
----------------------------------	----------------------------

## F16D 35/00

Fluid clutches in which the clutching is predominantly obtained by fluid adhesion ([F16D 37/00](#) takes precedence {; arrangements of viscous clutches in four-wheel drives - [B60K 17/3465](#) and [B60K 17/351](#)})

### References

#### Informative references

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

Arrangements of viscous clutches in four-wheel drives	<a href="#">B60K 17/351</a>
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## F16D 41/00

Freewheels or freewheel clutches (cycle brakes controlled by back-pedalling [B62L 5/00](#) {; one-way linear clutches [F16B 7/16](#)})

### References

#### Informative references

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

Cycle brakes controlled by back-pedalling	<a href="#">B62L 5/00</a>
One-way linear clutches	<a href="#">F16B 7/16</a>

## F16D 43/00

Automatic clutches (varying the relationship between two coaxial shafts [F16D 3/10](#); freewheels, freewheel clutches [F16D 41/00](#))

### References

#### Informative references

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

Couplings for varying the relationship between two coaxial shafts	<a href="#">F16D 3/10</a>
Freewheels, freewheel clutches	<a href="#">F16D 41/00</a>

## F16D 43/04

controlled by angular speed ([F16D 43/24](#) takes precedence; clutches in which the drive is transmitted through a medium consisting of small particles [F16D 37/00](#))

### References

#### Limiting references

This place does not cover:

Clutches in which the drive is transmitted through a medium consisting of small particles	<a href="#">F16D 37/00</a>
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**F16D 43/202**

of the ratchet type (slip couplings of the ratchet type [F16D 7/04](#))

**References****Informative references**

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

Slip couplings of the ratchet type	<a href="#">F16D 7/04</a>
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**F16D 43/204**

with intermediate balls or rollers

**References****Informative references**

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

Slip couplings with intermediate balls or rollers	<a href="#">F16D 7/06</a>
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**F16D 43/206**

moving axially between engagement and disengagement

**References****Informative references**

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

Corresponding slip couplings	<a href="#">F16D 7/08</a>
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**F16D 43/208**

moving radially between engagement and disengagement

**References****Informative references**

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

Corresponding slip couplings	<a href="#">F16D 7/10</a>
------------------------------	---------------------------

**F16D 43/21**

with friction members {(slip couplings of the friction type [F16D 7/02](#))}

**References****Informative references**

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

Corresponding slip couplings	<a href="#">F16D 7/02</a>
------------------------------	---------------------------

**F16D 43/26**

acting at definite angular position or disengaging after {consecutive} definite number of rotations (actuating by means of stationary abutment [F16D 11/02](#), [F16D 13/02](#), [F16D 15/00](#); control of change-speed or reversing-gearings conveying rotary motion [F16H 59/00](#) - [F16H 63/00](#))

**References****Informative references**

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

Actuating by means of stationary abutment	<a href="#">F16D 11/02</a> , <a href="#">F16D 13/02</a> , <a href="#">F16D 15/00</a>
Control of change-speed or reversing-gearings conveying rotary motion	<a href="#">F16H 59/00</a> - <a href="#">F16H 63/00</a>

**F16D 47/02**

of which at least one is a coupling

**References****Informative references**

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

Clutch flywheels with damping devices	<a href="#">F16F 15/10</a>
---------------------------------------	----------------------------

**F16D 47/04**

of which at least one is a freewheel ([F16D 47/02](#), [F16D 47/06](#) take precedence; freewheels combined with a clutch to lock the driving and driven members of the freewheel [F16D 41/04](#), [F16D 41/26](#))

**References****Informative references**

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

Freewheels combined with a clutch to lock the driving and driven members of the freewheel	<a href="#">F16D 41/04</a> , <a href="#">F16D 41/26</a>
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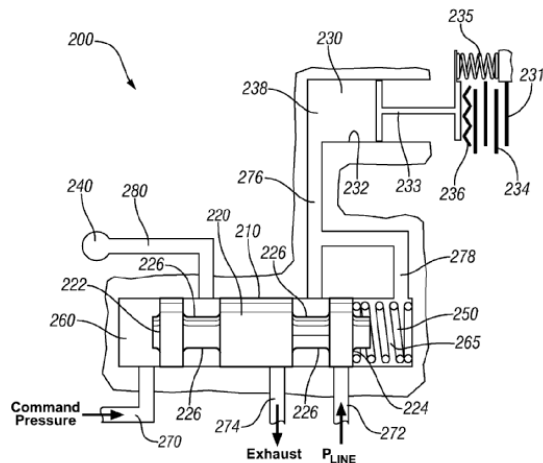
**F16D 2048/0209**

**{characterised by fluid valves having control pistons, e.g. spools}**

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0209](#)



*FIG 4*

**F16D 2048/0212**

**{Details of pistons for primary or secondary cylinders especially adapted for fluid control}**

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0212](#).

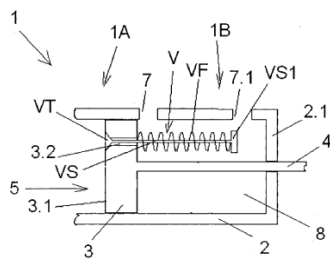


Fig. 2a

## References

### **Informative references**

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

Details of pistons in primary or secondary cylinders	<a href="#">F16D 2025/081</a> , <a href="#">F16D 25/082</a>
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## F16D 2048/0221

{Valves for clutch control systems; Details thereof}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0221](#).

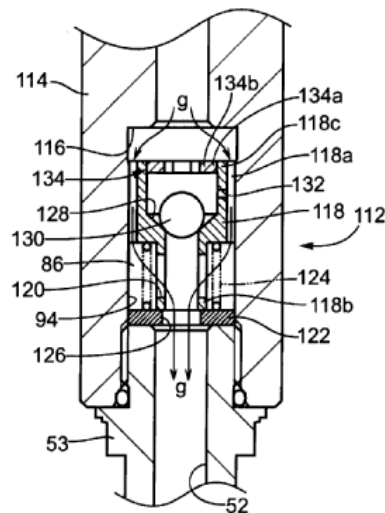
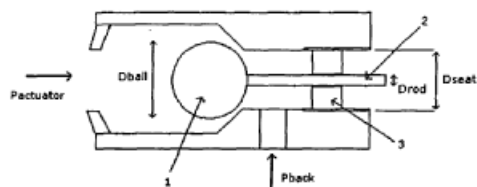


FIGURE 1



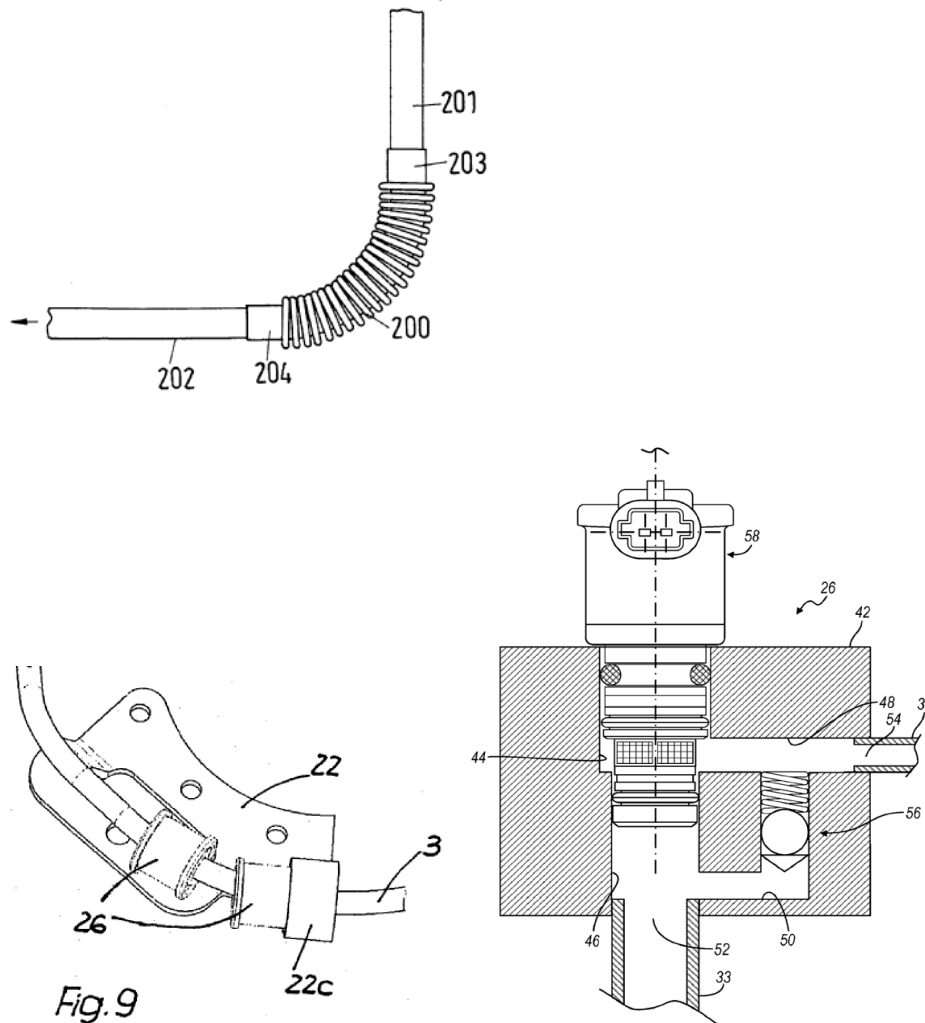
## F16D 2048/0224

{Details of conduits, connectors or the adaptors therefor specially adapted for clutch control}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0224](#).



## F16D 2048/0227

{Source of pressure producing the clutch engagement or disengagement action within a circuit; Means for initiating command action in power assisted devices}

### References

#### Informative references

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

Fluid-actuated clutches with the line of action of the fluid-actuated members being distinctly separate from the axis of rotation	<a href="#">F16D 25/088</a>
---	-----------------------------

Clutches and systems of clutches with a fluid pressure piston driven by an electric motor

[F16D 29/005](#)

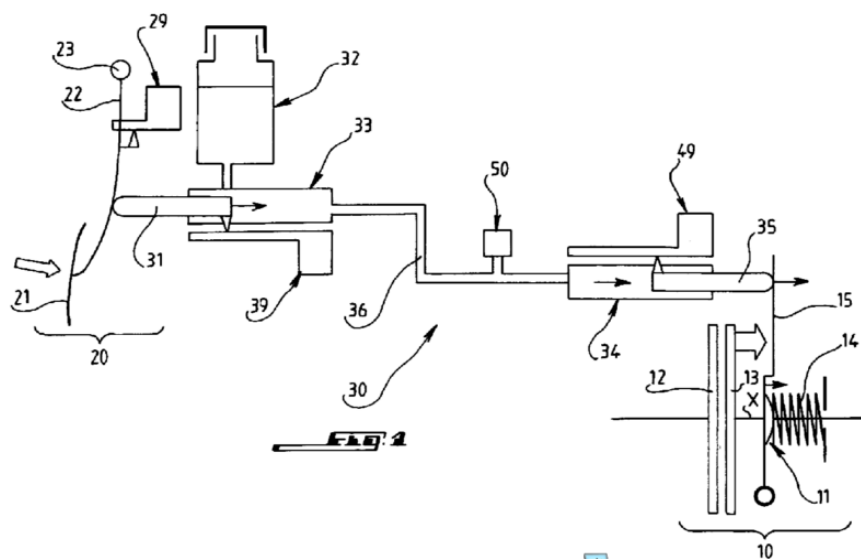
## F16D 2048/023

{by pedal actuation}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/023](#).



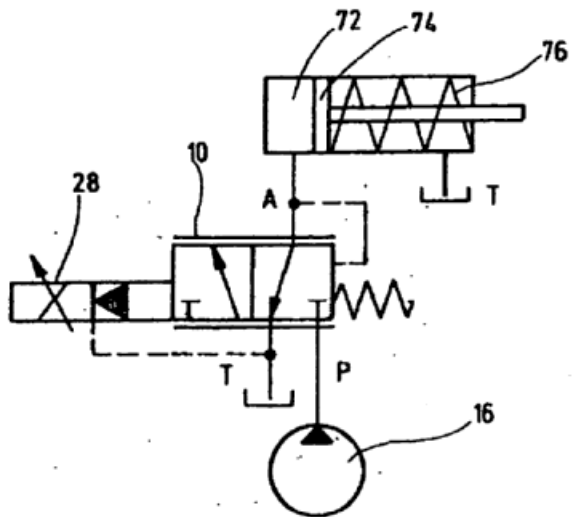
### References

#### Informative references

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

Pedals per se

[G05G 1/30](#)

**F16D 2048/0233****{by rotary pump actuation}****Definition statement***This place covers:*Illustrative example of subject matter classified in [F16D 2048/0233](#).**Fig.7**

**F16D 2048/0236**

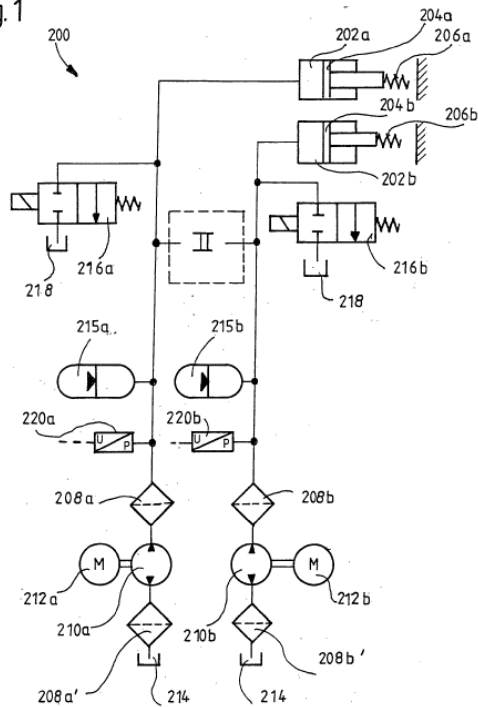
{with multiple independent pumps, e.g. one per clutch, or for supplying fluid to different systems}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0236](#).

Fig. 1



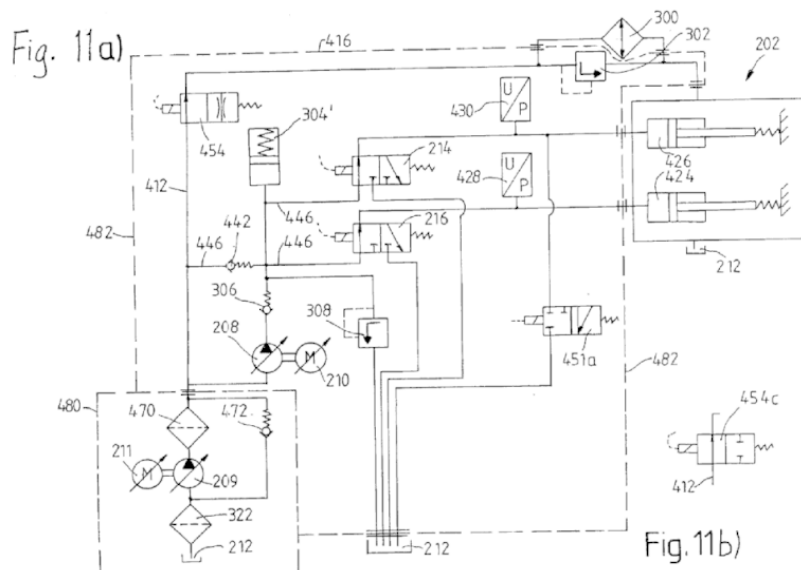
**F16D 2048/0239**

{One fluid source supplying fluid at high pressure and one fluid source supplying fluid at low pressure}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0239](#).

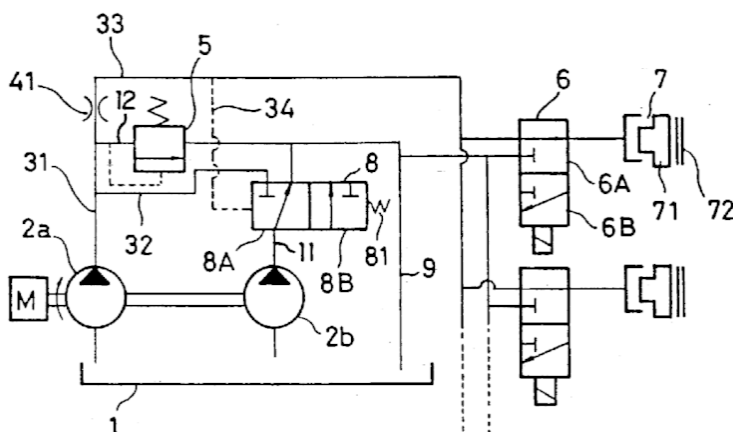
**F16D 2048/0242**

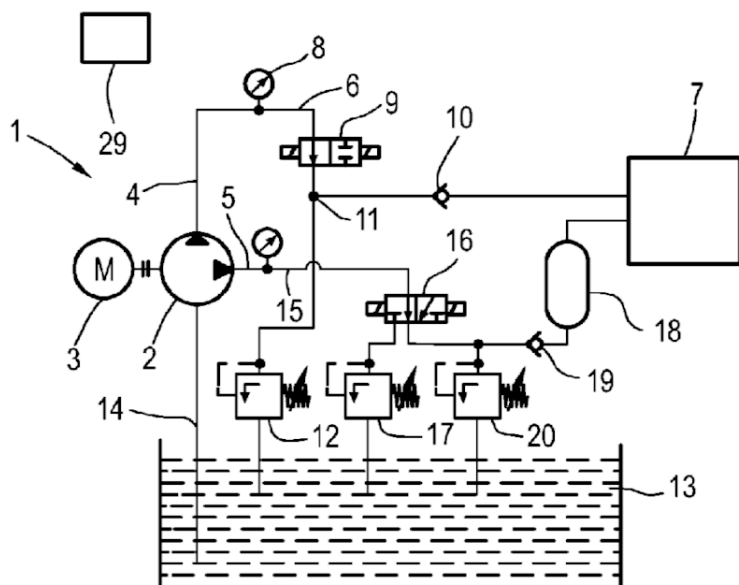
{Two or more rotating pumps driven together by the same power source, e.g. connected by a shaft, or a single pump having two or more fluid outputs}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0242](#).





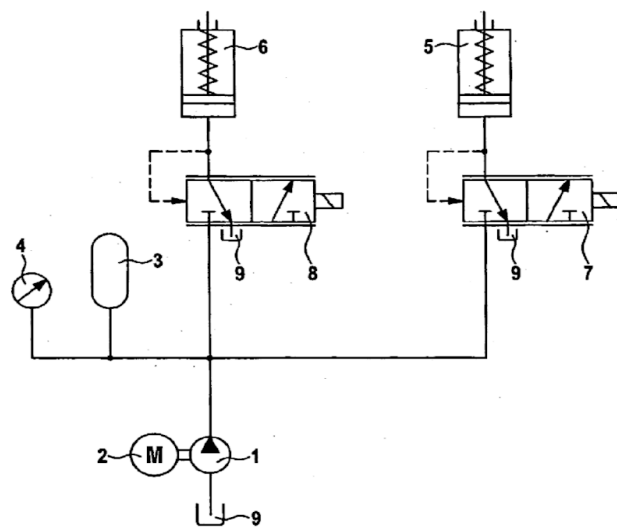
## F16D 2048/0245

{Electrically driven rotary pumps}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0245](#)



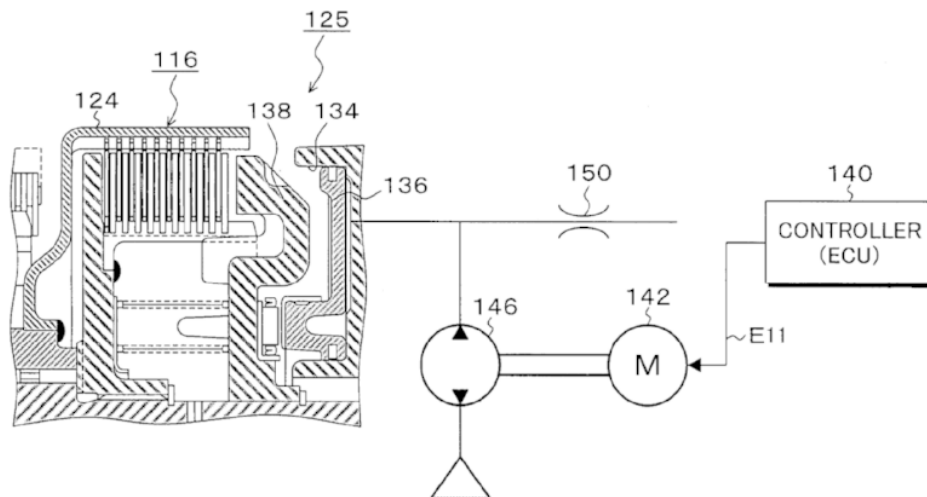
**F16D 2048/0248**

{Reversible rotary pumps, i.e. pumps that can be rotated in the two directions}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0248](#).

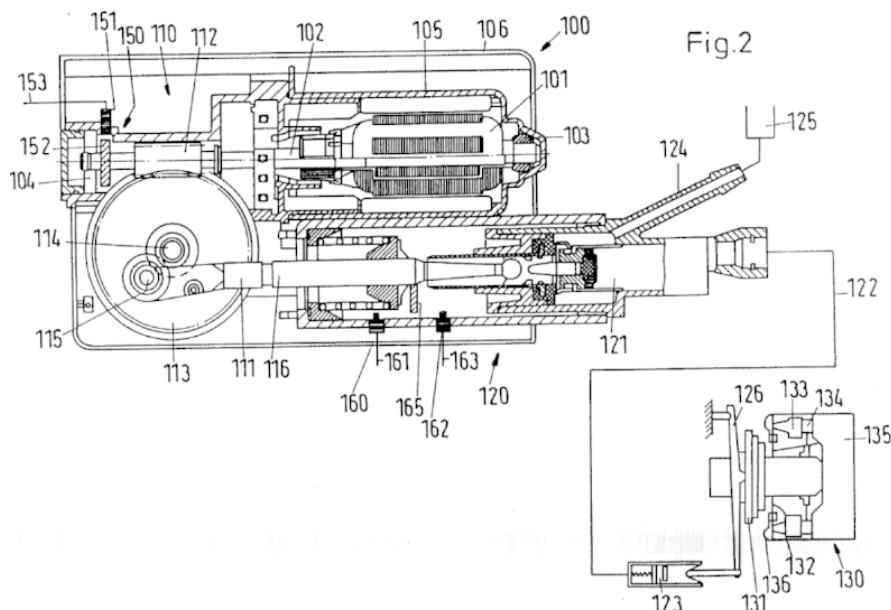
**F16D 2048/0251**

{Electric motor driving a piston, e.g. for actuating the primary cylinder}

**Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0251](#).





## References

### Informative references

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

Details of actuators per se	<a href="#">F16D 29/00</a>
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## F16D 2048/0254

{Double actuation, i.e. two actuation means can produce independently an engagement or disengagement of the clutch}

### Definition statement

This place covers:

Illustrative example of subject matter classified in [F16D 2048/0254](#).

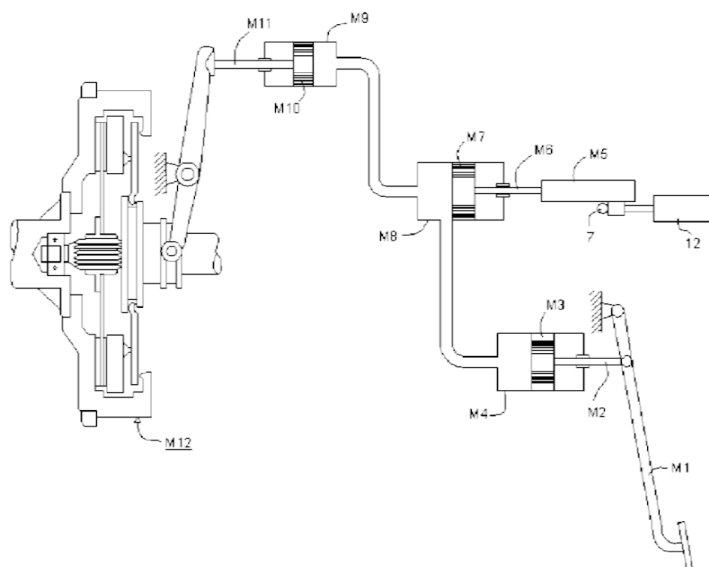
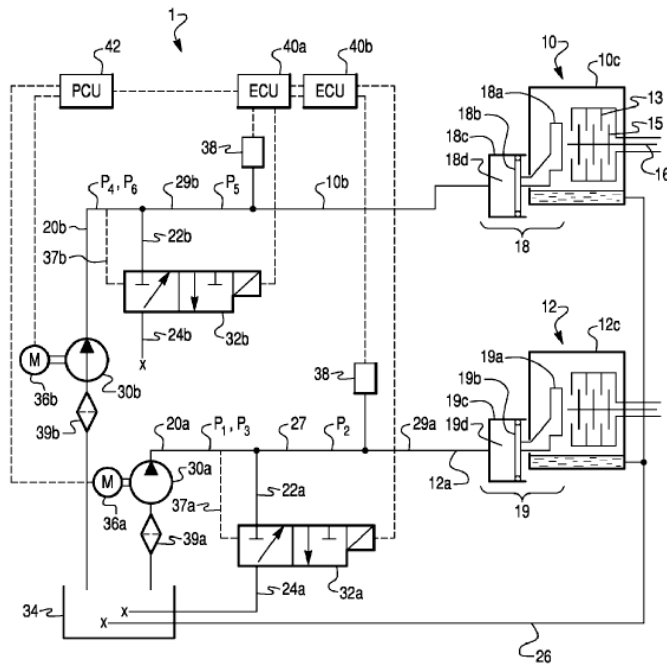


Fig. 5



## F16D 2048/026

{The controlling actuation is directly performed by the pressure source, i.e. there is no intermediate valve for controlling flow or pressure}

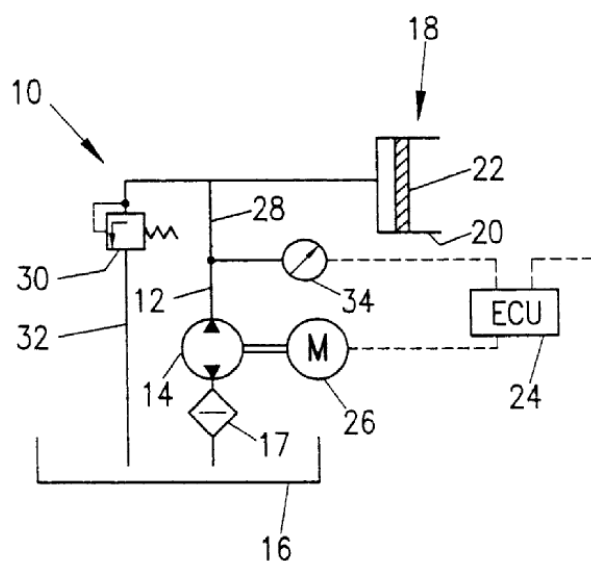
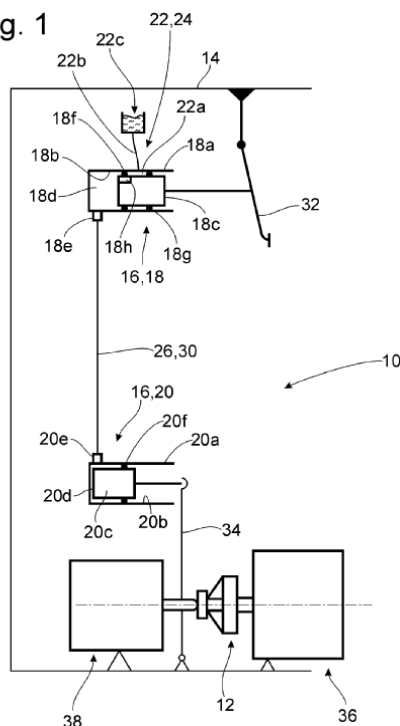
### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/026](#).

Arrangement: Source - Actuation cylinder

**Fig. 1**



## **F16D 2048/0263**

**{Passive valves between pressure source and actuating cylinder, e.g. check valves or throttle valves}**

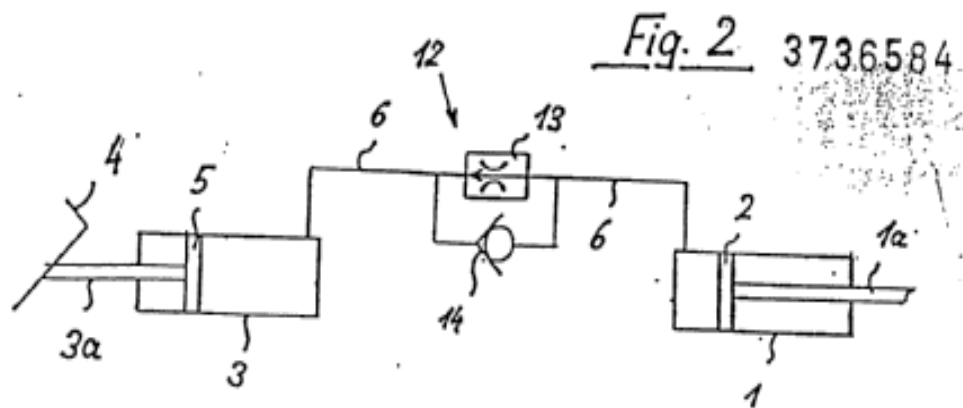
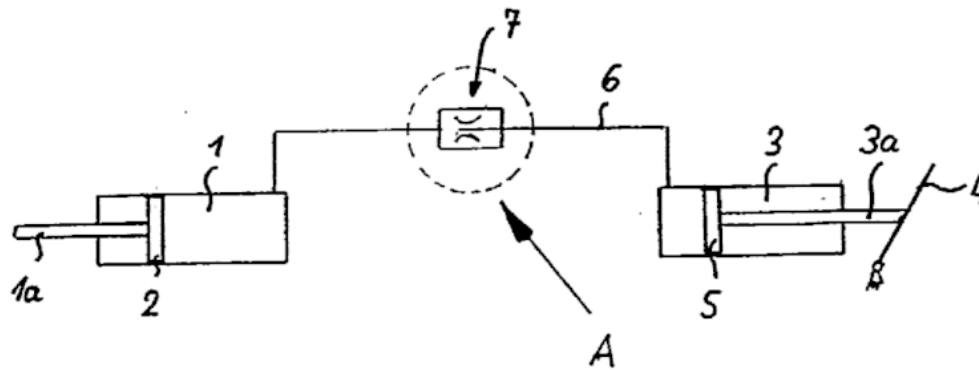
### **Definition statement**

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0263](#).

Definition statement

Arrangement: Source- Passive valves - Actuation cylinder

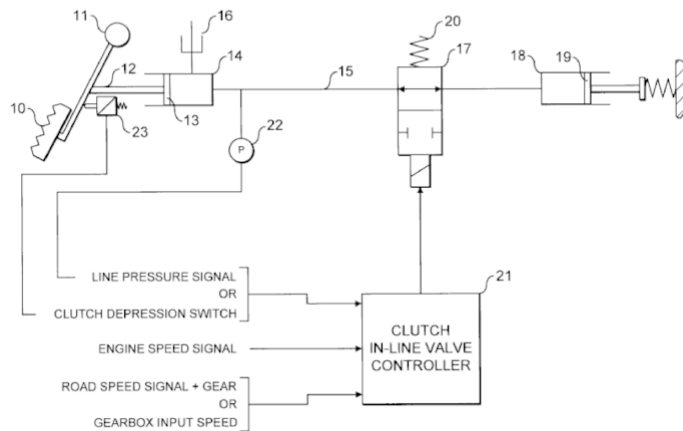
**F16D 2048/0266**

{Actively controlled valves between pressure source and actuation cylinder}

**Definition statement***This place covers:*Illustrative example of subject matter classified in [F16D 2048/0266](#).

Definition statement

Arrangement: Source - Active valves - Actuation cylinder



## F16D 2048/0269

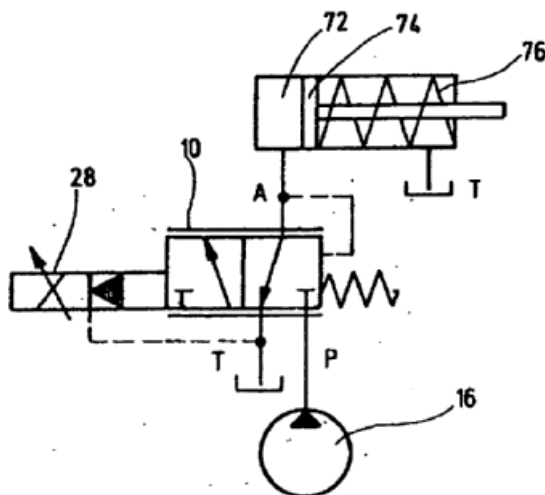
{Single valve for switching between fluid supply to actuation cylinder or draining to the sump}

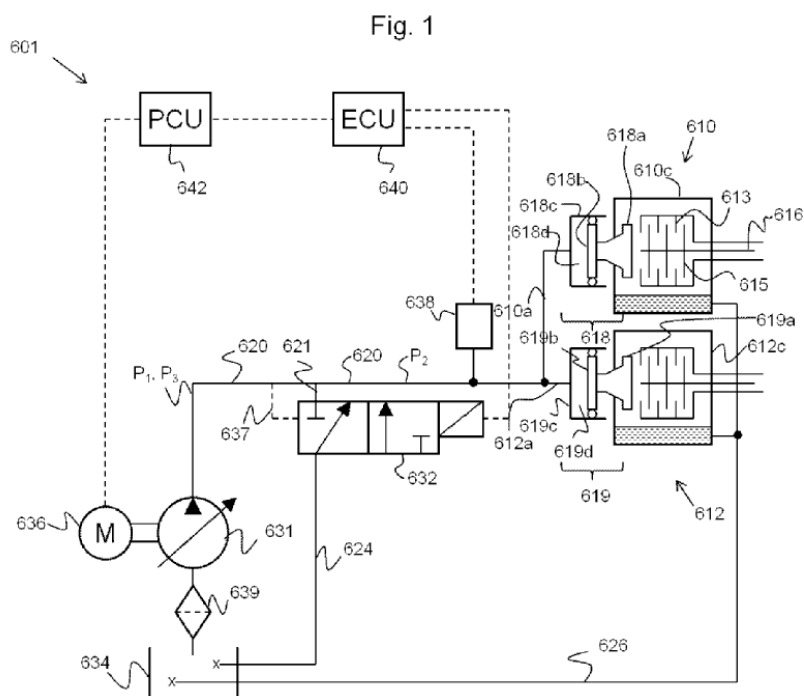
### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0269](#).

Arrangement: Source - Single valve - Actuation cylinder





## F16D 2048/0272

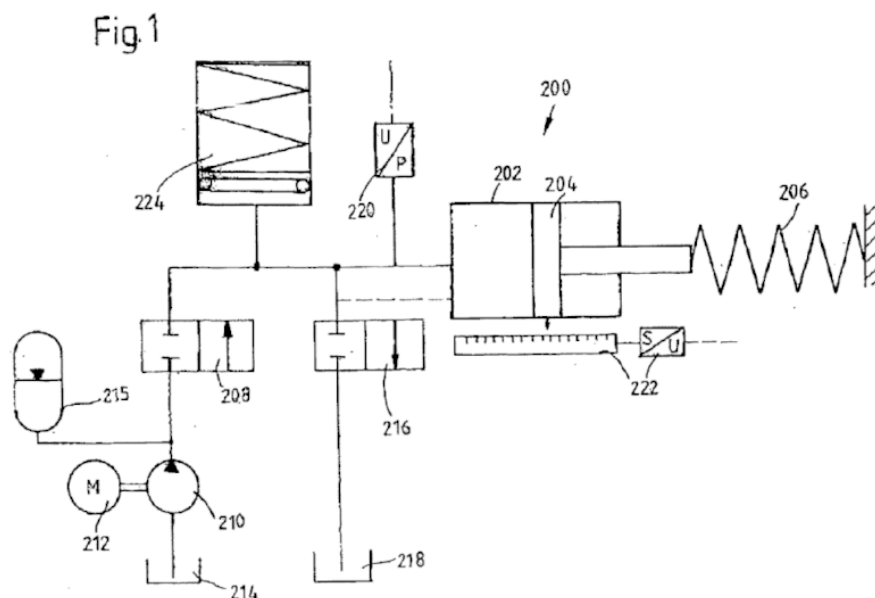
{Two valves, where one valve is supplying fluid to the cylinder and the other valve is for draining fluid to the sump}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0272](#).

Arrangement: Source - Two valves - Actuation cylinder/Sump



## F16D 2048/0275

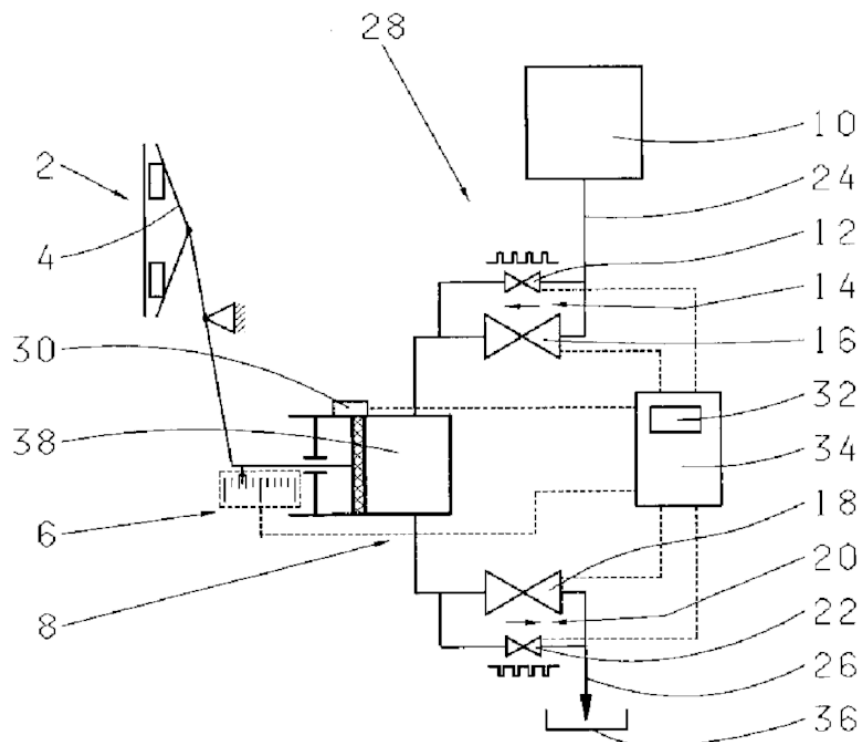
{Two valves arranged in parallel, e.g. one for coarse and the other for fine control during supplying or draining fluid from the actuation cylinder}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0275](#).

Arrangement: Source - Two valves in parallel - Actuation cylinder



## F16D 2048/0278

{Two valves in series arrangement for controlling supply to actuation cylinder}

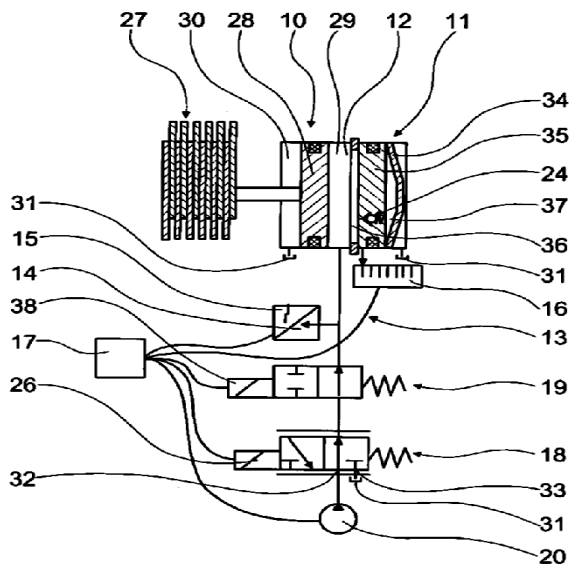
### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0278](#).

Definition statement

Arrangement: Source - Two valves in series - Actuation cylinder



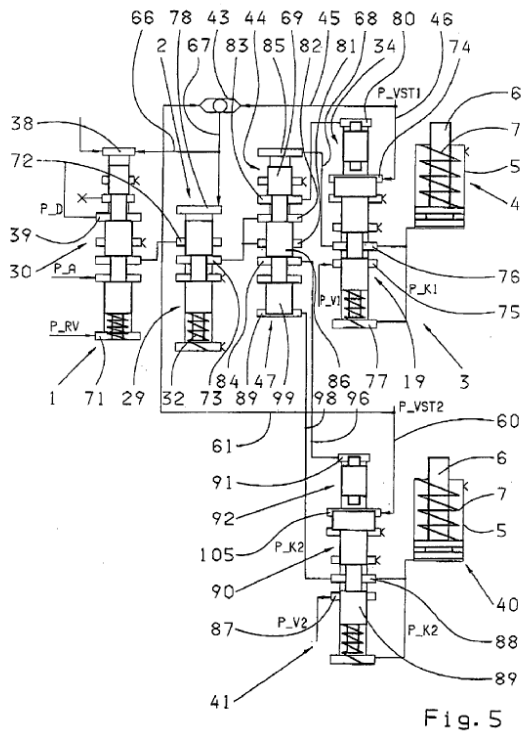
## F16D 2048/0281

{Complex circuits with more than two valves in series or special arrangements thereof not provided for in previous groups}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0281](#).





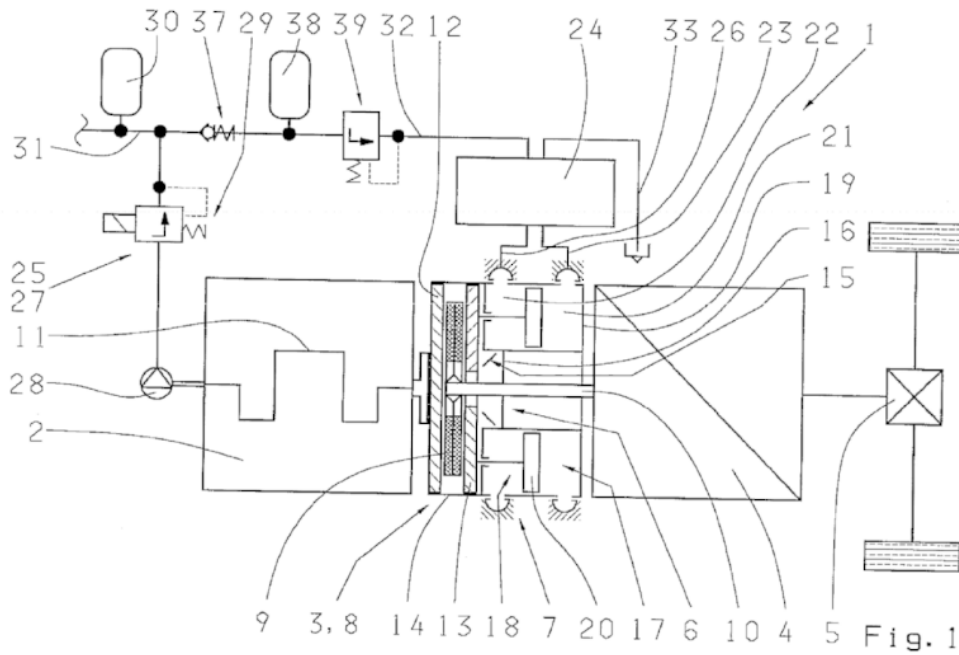
## F16D 2048/0284

**{characterised by valve arrangements supplying fluid to a two chamber-cylinder}**

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0284](#).



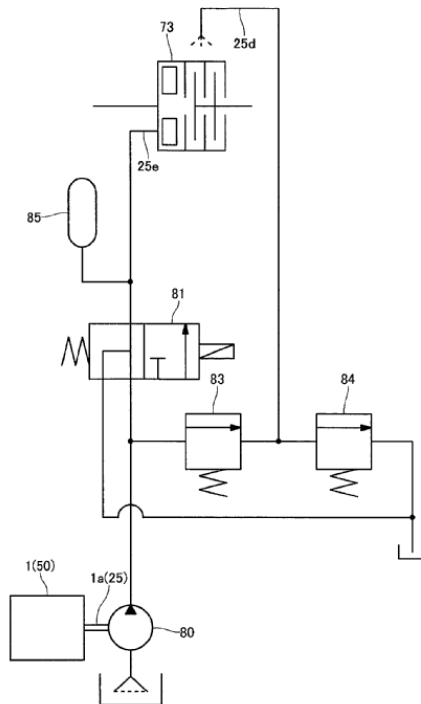
## F16D 2048/029

{Hydraulic circuits combining clutch actuation with clutch lubrication or cooling}

### Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/029](#).



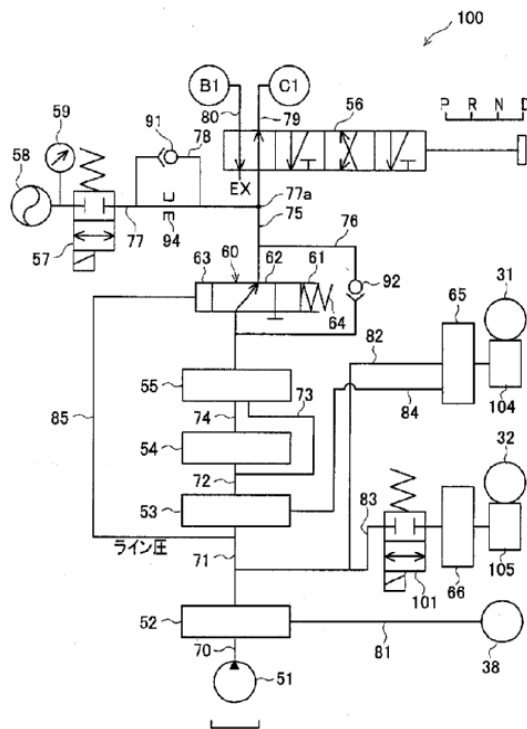
**F16D 2048/0293**

### {Hydraulic circuits combining clutch and transmission actuation}

## Definition statement

*This place covers:*

Illustrative example of subject matter classified in [F16D 2048/0293](#).



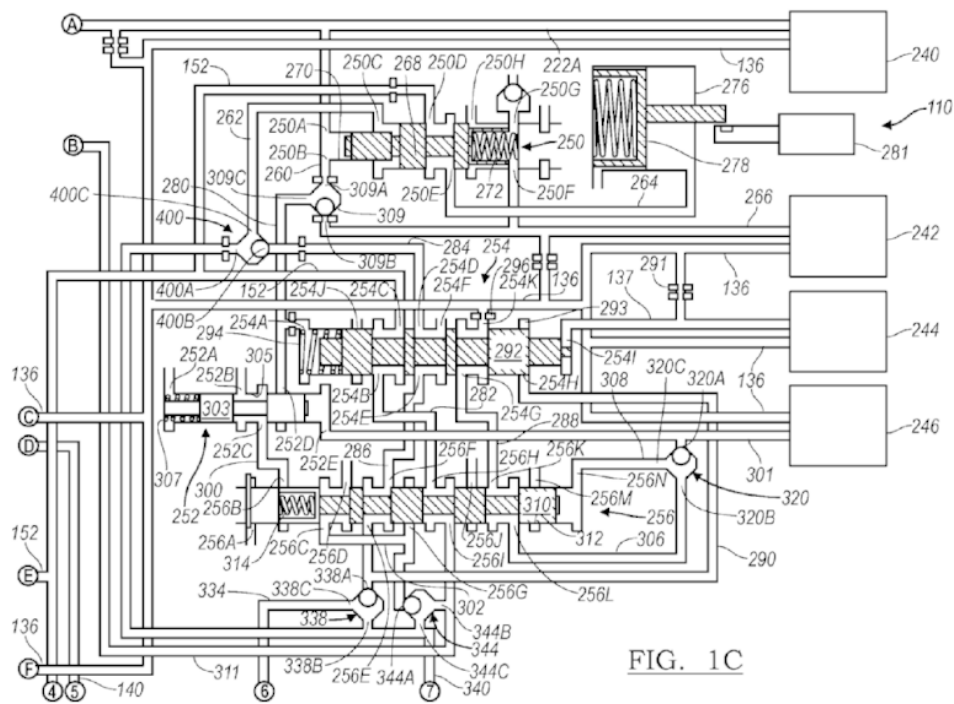
F16D 2048/0296

{Hydraulic circuits controlled exclusively by hydraulic pressure, i.e. with no electrically controlled valves}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0296.



F16D 49/00

Brakes with a braking member co-operating with the periphery of a drum, wheel-rim, or the like (similar clutches F16D 13/10)

Definition statement

This place covers:

External drum brakes.

References

Limiting references

This place does not cover:

Bicycle brakes engaging the tyre surface	B62L 1/04
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Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2129/00.

## F16D 51/00

**Brakes with outwardly-movable braking members co-operating with the inner surface of a drum or the like (similar clutches [F16D 13/14](#))**

### Definition statement

*This place covers:*

Internal drum brakes

### Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).

## F16D 53/00

**Brakes with braking members co-operating with both the periphery and the inner surface of a drum, wheel-rim, or the like (similar clutches [F16D 13/20](#))**

### Definition statement

*This place covers:*

Brakes with a drum that is engaged both radially internally and externally.

### Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).

## F16D 55/00

**Brakes with substantially-radial braking surfaces pressed together in axial direction, e.g. disc brakes (similar clutches [F16D 13/38](#))**

### Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).

## F16D 55/22

**by clamping an axially-located rotating disc between movable braking members, e.g. movable brake discs or brake pads**

### Definition statement

*This place covers:*

Standard disc brakes having an axially fixed disc.

**F16D 55/224****with a common actuating member for the braking members****Definition statement***This place covers:*

The common actuating member (e.g. caliper) is movably mounted (sliding, pivoting) in order to apply the brake force evenly on both sides of the disc.

**Special rules of classification**

This group is used if the way of mounting of the actuating member is not relevant or not shown.

**F16D 55/2245**

{in which the common actuating member acts on two levers carrying the braking members, e.g. tong-type brakes (similar brakes for rail vehicles [B61H 5/00](#))}

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

Tong brakes, mainly for railway vehicles.

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

Rim brakes for bicycles	<a href="#">B62L 1/06</a>
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**F16D 55/2255****in which the common actuating member is pivoted****Definition statement***This place covers:*

e.g. pivoting caliper disc brakes.

**F16D 55/228****with a separate actuating member for each side****Definition statement***This place covers:*

so-called fixed caliper brakes.

**F16D 55/24**

**with a plurality of axially-movable discs, lamellae, or pads, pressed from one side towards an axially-located member**

**Definition statement**

*This place covers:*

The term "plurality of" relates to stator and rotor elements, i.e. brakes with one axially movable rotor and one axially movable stator (disc or pad) fall within the scope of this class.

**F16D 55/28**

**Brakes with only one rotating disc**

**Definition statement**

*This place covers:*

Brakes with a single disc which is rotating and axially movable.

**F16D 55/36**

**Brakes with a plurality of rotating discs all lying side by side**

**Definition statement**

*This place covers:*

so-called multi-disc or lamellae brakes.

**F16D 57/00**

**Liquid-resistance brakes; {Brakes using the internal friction of fluids or fluid-like media, e.g. powders (for braking drums, barrels or ropes of cranes, lift hoists or winches [B66D 5/026](#))}**

**Special rules of classification**

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).

**F16D 59/00**

**Self-acting brakes, e.g. coming into operation at a predetermined speed**

**Special rules of classification**

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).

## F16D 59/02

**spring-loaded and adapted to be released by mechanical, fluid, or electromagnetic means**

### Definition statement

*This place covers:*

Spring-applied brakes, regardless of their type (drum / disc).

### Special rules of classification

This group is not used for classification anymore. Instead a classification for the type of brake and the appropriate codes in group [F16D 2121/00](#) "for releasing a normally applied brake" is assigned.

Example:

A spring-applied, electromagnetically released fixed caliper disc brake is classified [F16D 55/228](#) and [F16D 2121/22](#).

## F16D 61/00

**Brakes with means for making the energy absorbed available for use  
([F16D 57/00](#) takes precedence)**

### References

#### Limiting references

*This place does not cover:*

Electrodynamic brake systems for vehicles	<a href="#">B60L 7/00</a>
Dynamo-electric brakes	<a href="#">H02K 49/00</a>

### Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).

## F16D 63/00

**Brakes not otherwise provided for; Brakes combining more than one of the types of groups [F16D 49/00](#) - [F16D 61/00](#)**

### Definition statement

*This place covers:*

Brakes combining a plurality of brakes, each of these brakes is additionally classified in the relevant groups, e.g. a combined disc and drum brake is classified [F16D 63/00](#) and [F16D 51/00](#) and [F16D 55/00](#).

### Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).



## F16D 65/00

**Parts or details (similar members for clutches [F16D 13/58](#))**

### Definition statement

*This place covers:*

Brake parts, details and accessories which cannot be classified in any of the other groups or in the subgroups of [F16D 65/00](#).

### Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).

## F16D 65/0006

**{Noise or vibration control}**

### Definition statement

*This place covers:*

Means for noise or vibration control in brakes.

### References

#### Limiting references

*This place does not cover:*

Resilient means interposed between pads and supporting members (so-called anti-rattle springs)	<a href="#">F16D 65/097</a>
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### Special rules of classification

If noise or vibration of a specific brake or component is controlled, an additional classification is given.

Example:

A brake disc with means for noise damping is classified [F16D 65/0006](#) and [F16D 65/12](#).

## F16D 65/005

**{Components of axially engaging brakes not otherwise provided for}**

### Definition statement

*This place covers:*

Parts of axially engaging brakes, e.g. disc brakes, which are classified [F16D 55/00](#).

**F16D 65/02****Braking members; Mounting thereof (friction linings or attachment thereof  
[F16D 69/00](#))****Definition statement***This place covers:*

Members interacting with each other to produce the braking effect, including active braking members, e.g. brake pads, and passive members to be braked, e.g. brake discs and drums; Accessories for mounting, e.g. holding springs, abutments.

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

Friction linings as such (physical aspects, e.g. shape)	<a href="#">F16D 69/00</a>
Friction lining composition	<a href="#">F16D 69/02</a>

**F16D 65/09****Pivots or supporting members therefor****Definition statement***This place covers:*

Drum brake shoe pivots or abutments, e.g. anchor blocks.

**F16D 65/091****{for axially holding the segments}****Definition statement***This place covers:*

e.g. springs holding drum brake shoes in contact with the brake carrier.

**F16D 65/095****Pivots or supporting members therefor****Definition statement***This place covers:*

e.g. details of disc brake pad abutments.

**F16D 65/097**

**Resilient means interposed between pads and supporting members {or other brake parts}**

**Definition statement**

*This place covers:*

primarily so-called anti-rattle springs.

**F16D 65/10**

**Drums for externally- or internally-engaging brakes**

**Definition statement**

*This place covers:*

Cylindrical braked members, engaged on the radially inner and/or outer side. Contains mainly brake drums for standard drum brakes, i.e. with radially inner braking surface.

**References****Limiting references**

*This place does not cover:*

Rotors having both a drum and a disc part	<a href="#">F16D 65/12</a>
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**Special rules of classification**

Additional classification is given in groups [F16D 2065/13](#).

**F16D 65/12**

**Discs; Drums for disc brakes**

**Definition statement**

*This place covers:*

Simple disc rotors and rotors having both a drum and a disc part.

**Special rules of classification**

Additional classification is given in groups [F16D 2065/13](#).

**F16D 65/16**

**arranged in or on the brake**

**Definition statement**

*This place covers:*

Actuating mechanisms which are integrated in the brake itself.

## References

### Limiting references

*This place does not cover:*

Actuation mechanisms arranged apart from the brake, e.g. connected to the brake by a rod.	<a href="#">F16D 65/12</a>
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## F16D 65/18

**adapted for drawing members together {, e.g. for disc brakes}**

### Definition statement

*This place covers:*

in particular disc brake actuators.

## F16D 65/22

**adapted for pressing members apart {, e.g. for drum brakes}**

### Definition statement

*This place covers:*

in particular drum brake actuators.

## F16D 65/28

**arranged apart from the brake**

### Definition statement

*This place covers:*

Independent actuator units, e.g. secondary cylinders acting on the brake members via a rod.

## References

### Informative references

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

Brake cylinders other than ultimate actuators	<a href="#">B60T 17/08</a>
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## F16D 65/78

**Features relating to cooling**

### Definition statement

*This place covers:*

Anything to do with cooling of brakes; e.g. modification of brakes to improve cooling, liquid cooling circuits.

## References

### Limiting references

*This place does not cover:*

Brake drums with cooling fins	<a href="#">F16D 65/10</a> and <a href="#">F16D 2065/1332</a>
Internally ventilated brake discs	<a href="#">F16D 65/12</a> and <a href="#">F16D 2065/1328</a>
Vehicle modifications to facilitate cooling of brakes	<a href="#">B60T 5/00</a>

## F16D 66/00

**Arrangements for monitoring working conditions, e.g. wear, temperature**

### Definition statement

*This place covers:*

Devices for brake monitoring only.

## References

### Limiting references

*This place does not cover:*

Monitoring brake control circuits	<a href="#">B60T 17/18</a>
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### Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#).

## F16D 67/00

**Combinations of couplings and brakes; Combinations of clutches and brakes (combinations of couplings and clutches [F16D 47/02](#); conjoint control of brake systems and driveline clutches in vehicles [B60W 10/02](#), [B60W 10/18](#))**

### Definition statement

*This place covers:*

Arrangements combining clutches with brakes in one unit

Arrangements combining couplings with brakes in one unit

## References

### Limiting references

*This place does not cover:*

Conjoint control of brake systems and driveline clutches in vehicles	<a href="#">B60W 10/02</a> , <a href="#">B60W 10/18</a>
--	---

## Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2121/00](#) - [F16D 2131/00](#), e.g. additional classification for indicating type of brake and actuating force are assigned.

## F16D 67/02

### Clutch-brake combinations

#### Definition statement

*This place covers:*

Clutches with external or internal control combined with a brake.

## F16D 69/00

**Friction linings; Attachment thereof; Selection of coating friction substances or surfaces (clutching elements [F16D 13/60](#); braking members [F16D 65/02](#))**

#### Definition statement

*This place covers:*

Friction elements characterised by their physical aspects (e.g. shape or surface structure).

#### References

##### Limiting references

*This place does not cover:*

Braking members, e.g. assembly of friction material and support structure, friction block with backing plate	<a href="#">F16D 65/02</a>
Friction lining composition	<a href="#">F16D 69/02</a>

## Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups [F16D 2200/00](#) and [F16D 2250/00](#).

## F16D 69/02

### Composition of linings {; Methods of manufacturing}

#### Definition statement

*This place covers:*

- processes for making friction linings
- special shapes or arrangements of linings
- semi-metallic compositions e.g. metal-ceramic

#### References

##### Limiting references

*This place does not cover:*

- ceramic composites (e.g. C/SiC): [F16D 69/023](#) with Indexing Code for "ceramic composite" and [C04B](#)

- anti friction materials: [F16C 33/00](#)

### Informative references

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

Clutching elements	<a href="#">F16D 13/60</a>
Braking elements	<a href="#">F16D 65/02</a>
Mating compositions for stator / rotor	<a href="#">F16D 2069/003</a>
Layered structure	<a href="#">F16D 2069/005</a> , <a href="#">F16D 2069/006</a> , <a href="#">F16D 2069/007</a>
Clutch discs	<b>F13D13/64</b>

### Special rules of classification

Surface treatment of the friction surface [F16D 69/02](#) and Indexing Code for "surface treatment"

## F16D 69/023

**{Composite materials containing carbon and carbon fibres or fibres made of carbonizable material}**

### Definition statement

*This place covers:*

C/C composites and ceramic composites : carbon/carbon composites infiltrated with Si, B or Metals.

### References

#### Informative references

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

C/C composites infiltrated with silicium, in general	<a href="#">C04B 35/573</a>
C/C composite materials in general	<a href="#">C04B 35/83</a>

### Special rules of classification

For ceramic composites: [F16D 69/023](#) and Indexing Code for "ceramic composite".

## F16D 69/027

**{Compositions based on metals or inorganic oxides}**

### Definition statement

*This place covers:*

Compositions containing :

- metals or metal oxides as BINDER
- inorganic binders
- sintered metals

## References

### Informative references

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

Metal alloys	<a href="#">C22C</a>
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## F16D 2121/00

### Type of actuator operation force

#### Definition statement

*This place covers:*

This code indicates which operation force drives the brake and is combined with a classification characterising the general structure of the brake or the actuator itself (e.g. drum / disc brake).

If different sources are present, each is classified separately, and in addition, a classification in group [F16D 2123/00](#) is assigned.

## References

### Informative references

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

Actuator components	<a href="#">F16D 2125/00</a>
Actuators for ancillary elements like parking brake locks	<a href="#">F16D 2129/00</a>

## F16D 2121/18

### Electric or magnetic

## References

### Limiting references

*This place does not cover:*

Brakes comprising a medium with electrically or magnetically controlled internal friction	<a href="#">F16D 57/002</a>
Electrodynamic brake systems for vehicles	<a href="#">B60L 7/00</a>
Dynamo-electric brakes; eddy current brakes	<a href="#">H02K 49/00</a>

## F16D 2123/00

### Multiple operation forces

#### Definition statement

*This place covers:*

This code indicates the presence of multiple independently operating actuators. Not used for plural actuators which are connected to the same power source and can only work in concert, like interconnected hydraulic cylinders.

When this code is assigned, each operation force is indexed additionally.



## F16D 2125/00

### Components of actuators

#### Definition statement

*This place covers:*

The code is used to describe the mechanical construction of actuators; a symbol is assigned for each individual component.

## F16D 2127/00

### Auxiliary mechanisms

#### Definition statement

*This place covers:*

Additional control mechanisms having a specific function; does not include slack adjusters (classified in group [F16D 65/38](#)) or simple mechanical elements (indexed [F16D 2125/00](#)).

## F16D 2500/3101

### Detection of a brake actuation by a sensor on the brake

#### References

##### Informative references

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

Brake pedal position	<a href="#">F16D 2500/31426</a>
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