# COOPERATIVE PATENT CLASSIFICATION

**B**

PERFORMING OPERATIONS; TRANSPORTING  
**(NOTES omitted)**

## SHAPING

**B22**

CASTING; POWDER METALLURGY

**B22C**

FOUNDRY MOULDING *(moulding refractory materials in general B28B)*

**NOTE**

This subclass covers:
- the making of moulds for casting metals or of other refractory moulds;
- selection or preparation of materials therefor;
- the necessary patterns, processes, machines, accessory devices or tools.

**WARNINGS**

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   - B22C 3/02 covered by B22C 3/00
   - B22C 5/13 covered by B22C 5/12
   - B22C 7/05 covered by B22C 7/04
   - B22C 9/11 covered by B22C 9/12
   - B22C 9/14 covered by B22C 9/12
   - B22C 15/264 - B22C 15/276 covered by B22C 15/23
   - B22C 19/01 covered by B22C 19/00

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

### 1/00 Compositions of refractory mould or core materials; Grain structures thereof (refractory materials in general C04B 35/00); Chemical or physical features in the formation or manufacture of moulds

<table>
<thead>
<tr>
<th>CPC</th>
<th>Description</th>
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<tbody>
<tr>
<td>1/00</td>
<td>Compositions of refractory mould or core materials; Grain structures thereof (refractory materials in general C04B 35/00); Chemical or physical features in the formation or manufacture of moulds</td>
</tr>
<tr>
<td>1/02</td>
<td>. characterised by additives for special purposes, e.g. indicators, breakdown additives</td>
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<tr>
<td>1/04</td>
<td>. . for protection of the casting, e.g. against decarboxylation</td>
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<tr>
<td>1/06</td>
<td>. . . for casting extremely oxidisable metals</td>
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<td>1/08</td>
<td>. . . for decreasing shrinkage of the mould, e.g. for investment casting</td>
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<tr>
<td>1/10</td>
<td>. . . for influencing the hardening tendency of the mould material (influencing the hardening tendency of the binding agent only B22C 1/16)</td>
</tr>
<tr>
<td>1/12</td>
<td>. . for manufacturing permanent moulds or cores</td>
</tr>
<tr>
<td>1/14</td>
<td>. . for separating the pattern from the mould</td>
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<tr>
<td>1/16</td>
<td>. . characterised by the use of binding agents; Mixtures of binding agents</td>
</tr>
<tr>
<td>1/162</td>
<td>. . {use of a gaseous treating agent for hardening the binder}</td>
</tr>
<tr>
<td>1/165</td>
<td>. . {in the manufacture of multilayered shell moulds}</td>
</tr>
<tr>
<td>1/167</td>
<td>. . {Mixtures of inorganic and organic binding agents}</td>
</tr>
<tr>
<td>1/18</td>
<td>. . . of inorganic agents (B22C 1/162 takes precedence)</td>
</tr>
<tr>
<td>1/181</td>
<td>. . . {Cements, oxides or clays}</td>
</tr>
<tr>
<td>1/183</td>
<td>. . . {Sols, colloids or hydroxide gels}</td>
</tr>
<tr>
<td>1/185</td>
<td>. . . {containing phosphates, phosphoric acids or its derivatives}</td>
</tr>
<tr>
<td>1/186</td>
<td>. . . {containing ammonium or metal silicates, silica sols}</td>
</tr>
<tr>
<td>1/188</td>
<td>. . . {alkali metal silicates}</td>
</tr>
<tr>
<td>1/189</td>
<td>. . . of organic agents</td>
</tr>
<tr>
<td>1/205</td>
<td>. . . {of organic silicon or metal compounds, other organometallic compounds}</td>
</tr>
<tr>
<td>1/22</td>
<td>. . . of resins or rosins</td>
</tr>
<tr>
<td>1/2206</td>
<td>. . . {obtained by reactions only involving carbon-to-carbon unsaturated bonds}</td>
</tr>
<tr>
<td>1/2213</td>
<td>. . . {Polyylenes}</td>
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<tr>
<td>1/222</td>
<td>. . . {Polycrylates}</td>
</tr>
<tr>
<td>1/2226</td>
<td>. . . {Polymers containing halogens}</td>
</tr>
<tr>
<td>1/2233</td>
<td>. . . {obtained otherwise than by reactions only involving carbon-to-carbon unsaturated bonds}</td>
</tr>
<tr>
<td>1/224</td>
<td>. . . {Furan polymers (B22C 1/2273 takes precedence)}</td>
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<tr>
<td>1/2246</td>
<td>. . . {Condensation polymers of aldehydes and ketones (B22C 1/224, B22C 1/2273 takes precedence)}</td>
</tr>
<tr>
<td>1/2253</td>
<td>. . . . . . {with phenols}</td>
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<tr>
<td>1/226</td>
<td>. . . . {Polypeoxides}</td>
</tr>
<tr>
<td>1/2266</td>
<td>. . . . {Polysters; Polycarbonates}</td>
</tr>
<tr>
<td>1/2273</td>
<td>. . . {Polyurethanes; Polyisocyanates}</td>
</tr>
<tr>
<td>1/228</td>
<td>. . . . {Polyamides}</td>
</tr>
<tr>
<td>1/2286</td>
<td>. . . . {Polyethers}</td>
</tr>
</tbody>
</table>
Selection of compositions for coating the surfaces of moulds, cores, or patterns

Machines or devices specially designed for dressing or handling the mould material so far as specially adapted for that purpose (of general adaptability, see the relevant places, e.g. for material with water-setting properties B28C)

Dressing by centrifuging essentially or additionally by grinding, blending, mixing, kneading, or stirring

Blending, mixing, kneading or stirring; Methods therefor (B22C 5/0486 takes precedence)

Horizontal mixing and conveying units, e.g. the unit being rotatable about a vertical axis, or having a supplementary mixing house with a vertical axis at its end

Details concerning the method

Devices having a fixed receptable with rotating tools, some or all of these tools being rolls or balls loosely mounted on their axis or loose balls in contact with the side wall or the bottom of the receptacle, e.g. with aerating means; “Devices of the Muller type”

having only one vertical tool-driving shaft

having at least two vertical tool-driving shafts

having a horizontal tool-driving shaft

Devices having a vertical stirrer shaft in a fixed receptacle (B22C 5/0422 takes precedence)

the material flowing continuously through the device

Devices having a horizontal stirrer shaft in a fixed receptacle (B22C 5/0422 takes precedence)

with bottom disc rotating about a vertical axis or with receptacle rotating about a vertical or steeply inclined axis, e.g. with fixed or driven tools, such as rolls

with a receptacle rotating about a horizontal or slightly inclined axis, e.g. with fixed or rotating tools

Plants

having feeding moulds, e.g. using gas

Parts; Accessories; Controlling; Feeding; Discharging; Proportioning

Mixing while transporting the mixture on an endless belt, e.g. with driven stirring elements

using vibrations

Movable devices for cutting or mixing material laying on the ground

using rotating tools

combined with another operation, e.g. sieving, or with means for picking up material from the ground

by sieving or magnetic separating

by sprinkling, cooling, or drying

Cooling or drying the sand together with the castings

by dust separating

for filling flasks (in combination with compacting B22C 15/20 - B22C 15/28)

Equipment for storing or handling the dressed mould material, forming part of a plant for preparing such material

with conveyors or other equipment for feeding the material

Plants for preparing mould materials

[comprising a wet reclamation step]

Patterns; Manufacture thereof so far as not provided for in other classes

Adjustable, sectional, expandable or flexible patterns

Lost patterns

Patterns made from expanded plastic materials

by assembling preformed parts (joining of plastics, in general B22C 65/00)

Pattern plates

Core boxes

Sealing means

Venting means

Ejector elements

Moulds or cores (uniquely adapted to particular casting processes B22D); Moulding processes (processes involving the use of particular moulding machines, see the relevant groups for these machines)

Sand moulds or like moulds for shaped castings

formed by vacuum-sealed moulding

Use of lost patterns

Removing the consumable pattern

Use of patterns which are eliminated by the liquid metal in the mould

Permanent moulds for shaped castings (moulds for ingots B22D 7/06)

Materials which make up the mould

Mechanisms for locking or opening moulds

Locating means for cores

Cooling or heating equipment for moulds

Venting means for moulds

Semi-permanent moulds

Features with respect to supply of molten metal, e.g. ingates, circular gates, skim gates

Sprues, pouring cups

Breaker cores

Filters

Feeder heads

Cores; Manufacture or installation of cores (breaker cores B22C 9/084)

Permanent cores

Multipart cores

Salt cores

Vented or reinforced cores

Installation of cores

Treating moulds or cores, e.g. drying, hardening

Gas-hardening

Hardening by freezing

Finishing

Stack moulds, i.e. arrangement of multiple moulds or flasks
Moulding machines for making moulds or cores

11/00 Moulding machines characterised by the relative arrangement of the parts of same
11/02 . Machines in which the moulds are moved during a cycle of successive operations
11/04 . by a horizontal rotary table or carrier
11/06 . by a vertical rotary carrier
11/08 . by non-rotary conveying means, e.g. by travelling platforms
11/10 . with one or more flasks forming part of the machine, from which only the sand moulds made by compacting are removed
11/12 . Moulding machines able to travel

13/00 Moulding machines for making moulds or cores of particular shapes
13/02 . equipped with templates, e.g. for sweeping operation
13/04 . with rotary templates, e.g. arranged on a pillar
13/06 . with non-rotary template and rotary flask
13/08 . for shell moulds or shell cores
13/085 . (by investing a lost pattern)
13/10 . for pipes or elongated hollow articles
13/12 . for cores
13/14 . by sweeping, turning, or coating
13/16 . by pressing through a die

15/00 Moulding machines characterised by the compacting mechanism; Accessories therefor
15/02 . Compacting by pressing devices only
15/04 . involving muscle power, e.g. hand-operated levers
15/06 . involving mechanical gearings, e.g. crank gears (B22C 15/04 takes precedence)
15/08 . involving pneumatic or hydraulic mechanisms
15/10 . Compacting by jarring devices only
15/12 . involving mechanical gearings
15/14 . involving pneumatic or hydraulic mechanisms
15/16 . the machine having special provision for reducing shock to its frame
15/18 . . . . by means of separate shock-absorbers
15/20 . Compacting by centrifugal forces only, e.g. in sand slingers
15/23 . Compacting by gas pressure or vacuum
15/24 . involving blowing devices in which the mould material is supplied in the form of loose particles
15/245 . . . [Blowing tubes]
15/26 . involving propulsion devices in which the mould material is supplied in the shape of a compacted column or the like
15/28 . Compacting by different means acting simultaneously or successively, e.g. preliminary blowing and finally pressing
15/30 . . by both pressing and jarring devices
15/32 . . . involving mechanical gearing only
15/34 . . . involving pneumatic or hydraulic mechanisms only

17/00 Moulding machines characterised by the mechanism for separating the pattern from the mould or for turning over the flask or the pattern plate
17/02 . Moulding machines with pin lifting arrangement
17/04 . Drop-plate moulding machines
17/06 . Moulding machines using stripping plates; Stripping plates
17/08 . Moulding machines with mechanisms to turn over the pattern plate or the mould around a horizontal axis
17/10 . . Turning-over pattern plate and flask only (B22C 17/14 takes precedence)
17/12 . . Turning-over pattern plate, flask, and compacting device as a unit (B22C 17/14 takes precedence)
17/14 . . arranged to one side of the mould table, so-called roll-over table moulding machines

19/00 Components or accessories for moulding machines
19/02 . Mould tables
19/04 . Controlling devices specially designed for moulding machines
19/06 . Devices for rapping or loosening the pattern

21/00 Flasks; Accessories therefor (stripping plates B22C 17/06)
21/01 . for vacuum-sealed moulding
21/02 . Sectional flasks, i.e. with divided, articulated, or interchangeable side sections
21/04 . Upset frames; Bottom boards or mould boards (pattern plates B22C 7/04)
21/06 . . Bottom boards or mould boards
21/08 . Clamping equipment
21/10 . Guiding equipment
21/12 . Accessories
21/14 . . . for reinforcing or securing moulding materials or cores, e.g. gaggers, chaplets, pins, bars

23/00 Tools; Devices not mentioned before for moulding
23/02 . Devices for coating moulds or cores

25/00 Foundry moulding plants (for preparing mould materials B22C 5/18; in combination with casting plants B22D 47/02)