### CPC - COOPERATIVE PATENT CLASSIFICATION

**B**

**PERFORMING OPERATIONS; TRANSPORTING**

*(NOTES omitted)*

**SHAPING**

**B22**

**CASTING; POWDER METALLURGY**

**B22D**

**CASTING OF METALS; CASTING OF OTHER SUBSTANCES BY THE SAME PROCESSES OR DEVICES** (shaping of plastics or substances in a plastic state **B29C**; metallurgical processing, selection of substances to be added to metal **C21, C22**)

**WARNING**

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.

<table>
<thead>
<tr>
<th>1/00</th>
<th>Treatment of fused masses in the ladle or the supply runners before casting *(for continuous casting <strong>B22D 11/10</strong>; metallurgical processing, e.g. refining of iron or other metal *<em>C21, C22, C25C)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/002</td>
<td>[Treatment with gases <em>(C21C 7/072, C22B 9/05 take precedence)</em>]</td>
</tr>
<tr>
<td>1/005</td>
<td>. [Injection assemblies therefor (features relating to gas injection, provided on closures of the sliding gate type <strong>B22D 41/42</strong>; provided on pouring nozzles <strong>B22D 41/58</strong>; provided on closures of the stopper-rod type <strong>B22D 41/186</strong>)]</td>
</tr>
<tr>
<td>1/007</td>
<td>. [Treatment of the fused masses in the supply runners <em>(B22D 1/002, B22D 1/005 take precedence)</em>]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2/00</th>
<th>Arrangement of indicating or measuring devices, e.g. for temperature or viscosity of the fused mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/001</td>
<td>. <em>(for the slag appearance in a molten metal stream)</em></td>
</tr>
<tr>
<td>2/003</td>
<td>. *(for the level of the molten metal <em>(B22D 11/181 and B22D 11/201 take precedence; level indicators in general <strong>G01F 23/00</strong>)</em>)</td>
</tr>
<tr>
<td>2/005</td>
<td>. <em>(for the thickness of a frozen shell <em>(B22D 11/188 and B22D 11/207 take precedence)</em>)</em></td>
</tr>
<tr>
<td>2/006</td>
<td>. <em>(for the temperature of the molten metal <em>(measuring temperature in general <strong>G01K</strong>)</em>)</em></td>
</tr>
<tr>
<td>2/008</td>
<td>. <em>(for the viscosity of the molten metal <em>(measuring viscosity in general <strong>G01N 11/00</strong>)</em>)</em></td>
</tr>
</tbody>
</table>

**Casting of pigs, i.e. metal castings suitable for subsequently melting; similar casting**

<table>
<thead>
<tr>
<th>3/00</th>
<th>Pig or like casting <em>(equipment for conveying molten metal <strong>B22D 35/00</strong>)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>3/02</td>
<td>. Moulding of beds</td>
</tr>
</tbody>
</table>

**5/00**

**Machines or plants for pig or like casting**

| 5/005 | . *(Devices for stacking pigs; Pigforms to be stacked)* |
| 5/02 | . *(with rotary casting tables)* |
| 5/04 | . *(with endless casting conveyors)* |

**Casting of ingots, i.e. metal castings suitable for subsequently rolling or forging**

| 7/00 | Casting ingots, *(e.g. from ferrous metals)* *(equipment for conveying molten metal **B22D 35/00**)* |

| 7/005 | . *(from non-ferrous metals)* |
| 7/02 | . *(Casting compound ingots of two or more different metals in the molten state, i.e. integrally cast)* |
| 7/04 | . *(Casting hollow ingots)* |
| 7/06 | . *(Ingot moulds or their manufacture)* |
| 7/062 | . *(Stools for ingot moulds)* |
| 7/064 | . *(Cooling the ingot moulds)* |
| 7/066 | . *(Manufacturing, repairing or reinforcing ingot moulds)* |
| 7/068 | . *(characterised by the materials used therefor)* |
| 7/08 | . *(Divided ingot moulds)* |
| 7/10 | . *(Hot tops therefor *(heating the top discard of ingots **B22D 27/06**)*)* |
| 7/102 | . *(from refractorial material only)* |
| 7/104 | . *(from exothermic material only)* |
| 7/106 | . *(Configuration of hot tops)* |
| 7/108 | . *(Devices for making or fixing hot tops)* |
| 7/12 | . *(Appurtenances, e.g. for sintering, for preventing splashing)* |

**9/00**

**Machines or plants for casting ingots**

| 9/003 | . *(for top casting)* |
| 9/006 | . *(for bottom casting)* |

**Particular casting processes; Machines or apparatus therefor**

<table>
<thead>
<tr>
<th>11/00</th>
<th>Continuous casting of metals, i.e. casting in indefinite lengths <em>(metal drawing, metal extruding <strong>B21C</strong>)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>11/001</td>
<td>. <em>(of specific alloys)</em></td>
</tr>
<tr>
<td>11/002</td>
<td>. <em>(Stainless steels)</em></td>
</tr>
<tr>
<td>11/003</td>
<td>. <em>(Aluminium alloys)</em></td>
</tr>
<tr>
<td>11/004</td>
<td>. <em>(Copper alloys)</em></td>
</tr>
<tr>
<td>11/005</td>
<td>. <em>(of wire <em>(casting on wire <strong>B22D 19/14</strong>)</em>)</em></td>
</tr>
<tr>
<td>11/006</td>
<td>. <em>(of tubes)</em></td>
</tr>
<tr>
<td>11/007</td>
<td>. <em>(of composite ingots, i.e. two or more molten metals of different compositions being used to integrally cast the ingots <em>(casting of composite ingots in definite lengths <strong>B22D 7/02</strong>)</em>)</em></td>
</tr>
<tr>
<td>11/008</td>
<td>. <em>(of clad ingots, i.e. the molten metal being cast against a continuous strip forming part of the cast product)</em></td>
</tr>
</tbody>
</table>
Particular casting processes; Machines or apparatus therefor

11/009  .  .  .  [of work of special cross-section, e.g. I-beams, U-profiles]
11/01  .  .  .  without moulds, e.g. on molten surfaces
11/015  .  .  .  [using magnetic field for conformation, i.e. the metal is not in contact with a mould]
11/04  .  .  .  into open-ended moulds (B22D 11/06, B22D 11/07 take precedence; plants for continuous casting, e.g. for upwardly drawing the strand B22D 11/14)
11/0401  .  .  .  [Moulds provided with a feed head]
11/0403  .  .  .  [Multiple moulds]
11/0405  .  .  .  [Rotating moulds]
11/0406  .  .  .  [Moulds with special profile]
11/0408  .  .  .  [Moulds for casting thin slabs]
11/041  .  .  .  for vertical casting (B22D 11/043, B22D 11/049 - B22D 11/059 take precedence)
11/043  .  .  .  Curved moulds (B22D 11/049 - B22D 11/059 take precedence)
11/045  .  .  .  for horizontal casting (B22D 11/049 - B22D 11/059 take precedence)
11/0455  .  .  .  [Bidirectional horizontal casting]
11/047  .  .  .  Means for joining tundish to mould
11/0475  .  .  .  [characterised by use of a break ring]
11/049  .  .  .  for direct chill casting, e.g. electromagnetic casting
11/05  .  .  .  into moulds having adjustable walls
11/051  .  .  .  into moulds having oscillating walls
11/053  .  .  .  Means for oscillating the moulds
11/0535  .  .  .  [in a horizontal plane]
11/055  .  .  .  Cooling the moulds ((B22D 11/04 takes precedence))
11/057  .  .  .  Manufacturing or calibrating the moulds
11/059  .  .  .  Mould materials or platings
11/06  .  .  .  into moulds with travelling walls, e.g. with rolls, plates, belts, caterpillars
11/0602  .  .  .  [formed by a casting wheel and belt, e.g. Properzi-process]
11/0605  .  .  .  [formed by two belts, e.g. Hazelett-process]
11/0608  .  .  .  [formed by caterpillars]
11/0611  .  .  .  [formed by a single casting wheel, e.g. for casting amorphous metal strips or wires]
11/0614  .  .  .  [the casting wheel being immersed in a molten metal bath, and drawing out upwardly the casting strip]
11/0617  .  .  .  [the casting wheel having its axis vertical and a casting strip formed in a peripheral groove of the wheel]
11/062  .  .  .  [the metal being cast on the inside surface of the casting wheel]
11/0622  .  .  .  [formed by two casting wheels]
11/0625  .  .  .  [the two casting wheels being immersed in a molten metal bath and drawing out upwardly the casting strip]
11/0628  .  .  .  [formed by more than two casting wheels]
11/0631  .  .  .  [formed by a travelling straight surface, e.g. through-like moulds, a belt]
11/0634  .  .  .  [formed by a casting wheel and a co-operating shoe]
11/0637  .  .  .  [Accessories therefor]
11/064  .  .  .  [for supplying molten metal (supplying molten metal to open-ended moulds B22D 11/10)]
11/0642  .  .  .  [Nozzles (nozzles used in open-ended moulds B22D 41/50)]
11/0645  .  .  .  [Sealing means for the nozzle between the travelling surfaces]
11/0648  .  .  .  [Casting surfaces]
11/0651  .  .  .  [Casting wheels (B22D 11/0682 takes precedence)]
11/0654  .  .  .  [Casting belts (B22D 11/0685 takes precedence)]
11/0657  .  .  .  [Caterpillars (B22D 11/0688 takes precedence)]
11/066  .  .  .  [Side dams (B22D 11/0691 takes precedence)]
11/0662  .  .  .  [having electromagnetic confining means]
11/0665  .  .  .  [for treating the casting surfaces, e.g. calibrating, cleaning, dressing, preheating]
11/0668  .  .  .  [for dressing, coating or lubricating]
11/0671  .  .  .  [for heating or drying]
11/0674  .  .  .  [for machining]
11/0677  .  .  .  [for guiding, supporting or tensioning the casting belts]
11/068  .  .  .  [for cooling the cast product during its passage through the mould surfaces (cooling open-ended moulds B22D 11/04; secondary cooling B22D 11/124)]
11/0682  .  .  .  [by cooling the casting wheel]
11/0685  .  .  .  [by cooling the casting belts (B22D 11/0677 takes precedence)]
11/0688  .  .  .  [by cooling the caterpillars]
11/0691  .  .  .  [by cooling the side dams]
11/0694  .  .  .  [for peeling-off or removing the cast product]
11/0697  .  .  .  [for casting in a protected atmosphere]
11/07  .  .  .  Lubricating the moulds
11/08  .  .  .  Accessories for starting the casting procedure
11/081  .  .  .  [Starter bars]
11/083  .  .  .  [Starter bar head; Means for connecting or detaching starter bars and ingots]
11/085  .  .  .  [Means for storing or introducing the starter bars in the moulds]
11/086  .  .  .  [Means for connecting cast ingots of different sizes or compositions]
11/088  .  .  .  [Means for sealing the starter bar head in the moulds]
11/10  .  .  .  Supplying or treating molten metal (B22D 41/00 takes precedence)
11/103  .  .  .  Distributing the molten metal, e.g. using runners, floats, distributors
11/106  .  .  .  Shielding the molten jet (B22D 41/50 takes precedence)
11/108  .  .  .  Feeding additives, powders, or the like
11/11  .  .  .  Treating the molten metal
11/111  .  .  .  by using protecting powders
11/112  .  .  .  by accelerated cooling
11/113  .  .  .  by vacuum treating
11/114  .  .  .  by using agitating or vibrating means (B22D 11/117 takes precedence)
11/115  .  .  .  by using magnetic fields
11/116  .  .  .  Refining the metal
11/117  .  .  .  by treating with gases (B22D 11/118, B22D 11/119 take precedence)
11/118  .  .  .  by circulating the metal under, over or around weirs (B22D 11/119 takes precedence)
11/119  .  .  .  by filtering
Particular casting processes; Machines or apparatus therefor

11/12 . . . Accessories for subsequent treating or working cast stock in situ (rolling immediately subsequent to continuous casting B21B 1/46, B21B 13/22)
11/1206 . . . [for plastic shaping of strands (rolling mills B21B 1/46)]
11/1213 . . . [for heating or insulating strands]
11/122 . . . [using magnetic fields]
11/1226 . . . [for straightening strands]
11/1233 . . . [for marking strands]
11/124 . . . [for cooling]
11/1241 . . . [by transporting the cast stock through a liquid medium bath or a fluidized bed]
11/1243 . . . [by using cooling grids or cooling plates]
11/1245 . . . [using specific cooling agents]
11/1246 . . . [Nozzles; Spray heads]
11/1248 . . . [Means for removing cooling agent from the surface of the cast stock]
11/126 . . . [for cutting]
11/1265 . . . [having auxiliary devices for deburring]
11/128 . . . [for removing]
11/1281 . . . [Vertical removing]
11/1282 . . . [Vertical casting and curving the cast stock to the horizontal]
11/1284 . . . [Horizontal removing]
11/1285 . . . [Segment changing devices for supporting or guiding frames]
11/1287 . . . [Rolls; Lubricating, cooling or heating rolls while in use]
11/1288 . . . [Walking bar members]
11/14 . . . Plants for continuous casting
11/141 . . . [for vertical casting]
11/142 . . . [for curved casting]
11/143 . . . [for horizontal casting]
11/144 . . . [with a rotating mould]
11/145 . . . [for upward casting]
11/146 . . . [for inclined casting]
11/147 . . . [Multi-strand plants]
11/148 . . . [Safety arrangements]
11/16 . . . Controlling or regulating processes or operations
11/161 . . . [for automatic starting the casting process]
11/163 . . . [for cutting cast stock]
11/165 . . . [for the supply of casting powder]
11/166 . . . [for mould oscillation]
11/168 . . . [for adjusting the mould size or mould taper]
11/18 . . . [for pouring (B22D 11/20 takes precedence)]
11/181 . . . [responsive to molten metal level or slag level]
11/182 . . . [by measuring temperature]
11/183 . . . [by measuring molten metal weight]
11/185 . . . [by using optical means]
11/186 . . . [by using electric, magnetic, sonic or ultrasonic means]
11/187 . . . [by using X-rays or nuclear radiation]
11/188 . . . [responsive to thickness of solidified shell]
11/20 . . . [for removing cast stock]
11/201 . . . [responsive to molten metal level or slag level]
11/202 . . . [by measuring temperature]
11/203 . . . [by measuring molten metal weight]
11/204 . . . [by using optical means]
11/205 . . . [by using electric, magnetic, sonic or ultrasonic means]
11/206 . . . [by using X-rays or nuclear radiation]
11/207 . . . [responsive to thickness of solidified shell]
11/208 . . . [for aligning the guide rolls]
11/22 . . . [for cooling cast stock or mould]
11/225 . . . [for secondary cooling]

13/00 Centrifugal casting; Casting by using centrifugal force
13/02 . . . of elongated solid or hollow bodies, e.g. pipes, in moulds rotating around their longitudinal axis
13/023 . . . [the longitudinal axis being horizontal]
13/026 . . . [the longitudinal axis being vertical]
13/04 . . . of shallow solid or hollow bodies, e.g. wheels or rings, in moulds rotating around their axis of symmetry
13/06 . . . of solid or hollow bodies in moulds rotating around an axis arranged outside the mould
13/063 . . . [for dentistry or jewellery]
13/066 . . . [several moulds being disposed in a circle]
13/08 . . . in which a stationary mould is fed from a rotating mass of liquid metal
13/10 . . . Accessories for centrifugal casting apparatus, e.g. moulds, linings therefor, means for feeding molten metal, cleansing moulds, removing castings (making or lining moulds B22C)
13/101 . . . [Moulds]
13/102 . . . [Linings for moulds (making or lining moulds B22C)]
13/104 . . . [Cores]
13/105 . . . [Cooling for moulds or cores]
13/107 . . . [Means for feeding molten metal]
13/108 . . . [Removing of casting]
13/12 . . . Controlling, supervising, specially adapted to centrifugal casting, e.g. for safety reasons (controlling or regulating in general C05)

15/00 Casting using a mould or core of which a part significant to the process is of high thermal conductivity, e.g. chill casting; Moulds or accessories specially adapted therefor
15/005 . . . [of rolls, wheels or the like (B22D 19/16 takes precedence)]
15/02 . . . of cylinders, pistons, bearing shells or like thin-walled objects
15/04 . . . Machines or apparatus for chill casting ((B22D 15/005), B22D 15/02 take precedence)

17/00 Pressure die casting or injection die casting, i.e. casting in which the metal is forced into a mould under high pressure
17/002 . . . [using movable moulds (for plastics B29C 45/04)]
17/005 . . . [using two or more fixed moulds (for plastics B29C 45/12)]
17/007 . . . [Semi-solid pressure die casting]
17/02 . . . Hot chamber machines, i.e. with heated press chamber in which metal is melted
17/04 . . . Plunger machines
17/06 . . . Air injection machines
17/08 . . . Cold chamber machines, i.e. with unheated press chamber into which molten metal is ladled
17/10 . . . with horizontal press motion
17/12 . . . with vertical press motion
17/14 . . . Machines with evacuated die cavity
17/145 . . . [Venting means therefor (for permanent moulds B22C 9/067)]
17/16 . . . specially adapted for casting slide fasteners or elements therefor
Particular casting processes; Machines or apparatus therefor

17/18 Machines built up from units providing for different combinations

17/20 Accessories: Details

17/2007 [Methods or apparatus for cleaning or lubricating moulds]

17/2015 Means for forcing the molten metal into the die (for plastics B29C 45/46)

17/2023 [Nozzles or shot sleeves]

17/203 [Injection pistons (B22D 17/2053 takes precedence; for plastics B29C 45/53)]

17/2038 [Heating, cooling or lubricating the injection unit (for plastics B29C 45/74, B29C 45/83)]

17/2046 [with provisions for damping the pressure peak]

17/2053 [using two or more cooperating injection pistons]

17/2061 [using screws]

17/2069 [Exerting after-pressure on the moulding material]

17/2076 [Cutting-off equipment for sprues or ingates (for plastics B29C 45/38)]

17/2084 [Manipulating or transferring devices for evacuating cast pieces]

17/2092 [Safety devices (for plastics B29C 45/84)]

17/22 [Dies (manufacture, see the appropriate class, e.g. B23P 15/24); Die plates; Die supports; Cooling equipment for dies; Accessories for loosening and ejecting castings from dies]

17/2209 [Selection of die materials (for permanent moulds B22C 9/061)]

17/2218 [Cooling or heating equipment for dies (for permanent moulds B22C 9/065; for plastics B29C 45/73)]

17/2227 [Die seals (for plastics B29C 45/2608)]

17/2236 [Equipment for loosening or ejecting castings from dies (for plastics B29C 45/40)]

17/2245 [having walls provided with means for marking or patterning]

17/2254 [having screw-threaded die walls]

17/2263 [having tubular die cavities]

17/2272 [Sprue channels]

17/2281 { closure devices therefor}

17/229 [with exchangeable die part (B22D 17/2245 takes precedence)]

17/24 Accessories for locating and holding cores or inserts

17/26 [Mechanisms or devices for locking or opening dies]

17/263 [mechanically]

17/266 [hydraulically]

17/28 Melting pots

17/30 Accessories for supplying molten metal, e.g. in rations (supplying molten metal in ration in general B22D 39/00)

17/32 Controlling equipment

18/00 Pressure casting; Vacuum casting (B22D 17/00 takes precedence; treating the metal in the mould by using pressure or vacuum B22D 27/00)

18/02 Pressure casting making use of mechanical pressure devices, e.g. cast-forging (B22D 18/04 takes precedence)

18/04 Low pressure casting, i.e. making use of pressures up to a few bars to fill the mould

18/06 Vacuum casting, i.e. making use of vacuum to fill the mould

18/08 Controlling, supervising, e.g. for safety reasons (controlling or regulating in general G05)

19/00 Casting in, on, or around objects which form part of the product (B22D 23/04 takes precedence; aluminio-thermic welding B23K 23/00; coating by casting molten metal on the substrate C23C 6/00)

19/0009 [Cylinders, pistons]

19/0018 [cyliniders with fins]

19/0027 [pistons]

19/0036 [gears]

19/0045 [household utensils]

19/0054 [rotors, stators for electrical motors]

19/0063 [finned exchangers (cylinders B22D 19/0018)]

19/0072 [for making objects with integrated channels]

19/0081 [pretreatment of the insert, e.g. for enhancing the bonding between insert and surrounding cast metal]

19/009 [for casting objects the members of which can be separated afterwards]

19/02 for making reinforced articles (B22D 19/14 takes precedence)

19/04 [for joining parts]

19/045 [for joining tubes]

19/06 [for manufacturing or repairing tools]

19/08 [for building-up linings or coverings, e.g. of anti-frictional metal]

19/085 [of anti-frictional metal]

19/10 Repairing defective or damaged objects by metal casting procedures (by other procedures B22P 6/04; ingot mould B22D 7/06; B22D 19/06 takes precedence)

19/12 [for making objects, e.g. hinges, with parts which are movable relatively to one another]

19/14 the objects being filamentary or particulate in form (making alloys containing fibres or filaments by contacting the fibres or filaments with molten metal C22C 47/08)

19/16 [for making compound objects cast of two or more different metals, e.g. for making rolls for rolling mills (casting compound ingots B22D 7/00)]

21/00 Casting non-ferrous metals or metallic compounds so far as their metallurgical properties are of importance for the casting procedure; Selection of compositions therefor [(non-ferrous ingots B22D 7/005)]

21/002 [Castings of light metals]

21/005 [with high melting point, e.g. Be 1280 degrees C, Ti 1725 degrees C]

21/007 [with low melting point, e.g. Al 659 degrees C, Mg 650 degrees C]

21/02 Casting exceedingly oxidisable non-ferrous metals, e.g. in inert atmosphere (use of inert atmosphere in casting metals in general B22D 23/00; apparatus for vacuum casting B22D 27/15)

21/022 [Casting heavy metals, with exceedingly high melting points, i.e. more than 1600 degrees C, e.g. W 3380 degrees C, Ta 3000 degrees C, Mo 2620 degrees C, Zr 1860 degrees C, Cr 1765 degrees C, V 1715 degrees C]
Particular casting processes; Machines or apparatus therefor

23/00 Casting processes not provided for in groups B22D 1/00 - B22D 21/00 (making metallic powder by casting B22F 9/08; aluminio-thermic welding B23K 23/00; remelting metals C22B 9/16)

23/003 . . (Moulding by spraying metal on a surface)

23/006 . . (Casting by filling the mould through rotation of the mould together with a molten metal holding recipient, about a common axis)

23/02 Top casting

23/04 . . Casting by dipping (hot-dipping or immersion processes for applying coating material in the molten state without affecting the shape C23C 2/00)

23/06 . Melting-down metal, e.g. metal particles, in the mould

23/10 . . Electroslag casting ([electroslag remelting C22B 9/18])

25/00 Special casting characterised by the nature of the product (B22D 15/02, B22D 17/16, B22D 19/00 take precedence; casting stereotype plates B41D 3/00)

25/005 . . . (Casting metal foams)

25/02 . . by its peculiarity of shape; of works of art ([cylinders, pistons B22D 15/02])

25/023 . . . (Casting chains or the like)

25/026 . . . (Casting jewelry articles (B22D 13/063 takes precedence))

25/04 . . . Casting metal electric battery plates or the like (manufacture thereof by multi-step processes H01M 4/82)

25/06 . . by its physical properties (B22D 27/00 takes precedence)

25/08 . . . by uniform hardness (B22D 15/00 takes precedence)

27/00 Treating the metal in the mould while it is molten or ductile (B22D 7/12, B22D 17/11, B22D 43/00 take precedence); {Pressure or vacuum casting (B22D 17/00 takes precedence)}

27/003 . . . (by using inert gases)

27/006 . . . (by using reactive gases)

27/02 . Use of electric or magnetic effects ({for continuous casting B22D 11/015, B22D 11/11})

27/04 . Influencing the temperature of the metal, e.g. by heating or cooling the mould

27/045 . . . (Directionally solidified castings)

27/06 . . . Heating the top discard of ingots (hot tops for ingot moulds B22D 7/10)

27/08 . . Shaking, vibrating, or turning of moulds

27/09 . . by using pressure

27/11 . . making use of mechanical pressing devices

27/13 . . making use of gas pressure

27/15 . by using vacuum

27/18 . . Measures for using chemical processes for influencing the surface composition of castings, e.g. for increasing resistance to acid attack

27/20 . . Measures not previously mentioned for influencing the grain structure or texture; Selection of compositions therefor

Final measures after casting (cleaning of castings by sand-blasting B24C)

29/00 Removing castings from moulds, not restricted to casting processes covered by a single main group; Removing cores; Handling ingots ([B22D 13/10, B22D 11/124, B22D 17/00 take precedence])

29/001 . . . (Removing cores)

29/002 . . . (by leaching, washing or dissolving)

29/003 . . . (by using heat)

29/005 . . . (by vibrating or hammering)

29/006 . . . (by abrasive, water or air blasting)

29/007 . . . (by using explosive shock waves)

29/008 . . . . (in a liquid medium)

29/02 . . Vibratory apparatus specially designed for shaking out flasks

29/04 . . Handling or stripping castings or ingots (grippers in general, see the relevant subclasses, e.g. B66C)

29/06 . . Strippers actuated by fluid pressure

29/08 . . Strippers actuated mechanically

30/00 Cooling castings, not restricted to casting processes covered by a single main group (accessories for cooling cast stock in continuous casting of metals B22D 11/124; controlling or regulating processes or operations for cooling cast stock or mould in continuous casting of metals B22D 11/22; chill casting B22D 15/00)

31/00 Cutting-off surplus material, e.g. gates; {Cleaning and working on castings (B22D 17/076 takes precedence)}

31/002 . . . (Cleaning, working on castings)

31/005 . . . . (Sealing or impregnating porous castings)

31/007 . . . . (Tumbling mills)

Other equipment for casting (arrangement of indicating or measuring devices B22D 2/00)

33/00 Equipment for handling moulds

33/005 . . . (Transporting flaskless moulds)

33/02 . . . Turning or transposing moulds

33/04 . . . Bringing together or separating moulds

33/06 . . . Burdening or relieving moulds

35/00 Equipment for conveying molten metal into beds or moulds (B22D 37/00 - B22D 41/00 take precedence; specially adapted to particular processes or machines, see the relevant groups)

35/02 . . . into beds

35/04 . . . into moulds, e.g. base plates, runners

35/045 . . . . (Runner base plates for bottom casting ingots)

35/06 . . . Heating or cooling equipment

37/00 Controlling or regulating the pouring of molten metal from a casting melt-holding vessel ((B22D 11/18 takes precedence) B22D 39/00, B22D 41/00 take precedence; specially adapted to particular processes or machines, see the relevant groups of this subclass)
Other equipment for casting

B22D

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37/005 . . . [Shielding the molten metal stream (B22D 11/106, B22D 41/50 take precedence)]

39/00 Equipment for supplying molten metal in rations (specially adapted to particular processes or machines, see the relevant groups of this subclass)

39/003 . . . [using electromagnetic field]

39/006 . . . [Electromagnetic conveyors]

39/02 having means for controlling the amount of molten metal by volume

39/023 . . . [using a displacement member]

39/026 . . . [using a ladler]

39/04 having means for controlling the amount of molten metal by weight

39/06 having means for controlling the amount of molten metal by controlling the pressure above the molten metal

41/00 Casting melt-holding vessels, e.g. ladles, tundishes, cups or the like (B22D 39/00, B22D 43/00 take precedence)

41/001 . . . [devices for cleaning ladles (cleaning in general B08B)]

41/003 . . . [with impact pads]

41/005 . . . with heating or cooling means

41/01 . . . Heating means

41/015 . . . with external heating, i.e. the heat source not being a part of the ladle

41/02 . . . Linings

41/023 . . . [Apparatus used for making or repairing linings (equipment used for making or repairing converter linings C21C 5/441)]

41/026 . . . [Apparatus used for fracturing and removing of linings]

41/04 . . . tiltable

41/05 . . . Tea-pot spout ladles

41/06 . . . Equipment for tilting

41/08 . . . for bottom pouring (B22D 41/14, B22D 41/50 take precedence)

41/12 . . . Travelling ladles or similar containers; Cars for ladles (casting cranes B66C)

41/13 . . . Ladle turrets

41/14 . . . Closures

41/16 . . . stopper-rod type, i.e. a stopper-rod being positioned downwardly through the vessel and the metal therein, for selective registry with the pouring opening

41/18 . . . Stopper-rods therefor

41/183 . . . . . . . . . . with cooling means

41/186 . . . . . . . . . . with means for injecting a fluid into the melt

41/20 . . . Stopper-rod operating equipment

41/22 . . . sliding-gate type, i.e. having a fixed plate and a movable plate in sliding contact with each other for selective registry of their openings

41/24 . . . characterised by a rectilinearly movable plate (B22D 41/38 - B22D 41/42 take precedence)

41/26 . . . characterised by a rotatively movable plate (B22D 41/38 - B22D 41/42 take precedence)

41/28 . . . Plates therefor (B22D 41/38 - B22D 41/42 take precedence)

41/30 . . . Manufacturing or repairing thereof

41/32 . . . characterised by the materials used therefor

41/34 . . . . . . . . . . Supporting, fixing or centering means therefor

41/36 . . . . . . . . . . Treating the plates, e.g. lubricating, heating (lades, cups or the like with heating means B22D 41/01)

41/38 . . . . . . . . . . Means for operating the sliding gate

41/40 . . . . . . . . . . Means for pressing the plates together

41/42 . . . . . . . . . . Features relating to gas injection

41/44 . . . . . . . . . . Consumable closure means, i.e. closure means being used only once

41/46 . . . . . . . . . . Refractory plugging masses

41/465 . . . . . . . . . . [Unplugging a vessel discharge port]

41/48 . . . . . . . . . . Melttable closures

41/50 . . . Pouring-nozzles

41/502 . . . . . . . . . . [Connection arrangements; Sealing means therefor]

41/505 . . . . . . . . . . [Rings, inserts or other means preventing external nozzle erosion by the slag]

41/507 . . . . . . . . . . [giving a rotating motion to the issuing molten metal]

41/52 . . . . . . . . . . Manufacturing or repairing thereof

41/54 . . . . . . . . . . characterised by the materials used therefor

41/56 . . . . . . . . . . Means for supporting, manipulating or changing a pouring-nozzle

41/58 . . . . . . . . . . with gas injecting means

41/60 . . . . . . . . . . with heating or cooling means

41/62 . . . . . . . . . . with stirring or vibrating means

43/00 Mechanical cleaning, e.g. skimming of molten metals

43/001 . . . . . . . . . . [Retaining slag during pouring molten metal]

43/002 . . . . . . . . . . [by using floating means]

43/004 . . . . . . . . . . [by using filtering means (B22C 9/086 takes precedence)]

43/005 . . . . . . . . . . [Removing slag from a molten metal surface]

43/007 . . . . . . . . . . [by using scrapers]

43/008 . . . . . . . . . . [by suction]

45/00 Equipment for casting, not otherwise provided for

45/005 . . . . . . . . . . [Evacuation of fumes, dust or waste gases during manipulations in the foundry (during steel manufacture C21C 5/38; evacuation from furnaces F27D 17/001)]

46/00 Controlling, supervising, not restricted to casting covered by a single main group, e.g. for safety reasons (controlling or regulating in general G05)

47/00 Casting plants

47/02 . . . for both moulding and casting