

# CPC COOPERATIVE PATENT CLASSIFICATION

## B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

### SHAPING

## B28 WORKING CEMENT, CLAY, OR STONE

**B28B SHAPING CLAY OR OTHER CERAMIC COMPOSITIONS; SHAPING SLAG; SHAPING MIXTURES CONTAINING CEMENTITIOUS MATERIAL, e.g. PLASTER** (foundry moulding [B22C](#); working stone or stone-like material [B28D](#); shaping of substances in a plastic state, in general [B29C](#); making layered products not composed wholly of these substances [B32B](#); shaping *in situ*, see the relevant classes of section E)

### NOTE

In this subclass, the following term is used with the meaning indicated:

- "the material" means:
  - a. clay or other ceramic compositions;
  - b. slag;
  - c. mixtures with water-setting properties given by clay, cementitious material, or slag.

### 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:  
[B28B 23/08](#) covered by [B28B 21/60](#), [B28B 23/06](#)
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  | <b>Producing shaped {prefabricated} articles from the material</b> (using presses <a href="#">B28B 3/00</a> ; shaping on moving conveyors <a href="#">B28B 5/00</a> ; producing tubular articles <a href="#">B28B 21/00</a> {; producing articles with embedded elements <a href="#">B28B 23/00</a> })                                                                                      | 1/04      | . by tamping or ramming (followed by pressing <a href="#">B28B 3/02</a> )                                                                                                                                                                                                                                |
| 1/001 | . {Rapid manufacturing of 3D objects by additive depositing, agglomerating or laminating of material (selective deposition modelling of metallic powder <a href="#">B22F 10/00</a> ; rapid manufacturing of 3D objects in general and in particular of plastics <a href="#">B29C 64/00</a> )}                                                                                               | 1/045     | . . {combined with vibrating or jolting}                                                                                                                                                                                                                                                                 |
| 1/002 | . {assembled from preformed elements}                                                                                                                                                                                                                                                                                                                                                       | 1/08      | . by vibrating or jolting {(of moulding sand <a href="#">B22C 15/10</a> ; of concrete in general <a href="#">E04G 21/063</a> )}                                                                                                                                                                          |
| 1/004 | . {Devices for shaping artificial aggregates from ceramic mixtures or from mixtures containing hydraulic binder (from slag <a href="#">C04B 5/00</a> ; composition of artificial aggregates <a href="#">C04B 18/02</a> )}                                                                                                                                                                   | 1/081     | . . {Vibration-absorbing means}                                                                                                                                                                                                                                                                          |
| 1/005 | . {Devices or processes for obtaining articles having a marble appearance (producing decorative effects <a href="#">B44C</a> ; design of stone surfaces, e.g. marble, <a href="#">B44F 9/04</a> )}                                                                                                                                                                                          | 1/082     | . . {combined with a vacuum, e.g. for moisture extraction (in general <a href="#">E04G 21/061</a> )}                                                                                                                                                                                                     |
| 1/007 | . {by freezing the material}                                                                                                                                                                                                                                                                                                                                                                | 1/084     | . . {the vibrating moulds or cores being moved horizontally for making strands of moulded articles}                                                                                                                                                                                                      |
| 1/008 | . {made from two or more materials having different characteristics or properties (casting for producing layered articles <a href="#">B28B 1/16</a> ; feeding several successive layers, optionally of different materials <a href="#">B28B 13/022</a> ; coating <a href="#">B28B 11/04</a> ; applying material to surfaces to form a permanent layer thereon <a href="#">B28B 19/00</a> )} | 1/085     | . . . {Introducing non-longitudinal reinforcing elements, e.g. spirally shaped}                                                                                                                                                                                                                          |
| 1/02  | . by turning or jiggering {in moulds or moulding surfaces on rotatable supports}                                                                                                                                                                                                                                                                                                            | 1/087     | . . by means acting on the mould {; Fixation thereof to the mould}                                                                                                                                                                                                                                       |
| 1/025 | . . {Potters wheels}                                                                                                                                                                                                                                                                                                                                                                        | 1/0873    | . . . {the mould being placed on vibrating or jolting supports, e.g. moulding tables}                                                                                                                                                                                                                    |
|       |                                                                                                                                                                                                                                                                                                                                                                                             | 2001/0876 | . . . . {Supports, e.g. tables, therefor}                                                                                                                                                                                                                                                                |
|       |                                                                                                                                                                                                                                                                                                                                                                                             | 1/093     | . . by means directly acting on the material, e.g. by cores wholly or partly immersed in the material {or elements acting on the upper surface of the material}{( <a href="#">B28B 1/084</a> takes precedence; } internal vibrators for compacting concrete <i>in situ</i> <a href="#">E04G 21/08</a> )} |
|       |                                                                                                                                                                                                                                                                                                                                                                                             | 1/0935    | . . . {using only elements wholly or partly immersed in the material, e.g. cores}                                                                                                                                                                                                                        |
|       |                                                                                                                                                                                                                                                                                                                                                                                             | 1/10      | . . and applying pressure otherwise than by the use of presses                                                                                                                                                                                                                                           |
|       |                                                                                                                                                                                                                                                                                                                                                                                             | 1/105     | . . . {this load also being actively vibrated or jolted}                                                                                                                                                                                                                                                 |

- 1/14 . by simple casting, the material being neither forcibly fed nor positively compacted (for molten material [B28B 1/54](#))
- 1/16 . . for producing layered articles (coating [B28B 11/04](#))
- 1/20 . by centrifugal or rotational casting (slip-casting involving rotation of the mould [B28B 1/28](#); for molten material [B28B 1/54](#))
- 1/24 . by injection moulding {(injection moulding of ceramic slips [B28B 1/265](#); of tubular articles [B28B 21/38](#))}
- 1/26 . by slip-casting, i.e. by casting a suspension or dispersion of the material in a liquid-absorbent or porous mould, the liquid being allowed to soak into or pass through the walls of the mould; Moulds therefor ([B28B 1/52](#) takes precedence){; specially for manufacturing articles starting from a ceramic slip; Moulds therefor (of tubular articles [B28B 21/08](#))}
- 1/261 . . {Moulds therefor (absorbent moulds in general [B28B 7/344](#))}
- 1/262 . . . {Mould materials; Manufacture of moulds or parts thereof}
- 1/263 . . . . {Plastics}
- 1/264 . . . . {Plaster}
- 1/265 . . {pressure being applied on the slip in the filled mould or on the moulded article in the mould, e.g. pneumatically, by compressing slip in a closed mould}
- 1/266 . . . {Means for counteracting the pressure being applied on the slip or on the moulded article in the mould, e.g. means for clamping the moulds parts together in a frame-like structure}
- 1/267 . . {in moulds or on moulding surfaces supported by, or formed in or by, conveyors}
- 1/268 . . {by dipping moulding surfaces in the slip (in general [B28B 1/38](#))}
- 1/269 . . {by electrophoresis (electrophoresis in general [C25](#))}
- 1/28 . . involving rotation of the mould {about a centrifugal axis}
- 1/29 . by profiling or strickling the material in open moulds or on moulding surfaces {(in rotary moulds [B28B 1/02](#); by means of profiled rollers [B28B 3/12](#), [B28B 3/123](#))}
- 1/30 . by applying the material on to a core or other moulding surface to form a layer thereon (to form a permanent layer [B28B 19/00](#))
- 1/32 . . by projecting, e.g. spraying (spraying in general [B05B](#), [B05D](#))
- 1/34 . . . by centrifugal force {(centrifugally acting implements for applying plaster or the like to walls [E04F 21/10](#))}
- 1/38 . . by dipping (in general [B05C](#), [B05D](#) {; shaping from synthetic resin [B29C 41/14](#)})
- 1/40 . . by wrapping, e.g. winding
- 1/42 . . . using mixtures containing fibres, e.g. for making sheets by slitting the wound layer
- 1/44 . by forcing cores into filled moulds for forming hollow articles
- 1/445 . . {Hollow punches or cores}
- 1/48 . by removing material from solid section preforms for forming hollow articles, e.g. by punching or boring
- 1/50 . specially adapted for producing articles of expanded material, e.g. cellular concrete (chemical aspects {or making expanded aggregate} [C04B](#))
- 1/503 . . {Moulds therefor}
- 1/506 . . . {with means for, or adapted for, cutting the moulded article into pieces (in general [B28B 7/14](#))}
- 1/52 . specially adapted for producing articles from mixtures containing fibres, {e.g. asbestos cement}(by wrapping on to mandrels [B28B 1/42](#))
- 1/521 . . {from dry mixtures to which a setting agent is applied after forming ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- 1/522 . . {for producing multi-layered articles ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- 1/523 . . {containing metal fibres ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- 1/525 . . {containing organic fibres, e.g. wood fibres ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- 1/526 . . {by delivering the materials on a conveyor of the endless-belt type}
- 1/527 . . {by delivering the materials on a rotating drum, e.g. a sieve drum, from which the materials are picked up by a felt}
- 1/528 . . {for producing corrugated sheets ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- 1/54 . specially adapted for producing articles from molten material, e.g. slag {refractory ceramic materials}(chemical aspects [C04B](#) {; from molten bituminous material [B29C](#)})
- 3/00 Producing shaped articles from the material by using presses (shaping on moving conveyors [B28B 5/00](#)); Presses specially adapted therefor (presses in general [B30B](#))**
- 3/003 . {Pressing by means acting upon the material via flexible mould wall parts, e.g. by means of inflatable cores, isostatic presses (isostatic presses in general [B30B 5/02](#))}
- 3/006 . {Pressing by atmospheric pressure, as a result of vacuum generation or by gas or liquid pressure acting directly upon the material, e.g. jets of compressed air (moulds for treating with gases or degassing [B28B 7/44](#); compacting concrete by means of vacuum in general [E04G 21/061](#))}
- 3/02 . wherein a ram exerts pressure on the material in a moulding space; Ram heads of special form
- 3/021 . . {Ram heads of special form}
- 3/022 . . {combined with vibrating or jolting}
- 3/024 . . {the pressure on the material being transmitted through flexible or resilient wall parts, e.g. flexible cushions on the ramming surface, resilient wall parts pressing as a result of deformation caused by ram pressure}
- 3/025 . . {Hot pressing, e.g. of ceramic materials}
- 3/027 . . {using a bottom press ram actuated upwardly towards mould covers}
- 3/028 . . {Centering the press head, e.g. using guiding pins or chamfered mould edges}
- 3/04 . . with one ram per mould ([B28B 3/10](#) takes precedence)
- 3/06 . . . with two or more ram and mould sets
- 3/08 . . with two or more rams per mould
- 3/083 . . . {The juxtaposed rams working in the same direction}

3/086	. . . {The rams working in different directions}	5/025	. . . {the moulds or the moulding surfaces being divided by separating walls and being continuously fed ( <a href="#">feeding B28B 13/02</a> )}
3/10	. . each charge of material being compressed against previously formed body	5/026	. . {the shaped articles being of indefinite length}
3/12	. wherein one or more rollers exert pressure on the material	5/027	. . . {the moulding surfaces being of the indefinite length type, e.g. belts, and being continuously fed ( <a href="#">feeding B28B 13/02</a> )}
3/123	. . {on material in moulds or on moulding surfaces moving continuously underneath or between the rollers, e.g. on an endless belt}	5/028	. . . {the moulding surfaces being of definite length, e.g. succession of moving pallets, and being continuously fed ( <a href="#">feeding B28B 13/02</a> )}
3/126	. . {on material passing directly between the co-operating rollers}	5/04	. in moulds moved in succession past one or more shaping stations ( <a href="#">on turn-tables B28B 5/06</a> )
3/14	. . with co-operating pocketed rollers	2005/041	. . {with compacting of the material}
3/16	. . with co-operating profiled rollers	2005/042	. . . {only by vibrating or jolting}
3/18	. . Roller-and-ring machines, i.e. with roller disposed within a ring and co-operating with the inner surface of the ring	2005/044	. . . {only by tamping or ramming}
3/20	. wherein the material is extruded ( <a href="#">extrusion moulding of plastics B29C 48/00</a> )	2005/045	. . . {only by pressing}
3/201	. . {Means for heating or cooling the barrel}	2005/047	. . . {by tamping, ramming or pressing as well as by vibrating, jolting or by rolling}
2003/203	. . {for multi-channelled structures, e.g. honeycomb structures}	2005/048	. . {in moulds carried on a conveyor of the endless-belt type}
3/205	. . {using vibrations}	5/06	. in moulds on a turntable
3/206	. . {Forcing the material through screens or slots}	5/08	. . intermittently rotated
3/208	. . {Exchangeable wear parts, e.g. liners}	5/10	. in moulds carried on the circumference of a rotating drum
3/22	. . by screw or worm	5/12	. . intermittently rotated
3/222	. . . {Screw or worm constructions}	2005/125	. . . {Revolving presses}
3/224	. . . {Twin screw extruders, e.g. double shaft extruders}	<b>7/00</b>	<b>Moulds; Cores; Mandrels</b> (specially adapted for the production of the tubular articles <a href="#">B28B 21/00</a> ; {for casting metals <a href="#">B22C 9/00</a> ; moulds for plastic materials in general <a href="#">B29C 33/00</a> ; falsework, forms or shutterings for forming buildings or parts thereof <a href="#">in situ E04G 9/00 - E04G 15/00</a> })
3/226	. . . {Means for heating or cooling the screw}	7/0002	. {Auxiliary parts or elements of the mould}
3/228	. . . {Slipform casting extruder, e.g. self-propelled extruder}	7/0005	. . {Mould identification means, e.g. by radio frequency identification device [RFID]}
3/24	. . by reciprocating plunger	7/0008	. . {Venting channels, e.g. to avoid vacuum during demoulding or allowing air to escape during feeding, pressing or moulding}
3/26	. . Extrusion dies	7/0011	. . {Mould seals}
3/2609	. . . {Containing rotating elements perpendicular to the axis of extrusion}	7/0014	. . {Fastening means for mould parts, e.g. for attaching mould walls on mould tables; Mould clamps ( <a href="#">clamping means specially adapted for counteracting a pressure being applied on a slip or on the moulded article in the mould B28B 1/266</a> )}
3/2618	. . . {using lubricating means}	7/0017	. . . {for attaching mould walls on mould tables}
3/2627	. . . {using means for making hollow objects with transverse walls, e.g. hollow objects closed on all sides}	7/002	. . . {using magnets}
3/2636	. . . {using means for co-extruding different materials}	7/0023	. . . {using vacuum}
3/2645	. . . {using means for inserting reinforcing members}	7/0026	. . . {using adhesive}
3/2654	. . . {Means for heating or cooling the die}	7/0029	. {Moulds or moulding surfaces not covered by <a href="#">B28B 7/0058</a> - <a href="#">B28B 7/36</a> and <a href="#">B28B 7/40</a> - <a href="#">B28B 7/465</a> , e.g. moulds assembled from several parts}
3/2663	. . . {Exchangeable wear parts, e.g. liners}	7/0032	. . {Moulding tables or similar mainly horizontal moulding surfaces}
3/2672	. . . {Means for adjusting the flow inside the die, e.g. using choke means}	7/0035	. . {Moulds characterised by the way in which the sidewalls of the mould and the moulded article move with respect to each other during demoulding}
3/2681	. . . {Adjustable dies, e.g. for altering the shape of the product}	7/0038	. . . {the sidewalls of mould and moulded article moving only past each other, e.g. box-shaped moulds which are lifted off from the moulding}
3/269	. . . {For multi-channelled structures, e.g. honeycomb structures}		
<b>5/00</b>	<b>Producing shaped articles from the material in moulds or on moulding surfaces, carried or formed by, in, or on conveyors irrespective of the manner of shaping (shaping aspects <a href="#">see the relevant groups</a>)</b>		
5/02	. on conveyors of the endless-belt or chain type ( <a href="#">in combination with pressing rollers B28B 3/12</a> )		
5/021	. . {the shaped articles being of definite length}		
5/022	. . . {the moulds or the moulding surfaces being individual independant units and being discontinuously fed ( <a href="#">feeding B28B 13/0215 and sub-groups</a> )}		
5/023	. . . . {Moulds mounted on an endless chain conveyor for making pottery ware}		

- 7/0041 . . . {the sidewalls of the mould being moved only parallelly away from the sidewalls of the moulded article}
- 7/0044 . . . {the sidewalls of the mould being only tilted away from the sidewalls of the moulded article, e.g. moulds with hingedly mounted sidewalls}
- 2007/0047 . . {Mould seals}
- 2007/005 . . {Fastening means for mould parts, e.g. for attaching mould walls on mould tables; Mould clamps}
- 2007/0052 . . . {for attaching mould walls on mould tables}
- 7/0055 . . {Mould pallets; Mould panels}
- 7/0058 . {Moulds, cores or mandrels with provisions concerning the elimination of superfluous material; Moulds with burr-removing means provided therein or carried thereby}
- 7/0061 . {Moulds, cores or mandrels specially adapted for mechanically working moulding surfaces during moulding or demoulding, e.g. smoothing by means of mould walls driven during moulding or of parts acting during demoulding}
- 7/0064 . {Moulds characterised by special surfaces for producing a desired surface of a moulded article, e.g. profiled or polished moulding surfaces ([B28B 7/36](#) takes precedence; producing decorative effects [B44C](#); designs of stone surfaces [B44F](#))}
- 7/0067 . . {with polished or glossy moulding surfaces}
- 7/007 . . {with moulding surfaces simulating natural effects, e.g. wood or stone}
- 7/0073 . . {with moulding surfaces simulating assembled bricks or blocks with mortar joints ([B28B 7/007](#) takes precedence)}
- 7/0076 . . {with surfaces for moulding letters or marks}
- 7/0079 . . {with surfaces for moulding interlocking means, e.g. grooves and ribs}
- 7/0082 . . {with surfaces for moulding parallel grooves or ribs ([B28B 7/0073](#), [B28B 7/0079](#) takes precedence)}
- 7/0085 . . {with surfaces for moulding chamfers}
- 7/0088 . {Moulds in which at least one surface of the moulded article serves as mould surface, e.g. moulding articles on or against a previously shaped article, between previously shaped articles}
- 7/0091 . {Transformable moulds allowing the change of shape of an initial moulded preform by preform deformation or the change of its size by moulding on the preform}
- 7/0094 . {Moulds for concrete test samples}
- 7/0097 . {Press moulds; Press-mould and press-ram assemblies}
- 7/02 . Moulds with adjustable parts {specially for modifying at will the dimensions or form of the moulded article}
- 7/025 . . {the mould surface being made of or being supported by a plurality of small elements, e.g. to create double curvatures}
- 7/04 . . one or more of the parts being pivotally mounted
- 7/06 . Moulds with flexible parts
- 7/065 . . {Casting in sack or bag like moulds}
- 7/08 . Moulds provided with means for tilting or inverting
- 7/082 . . {Tiltable moulding tables or similar moulding surfaces (specially for casting and erecting walls or parts thereof during construction work [E04G 11/32](#))}
- 7/085 . . {for making double wall panels}
- 7/087 . . {using rocker or rolling means}
- 7/10 . Moulds with means incorporated therein, or carried thereby, for ejecting {or detaching} the moulded article ({flexible moulds bent open for ejecting [B28B 7/06](#); ejecting by tilting or inverting the mould [B28B 7/08](#); } devices, not forming part of the mould, for ejecting the moulded article [B28B 13/06](#))
- 7/12 . . by fluid pressure {, e.g. acting through flexible wall parts or linings of the moulds}
- 7/14 . Moulds with means incorporated therein, or carried thereby, for cutting the moulded article into parts ({for expanded material [B28B 1/506](#); } cutting means independent of the mould [B28B 11/14](#))
- 7/16 . Moulds for making shaped articles with cavities or holes open to the surface {, e.g. with blind holes}
- 7/162 . . {for building blocks or similar block-shaped articles}
- 7/164 . . {for plates, panels, or similar sheet- or disc-shaped articles}
- 7/166 . . {for oblong articles, e.g. hollow masts}
- 7/168 . . {for holders or similar hollow articles, e.g. vaults, sewer pits}
- 7/18 . . the holes passing completely through the article
- 7/183 . . . {for building blocks or similar block-shaped objects}
- 7/186 . . . {for plates, panels or similar sheet- or disc-shaped objects, also flat oblong moulded articles with lateral openings, e.g. panels with openings for doors or windows, grated girders}
- 7/20 . Moulds for making shaped articles with undercut recesses, e.g. dovetails
- 7/22 . Moulds for making units for prefabricated buildings {, i.e. units each comprising an important section of at least two limiting planes of a room or space, e.g. cells (for making rooms or entire buildings in situ [E04G 11/02](#))}; Moulds for making prefabricated stair units
- 7/225 . . {for making stairs or stair units comprising more than one step (in situ [E04G 13/06](#))}
- 7/24 . Unitary mould structures with a plurality of moulding spaces {, e.g. moulds divided into multiple moulding spaces by integratable partitions, mould part structures providing a number of moulding spaces in mutual co-operation (assemblies of individually complete moulds [B28B 7/26](#))}
- 7/241 . . {Detachable assemblies of mould parts providing only in mutual co-operation a number of complete moulding spaces}
- 7/243 . . . {for making plates, panels or similar sheet- or disc-shaped objects}
- 7/245 . . . . {using transportable mould batteries}
- 7/246 . . . {for making oblong objects, e.g. girders}
- 7/248 . . . {using angle-shaped mould parts, e.g. L-parts}
- 7/26 . Assemblies of separate moulds {, i.e. of moulds or moulding space units, each forming a complete mould or moulding space unit independently from each other}
- 7/263 . . {for making plates, panels or similar sheet- or disc-shaped objects}
- 7/266 . . {for making oblong objects, e.g. girders}
- 7/28 . Cores; Mandrels ({[B28B 1/44](#) takes precedence; for special materials in general [B28B 7/34](#); cores for making blind holes in situ [E04G 15/04](#); for making recesses [E04G 15/06](#))}



- 7/285 . . {Core puller}
- 7/30 . . adjustable, collapsible, or expanding {(for making tubular objects [B28B 21/88](#))}
- 7/303 . . . {specially for making undercut recesses or continuous cavities the inner section of which is superior to the section of either of the mouths}
- 7/306 . . . {pliable or extensible}
- 7/32 . . . inflatable {(connection of valves to inflatable elastic bodies [B60C 29/00](#))}
- 7/34 . Moulds, cores, or mandrels of special material, e.g. destructible materials (for slip casting [B28B 1/26](#))
- 7/342 . . {which are at least partially destroyed, e.g. broken, molten, before demoulding; Moulding surfaces or spaces shaped by, or in, the ground, or sand or soil, whether bound or not; Cores consisting at least mainly of sand or soil, whether bound or not}
- 7/344 . . {from absorbent or liquid- or gas-permeable materials, e.g. plaster moulds in general}
- 7/346 . . {Manufacture of moulds}
- 7/348 . . {of plastic material or rubber}
- 7/36 . Linings or coatings, {e.g. removable, absorbent linings, permanent anti-stick coatings; Linings becoming a non-permanent layer of the moulded article}(lubricating surfaces of moulds, cores or mandrels [B28B 7/38](#))
- 7/362 . . {specially for making moulded articles from concrete with exposed aggregate}
- 7/364 . . {of plastic material or rubber}
- 7/366 . . {Replaceable lining plates for press mould}
- 7/368 . . {Absorbent linings}
- 7/38 . Treating surfaces of moulds, cores, or mandrels to prevent sticking
- 7/382 . . {Devices for treating, e.g. sanding}
- 7/384 . . {Treating agents (for plastic moulding materials in general [B29C 33/60](#); lubricants in general [C10M](#))}
- 7/386 . . {Cleaning}
- 7/388 . . {with liquid material, e.g. lubricating}
- 7/40 . characterised by means for modifying the properties of the moulding material
- 7/42 . . for heating or cooling, e.g. steam jackets {, by means of treating agents acting directly on the moulding material}
- 7/44 . . for treating with gases or degassing, e.g. for de-aerating {(treating with hot gases or vapour [B28B 7/42](#))}
- 7/46 . . for humidifying or dehumidifying
- 7/465 . . . {Applying setting liquid to dry mixtures}
- 11/00** **Apparatus or processes for treating or working the shaped {or preshaped} articles (specially adapted for tubular articles [B28B 21/92](#); decoration or surface treatment in general [B05](#), [B44](#); compacting concrete in situ in connection with building [E04G 21/06](#); drying [F26](#))**
- 11/001 . {Applying decorations on shaped articles, e.g. by painting}
- 11/002 . {Apparatus for washing concrete for decorative purposes or similar surface treatments for exposing the texture}
- 11/003 . {the shaping of preshaped articles, e.g. by bending ([B28B 11/08](#) takes precedence)}
- 11/005 . . {Using heat to allow reshaping, e.g. to soften ceramic articles}
- 11/006 . . {Making hollow articles or partly closed articles}
- 11/007 . . . {Using a mask for plugging}
- 11/008 . . {Blow moulding, e.g. with or without the use of a membrane}
- 11/02 . for attaching appendages, e.g. handles, spouts
- 11/04 . for coating {or applying engobing layers}(glazing, engobing [C04B](#))
- 11/041 . . {for moulded articles undergoing a thermal treatment at high temperatures, such as burning, after coating}
- 11/042 . . {with insulating material}
- 11/043 . . . {filling cavities or chambers of hollow blocks}
- 11/044 . . {with glaze or engobe or enamel or varnish}
- 11/045 . . {by dipping}
- 11/046 . . {by rolling}
- 11/047 . . {by pouring, e.g. curtain coating}
- 11/048 . . {by spraying or projecting}
- 11/049 . . {Recycling of the coating material}
- 11/06 . . with powdered or granular material {, e.g. sanding of shaped articles}
- 11/08 . for reshaping the surface, e.g. smoothing, roughening, corrugating, making screw-threads
- 11/0809 . . {Hand tools therefore}
- 11/0818 . . {for roughening, profiling, corrugating}
- 11/0827 . . . {for corrugating, profiling or the like of plates such as asbestos cement sheets}
- 11/0836 . . . {for pottery articles}
- 11/0845 . . {for smoothing}
- 11/0854 . . {for making screw-threads or the like in the surface of the shaped article}
- 11/0863 . . {for profiling, e.g. making grooves}
- 11/0872 . . {Non-mechanical reshaping of the surface, e.g. by burning, acids, radiation energy, air flow, etc.}
- 11/0881 . . {Using vibrating mechanisms, e.g. vibrating plates for ageing stones}
- 11/089 . . {Using impacting tools}
- 11/10 . . by using presses
- 11/12 . for removing parts of the articles by cutting
- 11/125 . . {Cutting-off protruding ridges, also profiled cutting}
- 11/14 . for dividing shaped articles by cutting
- 11/145 . . {for dividing block-shaped bodies of expanded materials, e.g. cellular concrete}
- 11/16 . . for extrusion {or for materials supplied in long webs}
- 11/161 . . . {in vertically operating extrusion presses}
- 11/163 . . . {in which the cutting device is moved longitudinally with the moving strand}
- 11/165 . . . . {mounted on a carrier}
- 11/166 . . . {with devices for determining the correct cutting moment, e.g. measuring rollers or the like}
- 11/168 . . . {in which the material is cut-out from a strand or web by means of a frame-shaped knife}
- 11/18 . for removing burr {(combined with the mould [B28B 7/0058](#))}
- 11/22 . for cleaning
- 11/24 . for curing, setting or hardening (processes for influencing or modifying the setting or hardening ability of mortars, concrete or artificial stone compositions, in general [C04B 40/00](#))

- 11/241 . . {using microwave heating means}
- 11/242 . . {by passing an electric current through wires, rods or reinforcing members incorporated in the article}
- 11/243 . . {Setting, e.g. drying, dehydrating or firing ceramic articles ([B28B 11/242](#) takes precedence)}
- 11/245 . . {Curing concrete articles ([B28B 11/242](#) takes precedence)}
- 11/246 . . . {Underwater curing}
- 11/247 . . {Controlling the humidity during curing, setting or hardening}
- 11/248 . . {Supports for drying}
- 13/00 Feeding the unshaped material to moulds or apparatus for producing shaped articles; Discharging shaped articles from such moulds or apparatus** (feeding or discharging devices incorporated in, or operatively associated with, a particular type of shaping apparatus, or specially designed to supply materials to a particular type of shaping apparatus, [see the relevant groups for the apparatus](#))
- 13/02 . Feeding the unshaped material to moulds or apparatus for producing shaped articles
- 13/0205 . . {supplied to the moulding device in form of a coherent mass of material, e.g. a lump or an already partially preshaped tablet, pastil or the like}
- 13/021 . . {by fluid pressure acting directly on the material, e.g. using vacuum, air pressure}
- 13/0215 . . {Feeding the moulding material in measured quantities from a container or silo}
- 13/022 . . . {Feeding several successive layers, optionally of different materials}
- 13/0225 . . . {Feeding specific quantities of material at specific locations in the mould}
- 13/023 . . . {by using a feed box transferring the moulding material from a hopper to the moulding cavities}
- 13/0235 . . . . {the feed box being provided with agitating means, e.g. stirring vanes to avoid premature setting of the moulding material ([agitation in general B01F](#))}
- 2013/024 . . . . {the feed box being provided with means for transporting the moulded products, e.g. out of the machine}
- 13/0245 . . . . {Rotatable feed frames, e.g. horizontally rotated over 90 degrees}
- 13/025 . . . . {the feed box being vibrated, e.g. to promote discharging of the material}
- 13/0255 . . . . {Disposal of residual material, e.g. by means of the return stroke of the feed drawer}
- 13/026 . . . {by using a movable hopper transferring the moulding material to the moulding cavities}
- 2013/0265 . . . {Feeding a slurry or a ceramic slip}
- 13/027 . . . {by using a removable belt or conveyor transferring the moulding material to the moulding cavities}
- 13/0275 . . . {Feeding a slurry or a ceramic slip}
- 13/028 . . {Deflecting the flow of the unshaped material}
- 13/0285 . . {the material being prearranged on a sheet, e.g. using a decal}
- 13/029 . . {through a sieve or grid, e.g. to ensure evenly filling of cavities}
- 13/0295 . . {Treating the surface of the fed layer, e.g. removing material or equalization of the surface}
- 13/04 . Discharging the shaped articles ({[discharging tubular articles after shaping B28B 21/90](#); } conveying systems for ceramic mouldings [B65G 49/08](#))
- 13/06 . . Removing the shaped articles from moulds (by means incorporated in, or carried by, the moulds [B28B 7/10](#))
- 13/062 . . . {by elastically deforming the mould, e.g. bending flexible moulds}
- 13/065 . . . {by applying electric current or other means of discharging, e.g. pneumatic or hydraulic discharging means}
- 13/067 . . . {by applying blows or vibrations followed by, or during, the removal of a mould part}
- 15/00 General arrangement or layout of plant {Industrial outlines, plant installations}**
- 15/002 . {Mobile plants, e.g. on vehicles or on boats}
- 15/005 . {Machines using pallets co-operating with a bottomless mould; Feeding or discharging means for pallets ([feeding pallets for making a continuous moulding surface B28B 5/025](#), [B28B 5/028](#))}
- 15/007 . {Plant with two or more identical shaping or moulding devices}
- 17/00 Details of, or accessories for, apparatus for shaping the material; Auxiliary measures taken in connection with such shaping** (moulds [B28B 7/00](#); after-treatment [B28B 11/00](#); feeding or discharging [B28B 13/00](#); arrangements for embedding elements in the material [B28B 23/00](#); details, accessories, or auxiliary measures special to any one type of shaping, machine or method of shaping, [see the relevant groups for such machines or methods](#))
- 17/0009 . {Shaping of preshaped articles (shaping the surface of articles [B28B 11/08](#))}
- 17/0018 . {Separating articles from each other}
- 17/0027 . {Accessories for obtaining rubblestones}
- 17/0036 . {Cutting means, e.g. water jets}
- 17/0045 . {Tensioning devices for cutting means}
- 17/0054 . {Cleaning devices for cutting means}
- 17/0063 . {Control arrangements}
- 17/0072 . . {Product control or inspection}
- 17/0081 . . {Process control}
- 17/009 . {Changing the forming elements, e.g. exchanging moulds, dies}
- 17/02 . Conditioning the material prior to shaping ({[for mixtures containing clay or cement B28C](#)})
- 17/023 . . {Conditioning gypsum}
- 17/026 . . {Conditioning ceramic materials}
- 17/04 . Exhausting or laying dust
- 19/00 Machines or methods for applying the material to surfaces to form a permanent layer thereon** (making shaped articles on mandrels [B28B 1/30](#); applying liquids or other fluent materials to surfaces in general [B05C](#); glazing or engobing [C04B](#); applying the material to walls or other fixed structures, [see the relevant classes of section E](#))
- 19/0007 . {for producing articles with exposed aggregate}
- 19/0015 . {on multilayered articles}
- 19/0023 . {Lining the inner wall of hollow objects, e.g. pipes}
- 19/003 . {to insulating material}

- 19/0038 . {lining the outer wall of hollow objects, e.g. pipes}
- 19/0046 . {to plastics}
- 19/0053 . {to tiles, bricks or the like}
- 19/0061 . . {Means for arranging or fixing the tiles, bricks or the like in the mould}
- 19/0069 . . . {the tiles, bricks or the like being sunk in resilient mould material}
- 19/0076 . . . {the tiles, bricks or the like being sunk in heated mould material, e.g. thermoplastic material to temporarily fix them}
- 19/0084 . . . {using pressurized elements for fixing the tiles, bricks or the like}
- 19/0092 . {to webs, sheets or the like, e.g. of paper, cardboard}

**Methods, apparatus, or machines, specially adapted for the production of tubular or reinforced articles**

- 21/00** **Methods or machines specially adapted for the production of tubular articles**
- 21/02 . by casting into moulds
- 21/04 . . by simple casting, the material being neither positively compacted nor forcibly fed
- 21/06 . . into moulds having sliding parts ([B28B 21/26](#) takes precedence; forms, shutterings, or falsework for making rooms as a whole, whole stories, or whole buildings in situ [E04G 11/02](#))
- 21/08 . . by slip-casting; Moulds therefor
- 21/10 . . using compacting means
- 21/12 . . . tamping or ramming the material or the mould elements
- 21/14 . . . vibrating, e.g. the surface of the material
- 21/16 . . . . one or more mould elements
- 21/18 . . . using expansible or retractable mould or core elements
- 21/20 . . . . using inflatable cores, e.g. having a frame inside the inflatable part of the core (connection of valves to inflatable elastic bodies [B60C 29/00](#))
- 21/205 . . . . . {having a rigid frame inside the inflatable part of the core}
- 21/22 . . . using rotatable mould or core parts
- 21/24 . . . . using compacting heads, rollers, or the like
- 21/242 . . . . . {the working diameter of the compacting mechanism being adjustable, e.g. the compacting rollers on the head being displaceable}
- 21/245 . . . . . {using a horizontal compacting roller in a horizontally rotatable mould}
- 21/247 . . . . . {the rollers of the compaction head being driven, e.g. to overcome or modify the tangential force}
- 21/26 . . . . . with a packer head serving as a sliding mould or provided with guiding means for feeding the material
- 21/28 . . . . . combined with vibration means
- 21/30 . . . . Centrifugal moulding
- 21/305 . . . . . {Moulding machines with vertical rotation axis}
- 21/32 . . . . . Feeding the material into the moulds
- 21/34 . . . . . combined with vibrating or other additional compacting means
- 21/36 . . . applying fluid pressure or vacuum to the material ([combined with slip-casting B28B 21/08](#))

- 21/38 . . . . introducing the material wholly or partly under pressure {; [Injection-moulding machines](#)}
- 21/40 . . . . by evacuating one or more of the mould parts {; [Vacuum machines](#)}
- 21/42 . by shaping on or against mandrels or like moulding surfaces
- 21/44 . . by projecting, e.g. spraying
- 21/46 . . by dipping
- 21/48 . . by wrapping, e.g. winding
- 21/50 . . Details of compression or compacting means
- 21/52 . by extruding
- 21/54 . . Mouthpieces for shaping sockets, bends, or like peculiarly-shaped tubular articles
- 21/56 . incorporating reinforcements {or inserts}
- 21/563 . . {[Gaskets](#)}
- 21/566 . . {[Climbing elements](#)}
- 21/58 . . Steel tubes
- 21/60 . . prestressed reinforcements
- 21/62 . . . circumferential {laterally tensioned}
- 21/64 . . . . Winding arrangements
- 21/66 . . . Reinforcing mats
- 21/68 . . and applying centrifugal forces
- 21/70 . by building-up from preformed elements
- 21/72 . . Producing multilayer tubes
- 21/74 . . Producing pipe bends, sockets, sleeves; Moulds therefor ([combined with extrusion presses B28B 21/54](#))
- 21/76 . Moulds {(for slip-casting [B28B 21/08](#))}
- 21/765 . . {[Top or bottom rings](#)}
- 21/78 . . with heating or cooling means, e.g. steam jackets
- 21/80 . . adapted to centrifugal or rotational moulding
- 21/82 . . built-up from several parts; Multiple moulds; Moulds with adjustable parts
- 21/84 . . . Moulds with one or more pivotable parts
- 21/86 . Cores ([in general B28B 7/00](#))
- 21/88 . . adjustable, collapsible or expansible ([using inflatable cores B28B 21/20](#) {; for compacting [B28B 21/18](#)})
- 21/90 . Methods or apparatus for {[demoulding or](#)} discharging after shaping
- 21/905 . . {[Removing from a mandrel](#)}
- 21/92 . Methods or apparatus for treating or reshaping
- 21/925 . . {for wrapping}
- 21/94 . . for impregnating or coating by applying liquids or semi-liquids
- 21/96 . . for smoothing, roughening, corrugating or for removing burr
- 21/965 . . . {for grooving or corrugating}
- 21/98 . . for reshaping, e.g. by means of reshape moulds
- 23/00** **Arrangements specially adapted for the production of shaped articles with elements wholly or partly embedded in the moulding material; {Production of reinforced objects}(B28B 21/00 takes precedence; in units for prefabricated buildings [B28B 7/22](#))**
- 23/0006 . {the reinforcement consisting of aligned, non-metal reinforcing elements}
- 23/0012 . {Producing brick netting}
- 23/0018 . {Producing metal-clad stones, such as oven stones}
- 23/0025 . {with installation or service material, e.g. tubes for electricity or water}

- 23/0031 . {with product identification means, e.g. labels on test products or integrated circuit tags inside products RFID}
- 23/0037 . {with elements being able to conduct light, e.g. light conducting fibers}
- 23/0043 . {with gaskets or sealing elements, e.g. for tunnelings or man holes ([B28B 21/563 takes precedence](#))}
- 23/005 . {with anchoring or fastening elements for the shaped articles}
- 23/0056 . {Means for inserting the elements into the mould or supporting them in the mould ([B28B 23/022 takes precedence](#))}
- 23/0062 . {forcing the elements into the cast material, e.g. hooks into cast concrete}
- 23/0068 . {Embedding lost cores}
- 23/0075 . {for decorative purposes}
- 23/0081 . {Embedding aggregates to obtain particular properties}
- 23/0087 . . {Lightweight aggregates for making lightweight articles}
- 23/0093 . . {Heavy aggregates or scrap material for making heavy articles}
- 23/02 . wherein the elements are reinforcing members ([B28B 23/0006 takes precedence](#))
- 23/022 . . {Means for inserting reinforcing members into the mould or for supporting them in the mould ([inserting during extrusion B28B 3/2645](#))}
- 23/024 . . . {Supporting means}
- 23/026 . . . . {Mould partitionning elements acting as supporting means in moulds, e.g. for elongated articles}
- 23/028 . . {for double - wall articles}
- 23/04 . . the elements being stressed
- 23/043 . . . {Wire anchoring or tensioning means for the reinforcements}
- 23/046 . . . . {Post treatment to obtain pre-stressed articles}
- 23/06 . . . for the production of elongated articles
- 23/10 . . . the shaping being effected by centrifugal or rotational moulding
- 23/12 . . . to form prestressed circumferential reinforcements
- 23/14 . . . . by wrapping, e.g. winding, apparatus
- 23/16 . . . . Prestressed reinforcing nets
- 23/18 . . for the production of elongated articles ([B28B 23/06 takes precedence](#))
- 23/20 . . the shaping being effected by centrifugal or rotational moulding ([B28B 23/10 takes precedence](#))
- 23/22 . . assembled from preformed parts