

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

SHAPING

B28 WORKING CEMENT, CLAY, OR STONE

B28B SHAPING CLAY OR OTHER CERAMIC COMPOSITIONS, SLAG, OR 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.

WARNING

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](#)

| | | | |
|--------------|---|------------------|---|
| 1/00 | Producing shaped {prefabricated} articles from the material (using presses B28B 3/00 ; shaping on moving conveyors B28B 5/00 ; producing tubular articles B28B 21/00 {; producing articles with embedded elements B28B 23/00 }) | 1/08 | • by vibrating or jolting {(of moulding sand B22C 15/10 ; of concrete in general E04G 21/063)} |
| | | 1/081 | • • {Vibration-absorbing means} |
| | | 1/082 | • • {combined with a vacuum, e.g. for moisture extraction (in general E04G 21/061)} |
| 1/001 | • {Rapid manufacturing of 3D objects by additive depositing, agglomerating or laminating of material (selective deposition modelling of metallic powder B22F 3/008 ; rapid manufacturing of 3D objects in general and in particular of plastics B29C 64/00)} | 1/084 | • • {the vibrating moulds or cores being moved horizontally for making strands of moulded articles} |
| 1/002 | • {assembled from preformed elements} | 1/085 | • • • {Introducing non-longitudinal reinforcing elements, e.g. spirally shaped} |
| 1/004 | • {Devices for shaping artificial aggregates from ceramic mixtures or from mixtures containing hydraulic binder (from slag C04B 5/00 ; composition of artificial aggregates C04B 18/02)} | 1/087 | • • by means acting on the mould {; Fixation thereof to the mould} |
| 1/005 | • {Devices or processes for obtaining articles having a marble appearance (producing decorative effects B44C ; design of stone surfaces, e.g. marble, B44F 9/04)} | 1/0873 | • • • {the mould being placed on vibrating or jolting supports, e.g. moulding tables} |
| | | 2001/0876 | • • • • {Supports, e.g. tables, therefor} |
| 1/007 | • {by freezing the material} | 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} ({ B28B 1/084 takes precedence; } internal vibrators for compacting concrete in situ E04G 21/08) |
| 1/008 | • {made from two or more materials having different characteristics or properties (casting for producing layered articles B28B 1/16 ; feeding several successive layers, optionally of different materials B28B 13/022 ; coating B28B 11/04 ; applying material to surfaces to form a permanent layer thereon B28B 19/00)} | 1/0935 | • • • {using only elements wholly or partly immersed in the material, e.g. cores} |
| 1/02 | • by turning or jiggering {in moulds or moulding surfaces on rotatable supports} | 1/10 | • • and applying pressure otherwise than by the use of presses |
| 1/025 | • • {Potters wheels} | 1/105 | • • • {this load also being actively vibrated or jolted} |
| 1/04 | • by tamping or ramming (followed by pressing B28B 3/02) | 1/14 | • by simple casting, the material being neither forcibly fed nor positively compacted (for molten material B28B 1/54) |
| 1/045 | • • {combined with vibrating or jolting} | 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}
- 3/10 . . each charge of material being compressed against previously formed body

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| 3/12 | . wherein one or more rollers exert pressure on the material | 5/026 | . . {the shaped articles being of indefinite length} |
| 3/123 | . . {on material in moulds or on moulding surfaces moving continuously underneath or between the rollers, e.g. on an endless belt} | 5/027 | . . . {the moulding surfaces being of the indefinite length type, e.g. belts, and being continuously fed (feeding B28B 13/02)} |
| 3/126 | . . {on material passing directly between the co-operating rollers} | 5/028 | . . . {the moulding surfaces being of definite length, e.g. succession of moving pallets, and being continuously fed (feeding B28B 13/02)} |
| 3/14 | . . with co-operating pocketed rollers | 5/04 | . in moulds moved in succession past one or more shaping stations (on turn-tables B28B 5/06) |
| 3/16 | . . with co-operating profiled rollers | 2005/041 | . . {with compacting of the material} |
| 3/18 | . . Roller-and-ring machines, i.e. with roller disposed within a ring and co-operating with the inner surface of the ring | 2005/042 | . . . {only by vibrating or jolting} |
| 3/20 | . wherein the material is extruded (extrusion moulding of plastics B29C 47/00) | 2005/044 | . . . {only by tamping or ramming} |
| 3/201 | . . {Means for heating or cooling the barrel} | 2005/045 | . . . {only by pressing} |
| 2003/203 | . . {for multi-channelled structures, e.g. honeycomb structures} | 2005/047 | . . . {by tamping, ramming or pressing as well as by vibrating, jolting or by rolling} |
| 3/205 | . . {using vibrations} | 2005/048 | . . {in moulds carried on a conveyor of the endless-belt type} |
| 3/206 | . . {Forcing the material through screens or slots} | 5/06 | . in moulds on a turntable |
| 3/208 | . . {Exchangeable wear parts, e.g. liners} | 5/08 | . . intermittently rotated |
| 3/22 | . . by screw or worm | 5/10 | . in moulds carried on the circumference of a rotating drum |
| 3/222 | . . . {Screw or worm constructions} | 5/12 | . . intermittently rotated |
| 3/224 | . . . {Twin screw extruders, e.g. double shaft extruders} | 2005/125 | . . . {Revolving presses} |
| 3/226 | . . . {Means for heating or cooling the screw} | 7/00 | Moulds; Cores; Mandrels (specially adapted for the production of the tubular articles B28B 21/00; {for casting metals B22C 9/00; moulds for plastic materials in general B29C 33/00; falsework, forms or shutterings for forming buildings or parts thereof in situ E04G 9/00 - E04G 15/00}) |
| 3/228 | . . . {Slipform casting extruder, e.g. self-propelled extruder} | 7/0002 | . {Auxiliary parts or elements of the mould} |
| 3/24 | . . by reciprocating plunger | 7/0005 | . . {Mould identification means, e.g. by radio frequency identification device [RFID]} |
| 3/26 | . . Extrusion dies | 7/0008 | . . {Venting channels, e.g. to avoid vacuum during demoulding or allowing air to escape during feeding, pressing or moulding} |
| 3/2609 | . . . {Containing rotating elements perpendicular to the axis of extrusion} | 7/0011 | . . {Mould seals} |
| 3/2618 | . . . {using lubricating means} | 7/0014 | . . {Fastening means for mould parts, e.g. for attaching mould walls on mould tables; Mould clamps (clamping means specially adapted for counteracting a pressure being applied on a slip or on the moulded article in the mould B28B 1/266)} |
| 3/2627 | . . . {using means for making hollow objects with transverse walls, e.g. hollow objects closed on all sides} | 7/0017 | . . . {for attaching mould walls on mould tables} |
| 3/2636 | . . . {using means for co-extruding different materials} | 7/002 | . . . {using magnets} |
| 3/2645 | . . . {using means for inserting reinforcing members} | 7/0023 | . . . {using vacuum} |
| 3/2654 | . . . {Means for heating or cooling the die} | 7/0026 | . . . {using adhesive} |
| 3/2663 | . . . {Exchangeable wear parts, e.g. liners} | 7/0029 | . {Moulds or moulding surfaces not covered by B28B 7/0058 - B28B 7/36 and B28B 7/40 - B28B 7/465 , e.g. moulds assembled from several parts} |
| 3/2672 | . . . {Means for adjusting the flow inside the die, e.g. using choke means} | 7/0032 | . . {Moulding tables or similar mainly horizontal moulding surfaces} |
| 3/2681 | . . . {Adjustable dies, e.g. for altering the shape of the product} | 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} |
| 3/269 | . . . {For multi-channelled structures, e.g. honeycomb structures} | 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} |
| 5/00 | 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 see the relevant groups) | 7/0041 | . . . {the sidewalls of the mould being moved only parallelly away from the sidewalls of the moulded article} |
| 5/02 | . on conveyors of the endless-belt or chain type (in combination with pressing rollers B28B 3/12) | | |
| 5/021 | . . {the shaped articles being of definite length} | | |
| 5/022 | . . . {the moulds or the moulding surfaces being individual independent units and being discontinuously fed (feeding B28B 13/0215 and sub-groups)} | | |
| 5/023 | {Moulds mounted on an endless chain conveyor for making pottery ware} | | |
| 5/025 | . . . {the moulds or the moulding surfaces being divided by separating walls and being continuously fed (feeding B28B 13/02)} | | |

- 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](#); of 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