

CPC**COOPERATIVE PATENT CLASSIFICATION****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

[B28B 23/08](#) covered by [B28B 21/60](#), [B28B 23/06](#)

B28B 1/00

Producing shaped {prefabricated} articles from the material (using presses [B28B 3/00](#); shaping on moving conveyers [B28B 5/00](#); producing tubular articles [B28B 21/00](#); {producing articles with embedded elements [B28B 23/00](#)})

B28B 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 67/0051](#)) }

B28B 1/002

- . {assembled from preformed elements}

B28B 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](#)) }

B28B 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](#)) }

B28B 1/007

- . {by freezing the material}

B28B 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](#)) }

B28B 1/02

- . by turning or jiggering {in moulds or moulding surfaces on rotatable supports}

B28B 1/025

- .. { Potters wheels}

- B28B 1/04 . by tamping or ramming (followed by pressing [B28B 3/02](#))
- B28B 1/045 .. {combined with vibrating or jolting}
- B28B 1/08 . by vibrating or jolting {(of moulding sand [B22C 15/10](#); of concrete in general [E04G 21/063](#))}
- B28B 1/081 .. {Vibration-absorbing means}
- B28B 1/082 .. {combined with a vacuum, e.g. for moisture extraction (in general [E04G 21/061](#))}
- B28B 1/084 .. {the vibrating moulds or cores being moved horizontally for making strands of moulded articles}
- B28B 1/085 ... {Introducing non-longitudinal reinforcing elements, e.g. spirally shaped}
- B28B 1/087 . by means acting on the mould; {Fixation thereof to the mould}
- B28B 1/0873 ... {the mould being placed on vibrating or jolting supports, e.g. moulding tables}
- B28B 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](#)
- B28B 1/0935 ... {using only elements wholly or partly immersed in the material, e.g. cores}
- B28B 1/10 . and applying pressure otherwise than by the use of presses
- B28B 1/105 ... {this load also being actively vibrated or jolted}
- B28B 1/14 . by simple casting, the material being neither forcibly fed nor positively compacted (for molten material [B28B 1/54](#))
- B28B 1/16 .. for producing layered articles (coating [B28B 11/04](#))
- B28B 1/20 . by centrifugal or rotational casting (slip-casting involving rotation of the mould [B28B 1/28](#); for molten material [B28B 1/54](#))
- B28B 1/24 . by injection moulding {(injection moulding of ceramic slips [B28B 1/265](#); of tubular articles [B28B 21/38](#))}
- B28B 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](#))}
- B28B 1/261 .. {Moulds therefor (absorbent moulds in general [B28B 7/344](#))}
- B28B 1/262 ... {Mould materials; Manufacture of moulds or parts thereof}
- B28B 1/263 {Plastics}
- B28B 1/264 {Plaster}
- B28B 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}
- B28B 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 (fastening means, clamping means for mould parts in general [B28B 7/00B5](#))}
- B28B 1/267 . {in moulds or on moulding surfaces supported by, or formed in or by, conveyers}
- B28B 1/268 . {by dipping moulding surfaces in the slip (in general [B28B 1/38](#))}
- B28B 1/269 . {by electrophoresis (electrophoresis in general [C25](#))}
- B28B 1/28 . involving rotation of the mould {about a centrifugal axis}

- B28B 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](#))}
- B28B 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](#))
- B28B 1/32 . . by projecting, e.g. spraying (spraying in general [B05B](#), D)
- B28B 1/34 . . . by centrifugal force {(centrifugally acting implements for applying plaster or the like to walls [E04F 21/10](#))}
- B28B 1/38 . . by dipping (in general [B05C](#), D; { shaping from synthetic resin [B29C 41/14](#)})
- B28B 1/40 . . by wrapping, e.g. winding
- B28B 1/42 . . . using mixtures containing fibres, e.g. for making sheets by slitting the wound layer

- B28B 1/44 . by forcing cores into filled moulds for forming hollow articles
- B28B 1/445 . . { Hollow punches or cores}

- B28B 1/48 . by removing material from solid section preforms for forming hollow articles, e.g. by punching or boring

- B28B 1/50 . specially adapted for producing articles of expanded material, e.g. cellular concrete (chemical aspects {or making expanded aggregate}[C04B](#))
- B28B 1/503 . . {Moulds therefor}
- B28B 1/506 . . . {with means for, or adapted for, cutting the moulded article into pieces (in general [B28B 7/14](#))}

- B28B 1/52 . specially adapted for producing articles from mixtures containing fibres, {e.g. asbestos cement}(by wrapping on +o mandrels [B28B 1/42](#))
- B28B 1/521 . . {from dry mixtures to which a setting agent is applied after forming ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- B28B 1/522 . . {for producing multi-layered articles ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- B28B 1/523 . . {containing metal fibres ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- B28B 1/525 . . {containing organic fibres, e.g. wood fibres ([B28B 1/526](#), [B28B 1/527](#) take precedence)}
- B28B 1/526 . . {by delivering the materials on a conveyer of the endless-belt type}
- B28B 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}
- B28B 1/528 . . {for producing corrugated sheets ([B28B 1/526](#), [B28B 1/527](#) take precedence)}

- B28B 1/54 . specially adapted for producing articles from molten material, e.g. slag {refractory ceramic materials}(chemical aspects [C04B](#); {from molten bituminous material [B29C](#)})

- B28B 3/00 Producing shaped articles from the material by using presses (shaping on moving conveyers [B28B 5/00](#)); Presses specially adapted therefor (presses in general [B30B](#))**
- B28B 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](#))}
- B28B 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](#))}

- B28B 3/02 . wherein a ram exerts pressure on the material in a moulding space; Ram heads of special form
- B28B 3/021 .. {Ram heads of special form}
- B28B 3/022 .. {combined with vibrating or jolting}
- B28B 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}
- B28B 3/025 .. {Hot pressing, e.g. of ceramic materials}
- B28B 3/027 .. {using a bottom press ram actuated upwardly towards mould covers}
- B28B 3/028 .. {Centering the press head, e.g. using guiding pins or chamfered mould edges}
- B28B 3/04 .. with one ram per mould ([B28B 3/10](#) takes precedence)
- B28B 3/06 ... with two or more ram and mould sets
- B28B 3/08 .. with two or more rams per mould
- B28B 3/083 ... {The juxtaposed rams working in the same direction}
- B28B 3/086 ... {The rams working in different directions}
- B28B 3/10 .. each charge of material being compressed against previously formed body
- B28B 3/12 . wherein one or more rollers exert pressure on the material
- B28B 3/123 .. {on material in moulds or on moulding surfaces moving continuously underneath or between the rollers, e.g. on an endless belt}
- B28B 3/126 .. {on material passing directly between the co-operating rollers}
- B28B 3/14 .. with co-operating pocketed rollers
- B28B 3/16 .. with co-operating profiled rollers
- B28B 3/18 .. Roller-and-ring machines, i.e. with roller disposed within a ring and co-operating with the inner surface of the ring
- B28B 3/20 . wherein the material is extruded {(extrusion moulding of plastics [B29C 47/00](#))}
- B28B 3/201 .. {Means for heating or cooling the barrel}
- B28B 3/205 .. {using vibrations}
- B28B 3/206 .. {Forcing the material through screens or slots}
- B28B 3/208 .. {Exchangeable wear parts, e.g. liners}
- B28B 3/22 .. by screw or worm
- B28B 3/222 ... {Screw or worm constructions}
- B28B 3/224 ... {Twin screw extruders, e.g. double shaft extruders}
- B28B 3/226 ... {Means for heating or cooling the screw}
- B28B 3/228 ... {Slipform casting extruder, e.g. self-propelled extruder}
- B28B 3/24 .. by reciprocating plunger
- B28B 3/26 .. Extrusion dies
- B28B 3/2609 ... {Containing rotating elements perpendicular to the axis of extrusion}
- B28B 3/2618 ... {using lubricating means}
- B28B 3/2627 ... {using means for making hollow objects with transverse walls, e.g. hollow

- objects closed on all sides}
- B28B 3/2636 . . . {using means for co-extruding different materials}
- B28B 3/2645 . . . {using means for inserting reinforcing members}
- B28B 3/2654 . . . { Means for heating or cooling the die}
- B28B 3/2663 . . . { Exchangeable wear parts, e.g. liners}
- B28B 3/2672 . . . { Means for adjusting the flow inside the die, e.g. using choke means}
- B28B 3/2681 . . . { Adjustable dies, e.g. for altering the shape of the product}
- B28B 3/269 . . . { For multi-channeled structures, e.g. honeycomb structures}

B28B 5/00 **Producing shaped articles from the material in moulds or on moulding surfaces, carried or formed by, in, or on conveyers irrespective of the manner of shaping**
(shaping aspects see the relevant groups)

- B28B 5/02 . on conveyers of the endless-belt or chain type (in combination with pressing rollers [B28B 3/12](#))
- B28B 5/021 .. {the shaped articles being of definite length}
- B28B 5/022 . . . {the moulds or the moulding surfaces being individual independant units and being discontinuously fed (feeding [B28B 13/0215](#) and sub-groups)}
- B28B 5/023 {Moulds mounted on an endless chain conveyer for making pottery ware}
- B28B 5/025 . . . {the moulds or the moulding surfaces being divided by separating walls and being continuously fed (feeding [B28B 13/02](#))}
- B28B 5/026 .. {the shaped articles being of indefinite length}
- B28B 5/027 . . . {the moulding surfaces being of the indefinite length type, e.g. belts, and being continuously fed (feeding [B28B 13/02](#))}
- B28B 5/028 . . . {the moulding surfaces being of definite length, e.g. succession of moving pallets, and being continuously fed (feeding [B28B 13/02](#))}
- B28B 5/04 . in moulds moved in succession past one or more shaping stations (on turn-tables [B28B 5/06](#))
- B28B 5/06 . in moulds on a turn-table
- B28B 5/08 .. intermittently rotated
- B28B 5/10 . in moulds carried on the circumference of a rotating drum
- B28B 5/12 .. intermittently rotated

B28B 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](#) to [E04G 15/00](#)})

- B28B 7/0002 . { Auxiliary parts or elements of the mould}
- B28B 7/0005 .. { Mould identification means, e.g. by radio frequency identification device [RFID]}
- B28B 7/0008 .. { Venting channels, e.g. to avoid vacuum during demoulding or allowing air to escape during feeding, pressing or moulding}
- B28B 7/0011 .. { Mould seals}
- B28B 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](#))

- B28B 7/0017 . . . { for attaching mould walls on mould tables}
- B28B 7/002 . . . { using magnets}
- B28B 7/0023 . . . { using vacuum}
- B28B 7/0026 . . . { using adhesive}

- B28B 7/0029 . {Moulds or moulding surfaces not covered by [B28B 7/0058](#) to [B28B 7/36](#) and [B28B 7/40](#) to [B28B 7/465](#), e.g. moulds assembled from several parts}
- B28B 7/0032 . . {Moulding tables or similar mainly horizontal moulding surfaces}
- B28B 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}
- B28B 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}
- B28B 7/0041 . . . {the sidewalls of the mould being moved only parallelly away from the sidewalls of the moulded article}
- B28B 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}
- B28B 7/0055 . . {Mould pallets; Mould panels}

- B28B 7/0058 . {Moulds, cores or mandrels with provisions concerning the elimination of superfluous material; Moulds with burr-removing means provided therein or carried thereby}

- B28B 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}

- B28B 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](#))}
- B28B 7/0067 . . {with polished or glossy moulding surfaces}
- B28B 7/007 . . {with moulding surfaces simulating natural effects, e.g. wood or stone}
- B28B 7/0073 . . {with moulding surfaces simulating assembled bricks or blocks with mortar joints ([B28B 7/007](#) takes precedence)}
- B28B 7/0076 . . {with surfaces for moulding letters or marks}
- B28B 7/0079 . . {with surfaces for moulding interlocking means, e.g. grooves and ribs}
- B28B 7/0082 . . {with surfaces for moulding parallel grooves or ribs ([B28B 7/0073](#), [B28B 7/0079](#) takes precedence)}
- B28B 7/0085 . . {with surfaces for moulding chamfers}

- B28B 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}

- B28B 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}

- B28B 7/0094 . {Moulds for concrete test samples}

- B28B 7/0097 . {Press moulds; Press-mould and press-ram assemblies}

- B28B 7/02 . Moulds with adjustable parts {specially for modifying at will the dimensions or form of the moulded article}
- B28B 7/025 . . { the mould surface being made of or being supported by a plurality of small elements, e.g. to create double curvatures}
- B28B 7/04 . . one or more of the parts being pivotally mounted
- B28B 7/06 . Moulds with flexible parts
- B28B 7/065 . . { Casting in sack or bag like moulds}
- B28B 7/08 . Moulds provided with means for tilting or inverting
- B28B 7/082 . . {Tiltable moulding tables or similar moulding surfaces (specially for casting and erecting walls or parts thereof during construction work [E04G 11/32](#))}
- B28B 7/085 . . {for making double wall panels}
- B28B 7/087 . . {using rocker or rolling means}
- B28B 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](#))
- B28B 7/12 . . by fluid pressure, {e.g. acting through flexible wall parts or linings of the moulds}
- B28B 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](#))
- B28B 7/16 . Moulds for making shaped articles with cavities or holes open to the surface, {e.g. with blind holes}
- B28B 7/162 . . {for building blocks or similar block-shaped articles}
- B28B 7/164 . . {for plates, panels, or similar sheet- or disc-shaped articles}
- B28B 7/166 . . {for oblong articles, e.g. hollow masts}
- B28B 7/168 . . {for holders or similar hollow articles, e.g. vaults, sewer pits}
- B28B 7/18 . . the holes passing completely through the article
- B28B 7/183 . . . {for building blocks or similar block-shaped objects}
- B28B 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}
- B28B 7/20 . Moulds for making shaped articles with undercut recesses, e.g. dovetails
- B28B 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
- B28B 7/225 . . {for making stairs or stair units comprising more than one step (in situ [E04G 13/06](#))}
- B28B 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](#))}

- B28B 7/241 .. {Detachable assemblies of mould parts providing only in mutual co-operation a number of complete moulding spaces}
- B28B 7/243 ... {for making plates, panels or similar sheet- or disc-shaped objects}
- B28B 7/245 {using transportable mould batteries}
- B28B 7/246 ... {for making oblong objects, e.g. girders}
- B28B 7/248 ... {using angle-shaped mould parts, e.g. L-parts}

- B28B 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}
- B28B 7/263 .. {for making plates, panels or similar sheet- or disc-shaped objects}
- B28B 7/266 .. {for making oblong objects, e.g. girders}

- B28B 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)}
- B28B 7/285 .. {Core puller}
- B28B 7/30 .. adjustable, collapsible, or expanding {(for making tubular objects B28B 21/88)}
- B28B 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}
- B28B 7/306 ... {pliable or extensible}
- B28B 7/32 ... inflatable {(connection of valves to inflatable elastic bodies B60C 29/00)}

- B28B 7/34 . Moulds, cores, or mandrels of special material, e.g. destructible materials (for slip casting B28B 1/26)
- B28B 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}
- B28B 7/344 .. {from absorbent or liquid- or gas-permeable materials, e.g. plaster moulds in general}
- B28B 7/346 .. {Manufacture of moulds}
- B28B 7/348 .. {of plastic material or rubber}

- B28B 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)
- B28B 7/362 .. {specially for making moulded articles from concrete with exposed aggregate}
- B28B 7/364 .. {of plastic material or rubber}
- B28B 7/366 .. {Replaceable lining plates for press mould}
- B28B 7/368 .. {Absorbent linings}

- B28B 7/38 . Treating surfaces of moulds, cores, or mandrels to prevent sticking
- B28B 7/382 .. {Devices for treating, e.g. sanding}
- B28B 7/384 .. {Treating agents (for plastic moulding materials in general B29C 33/60; lubricants in general C10M)}
- B28B 7/386 .. {Cleaning}
- B28B 7/388 .. {with liquid material, e.g. lubricating}

- B28B 7/40 . characterised by means for modifying the properties of the moulding material
- B28B 7/42 . . for heating or cooling, e.g. steam jackets, {by means of treating agents acting directly on the moulding material}
- B28B 7/44 . . for treating with gases or degassing, e.g. for de-aerating {(treating with hot gases or vapour B28B 7/42)}
- B28B 7/46 . . for humidifying or dehumidifying
- B28B 7/465 . . . {Applying setting liquid to dry mixtures}

- B28B 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)

- B28B 11/001 . {Applying decorations on shaped articles, e.g. by painting}
- B28B 11/002 . { Apparatus for washing concrete for decorative purposes or similar surface treatments for exposing the texture}

- B28B 11/003 . {the shaping of preshaped articles, e.g. by bending (B28B 11/08 takes precedence)}
- B28B 11/005 . . { Using heat to allow reshaping, e.g. to soften ceramic articles}
- B28B 11/006 . . {Making hollow articles or partly closed articles}
- B28B 11/007 . . . { Using a mask for plugging}
- B28B 11/008 . . { Blow moulding, e.g. with or without the use of a membrane}

- B28B 11/02 . for attaching appendages, e.g. handles, spouts

- B28B 11/04 . for coating {or applying engobing layers}(glazing, engobing C04B)
- B28B 11/041 . . {for moulded articles undergoing a thermal treatment at high temperatures, such as burning, after coating}
- B28B 11/042 . . {with insulating material}
- B28B 11/043 . . . { filling cavities or chambers of hollow blocks}
- B28B 11/044 . . {with glaze or engobe or enamel or varnish}
- B28B 11/045 . . { by dipping}
- B28B 11/046 . . { by rolling}
- B28B 11/047 . . { by pooring, e.g. curtain coating}
- B28B 11/048 . . { by spraying or projecting}
- B28B 11/049 . . { Recycling of the coating material}
- B28B 11/06 . . with powdered or granular material, {e.g. sanding of shaped articles}

- B28B 11/08 . for reshaping the surface, e.g. smoothing, roughening, corrugating, making screw-threads
- B28B 11/0809 . . { Hand tools therefore}
- B28B 11/0818 . . {for roughening, profiling, corrugating}
- B28B 11/0827 . . . {for corrugating, profiling or the like of plates such as asbestos cement sheets}
- B28B 11/0836 . . . {for pottery articles}
- B28B 11/0845 . . {for smoothing}

- B28B 11/0854 . . {for making screw-threads or the like in the surface of the shaped article}
- B28B 11/0863 . . {for profiling, e.g. making grooves}
- B28B 11/0872 . . { Non-mechanical reshaping of the surface, e.g. by burning, acids, radiation energy, air flow, etc.}
- B28B 11/0881 . . { Using vibrating mechanisms, e.g. vibrating plates for ageing stones}
- B28B 11/089 . . { Using impacting tools}
- B28B 11/10 . . by using presses

- B28B 11/12 . for removing parts of the articles by cutting
- B28B 11/125 . . {Cutting-off protruding ridges, also profiled cutting}

- B28B 11/14 . for dividing shaped articles by cutting
- B28B 11/145 . . {for dividing block-shaped bodies of expanded materials, e.g. cellular concrete}
- B28B 11/16 . . for extrusion {or for materials supplied in long webs}
- B28B 11/161 . . . {in vertically operating extrusion presses}
- B28B 11/163 . . . {in which the cutting device is moved longitudinally with the moving strand}
- B28B 11/165 . . . {mounted on a carrier}
- B28B 11/166 . . . {with devices for determining the correct cutting moment, e.g. measuring rollers or the like}
- B28B 11/168 . . . {in which the material is cut-out from a strand or web by means of a frame-shaped knife}

- B28B 11/18 . for removing burr [(N: combined with the mould [B28B 7/0058](#))]

- B28B 11/22 . for cleaning

- B28B 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](#))
- B28B 11/241 . . { using microwave heating means}
- B28B 11/242 . . {by passing an electric current through wires, rods or reinforcing members incorporated in the article}
- B28B 11/243 . . {Setting, e.g. drying, dehydrating or firing ceramic articles ([B28B 11/242](#) takes precedence)}
- B28B 11/245 . . {Curing concrete articles ([B28B 11/242](#) takes precedence)}
- B28B 11/246 . . . { Underwater curing}
- B28B 11/247 . . { Controlling the humidity during curing, setting or hardening}
- B28B 11/248 . . { Supports for drying}

- B28B 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)

- B28B 13/02 . Feeding the unshaped material to moulds or apparatus for producing shaped articles
- B28B 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}
- B28B 13/021 . . {by fluid pressure acting directly on the material, e.g. using vacuum, air pressure}
- B28B 13/0215 . . {Feeding the moulding material in measured quantities from a container or silo}
- B28B 13/022 . . . {Feeding several successive layers, optionally of different materials}
- B28B 13/0225 . . . { Feeding specific quantities of material at specific locations in the mould}
- B28B 13/023 . . . {by using a feed box transferring the moulding material from a hopper to the moulding cavities}
- B28B 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**)}
- B28B 13/0245 { Rotatable feed frames, e.g. horizontally rotated over 90 degrees}
- B28B 13/025 { the feed box being vibrated, e.g. to promote discharging of the material}
- B28B 13/0255 { Disposal of residual material, e.g. by means of the return stroke of the feed drawer}
- B28B 13/026 . . . { by using a movable hopper transferring the moulding material to the moulding cavities}
- B28B 13/027 . . . { by using a removable belt or conveyor transferring the moulding material to the moulding cavities}
- B28B 13/0275 . . . { Feeding a slurry or a ceramic slip}
- B28B 13/028 . . { Deflecting the flow of the unshaped material}
- B28B 13/0285 . . { the material being prearranged on a sheet, e.g. using a decal}
- B28B 13/029 . . { through a sieve or grid, e.g. to ensure evenly filling of cavities}
- B28B 13/0295 . . { Treating the surface of the fed layer, e.g. removing material or equalization of the surface}
- B28B 13/04 . Discharging the shaped articles ({discharging tubular articles after shaping [B28B 21/90](#);} [conveying systems for ceramic mouldings B65G 49/08](#))
- B28B 13/06 . . Removing the shaped articles from moulds ([by means incorporated in, or carried by, the moulds B28B 7/10](#))
- B28B 13/062 . . . { by elastically deforming the mould, e.g. bending flexible moulds}
- B28B 13/065 . . . {by applying electric current or other means of discharging, e.g. pneumatic or hydraulic discharging means}
- B28B 13/067 . . . {by applying blows or vibrations followed by, or during, the removal of a mould part}
- B28B 15/00** **General arrangement or lay-out of plant** {Industrial outlines, plant installations}
- B28B 15/002 . {Mobile plants, e.g. on vehicles or on boats}
- B28B 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](#)**)}
- B28B 15/007 . {Plant with two or more identical shaping or moulding devices}
- B28B 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)

- B28B 17/0009 . {Shaping of preshaped articles (shaping the surface of articles [B28B 11/08](#))}
- B28B 17/0018 . {Separating articles from each other}
- B28B 17/0027 . {Accessories for obtaining rubblestones}
- B28B 17/0036 . {Cutting means, e.g. water jets}
- B28B 17/0045 . {Tensioning devices for cutting means}
- B28B 17/0054 . {Cleaning devices for cutting means}
- B28B 17/0063 . {Control arrangements}
- B28B 17/0072 . . { Product control or inspection}
- B28B 17/0081 . . { Process control}
- B28B 17/009 . {Changing the forming elements, e.g. exchanging moulds, dies}
- B28B 17/02 . Conditioning the material prior to shaping {(for mixtures containing clay or cement [B28C](#))}
- B28B 17/023 . . {Conditioning gypsum}
- B28B 17/026 . . {Conditioning ceramic materials}
- B28B 17/04 . Exhausting or laying dust
- B28B 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)
- B28B 19/0007 . {for producing articles with exposed aggregate}
- B28B 19/0015 . {on multilayered articles}
- B28B 19/0023 . {Lining the inner wall of hollow objects, e.g. pipes}
- B28B 19/003 . {to insulating material}
- B28B 19/0038 . {lining the outer wall of hollow objects, e.g. pipes}
- B28B 19/0046 . {to plastics}
- B28B 19/0053 . {to tiles, bricks or the like}
- B28B 19/0061 . . {Means for arranging or fixing the tiles, bricks or the like in the mould}
- B28B 19/0069 . . . { the tiles, bricks or the like being sunk in resilient mould material}

- B28B 19/0076 . . . { the tiles, bricks or the like being sunk in heated mould material, e.g. thermoplastic material to temporarily fix them}
- B28B 19/0084 . . . { using pressurized elements for fixing the tiles, bricks or the like}
- B28B 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

B28B 21/00

Methods or machines specially adapted for the production of tubular articles

- B28B 21/02 . by casting into moulds
- B28B 21/04 . . by simple casting, the material being neither positively compacted nor forcibly fed
- B28B 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](#))
- B28B 21/08 . . by slip-casting; Moulds therefor
- B28B 21/10 . . using compacting means
 - B28B 21/12 . . . tamping or ramming the material or the mould elements
 - B28B 21/14 . . . vibrating, e.g. the surface of the material
 - B28B 21/16 one or more mould elements
 - B28B 21/18 . . . using expansible or retractable mould or core elements
 - B28B 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](#))
 - B28B 21/205 {having a rigid frame inside the inflatable part of the core}
 - B28B 21/22 . . . using rotatable mould or core parts
 - B28B 21/24 using compacting heads, rollers, or the like
 - B28B 21/242 { the working diameter of the compacting mechanism being adjustable, e.g. the compacting rollers on the head being displaceable}
 - B28B 21/245 {using a horizontal compacting roller in a horizontally rotatable mould}
 - B28B 21/247 { the rollers of the compaction head being driven, e.g. to overcome or modify the tangential force}
 - B28B 21/26 with a packer head serving as a sliding mould or provided with guiding means for feeding the material
 - B28B 21/28 combined with vibration means
 - B28B 21/30 . . . Centrifugal moulding
 - B28B 21/305 {Moulding machines with vertical rotation axis}
 - B28B 21/32 Feeding the material into the moulds
 - B28B 21/34 combined with vibrating or other additional compacting means
 - B28B 21/36 . . . applying fluid pressure or vacuum to the material ([combined with slip-casting](#) [B28B 21/08](#))
 - B28B 21/38 introducing the material wholly or partly under pressure; {Injection-moulding machines}
 - B28B 21/40 by evacuating one or more of the mould parts; {Vacuum machines}

- B28B 21/42 . by shaping on or against mandrels or like moulding surfaces
- B28B 21/44 . . by projecting, e.g. spraying
- B28B 21/46 . . by dipping
- B28B 21/48 . . by wrapping, e.g. winding
- B28B 21/50 . . Details of compression or compacting means

- B28B 21/52 . by extruding
- B28B 21/54 . . Mouthpieces for shaping sockets, bends, or like peculiarly-shaped tubular articles

- B28B 21/56 . incorporating reinforcements {or inserts}
- B28B 21/563 . . {Gaskets}
- B28B 21/566 . . {Climbing elements}
- B28B 21/58 . . Steel tubes
- B28B 21/60 . . prestressed reinforcements
- B28B 21/62 . . . circumferential {laterally tensioned}
- B28B 21/64 Winding arrangements
- B28B 21/66 . . . Reinforcing mats
- B28B 21/68 . . and applying centrifugal forces

- B28B 21/70 . by building-up from preformed elements
- B28B 21/72 . . Producing multilayer tubes
- B28B 21/74 . . Producing pipe bends, sockets, sleeves; Moulds therefor (combined with extrusion presses [B28B 21/54](#))

- B28B 21/76 . Moulds {(for slip-casting [B28B 21/08](#))}
- B28B 21/765 . . { Top or bottom rings}
- B28B 21/78 . . with heating or cooling means, e.g. steam jackets
- B28B 21/80 . . adapted to centrifugal or rotational moulding
- B28B 21/82 . . built-up from several parts; Multiple moulds; Moulds with adjustable parts
- B28B 21/84 . . . Moulds with one or more pivotable parts

- B28B 21/86 . Cores (in general [B28B 7/00](#))
- B28B 21/88 . . adjustable, collapsible or expansible (using inflatable cores [B28B 21/20](#){for compacting [B28B 21/18](#)})

- B28B 21/90 . Methods or apparatus for {demoulding or} discharging after shaping
- B28B 21/905 . . {Removing from a mandrel}

- B28B 21/92 . Methods or apparatus for treating or reshaping
- B28B 21/925 . . {for wrapping}
- B28B 21/94 . . for impregnating or coating by applying liquids or semi-liquids
- B28B 21/96 . . for smoothing, roughening, corrugating or for removing burr
- B28B 21/965 . . . {for grooving or corrugating}
- B28B 21/98 . . for reshaping, e.g. by means of reshape moulds

B28B 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)
B28B 23/0006	. {the reinforcement consisting of aligned, non-metal reinforcing elements}
B28B 23/0012	. {Producing brick netting}
B28B 23/0018	. {Producing metal-clad stones, such as oven stones}
B28B 23/0025	. { with installation or service material, e.g. tubes for electricity or water}
B28B 23/0031	. { with product identification means, e.g. labels on test products or integrated circuit tags inside products RFID}
B28B 23/0037	. { with elements being able to conduct light, e.g. light conducting fibers}
B28B 23/0043	. {with gaskets or sealing elements, e.g. for tunnelings or man holes (B28B 21/563 takes precedence)}
B28B 23/005	. {with anchoring or fastening elements for the shaped articles}
B28B 23/0056	. {Means for inserting the elements into the mould or supporting them in the mould (B28B 23/022 takes precedence)}
B28B 23/0062	. { forcing the elements into the cast material, e.g. hooks into cast concrete}
B28B 23/0068	. {Embedding lost cores}
B28B 23/0075	. {for decorative purposes}
B28B 23/0081	. {Embedding aggregates to obtain particular properties}
B28B 23/0087	.. {Lightweight aggregates for making lightweight articles}
B28B 23/0093	.. {Heavy aggregates or scrap material for making heavy articles}
B28B 23/02	. wherein the elements are reinforcing members {(B28B 23/0006 takes precedence)}
B28B 23/022	.. {Means for inserting reinforcing members into the mould or for supporting them in the mould (inserting during extrusion B28B 3/2645)}
B28B 23/024	... {Supporting means}
B28B 23/026 {Mould partitionning elements acting as supporting means in moulds, e.g. for elongated articles}
B28B 23/028	.. {for double - wall articles}
B28B 23/04	.. the elements being stressed
B28B 23/043	... {Wire anchoring or tensioning means for the reinforcements}
B28B 23/046	... {Post treatment to obtain pre-stressed articles}
B28B 23/06	... for the production of elongated articles
B28B 23/10	... the shaping being effected by centrifugal or rotational moulding

- B28B 23/12 . . . to form prestressed circumferential reinforcements
 - B28B 23/14 by wrapping, e.g. winding, apparatus
 - B28B 23/16 Prestressed reinforcing nets
 - B28B 23/18 . . for the production of elongated articles([B28B 23/06 takes precedence](#))
 - B28B 23/20 . . the shaping being effected by centrifugal or rotational moulding ([B28B 23/10 takes precedence](#))
 - B28B 23/22 . . assembled from preformed parts
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- B28B 2001/00** **Producing shaped {prefabricated} articles from the material** (using presses [B28B 3/00](#); shaping on moving conveyers [B28B 5/00](#); producing tubular articles [B28B 21/00](#); {producing articles with embedded elements [B28B 23/00](#)})
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- B28B 2001/08 . by vibrating or jolting {(of moulding sand [B22C 15/10](#); of concrete in general [E04G 21/063](#))}
 - B28B 2001/087 . . by means acting on the mould; {Fixation thereof to the mould}
 - B28B 2001/0873 . . . {the mould being placed on vibrating or jolting supports, e.g. moulding tables}
 - B28B 2001/0876 Supports, e.g. tables, therefor
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- B28B 2003/00** **Producing shaped articles from the material by using presses** (shaping on moving conveyers [B28B 5/00](#)); **Presses specially adapted therefor** (presses in general [B30B](#))
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- B28B 2003/20 . wherein the material is extruded {(extrusion moulding of plastics [B29C 47/00](#))}
 - B28B 2003/203 . . for multi-channelled structures, e.g. honeycomb structures
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- B28B 2005/00** **Producing shaped articles from the material in moulds or on moulding surfaces, carried or formed by, in, or on conveyers irrespective of the manner of shaping** (shaping aspects see the relevant groups)
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- B28B 2005/04 . in moulds moved in succession past one or more shaping stations ([on turn-tables B28B 5/06](#))
 - B28B 2005/041 . . with compacting of the material
 - B28B 2005/042 . . . only by vibrating or jolting
 - B28B 2005/044 . . . only by tamping or ramming
 - B28B 2005/045 . . . only by pressing
 - B28B 2005/047 . . . by tamping, ramming or pressing as well as by vibrating, jolting or by rolling
 - B28B 2005/048 . . in moulds carried on a conveyer of the endless-belt type
 - B28B 2005/10 . in moulds carried on the circumference of a rotating drum
 - B28B 2005/12 . . intermittently rotated
 - B28B 2005/125 . . . Revolving presses
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- B28B 2007/00** **Moulds; Cores; Mandrels**([specially adapted for the production of the tubular articlesB28B 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](#) to [E04G 15/00](#)}}

- B28B 2007/0029 . {Moulds or moulding surfaces not covered by [B28B 7/0058](#) to [B28B 7/36](#) and [B28B 7/40](#) to [B28B 7/465](#), e.g. moulds assembled from several parts}
- [B28B 2007/0047](#) . . Mould seals
- [B28B 2007/005](#) . . Fastening means for mould parts, e.g. for attaching mould walls on mould tables; Mould clamps
- [B28B 2007/0052](#) . . . for attaching mould walls on mould tables

- B28B 2013/00** **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)

- B28B 2013/02 . Feeding the unshaped material to moulds or apparatus for producing shaped articles
- B28B 2013/0215 . . {Feeding the moulding material in measured quantities from a container or silo}
- B28B 2013/023 . . . {by using a feed box transferring the moulding material from a hopper to the moulding cavities}
- [B28B 2013/024](#) the feed box being provided with means for transporting the moulded products, e.g. out of the machine
- [B28B 2013/0265](#) . . . Feeding a slurry or a ceramic slip