

**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**

The following IPC group(s) are not used in the CPC scheme. Subject matter covered by these groups is classified in the following groups:

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

**Guidance heading:****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 . . { Tilttable 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 }

**Guidance heading:** 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

#### Guidance heading:

**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](#) } )

- 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

**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](#) )

- 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

**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 )

- 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 conveyor 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

**B28B 2007/00** **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 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