

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 2001/0876 [Supports, e.g. tables, therefor](#)
- 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 2003/203 .. for multi-channelled structures, e.g. honeycomb structures
- 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 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 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 2005/125	...	Revolving presses

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 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 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 2013/024 the feed box being provided with means for transporting the moulded products, e.g. out of the machine
- 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 2013/0265 ... Feeding a slurry or a ceramic slip
- 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