**CPC**  
**COOPERATIVE PATENT CLASSIFICATION**

**B**  
**PERFORMING OPERATIONS; TRANSPORTING**  
*(NOTES omitted)*

**SHAPING**

**B28**  
**WORKING CEMENT, CLAY, OR STONE**

**B28C**  
**PREPARING MIXTURES CONTAINING CLAY OR CEMENTITIOUS MATERIAL, e.g. PLASTER** *(preparing material for foundry moulds B22C 5/00)*

**NOTE**

In this subclass, the following terms or expressions are used with the meanings indicated:
- "cement" or "mixtures of cement with other substance" includes plaster;
- "clay" includes like ceramic compositions.

**WARNING**

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 **Apparatus or methods for obtaining or processing clay** *(filtration in general B01D; separation of solids from solids B03, B07; chemical part C04B; by mining or quarrying E21C 41/16, E21C 41/26, E21C 47/10)*

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**Mixing clay or cement with other material** *(general arrangement or layout of plant B28C 9/00; mixers in general B01F; concrete paving mixers combined with distributing devices E01C 19/00; machines for preparing mixtures of road-metal with bitumen E01C 19/10)*

**NOTE**

In groups B28C 3/00 - B28C 7/00, the following term is used with the meaning indicated:
- "mixing" includes preliminary mixing, e.g. of some of the ingredients final mixing, and agitating the mixture to prevent segregation thereof.

3/00 **Apparatus or methods for mixing clay with other substances** *(producing clay suspensions B28C 1/02)*

5/00 **Apparatus or methods for producing mixtures of cement with other substances, e.g. slurries, mortars, porous or fibrous compositions** *(controlling the mixing apparatus and supplying the ingredients B28C 7/00 (separating cement from waste concrete B03B 9/063))*
Mixing clay or cement with other material

5/003 . . . . [Methods for mixing (B28C 5/386, B28C 5/402 take precedence)]
5/006 . . . . [involving mechanical aspects]
5/02 . . . . without using driven mechanical means effecting the mixing (B28C 5/48 takes precedence)
5/023 . . . . [using a flexible mat or bag]
5/026 . . . . [Mixing guns or nozzles; Injector mixers (applying plaster by gas pressure E04F 21/12; both conveying and distributing concrete E04G 21/03; conveying concrete B65G 53/32; accelerating or decelerating material flow in troughs or tubes B65G 53/58)]
5/04 . . . . Gravitational mixing; Mixing by intermingling streams of ingredients (B28C 5/026 takes precedence); ingredients projected by fluid pressure B28C 5/06)
5/06 . . . . the mixing being effected by the action of a fluid (in combination with driven mechanical means, producing cellular concrete B28C 5/38)
5/08 . . . . using driven mechanical means affecting the mixing (B28C 5/40, B28C 5/42, B28C 5/48 take precedence; in combination with the action of a fluid B28C 5/38)
5/0806 . . . . [Details; Accessories]
5/0812 . . . . [Drum mixer cover, e.g. lid]
5/0818 . . . . [Charging or discharging gates or chutes; Sealing means]
5/0825 . . . . [Drum insulating means]
5/0831 . . . . [Drives or drive systems, e.g. toothed racks, winches (B28C 7/0876 takes precedence)]
5/0837 . . . . [Drives for mixers of the tilted-drum type (B28C 5/085 takes precedence)]
5/0843 . . . . [Drives for drums rotating about a horizontal axis and supported by rotating rollers (B28C 5/085 takes precedence)]
5/085 . . . . [Hydraulic drives]
5/0856 . . . . [Supporting frames or structures, e.g. supporting wheels]
5/0862 . . . . [Adaptations of mixing containers therefor, e.g. use of material, coatings]
5/0868 . . . . [Mixing apparatus in which a mixing container is hoisted along an inclined or vertical track during mixing to discharge at a higher level]
5/0875 . . . . [Mixing in separate stages involving different containers for each stage]
5/0881 . . . . [having a stator-rotor system with intermeshing teeth or cages]
5/0887 . . . . [provided with sieves or filters]
5/0893 . . . . [Mobile mixing devices, e.g. hanging]
5/10 . . . . Mixing in containers not actuated to effect the mixing
5/12 . . . . with stirrers sweeping through the materials [e.g. with incorporated feeding or discharging means or with oscillating stirrers]
5/1207 . . . . [with means for elevating the stirrer, e.g. out of the containers]
5/1215 . . . . [Independent stirrer-drive units, e.g. portable or mounted on a wheelbarrow]
5/1223 . . . . [discontinuously operating mixing devices, e.g. with consecutive containers]
5/123 . . . . [with pressure or suction means for discharging]
5/1238 . . . . [for materials flowing continuously through the mixing device and with incorporated feeding or discharging devices (feeding or discharging devices per se B28C 5/0818)]
5/1246 . . . . [with feeding devices (B28C 5/1276, B28C 5/1292 take precedence)]
5/1253 . . . . [with discharging devices (B28C 5/1276, B28C 5/1292 take precedence)]
5/1261 . . . . [Applying pressure for discharging (applying pressure during mixing B28C 5/462)]
5/1269 . . . . [for making cellular concrete (in general B28C 5/381)]
5/1276 . . . . [with consecutive separate containers with rotating stirring and feeding or discharging means]
5/1284 . . . . [having a feeding hopper and consecutive vertical or inclined mixing container fed at its upper part]
5/1292 . . . . [with rotating stirring and feeding or discharging means fixed on the same axis, e.g. in an inclined container fed at its lower part]
5/14 . . . . the stirrers having motion about a horizontal or substantially horizontal axis ([with feeding or discharging means B28C 5/12)]
5/141 . . . . [with container tiltable or elevatable for emptying]
5/142 . . . . [the stirrer shaft carrying screw-blades]
5/143 . . . . [for materials flowing continuously through the mixing device]
5/145 . . . . [with several mixing chambers arranged one after the other]
5/146 . . . . [with several stirrers with parallel shafts in one container (B28C 5/145 takes precedence)]
5/147 . . . . [the material being moved perpendicularly to the axis of the shafts]
5/148 . . . . [the stirrer shaft carrying a plurality of radially extending mixing bars]
5/16 . . . . the stirrers having motion about a vertical or steeply inclined axis ([with feeding or discharging means B28C 5/12)]
5/161 . . . . [in containers tiltable for emptying in containers with inclined axes]
5/163 . . . . [in annularly-shaped containers]
5/165 . . . . [with stirrers having planetary motion]
5/166 . . . . [Pan-type mixers]
5/168 . . . . [with stirrers having planetary motion]
5/18 . . . . Mixing in containers to which motion is imparted to effect the mixing
5/1806 . . . . [rotating about an inclined axis (about a steeply inclined axis B28C 5/26)]
5/1812 . . . . [with rotating mixing tools]
5/1818 . . . . [Mobile or portable devices, e.g. on a wheelbarrow (B28C 5/1887 takes precedence)]
5/1825 . . . . [Mixers of the tilted-drum type, e.g. mixers pivotable about an axis perpendicular to the axis of rotation for emptying]
5/1831 . . . . [to be mounted on a tractor]
5/1837 . . . . [provided with feeding means, e.g. hoisting skips (B28C 5/1831, B28C 5/185, B28C 5/1856 take precedence)]
Mixing clay or cement with other material

5/1843 . . . . [having several drums]
5/185 . . . . [having driven stirrers, e.g. driven from underneath]
5/1856 . . . . [Details or parts, e.g. drums (drives B28C 5/0831)]
5/1862 . . . . [Construction of drum, e.g. provided with mixing blades]
5/1868 . . . . [with mixing elements held stationary]
5/1875 . . . . [Tilting means; Locks or brakes therefor]
5/1881 . . . . [the mixing drums being tilted otherwise than about a fixed axis perpendicular to the axis of rotation of the drum, e.g. by means of a set of links]
5/1887 . . . . [Mobile or portable devices, e.g. for use by do-it-yourself enthusiasts]
5/1893 . . . . [the mixing drum being rotated by pulling it over the ground; the mixing drum or the stirrer being driven by movement of the wheel of a vehicle]
5/20 . . . . rotating about a horizontal or substantially horizontal axis during mixing, e.g. without independent stirrers
5/2009 . . . . [with multi-compartment drums]
5/2018 . . . . [Transportable containers, e.g. on a wheelbarrow, to be fixed totally or partly in a mixer, e.g. for rotation therewith]
5/2027 . . . . [using spiral-shaped mixing drums]
5/2036 . . . . [with the material travelling through the mixer, the discharge being opposite the feed inlet (B28C 5/2072, B28C 5/222, B28C 5/24 take precedence)]
5/2045 . . . . [Parts or components (drives B28C 5/0831)]
5/2054 . . . . [Drums, e.g. provided with non-rotary mixing blades (B28C 5/2009 takes precedence)]
5/2063 . . . . [Drums consisting of axially displaceable halves; Drums having discharging opening on their cylindrical part, e.g. the drum rotating in opposite direction for mixing or for discharging; Drums having a cylindrical part not being a surface of revolution]
5/2072 . . . . [Fedding or discharging mechanisms]
5/2081 . . . . [Chutes pivotable about an axis parallel to the plane of the inlet or outlet opening]
5/209 . . . . [Chutes rotatable about an axis parallel to the drum axis]
5/22 . . . . with stirrers held stationary [, e.g. the material forming a ring zone by centrifugal force]
5/24 . . . . with driven stirrers
5/26 . . . . rotating about a vertical or steeply inclined axis during the mixing [, e.g. comprising a flat bottomplate rotating about a vertical axis, co-operating with blades or stirrers]
5/28 . . . . without independent stirrers
5/30 . . . . with stirrers held stationary
5/32 . . . . with driven stirrers
5/325 . . . . [with several stirrer shafts]
5/34 . . . . Mixing on or by conveyors [, e.g. by belts or chains provided with mixing elements]
5/36 . . . . Endless-belt mixers [, i.e. for mixing while transporting the material on an endless belt, e.g. with stationary mixing elements]
5/365 . . . . [Mixing with driven mixing elements while transporting the mixture on an endless belt]
5/38 . . . . wherein the mixing is effected both by the action of a fluid and by directly-acting driven mechanical means, e.g. stirring means [, Producing cellular concrete]
5/381 . . . . [Producing cellular concrete (B28C 5/1269 takes precedence; producing foam B01F 3/04446, B01F 3/04992)]
5/383 . . . . [comprising stirrers to effect the mixing]
5/385 . . . . [Stirrers specially adapted therefor]
5/386 . . . . [Plants; Systems; Methods]
5/388 . . . . [Methods]
5/40 . . . . Mixing specially adapted for preparing mixtures containing fibres
5/402 . . . . [Methods]
5/404 . . . . [Pre-treatment of fibres]
5/406 . . . . [and mixing with binding material]
5/408 . . . . [by spraying fibres and binding material]
5/42 . . . . Apparatus specially adapted for being mounted on vehicles with provision for mixing during transport (B28C 5/1892 takes precedence; mounted on a wheelbarrow B28C 5/1215, B28C 5/1818, B28C 5/2018; vehicle aspect B60P 3/16)
5/4203 . . . . [Details; Accessories]
5/4206 . . . . [Control apparatus; Drive systems, e.g. coupled to the vehicle drive-system]
5/421 . . . . [Drives (in general B28C 5/0831)]
5/4213 . . . . [Hydraulic drives (B28C 5/4217 takes precedence)]
5/4217 . . . . [Drives in combination with drum mountings; Drives directly coupled to the axis of rotating drums]
5/422 . . . . [Controlling or measuring devices (B28C 5/4227 takes precedence)]
5/4224 . . . . [Roll-over prevention]
5/4227 . . . . [Transmission control mechanisms]
5/4231 . . . . [Proportioning or supplying water (in general B28C 7/172)]
5/4234 . . . . [Charge or discharge systems therefor]
5/4237 . . . . [Charging, e.g. hoppers]
5/4241 . . . . [having self-charging means, e.g. skips, scoops or buckets, picking up the material from the ground]
5/4244 . . . . [Discharging; Concrete conveyor means, chutes or spouts therefor (in general B28C 7/168)]
5/4248 . . . . [using chutes (combined with transporting belts B28C 5/4255, combined with pumps or screws B28C 5/4258)]
5/4251 . . . . [telscopic or foldable chutes]
5/4255 . . . . [using transporting belts, e.g. mounted on a foldable frame]
5/4258 . . . . [using pumps or transporting screws]
5/4262 . . . . [Closures; Sealing mechanisms (B28C 5/4237 takes precedence)]
5/4265 . . . . [Mounting means for drums; Support frames]
5/4268 . . . . [Drums, e.g. provided with non-rotary mixing blades (drums for concrete mixers with horizontal axis B28C 5/2054)]
Mixing clay or cement with other material

5/4272 . . . (with rotating drum rotating about a horizontal or inclined axis, e.g. comprising tilting or raising means for the drum (B28C 5/4279 takes precedence))
5/4275 . . . (with a drum rotating about a horizontal axis, e.g. perpendicular to the longitudinal axis of the vehicle)
5/4279 . . . (with rotating drum and independently-rotating mixing tools)
5/4282 . . . (with moving mixing tools in a stationary container)
5/4286 . . . (with mixing screw-blades)
5/4289 . . . (with stirrers rotating about a vertical axis)
5/4293 . . . (with reciprocating or oscillating stirrers)
5/4296 . . . (mounted on a tractor or on a tractor wheel (for tilted-drum type mixers B28C 5/1831; charging thereof B28C 5/4237))

5/44 . Apparatus specially adapted for drive by muscle power
5/46 . Arrangements for applying super- or sub-atmospheric pressure during mixing; Arrangements for cooling or heating during mixing [, e.g. by introducing vapour]
5/462 . . . (Mixing at sub- or super-atmospheric pressure (B28C 5/1261 takes precedence))
5/464 . . . (at sub-atmospheric pressure)
5/466 . . . (Heating, e.g. using steam)
5/468 . . . (Cooling, e.g. using ice)
5/48 . wherein the mixing is effected by vibrations (mixers with vibrating mechanisms in general B01F 11/00)
5/485 . . . (with reciprocating or oscillating stirrers; Stirrers therefor (B28C 5/4293 takes precedence))

7/00 Controlling the operation of apparatus for producing mixtures of clay or cement with other substances; Supplying or proportioning the ingredients for mixing clay or cement with other substances; Discharging the mixture (B28C 5/42 takes precedence; feeding material in general B65G; proportioning in general G01F)

7/0007 . . . (Pretreatment of the ingredients, e.g. by heating, sorting, grading, drying, disintegrating; Preventing generation of dust)
7/0015 . . . (Tagging of the ingredients, e.g. by using ingredient identification means like RFID or labels)
7/0023 . . . (by heating or cooling (during mixing B28C 5/46))
7/003 . . . (Heating, e.g. using steam)
7/0038 . . . (Cooling, e.g. using ice)
7/0046 . . . (Storage or weighing apparatus for supplying ingredients (B28C 7/04 takes precedence))
7/0053 . . . (Storage containers, e.g. hoppers, silos, bins (B28C 7/0084 takes precedence))
7/0061 . . . (Storage container plant)
7/0069 . . . (having compartments)
7/0076 . . . (Parts or details thereof, e.g. opening, closing or unloading means)
7/0084 . . . (Storage containers or silos mounted on, or specially adapted for transport by, vehicles; Means for erecting containers or silos)
7/0092 . . . (Stationary storage means having elements to divide the ground in sectors)
7/02 . Controlling the operation of the mixing
7/022 . . . (by measuring the consistency or composition of the mixture, e.g. with supply of a missing component)
7/024 . . . (by measuring properties of the mixture, e.g. moisture, electrical resistivity, density)
7/026 . . . (by measuring data of the driving system, e.g. rotational speed, torque, consumed power)
7/028 . . . (by counting the number of revolutions performed, or by measuring the mixing time)
7/04 . Supplying or proportioning the ingredients (B28C 7/022 takes precedence; forming a predetermined ratio of the components to be mixed, in general B01F 15/04)
7/0404 . . . (Proportioning)
7/0409 . . . (taking regard of the moisture content of the solid ingredients; Moisture indicators)
7/0413 . . . (two or more flows in predetermined ratio)
7/0418 . . . (control systems therefor)
7/0422 . . . (Weighing predetermined amounts of ingredients, e.g. for consecutive delivery)
7/0427 . . . (using a charging-skip, to be hoisted or tilted, provided with weight-indicating means)
7/0431 . . . (using a weighing belt or the like)
7/0436 . . . (Weighing means specially adapted for use in batching plants)
7/044 . (Weighing mechanisms specially adapted therefor; Weighing containers (other containers B28C 7/0046))
7/0445 . . . (using a weighing receptacle movable between several positions, e.g. moving vertically, horizontally or rotating about an axis (B28C 7/0437 takes precedence))
7/045 . . . (using a weighing receptacle movable between several positions, e.g. moving vertically, horizontally or rotating about an axis (B28C 7/0437 takes precedence))
7/0454 . . . (Volumetric measuring devices, e.g. for consecutively delivering predetermined volumes of ingredients)
7/0459 . . . (the ingredients being first supplied into measuring chambers, e.g. containers or skips)
7/0463 . . . (Measuring chambers or containers therefor (other containers B28C 7/0046))
7/0468 . . . (the measuring chambers being provided on a rotating drum)
7/0472 . . . (for continuous feeding, e.g. by controlling the velocity of a transporting belt or the thickness of the ingredients on the belt or by regulating the outlet of a hopper (B28C 7/0477 takes precedence))
7/0477 . . . (by using conveyor screws)
7/0481 . . . (Plant for proportioning, supplying or batching (B28C 7/0436, B28C 7/0811 take precedence; plant in general B28C 9/00))
7/0486 . . . (the plant being mobile)
7/049 . . . (and broken-down for transport)
7/0495 . . . . . (with a frame carrying the supplying, proportioning or batching elements, movable between a horizontal transport position and an inclined working position)
7/06 . Supplying the solid ingredients, e.g. by means of endless conveyors or jiggling conveyors
Mixing clay or cement with other material

7/061 . . . [from stationary storage means having elements for dividing the ground sectorially (B28C 7/0811 takes precedence)]
7/062 . . . [with a hydraulic or hydraulic conveyor]
7/064 . . . [Supply from sacks; Sack openers]
7/065 . . . [with a pivotal charging-bin (B28C 7/068 takes precedence)]
7/067 . . . [by means of stationary hoppers, chambers or bins from which the material is fed gravitationally, e.g. having agitating means therein (hoppers or bins per se B28C 7/0053)]
7/068 . . . [having means to elevate or hoist a charging-bin or container]
7/08 . . . by means of scrapers or skips
7/0805 . . . [by means of a barrow or the like]
7/0811 . . . [from stationary storage means having elements for dividing the ground sectorially]
7/0817 . . . [on an endless chain]
7/0823 . . . [using manually-operated cable-pulled drag shovels (B28C 7/0841 takes precedence)]
7/0829 . . . [using reciprocating cable-suspended drag shovels]
7/0835 . . . [using skips to hoist along guides or to be tilted, to charge working-site concrete mixers (proportioning by means of a skip B28C 7/0042, B28C 7/0059)]
7/0841 . . . [having mechanisms to fill the skip in its lowest position, e.g. by drag shovels, from a hopper]
7/0847 . . . [the skips being hoisted along vertical or inclined guides]
7/0852 . . . [and being tilted in their upmost position for discharging them at their upper side]
7/0858 . . . [the skips being tilted (B28C 7/0852 takes precedence)]
7/0864 . . . [about a fixed axis]
7/087 . . . [Parts; Accessories, e.g. safety devices]
7/0876 . . . [Drives therefor, e.g. winches, hydraulic drives]
7/0882 . . . [Skips]
7/0888 . . . [Vibration devices, e.g. for facilitating the emptying of the skips]
7/09 . . . [Parts, e.g. winches]
7/10 . . . by means of rotary members {, e.g. inclinable screws}
7/12 . . . Supplying or proportioning liquid ingredients
7/122 . . . [by means of a measuring chamber, e.g. container]
7/124 . . . [for use with a skip]
7/126 . . . [Supply means, e.g. nozzles]
7/128 . . . [Nozzles; Valves; Valve-actuating means]
7/14 . . . Supply means incorporated in, or mounted on, mixers
7/16 . . . Discharge means {, e.g. with intermediate storage of fresh concrete}
7/161 . . . [with storage reservoirs for temporarily storing the fresh concrete; Charging or discharging devices therefor]
7/162 . . . [by means of conveyors, other than those comprising skips or containers, e.g. endless belts, screws, air or container]
7/163 . . . [using a pump]

7/165 . . . [using a fluid, e.g. gas (B28C 5/06, B28C 5/1261 takes precedence)]
7/166 . . . [comprising a lock rotor with pockets for feeding determined quantities of material from a hopper into the driving fluid]
7/167 . . . [by means of a screw conveyor]
7/168 . . . [Discharging chutes for concrete mixers]

9/00 General arrangement or layout of plant

9/002 . . . [Mixing systems, i.e. flow charts or diagrams; Making slurries; Involving methodical aspects; Involving pretreatment of ingredients; Involving packaging]
9/004 . . . [Making slurries, e.g. with discharging means for injecting in a well or projecting against a wall]
9/006 . . . [comprising a multicompartimento silo with the mixing device, e.g. a mixing screw, fitted directly at the underside of the silo, e.g. with proportioning means at the exit of the silo]
9/008 . . . [Plant adapted for mixing materials lying on the ground, e.g. in sectors (B28C 9/0436 takes precedence)]
9/02 . . . for producing mixtures of clay or cement with other materials
9/04 . . . the plant being mobile, [e.g. mounted on a carriage or a set of carriages] (B28C 5/42, B28C 9/004, B28C 9/006) takes precedence]
9/0409 . . . [and broken-down for transport (B28C 9/0445 takes precedence)]
9/0418 . . . [with a storage silo movable between a horizontal transport position and a vertical working position]
9/0427 . . . [with a frame carrying the supplying and mixing elements movable between a horizontal transport position and an inclined working position]
9/0436 . . . [Plant adapted for mixing material lying in sectors on the ground]
9/0445 . . . [and broken-down for transport]
9/0454 . . . [Self-contained units, i.e. mobile plants having storage containers for the ingredients (B28C 9/0472, B28C 9/0481) takes precedence]
9/0463 . . . [with a mixing discharge trough with a free end, e.g. provided with a mixing screw or pivotable about a vertical or horizontal axis]
9/0472 . . . [provided with two or more carriages for storing the ingredients or for the mixing device, e.g. transportable on rails]
9/0481 . . . [with means for loading the material from ground level to the mixing device, e.g. with an endless conveyor or a charging skip (B28C 9/0436 takes precedence)]
9/049 . . . [with at least a storage compartment for one of the ingredients]