CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

SHAPING

B29 WORKING OF PLASTICS; WORKING OF SUBSTANCES IN A PLASTIC STATE IN GENERAL

(NOTES omitted)

B29B PREPARATION OR PRETREATMENT OF THE MATERIAL TO BE SHAPED; MAKING GRANULES OR PREFORMS; RECOVERY OF PLASTICS OR OTHER CONSTITUENTS OF WASTE MATERIAL CONTAINING PLASTICS

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.

7/00 **Mixing; Kneading** ({for preparation of dough A21C 1/00;} in general B01F; combined with calendering B29C 43/24, with injection B29C 45/46, with extrusion B29C 48/36)

7/002 . {Methods (chemical aspects C08J 3/00)}

7/005 . . {for mixing in batches}

7/007 . . {for continuous mixing}

7/02 . non-continuous, with mechanical mixing or kneading devices, i.e. batch type

7/04 . . with non-movable mixing or kneading devices

7/06 . . with movable mixing or kneading devices

7/08 . . . shaking, oscillating or vibrating

7/085 . . . . {by means of axially movable pistons}

7/10 . . . rotary

7/103 . . . . {with rollers or the like in casings}

7/106 . . . . {using rotary casings}

7/12 . . . . with single shaft

7/125 . . . . . {having a casing closely surrounding the rotor, e.g. for masticating rubber (with more than one shaft B29B 7/183); Rotors therefor (B29B 7/14, B29B 7/16 take precedence)}

7/14 . . . . . with screw or helix

7/16 . . . . . with paddles or arms

7/18 . . . . with more than one shaft

7/183 . . . . . {having a casing closely surrounding the rotors, e.g. of Banbury type (with single shaft B29B 7/125)}

7/186 . . . . . {Rotors therefor}

7/20 . . . . . with intermeshing devices, e.g. screws

7/22 . . Component parts, details or accessories; Auxiliary operations

7/24 . . . for feeding

7/242 . . . . {in measured doses}

7/244 . . . . . {of several materials}

7/246 . . . . {in mixers having more than one rotor and a casing closely surrounding the rotors, e.g. with feeding plungers}

7/248 . . . . {with plungers for introducing the material, e.g. from below (B29B 7/246 takes precedence)}

7/26 . . . for discharging, e.g. doors

7/263 . . . . {from the underside in mixers having more than one rotor and a a casing closely surrounding the rotors}

7/266 . . . . . {using sliding doors}

7/28 . . . for measuring, controlling or regulating, e.g. viscosity control {(B29B 7/242 takes precedence)}

7/283 . . . . {measuring data of the driving system, e.g. torque, speed, power}

7/286 . . . . {measuring properties of the mixture, e.g. temperature, density (B29B 7/283 takes precedence)}

7/30 . continuous, with mechanical mixing or kneading devices

7/32 . . with non-movable mixing or kneading devices

7/325 . . . {Static mixers (in general B01F 25/42)}

7/34 . . with movable mixing or kneading devices

7/36 . . . shaking, oscillating or vibrating

7/365 . . . . {by means of axially movable pistons}

7/38 . . . rotary (B29B 7/52 takes precedence)

7/385 . . . . {fluid mixers}

7/40 . . . . with single shaft

7/401 . . . . . {having a casing closely surrounding the rotor, e.g. with a plunger for feeding the material (B29B 7/407, B29B 7/42 take precedence)}

7/402 . . . . . {using a rotor-stator system with intermeshing elements, e.g. teeth (B29B 7/408, B29B 7/404 take precedence)}

7/404 . . . . . {with feeding or valve actuating means, e.g. with cleaning means}

7/405 . . . . . {Mixing heads (B29B 7/404, B29B 7/42 take precedence; mixing heads without moving stirrer B29B 7/7457)}

7/407 . . . . . {with a casing closely surrounding the rotor, e.g. with conical rotor}

7/408 . . . . . {with mixing elements on a rotor co-operating with mixing elements, perpendicular to the axis of the rotor, fixed on a stator}
7/42 . . . . . with screw or helix
7/421 . . . . . {with screw and additionally other mixing elements on the same shaft, e.g. paddles, discs, bearings, rotor blades of the Banbury type}
7/422 . . . . . {with screw sections co-operating, e.g. intermeshing, with elements on the wall of the surrounding casing}
7/423 . . . . . {and oscillating axially (in general B01F 31/401)}
7/424 . . . . . {with conical screw surrounded by conical casing}
7/425 . . . . . {with screw surrounded by a casing provided with grooves or cavities}
7/426 . . . . . {with consecutive casings or screws, e.g. for charging, discharging, mixing}
7/427 . . . . . {with independently driven screws rotating about the same axis, e.g. oscillating axially; with axially oscillating screws (B29B 7/423 takes precedence)}
7/428 . . . . . {Parts or accessories, e.g. casings, feeding or discharging means}
7/429 . . . . . {Screws (B29B 7/421 takes precedence)}
7/44 . . . . . with paddles or arms
7/46 . . . . with more than one shaft
7/465 . . . . . {each shaft comprising rotor parts of the Banbury type in addition to screw parts}
7/48 . . . . . with intermeshing devices, e.g. screws
7/481 . . . . . {provided with paddles, gears or discs (B29B 7/482 takes precedence)}
7/482 . . . . . {provided with screw parts in addition to other mixing parts, e.g. paddles, gears, discs}
7/483 . . . . . {the other mixing parts being discs perpendicular to the screw axis}
7/484 . . . . . {with two shafts provided with screws, e.g. one screw being shorter than the other (B29B 7/482 takes precedence)}
7/485 . . . . . {with three or more shafts provided with screws}
7/486 . . . . . {with screws surrounded by a casing provided with grooves or cavities}
7/487 . . . . . {with consecutive casings or screws, e.g. for feeding, discharging, mixing}
7/488 . . . . . {Parts, e.g. casings, sealings; Accessories, e.g. flow controlling or throttling devices (discharging B29B 7/582; feeding B29B 7/60)}
7/489 . . . . . {Screws (B29B 7/482 takes precedence)}
7/50 . . . . with rotary casing
7/52 . . . with rollers or the like, e.g. calenders
7/523 . . . . {co-operating with casings}
7/526 . . . . . {with two or more rollers}
7/54 . . . . with a single roller co-operating with a stationary member {other than the casing}
7/56 . . . . with co-operating rollers {, e.g. with repeated action, i.e. the material leaving a set of rollers being reconducted to the same set or being conducted to a next set}
7/562 . . . . . {with means for axially moving the material on the rollers}
7/564 . . . . . {at least one of the rollers being provided with helicoidal grooves or ridges, e.g. followed by axial extrusion}
7/566 . . . . . {provided with means to take material away from a set of rollers and to reconduct it to the same set; provided with endless belts, e.g. which can be in or out of cooperation with at least one of the rollers}
7/568 . . . . . {with consecutive sets of rollers or a train of rollers}
7/58 . . Component parts, details or accessories; Auxiliary operations
7/582 . . . {for discharging, e.g. doors}
7/584 . . . {for mixers with rollers, e.g. wedges, guides, pressing means, thermal conditioning}
7/586 . . . . {Drives}
7/588 . . . . {cutting devices, e.g. movable cutting devices (scrapers for stripping the material from rollers B29B 7/645)}
7/60 . . . for feeding, e.g. end guides for the incoming material {(B29B 7/7615 takes precedence; feeding predetermined amounts for mixing in general B01F 35/714)}
7/603 . . . . {in measured doses, e.g. proportioning of several materials}
7/606 . . . . {specially adapted for feeding calenders or the like}
7/62 . . . Rollers, e.g. with grooves (B29B 7/564 takes precedence)
7/625 . . . . {provided with cooling or heating means}
7/64 . . . Stripping the material from the rollers
7/645 . . . . {by means of a scraper moving in the axial direction of the rollers}
7/66 . . . Recycling the material {(B29B 7/566 takes precedence)}
7/68 . . . Positioning of rollers
7/70 . . . Conditioning of rollers, e.g. cleaning
7/72 . . . Measuring, controlling or regulating
7/722 . . . . {Safety devices}
7/724 . . . . {for continuous roller mixers, e.g. calenders (B29B 7/722 takes precedence)}
7/726 . . . . {Measuring properties of mixture, e.g. temperature or density (B29B 7/724 takes precedence)}
7/728 . . . . {Measuring data of the driving system, e.g. torque, speed, power, vibration (B29B 7/724 takes precedence)}
7/74 . using other mixers or combinations of {mixers, e.g. of} dissimilar mixers {; Plant}
7/7404 . . {Mixing devices specially adapted for foamable substances (B29B 7/76 takes precedence)}
7/7409 . . . {with supply of gas}
7/7414 . . . . {with rotatable stirrer, e.g. using an intermeshing rotor-stator system (B29B 7/7423 takes precedence)}
7/7419 . . . . {with static or injector mixer elements}

7/7423 . . . . . {preceded or followed by rotatable stirring device}
7/7428 . . . . {Methodical aspects}
7/7433 . . . {Plants}
7/7438 . . {Mixing guns, i.e. hand-held mixing units having dispensing means (B29B 7/761, B29B 7/7678 take precedence)}
7/7442 . . . {with driven stirrer}
7/7447 . . . {including means for feeding the components}
7/7452 . . . {for mixing components by spraying them into each other; for mixing by intersecting sheets}
7/7457 . . {Mixing heads without moving stirrer (B29B 7/7438, B29B 7/76 take precedence)}
7/7461 . . {Combinations of dissimilar mixers}
7/7466 . . {Combinations of similar mixers}
7/7471 . . {Mixers in which the mixing takes place at the inlet of a mould, e.g. mixing chambers situated in the mould opening}
7/7476 . . {Systems, i.e. flow charts or diagrams; Plants}
7/748 . . . {Plants (B29B 7/7433, B29B 7/7485, B29B 7/7495 take precedence)}
7/7485 . . . {with consecutive mixers, e.g. with premixing some of the components}
7/749 . . . . {with stirring means for the individual components before they are mixed together}
7/7495 . . . {for mixing rubber}
7/76 . . {Mixers} with stream-impingement mixing head
7/7605 . . . {having additional mixing arrangements (B29B 7/7673 takes precedence)}
7/761 . . . {of gun-type, i.e. hand-held units having dispensing means (B29B 7/7678 takes precedence)}
7/7615 . . . {characterised by arrangements for controlling, measuring or regulating, e.g. for feeding or proportioning the components}
7/7621 . . . . {involving introducing a gas or another component in at least one of the components}
7/7626 . . . . {using measuring chambers of piston or plunger type (B29B 7/7621 takes precedence; for mixing in general B01F 35/882)}
7/7631 . . . {Parts; Accessories (B29B 7/7684 takes precedence)}
7/7636 . . . . {Construction of the feed orifices, bores, ports}
7/7642 . . . . . {Adjustable feed orifices, e.g. for controlling the rate of feeding}
7/7647 . . . . {Construction of the mixing conduit module or chamber part}
7/7652 . . . . {Construction of the discharge orifice, opening or nozzle}
7/7657 . . . . . {Adjustable discharge orifices, openings or nozzle openings, e.g. for controlling the rate of dispensing}
7/7663 . . . {the mixing head having an outlet tube with a reciprocating plunger, e.g. with the jets impinging in the tube}
7/7668 . . . . {having a second tube intersecting the first one with the jets impinging in the second tube}
7/7673 . . . . {having additional mixing arrangements (B29B 7/7668 takes precedence)}
7/7678 . . . . {of the gun type, i.e. hand-held units}
7/7684 . . . . {Parts; Accessories}
7/7689 . . . . . {Plunger constructions}
7/7694 . . . . . {comprising recirculation channels; ducts formed in the plunger}
7/78 . . by gravity, e.g. falling particle mixers
7/80 . Component parts, details or accessories; Auxiliary operations (B29B 7/22, B29B 7/58 take precedence {; cleaning mixers B01F 35/145})
7/801 . . {Valves}
7/802 . . {Constructions or methods for cleaning the mixing or kneading device (cleaning in general B08B)}
7/803 . . . {Cleaning of mixers of the gun type, stream-impigement type, mixing heads}
7/805 . . . . {Cleaning of the mixing conduit, module or chamber part}
7/806 . . . . {Cleaning of the discharge opening, e.g. orifice of the dispenser}
7/807 . . . . {Cleaning of the central body of the plunger}
7/808 . . . . {Cleaning of the plunger tip}
7/82 . . Heating or cooling
7/823 . . . {Temperature control}
7/826 . . . {Apparatus therefor}
7/84 . . Venting or degassing {; Removing liquids, e.g. by evaporating components}
7/842 . . . {Removing liquids in liquid form}
7/845 . . . {Venting, degassing or removing evaporated components in devices with rotary stirrers}
7/847 . . . . {Removing of gaseous components before or after mixing}
7/86 . . for working at sub- or superatmospheric pressure {(B01F 33/70 takes precedence)}
7/88 . . Adding charges {, i.e. additives}
7/885 . . . {with means for treating, e.g. milling, the charges (B29B 7/905 takes precedence)}
7/90 . . . Fillers or reinforcements {, e.g. fibres}
7/905 . . . . {with means for pretreatment of the charges or fibres}
7/92 . . . . Wood chips or wood fibres
7/94 . . . Liquid charges
7/945 . . . . {involving coating particles}

9/00 **Making granules** (in general B01J; chemical aspects C08J 3/12)
9/02 . by dividing preformed material
9/04 . . in the form of plates or sheets
9/06 . . in the form of filamentary material, e.g. combined with extrusion
9/065 . . . {under-water, e.g. underwater pelletizers}
9/08 . by agglomerating smaller particles
9/10 . by moulding the material, i.e. treating it in the molten state
9/12 . characterised by structure or composition
2009/125 . . {Micropellets, microgranules, microparticles}
9/14 . . fibre-reinforced
9/16 . Auxiliary treatment of granules
2009/161 . . {Absorbing, i.e. introducing a gas, a liquid or a solid material into the granules}
2009/163 . . {Coating, i.e. applying a layer of liquid or solid material on the granule}
2009/165 . . {Crystallizing granules}
2009/166 . . {Deforming granules to give a special form, e.g. spheroidizing, rounding}

2009/168 . . {Removing undesirable residual components, e.g. solvents, unreacted monomers; Degassing}

11/00 **Making preforms** (B29C 61/06 takes precedence {; combined with blow-moulding B29C 49/02, with thermoforming B29C 51/02; making preforms for manufacturing of light guides B29D 11/00721})

11/02 . by dividing preformed material, e.g. sheets, rods

11/04 . by assembling preformed material

11/06 . by moulding the material

11/08 . . Injection moulding

11/10 . . Extrusion moulding

11/12 . . Compression moulding

11/14 . characterised by structure or composition

11/16 . . comprising fillers or reinforcement {(non-woven fabrics per se D04H 1/00, D04H 3/00)}

13/00 **Conditioning or physical treatment of the material to be shaped** (chemical aspects C08J 3/00 {; heating, cooling or curing during shaping B29C 35/00; thermal after-treatment B29C 71/02})

2013/002 . {Extracting undesirable residual components, e.g. solvents, unreacted monomers, from material to be moulded}

2013/005 . {Degassing undesirable residual components, e.g. gases, unreacted monomers, from material to be moulded}

13/007 . {Treatment of sinter powders}

13/02 . by heating (B29B 13/06, B29B 13/08 take precedence)

13/021 . . {Heat treatment of powders}

13/022 . . {Melting the material to be shaped}

13/023 . . {Half-products, e.g. films, plates}

13/024 . . . {Hollow bodies, e.g. tubes or profiles}

13/025 . . . . {Tube ends}

2013/026 . . . {Obtaining a uniform temperature over the whole surface of films or tubes}

2013/027 . . . {Obtaining a temperature gradient over the surface of films or tubes}

2013/028 . . . {Obtaining a temperature gradient across the wall thickness of plates or tubes}

13/04 . by cooling {(cooling moulded articles or half products B29C 35/16)}

13/045 . . {of powders or pellets}

13/06 . by drying (B29B 13/08 takes precedence {; drying moulded articles or half products B29C 37/0092})

13/065 . . {of powder or pellets}

13/08 . by using wave energy or particle radiation

13/10 . by grinding, e.g. by triturating; by sieving; by filtering

15/00 **Pretreatment of the material to be shaped, not covered by groups B29B 7/00 - B29B 13/00**

15/02 . of crude rubber, gutta-percha, or similar substances (tapping latex A01G; chemical aspects C08C)

15/023 . . {Breaking up rubber bales}

15/026 . . {Baling of rubber}

15/04 . . Coagulating devices

15/06 . . Washing devices

15/08 . of reinforcements or fillers (chemical aspects C08J, C08K)

15/10 . . Coating or impregnating {independently of the moulding or shaping step}(applying liquids in general B05)

NOTE

Where the coating or impregnating is combined with moulding the documents are classified in B29C 53/8066, B29C 70/00

15/105 . . . {of reinforcement of definite length with a matrix in solid form, e.g. powder, fibre or sheet form (calendering B29C 70/506)}

15/12 . . . of reinforcements of indefinite length

15/122 . . . . {with a matrix in liquid form, e.g. as melt, solution or latex}

15/125 . . . . . {by dipping}

15/127 . . . . . {by spraying}

15/14 . . . . of filaments or wires

17/00 **Recovery of plastics or other constituents of waste material containing plastics;** ({volume reduction of waste plastics, e.g. by mechanical compacting or melting disposal of solid waste B09B;} chemical recovery C08J 11/00)

17/0005 . {Direct recuperation and re-use of scrap material during moulding operation, i.e. feed-back of used material}

2017/001 . {Pretreating the materials before recovery}

2017/0015 . . {Washing, rinsing}

2017/0021 . . {Dividing in large parts}

17/0026 . {by agglomeration or compacting}

2017/0031 . . {Melting the outer surface of compressed waste, e.g. for forming briquets by expelling the compressed waste material through a heated tool}

17/0036 . . {of large particles, e.g. beads, granules, pellets, flakes, slices}

17/0042 . . {for shaping parts, e.g. multilayered parts with at least one layer containing regenerated plastic}

17/0047 . . {Compacting complete waste articles}

17/0052 . . . {Hollow articles, e.g. bottles}

2017/0057 . . . . {Externally powered deformation tools, e.g. tools being part of relatively big non domestic installations, powered by motors}

2017/0063 . . . . {Manually driven deformation tools, e.g. tools being part of domestic installations}

2017/0068 . . . . {Softening the hollow articles by heat and causing permanent deformation}

2017/0073 . . . . {Removing caps or labels during deformation}

2017/0078 . . . . {Maintaining the deflated state, e.g. by mounting original screw lids after deformation}

2017/0084 . . . . {Deflating the hollow articles by vacuum; Details of the nozzles used in the vacuum generating devices}

2017/0089 . {Recycling systems, wherein the flow of products between producers, sellers and consumers includes at least a recycling step, e.g. the products being fed back to the sellers or to the producers for recycling purposes}

2017/0094 . {Mobile recycling devices, e.g. devices installed in truck trailers}

17/02 . Separating plastics from other materials

2017/0203 . . {Separating plastics from plastics}

17/0206 . . {Selectively separating reinforcements from matrix material by destroying the interface bound before disintegrating the matrix to particles or powder, e.g. from tires or belts}
17/021 . . . {using local heating of the reinforcement}
2017/0213 . . {Specific separating techniques}
2017/0217 . . . {Mechanical separating techniques; devices therefor}
2017/022 . . . . {Grippers, hooks, piercing needles, fingers, e.g. mounted on robots}
2017/0224 . . . . {Screens, sieves}
2017/0227 . . . . {Vibratory or shaking tables}
2017/0231 . . . . {Centrifugating, cyclones}
2017/0234 . . . . {using gravity, e.g. separating by weight differences in a wind sifter}
2017/0237 . . . . {using density difference}
2017/0241 . . . . . {in gas, e.g. air flow}
2017/0244 . . . . . {in liquids}
2017/0248 . . . . {Froth flotation, i.e. wherein gas bubbles are attached to suspended particles in an aerated liquid}
2017/0251 . . . . {Hydropulping for converting the material under the influence of water into a slurry, e.g. for separating laminated plastic from paper}
2017/0255 . . . {using different melting or softening temperatures of the materials to be separated}
2017/0258 . . . . {using heated surfaces for selective softening or melting of at least one plastic ingredient}
2017/0262 . . . {using electrical caracteristics}
2017/0265 . . . . {Electrostatic separation}
2017/0268 . . . {Separation of metals}
2017/0272 . . . . {Magnetic separation}
2017/0275 . . . {using chemical sensors, e.g. analysing gasified constituents}
2017/0279 . . . {Optical identification, e.g. cameras or spectroscopy}
2017/0282 . . . {using information associated with the materials, e.g. labels on products}
2017/0286 . . . {Cleaning means used for separation}
2017/0289 . . . . {Washing the materials in liquids}
2017/0293 . . . {Dissolving the materials in gases or liquids}
2017/0296 . . . . {Dissolving the materials in aqueous alkaline solutions, e.g. NaOH or KOH}
17/04 . Disintegrating plastics, {e.g. by milling}(B29B 9/02, B29B 11/02, B29B 13/10, {B29B 17/02} take precedence)
17/0404 . . {to powder}
17/0408 . . . {using cryogenic systems}
17/0412 . . {to large particles, e.g. beads, granules, flakes, slices}
2017/0416 . . {Cooling the plastics before disintegration, e.g. freezing}
2017/042 . . {Mixing disintegrated particles or powders with other materials, e.g. with virgin materials}
2017/0424 . . {Specific disintegrating techniques; devices therefor}
2017/0428 . . . {Jets of high pressure fluid}
2017/0432 . . . . {Abrasive blasting, i.e. the jets being charged with abrasives}
2017/0436 . . . {Immersion baths}
2017/044 . . . {Knives}
2017/0444 . . . {Cutting wires, e.g. vibrating wires}
2017/0448 . . . {Cutting discs}
2017/0452 . . . . {the discs containing abrasives}
2017/0456 . . . {Pressing tools with calibrated openings, e.g. in sizing plates, for disintegrating solid materials}
2017/046 . . . {Extruder as pressing tool with calibrated die openings for forming and disintegrating pasty or melted material}
2017/0464 . . . {Solid state shear extrusion pulverisation}
2017/0468 . . . {Crushing, i.e. disintegrating into small particles}
2017/0472 . . . {Balls or rollers in a container}
2017/0476 . . . {Cutting or tearing members, e.g. spiked or toothed cylinders or intermeshing rollers}
2017/048 . . . {Cutter-compactors, e.g. of the EREMA type}
2017/0484 . . . {Grinding tools, roller mills or disc mills}
2017/0488 . . . {Hammers or beaters}
2017/0492 . . . {Projecting the material on stationary or moving impact surfaces or plates}
2017/0496 . . . {Pyrolysing the materials}