

# CPC COOPERATIVE PATENT CLASSIFICATION

## B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

### SEPARATING; MIXING

#### B01 PHYSICAL OR CHEMICAL PROCESSES OR APPARATUS IN GENERAL

#### B01F MIXING, e.g. DISSOLVING, EMULSIFYING OR DISPERSING ([mixing paints B44D 3/06](#))

##### NOTES

- This subclass covers:
  - agitation or homogenisation of products formed by a combination of two or more components with the purpose of obtaining a homogeneous composition or homogeneous conditions in the mass of material;
  - stirring of a single material with the purpose of obtaining homogeneous conditions in the mass of material;
  - mixing, agitation and homogenisation of materials, irrespective of the application in which it is produced, whenever the device or the method are directed to achieve the desired effect.
- In this subclass, the following term is used with the meaning indicated:
  - "mixing" also covers stirring of a single material.

##### 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.}

<b>21/00</b>	<b>Dissolving</b> ( <a href="#">separating by dissolving B01D</a> ; <a href="#">dissolving to effect cooling F25D 5/00</a> )	<b>23/00</b>	<b>Mixing according to the phases to be mixed, e.g. dispersing or emulsifying</b>
21/02	. {Methods}		<b>NOTE</b>
21/10	. using driven stirrers		In this group, the following term is used with the meaning indicated:
21/15	. {comprising constructions for blocking or redispersing undissolved solids, e.g. sieves, separators or guiding constructions ( <a href="#">B01F 21/221 takes precedence</a> )}		. "gases" covers also vapours.
21/20	. using flow mixing	23/02	. {Maintaining the aggregation state of the mixed materials}
21/22	. . {using additional holders in conduits, containers or pools for keeping the solid material in place, e.g. supports or receptacles}	23/021	. . {Maintaining mixed ingredients in movement to prevent crystallisation of the ingredients after mixing}
21/221	. . . {comprising constructions for blocking or redispersing undissolved solids}	23/022	. . {Preventing precipitation of solid ingredients during or after mixing by adding a solvent}
21/30	. {Workflow diagrams or layout of plants, e.g. flow charts; Details of workflow diagrams or layout of plants, e.g. controlling means}	23/023	. . {Preventing sedimentation, conglomeration or agglomeration of solid ingredients during or after mixing by maintaining mixed ingredients in movement}
21/40	. {characterised by the state of the material being dissolved}	23/024	. . {Maintaining mixed ingredients in movement to prevent separation of the ingredients after mixing}
21/401	. . {Molten solids}	23/04	. {Specific aggregation state of one or more of the phases to be mixed}
21/402	. . {characterised by the configuration, form or shape of the solid material, e.g. in the form of tablets or blocks}	23/041	. . {Mixing ingredients in more than two different agglomeration states, phases}
21/4021	. . . {in the form of tablets stored in containers, canisters or receptacles}	23/042	. . {Mixing cryogenic aerosols, i.e. mixtures of gas with solid particles in cryogenic condition, with other ingredients}
21/403	. . {Solid carbon dioxide or dry ice}	23/043	. . {Mixing fluids or with fluids in a supercritical state, in supercritical conditions or variable density fluids}
21/50	. {Elements used for separating or keeping undissolved material in the mixer}	23/06	. {Mixing phases by adding a very small quantity of one of the phases or microdosing}
21/501	. . {Tablet canisters provided with perforated walls, sieves, grids or filters}		
21/502	. . {Baffles}		
21/503	. . {Filters}		
21/504	. . {Sieves, i.e. perforated plates or walls}		

- 23/061 . . {Adding a small quantity or concentration of an additional phase in a main phase, e.g. acting as a carrier phase}
- 23/062 . . {Mixing ingredients in very small quantity, adding microingredients or microconcentration, e.g. adding vitamins, minerals, proteins, enzymes, hormones, antibiotics or worm medicines}
- 23/09 . {Mixing systems, i.e. flow charts or diagrams for components having more than two different of undetermined agglomeration states, e.g. supercritical states}
- 23/10 . Mixing gases with gases
- 23/12 . . {with vapourisation of a liquid (disinfection, sterilisation or deodorisation of air [A61L 9/00](#))}
- 23/14 . . {with moving mixing elements, e.g. with liquid seal}
- 23/19 . . {Mixing systems, i.e. flow charts or diagrams; Arrangements, e.g. comprising controlling means}
- 23/191 . . . {characterised by the construction of the controlling means}
- 23/20 . Mixing gases with liquids
- 23/21 . . by introducing liquids into gaseous media
- 23/211 . . . {Methods}
- 23/213 . . . by spraying or atomising of the liquids
- 23/2131 . . . . {using rotating elements, e.g. rolls or brushes}
- 23/21311 . . . . . {for spraying the liquid radially by centrifugal force}
- 23/21312 . . . . . {with additional rotating elements mounted on the same axis, e.g. fans, for moving the gas}
- 23/2132 . . . . {using nozzles}
- 23/21321 . . . . . {High pressure atomization, i.e. the liquid is atomized and sprayed by a jet at high pressure}
- 23/21322 . . . . . {Internal mixer atomization, i.e. liquid and gas are mixed and atomized in a jet nozzle before spraying}
- 23/2133 . . . . {using electric, sonic or ultrasonic energy}
- 23/214 . . . {using a gas-liquid mixing column or tower}
- 23/215 . . . {by forcing the gas through absorbent pads containing the liquid}
- 23/216 . . . {by using liquefied or cryogenic gases as liquid component}
- 23/23 . . by introducing gases into liquid media, e.g. for producing aerated liquids
- 23/231 . . . by bubbling (mixers with gas or liquid agitation, e.g. with air supply tubes [B01F 33/40](#))
- 23/23105 . . . . {Arrangement or manipulation of the gas bubbling devices}
- 23/2311 . . . . . {Mounting the bubbling devices or the diffusers}
- 23/23112 . . . . . {comprising the use of flow guiding elements adjacent or above the gas stream}
- 23/231121 . . . . . . {the flow guiding elements being baffles, tubes or walls}
- 23/231122 . . . . . . {the flow guiding elements being dome-shaped elements, i.e. for trapping air, e.g. cap-, umbrella- or inversed cone-shaped}
- 23/23113 . . . . . {characterised by the disposition of the bubbling elements in particular configurations, patterns or arrays}
- 23/23114 . . . . . {characterised by the way in which the different elements of the bubbling installation are mounted}
- 23/231141 . . . . . . {Mounting auxiliary devices, e.g. pumps or compressors in a particular place on the bubbling installation, e.g. under water}
- 23/231142 . . . . . . {Mounting the gas transporting elements, i.e. connections between conduits}
- 23/231143 . . . . . . {Mounting the bubbling elements or diffusers, e.g. on conduits, using connecting elements; Connections therefor}
- 23/23115 . . . . . . {characterised by the way in which the bubbling devices are mounted within the receptacle}
- 23/231151 . . . . . . {the bubbling devices being fixed or anchored in the bottom}
- 23/231152 . . . . . . {the bubbling devices being supported, e.g. on cables or laying on the bottom}
- 23/231153 . . . . . . {the bubbling devices being suspended on a supporting construction, i.e. not on a floating construction}
- 23/231154 . . . . . . {the bubbling devices being provided with ballast to keep them floating under the surface, i.e. when the bubbling devices are lighter than the liquid}
- 23/231155 . . . . . . {the bubbling devices floating and having a pendulum movement, going to and from or moving in alternating directions}
- 23/231156 . . . . . . {the bubbling devices floating and having a rotating movement around a central vertical axis}
- 23/23116 . . . . . . {Means for manipulating the bubbling constructions or elements, e.g. for raising or lowering them}
- 23/2312 . . . . . {Diffusers}
- 23/23121 . . . . . . {having injection means, e.g. nozzles with circumferential outlet}
- 23/23122 . . . . . . {having elements opening under air pressure, e.g. valves}
- 23/23123 . . . . . . {consisting of rigid porous or perforated material}
- 23/231231 . . . . . . . {the outlets being in the form of perforations}
- 23/231232 . . . . . . . {in the form of slits or cut-out openings}
- 23/231233 . . . . . . . {comprising foam-like gas outlets}
- 23/23124 . . . . . . . {consisting of flexible porous or perforated material, e.g. fabric}
- 23/231241 . . . . . . . {the outlets being in the form of perforations}
- 23/231242 . . . . . . . {in the form of slits or cut-out openings}
- 23/231243 . . . . . . . {comprising foam-like gas outlets}
- 23/231244 . . . . . . . {Dissolving, hollow fiber membranes}

- 23/231245 . . . . . {Fabric in the form of woven, knitted, braided, non-woven or flocculated fibers or filaments}
- 23/23125 . . . . . {characterised by the way in which they are assembled or mounted; Fabricating the parts of the diffusers}
- 23/23126 . . . . . {characterised by the shape of the diffuser element}
- 23/231261 . . . . . {having a box- or block-shape, being in the form of aeration stones}
- 23/231262 . . . . . {having disc shape}
- 23/231263 . . . . . {having dome-, cap- or inversed cone-shape}
- 23/231264 . . . . . {being in the form of plates, flat beams, flat membranes or films}
- 23/231265 . . . . . {being tubes, tubular elements, cylindrical elements or set of tubes}
- 23/231266 . . . . . {being in the form of rings or annular elements}
- 23/231267 . . . . . {being axially stacked discs, rings or plates}
- 23/231268 . . . . . {being helically wound, coiled and joined bands or wires}
- 23/231269 . . . . . {being spirally wound, coiled tubes or spirally wound, coiled and joined bands or wires}
- 23/23127 . . . . . {Screens, nets, grades or grids}
- 23/23128 . . . . . {having specific properties or elements attached thereto}
- 23/231281 . . . . . {made of or comprising a biocide}
- 23/231282 . . . . . {made of or comprising a material able to store a gas which is released when water flows through it}
- 23/231283 . . . . . {having elements to protect the parts of the diffusers, e.g. from clogging when not in use}
- 23/2319 . . . . . {Methods of introducing gases into liquid media}
- 23/232 . . . . . using flow-mixing means for introducing the gases, e.g. baffles
- 23/2321 . . . . . {by moving liquid and gas in counter current}
- 23/23211 . . . . . {the liquid flowing in a thin film to absorb the gas}
- 23/232111 . . . . . {the liquid film or layer flowing over a horizontal or inclined surface, e.g. perforated}
- 23/232112 . . . . . {the liquid film or layer flowing over a vertical surface, e.g. a mesh}
- 23/2322 . . . . . {using columns, e.g. multi-staged columns}
- 23/2323 . . . . . {by circulating the flow in guiding constructions or conduits}
- 23/23231 . . . . . {being at least partially immersed in the liquid, e.g. in a closed circuit}
- 23/232311 . . . . . {the conduits being vertical draft pipes with a lower intake end and an upper exit end}
- 23/232312 . . . . . {the guiding constructions being baffles for guiding the flow up-and-down or from left-to-right}
- 23/2326 . . . . . adding the flowing main component by suction means, e.g. using an ejector
- 23/233 . . . . . using driven stirrers with completely immersed stirring elements
- 23/2331 . . . . . {characterised by the introduction of the gas along the axis of the stirrer or along the stirrer elements}
- 23/23311 . . . . . {through a hollow stirrer axis}
- 23/23312 . . . . . {through a conduit surrounding the stirrer axis}
- 23/23313 . . . . . {through a separate conduit substantially parallel with the stirrer axis}
- 23/23314 . . . . . {through a hollow stirrer element}
- 23/23315 . . . . . {through a hollow guide surrounding the stirrer element}
- 23/23316 . . . . . {through a separate hollow guide substantially parallel with the stirrer element}
- 23/2332 . . . . . {the stirrer rotating about a horizontal axis; Stirrers therefor}
- 23/2333 . . . . . {Single stirrer-drive aerating units, e.g. with the stirrer-head pivoting around an horizontal axis}
- 23/2334 . . . . . {provided with stationary guiding means surrounding at least partially the stirrer}
- 23/23341 . . . . . {with tubes surrounding the stirrer}
- 23/23342 . . . . . {the stirrer being of the centrifugal type, e.g. with a surrounding stator}
- 23/2335 . . . . . {characterised by the direction of introduction of the gas relative to the stirrer}
- 23/23351 . . . . . {the gas moving along the axis of rotation}
- 23/23352 . . . . . {the gas moving perpendicular to the axis of rotation}
- 23/23353 . . . . . {the gas being sucked towards the rotating stirrer}
- 23/23354 . . . . . {the gas being driven away from the rotating stirrer}
- 23/2336 . . . . . {characterised by the location of the place of introduction of the gas relative to the stirrer}
- 23/23361 . . . . . {the gas being introduced in a guide tube surrounding at least partially the axis of the stirrer}
- 23/23362 . . . . . {the gas being introduced under the stirrer}
- 23/23363 . . . . . {the gas being introduced above the stirrer}
- 23/23364 . . . . . {the gas being introduced between the stirrer elements}
- 23/233641 . . . . . {at the stirrer axis}
- 23/233642 . . . . . {at the stirrer elements}
- 23/23365 . . . . . {the gas being introduced at the radial periphery of the stirrer}
- 23/23366 . . . . . {the gas being introduced in front of the stirrer}
- 23/23367 . . . . . {the gas being introduced behind the stirrer}
- 23/234 . . . . . Surface aerating
- 23/2341 . . . . . {by cascading, spraying or projecting a liquid into a gaseous atmosphere (B01F 23/2342 takes precedence)}
- 23/23411 . . . . . {by cascading the liquid}
- 23/23412 . . . . . {using liquid falling from orifices in a gaseous atmosphere, the orifices being exits from perforations, tubes or chimneys}
- 23/23413 . . . . . {using nozzles for projecting the liquid into the gas atmosphere}

- 23/2342 . . . . {with stirrers near to the liquid surface, e.g. partially immersed, for spraying the liquid in the gas or for sucking gas into the liquid, e.g. using stirrers rotating around a horizontal axis or using centrifugal force}
- 23/23421 . . . . . {the stirrers rotating about a vertical axis}
- 23/234211 . . . . . {Stirrers thereof}
- 23/235 . . . . for making foam
- 23/2351 . . . . . {using driven stirrers}
- 23/236 . . . . specially adapted for aerating or carbonating beverages
- 23/2361 . . . . . within small containers, e.g. within bottles
- 23/23611 . . . . . {Portable appliances comprising a gas cartridge}
- 23/2362 . . . . . {for aerating or carbonating within receptacles or tanks, e.g. distribution machines (B01F 23/2361 takes precedence)}
- 23/2363 . . . . . {Mixing systems, i.e. flow charts or diagrams; Arrangements, e.g. comprising controlling means}
- 23/2364 . . . . . {using security elements, e.g. valves, for relieving overpressure}
- 23/2366 . . . . {Parts; Accessories}
- 23/2368 . . . . . {Mixing receptacles, e.g. tanks, vessels or reactors, being completely closed, e.g. hermetically closed}
- 23/237 . . . . characterised by the physical or chemical properties of gases or vapours introduced in the liquid media
- 23/2373 . . . . . for obtaining fine bubbles, i.e. bubbles with a size below 100 µm
- 23/2375 . . . . . for obtaining bubbles with a size below 1 µm
- 23/2376 . . . . . {characterised by the gas being introduced}
- 23/23761 . . . . . {Aerating, i.e. introducing oxygen containing gas in liquids}
- 23/237611 . . . . . . {Air}
- 23/237612 . . . . . . {Oxygen}
- 23/237613 . . . . . . {Ozone}
- 23/23762 . . . . . . {Carbon dioxide}
- 23/237621 . . . . . . {in beverages}
- 23/23763 . . . . . . {Chlorine or chlorine containing gases}
- 23/23764 . . . . . . {Hydrogen}
- 23/23765 . . . . . . {Nitrogen}
- 23/23766 . . . . . . {Sulphur containing gas}
- 23/23767 . . . . . . {Introducing steam or damp in liquids}
- 23/238 . . . . . {using vibrations, electrical or magnetic energy, radiations}
- 23/29 . . . . {Mixing systems, i.e. flow charts or diagrams}
- 23/291 . . . . . {for obtaining foams or aerosols}
- 23/30 . . . . Mixing gases with solids
- 23/32 . . . . {by introducing solids in gas volumes}
- 23/34 . . . . {by introducing gases in solid materials, e.g. in masses of powder or particles}
- 23/341 . . . . . {by introducing steam, e.g. for wetting the solids}
- 23/36 . . . . {by mixing in fluidised bed state}
- 23/39 . . . . {Mixing systems, i.e. flow charts or diagrams}
- 23/40 . . . . Mixing liquids with liquids; Emulsifying
- 23/405 . . . . {Methods of mixing liquids with liquids (B01F 23/4105 takes precedence)}
- 23/41 . . . . Emulsifying
- 23/4105 . . . . . {Methods of emulsifying}
- 23/411 . . . . . using electrical or magnetic fields, heat or vibrations
- 23/4111 . . . . . . {using vibrations}
- 23/413 . . . . . {Homogenising a raw emulsion or making monodisperse or fine emulsions}
- 23/414 . . . . . {characterised by the internal structure of the emulsion}
- 23/4141 . . . . . {High internal phase ratio [HIPR] emulsions, e.g. having high percentage of internal phase, e.g. higher than 60-90 % of water in oil [W/O]}
- 23/4142 . . . . . {Inversed-type emulsions}
- 23/4143 . . . . . {Microemulsions}
- 23/4144 . . . . . {Multiple emulsions, in particular double emulsions, e.g. water in oil in water; Three-phase emulsions}
- 23/4145 . . . . . {Emulsions of oils, e.g. fuel, and water}
- 23/4146 . . . . . {Emulsions including solid particles, e.g. as solution or dispersion, i.e. molten material or material dissolved in a solvent or dispersed in a liquid}
- 23/43 . . . . using driven stirrers
- 23/431 . . . . . {the liquids being introduced from the outside through or along the axis of a rotating stirrer, e.g. the stirrer rotating due to the reaction of the introduced liquid}
- 23/45 . . . . using flow mixing
- 23/451 . . . . . by injecting one liquid into another
- 23/452 . . . . . {by uniting flows taken from different parts of a receptacle or silo; Sandglass-type mixing (for particulate material B01F 25/80)}
- 23/453 . . . . . {by moving the liquids in countercurrent}
- 23/454 . . . . . by injecting a mixture of liquid and gas
- 23/47 . . . . involving high-viscosity liquids, e.g. asphalt
- 23/471 . . . . . {using a very viscous liquid and a liquid of low viscosity}
- 23/48 . . . . . {characterised by the nature of the liquids (B01F 23/47 takes precedence)}
- 23/481 . . . . . {using liquefied or cryogenic gases}
- 23/482 . . . . . {using molten solids}
- 23/483 . . . . . {using water for diluting a liquid ingredient, obtaining a predetermined concentration or making an aqueous solution of a concentrate}
- 23/49 . . . . {Mixing systems, i.e. flow charts or diagrams}
- 23/50 . . . . Mixing liquids with solids (displacing one liquid by another in dispersions of solids in liquids B01D 12/00)
- 23/51 . . . . . {Methods thereof}
- 23/511 . . . . . {characterised by the composition of the liquids or solids}
- 23/53 . . . . using driven stirrers
- 23/54 . . . . . {wetting solids}
- 23/55 . . . . . {the mixture being submitted to electrical, sonic or similar energy}
- 23/551 . . . . . {using vibrations}
- 23/56 . . . . . {by introducing solids in liquids, e.g. dispersing or dissolving}
- 23/565 . . . . . {by introducing liquids in solid material, e.g. to obtain slurries}
- 23/566 . . . . . {by introducing liquids in a fluidised bed}
- 23/57 . . . . . Mixing high-viscosity liquids with solids
- 23/58 . . . . . {characterised by the nature of the liquid (B01F 23/57 takes precedence)}

## B01F

- 23/581 . . . {Mixing liquids with solids, slurries or sludge, for obtaining a diluted slurry}
- 23/582 . . . {Mixing foam with solids}
- 23/59 . . {Mixing systems, i.e. flow charts or diagrams}
- 23/60 . Mixing solids with solids
- 23/62 . . using a receptacle with a bottom discharge with oscillating or vibrating opening and closing elements; using a receptacle with a bottom discharge with elements fitted on moving chains
- 23/64 . . using rotatable mixing elements at the lower end of discharge hoppers
- 23/66 . . {by evaporating or liquefying at least one of the components; using a fluid which is evaporated after mixing}
- 23/69 . . {Mixing systems, i.e. flow charts or diagrams; Arrangements, e.g. comprising controlling means}
- 23/70 . Pre-treatment of the materials to be mixed
- 23/701 . . {Coating solid materials}
- 23/702 . . {Cooling materials}
- 23/703 . . {Degassing or de-aerating materials; Replacing one gas within the materials by another gas}
- 23/704 . . {Drying materials, e.g. in order to mix them in solid state}
- 23/705 . . {Submitting materials to electrical energy fields to charge or ionize them}
- 23/706 . . {Evaporating solvents or dispersion liquids, e.g. water, at least partially}
- 23/707 . . {Extracting materials to be mixed from a stream of fluid or from a solid containing them, e.g. by adsorption, absorption or distillation}
- 23/708 . . {Filtering materials}
- 23/709 . . {Freezing materials, e.g. to mix them in solid state}
- 23/71 . . {Grinding materials}
- 23/711 . . {Heating materials, e.g. melting}
- 23/712 . . {Irradiating materials}
- 23/713 . . {Sieving materials}
- 23/80 . After-treatment of the mixture
- 23/801 . . {Coating the solid mixture}
- 23/802 . . {Cooling the mixture}
- 23/803 . . {Venting, degassing or ventilating of gases, fumes or toxic vapours from the mixture}
- 23/804 . . {Drying the mixture}
- 23/805 . . {Submitting a mixture to electrical energy fields, e.g. corona discharge}
- 23/806 . . {Evaporating a carrier, e.g. liquid carbon dioxide used to dissolve, disperse, emulsify or other components that are difficult to be mixed; Evaporating liquid components}
- 23/807 . . {Extracting components from the mixture, e.g. by adsorption, absorption or distillation}
- 23/808 . . {Filtering the mixture}
- 23/809 . . {Freezing the mixture}
- 23/81 . . {Grinding the mixture}
- 23/811 . . {Heating the mixture}
- 23/812 . . {Irradiating the mixture}
- 25/101 . . {wherein the vortex flows in a spherical shaped receptacle or chamber}
- 25/102 . . {wherein the vortex is created by two or more jets introduced tangentially in separate mixing chambers or consecutively in the same mixing chamber}
- 25/103 . . {with additional mixing means other than vortex mixers, e.g. the vortex chamber being positioned in another mixing chamber}
- 25/104 . . {characterised by the arrangement of the discharge opening}
- 25/1041 . . . {the mixing chamber being vertical with the outlet tube at its upper side}
- 25/1042 . . . {the mixing chamber being vertical and having an outlet tube at its bottom whose inlet is at a higher level than the inlet of the vortex creating jet, e.g. the jet being introduced at the bottom of the mixing chamber}
- 25/105 . {Mixing heads, i.e. compact mixing units or modules, using mixing valves for feeding and mixing at least two components}
- 25/1051 . . {of the mixing valve type}
- 25/12 . {Interdigital mixers, i.e. the substances to be mixed are divided in sub-streams which are rearranged in an interdigital or interspersed manner ([micromixers using interdigital streams B01F 33/3012](#))}
- 25/14 . {Mixing drops, droplets or bodies of liquid which flow together or contact each other ([micromixers using where the materials to be mixed are in the form of droplets B01F 33/302](#))}
- 25/20 . Jet mixers, i.e. mixers using high-speed fluid streams ([using jets to create vortex flow B01F 25/10](#))
- 25/21 . . with submerged injectors, e.g. nozzles, for injecting high-pressure jets into a large volume or into mixing chambers
- 25/211 . . . {the injectors being surrounded by guiding tubes}
- 25/212 . . . {the injectors being movable, e.g. rotating}
- 25/2121 . . . . {Pivoting or oscillating in a multidirectional way during jetting}
- 25/2122 . . . . {Rotating during jetting}
- 25/2123 . . . . {being vertically moved to bring the injector in or out of operative position}
- 25/2124 . . . . {being moved or transported between different locations during jetting}
- 25/2125 . . . . {Moving to adjust the direction of jetting, the injectors being fixed during operation}
- 25/23 . . Mixing by intersecting jets
- 25/231 . . . {the intersecting jets having the configuration of sheets, cylinders or cones}
- 25/25 . . Mixing by jets impinging against collision plates
- 25/27 . . Mixing by jetting components into a conduit for agitating its contents
- 25/28 . . {characterised by the specific design of the jet injector}
- 25/281 . . . {the jet injector being of the explosive rapid expansion of supercritical solutions [RESS] or fluid injection of molecular spray [FIMS] type, i.e. the liquid is jetted in an environment (gas or liquid) by nozzles, in conditions of significant pressure drop, with the possible generation of shock waves}

## Mixers

- 25/00 **Flow mixers; Mixers for falling materials, e.g. solid particles ([centrifugal mixers B04](#))**
- 25/10 . Mixing by creating a vortex flow, e.g. by tangential introduction of flow components

- 25/282 . . . {the jet injector being of Coanda-type, i.e. having a surface to attract the jet for adjusting its direction}
- 25/30 . Injector mixers (mixing by creating vortex flow [B01F 25/10](#))
- 25/305 . . {the additional component being axially fed and radially discharged through a circumferential outlet}
- 25/31 . . in conduits or tubes through which the main component flows
- 25/311 . . . {for mixing more than two components; Devices specially adapted for generating foam}
- 25/3111 . . . . {Devices specially adapted for generating foam, e.g. air foam}
- 25/31112 . . . . . {with additional mixing means other than injector mixers, e.g. screen or baffles ([B01F 25/31113](#) takes precedence)}
- 25/31113 . . . . . {with rotating elements, e.g. driven by one of the components for feeding or by the resulting mixture for additional mixing}
- 25/31114 . . . . . {with means for introducing an additional component, e.g. in predetermined proportion or in the main component}
- 25/312 . . . with Venturi elements; Details thereof
- 25/3121 . . . . {with additional mixing means other than injector mixers, e.g. screens, baffles or rotating elements}
- 25/3122 . . . . {the material flowing at a supersonic velocity thereby creating shock waves}
- 25/3123 . . . . {with two or more Venturi elements}
- 25/31231 . . . . . {used alternatively}
- 25/31232 . . . . . {used simultaneously}
- 25/31233 . . . . . {used successively}
- 25/3124 . . . . {characterised by the place of introduction of the main flow}
- 25/31241 . . . . . {the main flow being injected in the circumferential area of the venturi, creating an aspiration in the central part of the conduit}
- 25/31242 . . . . . {the main flow being injected in the central area of the venturi, creating an aspiration in the circumferential part of the conduit ([B01F 25/31243](#) takes precedence)}
- 25/31243 . . . . . {Eductor or eductor-type venturi, i.e. the main flow being injected through the venturi with high speed in the form of a jet}
- 25/3125 . . . . {characteristics of the Venturi parts}
- 25/31251 . . . . . {Throats}
- 25/312511 . . . . . . {Adjustable Venturi throat}
- 25/312512 . . . . . . {Profiled, grooved, ribbed throat, or being provided with baffles}
- 25/31252 . . . . . {Nozzles}
- 25/312521 . . . . . . {Adjustable Venturi nozzle}
- 25/312522 . . . . . . {Profiled, grooved, ribbed nozzle, or being provided with baffles}
- 25/31253 . . . . . {Discharge}
- 25/312531 . . . . . . {Adjustable discharge conduit or barrel, e.g. adjustable in width}
- 25/312532 . . . . . . {Profiled, grooved, ribbed discharge conduit, or being provided with baffles}
- 25/312533 . . . . . . {Constructional characteristics of the diverging discharge conduit or barrel, e.g. with zones of changing conicity}
- 25/313 . . . wherein additional components are introduced in the centre of the conduit
- 25/3131 . . . . . {with additional mixing means other than injector mixers, e.g. screens, baffles or rotating elements}
- 25/3132 . . . . . {by using two or more injector devices}
- 25/31321 . . . . . . {used alternatively}
- 25/31322 . . . . . . {used simultaneously}
- 25/31323 . . . . . . {used successively}
- 25/31324 . . . . . . {arranged concentrically}
- 25/3133 . . . . . {characterised by the specific design of the injector}
- 25/31331 . . . . . . {Perforated, multi-opening, with a plurality of holes}
- 25/313311 . . . . . . . {Porous injectors}
- 25/31332 . . . . . . {Ring, torus, toroidal or coiled configurations}
- 25/31333 . . . . . . {Rotatable injectors}
- 25/31334 . . . . . . {the opening for introducing the supplementary stream being a slit}
- 25/314 . . . wherein additional components are introduced at the circumference of the conduit
- 25/3141 . . . . . {with additional mixing means other than injector mixers}
- 25/3142 . . . . . {the conduit having a plurality of openings in the axial direction or in the circumferential direction}
- 25/31421 . . . . . . {the conduit being porous}
- 25/31422 . . . . . . {with a plurality of perforations in the axial direction only}
- 25/31423 . . . . . . {with a plurality of perforations in the circumferential direction only and covering the whole circumference}
- 25/314231 . . . . . . . {the perforations being a complete cut-out in the circumferential direction covering the whole diameter of the tube, i.e. having two consecutive tubes placed consecutively, the additional component being introduced between them}
- 25/31424 . . . . . . {with a plurality of perforations aligned in a row perpendicular to the flow direction}
- 25/31425 . . . . . . {with a plurality of perforations in the axial and circumferential direction covering the whole surface}
- 25/3143 . . . . . {characterised by the specific design of the injector}
- 25/31431 . . . . . . {being a slit extending in the longitudinal direction only}
- 25/31432 . . . . . . {being a slit extending in the circumferential direction only}
- 25/31433 . . . . . . {being rotatable, e.g. placed on a rotatable housing or conduit}
- 25/31434 . . . . . . {being a bundle of similar tubes, each of them having feedings on the circumferential wall, e.g. as mixer for a reactor}
- 25/315 . . . wherein a difference of pressure at different points of the conduit causes introduction of the additional component into the main component ([B01F 25/316](#) takes precedence)

- 25/316 . . . with containers for additional components fixed to the conduit
- 25/32 . . wherein the additional components are added in a by-pass of the main flow
- 25/40 . Static mixers ([colloid-mills B02C](#); [mixing valves F16K 11/00](#))
- 25/41 . . Mixers of the fractal type
- 25/42 . . in which the mixing is affected by moving the components jointly in changing directions, e.g. in tubes provided with baffles or obstructions
- 25/421 . . . by moving the components in a convoluted or labyrinthine path ([B01F 25/433 takes precedence](#))
- 25/422 . . . . between stacked plates, e.g. grooved or perforated plates
- 25/423 . . . . {by means of elements placed in the receptacle for moving or guiding the components}
- 25/4231 . . . . . {using baffles}
- 25/4232 . . . . . {using dams}
- 25/4233 . . . . . {using plates with holes, the holes being displaced from one plate to the next one to force the flow to make a bending movement}
- 25/43 . . . Mixing tubes, e.g. wherein the material is moved in a radial or partly reversed direction
- 25/431 . . . . Straight mixing tubes with baffles or obstructions that do not cause substantial pressure drop; Baffles therefor
- 25/4311 . . . . . {the baffles being adjustable}
- 25/4312 . . . . . {having different kinds of baffles, e.g. plates alternating with screens}
- 25/4313 . . . . . {comprising a plurality of stacked ducts having their axes parallel to the tube axis}
- 25/4314 . . . . . with helical baffles
- 25/43141 . . . . . {composed of consecutive sections of helical formed elements}
- 25/4315 . . . . . {the baffles being deformed flat pieces of material ([B01F 25/4314 takes precedence](#))}
- 25/43151 . . . . . {composed of consecutive sections of deformed flat pieces of material}
- 25/4316 . . . . . {the baffles being flat pieces of material, e.g. intermeshing, fixed to the wall or fixed on a central rod}
- 25/43161 . . . . . {composed of consecutive sections of flat pieces of material}
- 25/43162 . . . . . {Assembled flat elements}
- 25/43163 . . . . . {in the form of small flat plate-like elements}
- 25/4317 . . . . . {Profiled elements, e.g. profiled blades, bars, pillars, columns or chevrons}
- 25/43171 . . . . . {Profiled blades, wings, wedges, i.e. plate-like element having one side or part thicker than the other}
- 25/43172 . . . . . {Profiles, pillars, chevrons, i.e. long elements having a polygonal cross-section}
- 25/4318 . . . . . {Ring-shaped blades or strips}
- 25/4319 . . . . . {Tubular elements}
- 25/43195 . . . . . {Wires or coils}
- 25/431951 . . . . . {Spirally-shaped baffle}
- 25/431952 . . . . . {Conical or pyramidal elements}
- 25/43197 . . . . . {characterised by the mounting of the baffles or obstructions}
- 25/431971 . . . . . {Mounted on the wall}
- 25/431972 . . . . . {Mounted on an axial support member, e.g. a rod or bar}
- 25/431973 . . . . . {Mounted on a support member extending transversally through the mixing tube}
- 25/431974 . . . . . {Support members, e.g. tubular collars, with projecting baffles fitted inside the mixing tube or adjacent to the inner wall}
- 25/432 . . . . with means for dividing the material flow into separate sub-flows and for repositioning and recombining these sub-flows; Cross-mixing, e.g. conducting the outer layer of the material nearer to the axis of the tube or vice-versa
- 25/4321 . . . . . {the subflows consisting of at least two flat layers which are recombined, e.g. using means having restriction or expansion zones}
- 25/43211 . . . . . {using a simple by-pass for separating and recombining the flow, e.g. by using branches of different length}
- 25/4322 . . . . . {essentially composed of stacks of sheets, e.g. corrugated sheets}
- 25/4323 . . . . . {using elements provided with a plurality of channels or using a plurality of tubes which can either be placed between common spaces or collectors}
- 25/43231 . . . . . {the channels or tubes crossing each other several times}
- 25/433 . . . . Mixing tubes wherein the shape of the tube influences the mixing, e.g. mixing tubes with varying cross-section or provided with inwardly extending profiles
- 25/4331 . . . . . {Mixers with bended, curved, coiled, wounded mixing tubes or comprising elements for bending the flow}
- 25/4332 . . . . . {Mixers with a strong change of direction in the conduit for homogenizing the flow}
- 25/4333 . . . . . {Mixers with scallop-shaped tubes or surfaces facing each other}
- 25/4334 . . . . . {Mixers with a converging cross-section}
- 25/4335 . . . . . {Mixers with a converging-diverging cross-section}
- 25/4336 . . . . . {Mixers with a diverging cross-section}
- 25/4337 . . . . . {Mixers with a diverging-converging cross-section}
- 25/4338 . . . . . {Mixers with a succession of converging-diverging cross-sections, i.e. undulating cross-section}
- 25/434 . . . . Mixing tubes comprising cylindrical or conical inserts provided with grooves or protrusions
- 25/4341 . . . . . {the insert being provided with helical grooves}
- 25/4342 . . . . . {the insert being provided with a labyrinth of grooves or a distribution of protrusions}
- 25/435 . . . . Mixing tubes composed of concentric tubular members
- 25/438 . . {with movable slits formed between reciprocating surfaces}

- 25/44 . . Mixers in which the components are pressed through slits
- 25/441 . . . characterised by the configuration of the surfaces forming the slits
- 25/4412 . . . . {the slits being formed between opposed planar surfaces, e.g. pushed against each other by springs}
- 25/44121 . . . . . {with a plurality of parallel slits, e.g. formed between stacked plates}
- 25/4413 . . . . {the slits being formed between opposed conical or cylindrical surfaces}
- 25/4414 . . . . {the slits being formed between the balls and the seats of a bearing-like construction}
- 25/4415 . . . . {the slits being formed between the helical windings of a spring-like construction or by deforming a spring}
- 25/4416 . . . . {the opposed surfaces being provided with grooves}
- 25/44161 . . . . . {Axial grooves formed on opposed surfaces, e.g. on cylinders or cones}
- 25/44162 . . . . . {Circumferential grooves formed on opposed surfaces, e.g. on planar surfaces or on cylinders or cones}
- 25/44163 . . . . . {Helical grooves formed on opposed surfaces, e.g. on cylinders or cones}
- 25/44164 . . . . . {Crossing sets of grooves forming a labyrinth formed on opposed surfaces, e.g. on planar surfaces or on cylinders or cones}
- 25/44165 . . . . . {Radial grooves formed on opposed surfaces, e.g. on planar surfaces}
- 25/44166 . . . . . {Spiral grooves formed on opposed surfaces, e.g. on planar surfaces}
- 25/44167 . . . . . {the grooves being formed on the outer surface of the cylindrical or conical core of the slits}
- 25/44168 . . . . . {the grooves being formed on the inner surface of the cylindrical or conical housing of the slits}
- 25/442 . . . characterised by the relative position of the surfaces during operation
- 25/4421 . . . . {the surfaces being maintained in a fixed position, spaced from each other, therefore maintaining the slit always open}
- 25/4422 . . . . {the surfaces being maintained in a fixed but adjustable position, spaced from each other, therefore allowing the slit spacing to be varied ([B01F 25/4423 takes precedence](#))}
- 25/4423 . . . . {the surfaces being part of a valve construction, formed by opposed members in contact, e.g. automatic positioning caused by spring pressure}
- 25/45 . . Mixers in which the materials to be mixed are pressed together through orifices or interstitial spaces, e.g. between beads ([B01F 25/44 takes precedence](#))
- 25/451 . . . characterised by means for moving the materials to be mixed or the mixture
- 25/4511 . . . . {with a rotor surrounded by a stator provided with orifices}
- 25/4512 . . . . {with reciprocating pistons}
- 25/452 . . . characterised by elements provided with orifices or interstitial spaces
- 25/4521 . . . . {the components being pressed through orifices in elements, e.g. flat plates or cylinders, which obstruct the whole diameter of the tube}
- 25/45211 . . . . . {the elements being cylinders or cones which obstruct the whole diameter of the tube, the flow changing from axial in radial and again in axial}
- 25/45212 . . . . . {the elements comprising means for adjusting the orifices}
- 25/4522 . . . . {the components being pressed through porous bodies, e.g. flat plates, blocks or cylinders, which obstruct the whole diameter of the tube ([B01F 25/45243 takes precedence](#))}
- 25/45221 . . . . . {the porous bodies being cylinders or cones which obstruct the whole diameter of the tube, the flow changing from axial in radial and again in axial}
- 25/4523 . . . . {the components being pressed through sieves, screens or meshes which obstruct the whole diameter of the tube}
- 25/45231 . . . . . {the sieves, screens or meshes being cylinders or cones which obstruct the whole diameter of the tube, the flow changing from axial in radial and again in axial}
- 25/4524 . . . . {the components being pressed through foam-like inserts or through a bed of loose bodies, e.g. balls}
- 25/45241 . . . . . {through a bed of balls}
- 25/45242 . . . . . {through a bed of fibres, steel wool or wood chips}
- 25/45243 . . . . . {through a foam or expanded material body}
- 25/46 . . Homogenising or emulsifying nozzles
- 25/50 . . Circulation mixers, e.g. wherein at least part of the mixture is discharged from and reintroduced into a receptacle
- 25/51 . . in which the mixture is circulated through a set of tubes, e.g. with gradual introduction of a component into the circulating flow
- 25/52 . . with a rotary stirrer in the recirculation tube
- 25/53 . . in which the mixture is discharged from and reintroduced into a receptacle through a recirculation tube, into which an additional component is introduced
- 25/54 . . provided with a pump inside the receptacle to recirculate the material within the receptacle
- 25/60 . . Pump mixers, i.e. mixing within a pump
- 25/62 . . of the gear type
- 25/621 . . . {Wankel pump}
- 25/64 . . of the centrifugal-pump type, i.e. turbo-mixers
- 25/641 . . . {Multi-staged turbo-mixers}
- 25/642 . . . {consisting of a stator-rotor system with intermeshing teeth or cages}
- 25/643 . . . {with axial access to the mixing device at both its sides}
- 25/70 . . Spray-mixers, e.g. for mixing intersecting sheets of material
- 25/72 . . with nozzles
- 25/721 . . . for spraying a fluid on falling particles or on a liquid curtain
- 25/74 . . with rotating parts, e.g. discs

- 25/741 . . . {with a disc or a set of discs mounted on a shaft rotating about a vertical axis, on top of which the material to be thrown outwardly is fed}
- 25/7411 . . . . {with repeated action, i.e. the material thrown outwardly being guided, by means provided on the surrounding casing or on top of the next lower disc}
- 25/742 . . . {for spraying a liquid on falling particles or on a liquid curtain (B01F 25/7411 takes precedence)}
- 25/743 . . . {the material being fed on both sides of a part rotating about a vertical axis}
- 25/744 . . . {the rotating part being composed of at least two cooperating members rotating independently about the same vertical axis}
- 25/80 . Falling particle mixers, e.g. with repeated agitation along a vertical axis
- 25/82 . . uniting flows of material taken from different parts of a receptacle or from a set of different receptacles
- 25/821 . . . {by means of conduits having inlet openings at different levels}
- 25/8211 . . . . {by means of a central conduit or central set of conduits}
- 25/822 . . . {the receptacle being divided into compartments for receiving or storing the different components}
- 25/823 . . . {Flow collectors therefor}
- 25/83 . . with receptacles provided with fixed guiding elements therein, e.g. baffles; Cross-mixers comprising crossing channels for guiding the falling particles
- 25/84 . . {Falling-particle mixers comprising superimposed receptacles, the material flowing from one to the other, e.g. of the sandglass type}
- 25/85 . . wherein the particles fall onto a film that flows along the inner wall of a mixer
- 25/90 . . with moving or vibrating means, e.g. stirrers, for enhancing the mixing
- 25/901 . . . {using one central conveyor or several separate conveyors, e.g. belt, screw conveyors or vibrating tables, for discharging flows from receptacles, e.g. in layers}
- 2025/91 . . {Direction of flow or arrangement of feed and discharge openings}
- 2025/911 . . {Axial flow}
- 2025/912 . . {Radial flow}
- 2025/9121 . . . {from the center to the circumference, i.e. centrifugal flow}
- 2025/9122 . . . {from the circumference to the center}
- 2025/913 . . {Vortex flow, i.e. flow spiraling in a tangential direction and moving in an axial direction}
- 2025/914 . . {Tangential flow, i.e. flow spiraling in a tangential direction in a flat plane or belt-like area}
- 2025/915 . . {Reverse flow, i.e. flow changing substantially 180° in direction}
- 2025/916 . . {Turbulent flow, i.e. every point of the flow moves in a random direction and intermixes}
- 2025/917 . . {Laminar or parallel flow, i.e. every point of the flow moves in layers which do not intermix}
- 2025/9171 . . . {Parallel flow, i.e. every point of the flow moves in parallel layers where intermixing can occur by diffusion or which do not intermix; Focusing, i.e. compressing parallel layers without intermixing them}
- 2025/918 . . {Counter current flow, i.e. flows moving in opposite direction and colliding}
- 2025/919 . . {characterised by the disposition of the feed and discharge openings}
- 2025/9191 . . . {characterised by the arrangement of the feed openings for one or more flows, e.g. for the mainflow and the flow of an additional component}
- 2025/91911 . . . . {with feed openings in the center of the main flow}
- 2025/91912 . . . . {with feed openings at the circumference of the main flow}
- 2025/919121 . . . . . {with feed openings around the complete circumference of the main flow, e.g. being a perforated or porous part}
- 2025/919125 . . . . . {with feed openings in the center and at the circumference of the main flow}
- 2025/91913 . . . . . {with feed openings facing each other, e.g. for creating counter flows, for creating a series of vortex flows}
- 2025/93 . . {Arrangements, nature or configuration of flow guiding elements}
- 2025/931 . . {Flow guiding elements surrounding feed openings, e.g. jet nozzles}
- 2025/932 . . {Nature of the flow guiding elements}
- 2025/9321 . . . {Surface characteristics, e.g. coated or rough}
- 27/00 Mixers with rotary stirring devices in fixed receptacles (magnetic mixers B01F 33/45); Kneaders**
- 27/05 . Stirrers
- 27/051 . . characterised by their elements, materials or mechanical properties
- 27/052 . . . Stirrers with replaceable wearing elements; Wearing elements therefor
- 27/053 . . . characterised by their materials
- 27/0531 . . . . {with particular surface characteristics, e.g. coated or rough}
- 27/054 . . . Deformable stirrers, e.g. deformed by a centrifugal force applied during operation
- 27/0541 . . . . {with mechanical means to alter the position of the stirring elements}
- 27/0542 . . . . {deformable by centrifugal force}
- 27/0543 . . . . {the position of the stirring elements depending on the direction of rotation of the stirrer}
- 27/06 . . . {Stirrers made by deforming a plate}
- 27/07 . . characterised by their mounting on the shaft
- 27/071 . . . {Fixing of the stirrer to the shaft}
- 27/072 . . . characterised by the disposition of the stirrers with respect to the rotating axis
- 27/0721 . . . . {parallel with respect to the rotating axis}
- 27/0722 . . . . {perpendicular with respect to the rotating axis}
- 27/0723 . . . . {oblique with respect to the rotating axis}
- 27/0724 . . . . {directly mounted on the rotating axis}
- 27/0725 . . . . {on the free end of the rotating axis}

- 27/0726 . . . . {having stirring elements connected to the stirrer shaft each by a single radial rod, other than open frameworks}
- 27/07261 . . . . . {of the anchor type, i.e. the stirring elements being connected to the rods by one end and extending parallel to the shaft axis}
- 27/0727 . . . . {having stirring elements connected to the stirrer shaft each by two or more radial rods, e.g. the shaft being interrupted between the rods, or of crankshaft type}
- 27/073 . . . {with stirring elements moving with respect to the stirrer shaft, e.g. floating or comprising contracting chambers}
- 27/074 . . . {having two or more mixing elements being concentrically mounted on the same shaft}
- 27/09 . . characterised by the mounting of the stirrers with respect to the receptacle
- 27/091 . . . with elements co-operating with receptacle wall or bottom, e.g. for scraping the receptacle wall
- 27/092 . . . {occupying substantially the whole interior space of the receptacle}
- 27/093 . . . eccentrically arranged
- 27/11 . . characterised by the configuration of the stirrers
- 27/111 . . . Centrifugal stirrers, i.e. stirrers with radial outlets; Stirrers of the turbine type, e.g. with means to guide the flow
- 27/1111 . . . . with a flat disc or with a disc-like element equipped with blades, e.g. Rushton turbine
- 27/112 . . . with arms, paddles, vanes or blades
- 27/1121 . . . . pin-shaped
- 27/1122 . . . . anchor-shaped
- 27/1123 . . . . sickle-shaped, i.e. curved in at least one direction
- 27/1124 . . . . rake-shaped or grid-shaped
- 27/1125 . . . . with vanes or blades extending parallel or oblique to the stirrer axis
- 27/11251 . . . . . {having holes in the surface}
- 27/11252 . . . . . {paddle wheels}
- 27/11253 . . . . . {the blades extending oblique to the stirrer axis}
- 27/1126 . . . . the stirrer being a bent rod supported at one end only
- 27/1127 . . . . spoon-shaped
- 27/113 . . . Propeller-shaped stirrers for producing an axial flow, e.g. shaped like a ship or aircraft propeller
- 27/1131 . . . . with holes in the propeller blade surface
- 27/1132 . . . . with guiding tubes or tubular segments fixed to and surrounding the tips of the propeller blades, e.g. for supplementary mixing
- 27/1133 . . . . {the impeller being of airfoil or aerofoil type}
- 27/1134 . . . . {the impeller being of hydrofoil type}
- 27/114 . . . Helically shaped stirrers, i.e. stirrers comprising a helically shaped band or helically shaped band sections
- 27/1141 . . . . {having holes in the surface}
- 27/1142 . . . . of the corkscrew type
- 27/1143 . . . . screw-shaped, e.g. worms
- 27/1144 . . . . with a plurality of blades following a helical path on a shaft or a blade support
- 27/1145 . . . . ribbon shaped with an open space between the helical ribbon flight and the rotating axis
- 27/11451 . . . . . {forming open frameworks or cages}
- 27/115 . . . comprising discs or disc-like elements essentially perpendicular to the stirrer shaft axis
- 27/1151 . . . . with holes on the surface
- 27/1152 . . . . with separate elements other than discs fixed on the discs, e.g. vanes fixed on the discs
- 27/1153 . . . . {the discs being made by deforming flat discs}
- 27/1154 . . . . {the discs being cup shaped, e.g. semi sphere}
- 27/1155 . . . . {with interconnected discs, forming open frameworks or cages}
- 27/116 . . . Stirrers shaped as cylinders, balls or rollers
- 27/1161 . . . . {having holes in the surface}
- 27/1162 . . . . {Balls}
- 27/1163 . . . . {Rollers}
- 27/11631 . . . . . {comprising paddles fixed thereon, e.g. with a total a diameter close to that of the surrounding receptacle}
- 27/117 . . . Stirrers provided with conical-shaped elements, e.g. funnel-shaped
- 27/1171 . . . . {having holes in the surface}
- 27/118 . . . Stirrers in the form of brushes, sieves, grids, chains or springs
- 27/119 . . . Stirrers with rigid wires or flexible rods
- 27/1191 . . . . {with a bent rod of non-helical configuration supported at one end}
- 27/13 . . . Openwork frame or cage stirrers not provided for in other groups of this subclass
- 27/15 . . . Stirrers with tubes for guiding the material
- 27/17 . . . Stirrers with additional elements mounted on the stirrer, for purposes other than mixing
- 27/171 . . . . for disintegrating, e.g. for milling
- 27/172 . . . . for cutting, e.g. with knives
- 27/19 . . . Stirrers with two or more mixing elements mounted in sequence on the same axis
- 27/191 . . . . with similar elements
- 27/192 . . . . with dissimilar elements
- 27/1921 . . . . . {comprising helical elements and paddles}
- 27/21 . . characterised by their rotating shafts
- 27/211 . . characterised by the material of the shaft
- 27/2111 . . . Flexible shafts
- 27/212 . . {Construction of the shaft ([B01F 27/2121](#), [B01F 27/2122](#), [B01F 27/2123](#), [B01F 27/2124](#) take precedence)}
- 27/2121 . . composed of interconnected parts
- 27/2122 . . Hollow shafts
- 27/2123 . . Shafts with both stirring means and feeding or discharging means
- 27/2124 . . Shafts with adjustable length, e.g. telescopic shafts
- 27/213 . . characterised by the connection with the drive
- 27/23 . . characterised by the orientation or disposition of the rotor axis
- 27/231 . . with a variable orientation during mixing operation, e.g. with tiltable rotor axis
- 27/2311 . . . {the orientation of the rotating shaft being adjustable in the interior of the receptacle, e.g. by tilting the stirrer shaft during the mixing}
- 27/2312 . . . {the position of the rotating shaft being adjustable in the interior of the receptacle, e.g. to locate the stirrer in different locations during the mixing}

- 27/232 . . with two or more rotation axes
- 27/2321 . . . {having different inclinations, e.g. non parallel}
- 27/2322 . . . with parallel axes
- 27/2323 . . . with perpendicular axes
- 27/2324 . . . {planetary}
- 27/25 . Mixers with both stirrer and drive unit submerged in the material being mixed
- 27/251 . . {Vertical beam constructions therefor}
- 27/27 . Mixers with stator-rotor systems, e.g. with intermeshing teeth or cylinders or having orifices (the stirrers having a central axial inflow and a substantially radial outflow B01F 27/81)
- 27/271 . . with means for moving the materials to be mixed radially between the surfaces of the rotor and the stator
- 27/2711 . . . {provided with intermeshing elements}
- 27/2712 . . . {provided with ribs, ridges or grooves on one surface}
- 27/2713 . . . {the surfaces having a conical shape}
- 27/2714 . . . {the relative position of the stator and the rotor, gap in between or gap with the walls being adjustable}
- 27/272 . . with means for moving the materials to be mixed axially between the surfaces of the rotor and the stator, e.g. the stator rotor system formed by conical or cylindrical surfaces
- 27/2721 . . . {provided with intermeshing elements}
- 27/2722 . . . {provided with ribs, ridges or grooves on one surface}
- 27/2723 . . . {the surfaces having a conical shape}
- 27/2724 . . . {the relative position of the stator and the rotor, gap in between or gap with the walls being adjustable}
- 27/276 . . {the mixer being composed of a stator-rotor system being formed by bearing elements, e.g. roller bearings}
- 27/40 . Mixers with rotor-rotor system, e.g. with intermeshing teeth
- 27/41 . . with the mutually rotating surfaces facing each other
- 27/411 . . . {provided with intermeshing elements}
- 27/412 . . . {provided with ribs, ridges or grooves on one surface}
- 27/42 . . with rotating surfaces next to each other, i.e. on substantially parallel axes
- 27/421 . . . {provided with intermeshing elements}
- 27/422 . . . {provided with ribs, ridges or grooves on one surface}
- 27/50 . Pipe mixers, i.e. mixers wherein the materials to be mixed flow continuously through pipes, e.g. column mixers
- 27/55 . with stirrers driven by the moving material
- 27/60 . with stirrers rotating about a horizontal or inclined axis
- 27/61 . . about an inclined axis
- 27/62 . . {comprising liquid feeding, e.g. spraying means}
- 27/621 . . . {the liquid being fed through the shaft of the stirrer}
- 27/625 . . {the receptacle being divided into compartments, e.g. with porous divisions}
- 27/627 . . {the receptacles being tiltable, e.g. for emptying}
- 27/63 . . co-operating with deflectors or baffles fixed to the receptacle
- 27/65 . . with buckets
- 27/70 . . with paddles, blades or arms
- 27/701 . . . comprising two or more shafts, e.g. in consecutive mixing chambers
- 27/702 . . . . with intermeshing paddles
- 27/703 . . . . with stirrers rotating at different speeds
- 27/704 . . . . with stirrers facing each other, i.e. supported by opposite walls of the receptacle
- 27/705 . . . . with stirrers rotating in opposite directions about the same axis, e.g. with a first stirrer surrounded by a tube inside a second stirrer
- 27/706 . . . . with all the shafts in the same receptacle (B01F 27/702-B01F 27/705 take precedence)
- 27/707 . . . the paddles co-operating, e.g. intermeshing, with elements on the receptacle wall
- 27/708 . . . characterised by the shape of the stirrer as a whole, i.e. of Z- or S-shape
- 27/71 . . with propellers
- 27/711 . . . {co-operating with stationary guiding means, e.g. baffles}
- 27/7111 . . . . {the guiding means being tubes surrounding the propellers}
- 27/72 . . with helices or sections of helices
- 27/721 . . . with two or more helices in the same receptacle
- 27/722 . . . . the helices closely surrounded by a casing
- 27/7221 . . . . . {the stirrers being composed of helices and paddles on the same shaft, e.g. helically arranged ovally shaped paddles}
- 27/723 . . . . the helices intermeshing to knead the mixture
- 27/724 . . . with a single helix closely surrounded by a casing
- 27/725 . . . {with two or more helices in respective separate casings, e.g. one casing inside the other}
- 27/726 . . . with two helices with opposite pitch on the same shaft; with two helices on the same axis, driven in opposite directions or at different speeds
- 27/73 . . with rotary discs
- 27/731 . . . {with two or more parallel shafts provided with perpendicularly mounted discs, e.g. lens shaped, one against the other on each shaft and in circumferential contact with the discs on the other shafts, e.g. for cleaning}
- 27/74 . . with rotary cylinders
- 27/75 . . with stirrers having planetary motion, i.e. rotating about their own axis and about a sun axis
- 27/755 . . . {the stirrers being cylinders, balls or gears}
- 27/80 . with stirrers rotating about a substantially vertical axis
- 27/805 . . wherein the stirrers or the receptacles are moved in order to bring them into operative position; Means for fixing the receptacle
- 27/806 . . . with vertical displacement of the stirrer, e.g. in combination with means for pivoting the stirrer about a vertical axis in order to co-operate with different receptacles
- 27/807 . . . with the stirrer-head pivoting about a horizontal axis to bring it in and out of operative position, e.g. with receptacles pivoting about a horizontal axis for emptying
- 27/808 . . with stirrers driven from the bottom of the receptacle

- 27/81 . . the stirrers having central axial inflow and substantially radial outflow
- 27/811 . . . {with the inflow from one side only, e.g. stirrers placed on the bottom of the receptacle, or used as a bottom discharge pump}
- 27/8111 . . . . {the stirrers co-operating with stationary guiding elements, e.g. surrounding stators or intermeshing stators (B01F 27/812 takes precedence)}
- 27/812 . . . {the stirrers co-operating with surrounding stators, or with intermeshing stators, e.g. comprising slits, orifices or screens}
- 27/813 . . . {the stirrers co-operating with stationary guiding elements (B01F 27/812 takes precedence)}
- 27/82 . . Pan-type mixers, i.e. mixers in which the stirring elements move along the bottom of a pan-shaped receptacle (with stirring elements moving along the wall or bottom of the receptacle B01F 27/091)
- 27/83 . . the stirrers being additionally moved radially, or oscillating about an axis perpendicular to the stirrer axis
- 27/84 . . with two or more stirrers rotating at different speeds or in opposite directions about the same axis
- 27/85 . . with two or more stirrers on separate shafts
- 27/851 . . . {the receptacle being subdivided in adjacent compartments}
- 27/86 . . co-operating with deflectors or baffles fixed to the receptacle
- 27/861 . . . {the baffles being of cylindrical shape, e.g. a mixing chamber surrounding the stirrer, the baffle being displaced axially to form an interior mixing chamber}
- 27/862 . . . {the baffles being adjustable or movable (B01F 27/861 takes precedence)}
- 27/87 . . the receptacle being divided into superimposed compartments
- 27/88 . . with a separate receptacle-stirrer unit that is adapted to be coupled to a drive mechanism
- 27/90 . . with paddles or arms
- 27/902 . . . cooperating with intermeshing elements fixed on the receptacle walls
- 27/9021 . . . . {the elements being vertically arranged, e.g. fixed on the bottom}
- 27/906 . . . with fixed axis
- 27/91 . . with propellers
- 27/911 . . . {forcing the material through orifices or slits, e.g. in a stationary part}
- 27/92 . . with helices or screws
- 27/921 . . . with helices centrally mounted in the receptacle
- 27/9211 . . . . {the helices being surrounded by a guiding tube}
- 27/92112 . . . . . {combined with means for uniting flows of material taken from different parts of the receptacle}
- 27/9212 . . . . with conical helices
- 27/9213 . . . . {the helices having a diameter only slightly less than the diameter of the receptacle}
- 27/9214 . . . . {with additional mixing elements other than helices; having inner and outer helices; with helices surrounding a guiding tube}
- 27/922 . . . with two or more helices, e.g. with intermeshing helices
- 27/923 . . . . {the material flowing continuously through the receptacle}
- 27/93 . . with rotary discs
- 27/94 . . with rotary cylinders or cones
- 27/941 . . . {being hollow, perforated or having special stirring elements thereon}
- 27/95 . . with stirrers having planetary motion, i.e. rotating about their own axis and about a sun axis
- 27/951 . . . {with at least one stirrer mounted on the sun axis}
- 27/952 . . . the stirrers being cylinders with their circumference in contact with the bottom of the receptacle and rotating about an axis at an angle to the sun axis, e.g. mixers of the Muller type
- 27/953 . . . {using only helical stirrers}
- 27/96 . . with openwork frames or cages
- 29/00 Mixers with rotating receptacles**
- 29/10 . . with receptacles rotated about two different axes, e.g. receptacles having planetary motion
- 29/15 . . Use of centrifuges for mixing
- 29/20 . . with receptacles rotating about an axis at an angle to their longitudinal axis (B01F 29/62 takes precedence)
- 29/25 . . with material flowing continuously through the receptacles from inlet to discharge
- 29/251 . . . {with at least one screw inside the receptacle for feeding or discharging, e.g. the axis of screw and receptacle being parallel}
- 29/252 . . . {the feed and discharge openings being at opposite ends of the receptacle}
- 29/253 . . . {the feed and discharge openings being at the same side of the receptacle}
- 29/30 . . Mixing the contents of individual packages or containers, e.g. by rotating tins or bottles
- 29/31 . . the containers being supported by driving means, e.g. by rotating rollers
- 29/32 . . Containers specially adapted for coupling to rotating frames or the like; Coupling means therefor
- 29/321 . . . of test-tubes or the like
- 29/322 . . . of two or more containers supported for simultaneous mixing, e.g. for bottles in crates
- 29/33 . . by imparting a combination of movements to two or more containers
- 29/331 . . . {by means of a rotary table provided with a plurality of bottle grippers at its periphery, an additional movement being imparted to the grippers}
- 29/332 . . . {the bottles being submitted to a screw-motion about an axis perpendicular to the axis of the bottles and lying intermediate the ends of the bottles}
- 29/333 . . . {essentially by rotating bottles about an axis perpendicular to the bottle axis and lying outside the bottles, using a rotating drum provided with pockets for the bottles at its periphery}
- 29/34 . . Constructional details of holders for the individual packages or containers
- 29/40 . . {Parts or components, e.g. receptacles, feeding or discharging means (B01F 29/251 takes precedence)}
- 29/401 . . {Receptacles, e.g. provided with liners}

- 29/4011 . . . {characterised by the shape or cross-section of the receptacle, e.g. of Y-, Z-, S-, or X shape}
- 29/40111 . . . . {Non-cylindrical sections, e.g. elliptical or irregular}
- 29/40112 . . . . {Polygonal sections, e.g. triangular or square}
- 29/40113 . . . . {Conical, double-conical or diabolo shapes}
- 29/40114 . . . . {Cubic, cubical or polyhedral shapes}
- 29/40115 . . . . {S shapes}
- 29/40116 . . . . {Spherical shapes}
- 29/40117 . . . . {Toroidal shapes}
- 29/40118 . . . . {V or W shapes}
- 29/40119 . . . . {X shapes}
- 29/401195 . . . . {Y or double Y shapes}
- 29/402 . . . {characterised by the relative disposition or configuration of the interior of the receptacles}
- 29/4021 . . . . {Multi-compartment receptacles}
- 29/4022 . . . . {Configuration of the interior}
- 29/40221 . . . . . {provided with baffles, plates or bars on the wall or the bottom}
- 29/40222 . . . . . {provided with guide tubes on the wall or the bottom}
- 29/4023 . . . . {Nature of the receptacle}
- 29/40231 . . . {Surface characteristics, e.g. coated, rough}
- 29/403 . . {Disposition of the rotor axis}
- 29/4031 . . . {horizontal}
- 29/4032 . . . {vertical}
- 29/4033 . . . {inclined}
- 29/4034 . . . {variable, e.g. tiltable during the operation}
- 29/4035 . . . {with a receptacle rotating around two or more axes}
- 29/40351 . . . . {having different, non-perpendicular inclinations, e.g. skew axes}
- 29/40352 . . . . {being parallel axes}
- 29/40353 . . . . {being perpendicular axes}
- 29/40354 . . . . {arranged for planetary motion}
- 29/4036 . . . {with a plurality of rotating receptacles}
- 29/40361 . . . . {having axes of different, non-perpendicular inclinations}
- 29/40362 . . . . {having parallel axes}
- 29/40363 . . . . {having perpendicular axes}
- 29/40364 . . . . {being concentrically arranged}
- 29/40365 . . . . {arranged for planetary motion}
- 29/60 . . rotating about a horizontal or inclined axis, e.g. drum mixers
- 29/61 . . {comprising liquid spraying devices}
- 29/62 . . without bars, i.e. without mixing elements; characterised by the shape or cross section of the receptacle, e.g. of Y-, Z-, S- or X- shape; with cylindrical receptacles rotating about an axis at an angle to their longitudinal axis
- 29/63 . . with fixed bars, i.e. stationary, or fixed on the receptacle
- 29/64 . . with stirring devices moving in relation to the receptacle, e.g. rotating
- 29/80 . . rotating about a substantially vertical axis
- 29/81 . . with stationary mixing elements
- 29/82 . . {the receptacle comprising a rotary part, e.g. the bottom, and a stationary part, e.g. the wall, with optional use of a stirrer; the receptacle comprising parts moving in opposite directions}
- 29/83 . . with rotary paddles or arms, e.g. movable out of the receptacle
- 29/835 . . . {Pan-type mixers, i.e. having stirrers moving along the bottom of a pan-shaped receptacle}
- 29/84 . . with propellers
- 29/85 . . with helices, e.g. rotating about an inclined axis
- 29/86 . . with rotary discs
- 29/87 . . with rotary cylinders
- 29/90 . . with stirrers having planetary motion
- 31/00 Mixers with shaking, oscillating, or vibrating mechanisms**
- 31/10 . . with a mixing receptacle rotating alternately in opposite directions
- 31/20 . . Mixing the contents of independent containers, e.g. test tubes
- 31/201 . . . {Holders therefor}
- 31/202 . . . {for beverage bottles, e.g. within crates or with feeding means for the bottles}
- 31/22 . . with supporting means moving in a horizontal plane, e.g. describing an orbital path for moving the containers about an axis which intersects the receptacle axis at an angle
- 31/23 . . by pivoting the containers about an axis
- 31/231 . . . {the containers being of the sandglass-type or being linked with their openings}
- 31/24 . . the containers being submitted to a rectilinear movement
- 31/25 . . the containers being submitted to a combination of movements other than within a horizontal plane, e.g. rectilinear and pivoting movement (with a receptacle submitted to a combination of movements, i.e. at least one movement being vibratory or oscillatory [B01F 31/50](#))
- 31/26 . . {the containers being submitted to a wobbling movement}
- 31/265 . . {the vibrations being caused by an unbalanced rotating member}
- 31/27 . . {the vibrations being caused by electromagnets}
- 31/275 . . {with means for transporting test tubes to and from the stirring device}
- 31/28 . . {the vibrations being caused by piezoelectric elements}
- 31/29 . . Mixing by periodically deforming flexible tubular members through which the material is flowing
- 31/30 . . comprising a receptacle to only a part of which the shaking, oscillating, or vibrating movement is imparted
- 31/31 . . using receptacles with deformable parts, e.g. membranes, to which a motion is imparted
- 31/311 . . . {the motion being a linear movement to one part of the receptacle}
- 31/312 . . . {the motion being a transversal movement to one part of the receptacle, e.g. by moving alternatively up and down the opposite edges of a closing lid to cause a pumping action}
- 31/40 . . with an axially oscillating rotary stirrer
- 31/401 . . . {for material flowing continuously axially therethrough}
- 31/42 . . with pendulum stirrers, i.e. with stirrers suspended so as to oscillate about fixed points or axes
- 31/44 . . with stirrers performing an oscillatory, vibratory or shaking movement ([B01F 31/40](#), [B01F 31/42](#) take precedence)
- 31/441 . . performing a rectilinear reciprocating movement

- 31/443 . . {performing a superposed additional movement other than oscillation, vibration or shaking}
- 31/445 . . performing an oscillatory movement about an axis
- 31/449 . . {Stirrers constructions}
- 31/46 . . with an annular vibrating trough
- 31/50 . . with a receptacle submitted to a combination of movements, i.e. at least one vibratory or oscillatory movement
- 31/55 . . the materials to be mixed being contained in a flexible bag submitted to periodical deformation
- 31/56 . . {having a vibrating receptacle provided with stirring elements, e.g. independent stirring elements}
- 31/57 . . {for material continuously moving therethrough ([B01F 31/29](#), [B01F 31/30](#), [B01F 31/40L](#), [B01F 31/46](#), [B01F 31/84](#) take precedence)}
- 31/60 . . with a vibrating receptacle ([B01F 31/10](#), [B01F 31/20](#), [B01F 31/50](#) take precedence)
- 31/65 . . the materials to be mixed being directly submitted to a pulsating movement, e.g. by means of an oscillating piston or air column
- 31/651 . . {Mixing by successively aspirating a part of the mixture in a conduit, e.g. a piston, and reinjecting it through the same conduit into the receptacle}
- 31/70 . . {Drives therefor, e.g. crank mechanisms}
- 31/80 . . Mixing by means of high-frequency vibrations above one kHz, e.g. ultrasonic vibrations
- 31/81 . . by vibrations generated inside a mixing device not coming from an external drive, e.g. by the flow of material causing a knife to vibrate or by vibrating nozzles
- 31/82 . . {the material being forced through a narrow vibrating slit}
- 31/83 . . {comprising a supplementary stirring element}
- 31/831 . . . {the vibrations being generated by the rotation of the stirring element}
- 31/84 . . {for material continuously moving through a tube, e.g. by deforming the tube}
- 31/841 . . . {with a vibrating element inside the tube}
- 31/85 . . with a vibrating element inside the receptacle
- 31/86 . . with vibration of the receptacle or part of it
- 31/861 . . . {caused by hitting or striking the receptacle}
- 31/87 . . transmitting the vibratory energy by means of a fluid, e.g. by means of air shock waves
- 31/89 . . {Methodical aspects; Controlling}
- 33/00 Other mixers; Mixing plants; Combinations of mixers**
- 33/05 . . Mixers using radiation, e.g. magnetic fields or microwaves to mix the material ([B01F 23/2133](#), [B01F 23/238](#), [B01F 23/55](#),) [B01F 33/3031](#), [B01F 33/3032](#) take precedence)
- 33/051 . . {the energy being electrical energy working on the ingredients or compositions for mixing them}
- 33/052 . . {the energy being electric fields for electrostatically charging of the ingredients or compositions for mixing them}
- 33/053 . . {the energy being magnetic or electromagnetic energy, radiation working on the ingredients or compositions for or during mixing them}
- 33/054 . . {the energy being in the form of a laser to modify the characteristics or conditions of the products, e.g. for heating}
- 33/055 . . {the energy being particle radiation working on the ingredients or compositions for or during mixing them}
- 33/12 . . Mixers in which the mixing of the components is achieved by natural convection
- 33/25 . . Mixers with loose mixing elements, e.g. loose balls in a receptacle
- 33/251 . . {using balls as loose mixing element}
- 33/252 . . {using bubbles as loose mixing element}
- 33/253 . . {using sliders or cylindrical elements as loose mixing element}
- 33/254 . . {using springs as loose mixing element}
- 33/26 . . {Mixers with an endless belt for transport of the material, e.g. in layers or with mixing means above or at the end of the belt}
- 33/27 . . {Mixers having moving endless chains or belts, e.g. provided with paddles, as mixing elements}
- 33/30 . . Micromixers
- 33/301 . . using specific means for arranging the streams to be mixed, e.g. channel geometries or dispositions
- 33/3011 . . . using a sheathing stream of a fluid surrounding a central stream of a different fluid, e.g. for reducing the cross-section of the central stream or to produce droplets from the central stream
- 33/3012 . . . Interdigital streams, e.g. lamellae
- 33/30121 . . . . {the interdigital streams being concentric lamellae}
- 33/3017 . . . {Mixing chamber}
- 33/302 . . the materials to be mixed flowing in the form of droplets
- 33/3021 . . . {the components to be mixed being combined in a single independent droplet, e.g. these droplets being divided by a non-miscible fluid or consisting of independent droplets}
- 33/3022 . . . {the components being formed by independent droplets which are alternated, the mixing of the components being achieved by diffusion between droplets}
- 33/3031 . . using electro-hydrodynamic [EHD] or electrokinetic [EKI] phenomena to mix or move the fluids
- 33/3032 . . using magneto-hydrodynamic [MHD] phenomena to mix or move the fluids
- 33/3033 . . using heat to mix or move the fluids
- 33/3034 . . {using induced convection or movement in the mixture to mix or move the fluids without mechanical means, e.g. thermodynamic instability, strong gradients, etc.}
- 33/3035 . . {using surface tension to mix, move or hold the fluids}
- 33/30351 . . . {using hydrophilic/hydrophobic surfaces}
- 33/30352 . . . {using roughness of the surfaces}
- 33/3036 . . {using a biological motor, i.e. biological molecules which are activated and movement is induced to stir a fluid}
- 33/3037 . . {using coupled electrorotation [CER] phenomena to mix or move fluids, or to sense properties of the mixture}
- 33/3038 . . {using ciliary stirrers to move or stir the fluids}
- 33/3039 . . with mixing achieved by diffusion between layers
- 33/304 . . {the mixing being performed in a mixing chamber where the products are brought into contact}
- 33/3045 . . {using turbulence on microscale}

- 33/305 . . {using mixing means not otherwise provided for ([B01F 25/00](#), [B01F 27/00](#), [B01F 29/00](#), [B01F 31/00](#), [B01F 33/301](#) - [B01F 33/3045](#), [B01F 33/40](#) and [B01F 33/45](#) take precedence)}
- 33/35 . Mixing after turning the mixing vessel upside down
- 33/40 . Mixers using gas or liquid agitation, e.g. with air supply tubes
- NOTE**
- {The agitating fluid is not meant to mix with the material.}
- 33/401 . . {Methods}
- 33/402 . . {comprising supplementary stirring elements}
- 33/4021 . . . {the gas being introduced through the shaft of the stirring element}
- 33/403 . . {for mixing liquids ([B01F 33/402](#), [B01F 33/405](#), [B01F 33/406](#) take precedence)}
- 33/404 . . {for mixing material moving continuously therethrough, e.g. using impinging jets}
- 33/405 . . {in receptacles having guiding conduits therein, e.g. for feeding the gas to the bottom of the receptacle}
- 33/4051 . . . {with vertical conduits through which the material is being moved upwardly driven by the fluid}
- 33/40511 . . . . {with a central conduit or a central set of conduits}
- 33/40512 . . . . {involving gas diffusers at the bottom}
- 33/406 . . {in receptacles with gas supply only at the bottom ([B01F 33/405](#) takes precedence)}
- 33/4061 . . . {through orifices arranged around a central cone ([B01F 33/4062](#) takes precedence)}
- 33/4062 . . . {with means for modifying the gas pressure or for supplying gas at different pressures or in different volumes at different parts of the bottom}
- 33/407 . . {by blowing gas on the material from above}
- 33/408 . . {Controlling}
- 33/409 . . {Parts, e.g. diffusion elements; Accessories}
- 33/4092 . . {Storing receptacles provided with separate mixing chambers}
- 33/4094 . . {Plants}
- 33/45 . Magnetic mixers; Mixers with magnetically driven stirrers
- 33/451 . . wherein the mixture is directly exposed to an electromagnetic field without use of a stirrer, e.g. for material comprising ferromagnetic particles or for molten metal
- 33/452 . . using independent floating stirring elements
- 33/453 . . using supported or suspended stirring elements
- 33/4531 . . . {using an axis supported in several points for mounting the stirring element}
- 33/4532 . . . {using a bearing, tube, opening or gap for internally supporting the stirring element}
- 33/4533 . . . {supporting the stirring element in one point}
- 33/4534 . . . {using a rod for supporting the stirring element, e.g. stirrer sliding on a rod or mounted on a rod sliding in a tube}
- 33/4535 . . . {using a stud for supporting the stirring element}
- 33/4536 . . . {using a wire for supporting or suspending the stirring element, e.g. stirrer sliding on a wire}
- 33/4537 . . . {the stirring element being suspended by one point}
- 33/50 . Movable or transportable mixing devices or plants
- 33/501 . . Movable mixing devices, i.e. readily shifted or displaced from one place to another, e.g. portable during use
- 33/5011 . . . . {portable during use, e.g. hand-held}
- 33/50111 . . . . . {Small portable bottles, flasks, vials, e.g. with means for mixing ingredients or for homogenizing their content, e.g. by hand shaking}
- 33/50112 . . . . . {of the syringe or cartridge type}
- 33/50113 . . . . . {of the pipette type}
- 33/50114 . . . . . {of the hand-held gun type}
- 33/50115 . . . . . {Stirring devices adapted to be connected to a standard boring machine or other kind of domestic tool}
- 33/5012 . . . . {adapted to be mounted during use on a standard, base or support}
- 33/5013 . . . . {movable by mechanical means, e.g. hoisting systems, grippers or lift trucks}
- 33/5014 . . . . {movable by human force, e.g. kitchen or table devices}
- 33/502 . . Vehicle-mounted mixing devices
- 33/5021 . . . . {the vehicle being self-propelled, e.g. truck mounted, provided with a motor, driven by tracks ([B01F 33/5022](#) - [B01F 33/5027](#) take precedence)}
- 33/5022 . . . . {the vehicle being a carriage moving or driving along fixed or movable beams or bridges}
- 33/5023 . . . . {the vehicle being a trailer which is hand moved or coupled to self-propelling vehicles}
- 33/5024 . . . . {the vehicle being moved by human force}
- 33/5025 . . . . {using rails for guiding the mixing installation during moving or displacing}
- 33/5026 . . . . {using sledges or skids for moving or displacing the mixing installation}
- 33/5027 . . . . {using driven tracks, caterpillars or crawler for moving or displacing the mixing installation}
- 33/503 . . Floating mixing devices
- 33/70 . Mixers specially adapted for working at sub- or super-atmospheric pressure, e.g. combined with de-foaming
- 33/71 . . working at super-atmospheric pressure, e.g. in pressurised vessels
- 33/80 . Mixing plants; Combinations of mixers
- 33/805 . . {for granular material}
- 33/8051 . . . . {with several silos arranged in a row or around a central delivery point, e.g. provided with proportioning means}
- 33/80514 . . . . . {the silos being arranged in a circular configuration, i.e. in a circle around a central delivery point}
- 33/8052 . . . . {involving other than mixing operations, e.g. milling, sieving or drying}
- 33/81 . . Combinations of similar mixers, e.g. with rotary stirring devices in two or more receptacles
- 33/811 . . . . {in two or more consecutive, i.e. successive, mixing receptacles or being consecutively arranged}
- 33/812 . . . . {in two or more alternative mixing receptacles, e.g. mixing in one receptacle and dispensing from another receptacle}
- 33/813 . . . . {mixing simultaneously in two or more mixing receptacles}
- 33/82 . . Combinations of dissimilar mixers

33/821	. . . {with consecutive receptacles}	33/87	. Roll-type mixers
33/8212	. . . . {with moving and non-moving stirring devices}	<b>35/00</b>	<b>Accessories for mixers; Auxiliary operations or auxiliary devices; Parts or details of general application</b>
33/822	. . . {with moving and non-moving stirring devices in the same receptacle}	35/10	. Maintenance of mixers
33/823	. . . {in two or more alternative mixing receptacles, e.g. mixing in one receptacle and dispensing from another receptacle}	35/11	. . using fluids
33/824	. . . {mixing simultaneously in two or more mixing receptacles}	35/12	. . using mechanical means
33/83	. . Mixing plants specially adapted for mixing in combination with disintegrating operations	35/121	. . . {using a brush for cleaning out rests of products}
33/8305	. . . {Devices with one shaft, provided with mixing and milling tools, e.g. using balls or rollers as working tools; Devices with two or more tools rotating about the same axis}	35/122	. . . {using pushers, i.e. a piston, for pushing out rests of products}
33/831	. . . {Devices with consecutive working receptacles, e.g. with two intermeshing tools in one of the receptacles ( <a href="#">B01F 33/8305</a> takes precedence)}	35/123	. . . {using scrapers for cleaning mixers}
33/833	. . . {Devices with several tools rotating about different axis in the same receptacle}	35/13	. . using one or more of the components of the mixture to wash-out the mixer
33/834	. . {Mixing in several steps, e.g. successive steps ( <a href="#">B01F 33/81</a> , <a href="#">B01F 33/82</a> and <a href="#">B01F 33/85</a> take precedence)}	35/145	. . {Washing or cleaning mixers not provided for in other groups in this subclass; Inhibiting build-up of material on machine parts using other means}
33/836	. . {combining mixing with other treatments}	35/1452	. . . {using fluids}
33/8361	. . . {with disintegrating}	35/1453	. . . . {by means of jets of fluid, e.g. air}
33/83611	. . . . {by cutting}	35/146	. . . {Working under sterile conditions; Sterilizing the mixer or parts thereof}
33/83612	. . . . {by crushing or breaking}	35/165	. {Making mixers or parts thereof}
33/83613	. . . . {by grinding or milling}	35/181	. {Preventing generation of dust or dirt; Sieves; Filters ( <a href="#">B01F 35/145</a> , <a href="#">B01F 35/43</a> take precedence)}
33/83614	. . . . {with irradiating}	35/184	. . {Preventing generation of dust}
33/8362	. . . {with chemical reactions}	35/186	. . {using splash guards in mixers for avoiding dirt or projection of material}
33/8363	. . . {with coating}	35/187	. . {using filters in mixers, e.g. during venting}
33/8364	. . . {with drying}	35/1872	. . . {Filters for micro-living organisms, i.e. filtering of the mixture}
33/84	. . Mixing plants with mixing receptacles receiving material dispensed from several component receptacles, e.g. paint tins	35/188	. . {using sieves in mixers for purposes other than mixing, e.g. eliminating dust during venting}
33/841	. . . with component receptacles fixed in a circular configuration on a horizontal table, e.g. the table being able to be indexed about a vertical axis	35/189	. . {Venting, degassing or ventilating of gases, fumes or toxic vapours during mixing}
33/844	. . . {with means for customizing the mixture on the point of sale, e.g. by sensing, receiving or analysing information about the characteristics of the mixture to be made}	35/20	. Measuring; Control or regulation
33/8442	. . . . {using a computer for controlling information and converting it in a formula and a set of operation instructions, e.g. on the point of sale}	35/21	. . Measuring
33/846	. . . {using stored recipes for determining the composition of the mixture to be produced, i.e. for determining the amounts of the basic components to be dispensed from the component receptacles}	35/211	. . . {of the operational parameters ( <a href="#">B01F 35/212</a> and <a href="#">B01F 35/213</a> take precedence)}
33/848	. . . {using data, i.e. barcodes, 3D codes or similar type of tagging information, as instruction or identification codes for controlling the dispensing and mixing operations}	35/2111	. . . . {Flow rate}
33/85	. . Mixing plants with mixing receptacles or mixing tools that can be indexed into different working positions	35/21111	. . . . . {Mass flow rate}
33/86	. {Mixing heads comprising a driven stirrer}	35/21112	. . . . . {Volumetric flow rate}
33/862	. . {the stirrer being provided with a surrounding stator}	35/2112	. . . . {Level of material in a container or the position or shape of the upper surface of the material}
		35/2113	. . . . {Pressure}
		35/2114	. . . . {Speed of feeding material, e.g. bands or strips}
		35/2115	. . . . {Temperature}
		35/21151	. . . . . {using infrared radiation thermometer or pyrometer or infrared sensors for temperature measurement without contact}
		35/2116	. . . . {Volume}
		35/2117	. . . . {Weight}
		35/212	. . . of the driving system data, e.g. torque, speed or power data
		35/213	. . . of the properties of the mixtures, e.g. temperature, density or colour
		35/2131	. . . {Colour or luminescence}
		35/2132	. . . {Concentration, pH, pOH, p(ION) or oxygen-demand ( <a href="#">B01F 35/2133</a> takes precedence)}
		35/2133	. . . {Electrical conductivity or dielectric constant of the mixture}

- 35/2134 . . . {Density or solids or particle number}
- 35/2135 . . . {Humidity, e.g. moisture content}
- 35/2136 . . . {Viscosity}
- 35/214 . . . characterised by the means for measuring
- 35/2142 . . . . {using wireless sensors introduced in the mixture, e.g. transponders or RFID tags, for measuring the parameters of the mixture or components to be mixed}
- 35/2144 . . . . {using radiation for measuring the parameters of the mixture or components to be mixed}
- 35/22 . . Control or regulation
- 35/2201 . . . {characterised by the type of control technique used}
- 35/2202 . . . . {Controlling the mixing process by feedback, i.e. a measured parameter of the mixture is measured, compared with the set-value and the feed values are corrected}
- 35/2203 . . . . {Controlling the mixing process by feed-forward, i.e. a parameter of the components to be mixed is measured and the feed values are calculated}
- 35/2204 . . . . {Controlling the mixing process by fuzzy control, i.e. a prescribed fuzzy rule}
- 35/2205 . . . . {Controlling the mixing process from a remote server, e.g. by sending commands using radio, telephone, internet, local network, GPS or other means}
- 35/2206 . . . . {Use of stored recipes for controlling the computer programs, e.g. for manipulation, handling, production or composition in mixing plants ([B01F 33/846 takes precedence](#))}
- 35/2207 . . . . {Use of data, i.e. barcodes, 3D codes or similar type of tagging information, as instruction or identification codes for controlling the computer programs, e.g. for manipulation, handling, production or compounding in mixing plants ([B01F 33/848 takes precedence](#))}
- 35/2208 . . . . {Controlling using ultrasonic waves during the operation}
- 35/2209 . . . . {Controlling the mixing process as a whole, i.e. involving a complete monitoring and controlling of the mixing process during the whole mixing cycle}
- 35/221 . . . of operational parameters, e.g. level of material in the mixer, temperature or pressure
- 35/2211 . . . . {Amount of delivered fluid during a period}
- 35/2212 . . . . {Level of the material in the mixer}
- 35/2213 . . . . {Pressure}
- 35/2214 . . . . {Speed during the operation}
- 35/22141 . . . . . {Speed of feeding of at least one component to be mixed}
- 35/22142 . . . . . {Speed of the mixing device during the operation}
- 35/221421 . . . . . . {Linear speed of the tip of a moving stirrer during the operation}
- 35/221422 . . . . . . {Speed of rotation of the mixing axis, stirrer or receptacle during the operation}
- 35/2215 . . . . {Temperature}
- 35/2216 . . . . {Time, i.e. duration, of at least one parameter during the operation}
- 35/22161 . . . . . {duration of the mixing process or parts of it}
- 35/22162 . . . . . {Time of feeding of at least one of the components to be mixed}
- 35/2217 . . . . . {Volume of at least one component to be mixed}
- 35/2218 . . . . . {Weight of at least one component to be mixed}
- 35/222 . . . of the operation of the driving system, e.g. torque, speed or power of motors; of the position of mixing devices or elements
- 35/2221 . . . . . {the position of baffles used to modify the flow in a conduit or a container}
- 35/30 . . Driving arrangements; Transmissions; Couplings; Brakes
- 35/31 . . Couplings
- 35/32 . . Driving arrangements
- 35/32005 . . . {Type of drive}
- 35/3201 . . . . {by using acoustic force, e.g. acoustically induced bubbles, acoustic windmill, acoustic scallop}
- 35/32015 . . . . . {Flow driven}
- 35/3202 . . . . . {Hand driven}
- 35/32021 . . . . . . {Shaking by hand a portable receptacle or stirrer for mixing}
- 35/32025 . . . . . {Battery driven}
- 35/3203 . . . . . {Gas driven}
- 35/32035 . . . . . {Gravity driven, e.g. by means of weights out of balance or plunger-weights moving in a cylinder}
- 35/3204 . . . . . {Motor driven, i.e. by means of an electric or IC motor}
- 35/32045 . . . . . {Hydraulically driven}
- 35/3205 . . . . . {by using optical pressure force, e.g. produced by a laser beam}
- 35/32055 . . . . . {by using solar energy}
- 35/3206 . . . . . {by the rotation of the wheels during movement}
- 35/32065 . . . . . {Wind driven}
- 35/321 . . . {Disposition of the drive}
- 35/3211 . . . . . {independent from the receptacle}
- 35/3212 . . . . . {mounted on the receptacle}
- 35/3213 . . . . . {at the lower side of the axis, e.g. driving the stirrer from the bottom of a receptacle}
- 35/3214 . . . . . {at the upper side of the axis, e.g. driving the stirrer from the top of a receptacle}
- 35/3215 . . . . . {the driving system comprising more than one motor, e.g. having an auxiliary motor or comprising independently driven elements}
- 35/32151 . . . . . . {Driving the stirrer axis from both ends of the axis, i.e. using at least two motors per shaft}
- 35/322 . . . {Construction of driving shafts}
- 35/323 . . . {for vertical stirrer shafts ([B01F 35/324 takes precedence](#))}
- 35/3231 . . . . . {Driving several stirrer shafts, e.g. about the same axis}
- 35/324 . . . {Driving independent stirrer shafts, i.e. not fitted on the container}
- 35/325 . . . {Driving reciprocating or oscillating stirrers}
- 35/33 . . Transmissions; Means for modifying the speed or direction of rotation
- 35/331 . . . {alternately changing the speed of rotation}

- 35/332 . . . {alternately changing the direction of rotation}
- 35/333 . . . {the rotation sense being changeable, e.g. to mix or aerate, to move a fluid forward or backward or to suck or blow}
- 35/34 . . . {Brake mechanisms}
- 2035/35 . . . {Use of other general mechanical engineering elements in mixing devices}
- 2035/351 . . . {Sealings}
- 2035/3511 . . . . {for laboratory mixers}
- 2035/3512 . . . . {Fluid sealings, e.g. using liquids or air under pressure which is leaking into the mixing receptacle}
- 2035/3513 . . . . {comprising a stationary member in frontal contact with a movable member}
- 2035/352 . . . {Bearings}
- 2035/353 . . . {Lubricating systems}
- 35/40 . . . Mounting or supporting mixing devices or receptacles; Clamping or holding arrangements therefor
- 35/41 . . . Mounting or supporting stirrer shafts or stirrer units on receptacles
- 35/411 . . . . {by supporting only one extremity of the shaft}
- 35/4111 . . . . . {at the top of the receptacle}
- 35/4112 . . . . . {at the bottom of the receptacle, e.g. by studs}
- 35/4113 . . . . . {at a side wall of the receptacle}
- 35/412 . . . . {by supporting both extremities of the shaft}
- 35/4121 . . . . . {at the top and at the bottom of the receptacle, e.g. for performing a conical orbital movement about a vertical axis}
- 35/4122 . . . . . {at the side walls of the receptacle}
- 35/413 . . . . {by means of clamps or clamping arrangements for fixing attached stirrers or independent stirrer units}
- 35/414 . . . . {using inflatable arrangements for supporting a stirring element}
- 35/42 . . . Clamping or holding arrangements for mounting receptacles on mixing devices
- 35/421 . . . . {having a cup-shaped or cage-type form}
- 35/422 . . . . {having a jaw-type or finger-type shape}
- 35/423 . . . . {of the vertically movable, two-plates type}
- 35/424 . . . . {by means of an air cushion used for supporting the mixing receptacle}
- 35/425 . . . . {Holding arrangements for retaining loose elements of the mixing receptacle, e.g. for holding the handle of a can, while it is being shaken}
- 35/43 . . . Supporting receptacles on frames or stands
- 35/45 . . . Closures or doors specially adapted for mixing receptacles; Operating mechanisms therefor
- 35/451 . . . . {by rotating them about an axis parallel to the plane of the opening}
- 35/452 . . . . {by moving them in the plane of the opening [\(B01F 35/454 takes precedence\)](#)}
- 35/4521 . . . . . {by rotating them about an axis perpendicular to the plane of the opening}
- 35/453 . . . . {by moving them perpendicular to the plane of the opening}
- 35/4531 . . . . . {and moving them afterwards in another direction}
- 35/454 . . . . {Moving covers on a cylindrical drum in a circular path along the drum}
- 35/50 . . . Mixing receptacles
- 35/51 . . . characterised by their material
- 35/511 . . . provided with liners, e.g. wear resistant or flexible liners
- 35/512 . . . characterised by surface properties, e.g. coated or rough
- 35/513 . . . Flexible receptacles, e.g. bags supported by rigid containers
- 35/514 . . . {the mixing receptacle or conduit being transparent or comprising transparent parts}
- 35/52 . . . Receptacles with two or more compartments
- 35/522 . . . . {comprising compartments keeping the materials to be mixed separated until the mixing is initiated [\(containers or packages for packaging two or more different materials which must be maintained separate prior to use in admixture \[B65D 81/32\]\(#\)\)](#)}
- 35/53 . . . characterised by the configuration of the interior, e.g. baffles for facilitating the mixing of components
- 35/531 . . . . {with baffles, plates or bars on the wall or the bottom}
- 35/5311 . . . . . {with horizontal baffles mounted on the walls}
- 35/5312 . . . . . {with vertical baffles mounted on the walls}
- 35/532 . . . . {with guide tubes on the wall or the bottom}
- 35/54 . . . {Closely surrounding the rotating element}
- 35/55 . . . {Baffles; Flow breakers [\(B01F 35/531 takes precedence\)](#)}
- 35/56 . . . {General build-up of the mixers}
- 35/561 . . . {the mixer being built-up from a plurality of modules or stacked plates comprising complete or partial elements of the mixer}
- 35/562 . . . {the mixer or mixing elements being collapsible, i.e. when discharging the products}
- 35/5621 . . . . {the complete mixer being collapsible, i.e. the housing can be collapsed}
- 35/60 . . . Safety arrangements
- 35/602 . . . . {with a safety or relief valve}
- 35/605 . . . . {Safety devices concerning the operation of the mixer}
- 35/6052 . . . . . {with locking, blocking or interlocking mechanisms for preventing operation of the actuation mechanism of the mixing device}
- 35/71 . . . Feed mechanisms [\(with proportioning \[B01F 35/80\]\(#\)\)](#)
- 35/711 . . . . {for feeding a mixture of components, i.e. solids in liquid, solids in a gas stream}
- 35/712 . . . . {for feeding fluids}
- 35/713 . . . . {comprising breaking packages or parts thereof, e.g. piercing or opening sealing elements between compartments or cartridges [\(containers or packages per se \[B65D\]\(#\)\)](#)}
- 35/7131 . . . . . {Breaking or perforating packages, containers or vials}
- 35/7132 . . . . . {the package containing one of the components dissolves when in contact with the other component of the mixture [\(disintegrable, dissolvable or edible packaging materials \[B65D 65/46\]\(#\)\)](#)}
- 35/7133 . . . . . {Opening clips which seal openings between the compartments}
- 35/7134 . . . . . {Dissolving the seal when in contact with one of the products to be mixed, thereby bringing the compartments in communication}
- 35/7135 . . . . . {Opening the seal between the compartments by application of heat}

- 35/7136 . . . {Opening hooks which lock or close-off openings between compartments}
- 35/7137 . . . {Piercing, perforating or melting membranes or closures which seal the compartments}
- 35/7138 . . . {Opening valves which close-off openings between compartments}
- 35/7139 . . . {Removing separation walls, plugs which close off the different compartments, e.g. by rotation or axially sliding}
- 35/714 . . {for feeding predetermined amounts ([B01F 35/88 takes precedence](#))}
- 35/7141 . . . {using measuring chambers moving between a loading and unloading position, e.g. reciprocating feed frames}
- 35/71411 . . . . {rotating or oscillating about an axis}
- 35/714111 . . . . . {the measuring chambers being pockets on the circumference of a drum rotating about a horizontal axis with discharging by gravity}
- 35/714112 . . . . . {the measuring chambers being channels extending between both front faces of a rotating cylinder or disc}
- 35/715 . . {Feeding the components in several steps, e.g. successive steps}
- 35/716 . . {characterised by the relative arrangement of the containers for feeding or mixing the components}
- 35/7161 . . . {the containers being connected coaxially before contacting the contents}
- 35/7162 . . . {A container being placed inside the other before contacting the contents}
- 35/7163 . . . {the containers being connected in a mouth-to-mouth, end-to-end disposition, i.e. the openings are juxtaposed before contacting the contents}
- 35/7164 . . . {the containers being placed in parallel before contacting the contents}
- 35/717 . . {characterised by the means for feeding the components to the mixer}
- 35/71705 . . . {using belts}
- 35/7171 . . . {using boxes, closable containers, sacks or carts}
- 35/71715 . . . {using buckets, cups or open containers}
- 35/7172 . . . {using capillary forces}
- 35/71725 . . . {using centrifugal forces}
- 35/7173 . . . {using gravity, e.g. from a hopper}
- 35/71731 . . . . {using a hopper}
- 35/71735 . . . {using grippers}
- 35/7174 . . . {using pistons, plungers or syringes}
- 35/71745 . . . {using pneumatic pressure, overpressure, gas or air pressure in a closed receptacle or circuit system}
- 35/7175 . . . {using propellers}
- 35/71755 . . . {using means for feeding components in a pulsating or intermittent manner}
- 35/717551 . . . . {using electrical pulses}
- 35/7176 . . . {using pumps}
- 35/71761 . . . . {Membrane pumps}
- 35/717611 . . . . . {Peristaltic pumps}
- 35/717612 . . . . . {Piezoelectric pumps}
- 35/717613 . . . . . {Piston pumps}
- 35/717614 . . . . . {Venturi pumps}
- 35/71765 . . . {using rakes or plain plates with raking movement}
- 35/7177 . . . {using rollers}
- 35/71775 . . . {using helical screws}
- 35/7178 . . . {using shovels or scoops}
- 35/71785 . . . {using slides or vibrating tables}
- 35/7179 . . . {using sprayers, nozzles or jets}
- 35/71791 . . . . {using ink jet heads or cartridges, e.g. of the thermal bubble jet or piezoelectric type}
- 35/71795 . . . {Squeezing a flexible container}
- 35/718 . . . {using vacuum, under pressure in a closed receptacle or circuit system}
- 35/71801 . . . . {using a syphon to create a suction of a component}
- 35/71805 . . . {using valves, gates, orifices or openings}
- 35/718051 . . . . . {being adjustable}
- 35/7181 . . . {using fans or turbines}
- 35/71815 . . . {using vibrations, e.g. standing waves or ultrasonic vibrations}
- 35/7182 . . . {with means for feeding the material with a fractal or tree-type distribution in a surface}
- 35/71825 . . . {using means for feeding one phase surrounded by another phase without mixing during the feeding}
- 35/75 . . Discharge mechanisms
- 35/751 . . {Discharging by opening a gate, e.g. using discharge paddles}
- 35/7511 . . . {the gate carrying a stirrer acting as discharge pump}
- 35/752 . . {with arrangements for converting the mechanism from mixing to discharging, e.g. by either guiding a mixture back into a receptacle or discharging it}
- 35/753 . . {Discharging at the upper side of the receptacle, e.g. by pressurising the liquid in the receptacle or by centrifugal force}
- 35/754 . . {characterised by the means for discharging the components from the mixer}
- 35/7541 . . . {using belts}
- 35/75415 . . . {using gravity}
- 35/7542 . . . {Discharging the components by overflow}
- 35/75425 . . . {using pistons or plungers}
- 35/754251 . . . . . {reciprocating in the mixing receptacle}
- 35/7543 . . . {using pneumatic pressure, overpressure or gas pressure in a closed receptacle or circuit system}
- 35/75435 . . . {using means for discharging the mixture in a pulsating or intermittent manner}
- 35/754351 . . . . . {using electrical pulses}
- 35/7544 . . . {using pumps}
- 35/75441 . . . . {Venturi pumps}
- 35/75445 . . . {using pushers}
- 35/7545 . . . {using slides}
- 35/75455 . . . {using a rotary discharge means, e.g. a screw beneath the receptacle ([B01F 35/751 takes precedence](#))}
- 35/754551 . . . . . {using helical screws}
- 35/7546 . . . {using squeezing means on a deformable container}
- 35/75465 . . . {using suction, vacuum, e.g. with a pipette}
- 35/7547 . . . {using valves, gates, orifices or openings}
- 35/75471 . . . . . {being adjustable}
- 35/75475 . . . {using fans or ventilators}
- 35/7548 . . . {using tilting or pivoting means for emptying the mixing receptacle}
- 35/75485 . . . {the mixing receptacle rotating in opposite directions for mixing and for discharging}

- 35/7549 . . . {using distributing means, e.g. manifold valves or multiple fittings for supplying the discharge components to a plurality of dispensing places}
- 35/79 . {Preventing lumping, or comminuting lumps, during feeding or discharging, e.g. by means of vibrations, or by scrapers}
- 35/80 . Forming a predetermined ratio of the substances to be mixed (controlling ratio of two or more flows of fluid or fluent material G05D 11/02)
- 35/81 . . Forming mixtures with changing ratios or gradients
- 35/82 . . by adding a material to be mixed to a mixture in response to a detected feature, e.g. density, radioactivity, consumed power or colour
- 35/83 . . by controlling the ratio of two or more flows, e.g. using flow sensing or flow controlling devices
- 35/831 . . . {using one or more pump or other dispensing mechanisms for feeding the flows in predetermined proportion, e.g. one of the pumps being driven by one of the flows (B01F 35/832 takes precedence)}
- 35/8311 . . . . {with means for controlling the motor driving the pumps or the other dispensing mechanisms}
- 35/832 . . . {Flow control by weighing}
- 35/833 . . . {Flow control by valves, e.g. opening intermittently}
- 35/8331 . . . . {the flow of one component operating the actuator of the valve, e.g. by deforming a membrane which operates de valve actuator}
- 35/834 . . . {the flow of substances to be mixed circulating in a closed circuit, e.g. from a container through valve, driving means, metering means or dispensing means, e.g. 3-way valve, and back to the container}
- 35/88 . . by feeding the materials batchwise
- 35/881 . . . {by weighing, e.g. with automatic discharge}
- 35/8811 . . . . {the weighing being effected by material receiving containers rotating or tilting under the influence of the weight of the material in those containers}
- 35/882 . . . {using measuring chambers, e.g. volumetric pumps, for feeding the substances}
- 35/8821 . . . . {involving controlling}
- 35/8822 . . . . {using measuring chambers of the piston or plunger type (B01F 35/8823 takes precedence)}
- 35/88221 . . . . . {with double acting pistons (B01F 35/88222 takes precedence)}
- 35/88222 . . . . . {without external means for driving the piston, e.g. the piston being driven by one of the components}
- 35/8823 . . . . {using diaphragms or bellows}
- 35/883 . . . {using flow rate controls for feeding the substances}
- 35/892 . . {for solid materials, e.g. using belts, vibrations, hoppers with variable outlets or hoppers with rotating elements, e.g. screws, at their outlet (B01F 35/82 - B01F 35/88 take precedence)}
- 35/8921 . . . {the material after falling on a, e.g. rotatable, plate being wiped from this plate by means of a scraper}
- 35/894 . . {Measuring receptacles therefor}
- 35/896 . . {characterised by the build-up of the device}

- 35/90 . Heating or cooling systems
- 35/91 . . using gas or liquid injected into the material, e.g. using liquefied carbon dioxide or steam
- 35/92 . . for heating the outside of the receptacle, e.g. heated jackets or burners
- 35/93 . . arranged inside the receptacle
- 35/94 . . using radiation, e.g. microwaves or electromagnetic radiation
- 35/95 . . using heated or cooled stirrers
- 2035/98 . . {Cooling}
- 2035/99 . . {Heating}

#### **Indexing schemes associated with groups**

#### **B01F 21/00 - B01F 35/00 and relating to the nature of the mixed materials, the field of application and complementary technical information about mixing**

- 2101/00** . **Mixing characterised by the nature of the mixed materials or by the application field**
- 2101/005 . {Mixing or agitating manure, dung}
- 2101/02 . Mixing or agitating during harvesting or mowing, e.g. mixing with solid harvested products or particles
- 2101/04 . Mixing biocidal, pesticidal or herbicidal ingredients used in agriculture or horticulture, e.g. for spraying
- 2101/06 . Mixing of food ingredients
- 2101/07 . . Mixing ingredients into milk or cream, e.g. aerating
- 2101/08 . . Mixing of dough
- 2101/09 . . Mixing of cereals, grains or seeds materials
- 2101/10 . . Mixing of butter or margarine ingredients
- 2101/11 . . Mixing of cheese ingredients
- 2101/12 . . Mixing of chocolate ingredients
- 2101/13 . . Mixing of ice-cream ingredients
- 2101/14 . . Mixing of ingredients for non-alcoholic beverages; Dissolving sugar in water
- 2101/15 . . Mixing of beer ingredients
- 2101/16 . . Mixing wine or other alcoholic beverages; Mixing ingredients thereof
- 2101/17 . . . Aeration of wine
- 2101/18 . . Mixing animal food ingredients
- 2101/1805 . {Kitchen, household equipment for mixing}
- 2101/19 . Mixing dentistry compositions
- 2101/20 . Mixing of ingredients for bone cement
- 2101/21 . Mixing of ingredients for cosmetic or perfume compositions
- 2101/22 . Mixing of ingredients for pharmaceutical or medical compositions
- 2101/2202 . {Mixing compositions or mixers in the medical or veterinary field}
- 2101/2204 . {Mixing chemical components in generals in order to improve chemical treatment or reactions, independently from the specific application}
- 2101/23 . Mixing of laboratory samples e.g. in preparation of analysing or testing properties of materials
- 2101/2305 . {Mixers of the two-component package type, i.e. where at least two components are separately stored, and are mixed in the moment of application}
- 2101/24 . Mixing of ingredients for cleaning compositions
- 2101/25 . Mixing waste with other ingredients
- 2101/26 . Mixing ingredients for casting metals
- 2101/27 . Mixing ingredients for grinding, polishing or lapping materials

- 2101/28 . Mixing cement, mortar, clay, plaster or concrete ingredients
- 2101/2805 . {Mixing plastics, polymer material ingredients, monomers or oligomers}
- 2101/30 . Mixing paints or paint ingredients, e.g. pigments, dyes, colours, lacquers or enamel
- 2101/305 . {Treatment of water, waste water or sewage}
- 2101/32 . Mixing fertiliser ingredients
- 2101/33 . . Mixing compost ingredients or organic waste
- 2101/34 . Mixing fuel and prill, i.e. water or other fluids mixed with solid explosives, to obtain liquid explosive fuel emulsions or slurries
- 2101/35 . Mixing inks or toners
- 2101/36 . Mixing of ingredients for adhesives or glues; Mixing adhesives and gas
- 2101/38 . Mixing of asphalt, bitumen, tar or pitch or their ingredients
- 2101/39 . Mixing of ingredients for grease or lubricating compositions
- 2101/40 . Mixing of ingredients for oils, fats or waxes
- 2101/44 . Mixing of ingredients for microbiology, enzymology, *in vitro* culture or genetic manipulation
- 2101/45 . Mixing in metallurgical processes of ferrous or non-ferrous materials
- 2101/4505 . {Mixing ingredients comprising detergents, soaps, for washing, e.g. washing machines}
- 2101/47 . Mixing of ingredients for making paper pulp, e.g. wood fibres or wood pulp
- 2101/48 . Mixing water in water-taps with other ingredients, e.g. air, detergents or disinfectants
- 2101/49 . Mixing drilled material or ingredients for well-drilling, earth-drilling or deep-drilling compositions with liquids to obtain slurries
- 2101/50 . Mixing mined ingredients and liquid to obtain slurries
- 2101/501 . {Mixing combustion ingredients, e.g. gases, for burners or combustion chambers}
- 2101/503 . {Mixing fuel or propellant and water or gas, e.g. air, or other fluids, e.g. liquid additives to obtain fluid fuel}
- 2101/505 . {Mixing fuel and water or other fluids to obtain liquid fuel emulsions}
- 2101/54 . Mixing liquid fragrances with air
- 2101/55 . Mixing liquid air humidifiers with air
- 2101/56 . Mixing photosensitive chemicals or photographic base materials
- 2101/57 . Mixing radioactive materials, e.g. nuclear materials
- 2101/58 . Mixing semiconducting materials, e.g. during semiconductor or wafer manufacturing processes
- 2101/59 . Mixing reaction ingredients for fuel cells
- 2215/0418 . . . . Geometrical information
- 2215/0422 . . . . Numerical values of angles
- 2215/0427 . . . . Numerical distance values, e.g. separation, position
- 2215/0431 . . . . Numerical size values, e.g. diameter of a hole or conduit, area, volume, length, width, or ratios thereof
- 2215/0436 . . . . Operational information
- 2215/044 . . . . Numerical composition values of components or mixtures, e.g. percentage of components
- 2215/0445 . . . . Numerical electrical values, e.g. intensity, voltage
- 2215/045 . . . . Numerical flow-rate values
- 2215/0454 . . . . Numerical frequency values
- 2215/0459 . . . . Numerical values of dimensionless numbers, i.e. Re, Pr, Nu, transfer coefficients
- 2215/0463 . . . . Numerical power values
- 2215/0468 . . . . Numerical pressure values
- 2215/0472 . . . . Numerical temperature values
- 2215/0477 . . . . Numerical time values
- 2215/0481 . . . . Numerical speed values
- 2215/0486 . . . . Material property information
- 2215/049 . . . . Numerical values of density of substances
- 2215/0495 . . . . Numerical values of viscosity of substances

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**2215/00 Auxiliary or complementary information in relation with mixing**

- 2215/04 . Technical information in relation with mixing
- 2215/0404 . . theories or general explanations of phenomena associated with mixing or generalizations of a concept by comparison of equivalent methods
- 2215/0409 . . Relationships between different variables defining features or parameters of the apparatus or process
- 2215/0413 . . Numerical information