CPC  COOPERATIVE PATENT CLASSIFICATION

B  PERFORMING OPERATIONS; TRANSPORTING
(NOTES omitted)

SEPARATING; MIXING

B04  CENTRIFUGAL APPARATUS OR MACHINES FOR CARRYING-OUT PHYSICAL OR CHEMICAL PROCESSES

B04B  CENTRIFUGES (high-speed drum mills B02C 19/11; domestic spin driers D06F; analysing, measuring or monitoring physical or chemical properties of samples during centrifuging, see the relevant subclasses for these procedures, e.g. G01N)

NOTE
This subclass covers machines or apparatus for separating, mixing, drying, extracting, purifying, or like treating in which centrifugal effects are generated by rotary bowls or other rotors. Where such machines or apparatus involve pumping effects, such effects must be incidental or subsidiary to the treating.

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.

Types of centrifuges: Centrifuges characterised by discharging means

1/00  Centrifuges with rotary bowls provided with solid jackets for separating predominantly liquid mixtures with or without solid particles
1/02  . without inserted separating walls
1/04  . with inserted separating walls
1/06  . of cylindrical shape
1/08  . of conical shape
1/10  . with discharging outlets in the plane of the maximum diameter of the bowl (i.e. cleaning B04B 15/06)
1/12  . with continuous discharge
1/14  . with periodical discharge
1/16  . with discharging outlets controlled by the rotational speed of the bowl
1/18  . controlled by the centrifugal force of an auxiliary liquid
1/20  . discharging solid particles from the bowl by a conveying screw coaxial with the bowl axis and rotating relatively to the bowl
1/2008  . {with an abrasion-resistant conveyor or drum}
1/2016  . {Driving control or mechanisms; Arrangement of transmission gearing}
2001/2025  . {with drive comprising a planetary gear}
2001/2033  . {with feed accelerator inside the conveying screw}
2001/2041  . {with baffles, plates, vanes or discs attached to the conveying screw}
2001/205  . {with special construction of screw thread, e.g. segments, height}
2001/2058  . {with ribbon-type screw conveyor}
2001/2066  . {with additional disc stacks}
2001/2075  . {with means for recovering the energy of the outflowing liquid}
2001/2083  . {Configuration of liquid outlets}

2001/2091  . {Configuration of solids outlets}
3/00  Centrifuges with rotary bowls in which solid particles or bodies become separated by centrifugal force and simultaneous sifting or filtering
3/02  . discharging solid particles from the bowl by means coaxial with the bowl axis and moving to and fro, i.e. push-type centrifuges
3/025  . {with a reversible filtering device}
3/04  . discharging solid particles from the bowl by a conveying screw coaxial with the bowl axis and rotating relatively to the bowl
3/06  . discharging solid particles by vibrating the bowl
3/08  . discharging solid particles by bowl walls in the form of endless bands

5/00  Other centrifuges
5/005  . {Centrifugal separators or filters for fluid circulation systems, e.g. for lubricant oil circulation systems}
5/02  . Centrifuges consisting of a plurality of separate bowls rotating round an axis situated between the bowls
5/04  . Radial chamber apparatus for separating predominantly liquid mixtures, e.g. butyrometers
5/0407  . {for liquids contained in receptacles (B04B 5/0442 takes precedence)}
5/0414  . {comprising test tubes}
5/0421  . {pivotably mounted}
5/0428  . {with flexible receptacles}
2005/0435  . {with adapters for centrifuge tubes or bags}
5/0442  . {with means for adding or withdrawing liquid substances during the centrifugation, e.g. continuous centrifugation}
2005/045  . {having annular separation channels}
2005/0457  . {having three-dimensional spirally wound separation channels}
Types of centrifuges; Centrifuges characterised by discharging means

2005/0464 . . .  [with hollow or massive core in centrifuge bowl]  9/14  . Balancing rotary bowls  
[balancing \(B04B\) \(9/00\); Schrappers]

2005/0471 . . .  [with additional elutriation separation of different particles]  2009/143  .  [by weight compensation with liquids]  9/146  .  [Unbalance detection devices]

2005/0478 . . .  [with filters in the separation chamber]  11/00  Feedback, charging, or discharging bowls  
[\(B04B\) \(1/00\), \(B04B\) \(3/00\), \(B04B\) \(7/04\) take precedence]

2005/0485 . . .  [with a displaceable piston in the centrifuge chamber]  11/02  .  Continuous feeding or discharging; Control arrangements therefor

2005/0492 . . .  [with fluid conveying umbilicus between stationary and rotary centrifuge parts]  11/04  .  Periodical feeding or discharging; Control arrangements therefor

5/06  . Centrifugal counter-current apparatus  11/043  .  [Load indication with or without control arrangements]

5/08  . Centrifuges for separating predominantly gaseous mixtures  2011/046  .  [Loading, unloading, manipulating sample containers]

5/10  . Centrifuges combined with other apparatus, e.g. electrostatic separators; Sets or systems of several centrifuges  11/05  .  Base discharge
[\(B04B\) \(5/12\) takes precedence; magnetic or electrostatic separators \(B03C\); amassing particles by electric fields, e.g. by agglomeration \(B03C\) \(3/0175\)]

5/12  . Centrifuges in which rotors other than bowls generate centrifugal effects in stationary containers  11/06  .  Arrangement of distributors or collectors in centrifuges

5/20  . (the rotors comprising separating walls)  11/08  .  Skimmers or scrapers for discharging  
[\(B04B\) \(1/00\); \(B04B\) \(3/00\), \(B04B\) \(7/04\) take precedence]

7/00  Elements: Accessories  11/082  .  [Skimmers for discharging liquid]

7/00  Elements of centrifuges (drives \(B04B\) \(9/00\); feeding, charging, or discharging appurtenances or devices \(B04B\) \(11/00\))  2011/084  .  [with cables for cake removal]

7/005  . Retaining arms for gripping the stationary part of a centrifuge bowl or hold the bowl itself  2011/086  .  [with a plurality of scraper blades]

7/02  . Casings; Lids (shock absorbers, vibration dampers \(F16F\))  2011/088  .  [with angularly and axially offset scrapers]

7/025  . (Lids for laboratory centrifuge rotors)  13/00  Control arrangements specially designed for centrifuges; Programme control of centrifuges  
[control arrangements for feed, charge, or discharge \(B04B\) \(11/00\)]]

7/04  . Casings facilitating discharge  13/003  .  [Rotor identification systems]

7/06  . Safety devices  
[\(B04B\) \(1/00\); \(B04B\) \(3/00\), \(B04B\) \(7/04\) take precedence]

7/065  . (Devices and measures in the event of rotor fracturing, e.g. lines of weakness, stress regions)  2013/006  .  [Interface detection or monitoring of separated components]

7/08  . Rotary bowls (centrifugal casting machines \(B22D\))  15/00  Other accessories for centrifuges

7/085  .  [fibre- or metal-reinforced]

7/10  . Bowls for shaping solids  15/02  .  for cooling, heating, or heat insulating

7/12  . Inserts, e.g. armouring plates  15/04  .  for suppressing the formation of foam

7/14  . for separating walls of conical shape  15/06  .  for cleaning bowls, filters, sieves, inserts, or the like

7/16  . Sieves or filters (filters in general \(B01D\); sieves in general \(B07B\))  15/08  .  for ventilating or producing a vacuum in the centrifuge

7/18  . formed or coated with sieving or filtering elements (filters in general \(B01D\); sieves in general \(B07B\))

9/00  Drives specially designed for centrifuges; Arrangement or disposition of transmission gearing; Suspending or balancing rotary bowls

9/02  . Electric motor drives  
[(\(B04B\) \(9/00\); \(B04B\) \(11/00\)); (dynamo-electric machines associated with centrifuges \(H02K\) \(7/16\))]

9/04  . Direct drive  15/10  .  for forming a filtering layer in the rotary bowl

9/06  . Fluid drive  15/12  .  for drying or washing the separated solid particles

9/08  . Arrangement or disposition of transmission gearing  2009/085  .  (locking means between drive shaft and rotor)
[(\(B04B\) \(1/2016\); Couplings; Brakes)]

9/10  . Control of the drive; Speed regulating  
[(\(B04B\) \(1/2016\); Bearing; packings for bearings)]

9/12  . Suspending rotary bowls