

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

SEPARATING; MIXING

B02 CRUSHING, PULVERISING, OR DISINTEGRATING; PREPARATORY TREATMENT OF GRAIN FOR MILLING

B02C CRUSHING, PULVERISING, OR DISINTEGRATING IN GENERAL; MILLING GRAIN ({household tools and machines for pulverising foodstuffs, e.g. coffee and spice mills [A47J 42/00](#); pharmaceutical mortars [A61J 3/02](#); mechanical processing of refuse and garbage [B03B 9/06](#); dressing mould materials by grinding [B22C 5/04](#)}; obtaining metallic powder by crushing, grinding or milling [B22F 9/04](#)}; {recovery of plastics by disintegrating [B29B 17/00](#); crushing raw materials in starch making [C08B 30/02](#); beaters for papermaking [D21D 1/02](#); crushing devices specially for transport in mines [E21F 13/002](#); slag crushing devices [F23J 1/00](#); fuel milling devices in combustion apparatus [F23K 1/00](#); household devices for crushing coal [F24B 15/02](#); ice disintegrating devices [F25C 5/02](#)})

WARNING

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

1/00	Crushing or disintegrating by reciprocating members	2/10	. concentrically moved; Bell crushers
1/005	. {hydraulically or pneumatically operated}	4/00	Crushing or disintegrating by roller mills (with milling members in the form of rollers or balls co-operating with rings or discs B02C 15/00; roller mills or roll refiners exclusively for chocolate A23G 1/10, A23G 1/12)
1/02	. Jaw crushers or pulverisers	4/02	. with two or more rollers
1/025	. . {Jaw clearance or overload control}	4/04	. . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids
1/04	. . with single-acting jaws	4/06	. . specially adapted for milling grain
1/043	. . . {with cooperating single acting jaws}	4/08	. . with co-operating corrugated or toothed crushing-rollers
1/046	. . . {of the plural stage type}	4/10	. with a roller co-operating with a stationary member
1/06	. . with double-acting jaws	4/12	. . in the form of a plate
1/08	. . with jaws coacting with rotating roller	4/14	. . . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids
1/10	. . Shape or construction of jaws	4/16	. . . specially adapted for milling grain
1/12	. Mills with non-rotating spiked members	4/18	. . in the form of a bar
1/14	. Stamping mills	4/20	. . . wherein the roller is corrugated or toothed
2/00	Crushing or disintegrating by gyratory or cone crushers {(with non-coaxial discs with intersecting axes B02C 7/005)}	4/22	. . . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids
2002/002	. {the bowl being a driven element for providing a crushing effect}	4/24	. . . specially adapted for milling grain
2/005	. {Lining}	4/26	. . in the form of a grid or grating
2/007	. {Feeding devices}	4/28	. Details
2/02	. eccentrically moved	4/283	. . {Lateral sealing shields}
2/04	. . with vertical axis	4/286	. . {Feeding devices}
2/042	. . . {Moved by an eccentric weight}	4/30	. . Shape or construction of rollers
2/045	. . . {and with bowl adjusting or controlling mechanisms (B02C 2/042 , B02C 2/06 take precedence)}	4/305	. . . {Wear resistant rollers}
2/047	. . . {and with head adjusting or controlling mechanisms (B02C 2/042 , B02C 2/06 take precedence)}	4/32	. . Adjusting, applying pressure to, or controlling the distance between, milling members
2/06	. . . and with top bearing {(B02C 2/042 takes precedence)}	4/34	. . . in mills wherein a roller co-operates with a stationary member
2/08	. . with horizontal axis		

- 4/36 . . . in mills specially adapted for paste-like materials
- 4/38 . . . in grain mills
- 4/40 . . Detachers, e.g. scrapers
- 4/42 . . Driving mechanisms; Roller speed control
- 4/423 . . . {with vibrating or oscillating mechanisms}
- 4/426 . . . {Torque counterbalancing mechanisms}
- 4/44 . . Cooling or heating rollers or bars
- 7/00 Crushing or disintegrating by disc mills (apparatus specially adapted for manufacture or treatment of cocoa or cocoa products exclusively [A23G 1/04](#))**
- 7/005 . {Crushers with non-coaxial toothed discs with intersecting axes}
- 7/02 . with coaxial discs
- 7/04 . . with concentric circles of intermeshing teeth
- 7/06 . . with horizontal axis ([B02C 7/04 takes precedence](#))
- 7/08 . . with vertical axis ([B02C 7/04 takes precedence](#))
- 7/10 . with eccentric discs
- 7/11 . Details
- 7/12 . . Shape or construction of discs
- 7/13 . . . for grain mills
- 7/14 . . Adjusting, applying pressure to, or controlling distance between, discs
- 7/16 . . Driving mechanisms
- 7/17 . . Cooling or heating of discs
- 7/175 . Disc mills specially adapted for paste-like material, e.g. paint, chocolate, colloids
- 7/18 . Disc mills specially adapted for grain
- 7/182 . . {with horizontal axis}
- 7/184 . . {with vertical axis}
- 7/186 . . {Adjusting, applying pressure to, or controlling distance between, discs}
- 7/188 . . {Driving mechanisms}
- 9/00 Other milling methods or mills specially adapted for grain**
- 9/02 . Cutting or splitting grain
- 9/04 . Systems or sequences of operations; Plant
- 11/00 Other auxiliary devices or accessories specially adapted for grain mills**
- 11/02 . Breaking up amassed particles, e.g. flakes
- 11/04 . Feeding devices
- 11/06 . Arrangements for preventing fire or explosion (methods for preventing or extinguishing fires, devices therefor [A62C](#))
- 11/08 . Cooling, heating, ventilating, conditioning with respect to temperature or water content (conditioning grain before milling [B02B 1/08](#); air-conditioning or ventilating in general [F24F](#))
- 13/00 Disintegrating by mills having rotary beater elements {; Hammer mills}**
- 13/02 . with horizontal rotor shaft (with axial flow [B02C 13/10](#))
- 13/04 . . with beaters hinged to the rotor; Hammer mills
- 13/06 . . with beaters rigidly connected to the rotor
- 13/08 . . . and acting as a fan
- 13/09 . . . and throwing the material against an anvil or impact plate {(with vertical axis [B02C 13/1807](#))}
- 13/095 {with an adjustable anvil or impact plate}
- 13/10 . with horizontal rotor shaft and axial flow
- 13/12 . . with vortex chamber
- 13/13 . with horizontal rotor shaft and combined with sifting devices, e.g. for making powdered fuel
- 13/14 . with vertical rotor shaft, e.g. combined with sifting devices
- 2013/145 . . {with fast rotating vanes generating vortexes effecting material on material impact}
- 13/16 . . with beaters hinged to the rotor
- 13/18 . . with beaters rigidly connected to the rotor
- 13/1807 . . . {the material to be crushed being thrown against an anvil or impact plate (with horizontal axis [B02C 13/09](#); centrifugal acceleration of material through radially extending channels [B02C 19/0025](#); centrifugal acceleration of material by means of an open top rotor [B02C 19/0031](#))}
- 13/1814 {by means of beater or impeller elements fixed on top of a disc type rotor}
- 13/1821 {the beater or impeller elements being rotatably fixed around their own axis}
- 13/1828 {with dead bed protected beater or impeller elements}
- 13/1835 {by means of beater or impeller elements fixed in between an upper and lower rotor disc}
- 13/1842 {with dead bed protected beater or impeller elements}
- 13/185 {Construction or shape of anvil or impact plate}
- 2013/1857 {rotating coaxially around the rotor shaft}
- 2013/1864 {rotatable around its own axis}
- 2013/1871 {vertically adjustable}
- 2013/1878 {radially adjustable}
- 2013/1885 {of dead bed type}
- 2013/1892 {cooled or heated}
- 13/20 . with two or more co-operating rotors
- 13/205 . . {arranged concentrically}
- 13/22 . with intermeshing pins {; Pin Disk Mills}
- 13/24 . . arranged around a vertical axis
- 13/26 . Details
- 13/28 . . Shape or construction of beater elements
- 13/2804 . . . {the beater elements being rigidly connected to the rotor}
- 2013/2808 . . . {the beater elements are attached to disks mounted on a shaft}
- 2013/2812 . . . {the beater elements are attached to a hollow cylindrical rotor}
- 2013/2816 . . . {of chain, rope or cable type}
- 13/282 . . Shape or inner surface of mill-housings
- 2013/2825 . . . {with fastening means for fixing lining members to the inner surface of mill-housings}
- 13/284 . . . Built-in screens
- 13/286 . . Feeding or discharge
- 2013/28609 . . . {Discharge means}
- 2013/28618 . . . {Feeding means}
- 2013/28627 {of ram or pusher type}
- 2013/28636 {of conveyor belt type}
- 2013/28645 {of conveyor belt and cooperating roller type}
- 2013/28654 {of screw type}
- 2013/28663 {using rollers}
- 2013/28672 {Feed chute arrangements}
- 2013/28681 {Feed distributor plate for vertical mill}

2013/2869	. . . {Arrangements of feed and discharge means in relation to each other}	17/07	. . . in radial arrangement
13/288	. . Ventilating, or influencing air circulation	17/08	. . with containers performing a planetary movement
2013/29	. . {devices for manipulating beater elements}	17/10	. with one or a few disintegrating members arranged in the container
13/30	. . Driving mechanisms	17/14	. Mills in which the charge to be ground is turned over by movements of the container other than by rotating, e.g. by swinging, vibrating, tilting {(mills provided with vibrators in general B02C 19/16)}
13/31	. . Safety devices or measures	17/16	. Mills in which a fixed container houses stirring means tumbling the charge
15/00	Disintegrating by milling members in the form of rollers or balls co-operating with rings or discs {(high-speed drum mills B02C 19/11)}	17/161	. . {Arrangements for separating milling media and ground material}
15/001	. {Air flow directing means positioned on the periphery of the horizontally rotating milling surface}	17/163	. . {Stirring means}
2015/002	. {combined with a classifier}	2017/165	. . {with stirring means comprising more than one agitator}
15/003	. {Shape or construction of discs or rings}	17/166	. . {of the annular gap type}
15/004	. {Shape or construction of rollers or balls}	17/168	. . {with a basket media milling device arranged in or on the container, involving therein a circulatory flow of the material to be milled}
15/005	. . {Rollers or balls of composite construction}	17/18	. Details
15/006	. {Ring or disc drive gear arrangement}	17/1805	. . {Monitoring devices for tumbling mills}
15/007	. {Mills with rollers pressed against a rotary horizontal disc (with pendularly mounted rollers B02C 15/04)}	17/181	. . {Bearings specially adapted for tumbling mills}
2015/008	. {Roller drive arrangements}	17/1815	. . {Cooling or heating devices}
15/02	. Centrifugal pendulum-type mills	17/182	. . {Lids}
15/04	. Mills with pressed pendularly-mounted rollers, e.g. spring pressed	17/1825	. . {Lifting devices (lifting devices associated with the lining for containers B02C 17/22)}
15/045	. . {pressed against the interior of a ring rotating in a vertical plane}	17/183	. . {Feeding or discharging devices}
15/06	. Mills with rollers forced against the interior of a rotary ring, e.g. under spring action (B02C 15/04 takes precedence)	17/1835	. . . {Discharging devices combined with sorting or separating of material (B02C 17/186 takes precedence)}
15/08	. Mills with balls or rollers centrifugally forced against the inner surface of a ring, the balls or rollers of which are driven by a centrally arranged member (B02C 15/02 takes precedence)	17/184	. . . . {with separator arranged in discharge path of crushing zone}
15/10	. Mills with balls or rollers centrifugally forced against the inner surface of a ring, the balls or rollers of which are driven by other means than a centrally-arranged member	17/1845	. . . . {with return of oversize material to crushing zone}
15/12	. Mills with at least two discs {or rings} and interposed balls or rollers mounted like ball or roller bearings	17/185	. . . . {with more than one separator}
15/123	. . {with rings and interposed rollers}	17/1855	. . . . {with separator defining termination of crushing zone, e.g. screen denying egress of oversize material}
2015/126	. . {of the plural stage type}	17/186	. . . {Adding fluid, other than for crushing by fluid energy}
15/14	. Edge runners, e.g. Chile mills	17/1865	. . . . {after crushing}
2015/143	. . {each runner pivot carrying more than one runner}	17/187	. . . . {with recirculation of material to crushing zone}
2015/146	. . {Step-shaped runners}	17/1875	. . . . {passing gas through crushing zone}
15/16	. with milling members essentially having different peripheral speeds and in the form of a hollow cylinder or cone and an internal roller or cone	17/188	. . . . {characterised by point of gas entry or exit or by gas flow path}
17/00	Disintegrating by tumbling mills, i.e. mills having a container charged with the material to be disintegrated with or without special disintegrating members such as pebbles or balls (high-speed drum mills B02C 19/11 {; drums for polishing or grinding B24B)}	17/1885	. . . . {the applied gas acting to effect material separation (B02C 17/1895 takes precedence)}
17/002	. {with rotary cutting or beating elements}	17/189	. . . . {with return of oversize material to crushing zone (B02C 17/1895 takes precedence)}
17/005	. {the charge being turned over by magnetic forces}	17/1895	. . . . {gas being recirculated to crushing zone}
17/007	. {specially adapted for disintegrating refuse}	17/20	. . Disintegrating members
17/02	. with perforated container	17/205	. . . {Adding disintegrating members to the tumbling mill}
17/04	. with unperforated container	17/22	. . Lining for containers
17/06	. . with several compartments	17/225	. . . {using rubber or elastomeric material}
2017/065	. . . {with several compartments in the form of multiwell blocks}	17/24	. . Driving mechanisms
		18/00	Disintegrating by knives or other cutting or tearing members which chop material into fragments {(tree stump comminutors A01G 23/067)}
		18/0007	. {specially adapted for disintegrating documents}

B02C

- 2018/0015 . . {for disintegrating CDs, DVDs and/or credit cards}
- 2018/0023 . . {Switching devices}
- 2018/003 . . {Removing clips, pins or staples before disintegrating}
- 2018/0038 . . {Motor drives}
- 2018/0046 . . {Shape or construction of frames, housings or casings}
- 2018/0053 . . {hand-operated}
- 2018/0061 . . {with compacting devices for the disintegrated material}
- 2018/0069 . . {with stripping devices}
- 18/0076 . {with cutting or tearing members fixed on endless flexible members (without cutting or tearing members [B02C 19/0006](#))}
- 18/0084 . {specially adapted for disintegrating garbage, waste or sewage}
- 18/0092 . . {for waste water or for garbage}
- 18/02 . with reciprocating knives
- 18/04 . . Details
- 18/06 . with rotating knives
- 18/062 . . {with rotor elements extending axially in close radial proximity of a concentrically arranged slotted or perforated ring}
- 18/065 . . {within rotatable bowls, e.g. meat cutters}
- 18/067 . . {Tub-grinders}
- 18/08 . . within vertical containers {([B02C 18/062](#), [B02C 18/065](#) take precedence)}
- 18/083 . . . {with a disc rotor having generally radially extending slots or openings bordered with cutting knives}
- 18/086 . . . {specially adapted for disintegrating plastics, e.g. cinematographic films (for plastic bottles [B02C 19/0093](#), disintegrating plastics [B29B 17/00](#))}
- 18/10 . . . with drive arranged above container {([B02C 18/083](#) takes precedence)}
- 18/12 . . . with drive arranged below container {([B02C 18/083](#) takes precedence)}
- 18/14 . . within horizontal containers {([B02C 18/062](#), [B02C 18/065](#) take precedence)}
- 18/141 . . . {with axial flow}
- 18/142 . . . {with two or more inter-engaging rotatable cutter assemblies}
- 18/143 . . . {with a disc rotor having generally radially extending slots or openings bordered with cutting knives}
- 18/144 . . . {with axially elongated knives}
- 18/145 . . . {with knives spaced axially and circumferentially on the periphery of a cylindrical rotor unit}
- 18/146 . . . {with a rotor comprising a plurality of axially contiguous disc-like segments each having at least one radially extending cutting element}
- 2018/147 . . . {of the plural stage type}
- 18/148 . . . {specially adapted for disintegrating plastics, e.g. cinematographic films (for plastic bottles [B02C 19/0093](#), disintegrating plastics [B29B 17/00](#))}
- 18/16 . . Details
- 2018/162 . . . {Shape or inner surface of shredder-housings}
- 2018/164 . . . {Prevention of jamming and/or overload}
- 2018/166 . . . {Lubricating the knives of the cutting mechanisms}
- 2018/168 . . . {User safety devices or measures in shredders}
- 18/18 . . . Knives; Mountings thereof
- 18/182 {Disc-shaped knives}
- 18/184 {with peripherally arranged demountable cutting tips or elements}
- 18/186 {Axially elongated knives}
- 2018/188 {Stationary counter-knives; Mountings thereof}
- 18/20 Sickle-shaped knives
- 18/22 Feed or discharge means
- 2018/2208 {for weblike material}
- 18/2216 {Discharge means}
- 18/2225 {Feed means}
- 18/2233 {of ram or pusher type}
- 18/2241 {of conveyor belt type ([B02C 18/225](#) takes precedence)}
- 18/225 {of conveyor belt and cooperating roller type}
- 18/2258 {of screw type}
- 18/2266 {of revolving drum type}
- 18/2275 {using a rotating arm}
- 18/2283 {using rollers ([B02C 18/225](#) takes precedence)}
- 18/2291 {Feed chute arrangements}
- 18/24 . . . Drives
- 18/26 . with knives which both reciprocate and rotate
- 18/28 . with spiked cylinders
- 18/30 . Mincing machines with perforated discs and feeding worms
- 18/301 . . {with horizontal axis}
- 18/302 . . . {with a knife-perforated disc unit}
- 18/304 . . . {with several axially aligned knife-perforated disc units}
- 18/305 . . {Details}
- 2018/307 . . . {Cooling arrangements in mincing machines}
- 2018/308 . . {with separating devices for hard material, e.g. bone}
- 18/32 . . with sharpening devices
- 18/34 . . with means for cleaning the perforated discs
- 18/36 . . Knives or perforated discs
- 18/362 . . . {Knives}
- 18/365 . . . {Perforated discs}
- 2018/367 . . . {Resiliently mounted knives or discs}
- 18/38 . . Drives
- 19/00 Other disintegrating devices or methods (for grain [B02C 9/00](#))**
- 19/0006 . {Crushing by endless flexible members (with cutting or tearing members [B02C 18/0076](#))}
- 19/0012 . {Devices for disintegrating materials by collision of these materials against a breaking surface or breaking body and/or by friction between the material particles (also for grain)}
- 19/0018 . . {using a rotor accelerating the materials centrifugally against a circumferential breaking surface (rotors with beater elements [B02C 13/09](#), [B02C 13/1807](#))}
- 19/0025 . . . {by means of a rotor with radially extending channels}
- 19/0031 . . . {by means of an open top rotor}
- 19/0037 {with concentrically arranged open top rotors}

B02C

- 19/0043 . . {the materials to be pulverised being projected against a breaking surface or breaking body by a pressurised fluid ([jet mills B02C 19/06](#))}
- 19/005 . . {the materials to be pulverised being disintegrated by collision of, or friction between, the material particles ([jet mills B02C 19/06](#))}
- 19/0056 . {specially adapted for specific materials not otherwise provided for}
- 19/0062 . . {specially adapted for shredding scrap metal, e.g. automobile bodies}
- 19/0068 . . {specially adapted for breaking-up fluorescent tubes}
- 19/0075 . . {specially adapted for disintegrating medical waste ([disposal of medical waste B09B 3/0075](#), [sterilisation of refuse A61L 11/00](#))}
- 19/0081 . . {specially adapted for breaking-up bottles}
- 19/0087 . . . {for glass bottles}
- 19/0093 . . . {for plastic bottles}
- 19/06 . Jet mills
- 19/061 . . {of the cylindrical type ([B02C 19/068 takes precedence](#))}
- 19/063 . . {of the toroidal type ([B02C 19/068 takes precedence](#))}
- 19/065 . . {of the opposed-jet type ([B02C 19/068 takes precedence](#))}
- 19/066 . . {of the jet-anvil type ([B02C 19/068 takes precedence](#))}
- 19/068 . . {of the fluidised-bed type}
- 19/08 . Pestle and mortar
- 19/10 . Mills in which a friction block is towed along the surface of a cylindrical or annular member
- 19/11 . High-speed drum mills ([for separating B04B](#))
- 19/16 . Mills provided with vibrators ([roller mills B02C 4/423](#); [tumbling mills B02C 17/14](#))
- 19/18 . Use of auxiliary physical effects, e.g. ultrasonics, irradiation, for disintegrating
- 2019/183 . . {Crushing by discharge of high electrical energy}
- 19/186 . . {Use of cold or heat for disintegrating ([B02C 4/44](#), [B02C 7/17](#), [B02C 11/08 take precedence](#))}
- 19/20 . Disintegrating by grating ([domestic food grating devices A47J 43/25](#))}
- 19/22 . Crushing mills with screw-shaped crushing means
- 21/00 Disintegrating plant with or without drying of the material ([for grain B02C 9/04](#))**
- 21/002 . {using a combination of a roller mill and a drum mill}
- 21/005 . . {the roller mill having cooperating rollers}
- 21/007 . {using a combination of two or more drum or tube mills}
- 21/02 . Transportable disintegrating plant
- 2021/023 . . {for disintegrating material on the surface of the ground}
- 21/026 . . {self-propelled}
- 23/00 Auxiliary methods or auxiliary devices or accessories specially adapted for crushing or disintegrating not provided for in preceding groups or not specially adapted to apparatus covered by a single preceding group ([specially adapted for grain mills B02C 11/00](#); [separating or sorting in general B03](#), [B04](#), [B07](#))**
- 23/02 . Feeding devices ([for grain mills B02C 11/04](#); [for roller mills B02C 4/286](#); [transport devices in general B65G](#))
- 23/04 . Safety devices ([in general F16P](#) {; [for rotary mills B02C 13/31](#)})
- 23/06 . Selection or use of additives to aid disintegrating
- 23/08 . Separating or sorting of material, associated with crushing or disintegrating ([B02C 23/18 takes precedence](#) {; [beater mills combined with sifting devices B02C 13/13](#), [B02C 13/14](#); [for tumbling mills B02C 17/1835](#))}
- 23/10 . . with separator arranged in discharge path of crushing or disintegrating zone
- 23/12 . . . with return of oversize material to crushing or disintegrating zone
- 23/14 . . with more than one separator
- 23/16 . . with separator defining termination of crushing or disintegrating zone, e.g. screen denying egress of oversize material
- 2023/165 . . . {Screen denying egress of oversize material}
- 23/18 . Adding fluid, other than for crushing or disintegrating by fluid energy ([for tumbling mills B02C 17/186](#); [feeding devices B02C 23/02](#))
- 23/20 . . after crushing or disintegrating
- 23/22 . . . with recirculation of material to crushing or disintegrating zone
- 23/24 . . Passing gas through crushing or disintegrating zone ([B02C 15/001](#), [B02C 23/38](#), [B02C 23/40 take precedence](#))
- 23/26 . . . characterised by point of gas entry or exit or by gas flow path
- 23/28 . . . gas moving means being integral with, or attached to, crushing or disintegrating element
- 23/30 . . . the applied gas acting to effect material separation ([B02C 23/34 takes precedence](#))
- 23/32 . . . with return of oversize material to crushing or disintegrating zone ([B02C 23/34 takes precedence](#))
- 23/34 . . . gas being recirculated to crushing or disintegrating zone
- 23/36 . . the crushing or disintegrating zone being submerged in liquid
- 23/38 . . in apparatus having multiple crushing or disintegrating zones
- 23/40 . . with more than one means for adding fluid to the material being crushed or disintegrated
- 25/00 Control arrangements specially adapted for crushing or disintegrating**
- 2201/00 Codes relating to disintegrating devices adapted for specific materials**
- 2201/02 . for reinforced concrete
- 2201/04 . for used tyres
- 2201/06 . for garbage, waste or sewage
- 2201/063 . . for waste water or sewage
- 2201/066 . . for garden waste
- 2210/00 Codes relating to different types of disintegrating devices**
- 2210/01 . Indication of wear on beaters, knives, rollers, anvils, linings and the like
- 2210/02 . Features for generally used wear parts on beaters, knives, rollers, anvils, linings and the like