### 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.

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<td>. . Shape or construction of jaws</td>
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<td>. Mills with non-rotating spiked members</td>
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<td>1/14</td>
<td>. Stamping mills</td>
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<table>
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<th>2/00</th>
<th>Crushing or disintegrating by gyratory or cone crushers</th>
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<td>2/002</td>
<td>[with non-coaxial discs with intersecting axes B02C 7/005]</td>
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<td>[the bowl being a driven element for providing a crushing effect]</td>
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<td>. . [and with bowl adjusting or controlling mechanisms (B02C 2/042, B02C 2/06 take precedence)]</td>
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<tr>
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<td>. . [and with head adjusting or controlling mechanisms (B02C 2/042, B02C 2/06 take precedence)]</td>
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<tr>
<td>2/06</td>
<td>. . and with top bearing [(B02C 2/042 takes precedence)]</td>
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<tr>
<td>2/08</td>
<td>. . with horizontal axis</td>
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</tbody>
</table>

| 2/10 | . concentrically moved; Bell crushers |
| 4/00 | Crushing or disintegrating by roller mills |
| 4/02 | . with two or more rollers |
| 4/04 | . . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids |
| 4/06 | . . specially adapted for milling grain |
| 4/08 | . . with co-operating corrugated or toothed crushing-rollers |
| 4/10 | . with a roller co-operating with a stationary member |
| 4/12 | . . in the form of a plate |
| 4/14 | . . . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids |
| 4/16 | . . . specially adapted for milling grain |
| 4/18 | . . in the form of a bar |
| 4/20 | . . wherein the roller is corrugated or toothed |
| 4/22 | . . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids |
| 4/24 | . . . specially adapted for milling grain |
| 4/26 | . . in the form of a grid or grating |
| 4/28 | . . Details |
| 4/283 | . . [Lateral sealing shields] |
| 4/286 | . . [Feeding devices] |
| 4/30 | . . Shape or construction of rollers |
| 4/305 | . . . [Wear resistant rollers] |
| 4/32 | . . Adjusting, applying pressure to, or controlling the distance between, rolling members |
| 4/34 | . . . in mills wherein a roller co-operates with a stationary member |
Crushing or disintegrating by disc mills (apparatus specially adapted for manufacture or treatment of cocoa or cocoa products exclusively A23G 1/04)

7/00

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

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]
15/00 Disintegrating by milling members in the form of rollers or balls co-operating with rings or discs

15/001 [Air flow directing means positioned on the periphery of the horizontally rotating milling surface]

15/002 [Combined with a classifier]

15/003 [Shape or construction of discs or rings]

15/004 [Shape or construction of rollers or balls]

15/005 [Rollers or balls of composite construction]

15/006 [Ring or disc drive gear arrangement]

15/007 [Mills with rollers pressed against a rotary horizontal disc (with pendularly mounted rollers B02C 15/04)]

15/02 Centrifugal pendulum-type mills

15/04 Mills with pressed pendularly-mounted rollers, e.g. spring pressed

15/045 [Pressed against the interior of a ring rotating in a vertical plane]

15/06 Mills with rollers forced against the interior of a rotary ring, e.g. under spring action (B02C 15/04 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)

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

15/12 Mills with at least two discs (or rings) and interposed balls or rollers mounted like ball or roller bearings

15/123 [with rings and interposed rollers]

15/126 [of the plural stage type]

15/14 Edge runners, e.g. Chile mills

15/143 [Each runner pivot carrying more than one runner]

15/146 [Step-shaped runners]

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

17/00 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]

17/002 [with rotary cutting or beating elements]

17/005 [The charge being turned over by magnetic forces]

17/007 [Specially adapted for disintegrating refuse]

17/02 with perforated container

17/04 with unperforated container

17/06 with several compartments

17/065 [with several compartments in the form of multowell blocks]

17/07 [in radial arrangement]

17/08 [with containers performing a planetary movement]

17/10 [with one or a few disintegrating members arranged in the container]

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)

17/16 Mills in which a fixed container houses stirring means tumbling the charge

17/161 [Arrangements for separating milling media and ground material]

17/163 [Stirring means]

2017/165 [with stirring means comprising more than one agitator]

17/166 [of the annular gap type]

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]

17/17 Details

17/1805 [Monitoring devices for tumbling mills]

17/181 [Bearings specially adapted for tumbling mills]

17/1815 [Cooling or heating devices]

17/182 [Lids]

17/1825 [Lifting devices (lifting devices associated with the lining for containers B02C 17/22)]

17/183 [Feeding or discharging devices]

17/1835 [Discharging devices combined with sorting or separating of material (B02C 17/186 takes precedence)]

17/184 [With separator arranged in discharge path of crushing zone]

17/1845 [With return of oversize material to crushing zone]

17/185 [With more than one separator]

17/1855 [With separator defining termination of crushing zone, e.g. screen denying egress of oversize material]

17/186 [Adding fluid, other than for crushing by fluid energy]

17/1865 [After crushing]

17/187 [With recirculation of material to crushing zone]

17/1875 [Passing gas through crushing zone]

17/188 [Characterised by point of gas entry or exit or by gas flow path]

17/1885 [The applied gas acting to effect material separation (B02C 17/1895 takes precedence)]

17/189 [With return of oversize material to crushing zone (B02C 17/1895 takes precedence)]

17/1895 [Gas being recirculated to crushing zone]

17/20 Disintegrating members

17/205 [Adding disintegrating members to the tumbling mill]

17/22 Lining for containers

17/225 [Using rubber or elastomeric material]

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)
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 18/075 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 . . . [drive arranged above container (B02C 18/083 takes precedence)]

18/12 . . . [drive arranged below container (B02C 18/083 takes precedence)]

18/14 . . . within horizontal containers [(B02C 18/062, B02C 18/075 take precedence)]

18/141 . . . [with axial flow]

18/142 . . . [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

18/162 . . . [Shape or inner surface of shredder-housings]

18/164 . . . [Prevention of jamming and/or overload]

18/166 . . . [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]
2019/186 . . [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