COOPERATIVE PATENT CLASSIFICATION

PERFORMING OPERATIONS; TRANSPORTING

SEPARATING; MIXING

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

CRUSHING, PULVERISING, OR DISINTEGRATING IN GENERAL; MILLING GRAIN

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.

Crushing or disintegrating by reciprocating members

1/00

1/005 [hydraulically or pneumatically operated]

1/02 Jaw crushers or pulverisers

1/025 [Jaw clearance or overload control]

1/04 [with single-acting jaws]

1/043 [with cooperating single acting jaws]

1/046 [of the plural stage type]

1/06 [with double-acting jaws]

1/08 [with jaws coacting with rotating roller]

1/10 [Shape or construction of jaws]

1/12 Mills with non-rotating spiked members

1/14 Stamping mills

Crushing or disintegrating by gyratory or cone crushers

2/00

2002/002 [the bowl being a driven element for providing a crushing effect]

2/005 [Lining]

2/007 [Feeding devices]

2/04 eccentrically moved

2/04 with vertical axis

2/042 [Moved by an eccentric weight]

2/045 [and with bowl adjusting or controlling mechanisms (B02C 2/042, B02C 2/06 take precedence)]

2/047 [and with head adjusting or controlling mechanisms (B02C 2/042, B02C 2/06 take precedence)]

2/06 [and with top bearing (B02C 2/042 takes precedence)]

2/08 [with horizontal axis]

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, milling 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)

Detaching by mills having rotary beaters adapted for grain mills

Other auxiliary devices or accessories specially adapted for grain mills

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]

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 massed 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 F24E)

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

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)

Mills in which a fixed or nonrotating container is used and charging is carried out by tumbling or shaking (B02C 19/17)

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])

with rotary cutting or beating elements

the charge being turned over by magnetic forces

specially adapted for disintegrating refuse

perforated container

with unperforated container

with several compartments

Disintegrating by knives or other cutting or tearing members which chop material into fragments (tree stump cutters A01G 23/067)

specially adapted for disintegrating documents
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]

2018/208 . . . [for weblike material]

2018/2216 . . . [Discharge means]

2018/2225 . . . [Feed means]

2018/2233 . . . [of ram or pusher type]

2018/2241 . . . [of conveyor belt type (B02C 18/225 takes precedence)]

2018/225 . . . [of conveyor belt and cooperating roller type]

2018/2258 . . . [of screw type]

2018/2266 . . . [of revolving drum type]

2018/2275 . . . [using a rotating arm]

2018/2283 . . . [using rollers (B02C 18/225 takes precedence)]

2018/2291 . . . [Feed chute arrangements]

2018/24 . . . Drives

2018/26 . . . with knives which both reciprocate and rotate

2018/28 . . . with spiked cylinders

2018/30 . . . Mincing machines with perforated discs and feeding worms

2018/301 . . . [with horizontal axis]

2018/302 . . . [with a knife-perforated disc unit]

2018/304 . . . [with several axially aligned knife-perforated disc units]

2018/305 . . . [Details]

2018/307 . . . [Cooling arrangements in mincing machines]

2018/308 . . . [with separating devices for hard material, e.g. bone]

2018/32 . . . with sharpening devices

2018/34 . . . with means for cleaning the perforated discs

2018/36 . . . Knives or perforated discs

2018/362 . . . [Knives]

2018/365 . . . [Perforated discs]

2018/367 . . . [Resiliently mounted knives or discs]

2018/38 . . . 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]
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

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

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 11/04; separating or sorting in general B03, B04, B07)

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
- 21/026  [self-propelled]

Disintegrating by grating (domestic food grating mills) B02C 4/423

- 21/10  with separator arranged in discharge path of crushing or disintegrating zone
- 21/12  with return of oversize material to crushing or disintegrating zone
- 21/14  with more than one separator
- 21/16  with separator defining termination of crushing or disintegrating zone, e.g. screen denying egress of oversize material

Passing gas through crushing or disintegrating zone (B02C 15/001, B02C 23/38, B02C 23/40 take precedence)

- 23/24  with return of oversize material to crushing or disintegrating zone (B02C 23/34 takes precedence)
- 23/32  with more than one means for adding fluid to the material being crushed or disintegrated

Control arrangements specially adapted for crushing or disintegrating

- 25/00

Feeding devices (for grain mills B02C 11/04; for roller mills B02C 4/286; transport devices in general B65G)

- 23/02

Safety devices (in general F16P ; for rotary mills B02C 13/31)

- 23/04

Selection or use of additives to aid disintegrating

- 23/06

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)

- 23/08

Selection or use of additives to aid disintegrating

- 23/10

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)

Pestle and mortar

- 19/08

Mills in which a friction block is towed along the surface of a cylindrical or annular member

- 19/10

High-speed drum mills (for separating B04B)

- 19/11

Mills provided with vibrators (roller mills B02C 4/423; tumbling mills B02C 17/14)

- 19/16

Use of auxiliary physical effects, e.g. ultrasonics, irradiation, for disintegrating

- 19/18

Crushing by discharge of high electrical energy

- 19/183

Use of cold or heat for disintegrating

- 19/186

Disintegrating by grating (domestic food grating devices A47J 43/25)

- 19/20

Crushing mills with screw-shaped crushing means

- 19/21

Selection or use of additives to aid disintegrating

- 19/22

Passing gas through crushing or disintegrating zone (B02C 15/001, B02C 23/38, B02C 23/40 take precedence)

- 19/23

Mills in which a friction block is towed along the surface of a cylindrical or annular member

- 19/26

the crushing or disintegrating zone being submerged in liquid

- 19/28

in apparatus having multiple crushing or disintegrating zones

- 19/30

the applied gas acting to effect material separation (B02C 23/34 takes precedence)

- 19/32

with return of oversize material to crushing or disintegrating zone (B02C 23/34 takes precedence)

- 19/34

gas being recirculated to crushing or disintegrating zone

- 19/36

the crushing or disintegrating zone being submerged in liquid

- 19/38

in apparatus having multiple crushing or disintegrating zones

- 19/40

with more than one means for adding fluid to the material being crushed or disintegrated

- 19/43

for reinforced concrete

- 19/45

for used tyres

- 19/47

for garbage, waste or sewage

- 19/49

for waste water or sewage

- 19/51

for garden waste

- 19/53

for reinforced concrete

- 19/55

for used tyres

- 19/57

for garbage, waste or sewage

- 19/59

for waste water or sewage

- 19/51

for garden waste