

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

B02C CRUSHING, PULVERISING, OR DISINTEGRATING IN GENERAL; MILLING GRAIN (obtaining metallic powder by crushing, grinding or milling B22F 9/04)

Subclass index

DISINTEGRATING IN GENERAL

Using reciprocating or rotary
crushers 1/00, 2/00
Using rollers..... 4/00
Using discs..... 7/00
Using rotary beaters..... 13/00
By tumbling 17/00

Otherwise15/00, 18/00,
19/00

Auxiliary methods, accessories.....23/00

DISINTEGRATING PLANT; CONTROL

ARRANGEMENTS21/00; 25/00

MILLING METHODS OR MILLS

SPECIALLY ADAPTED FOR GRAIN;

ACCESSORIES THEREFOR.....4/06, 4/16,
4/24, 4/38, 7/13, 7/18, 9/00; 11/00

1/00 Crushing or disintegrating by reciprocating members

- 1/02 . Jaw crushers or pulverisers
- 1/04 . . with single-acting jaws
- 1/06 . . with double-acting jaws
- 1/08 . . with jaws coacting with a rotating roller
- 1/10 . . Shape or construction of jaws
- 1/12 . Mills with non-rotating spiked members
- 1/14 . Stamping mills

2/00 Crushing or disintegrating by gyratory or cone crushers

- 2/02 . eccentrically moved
- 2/04 . . with vertical axis
- 2/06 . . . and with top bearing
- 2/08 . . with horizontal axis
- 2/10 . concentrically moved; Bell crushers

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)

- 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
- 4/30 . . Shape or construction of 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

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

4/44 . . 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)

- 7/02 . 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

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**
- 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
 - 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
 - 13/16 . . with beaters hinged to the rotor
 - 13/18 . . with beaters rigidly connected to the rotor
 - 13/20 . with two or more co-operating rotors
 - 13/22 . with intermeshing pins
 - 13/24 . . arranged around a vertical axis
 - 13/26 . Details
 - 13/28 . . Shape or construction of beater elements
 - 13/282 . . Shape or inner surface of mill-housings
 - 13/284 . . . Built-in screens
 - 13/286 . . Feeding or discharge
 - 13/288 . . Ventilating, or influencing air circulation
 - 13/30 . . Driving mechanisms
 - 13/31 . . Safety devices or measures
- 15/00 Disintegrating by milling members in the form of rollers or balls co-operating with rings or discs**
- 15/02 . Centrifugal pendulum-type mills
 - 15/04 . Mills with pressed pendularly-mounted rollers, e.g. spring pressed [4]
 - 15/06 . Mills with rollers forced against the interior of a rotary ring, e.g. under spring action (B02C 15/04 takes precedence) [4]
 - 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 and interposed balls or rollers mounted like ball or roller bearings [4]
 - 15/14 . Edge runners, e.g. Chile mills
 - 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)**
- 17/02 . with perforated container
 - 17/04 . with unperforated container
 - 17/06 . . with several compartments
 - 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
- 17/16 . Mills in which a fixed container houses stirring means tumbling the charge
- 17/18 . Details
- 17/20 . . Disintegrating members
- 17/22 . . Lining for containers
- 17/24 . . Driving mechanisms
- 18/00 Disintegrating by knives or other cutting or tearing members which chop material into fragments (slicing B26D); Mincing machines or similar apparatus using worms or the like (machines for domestic use not covered otherwise A47J 43/04; multi-purpose machines for preparing food A47J 44/00)**
- 18/02 . with reciprocating knives
 - 18/04 . . Details
 - 18/06 . with rotating knives
 - 18/08 . . within vertical containers
 - 18/10 . . . with drive arranged above container
 - 18/12 . . . with drive arranged below container
 - 18/14 . . within horizontal containers
 - 18/16 . . Details
 - 18/18 . . . Knives; Mountings thereof
 - 18/20 Sickle-shaped knives
 - 18/22 . . . Feed or discharge means
 - 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
 - 18/32 . . with sharpening devices
 - 18/34 . . with means for cleaning the perforated discs
 - 18/36 . . Knives or perforated discs
 - 18/38 . . Drives
- 19/00 Other disintegrating devices or methods (for grain B02C 9/00)**
- 19/06 . Jet mills
 - 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 (tumbling mills B02C 17/14)
 - 19/18 . Use of auxiliary physical effects, e.g. ultrasonics, irradiation, for disintegrating
 - 19/20 . Disintegrating by grating
 - 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)**
- 21/02 . Transportable disintegrating plant
- 23/00 Auxiliary methods or auxiliary devices or accessories specially adapted for crushing or disintegrating not provided for in groups B02C 1/00 to B02C 21/00 or not specially adapted to apparatus covered by one only of groups B02C 1/00 to B02C 21/00 (separating or sorting in general B03, B04, B07)**
- 23/02 . Feeding devices (transport devices in general B65G)
 - 23/04 . Safety devices (in general F16P)
 - 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) [2]
 - 23/10 . . with separator arranged in discharge path of crushing or disintegrating zone [2]

- 23/12 . . . with return of oversize material to crushing or disintegrating zone [2]
- 23/14 . . with more than one separator [2]
- 23/16 . . with separator defining termination of crushing or disintegrating zone, e.g. screen denying egress of oversize material [2]
- 23/18 . Adding fluid, other than for crushing or disintegrating by fluid energy (feeding devices B02C 23/02) [2]
- 23/20 . . after crushing or disintegrating [2]
- 23/22 . . . with recirculation of material to crushing or disintegrating zone [2]
- 23/24 . . Passing gas through crushing or disintegrating zone (B02C 23/38, B02C 23/40 take precedence) [2]
- 23/26 . . . characterised by point of gas entry or exit or by gas flow path [2]
- 23/28 . . . gas moving means being integral with, or attached to, crushing or disintegrating element [2]
- 23/30 . . . the applied gas acting to effect material separation (B02C 23/34 takes precedence) [2]
- 23/32 . . . with return of oversize material to crushing or disintegrating zone (B02C 23/34 takes precedence) [2]
- 23/34 . . . gas being recirculated to crushing or disintegrating zone [2]
- 23/36 . . the crushing or disintegrating zone being submerged in liquid [2]
- 23/38 . . in apparatus having multiple crushing or disintegrating zones [2]
- 23/40 . . with more than one means for adding fluid to the material being crushed or disintegrated [2]
- 25/00 **Control arrangements specially adapted for crushing or disintegrating**