

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

### B02B PREPARING GRAIN FOR MILLING; REFINING GRANULAR FRUIT TO COMMERCIAL PRODUCTS BY WORKING THE SURFACE (making dough from cereals directly A21C; preservation or sterilisation of cereals A23B; cleaning fruit A23N; preparation of malt C12C)

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|------|---|------|---|
| 1/00 | <b>Preparing grain for milling or like processes</b> (hulling, husking, decorticating, polishing, removing the awns, or degerming B02B 3/00)                              | 3/04 | . by means of rollers                             |
|      |   | 3/06 | . by means of screws or worms                     |
|      |   | 3/08 | . by means of beaters or blades                   |
| 1/02 | . Dry treatment (sifting or sorting in general B07)   | 3/10 | . by means of brushes                             |
| 1/04 | . Wet treatment, e.g. washing, wetting, softening   | 3/12 | . by means of fluid                               |
| 1/06 | . . Devices with rotary parts   | 3/14 | . Producing flour or meal directly                |
| 1/08 | . Conditioning grain with respect to temperature or water content (air conditioning or ventilating of silos F24F; drying apparatus F26B; hygrometers G01N)                | 5/00 | <b>Grain treatment not otherwise provided for</b> |
|      |   | 5/02 | . Combined processes                              |
| 3/00 | <b>Hulling; Husking; Decorticating</b> (decorticating textile fibres D01B 1/14); <b>Polishing; Removing the awns</b> (in threshing machines A01F 12/42); <b>Degerming</b> | 7/00 | <b>Auxiliary devices</b>                          |
|      |   | 7/02 | . Feeding or discharging devices                  |
| 3/02 | . by means of discs   |      |   |

### 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

Otherwise ..... 15/00, 18/00, 19/00

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

DISINTEGRATING PLANT; CONTROL ARRANGEMENTS ..... 21/00; 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

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|------|--|------|---|
| 1/00 | <b>Crushing or disintegrating by reciprocating members</b>   | 4/04 | . . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids    |
| 1/02 | . Jaw crushers or pulverisers  | 4/06 | . . specially adapted for milling grain   |
| 1/04 | . . with single-acting jaws  | 4/08 | . . with co-operating corrugated or toothed crushing-rollers                              |
| 1/06 | . . with double-acting jaws  |      |   |
| 1/08 | . . with jaws coacting with a rotating roller  | 4/10 | . with a roller co-operating with a stationary member                                     |
| 1/10 | . . Shape or construction of jaws  | 4/12 | . . in the form of a plate  |
| 1/12 | . Mills with non-rotating spiked members   | 4/14 | . . . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids  |
| 1/14 | . Stamping mills   |      |   |
| 2/00 | <b>Crushing or disintegrating by gyratory or cone crushers</b>   | 4/16 | . . . specially adapted for milling grain   |
| 2/02 | . eccentrically moved  | 4/18 | . . in the form of a bar  |
| 2/04 | . . with vertical axis   | 4/20 | . . . wherein the roller is corrugated or toothed   |
| 2/06 | . . . and with top bearing   | 4/22 | . . . specially adapted for milling paste-like material, e.g. paint, chocolate, colloids  |
| 2/08 | . . with horizontal axis   | 4/24 | . . . specially adapted for milling grain   |
| 2/10 | . concentrically moved; Bell crushers  | 4/26 | . . in the form of a grid or grating  |
|      |  | 4/28 | . Details   |
| 4/00 | <b>Crushing or disintegrating by roller mills</b> (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) | 4/30 | . . Shape or construction of rollers  |
|      |  | 4/32 | . . Adjusting, applying pressure to, or controlling the distance between, milling members |
| 4/02 | . with two or more rollers   | 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**