Nov. 10, 1925. 1,560,800

A. HOBERECHT

FEEDING AND DISTRIBUTING APPARATUS FOR ROLLER MILLS

Original Filed Sept. 13, 1922 2 Sheets-Sheet 1

Fig. 1.

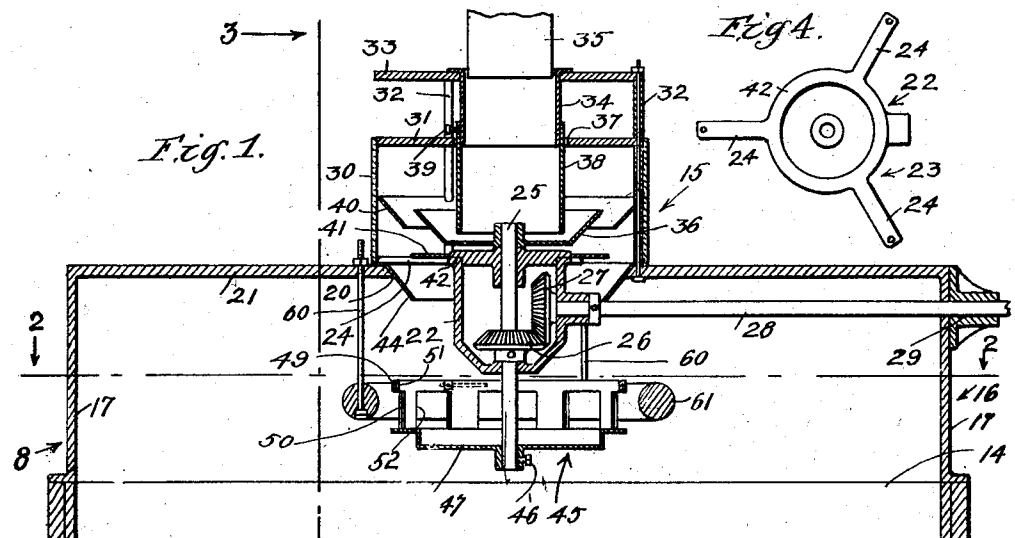


Fig. 2.

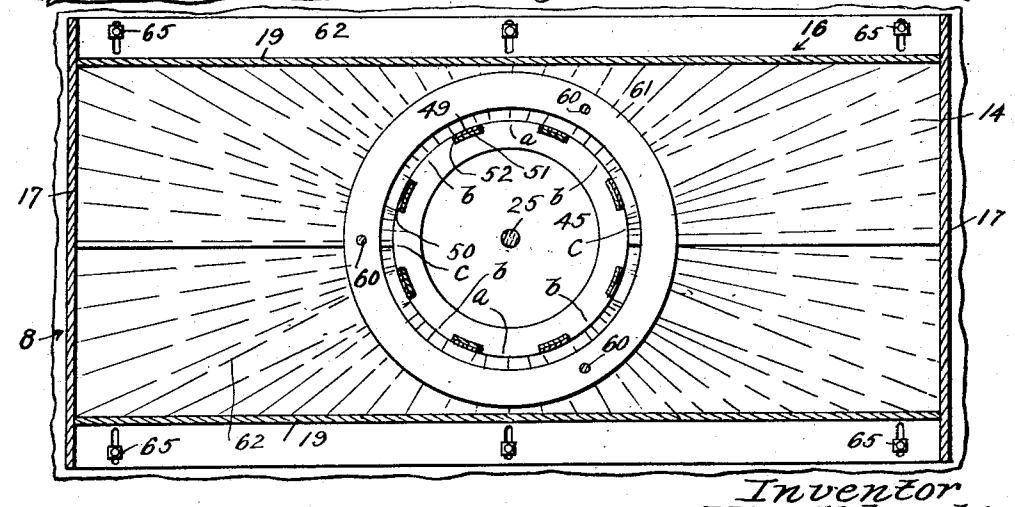


Fig. 4.

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Fig. 3.

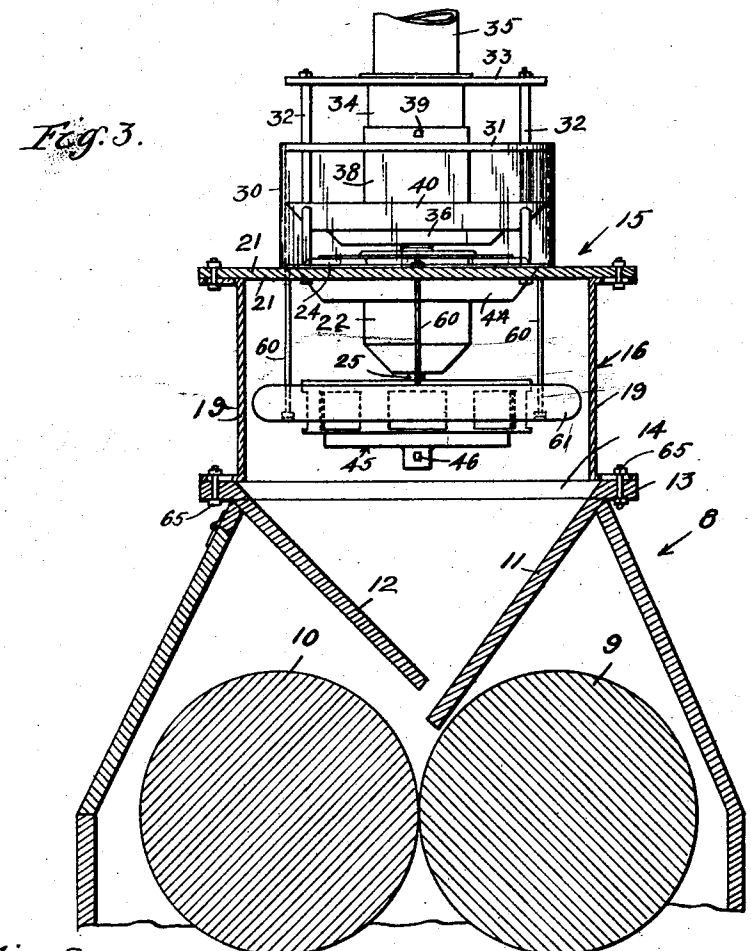


Fig. 5.

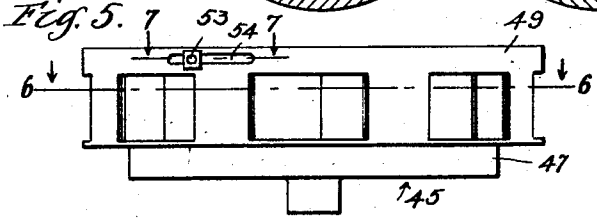


Fig. 7.

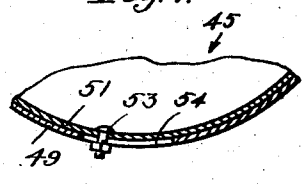
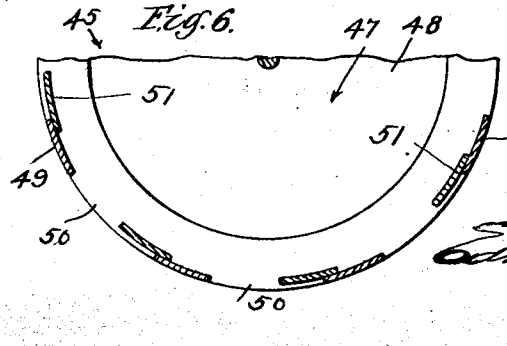


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALBERT HOBERECHT, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO EDWARD McKAIN, OF LOS ANGELES, CALIFORNIA.

FEEDING AND DISTRIBUTING APPARATUS FOR ROLLER MILLS.

Application filed September 13, 1922, Serial No. 587,918. Renewed February 4, 1925.

To all whom it may concern:

Be it known that I, ALBERT HOBERECHT, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Feeding and Distributing Apparatus for Roller Mills, of which the following is a specification.

This invention relates to improvements in a feeding and distributing device for roller mills such as is illustrated and described in my co-pending application entitled Feeders and distributors for roller mills, Serial No. 448,442, filed February 28, 1921.

A main object of my invention is to provide a rotary distributing device designed to feed grain or stock to cylindrical grain crushing rolls disposed therebelow in an even manner throughout their entire length.

Another object is to provide a feeding and distributing device in which a rotary distribution of the grain or milling material is converted into a straight line throw.

Still another object is to provide a distributing apparatus in which the size of the distributing outlets in the rotatable distributor may be conveniently regulated to suit the character of stock or grain being operated on.

Another and important object is to provide an adjustable deflecting means located adjacent the rotary distributor, whereby to efficiently control the throw of grain or stock issuing thereform.

A further object is to provide a distributing device so arranged that any foreign matter such as nuts, bolts, or other heavy metallic objects that would injure the grain rolls would be arrested in their passage therethrough.

I accomplish the above objects by means of the mechanism described herein and illustrated in the accompanying drawings, in which:

Fig. 1 is a central longitudinal section through the upper portion of a roller grinding mill of usual form, showing my feeding apparatus in sectional elevation in position thereon.

Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1, illustrating diagrammatically the action of my distributing member in converting a rotary throw of milling stock into a straight line throw.

Fig. 3 is a vertical sectional elevation of the upper portion of a roller mill, taken on line 3—3 of Fig. 1, the feeding and distributing mechanism being in elevation.

Fig. 4 is a plan view of a spider designed for supporting the gear casing in position.

Fig. 5 is an elevation of the grain distributor.

Fig. 6 is a partial sectional plan view of the grain distributor, taken on line 6—6 of Fig. 5.

Fig. 7 is a partial sectional plan view of the distributor outlet adjusting means, taken on line 7—7 of Fig. 5.

This construction is designed to replace the mechanism illustrated in my co-pending application heretofore referred to, mainly for the reason that I have simplified the distributing mechanism so as not only to insure an even distribution to the cylindrical milling rolls but in order to regulate the throw of the distributor according to the different varieties of grains or stock distributed thereby.

In the drawings 8 designates the upper portion of a roller mill of usual form which is fitted with a pair of cylindrical grain milling rolls 9 and 10, arranged to be rotated from a source of power, (not shown). Disposed above rolls 9 and 10 are cant boards 11 and 12, upon which the grain or other stock drops during the operation of the mill and by which it is deflected on to the rollers in an even manner throughout their entire length.

The top closure board 13 is provided with a rectangular opening 14, the length of said opening extending the entire length as the mill rolls 9 and 10 disposed therebelow, while the width is approximately equal to the distance between the upper edges of the boards 11 and 12, as clearly shown in Fig. 3 of the drawings.

Referring more particularly to Figs. 1 and 3, 15 designates my improved feeding and distributing apparatus, which preferably consists of a rectangular housing 16 which extends around the sides of a rectangular opening 14 formed in the top closure board 13 of the mill.

The oppositely disposed end walls 17 of the housing 16 and the side walls 19 are vertically disposed, the walls 19 being adjustably mounted as shown in Fig. 2 of

the drawings, for the purpose of adjusting the same to or from the distributor, as will be more fully described hereafter.

Mounted in a centrally disposed opening 20 formed in the top wall 21 of the rectangular housing 16 is a gear casing 22 rigidly secured in position by means of a spider 23 having arms 24 which are bolted or otherwise secured to the top wall 21 of housing 16. Vertically disposed in casing 22 is a revoluble shaft 25 to which is secured within the gear casing a beveled pinion 26 which meshes with a beveled driving pinion 7 secured to the inner end of a driving shaft 28. This shaft extends through the bearing 29 to the outside of the rectangular housing 16 and is provided with a suitable driving pulley (not shown).

Mounted on top wall 21, and surrounding opening 20 is an upward movable circular casing 30 preferably formed of transparent material provided with a top wall 31 supported by means of bolts 32, the transparent wall enabling the operator to observe the flow of stock passing to the distributing mechanism located therebelow. Supported above wall 31 by means of bolts 32 is a circular disk or wall 33 in which is centrally disposed a thimble 34, the lower end of a grain delivery spout 35 projecting thereinto, the upper end of the spout being connected to a source of grain or stock supply (not shown).

Secured to the upper end of shaft 25 and rotating therewith is a rotary feeding pan 36, having an outwardly inclined annular wall to facilitate a rapid and even distribution of the grain or stock delivered thereto.

Top wall 31 is provided with a central circular opening 37 in which is mounted a short pipe or sleeve 38 adjustably secured by means of a set screw 39 to the lower end of thimble 34, the lower end of the sleeve terminating within the feeding pan. By adjustably mounting the sleeve 38 on thimble 34, I am enabled to adjust or regulate the amount of grain or stock delivered to the feeding pan, and thus prevent an overflow to grinding rolls, or to drop sleeve 38 into bottom of feeding pan 36 and entirely shut off the stock supply to grinding rolls.

Secured to bolts 32 disposed within the space enclosed by the circular transparent wall of casing 30, and adjacent the upper edge of feed pan 36 is an annular deflecting ring 40, frusto conical in form, designed to direct the grain or stock downwardly and inwardly and on to a circular stationary plate or ledge 41 secured in position on the upper wall 42 of the gear casing. By the provision of the deflecting ring 40 and plate 41, all foreign substances, such as bolts, nuts, or other metallic or heavy objects that are accidentally mixed with the stock flowing through the grain delivery spout will be arrested during their passage through the distributing mechanism and lodged on the plate or ledge 41, from whence they may be readily removed by the operator by raising circular casing 30; while the stock or lighter material slides or rolls off and passes on downward between gear case and the casing.

Mounted in opening 20 formed in wall 21 of housing 16 is an annular deflecting ring 44 frusto conical in form and similar to ring 40, ring 44 directing the stock or grain falling thereon to the center of the distributor 45 located therebelow. Distributor 45 is rigidly attached to the lower end of shaft 25 by a set screw 46, and is preferably of circular form, having a bottom wall 47. Bottom wall 47 is provided with an annular side wall 49 having a plurality of discharge openings 50 formed therein and equally spaced apart. The size of openings 50 is controlled by an annular closure ring 51 disposed within the distributor and contacting with the inner peripheral surface of its annular wall 49. Ring 51 is provided with a plurality of notches 52, equally spaced apart and similar in configuration to the discharge openings formed in the wall of the distributor. Ring 51 is held in adjustable relation to the distributor wall by means of an adjusting bolt or screw 53 which passes through a slot 54 formed in the upper edge of wall 49. By means of ring 51 the size of the openings 50 in the annular wall may be quickly increased or diminished while the feeder is not in operation, to suit the character of material being distributed, thus when the mill is to operate on bran or fine fluffy middlings the ring 51 may be adjusted so that the openings in the distributor wall will be unobstructed, and when wheat, barley, or coarse middlings or round stock is being fed, the ring may be adjusted to decrease the size of the openings.

The above adjustment may be found desirable should the discharge of grain from the feed pan 36 be irregular, and in that event the openings 50 in the distributor may be partially closed so that a portion of the grain will be retained in the bottom of the distributor, thereby avoiding all waviness or flickering of the material as it passes through the distributing openings to the grinding rolls.

Adjustably suspended by means of bolts 60 is a material deflecting member 61, which is of greater diameter than the distributor 45. This deflector preferably consists of an annular ring preferably circular in cross section so that it will present no sharp edges to the material that is forced outwardly to the rolls by the distributor 45. When bran or fine fluffy middlings are being distributed to the rollers the deflecting member

61 will be raised so as to permit a full throw of the material to the rolls, while when wheat, coarse middlings, or round stock is being fed the deflector member 61 will be lowered into the position as shown in Fig. 1 of the drawings so as to control the throw of the material which is much heavier in character and travels farther than the lighter fluffy materials heretofore set forth. The deflector 61 may also be raised on one side and lowered on the other side so as to absolutely control the flow of milling material to the rolls, thus permitting a larger quantity at one end and a relatively smaller quantity at the opposite end of the rolls.

In Fig. 2 of the drawings I have illustrated diagrammatically the distribution of the grain or stock from the distributing member 45, and in order to clearly illustrate the path of travel of the grain or other material being fed to the mill from the distributor I have indicated the same by a plurality of fine lines 62, emanating from each opening in the distributor member. Grain or other material thrown from the openings —*a*— adjacent the side walls 19 of the housing will be deflected by said walls towards the center of the rolls, while grain impelled from the openings indicated at —*b*— will be forced a greater distance before striking the walls 19, and will be deflected on to the rolls a greater distance from their center than the grain flowing through the openings —*a*—. The openings —*c*— in the distributor member being almost entirely out of line with the walls 19, the grain or other material will impinge towards the end walls 17 and flow towards the extreme ends of the milling rolls 9 and 10, thus effecting an even horizontal distribution of the grain or other material throughout the entire length of the milling rolls.

From the foregoing description it will be apparent that by enclosing the distributor member 45 within a rectangular housing I am enabled to change a circular distribution of the grain or other material from the revolving distributor into a straight line distribution or throw, the walls of the housing forming an accurate and even deflecting means. When feeding some classes of stock, such as wheat, having a tendency to travel farther than light fluffy stock, it may be found desirable to move the oppositely disposed side walls 19 of the housing from each other so that a larger quantity of stock will flow toward the center of the rolls, and to this end I have provided each of the side walls 19 with an adjusting means 65, illustrated in this instance as a slot and set screw construction, although any other suitable convenient adjusting means may be employed.

As the grain is fed downwardly in a stream through the grain spout 35 from any source of supply it passes through the thimble 34 of the adjustable sleeve 38 to the rotary feeding pan 36. As the pan rotates the material will be thrown outwardly and upwardly so that it falls upon the deflecting ring 40 which will deflect the material downwardly and inwardly so that the material will fall upon a circular plate 41, and any foreign objects such as nuts, bolts, or screws, will be lodged on the plate 41 and prevented from entering the mills and injuring the rolls.

The material continues downwardly over and sliding off the outer edge of the annular deflecting ring 41, continuing on to annular deflecting ring 44 and which deflects the material towards the center of the distributing member 45.

The material is thence thrown outwardly by the distributing member 45 through the openings formed in its side wall approximately as shown in the diagrammatic view, Fig. 2 of the drawings.

By providing an annular adjustable deflecting member 61 adjacent the outlet openings in the distributor 45, I am enabled to control the throw of the material from the distributor in an even and efficient manner.

From the foregoing description it will at once be apparent that I have provided an extremely simple means for converting a circular flow of grain or other stock from the rotating distributing member into a straight line throw, so that the grain or stock will be fed evenly on to the milling rolls throughout their entire length and that the product resulting from the milling operation will be a positive and evenly ground product from the grinding rolls.

It will be noted from the foregoing description that by means of my distributing device I am enabled to do away entirely with all forms of hoppers, the flow of milling material passing through pipe 35 being delivered thereto through the medium of an elevator, reel, conveyor, or sifter.

Also, it will be observed that by controlling the flow of the milling material passing through pipe 35 all danger of delivering an excessive quantity of material to the distributing device will be avoided and no choking of the milling rolls will occur.

What I claim is:

1. In a feeding and distributing mechanism for roller mills, a rectangular housing having an opening therein, two of the oppositely disposed walls of said housing being adjustable, a casing mounted over said opening, a stock delivery spout connected with said casing, and a rotary grain distributing member disposed within said rectangular housing and below said delivery spout.

2. In a feeding and distributing mecha-

nism for roller mills, a rectangular housing having an opening in its top wall, a stock inlet pipe communicating with the opening in said housing, a rotary distributing member mounted in said housing adapted to distribute stock directly to the milling rolls, and means to rotate said distributor.

3. In a feeding and distributing mechanism for roller mills, a housing having an opening in its top wall, a casing mounted on said housing over said opening, a stock delivery means communicating with said casing, a rotary feeding member mounted below said delivery means, a rotary distributing member mounted below said feeding member, a deflecting member mounted adjacent said distributing member, and means to rotate the feeding and distributing members.

4. In a feeding and distributing mechanism for roller mills, a rectangular housing having an opening in its top wall, a stock inlet tube comunicating with the opening in said housing, a rotary distributing member mounted below said inlet tube and having outlet openings therein, and means to rotate said distributor.

5. In a feeding and distributing mechanism for roller mills, a housing having an opening in its top wall, a stock inlet tube communicating with the opening in said housing, a rotary distributing member mounted in said housing, a stock deflecting means surrounding said rotary distributing member, and means to rotate said distributor.

6. In a feeding and distributing mechanism for roller mills, a housing having an opening in its top wall, a stock inlet tube communicating with the opening in said housing, a rotary distributing member mounted in said housing, an adjustable stock deflecting means mounted in said housing surrounding said distributor, and means to rotate said distributor.

7. In a feeding and distributing mechanism for roller mills, a housing having an opening therein, a rotary feeding pan mounted in said opening, a stock inlet tube communicating with said feeding pan, means to adjust the flow of stock to said feeding pan, a rotary stock distributing member mounted in said housing, an adjustable deflecting member mounted adjacent said distributing member, and means to rotate the feeding pan and distributing member in unison.

8. In a feeding and distributing mechanism for roller mills, a rectangular housing having an opening formed in its top wall, a stock inlet tube communicating with the opening in said housing, a rotary distributing member mounted below said inlet and having stock outlet openings therein, means to increase or decrease the size of the stock outlet openings in the distributing member, and means to rotate said distributor.

9. In a feeding and distributing mechanism for roller mills, a rectangular housing having an opening in its top wall, a stock inlet tube communicating with the opening in said housing, a rotary feeding pan mounted below said inlet tube, means to regulate the flow of stock to said feeding pan, a rotary distributing member mounted below said feeding pan, means to direct the flow of stock from said feeding pan to said distributor, and means to rotate the feeding pan and the distributor in unison.

In witness that I claim the foregoing I have hereunto subscribed my name this 23rd day of August, 1922.

ALBERT HOBERECHT.