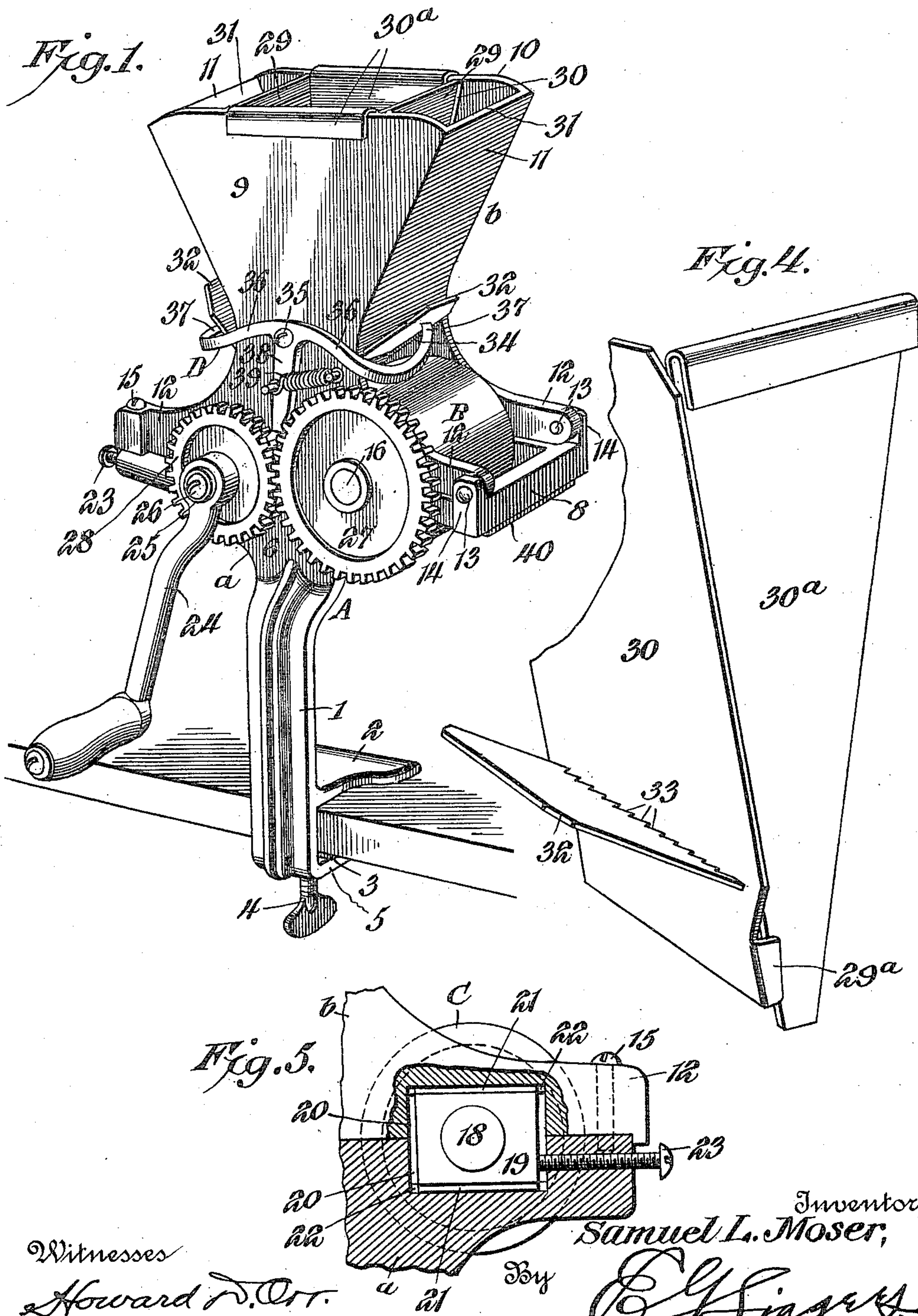


S. L. MOSER.
FLAKED GRAIN MILL.
APPLICATION FILED NOV. 29, 1909.

985,622.

Patented Feb. 28, 1911.

2 SHEETS—SHEET 1.

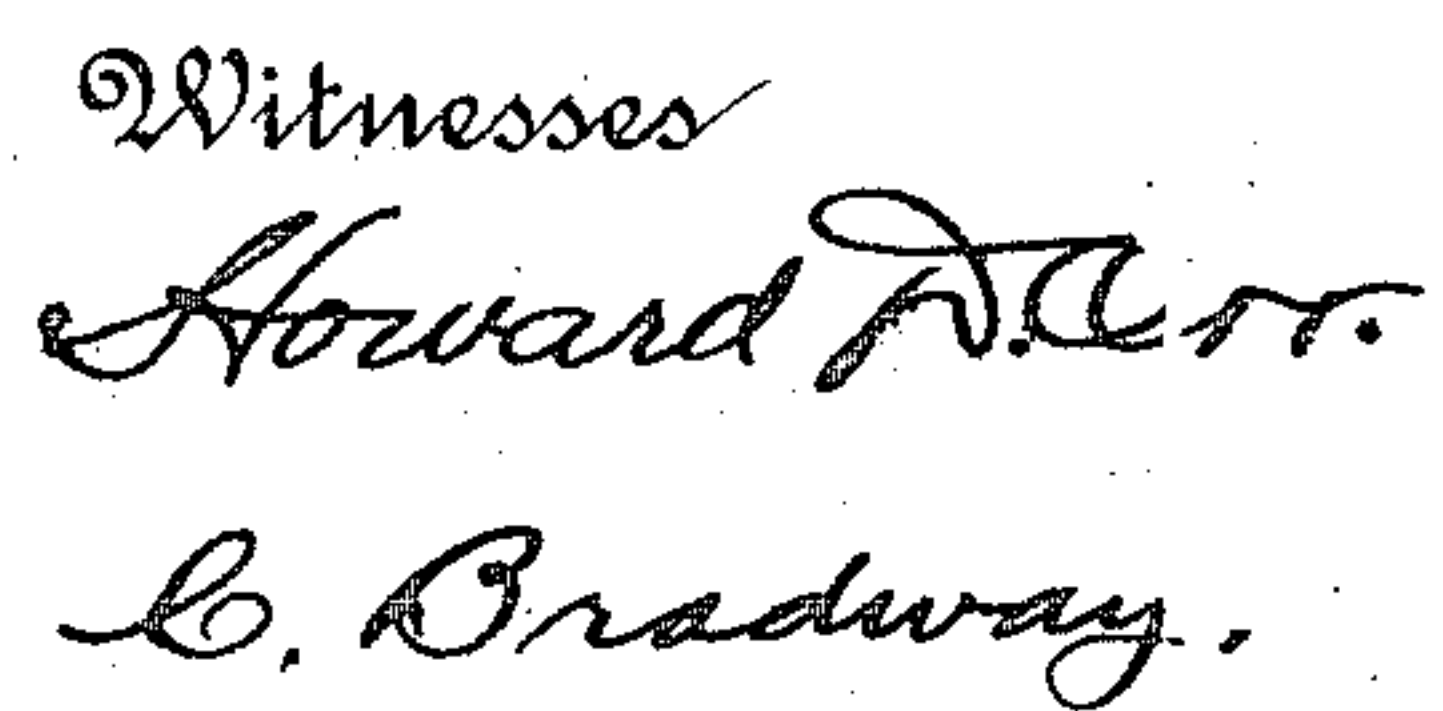


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

SAMUEL L. MOSER, OF UPPER SANDUSKY, OHIO.

FLAKED-GRAIN MILL.

985,622.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed November 29, 1909. Serial No. 530,472.

To all whom it may concern:

Be it known that I, SAMUEL L. MOSER, a citizen of the United States, residing at Upper Sandusky, in the county of Wyandot and State of Ohio, have invented a new and useful Flaked-Grain Mill, of which the following is a specification.

This invention relates to a crushing mill or flaker which is especially adapted for producing the flaked breakfast food and is designed especially for carrying out the process of preparing flaked grain, as disclosed in my co-pending application, Serial No. 530,471, filed November 29, 1909, although the mill may be used for other processes.

The invention has for one of its objects to improve and simplify the construction and operation of mills of this character so as to be reliable and efficient in use, composed of few parts, and so designed that the parts with which the grain comes in contact can be readily cleaned.

Another object of the invention is the provision of an improved hopper for mills of this type whereby the rolls can be automatically coated with Graham or other flour continuously during the feed to the rolls of the grain to be flaked, there being a flour sifting means for supplying the flour to the rolls.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a perspective view of the mill. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a vertical transverse section taken centrally through the machine. Fig. 4 is a fragmentary perspective view of the division plates of the hopper and one of the sifters shown removed from the hopper in their relative operative position. Fig. 5 is a fragmentary detail sectional view, showing one of the bearings for the adjustable crushing roll.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawings, A designates the frame of the machine which may be of

any approved construction and is preferably, although not necessarily, provided with a single supporting leg 1 formed with a foot flange 2 that coöperates with a clamping plate 3 for securing the mill to the edge of a table top or other suitable support, the clamping plate being swiveled on the upper end of a set screw 4 threaded in a laterally-extending base flange 5 on the leg. The frame is preferably composed of a base section *a* and an upper hopper section *b*. The section *a* is a horizontally-disposed rectangular frame to the front side of which is connected the leg 1. The base frame consists of front and rear walls 6 and 7 and connecting end walls 8. The upper section which, like the lower section, may be cast, is formed into a downwardly-contracted hopper composed of parallel front and rear walls 9 and 10 and inwardly and downwardly inclined connecting end walls 11, the front and rear walls being spaced apart to lie in the same plane with the walls 6 and 7 of the base section, as shown clearly in Fig. 3. The hopper section, which is provided with lateral extensions 12 formed integral with the front and rear walls, is adapted to swing open to one side of the machine for permitting the crushing rolls to be removed. For this purpose, the extensions 12 at one end of the machine are mounted on pivots 13 carried by upwardly-extending lugs 14 on the adjacent end of the base section, while the extensions 12 at the opposite end are secured to the base section by screws 15. By loosening the screws, which are threaded in the base section, the hopper section can be swung open.

The frame A is thus divisible or separable on a horizontal plane coincident with the axes of the crushing rolls B and C. The rolls are preferably hollow and constructed in the form of cylinders with smooth peripheral faces. They are disposed with their axes parallel and are of such length as to be accommodated between the front and rear walls of the frame. The roll B is provided with journals 16 which rotate in bearings 17 formed by opposed semi-circular recesses in the top and bottom edges of the front and rear walls of the frame sections so that the roll B will have a fixed axis of rotation. The journals 18 of the roll C are mounted in shiftable bearing boxes 19 which are set in opposed recesses 20 in the top and bottom edges of the front and rear walls of

the frame section, the bearing boxes having ribs 21 in their top and bottom edges to engage in grooves 22 in the top and bottom walls of the said recesses, so that the bearing boxes can slide back and forth and at the same time be prevented from lateral displacement. These bearing boxes are adjusted by screws 23 threaded in walls in the base frame section so that the inner ends of the screws will engage the bearing boxes. By turning the screws in one direction, the roll C will be moved toward the roll B, while turning the screw in the opposite direction will permit the movable roll to separate. The front journal 18 of the roll C has an extension for receiving an operating crank 24 which is held on the journal by a washer 25 bearing against the hub of the crank and a screw 26 threaded in the journal to retain, by its head, the washer in place. The rolls are simultaneously rotated by the crank by intermeshing gear wheels 27 and 28 secured, respectively, to the front journals of the rolls, the latter gear wheel being of smaller diameter so that the roll B will have a lower peripheral speed than the roll C. When the frame of the machine is opened by swinging the upper section b backwardly on the pivots 13, the rolls will remain in their bearings but can be readily taken out, if desired, for washing or any other purpose.

The hopper is designed to hold not only the grain to be flaked but a suitable powder for coating the rolls to prevent the grain from adhering thereto. Therefore, a pair of downwardly-converging partition plates 29 are arranged in the hopper, the edges of the plates fitting in guideways 30 formed on the inner surfaces of the front and rear walls, the guideways consisting of spaced ribs cast integral with the walls. These partition plates terminate adjacent the rolls immediately above the point where they contact or are nearest each other. Between these partition plates forming the central grain compartment are front and rear triangular plates 30^a which have their upper ends formed into L-shaped flanges that hook over the top of the front and rear walls of the hopper so as to be removably supported in place. The partition plates 29 and triangular plates 30^a are removable so that they can be washed from time to time. As shown in Fig. 3, the lower ends of the triangular plate are disposed inwardly from the ends of the rolls so that the grain will be prevented from lodging between the ends of the rolls and adjacent walls of the frame to clog the operation of the machine, and these lower ends of the triangular plates rest on inwardly-extending lugs 29^a formed on the lower corners of the partition plates. Between the end walls of the hopper and partition plates are formed compartments 31

for holding Graham flour or the like for coating the rolls. The lower ends of these flour-containing compartments are partially closed by plates 32 arranged at a downward inclination with their lower edges in proximity to the partition plates. These lower edges are serrated at 33 so as to permit flour to pass out of the compartments to sift on the rolls, the plates thus forming sifters. They are loosely arranged in recesses or guideways 34 cast on the front and rear walls of the frame and are adapted to have a gentle shaking action produced by an oscillatory agitator designated generally by D and pivoted at 35 on the front of the machine. This agitator consists of oppositely-extending arms 36 that have rearwardly-extending terminal portions 37 which project under the portions of the sifter plates that extend out of the hopper, and the agitator has a central depending arm 38 that has its lower extremity arranged in contact with the teeth of the large gear wheel 27, so that as the teeth pass under the said depending arm, the agitator will be oscillated, the said depending arm constituting at the same time a pawl for preventing reverse rotation of the rolls. The arm 38 is held in yielding engagement with the gear 27 by means of a spring 39 connected at one end with the arm and at the other end with a suitable part of the frame. As shown in Fig. 2, scrapers 40 are arranged on the end walls 8 of the base portion of the frame so as to scrape from the rollers whatever grain may adhere thereto.

In practice, the grain to be crushed is previously boiled and mixed with butter or other oil, according to the process disclosed in the application hereinbefore referred to, and the softened grain berries, thus prepared, are placed in the central compartment of the hopper from which it feeds by gravity between the crushing rolls. Graham or other flour is supplied to the end compartments 31 of the hopper. As the crank is rotated, the crushing rolls will turn at differential speed and the agitator D will shake the sifter plates to cause flour to sift on the rolls to coat those portions of the rolls that are moving toward the grain for crushing or flaking the same. This sifting operation is continued as long as the crank is turned so that there is no danger of the grain sticking to the rolls, and, of course, the grain flakes will take up the Graham flour which renders the food product more wholesome and nutritious. In other words, a flour-coated cereal product is obtained, which is new, so far as I am aware. The scrapers 40 insure proper cleaning of the rolls so that gumming will be prevented. The flaked grain will drop from the rolls into a suitable receptacle, and by finally toasting the flakes, the food product will be finished.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

In the claims the expression "flour coated" is not to be taken in any restricted sense, but includes any ground cereal. Corn meal and Graham flour are particularly recommended for use.

Having thus described the invention, what I claim and desire to secure by Letters Patent, is:—

1. A mill for producing a flour-coated cereal product comprising coacting crushing rolls, means for feeding grain between the rolls, and means for powdering the rolls with flour to prevent the grain from sticking to the rolls, the flour and grain being pressed together by the rolls and caused to adhere.

2. A mill for producing a flour-coated cereal product comprising a pair of co-acting crushing rolls, a hopper for feeding grain while in a softened state to and between the rolls, and means for feeding flour to both rolls at opposite sides of the hopper, the flour and grain being pressed together by the rolls and caused to adhere.

3. A mill for producing a flour-coated cereal product, comprising a pair of coacting crushing rolls, and a hopper mounted over the same and divided into separate compartments for simultaneously feeding the softened grain to be flaked and powder for coating the rolls to prevent the grain from adhering thereto, the grain and powder being pressed together by the rolls and caused to adhere.

4. A mill for producing a flour-coated cereal product, comprising a pair of coacting crushing rolls, means for feeding softened grain thereto, and devices for sifting flour upon the rolls at points in advance of the crushing portions of the rolls, whereby the grain and flour are pressed together and caused to adhere.

5. In a mill for producing a flour-coated cereal product, the combination of a pair of coacting crushing rolls, a hopper mounted over the same and divided into central and end compartments for holding grain and flour respectively, the central compartment being open to permit softened grain to feed by gravity to the rolls, and devices at the bottom of the end compartments for sifting flour upon the rolls, the grain and flour be-

ing pressed together by the rolls and caused to adhere.

6. A mill for producing a flour-coated cereal product comprising a pair of coacting crushing rolls, a hopper mounted in cooperative relation thereto, plates dividing the hopper into central grain and end flour compartments, said plates having their lower ends spaced apart to permit softened grain to feed by gravity to the rolls, sifter plates at the bottom of the end compartments coöperating with the first-mentioned plates for supplying flour to the rolls, and means for agitating the sifter plates, the flour and grain being pressed together by the rolls and caused to adhere.

7. A mill for producing flour-coated cereal product comprising coacting crushing rolls, a hopper divided into central grain and flour compartments, the central compartment being open at its lower end at a point above the meeting portions of the rolls to deliver softened grain thereto, sifting devices at the bottoms of the end compartments for sifting the flour upon the rolls, and an agitator common to the said devices, the flour and grain being pressed together by the rolls and caused to adhere.

8. A mill for producing a flour-coated product comprising coacting crushing rolls, a hopper above the same, partitions in the hopper dividing the same into central and end compartments and arranged with their lower ends spaced apart to permit softened grain to feed from the central compartment to the rolls, removable downwardly-inclined plates at the lower ends of the end compartments having their lower edges serrated and in contact with the partitions, and an oscillatory agitator mounted on the hopper and engaging the said plates for agitating the same to permit flour to sift from the end compartments upon the rolls, whereby the grain and flour are pressed together by the rolls and caused to adhere.

9. A mill for producing a flour-coated cereal product comprising a pair of coacting crushing rolls, a hopper disposed above the same and open at its bottom, removable partitions in the hopper dividing the same into central and end compartments, removable sifter plates extending across the lower ends of the end compartments with their lower edges in contact with the partitions above the lower ends thereof, an oscillatory agitator mounted on the hopper and having oppositely-extending arms engaging said plates for agitating the same, and rotary means for actuating the agitator, whereby the grain and flour are pressed together and caused to adhere.

10. A mill for producing a flour-coated cereal product comprising coacting crushing rolls, a hopper divided into separate grain and flour-holding compartments, each of

which communicates with the rolls, a device operating continuously during the rotation of the rolls for sifting flour from the flour compartment onto the rolls simultaneously with the delivery of the grain to the rolls from the grain compartment, whereby the flour and grain are pressed together and caused to adhere.

11. A mill for producing a flour-coated cereal product comprising coacting crushing rolls, a hopper, means for operating the rolls, means for feeding to the rolls the grain to be crushed, flour-containing compartments in the hopper, devices between the compartments and rolls for sifting flour upon the latter, an agitator mounted on the hopper and operatively connected with the devices, and means for actuating the agitator by the roll-operating means, whereby the grain and flour are pressed together and caused to adhere.

12. A mill for producing a flour-coated cereal product comprising a pair of coacting crushing rolls, means for rotating the same including intermeshing gears, means for feeding grain to the rolls, and devices operated by one of the gears for sifting flour on the rolls.

13. A mill comprising coacting rolls, intermeshing gears for driving the rolls simultaneously, sifting means arranged above the rolls for sifting material upon the latter, and a common device forming an agitator for the said means and a pawl for the gears.

14. A mill for producing a flour-coated cereal product comprising coacting crushing rolls, a hopper for feeding thereto the grain to be crushed, devices for sifting flour upon the rolls, an agitator for the devices, a spring acting on the agitator, and a toothed gear cooperating with the spring for oscillating the agitator.

15. A mill for producing a flour-coated cereal product comprising coacting crushing

rolls, a hopper disposed above the rolls and including separate grain and flour-containing compartments, sifting devices under the flour compartments and projecting from opposite sides of the hopper, an oscillatory agitator pivoted on the front side of the hopper and having oppositely-disposed members engaging the devices, a gearing for turning the rolls together, an arm connected with the agitator and arranged to engage the gearing to receive an oscillatory movement therefrom, and means for yieldingly holding the arm in cooperative relation with the gearing.

16. A mill comprising coacting rolls, a hopper disposed above the same, downwardly-converging removable plates in the hopper having their lower ends spaced apart at a point above the rolls to direct material to the latter, and additional removable plates disposed between the first-mentioned plates and cooperating therewith to form a material-holding compartment.

17. A mill comprising coacting rolls, a hopper disposed in cooperative relation thereto, oppositely-disposed plates between which the material is fed to the rolls, means for removably supporting the plates in the hopper, and additional removable plates extending between the first-mentioned plates at the edges thereof and having their lower ends set inwardly from the ends of the rolls, the upper ends of the last-mentioned plates being formed into members arranged to engage over the opposite walls of the hopper to support the plates to position.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

SAMUEL L. MOSER.

Witnesses:

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A. K. HALL.