

(No Model.)

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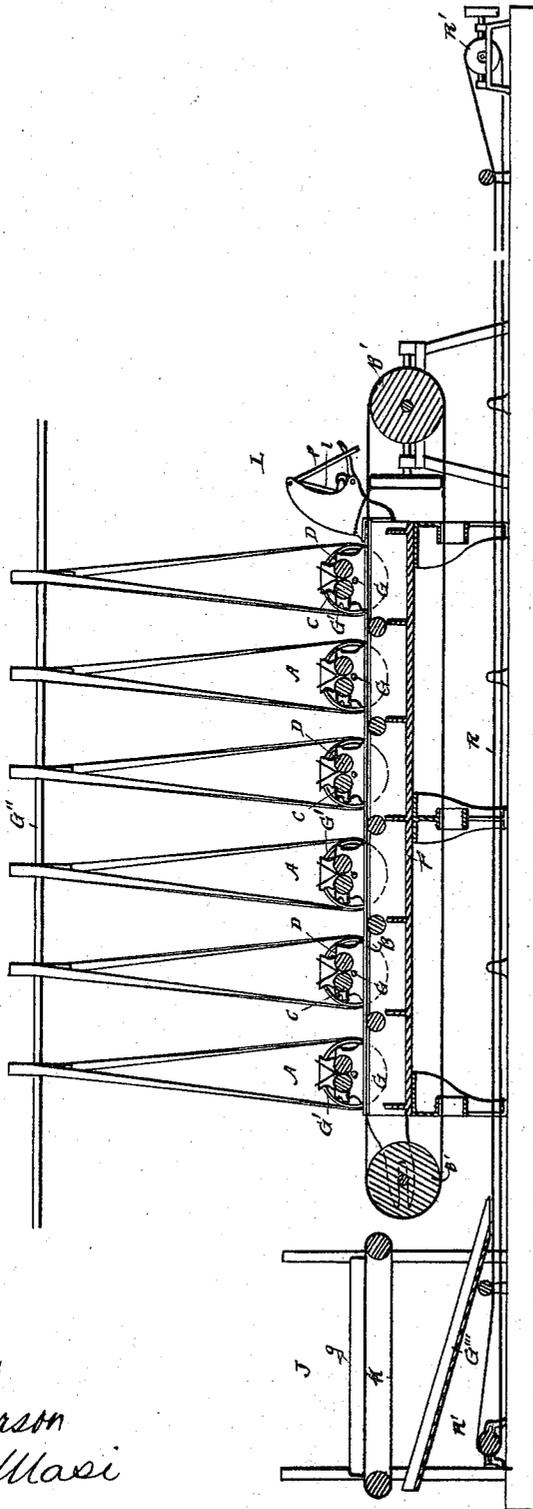
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MACHINE FOR REDUCING AND PREPARING CEREALS FOR FOOD.

No. 571,284.

Patented Nov. 10, 1896.

Fig. 1.



WITNESSES

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(No Model.)

4 Sheets—Sheet 4.

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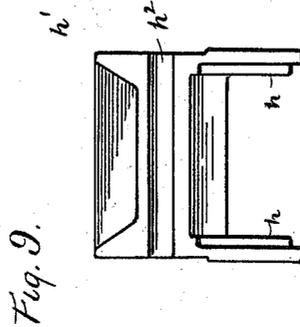
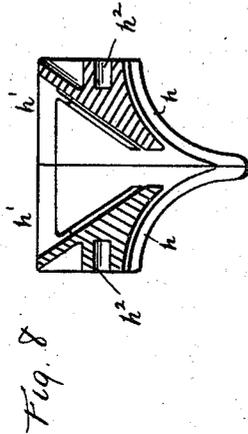


Fig. 8.

Fig. 9.

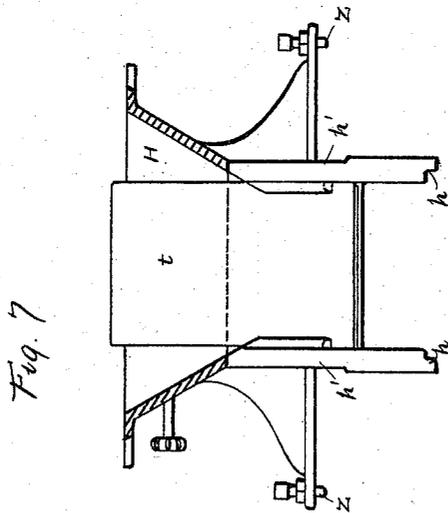


Fig. 7.

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MACHINE FOR REDUCING AND PREPARING CEREALS FOR FOOD.

SPECIFICATION forming part of Letters Patent No. 571,284, dated November 10, 1896.

Application filed February 7, 1896. Serial No. 578,394. (No model.)

To all whom it may concern:

Be it known that I, HENRY D. PERKY, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for the Reduction and Preparation of Cereals for Food; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of a central vertical section through the machine. Fig. 2 is an end view of the cutter-head and supporting-frame receiving-belt section. Fig. 3 is a central vertical section through the cutter-head with roller C broken to show cam at back. Fig. 4 is a sectional view of the section-cutter. Fig. 5 is an end view of the trough-feeder. Fig. 6 is a perspective view showing the troughs and the function of the section-cutter, the knife of the same being in dotted lines. Fig. 7 is a sectional view of one of the hoppers of the reducing-machines detached, the plane of section being at right angles to that of the section shown in Fig. 2. Fig. 8 is a detail view, partly in section, of the sectional hopper-walls *h'* detached. Fig. 9 is a side view of the same.

The object of this invention is to provide a competent and efficient machine for the reduction of grain in large quantities to thread-like or shredded form wherein the exterior and interior portions of the grain-berry are properly commingled and suitable rapid disposition of the reduced product in layers sectionally divided and arranged for convenience in the manufacture of biscuits or forms of bread is effected.

In carrying out this invention I provide upon a suitable frame F a series of reducers or shredding-heads A, which are arranged in line with each other, as indicated in the drawings, Fig. 1. Each reducing-head is provided with a pair of reducing-rolls C and D, preferably, whereof one roll, C, is grooved. The grooves of the roll extend circumferentially

and are of small or fine character and usually V-shaped in cross-section. The number of grooves may be about twenty to the inch. A groove being a width of one-fiftieth of an inch by about the same depth and a bottom surface of about one-sixth of the depth will serve an excellent purpose. The back roll D of the pair or set is smooth and its cylindrical surface is designed to be in exact and neat contact with that of the grooved roll. The rolls are geared together to run in contact, as indicated at E. The bearings for one of the rolls, preferably the back roll, are adjustable, as indicated at *d*. The rolls are provided with annular rabbets at their ends, as indicated at *c*, to form bearings for the inside faces of the concaves *h* of the lateral walls *h'* of the hopper H, which is removable. The grooved roll is provided with a circular notched cam C' at each end. Corresponding notches in the two cams should, as is obvious, be exactly opposite each other.

G indicates the driving-shaft, carrying a clutch-pinion G^x, adapted to engage the gear-wheel G^a of the front roll. The shifting-lever engages the clutch and enables the operator to disengage the driving mechanism from the rolls of the head in an instant, causing said rolls to cease working. Each drive-shaft is provided with a pulley G', which is belted to a line-shaft G'', whereby all the rollers of the reducing-heads are run at the same speed.

Each reducing-head is provided with a comb or scraper *a*, which is provided with teeth to engage the grooves of the roller C. A spring-actuated cleaner *b*, located in inclined position above the comb, is carried by the lever-arms *e*, which are provided with adjustable lugs *e'* to engage the notched cams of the grooved roller. This cleaner thereby has an intermittent motion toward the surface of the grooved roller and serves to push back to this roller such accumulations of the product material as may occur upon the comb or scraper *a*.

It may sometimes happen that the rabbeted bearings upon the end portions of the two rolls may not be exactly in alinement with each other. It is therefore advisable to provide the hopper with means whereby it can be adjusted to suit such a condition. To this end the lower portion of the hopper is made in two

sections h' , which are separate from the main frame H' , each section having a sliding engagement with said frame, as indicated at h^2 . The concaves h are formed on these sections, as shown in Figs. 7 and 9. By this construction it will be apparent that each section h' can be adjusted to suit its bearings on its subjacent roll independently of the other section.

Inclined cut-off slides f are seated in ways of the hopper-walls and are provided with rack-and-pinion devices f' in order to adjust the feed of the grain to the rolls or to cut it off. The inclination of the slides enables the operator to cut the flow off close to the rolls. The hopper is supported upon adjustable set-screws, as at Z .

Underneath the series of reducing-heads the frame F is provided with a series of idler-rollers for the feed branch of the endless receiver-belt B and below this with a return-way. The traveling belt B is provided with lateral studs or guides b^2 . B' indicates the driving and take-up pulleys for this belt.

At one end of the machine is provided a trough-feeding ledge or table J , having an adjustable guide or flange g (see Fig. 5) to insure feeding the troughs or sectional receivers I (see Fig. 6) in line with the receiver-belt B . This table is provided with a short feeding-belt K , which is designed to be driven at a speed somewhat faster than that of the main belt B , in order to insure closing the troughs or sectional receivers in abutted end-to-end position on the main belt. These sectional receivers have lateral flanges or walls and are open at their ends, which are shod with metal, as indicated at I^2 , to avoid undue wear. At one end each trough is provided with catch lugs or projections I' for the automatic operation of the cutter m . This cutter (see Fig. 4) is secured upon the frame beyond the last reducing-head. Its frame is provided with bearings for the parallel-motion hanger l , to which is secured the knife-frame N , carrying the knife m , which is connected to said frame by a retracting-spring N' . This frame or carriage is provided with lugs at its lower corners, as indicated at n , which are designed to be engaged by the catch projections I' of the sectional receivers I . A lever K^2 is pivoted to the hanger and engages a bearing of the knife by one of its arms. Its other arm, usually provided with an antifriction-roller, engages a cam-arm N^2 , which is pivoted to the fixed frame of the cutter and is counterbalanced, as at N^3 , to give it an upward motion to engage the trip-arm p . The hanger l is returned to normal position by means of the weighted arm W .

The grain, having been boiled, salted, and dried to proper consistency, as explained in Letters Patent No. 548,086, dated October 15, 1895, is fed into the hoppers of the reducing-machines and is reduced by their grooved rollers to shred or thread like form, each head

depositing a layer of the shred-like product upon the traveling sectional receiver. As these layers are deposited in succession the thickness of the product upon the receiver is gradually increased to the extent desired, in accordance with the number of reducing-heads composing the machine or such proportion of them as may be in gear. In order to form biscuit of fair size, I design to employ some thirty-odd heads in the gang. As each trough or section of the receiver engages the hanger of the cutter the knife-frame is swung forward and the knife is automatically reciprocated vertically in such a manner as to transversely divide the product into sections at the junction of the trough with the preceding one. The cam-arm of the cutter striking the trip-arm becomes disengaged, the trough passes forward, and the hanger returns to original position. The cam-arm rises and is set in engagement with the trip, ready for the next receiver section or trough. Below the receiver-belt is the trough return belt R , which runs upon a roller-way and is provided with driving and adjusting pulleys (indicated at R' .) An upwardly-inclined chute G''' is provided under the trough-feeding table J and serves to raise the troughs automatically to suitable position to be taken by an attendant and fed onto the belt K .

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a series of reducing or shredding heads, the endless carrier-belt arranged to travel below the said heads, a series of open-ended receivers designed to be carried on said belt, a cutting device located over the rear portion of said belt and adapted to be operated by the engagement therewith of the receivers as they pass thereunder, and means whereby said receivers may be again returned to feeding position, substantially as specified.

2. The combination of the series of reducing or shredding heads arranged in line, the roller-way below said heads, the endless belt arranged to run over said way, the feed-table at the front end of said belt, its feed-belt in line with the first-named belt and designed to be driven at a slightly greater speed, the sectional receivers, the automatic cutter, and the return belt and chute, substantially as specified.

3. The combination with the series of reducing-heads, the endless belt thereunder, and the sectional receivers having the trip-lugs or projections, of the section-cutter, having the parallel-motion hanger, the knife-frame secured to said hanger, and having trip-lugs for engagement with the lugs of said receivers, the knife, its retracting-spring and the cam-and-lever devices for forcing said knife to its work, substantially as specified.

4. The combination with the receivers having trip or catch lugs, of the parallel-motion

hanger, the knife-frame secured to said hanger and adapted to be engaged by the said trip or catch lugs, means whereby said engagement and the movement of the hanger caused thereby, causes the knife to descend to its work, and means for retracting the knife after the cut has been made and for returning the hanger to normal position, substantially as specified.

5. The section-cutter having the parallel-motion, counterbalanced hanger, the cutter-frame secured thereto and having a trip-lug or projection, the cutter, the retracting-spring therefor, the counterbalanced cam-lever, the trip-lever which secures said cam-lever in operative position, and the lever having one arm engaging a bearing of the knife and its outer arm engaging the said cam-lever, substantially as specified.

6. In a grain shredding or reducing machine, the combination with a pair of reducing-rolls one of which is circumferentially grooved, and the comb or scraper for removing the product from the grooved roll, of the inclined scraper arranged to play back and forth upon the upper surface of said scraper, a pair of oscillating, spring-actuated, pivoted levers to which said scraper is attached, notched cams upon the shaft of one of the reducing-rolls, and adjustable lugs carried by

said levers and engaging the respective cams, substantially as specified.

7. A grain shredding or reducing machine having a pair of rolls or cylinders journaled to rotate in neat contact with each other, one of said rolls or cylinders being circumferentially grooved, the hopper having the sectional, adjustable lateral walls provided with bearings on the ends of said rolls, the cut-off slides seated in ways of the hopper-walls, the driving mechanism for said rolls or cylinders, and clutch-gear whereby said rolls or cylinders may be disconnected from the driving mechanism, substantially as specified.

8. In a grain reducing or shredding machine, the combination with the reducing-rolls having the rabbeted end portions, of the vertically-adjustable hopper having a bearing upon said rabbeted end portions, the bearing-sections of the hopper being separate from the main frame of the hopper and capable of an independent endwise adjustment with relation to the said rolls, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY D. PERKY.

Witnesses:

S. N. ROGERS,
J. M. STANLEY.