No. 615,177. Patented Nov. 29, 1898.

J. C. HOLLOWAY.

GRAIN PEARLING MACHINE.

(Application filed Oct. 22, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

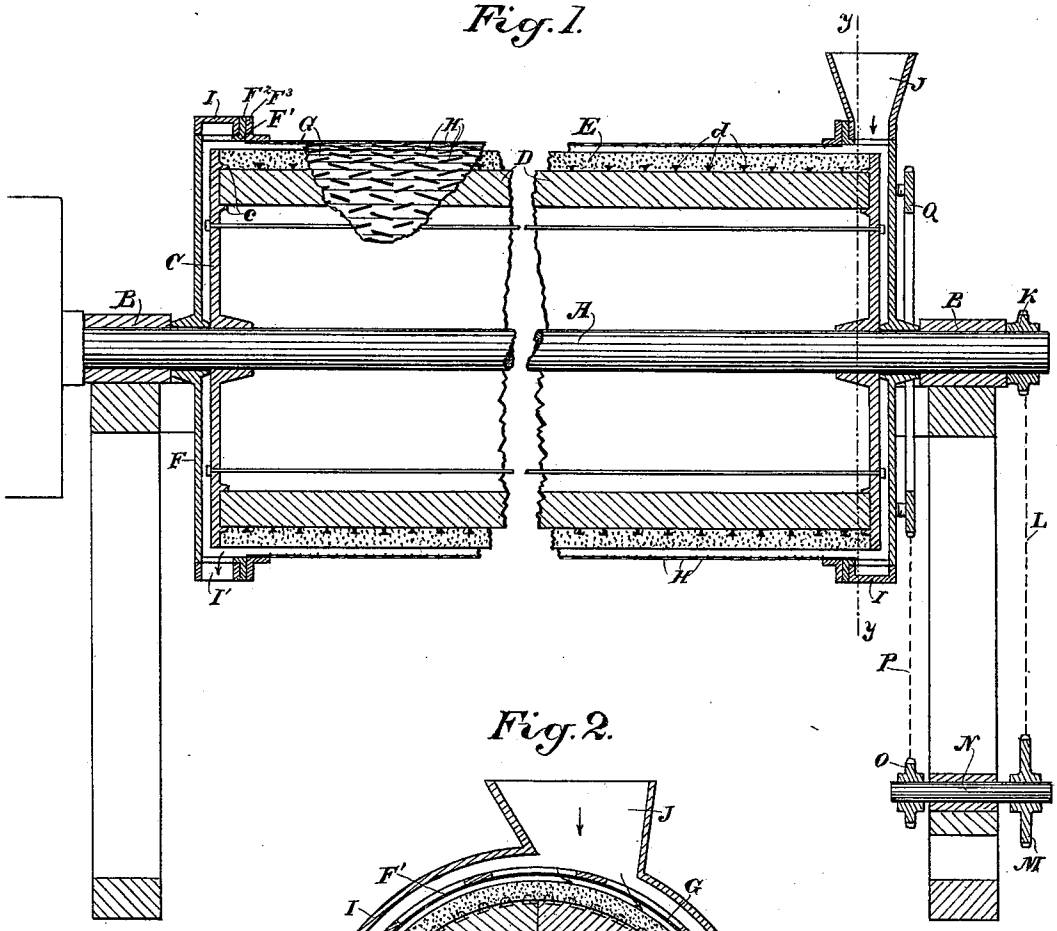
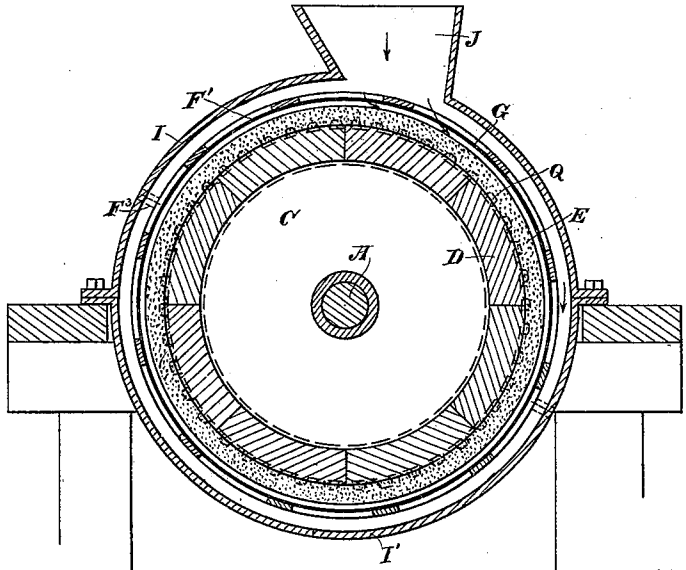


Fig. 2.



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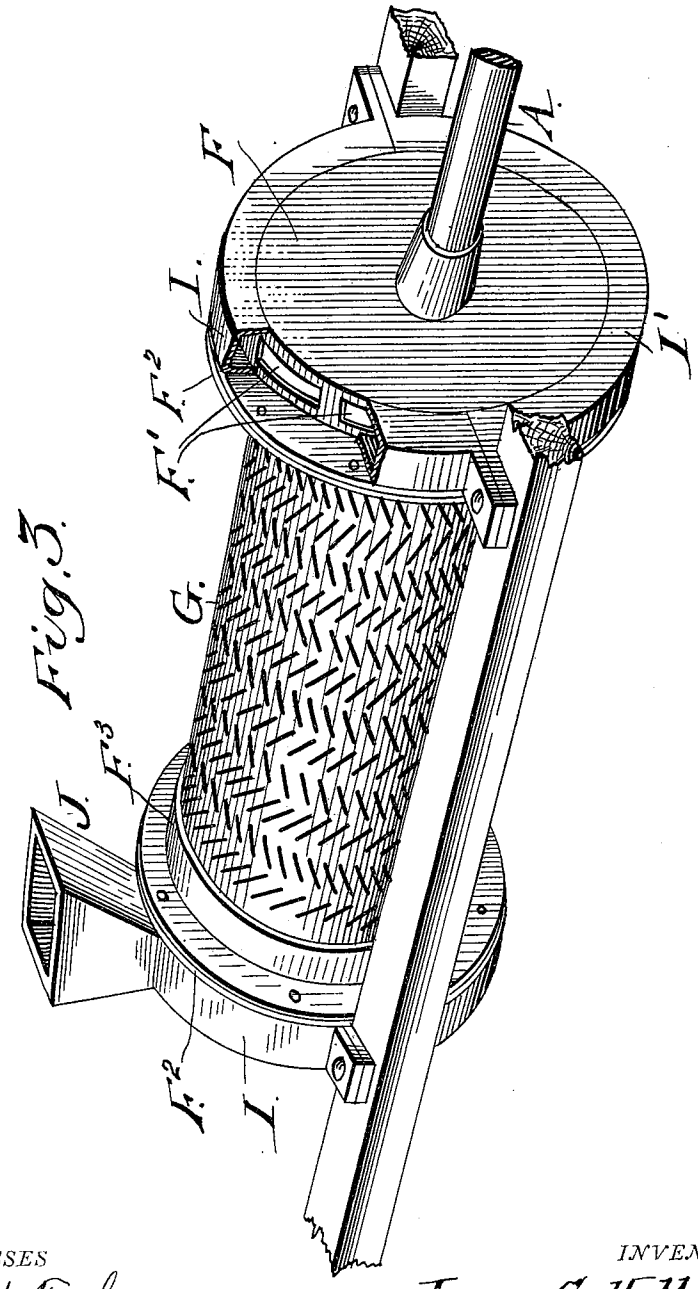


Fig. 3.

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UNITED STATES PATENT OFFICE.

JAMES C. HOLLOWAY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF FOUR-FIFTHS TO JOHN F. CUNNINGHAM AND CHARLES E. GROSJEAN, OF SAME PLACE.

GRAIN-PEARLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 615,177, dated November 29, 1898.

Application filed October 22, 1897. Serial No. 656,049. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. HOLLOWAY, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Grain-Pearling Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which is especially designed to carry out the operation known as "pearling" barley or other grains.

It consists of means for producing a continuous feed and discharge, comprising, essentially, rotary concentric drums, a stationary annular feed device at one end, and a corresponding discharge device fitting the other end of the drum, means for propelling the exterior and interior drums at different rates of speed, means to evenly distribute the grain within the apparatus, and in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section taken through the apparatus. Fig. 2 is a transverse section of the same on line *y y* of Fig. 1. Fig. 3 is a perspective view of the machine with parts broken away.

In the process known as "pearling" barley and other grains it has hitherto been customary to place the grain to be treated in an apparatus and work it in independent charges, each charge being completed and removed before a new charge was introduced.

In my invention I have made the operation continuous, so that the grain is fed in at one end and discharged completed at the other end without cessation or interruption.

In the ordinary form of apparatus there is a tendency of the machine to work unevenly and crowd the grain to one end, so that the work is retarded, and I prevent this by my improved construction.

In carrying out my invention I have here shown a cylinder mounted upon a shaft A, which is journaled in suitable bearing-boxes, (shown at B.) The cylinder has heads C fixed to the shaft. These heads are in the form of disks having inwardly-projecting annular flanges, as shown at *c*, these flanges being separated sufficiently to receive the ends of the wooden lagging D, which is fitted therein and forms a foundation for the composition E. The composition is of the nature of concrete or some emery-containing substance and is spread over the outside of the drum D, forming a complete inclosing cylinder. From the surface of the drum D pins project, having heads, as shown at *d*, and these heads are embedded in the composition when the latter has been applied to the surface of the cylinder D, and thus hold it in place and prevent its flying off by the centrifugal motion of the cylinder when in operation. Exterior to the head C are the heads F, which turn loosely upon the shaft A. These heads are formed, as shown in section, with short annular flanges F′ projecting toward each other, concentric with the ends of the cylinder D and standing a short distance outside thereof, so that there will be a channel extending all the way around. At the inner ends the flanges F′ are again turned outward, as shown at F^2, and to these flanges are bolted the angular flanges F^3. These angular flanges serve to support the exterior sheet-metal casing G, which entirely surrounds and incloses the composition cylinder E, and this casing has punched through it slits, as shown at H. A peculiarity in the construction of this casing as shown in my invention is the diagonal arrangement of these slits, so that one pair of slits surrounding the cylinder converge toward each other. The next row will form a divergence with the second of the first pair and the following one will again converge, and so on from one end to the other of the cylinder, as shown. This construction prevents the tendency to carry the grain too rapidly from one end to the other of the cylinder, as the tendency of one diagonally-arranged set of slits is counteracted by the angle of the next adjacent ones, and the grain is thus evenly distributed over the operating-surface. As these slits are punched from the outside the edges of each one form projections inwardly, and between these and the composition cylinder E the

grain is agitated and triturated until it is reduced from its elongated shape to the globular form known as "pearled."

In order to feed and discharge the grain, I have shown at each end an annular inclosing case I, which is supported from some portion of the framework of the machine, so that it remains stationary while the cylinders rotate within it. The inturned edges or flanges of this casing fit upon the exterior periphery of the flanges F′ of the heads F, as shown. Upon this annular casing I is the feed-hopper J. This hopper is set a little in advance of the vertical line in the direction in which the interior cylinders rotate, and thus determines the direction of delivery of the grain. The flanges F′ are formed with alternate spaces and ribs, and through the spaces in these flanges F′ grain passes into the annular space between the composition cylinder E and the exterior casing G, previously described. The inner cylinder is driven by a belt-pulley or other connection, through which power is applied to the shaft which carries it. The end of the shaft has a sprocket-wheel K fixed upon it, and a chain L passes from this sprocket-wheel to a sprocket-wheel M upon a journaled counter-shaft N. Upon the opposite end of the counter-shaft N is a small sprocket-pinion O, and a chain P passes around this pinion and around the sprocket-wheel Q, which is fixed to the head F of the outer cylindrical casing. This sprocket-wheel Q is of much larger diameter than its driving-pinion, and by this difference the speed at which the outer cylinder rotates is considerably less than that of the inner cylinder. The two cylinders thus travel in the same direction, but the greater speed of one over the other causes a constant trituration of the grain, which eventually produces the characteristic form desired. The discharge at the opposite end of the cylinder takes place through the flange F′ at that end and through a discharge-opening made in the lower part of the exterior annular and stationary ring I′ at that end. The supply at the feed end is made continuous and is admitted at such a rate as will equal the rate of discharge at the opposite end, and the operation thus becomes complete and continuous.

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

1. In an apparatus for pearling barley, the combination of concentric cylinders, separated from each other to provide a confined passage for the grain, one of said cylinders having end heads and an imperforate circumference and the other cylinder having end heads and an abrading or roughened surface opposing the surface of the first-named cylinder, a shaft to which the heads of the inner cylinder are fixed and upon which the heads of the other cylinder are loosely mounted, said loose heads having inwardly-turned flanges inclosing the ends of the inner cylinder and provided with openings for the passage of grain to and from the space between the cylinders, and means for rotating the cylinders at different rates of speed in the same direction.

2. In an apparatus for pearling grain, the combination of a horizontally-journaled driving-shaft, heads fixed thereto and having inwardly-projecting flanges, staves extending from one head to the other and having their ends fitted to said flanges to form a continuous drum, said staves having headed pins fixed to them, a composition forming the circumference of the cylinder and retained thereon by the embedding of the heads of the pins therein, a cylinder exterior to and separated from the composition-coated cylinder and having end heads loose on the shaft, said loose heads having inwardly-extending flanges extending over and separated from the ends of the inner cylinder, and provided with openings for the passage of the grain, and said exterior cylinder having slots punched in it from the exterior so as to produce an interior roughened surface to oppose the composition surface of the inner cylinder and means for rotating the cylinders at different rates of speed in the same direction.

3. In a machine for pearling barley, the combination of concentric cylinders, having opposing grinding-surfaces between which the grain passes, a shaft to which the inner cylinder is fixed and upon which the outer cylinder is loosely mounted, the end heads of the outer cylinder having inturned flanges inclosing the ends of the inner cylinder and provided with openings through which the grain passes, a supply-hopper communicating with the openings in one of said heads and a stationary casing inclosing each of the apertured heads, one of said casings having a discharge-opening, and means for rotating the outer cylinder in the same direction with but at a different rate of speed from the inner cylinder.

4. In a machine for pearling barley, the combination, of a driving-shaft and a cylinder fixed thereto and having an abrading-surface, an exterior cylinder having a roughened inner surface to oppose the surface of the inner cylinder, flanges secured to the ends of the outer cylinder and heads loose on the driving-shaft and provided with inturned flanges inclosing the ends of the inner cylinders and upturned and secured to the flanges on the ends of the cylinder, and concentric inclosing casings for the loose heads, said inturned flanges of the heads having openings leading to the inclosing casings and communicating with the space between the cylinders whereby a continuous feed and discharge is produced at opposite ends of the cylinders.

5. In a machine for pearling barley, the

combination, of an inner cylinder having a composition-coated exterior, an outer cylinder having oppositely-inclined slits arranged in alternate series and made from the outside to form an interior roughened surface adapted to oppose the composition surface of the inner cylinder, a stationary feed-ring at one end of the outer cylinder and a stationary discharge-ring at the opposite end thereof and means for rotating the cylinders at different rates of speed in the same direction.

In witness whereof I have hereunto set my hand.

JAMES C. HOLLOWAY.

Witnesses:
GEO. H. STRONG,
S. H. NOURSE.