Dec. 18, 1928. 1,696,048

F. H. McCORMICK ET AL

MACHINE FOR THE PICKLING OF GRAIN

Filed April 21, 1926

Fig. 5.

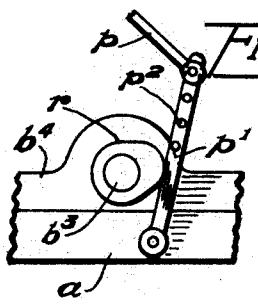


Fig. 1.

Fig. 3.

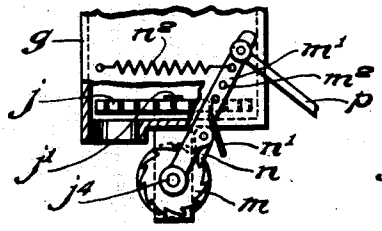


Fig. 4.

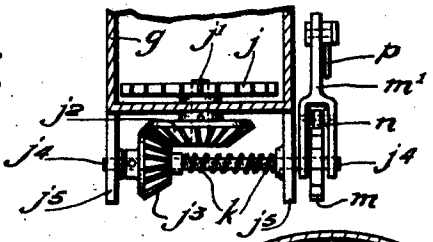


Fig. 2.

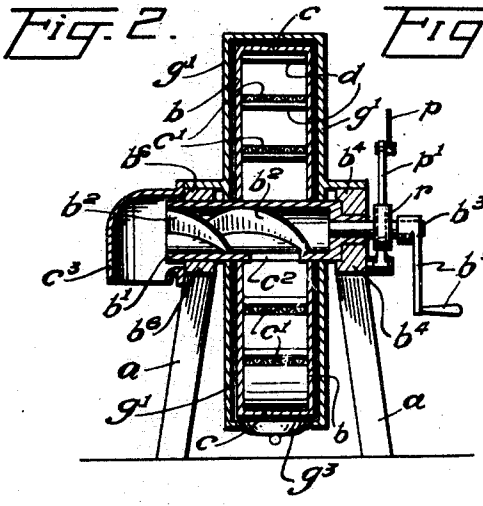
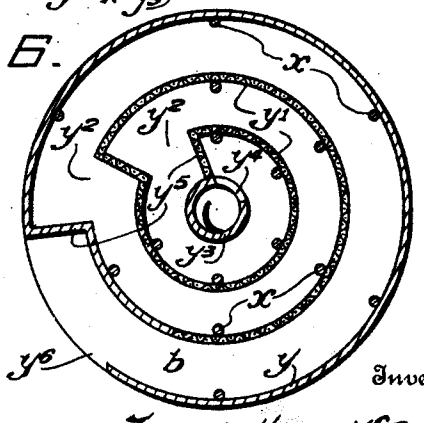


Fig. 6.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR THE PICKLING OF GRAIN.

Application filed April 21, 1926, Serial No. 103,587, and in Australia November 23, 1925.

This invention relates to a machine either for the dry or wet pickling of grain and whereby such pickling is performed in a free and continuous manner so that the pickling agent is caused to intimately adhere to each grain. The chief structural feature of the invention in its preferred form consists of a rotatable chamber held within a tight sealed and dust proof casing, said chamber having a convoluted wall which, for portion of its length, is solid and the remaining portion is perforated or made of meshed material. The grain with the pickling agent is caused to pass through the passage formed by said wall during the rotation of the chamber to effect the pickling operation. The grain is fed from a hopper through an inlet in the casing and a peripheral opening in the chamber and discharged through one end of a hollow hub within which is mounted a spiral blade. As an alternative construction of said chamber the walls may be arranged concentrically and be of a circular, hexagonal or other form. A further structural feature resides in the means employed for feeding the pickling agent in an intermittent and adjustable manner so that each oncoming body of grain punctually receives its predetermined quantity of pickling agent. These and other features, together with the operation of the machine, will now be described with the aid of the attached drawings wherein Fig. 1 is a side sectional elevation of one embodiment of the invention. Fig. 2 is an end sectional view of same from which the hopper and operative members for the pickling agent are omitted. Fig. 3 is an enlarged sectional view of the hopper and mechanism for the feed of the pickling agent. Fig. 4 is a sectional view on line 7—7 of Fig. 3. Fig. 5 is an enlarged view showing the cam drive for the feed mechanism. Fig. 6 is a side sectional view of an alternative construction of the pickling chamber wherein the walls are of a concentric circular form. In Figs. 1 and 3 the bevel gear of the pickling hopper is omitted for sake of clearness. Referring to said drawings. The machine is mounted on a frame a and comprises a substantially cylindrical chamber b secured to a hollow hub b^1 and mounted to rotate in a substantially cylindrical casing g^1 with its outer wall in close contact with the interior of the casing. A spiral blade b^2 is mounted in the hollow hub b^1 and one end of said hub is closed and of reduced diameter. The reduced end of the hub b^1 is secured to a shaft b^3 rotating in an end bearing b^4. The shaft b^3 is provided with a handle b^5 whereby the machine is rotated or same may be rotated by motive power. This hollow hub at its other or open end rotates in the bearing b^6. Between the two cheeks of the chamber b is secured a convoluted wall which for portion as c of its length is solid and of which the remaining portion c^1 is of a perforated or meshed formation. This convoluted wall c—c^1 has one end connected to the hollow hub b^1 and the passageway formed by the convolutions communicates with the interior of the hub b^1 through an opening in the periphery of the latter. The open end of the hub b^1 extends into a hood e^3 carried by the casing g^1 and to which a bag (not shown) may be attached for the reception of the pickled grain. The convoluted wall c—c^1 is provided with transverse ripples or corrugations d whose purpose is to cause an agitation of the grain and pickling agent during the pickling operation. A hopper e having an inclined bottom f and provided with a vertically slidable door e^1 formed with exit port e^2 is connected to an inlet in the periphery of the casing g^1 through which the grain is fed to the open end of the convoluted passageway of the chamber b, the area of discharge for said grain being adjusted by raising or lowering said door e^1. The grain descends from the hopper e to a low position within the casing g^1 and, when the chamber is rotated, the grain enters same through the open end of the convoluted passageway chamber b when said open end registers with the grain inlet of the casing g^1 as seen in Fig. 1. The dry pickling agent is delivered from the hopper g located at a high position on the tight sealed and dust proof casing g^1 to the pickling agent inlet of the casing g^1 through a pipe g^2. At a low position the casing g^1 has an opening closed by a door g^3 through which opening the excess pickling agent is removed. A star-shaped wheel j in the lower part of the hopper g is the vertical spindle j^1 which is rotated through a pair of bevel wheels j^2—j^3, one of which j^3 is keyed on the horizontal spindle j^4 working in bracket bearings j^5. On this spindle j^4 as seen in Fig. 4 is coiled a spiral spring k has

its opposite ends bearing against the wheel j^3 and one of the bearings j^5, the object of this spring being to check any return movement of the spindle j^4 and resultant excess feed of the pickling agent. On the outer end of said spindle j^4 is keyed a ratchet wheel m receiving motion through forked arm m^1 hinged on spindle j^4 and having thereon a pivoted drop pawl n which, when it is desired to stop the feed of the pickling agent, is lifted out of engagement with said ratchet wheel and held by bridle n^1 hinged on said arm m^1. A spiral spring whose function is to return the arm m^1 to its normal or idle position is connected to the hopper g and arm m^1. This arm m^1 is formed along its length with any number of holes m^2 whereby one end of the actuating rod p may be hingably and adjustably connected to said arm. The other end of said rod is hingably and adjustably attached to arm p^1 pivotally carried on the frame a and formed along its length with adjustment holes p^2 for said rod. The object of forming each of said arms m^1—p^1 with holes is to provide means for a more delicate adjustment of the feed of the pickling agent. The arm p^1 is intermittently rocked by a driving cam r keyed on the shaft b^3. An alternative construction of the pickling chamber is shown in Fig. 6 wherein the walls y—y^1 of the chamber are of cylindrical form and arranged concentrically and form between them passages through which the grain and pickling agent travels, said passages communicating with each other through peripheral openings y^2 and communicating with the central hub y^3 by the opening y^4 in the periphery of the hub. Adjacent to each of the openings y^2 is positioned a transverse baffle y^5 which causes the grain and pickling agent to pass through said openings.

The outer wall y is solid except for an inlet y^6 for the grain and pickling agent and the interiors of the walls are provided with ripples x.

The manner of using the machine is as follows:—

Assume that the unpickled grain and pickling agent are placed in their respective hoppers as e and g and that the rod p is adjusted in the holes m^2—p^2 of the arms m^1 and p^1 so as to determine the proportion of pickling agent to the feed of the grain. The chamber b is now rotated by handle b^5 and at each rotation the mouth of said chamber registers with the mouth of the grain hopper c consequently allowing a certain quantity of grain to enter the outer passage of chamber b, and said mouth, at each rotation, also registers with the mouth of the feed pipe g^2 from the pickling agent hopper g. During said rotation the grain and pickling agent b come intimately mixed during their travel through the passages between the walls c—c^1 of the chamber until the pickled grain is finally discharged through the hub b^1 and hood c^3 into a bag or other receiver. During the rotation of said chamber b the cam r makes intermittent contact against the arm p^1 and through rod p and associated members an intermittent rotary motion is imparted to the star wheel j for the feed of the pickling agent.

When a wet method of pickling is employed the feed mechanism of the pickling agent is disengaged as above mentioned and the pickling solution is placed in the chamber b which is rotated as above described in order to effect the pickling operation.

What we claim as our invention and desire to obtain Letters Patent, is—

1. An apparatus for pickling grain, comprising a casing having an inlet opening for grain adjacent its lower portion and having an inlet opening for pickling agent at its upper portion, a hollow hub extending lengthwise of said casing and rotatable in the latter, said hub having an opening in its periphery and having one end open and its other end closed, a chamber surrounding said hub and rotatable therewith, said chamber having an opening in its wall adapted, during the rotation of said chamber to successively register with the grain and pickling agent inlets of said casing.

2. An apparatus according to claim 1 wherein a spiral blade is mounted in the hollow hub.

3. An apparatus according to claim 1 wherein the casing is of cylindrical form and the exterior of the chamber is also of cylindrical form and fits closely against the interior of the casing.

4. An apparatus according to claim 1 wherein the chamber is provided on its interior with means adapted during the rotation of said chamber to mix grain and pickling agent delivered to said chamber through the opening in its wall and move said mixed grain and pickling agent toward the peripheral opening of the hollow hub.

5. An apparatus according to claim 1 wherein a grain delivery hopper having an inclined bottom is connected to the grain inlet of the casing and having means for regulating the rate of delivery of grain from said hopper to said casing.

6. An apparatus according to claim 1 wherein a hopper to contain pickling agent is connected to the pickling agent inlet of the casing and means associated with said hopper and actuated by the rotation of the hollow hub controls the rate of delivery of pickling agent from said hopper to said pickling agent inlet.

7. An apparatus according to claim 1 comprising a hopper to contain pickling agent connected to the pickling agent inlet of the casing, means in said hopper for con-

trolling the rate of delivery of pickling agent from the hopper to the pickling agent inlet of the casing, means intermittently actuated by the rotation of the hub for operating said controlling means, and means for adjusting said intermittently operated means for regulating the operation of said controlling means in timed relation to the registration of the opening in the wall of the chamber with the grain inlet of the casing.

8. An apparatus for pickling grain, comprising a substantially cylindrical casing having closed end walls and having in its periphery a grain inlet and a pickling agent inlet spaced apart from one another, a hollow hub rotatable in said casing coaxially with the latter, said hub having one end closed and having its other end open and extending through an end wall of the casing, said hub also having an opening in its periphery, and a chamber rotatable in said casing with said hub, said chamber comprising end walls and a strip having its side edges connected to said end walls and one of its end edges connected to said hub and being wound around said hub to form spaced convolutions with its outer convolution in close proximity to the interior of the casing and having its outer end edge spaced from its outer convolution to form an inlet to the space between said convolutions, said inlet, during the rotation of said chamber, alternately registering with the grain inlet and the pickling agent inlet of said casing.

In testimony whereof we have hereunto set our hands.

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