Sept. 6, 1927. 1,641,698

E. C. SHAW

PACKER

Filed Oct. 19, 1922

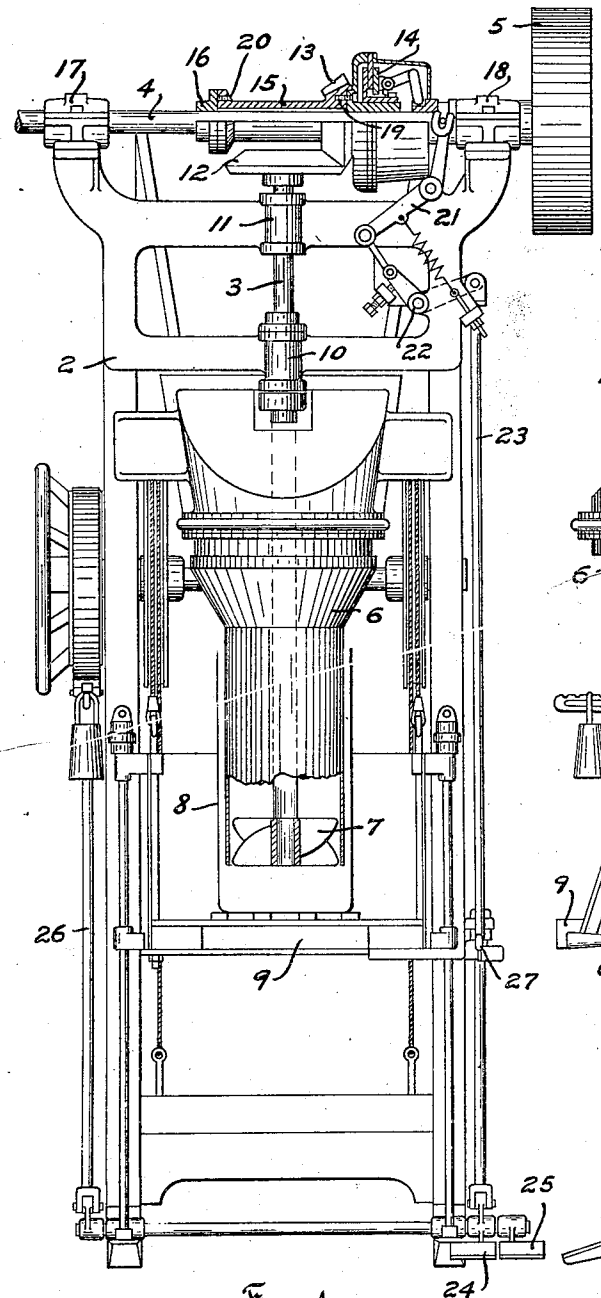


Fig. 1

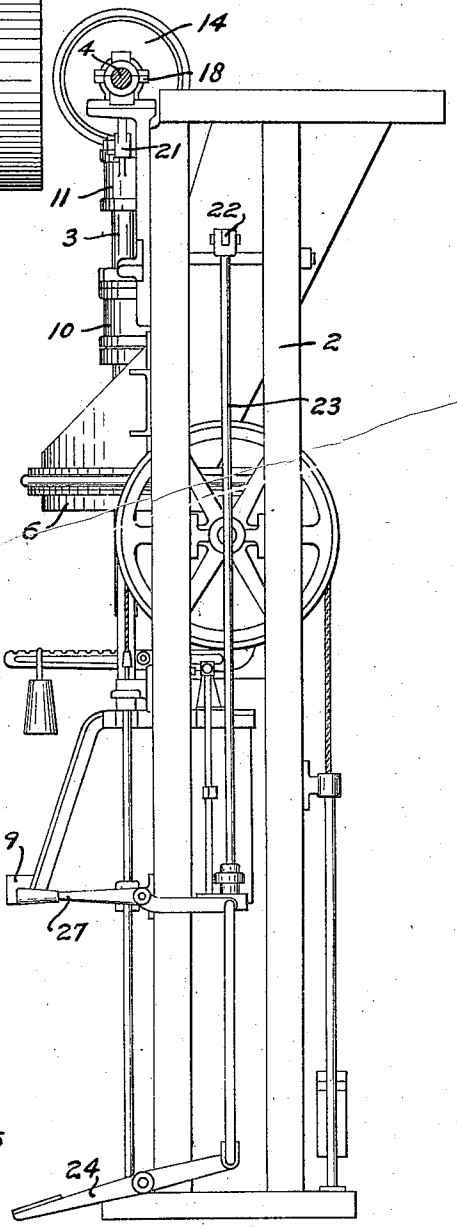


Fig. 2

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Patented Sept. 6, 1927. 1,641,698

UNITED STATES PATENT OFFICE.

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PACKER.

Application filed October 19, 1922. Serial No. 595,564.

This invention relates in general to improvements in the art of packing granular substances, and relates more specifically to improvements in the construction and operation of apparatus for delivering materials such as flour to receptacles such as fabric sacks.

An object of the invention is to provide a packer which is simple in construction and efficient in operation.

It has heretofore been common practice in the art of flour milling to utilize devices known as packers for delivering flour to sacks and for properly compressing the flour as delivered. These packers are ordinarily driven from a conveniently located line shaft in the flour mill. In order to properly pack the material delivered to the sacks, it is customary to employ augers all of which preferably rotate in the same direction and in one direction only. It has heretofore been difficult for manufacturers to furnish machines in which the augers would operate with the desired direction of rotation, irrespective of the direction of rotation of the line shaft, without making extensive structural changes. The present invention contemplates provision of a packer which may be furnished to any mill and connected up to any line shaft regardless of the direction of rotation thereof, while maintaining the proper direction of rotation of the auger. With the present invention the driving connection between the clutch and the auger may be readily reversed without in any manner affecting the efficiency of the drive or the convenience of operation of the packer.

Another objection to the prior packers is the fact that insufficient precaution is taken in their construction, to prevent oil and grease from intermingling with the flour passing through the machine. The bearings for the upright auger shafts of the prior machines are invariably located so that lubricant escaping therefrom will enter the material conducting spout. The present invention contemplates provision of means whereby lubricant cannot enter the spout, thereby eliminating undesirable entry of oil and grease to the flour conducting passage.

The invention further contemplates improvements in the construction of packers whereby such devices are improved as to durability and compactness as well as in general appearance and efficiency of operation.

A clear conception of the various features of the present invention and of operation of devices embodying the same, may be had by referring to the drawing accompanying and forming a part of this specification in which like reference characters designate the same or similar parts in the several views.

Fig. 1 is a front, part sectional view of an improved packer.

Fig. 2 is a side elevation of the improved packer.

The packer comprises generally a main frame 2, a spout 6 supported by the main frame, a feeding auger and stirrer for withdrawing material from the supply hopper at a uniform rate, a packing auger 7 located at the lower discharge end of the spout 6 and rotatable therein about a vertical axis, a vertical auger supporting shaft 3 extending centrally and upwardly through the spout 6 and supported in upper bearings 10, 11 carried directly by the main frame 2, a horizontal driving shaft 4 supported in laterally spaced bearings 17, 18 carried by the main frame 2, gearing connecting the auger shaft 3 and the driving shaft 4, a friction clutch 14 adapted to connect the driving shaft 4 with the gearing, and a pulley 5 for rotating the horizontal shaft 4. The main frame 2 is of rigid and relatively symmetrical construction, the bearings 10, 11, 17 and 18 being rigidly associated with the frame. The spout 6 is directed forwardly from the top of the packer and has a lower end adapted to enter a sack 8 as illustrated in Fig. 1. The spout 6 is of ordinary construction and is preferably formed of sheet metal. The augers 7 are of relatively standard design, being universally rotatable in one direction only. The auger shaft 3 the lower end of which is rigidly attached to the auger 7 has a bevel gear 12 rigidly attached to the upper end thereof above the upper bearing 11. The bearings 10, 11 are located above and entirely outside of the spout 6 and the point of penetration of the spout 6 by the shaft 3 is preferably sealed by means of a rectangular piece of felt or the like attached to the inner side of the spout top plate. By thus locating the bearings 10, 11 and providing suitable packing, oil or grease which may escape from the

bearings is positively prevented from entering the spout 6, and the bearings 10, 11 are freely accessible for lubrication and inspection.

The clutch 14 is fixedly associated with the horizontal drive shaft 4 at one side of the auger shaft 3 and between the bearings 17, 18. When the machine is viewed from the front, the clutch 14 is preferably located to the right of the auger shaft 3. One element of the clutch 14 is drivingly connected to the horizontal shaft 4 while the other element of the clutch is drivingly connected to a reversible sleeve 15 by means of cap screws 19. The sleeve 15 is disposed coaxial with the shaft 4 and has a bevel pinion 13 formed integral with one end thereof and coactable with the gear 12. A collar 16 is loosely mounted upon the shaft 4 and is coactable with an end of the sleeve 15. The end of the sleeve 15 opposite to the pinion 13 is provided with tapped holes 20 which are preferably in alinement with the tapped holes with which the cap screws 19 coact in Fig. 1.

The clutch 14 is operable by means of a lever 21 pivotally mounted upon the frame 2 and having a depending end connected with the upper end of an actuating rod 23 by means of a bell crank 22 pivotally associated with the frame 2. The lower extremity of the actuating rod 23 is provided with a foot operable actuating lever 24 while an intermediate portion of the rod 23 is provided with a hand operable actuating lever 27. The sack 8 which is to be filled, may be supported upon a carriage 9 which is vertically movable relatively to the frame 2. The construction of the carriage and its manipulating mechanism is relatively standard in this type of machine and instrumentalities are ordinarily provided whereby movement of the carriage 9 to its extreme positions will automatically operate the clutch 14. The operation of the clutch 14 is however also controllable by means of the foot and hand levers 24, 27 which, due to the fact that a majority of the individuals operating such machines favor the use of their right hand and foot, are preferably located at the right hand side of the machine as indicated.

During normal operation of the packer, and assuming the carriage 9 to be located in an upper position as indicated in the drawing, the clutch 14 is thrown into driving position and rotary motion is being transmitted from the pulley 5 through the shaft 4, clutch 14, gears 13, 12 and auger shaft 3 to the feed auger and stirrer (not shown) and to the packing auger 7. Material is being delivered through the spout 6 and is being fed by the auger 7 into the sack 8, the auger simultaneously compressing the material within the sack. As this feeding of material into the sack 8 continues, the pressure exerted by the auger 7 forces the carriage 9 downwardly until the sack 8 is eventually filled. When the carriage 9 reaches a predetermined position corresponding to desirable filling of the sack 8, the clutch control rod 23 is automatically forced downwardly and the clutch 14 is thrown into inoperative position. The filled sack 8 may then be removed, an empty sack applied and the carriage 9 raised to the position illustrated in Fig. 1 whereupon the clutch 14 is again thrown into operative position and filling of the newly presented sack is effected as described. While the operation of the packer is thus normally automatically controlled, the manually operable levers 24, 27 may also be utilized to effect manual control of the clutch 14. As previously stated, this automatic operation of the device is well known to those acquainted with the art and forms no part of the present invention.

With the structure assembled as illustrated in the drawing, the auger 7 will be rotated in the proper and standard direction of rotation for a predetermined direction of rotation of the driving pulley 5 and clutch 14. If the rotation of the pulley 5 and clutch 14 is to be reversed, then it is necessary to change the connection between the clutch 14 and the gear 12 in order to maintain the proper direction of rotation of the auger 7. Such change in structure may be readily effected by merely reversing the sleeve 15 and causing the pinion 13 to coact with the gear 12 on the opposite side of the vertical axis of the auger shaft 3. The cap screws 19 may then be inserted in the tapped holes 20 and in the end head of the clutch 14. It will be obvious that such change in assemblage of the elements may be readily effected in a few moments and with the use of a wrench, thus making it possible for a manufacturer to furnish the packer to any mill with suitable instructions as to the positioning of the sleeve 14 for a desired direction of rotation of the pulley 5. The change in direction of rotation may be made without disturbing the location of the clutch 14 and its control mechanism.

By locating the bearings 10, 11 above and entirely outside of the spout 6, these bearings are made readily accessible and grease and oil are prevented from entering the spout 6. The bearings 10, 11, 17, 18 are readily accessible for lubrication and the symmetrical construction of the machine produces a pleasing appearance.

It will be obvious that with the present invention the packer may always be furnished with the clutch 14 and control levers 24, 25, 27 fixedly located at the right hand side of the machine, thus enhancing the convenience of operation. While a specific

form of construction for effecting the objects of the present invention, has been illustrated herein, it should be understood that it is not desired to limit the invention by such disclosure, for obvious modifications within the scope of the claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:

1. In a packer, an auger shaft rotatable in one direction only and having a driven gear secured to an end thereof, a driving shaft interchangeably rotatable in opposite directions and extending transversely across the axis of said auger shaft adjacent to said gear, a single driving gear mounted upon said driving shaft and interchangeably reversible thereon to cooperate with opposite peripheral portions of said driven gear, a clutch fixedly located upon said driving shaft and cooperable with said driving gear to transmit rotary motion through said driven gear to said auger shaft, and means for effecting interchangeable rigid attachment of said driving gear to said clutch in reversed positions.

2. In a packer, a vertical shaft rotatable in one direction only and having a driven bevel gear secured to the upper end thereof, a horizontal shaft interchangeably rotatable in opposite directions and extending transversely across the axis of said vertical shaft above said gear, a single driving bevel gear mounted upon said horizontal shaft and interchangeably reversible thereon to cooperate with opposite peripheral portions of said driven gear, a clutch fixedly located upon said horizontal shaft and cooperable with said driving gear to transmit rotary motion through said driven gear to said vertical shaft, and means for effecting interchangeable rigid attachment of said driving gear to said clutch in reversed positions.

In testimony whereof, the signature of the inventor is affixed hereto.

ERNEST C. SHAW.