May 22, 1951 P. J. SOULEN 2,553,684

BAGGING MACHINE WITH FEED AND FEED CUTOFF OPERATED BY MOTOR DRIVEN AND BRAKE RETARDED RECEPTACLE SUPPORT

Filed Oct. 13, 1945

FIG. 2.

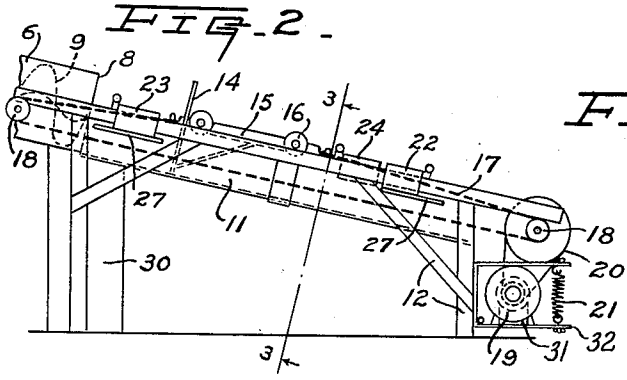
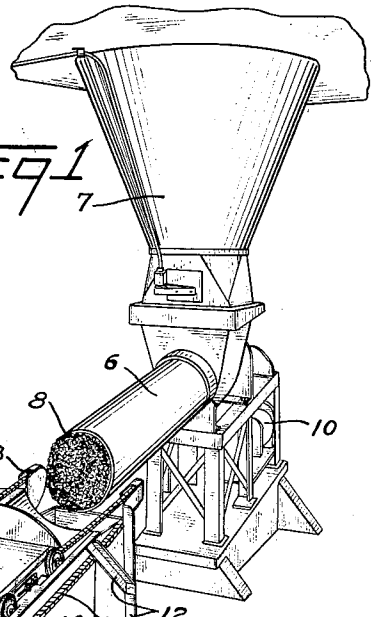


FIG. 1



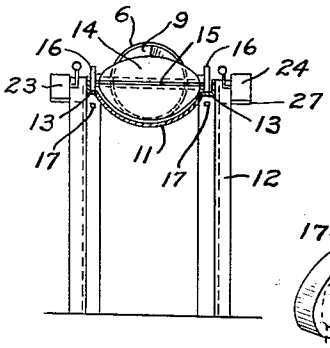
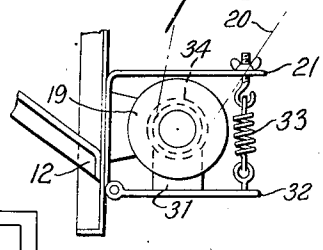


FIG. 3.

FIG. 5



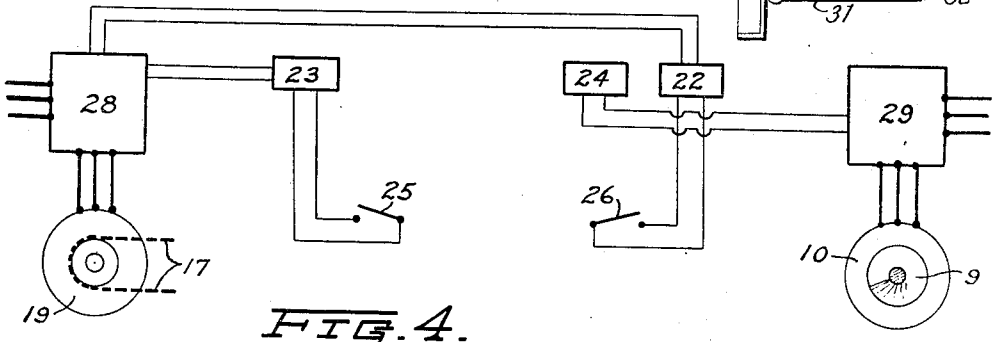


FIG. 4.

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Patented May 22, 1951 2,553,684

UNITED STATES PATENT OFFICE

2,553,684

BAGGING MACHINE WITH FEED AND FEED CUTOFF OPERATED BY MOTOR-DRIVEN AND BRAKE RETARDED RECEPTACLE SUPPORT

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Application October 13, 1945, Serial No. 622,210

3 Claims. (Cl. 226—25)

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The present invention relates generally to improvements in the art of packing bulk commodities in containers such as bags, and relates more specifically to improvements in the construction and operation of mechanism for bagging relatively loose fibrous material such as building insulation or the like.

The primary object of my invention is to provide an improved bagging machine for diverse bulk materials, which is simple and durable in construction and highly efficient in use.

Some of the more specific objects of the invention are as follows:

To provide improved mechanism for introducing batches of relatively loose and fibrous materials into receptacles such as open ended bags, in a manner whereby approximately uniform batches are inserted into each of the successive receptacles.

To provide an improved bulk material bagging assemblage which is semi-automatic in operation, and which functions to fill the successive bags both rapidly and effectively.

To provide an improved bagging machine which is conveniently operable with minimum attention, and which is also safe and reliable in operation.

To provide an improved bagger for diverse bulk materials which are delivered in a substantially continuous stream from a source of production, and which has enormous capacity considering its simplicity and compactness.

To provide a new and useful bag filling mechanism which is durable in construction, and which may also be readily installed and operated at moderate cost.

To provide an improved insulation bagging assemblage especially adapted to handle fibrous bulk material, and which may be readily adjusted and operated to vary the density or compactness of the batches being inserted within the successive receptacles.

These and other specific objects and advantages of the invention will be apparent from the following detailed description.

A clear conception of the several features constituting my present improvement, and of the construction and operation of a typical material bagging machine embodying the invention, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a perspective view of a typical fibrous insulation bagging machine showing the material supply and feed tube packed with the bulk product, and also showing the baffle carriage in approximately mid-position;

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Fig. 2 is a diagrammatic side elevation of a portion of the improved bagging assemblage, showing only a fragment of the feed tube and also showing the baffle carriage in approximately mid-position;

Fig. 3 is a transverse section through the mechanism taken along the line 3—3 of Fig. 2, but showing the location of the limit switches on both sides;

Fig. 4 is a wiring diagram showing the approximate arrangement of the actuating motors, switches and other electrical apparatus involved in the improved bagging system; and

Fig. 5 is an enlarged side view of the electric motor and brake for restraining the downward movement of the bag retarding baffle plate or element along the inclined supporting trough.

While the invention has been shown and described herein as being advantageously applicable to electric motor operated machines for confining batches of fibrous building insulation material in successive bags, it is not my desire or intention to unnecessarily restrict the use or utility of the improvement by virtue of this specific embodiment.

Referring to the drawing, the typical motor driven insulation bagging assemblage shown therein, comprises in general a slightly downwardly inclined stationary bulk material feed tube or cylindrical spout 6 having its upper end in communication with a supply hopper 7 and its lower outlet end 8 open, while the interior of the tube is provided with a feed member or screw 9 adapted to be operated by an ordinary electric motor 10; a similarly inclined fixed bag supporting trough 11 mounted upon a suitable frame 12 with the upper trough end spaced slightly below the open spout end 8, the upper side portions of the frame 12 being provided with parallel tracks 13 which are also slightly inclined in the general direction of the trough 11; a bag retarding element or baffle plate 14 mounted upon a carriage 15 having supporting wheels 16 coacting with the tracks 13; a pair of roller chains 17 each having its opposite ends attached to the carriage 15, and coacting with sprockets 18 journalled in the upper and lower ends of the frame 12; a reversible electric motor 19 having its rotor drivingly connected to the lower sprockets 18 by suitable tooth or chain gearing 20, and being provided with a friction brake 21 which is adjustable to vary the motor speed; and three limit switches 22, 23, 24 mounted on the main frame 12 in operative relationship to the carriage 15, and being cooperable with a pair of foot-operable floor switches 25, 26 to control the operation of the assemblage.

The inclined feed tube or spout 6 is cylindrical and of such diameter and length that the successive bags which are to be filled with material may be slipped snugly over the spout until the bag bottoms span the outlet end 8 of the tube; and the hopper 7 which communicates with the upper inlet end of the spout 6, may communicate directly with the disintegrating chamber of a hammer-mill in which fibrous insulation is produced from newsprint, or with any other suitable source of bulk material supply. The fixed and slightly inclined bag supporting trough 11 may be formed of sheet metal bent into shallow trough shape, and the trough supporting frame 12 may be produced from structural steel, while the carriage 15 and its bag retarding baffle plate 14 may also be formed of sturdy sheet metal. When the carriage wheels 16 advance along the guide rails or tracks 13, the carriage 15 and baffle plate 14 should travel in approximately central alinement with the feed tube or spout 6, and the carriage 15 is provided with suitable cams of well known construction, adapted to actuate the limit switches 22, 23, 24 at predetermined moments. These limit switches are adjustably mounted upon supporting brackets 27 secured to the frame 12 so as to insure automatic functioning of the control switches at the proper moments, and the switches 22, 23 constitute controls for the movements of the carriage 15 and plate 14 while the switch 24 controls the operation of the feed member or screw 9 in a manner to be subsequently described.

While the feed screw driving motor 10 is rotatable in one direction only, the carriage and retarding element operating motor 19 is of a reversible type since it is adapted to advance the carriage 15 and the retarding plate 14 in opposite directions under certain conditions of operation. The friction brake 21 for retarding the carriage motor speed, comprises a brake shoe 31 carried by an arm 32 pivotally suspended at one end from the frame 12 and having an adjustable tension spring 33 secured to its opposite swinging end for pressing the shoe 31 into frictional engagement with a drum 34 secured to the motor rotor, see Fig. 5. The tension of the spring 33 is adjustable in order to positively predetermine the pressure to which the fibrous material is subjected while being forced into the successive bags by the feed screw 9. The carriage control limit switches 22, 23 cooperate with the motor 19 through a reversing relay 26, while the feed screw control limit switch 24 likewise cooperates with the motor 10 through a relay 29, both of which are of well known construction and are shown diagrammatically in Fig. 4. The motors 10, 19 are mounted in relatively protective zones or localities, and the sprockets 18 and gearing 20 are normally enclosed by suitable safety housings as shown in Fig. 1; and an overflow chute 30 may be provided at the junction of the spout 6 and trough 11, for material which may spill out of the loaded bags before they are finally tied and removed from the trough.

When the improved mechanism has been properly constructed and assembled as above described, and fibrous bulk material is being delivered to the supply hopper 7, the bagging machine may be placed in operation by merely slipping the successive bags over the material feeding spout 6 and by thereafter properly actuating the several switches. After an empty bag has been applied to the spout 6 and the retarding baffle plate 14 has been brought into contact with

the bag bottom which spans the outlet spout end 8 by operation of the motor 19, the motor 10 will be automatically operated by closing of the limit switch 24 and will thereby cause the feed screw 9 to revolve and to force fibrous material from the tubular spout 6 into the bag. As this loading of the bag with bulk material proceeds, the bag is progressively slid along the feed spout 6 and the carriage 15 and retarding baffle plate 14 are caused to move downwardly along the inclined tracks 13 toward the lower end of the machine, by the bulk material being introduced within the bag. This downward movement of the bag along the fixed supporting trough 11, is however retarded through the gearing 20 by the friction brake 21 applied to the rotor of the motor 19 which is idle during the loading period, and this retardation definitely determines the packing pressure to which the product is subjected while the bag is being loaded.

After each bag has been sufficiently loaded as predetermined by the initial adjustment and proper positioning of the limit switches, an actuating cam on the carriage 15 first opens the limit switch 24 and stops the motor 10 and the feed screw 9; and the operator immediately thereafter closes the floor switch 26, thereby rotating the motor 19 in one direction and causing the carriage 15 and baffle plate 14 to move rapidly away from the bottom end of the material laden bag resting upon the trough 11. When the baffle plate 14 has been thus sufficiently withdrawn from the loaded bag, another cam on the carriage 15 automatically actuates the limit switch 22 and stops the reversing motor 19 and carriage 15, thereby causing both motors 10, 19 to become idle. The insulation laden bag may then be completely withdrawn from the open end 8 of the feed spout 6, and the open bag end may be sealed and tied or otherwise closed, whereupon the loaded bag may be readily removed from the elevated inclined supporting trough 11, and a subsequent empty bag should be applied or slipped onto the spout 6.

The operator should then step on the other floor switch 25 thus causing the motor 19 to rotate in the opposite direction and to move the carriage 15 and baffle element 14 upwardly along the tracks 13 toward the closed bag bottom. As the upwardly advancing carriage 15 passes the limit switch 24, the tripping cam thereof is withdrawn and the switch 24 closes thereby automatically starting the motor 10 and placing the feed screw 9 in operation, so that material is being injected into the bag when the baffle plate 14 and carriage 15 reach the upper limit of travel. Another cam on the carriage 15 then opens the upper limit switch 23 to stop the reversing motor 19, after which the brake 21 again becomes effective to retard the downward loading motion of the bag and baffle plate 14 as above described. The bag loading cycle may then be repeated with respect to successive bags each of which is automatically loaded with the same amount of bulk material packed under uniform pressure as determined by the brake spring adjustment.

From the foregoing detailed description it should be apparent that my present invention provides an improved bulk material bagging mechanism which besides being simple, compact and durable in construction, is also highly efficient in operation and flexible in its adaptations. Except for the manual operations required to apply the empty bags to the feed spout 6 and to remove the filled bags from the elevated support-

ing trough 11, and the foot operation of the floor switches 25, 26, the machine functions automatically to load the successive bags with uniform batches of the fibrous material in a rapid and effective manner. The brake 21 and the limit switches 22, 23, 24 may be quickly and conveniently adjusted to vary the filling pressure and the predetermined quantity of bulk material admitted to each run of bags; and the inclined disposition of the spout 6 and trough 11 and the elevation of these parts considerably above the floor level permits ready application of the empty bags to the feed tube and removal of the loaded bags from the machine. The improved mechanism because of its simplicity may obviously be manufactured, installed and operated with minimum attention to fill bags with diverse materials at moderate cost; and the assemblage has proven highly satisfactory and successful in actual commercial use.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of operation, herein shown and described, for various modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. A bulk material bagging system comprising, a stationary cylindrical feed spout inclined downwardly toward its outlet end at a slight angle relative to the horizontal and having a diameter adapted for snug sliding coaction with the interiors of the successive empty bags applied thereto with the bag bottoms spanning said outlet end, a feed member operable within said spout to deliver bulk material from said outlet end into each bag and to thereby gradually fill and slip the bag from the spout periphery, a similarly slightly inclined fixed trough extending away from said outlet end beneath and parallel to said spout and upon which the lower side portion of each bag rests and is slidable while the bag is being filled, a bag retarding element guided for movement along said inclined trough and being movable downwardly along the trough by the bottom of the downwardly advancing bag resting within the trough, an electric motor having a reversible rotor drivingly connected to said retarding element and being positively rotatable in one direction to move said element away from the bottom of each material laden bag and in the opposite direction to advance the element toward said spout opening whenever an empty bag is applied to the spout, and a brake coacting with said motor rotor when idle for frictionally restraining the downward movement of said retarding element and of the bag coacting therewith in opposition to the moving force applied to the bag by said feed member.

2. A bulk material bagging system comprising, a stationary cylindrical feed spout inclined downwardly toward its outlet end at a slight angle relative to the horizontal and having a diameter adapted for snug sliding coaction with the interiors of the successive empty bags applied thereto with the bag bottoms spanning said outlet end, a feed member operable within said spout to deliver bulk material from said outlet end into each bag and to thereby gradually fill and slip the bag from the spout periphery, a similarly slightly inclined fixed trough extending away from said outlet end beneath and parallel to said spout and upon which the lower side portion of each bag rests and is slidable while the bag is being filled, a bag retarding element guided for movement along said inclined trough and being movable downwardly along the trough by the bottom of the downwardly advancing bag resting within the trough, an electric motor having a reversible rotor drivingly connected to said retarding element and being positively rotatable in one direction to move said element away from the bottom of each material laden bag and in the opposite direction to advance the element toward said spout opening whenever an empty bag is applied to the spout, a brake coacting with said motor rotor when idle for frictionally restraining the downward movement of said retarding element and of the bag coacting therewith in opposition to the moving force applied to the bag by said feed member, and electrical control mechanism for automatically starting said feed member and for deenergizing said motor whenever said retarding element has been advanced to its fullest extent toward said spout outlet end.

3. A bulk material bagging system comprising, a stationary cylindrical feed spout inclined downwardly toward its outlet end at a slight angle relative to the horizontal and having a diameter adapted for snug sliding coaction with the interiors of the successive empty bags applied thereto with the bag bottoms spanning said outlet end, a feed member operable within said spout to deliver bulk material from said outlet end into each bag and to thereby gradually fill and slip the bag from the spout periphery, a similarly slightly inclined fixed trough extending away from said outlet end beneath and parallel to said spout and upon which the lower side portion of each bag rests and is slidable while the bag is being filled, a carriage guided to travel along said trough and having thereon a retarding plate engageable with each bag bottom and movable downwardly by the downwardly sliding bags resting within the trough, an electric motor having a reversible rotor drivingly connected to said carriage and being positively rotatable in one direction to move said plate away from the bottom of each material laden bag and in the opposite direction to advance the plate toward said spout opening whenever an empty bag is applied to the spout, and a brake coacting with said motor rotor when idle for frictionally restraining the downward movement of said carriage and of the bag coacting with said plate in opposition to the moving force applied within the bag by said feed member.

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