P. A. FRYE.

BAG FILLING MACHINE.

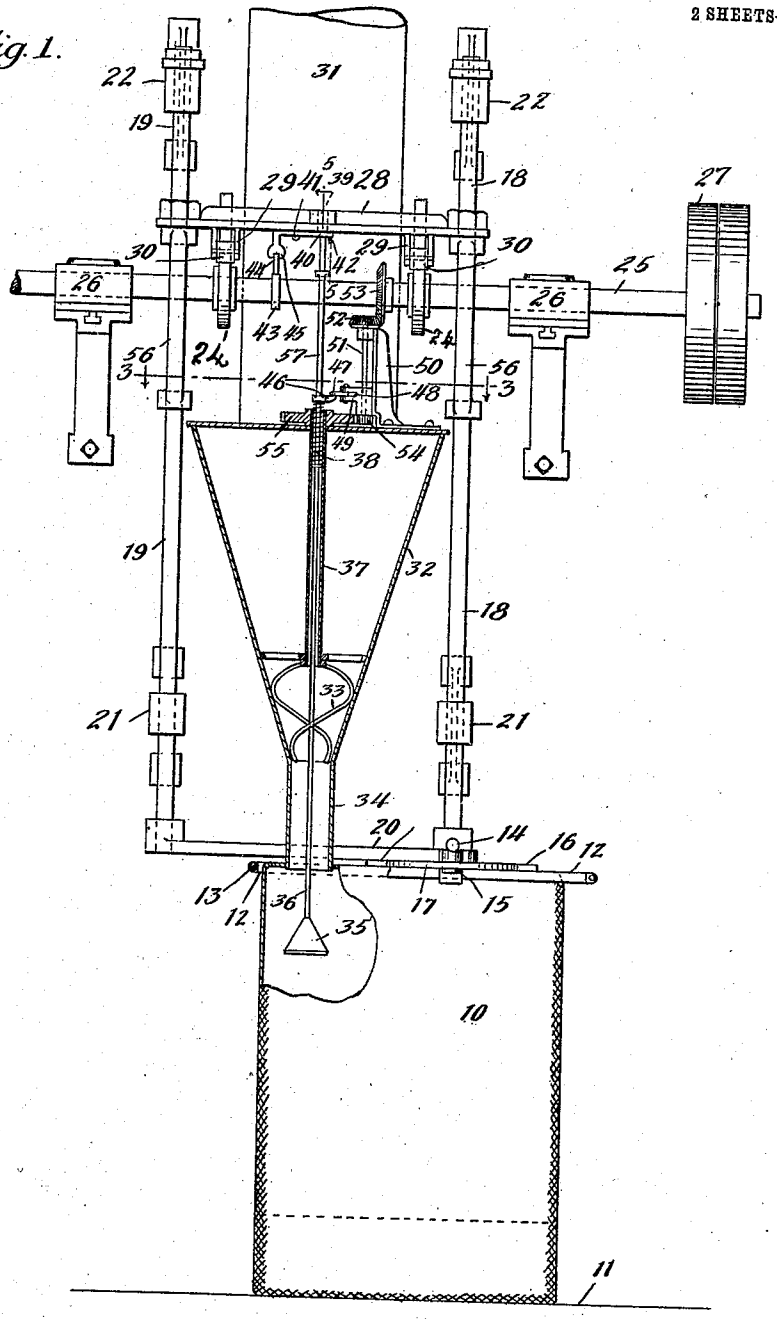
APPLICATION FILED MAR. 26, 1906.

915,847.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2

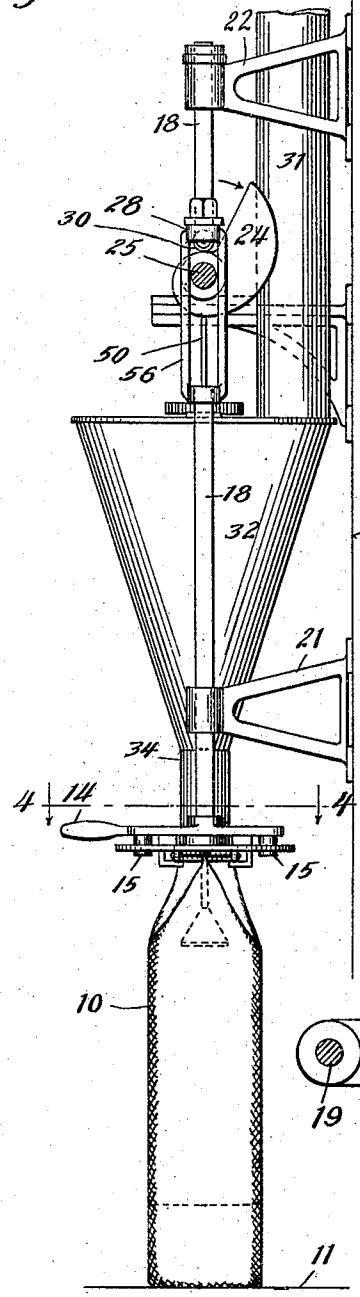


Fig. 3

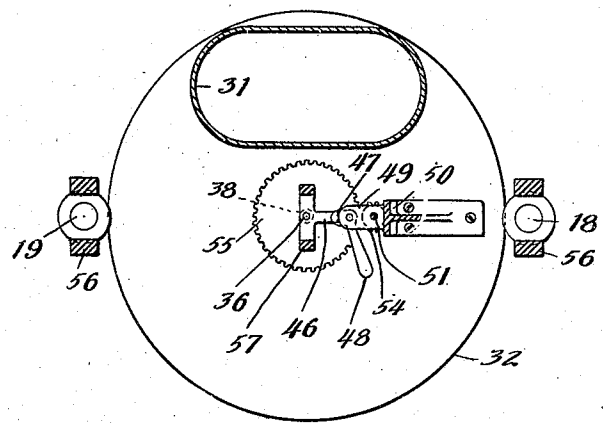


Fig. 5

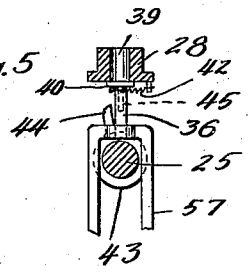
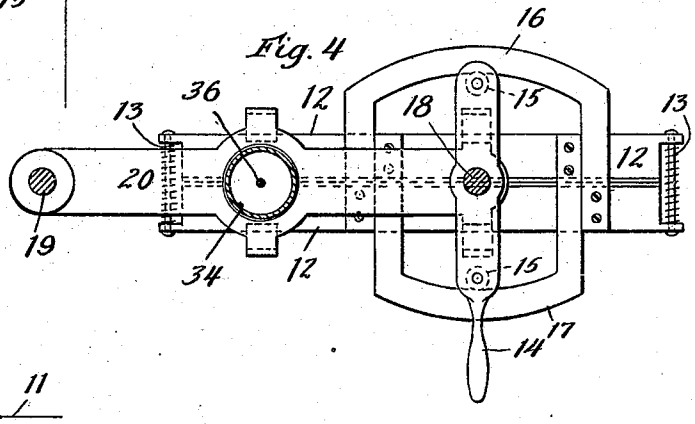


Fig. 4



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PHILIP A. FRYE, OF CLEVELAND, OHIO.

BAG-FILLING MACHINE.

No. 915,847. Specification of Letters Patent. Patented March 23, 1909.

Application filed March 26, 1906. Serial No. 307,978.

To all whom it may concern:

Be it known that I, PHILIP A. FRYE, a citizen of the United States, residing in Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Bag-Filling Machines, of which the following is a specification.

This invention relates to improvements in machines for filling bags with flour, sugar and other comminuted or fine materials.

My principal endeavor has been to devise a construction by which the bag can be filled solidly full at the top as well as at the bottom so that the dimensions of the bag may be kept as small as possible. This result I bring about mainly by two features of the mechanism. 1st., by adapting the mechanism so it will shake the bag while it is being filled in a novel manner, calculated to solidify the contents to such an extent as to render possible a material reduction in the amount of cloth or paper required in the bag, and second, by providing an improved mechanism for feeding and packing the material at the end of the filling operation. The mechanism by which these results are attained and its mode of operation are fully disclosed in the accompanying drawing, and set forth in the subjoined description.

In said drawing, Figure 1 is a front elevation of my improved bag filling machine, partly in section. Fig. 2 is a side elevation. Fig. 3 is a horizontal section. Fig. 4 is a section on the line 4—4 of Fig. 2 enlarged from the scale of Fig. 1. Fig. 5 is a detail section on the line 5—5 of Fig. 1.

Referring to the drawing, 10 represents the bag being filled, and 11 a platform or floor upon which it is placed and upon which it is repeatedly dropped while the filling is going on to solidify or pack the contents. At the level of the mouth of the bag are devices for gripping the top thereof, and these are desirably constructed as follows: Two parallel flat bars 12, 12 are arranged edge to edge at opposite sides of the mouth of the bag, and provided with springs 13, 13 at their ends adapted to force them apart. A swinging lever 14, having anti-friction rollers 15 15 at its ends, acts to draw the bars together and cause them to grasp the sewed and closed portion of the mouth of the bag with sufficient firmness to enable them to lift the bag, by the contact of its said rollers with rounded inner surfaces of yokes 16 and 17, each fastened to one of the bars and extending over the other bar, the curvature of the yokes being such as to enable the lever to cause the bars to exert their greatest pressure on the bag when the lever stands at right angles to the bars, and to release their clamping action when the lever is turned to a position parallel or nearly so to the bars. The lever is mounted centrally and swings on a rising and falling upright 18, located at one side of the feeding spout, and connected to a similar upright 19 at the other side of said spout by a cross head 20. The uprights 19 and 20 have bearings in brackets 21 and 22 attached to the wall 23 or other suitable support, and are repeatedly actuated up and down while the bag is being filled by face acting cams 24 24 preferably of the shape shown on a cross shaft 25 supported in bearings 26, 26 and actuated by pulley 27. The uprights are provided with a cross head 28 above the cams, and this cross head is provided with pairs of depending arms 29 between each pair of which is pivoted a roller 30 bearing on the acting face of one of the cams. As the shaft 25 is continuously driven in the direction indicated at Fig. 2, it will be seen that the uprights will be lifted by the cams at each revolution, and after being raised to the highest point thereby, will be allowed to descend suddenly, and that in this movement the bag clamping devices and the bag are correspondingly lifted and depressed so that the bag will in the repeated lifting and falling movements be raised from its platform 11 and quickly dropped onto the same with force and as the movements are often repeated during the filling operation, the contents of the bag become thoroughly shaken down and compacted.

My machine is intended to be used with bags having their mouths partially or even mainly closed, and to adapt it to this use the feeding device is made small so it may feed through the small portion of the mouth which is left open, and it is also adapted to ram or compact the contents in the vicinity of the unclosed portion of the mouth and force it under the closed portion, to the end that all parts of the bag may be filled solidly and evenly full. Hence the feeding devices are constructed as follows: The flour or other commodity is fed to the machine through the chute 31, delivering into a funnel 32 in which is a revolving agitator 33 of any suitable construction. The funnel terminates in a straight tubular mouth piece 34 adapted to

be entered in the bag as seen at Fig. 1, and in this mouth is a valve 35 adapted to be raised so as to close the mouth piece and interrupt the flow of the flour whenever that is desirable as it is toward the finish of the operation, and when the operation is complete. This valve is mounted on the lower end of an operating rod 36 which extends up through and beyond the funnel. In the upper part of the funnel the rod is surrounded by a tube 37, and within said tube is provided with a lifting spring 38, which maintains it with the valve raised to its closing position except when overcome as now to be explained. The upper end of rod 36 is adapted to move through a suitably arranged opening 39 in the cross head 28, and below this opening I arrange a plate 40 pivoted at 41 and provided with a spring 42 acting to keep it normally in position to close said opening and thus prevent the entrance into it of rod 36. It will be remembered that the cross head 28 moves up and down in the bag shaking operation and consequently if the plate 40 is in its normal position, the valve rod 36 would be depressed with each downward movement of the cross head and allowed to return under the power of its spring 38 with each upward movement, thus moving the valve 35 so that it opens and closes the mouth piece at each operation. I also apply to the main shaft 25 a collar 43 from which projects an arm 44 adapted to engage the downward projection 45 upon said plate 40 and force the plate to uncover the opening 39. This if properly timed, allows the upper end of the rod 36 to enter said opening 39 so that the valve is then permitted to close the mouth piece, but it continues to open and close the mouth piece as before, the plate 40 resuming its position at each upward stroke of the cross head. When the valve closes the mouth piece it acts with the same as a plunger, forcing its way into the material already in the bag when the bag is raised in the shaking operation, and creates an opening therein for fresh material which enters at once upon the opening of the mouth piece. During the initial stages of the filling operation, the valve 35 is held in its open position by engagement with the projection 46, of a catch 47 attached to and operated by a handle 48. This hand device, can, of course, be brought into use at any time and released whenever desired and when released the plate 40 uncovers the opening 39 so that the limited movement is then given the valve. The handle 48 and catch are supported in a bracket 49 attached to a standard 50 mounted on top of the funnel. This same standard is also provided with bearings for a vertical shaft 51, upon the upper end of which is a bevel pinion 52 meshing with a bevel gear 53 on the main shaft 25, and at the lower end said shaft 51 carries a spur pinion 54 meshing with a gear 55 secured upon the upper end of the tube 37 and rotating the same. The agitator 33 is rigidly attached to the lower end of the tube 37 and through said tube receives its rotary motion.

The uprights 18 and 19 in order to enable them to give room to the main shaft 25 are provided with looped sections 56 plainly illustrated at Fig. 2, which enables the uprights to move up and down without interference from the shaft. In like manner the valve rod 36 is provided with a loop section 57 passing down at either side of said main shaft.

The operation of the machine is substantially as follows: Supposing that the bag has been positioned, and the closed portion of its top clamped, the valve 35 is moved into and locked in the open position by the catch 47 so that the flour may flow freely into the bag until the bag is almost full. The lock upon the valve is now released so that the valve closes the mouth piece and shuts off the feed of the material and the valve rod rises against the plate 40. The bag holder which during the entire operation is being lifted and dropped in its shaking movements, now carries the bag upward far enough so that the closed mouth of the funnel is forced down into the material a sufficient distance to form an open space therein and when the bag descends, the plate 40 will force the valve to open the mouth piece and allow some of the material to enter said open space. At the next rise and fall of the bag, this operation will be repeated and is repeated as often as necessary until the desired quantity has been forced into the bag.

It will be noted that the bag before filling is closed except for a space large enough to admit the valve and mouth piece and that such opening is in the top of the bag so that it must be filled by a vertically moving packing device. This is a desirable feature of the machine because it reduces the amount of sewing to be done after filling, and because it enables the entire bag to be filled at one operation. I prefer to locate this opening at the corner of the bag, though this is not absolutely necessary.

My invention permits the filling of the bag solidly full without any danger of "scouring" the flour as it is called.

My invention feeds the material by gravity, and the plunger assists therein by compacting the material already in the bag, so that the operation is quick.

As already stated, the machine is adapted to operate upon bags the mouths of which have been previously sewed up partially or mainly. I regard this as an important feature of my invention because the machine forces the material under the closed portion so that such portion is much more solidly filled than in previous machines. And the ability to feed the material into the

open portion of the mouth as the compacting proceeds is also advantageous as I also fill the bag under that portion very full. In fact, the machine is adapted to compact the material to such an extent as to enable the use of smaller bags than heretofore, thus economizing materially the cost of the bags.

I claim:—

1. The combination with means for taking hold of the top of the bag and means for shaking the same, of means for filling the bag, consisting of a small vertical delivery tube projecting downward into the bag, and a valve at the lower end of said tube acting to close the same, and also to pack the material in the bag.

2. The combination with means for imparting a jigging or shaking movement to a bag, of filling means having a vertical mouth piece or delivery tube projecting down into the bag, a valve closing the bottom of said tube and adapted to be extended below the end of the tube, and means for alternately lowering and raising said valve.

3. The combination in a bag filling machine with means for imparting a rising and falling movement to the bag, of filling means having a vertical mouth piece or delivery tube adapted to be entered in the bag, a valve closing the bottom of the tube and adapted to be extended below the lower end of the same; automatically acting means for alternately lowering and raising the valve, and means for locking the valve when open.

4. The combination with means for imparting a rising and falling movement to a bag, of filling means having a vertical mouth piece or delivery tube adapted to enter the bag, a valve closing the bottom of said tube, means for alternately lowering and raising the valve, and means for holding the valve in the closed position when the bag rises.

5. The combination with means for imparting a rising and falling movement to the bag, of filling means having a vertical mouth piece or delivery tube adapted to enter the bag, a valve closing the bottom of said tube and opening the same by moving downward from the tube, and means for alternately lowering and raising said valve so the same may act in compressing the material in the bag and in admitting fresh material.

6. In a bag filling machine, means for imparting to the bag an up and down movement, in combination with filling devices having a vertical mouth piece adapted to enter the opening in the top of the bag and a valve closing the bottom of the mouth piece and adapted to open the same by moving bodily below the mouth piece in a straight line.

7. In a bag filling machine, means for imparting to the bag an up and down movement, in combination with filling devices having a vertical mouth piece adapted to enter the opening in the top of the bag, a valve closing the bottom of the mouth piece and adapted to act with the same in compressing the material, a vertical rod controlling said valve and lowering and raising it intermittently during each filling operation, and means for actuating said rod.

8. The bag filling machine wherein are combined a vertical feed tube adapted to be entered in the bag, a valve closing the bottom of said tube and mechanical means for moving said valve up and down during the filling operation, such downward movement causing the opening of the feeding tube so that fresh material is admitted to the bag at intervals, and said valve and tube acting to compact the material in the bag.

9. The bag filling machine wherein are combined means for shaking the bag, a vertical feed tube adapted to be entered in the bag, a valve closing the bottom of said tube and mechanical means for moving said valve up and down during the filling operation, such downward movement causing the opening of the feeding tube so that fresh material is admitted to the bag at intervals, and said valve and tube acting to compact the material in the bag.

10. The bag filling machine wherein are combined means for shaking the bag, a feeding tube adapted to be entered in the bag, a valve closing the bottom of the tube so it may act to compact the material when the bag is lifted by the shaking apparatus, means whereby said valve may be opened at each descending movement of the bag, and means timed to close the valve when the bag rises.

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