

June 24, 1930.

E. A. MARSH

1,766,444

APPARATUS FOR FILLING PACKAGES

Filed Jan. 7, 1929

2 Sheets-Sheet 1

Fig 2

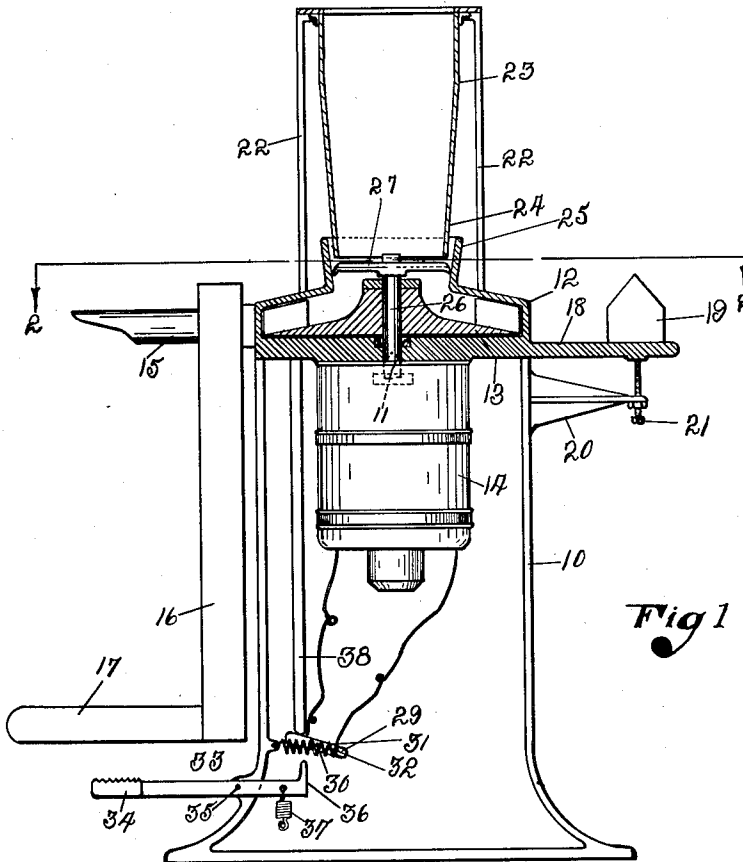
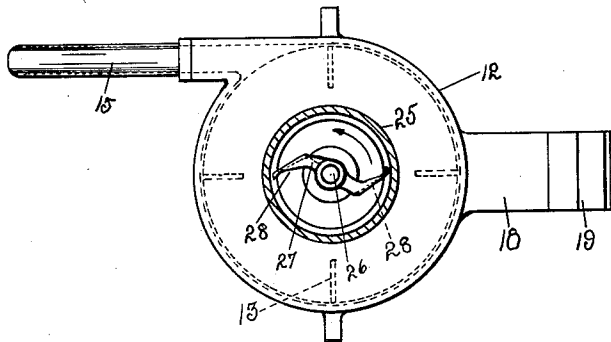


Fig 1

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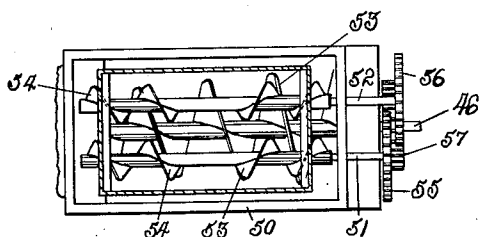


Fig 4

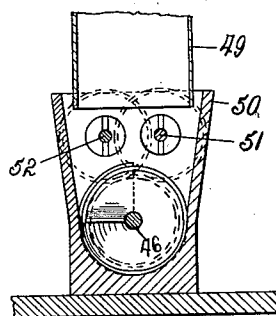


Fig 5

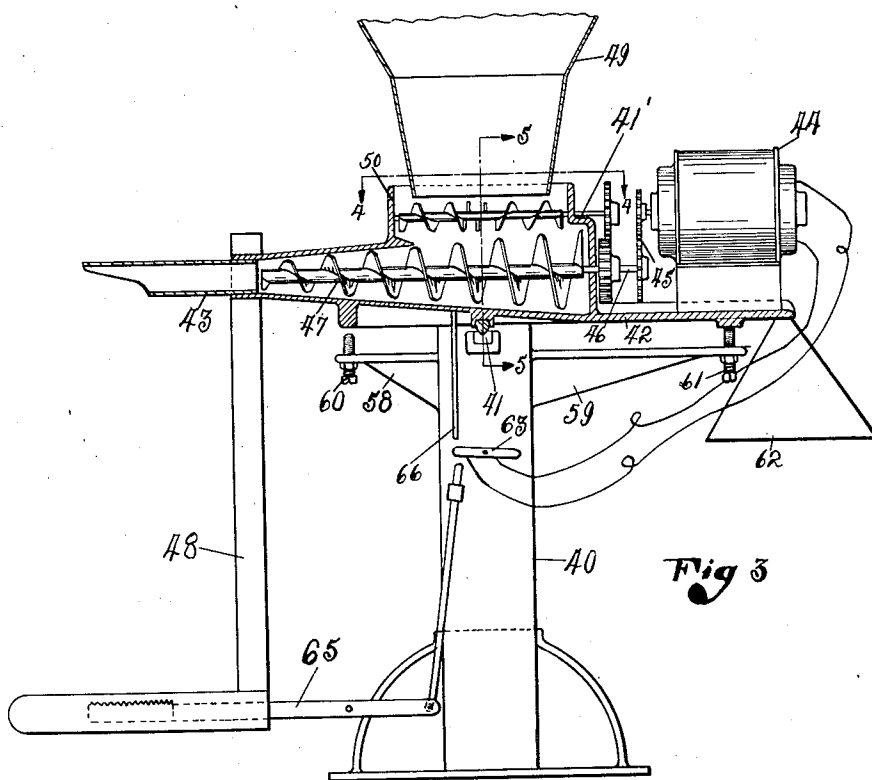


Fig 3

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## UNITED STATES PATENT OFFICE

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## APPARATUS FOR FILLING PACKAGES

Application filed January 7, 1929. Serial No. 330,840.

This invention relates to apparatus for filling packages, and more particularly to apparatus in which the package is weighed while being filled and the filling operation is stopped when a sufficient weight of material has been placed in the package. The invention has to do with the combination of the weighing and filling mechanism. The object of the invention is to provide apparatus of the character described which is simple in construction, efficient in operation, and reliable in action. Further objects and details of the invention will appear as the description proceeds.

In the accompanying drawings forming a part of this specification, Figure 1 is a partial vertical section and partial elevation of one form of apparatus embodying the invention; Fig. 2 is a cross section substantially on the line 2—2 of Fig. 1; Fig. 3 is a view similar to Fig. 1, but showing an alternative form of construction; Fig. 4 is a horizontal section on the line 4—4 of Fig. 3; Fig. 5 is a vertical section on the line 5—5 of Fig. 3.

In the apparatus shown in Figs. 1 and 2, there is a framework 10 upon which there is pivotally mounted at 11 a filling and weighing device. The filling and weighing device comprises a casing 12 for a propeller 13 which may be driven from a suitable motor in a casing 14 mounted upon the underside of casing 12. From the left side of casing 12 there projects a filling tube 15 and suspended from this side of the filling apparatus there is a support 16 for a bag or other receptacle to be filled. In the construction shown, the spout 15 is adapted to enter the valve of a valve bag, the bottom of which may rest upon support 17, if desired. This support for the bag is no part of the present invention and is indicated diagrammatically.

From the right side of casing 12 there projects a bracket 18 upon which there rests a weight 19. Beneath bracket 18 there is a bracket 20 extending from frame 10 and carrying a stop screw 21 which limits the downward movement of bracket 18.

Upon an upward extension 22 of frame 10 there is mounted a hopper 23 adapted to contain a supply of material to be packaged. It

will be readily understood that this hopper may be continued and expanded, if desired, or may receive material in any desired way from a suitable source.

In the form shown in Fig. 1, the lower end 24 of hopper 23 is substantially circular in cross section and is surrounded by a flange 25 extending upward from casing 12. Mounted upon the shaft 26 of propeller 13 there is a clearing device 27 having means such as angular vanes 28 for urging material towards the middle of the flange when the propeller is rotated in the direction of the arrow shown in Fig. 2.

Beneath motor casing 14 there is indicated a switch member 29 pivoted at 30 to the frame. A spring 31 attached to the switch at 32 and to the frame at 33 passes adjacent the pivot point 30 and operates to hold the switch in either open or closed position. A pedal 34 pivoted at 35 upon frame 10 has a projection 36 adapted to contact the switch and move it to the closed position in which it is shown in Fig. 1. A spring 37 returns the pedal to the position in which it is shown, when it is released by the operator's foot. A rod 38 projects downward from the frame carrying casing 12 and is in position to contact switch 29 and move it to open position when the left side of the casing is lowered.

Before describing the alternative form shown in Figs. 3 to 5, the operation of the apparatus thus far described will be indicated. With the apparatus in the position in which it is shown in Fig. 1, with the switch closed, the motor operates propeller 13 and clearing device 27. It will be understood that material is maintained in hopper 23 in any desirable way so that it is fed continuously therefrom to the central portion of the feeder casing. When a container resting upon spout 15 and/or support 17 is empty, weight 19 counterbalances the load so that bracket 18 rests upon stop screw 21. When sufficient material has been fed into the container to counterbalance the weight, the casing 12 and its associated parts swing upon pivot 11 and the container is lowered. This results in the downward movement of

rod 38 which contacts and opens switch 29, thereby stopping the filling operation.

It will be noted that hopper 23 is mounted directly and symmetrically over the line of oscillation about pivot 11 so that the weight of the material in the hopper does not affect the movement of the filling and weighing device. The function of clearing device 27 is to insure against material piling up between the lower end of hopper 23 and the upper edge of flange 25 so as to interfere with the free movement of the filling and weighing device. Furthermore, the movement of clearing device 27 creates and maintains a line of cleavage between the material in the hopper and the material in the casing so as to prevent any material interference with the weighing operation because of friction along this line.

After the filled receptacle has been removed, it will be readily understood that weight 19 returns the filling and weighing device to its position resting on stop 21 and the apparatus is in position to have the operation repeated.

With some kinds of material and with proper speed of operation of the discharging propeller, etc., the clearing device 27 may be omitted, as the material will be drawn down into the propeller at such a rate as to avoid any danger of its working up between the lower end of hopper 23 and flange 25. In the construction shown, the blades 28 of device 27 are placed at an angle to the vertical so that they press material downward as well as inward. It will be readily understood that the blades might be constructed so as to press the material inward only or to press it downward only, or the angular ends of the arms might be omitted and the device used merely to agitate the material and maintain a line of cleavage at the bottom of hopper 23.

The ends of blades 28 may be brought more closely adjacent to flange 25 when the blades are mounted upon the propeller in the manner shown, so as to move with the weighing and filling device. However, by using slightly shorter arms, this device might be mounted upon a stationary support connected to hopper 23 or a stationary portion of the frame. If desired, it might be mounted upon the lower end of a shaft extending downward through the hopper.

The apparatus disclosed in Figures 3 to 5 inclusive is similar in general principle to that shown in Figs. 1 and 2. In this alternative form of construction the apparatus is shown as mounted upon a frame 40, there being pivots 41 upon which the weighing and filling device is mounted. This weighing and filling device comprises a casing 41' having a bracket 42 extending to the right and a filling spout 43 extending to the left. Upon bracket 42 there is mounted a motor

44 connected by suitable gearing 45 to the drive shaft 46 of a screw 47 extending through casing 41 to feed spout 43. A frame 48 is indicated diagrammatically for supporting a receptacle in filling relation with spout 43.

A stationary hopper 49 discharges downward within a flange 50 on casing 41'. In the construction shown, the bottom end of hopper 49 and flange 50 are rectangular in cross section, their sides being parallel and having but limited play therebetween, while there is more room between the ends of flange 50 and the hopper so as to allow for the oscillation of the flange about axis 41 without being interfered with by the hopper.

Mounted in flange 50 directly beneath hopper 49, there is a pair of shafts 51 and 52, each carrying screws 53 and 54 within the flange. On the ends of shafts 51 and 52 there are gears 55 and 56 in mesh with a gear 57 on shaft 46. Screws 53 and 54 are pitched in opposite directions and the parts are so related that they are driven in a direction to force feed towards the middle of flange 50, thereby preventing material from piling up between the hopper and the flange above the ends of these screws.

It will be noted that the hopper is mounted directly over and symmetrically in relation to the axis about which the filling and weighing mechanism is mounted.

Projecting from frame 40 there are brackets 58 and 59 carrying stop screws 60 and 61 for limiting the oscillation of the filling and weighing machine. Motor 44 being mounted on the right side of the weighing and filling mechanism partially counterbalances a receptacle supported on member 48 at the left of the axis of the weighing device. A weight 62 may be provided for adding any additional weight necessary to counterbalance the receptacle until it is properly filled. Mounted upon frame 40 there is a switch 63 similar to switch 29 and operated to control the circuit to motor 44. The switch may be closed by a rod 64 and pedal 65 diagrammatically indicated on the drawings and which may be constructed similarly to pedal 34; and a rod 66 connected to casing 41 is operated to move the switch to open position when the left side of the filling and weighing mechanism descends so as to rest upon stop 60.

The operation of this device will be readily apparent from the description of the device shown in Figs. 1 and 2, the only material difference being in the means employed for feeding material from the casing into the receptacle.

It is advantageous to drive the feeding means by an electric motor mounted upon the casing to swing therewith as this means of driving the feeding device is easily con-

connected to a source of power without interfering with the oscillation of the weighing device. It will be understood that other means for driving the filling device without interference with the weighing operation might be devised, but that the means shown is considered the most simple and effective.

It will be readily understood that other types of feeding means might be employed and come within the broader principles of this invention and that numerous other changes may be made in the disclosed construction within the terms of the appended claims.

What is claimed is:

1. In combination, a feeding and weighing device mounted upon a horizontal axis and means to discharge material to said feeding and weighing device directly above said axis and symmetrically arranged with respect thereto, said feeding and weighing device comprising a weight on one side of said axis, a receptacle support on the other side of said axis and means for feeding material from the plane of said axis to said receptacle.

2. In combination, a filling and weighing device mounted upon a horizontal axis and having a receiving opening above said axis, a hopper adapted to discharge material into said receiving opening, the discharge end of said hopper being arranged directly above and in symmetrical relation to said axis, a weight on said filling and weighing device on one side of said axis and a support for a receptacle on the other side of said axis, and means for feeding material from the plane of said axis to said receptacle.

3. In combination, a casing mounted upon a horizontal axis and having an inlet opening above and in symmetrical relation to said axis and a discharge opening at one side of said axis, a support for a receptacle in position to receive material from said discharge opening, said support being mounted to move with said casing, a weight on the other side of the axis adapted to counterbalance a receptacle on said support, and means in the casing to discharge material therefrom through said opening.

4. In combination, a casing mounted upon a horizontal axis and having an inlet opening above and in symmetrical relation to said axis and a discharge opening at one side of said axis, a support for a receptacle in position to receive material from said discharge opening, said support being mounted to move with said casing, a weight on the other side of the axis adapted to counterbalance a receptacle on said support, means in the casing to discharge material therefrom through said opening, and a hopper adapted to discharge material into said inlet opening, the discharge end of the hopper

being arranged above and symmetrically in relation to said axis.

5. In combination, a feeding and weighing device mounted upon a horizontal axis and means to discharge material to said feeding and weighing device directly above said axis and symmetrically arranged with respect thereto, said feeding and weighing device comprising a weight on one side of said axis, a receptacle support on the other side of said axis and means for feeding material from the plane of said axis to said receptacle, and automatic means controlled by the movement of the filling and weighing device about said axis to stop said feeding means.

6. In combination, a feeding and weighing device mounted upon a horizontal axis and means to discharge material to said feeding and weighing device directly above said axis and symmetrically arranged with respect thereto, said feeding and weighing device comprising a weight on one side of said axis, a receptacle support on the other side of said axis, means for feeding material from the plane of said axis to said receptacle, an electric motor for said feeding means mounted to oscillate therewith, a switch controlling the operation of the motor and connections between the switch and the filling and weighing device whereby the oscillation thereof, in response to the filling of a receptacle thereon, stops the motor.

7. In combination, a feeding and weighing device mounted upon a horizontal axis and means to discharge material to said feeding and weighing device directly above said axis and symmetrically arranged with respect thereto, said feeding and weighing device comprising a weight on one side of said axis, a receptacle support on the other side of said axis and means for feeding material from the plane of said axis to said receptacle, and movable means for maintaining a line of cleavage between the material in said discharging means and the material in said feeding and weighing device.

8. In combination, a casing having an opening in its upper side and a flange about said opening, said casing being mounted upon a horizontal axis, a weight on one side of said axis and a support for a receptacle on the other side of the axis, means in the casing for feeding material from the plane of the axis to a receptacle, a guide for material having its discharge end opening within said flange and above and in symmetrical relation to said axis, and means adjacent the lower end of said guide to maintain a plane of cleavage between the material in said guide and the material in the casing.

9. In combination, a casing having an opening in its upper side and a flange about said opening, said casing being mounted upon a horizontal axis, a weight on one side

of said axis and a support for a receptacle on the other side of the axis, means in the casing for feeding material from the plane of the axis to a receptacle, a guide for material having its discharge end opening within said flange and above and in symmetrical relation to said axis, and means within said flange for feeding material towards the plane of said axis, whereby material is prevented from piling up between the flange and the guide so as to interfere with oscillation of the filling and weighing device.

10. In combination, a guide for material having a downwardly directed discharge opening, a casing mounted upon an axis directly beneath and in symmetrical relation with said discharge opening, said casing having an upwardly directed flange surrounding but spaced from the lower end of said guide and having a lateral discharge opening, a centrifugal propeller mounted within said casing upon a vertical axis approximately intersecting said horizontal axis, said propeller being adapted to discharge material through said discharge opening, a support for a receptacle mounted to swing with said casing and adapted to hold a receptacle in receiving relation with said discharge opening, and a weight connected with said casing on the other side of said axis from said receptacle support.

11. In combination, a guide for material having a downwardly directed discharge opening, a casing mounted upon an axis directly beneath and in symmetrical relation with said discharge opening, said casing having an upwardly directed flange surrounding but spaced from the lower end of said guide and having a lateral discharge opening, a centrifugal propeller mounted within said casing upon a vertical axis approximately intersecting said horizontal axis, said propeller being adapted to discharge material through said discharge opening, a support for a receptacle mounted to swing with said casing and adapted to hold a receptacle in receiving relation with said discharge opening, a weight connected with said casing on the other side of said axis from said receptacle support, and a device mounted to rotate with said propeller immediately beneath said discharge opening and form a line of cleavage between the material in the guide and in the casing.

12. In combination, a guide for material having a downwardly directed discharge opening, a casing mounted upon an axis directly beneath and in symmetrical relation with said discharge opening, said casing having an upwardly directed flange surrounding but spaced from the lower end of said guide and having a lateral discharge opening, a centrifugal propeller mounted within said casing upon a vertical axis approximately intersecting said horizontal

axis, said propeller being adapted to discharge material through said discharge opening, a support for a receptacle mounted to swing with said casing and adapted to hold a receptacle in receiving relation with said discharge opening, a weight connected with said casing on the other side of said axis from said receptacle support, and a device mounted to rotate with said propeller immediately beneath said discharge opening and move material from said flange towards the axis of the propeller.

13. In combination, a guide for material having a downwardly directed discharge opening, a casing mounted upon an axis directly beneath and in symmetrical relation with said discharge opening, said casing having an upwardly directed flange surrounding but spaced from the lower end of said guide and having a lateral discharge opening, a centrifugal propeller mounted within said casing upon a vertical axis approximately intersecting said horizontal axis, said propeller being adapted to discharge material through said discharge opening, a support for a receptacle mounted to swing with said casing and adapted to hold a receptacle in receiving relation with said discharge opening, a weight connected with said casing on the other side of said axis from said receptacle support, and a device mounted to rotate with said propeller immediately beneath said discharge opening and move material downward towards the propeller.

14. In combination, a guide for material having a downwardly directed discharge opening, a casing mounted upon an axis directly beneath and in symmetrical relation with said discharge opening, said casing having an upwardly directed flange surrounding but spaced from the lower end of said guide and having a lateral discharge opening, a centrifugal propeller mounted within said casing upon a vertical axis approximately intersecting said horizontal axis, said propeller being adapted to discharge material through said discharge opening, a support for a receptacle mounted to swing with said casing and adapted to hold a receptacle in receiving relation with said discharge opening, a weight connected with said casing on the other side of said axis from said receptacle support, an electric motor mounted on said casing, a switch controlling the motor, and means connected to the casing for opening the switch and stopping the motor when the receptacle-supporting side of the casing moves downward.

In testimony whereof I have hereunto signed my name to this specification.

ESLI A. MARSH.