

June 9, 1942.

R. W. VERGOBBI

2,286,130

PACKAGING MACHINE

Filed July 24, 1940

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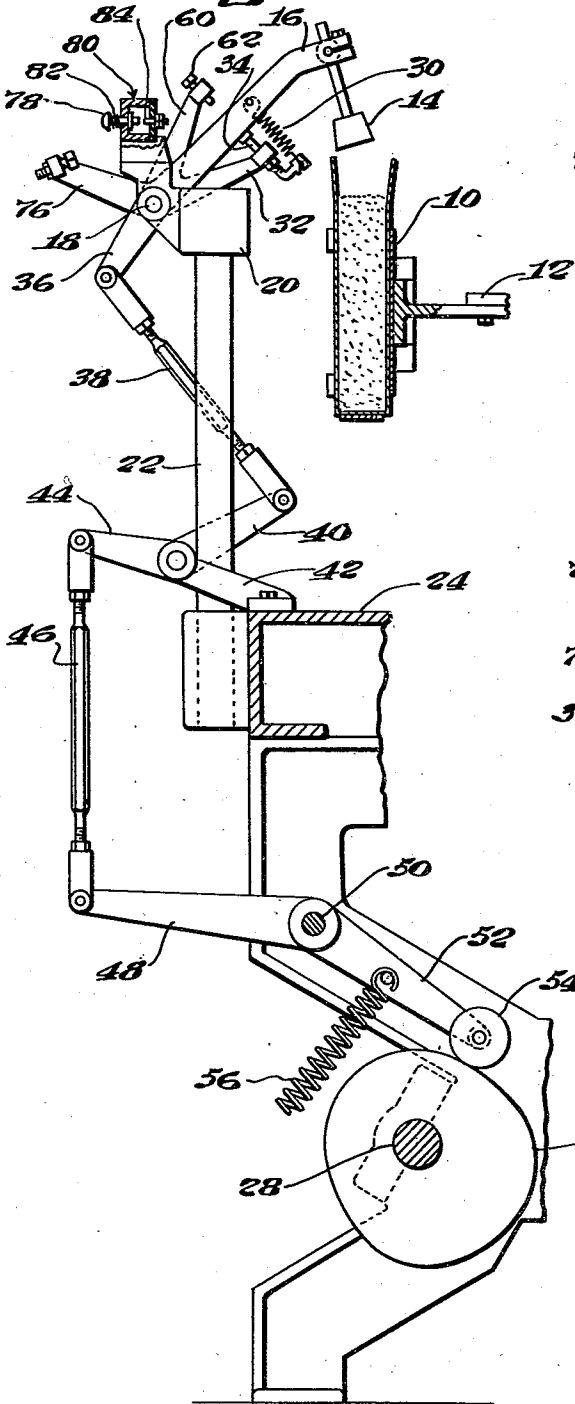
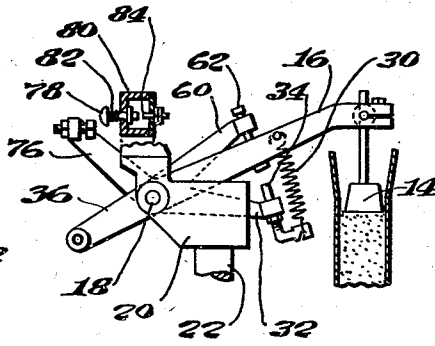
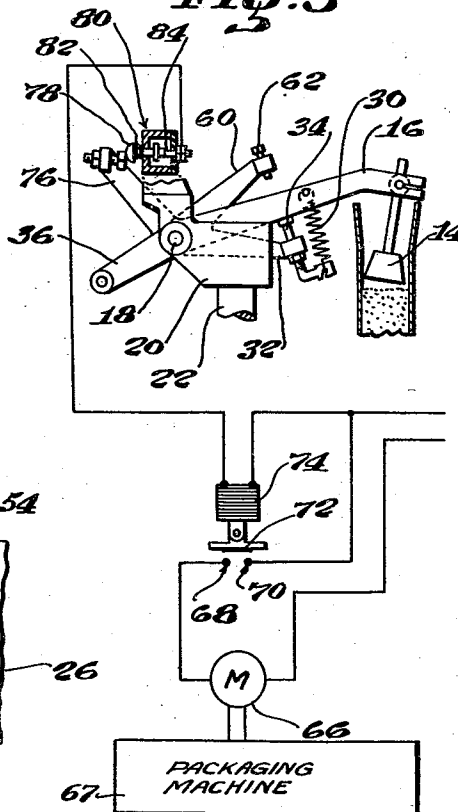


Fig. 2



Phiếu.3



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2,286,130

PACKAGING MACHINE

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Application July 24, 1940, Serial No. 347,137

6 Claims. (Cl. 226—71)

This invention relates to a packaging machine.

One object of the invention is to provide a packaging machine with novel and improved mechanism for compressing the material being packaged in a container, which is capable not only of efficiently and economically effecting the compression of material in the container after it has been filled, but in addition, controls the operation of the machine in the event that the particular package being operated upon has been incompletely filled.

The invention, while particularly adapted for use in connection with a packaging machine and particularly a filling or weighing machine, is nevertheless, in its broader aspects, capable of use to advantage with other types of packaging machines such as a top sealing machine wherein it is desired to compress material which has been introduced into a container and at the same time to control the operation of the machine in the event that the container has been incompletely filled.

With this general object in view and such others as may hereinafter appear, the invention consists in the packaging machine and in the various structures, arrangements and combinations of parts hereinafter described and particularly defined in the claims at the end of this specification.

In the drawing which illustrates the preferred embodiment of the invention, Fig. 1 is a side elevation, partly in cross-section, of a sufficient portion of a packaging machine to enable the present invention to be understood; Fig. 2 is a side elevation of a portion of the mechanism shown in Fig. 1, with the parts in a different position of operation; and Fig. 3 is a similar view illustrating the parts in still another position of operation and showing a wiring diagram associated therewith.

In general, the present invention contemplates a packaging machine of the type having provision for filling, closing and sealing containers in which novel and improved mechanism is provided for effecting the compression of the material which has been previously introduced into the container so that the material will be on a level with or slightly below the top score lines of the carton to enable the top flaps to be successfully closed and sealed. Provision is also made for permitting the compressing member to travel beyond the normal level of the material in the container in the event that the container is incompletely filled or is below a predetermined level and such abnormal movement of the com-

pressing member may be arranged to control the operation of the machine such as by interrupting a circuit to the driving motor to terminate the operation thereof and to permit the defectively filled container to be removed. Thus, in the operation of the machine, assurance is made that each container is properly filled before being passed through the top closing mechanism of the packaging machine.

Referring now to the drawing, the packaging machine herein illustrated includes a container supporting pocket 10, a plurality of which are mounted upon a rotatable disk or other carrier 12 adapted to be intermittently moved to present the containers to the various instrumentalities comprising the packaging machine. In the operation of the machine, after the container has been filled, it is moved into operative position to a compressing station, forming the subject matter of the present invention, and which is arranged to compress the material in the loosely filled container down to a predetermined level therein. In the illustrated embodiment of the invention, the compressing mechanism includes a plunger member 14 carried by a lever 16 rockingly mounted on a shaft 18 journaled in suitable bearings provided in a bracket 20. The bracket 20 is supported on a standard 22 attached to the machine frame 24, as shown in Fig. 1.

Provision is made for effecting movement of the plunger 14 from the position shown in Fig. 1 into compressing engagement with the material in the container through connections from a cam 26 which is mounted fast upon a cam shaft 28 forming part of the packaging machine. As shown in Fig. 1, the lever 16 is connected by a spring 30 to one arm 32 of a three-armed lever also rockingly mounted on the shaft 18. The spring 30 is arranged to hold the lever 16 against a stop 34 carried in the arm 32 so that in operation, the lever 16 is moved as a unit with the arm 32. An operating arm 36, forming part of the three-armed lever is connected by a link 38 to one arm 40 of a bell-crank pivotally mounted in a bracket 42 attached to the machine frame. The second arm 44 of the bell-crank is connected by a link 46 to one arm 48 of a cam lever pivotally mounted at 50 in the machine frame, and the other arm 52 of the cam lever carries a roller 54 which cooperates with the cam 26. A spring 56 connected to the arm 52 holds the roller 54 against its cam.

From the description thus far it will be observed that when the plunger arm 16 is rocked

in a clockwise direction through the connections described, the plunger 14 will engage the material in the container, and under normal operating conditions, when the container is properly filled, the plunger lever 16 will be stopped by such engagement permitting the three-armed lever to continue its operating stroke, the spring 30 becoming extended at this time. Upon further movement of the three-armed lever, the third arm 60 of the latter, which carries an adjustable limiting screw 62, is arranged to engage the lever 16 to force the latter down further into the container and to effect compression of the material down to a predetermined level, as clearly illustrated in Fig. 2. At this time, the spring 30 is fully extended and the plunger is prevented from being urged further into the container by the resistance of the material therein when the container is sufficiently filled.

From the above description, it will be seen that in the event that the container is incompletely filled, or if the material deposited therein falls below a predetermined level, the spring 30 will cause the plunger 14 and lever 16 to follow along with the arm 32 and to carry the plunger further down into the container, as illustrated in Fig. 3. When this occurs, provision is made for stopping the machine in order that the defectively filled container may be removed therefrom. In the illustrated embodiment of the invention, provision is made for opening a circuit to a driving motor of the machine, indicated diagrammatically at 66, the packaging machine to which the motor is connected being diagrammatically shown at 67. The contacts 68, 70 in the motor circuit are normally closed by a connecting bar 72 carried by a solenoid 74. The solenoid 74 forms part of a circuit which is arranged to be closed to energize the solenoid when the plunger is permitted to be rocked beyond its normal stroke. As herein shown, a second arm 76 formed integrally with the plunger lever 16 is arranged to engage one member 78 of a switch 80 carried by the bracket 20. The contact member 78 is normally held in its open position by a coil spring 82 and upon pressure being applied by the arm 76 the member 78 is pressed into engagement with a stationary contact 84 of the switch 80 to close the circuit to the solenoid, as clearly shown in Fig. 3. Thus, when the abnormal movement of the plunger into the container indicates a defectively filled container, the solenoid 74 is energized to open the circuit to the driving motor 66 to stop the machine. It will be understood that the above described circuit controlling means is merely illustrative and that other forms of circuit controlling devices may be employed arranged to be actuated by abnormal movement of the plunger to either make or break the contacts to effect stopping of the motor or other power means of the machine.

While the preferred embodiment of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. In a packaging machine, in combination, container supporting means for supporting a container having a load of material, means for compressing the material in the container including a plunger, means for imparting a predetermined normal plunging movement to the plunger to effect the compression of the material

in the container to a predetermined level, said plunger being mounted to be capable of additional abnormal movement into the container in the event that the container has been incompletely filled, and control means comprising an electrical control circuit and connections between the plunger and said electrical control circuit for modifying the latter in the event of said abnormal movement of the plunger.

2. In a packaging machine, in combination, container supporting means for supporting a container having a load of material, means for compressing the material in the container including a plunger, means for imparting a predetermined normal plunging movement to the plunger to effect the compression of the material in the container to a predetermined level, said plunger being mounted to be capable of additional abnormal movement in the container in the event that the material in the container is below said predetermined level, and control means comprising an electrical control circuit and connections between the plunger and said electrical control circuit for modifying the latter in the event of said abnormal movement of the plunger.

3. In a packaging machine, in combination, container supporting means for supporting a container having a load of material, means for compressing the material in the container including a plunger, means for imparting a predetermined normal plunging movement to the plunger to effect the compression of the material in the container to a predetermined level, said plunger being mounted to be capable of addition abnormal movement into the container in the event that the container has been incompletely filled, operating means for operating the packaging machine, control means connected with said operating mechanism, and connections between said control means and said plunger having provision whereby the control means is rendered operative to interrupt the operation of the machine in the event of the abnormal movement of said plunger.

4. In a packaging machine, in combination, container supporting means for supporting a container having a load of material, means for compressing the material in the container including a plunger, means for imparting a normal plunging stroke to the plunger to effect compression of the material in the container, said plunger being mounted to be capable of additional abnormal movement into the container in the event that the container has been incompletely filled, operating means including an electrical motor for operating the packaging machine, a circuit for said motor, a second circuit including a solenoid adapted to open and close said motor circuit, and means operatively connected to said plunger for actuating said solenoid to open said motor circuit and to terminate the operation of the machine when the plunger is moved through said abnormal movement.

5. In a packaging machine, in combination, container supporting means for supporting a container having a load of material, means for compressing the material in the container including a rockingly mounted plunger, a two-armed lever mounted to rock with said plunger, a spring connecting said plunger to one arm of said two-armed lever, means for imparting movement to said two-armed lever to cause said plunger to engage the material in the container, a second arm of said two-armed lever being ar-

ranged to engage said plunger to positively force the material down to a predetermined level against the resistance of the material, said spring operating to cause said plunger to fall below said predetermined level in the event that the container is incompletely filled, and control means operatively connected to said plunger adapted to terminate the operation of the machine when said plunger moves below said predetermined level.

6. In a packaging machine, in combination, container supporting means for supporting a container having a load of material, means for compressing the material in the container including

a plunger, means for imparting a predetermined compressing movement to the plunger against the resistance of the material to compress the latter to a predetermined level when the container is sufficiently filled, said plunger being adapted to move beyond said predetermined limit when the container is insufficiently filled, operating means for operating the machine, and control means including connections between said plunger and said operating means adapted to interrupt the operation of the machine in the event said plunger is moved beyond said predetermined limit.

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