

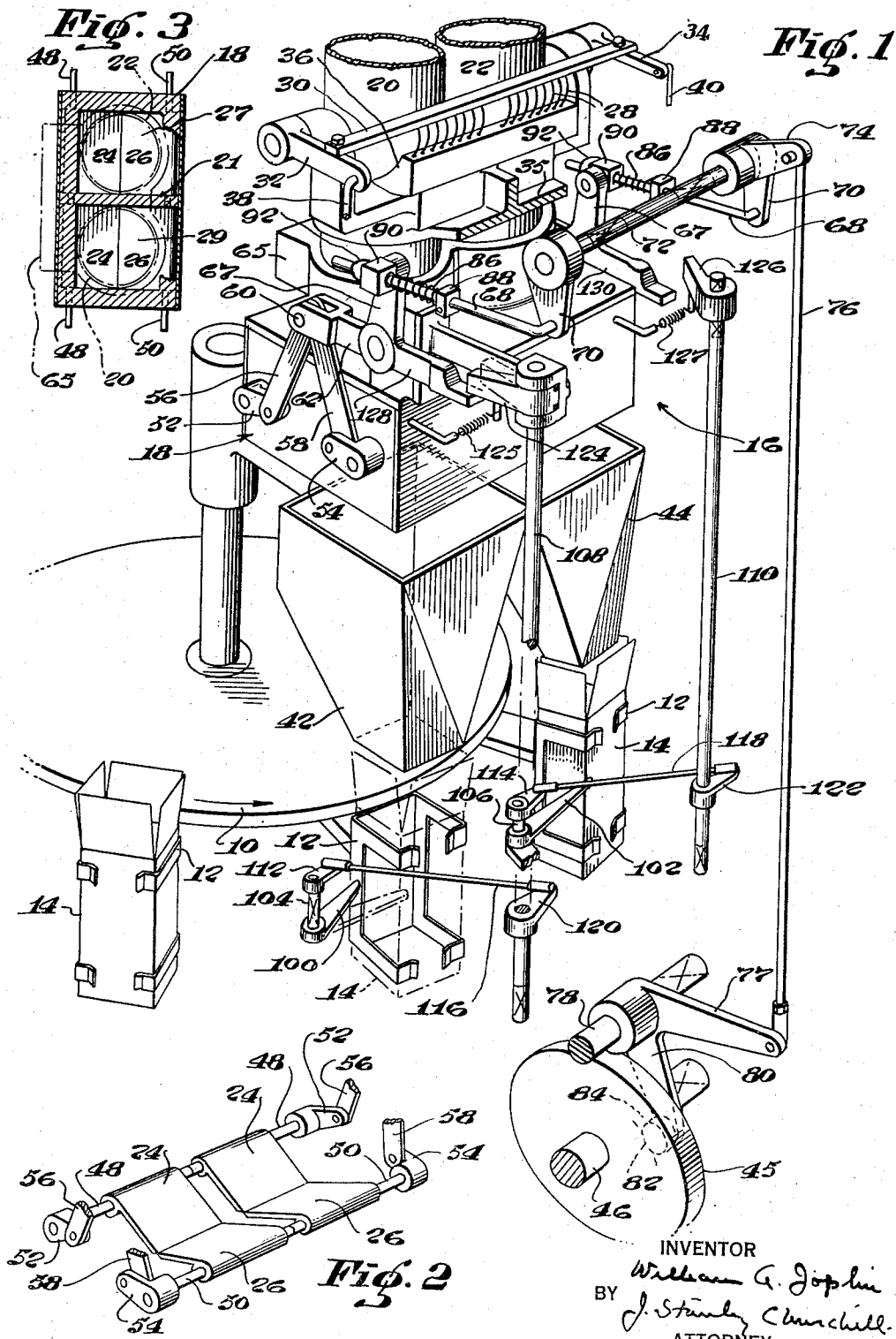
Feb. 1, 1944.

W. A. JOPLIN

2,340,536

PACKAGING MACHINE

Filed July 24, 1940



UNITED STATES PATENT OFFICE

2,340,536

PACKAGING MACHINE

William A. Joplin, Wollaston, Mass., assignor to
Pneumatic Scale Corporation, Limited, Quincy,
Mass., a corporation of Massachusetts

Application July 24, 1940, Serial No. 347,172

4 Claims. (Cl. 226-97)

This invention relates to a packaging machine. The invention has for an object to provide a novel and improved packaging machine provided with filling mechanism arranged to release the material into a container disposed therebeneath and in which control mechanism is provided adapted to prevent release of the material in the event that there is no container present.

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 illustrating the preferred embodiment of the invention, Fig. 1 is a perspective view of a sufficient portion of a packaging machine to enable the present invention to be understood; Fig. 2 is a detail view in perspective of the shutters for the filling device shown in Fig. 1; and Fig. 3 is a plan view in cross-section of the filling hopper.

In general, the present invention contemplates a packaging machine having a carrier provided with a plurality of container supporting pockets adapted to be intermittently moved to present the containers into and from filling position. The illustrated packaging machine is preferably provided with a dual filling device adapted to fill two containers at a time while the latter are supported in said intermittently movable pockets, and in the operation of the machine, two containers, each held in its individual container supporting pocket, are moved into position to present them in alignment with a pair of movable funnels disposed beneath the filling device, the latter being arranged to release its material into the funnels when the containers arrive into filling position. Prior to arriving at the filling station, the containers are individually withdrawn from a magazine in which they are stacked in their flat or collapsed condition and are opened up and inserted into their individual pockets. The containers are then moved to a bottom folding station where the bottom flaps of the container are closed in readiness to be filled.

In order to increase the filling time, the funnels are arranged to be moved along with the containers during one intermittent movement, whereupon the funnels are moved back to their original position. During the retracting movement of the funnels, the carrier is advanced another intermittent movement so that the funnels

are again in position over two empty containers ready to be filled.

In accordance with the present invention, provision is made for controlling the operation of the filling mechanisms to prevent release of the material therein in the event that there are no containers in the pockets, such as might occur through failure of the container withdrawing and opening means, or through depletion of the supply of containers. The present control mechanism includes individual detecting fingers for each container presented beneath the dual filling apparatus arranged to control individual pairs of shutters of the filling apparatus, so that the latter may operate to fill one container in the event that the container is absent from the companion pocket.

Referring now to the drawing, the present control mechanism is preferably illustrated as embodied in a packaging machine provided with an intermittently rotatable carrier disk 10 upon which a plurality of container supporting pockets 12 are mounted to be movable therewith. The packaging machine is provided with mechanism, not shown, for withdrawing containers 14 from a stack in which they are stored in their collapsed condition, and provision is made for opening and transferring the containers into their individual pockets 12, with their top and bottom flaps extended. The bottom flaps are then closed, by suitable mechanism, not shown, preparatory to being presented to the filling mechanism, indicated generally at 16. Thereafter, the containers are presented to subsequent stations where the top flaps of the container are closed and sealed to produce a filled and sealed package. Such mechanisms may comprise any of the known devices used with packaging machines now upon the market, only a sufficient portion of such a machine being herein illustrated as to enable the present invention to be understood.

The illustrated filling mechanism comprises a dual feeding hopper 18 arranged to receive material from a supply thereof through feed conduits 20, 22. The feeding hopper 18 is provided with a central partitioning wall 21, as shown in Fig. 3, to form a dual feed hopper, and each compartment 21, 23, is provided with a pair of bottom shutters 24, 26 arranged to be opened and closed in timed relation to the movement of the containers. In operation, the material flows by gravity through the conduits 20, 22, and provision is preferably made for permitting a predetermined amount of the material to be released into the compartments of the feeding hopper,

such as by closing and opening the conduits at predetermined intervals in the operation of the machine. The conduit opening and closing mechanism herein illustrated, comprises a plurality of curved wires 28 mounted upon a cross-bar 30 supported at either end upon similar rocker arms 32, 34 pivotally mounted in a supporting bracket 35. The curved wires 28 extend through holes in a guide bar 36 and are arranged to be rocked into and from conduit opening and closing position through suitable cam operated mechanism, not shown, which may be operatively connected to the arms 32, 34 by links 38, 40. The curved wires 28 may be spaced relatively close together, depending upon the type of material being run, so as to cut off the supply of material when they are in their closed position. The wires are preferably used when running coarse, fragile materials, such as corn flakes, so as to reduce breakage of the material to a minimum, although, when running finely divided material, such as sugar, coffee and the like, a solid plate may be used to cut off the supply of material.

In the operation of the device, the curved wire gates 28 are opened and closed at predetermined intervals in order to release a sufficient amount of material into each compartment 27, 29 of the feeding hopper 18 to fill the containers 14 being moved into position therebeneath. Provision is made for opening the shutters 24, 26 to release the material thus accumulated and to permit the material to fall into a pair of funnels 42, 44 interposed between the feeding hopper and the containers and arranged to guide the material into the containers. As herein illustrated, the shutters 24, 26 are arranged to be opened through connections from a cam 45 mounted fast upon a cam shaft 46 which may form a part of the packaging machine. The shutters are mounted fast upon pins 48, 50 journaled in suitable bearings in the hopper, and as herein shown, are arranged to be operated in pairs, each pin being provided with an arm 52 or 54 fast thereon such arms being connected by links 56, 58 to a common pivotal point 60 carried on the end of one arm 62 of each of similar three-armed levers pivotally mounted upon studs 64 carried in either end of the hopper top 65. The second arms 67 of each of the three-armed levers are yieldingly connected by links 68 to lever 70 fast upon a rocker shaft 72 journaled in suitable bearings in the machine frame. An arm 74 fast upon the rocker shaft is connected by a link 76 to one arm 77 of a bell-crank pivotally mounted on a cross-shaft 78. The second arm 80 of the bell-crank carries a cam roller 82 which operates in a cam path 84 formed in the closed cam 45. As herein shown, the yieldable connections between the arms 67 and arms 70 for operating each pair of shutters 24, 26 include coil springs 86 which bear against collars 88 fixed to the links 68 and against swivelled connections 90 carried by the arms 67. The links 68 are slidably fitted in the swivelled connections 90 and collars 92 fixed to the links 68 are arranged to bear against the opposite side of the swivelled connections in order to limit the extension of the springs 86. With this construction, it will be observed that when the arms 67 are rocked in a counterclockwise direction viewing Fig. 1, the springs 86 bearing against the swivelled connections effect opening of the shutters while movement of the arms 67 in the opposite direction will effect a positive closing of the shutters, through engagement of

the collars 92 with the swivelled connections 90.

In accordance with the present invention, provision is made for preventing opening of the gates when there is no container present in the container supporting pockets 12, and as herein shown, detecting fingers 100, 102 mounted upon vertical studs 104, 106 are arranged to extend into the path of the containers as they are moved into filling position. When the detecting fingers 100, 102 engage a container in the pocket, the studs 104, 106 are rocked, and such rocking movement is transmitted to vertical shafts 108, 110 through connections including arms 112, 114, links 116, 118 and levers 120, 122. The upper ends of the vertical shafts 108, 110 are provided with latch members 124, 126 and the parts are normally urged by springs 125, 127 in a direction such as to engage latch arms 128, 130 forming part of the three-armed levers, above referred to.

From the above description, it will be observed that when there are containers present in the pockets 12, the detecting fingers 100, 102 will be rocked by engagement with the containers being brought into filling position, and the latch members 124, 126 will be rocked out of the path of the latch arms 128, 130 permitting the shutters 24, 26 to be opened to release the material into the containers 14. On the other hand, in the event that there are no containers present in the container supporting pockets 12, the latch members will remain in the path of movement of the latch arms 128, 130 to prevent opening of the shutters. When this occurs, the links 68 slide through the swivelled connections 90, the spring 86 being permitted to yield when the cam 45 operates to move the links in a shutter opening direction. With this construction, it will also be observed that in the event the carton is absent from one pocket only, the gates associated with such pocket will fail to open, while permitting the companion gates to open to fill the container in the companion pocket.

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, a plurality of container holding members for supporting a plurality of containers in operative position to be simultaneously filled, a plurality of filling mechanisms, each including a hopper and a gate associated therewith adapted to be opened to discharge material from the associated hopper into a container supported by a container supporting member, and gate operating mechanism including a movable member common to all of said gates, means for moving said movable member for simultaneously opening all of said gates to fill said containers, control mechanism operatively connected with said gates to prevent an individual gate from opening in the absence of a container from the container holding member associated with said individual gate, and resilient means individual to each of said gates forming yieldable connections between said movable member and said gates for yieldably transmitting movement of said movable member to said gates for opening said gates to enable said movable member to be moved against the resistance of said resilient means and enable said individual

gate to be held in closed position by said control mechanism.

2. In a packaging machine, in combination, a plurality of container holding members for supporting a plurality of containers in operative position to be simultaneously filled, a plurality of filling mechanisms, each including a hopper and a gate associated therewith adapted to be opened to discharge material from the associated hopper into a container supported by a container supporting member, and gate operating mechanism including a movable member common to all of said gates, means for moving said movable member for simultaneously opening all of said gates to fill said containers, control mechanism operatively connected with said gates to prevent an individual gate from opening in the absence of a container from the container holding member associated with said individual gate, and resilient means individual to each of said gates forming yieldable connections between said movable member and said gates for yieldably transmitting movement of said movable member to said gates for opening said gates to enable said movable member to be moved against the resistance of said resilient means and enable said individual gate to be held in closed position by said control mechanism, said control mechanism including feeler members for detecting the presence of containers in said container holding members, latch members for retaining said gates in closed position and connections between said feeler members and said latch members for removing said latch members to inoperative position when containers are present in said container holding members.

3. In a packaging machine, in combination, a plurality of container holding members for supporting a plurality of containers in operative position to be simultaneously filled, a plurality of filling mechanisms, each including a hopper and a gate associated therewith adapted to be opened to discharge material from the associated hopper into a container supported by a container supporting member, and gate operating mechanism including a movable member common to all of said gates, means for moving said movable member for simultaneously opening all of said gates

to fill said containers, control mechanism operatively connected with said gates to prevent an individual gate from opening in the absence of a container from the container holding member associated with said individual gate, and compression springs individual to each of said gates forming yielding connections between said movable member and said gates for yieldably transmitting movement of said movable member to said gates for opening said gates to enable said movable member to be moved against the resistance of said springs and enable said individual gate to be held in closed position by said control mechanism.

4. In a packaging machine, in combination, a plurality of container holding members for supporting a plurality of containers in operative position to be simultaneously filled, a plurality of filling mechanisms, each including a hopper and a gate associated therewith adapted to be opened to discharge material from its associated hopper into a container supported by a container supporting member, and gate operating mechanism including a movable member common to all of said gates, cam means for moving said movable member for simultaneously opening all of said gates to fill said containers, control mechanism having latch members individual to each of said gates to prevent an individual gate from opening in the absence of a container from a container holding member associated with said individual gate, and resilient means individual to each of said gates forming yielding connections between said movable member and said gates for yieldably transmitting movement of said movable member to said gates for opening said gates to enable said movable member to be moved against the resistance of said resilient means and enable said individual gate to be held in closed position by said control mechanism, said control mechanism also having feeler members for detecting the presence of containers in said container holding members and connections between said feeler members for moving said latch members to inoperative position when containers are present in said container holding members.

WILLIAM A. JOPLIN.