

May 12, 1936.

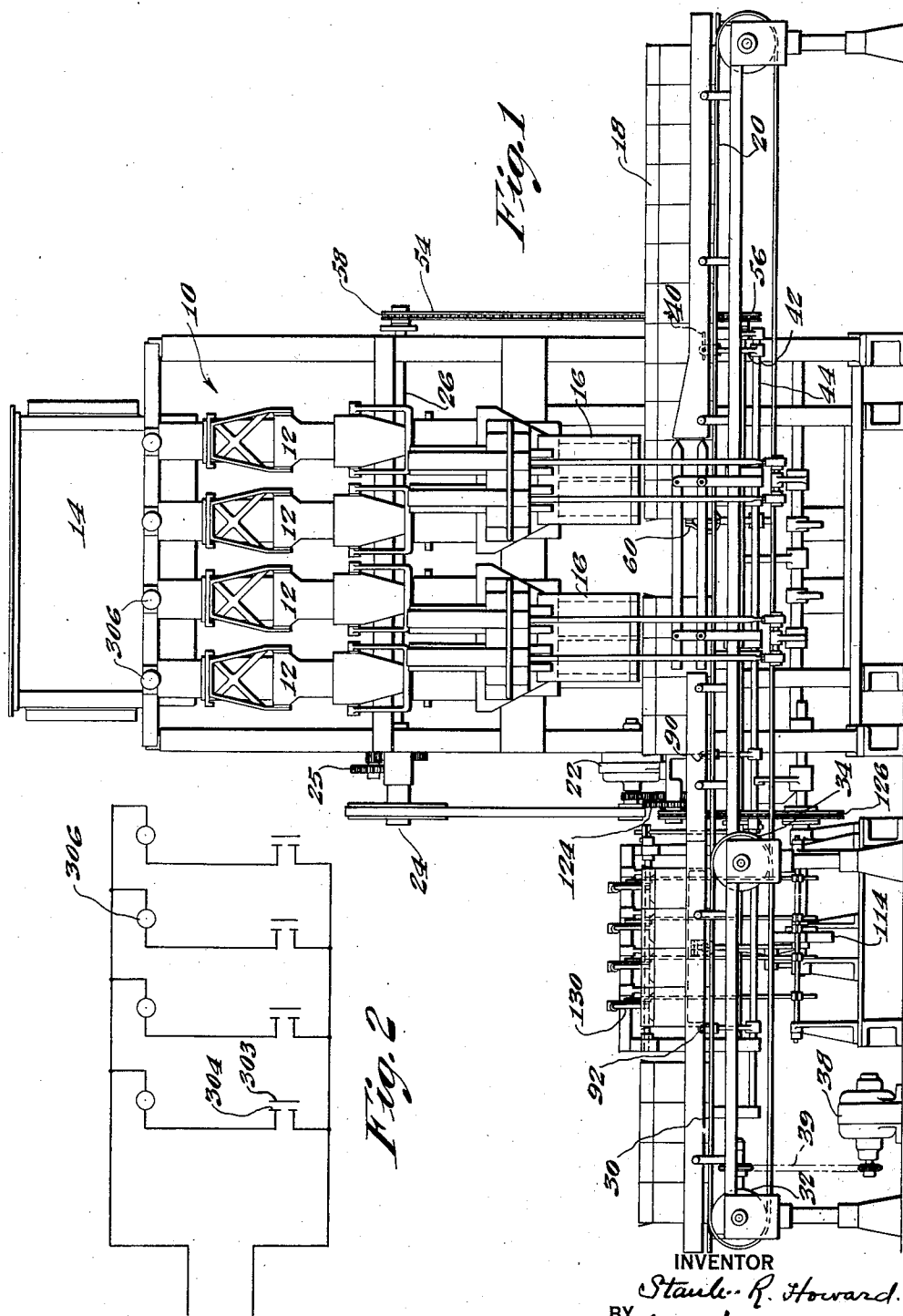
S. R. HOWARD

2,040,436

PACKAGING MACHINE

Filed April 13, 1934

7 Sheets-Sheet 1



INVENTOR
Stanley R. Howard.
BY J. Stanley Churchill.
ATTORNEY

May 12, 1936.

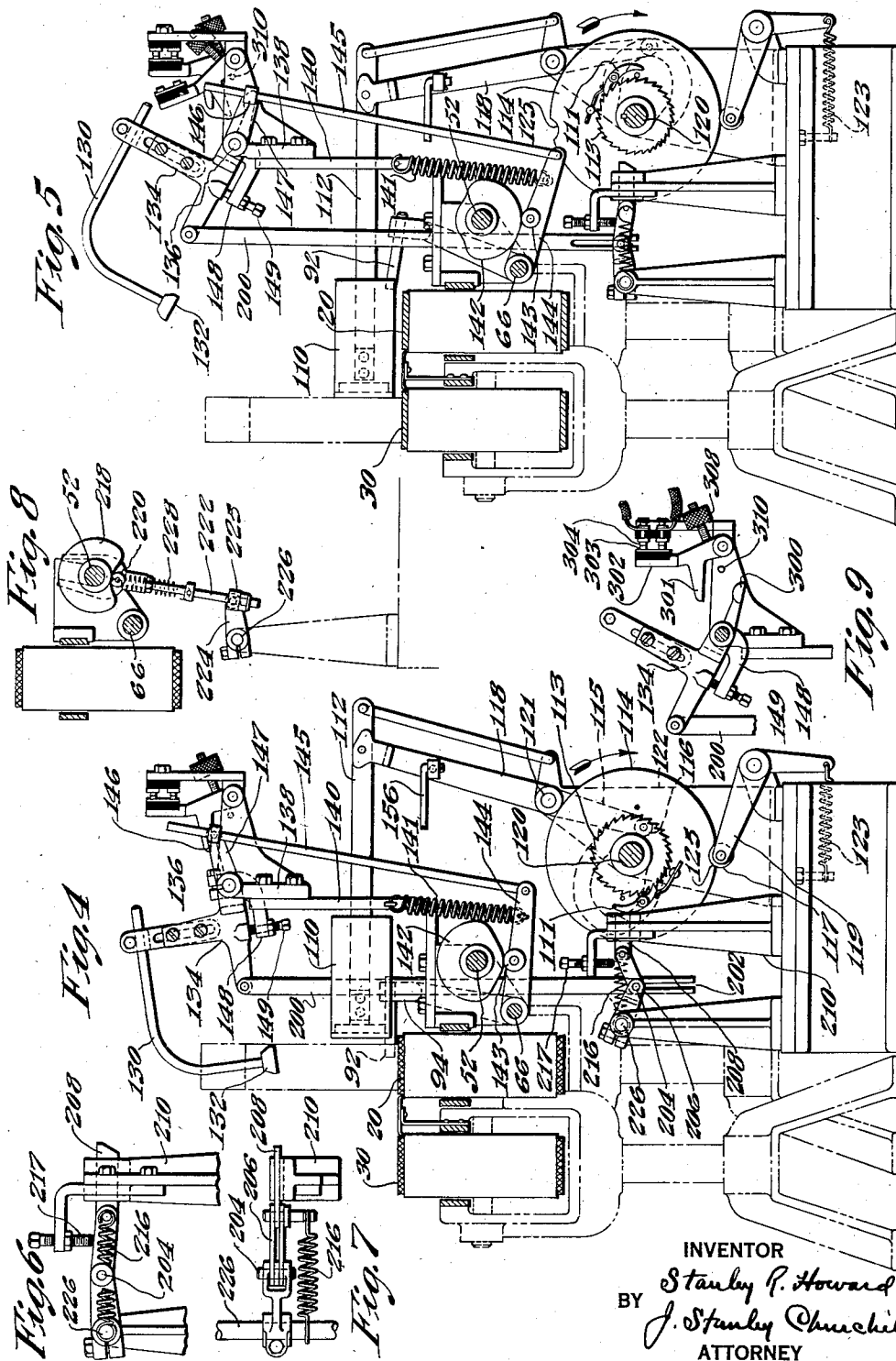
S. R. HOWARD

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Filed April 13, 1934

7 Sheets-Sheet 3



INVENTOR
Stanley P. Howard
BY J. Stanley Churchill
ATTORNEY

May 12, 1936

S. R. HOWARD

2,040,436

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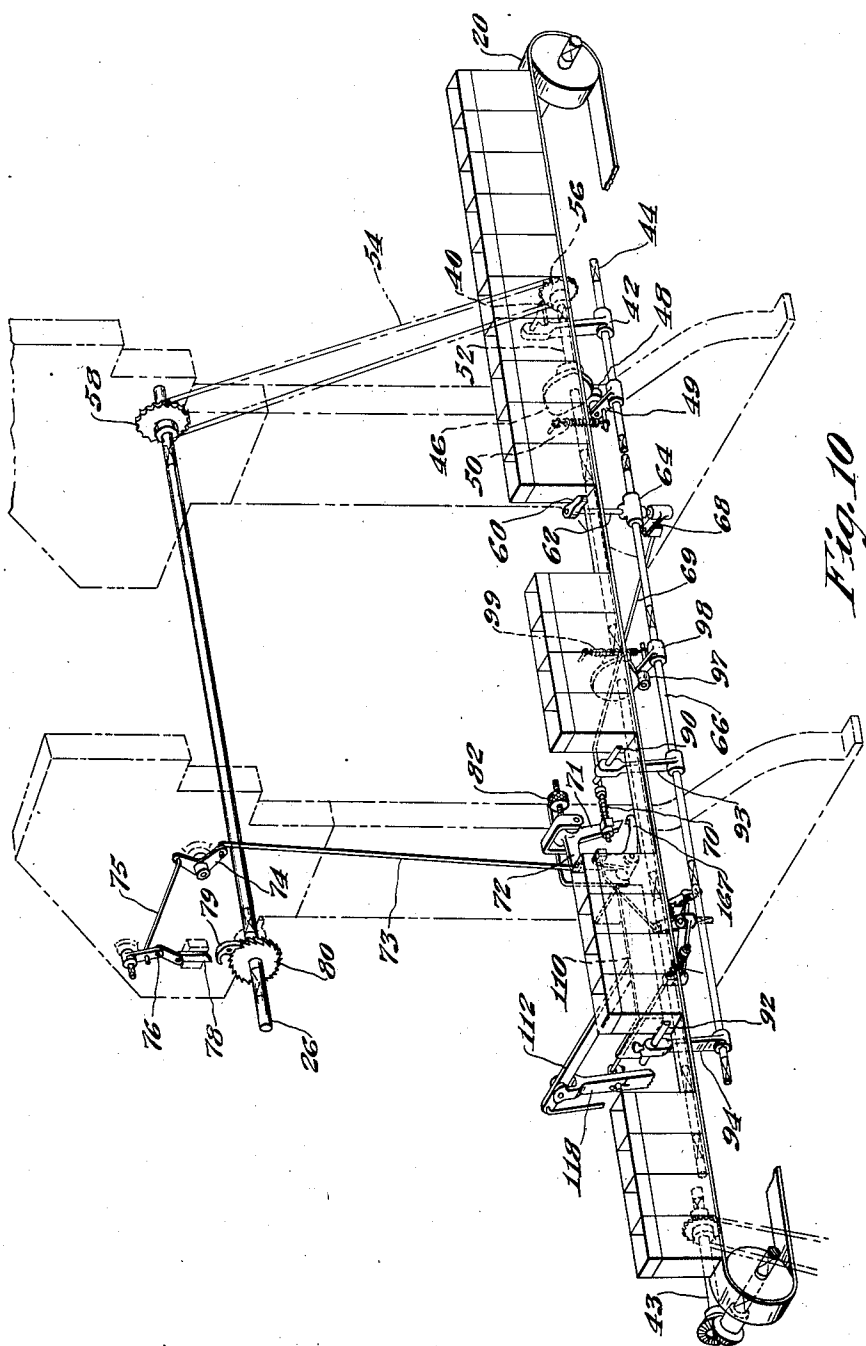


Fig. 10

INVENTOR
Stanley R. Howard
BY J. Stanley Churchill,
ATTORNEY

May 12, 1936

S. R. HOWARD

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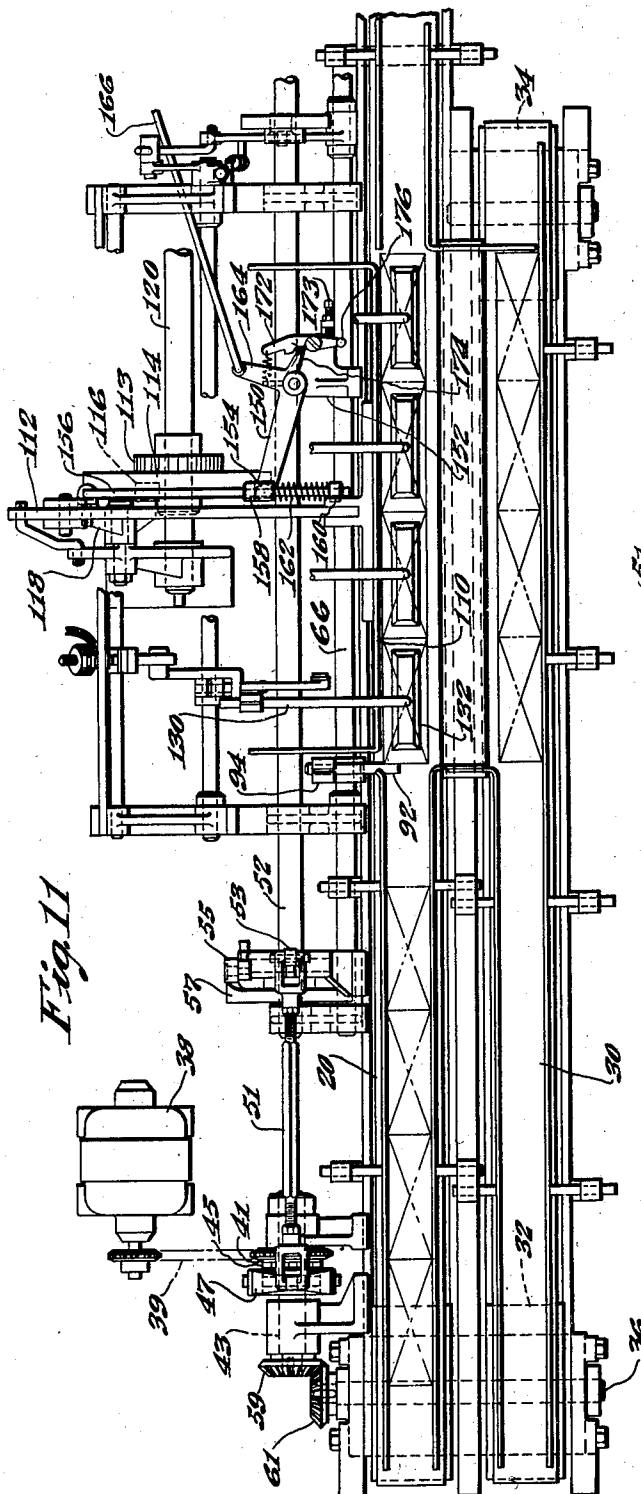


Fig. 11

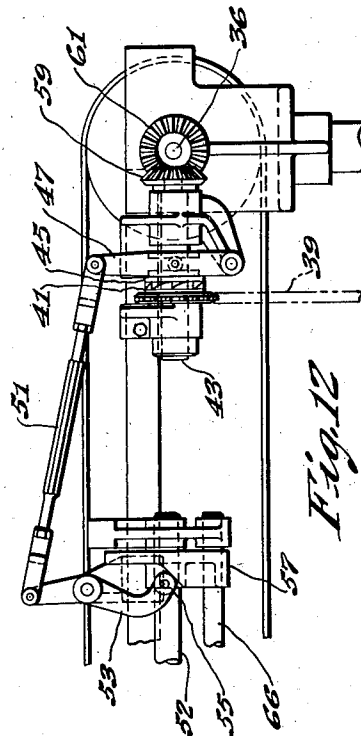


Fig. 12

INVENTOR
Stanley R. Howard
BY J. Stanley Churchill
ATTORNEY

May 12, 1936.

S. R. HOWARD

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PACKAGING MACHINE

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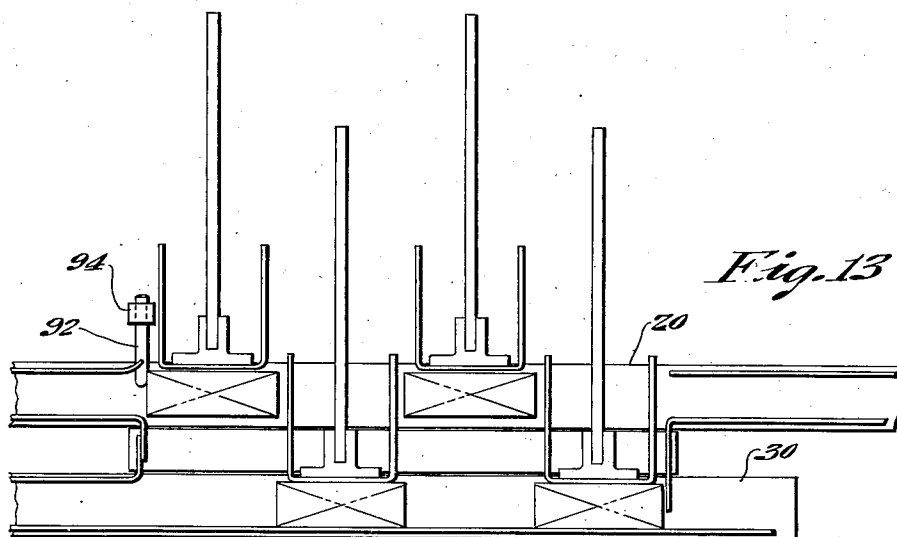


Fig. 13

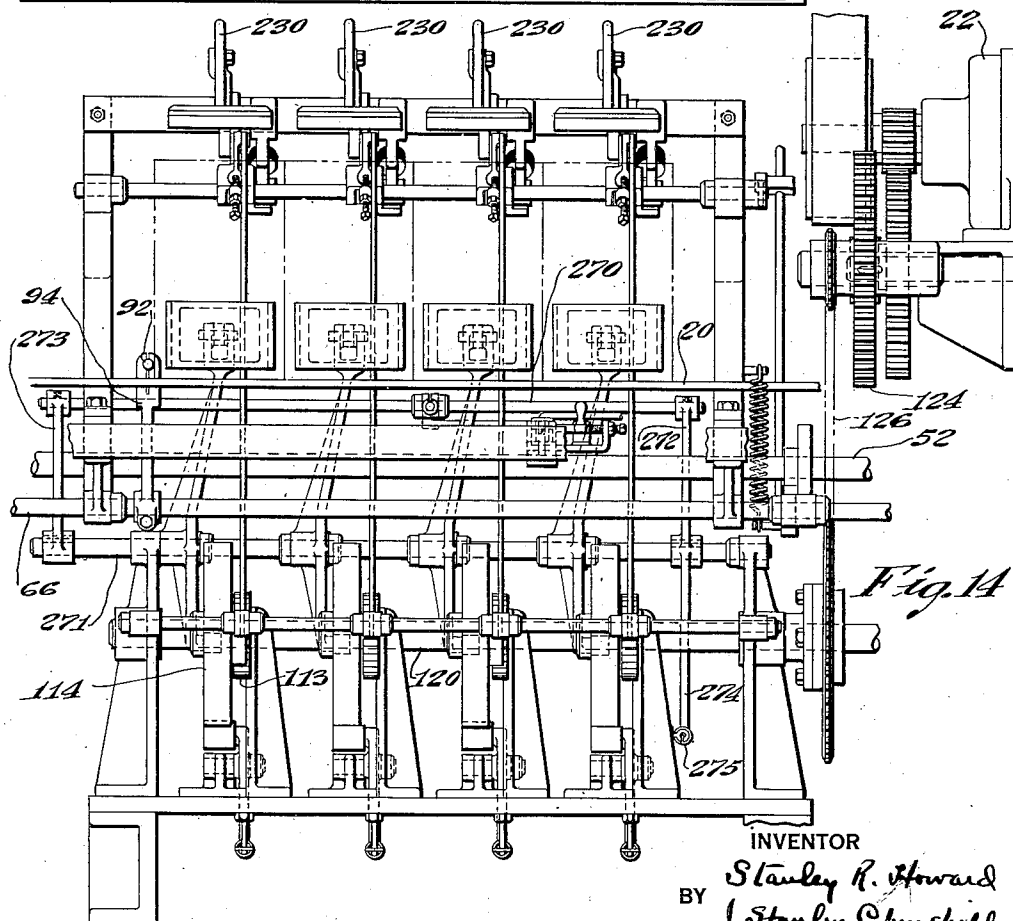


Fig. 14

INVENTOR
Stanley R. Howard
BY J. Stanley Churchill
ATTORNEY

May 12, 1936.

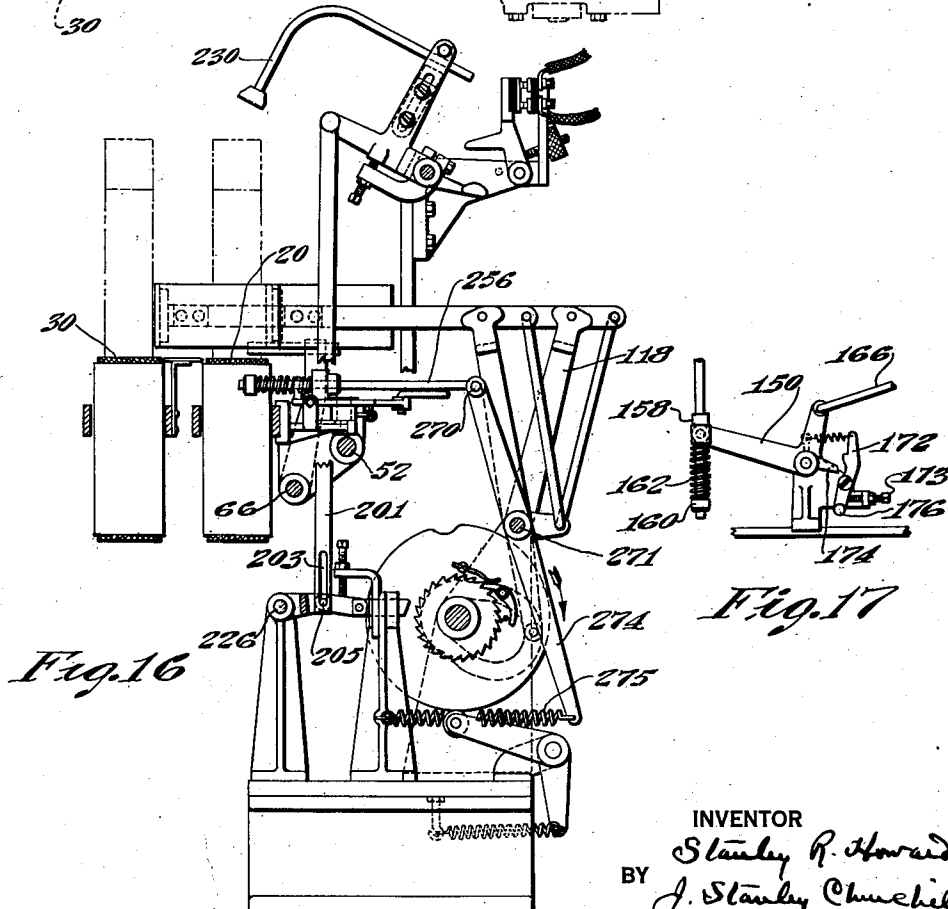
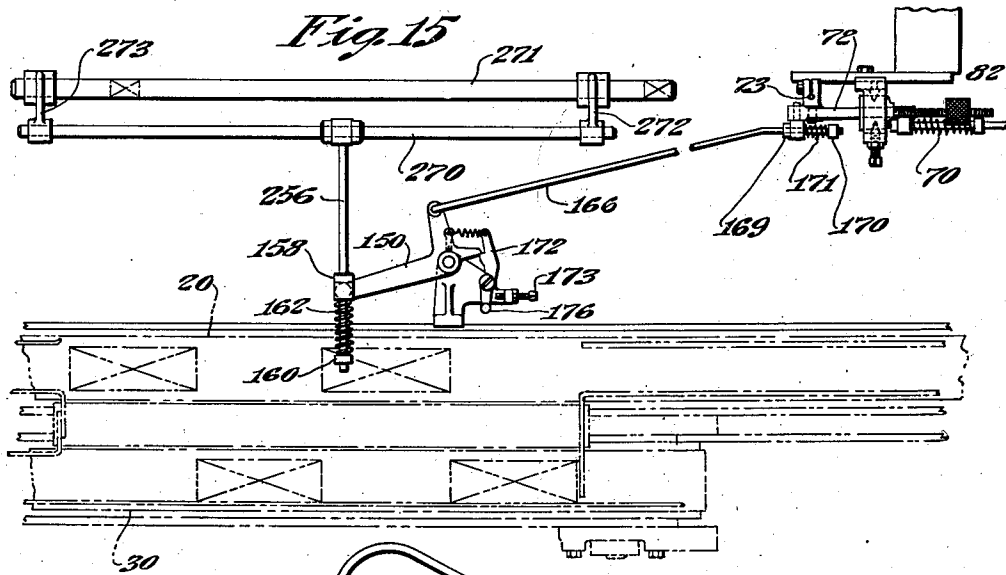
S. R. HOWARD

2,040,436

PACKAGING MACHINE

Filed April 13, 1934

7 Sheets-Sheet 7



INVENTOR
Stanley R. Howard
BY
J. Stanley Churchill
ATTORNEY

UNITED STATES PATENT OFFICE

2,040,436

PACKAGING MACHINE

Stanley R. Howard, Milton, Mass., assignor to
Pneumatic Scale Corporation, Limited, Quincy,
Mass., a corporation of Massachusetts

Application April 13, 1934, Serial No. 720,399

10 Claims. (Cl. 228—95)

This invention relates to a packaging machine and more particularly to a machine for filling packages with flowable solid material.

One object of the invention is to provide a novel and improved packaging machine in which provision is made for detecting incompletely filled packages by a detecting member which is introduced into the package after the latter has been filled and for separating incompletely filled packages from the normal discharge of packages from the machine.

Another object of the invention is to provide a novel and improved packaging machine in which provision is made for detecting incompletely filled packages by the operation of a plurality of detecting mechanisms adapted to feel for the contents of the package and for automatically separating the incompletely filled packages from the normal discharge of packages from the machine, and also in which provision is preferably made for selectively controlling the operation of the packaging machine from any one of a plurality of detecting members.

With these general objects 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 drawings illustrating the preferred embodiments of the invention, Fig. 1 is a front elevation of a machine embodying the invention; Fig. 2 is a wiring diagram for the trouble indicating devices to be referred to; Fig. 3 is a front elevation of one form of the detecting and separating mechanism forming a part of the present machine; Figs. 4 and 5 are views in side elevation of the detecting and package separating mechanism shown in Fig. 3, the parts being shown in different positions of operation; Figs. 6 and 7 are views in side elevation and plan respectively, illustrating the pawl stop to be referred to; Fig. 8 is a detail of the pawl stop resetting device; Fig. 9 is a detail of a switch for the trouble indicating mechanism; Fig. 10 is a perspective view of the conveyor and associated mechanism shown in Fig. 1; Fig. 11 is a plan view of a portion of the machine shown in Fig. 3; Fig. 12 is a detail view of the conveyor drive; Fig. 13 is a detail in plan illustrating a modified form of detecting and package separating mechanism which may form a part of the present machine; Fig. 14 is a front elevation of the mechanism shown in Fig. 13; Fig. 15 is a detail in plan illustrating the

mechanism for selectively controlling the operation of the packaging machine from the detecting mechanism; Fig. 16 is a side elevation of the mechanism shown in Fig. 14, one of the package pushers being shown in operative package pushing position; and Fig. 17 is a detail of a portion of the mechanism shown in Fig. 15.

In general, the invention contemplates a packaging machine which may include any usual or preferred form of package filling mechanism such as the package filling mechanism embodied in the well known weighing machines and in the measuring machines now upon the market, and in both of which provision is made for introducing successive loads into successive packages as the latter are automatically fed into the machine by the usual incoming conveyor. After the loads have been introduced into the packages, the packages and their loads are automatically conveyed from the machine upon a discharge conveyor. Inasmuch as the details of the package filling mechanisms of self form no part of the present invention, it is believed sufficient to state that such mechanisms may operate in accordance with the operation of any usual or preferred form now upon the market, and only a sufficient portion of such mechanisms will be hereinafter more specifically referred to as will enable the different features of the present invention to be understood.

In accordance with the present invention, provision is made for detecting incompletely filled packages in a novel and improved manner and for segregating the incompletely filled packages to prevent the intermingling of such incompletely filled packages with the normal and completely filled packages being discharged from the machine. Another feature of the invention contemplates the use of a plurality of detector mechanisms designed to detect the contents of a group of the filled packages and to effect the separation from the main line of packages being discharged from the machine of those packages which are incompletely filled, and also preferably for effecting the control of the filling mechanism per se selectively in accordance with the detection of an incompletely filled package by any one of the plurality of detecting mechanisms.

Referring now to the drawings, I have herein illustrated the filling mechanism 10 as including weighing mechanism having four scales 12 arranged in groups of two and onto which the material to be weighed is fed in the usual manner from a supply hopper 14. The flow of the material onto the scales 12 is controlled by suitable

gates and operating mechanism therefor (not shown), and provision is also made for resetting and locking the scales in accordance with the common practice in the usual forms of automatic weighing machines now upon the market. After the four loads have been weighed upon the scales 12, the loads are dumped through discharge chutes 16 into packages 18 properly positioned beneath the discharge chutes by an incoming conveyor 20. For the purposes of the present invention it is believed to be sufficient to state that the weighing mechanism is driven by a motor 22 through a belt connection to a shaft 24 and thence through suitable gearing 25 to a main drive shaft 26. From this shaft 26 the gate operating mechanism, the scale resetting and locking mechanism, and the stirring devices within the hoppers (all not shown), are driven so that the operation of the entire weighing mechanism is controlled by the shaft 26 in accordance with usual practice.

Referring now to Figs. 10 and 11, the movement of the packages through the machine and into and from filling position is effected as follows. The machine is provided with the belt 20 which serves as an incoming conveyor and as a discharge conveyor for normal packages, and the machine is also provided with a short discharge conveyor 30 mounted to run over pulleys 32, 34, one of which is secured upon the driving shaft 36 by which the main belt 20 is driven, so that both belts 20, 30 are driven together in the same direction. Provision is made as will be described for detecting incompletely filled packages and for automatically transferring such packages onto the second belt 30 to be discharged from the machine in a path separate from the normal discharge of the packages by the belt 20.

In order to drive the conveyor belts 20 and 30, a motor 38 is provided connected by a sprocket and chain drive 39 to one member of a clutch 41 free on the short shaft 43. The second member of the clutch 45 is formed as a part of a sleeve adapted to be moved on the shaft by a yoke 47 connected by a link 51 to a cam arm 53, the latter having a cam roll 55 which cooperates with a driven cam 57, see Fig. 12. The cam 57 is mounted upon the control shaft 52 and the cam 57 is so designed as to interrupt the movement of the belt during substantially all of the package filling and package detecting operations above described while maintaining the belts in operation during the remaining operations of the machine. As illustrated in Fig. 12, the short shaft 43 is connected by bevel gears 59, 61 to the main drive shaft 36 upon which the two driven pulleys for the belts 20 and 30 are mounted.

As shown in Fig. 10, a line of packages to be filled is conveyed by the belt 20 into the machine from any suitable source of supply, and in practice from the usual bottom sealing machine, and in order to segregate the packages into groups of four, provision is made for holding back the line of packages being fed into the machine, as herein shown by a package engaging member 40 mounted upon an arm 42 secured on a short shaft 44, and the latter is adapted to be rocked by a cam 46 through a cam roll 48 on an arm 49 also mounted upon the shaft 44, a suitable spring 50 being provided to hold the cam roll against the cam. The cam 46 is mounted upon the control shaft 52 and the control shaft 52 is driven in timed relation to the operation of the weighing mechanism through connections including a driving chain 54 running around sprockets 56, 58.

The sprocket 58 is operatively connected with the shaft 26 by which the operations of the weighing mechanisms above referred to are controlled, so that the control shaft 52 will make one revolution at each revolution of the shaft 26.

As illustrated in Fig. 10, the package engaging member 40 is arranged to engage the fifth package from the forward end of the line of packages being conveyed into the machine so as to hold back the remainder of the line and to permit the group of four packages to be moved by the belt against a stop member 60. The stop member 60 is mounted upon the upper end of a shaft 62 pivotally mounted in a bearing member 64 secured to rock with a shaft 66. The shaft 62 is connected by linkage including an arm 68, a link 69 having a yielding connection 70 to one arm 71 of a bell crank, the second arm 72 of which is connected by a second link 73 to a bell crank 74, and the second arm of the bell crank 74 is connected by a link 75 to a toggle 76, the latter being connected to a pawl stop 78 adapted, when the toggle is straightened, to be positioned in the path of the tail of the usual pawl 79 to hold it from engagement with the ratchet wheel 80. The pawl and ratchet 79, 80 comprise elements of the usual pawl and ratchet drive for the shaft 26. The bell crank 71, 72 is counter-weighted by the counter-weight 82 and the parts are so arranged that the stop member 60 until engaged by the first of the group of packages being advanced by the belt 20 projects angularly across the path of the packages and is pivotally moved by the first package into the position shown in Fig. 10. This pivotal motion is transmitted through the linkage described to the pawl stop 78 and operates to withdraw the pawl stop 78 from the path of the tail of the pawl 79 and into the position shown in Fig. 10, permitting the shaft 26 to be driven and the various operations of the machine to continue. In the event, however, that no package is advanced against the stop 60, then the pawl stop 78 is permitted to remain in the path of the tail of the pawl and the pawl and ratchet clutch is disengaged. The machine is also provided with two additional stop members 90, 92 mounted upon arms 93, 94, respectively, the latter being secured upon the shaft 66, and the stops 90, 92 are positioned so as to retain groups of the packages in the second filling station and in the detecting station respectively, as will be apparent from inspection of Fig. 1. In the illustrated machine the filling mechanism is arranged so that the first two packages of the group of four packages retained by the stop 60 are filled at that station while the last two packages of the group are filled when the group is positioned at the second filling station, being retained in such position by the stop 90. The shaft 66 for operating all of the stops 60, 90 and 92 simultaneously is arranged to be rocked by an operating cam 96 on the control shaft 52 through a cam roller 97 on a cam arm 98 secured to the shaft 66 and a spring 99 serves to keep the cam roller in engagement with the cam.

Referring particularly to Figs. 3, 4, and 5, provision is made for pushing a group of the filled packages, and as herein shown, of a group of four packages, from the main discharge belt 20 over onto the auxiliary belt 30 upon the detection of an incomplete filling of any one of the packages. For this purpose the machine is provided with a group package pusher 110, mounted upon a pusher rod 112 which is actuated by a cam 114 loosely mounted on the shaft 120. The rod 112 is con-

nected to an arm 118 which is pivoted on a stud 121 carried in a bracket 122 forming a part of the machine frame. An extended end 115 of the arm 118 carries a cam roller 116 which cooperates with the cam 114. The arm 118 forms part of a four bar linkage of usual construction which is provided to impart a substantially straight line motion to the group package pusher 110.

The cam 114 carries a spring pressed pawl 111 which is arranged to engage with a ratchet 113 secured on the shaft 120. The purpose of this construction is to permit the cam 114 to be disengaged from the ratchet 113 until an incompletely filled package is detected; as will be described.

The shaft 120 upon which the cam 114 and ratchet 113 are mounted is driven from the motor 22 through gearing 124 and a sprocket and chain drive 126, as illustrated in Figs. 1 and 14, so that the shaft 120 is continuously rotated during the operation of the machine. The cam 114 is mounted free to turn on the shaft 120 and provision is made for holding the cam from turning, from frictional engagement or otherwise, when not acted upon by the ratchet 113. As herein shown, a roller 117 carried by an arm 119 is arranged to bear against the periphery of the cam 114, and is yieldingly urged against the cam by a spring 123. At the end of the pusher cycle the roller 117 engages with a recess 125 cut in the periphery of the cam to thereby retain the cam in this position until acted upon by the ratchet 113.

The mechanism for detecting incompletely filled packages in the group of packages positioned at the detecting station and which are held by the stop 92 (Fig. 10) includes a plurality of detecting members 130 each being herein shown as comprising a curved bar having a bearing member 132 on the end thereof and which is adapted in one position of the mechanism to extend down into the individual packages of the group and in another position to be completely withdrawn, such positions being indicated in Figs. 4 and 5. Each detecting member 130 is mounted in a supporting member 134 adjustable in and forming a part of a bell crank mounted free to turn upon a supporting shaft 136 journaled in bearing 138 and standards 140 forming a part of the machine frame. The detecting member 130 is raised into the position shown in Fig. 5 by an operating cam 142 mounted upon the shaft 52 through a cam roller 143 on a cam arm 144 connected by a link 145 and swivel connection 146 to an arm 147 secured to the shaft 136, as shown. In this manner the shaft 136 is oscillated during the operation of the machine. Each supporting member 134 in which the detector is mounted is swung upwardly when the shaft 136 is thus rocked through the connections described by an individual arm 148 secured to the shaft 136 and having a contacting screw 149 adjustably mounted therein which is arranged to engage the underside of the supporting member 134 and to rock the same upwardly from the position shown in Fig. 4 to that shown in Fig. 5. A spring 141 holds the cam roller 143 against its cam 142.

The downward movement of each detector comprises the detecting stroke, and in the event that a package is incompletely filled the bearing member 132 upon the end of the detector 130 is permitted to fall under the weight of the parts, the supporting member 134 being free to turn on the shaft 136. As the bearing member 132 descends, it passes downwardly into the incompletely filled package into a position such as is illus-

trated in Fig. 4, and the movement of the parts into this position is utilized to effect the operation of the package pusher 110 by which the group of four packages are pushed over onto the secondary or auxiliary belt 30 to be discharged from the machine in a separate path. As herein shown the supporting member 134 has pivoted thereto a depending rod 200 provided with a forked lower end 202 arranged to straddle a projecting portion of a pin 204 comprising the pivotal pin of a toggle 206. One member of the toggle 206 is pivoted to a pawl stop 208 slidably mounted in suitable bearings in a framework 210 and which is arranged to be moved into and from the path of the tail of the pawl 111 of the pawl and ratchet clutch 113 above referred to by the straightening or breaking of the toggle 206. The other members of the toggle are secured to the shaft 226. A spring 216 is provided to assist in retaining the toggle 206 in its straightened position and for effecting rapid movement of the toggle into its broken position after the pivot pin 204 has once passed dead center, all as will be apparent from an inspection of Figs. 4 and 5. In its straightened position the toggle 206 comes in contact with a stop screw 217 which holds the toggle from further movement in this direction, as shown in Fig. 6.

From the description thus far it will be apparent, therefore, that when any one of the detecting members 130 is permitted by an incompletely filled package to descend into such a position, as is illustrated in Fig. 4, the end of the slot 202 in the rod 200 operates to force the pivot pin 204 of the toggle 206 downwardly and to cause the pawl stop 208 to be withdrawn from the path of the tail of the pawl 111 so that the pawl is permitted to engage the ratchet 113 and effect the movement of the group package pusher 110 through one cycle of operation. After the detecting operation has been thus performed the detector 130 is again raised to the position illustrated in Fig. 5 by the operation of the cam 142 through the connections above described, thus lifting the rod and permitting the toggle 206 to be straightened again and the pawl stop 208 restored into the path of the tail of the pawl 111 until the next incompletely filled package is encountered. As illustrated in Fig. 8, a cam 218 also mounted upon the shaft 52 is connected through a cam roll 220 and connecting link 222 to an arm 224 secured upon the shaft 226 upon which the second member of the toggle is mounted. The upper end of the link 222 is forked and embraces the shaft 52, as shown in Fig. 8. The cam roll 220 is held against the cam 218 by a spring 228, one end of which is fastened to the link 222, as shown in Fig. 3, and a second end of which is connected to a collar 229 mounted free to turn on the shaft 52, and in this manner, the spring 228 operates to raise the toggle into the position shown in Fig. 5 where the spring 216 operates to retain the toggle in its straightened position until the next incompletely filled package is detected. As the cam 218 operates during each cycle of the machine the link 222 is arranged to slide through a clearance hole in a swivel connection 225 attached to the arm 224, leaving the arm 224 in the position shown in Fig. 8, until the shaft 226 is rocked by the connections above described.

Provision is made for stopping the machine whenever an incompletely filled package has been detected in order to permit the operator to correct the machine. As illustrated in Figs. 3, 4, and 11, a bell crank 150 is pivoted on a suitable bracket 152 and one arm thereof is provided with a swivel

joint indicated at 154. A rod 156 is connected at one end to the lever 118 by which the package pusher 110 is actuated, and is provided with a collar 158 adapted to engage the swivel joint 154 upon forward movement of the rod 156 when the package pusher is actuated upon the detection of an incompletely filled package. The rod 156 is also provided with a second collar 160 and a coil spring 162 is interposed between the collar 160 and the swivel joint 154. Upon the detection of an incompletely filled package, therefore, the bell crank 150 is swung to the left, viewing Fig. 11. The second arm 164 is connected by a link 166 to one arm of a bell crank 168, the second arm of which comprises a latch member 167 and is adapted to be swung upwardly, viewing Fig. 3, into a position to hook under the end of the arm 71 of the bell crank comprising a part of the mechanism for controlling the initiation of the operation of the weighing devices and of the weighing mechanism, as above described. The arm 168 is connected to the link 166 through the two collars 169, 170 and spring 171, all as illustrated in Fig. 3. As a result of this construction, therefore, when an incompletely filled package has been detected and the package pusher has been operated as above described to push the group of packages onto the outgoing belt 30, then the latch 167 is raised into position to hold the arm 71 of the bell crank from movement under the influence of the incoming packages engaging the stop member 60, as above described. This leaves the group of packages which have been transferred by the package pusher in position on the outgoing belt 30 and the machine will not again resume operation until the latch 167 has been moved into disengaging position by the operator. In order to hold the bell crank 150 in the position in which it has been moved following the operation of the package pusher, as above described, a pivoted spring controlled latch member 172 is provided which is adapted to engage a finger 174 formed as a part of the bell crank 150 and to hold the bell crank from movement in a clockwise direction, viewing Fig. 11, until the latch is manually disengaged by the operator. For this purpose a handle 176 is provided to facilitate the disengagement of the latch 172. The coil spring connection 162 is provided to permit the rod 156 to travel back with the arm 118 sliding loosely through a hole in the swivel joint 154, after the bell crank 150 has been latched by the latch member 172 and finger 174. When the rod 156 moves back the collar 160 attached to the rod 156 compresses the spring 162 so that when the finger 174 is released the bell crank 150 will be moved back to its normal position. It may sometimes be desired, under certain conditions of use, to allow the filling machine to continue in its operation without being disturbed by the detecting mechanism and, for this purpose, provision is made for rendering the latch member 172 inoperative. As shown in Fig. 17, a set screw 173 is provided to bear against the handle 176 of the latch member 172. The set screw 173 normally acts as a stop to hold the latch member 172 in its adjusted position in relation to the finger 174, but, when it is desired to allow the filling machine to continue without being disturbed by the detecting mechanism, the set screw 173 is adjusted to the position shown in Fig. 17, to hold the latch member 172 out of the path of the finger 174. As a result, the bell crank 150 will not be held in the position shown in Fig. 15 and therefore the latch member 167 will not be held

in contact with the arm 71 to stop the machine. The movement of the bell crank 150 and the impingement of the packages against the stop 60 which moves the bell crank arm 71, are so timed that the latch 167 is out of the path of movement of the arm 71 when a package strikes the member 60.

In the embodiment of the machine, as thus far described, it will be observed that when one of the detecting members detects an incompletely filled package, then the entire group of packages is transferred by the group package pusher onto the outgoing belt 30. For some purposes it has been found desirable to transfer only the particular package or packages from the group being tested which are found to have been incompletely filled, and as illustrated in Figs. 13, 14, 15, and 16, I have illustrated the mechanism preferably employed for accomplishing this result. As therein shown, the machine is provided with four individual package pusher members for pushing the particular packages of the group being detected, which are found to have been incompletely filled, over onto the outgoing belt 30. The machine is also provided with four individual pusher actuating mechanisms which, except as to details to be pointed out, may be duplicates of the previously described pusher actuating mechanism employed in the embodiment of the invention involving the group package pusher. Each detector 230 is connected with its individual pusher actuating mechanism through connections including the rod 201, and by reference to Fig. 16 it will be observed that the rod 201 is at its lower end provided with a closed slot 203 in which the pivot pin 205 of the toggle is received so that the toggle is raised and depressed in engagement of the pin with the opposite end walls of the slot 203. With this construction the necessity of rocking the shaft 226 by the cam shown in Fig. 8 and associated parts is avoided inasmuch as the toggle is moved positively in both directions.

From the description thus far it will be observed that upon the detection of an incompletely filled package by one or more of the detecting members 230, the individual package pushers operatively connected therewith operate to push such incompletely filled packages onto the outgoing belt 30 while permitting the completely filled packages of the group being tested to remain on the belt 20 to be discharged in the normal manner from the machine.

Provision is made for stopping the machine following the detection of an individual incompletely filled package and the operation of an individual package pusher, and as illustrated in Figs. 15 and 16 this is accomplished by mechanism which may be a duplicate of the mechanism employed in connection with the embodiment of the invention previously described with the exception that instead of a direct connection between the rod 156 and the lever 118 of the package pusher actuating mechanism, a similar rod 256 is provided, see Fig. 15, which is connected to a crossbar 270 pivotally mounted in the upper ends of levers 272, 273, secured to a shaft 271, and the extended end 274 of one of the levers is connected by a spring 275 to maintain the bar 270 in an outward position in front of the pusher actuating levers 118. As a result of this construction, upon the detection of an incompletely filled package and the actuation of an individual package pusher, the bar 270 is engaged by the individual lever 118 of such package pusher and advanced causing the bell crank 150 to operate in

the manner above described in connection with the latching mechanism illustrated in Fig. 11.

Provision is made in both embodiments of the invention, as herein illustrated, for indicating the particular package filling mechanism by which a particular package has been incompletely filled when any one of the plurality of detector members has detected an incompletely filled package, and for this purpose each supporting member, see Figs. 4, 5, 9, and 16, is provided with a contact member 300 arranged, when the detector has been moved into the package into a position such as to detect an incomplete filling thereof, to engage with an abutment 301 on a pivoted contact member 302 so as to close an electrical circuit at the contacts 303, 304, and as illustrated in Figs. 1 and 2 to actuate an indicating member 306 which may comprise a light, bell, or other instrumentality by which the particular filling mechanism associated with the particular detector may be readily determined by the operator. In this manner the correction of the machine to overcome the incomplete filling of the packages may be easily and conveniently accomplished. The contact member 302 is held in the closed position, after the supporting member 134 has been rocked to the position shown in Fig. 9, by a counter-weight 308. After the filling mechanism has been corrected the contact member 302 is manually reset to open the circuit at the contact points 303 and 304. A stop pin 310 is provided, against which the member 302 rests in its open position.

While the preferred embodiments of the present invention have 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 package filling machine, in combination, a filling device arranged to simultaneously fill a plurality of packages forming a group, a discharge conveyor for discharging the filled packages from the machine, a plurality of detectors for operating on a group of filled packages to detect incompletely filled packages, and means for separating said group of packages from a line of packages being discharged in the event that any detector detects an incompletely filled package.

2. In a package filling machine, in combination, a filling device arranged to simultaneously fill a plurality of packages forming a group, a discharge conveyor for discharging filled packages from the machine, a plurality of detecting mechanisms for operating upon a group of packages, each being provided with a feeler member insertable into the package, and mechanism operatively connected with said feeler members for removing incompletely filled packages from the line of packages being discharged.

3. In a package filling machine, a filling device arranged to simultaneously fill a plurality of packages forming a group, in combination, a discharge conveyor for discharging filled packages from the machine, a plurality of detecting mechanisms for operating upon a group of packages, each being provided with a feeler member insertable into the package, and mechanism for removing those packages indicated by said feeler members as being incompletely filled from the line of packages being discharged from the machine.

4. In a package filling machine, in combina-

tion, a package filling mechanism, means for discharging the filled packages from the package filling mechanism, detecting mechanism including a feeler insertable into a package for detecting an incompletely filled package, package moving means, connections between said package moving means and said feeler for effecting the segregation of incompletely filled packages, and connections between said detecting mechanisms and the package filling mechanism for terminating the operation of the package filling mechanism in the event that the detecting mechanism detects an incompletely filled package.

5. In a package filling machine, in combination, a filling device for filling successive packages, a discharge conveyor for discharging the flow of packages from the machine, a plurality of detectors for operating on a group of packages to detect incompletely filled packages, means for separating said group of packages from a line of packages being discharged in the event that any detector detects an incompletely filled package, and means rendered operative by said detectors for terminating the operation of the package filling mechanism in the event that one of the detectors detects an incompletely filled package.

6. In a package filling machine, in combination, a filling device for filling successive packages, a discharge conveyor for discharging filled packages from the machine, a feeler member capable of being inserted into the package for detecting an incompletely filled package, a package pusher rendered operative by said feeler member in the event that it detects an incompletely filled package to remove such package from the line of packages being discharged from the machine, and connections between said feeler member and the package filling mechanism for terminating the operation of the latter in the event that the feeler member detects an incompletely filled package.

7. In a package filling machine, in combination, a filling device for filling successive packages, a discharge conveyor for discharging filled packages from the machine, a plurality of detecting mechanisms for operating upon a group of packages, each being provided with a feeler member insertable into the package, mechanism operatively connected with said feeler members for removing incompletely filled packages from the line of packages being discharged, and connections between said detecting mechanisms and the package filling mechanism for terminating the operation of the latter in the event that one of the detecting mechanisms detects an incompletely filled package.

8. In a package filling machine, in combination, a package filling mechanism arranged to simultaneously fill a plurality of packages forming a group, means for discharging filled packages from the machine, a plurality of detecting mechanisms for simultaneously operating upon a group of packages being discharged, each being provided with a feeler insertable into the package, and connections between said detecting mechanisms and the package filling mechanism for terminating the operation of the latter in the event that an incompletely filled package is detected by any of the detecting mechanisms.

9. In a package filling machine, in combination, package filling mechanism, means for conveying the filled packages from the package filling mechanism, detecting mechanism, means operatively connected therewith for terminating

the operation of the package filling mechanism in the event that the detecting mechanism detects an incompletely filled package, and manually operated means for rendering the last mentioned means inoperative under certain conditions of use.

10. In a package filling machine, in combination, package filling mechanism, means for discharging the filled packages from the package

filling mechanism, a plurality of detectors operating on a group of packages, means for terminating the operation of the filling mechanism in the event that any of the detectors detects an incompletely filled package, and means under the control of the operator for rendering said last mentioned means inoperative under certain conditions of use.

STANLEY R. HOWARD.