

March 21, 1961

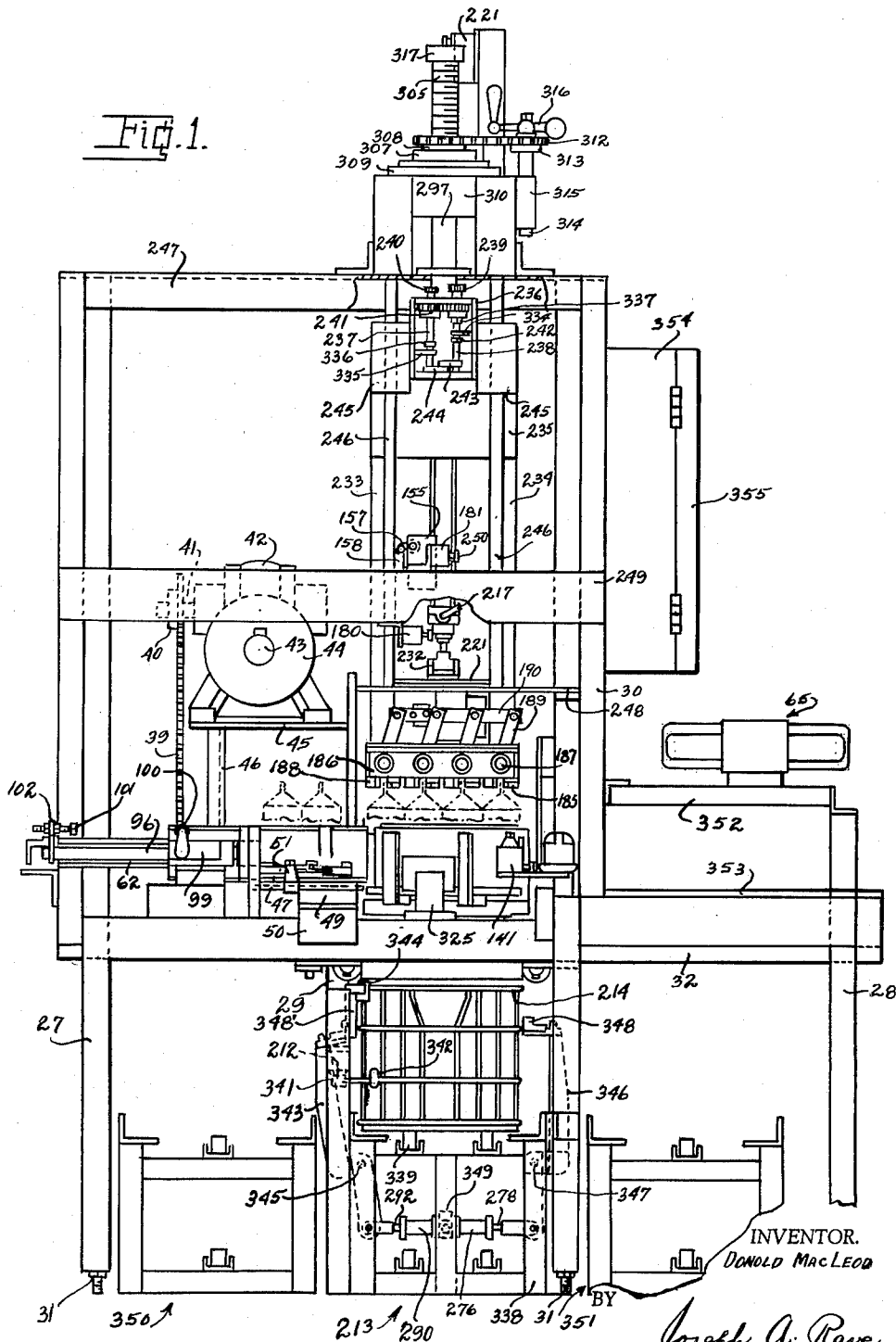
D. MacLEOD

2,975,569

FILLED CONTAINER CASER

Filed March 18, 1958

8 Sheets-Sheet 1



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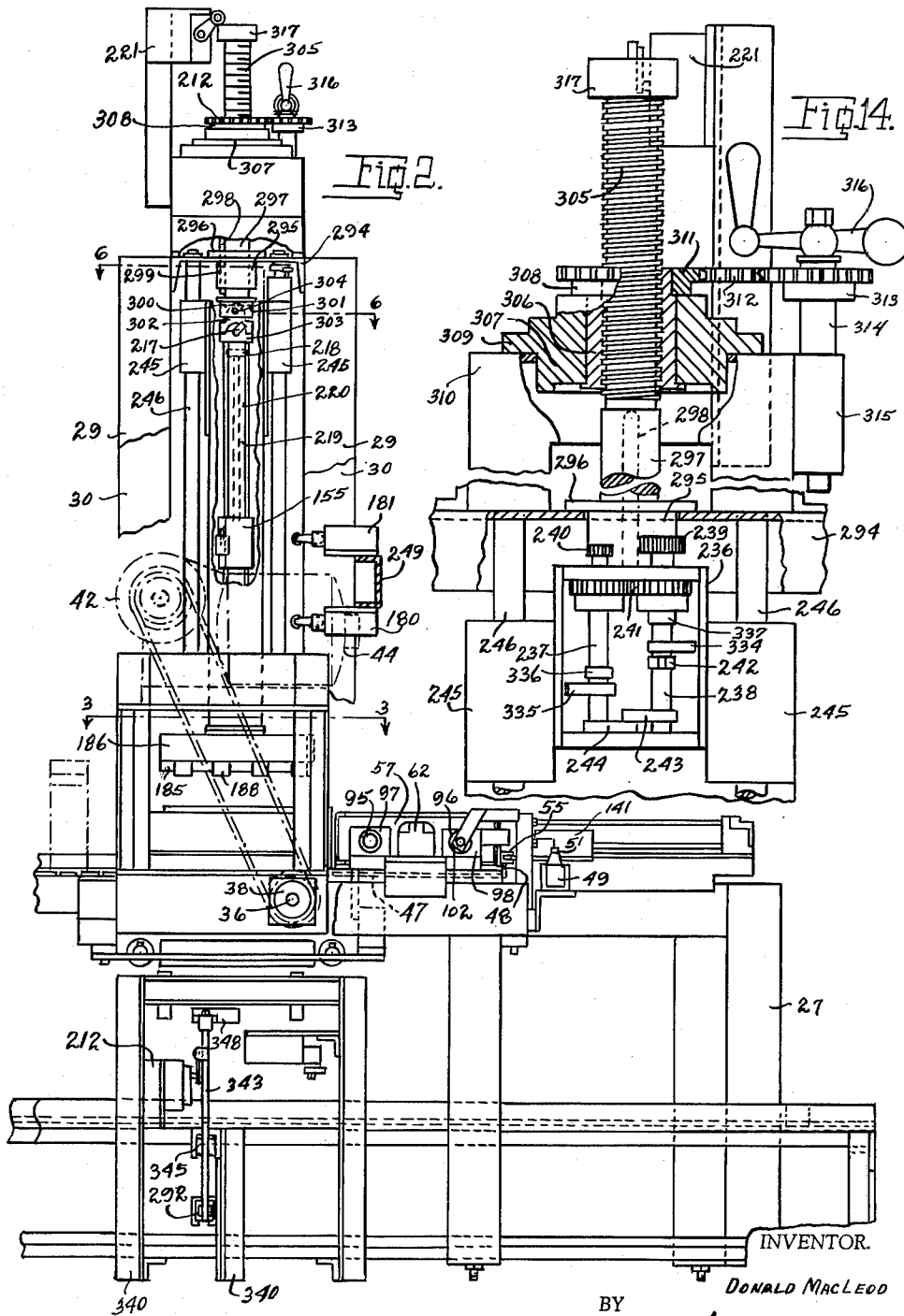
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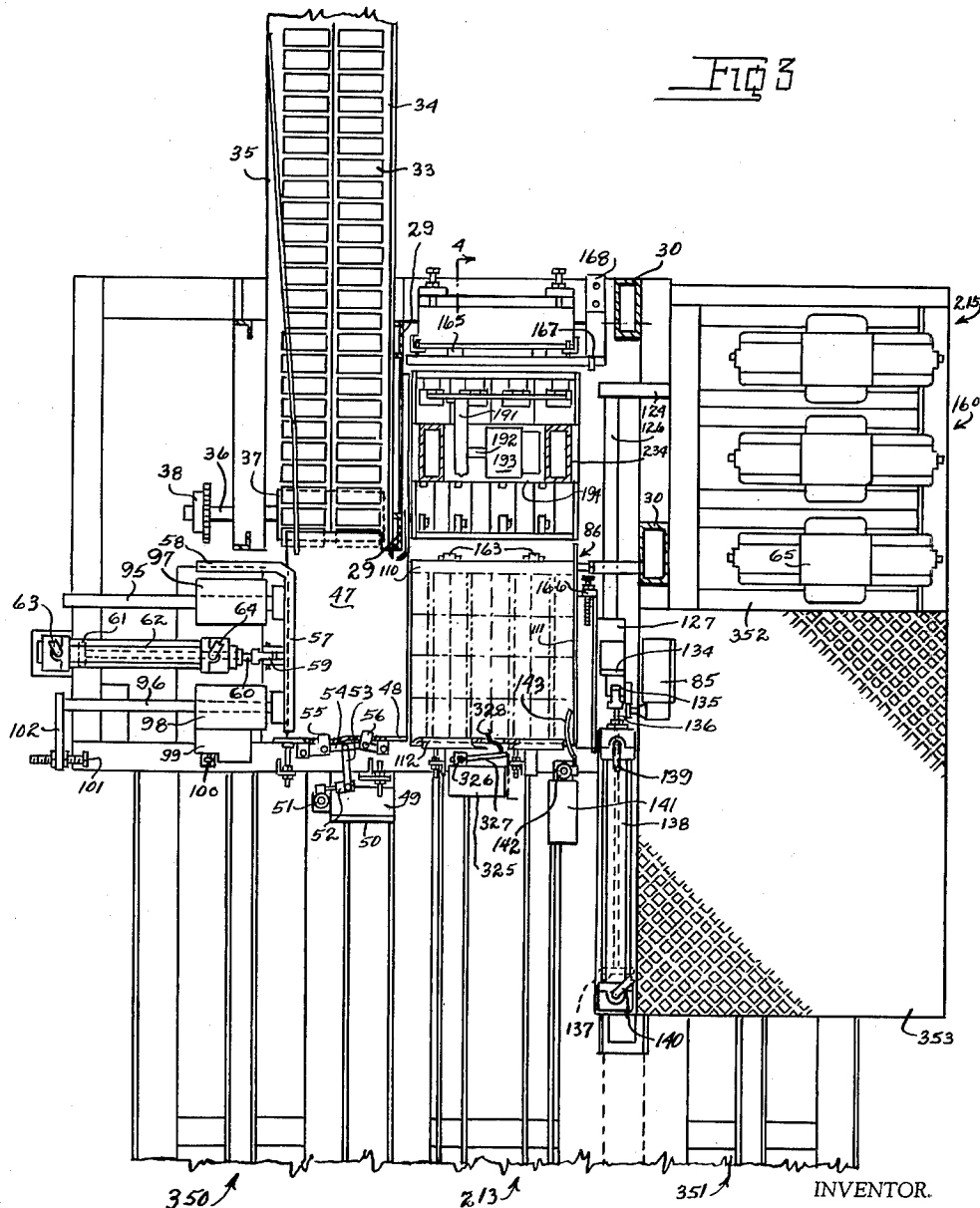
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8 Sheets-Sheet 3



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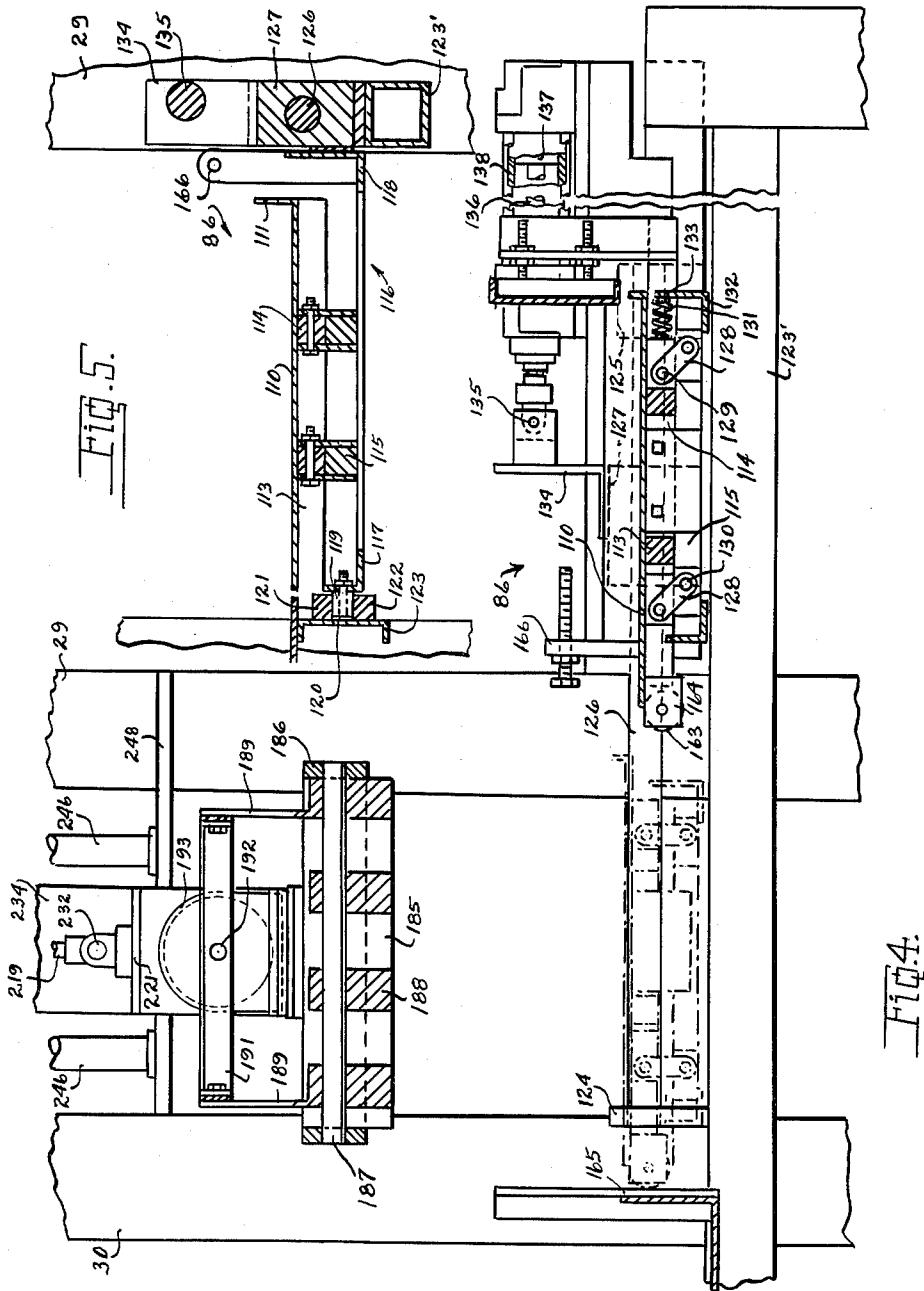
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8 Sheets-Sheet 5

Fig. 6.

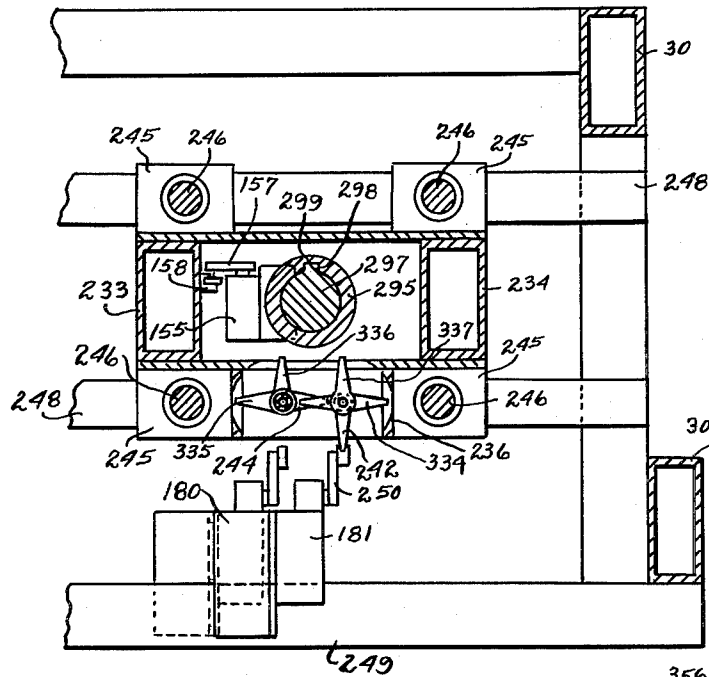
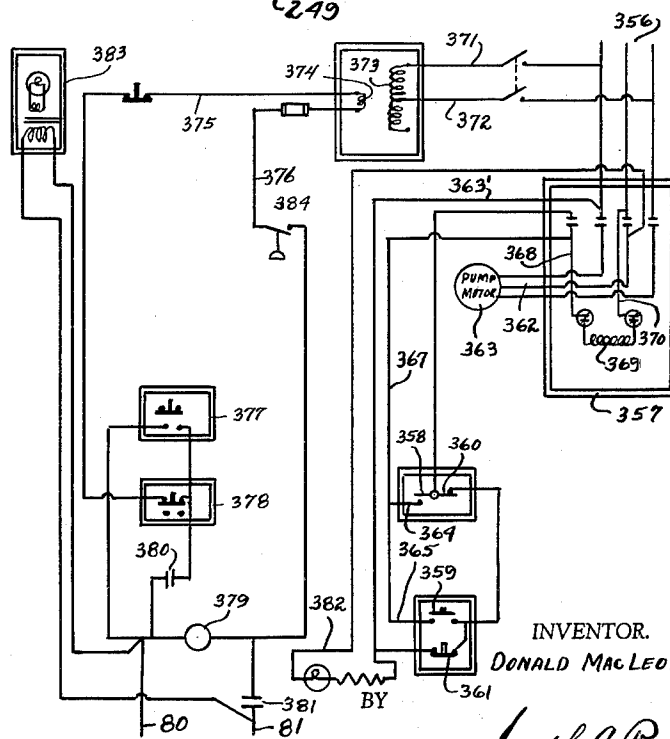


Fig. 10.



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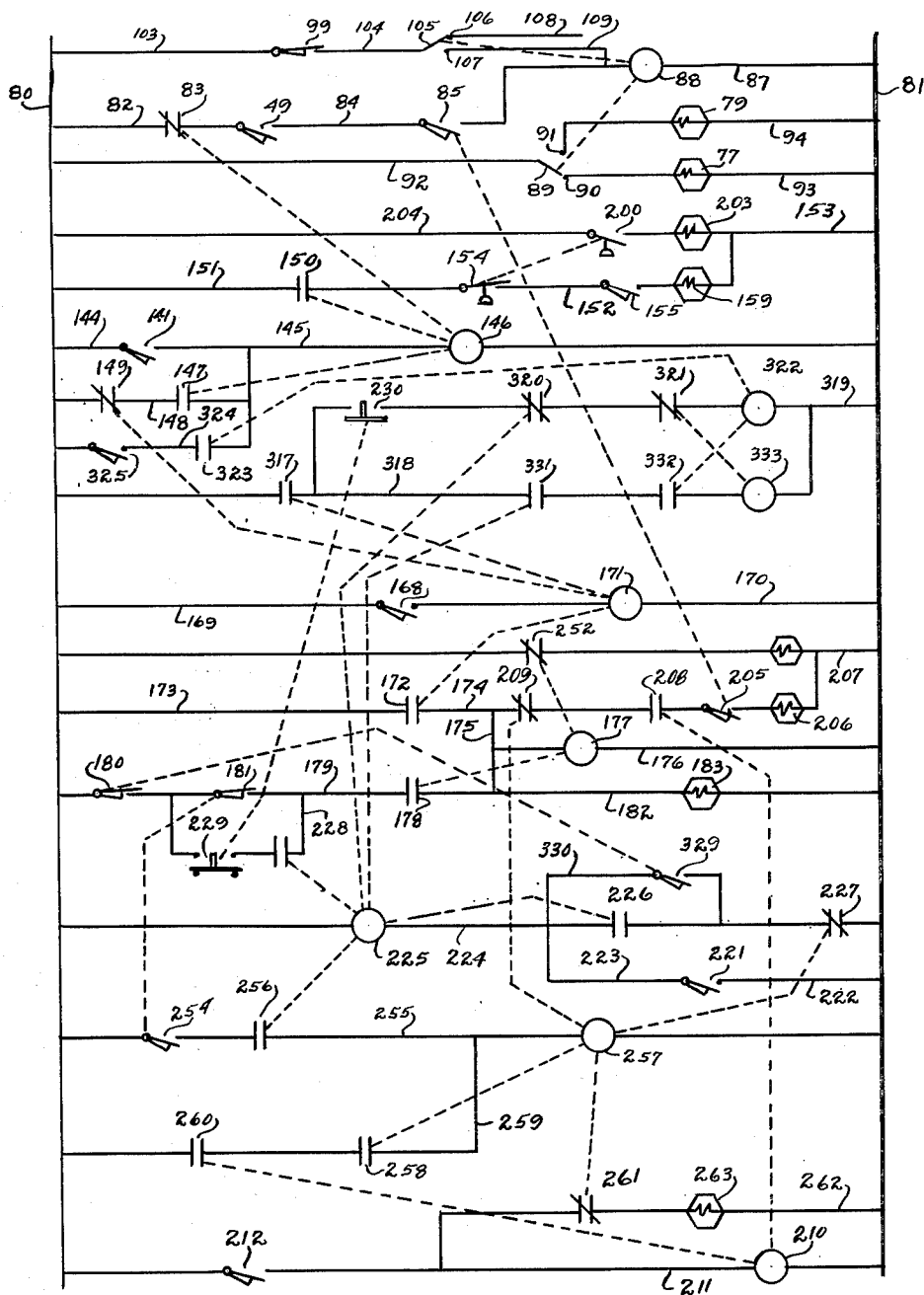
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8 Sheets-Sheet 6



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FIG 7

March 21, 1961

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Filed March 18, 1958

8 Sheets-Sheet 7

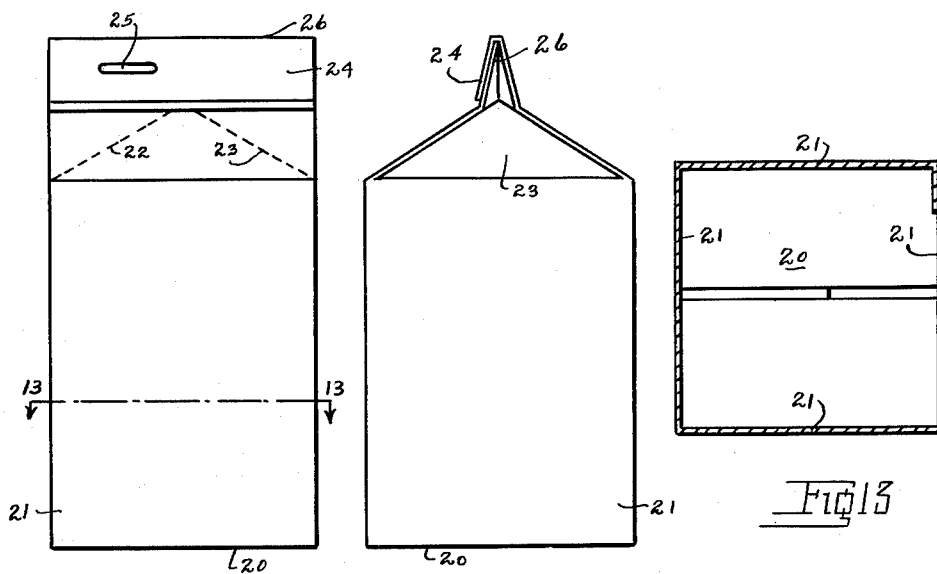


FIG 11

FIG 12

FIG 13

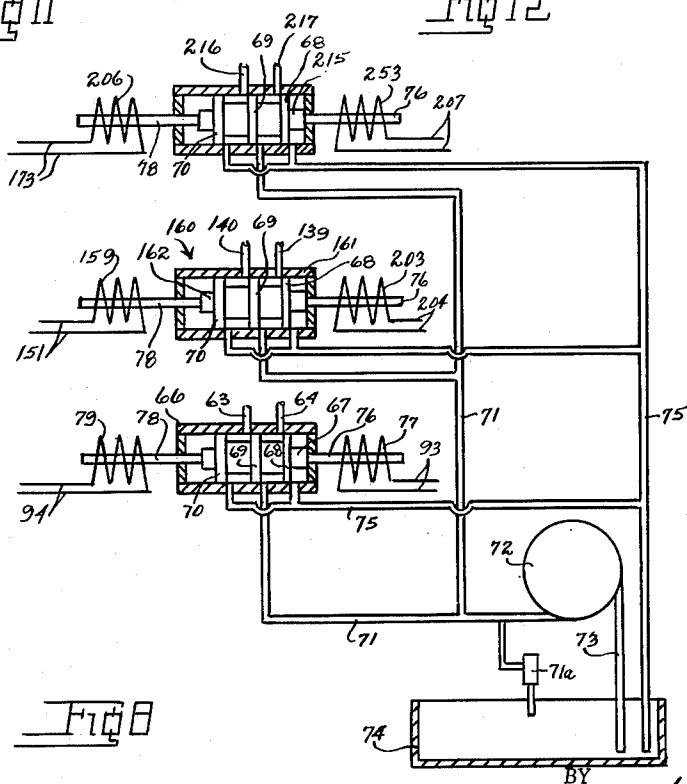


FIG 8

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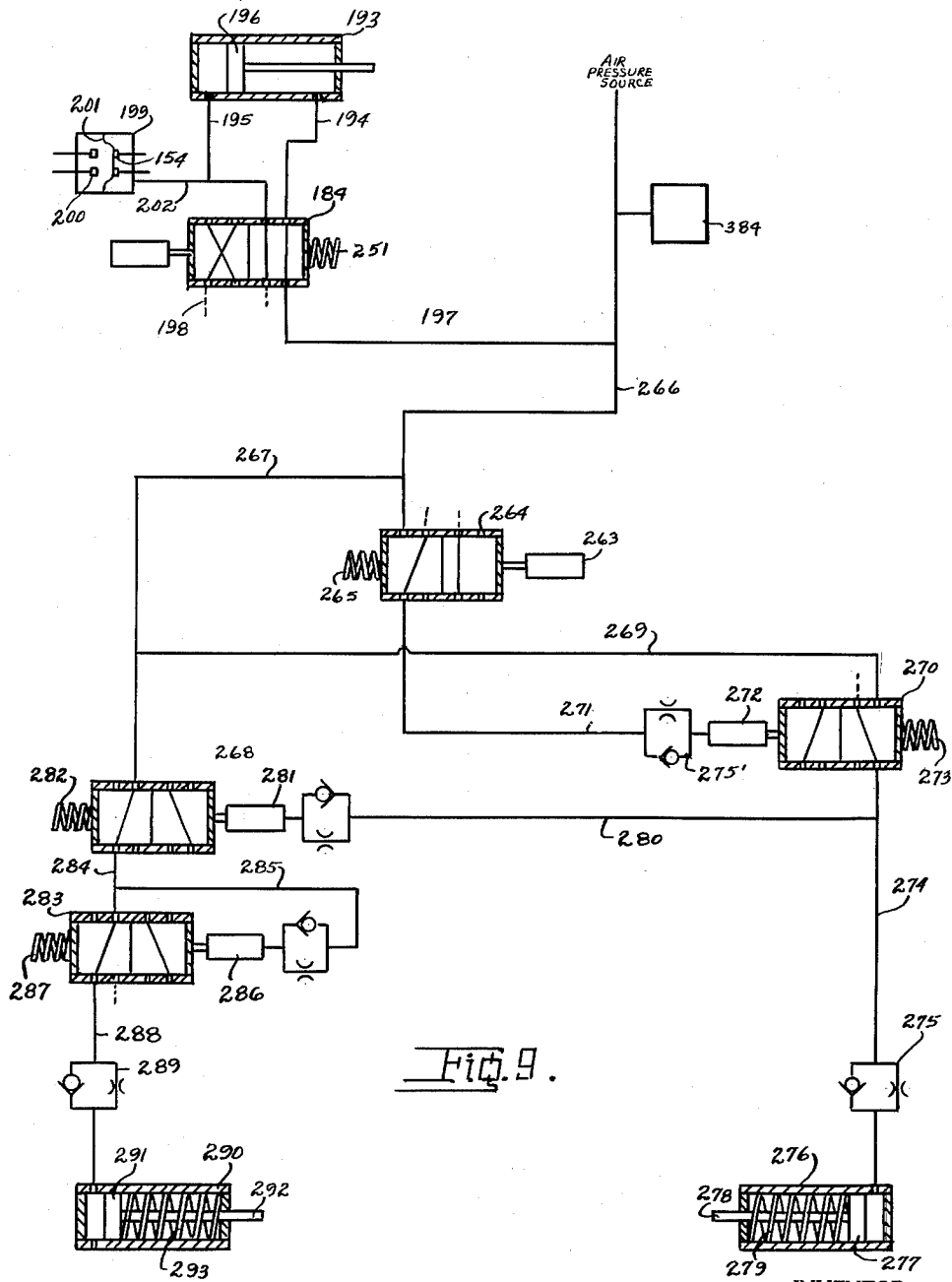
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2,975,569

FILLED CONTAINER CASER

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18 Claims. (Cl. 53—62)

This invention relates to improvements in a casing machine, that is a machine for loading milk containers of the impregnated cardboard carton variety in the case, basket or box and which case, basket or box the said containers are delivered to retail dispensers and which cases are utilized in the delivery of the containers to homes.

These cardboard containers, generally referred to as bottles, are made in a plurality of sizes to contain a half gallon, a quart, a pint and a half pint. The carton containers are also made in a size between the half pint and pint for containing mixed drinks, such as chocolate milk, and which containers are adapted to have the contents shaken before consumption.

It is the practice to utilize the same size case for each of the sizes of cardboard containers above set forth with a case holding a full layer of half gallon and quart containers upstanding from the case bottom, a full layer and a partial layer of pints, said partial layer including one-half or three-quarter the number of containers forming a full layer, and half pints and third quarts, the nominal size of the container between the half pint and pint containers, being disposed in the case in two full layers.

The caser of the present invention is adapted to be adjusted for automatically loading each case with the proper number of carton containers regardless of the size being cased.

It is the principal object of the present invention, therefore, to provide a casing machine for automatically and expeditiously casing filled container cartons.

Another object of this invention is the provision of a caser for accomplishing the foregoing objects that is compact in construction and simple of operation so that upon the setting up of the same its operation is continuous.

Another object of this invention is the provision of a filled container caser that receives the said containers after being filled and sealed and automatically divides the filled containers into the desired number per case and fills the case for delivery to a subsequent user.

It is also an object of this invention to provide, in conjunction with the caser, case conveying means which automatically positions a case with respect to the caser and prevents operation of the caser unless the case is properly positioned with respect to the caser.

It is a further and specific object of the present invention to provide a caser for casing filled carton type containers and which caser passes filled containers through various stages and positions between the receiving thereof and the casing thereof and which positions and operations are interlocked to prevent a subsequent operation prior to the completion of a previous operation.

Other objects and advantages of the present invention should be readily apparent by reference to the following specification considered in conjunction with the accompanying drawings forming a part thereof and it is to be understood that any modifications may be made in the exact structural details there shown and described, within

2

the scope of the appended claims, without departing from or exceeding the spirit of the invention.

In the drawings:

Fig. 1 is a front elevational view of the casing machine of the present invention.

Fig. 2 is a side elevational view of the machine of Fig. 1 as seen particularly from the left hand side of said Fig. 1.

Fig. 3 is, in the main, a top plan view of the caser of the present invention with certain parts being shown in section as seen from line 3—3 on Fig. 2.

Fig. 4 is a fragmentary sectional view through a portion of the machine as seen from line 4—4 on Fig. 3.

Fig. 5 is a view transversely of Fig. 4 as seen from line 5—5 on said Fig. 4.

Fig. 6 is a fragmentary transverse sectional view through the machine in a plane above that of Fig. 3 on Fig. 2 as seen from line 6—6 on said Fig. 2.

Fig. 7 is a diagrammatic view of the electric control circuit for effecting and controlling the operation of the machine.

Fig. 8 is a diagrammatic view of the hydraulic mechanism included in the operating mechanism of certain portions of the machine.

Fig. 9 is a diagrammatic view of the pneumatic control and actuating mechanism of certain parts of the machine.

Fig. 10 is a diagrammatic view of the motor control system and control current source for controlling and operating the machine.

Fig. 11 is a side elevational view of a carton container adapted to be cased by the machine of the present invention.

Fig. 12 is an end elevation of the container of Fig. 11.

Fig. 13 is a transverse sectional view through the container as seen from line 13—13 on Fig. 11.

Fig. 14 is an enlarged, fragmentary, elevational and sectional view of the elevator adjusting means.

Throughout the several views of the drawings similar reference characters are employed to denote the same or similar parts.

The machine of the present invention, as noted above, is for depositing a given number of filled paper containers of milk and the like into a box or basket generally referred to as a case. The machine itself is generally referred to as a "caser" since it cases a number of said filled containers.

Briefly the container is made of cardboard formed of a single blank scored and folded to have a rectangle cross section as illustrated in Figs. 11, 12 and 13.

As illustrated in said Figs. 11, 12 and 13, the container comprises a bottom 20 from the edges of which upstand walls 21, at right angles to one another, to provide the said container with a transverse cross section rectangular in area. Two opposed of the walls are inwardly bent at their upper ends to be between the remaining two opposed walls, as illustrated at 22 and 23 in Fig. 11. The remaining two opposed walls extend for the full height of the container and incline toward one another with one of said walls having at its upper end a flap 24 folded over the upper end of the opposed wall and with the said overlapped members secured to one another as by wire staples 25, as illustrated in Fig. 12. This construction is well known and the overlapped upper ends of the containers is referred to as a gable, indicated in the drawings by the reference numeral 26.

The said containers are each of a similar construction and are provided in a number of capacities such as half pint, third quart, full pint, quart and half gallon and which containers vary in area as well as in vertical height. The chief variation in said containers is in height, in so far as the half pint, full pint and quarts are concerned,

and with said containers each having their side walls of the same width, while the half gallon container is not only of greater height but also has its walls of a greater width.

The boxes or cases into which the above containers are placed are identical in size and form and it is obvious that more individual containers of smaller capacity can be put into such a box or case than can be the larger capacity containers. The customary practice is to put a single layer of half gallon and quart containers in a case to upstand from the bottom thereof while with pints it is customary to put a full layer on the case bottom together with a half or three quarters layer of pints on top of the said full layer with said incomplete layer of pints tilting over while on top of the bottom layer with half pint and third quart containers two full layer are placed in each case. Regardless of the capacity of the individual containers in the cases no case is filled beyond its upper edge so that said cases may be stacked one on top of another.

The case filling machine or caser of the present invention is adapted to be adjusted for properly loading the cases with each of the above mentioned sizes of filled containers.

The caser or vase filling machine of the present invention comprises a frame including spaced end uprights 27 and 28 which support laterally extending portions of the machine together with similarly spaced centrally located uprights 29 and 30. In order to adjust the vertical height of the machine as well as to dispose the operating tables of the machine in a horizontal plane, each of said uprights is provided at its lower end with a jack or leveling screw 31. The outer uprights are joined at their upper ends by means of a transverse member 32 and on which the aforementioned working tables are mounted.

The intermediate uprights 29 and 30 extend considerably above the transverse member 32 and provide the support for the actual casing or elevator mechanism as will presently be made clear. At one side, the left side, as seen in the drawings there is provided the means for bringing the filled containers to the machine and which or mechanism comprises an endless conveyor 33 which extends either from a filling machine, not shown in the drawings as it forms no part of the present invention, or the said conveyor 33 extends from the filling machine discharge conveyor, and which conveyor is not disclosed in the drawings. The loading conveyor 33 is suitably supported by a frame work including side members 34 and 35 which support at one end a shaft 36 having on its inner end a driving pulley or sprocket 37 for the said conveyor 33. Secured to the outer end of the shaft 36 is an actuating chain sprocket 38 about which is trained an endless sprocket chain 39. The chain 39, in turn, is trained about a sprocket 40 secured to a shaft 41 which forms part of a suitable speed reducer 42 connected with and driven by a shaft 43 of electric motor 44. The motor 44 is conveniently mounted on a platform 45 supported by the machine frame through suitable uprights 46 carried by the main frame elements 29, 30 and 32.

While the conveyor chain 32 is illustrated as adapted to support and convey two rows of filled containers it is to be understood that a conveyor capable of handling a single row of containers is contemplated in the present invention. In either event the conveyor side rails 34 and 35 are each arranged with respect to one another for properly and efficiently positioning said containers when they reach the discharge end of the conveyor 33 and which discharge end is at the end thereof at which the actuating drum or sprocket 37 is connected.

The discharge of the filled containers from the conveyor 33 is onto a supporting plate 47 which for convenience in description may be termed an accumulating platform which is fixed and supported by the transverse frame member 32 or suitable supports carried thereby. The said filled containers are moved on the said fixed

table or platform 47 to a stop plate 48 upstanding from the said table 47 at its forward end, opposite to that of the conveyor 33. Obviously, in so far as the machine illustrated in the drawings is concerned, two rows of said filled containers will be moved or pushed into position and with their vertical sides pressed against one another as that is the sole means of moving the containers onto and relative to the table or platform 47.

Outwardly of the platform or table and its end stop 48 there is provided a limit switch 49 mounted in position through appropriate supporting members including angle iron 50. The limit switch 49 is a commercial switch of the kind including contacts which are normally open and which contacts are closed through an actuator 51 carried by the housing of said switch 49. The actuator 51 is provided with operating linkage including a lever 52, link 53, a cross link 54, pivoted intermediate its ends to the outer end of link 53, and actuating fingers 55 and 56 each in the form of a bell crank and respectively pivoted to opposite ends of the link 54. Each of said bell crank actuating fingers 55 and 56 has one of its arms pivoted to the stop plate 48 and the other of its arms projecting through a suitable aperture in the stop plate 48. There is one of the bell crank switch actuators 55 and 56 in line with each of the rows of filled containers coming off of the conveyor 33.

Obviously there can or may be a break in the continuity of the rows of filled conveyors wherefore one of said rows may reach the stop plate 48 before the other row. Upon one of said rows of filled conveyors reaching the stop plate 48 before the other the foremost container will engage its switch actuator 55 or 56. Assuming for the purpose of this description, that the row or line of containers in alignment with switch actuator 55 reaches the stop plate 48 and its actuator 55 before the other, the actuator 55 will not close the limit switch 49 because its movement will merely tend to further open the switch by actuating the link 53 and lever 52 in a switch opening direction, namely, in a counterclockwise direction as seen in Fig. 3. The reason for this is that the switch is always biased to the opening thereof and it requires the actuation of both switch actuators 55 and 56 to close said switch.

If it be assumed that the line or row of filled containers from the conveyor 33 that is in line with the switch actuator 56 is the first to reach the stop plate 48 and switch actuator 56 the switch 49 would still not be closed but merely opened. If one of the actuators 55 and 56 is moved to its switch closing position by its line or row of filled containers from the conveyor 33 then upon engagement of the other of said switch actuators by its line or row of filled containers, the link 54 having its one end anchored, will, whereupon the actuation of said second switch actuator, through the said floating link 54, fixed link 53, lever 52 and actuator 51 cause the closing of said limit switch.

One side of the accumulator table 47 is provided by an upstanding plate 57 which actually is a pusher and has at its end nearest the conveyor 37 a fence 58. Substantially centrally of the pusher 57 it is connected through a clevis connection 59 with one end of a piston rod 60 which has at its other end a piston 61 disposed in a piston cylinder 62. The said cylinder 62 is suitably supported on framing mechanism supplied by the main frame and its transverse supporting mechanism and is believed amply clear from the drawings without a specific description thereof.

The piston cylinder 62 has connected with its opposite ends, respectively, conduits 63 and 64 which, in turn, terminate in a valve housing 65. The valve housing 65 has disposed therein, see diagrammatic view Fig. 8, a valve lands 68, 69 and 70 thereon with connecting circumferential grooves therebetween.

As shown in said Fig. 8 the valve sleeve 66 is provided with additional ports and with one of which one end of

5

conduit 71 is connected with said conduit 71 having its other end connected with the outlet of an hydraulic pump 72. The said pump 72 has its inlet connected by a conduit 73 with a sump or tank 74 containing an hydraulic medium. The pipe or conduit 71 has connected therewith a pressure regulating valve 71a to determine the working pressure in the system. Additional ports in the valve sleeve 66 has connected therewith one end of a discharge pipe or conduit 75 which terminates in the sump or tank 74.

As illustrated in Fig. 8 the valve 67 is positioned for connecting the hydraulic medium from the pump 72 with the conduit 64 and right hand end, as seen in Fig. 3, of the cylinder 62 for actuating the piston therein to the left and fully retracting the fence 58 and pusher 57 to the position thereof illustrated in said Fig. 3.

The valve 67 has extending from one side thereof a valve stem 76 which acts as the core of an electro magnetic solenoid 77, disposed within a housing connected to the valve housing 65 while the said valve 67 as extending from its other side a similar valve stem 78 likewise forming the core of an electro magnetic solenoid 79. The said valve and its operating solenoids are commercially obtainable items and are believed to be well known, it is to be remembered that the energization of either one causes a corresponding shift in the valve 67 and a subsequent operation of the piston controlled thereby. Each of the said electro magnetic solenoids is under the control of a switch as will presently be made clear.

As is obvious, the case of the present invention is electrically and hydraulically actuated and the electric control circuit is diagrammatically illustrated with accepted electrical symbols in Fig. 8. The operation of which along with the mechanisms controlled thereby will be described in the sequence of describing a complete cycle of the machine. Assuming, as we did above, that the filling machine is in operation for successively filling containers and which are closed or sealed after being filled, as shown in Figs. 11 and 12, and the said filled containers delivered in a substantially continuous stream from the loading conveyor 33 to the accumulating table 47 and that, in so far as the disclosure in the drawing is concerned two full rows thereof are on the said accumulating table 47, (it should be noted that a full load on the accumulating table includes eight containers, two rows of four each), and that when the limit switch 49 is closed the following operation takes place.

As seen in Fig. 7 and assuming for the moment that the vertical line are electric wires or conductors 80 and 81 and are connected with an electric current source of appropriate voltage to operate the control mechanism, such voltage will generally be of approximately 110 volts A.C. Assuming that the circuit is otherwise in order as will be noted, from Fig. 7, that one side of limit switch 49 has extending therefrom a wire 82 that terminates in the current source wire 80 with said wire 82 including normally closed relay switch contact 83 controlled by a relay switch solenoid to be subsequently pointed out. The other side of said limit switch 49 has connected therewith a wire 84 terminating in one side of a normally open limit switch 85. At this time the said limit switch 85 is closed, as follows.

The normally open relay switch 85 is located adjacent, what may be termed, a carriage 86 and onto which the filled containers are transferred by the pusher 57 from the accumulator table 47, as will presently be made clear, and said carriage 86 is presently in its retracted position wherefore the said normally open limit switch is now closed.

As seen in said Fig. 7 said limit switch 85 has its other side connected with the other current feed wire 81, said connection being by way of a wire 87 that includes a solenoid coil 88 of a relay switch. The solenoid coil 88 controls a movable switch member 89 operable between fixed switch contacts 90 and 91. The movable switch

6

member 89 is normally closed with the switch contact 90 and is connected with the switch contact 91, after being disconnected from its switch contact 90, upon the energization of the relay switch solenoid coil 88.

From the foregoing it will be noted that the accumulation of a full load of filled containers on the accumulator table 47 closes the limit switch 49 and completes an electric circuit for energizing relay switch solenoid coil 88 and actuates movable switch member 89. The movable switch member 89 is connected through a wire 92 with the control current feed wire 80 while the engageable or fixed contacts 90 and 91 are respectively connected by wires 93 and 94 with the other control current feed wire 81. The circuit wire 94 includes the electro magnetic solenoid 79 while the circuit wire 93 includes the electro magnetic solenoid 77 of the valve 67.

The energization of the relay switch solenoid coil 88 closes the circuit including the normally open switch contact 91 and thereby completes an electric circuit through the hydraulic valve actuating solenoid 79. As seen in Fig. 8 the energization of the solenoid 79 shifts the valve 67 for thereby connecting the hydraulic pump pressure conduit 71 with the conduit 63 to the outer or left hand end of the cylinder 62, as seen in Figs. 1 and 3, for actuating the piston 61 therein to the right. This actuation of the piston 61 carries with it the pusher 57 for shifting the accumulated filled containers on the accumulator table 47 onto the afore mentioned carriage 86.

It should be noted that the parts are so designed that the accumulated filled containers on the table 47 are completely and fully shifted onto the carriage 86 whether said accumulation consists of one row, inwardly of the stop plate 48, or two rows as specifically illustrated in Fig. 3.

For the purpose of insuring proper movement of the pusher 57 it has projecting from its rear surface one or more guide bars, two being shown, 95 and 96, each of which passes through a guide block 97 and 98 carried by and upstanding from a portion of the machine frame. For convenience, the guide block 98 is taken advantage of to support a limit switch 99 including an actuating arm 100. The actuating arm 100 of the limit switch 99 is adapted to be engaged and operated by an abutment 101 conveniently carried by guide bar 96 through an arm 102 secured to said guide bar 96. The said limit switch is operated when the pusher 57 has fully and completely transferred the filled containers from the accumulator table 47 to the carriage 86.

The limit switch 99 as shown in Fig. 7 is a normally closed switch and has one side thereof connected by a wire 103 with the current supply or feed wire 80. The other side of said limit switch 99 has connected therewith one end of a wire 104 that terminates in a movable switch member 105 which is substantially similar to the movable switch member 89 and is movable between fixed switch contacts 106 and 107. The movable switch member 106 is under the control of the relay switch solenoid coil 88 in the same manner that the movable switch member 89 is controlled by said relay switch solenoid coil 88. The movable switch member 105 is biased toward its contact 106 and which is, therefore, its normally closed contact and said switch contact 106 is connected by a wire 108 through indicating mechanism with the other current feed wire 81. The normally open switch contact 107 is connected by a wire 109 with the wire 81 at a point between the limit switch 85 and the relay switch solenoid coil 88 and, as will presently be obvious, acts as a holding switch for the said coil 88.

In other words the closing of limit switch 49 by the accumulation of the desired number of filled containers on accumulator table 47 effects the operation of the pusher and which will push said containers beyond the limit switch thereby allowing it to open but since the movable switch member 105 is now in contact with its

normally open contact 107 and the limit switch 99 is closed the current will continue to flow through solenoid switch coil 88 for maintaining its movable members 105 and 89 in contact with their normally open contacts, namely, respectively, 107 and 91.

After the pusher 57 has completely transferred the load from the accumulator table 47 to the carriage 86 the limit switch 49 is opened to break its circuit and the limit switch 99 is opened by the abutment 101 and thereby interrupting the circuit through said limit switch 99 and effecting a deenergization of the relay switch solenoid coil 88 and permitting the movable switch members 89 and 105 to return to their normal positions for thereby de-energizing the hydraulic valve shifting electromagnetic solenoid 79. At the same time the movable switch member 89 in returning to its normally closed position with switch contact 90, an electric circuit is set up from the control current source wire 80 by way of wire 92, movable switch member 89, contact 90 and wire 93 to current source wire 81 for thereby energizing the hydraulic valve electromagnetic solenoid 77 and shifting the valve 67 to the position illustrated in Fig. 8 for again connecting the hydraulic medium with conduit 64 for returning the position 61 and the pusher 57 to their normal positions as illustrated in Fig. 3.

It should be noted that during movement of the pusher 57 for shifting the filled containers from the accumulator table 47, the fence 58 of the pusher 57 prevented further discharge of filled containers from the conveyor 33 effecting, in effect, a stacking up of the containers while the conveyor moved therebeneath. The withdrawal of the pusher 57 to its retracted normal position carried with it, of course, the fence 58 so that the said filled containers on the conveyor 33 immediately commence accumulating on the accumulator table 47 by being pushed by the containers of the conveyor 33 until the load switch 49 is again closed whereupon the cycle above described is repeated.

In the specific example illustrated in the drawings there is required the accumulation of two loads of filled containers, each load of eight filled containers, which means that at the completion of the second load transfer there are sixteen filled containers on the carriage 86 and which is the exact number of containers required to cover the bottom of the box or case into which the said filled containers are being disposed.

The carriage 86 comprises a carriage table or platform 110 having as part thereof a side plate 111 and a back plate 112 which together position the load on said carriage. The carriage table or platform 110 is provided on its under surface, since said platform or table is of relatively thin material, with transverse reinforcing members 113 and longitudinally extending reinforcing members 114. The reinforcing members 114 are disposed in vertical alignment with similarly extending members or rails 115 carried by a longitudinally movable frame 116. The frame 116, is formed of angle irons in end abutment with one another and includes longitudinally extending angle irons 117 and 118 which constitute or form, in effect, the support for the carriage as a whole in its movement.

As seen in Fig. 5 the longitudinally extending angle iron 117 has connected with its one leg a roller 119 disposed in a trackway 120 formed between longitudinally extending bars 121 and 122 which are secured to and projecting from a transverse frame or supporting member, specifically identified by the reference numeral 123 in said Fig. 5.

Carried by a second transverse frame member, specifically identified in Figs. 4 and 5 by the reference numeral 123', are upstanding end supports or blocks 124 and 125 in which is secured a longitudinally extending guide bar 126. The guide bar 126 has mounted on it a bearing block 127 which is in turn secured to the up-

standing leg of the angle iron 118 of the carriage frame 116.

The carriage frame 116 through a plurality of links 128, which are arranged in pairs inwardly of the opposite ends thereof, has floatingly connected therewith the said carriage table or platform 110, see Figs. 4 and 5. Said links, in pairs, are, respectively, pivoted at one end by pivot 129 with the carriage table or platform depending members 114 and said links are at their other ends pivotally connected at 130 with the frame longitudinal members 115. The arrangement is such that in normal position the carriage table or platform 110 has its longitudinal reenforcing members 114 each disposed on a frame longitudinal member 115 immediately therebelow, as clearly illustrated in Fig. 5. The parts are yieldably retained in this position by means of one or more springs 131 each spring having one end abutting with an end of the carriage depending member 114 and the other end abutting with the upstanding leg of the front element of the carriage frame 116 and which element is identified in Fig. 4 by the reference numeral 132. Any suitable or desirable means may be employed, such as the inwardly projecting bosses 133, for retaining the spring 131 in its operative position.

The carriage including the bottom frame 116 and the table or platform 110 is adapted to be shifted upwardly, as seen in Fig. 3, or to the left, as seen in Fig. 2, for positioning the load of filled containers thereon with respect to the elevating mechanism preparatory to be lowered into a case. In order to effect the carriage movement a connecting bracket 134 is conveniently secured to the upper surface of the guide block 127 to have connected therewith, through a pivotally connection 135, one end of a piston rod 136 which extends from a piston 137 disposed in a cylinder 138 conveniently mounted on a portion of the main frame, such for example, the transverse frame member 123'. The cylinder 138 has connected with its opposite ends suitable conduits 139 and 140 through which a hydraulic medium is supplied to the cylinder for reversely actuating the piston 137 and correspondingly actuating the carriage 86.

Mounted on the machine main supporting frame, adjacent the outer corner of the carriage mechanism 86, is a limit switch 141 including a movable contact control element 142 which has connected therewith an actuator 143. As will be seen in Fig. 3 the actuator 143 lies in the path of the filled containers being pushed onto the carriage table or platform 110 and the parts are so arranged that the actuator 143 is actuated to its operative position upon the shifting of a full load of filled containers onto the said carriage mechanism 86 and which load is illustrated in dot and dash lines on the said carriage table or platform in Fig. 3 and which load has now operated the actuator 143 for closing the limit switch 141.

The load limit switch 141 is illustrated in Fig. 7 as a normally open switch and has one side thereof connected by a wire 144 with the control current supply wire 80 with said limit switch having its other contact connected by a wire 145 with the other control current supply wire 81 and with said wire 145 including the solenoid coil 146 of a relay switch. The relay switch of the solenoid coil 146 includes the normally closed switch contacts 83 in wire 82, above, and includes normally open switch contacts 147 in a holding circuit. The holding circuit for the relay switch solenoid coil 146 includes a wire 148 which extends from the control current supply wire 80 to a point in the wire 145 between the limit switch 141 and the relay switch solenoid coil 146 with said wire also including normally closed relay switch contacts 149 of a relay switch subsequently to be described.

From the foregoing it will be noted that the closing of the limit switch 141 energizes relay switch solenoid coil 146 for closing contacts 147 and maintaining the circuit for the said relay switch solenoid coil 146 and

at the same time breaking the circuit which includes relay switch solenoid coil 88 for thereby preventing the operation of the pusher mechanism which includes the limit switch 49 should the accumulator table receive a load of filled containers prior to the complete retraction of the carriage and its positioning in readiness for said subsequent load.

The energization of the relay switch solenoid coil 146 also closes normally open relay switch contacts 150 which are electrically connected by a wire 151 with the control current source wire 80 and are further connected through a wire 152 and a portion of a wire 153 and with the second control current source wire 81. In the wire 152 is an air pressure switch 154 which is normally closed, and so illustrated in Fig. 7, and which switch will be presently further identified. Also in the wire 152 is a limit switch 155 normally open and, again, so shown in the drawings.

The limit switch 155 is a part of the elevator mechanism which lowers the filled containers into the basket or case for subsequent delivery to dispensers of the filled containers. As illustrated in Fig. 1, the limit switch 155 is mounted on or carried by a portion of the elevator mechanism, specifically by the cylinder thereof, as will later be made clear. The said switch 155 includes a movable actuator 157 adapted to be engaged by an abutment 158 upon the upward movement of the elevator mechanism and said switch 155 is, in view of the illustration in Fig. 1, now closed and for the present description of the control mechanism the said switch 155 in Fig. 7 is closed and wherefore an electric circuit from the current supply wire 80 is now flowing through wire 151, normally open now closed limit switch 155 and portion of wire 153 with current likewise flowing through solenoid 159 of a hydraulic control valve mechanism now to be described.

As was noted above the cylinder 138 has connected with its opposite ends conduits 139 and 140 and which conduits terminate in a control valve mechanism 160, shown in elevation in Fig. 3 and in diagrammatic detail in Fig. 8. As shown in said Fig. 8 the said conduits 139 and 140 terminate in suitable ports in a valve sleeve 161 which has disposed therein a spool type valve 162 which, similar to the valve member 67, is provided with a plurality of lands identified by the same reference numerals as above, forming between them circumferential connecting grooves for alternately connecting the said pipes or conduits 139 and 140 with the pressure pipe or conduit 71 from the hydraulic medium pump 72 and with the discharge pipe or conduit 75 and the tank or sump 74. As illustrated in the drawings, particularly Fig. 8, the pressure pipe or conduit 71, particularly by the position of its valve 162, is connected with the pipe or conduit 139 for thereby holding the piston 137 in the position illustrated therefor in Fig. 3 and holding the carriage mechanism 86 in its retracted position and at this time the pipe or conduit 140 is connected with the hydraulic medium sump or tank by way of the discharge pipe or conduit 74. The completion of the circuit by the closing of the limit switch 141 energized the solenoid 159 and which solenoid 159, similar to the solenoid 79, above, is associated with the valve 162 for shifting same to its second position, namely, to the left hand end of the valve sleeve 161 as illustrated in Fig. 8 for thereby connecting the hydraulic pressure pipe or conduit 71 with the pipe or conduit 140 and the lower end of the cylinder 138 as seen in Fig. 3. This connection causes piston 137 to move upwardly in the cylinder 138 to carry with it the piston rod 136 and carriage mechanism 86 with its load of filled containers.

The carriage mechanism 86 moves until it is arrested and stopped. The carriage table or platform 110, see Fig. 4, has at its inner end one or more rollers 163, preferably two, see Fig. 3, freely rotatable on an axle bolt carried by a bracket 164 depending from the under surface of the carriage platform 110. In the path of said roller 163 the frame of the machine is provided with an

abutment 165 that engages with the rollers 163 for thereby arresting the movement of the said carriage table or platform 110. The stopping of the movement of the carriage table or platform 110 does not stop the movement of the carriage supporting frame 116 but actually permits the continued movement of said carriage frame. The continued movement of the carriage frame 116 with the stopping of the table or platform 110 causes said table or platform to be elevated through the links 128 since, as is obvious from Fig. 4, the movement of the carriage frame will tend to move the pivots 130 forwardly and cause the links to move therewith and oscillate them about said pivots to a position to dispose the said links over pivot 129 in a position vertically of the said pivots 130. The purpose of this construction, as will later be made clear, is to permit the freeing of the loaded containers from the carriage prior to the withdrawal of the carriage from beneath the said filled containers.

The carriage mechanism frame 116 has, see Fig. 3, upstanding therefrom an abutment 166 which when the carriage mechanism 86 reaches its innermost position and with its table or platform 110 elevated, engages the movable element or switch actuator 167 of a limit switch 168 carried by the frame of the machine in the vicinity of the stop 165.

As illustrated in Fig. 7 the limit switch 168 is a normally open switch and has one side thereof connected by a wire 169 with the control current supply wire 80. The other side of the said limit switch 168 is connected by a wire 170 with the other control current supply wire 81 and with said wire 170 including the solenoid coil 171 of a relay switch. The relay switch of solenoid coil 171 includes the normally closed switch contacts 149 in wire 148 and which normally closed switch contacts 149 are now opened for breaking the above described holding circuit that includes relay switch solenoid coil 146 for thereby de-energizing said relay switch solenoid 146 and opening normally open relay switch contacts 150 for breaking the above described electrical circuit including the valve electro magnetic solenoid 159.

The energization of the relay switch solenoid coil 171 also closed normally open switch contacts 172 which have one side thereof connected by a wire 173 with the control current supply wire 80 and which normally open, now closed, relay switch contacts 172 have their other side connected in part by a wire 174, a strap 175 and a wire 176 with the other control current supply wire 81 and with said wire 176 including therein the solenoid coil 177, of a relay switch. The relay switch of the solenoid coil 177 has associated therewith normally open, now closed, relay switch contacts 178 and which have one side thereof connected with the control current supply wire 80 through a wire 179 which includes normally closed, now closed, limit switches 180 and 181. The normally open now closed relay switch contacts 178 have their other side connected through a wire 182 with the other control current supply wire 81 and which wire 182 includes an electro magnetic solenoid 183 of a compressed air control valve 184 diagrammatically illustrated in the pneumatic circuit in Fig. 9. It should be noted that the strap wire 175 extends between or connects the wires 174 and 182.

As will be noted in Fig. 3 each of the filled containers has its closing flap, known in the trade as a "gable," and indicated in Figs. 11 and 12 by the numeral 26, extending in the same direction and which is the direction of movement of the carriage mechanism 86 as above described. The said movement of the carriage mechanism carries the filled containers to a position to be gripped or grasped by a gripper mechanism forming a part of the elevator mechanism. As shown in Figs. 1 and 3 the gripper mechanism comprises a fixed jaw 185 for each filled container and located on one side of each container gable. The said fixed jaws 185 are carried by a suitable framework including depending end members such as shown at 186 in Fig. 1 and in which is oscil-

latable or rotatably mounted rods or bars 187, there being as many such rods or bars as there are rows of filled containers. Secured to and movable with said bars or rods 187 is a movable jaw 188, there being as many movable jaws as there are fixed jaws 185. Connected with each rod or bar 187 at each end thereof and to upstand therefrom is a lever 189 with said levers at the similar ends of the rods or bars 187 having their upper end pivotly connected through a strap 190. To insure the proper operation of the movable jaws there is, preferably, a lever 189 at each end of each bar or rod 187 which have their upper ends connected by a similar strap 190; said lever and strap mechanism for one end of the rods or bars 187 being illustrated in Fig. 1, in elevation, and the said lever and strap arrangement for the other ends of said rods or bars 187 being illustrated in Fig. 3, in plan. The said levers and straps are connected for uniform and simultaneous operation by means of a tie bar 191, shown fragmentarily in Fig. 3 and extending from the strap at the back end of the gripper mechanism. The said tie bar 191 is connected, substantially midway of its length, to the outer end of a piston rod 192 projecting from a cylinder 193 which is carried by a horizontal plate 194 forming a part of the frame of the gripper mechanism. The said gripper mechanism is a part of the filled container elevator mechanism, as noted above, and as will presently be made clear.

The gripper cylinder 193 is diagrammatically illustrated in Fig. 9 and is shown as having extending from opposite ends thereof conduits 194 and 195. Fig. 9 further diagrammatically illustrates the piston rod 192 as having at its inner end a piston 196 with the conduits 194 and 195 on opposite sides of said piston 196. The pipes or conduits 194 and 195 have their other ends connected with the air valve 184 and as illustrated has the pressure pipe or conduit 194 for actuating the piston 196 to an open position for the gripper mechanism. The energization of the solenoid 183 effects the shifting of the valve 184 for connecting the pipe or conduit 195 with the air pressure line 197 and simultaneously connecting the conduit 194 with the exhaust pressure line 198 or atmosphere. This then permits the piston 196 to be actuated and through the piston rod 192 operate the gripper movable jaws 188 for now gripping the gables of the filled containers located within the gripper device.

Disposed in the pressure line 195 is a pressure switch mechanism 199 illustrated in Fig. 9 as including the above identified normally closed switch 154 and additionally including a normally open switch 200. As diagrammatically illustrated in said Fig. 9 the pressure switch 199 includes a diaphragm 201 which effects the opening and closing of the switches 154 and 200 and which diaphragm is operated by the pressure in the pressure line 195 and for which purpose the said pressure switch mechanism 199 is connected by a pipe or conduit 202 with the said pressure line 195.

As illustrated in Fig. 7 the normally open pressure switch 200 has connected at one side thereof the wire 153 and which includes an electro magnetic solenoid 203. The other side of the normally open pressure switch 200 is connected by a wire 204 with the current source supply wire 80.

From the foregoing it should be noted that after sufficient pressure has been built up in the gripper cylinder 193 to securely grip each of the filled containers said pressure closes the switch 200 and opens the normally closed switch 154 for thereby rendering the circuit including the same inoperative so that the subsequent closing of the normally open switch contacts 150 will not complete the circuit.

The electro magnetic solenoid 203 is connected with the valve stem 76 of the valve 162 for returning said valve 162 to the position thereof illustrated in Fig. 8 for retracting the carriage mechanism 86 to its position for receiving a subsequent load of filled containers from the

accumulator table 47. Upon full retraction of the carriage mechanism 86 the normally opened limit switch 85 is closed for thereby readying the circuit including the same and which circuit is subsequently closed by the closing of the limit switch 49 upon the completion of an accumulated load on the accumulator table 47 as above pointed out and whereupon the cycle including the pusher 57 is started.

The limit switch 85 is in reality a double switch including normally open limit switch 205 which is in the electric conduit or wire 174 extending from the normally open relay switch contacts 172 and with said wire 174 further including electro magnetic solenoid coil 206 connected by wire 207 with the current supply wire 81. Also included in the wire 174 is the normally open relay switch contacts 208 and the normally closed relay switch contacts 209.

The normally open relay switch contacts 208 are under the control of the relay switch solenoid coil 210 which is included in an electric conductor or wire 211 extending between the control current wires 80 and 81. Included also in the electric conduit or wire 211 is normally open limit switch 212 which is a part of the positioning mechanism for the case into which the filled containers are now to be disposed.

The limit switch 212 is located on the frame of the machine or at least on a supplemental frame which carries a conveyor mechanism indicated in general by the reference numeral 213 on which the container cases are mounted to have loaded therein the filled containers. The said limit switch 212 is closed by a case, indicated by the reference numeral 213, see Fig. 1, and therefore may be considered as closing the said circuit and including the relay switch solenoid coil 210.

Since the limit switch 212, for the present is to be considered as closed by the case 214 and will remain closed so long as said case is positioned as in Fig. 1, the relay switch solenoid coil 210 is energized for closing the normally open relay switch contacts 208 and thereby effecting a circuit from the electric current source wire 80 by way of wire 173, normally closed now closed relay switch contacts 209, normally open now closed relay switch contacts 208, normally open now closed relay switch 205 for energizing electro magnetic solenoid 206 which has its other side connected by a portion of the wire 207 with the electric current supply wire 81.

The electro magnetic solenoid 206 is associated with the valve stem 78 of a valve 215 which is a part of a valve mechanism similar to valve mechanisms 65 and 160. The valve 215, is therefore provided with lands to form therebetween connecting grooves for connecting the hydraulic pressure line 71 alternately with hydraulic conduits or pipes 216 or 217 and connecting the other of said pipes or conduits with the hydraulic return line 75 and the tank or sump 74. The valve 215 controls the operation of a piston 218 disposed in a cylinder 219 and extending vertically of the central part of the machine frame. The piston rod 229 has secured to its lower end a plate 221 which forms a part of the frame which carries the filled containers gripper mechanism.

The cylinder 219 has connected with its upper end the other end of the pipe or conduit 216 while the lower end of said cylinder has connected therewith the other end of the pipe or conduit 217.

From the foregoing it will be noted that upon the gripping of the filled containers by the gripper jaws and upon the building up of sufficient pressure to indicate said containers are properly gripped the carriage mechanism 86 is retracted to its position for receiving a new load. Upon the full retraction of the carriage mechanism 86 and the proper clamping of a case beneath the gripper mechanisms, the limit switch 85 is closed and the limit switch 212 is closed for thereby permitting the lowering of the gripper mechanism to the bottom of its stroke to deposit the filled containers on the base bottom.

13

If it be assumed that the machine is operating on or casing quart size containers, as illustrated in the drawings, a limit switch 221, located at the upper end of the said central part of the machine frame structure, see Fig. 1, is a normally open switch which is maintained closed during the casing of quart size filled containers and which switch 221 has one side thereof connected by a wire 222 with the control current feed wire 81 while its other side is connected by a wire 223 with a wire 224 that extends between the control current feed wires 80 and 81 and with said wire 224 including a relay switch solenoid coil 225, normally open relay switch contacts 226 and normally closed relay switch contacts 227. The limit switch 221, being closed, during the movement of the elevator mechanism energizes said relay switch solenoid coil 225 for the closing of the relay switch contacts 226 and which contacts 226 act as a holding contact for the said relay switch solenoid coil 225.

It should be noted that the circuit including normally closed limit switch 181 is provided with a bypass circuit which includes a wire 228 having one end connected with the control circuit wire 179 at a point between said normally closed limit switch 181 and normally open relay switch contacts 178. Said by pass circuit wire 228 has therein a manually operable switch 229 which is open, and so illustrated, when filled containers of a quart size are being loaded or cased and which switch is closed when other sizes of filled containers are being loaded or cased, as will presently be made clear. It should be here noted that the switch 229 is mechanically connected with a second switch 230 so that said switches are actuated simultaneously and said switch 230 is, at this time and during the loading or casing quarts, likewise open. The said bypass circuit wire 228 in addition to the switch 229 includes normally open relay switch contacts 231 which are associated with and under the control of relay switch solenoid coil 225 and while said normally open switch contacts 231 are now closed the bypass circuit wire 228 is not complete due to the open switch 229 therein.

The elevator mechanism continues to descend toward the bottom of the case or box and just before the filled cartons reach the bottom of said case or box they are released from the gripper mechanism and the elevator mechanism returned to its upper position, by mechanism now to be described. The gripper and elevator mechanisms include, as noted above, the plate 221 to which the piston 220 is connected with said connection, as illustrated in Figs. 1 and 4, including a knuckle or pivot joint 232 and with the ends of said plate 221 welded or otherwise secured to a pair of upright members 233 and 234 which constitute the elevator frame and which upright members 233 and 234 have their upper ends joined on opposite sides a similar plate 235. One of the said plates, preferably the one to the front of the machine, has at its upper end a cam box 236 in which is mounted the means for operating the limit switches 180 and 181 at the proper moment and depending upon which size of filled containers is being boxed or cased.

Any suitable or desirable means may be employed for this purpose, that shown in the drawings comprising a pair of aligned shafts 237 and 238, each journaled in the upper and lower walls of the control mechanism box 236. The shafts 237 and 238 project above the said control box and each, respectively, is provided with a knob 239 and 240 whereby said shafts are rotated and to insure their simultaneous rotation or angular adjustment, since their angular positions with respect to one another is important, is effected the said shafts are interconnected to a pair of intermeshed gears or pinions 241. Mounted on said shafts are fingers or cams with shaft 238 having thereon fingers 242, 243, 334 and 336 while the shaft 237 has thereon the fingers or cams 244, 355 and 357.

The elevator mechanism including the control box 236 is guided in its vertical movement by guide blocks 245 from each end of each of the strap plates 235, or from

14

each corner of the frame, with said guide blocks each having centrally thereof a guide rod 246 which has its upper end suitably secured to an upper transverse frame member 247. The said guide rods 246 have their lower ends secured in or to a transverse frame member 248 which conveniently includes a part of the motor supporting frame 46, above identified.

For the present description of the machine, it is assumed that the control box 236 has its shaft operated to the positions whereby the finger or cam 242 is forwardly projecting. The said finger or cam 242 in its operative position will engage and open limit switch 181 which, as seen in Fig. 1, is mounted on a transverse frame member 249.

The limit switch 181 is provided with an oscillatable or rotatable actuator 250 located in the path of movement of the finger or cam 242 and the parts are so related to one another that the finger 242 actuates the limit switch 181 for opening the same when the filled containers, as noted above, are just above the bottom of the box or case and the said opening of the limit switch causes the release of said filled containers as follows.

The air control valve 184 was shifted, as noted above, by the electro magnetic solenoid 183 to effect the operation of the said gripper jaws. As seen in Fig. 9 the shifting of said valve 184 to the right for thereby connecting the air pressure line 197 with the cylinder line or conduit 195. This shifting of the said valve 184 was against the resistance of a spring 251 and the opening of the normally closed limit switch 181 de-energized the said electro magnetic solenoid 183 for thereby relieving the tension in the spring 251, and permitting the said spring to shift the valve 184 to the position thereof illustrated in said Fig. 9 and which may be termed the normal open position of said valve and thereby connecting the air pressure line 197 with the cylinder 193 on the side of the piston for opening the clamp or gripper jaws on the containers.

The said operation of the valve 184 thereby released the pressure switch 199 and permitted the closing of the normally closed switch contacts 154 and the opening of the normally open switch contacts 200 for subsequent operation of the electro magnetic solenoid 159.

More importantly, at this time, the opening of the normally closed limit switch 181 broke or disconnected the electric circuit including relay switch solenoid coil 177 for thereby permitting the closing of normally closed relay switch contacts 252 which are in the control circuit or wire 207 a portion of which was above referred to and which wire includes electro magnetic solenoid 253.

The electro magnetic solenoid 253 is associated with the valve stem 76 of the valve 215 and returns the said valve 215 to the position illustrated therefor in Fig. 8 for thereby connecting the hydraulic pressure line 71 with the pipe or conduit 217 and the lower end of the elevator cylinder 219 for causing the upward movement of the piston 218 therein. This upward movement of the piston 218 continues until the said piston reaches its uppermost position.

It will be noted that the limit switch 181 is in reality a double switch including the normally closed switch contacts 181 and also including normally open limit switch contacts 254 and which switch 254 is included in an electric conduit or wire 255 extending between the control circuit current wires 80 and 81 with said wire 255 including normally open relay switch contacts 256, under the control of relay switch solenoid coil 225 now energized and wherefore said normally open relay switch contacts 256 are closed, and said electrical conduit or wire 255 further includes the relay switch solenoid coil 257 of a relay switch which controls the normally closed relay switch contacts 227 and 209. The closing of the limit switch 254, however, completes the electric circuit for energizing the relay switch solenoid coil 257 and effects the closing of the relay switch holding switch contacts

258 which are normally open. The said normally open, now closed, relay switch contacts 258 are included in the electric conduit or wire 259 which extends from the control circuit current wire 80 to the wire 255 at a point between the normally open relay switch contacts 256 and relay switch solenoid coil 257. Included in the electric conduit or wire 259 are normally open relay switch contacts 260 which are under the control of relay switch solenoid coil 210 and now energized by the closed though normally open limit switch 212 and which limit switch 212 is closed by the case being loaded.

The energization of the relay switch solenoid coil 257 opened normally closed relay switch contacts 261 which are under the control of said relay switch solenoid coil 257. The said normally closed relay switch contacts 261 are included in an electric conductor or wire 262 extending from a point between the limit switch 212 and the relay switch solenoid 210 with said electric conduit or wire 262 including an electro magnetic solenoid 263.

The electro magnetic solenoid 263, see Fig. 9, is associated with air valve 264 and which valve 264 insofar as the present description is concerned, and as disclosed in the drawing is in its left hand position against the resistance of the spring 265. In this position compressed air in conduit or pipe 266 was prevented from flowing through the said valve. At this time a branch air line or conduit 267 extends to an air control valve 268 and with a second air conduit 269 carrying air to a valve mechanism 270. Extending from the valve mechanism 264 is a restricted air line 271 that terminates in a valve shifting mechanism 272 for the valve mechanism 270 and which valve mechanism 270 is a normally closed valve wherefore actuated to the position shown in Fig. 9 by the spring 273. Extending from the valve mechanism 270 is an air conduit 274 which passes through an air flow regulator 275 to one end of a cylinder 276 in which is disposed a piston 277 that has projecting from it a piston rod 278 connected with mechanism for clamping the box or case 214 in the position illustrated in Fig. 1 and which, as noted above, is the loading position for the case. The actuation of the piston 277, as will presently be made clear, is against the resistance of a spring 279.

From the foregoing it should be noted that upon the closing of limit switch 212 by the case and the completion of the circuit including the electro magnetic solenoid 263 the valve mechanism 264 was actuated to permit a flow therethrough which was through the conduit or line 271 for energizing the air valve shifter 272 and shifting said valve 270 from its normally closed position to an open position for thereby connecting the air pressure line 266 through conduits or air pressure lines 267 and 269 with the conduit 274 and actuating the case clamping piston 277.

The energization of the relay switch solenoid coil 257 by the closing of the normally open limit switch contacts 254 opens the relay switch normally closed contacts 261 thereby de-energizing the solenoid 263 and permit the spring 265 to return the valve 264 to the position illustrated in Fig. 9 and connected the line 274 to the atmosphere thereby rendering the valve shifter 272 inoperative and the return of the valve 270 to its normal position by the spring 273 and thereby connect the case clamping cylinder 276 to atmosphere and permit the spring 279 to release the clamp piston so that the case with its load may be released. It should be noted that there is a time delay mechanism 275' in the air line to delay withdrawal of the piston 277 to insure clearance of the filled case by the elevator.

The energization of the solenoid 263 by the positioning of the case, as noted above, shifted the valve 264 from its normally closed position to its open position thereby permitting the flow of compressed air into the line 271 to open the normally closed valve 270 and permit flow there-through from the conduit 269 to the conduit 274. This

flow of air in conduit or line 274 also caused a flow of air in the conduit or line 280 to a valve actuator 281 associated with the normally open valve 268 and which is illustrated in its normally open position under the influence of spring 282. Therefore, the shifting of the valve 270 to its normally closed position and connecting the pipe or line 274 to exhaust also connects the line or pipe 280 to the exhaust and effects the de-energization of the valve actuator 281 and the shifting of the said valve 268 to its normally open position and permit flow there-through from the conduit 267. This flow of air from the said valve 268 to a valve 283, by way of pipe or conduit 284, also effects an air flow through a pipe or conduit 285 to a valve actuator 286 associated with the said valve 283. This flow of air in the conduit 285 is restricted so that a time delay is provided before the said valve actuator is permitted to actuate the said valve 283 against its spring 287 to shift it from its normal position for connecting the air flow in conduit 284 with the conduit 288 including air flow control valve 289 and the cylinder 290. The cylinder 290 includes a piston 291 with a piston rod 292 connected, as will later be made clear, with a case ejector mechanism. The shift of the piston 291 in a case ejecting direction is against the yielding resistance of a spring 293.

As will be noted from Fig. 1 the case 214 is to the left of its conveyor and held there by a clamp shoe 348 and that the upper left hand corner of the case is against a block or a shoe 348'. Upon the case receiving its load the clamp shoe is released, as above pointed out, whereupon the pneumatic mechanism above described comes into operation for shifting the said case 214 away from or laterally of the stop 344, whereupon the case with its load is transported from beneath the elevator mechanism. Due to the time delay and retracting mechanisms built into the ejector system the said ejector shoe is actuated and after shifting the loaded case clear of the stop is retracted so as not to interfere with the empty case being brought into engagement with the said stop 344.

From the foregoing it will be noted that the de-energization of the solenoid 263 not only effects an unclamping of the filled case but at the same time effects the operation of a filled case ejector mechanism for shifting the said full case from the loading position and permitting the placement of an empty case in position to be loaded.

The positioning of the empty case again closes the limit switch 212 to permit the depositing therein of filled containers. The cycle of the mechanism had been progressing as above set forth so that a new load of filled containers are now on the carriage mechanism 86 for transfer to the elevator.

As was noted above the cycle of the machine just described was for handling sealed containers of a quart size and which containers are deposited in a single row, per case, on the bottom thereof. As was noted above when operating on or loading pints in a case it is desired that an upper layer, such as a half layer, is to be placed upon the full layer on the case bottom. Assuming now that pint size containers are to be cased, certain adjustment are made in the machine and in the electric control circuit, said adjustment in the electric circuit being adjusting the manual control switch 229—230 to the point where said portion 229 of the said switch is closed while the portion 230 of said switch is also closed.

It will be appreciated that the accumulator table 47 and carriage platform 110 remain in the same plane regardless of the size of the container being loaded in the machine and that, therefore, the distance between the bottoms of said container and the bottom of the basket or case 214 remains the same and necessitates the same distance of travel of said container bottoms. However, in view of the fact that the said containers are of different heights, that is, decreasing in height from, for example, the quart to the pint to the third quart, and to

17

the half pint, the gripper mechanism must be lowered to a position for receiving the smaller height containers. To effect this adjustment the entire elevator mechanism along with the piston and cylinder mechanism are lowered thereby permitting the piston to travel to the same point before releasing its load after the gripping of the smaller height containers. Any suitable or desirable means may be provided to accomplish this result, preferably, at this time, the means illustrated in the drawings being utilized and which means specifically are as follows.

As seen in Fig. 2 the uprights of the machine frame are joined by a horizontal frame member 294 in which is mounted a guide bushing 295 secured in position by a flange 296 and with said flange disposed on the upper surface of the horizontal frame member 294 and with the sleeve thereof depending below said frame member. Disposed in said sleeve is a rod or bar 297 having projecting from one side thereof a key 298 that passes through a suitable keyway 299 formed through the bushing 295. The bar 297 has secured to its lower end a clevis head 300 including a slot 301 in which is disposed a tongue 302 carried by and upwardly projecting from a cylinder head 303 at the upper end of the cylinder 219. The said cylinder head 303 has connected therewith the pipe or conduit 217. The clevis 300 and the cylinder head tongue 302 are connected to one another by a pin 304 which extends therethrough.

The upper end of the rod or bar 297 is provided with screw threads 305 in threaded engagement with a nut 306. The nut 306 is rotatably mounted in a bushing or sleeve 307 and which nut 306 has a flange at its lower end engaging a lower surface of the sleeve 307 and the said nut 306 has at its upper end a screw collar 308 which engages the upper surface of the sleeve 307. The sleeve 307 has a radial flange 309 through which it is secured to a transverse frame member 310 at the upper ends of the central frame uprights. The screw collar 308 includes a sprocket 311 about which is trained a sprocket chain 312. The sprocket chain 312 is in turn trained around a driving sprocket 313 at the upper end of a shaft 314 rotatably journaled in a suitable bearing 315 carried by one of the framing uprights. The shaft 314 above the sprocket 313 is provided with an actuating handle or lever 316.

The upper end of the said rod or bar 297 has secured to it a collar 317 and which collar operates the normally open limit switch 221 for closing same when the machine is adjusted for loading or casing filled quarts and which limit switch is therefore open at the commencement of a cycle which loads or cases filled containers of a size other than said quarts.

From the foregoing it will be noted that actuation of the nut 306 through the handle or lever 316 and sprocket chain 312 in the desired direction will cause the screw 305 to be lowered and with it, since it is integral, the rod or bar 297 and the elevator cylinder 219 along with its piston 218 and the parts carried thereby which, of course, includes the gripper mechanism at the lower end of the said piston rod. Since the gripper mechanism includes the transverse plate 194, to which the elevator frame members 233 and 234 are attached and which in turn carry the connecting plates 235 and guide blocks 245 the entire elevator mechanism is accordingly vertically adjusted. The machine is further adjusted through the knobs 239 and 240, which in the case of loading pint containers, effects the withdrawal of the finger 242 on the shaft 238 and the bringing into play of fingers or cams 243 and 244 respectively on said shafts 238 and 237.

With these adjustments in the machine structure and the control circuit the machine is started in motion by operating the hydraulic pump motor and the filled container conveyor motor 44.

The machine functions, initially, substantially the same as above described which includes the accumulation of one or two rows of filled containers on the accumulator

18

table 47 for closing the limit switch 49 which through the cycle above described causes the movement of the pusher 57 to the right in Fig. 3. Upon the transfer of a full load onto the carriage mechanism 86 the limit switch 141 is closed for effecting the shifting of the carriage mechanism and its said load to operative position with the gripper mechanism and effecting its operation.

The complete shifting of the carriage mechanism to its operative position with respect to the gripper mechanism effects the operation of said gripper mechanism in the same manner as above set forth but at the same time sets in operation supplemental control mechanism upon the energization of the relay switch solenoid coil 171. The energization of said relay switch solenoid coil 171 closes normally open switch contacts 317 which are connected by an electric conduit or wire 318 extending from control circuit current wire 80 and a portion of electric conduit or wire 319 with the second control circuit current wire 81. Said electric conduit or wire 319 extends from said wire 81 to the wire 318 at a point adjacent the normally open now closed relay switch contacts 317. Included in said electric conduit or wire 319 is the portion 230 of the manually operated switch 229-230 and which switch portion 230, as noted above, is now closed. Included, additionally in said electric conduit or wire 319 are normally closed now closed relay switch contacts 320 and 321 and with said electrical conduit or wire 319 further including relay switch solenoid coil 322.

From the foregoing it will be noted that the closing of the normally open limit switch 168 by the transfer of a carriage load of filled pint containers in energizing the relay switch solenoid coil 171 closed the normally open relay contacts 317 for thereby completing an electric circuit through electric conduits or wires 318 and 319 and including the relay switch solenoid coil 322.

The energization of said relay switch solenoid coil 322 closed the normally open relay switch contacts 323 in a bypass electric conduit or wire 324 which includes a normally open limit switch 325 and which electric conduit or wire 324 extends from the control circuit current wire 80 to the wire 145 that includes the relay switch solenoid coil 146.

The limit switch 325 is located adjacent the carriage mechanism table or platform 110 and is ahead of the limit switch 141 and is actuated each time a full load of filled containers is transferred from the accumulator table thereto, but since the circuit including the said relay switch solenoid coil 322 is broken when casing quart containers the normally open switch contacts 323 remain open during the closing of said switch 325 and effects no influence on the control circuit.

Mechanically, and as seen in Fig. 3, the limit switch 325 includes an actuator 326 including a lever 327 having a finger 328 projecting through a suitable aperture in the carriage back plate 112 and disposed in the path of movement of the filled containers as they are pushed across the carriage table 110. As seen in Fig. 3 the said finger 328 is actuated when and after two full rows of filled containers have been transferred to the carriage.

It should be noted that by shifting the relay switch 325 to the left, or at least so shifting its actuating finger 328, the said relay switch 325 may be operated by each row of filled containers as they pass onto the carriage 86. Also, it should be noted, that by shifting the said relay switch 325 to the right it may be operated only after three full rows have been shifted onto the carriage table or platform.

The closing of said normally open relay switch 325, at this time, completes an electric circuit by way of the wires 324 and 145 and relay switch solenoid coil 146 for energizing the said solenoid coil 146. The energization of the said solenoid coil 146 closes normally open relay switch contacts 147 for thereby establishing a hold-

ing circuit for said solenoid coil 146 and which includes the wire 148 containing the normally open, now closed, relay switch contacts 147 and includes the normally closed, now closed, relay switch contacts 149 and extending from the control current wire 80 through the wire 145 to the control current wire 81.

The energization of the said relay switch solenoid coil 146, as pointed out above, opens the normally closed relay switch contacts 83 for breaking the circuit that includes the limit switch 49 so that, if closed, by the accumulation of a load on the accumulator table the pusher mechanism will not operate. The energization of the said relay switch solenoid coil 146 likewise, as above pointed out, closes normally open relay switch contacts 150 for completing the electric circuit thereof and effecting the energization of the electro magnetic solenoid 159 to feed the carriage, and its now partial load, to the elevator mechanism for gripping by the elevator grippers as above pointed out.

As soon as the grippers have picked up the filled containers, as pointed out above, the carriage is retracted to its loading position whereupon the elevator descends to the caser.

At this time, and as pointed out above, there is a layer of filled containers upstanding from the case bottom and the present partial load of filled containers is to be deposited onto said full layer but the elevator is not to descend to its lowermost position and is therefore arrested in its descent above said lowermost layer of filled containers. This is effected by the opening of the limit switch 181 which de-energizes the circuit including the electro magnetic solenoid 183 to permit the retraction of the gripper jaws to release the said filled containers and at the same time de-energizes the relay switch solenoid coil 177 for breaking the circuit thereto and at the same time permits the closing of normally closed relay switch contacts 252 which are controlled by the said relay switch solenoid coil 177. The closing of said normally closed relay switch contacts 252 completes a circuit thereacross by way of the wire or electrical conduit 207 for energizing electro magnetic solenoid 253 and which controls the valve 215 for effecting a withdrawal of the elevator after, as pointed out above, it has discharged its said partial layer of filled containers onto the full layer of containers on the case bottom.

The limit switch 180 is mounted on the transverse frame member 249, see Fig. 1, however, on the under side of said transverse member wherefore it is below the limit switch 181. The said limit switch 180 is operated by the finger 244 which, as noted above, was adjusted at the same time the finger 243 was positioned for operation with filled containers of the pint capacity. It should be noted that while the limit switch 181 was operated on the first descent of the elevator with a full load it was at that time strapped out by the circuit including the relay switch contacts 231.

The limit switch 180 is in reality a double switch and includes the normally opened limit switch 329 and which limit switch 329 is included in a bypass electric circuit or wire 330 which is strapped around the normally open relay switch contacts 226 which are controlled by the relay switch solenoid coil 225. The closing of said normally open relay switch 329 therefore completes a circuit through the said relay switch solenoid coil 225 which is by way of wire 224, wire 330 and the normally closed, now closed, relay switch contacts 227 and the energization of which relay switch solenoid coil 225 closes the normally open relay switch contacts 226 for thereby establishing a holding circuit for the said relay switch solenoid coil 225.

The energization of the relay switch solenoid coil 225 closes normally open relay switch contacts 331 in the electric current conductor or wire 318 and thereby completes an electric circuit in said wire 318 since the normally open relay switch contacts 332 in said wire were

closed upon the energization of relay switch solenoid coil 171 upon the retraction of the carriage mechanism for thereby setting up said circuit including the normally open, now closed, relay switch contacts 331 and 332. This electrical circuit wire 318 includes said relay switch solenoid coil 333 that controls the normally closed, now open, relay switch contacts 321. The relay switches including, respectively, the solenoid coils 322 and 333 are mechanically interlocked wherefor the energization of solenoid coil 322 closes contacts 332 and simultaneously opens contacts 321. Said contacts remain in these positions until the solenoid 333 is energized whereupon the contacts 332 are opened and the contacts 321 are closed. It should be noted that the energization of the solenoid coil 322 also closes normally open relay switch contacts 323.

As was noted above the machine or caser of the present invention is adapted for casing filled third quart and half pint containers by depositing a full layer on the bottom of the case and depositing a second full layer on top of the said first full layer. To accomplish this result the manually adjustable switch 229—230 has a third position wherein the portion 229 of said switch is closed while the second portion 230 is open. It will further be appreciated that the elevator mechanism as a whole is adjusted for height through the handle or lever 316 since the third quart and half pint containers are each of less height than the pint even though the width of the side walls are all substantially identical. The adjustment of the elevator mechanism carries with it the cam operating mechanism housing 236 and the parts carried thereby. The cam shafts 237 and 238 are also angularly adjusted with respect to one another whereby, when casing third quarts, the cams or fingers 334 and 335, respectively on shafts 237 and 238 are brought into operative positions for respectively actuating limit switches 181 and 180, the first switch 180 being operated when the elevator reaching its lowest limit of travel for depositing the layer of filled containers on the case bottom and the second switch, 181, being operated by the finger 334 for releasing the second layer of filled containers. When casing half pints the said cam shafts 237 and 238 are further angularly adjusted to bring into operation the cams or fingers 336 and 337, respectively, on shafts 237 and 238, again, for first operating the limit switch 180 and then operating the limit switch 181.

When casing either third quart or half pint filled containers two full layers are cased and which means that the case must remain clamped until the second full layer is disposed in the case in the same way that when casing pints the case must remain clamped until the second partial layer has been deposited. Since however two full layers are now being deposited in the case the mechanism under control of the portion 230 of the manually actuated switch 229—230 remains open wherefore the mechanism in electric conductors or wires 318 and 319 are not in the circuits, due primarily to the fact that the relay switches under control of relay switch solenoid coils 322 and 333 are not energized.

In the casing, therefore, of third quarts and half pints the first pass of the elevator for depositing the lowermost layer on the case bottom while operating mechanically connected limit switches 181 and 254 does not release the gripper since the said limit switch portion 254 could not energize the control relay solenoid coil 257 for thereby energizing the relay switch solenoid coil 225. The operation, however, of limit switch 180—329 would first de-energized the gripper magnetic valve then complete an electric circuit around the said relay switch solenoid coil 225 and which was held energized by its normally open now closed switch contacts 226.

The opening of the limit switch 180 de-energized the control relay solenoid coil 177 and permitted the closing of the normally closed relay switch contacts 252 and thereby energized the elevator control valve electro

magnetic solenoid 253 and effected a retraction of the elevator to its upper limit of travel.

The filled containers, as noted above, have been accumulating on the accumulator table and are being transferred to the carriage mechanism and which now upon receiving a second full load and closing of the relay switch 141 effects the transfer of the load with the carriage to the elevator gripper mechanism which now descends with its second full layer of containers.

On this second descent of the elevator and since the relay switch solenoid coil 225 is de-energized the bypass circuit around the limit switch 181 is now open or broken due to the fact that the normally open now open relay switch contacts 231 have interrupted the circuit, so that, the elevator, through its cam finger 335 or 337, depending upon whether third quarts or half pints are being cased, operates the limit switch 181 and thereby breaking the circuit to the gripper control valve and permitting release of the containers.

It will be obvious from Fig. 1 that the positions of the limit switches 180 and 181 with respect to the travel of the elevator mechanism and the positions of the several cams or fingers on the shafts 236 and 237 cause the release of the containers at different elevations with respect to the bottom of the case, namely, the operation of the limit switch 180 by the fingers on the shaft 237 will take place lower in the case, in fact, substantially at the bottom of the case, and will therefore be at the end of a greater travel of the elevator, while the operation of the limit switch 181 by the cam fingers on the shaft 238 is effected at a considerably higher point and which point is variable since the said containers pints, third quarts and half pints are of progressively less height.

From the foregoing it will now be appreciated that there has been provided a machine for placing containers in a box, basket or case and said container placement consisting either of a single layer on the case bottom, said single layer on the case bottom with a partial layer on said case bottom layer, or a second full layer on the case bottom layer. It will further be noted that the said containers are continuously supplied to the machine or caser and that said containers are accumulated in a proper or desirable order whereupon they are transferred to a carriage mechanism. The carriage mechanism is retained in position for receiving the accumulated containers until the desired number of containers, enough to make a full layer, or enough to make a desired partial layer, or enough to make two full layers, are received whereupon the carriage mechanism moves said containers to a position to be gripped or picked up by an elevator mechanism, said carriage itself elevating the containers to the proper position with respect to the elevator gripper or pick up device. The gripper or pick up device after properly gripping the containers permits the carriage mechanism to return to its receiving station whereupon the elevator lowers the containers to the case. The case is in a fixed or clamped position with respect to the elevator and so remains until the desired number of filled containers, whether a single layer, a single and a partial layer, or a double layer is received whereupon the case with its contents is released for replacement by an empty case.

It will further be noted that various steps in the travel of the filled containers, namely, from the accumulator to the carriage, the carriage to the gripper, the gripper to the case, and the replacement of the case, are all interlocked so that no subsequent operation is effected until the completion of the preceding operation.

Any suitable or desirable means may be employed in positioning and clamping an empty case with respect to the elevator and for automatically subsequently releasing the said case with its contents. As noted above in connection with the case pneumatic control circuit in Fig. 9 these functions are accomplished through piston and cylinder mechanisms. A physical embodiment

of such a device is illustrated in Figs. 1 and 2 and may include the following mechanism.

The cases are adapted to be transferred from a supply source exteriorly of the machine and which may be a decontaminating operation by a supplemental conveyor mechanism 213, referred to above, and which comprises a supporting frame work 338 on which is mounted a conveyor chain 339 conventional in all respects and well known. Mounted on a supplemental frame 340 immediately below the conveyor mechanism is the limit switch 212 which is provided with a movable or rotatable actuator 341 having a contact member 342 to be engaged by the forward or leading edge of the case 214. The case after engaging and operating the relay switch actuator engages a fixed stop 344. Mounted on a second portion of the supplemental frame 340 is a lever 343 having at its upper end an ejector and clamp shoe 348'. The ejector shoe 348' is positioned to cooperate with a clamp shoe and eject at the proper or desired point with respect to the elevator upon it being withdrawn, as above pointed out in connection with the case positioning and clamping mechanism. As will be noted in Figs. 1 and 2 the lever 343 is pivoted at 345 and has its lower end pivotly connected with the piston 292 of the cylinder 290.

During the holding of the case 214 by the stop 344' it is clamped in position and securely held until released by mechanism quite similar to the ejector mechanism. The clamping mechanism includes an arm or lever 346 pivoted intermediate its ends at 347 to the supplemental frame 340 and having at its upper end a clamp shoe 348. The lower end of the lever 346 is connected with the piston rod 278 of the clamp cylinder 276.

As shown in Fig. 1 the cylinders 276 and 290 are mounted through a similar bracket 349 to the supplemental frame 340 preferably substantially centrally of said supplemental frame to operate in opposite directions. It will be understood that the clamping of the case 214 is through the clamp shoe 348 holding the case against the opposite side of the conveyor mechanism and particularly against the clamping pad or against the ejector shoe 348'.

As shown in Fig. 1 a conveyor mechanism 350 is provided to the left of the conveyor mechanism 339 and which may be employed for empty cases to be subsequently transferred to the said conveyor mechanism 339 for placement and positioning with respect to the caser elevating mechanism. A similar conveyor mechanism 351 is provided to the right of the conveyor mechanism 338 and to which the filled cases are transferred after release from the caser.

It will be noted that the conveyor mechanism 350 is below the mechanism which accumulates the filled containers and the transfer mechanism which shifts or transfers the accumulated containers to the carriage and elevator mechanisms, while the conveyor mechanism 351 is mounted beneath the control mechanism which includes the hydraulic valves and their operating electro magnetic solenoids which effect and control the operation of the transfer mechanism, the carriage mechanisms and the elevator mechanism.

As seen in Figs. 1 and 3 said control valves and their respective operating electro magnetic solenoid are mounted on a suitable transverse supporting structure 352 at the upper end of the outer most vertical frame member 38. It should be noted that adjacent to the said supporting frame 352 the machine frame supports a platform 353 which is the operator's station for operating the control cam shafts 237 and 238 and for actuating the handle or lever 316 in adjusting the elevator mechanism depending upon the size or capacity of containers being cased.

Disposed above the frame 352 and platform 353 on the right hand side of the machine uprights is disposed a cabinet 354 closed by an access door 355 and which cabinet houses the various relay switches solenoid coils and their controlled contacts as well as other control mecha-

nism utilized in the electric control circuit and above pointed out as well as the switches for starting and stopping the hydraulic pump motor and the filled containers conveyor motor.

The motor operating and control circuit source disclosed in Fig. 14 is believed self explanatory but in brief comprises the three wire current source 356 which enters a magnetic starting switch 357 and which starting switch is under the control of a manual starting switch 358 located adjacent the hydraulic unit as well as under the control of a second manual starting switch 359 which may be remote from the hydraulic unit. Associated with each control switch 358 and 359 is a stop switch 360 and 361. Extending from the electro-magnetic switch 357 are the wires 362 to the hydraulic pump motor 363.

The complete circuit to and through the electro-magnetic switch 357 upon closing of either of the starting switch 358 and 359 is from one of wires 356 through wire 363, stop switch 361, wire 366, whichever of said starting switches is closed, either of wires 364 and 365, wire 367, wire 368, solenoid coil 369 and wire 370 to the second of the wires of the source 356.

Extending from two of the main current source wires 356 are wires 371 and 372 which are connected with the coil 373 of a current transformer and which current transformer has connected with its second coil 374, wires 375 and 376 which after passing through control starting switch 377 and stopping 378 feed to the control circuit feed wires 80 and 81. Included with the control switches 377 and 378 is a relay switch solenoid coil 379 controlling normally open relay switch contacts 380 and 381 and which maintain the solenoid coil 379 energized upon opening of switch 377. Suitable indicators 382 and 383 are also included in the hydraulic motor operating circuit and the control current lines.

Mounted in the wire 376 is a pressure switch 384 which breaks the circuit if insufficient pressure occurs in the pressure source and main air line 197—266.

What is claimed is:

1. In a case of the class described the combination of a normally stationary carriage adapted to receive and hold a given number of containers, means periodically placing said containers on said carriage until said given number thereof are on said carriage, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means supporting and moving said carriage for positioning the containers with respect to the grippers and retracting said carriage to its normally stationary position, means actuating said grippers to cause same to engage and grip the containers and means actuating said elevator after the retraction of the carriage to its normally stationary position for lowering the grippers and containers gripped thereby.

2. In a case of the class described the combination of a normally stationary carriage adapted to receive and hold a given number of containers, means periodically placing said containers on said carriage until said given number thereof are on said carriage, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means supporting and moving said carriage for positioning the containers with respect to the grippers and retracting said carriage to its normally stationary position, means actuating said grippers to cause same to engage and grip the containers, means actuating said elevator after the retraction of the carriage to its normally stationary position for lowering the grippers and containers gripped thereby, and interlocked control means for the carriage moving means and the grippers actuating means operated by the said carriage moving means and gripper actuating means to insure sequential operation thereof.

3. In a case of the class described the combination of a normally stationary carriage having a normal position receiving and supporting a given number of containers, an elevator laterally adjacent the carriage, gripper means

on said elevator adapted to have the containers positioned with respect thereto, means supporting and moving said carriage from its normal position for positioning the containers with respect to the grippers and retracting said carriage to its normally stationary position, means actuating said grippers to cause same to engage and grip the containers, means actuating said elevator after the retraction of the carriage to its normally stationary position for lowering the grippers and containers gripped thereby, interlocked control means for the carriage moving means and the grippers actuating means operated by the said carriage moving means and gripper actuating means to insure sequential operation thereof, and means placing containers on the carriage when in its normal position, comprising an accumulator table accumulating containers in quantities less than the said given number thereof of the carriage, and a pusher intermittently actuated upon accumulation of said lesser number of containers on the accumulator table pushing said containers onto the carriage until said given number of said containers are on said carriage.

4. In a case of the class described the combination of a normally stationary carriage having a normal position receiving and supporting a given number of containers, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means supporting and moving said carriage from its normal position for positioning the containers with respect to the grippers and retracting said carriage to its normally stationary position, means actuating said grippers to cause same to engage and grip the containers, means actuating said elevator after the retraction of the carriage to its normally stationary position for lowering the grippers and containers gripped thereby, interlocked control means for the carriage moving means and the grippers actuating means operated by said carriage moving means and gripper actuating means to insure sequential operation thereof, means placing containers on the carriage when in its normal stationary position, a case below the elevator receiving the containers, and means for releasing the grippers upon reception of the containers by the case.

5. In a case of the class described the combination of a normally stationary carriage having a normal position receiving and supporting a given number of containers, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means for actuating said grippers to grip the containers, means supporting and moving said carriage from its normal position for positioning the containers with respect to the grippers and retracting said carriage to its normally stationary position, means actuating said elevator for lowering the grippers and containers gripped thereby, interlocked control means for the carriage moving means and the grippers actuating means operated by the said carriage moving means and gripper actuating means to insure sequential operation thereof, means placing containers on the carriage when in its normal stationary position, a case below the elevator receiving the containers, means actuating said grippers for releasing the containers upon reception of the containers by the case, and an interlock between the elevator actuating mechanism and the grippers releasing actuating mechanism insuring sequential operation of the gripper and elevator operating mechanisms.

6. In a case of the class described for placing two layers of containers in a case, the combination of means supporting a plurality of containers to be cased and located above the case, an elevator, means associated with said elevator receiving and releasably holding said plurality of containers from said supporting means, means for reversely moving said elevator and its containers holding means between said containers supporting means above the case and a point with its containers adjacent the case bottom for placing a first layer of containers on

25

said case bottom, control means for controlling the operation of said elevator moving means and its containers holding means from said supporting means above the case to said point adjacent the case bottom, additional means controlling the operation of said elevator moving means and its container holding means from said supporting means above the case to a point corresponding to the height of said containers first layer and placing a second container of layers in the case, and means releasing the containers from the containers holding means when in positions of placing said first and second layer of containers in the case.

7. In a case of the class described for placing two layers of containers in a case, the combination of means supporting a plurality of containers to be cased and located above the case, an elevator, means associated with said elevator receiving and releasably holding said plurality of containers from said supporting means, means for reversely moving said elevator and its containers holding means between said containers supporting means above the case and a point with its containers adjacent the case bottom for placing a first layer of containers on said case bottom, control means for controlling the operation of said elevator moving means and its containers holding means from said supporting means above the case to said point adjacent the case bottom, additional means controlling the operation of said elevator moving means and its containers holding means from said support means above the case to a point corresponding to the height of said containers first layer for placing a second layer of containers in the case, said elevator controlling means and said elevator additional controlling means being adapted for sequential operation, means causing said elevator controlling means and said elevator additional controlling means to operate in sequence, and means releasing the containers from the containers holding means when in positions of placing said first and second layer of containers in the case.

8. In a case of the class described the combination of a carriage having a normal position receiving and supporting a given number of containers, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means supporting said carriage for movement in the plane of its normal position from a point laterally of the elevator to a position beneath the elevator and the containers gripper means, means associated with said carriage for raising same and operatively associating the containers and gripper means, means actuating said grippers to cause same to engage and grip the containers, means actuating said elevator for lowering the grippers and containers gripped thereby, and interlocked control means for the carriage moving means and grippers actuating means to insure sequential operation thereof.

9. In a case of the class described the combination of a carriage having a normal position receiving and supporting a given number of containers, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means supporting said carriage for movement in the plane of its normal position from a point laterally of the elevator to a position beneath the elevator and the containers gripper means, means associated with said carriage for raising same and operatively associating the containers and gripper means including connecting links pivotly connecting and between the carriage and its supporting means, and an abutment restraining movement of the carriage while permitting movement of the carriage moving means, means actuating said grippers to cause same to engage and grip the containers, means actuating said elevator for lowering the grippers and containers gripped thereby, and interlocked control means for the carriage moving means and grippers actuating means to insure sequential operation thereof.

26

10. In a case of the class described the combination of a carriage having a normal position receiving and supporting a given number of containers, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means supporting said carriage for movement in the plane of its normal position from a point laterally of the elevator to a position beneath the elevator and the containers gripper means, means associated with said carriage for raising same and operatively associating the containers and gripper means including connecting links pivotly connecting and between the carriage and its supporting means, and an abutment restraining movement of the carriage while permitting movement of the carriage moving means, means actuating said grippers to cause same to engage and grip the containers, means actuating said elevator for lowering the grippers and containers gripped thereby, interlocked control means for the carriage moving means and grippers actuating means to insure sequential operation thereof, and yieldable means for returning the carriage to its normal position on the moving means upon retraction of the carriage from its abutment.

11. In a case of the class described the combination with a conveyor for conveying containers to be cased, an accumulator table receiving said containers from the conveyor, means periodically shifting the containers from the accumulator table after each accumulation of a predetermined number of containers, a normally stationary carriage having a normal position adjacent the accumulator table and a capacity greater than the capacity of the accumulator table and receiving periodic transfers of said containers from the accumulator table, control means operable by said containers after each accumulation of said predetermined number of containers for actuating the shifting means, said carriage being adapted to receive a given number of containers as periodically moved thereon from the accumulator table, an elevator laterally adjacent the carriage, means mounting said carriage for movement laterally of its normal position to be beneath the elevator, container gripper means associated with said elevator, means moving said carriage from its normal position to a position to be beneath the elevator and its gripper means and retracting the carriage, means operable by said containers after the given number thereof are disposed on the carriage for actuating said carriage moving means, means for actuating the containers gripper means, and means operable by said carriage upon the positioning thereof beneath the elevator for actuating the gripper means, retracting the carriage and lowering the elevator and its gripper means to a point below the carriage.

12. In a case of the class described the combination with a conveyor for conveying containers to be cased, an accumulator table receiving said containers from the conveyor, means periodically shifting the containers from the accumulator table after each accumulation of a predetermined number of containers, a normally stationary carriage having a normal position adjacent the accumulator table and a capacity greater than the capacity of the accumulator table and receiving periodic transfers of said containers from the accumulator table, control means operable by said containers after each accumulation of said predetermined number of containers for actuating the shifting means, said carriage being adapted to receive a given number of containers as periodically moved thereon from the accumulator table, an elevator laterally adjacent the carriage, means mounting said carriage for movement laterally of its normal position to be beneath the elevator, container gripper means associated with said elevator, means moving said carriage from its normal position to a position to be beneath the elevator and its gripper means and retracting the carriage, means operable by said containers after the given number thereof

are disposed on the carriage for actuating said carriage moving means, means for actuating the containers gripper means, means operable by said carriage upon the positioning thereof beneath the elevator for actuating the gripper means, retracting the carriage and lowering the elevator and its gripper means to a point below the carriage, and interlocking means between the carriage moving means and gripper means actuating means to insure sequential operation of said means.

13. In a case of the class described the combination with a conveyor for conveying containers to be cased, an accumulator table receiving said containers from the conveyor, means periodically shifting the containers from the accumulator table after each accumulation of a predetermined number of containers, a normally stationary carriage having a normal position adjacent the accumulator table and a capacity greater than the capacity of the accumulator table and receiving periodic transfers of said containers from the accumulator table, control means operable by said containers after each accumulation of said predetermined number of containers for actuating the shifting means, said carriage being adapted to receive a given number of containers as periodically moved thereon from the accumulator table, and elevator laterally adjacent the carriage, means mounting said carriage for movement laterally of its normal position to be beneath the elevator, container gripper means associated with said elevator, means moving said carriage from its normal position to a position to be beneath the elevator and its gripper means and retracting the carriage, means operable by said containers after the given number thereof are disposed on the carriage for actuating said carriage moving means, means associated with said carriage and its moving means for elevating the carriage and operatively associating the containers and the containers gripper means, means for actuating the containers gripper means, and means operable by said carriage upon the positioning thereof beneath the elevator for actuating the gripper means, retracting the carriage and lowering the elevator and its gripper means to a point below the carriage, and interlocking means between the carriage moving means and gripper means actuating means to insure sequential operation of said means.

14. In a case of the class described the combination with a conveyor for conveying containers to be cased, of a carriage adapted to receive said containers, an elevator adjacent to and laterally of the carriage, container gripper means associated with said elevator, means for moving the carriage for positioning the containers with respect to the containers gripping means and retracting the same, said elevator including a hydraulically actuated piston for reversely actuating the same, a cylinder for the piston, said piston having a stroke between a fixed high point and a plurality of low points with respect to its cylinder, a valve reversely actuating the piston at opposite ends of each piston stroke, means operable by the piston at its high point for operating the valve, separate means operated by the piston at each of its low points for operating the valve, and a separate control means for each piston low point valve operating means.

15. In a case of the class described the combination with a conveyor for conveying containers to be cased, of a carriage adapted to receive said containers, means shifting said containers from the conveyor to the carriage, an elevator adjacent to and laterally of the carriage, container gripper means associated with said elevator, means for moving the carriage for positioning the containers with respect to the containers gripping means and retracting the same, said elevator including a hydraulic medium actuated piston for reversely actuating the same, a cylinder for the piston, said piston having a stroke between a fixed high point and a plurality of low points, with respect to its cylinder a valve for controlling the flow of the hydraulic medium to the piston reversely

actuating the piston at the opposite ends of each piston stroke, electro magnetic means actuating said valve, a switch operable by the elevator at said fixed high point of its movement for operating the electro magnetic valve actuating means, a separate switch at each low point of the elevator stroke for actuating the valve electro magnetic actuating means at said each low point of the elevator stroke, and selectable means carried by the elevator for selectively operating said elevator stroke low point switches.

16. In case of the class described the combination of a normally stationary carriage having a normal position and of a capacity to receive and support a given number of containers, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means supporting said carriage for movement in the plane of its normal position from a point laterally of the elevator to a position beneath the elevator and positioning the containers with respect to the containers gripper means, means actuating said grippers to cause same to engage and grip the containers, means operable by said containers after the said given number thereof are disposed on the carriage for actuating said carriage moving means, additional means operable by said containers after a predetermined number thereof less than the capacity of the carriage for actuating said carriage moving means have been disposed on the carriage, and means for rendering said last named means inoperative.

17. In a case of the class described the combination of a normally stationary carriage having a normal position and of a capacity to receive and support a given number of containers, an elevator laterally adjacent the carriage, gripper means on said elevator adapted to have the containers positioned with respect thereto, means supporting said carriage for movement in the plane of its normal position from a point laterally of the elevator to a position beneath the elevator and positioning the containers with respect to the containers gripper means, means actuating said grippers to cause same to engage and grip the containers, means operable by said containers after the said given number thereof are disposed on the carriage for actuating said carriage moving means, additional means operable by said containers after a predetermined number thereof less than the capacity of the carriage for actuating said carriage moving means have been disposed on the carriage, said carriage given capacity number of containers actuating means and said carriage less than given capacity number of containers actuating means being adapted to operate sequentially, and means for connecting said two carriage actuating means for sequential operation.

18. In a case of the class described the combination with a conveyor for conveying containers to be cased, of a carriage adapted to receive said containers, means shifting said containers from the conveyor to the carriage, an elevator adjacent to and laterally of the carriage, container gripper means associated with said elevator, means for moving the carriage for positioning the containers with respect to the containers gripping means and retracting the same, said elevator including a hydraulic medium actuated piston for reversely actuating the same, a cylinder for the piston, said piston having a stroke between a fixed high point and a plurality of low points with respect to its cylinder, a valve for controlling the flow of the hydraulic medium to the piston reversely actuating the piston at the opposite ends of each piston stroke, electro magnetic means actuating said valve, a switch operable by the elevator at said fixed high point of its movement for operating the electro magnetic valve actuating means, a separate switch at each low point of the elevator stroke for actuating the valve electro magnetic means at said each low point of the elevator stroke, selectable means carried by the elevator for selectively operating said elevator low points switches, and means mounting said ele-

29

vator, its associated container gripping means, its included piston and its switch operating means for bodily and unitary movement to adjust said containers gripping means toward and from the containers receiving carriage.

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