

Aug. 4, 1964

J. H. WALTER
BOTTLE PACKING MACHINE

3,142,947

Filed Oct. 9, 1961

7 Sheets-Sheet 1

Fig. 1

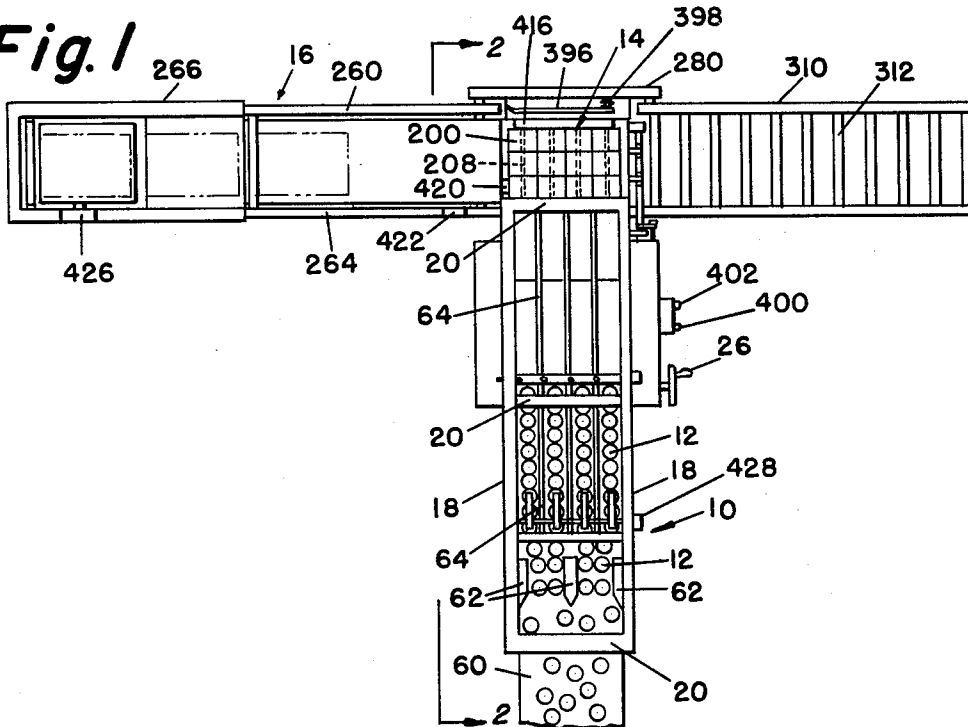
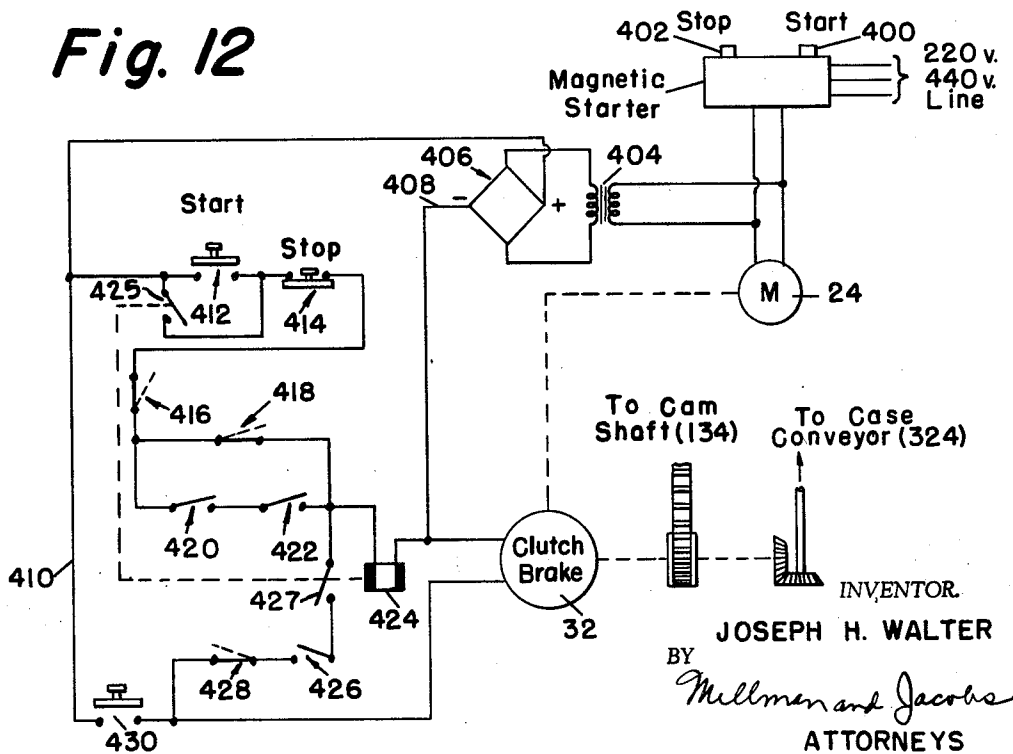


Fig. 12



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7 Sheets-Sheet 2

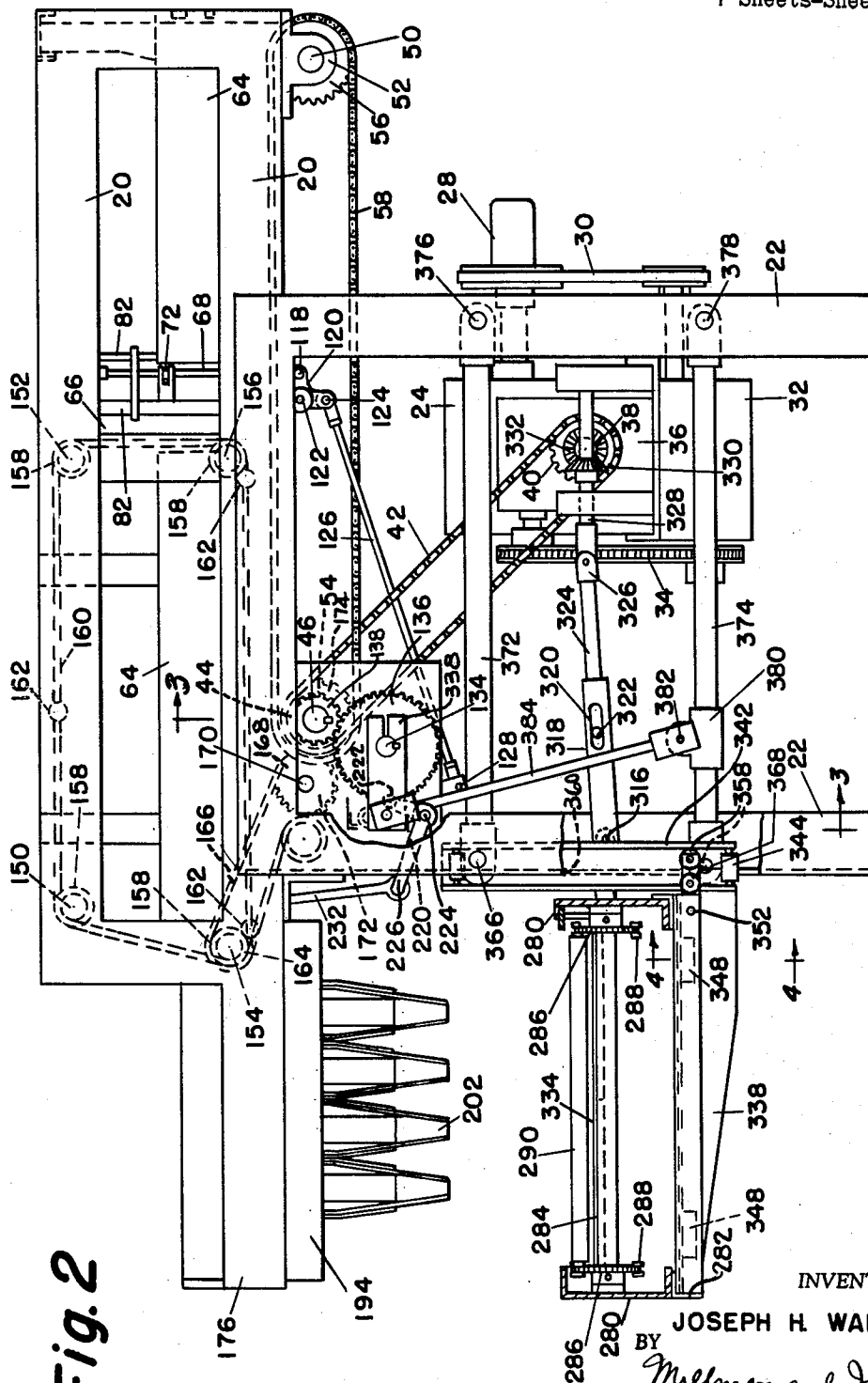


Fig. 2

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7 Sheets-Sheet 3

Fig. 3

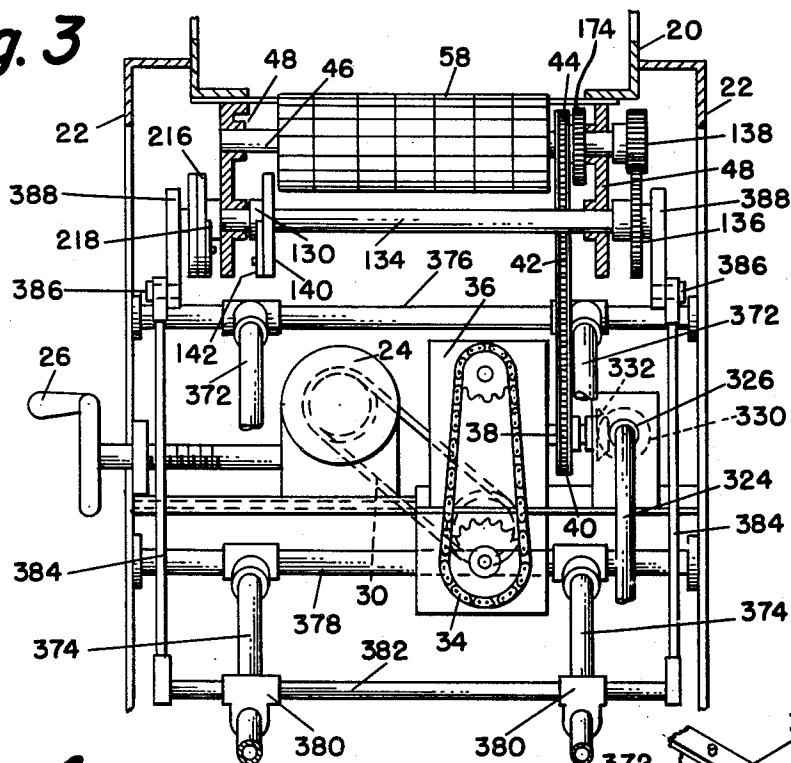


Fig. 4

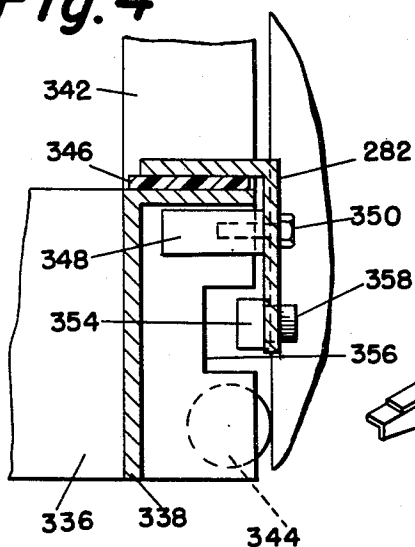
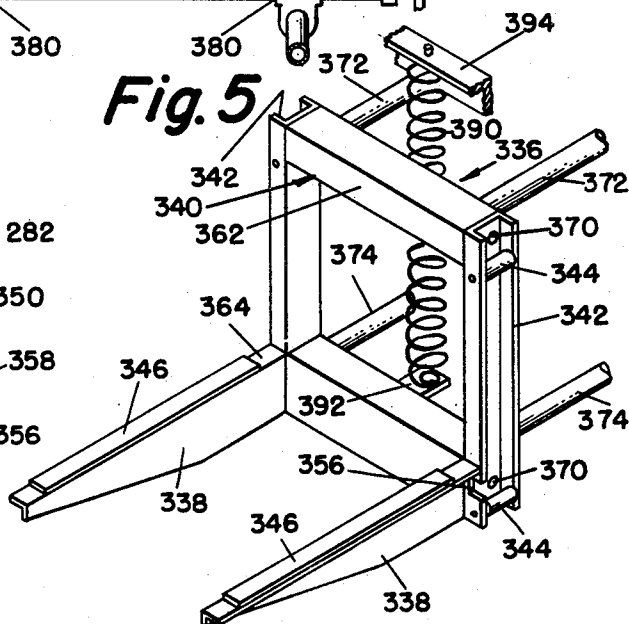


Fig. 5



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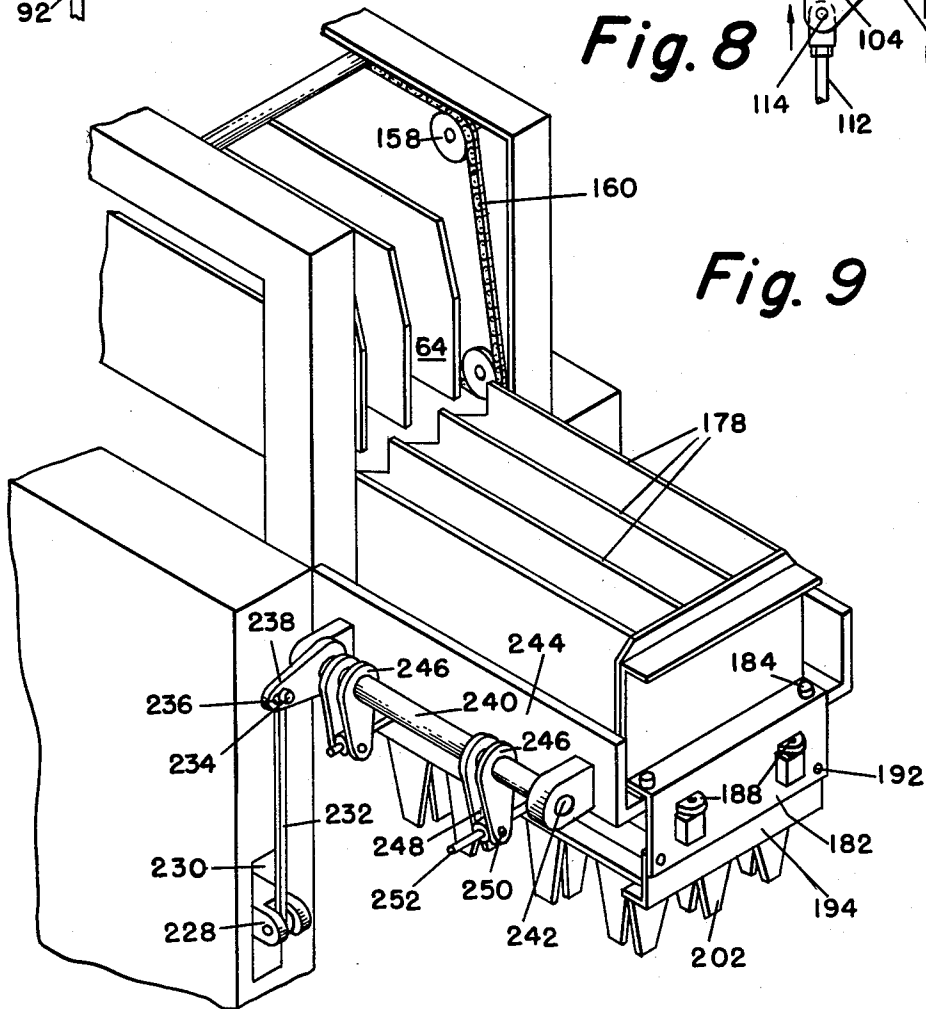
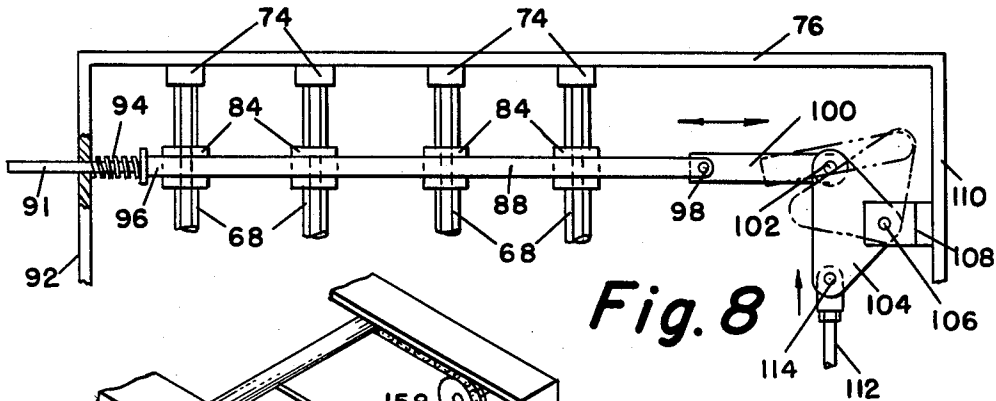
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7 Sheets-Sheet 5



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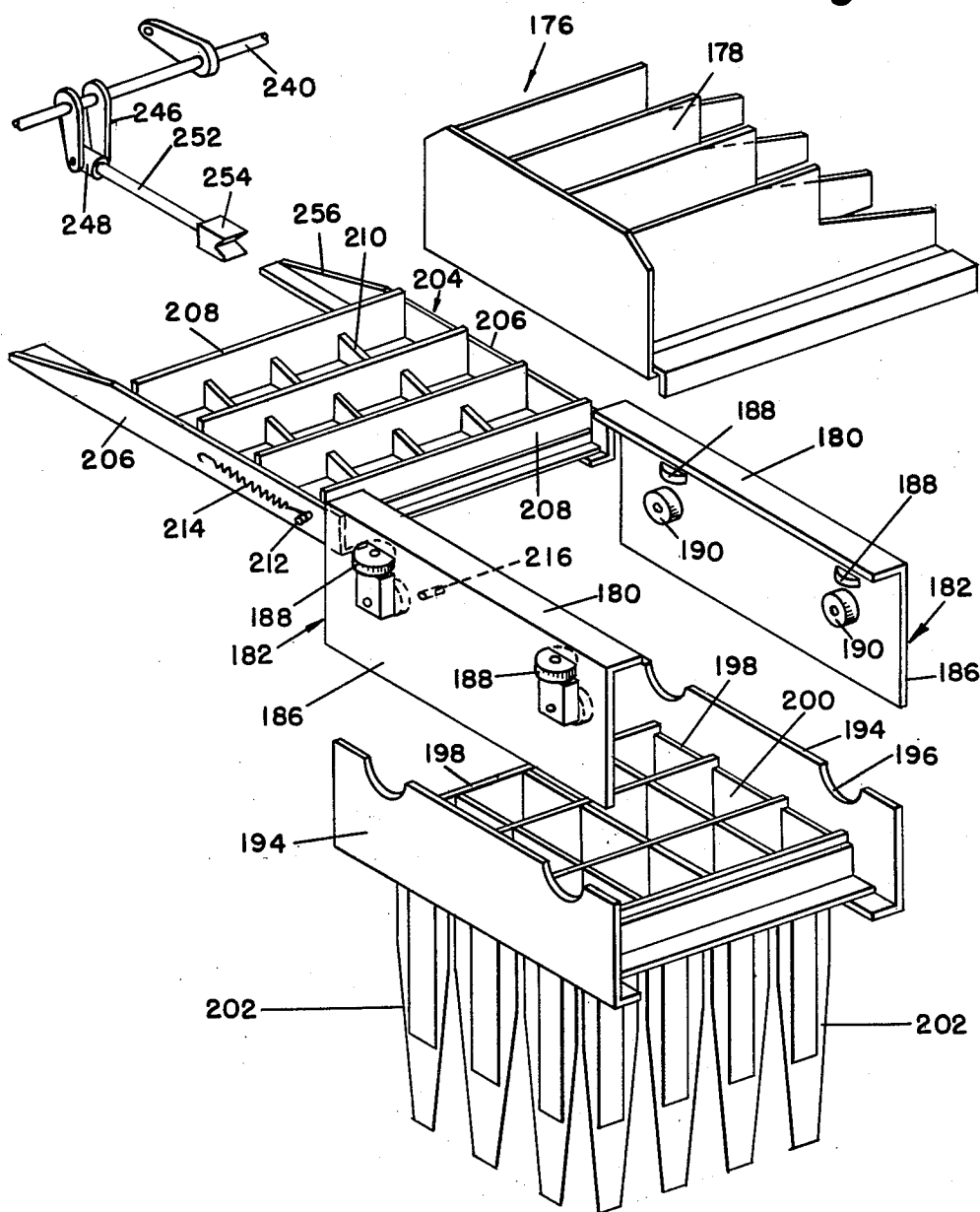
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7 Sheets-Sheet 6

Fig. 10



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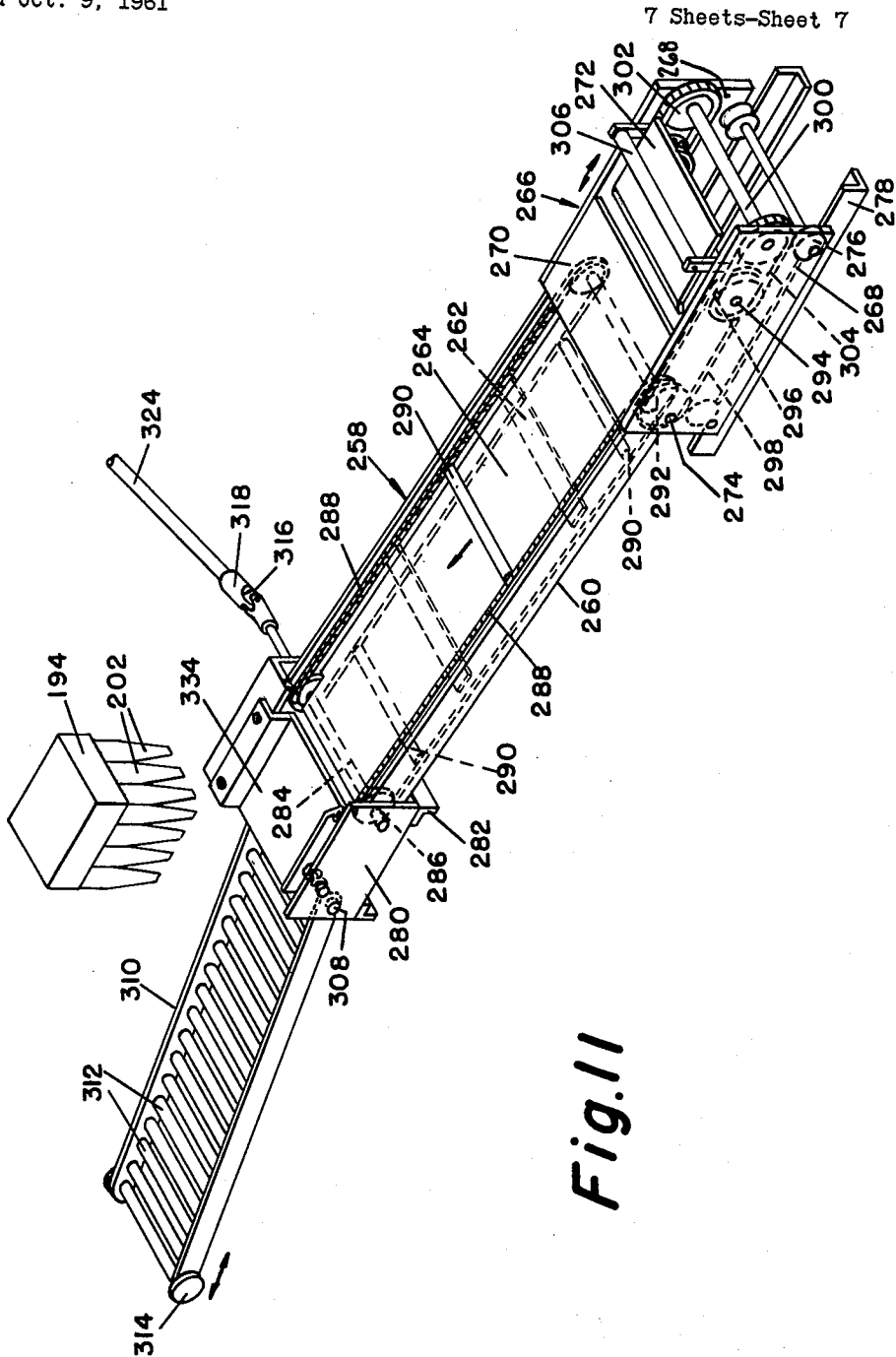


Fig. 11

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BOTTLE PACKING MACHINE

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Filed Oct. 9, 1961, Ser. No. 143,951
16 Claims. (Cl. 53—55)

This invention relates to a machine for packing bottles, jars, cans and the like, the primary object of which is to provide a continuous motion packer designed to stand the strain of around the clock performance with a minimum of maintenance, the same permitting speeds in excess of those which can be obtained with stop start or reciprocating motion mechanisms.

An important object of the invention is to provide a bottle packing machine employing a bottle conveyor terminating at a bottle dropping station and a case conveyor crosswise thereof beneath said station including mechanism assuring the fact that there is always a case ready when the bottles reach said station and vice versa, thereby eliminating valuable time lost at said station.

Another object of the invention is to provide a bottle packing machine wherein bottles in predetermined groups are positively fed by flight bars onto the bottle dropping station synchronously with a metering means operative to provide the predetermined groups thereby obviating the use of back pressure to convey the bottle and eliminating bottle jams.

Another object of the invention is to provide a bottle packing machine in which predetermined groups of bottles are positively fed onto a shiftable mechanism at a bottle dropping station above a vertical movable case-lift, the shiftable mechanism and case-lift being so synchronized that the former releases the bottles and allows them to drop into a case on the case-lift when the latter has just begun to descend to absorb the shock in loading.

Another object of the invention is to provide a bottle packing machine combining a bottle conveyor terminating in a bottle dropping station, a bottle metering means, a means synchronous with the metering means positively feeding the bottles in groups to the station, a case conveyor transverse to the bottle conveyor including a case-lift vertically movable beneath the station and a shiftable means at the station synchronous with the motion of said case-lift to permit the bottles to drop into an empty case on the table when the latter has just begun to descend, the timing of the machine being obtained simply and effectively by adjustable cams which are readily installed for a specific pack pattern.

Yet another object of the invention is to provide a bottle packing machine whose parts are relatively simple in construction, easily repaired or replaced, and which can be maintained and adjusted with a minimum of skill and manipulation.

These and other objects of the invention will become more apparent as the following description proceeds in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a top plan view of the machine;

FIGURE 2 is a sectional view taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a sectional view taken on the line 3—3 of FIGURE 2;

FIGURE 4 is a sectional view taken on the line 4—4 of FIGURE 2;

FIGURE 5 is a perspective view of the case-lift carriage;

FIGURE 6 is a group perspective view of the gate or bottle metering mechanism;

FIGURE 7 is an enlarged detail of the gate actuating mechanism;

FIGURE 8 is a sectional view taken on the line 8—8 of FIGURE 7;

2

FIGURE 9 is an enlarged perspective view of the bottle dropping station;

FIGURE 10 is an exploded perspective view of the bottle dropping mechanism, the compartments being shown as four deep and three wide as compared to three deep and four wide in FIGURE 1 to illustrate the versatility of the machine;

FIGURE 11 is a perspective view of the case conveyor per se;

FIGURE 12 is a wire diagram showing switch controls for the operation of the machine.

Specific reference is now made to the drawings wherein similar reference characters are used for corresponding elements throughout.

It will be understood that while the drawings and description herein refer to a bottle packing machine, the same can also be used for packing jars, cans and other containers as well in cases.

Referring first to FIGURE 1, it will be seen that the overall machine comprises an elongated substantially rectangular frame 10 mounting means to convey bottles 12 therealong to a bottle dropping station, generally 14, which is above a case conveyor 16 disposed crosswise of the bottle conveyor frame 10. The frame 10 includes interconnected longitudinal and transverse members 18 and 20 and vertical supporting beams 22. Suitably mounted on the frame beneath the bottle conveyor is a motor 24 whose speed can be varied manually as by a handle 26 to operate a Reeves pulley 28. The shaft of the motor is operatively connected by appropriate pulleys and belts 30 to the input shaft of a standard electric clutch 32, the take off shaft of which is operatively connected by appropriate pulleys or sprockets and belt or chain 34 to the input shaft of a gear reducer 36. The output shaft 38 of the gear reducer has coupled thereto a sprocket 40 over which is entrained a chain 42 which is, in turn, entrained over a further sprocket 44 which is keyed to a transversely extending shaft 46 whose ends are journaled in suitable frame brackets 48. Another shaft 50 is provided at the other end of the frame opposite the dropping station 14 which is also journaled in depending brackets 52. Keyed on the drive shaft 46 is a number of spaced sprockets 54 and loosely mounted on the other shaft 50 is a similar number of sprockets 56 over which is trained a bottle conveyor belt or platform 58 preferably made of nylon flats as shown in FIGURE 3.

The bottles 12 are transported to the conveyor belt 58 by any conventional conveyor 60, see FIGURE 1, and the belt 58 moves the bottles towards the packing platform or bottle dropping station 14 at a predetermined rate. The frame 12 mounts longitudinal partitions above the conveyor belt 62 which serve to divide the flow of bottles in lanes each confining two rows of bottles and further longitudinal partitions 64 which serve to divide the flow of bottles into lanes each confining a single row of bottles.

As the bottles are advanced by the conveyor belt towards the bottle dropping station they are confronted by a gate mechanism or metering device disposed vertically in a space 66 where the partitions 64 are discontinued. There are as many gates as there are lanes and each comprises a hexagonal rod 68 securing intermediate its ends a laterally extending yoked lug 70 mounting a roller or ball bearing 72 and serving as a closure member. Each rod 68 is journaled for axial rotation at its upper end as at 74 to a top frame member 76 and at its lower end 78 to a forwardly disposed extension 80 in alignment with each partition 64. The extensions 80 and partitions 64 carry vertically extending rods 82 for further support. Adjacent its upper end each rod 68 further secures a lateral yoked lug 84 which is provided with a short rod 86 rather than a roller as in lug 70. A gate actuating slide bar 88 is

provided which crosses the frame and includes cut-outs or notches 90 receiving the rods 86 so that the gates can be rotated in unison.

One end of the bar 88 is reduced as at 91 and passes through an aperture in a side frame member 92. A spring 94 is wound about the reduced portion and bears against the side member 92 and the shoulder 96 on the bar to normally urge the bar in a direction in which the gates 70 close off the lanes. The other end of the bar is pivoted as at 98 to a link 100 which is in turn pivoted as at 102 between a pair of right angle levers 104, the right angle corner of which is pivoted as at 106 to a pair of angle brackets 108 that are secured to another side frame member 110 opposite side frame member 92. A vertically extending rod 112 is pivoted as at 114 between the right angle levers 104 at the lower corner thereof, the rod passing through an angle member 116 there to be pivoted as at 118 to one leg of a bell crank 120 whose corner is in turn pivoted as at 122 to the angle member. The other leg of the bell crank is pivoted as at 124 to a rod 126 which, at its other end is pivoted as at 128 to a lever bar 130 whose upper end is keyed to a transversely extending rotatable shaft 132. A shaft 134 extends crosswise of the frame and is journaled thereto at its ends to which is keyed a gear 136 which meshes with a gear 138 on the conveyor shaft 46. The shaft 134 mounts a cam holder 140 to which is secured a cam 142 that is provided with slots 144 and screws or bolts 146 therethrough by which the same may be adjusted. The spring 94 acts through the linkage to urge the cam follower 148 on the lever bar 130 against the cam. It will thus be seen that the rotation of the shaft 134 at a predetermined rate, such as 1 r.p.m., and the adjustment of the cam will act to intermittently shift the gate actuating bar 88 against action of the spring 94 to thereby open and close the gates 70 in accordance with the number of bottles desired in each group for packing in an empty case at the packing station. The intermittent action of the gate opening and closing is synchronized with the mechanism to push the grouped bottles onto the bottle dropping member as will appear hereinafter.

Extending transversely of the frame in advance of the gate mechanism four shafts are provided which are journaled for rotation at their ends, two of which 150 and 152 are located at the top of the frame and the other two of which 154 and 156 are located directly above the extensions 80 on the partitions 64. The shaft 154 which is forwardmost is located at the bottle dropping location. Each shaft has keyed thereto adjacent its ends sprockets 158 over which are trained chains 160 thus providing a pair of transversely spaced vertically extending endless chains. Spanning the frame and appropriately secured at their ends to the chains are three flight bars in the form of rubber rollers 162 spaced apart a predetermined distance for a reason soon to appear. The shaft 154 also has keyed thereto a further sprocket 164 over which is trained a belt or chain 166 which, in turn, engages a sprocket or pulley 168 on a shaft 170 which is rotatably journaled at its ends and extends crosswise of the frame beneath the bottle conveyor. The shaft 170 also carries a gear 172 which meshes with a gear 174 on the shaft 46. Thus shaft 46 drives the flight bars 162 which move at a rate slower than the bottle conveyor by virtue of the ratio of the diameters of gear 172 to gear 174. The speed of travel of the flight bars relative to that of the bottle conveyor and the opening and closing of the gates is such that as the gates open, one of the flight bars 162 has appeared just in front of the gates in the space 66 and is ready to move forwardly towards the bottle dropping station above the bottle conveyor and beneath the forward partitions. The bottle conveyor pushes the bottles behind said flight bar which restrains its forward motion as it travels until the gates close again, the cam 142 being arranged to predetermine the groups of bottles desired to conform to the case compartments, such as 4 groups of 3, 4 groups of 4,

etc. When the gates close again, a second flight bar 162 has appeared behind the accumulated bottles and serves to positively push them forward towards the bottle dropping station while it at the same time meters or restrains the following group of bottles.

Coming now to the bottle dropping station, the same includes a fixed member with through holes for the bottles to pass through and a movable means to cover and uncover the holes synchronous with the up and down movement of a case table therebeneath. The fixed unit includes an auxiliary frame 176 which is secured by any suitable means to the front of the main frame and includes dividers 178 in alignment with dividers 64 but shorter in height. The frame 176 is secured upon the upper horizontal flanges 180 of side angle members 182 as at 184, the vertical legs 186 of said side angle members mounting a pair of spaced upper rollers 188 which extend through said legs 186 and are horizontally rotatable and a further pair of spaced rollers 190 on the inside thereof which are vertically rotatable. The members 182 are, in turn, secured as at 192 to the side plates 194 of a lower member whose upper edges include notches 196 to receive the inner vertical rollers 190. Secured by a suitable means to the plates 194 are crossed partitions 198 dividing the same into individual bottle compartments 200 or through holes. Secured to the partitions and in some cases to the plates 194 and depending therefrom are resilient fingers 202, preferably made of nylon, which guide the bottles through the holes and narrow their diameter somewhat.

The shiftable means to cover and uncover the holes comprises a grid member 204 consisting of side angle members 206 which secure partitions 208 between them spaced apart conformably with the spacing of the partitions 198 of the fixed member. Also, there is secured between each pair of partitions and in alignment with the cross partitions 198 inwardly dished divider blocks 210. The bottom flanges of the side angle members 206 rest slidably on the inner vertical rollers 190 while the horizontal rollers 188 press against the side flanges of said members. One of the side members 206 includes a lateral pin 212 which mounts one end of a spring 214, the other hook end of which engages a pin 216 which extends laterally inwardly of one of the members 182, the bias of the spring being such as to urge the grid to a closure position where the partitions 208 thereof cross the openings or holes 200 of the fixed member.

A means is provided to intermittently shift said grid member against the spring bias to an open position. This includes a cam holder 216 keyed to the shaft 134 to which is adjustable secured a cam 218 of the same type as cam 142. A link 220 mounts a cam follower 222 at one of its ends and is pivoted at its corner as at 224 to a frame member, the other arm 226 of which has a split or yoked end 228 which passes through a suitable opening 230 in a frame side member to one side of the bottle dropping station. A vertical rod 232 is pivoted at its lower end to the yoked end 228 of the link 220 and at its upper end is pivoted via a bolt 234 and slot 236 to an ear 238 that extends laterally from a rod 240 which is journaled for rotation as at 242 to an angle member 244 which extends from the frame along one side of the bottle dropping member. Fixed on the rod are pairs of ears 246 each of which receives between it a block 248 having lateral lugs 250 which are pivoted in the ears 246, each block threadedly receiving a rod 252. Each rod 252 carries a V-block 254 at its end which bears against an extension 256 on the grid.

The operation is such that the spring 214 urges the grid 204 to a closed position where the partitions 208 thereof cross the bottle openings 200. The spring also acts to urge the cam follower 222 against the cam 216 and when the follower rides on the cam surface the rods 252 and blocks 254 push the grid against action of the spring to an open or bottle dropping position, inter-

mittently, the same being timed with the rise and fall of the case table as will appear hereinafter.

The case conveyor 16 comprises an elongated ramp member 258 consisting of side channel members 260 including stiffeners or cross members 262 which mount an elongated case supporting plate 264. A box-like case receiver 266 is provided which consists of side members 268 carrying spaced transversely extending dead plates 270 and 272. The member 266 is pivoted at its forward end as at 274 to the ramp 258 for vertical movement, the member 266 being provided with means to allow horizontal movement such as rollers 276 engaging tracks 278.

The case-lift table includes side channel members 280 which are held together by cross members 282. A shaft 284 extends rotatably through the side members 280 and pivotally mounts the side members 260 of the ramp for relative vertical movement. Keyed to this shaft are sprockets 286 over which are trained chains 288 which extend the full length of the ramp on both sides thereof. Attached to the chains and spanning the ramp are three spaced flight bars 290, the spacing of the flight bars are such that one is pushing a case off the ramp and onto the table whenever the latter is in its bottom-most position ready to rise.

The pivoting of the member 266 to the ramp is accomplished by providing a shaft 274 which carries sprockets 292 over which the chains 288 are also trained. A further shaft 294 is provided just beneath the end of plate 270 which carries sprockets 296 over which are trained short chains 298, the other end of the chain being trained over sprockets on the first shaft 274. An idler shaft 300 is provided at the rear of member 266 which carries two sprockets 302 over which is trained a pair of chains 304; the other end of the chains being trained over sprockets on shaft 294. The chains 304 mount a flight bar 306 which travels only around the rear dead plate 272 so that when a case is fed to the dead plate 272 it is pushed off by the flight bar onto the first plate 270 and the next case pushes the first case onto the plate 264 of the ramp where it is pushed along the ramp by one of the flight bars 290 until it reaches the table.

Pivoted for vertical movement as at 308 to the other end of the side plates 280 is a further ramp member 310 to receive filled cases. This ramp may consist of spaced rollers 312 and a means such as a roller 314 is provided at the non-pivoted end to allow for horizontal movement thereof.

The flight bars 290 and consequently 306 are driven by the chains 288, 298 and 304. Chains 288 are driven by continuing shaft 284 inwardly of the main frame and coupling by a universal joint 316 to a telescoped member comprising an outer sleeve 318 having slots 320 through which extend lateral pintles 322 carried at the end of a rod 324 which is slidable in the sleeve. The rod 324 is further pivoted by a universal joint 326 to a short rod 328 which carries a bevel gear 330 that meshes with a further bevel gear 332 which is keyed on the output shaft 38.

The empty case supporting surface consists of a metal plate 334 which is cushioned by foam rubber and mounted on cross members (not shown) which are secured between the side plates 280.

The side plates 280 and case supporting plate 334 is mounted as a unit freely upon a carriage member 336, see FIGURE 5, which consists of a pair of forks 338 secured to a vertically extending rectangular frame member 340 whose vertical sides 342 are channels which mount in them towards the top and bottom thereof guide rollers 344. A Teflon liner 346 is interposed between the cross members 282 and the forks 338. A pair of blocks 348 are secured to the members 282 as at 350 and underlie the horizontal flange of the fork members 338 to prevent the table from falling off the carriage.

Secured by appropriate means as by bolts 352, see FIGURE 2, to the rear of the cross members 282 of the

case-lift table are lugs 354 which extend through cut-outs 356 in the channel side members 342 of the carriage, the lugs each rotatably mounting a pair of rollers 358 which straddle the vertical flange 360 of the forward frame legs 22. At the same time the rollers 344 on the carriage engage the vertical edges of the flanges 360.

The upper and lower cross members 362 and 364 which hold the channel members 342 together are angle members behind which are placed a pair of shafts 366 and 368 that are fixed at their ends in the channel members 342 as at 370. Pivoted on the upper and lower shafts by appropriate T connections are pairs of rearwardly extending pipe sections 372 and 374 whose other ends are pivoted as at 376 and 378 to the rear frame legs 22.

The shafts 374 each mount a T coupling 380 through which extends a shaft 382. Pivoted on the ends of shaft 382 are crank arms 384 which are, in turn, pivoted at their upper ends as at 386 to short cranks 388 which are keyed to the shaft 134 adjacent its ends. A spring 390 is provided which is terminally secured to a lug 392 on the carriage 336 and to an angle iron 394 which is carried crosswise at the top of the front frame legs 22. The spring biases the carriage and case table upwardly towards the bottle dropping member.

In operation, as the shaft 134 rotates, the cranks 388 and 384 cause the carriage to rise and fall. In so doing the carriage moves in an arc but the table 280, 282, 284 moves in a straight vertical path due to the fact that the rollers 358 thereof track the vertical flange 360 of the forward frame legs 22. The cam 218 can be so set on the shaft 134 which also operates the cranks for the case-lift that the grid can be made to open and drop bottles at any desired point relative to the position of the case-lift. The preferred setting is one in which the grid opens just after the guide fingers 202 have entered the compartments of the empty case and the case has just begun its downward travel to absorb the shock of the bottles dropping into the case. To insure proper location of the empty case vertically beneath the grid, a bar 396 is pivoted at one of its ends to the side frame 280 and urged by a spring 398 against the case pushing it towards the front end of the frame beneath the grid.

An electrical control circuit is provided, as shown in FIGURE 12, to ensure that there are always bottles when a case is to be filled and vice versa and that fallen bottles and bottles jammed in the grid will not interfere with the operation of the machine. The motor 24 is actuated by start and stop switches 400 and 402, the lines from which join a transformer 404 whose secondary winding is connected to a rectifier 406. The conductive wires 408 and 410 from the rectifier lead to the clutch brake 32. Additionally, a circuit with various switches is provided which is operatively connected to the clutch brake. To cause engagement or disengagement of the clutch brake manual start and stop switches 412 and 414 are interposed in the circuit.

A switch 416, normally closed, is provided in front of the grid and is actuated to open when a bottle has fallen from its erect position being urged against the switch by the flight bar 162 which is functioning to push the bottles onto the grid. This switch is connected in series to a switch 418, normally closed, that is actuated to open by a cam on shaft 134. Switch 416 is in series with but cam switch 418 is in parallel with two further switches 420 and 422. Switch 420 is a grid control switch which is located on a frame member next to the grid and is normally open. Switch 420 is actuated to close when the grid is completely closed and therefore nothing has obstructed its movement towards closure. If there is an obstruction, the switch 420 remains open.

Switch 422 is located on the side of the ramp 260 of the case conveyor adjacent the case-lift table and is normally open. It is actuated to close when a case contacts the switch. The circuit carrying switches 416, 418, 420 and 422 include a relay 424 which is normally open and

connected in series with two further switches 426 and 428. Switch 426 is normally open and is located on the infeed side of the case conveyor member 266. It is closed as long as a case contacts it as it is being fed onto the plate 372. Switch 428 is a lever operated, normally closed switch which remains closed as long as the lanes between partitions 64 remain full up to a predetermined point where the switch is located. When one or more of the lanes empty, the switch opens.

When the machine is running normally, the fallen bottle switch 416 remains closed as does the cam switch 418 for a portion of its cycle on shaft 134 allowing current to go through and keep relay 424 closed. Since switch 426 is being kept closed by the infeed of cases and switch 428 also remains closed because of bottles in the lanes, the circuit to clutch brake 32 is complete and operative. During the period of its cycle when cam switch 418 opens, the parallel circuit including switches 420 and 422 must be closed and this is the case as long as the grid is unobstructed and a case is contacting switch 422. The push button switch 430 is interposed as a jog switch to by-pass the circuit containing switches 416, 418, 420, 422, relay 424 and switches 426 and 428. Switch 430 would be used to empty out the machine or run the same manually when desired to make adjustments.

The circuit of FIGURE 12 may be traced from the positive terminal of the rectifier 406 through the normally open start switch 412, the normally closed stop switch 414, normally closed grid switch 416, the normally open switches 420 and 422 to one terminal of the relay coil 424, the other terminal of which is connected to the negative side of the rectifier 406. The switch 418 is connected across the switches 420 and 422. One switch 425 actuated by the relay 424 is normally open and connected as a latching switch across the start switch 412. A second normally open relay switch 427 is connected from the junction of relay 424 and switch 422 to switches 426 and 428 in series with the control of the clutch 32, the other terminal of which is returned to the negative rectifier terminal. A normally open switch 430 is connected from the positive terminal of rectifier 406 to the junction of switch 428 and the control of clutch brake 32.

In operation, the momentary closing of start switch 412 completes the circuit to energize relay 424 (when 416 is closed and either 418 is closed or both 420 and 422 are closed). When the relay 424 is energized latching switch 425 is closed across the start switch; thereby when either switch 416 is open or switches 420 or 422 are open (at the same time that switch 418 is open) the relay is deenergized and latching switch 425 is open requiring the operator to manually restart by means of the start button 412. When relay 424 is energized relay switch 427 is closed to actuate the clutch 32 via closed switches 426 and 428. If either switch 426 and 428 is open, the circuit for the clutch control is likewise open; however, the relay is not deenergized, so that the clutch is again actuated upon closing of that switch 426 or 428. When the relay 424 is deenergized by the opening of switches 416, 420 or 422, switch 427 also opens to open the circuit to the clutch brake 32. Thus, a circuit is provided which has a manual start button that is effective to disengage the clutch brake and to require operator's attention to reengage the clutch brake in those circumstances where a bottle has fallen on the grid or the grid is obstructed in its closing stroke or a case is not in position on the case conveyor adjacent the lift table, the circuit also being effective to disengage the clutch momentarily if bottles are not supplied beyond a predetermined position on the bottle conveyor or if cases are not supplied infeed to the case conveyor and automatically to reengage the clutch brake when the bottles and the cases are both so supplied.

While a preferred embodiment of the invention has been shown and described herein, it will be understood that a skilled artisan may make minor variations in the combination and arrangement of parts without departing from

the spirit of the invention and the scope of the appended claims.

I claim:

1. In a bottle packing machine, an elongated frame, a bottle conveyor mounted thereon for movement longitudinally thereof, longitudinally extending vertical dividers spaced above said conveyor providing single lanes for the bottles, a bottle dropping station at one end of said frame, said dividers being discontinued at a predetermined location providing a space separating the same into a forward section of dividers leading to said bottle dropping station and a rear section, means for intermittently opening and closing said lanes at said space, and longitudinally spaced flight bars spanning said conveyor and means to move said flight bars continuously around said forward section of dividers and above said conveyor at a rate slower than that of said conveyor.

2. A bottle packing machine comprising an elongated frame, a bottle conveyor mounted thereon for movement longitudinally thereof, longitudinally extending vertical dividers spaced above said conveyor providing single lanes for the bottles, a bottle dropping station at one end of said frame, said dividers being discontinued at a predetermined location providing a space separating the same into a forward section of dividers leading to said bottle dropping station and a rear section, means for intermittently opening and closing said lanes at said space, longitudinally spaced flight bars mounted on said frame above and spanning said conveyor, and means to move said flight bars around said forward section of said dividers at a rate slower than that of said conveyor, the spacing of said flight bars, their rate of movement and that of the lane opening and closing means being so correlated that when said opening and closing means has opened one of said flight bars is directly in front of said lane opening and closing means and in position to enter the space beneath said forward section of dividers and said opening and closing means closes after accumulation of a predetermined number of bottles and a second flight bar is in position to enter the space beneath said forward section of dividers behind said accumulated bottles and sweep them onto said bottle dropping station as said second flight bar moves in said space beneath said forward section of dividers.

3. The combination of claim 2 wherein said bottle dropping station includes a fixed member provided with through holes, a grid mounted on said fixed member to receive the bottles, and means to shift said grid from a position covering said holes to a position uncovering the same, said second flight bar sweeping the bottles onto the grid when the latter covers said holes.

4. The combination of claim 3, an empty case-carrying table and means mounting said table on said frame for vertical movement to and from said fixed member of said bottle dropping station in timed relation with the shifting of said grid to cover and uncover the holes of said fixed member.

5. The combination of claim 2, an empty case-carrying table and means mounting said table on said frame for vertical movement to and from said bottle dropping station.

6. The combination of claim 5 and an empty case-conveyor pivoted for vertical movement at one of its ends to said table and including means providing horizontal movement to its other end.

7. The combination of claim 6 and a filled-case receiving ramp pivoted for vertical movement at one of its ends to said table and including means providing horizontal movement to the other end of said ramp.

8. The combination of claim 4 wherein said frame includes vertical beams beneath said bottle dropping station, a table support, means mounting said table support on said beams providing both vertical movement as well as movement in an arc, means mounting said table on said support for sliding movement of said table relative to said support, and guide means mounting said table on said

beams providing only vertical movement of said table towards and away from said bottle dropping member.

9. The combination of claim 8 wherein said beams include vertically extending flanges and said table support mounting means includes vertical channels loosely receiving said flanges and rollers carried by said channels and contacting the edges of said flanges.

10. In a bottle packing machine, an elongated frame, a bottle conveyor mounted thereon for movement longitudinally thereof, longitudinally extending vertical dividers spaced above said conveyor providing single lanes for the bottles, a bottle dropping station at one end of said frame, said dividers being discontinued at a predetermined location providing a space separating the same into a forward section of dividers leading to said bottle dropping station and a rear section, means for intermittently opening and closing said lanes at said space, longitudinally spaced flight bars spanning said conveyor, means to move said flight bars continuously around said forward section of dividers and above said conveyor at a rate slower than that of said conveyor, a motor, a clutch connected between said motor and conveyor, an empty case conveyor, operatively connected to said clutch and including a table vertically movable to and from said bottle dropping station, a circuit to said clutch engaged when there are bottles in said lanes at a predetermined location and which is actuated to disengage said clutch when there are no bottles in said lanes beyond said predetermined location, and a second switch in said circuit adjacent said table next to said case conveyor, said second switch being actuated to cause engagement of said clutch only when an empty case is in position to operatively contact said second switch.

11. The combination of claim 10 and a third switch at the infeed side of said case conveyor in series with said second switch, said third switch being actuated to cause clutch engagement only when an empty case at said infeed side is in position to operatively contact said third switch.

12. In a bottle packing machine, an elongated frame, a bottle conveyor mounted thereon for movement longitudinally thereof, longitudinally extending vertical dividers spaced above said conveyor providing single lanes for the bottles, a bottle dropping station at one end of said frame, said dividers being discontinued at a predetermined location providing a space separating the same into a forward section of dividers leading to said bottle dropping station and a rear section, means for intermittently opening and closing said lanes at said space, longitudinally spaced flight bars spanning said conveyor, means to move said flight bars continuously around said forward section of dividers and above said conveyor at a rate slower than that of said conveyor, a motor, a clutch connected between said motor and conveyor, an empty case conveyor operatively connected to said clutch and including a table vertically movable to and from said bottle dropping station, said bottle dropping member including a fixed member with through holes for the bottles, a grid slidably mounted on said fixed member normally adapted to cover said holes and receive bottles delivered thereto from said bottle conveyor, means operatively connected to said clutch to shift said grid from a position covering said holes to a position uncovering the same and a circuit to said clutch including a switch which is normally actuated to cause clutch engagement, said switch being actuated by a fallen bottle on said grid to cause clutch disengagement.

13. In a bottle packing machine, an elongated frame, a bottle conveyor mounted thereon for movement longitudinally thereof, longitudinally extending vertical dividers spaced above said conveyor providing single lanes for the bottles, a bottle dropping station at one end of said frame, said dividers being discontinued at a predetermined location providing a space separating the same into a forward section of dividers leading to said bottle dropping station and a rear section, means for intermittently open-

ing and closing said lanes at said space, longitudinally spaced flight bars spanning said conveyor, means to move said flight bars continuously around said forward section of dividers and above said conveyor at a rate slower than that of said conveyor, a motor, a clutch connected between said motor and conveyor, an empty case conveyor operatively connected to said clutch and including a table vertically movable to and from said bottle dropping station, said bottle dropping member including a fixed member with through holes for the bottles, a grid slidably mounted on said fixed member normally adapted to cover said holes and receive bottles delivered thereto from said bottle conveyor, means operatively connected to said clutch to shift said grid from a position covering said holes to a position uncovering the same, and a circuit effective only during the time when said grid is normally closed to detect if said holes are uncovered by said grid and disengage said clutch.

14. In a bottle packing machine, an elongated frame, a bottle conveyor mounted thereon for movement longitudinally thereof, longitudinally extending vertical dividers spaced above said conveyor providing single lanes for the bottles, a bottle dropping station at one end of said frame, said dividers being discontinued at a predetermined location providing a space separating the same into a forward section of dividers leading to said bottle dropping station and a rear section, means for intermittently opening and closing said lanes at said space, longitudinally spaced flight bars spanning said conveyor, means to move said flight bars continuously around said forward section of dividers and above said conveyor at a rate slower than that of said conveyor, a motor, a clutch connected between said motor and conveyor, an empty case conveyor operatively connected to said clutch and including a table vertically movable to and from said bottle dropping station, said bottle dropping member including a fixed member with through holes for the bottles, a grid slidably mounted on said fixed member normally adapted to cover said holes and receive bottles delivered thereto from said bottle conveyor, means operatively connected to said clutch to shift said grid from a position covering said holes to a position uncovering the same, and a circuit effective only during the time when a case is normally on said case conveyor adjacent said table to detect if said case is not in position and disengage said clutch.

15. In a bottle packing machine, an elongated frame, a bottle conveyor mounted thereon for movement longitudinally thereof, longitudinally extending vertical dividers spaced above said conveyor providing single lanes for the bottles, a bottle dropping station at one end of said frame, said dividers being discontinued at a predetermined location providing a space separating the same into a forward section of dividers leading to said bottle dropping station and a rear section, means for intermittently opening and closing said lanes at said space, longitudinally spaced flight bars spanning said conveyor, means to move said flight bars continuously around said forward section of dividers and above said conveyor at a rate slower than that of said conveyor, a motor, a clutch connected between said motor and conveyor, an empty case conveyor operatively connected to said clutch and including a table vertically movable to and from said bottle dropping station, said bottle dropping member including a fixed member with through holes for the bottles, a grid slidably mounted on said fixed member normally adapted to cover said holes and receive bottles delivered thereto from said bottle conveyor, means operatively connected to said clutch to shift said grid from a position uncovering the same, and a circuit effective only during the time when said grid is normally closed and when a case is normally on said conveyor adjacent said table to detect if said holes are uncovered by said grid and said case is not in position and disengage said clutch.

16. In a bottle packing machine, an elongated frame, a bottle conveyor mounted thereon for movement longi-

11

itudinally thereof, longitudinally extending vertical dividers spaced above said conveyor providing single lanes for the bottles, a bottle dropping station at one end of said frame, said dividers being discontinued at a predetermined location providing a space separating the same into a forward section of dividers leading to said bottle dropping station and a rear section, means for intermittently opening and closing said lanes at said space, longitudinally spaced flight bars spanning said conveyor, means to move said flight bars continuously around said forward section of dividers and above said conveyor at a rate slower than that of said conveyor, a motor, a clutch connected between said motor and conveyor, an empty case conveyor operatively connected to said clutch and including a table vertically movable to and from said bottle dropping station, said bottle dropping member including a fixed member with through holes for the bottles, a grid slidably mounted on said fixed member normally adapted to cover said holes and receive bottles delivered thereto from said bottle conveyor, means operatively connected to said clutch to shift said grid from a position covering said holes to a position uncovering the same, and a circuit having a manual start button effective to

12

disengage said clutch and to require operator attention to reengage said clutch if a bottle has fallen on said grid or if the grid is obstructed in its closing stroke or if a case is not in a position on said case conveyor adjacent said table, said circuit also being effective to disengage said clutch momentarily if bottles are not supplied beyond a predetermined position on said bottle conveyor or cases are not supplied at infeed to said case conveyor and automatically to reengage said clutch when said bottles and cases are both so supplied.

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