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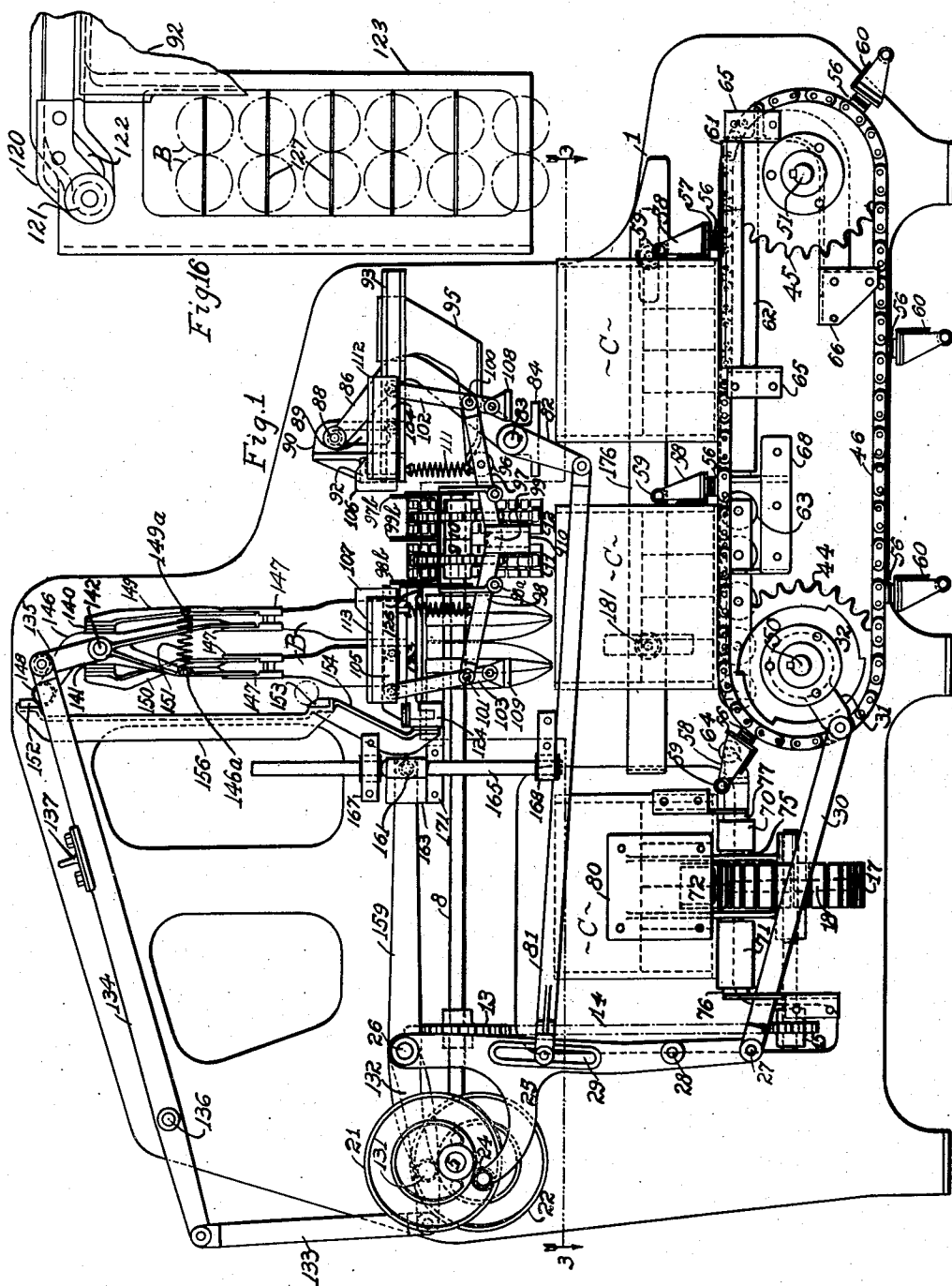
J. CATTONAR ET AL

2,277,688

PACKAGING MACHINE

Filed July 8, 1938

7 Sheets-Sheet 1



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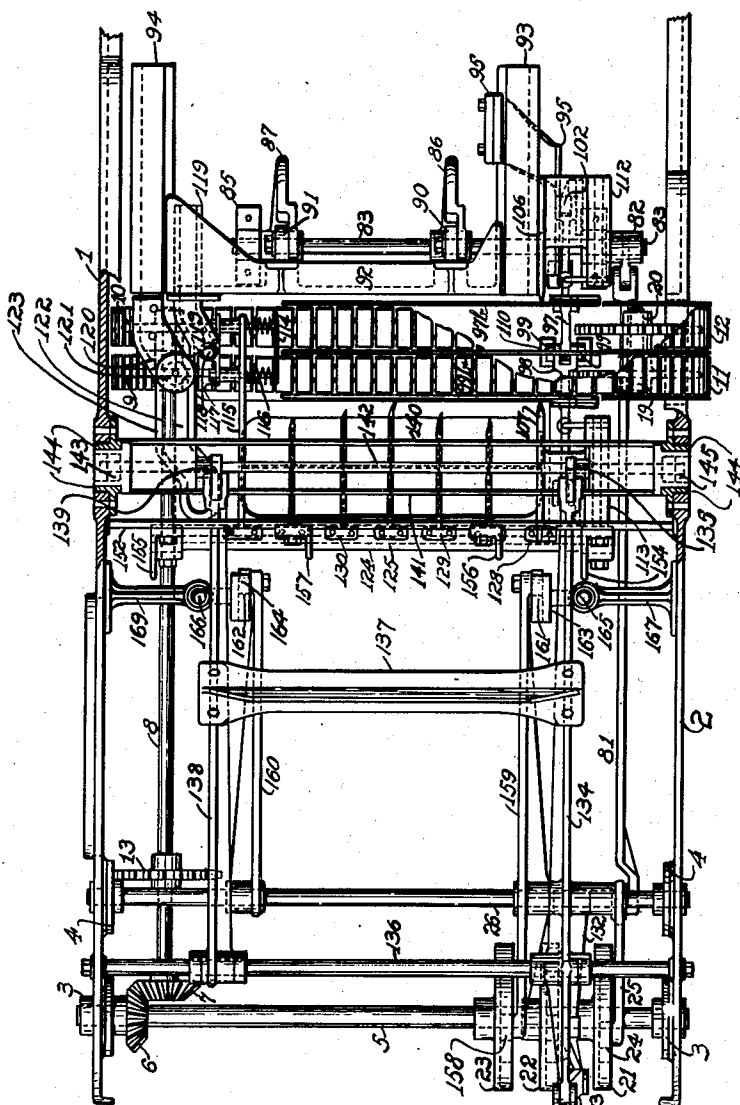


Fig. 2

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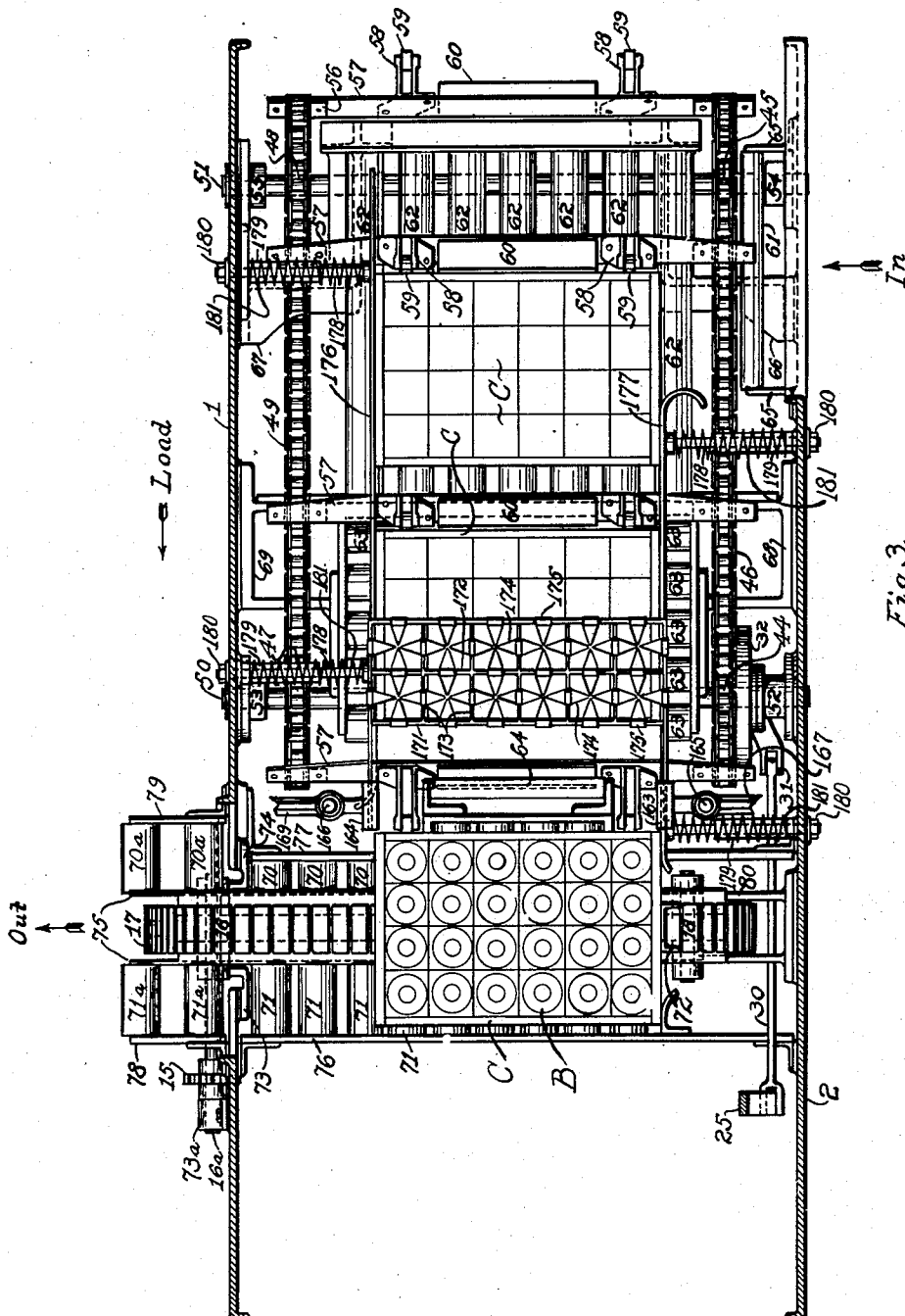
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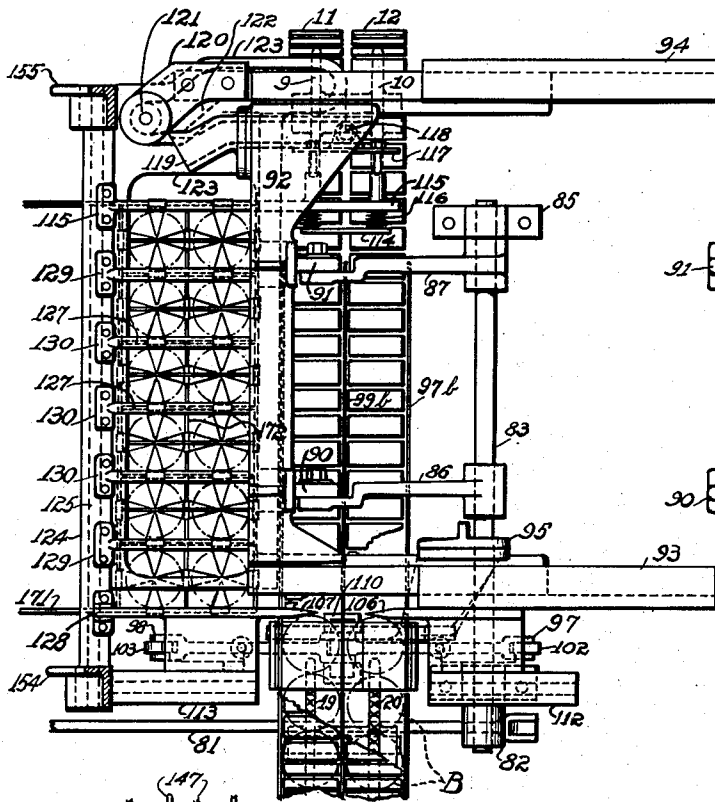


Fig. 4.

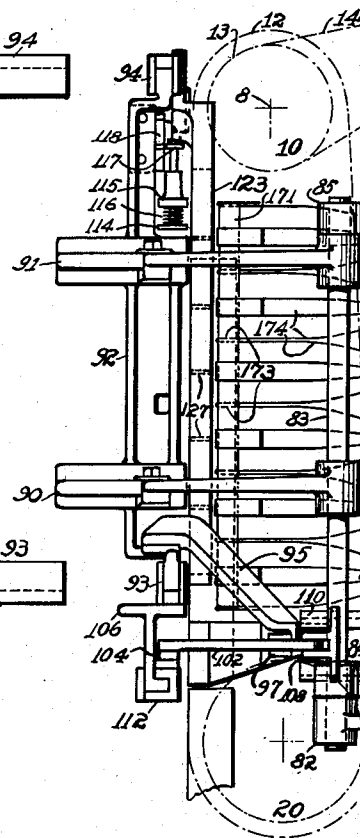


Fig. 5.

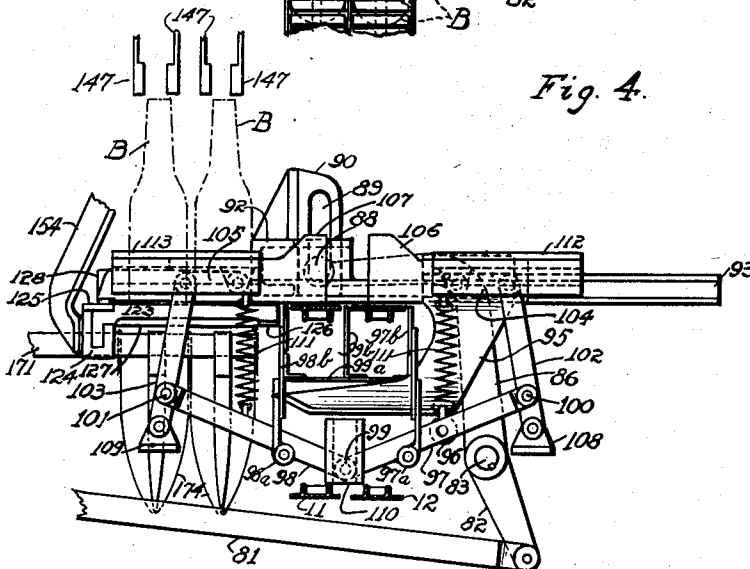


Fig. 6.

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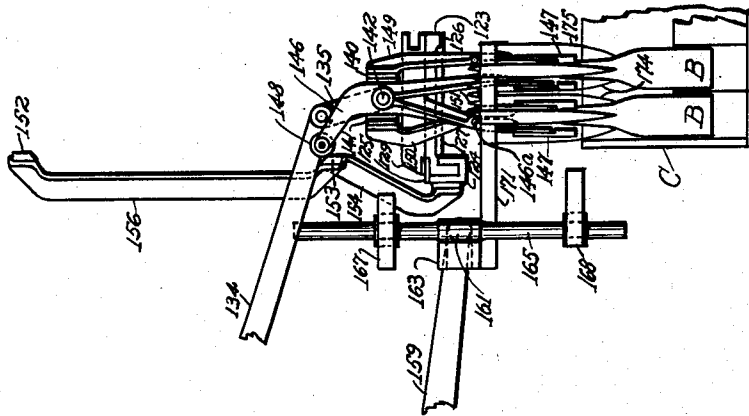


Fig. 7.

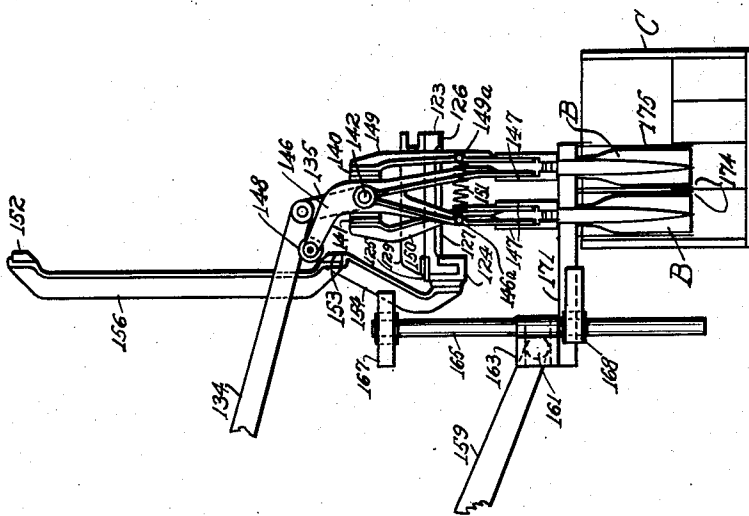


Fig. 8.

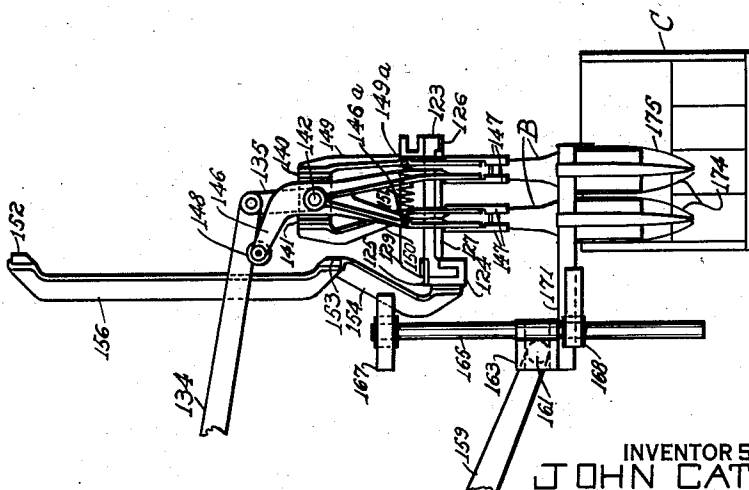


Fig. 9.

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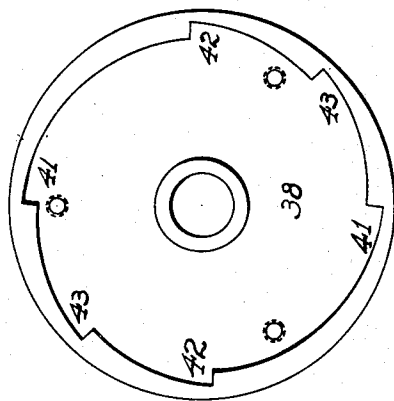


Fig. 12.

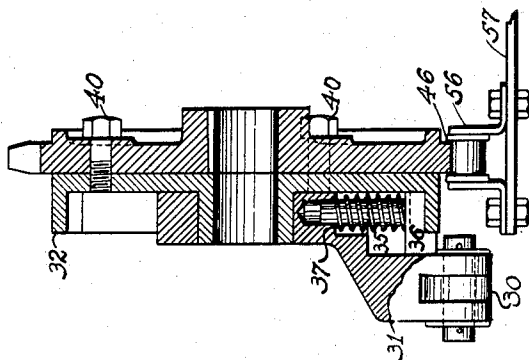


Fig. 11.

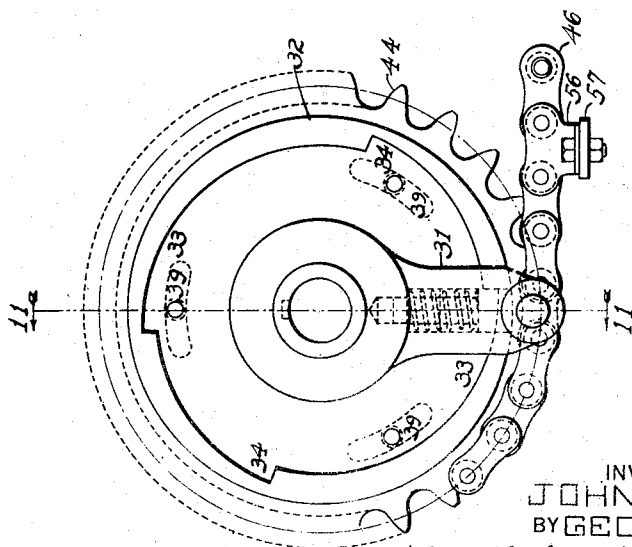


Fig. 10.

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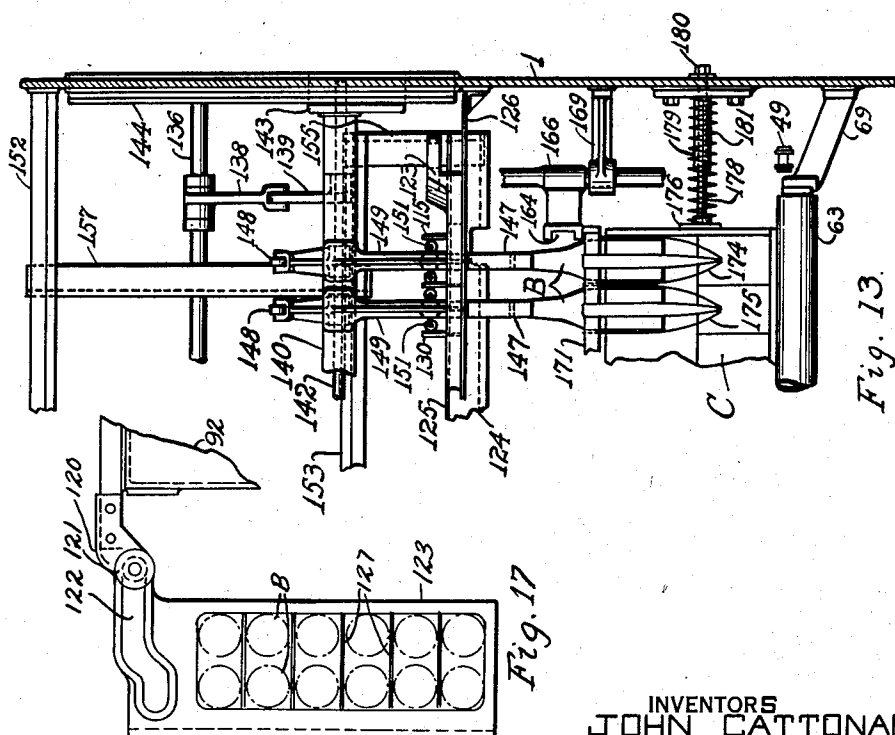
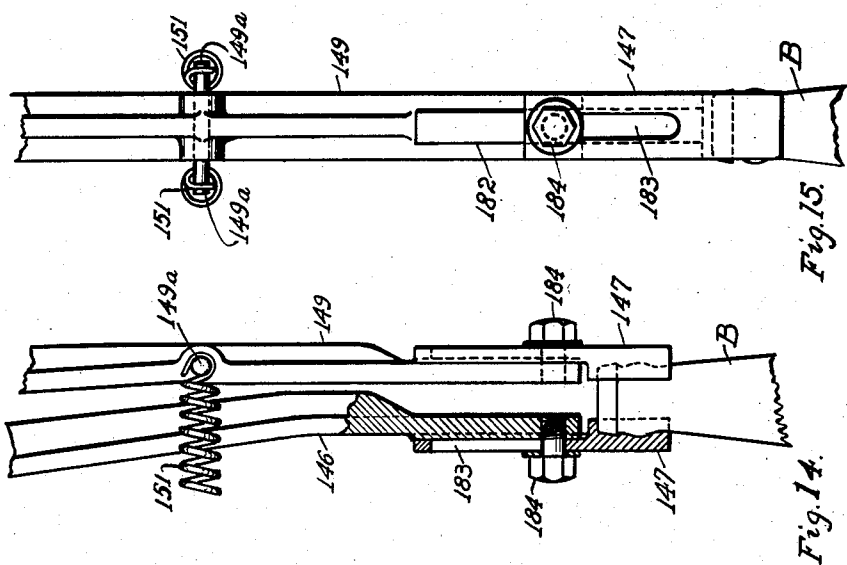
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7 Sheets-Sheet 7



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UNITED STATES PATENT OFFICE

2,277,688

PACKAGING MACHINE

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New York, N. Y., a corporation of New York

Application July 8, 1938, Serial No. 218,214

31 Claims. (Cl. 226—14)

The invention relates to the art of packaging and it particularly relates to machines for placing bottles and other containers in boxes and cases.

The invention has for its principal object to provide a new and improved packaging machine comprising a number of mechanical devices designed to handle different sizes and shapes of bottles and other containers of liquid or semi-liquid substances with no more disturbance to their contents than that given to them by the simple conveying mechanisms used in all bottling plants.

The invention further has for its object to provide means whereby beers and carbonated beverages may be packaged without shocks and falls, lest the contents be disturbed; the same for sparkling wines, while for "still" wines and other "still" beverages the same conditions may be observed at least in part.

Further, it is an object to provide a machine whereby containers of milk and cream may be boxed without dropping them into their cases so that all danger of the contents of the bottles being forced up to unseal the bottles (thus rendering the "sanitary sealing" useless) will be eliminated.

Again, it is an object to provide a bottle, etc., packaging machine by the use of which the labels, stamps and other printed matter on them will not be scratched, defaced, or otherwise damaged by springs or guides pressing too hard on them in order to break the violence of their free fall into the cases.

Boxes and cases which are to be used over and over again for local distribution (as in the case of those for beer, sodas, milk, etc.) are generally made of wood, while those for shipment out of the "home town" and which are not to be used over again are usually constructed of corrugated cardboard; it is therefore a further object of the invention to provide a packaging machine which will so operate that the delivery and shipping cases into which the bottles etc. are packed will not be damaged by the packaging operations.

Another object of the invention is to provide a system of case feeding which does not require any turning around of the cases; consequently no extra effort need be spent in replacing properly the filled cases on the case conveyor in order to make them continue their travel through the plant in the same direction when they leave the machine as they were traveling when they entered the machine.

Again, it is an object to provide a machine

which can be built in any size desired, whereby any size cases (containing one to twelve tiers or rows of bottle spaces with, for instance, one to twenty-four bottle spaces per tier) can be fed to and past the filling station and filled one or more rows or tiers at a time.

Further, the invention has for its object to provide an improved bottle-placing mechanism which by simply adjusting the parts can be used for receiving bottles of different sizes and placing them into cases of corresponding sizes.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends the invention still further resides in the novel details of construction, combination and arrangements of parts, all of which will be first fully described in the following detailed description, and then be particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Fig. 1 is a side elevation of the machine with the side wall at the infeed side removed.

Fig. 2 is a top plan view illustrating those parts which are located above the line 3—3 in Fig. 1.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged detail plan and partial sectional view of parts of the machine showing their relative positions after twelve bottles are slid over to the trap floor; the floor is shown shifted over to the right with the floor strips in position to support the bottles; the stopper is drawn back, the bottle feeder shut off, the longitudinal guiding strips are down out of the way and the jaws of the grippers are located just above the tops of the bottles.

Fig. 5 is a view looking at Fig. 4, from right to left in that figure, Fig. 5 being set on end for convenience of comparison with Fig. 4.

Fig. 6 is an elevation looking from bottom to top in Fig. 4.

Fig. 7 is a detail elevational view of the loading mechanism, showing the relative positions of the parts thereof with the lower ends of the springs at their lowest position inside of the pockets which the bottles are intended to occupy.

Fig. 8 is a view similar to Fig. 7 but with the bottles entering the pockets and spreading the spring-baskets open, thereby squaring the partitions which form the said pockets.

Fig. 9 is a view similar to Figs. 7 and 8, showing the same mechanism with the parts in the relative positions they assume when the bottles

are about to be freed to drop the short distance to the bottom of the case; the lower ends of the springs having reached the necks of the bottles where their pressure on the bottles will be the minimum.

Fig. 10 is a detail elevation showing the arrangement of the stroke distributor for the case feeder which is fastened to the sprocket that carries the chain of the feeder, and a portion of the chain itself with the cross bar that carries the case pusher.

Fig. 11 is a section on the line 11-11 of Fig. 10.

Fig. 12 is a side elevation of another distributor disc of modified construction designed to impart six strokes—four short and two long—during the loading of two cases of three tiers with four large bottles each, or twelve bottles per case.

Fig. 13 is a detail view of the mechanism shown in Fig. 7, looking from right to left in Fig. 7.

Fig. 14 is an enlarged detail view of a portion of a gripper, partly in elevation and partly in section.

Fig. 15 is an elevation of the parts shown in Fig. 14, looking from right to left in Fig. 14, and also showing the gripper jaw 147 lowered to reach a shorter or lower bottle.

Fig. 16 is a detail view showing the trap floor with a portion of the slider, the parts being in the position at the forward stroke of the slider, the bottles being indicated as resting on the strips 127.

Fig. 17 is a view similar to Fig. 16 with the slider at the limit of its return stroke and indicating how the bottles are dropped between the strips 127.

Referring now in detail to the accompanying drawings, in which like numerals and letters of reference indicate like parts in all figures, 1 and 2 represent respectively the back and front frames or wall-plates of the machine (calling the plate 2 on the infeed side the front plate). These plates have suitable bearings 3 for the main or cam shaft 5, and bearings 4 for the rock-shaft 26.

The cam shaft 5 is made to rotate by the application of power thereto in any of the usual ways (not shown) as, for example, by being operatively connected to the bottling machine, or by direct motor-driven connections, as is common practice and, per se, is not part of the invention. The speed of rotation of shaft 5 must, however, be synchronized to that of the filled bottle delivery conveyor (not shown) of the bottling plant employing the present invention.

Bevel gears 6 and 7 transmit the motion of cam shaft 5 to shaft 8 which carries the driving sprockets 9 and 10 for the drive chains 11 and 12 of the bottle feeder. The shaft 8 also has a driving sprocket 13 around which, and a sprocket 15 on the driven shaft 16*, the transmission chain 14 passes (see Figs. 1 and 2).

The shaft 16* has a driving sprocket 16 around which, and around an idler sprocket 18, the chain 17 of the outfeed or discharge conveyor passes.

The bottle feeder chains 11 and 12 pass around sprockets 19 and 20 at the infeed or front side of the machine and extend across between the plates 1 and 2 (see Figs. 4 and 5). There are three cams on shaft 5, i. e., cams 21, 22 and 23.

The track of cam 21 engages the roller 24 of a three-armed lever 25 which is pivoted on shaft 26. The long-swinging arm of lever 25 has connecting points 27 and 28 and a slot 29 of which point 27 at the end of the lever 25 serves to connect rod 30 which, at its other end, connects

to lever 31 of distributor 32 (see Figs. 1, 10 and 11). The connecting rod 30 may be connected to point 28 when the distributor 38 (Fig. 12) is used.

The distributor 32 is designed to impart two long and two short strokes to the case-feeding or transferring cross-conveyor. As shown in Fig. 10 and Fig. 11, the distributor 32 is fastened to sprocket 44 and has four radial recesses of which two long ones 33, 33 and two short ones 34, 34 are alternated and diametrically opposite to each other. The lever 31 embraces the hub of distributor disc 32 and swings on it. The lever is built hollow and in the housing 35 so formed is a pawl 36 of which the stem carries a compression spring 37 which compels pawl 36 to remain in contact with the walls of the recesses 33 and 34. The swing of the lever 31 will be the same at very cycle of the machine, i. e., equal to the peripheral length of the large recess 33 so that in one stroke it will bring pawl 36 from the point shown in Fig. 10 to the equivalent point inside of recess 34 and with its return stroke it will impart to the case feeder a long stroke.

The lever 31 will next swing back from the engaging point of recess 34 to almost the middle of the next large recess 33 and with its return stroke pawl 36 will slide idly on the walls of recess 33 until it hits the engaging point of recess 33 and for the remaining part only of its return stroke will impart to the case-feeder the so-called "short stroke" which will be equal to the peripheral length of recess 34. To this point in two strokes one case will be filled and with a complete revolution of distributor 32 four strokes will have been imparted to the case-feeder and two cases with four tiers of six bottles each will have been filled, each case containing twenty-four bottles.

The same principle applies to the distributor disc 38 of Fig. 12 which has six recesses, of which two are long 41, 41, and four are short, 42, 42, 43, 43. In this case the long stroke is shorter than in distributor 32. Therefore when disc 38 is to be used, connecting rod 30 is attached at point 28 to lever 25 where a shorter basic stroke is available. With six strokes of lever 31 one complete revolution of disc 38 will have been made and two cases of three tiers of four bottles each will have been fed through the machine and filled, one tier of four bottles at a time, each case containing twelve bottles.

Sprocket 44 is keyed fast on shaft 50 and at the other end of the case feeder sprocket 45 is keyed fast to shaft 51. These sprockets 44 and 45 carry a chain 46. At the other side, sprocket 47 is keyed to shaft 50, and sprocket 48 is keyed to shaft 51. These sprockets carry a chain 49. The shaft 50 runs in bearings 52 and 53 in frames or wall-plates 2 and 1 respectively, and shaft 51 runs in bearings 54 and 55 in the plates 2 and 1 respectively.

Chains 46 and 49 carry standard attachments 56 to which are fastened cross bars 57 squarely connecting the two chains. On cross bars 57 are mounted the case pushers. They each consist of two side brackets 58 which, with rollers 59, serve to bring the case to the proper place on the discharger, and an angle 60 between the two brackets which serves to push the case all along through the loading lines.

Slots 39 in sprocket 44 are provided for adjusting purposes; by loosening bolts 40 the whole carrier (composed of sprockets 44, 45, 47 and 48, with their respective chains 46 and 49, end

shafts 50 and 51) can be moved a convenient distance forward or backward in order to bring to the loading lines shorter or longer cases without disconnecting or disturbing in any way the distributor and relative mechanism.

The cases entering the machine (infeed) ride on rollers 61 first and then over rollers 62 to a certain point where their infeed is arrested by a guide 176 which runs alongside of plate 1, and the box is thereby lined up properly with the grippers. From this point the cases are taken along by the case pushers on bars 57 and fed through the loading lines or station. While being loaded the cases ride on rollers 63 and when filled rollers 59 on the brackets 58 will push the cases over roller 64 onto the discharge or out-feed conveyor (discharger). Brackets 65, fastened on plate 2 support roller 61; brackets 66 and 68, fastened on plate 2 support rollers 62 and 63; and brackets 67 and 68, fastened on plate 1, support rollers 62 and 63 also. Roller 64 is supported by its own brackets fastened on the frame of the discharger.

Case pusher 72 on discharge chain 17 will ride the filled cases on two series of rollers 70 and 71 and discharge them from the machine.

Brackets 73 and 74, fastened on plate 1, support sprocket 16, and bracket 80, fastened on plate 2, supports sprocket 18 of the discharger. The discharger chain 17 has flat links which run on angles 75. These angles, together with bars 76 and 77, form the frame for the rollers 70 and 71, and of the whole discharger; and the whole is supported by the plates 1 and 2 of the machine.

To facilitate the discharge of the cases, an extension of the discharge conveyor is built outside the frame. Rollers 70^a and 71^a, framed in angles 75, and bars 78 and 79 constitute the extension which is supported by wall-plate 1. Bearing 73^a supports shaft 16^a of sprockets 15 and 16 at the far end.

In the slot 29 of the long arm of lever 25 is fastened one end of connecting rod 81 of which the other end connects with one end of lever 82. Lever 82 has its other end keyed fast on shaft 83. With this arrangement an oscillating motion is imparted to shaft 83 which works in bearings 84 and 85. Levers 86 and 87, also keyed fast to shaft 83, carry at their other ends rollers 88 which roll in slots 89 of bearings 90 and 91 fastened on bottle slider 92.

Slider 92 slides in its side guides 93 at the side of the plate 2 and 94 at the side of the plate 1. With this arrangement, oscillations of shaft 83 are translated into linear motion of slider 92 which will slide twelve bottles over to the trap floor. Slot 29 in lever 25 will permit adjustments of strokes for slider 92 in order to bring to the desired place on the trap floor, bottles of different diameters.

Fastened to the side of slider 92, at the near side of Figs. 1 and 6, is a shoe 95 which, when going forward with slider 92, will press down on roller 96 which is fastened at about the middle of lever 97. Lever 97 is connected to lever 98 at which connection point they carry rollers 99 and at their other ends they connect, lever 97 with point 100 of lever 102, and 98 with point 101 of lever 103. One end of lever 102 connects, through link 104, to shutter 106, while the other end is pivoted at 108. The corresponding end of lever 103 connects, through link 105, with shutter 107 opposite to shutter 106 on the feeder, and the other end of the lever is pivoted at 109.

The action of shutting off the bottle feed is

now quite evident. By the action of shoe 95, levers 97 and 98 are lowered at their common connection point, rollers 99 will roll down into guide 110. This motion will drag levers 102 and 103 toward the center of the feeder, and by means of links 104 and 105 and shutters 106 and 107 will shut off the bottle feeder. Tension springs 111 will return the mechanism to its former position when shoe 95 releases its pressure on roller 96 on the return stroke of slider 92.

A brace 97^a is hinged on lever 97, on which brace a longitudinal guiding strip 97^b is fastened (see Figs. 4 and 6).

A brace 98^a is hinged to lever 98 and a longitudinal guiding strip 98^b is secured to the brace 98^a.

On cross plate 99^a is fastened a longitudinal guiding strip 99^b that is located between and parallel to strips 97^b and 98^b.

It will readily be seen that when, by the action of shoe 95, levers 97 and 98 are lowered, hinged braces 97^a and 98^a will also be lowered and longitudinal braces or strips 97^b, 98^b and 99^b will be brought down sufficiently to be out of the way of oncoming bottles being slid, by slider 92, from the bottle infeed conveyors 11 and 12 into position beneath the bottle grippers.

The shutters 106 and 107 slide in guides 112 and 113.

At the far end of the bottle infeeders proper is a bottle infeed stopping device comprising a stopper 114 having two stems that slide in the hubs of bottle guide 115, between which and the stopper 114, on the stems are compression springs 116. At the opposite side of guide 115, the stems of stopper 114 are fast on a cross bracket 117 which carries a roller 118 that engages in the track of guide 119 fastened on slider 92. This mechanism is constructed to measure a length of six bottles—twelve in two lines—and when the slider 92 moves forward, track 119, engaging roller 118, will force stopper 114 backward not only preventing jamming of the bottles but also giving a convenient clearance between them to facilitate sliding them over to the trap floor.

To an extension of slider 92, at the end near guide 94, is bolted a bracket 120 which at its end carries a roller 121 that engages in slot 122 of trap floor 123. The trap floor 123 is a cast frame with a prominence for slot 122, one side sliding in guide 124 covered by a cover 125 and the other side being supported by a cross bar 126.

Across the sides and fastened on them the floor carries vertically disposed strips 127. As will be seen by reference to Figs. 2 and 4, the floor is shifted, by action of roller 121 in slot 122, to the right when slider 92 slides over the twelve bottles; thus strips 127 are brought into position for the bottles to slide on and be supported.

Cross guides 115, 128, 129 and 130, fastened on cover 125, will hold the bottles at their sides and will keep them divided in twos. By the return stroke of slider 92, floor 123 will be shifted to the left and so strips 127 will be moved to the spaces under guides 128, 129 and 130, or between the bottles which at this point will be handled by the gripper carriage.

The gripper carriage is separately actioned by cam 22 on shaft 5. The track of cam 22 engages roller 131 of lever 132, one end of which is connected to link 133 and the other end of which is pivoted on shaft 26. The short arm of lever 134 connects with link 133, while its long arm connects with link 135. The lever's fulcrum is on shaft 136 to which it is keyed fast. A lever

138 is also keyed at one end fast on shaft 136, while the other end connects with link 139. Shaft 136 oscillates in its bearings which are fastened on plates 1 and 2, and levers 134 and 138 are connected to the gripper carriage by means of links 135 and 139; a brace 137 connects lever 134 with lever 138 so as to form, with them, a rigid frame.

The gripper carriage consists of two cross bars 140 and 141. Their ends are fastened to sliding heads 143 and 145 which slide vertically in guides 144 fastened on plates 1 and 2. Six double grippers are set into the carriage and each gripper consists of a part 146 that has two legs at the ends of which are attached jaws 147 designed to fit the shape of the neck of the bottle and at one arm of which is a roller 148. The whole of gripper part 146 swings on cross shaft 142. Parts 149 and 150, fastened on cross bars 140 and 141, also carry at their free ends two jaws 147 and do not swing but are rigid with cross bars 140—141. The gripper jaws 147 are adjustable on the ends of the gripper legs by means of set screws and slots; this permits jaws 147 to be lifted up or lowered down in order to reach higher or lower bottles. Tension springs 151, attached one end to one leg of part 146 and the other end to the opposite part of 149, tend to force the two legs of part 146 against the legs of parts 149 and 150, respectively, so locking the necks of the bottles. A beveled bar 152, having its ends fastened to plates 1 and 2, and a beveled bar 153, supported by braces 154 and 155, are located at convenient levels for rollers 148 to strike and roll on, thus freeing and locking the bottles at the desired times. Braces 156 and 157 serve to connect and serve as frames for beveled bars 152 and 153.

When the twelve bottles are slid over floor 123, jaws 147 are just above the tops of the bottles (see Fig. 6), rollers 148 are on the side of bar 152; the mechanism connected to cam 22 will lower the gripper's carriage, rollers 148 will roll over bevel of bar 152, freeing springs 151 to act on the legs of the grippers and so lock the necks of the bottles into jaws 147; as trap floor 123 will have been shifted to the left toward plate 2, the bottles locked to jaws 147, together with the gripper carriage, will start their downward travel toward the empty case below until rollers 148 will strike on beveled bar 153, and thereby cause the jaws to open and so free the bottles.

The track of cam 23, on shaft 5, engages a roller 158 on the short arm of lever 159 whose long arm carries a roller 161 which rolls in a horizontal guide 163 of a vertical shaft 165. The fulcrum of lever 159 is on the shaft 26 to which it is keyed fast. So also is one end of lever 160 whose other end has a roller 162 which rolls in a horizontal guide 164 of vertical shaft 166. Vertical shaft 165 slides in bearings 167 and 168 on plate 2, while vertical shaft 166 slides in bearings 169 and 170 fastened on plate 1 opposite to bearings 167 and 168.

To a downward projection of guides 163 and 164 are attached the extended arms of the spring baskets' frame 171 which has a longitudinal bar 172 and cross bars 173 fastened on frame 171 itself, thereby forming a system of twelve squares. Over the bars and end frame of which the spring basket labyrinth is made are folded and fastened the springs, of which sixteen double-leafed springs 174 and sixteen single-leafed springs 175 form the twelve spring baskets through which the twelve bottles or containers are to be lowered.

Figs. 14 and 15 show the springs 151, one end of each of which is hooked to a projection 149^a on the side of the bar 149 which does not swing, being fastened to the bar 140 of the gripper carriage; the other ends of the springs 151 are similarly hooked up at 146^a to the other leg of part 146 (not shown in Fig. 14, but shown in Fig. 1), which does swing on the shaft 142 of the gripper carriage. It will be apparent from Fig. 7 that when rollers 148 strike on beveled bar 153, part 146 with its two legs at the left of the bottles (two rows) will swing, freeing the bottles, while parts 149 and 150, their legs, one each, on the right of the bottles, will remain immovable, being fast on bars 140 and 141 respectively of the gripper carriage.

The adjustment of the jaws 147 of the gripper for the handling of shorter or taller bottles is accomplished as follows: the end of the legs of parts 146, 149 and 150 have a prominence 182 running lengthwise which fits and slides into a groove milled on jaws 147. A slot 183 is also cut in each of the jaws 147 and in the slot slides a set screw 184 that fastens the jaws 147 in any required position on parts 146, 149 and 150 to suit the height of the bottles to be handled.

As shown in Fig. 13, the crate C being fed into the machine (left to right) is stopped by a guiding rail 176 (hereinbefore referred to) which will also serve to align and guide the crates through the loading lines.

Rods 178, fast on rails 176 and 177, slide into sleeves 179 which are flanged and fastened to frame-plates 1 and 2 respectively. Nuts 180 outside of the frame-plates 1 and 2 serve to adjusting purposes; if shorter or longer boxes are to be fed, while compression springs 181 will take the thrust of slightly unequal boxes.

In the drawings the bottles are indicated by the letter B, and the boxes, cases or crates by the letter C. When in the specification and claims we use the terms boxes, cases or crates, it is to be understood that these terms are interchangeable and are not terms of limitation.

From the foregoing description, taken in connection with the accompanying drawings, which illustrate a preferred embodiment of the invention, it is thought that the complete construction, operation and advantages of the invention will be clear to those skilled in the art, and we desire it to be understood that changes in the details of the construction, arrangement and design of the parts may readily be made by those skilled in the art without departing from the spirit of the invention and within the scope of the appended claims.

What we claim is:

1. In a machine of the class described, having an infeed station, an outfeed station and a filling station for the crates, means to locate in a predetermined position the crate at the infeed station, the filling station being located between the infeed and outfeed stations, means continuously feeding the bottles to the machine at the filling station, means to locate the bottles at the filling station in proper positions for lowering into crate pockets beneath, means to arrest the infeeding of bottles when a desired row has been located above the crate until the same shall have been deposited into the crate, means to grip the bottles above the crate and lower the same into the crate together, said gripping means including gripping jaws which are normally located above the bottle necks and means to move the jaws down over the bottle necks into gripping

engagement therewith, and spring baskets through which the bottles are lowered and by which the bottles are guided into the crate, and means for lowering the baskets into and lifting them out of the crate, the complete loading operation for the crate being conducted in a plurality of stages or steps during the time the crate is passed from the infeed to the outfeed station.

2. In a machine of the class described, wherein crates having compartments arranged in longitudinal and transverse rows are passed from an infeed to an outfeed station through an intermediate station, the combination of bottle infeeding conveyors for delivering bottles in two or more longitudinal rows side by side to the intermediate station, means for bodily moving the crates laterally from the infeed through the intermediate to the outfeed station, by alternate long and short steps for purposes described, and means for placing the rows of bottles as a unit into the case, said last named means including vertically movable bottle-neck gripping jaws, one set for each row of bottles, said jaws being normally located directly above the bottles and constructed to be lowered to the bottles, and means to operate said jaws simultaneously for the purposes stated.

3. In a machine of the class described, a plural row bottle infeed conveyor, a slider for pushing the bottles from the bottle infeed conveyor; a bottle feed cut-off located at a fixed place at the side of the machine where the bottles enter, a bottle row partition between each two rows of bottles, and means actuated by said slider as it moves from position to position for lowering said partition to clear the bottles, actuating said bottle feed cut-off and arresting the feeding of bottles to the machine after a predetermined number have entered.

4. In a machine of the class described, a bottle infeed conveyor, a slider for pushing the bottles from the bottle infeed conveyor, a bottle feed cut-off at the side of the machine where the bottles enter, means actuated by said slider as it moves from position to position for actuating said bottle feed cut-off and arresting the feeding of bottles to the machine after a predetermined number have entered, said actuated means comprising a shutter for each bottle row, a system of levers and links to operate the shutters, and a shoe carried by said slider to co-operate with said lever and link system to move the shutters to closed position as said slider advances.

5. In a machine of the class described, a bottle infeed conveyor, a slider for pushing the bottles from the bottle infeed conveyor, a bottle feed cut-off at the side of the machine where the bottles enter, means actuated by said slider as it moves from position to position for actuating said bottle feed cut-off and arresting the feeding of bottles to the machine after a predetermined number have entered, said actuated means comprising a shutter for each bottle row, a system of levers and links to operate the shutters, a shoe carried by said slider to cooperate with said lever and link system to move the shutters to closed position as said slider advances, and spring means to return the shutters to open position as said slider retreats.

6. In a machine of the class described, a trap floor, a bottle infeeding mechanism including a conveyor, means to arrest the following bottles on the conveyor after a predetermined number have entered the machine, vertical longitudinal

guiding strips for holding the bottles on the conveyor in line, a slider to push the row of bottles off the conveyor onto the trap floor, and means actuated by said slider as it advances for operating said bottle-arresting means and withdrawing said guiding strips to free the row of bottles, and means to open the trap floor to permit the bottles to be lowered therethrough and means to grip the bottles before the trap floor is opened and to lower the bottles after the trap floor has been opened.

7. In a machine of the class described, a trap floor, a bottle infeeding mechanism including a conveyor, means to arrest the following bottles on the conveyor after a predetermined number have entered the machine, vertical longitudinal guiding strips for holding the bottles on the conveyor in line, a slider to push the row of bottles off the conveyor onto the trap floor, means actuated by said slider as it advances for operating said bottle-arresting means and withdrawing said guiding strips to free the row of bottles, said arresting means including a shutter, a lever for moving said shutter to and fro, a guiding strip carrier, a link connecting said lever to said carrier, a shoe on said slider and engaging a member on said lever to move it to close said shutter and withdraw said guiding strips during the forward movement of said slider, and means operable on the return movement of the slider for again opening the shutter and restoring said guide strips.

8. In a machine of the class described, a trap floor, a bottle infeeding mechanism including a conveyor, means to arrest the following bottles on the conveyor after a predetermined number have entered the machine, vertical longitudinal guiding strips for holding the bottles on the conveyor in line, a slider to push the row of bottles off the conveyor onto the trap floor, means actuated by said slider as it advances for operating said bottle-arresting means and withdrawing said guiding strips to free the row of bottles, and means for operating said trap floor to "open" and "close" the same in harmony with the movements of the slider, and means to grip the bottles before the trap floor is opened and to lower the bottles through the opening after the trap floor has been opened.

9. In a machine of the class described, a trap floor, a bottle infeeding mechanism including a conveyor, means to arrest the following bottles on the conveyor after a predetermined number have entered the machine, vertical longitudinal guiding strips for holding the bottles on the conveyor in line, a slider to push the row of bottles off the conveyor onto the trap floor, means actuated by said slider as it advances for operating said bottle-arresting means and withdrawing said guiding strips to free the row of bottles, said trap floor having spaced apart bottle-rest strips, the spaces between adjacent strips being wide enough to permit the bottles to pass through the floor when the floor has been shifted to move the bottle-rest strips from under the bottles, means for shifting said trap floor to "open" and "close" the same in harmony with the movements of the slider, said last named means comprising means to slidably mount the trap floor, and means connecting the slider with the trap floor to move the trap floor parts to their open or release position during the return movement of said slider, and means to grip the bottles and lower them through the trap floor spaces when the trap floor is in the open position.

10. In a machine of the class described, a trap floor, a bottle infeeding mechanism including a conveyor, means to arrest the following bottles on the conveyor after a predetermined number have entered the machine, vertical longitudinal guiding strips for holding the bottles on the conveyor in line, a slider to push the row of bottles off the conveyor onto the trap floor, means actuated by said slider as it advances for operating said bottle-arresting means and withdrawing said guiding strips to free the row of bottles, said arresting means including a shutter, a lever for moving said shutter to and fro, a guiding strip carrier, a link connecting said lever to said carrier, a shoe on said slider and engaging a member on said lever to move it to close said shutter and withdraw said guiding strips during the forward movement of said slider, means operable on the return movement of the slider for again opening the shutter and restoring said guide strips, means for operating said trap floor to "open" and "close" the same in harmony with the movements of the slider, said last named means comprising means to slidably mount the trap floor, and means connecting the slider with the trap floor to move the trap floor to its open or release position during the return movement of said slider.

11. In a machine of the class described, a bottle infeeding conveyor extending across the machine for delivering bottles in a row, a shutter cut-off at the ingoing side of the conveyor, a stopper toward which the bottles are fed by said conveyor, a slider for simultaneously pushing all bottles that are on the conveyor within the machine off said conveyor, a trap floor onto which the bottles are pushed, and means operated by the advance movement of said slider for moving said shutter to keep out following bottles after the line or row of bottles in the machine on the conveyor shall have engaged said stopper, means operated by the movement of said slider for retracting said stopper as said slider starts its forward movement, and means operated by the movement of the slider for "closing" the trap floor prior to pushing over the bottles thereon from said conveyor and for opening the trap floor on the return movement of the slider.

12. In a machine of the class described, a bottle infeeding conveyor extending across the machine for delivering bottles in a row, a shutter cut-off at the ingoing side of the conveyor, a stopper toward which the bottles are fed by said conveyor, a slider for simultaneously pushing all bottles that are on the conveyor within the machine off said conveyor, a trap floor onto which the bottles are pushed, means operated by the advance movement of said slider for moving said shutter to keep out following bottles after the line or row of bottles in the machine on the conveyor shall have engaged said stopper, means operated by the movement of said slider for retracting said stopper as said slider starts its forward movement, means operated by the movement of the slider for "closing" the trap floor prior to pushing over the bottles thereon from said conveyor and for opening the trap floor on the return movement of the slider, a bottle gripper over the trap floor, and means to actuate said gripper to grip said bottles by their necks while they are on the trap floor and hold them while the trap floor opens and for passing the bottles down through the openings of the trap floor when said floor has been moved to "open" position.

13. In a machine of the class described, a bottle infeeding conveyor extending across the machine for delivering bottles in a row, a shutter cut-off at the ingoing side of the conveyor, a stopper toward which the bottles are fed by said conveyor, a slider for simultaneously pushing all bottles that are on the conveyor within the machine off said conveyor, a trap floor onto which the bottles are pushed, means operated by the advance movement of said slider for moving said shutter to keep out following bottles after the line or row of bottles in the machine on the conveyor shall have engaged said stopper, means operated by the movement of said slider for retracting said stopper as said slider starts its forward movement, means operated by the movement of the slider for "closing" the trap floor prior to pushing over the bottles thereon from said conveyor and for opening the trap floor on the return movement of the slider, a bottle gripper over the trap floor, means to actuate said gripper to grip said bottles by their necks while they are on the trap floor and hold them while the trap floor opens and for passing the bottles down through the openings of the trap floor when said floor has been moved to "open" position, and means to release said grippers from the bottle necks after the bottles have been lowered a desired distance through the trap floor.

14. In a machine of the class described, a bottle infeeding conveyor extending across the machine for delivering bottles in a row, a shutter cut-off at the ingoing side of the conveyor, a stopper toward which the bottles are fed by said conveyor, a slider for simultaneously pushing all bottles that are on the conveyor within the machine off said conveyor, a trap floor onto which the bottles are pushed, means operated by the advance movement of said slider for moving said shutter to keep out following bottles after the line or row of bottles in the machine on the conveyor shall have engaged said stopper, means operated by the movement of said slider for retracting said stopper as said slider starts its forward movement, means operated by the movement of the slider for "closing" the trap floor prior to pushing over the bottles thereon from said conveyor and for opening the trap floor on the return movement of the slider, a bottle gripper over the trap floor, means to actuate said gripper to grip said bottles by their necks while they are on the trap floor and hold them while the trap floor opens and for passing the bottles down through the openings of the trap floor when said floor has been moved to "open" position, means to release said grippers from the bottle necks after the bottles have been lowered a desired distance through the trap floor, and spring baskets beneath the trap floor to receive the bottles as they pass below the trap floor, and means causing said baskets to follow the contained bottles during a portion of their lowering movement, said bottles being free to be passed through said baskets when released from said grippers.

15. In a machine of the class described, a bottle gripping, lowering and releasing mechanism, including a pair of sliding heads, means in which said heads are supported for vertical movement, a cross-shaft extending between said heads, a gripper carriage including said heads, a gripper bar fixed to said carriage, a cooperating gripper bar pivoted on said cross-shaft, said gripper bars each having a gripping jaw, co-operating one with the other to grip and hold a bottle by its

neck adjacent its mouth, an arm on said shaft, spring means continuously urging said jaws to grip, means to raise and lower said gripper carriage, and means cooperating with said arm to open said jaws at the upper limit of the movement of the carriage and again at the lower extremity of the movement of said carriage for gripping and lowering and then releasing a bottle.

16. In a machine of the class described, a bottle gripping, lowering and releasing mechanism, including a pair of sliding heads, means in which said heads are supported for vertical movement, a cross-shaft extending between said heads, a gripper carriage including said heads, a gripper bar fixed to said carriage, a cooperating gripper bar pivoted on said cross-shaft, said gripper bars each having a gripping jaw, cooperating one with the other to grip and hold a bottle by its neck adjacent its mouth, an arm on said shaft, spring means continuously urging said jaws to grip, means to raise and lower said gripper carriage, means cooperating with said arm to open said jaws at the upper limit of the movement of the carriage and again at the lower extremity of the movement of said carriage for gripping and lowering and then releasing a bottle, a trap floor to receive the bottles to be cased, a case-conveyor beneath said floor for positioning cases to receive the bottles from the bottle gripping, lowering and releasing mechanism, timed means to open the trap floor after the bottles have been gripped and through the openings in which floor the bottles are lowered, spring baskets beneath the trap floor and above the level of the case beneath, and means for holding the baskets close to the trap floor first to receive the bottles, then lowering the baskets with the contained bottles into the case and then moving the baskets out of the case along the bottles upwardly, the bottle-releasing means being effective to release the bottles when the lower ends of the basket springs, on the return movement, are over the shoulders of the bottles.

17. In a machine of the class described, a bottle gripping, lowering and releasing mechanism, including a pair of sliding heads, means in which said heads are supported for vertical movement, a cross-shaft extending between said heads, a gripper carriage including said heads, a gripper bar fixed to said carriage, a cooperating gripper bar pivoted on said cross-shaft, said gripper bars each having a gripping jaw, cooperating one with the other to grip and hold a bottle by its neck adjacent its mouth, an arm on said shaft, spring means continuously urging said jaws to grip, means to raise and lower said gripper carriage, means cooperating with said arm to open said jaws at the upper limit of the movement of the carriage and again at the lower extremity of the movement of said carriage for gripping and lowering and then releasing a bottle, a trap floor to receive the bottles to be cased, a case-conveyor beneath said floor for positioning cases to receive the bottles from the bottle gripping, lowering and releasing mechanism, timed means to open the trap floor after the bottles have been gripped and through the openings in which floor the bottles are lowered, spring baskets beneath the trap floor and above the level of the case beneath, and means for holding the baskets close to the trap floor first to receive the bottles, then lowering the baskets with the contained bottles into the case and then moving the baskets out of the case along the bottles upwardly, the bottle releasing means being effective to release the

bottles when the lower ends of the basket springs, on the return movement, are over the shoulders of the bottles, said spring baskets each including a frame and depending spring-fingers whose lower ends curve inwardly together, said ends being spread by the passing bottle serving to center the pocket of the case which receives the bottle.

18. In a machine of the class described, a trap floor comprising a skeleton frame having cross strips, means to mount said frame for endwise sliding movement, a bottle infeed conveyor parallel to the trap floor, a slider to push a row of bottles from said conveyor onto the cross strips of said frame as the slider moves forward, and connections between said slider and said trap floor for moving the trap floor to withdraw the cross strips from beneath the bottles so that the bottles may pass through the floor between adjacent cross strips, as said slider returns to its inactive or rearward position.

19. In a machine of the class described, a bottle gripping, lowering and releasing mechanism, including a pair of sliding heads, means in which said heads are supported for vertical movement, a cross-shaft extending between said heads, a gripper carriage including said heads, a gripper bar fixed to said carriage, a co-operating gripper bar pivoted on said cross-shaft, adjustable gripping jaws secured to said gripper bars and co-operative one with the other to grip and hold a bottle by its neck, spring means continuously urging said jaws to grip, means to raise and lower said gripper carriage, and means co-operating with said pivoted gripper bar for opening said jaws to receive and release a bottle.

20. In a machine for packaging bottles in cases, having a plurality of rows and tiers of bottle-receiving pockets, a loading station where bottles are placed in the cases in a plurality of rows at a time, an endless chain conveyor having a series of case pushers spaced apart a greater distance than the width of the cases, and means to move said conveyor in steps, first in a long step to bring a case into place to receive bottles in at least two rows of pockets and then in a shorter step to bring at least another two rows of pockets into position to receive other bottles at the loading station, and means to place at least two rows of bottles in a case at a time.

21. In a machine for packaging bottles in cases, having a plurality of rows and tiers of bottle-receiving pockets, a loading station where bottles are placed in the cases in a row or rows at a time, an endless chain conveyor having a series of case pushers spaced apart a greater distance than the width of the cases, means to move said conveyor in steps, first in a long step to bring a case into place to receive bottles in at least one row of pockets and then in a shorter step to bring at least another row of pockets into position to receive other bottles at the loading station, said conveyor-moving means including a distributor disc, a conveyor driving sprocket to which said disc is attached, said disc having suitably spaced ratchet-like recesses, a swinging lever carrying a disc-engaging pawl, and power-applying timed means to swing said lever.

22. In a machine of the class described, a frame having an opening through which the cases to be filled are serially inserted, a case stopper against which the cases are placed on their insertion into the machine, a case conveyor running transversely of the direction in which the cases are inserted and having pushers

to move the cases transversely away from the place where they are introduced, said case stopper comprising a yieldable guide rail, rods attached to the back of said guide rail, fixed sleeves on said frame through which said rods pass, nuts on the outer ends of said rods, and springs on said rods and said sleeves between said guide rail and said frame.

23. In a machine of the class described, a frame having an opening through which the cases to be filled are serially inserted, a case stopper against which the cases are placed on their insertion into the machine, a case conveyor running transversely of the direction in which said cases are inserted and having at least one pusher to move the cases transversely away from the place where they are introduced, said case stopper comprising a yieldable guide rail, and a pair of spring loaded guide rails yieldably and adjustably mounted on said frame and spaced apart to receive the cases pushed from the place where they were first received in the machine, said pair of guide rails being designed to receive between them and to center and guide cases of various lengths.

24. In a machine of the class described, wherein crates having compartments arranged in longitudinal and transverse rows are passed from an infeed to an outfeed station through an intermediate station, the combination of bottle infeeding means for delivering bottles in rows to the intermediate station, means for bodily moving the crates laterally from the infeed station through the intermediate station to the outfeed station by first a long step to locate the first row of crate pockets to receive bottles and then by a shorter step to locate succeeding rows of crate pockets in position to receive bottles, said cratemoving means comprising an endless conveyor, a distributor disc, a conveyor driving sprocket to which said disc is attached, said disc having suitable spaced ratchet-like recesses, a swinging lever carrying a disc-engaging pawl, and power-applying timed means to swing said lever.

25. In a machine of the class described, a bottle gripping, lowering and releasing mechanism including a pair of sliding heads, means in which said heads are supported for vertical movement, a cross-shaft extending between said heads, two cross-bars connecting said heads and lying one to each side of said shaft, a gripper bar fixed to each cross-bar, a duplex gripper bar mounted on said cross-shaft one bar of which duplex gripper bar cooperates with one of said fixed gripper bars and the other bar of which cooperates with the other fixed gripper bar, said gripper bars each having a gripper jaw, said gripper bars being formed to grip two spaced-apart bottles at a time, springs connecting the fixed gripper bars to the pivoted gripper bars for continuously urging the jaws to close, means to lower and raise said heads and the parts carried thereby, and means cooperating with said lowering and raising means and said duplex gripper bar for opening said jaws at the upper and lower positions of said heads respectively.

26. In a machine of the class described, in combination, means to enter empty crates endwise into the machine by movement in one direction, means to discharge filled crates endwise from the machine in the same direction, the two aforesaid means being laterally spaced apart, means for bodily moving the crates sidewise from the first mentioned means to the second mentioned means through a filling station,

means to feed bottles in at least one row in the direction of said first and second means above the level of the crates at the filling station, spring-finger baskets at the filling station above the level of the crates and below the level of the bottle feeding means, means to grip the bottles at the filling station, lower them into the baskets, lower the baskets and bottles together into the crates and thereafter release the bottles and withdraw the bottle gripping means and the baskets from the crates.

27. In a machine of the class described, wherein crates having compartments arranged in longitudinal and transverse rows are passed from an infeed to an outfeed station through an intermediate station, the combination of bottle infeeding conveyors for delivering bottles in two or more longitudinal rows side by side to the intermediate station, means for bodily moving the crates laterally from the infeed through the intermediate to the outfeed station, by alternate long and short steps for purposes described, and means for placing the rows of bottles as a unit into the case, said last named means including a set of bottle grippers normally located at a higher level than that of the tops of the bottles to be lowered and means for operating the grippers to grip all rows of bottles and simultaneously lower them into the crates.

28. In a packaging machine, the combinations of a bottle infeed conveyor; a bottle feed cut-off for segregating a predetermined number of bottles fed to the machine by said bottle infeed conveyor; arresting means for stopping the feeding of bottles after said predetermined number have entered the machine; strips at each side of the infeed conveyor within the machine; means for lowering said strips from their initial position; a slider at a right angle to the infeed conveyor for pushing the predetermined number of bottles off the infeed conveyor; means actuated by said slider as said slider moves during a portion of its forward stroke only, to operate during such portion of the stroke, the bottle feed cut-off, and to operate the strip lowering means to lower the strips; and spring means for returning said strips and said bottle infeed conveyor to their initial positions as said slider is returning to its initial position to enable a new predetermined number of bottles to be fed into the machine guided by said strips.

29. In a bottle packaging machine, a spring basket member consisting of leaves for surrounding the bottom and body of a bottle, means for lowering the basket with the bottle into a case, and means for withdrawing the leaves from the bottle by an upward movement along the body of the bottle after said bottle has entered a pocket in the case to be filled, means for gripping the neck of the bottle for feeding the bottle into a pocket in a case when surrounded by said leaves, and means for releasing the gripping means from the neck of the bottle when the end of said spring leaves have reached the shoulder of the bottle.

30. In a packaging machine, a case-support adapted to receive an empty case at the side of the machine and enable its conveyance longitudinally of the machine in a direction at right-angles to the direction of its entry, a spring-actuated guide-bar at the side of the machine opposite to the entrance side to act as a buffer against the end of the case upon the entry of a case, a pusher acting upon the broadside of the case and longitudinally of the machine to push

the case with the end of the case along said guide-bar, a second spring-actuated guide-bar parallel with the first guide-bar, and spaced from said guide-bar about the length of a case, in order that both guide-bars act to clampingly hold between them the said case as it is being pushed longitudinally of the machine by the pusher, said guide-bar having a curved end to enable the cases to freely enter within the guide-bar, a bottle-loading device in the path of the case for loading bottles into the lengthwise compartments of the case while the case is being held in proper position in respect to the loading device by the parallel guide-bars, and a conveyor for discharging the loaded cases disposed beyond the loading device for receiving loaded cases when the cases are freed of the parallel guide-bars.

31. In a bottle-packaging machine, the combination of means for supporting a bottle fed 20

thereto and arranged above a case to be loaded, said supporting means being within about one-half the diameter of the bottle, said supporting means being under the bottle and acting as the sole support for the bottle, a bottle-neck gripping means for gripping the neck of the bottle, means for withdrawing said bottle-supporting means to enable the bottle to drop save for the gripping means said withdrawing means being movable not more than one-half the diameter of the bottle to enable the bottle to drop, means for moving the bottle-gripping means with the bottle below the bottle-supporting means, said bottle gripping means gripping the bottle neck before the bottle-supporting means are withdrawn, and upon the withdrawal lowering the bottle to a compartment of the case to be loaded.

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