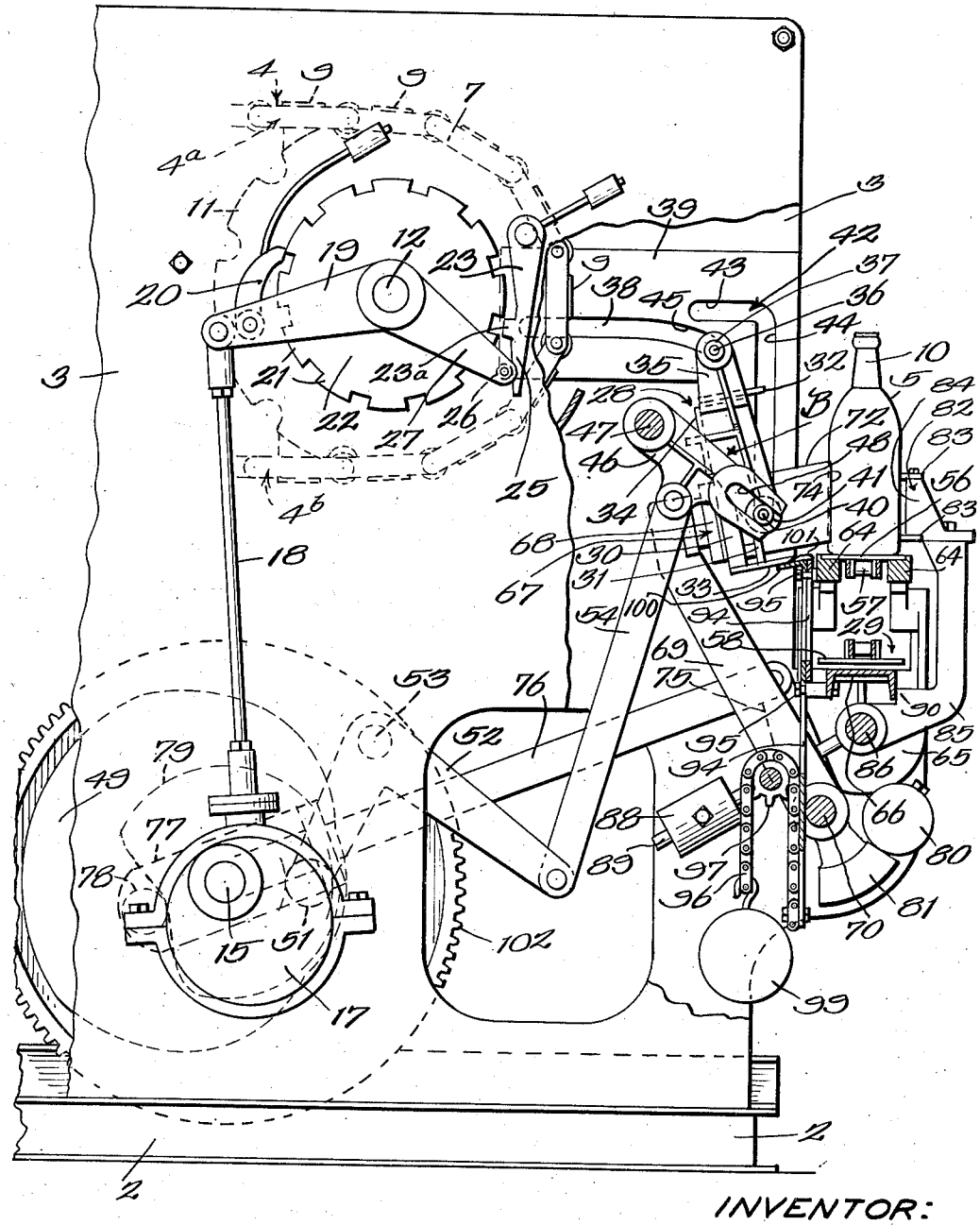
March 16, 1937. I. H. RISSER 2,073,945

CONTAINER DISCHARGING APPARATUS

Filed Aug. 10, 1936 3 Sheets-Sheet 1

FIG. 1.



INVENTOR:
IVAN H. RISSER
BY John H. Nelson
ATTY.

March 16, 1937. I. H. RISSER 2,073,945

CONTAINER DISCHARGING APPARATUS

Filed Aug. 10, 1936 3 Sheets-Sheet 2

Fig. 2.

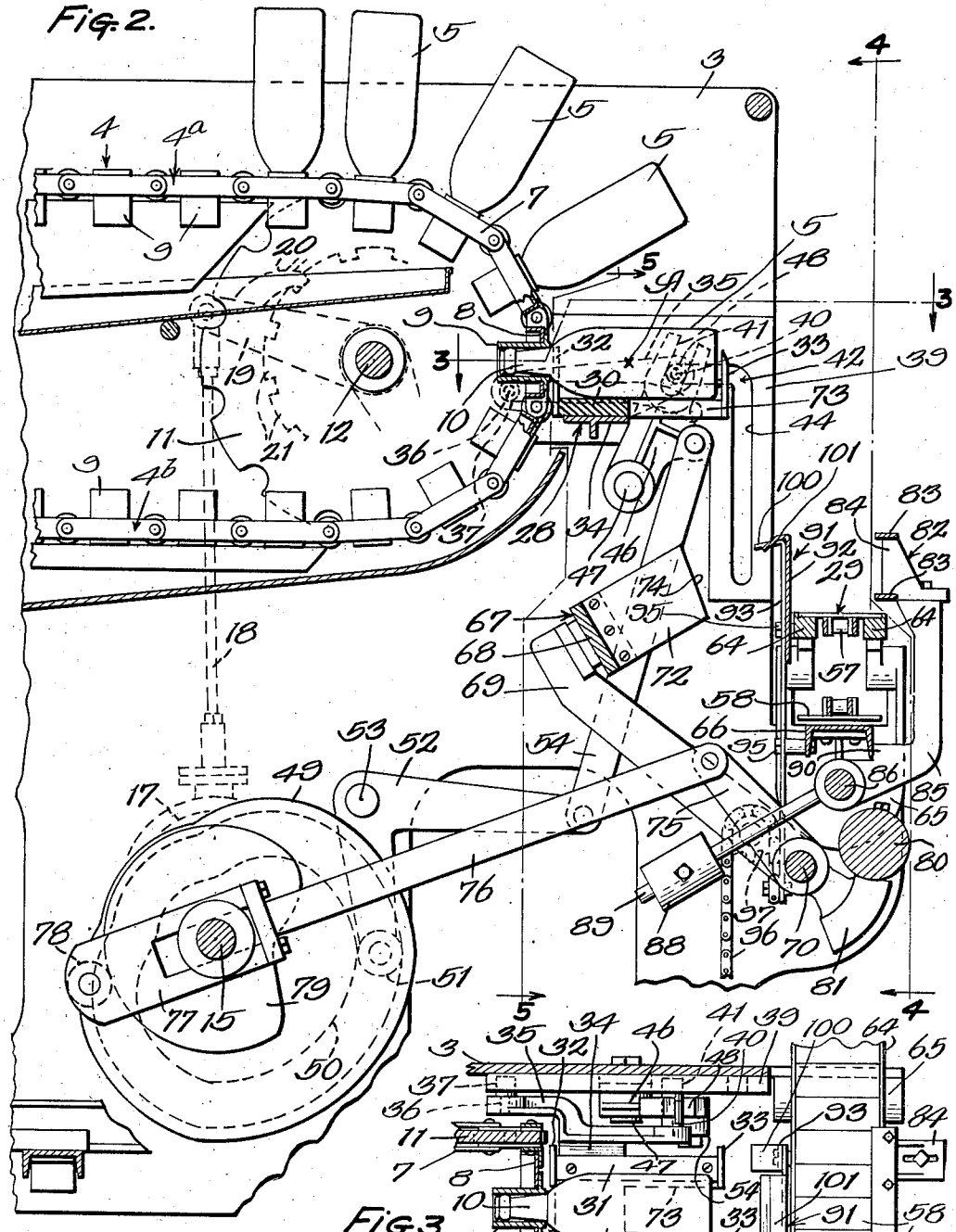
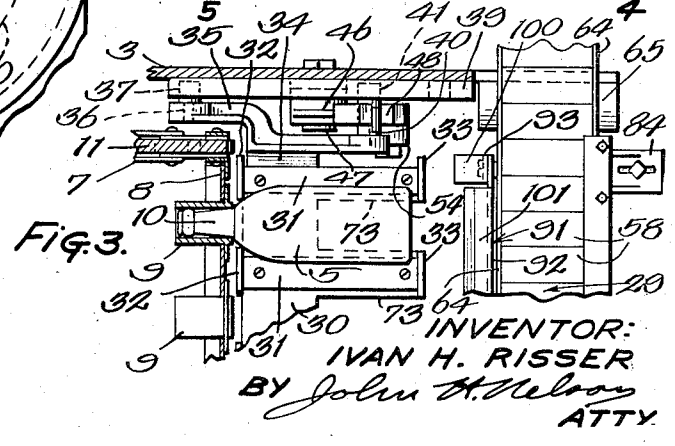


Fig. 3.



INVENTOR:
IVAN H. RISSER
BY John H. Nelson
ATTY.

March 16, 1937. I. H. RISSER 2,073,945

CONTAINER DISCHARGING APPARATUS

Filed Aug. 10, 1936 3 Sheets-Sheet 3

Fig. 4.

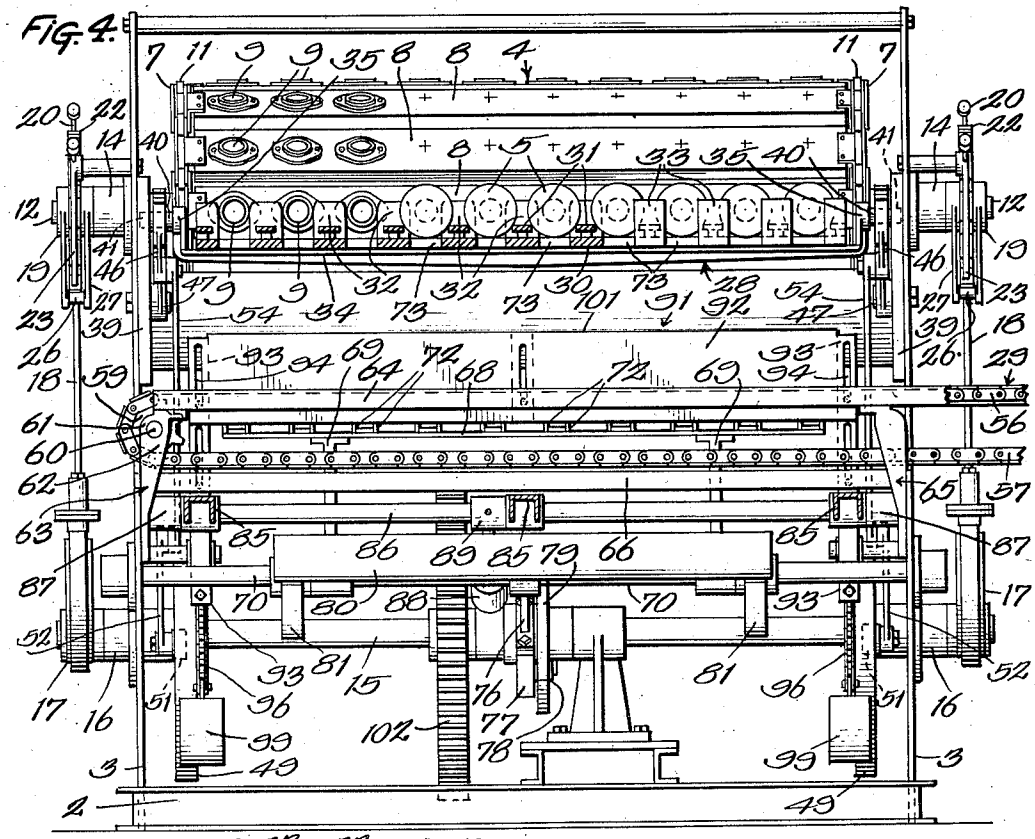


Fig. 5.

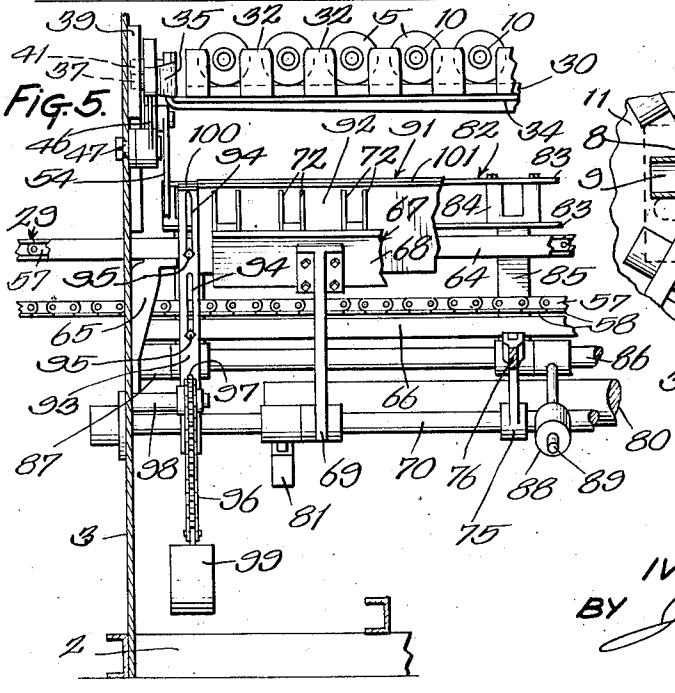
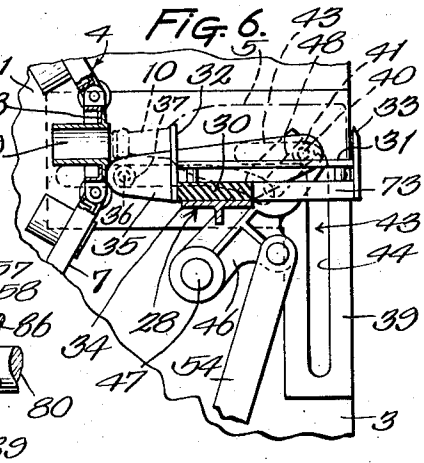


Fig. 6.



INVENTOR:
IVAN H. RISSER
BY John H. Nelson
ATTY.

Patented Mar. 16, 1937 2,073,945

UNITED STATES PATENT OFFICE

2,073,945

CONTAINER DISCHARGING APPARATUS

Ivan H. Risser, Chicago, Ill., assignor to U. S. Bottlers Machinery Co., Chicago, Ill., a corporation of Illinois

Application August 10, 1936, Serial No. 95,187

9 Claims. (Cl. 198—27)

This invention relates to container discharging apparatus, and more particularly pertains to such apparatus employed in connection with container cleaning machines.

An object of the invention is to provide such apparatus of the simplest construction to transport containers from a conveyor in which they are supported in holders or pockets in inverted position while being cleaned, or washed, then to discharge the cleaned containers onto another conveyor in upright position to be conveyed from the machine, without the possibility of damaging the containers while being transported. Further, the invention aims to provide such apparatus to handle bottles in the manner stated, wherein the bottles are conveyed through a washing machine with their extended necks snugly supported in pockets, and wherein the bottles are removed from the pockets without subjecting the mouths thereof to contact with mechanism, in preventing possible contamination of the mouths.

Other objects and advantages will become apparent by reference to the specification and the accompanying drawings, in which:

Fig. 1 is a side elevation of the discharging end portion of a container cleaning machine incorporating discharging means embodying the invention, with parts broken away and other parts shown in section.

Fig. 2 is a sectional elevation of the discharge end of the machine, as may be taken along a plane intersecting one of the pockets of the main conveyor thereof, and showing parts in changed position.

Fig. 3 is a detail plan section of certain parts seen in Fig. 2, as taken substantially on the section line 3—3 of said figure.

Fig. 4 is a sectional end elevation of the machine, as may be taken substantially on the section line 4—4 of said Fig. 2, and showing parts in diagram, parts in section and other parts being omitted.

Fig. 5 is a detail vertical section of the machine, as taken substantially on the section line 5—5 of Fig. 2.

Fig. 6 is a detail view of certain parts of the discharging means as seen in Fig. 2, with parts in changed position.

The structure illustrated comprises that portion of the frame of a bottle washing machine from which the cleaned bottles are discharged, and includes a base portion 2 of an open rectangular frame-work of structural pieces, and also includes side frames 3 in the form of upright plates suitably mounted on the base portion.

Disposed between the side frames 3, in spaced relation therefrom, is an endless conveyor 4 mounted to move in an upper horizontal active stretch 4^a and a lower return stretch 4^b, for conveying the bottles 5 in an inverted position through the machine to be washed and then drained. The conveyor 4 comprises two laterally arranged similar endless sprocket chains 7 on which are mounted cleats 8 in the form of channel pieces extending between the chains and being suitably secured onto the links of the chains respectively.

Each channel piece 8 of the conveyor 4 has a similar row of bottle holders or pockets 9 in the form of flanged tubular sections mounted on the channel pieces so as to extend therethrough, and which sections are arranged to receive the necks 10 of the bottles to firmly support same in inverted position on the upper stretch of the conveyor 4, and until the bottles reach a reclining or horizontal position at the juncture of the stretches of the conveyor, as will become apparent later.

The conveyor 4 is operated so that its upper stretch moves from left to right, as seen in Fig. 2, with the chains 7 thereof being supported at the juncture of the stretches upon drive sprockets 11, respectively, which are secured onto a drive shaft 12 suitably mounted in bearings 14 in the side frames 3. Although not shown, it will be understood that the receiving end of the conveyor 4 is suitably supported on idler sprockets.

The conveyor is driven intermittently so that each transverse row of washed and drained bottles supported in the pockets of the conveyor is moved about the axis of the drive shaft into reclining or horizontal position, as at the station "A", Fig. 2, at which position the bottles are in cooperative relation with transporting means of the invention for transporting the bottles from the conveyor and then conveying same from the machine in an upright position.

For intermittently driving the conveyor 4, as well as driving or operating other parts later described, a continuously rotating power shaft 15 is provided under the conveyor with its ends rotatably mounted in bearings 16 in the side frames 3, so as to extend therethrough. The power shaft is connected with the drive shaft 12 to intermittently drive same, by means of similar eccentrics 17 mounted respectively on the outer ends of the power shaft, with the eccentrics in pivotal connection with upright rods 18 whose top ends are pivotally connected with the outer ends of oscillating levers 19 oscillatably mounted on the ends

of the drive shaft outside the frames 3 and having weighted pawls 20, respectively, for engaging teeth 21 of ratchet wheels 22 secured on the ends of the drive shaft. Thus upon each revolution of the power shaft, the drive shaft is advanced one step during the upward stroke of the levers 19. The conveyor 4 is positively held during the return stroke of the levers 19, to maintain cooperative relation between the various devices of the invention and the conveyor when same dwells, by means of gravity urged holding dogs 23 pivotally mounted respectively on the side frames 3 and having teeth 23a for engaging the teeth of the ratchet wheels 22. The dogs 23 are retracted to release the ratchet wheels at the end of the return stroke of the levers 19 by means of the camming engagement between cam formations 25 of the dogs and pins 26 on the extensions 27 of the levers respectively.

The transporting means comprises a bottle carrier head 28 mounted to move back and forth between the station "A" of the bottles and a discharging conveyor 29, for transporting a row of bottles from the station, so that the bottles are withdrawn from the pockets of the conveyor 4 with the bottles remaining coaxial with the pockets during withdrawal of the necks of the bottles therefrom, then placing the bottles in substantially upright position in cooperative relation with the discharging conveyor to be transferred thereon.

The carrier head 28 includes a shelf comprising an elongated bottom portion 30 extending between the side frames 3 and having transverse partitions 31 spaced therealong to form recesses or troughs arranged in accordance with the spacing of the bottles supported in a row of pockets of the conveyor 4, so that the body portion of the bottles at the station "A" are receivable in the troughs when the head is in raised position. Secured on the bottom portion 30 of the shelf and located at the forward ends of the partitions 31, respectively, are bottle shoulder engaging abutments 32 in the form of upright wall portions providing restricted end openings of the troughs within which the necks of the bottles are snugly received so as to extend therethrough when at the station "A". Mounted at the rear ends of the partitions of the shelf, respectively, are bottle bottom engaging abutments 33 comprising end wall portions which cooperate with the abutments 32 in limiting endwise movement of the bottles in the troughs during movement of the carrier head into cooperative relation with the conveyor 29.

The carrier head is mounted so as to be movable into raised position with the troughs of the shelf disposed horizontally at the station "A" to receive the bottles from the conveyor 4, then to move bodily in a horizontal plane away from the conveyor until the necks of the bottles are withdrawn from the pockets, then to tilt into a position with the troughs positioned in a substantially upright manner as at the station "B" alongside the conveyor 29, whereby the bottles in the troughs will be arranged in upright position preparatory to being transferred onto the conveyor 29. To this end, the carrier includes an elongated bracket 34 upon which the shelf is secured and having its ends provided with transverse bracket portions 35, respectively, with each bracket portion having a pin 36 at its forward end mounting a roller 37 which is slidably received in a horizontal guide groove 38 of a guide plate 39 mounted on the inner side of each side frame 3. At the rear end of each bracket portion 35 adjacent the rear side of the shelf, is a pin 40 mounting a roller 41 slidably received in a guide groove 42 provided in each guide plate 39 and comprising a horizontal groove portion 43 extending toward the rear ends of the side frames 3 and continuing downward into a vertical groove portion 44. The rollers 37 and 41 of the bracket portions and the guide groove portions 38 and 43 are so arranged to guide the shelf bodily in a horizontal plane when it is moved away from the conveyor 4 until the necks of the bottles on the shelf are withdrawn from the pockets of the conveyor, whereupon on continued movement of the carrier the rear side of the shelf will be guided downward by the rollers 41 riding in the vertical groove portions 44 to cause the shelf to tilt into vertical position as mentioned. Each guide groove portion 38 of the guide plates continues rearwardly into a downwardly curved groove portion 45 to maintain effective guiding engagement with the rollers 37 of the carrier as same is raised.

The carrier head is operably connected with the power shaft 15 to be raised and lowered in timed relation with the operation of the conveyor 4, whereby it is caused to dwell in raised position at the station "A" sufficiently to receive the bottles from the conveyor, and whereby it is caused to dwell in lowered position for a time to permit the bottles to be transferred onto the conveyor 29. To this end, a lever 46 is fulcrumed on the inner side of each side frame 3, as at 47, with the free ends of the levers being slotted as at 48, to receive the rollers 41 of the bracket portions 35, respectively, so as to have sliding connection therewith as the levers are oscillated in unison to raise and lower the carrier head.

The levers 46 are oscillated in unison by similar cams 49 mounted on the power shaft 15 with each cam having a suitably formed cam groove 50 receiving, so as to operate, a roller 51 on one arm portion of an oscillating bell-crank lever 52 pivotally mounted, as at 53, on each side frame 3, and the other arm portion of each bell-crank having pivotal connection with one of the levers 46, to oscillate same, by means of a connecting link 54.

The discharging conveyor 29 is in the form of an endless link-belt mounted to extend alongside the carrier head 28 when same is in its lowered position, as at the station "B", with the upper active stretch 56 of the belt arranged in register with the end wall portions 33 of the shelf so that the bottles resting on said wall portions may be transferred laterally from the head and onto the conveyor. The link-belt comprises a sprocket chain 57 whose links are provided with cleats 58, and is supported over an idler sprocket 59 loosely mounted on a shaft 60 secured at its ends in bearings 61 of the upright forked portion 62 of a bracket 63 mounted on the inner side of one of the side frames 3. The upper stretch of the link-belt is guided and supported on spaced guide rails 64 supported on the bracket 63 and on a similar bracket 65 mounted on the other side frame. The rails 64 may continue beyond the machine to any length to support the belt as same conveys bottles to a station to be removed by hand or brought into cooperative relation with a filling machine for filling. Although not shown, it will be understood that suitable means may be employed to drive the conveyor 29 so that one row of bottles is conveyed from the machine before a succeeding row of bottles is placed on the conveyor.

Mounted on and extending between the brackets 63 and 65 is an elongated support or

channel piece 66 for supporting the lower stretch of the link-belt.

For transferring the bottles from the carrier 28 to the conveyor 29, an ejector head 67 is employed and comprises a flat bar 68 mounted across the top ends of two oscillating arms 69 secured to a horizontal shaft 70 rotatably mounted in bearings of the side frames 3. Mounted on the bar 68, to extend laterally thereof, are pairs of bottle ejector plates 72 which are so arranged whereby each pair is caused to project through an opening 73 in the bottom of the shelf, between its partitions 31, so that the bottles on the shelf are engaged by the plates and transferred onto the conveyor 29, as the arms 69 are oscillated when the carrier head is in its lowered position. The pairs of ejector plates have straight bottle engaging end portions 74 which properly position the bottles on the conveyor 29 at the end of the active stroke of the ejector head, as seen in Fig. 1.

The shaft 70 is operably connected with the power shaft 15 to operate the ejector head in timed relation with the operation of the carrier head 28, by means of an arm 75 secured to the shaft 70 and having its free end pivotally connected with one end of a connecting rod 76 whose other end is provided with a slotted head 77 through which the power shaft extends with suitable means guiding the head for sliding movement thereon, and on the end of the head 77 is a roller 78 having engagement with a cam 79 mounted on the power shaft and formed to operate the ejector head in the manner mentioned. The roller 78 is yieldably held in engagement with the cam 79 by means of a weight 80 secured across the ends of arms 81 on the shaft 70, so that the weight effects the active stroke of the ejector head as controlled by the cam 79.

As the bottles are transferred from the carrier head onto the conveyor 29 by the ejector head 67, they are urged against a yieldable guide 82 which slightly yields when initially engaged by the bottles, and then returns to its normal position as the ejector head is retracted to insure proper alignment of the bottles on the conveyor. Said yieldable guide comprises a pair of horizontal vertically spaced guide rails 83 disposed along the outer edge of the conveyor 29 and being mounted on brackets 84 mounted for adjustment on the top ends of upright arms 85 secured to a horizontal shaft 86 extending under the channel piece 66 and oscillatably mounted at its ends in bearings 87 of the brackets 63 and 65, respectively. The rails 83 are resiliently urged into position by force of gravity acting upon a weight 88 secured on a lever 89 mounted on the shaft 86, and the arms 85 having abutment portions, as at 90, for contact with the channel piece 66 to limit inward movement of the rails.

Along the inner side of the conveyor 29, opposite the guide rails 83, is a retractable guard 91 for confining the bottles on the conveyor after they have been transferred thereon, and wherein the guard is arranged to retract out of the path of the bottles as they are transferred from the carrier head onto the conveyor. The said guard comprises an elongated horizontally extending upright plate 92 disposed at the inner side of the conveyor 29 and being suitably secured at its ends to the upper portions of upright bars 93 mounted for vertical reciprocation to raise and lower the plate, wherein each bar has two vertically aligned guide slots 94—94, within which are received for sliding connection, bolts 95—95, secured to the inner support rail 64 and the channel piece 66, respectively. The guard plate is resiliently held in raised position by each bar being connected at its lower end with one end of a sprocket chain 96 which passes over an idler sprocket 97 rotatably mounted on a stud 98 of the adjacent side frame 3, and at the other end of the chain is secured a weight 99 to overcome the weight of the guard plate structure.

The upper end of each bar 93 is formed with a lateral projection 100 which projects into the path of the end wall portion 33 at an end of the shelf, as same is lowered, so as to be engaged thereby to depress the guard plate out of the path of the bottles when they are transferred from the shelf and onto the conveyor 29.

The top edge of the guard plate is formed with a lateral projection or flange 101 to provide a bridge over which the bottles pass from the shelf to the conveyor 29 when the plate is lowered, as seen in Fig. 1.

It may be mentioned that the power shaft 15 is adapted to be driven by any type of motor with a driving gear (not shown) arranged to drive a driven gear 102 secured on the power shaft.

Having thus described my invention, I claim:

1. In a machine of the class described, the combination with means to position a container at a given station with a pocket to receive an end portion of the container, of means to transport the container from the station including a movable carrier head located at the station with means thereon to receive the container and confine same against endwise displacement on the head, and means to move the carrier head to and from the station so that the head is moved bodily away from the pocket in a plane paralleling its axis at least while the end of the container is removed from the pocket.

2. In a machine of the class described, the combination with means to convey containers with extended necks to a given station in reclining position with a pocket to snugly receive a neck portion of a container, of means to transport a container from the station and discharge same in upright position including a movable carrier head located at the station with a recess formed to laterally receive the body portion of the container and confine same from endwise displacement on the head, and means to move the carrier head from the station to a position to right the container thereon so that the head is moved bodily in a plane paralleling the axis of the pocket at least while the neck of the container is removed from the pocket.

3. In a machine of the class described, the combination with conveyor means to convey containers with extended necks to a given station in horizontal position with a pocket to snugly receive the neck of a container, of means to transport a container from the station and discharge same in upright position including a movable carrier comprising a shelf located in horizontal position at the station being adapted to receive a container and having means to prevent endwise displacement thereof, and means to move the shelf from horizontal position to a substantially upright position so that same is moved bodily from the pocket in a horizontal plane while the neck of the container is removed from the pocket.

4. The structure as defined in claim 3, wherein the last means includes stationary guide means constraining one side of the shelf to move in a horizontal plane while the neck of the container is removed from the pocket then to move in a

vertical plane while the shelf tilts to an upright position.

5. The structure as defined in claim 3, wherein the last means includes stationary guide means constraining both sides of the shelf to move in a horizontal plane while the neck of the container is removed from the pocket then with one side continuing in a vertical plane while the shelf tilts to an upright position.

6. The structure as defined in claim 3, wherein the last means includes stationary guide means constraining one side of the shelf to move in a horizontal plane while the neck of the container is removed from the pocket then to continue in a vertical plane while the shelf tilts comprising a guide plate having a guide groove with a horizontal portion continuing into a vertical portion, and means connected with the shelf and slidably received in the groove.

7. The structure as defined in claim 3, wherein the last means includes stationary guide means for guiding the shelf comprising a guide plate having a guide groove with a horizontal portion continuing into a vertical portion, means on the shelf slidably received in the groove, and an oscillating lever having sliding connection with the shelf to operate same.

8. The structure as defined in claim 3, wherein the last means includes stationary guide means for guiding the shelf comprising a guide plate having a guide groove with a horizontal portion continuing into a vertical portion, a pin on the shelf in sliding connection in the groove, and an oscillating lever having sliding connection with the pin to operate the shelf.

9. In a machine of the class described, the combination with a horizontal conveyor for conveying containers in single order from the machine, a container carrier movable to raised and lowered positions and arranged to receive a row of containers in its raised position and place same at a station alongside the conveyor in its lowered position, and means to transfer the containers from the station laterally onto the conveyor, of means to confine the containers on the conveyor when the carrier is raised including a vertically movable guard disposed along the side of the conveyor adjacent the carrier with yieldable means maintaining same in raised position alongside the containers on the conveyor, and said carrier having cooperative engagement with the guard when lowered to lower same out of the path of the containers from the station to the conveyor.

IVAN H. RISSER.