Aug. 6, 1940. J. R. DOSTAL 2,210,530

BOTTLE-EJECTING AND DELIVERING MECHANISM

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Fig. 1.

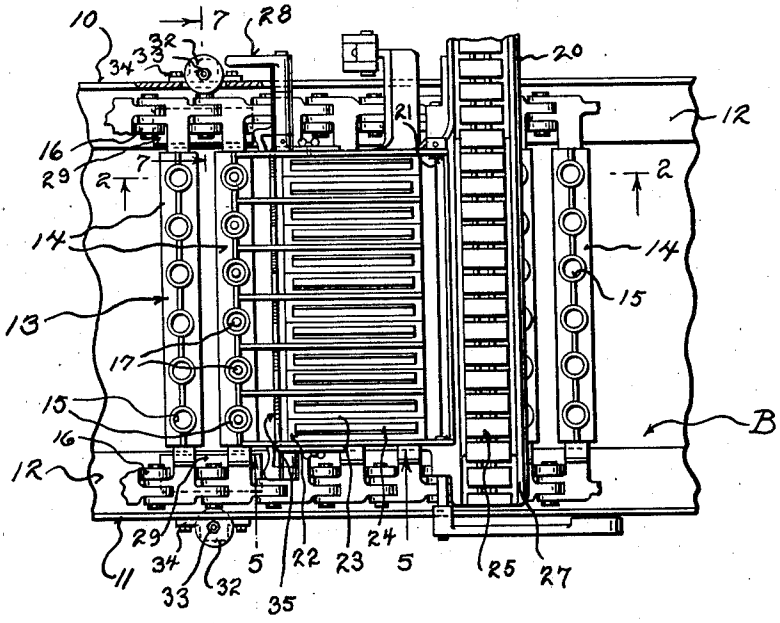


Fig. 2.

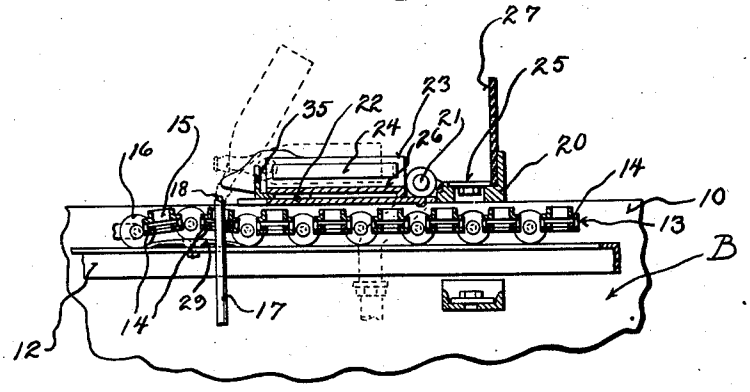
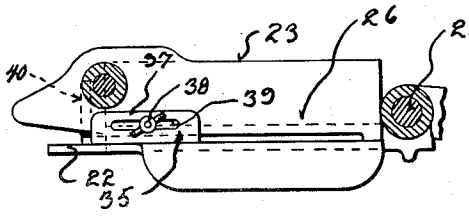


Fig. 5.



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Fig. 3.

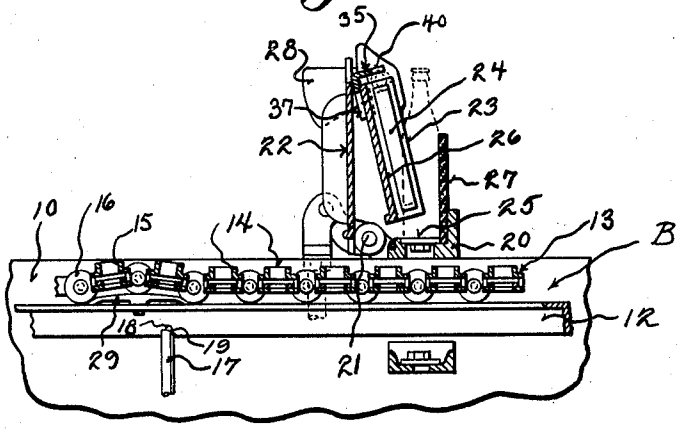


Fig. 6.

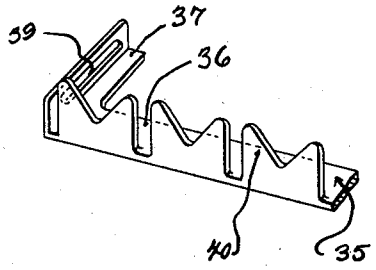


Fig. 4.

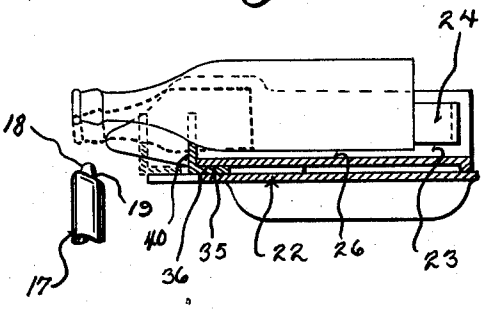


Fig. 8.

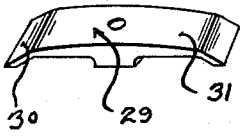
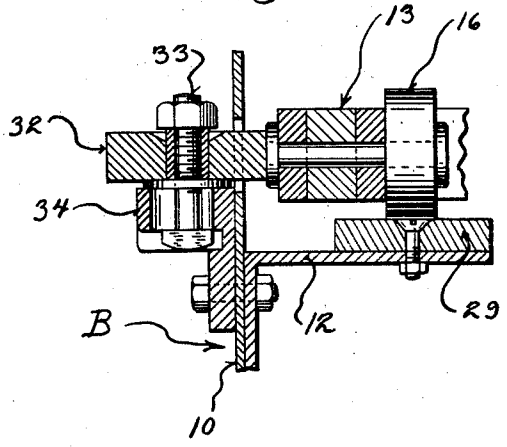


Fig. 7.



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Patented Aug. 6, 1940 2,210,530

UNITED STATES PATENT OFFICE

2,210,530

BOTTLE EJECTING AND DELIVERING MECHANISM

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Application May 15, 1940, Serial No. 335,281

8 Claims. (Cl. 198—20)

This invention appertains to bottle-washing machines, and more particularly to means for automatically receiving and carrying bottles from the machine after the washing operation, and is an improvement over my application Serial No. 237,872, filed October 31, 1938, now Patent No. 2,191,227.

One of the primary objects of my present invention is to provide means for positively holding and alining a transverse row of the bottle neck receiving sockets or cups carried by a conveyor flight with the row of ejecting plungers, whereby to insure the proper entrance of the plungers into the sockets or pockets for elevating and tilting the bottles toward the transfer table or cradle.

In bottle-washing machines, there is considerable play between the endless conveyor, which carries the bottles during the washing operation, and the guide tracks therefor carried by the side walls of the machine, and between the flights of the conveyor themselves. This often results in slight improper alining of the cups or sockets for the bottle necks with the ejecting plungers. Therefore, it is a prime object of the invention to provide transversely alined guide and holding rollers carried by the sides of the machine above the conveyor guide tracks for engaging the opposite sides of a conveyor flight directly above the ejecting plungers, whereby to hold the flight properly centralized and to prevent side play between the conveyor flight and the walls of the machine, whereby proper movement of the ejector plungers through the sockets, cups, or pockets is assured.

As pointed out in my mentioned patent, an important feature is the formation of the ejector plungers, so as to cause the tilting of the bottles toward the transfer table or cradle. However, in spite of this novel formation of plunger, some bottles (possibly due to irregular neck formation) will tilt in the wrong direction.

It is, therefore, another salient object of my invention to provide inclined cam shoes for engaging the conveyor, whereby to cause the conveyor flight positioned above the ejector plungers to tilt toward the transfer table or cradle, so that when the specially constructed plungers engage and raise the bottles, the tilting and falling thereof on the table or cradle is insured.

Likewise, in my mentioned patent, the transfer table or cradle was built to successfully handle bottles of varying sizes (such as from twelve-ounce bottles to twenty-four or thirty-six-ounce bottles). However, where the bottles were of a very small size (such as miniature or individual bottles commonly employed for grape juice, tomato juice, and the like), the same would fall off the front of the transfer table or cradle prior to the swinging of the table or cradle.

A further important object, therefore, of my present invention is the provision of an adjustable member associated with the transfer table or cradle in a novel manner, whereby the same can be brought instantly into play when small bottles are being washed, so that these bottles can be properly held on the transfer cradle or table against falling off the same.

With these and other objects in view the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawings, in which drawings:

Figure 1 is a fragmentary, top, plan view of a bottle-washing machine, illustrating the delivery end thereof, and showing my novel features incorporated therewith.

Figure 2 is a fragmentary, longitudinal, sectional view through the machine, taken on the line 2—2 of Figure 1, looking in the direction of the arrows, showing the conveyor flight positioned above the ejecting plungers tilted toward the transfer table.

Figure 3 is a view similar to Figure 2, but showing the movement of the transfer table or cradle for positioning the bottles upright on the conveyor for carrying the bottles from the machine.

Figure 4 is an enlarged, fragmentary, detail, sectional view through the transfer table or cradle, illustrating the adjustable means associated therewith for permitting the handling of miniature bottles thereby.

Figure 5 is a detail, sectional view through the transfer table or cradle, taken on the line 5—5 of Figure 1, looking in the direction of the arrows, illustrating the means for adjustably holding the small bottle attachment on the table or cradle.

Figure 6 is a fragmentary, detail, perspective view of the small bottle attachment per se.

Figure 7 is an enlarged, fragmentary, transverse, sectional view taken through the machine on the line 7—7 of Figure 1, looking in the direction of the arrows, illustrating the means for properly alining and holding a conveyor flight above the ejecting plungers.

Figure 8 is a detail, perspective view of one of the cam shoes employed for tilting the conveyor

flight positioned above the ejecting plungers toward the transfer table.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter B generally indicates one form of a bottle-washing machine, and it is to be understood that the various features of my present invention are applicable to numerous types of bottle-washing machines.

The machine B, as in the ordinary construction of machines now on the market, embodies a longitudinally extending casing having side walls 10 and 11 carrying guide tracks 12 for the endless bottle conveyor 13. This endless bottle conveyor 13 includes a plurality of transversely extending flights 14, which are pivotally connected together. Each of the flights 14 are provided with equidistantly spaced pockets, sockets, or cups 15 for the reception of the necks of inverted bottles. The cups or sockets are of such a form as to allow cleansing fluid to be sprayed into the bottles by stationary nozzles as the flights travel over the nozzles.

The portion of the bottle machine illustrated constitutes the discharge end where the bottles are removed after the same have passed through the machine and have been subjected to the various cleansing operations. The conveyor 13 can also include guide rollers 16 for the rails of the guide tracks 12. The endless conveyor is moved intermittently over the tracks, and the means for intermittently feeding the conveyor forms no part of the present invention and is well known to those skilled in the art. Hence, the feeding means has not been illustrated and will not be described.

At a suitable point in the machine where it is desired to remove the bottles, following the washing operations, a plurality of transversely alined plungers 17 are normally disposed below the top run of the conveyor, and when a flight is stopped, the plungers 17 are adapted to move upwardly through the sockets or cups in the flight which has been stopped directly above the same.

The plungers 17 can be carried in any desired manner and can be operated in any preferred way, and it is to be understood that these plungers can be operated in the same way as shown in my patent, which means simultaneously elevates and lowers the plungers when the alined flight is at rest between its intermittent movement.

As shown in Figure 4, the upper ends of the plungers 17 are provided with nozzles 18, which extend into the mouths of the bottles to aline the same on the plungers. The plungers are cut away on one side, as at 19, so that as the necks of the bottles are elevated by the plungers above the sockets or cups 15, the bottles will tilt in the direction of the cut-away portion, as indicated in dotted lines in Figure 2 of the drawings. Positioned adjacent the plungers 17 is a bottle-transfer mechanism, which can be of the same type as shown in my patent. Hence, the transfer mechanism includes a transversely extending support 20 rigidly connected with the casing of the machine. Pivotally connected to the support, as at 21, and normally resting thereon is the swinging transfer table 22. This table carries a plurality of bottle-receiving troughs 23, which are positioned in longitudinal alinement with the bottle neck receiving cups or sockets 15. The inner faces of the troughs 23 are preferably lined with rubber pads 24 for receiving the bottles from the plungers 17, as indicated in dotted lines in Figure 2. Directly in rear of the table 22 is the transversely extending delivery conveyor 25.

Considering now the operation of the plungers 17 and the transfer mechanism, it will be understood that the same are coordinated with the intermittent movement of the conveyor 13, being actuated from the same source, and as this mechanism is clearly described and illustrated in my patent, the same has not been shown or described in the present case. However, it can be seen that upon the elevation of the plunger 17 the bottles will be raised from the cups or sockets of the conveyor flight, and, as the necks are released, gravity will cause the bottles to tilt and be deposited upon the transfer table 22. The table is then elevated on its pivotal connection to the position shown in Figure 3, which causes the bottles to gradually slide downwardly in the troughs onto the conveyor 25. The table carries the tilting carriage 26 for shoving the bottles against the rubber abutment wall 27 arranged along one side of the conveyor 25. The tilting carriage 26 is normally urged toward the wall 27 when the table is in its raised position by the weights 28. This tilting construction is also shown in the patent.

In some instances, possibly due to irregularities in bottle necks, the bottles tilt to one side or the other and do not fall into the troughs 23 of the table 22 upon the raising of the plungers 17. In accordance with my present invention, I secure upon the tracks 12 rigid cam shoes 29. These cam shoes are arranged in transverse alinement and include front inclined approaches 30 and downwardly inclined rear faces 31. The rearwardly inclined faces 31 are positioned in transverse alinement with the ejecting plungers 17.

Hence, as the flights 14 of the conveyor 13 ride up upon the cam shoes and then reach the downwardly inclined rear faces 31, the flight resting upon the inclined rear faces 31 will tilt toward the transfer table.

Thus, before the bottles are released from the cups or sockets 15, the same are already in a correct tilted position, and, consequently, upon the raising of the ejecting plungers, as shown in Figure 2, the bottles will be raised from the cups or sockets in their tilted position toward the transfer table by the shape of the upper ends of the plungers. Consequently, by providing the cam shoes 29, the correct tilting and falling of the bottles into the troughs on the transfer table is assured.

Due to play in the conveyor 13 and play between the conveyor and the tracks 12 and the side walls 10 of the casing, it so happens that in some instances the flights, as they stop in their movement, will not be properly alined with the plungers 17 or with the troughs on the transfer table. In order to bring about the guiding of the flights to a correct position and the holding of the flights against movement during the operation of the ejecting plungers, I provide guide and steadying rollers 32 on each side of the casing of the machine. These rollers 32 are disposed in a horizontal plane and are rotatably mounted upon stud bolts 33 carried by brackets 34 bolted or otherwise secured to the outer faces of the side walls 10 of the casing. These rollers are arranged in transverse alinement with one another and with the centers of the cam shoes 29. Consequently, the rollers 32 will engage the pivot studs employed for connecting adjacent flights 14 together, and as the rollers 32 engage the opposite sides of the conveyor, the flights will

be held firm and will be centralized relative to the troughs 23 of the transfer table and the ejecting plungers 17.

The bottle-washing machines have the transfer tables so constructed as to handle bottles of varying sizes. Generally, bottles run from twelve-ounce to quart sizes and larger. The transfer tables will effectively handle bottles of these sizes. However, where it becomes necessary to wash miniature or small individual bottles, such as are employed by grape juice and tomato juice manufacturers, the transverse center of such small bottles will be disposed in advance of the forward edge of the transfer table. Thus, such small bottles will be overbalanced at their front ends, and will fall off the transfer table.

In accordance with my invention, I provide means 35 associated with the transfer table for supporting relatively small bottles, so that the transfer table can effectively handle such bottles.

By referring to Figures 4 to 6, inclusive, it will be seen that such means 35 includes a plate 36, which extends transversely across the machine at the front of the transfer table. The ends of the plate 36 carry rearwardly extending, angle-shaped arms 37. The plate and the arms are adapted to slide in and out on the table, and are held in an adjusted position by means of adjustable bolts 38, which extend through the sides of the tilting carriage 26 and through slots 39 formed in the angle-shape arms 37.

The front edge of the plate 36 carries upstanding, V-shaped, supporting guards 40. These V-shaped guards 40 are disposed directly in front of and in alinement with the V-shaped troughs 23.

In Figure 4, a small bottle is shown in dotted lines, and in order to support this small bottle, the member 35 is slid forwardly so that the V-shaped supports 40 will rest under the bottle necks. Obviously, then, the bottle necks and the bodies of the bottles will be supported, and the small bottles will not rock or tilt on the transfer table. During the handling of large bottles, the supporting mechanism 35 can be slid in on the transfer table against the forward edge of the tilting carriage 26.

From the foregoing description, it can be seen that I have provided novel means for insuring the proper tilting of the bottles toward the transfer carriage or table and the proper holding of the conveyor flights relative to the ejecting plungers and the troughs on the transfer table, and that I have also provided novel means for permitting the handling of miniature bottles by the transfer table.

Changes in details may be made without departing from the spirit or the scope of my invention, but what I claim as new is:

1. In a bottle-washing machine including an intermittently movable conveyor provided with hollow sockets for the reception of the necks of inverted bottles, said conveyor having a horizontal run, a bottle-delivery mechanism comprising, a delivery conveyor, a plurality of plungers for projecting bottles from the sockets, a transfer mechanism for receiving the ejected bottles and for depositing the same upon the delivery conveyor, and means for tilting a part of the horizontal run of the intermittently movable conveyor intermediate the ends of the horizontal run and adjacent the transfer mechanism for causing the sockets in front of the transfer mechanism to tilt toward said transfer mechanism, whereby upon the lifting of the bottles by the plungers in the tilted sockets the bottles will fall on said transfer mechanism.

2. In a bottle-washing machine including an intermittently movable conveyor having a plurality of pivotally connected flights said conveyor having a horizontal run, each of the flights having bottle neck receiving means, a bottle-delivery mechanism extending transversely across the conveyor, means for raising the bottles out of the bottle neck receiving means on the flights, a transfer mechanism for receiving ejected bottles and depositing the same upon the delivering mechanism, and means for tilting the flights of the horizontal run of the conveyor intermediate the ends of the horizontal run toward the transfer mechanism as the flights come to rest in front of the transfer mechanism, whereby upon the raising of the bottles in the tilted flights the bottles will fall on said transfer mechanism.

3. In a bottle-washing machine including an intermittently movable conveyor provided with a plurality of pivotally connected flights having hollow sockets for the receiving necks of inverted bottles, a bottle-delivery mechanism extending transversely across the machine, a plurality of plungers for projecting bottles from said sockets, a transfer mechanism for receiving the ejected bottles and for depositing the bottles upon the delivering mechanism, and cam shoes arranged in transverse alinement disposed on opposite sides of the machine for tilting the flights toward the transfer mechanism as the flights come to rest in front of said transfer mechanism.

4. In a bottle-washing machine including an intermittently movable conveyor provided with flights having hollow sockets for the reception of inverted bottles, a bottle-delivering mechanism extending transversely across the conveyor, means for ejecting bottles from the sockets, means for receiving the ejected bottles and for depositing the same upon the delivering mechanism, and means arranged in front of the receiving means projecting toward and engaging the ends of a flight directly in front of the receiving means for centering and holding the flights relative to the ejecting mechanism and the transfer mechanism as the flights come to rest in front of the transfer mechanism.

5. In a bottle-washing machine including an intermittently movable conveyor provided with a plurality of pivotally connected flights having hollow sockets for the reception of inverted bottles, a bottle-delivery mechanism extending across the conveyor, a plurality of plungers for projecting bottles from said sockets, a transfer mechanism for receiving the ejected bottles and for depositing the bottles upon the delivery mechanism, and guide and centering rollers carried by the opposite sides of the machine and arranged in transverse alinement in front of the transfer mechanism projecting toward the sides of the conveyor and engaging the opposite sides of the conveyor for holding a flight with its sockets properly centered in front of the transfer mechanism.

6. In a bottle-washing machine including an intermittently movable conveyor provided with a plurality of pivotally connected flights having hollow sockets for the reception of inverted bottles, a bottle-delivery mechanism extending across the conveyor, a plurality of plungers for projecting bottles from said sockets, a transfer mechanism for receiving the ejected bottles and

for depositing the bottles upon the delivery mechanism, guide and centering rollers carried by the opposite sides of the machine and arranged in transverse alinement for engaging the opposite sides of the conveyor for holding a flight with its sockets properly centered in front of the transfer mechanism, and means for tilting the flight centered by said rollers.

7. In a bottle-washing machine, a movable conveyor for receiving bottles being washed, a bottle-delivering mechanism extending across the conveyor, means for ejecting bottles from the conveyor, a transfer mechanism including a table having a plurality of troughs for receiving the ejected bottles and for depositing the same upon the delivering mechanism, means on the front of the table for engaging the necks of the bottles, and means for adjustably supporting said bottle neck-engaging means on the table.

8. In a bottle-washing machine, a movable conveyor for receiving bottles being washed, a bottle-delivering mechanism extending across the conveyor, means for ejecting bottles from the conveyor, a transfer mechanism including a table having a plurality of troughs for receiving the ejected bottles and for depositing the same upon the delivering mechanism, and means for adjusting the table for receiving various sizes of bottles, including a plate, rearwardly extending arms engaging the opposite sides of the table, means adjustably connecting the arms to the table, and V-shaped supports on the front edge of the plate movable with the plate and arms toward and away from the troughs.

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