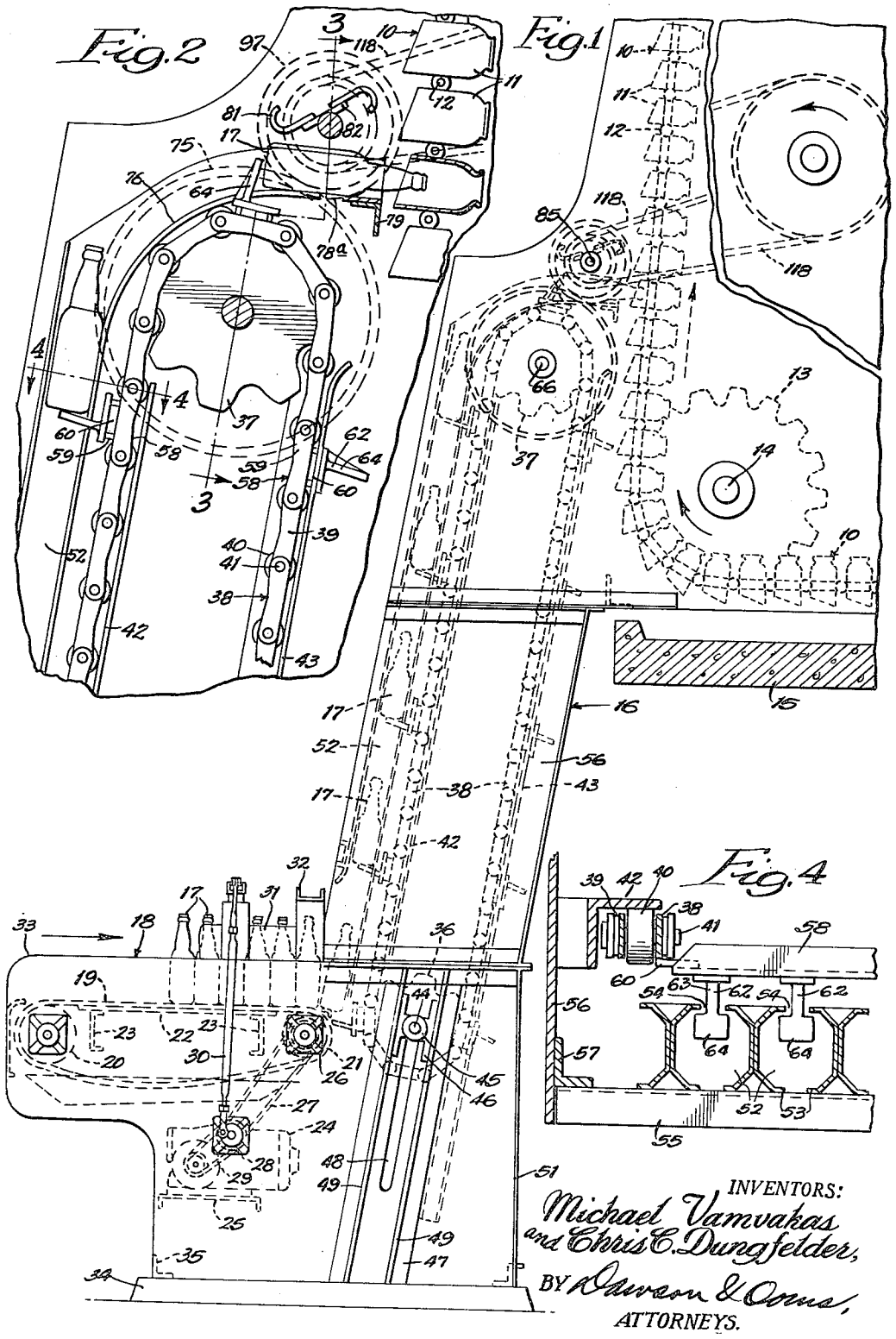
Oct. 9, 1956 M. VAMVAKAS ET AL 2,765,897

CONTINUOUS ELEVATING BOTTLE FEED MECHANISM

Filed Aug. 22, 1952

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

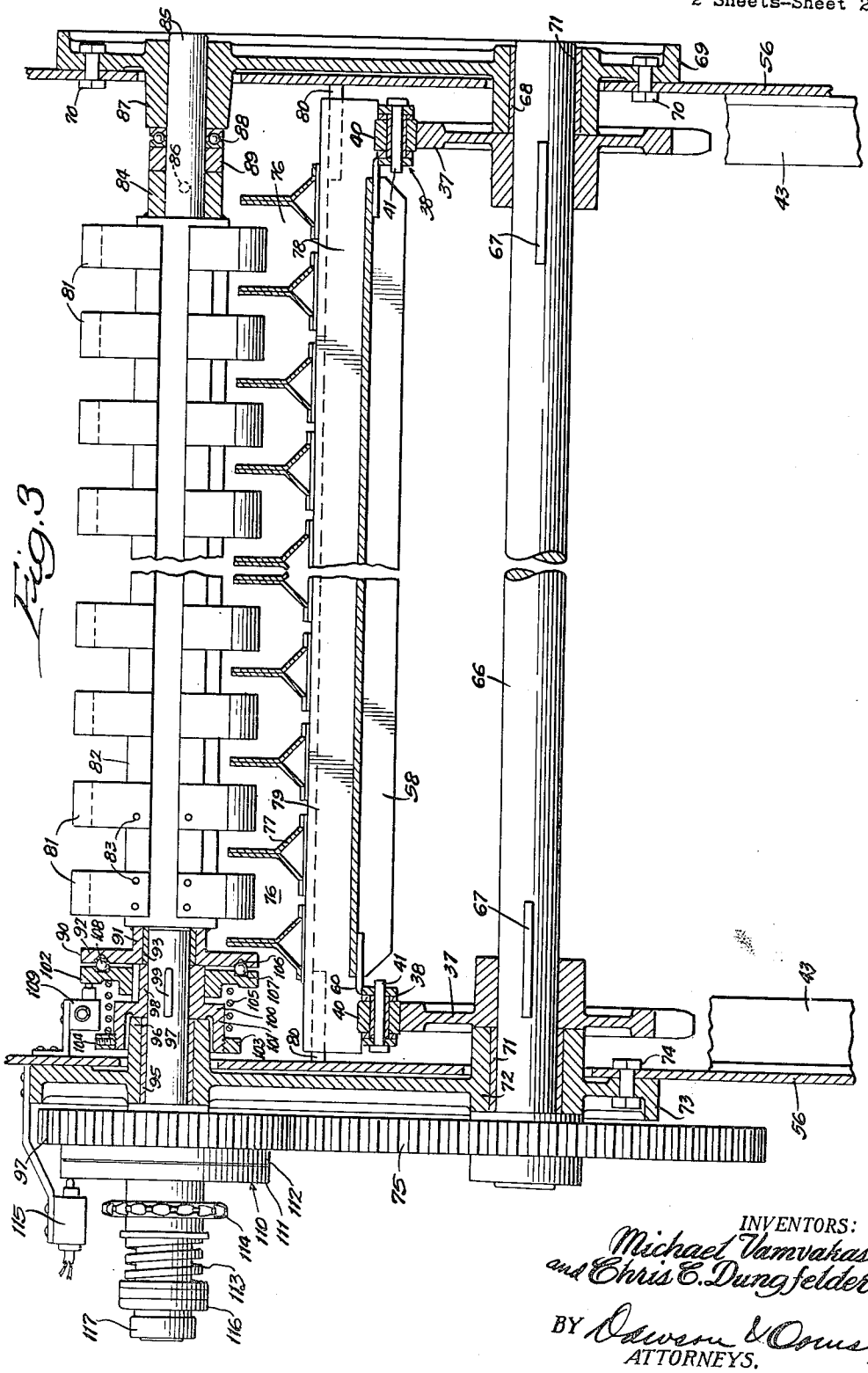


Fig. 3

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CONTINUOUS ELEVATING BOTTLE FEED MECHANISM

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Application August 22, 1952, Serial No. 305,808

11 Claims. (Cl. 198—25)

This invention relates to a continuous bottle feed mechanism and more particularly to a continuous bottle infeed mechanism wherein a bottle elevator lifts bottles from a lower level to an upper level or floor where they are fed into bottle carrier pockets provided in a conditioning line. A conditioning line might be, for example, a bottle washer, pasteurizer, etc. This application is a continuation-in-part of co-pending application Serial No. 291,256.

In bottle conditioning installations, bottle washers for example, it is a frequent requirement that the bottle washer be located on a level or floor above the bottle feed table. The feed table may be a continuously moving conveyor carrying bottles from a discharge or unloading station to a point below the washer. Where plants require this type of installation, special bottle washers are employed having greatly lengthened carrier chains and having a depending loop extending downwardly to the floor below and adjacent the feeder table. This arrangement is very disadvantageous, since the units must be specially designed and constructed and the increased length of the bottle carrier chains requires that they be of much stronger construction than ordinarily. The increased length of the carrier chain must be provided with bottle carrier pockets, and the excess weight caused by the extra length and the carrier pockets unduly loads the washer driving mechanism. Further, ratchets, levers, etc., must be added to balance the increased load, and the extra chain length and increased load results in added over-all stretch of the chains which adversely affects the bottle centering with respect to the rinsing spindles, etc. Moreover, the movement of the carrier chains and bottle pockets to a lower or basement level after having passed through the washing baths is accompanied by the dripping of water therefrom, and enclosures and drains must be provided to confine and remove water deposits. All of these factors create serious problems, and washers of this type are cumbersome, difficult to install, and are very expensive.

It is an object of this invention, then, to provide a bottle feed mechanism having elevating means for lifting bottles from a lower level to an upper level and that overcomes all of the disadvantages described. Another object of the invention is to provide a self-contained continuous bottle elevating mechanism adapted for use with conventional conditioning lines. Still a further object is to provide a continuous bottle feed mechanism having a bottle elevator for raising bottles from a lower to an upper floor level. Yet another object is to provide a continuous bottle feed elevator for use with bottle washers and the like that can be disposed at various vertical angles with respect to the bottle washer so as to provide installation flexibility.

It is a further object to provide a continuous bottle infeed mechanism having a depending elevator leg and in which bottles are raised by bottle rests or lifting fingers through substantially vertical guides from an infeed conveyor mounted on a lower or basement floor level to an upper floor level and then through arcuate guides or troughs where rotary pusher fingers nudge the bottles into carrier pockets provided by a conditioning line carrier that may be continuously moving. Still a further object is that of providing a continuous bottle infeed having an elevator leg in which a plurality of spaced bottle lifting finger banks are carried by elevator chains; each bank having a plurality of spaced-apart lifting fingers extending in horizontal alignment and adapted to raise a plurality of bottle from an infeed conveyor to a floor level thereabove and then through arcuate guides where a plurality of rotary pusher fingers, a pair for each arcuate guide, push the bottles into a bank of carrier pockets. Further objects and advantages of the invention will appear as the specification proceeds.

A specific embodiment of the invention is illustrated in the accompanying drawing, in which—

Figure 1 is a broken side view of the bottle feed mechanism; Fig. 2 is an enlarged broken side view of the upper portion of the elevator and the pusher fingers; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2; and Fig. 4 is a broken sectional view taken on line 4—4 of Fig. 2.

Our continuous bottle feed mechanism can be used with any double end washer or conditioner wherein bottles are fed into the conditioner at one end and are removed from the conditioner at the opposite end. The bottle carrier provided by the washer may be driven intermittently or, preferably, continuously. In Fig. 1, a bottle carrier 10 provided by a bottle washer or other conditioning apparatus is equipped with a plurality of bottle-receiving pockets 11. A plurality of pockets 11 may extend across or transversely of the washer in spaced-apart, side-by-side relation forming banks of pockets mounted longitudinally of the carrier in spaced-apart relation upon bearings and chain links 12 to permit pivotal movement of the pocket banks. The bottle carrier 10 may be driven by a sprocket 13 keyed or otherwise secured to a shaft 14. Any suitable means may be employed to drive the shaft 14, such as an electric motor (not shown). Bottle carriers of this type are well known in the art and a detailed discussion of the structure is therefore not thought necessary.

The bottle washer is mounted upon an upper floor level 15 and extending downwardly from the bottle washer to a lower or basement level is a bottle elevator designated generally by the numeral 16. The elevator 16 raises bottles 17 from an automatic infeed conveyor 18 upwardly to a position adjacent the carrier pockets 11 provided by the bottle washer.

The automatic infeed conveyor 18 consists of a conveyor belt 19, which may be of any well known and suitable type, entrained about a pair of spaced rollers 20 and 21. The conveyor belt 19 glides over a support table 22 mounted upon brackets 23. A motor 24 mounted upon a bracket 25 drives the roller 21 through a sprocket 26 secured thereto, by means of a chain 27. The motor 24 also drives a sprocket 28 through a chain 29 which in turn oscillates a shaft 30 connected to the sprocket 28 off center, which oscillates vanes 31 which engage the bottles 17 on the conveyor belt 19 and thereby prevent jamming of the bottles, etc. The bottles 17 are carried by the conveyor belt 19 into stationary or primary bottle guides 32 mounted at the inner end of the conveyor and adjacent the elevator 16. A guard 33 prevents the bottles 17 from falling off of the conveyor belt 19. The conveyor 18 may be mounted upon a base plate 34 by brackets 35. Conveyors of this type are well known in the art and further discussion is not believed necessary.

The elevator 16 includes a lower pair of spaced idler sprockets 36 and a pair of aligned upper driven sprockets

37. Entrained about the sprockets 36 and 37 are a pair of elevator chains 38, one on each side of the apparatus. The chains 38 have links 39 joined by rollers 40 and pins 41. The teeth of the sprockets 36 and 37 engage the chains 38 between the rollers 40. Chain tracks 42 and 43 are provided for the elevator chains 38. The lower sprockets 36 are mounted upon an axle 44 rotatably mounted in a hub or bearing 45 equipped with H-shaped flanges forming brackets 46. Guides 47 provided with an elongated slot 48 and flange portions 49 receive the brackets 46. The axle 44 is received within the slots 48 and the brackets 46, and the axle 44 may be moved longitudinally within the guide or support 47 and provides a takeup for the elevator chain 38 and permits adjustment to satisfy the requirements of various installations. If desired, the elevator may be equipped with closure plates 50 and 51.

Mounted intermediate the elevator chains are a plurality of generally vertical bottle guides 52. The bottle guides 52 extend upwardly from adjacent the infeed conveyor 18 to a point adjacent the bottle washer infeed in parallel alignment. Each of the guides 52 is formed by a pair of angular brackets or spacers 53. The brackets 53 forming each of the guides 52 are spaced apart to provide a longitudinally-extending slot 54 throughout the entire length of the bottle guide. Adjacent brackets 53 may be secured together by any suitable means such as rivets, spot welding, etc. A bottle guide support 55 is secured to the side walls 56 of the elevator (seen best in Fig. 4). The support 55 may be mounted upon the walls 56 by brackets 57 or by any other suitable means. The brackets 53 may be welded or riveted to the support 55. Each of the bottle guides 52 is adapted to receive bottles and is sufficiently large to permit the bottles to move freely therethrough.

Secured to the chains 38 at desired intervals are U-shaped brackets 58 extending longitudinally between the chains. The brackets 58 provide inwardly-extending leg portions 59 and a flat face portion 60. The U-shaped brackets 58 provide a support or mounting for a plurality of spaced-apart lifting fingers 62 having a web portion 63 and a relatively flat bottle engaging or bottle rest support 64. Any suitable means may be employed to secure the lifting fingers 62 to the U-shaped brackets 58, such as welding, etc. The lifting fingers 62 are spaced axially along the flat face portion 60 and in alignment with the slots 54 provided by the bottle guides 52. The web portion 63 is adapted to be received within the slots 54 and to move freely therein, while the bottle rest portion 64 extends into the bottle guide 52 and is adapted to receive and support bottles therein. As noted in Fig. 1, the forward wall of the bottle guides and the bottle guide support 55 terminate at a sufficient height above the infeed conveyor 18 so as to permit the bottles 17 to move freely from the conveyor through the stationary or primary guides 32 over a dead plate 65 and into the bottle guides 52. The lifting finger assemblies should be secured to the elevator chains 38 at equal intervals equivalent to half of the pitch circumference of the drive sprockets 37.

Referring to Fig. 3, the upper drive sprockets 37 are locked upon a shaft or axle 66 by keys 67. The shaft 66 extends through a bearing 71 in a collar 68 which is integral with a bracket or hanger 69 secured to the wall 56 on the dead end or idle side of the washer by bolts 70. The opposite end of the shaft 66 is rotatably mounted in a similar bearing 71 within a collar 72. The collar 72 is provided by a bracket or hanger 73 secured to the wall 56 on the drive side of the washer by bolts 74. A gear 75 is mounted upon the end of the shaft 66 and is pinned or locked thereon so that rotation of the gear also drives the shaft.

A plurality of bottle guides or troughs 76 provided by angular brackets or spacers 77 abut the upper end of the bottle guides 52 and curve inwardly to a point adjacent the bottle carrier pockets 11. The brackets 77 forming

an arcuate guide 76 are spaced apart and provide a slot 78 extending longitudinally through the guides. The webs 63 of the lifting fingers ride through the slot 78 and a recess 78*a* is provided in each of the guides adjacent the discharge ends thereof to permit the enlarged support 64 of the lifting fingers to move from within the arcuate guides when the fingers are carried downwardly. Adjacent brackets 77 may be secured together by rivets or by welding. The brackets or spacers 77 are welded or otherwise secured to an L-shaped channel 79 mounted upon inwardly-extending bars or supports 80 rigidly fastened to the side walls 56. The lower ends of the brackets 77 providing the bottle guides or troughs 76 may be rigidly secured to the upper ends of the vertical bottle guides 52 and supported thereby. This structure is defined in more detail in our co-pending application, Serial No. 291,256.

It can be seen in Figs. 1 and 2 that the arcuate bottle troughs 76 terminate at their discharge end adjacent the bottle carrier 10 and that the bottles are nudged into the carrier pockets 11 by a pair of pusher fingers 81. A pair of pusher fingers 81 are provided for each of the bottle troughs 76 and are mounted in pairs and in spaced-apart relation along a support bar 82. The fingers 81 may be secured to the support member 82 by cap screws 83. A detailed description of the pusher fingers 81 and support therefor may be found in our co-pending application previously referred to.

On the idle side of the bottle washer, the support bar 82 is secured by welding to a collar 84 receiving a stub shaft 85 and locked thereto by a pin 86. The shaft 85 extends through a collar 87 provided by the bracket or hanger 69. A thrust bearing 88 is interposed between the collar 84 and the hub or collar 87 and a set collar or spacer 89 spaces the collar 84 from the bearing 88 and permits ready assembly and disassembly of the pusher finger unit.

On the drive side of the bottle washer, the support bar 82 is rigidly secured to a clutch plate 90 having a hub or collar portion 91 and a laterally-extending flange portion 92. The hub portion 91 is equipped with a bearing 93 rotatably receiving a shaft 94 therein. The shaft 94 is rotatably mounted in a bearing 95 provided by a hub or collar 96 with which the bracket or hanger 73 is equipped. The shaft 94 extends outwardly from the hanger 73 and has mounted thereon a gear 97 meshing with the gear 75 mounted upon the elevator shaft 66. Intermediate the inner end of the hub 96 and the clutch plate 90 is a sleeve 98 mounted upon the shaft 94 and locked thereon by a key 99. The sleeve 98 has formed integrally thereon a laterally-extending flange portion 100 terminating at one end with an outwardly-extending collar 101 which is threaded externally at one end.

A second clutch plate or flange 102 is mounted upon the sleeve 98 and is keyed thereon so that it is free to move axially but cannot rotate relative to the sleeve. The threaded end of the collar 101 is equipped with a nut 103 that may be locked upon the sleeve by a set screw 104. The nut 103 provides a stop for a coil spring 105 engaging the clutch plate 102 at its opposite end. The clutch plates 90 and 102 are each provided with four recesses 106 and 107 spaced apart upon the abutting surfaces or faces thereof. Steel balls 108 are mounted within the recesses and normally lock the clutch plates 90 and 102 so that they rotate together.

As the shaft 94 rotates, the sleeve 98 is driven in rotation thereby as well as the clutch plate 102 which is mounted thereon. The spring 105 urges the clutch plate 102 inwardly toward the mating clutch face 90 and the steel balls 108 are locked within the recesses 106 and 107. The clutch plate 90 is thereby driven in rotation and rotates the support bar 82 and the pusher fingers 81 mounted thereon. In the event the pusher finger assembly becomes locked and cannot rotate, the steel balls 108 are moved out of the recesses 106 which are cone-shaped to permit easy movement therefrom, and ride up

upon the face of the plate 92. The clutch plate 102 is moved outwardly or laterally thereby against the force exerted by the spring 105 and triggers a microswitch 109 which breaks the driving motor circuit and the bottle washer is shut down.

A similar clutch assembly 110 having mating clutch plates 111 and 112 is mounted adjacent the gear 97. A spring 113 normally urges the clutch plate 111 into engagement with the clutch plate 112 and permits the gear 97 and the shaft 94 to be driven by the sprocket 114. However, in the event the elevator mechanism locks, the clutch plate 111 moves outwardly and triggers the microswitch 115 and the driving motor circuit is broken and the apparatus is shut down. The structure and operation of the clutch 110 is identical with the clutch assembly previously described. Washers 116 and a set collar 117 provide a stop for the spring 113 and lock the parts on the shaft 94. The sprocket 114 may be driven through a chain 118 (Fig. 1) entrained about the bottle washer driving mechanism.

Operation

In operation, bottles to be washed or otherwise treated are fed onto the continuous conveyor belt 19 either mechanically or by hand and are carried thereby into the stationary bottle guides 32 and over the dead plate 65. The motor 24 drives the conveyor belt 19 and also operates the oscillating vanes 31. The bottle elevator 16 is driven through the gear 75 and upper sprockets 37 and carries the lifting fingers 62 past the dead plate 65, where the fingers engage a bottle and carry the bottle upwardly through the vertical guides 52 and finally through the arcuate guides or troughs 76 and into the discharge end of the guide. During this operation the enlarged forward portion or bottle rest support 64 moves through the elongated slot 54 in the bottle guide 52. When the lifting finger 62 moves free from the end of the bottle in the discharge end of the arcuate guide 76, the neck and greater portion of the bottle is partially within a bottle-receiving pocket 11 momentarily aligned with or slightly below the discharge end of the guide 76. The lifting finger 62 then moves downwardly through the recess 78*a* and is carried downwardly about the return portion of the carrier chain 38. In the meantime, subsequent lifting fingers 62 have picked up bottles fed over the dead plate 65 and are moving them upwardly toward the upper end of the elevator 16.

One of the pusher fingers 81 rotates downwardly engaging the bottle in the discharge end of the guide immediately after the lifting finger 62 releases the bottle. This pusher finger moves the bottle still further into the bottle-receiving pocket 11 and then becomes disengaged from the end of the bottle. The other or second pusher finger 81 rotates into engagement with the end of the same bottle and urges or nudges it completely into the bottle pocket. During this time the bottle-receiving pocket 11 has moved from the position in which it was generally aligned with the end of the arcuate guide 76 to a position thereabove and in which the next or subsequent bottle pocket is in general alignment with the discharge end of the guide.

It is seen, then, that the pusher fingers 81 each engage the same bottle and together move each bottle completely into the carrier pocket 11. For this purpose, both of the pusher fingers 81 are mounted on the same side of the support bar 82. In effect, the pusher fingers move upwardly with the bottles and gently urge them into the bottle-receiving pockets without damaging the bottles by scarring, scuffing, etc.

If a broken bottle becomes lodged in a bottle-receiving pocket 11, or for some other reason the apparatus becomes jammed, the balls 108 move out of the cone-shaped recesses 106 and onto the face of the flange 92 forming a part of the clutch plate 90. The clutch plate 102 is moved laterally thereby and triggers the microswitch 109 and the motor driving circuit is deactuated. In the same manner, if a bottle becomes wedged in the vertical bottle guides 52, or for some other reason the elevator 16 jams, the bottles in the clutch 110 are forced out of their recesses and the clutch plate 111 moves laterally to actuate the microswitch 115, and the circuit to the driving motor will be deactuated and the apparatus will shut down.

The continuously moving lifting fingers 62 successively enter the generally vertical bottle guides 52 and there engage bottles that have been fed into the guides in a generally vertical position by the continuous infeed conveyor 18. The lifting fingers gently raise the bottles through the vertical guides and through the arcuate troughs 76 and into a position at the discharge end of the arcuate guides in which the bottles are in a generally horizontal plane. At this point, the lifting fingers move free of the bottles, and the neck of the bottles and the body are partially within the pockets 11. The movement of the pusher fingers 81 against the bottom of the bottles and in combination with the upward movement of the bottle carriers, pushes the bottles completely into the pockets 11. It is noted that the upward movement of the bottle carrier itself is utilized in combination with the pushing action of the fingers 81 to move the bottles completely within the bottle-receiving pockets 11.

The pusher fingers 81 are rotatably driven by the gear 97 which meshes with the elevator driving gear 75. The sprocket 114 secured to a common shaft with the gear 97 may be driven from the bottle washer or other conditioning apparatus with which the infeed is used. If desired, the sprocket 114 may be driven from an independent source.

The distance between floors varies from plant to plant and the distance between the infeed conveyor 18 and the bottle infeed station adjacent the pusher fingers 81 varies with each installation. It is necessary, then to alter the length of the elevator 16 for each installation or to provide some means for changing the length of the elevator as required. We provide two possible adjustments and our infeed mechanism is therefore very flexible. The vertical angle of the elevator 16 with respect to the conditioning apparatus with which it is used is not critical and this vertical angle may be changed as required to accommodate the various distances between floor levels that may be encountered. For example, if the distance between the basement and upper floor level is great, the elevator 16 may be mounted in a position in which it is perpendicular to the basement floor. On the other hand, if the distance between the floor levels is small, the infeed conveyor 18 and therefore the lower end of the elevator 16 may be moved laterally or to the left, as seen in Fig. 1, until the proper distance is attained.

The second adjustment resides in the guide or support 47 which is equipped with an elongated slot 48 and laterally-extending flanges 49. The lower sprockets 36 and axle therefor are equipped with brackets or shoes 46 that are slidably received within the channel provided between the two spaced flanges 49. The sprocket axle or shaft 44 extends through the slots 48 and is slidably received therein. Therefore the lower sprockets and the axle may be moved longitudinally with respect to the guide 47 until all unnecessary slack has been taken from the carrier chains 38. This arrangement provides, then, a takeup for the elevator 16 and also lengthens or shortens the effective length of the elevator 16, depending upon the position of the sprockets with respect to the guide bracket 47.

It is seen that we have provided a continuous bottle infeed mechanism that permits continuous operation of a bottle infeed conveyor and, if desired, a continuously operating bottle carrier equipped with pockets and moving bottles through a conditioning line, etc. It is desirable to eliminate intermittent operation, since continuous operation of the bottle infeed mechanism results in gentle

and smooth moving of the bottles, and breakage, damage to the embossed designs and name brands, scuffing, marring, etc., are minimized, with resultant savings in bottle replacement costs, etc.

While in the foregoing specification we have described a specific embodiment of our invention in considerable detail for purposes of illustration, it will be understood that the details of our invention may be varied by those skilled in the art without departing from the spirit and scope of our invention.

We claim:

1. In bottle infeed mechanism for use in bottle conditioning lines wherein an endless bottle carrier equipped with a plurality of spaced-apart bottle-receiving pockets moves said pockets consecutively through an infeed station, a bottle elevator adapted to raise bottles from a lower floor level to an upper level and adjacent said infeed station, conveyor means adjacent the lower end of said elevator for feeding bottles thereto, an arcuate guide at the infeed station and adapted to have bottles moved therethrough by said elevator, and rotary pusher fingers engageable with a bottle in the discharge end of said guide to push the same into a bottle-receiving pocket.

2. The structure of claim 1 in which said elevator is equipped with a plurality of lifting fingers spaced longitudinally therealong for lifting bottles from said conveyor to the discharge end of said guide, and a bottle guide aligned with said fingers and extending between said conveyor and said arcuate guide and having a longitudinally-extending slot therethrough adapted to receive said fingers whereby bottles are raised through said bottle guide by said fingers.

3. In bottle infeed mechanism for use in bottle washers and the like wherein an endless carrier equipped with a plurality of longitudinally-spaced bottle-receiving pockets is continuously driven and moves said pockets consecutively adjacent an infeed station, a bottle elevator extending between a lower floor level and said infeed station and being equipped with a plurality of lifting fingers spaced longitudinally of said elevator and being aligned longitudinally thereon, a bottle guide mounted forwardly of said elevator and in alignment with said fingers and having a longitudinally-extending slot therethrough adapted to receive said fingers, means for driving said elevator continuously, a continuous conveyor adjacent the lower end of said elevator and adapted to feed bottles thereto, rotary pusher fingers mounted adjacent said infeed station and adapted to move bottles into said pockets, and means for continuously driving said pusher fingers.

4. In bottle infeed mechanism, a frame, an arcuate bottle guide mounted in said frame, a continuously-moving bottle carrier mounted adjacent an end of said guide and equipped with a plurality of pockets adapted to receive bottles, a shaft rotatably mounted in said frame and being provided with radial pusher fingers, means for continuously rotating said shaft whereby said fingers are moved through an arcuate path, said fingers being adapted to successively engage a bottle fed into said guide to urge the same into one of said pockets, a bottle elevator adapted to raise bottles from a lower floor level to an upper level and into said arcuate guide and comprising endless carriers extending between said upper and lower levels, rotatably-mounted supports for said carriers, means for continuously driving said carriers, bottle guides at the forward side of said carriers terminating at the upper end in said arcuate guide, and a plurality of longitudinally-spaced lifting fingers carried by said carriers and adapted to receive bottles at the lower end of said carriers and raise the bottles through said bottle guide and into said arcuate guide, and a continuous conveyor for feeding bottles to said elevator adjacent the lower end thereof.

5. In apparatus of the character described, an elevator equipped with a plurality of lifting fingers adapted to receive receptacles thereon for raising the same from a lower to an upper level, a carrier equipped with a plurality of pockets adapted to receive receptacles therein, a guide extending between the upper level of said elevator and said carrier and being adapted to have said pockets align therewith and to receive receptacles fed thereto by said elevator, means for moving said carrier continuously to advance the pockets thereof in an endless motion past said guide, arcuately-spaced-apart pusher fingers mounted for rotary movement adjacent said guide for engaging receptacles thereon to push the same into said pockets while the pockets are in motion, and means for driving said elevator and pusher fingers, said pusher fingers being arranged to each engage every receptacle in said guide so that each pusher finger contributes in part to pushing the receptacle into a moving pocket.

6. In apparatus of the character described, an elevator equipped with a plurality of lifting fingers adapted to receive receptacles thereon for raising the same from a lower to an upper level, said elevator being adapted to be driven continuously, a carrier equipped with a plurality of pockets adapted to receive receptacles therein and being adapted to be driven continuously, a guide extending between the upper level of said elevator and said carrier and being adapted to have said pockets align successively therewith in their path of movement and to receive receptacles fed thereto by said elevator, at least two arcuately-spaced pusher fingers mounted for rotary movement about a common axis and adjacent said guide for engaging receptacles on said guide to push the same into said pockets, said pusher fingers being adapted to be continuously driven, and means for driving said elevator, said pusher fingers being arranged to each engage every receptacle fed to said guide for contributorily pushing the same completely into a pocket passing in alignment along said guide and while the pocket is in motion.

7. In automatic bottle feed mechanism, an elongated elevator adapted to receive bottles thereon and to raise the same to an upper level, an arcuate guide extending upwardly and laterally from said upper level and being adapted to receive bottles thereon from said elevator, an endless bottle carrier equipped with a plurality of spaced-apart bottle-receiving pockets, said carrier being oriented in substantial alignment with said guide whereby said pockets are successively passed adjacent the discharge end of the guide and in alignment therewith, means for driving said elevator and said carrier continuously, a pair of pusher fingers mounted for rotary movement about a common axis adjacent said guide, said fingers being spaced apart and arranged to engage bottles in said guide and to push the same therefrom and into a bottle-receiving pocket, said fingers being arranged to each engage a bottle within said guide to push the same into a pocket, and means for rotating said fingers continuously and at a speed wherein each finger is brought into engagement with each bottle fed into said guide to contribute to moving the same into a pocket.

8. In bottle infeed mechanism for use in bottle conditioning lines wherein an endless bottle carrier equipped with a plurality of spaced-apart bottle-receiving pockets moves said pockets consecutively through an infeed station, a bottle elevator adapted to raise bottles from a lower level to an upper level and adjacent said infeed station, means adjacent the lower end of said elevator for feeding bottles thereto, an arcuate guide at said infeed station extending from said elevator for positioning adjacent a bottle carrier and being constructed and arranged to have bottles moved thereinto by said elevator, and pusher fingers engageable with a bottle at the discharge end of said guide to push such bottle into a bottle-receiving pocket.

9. In a bottle infeed mechanism for use in bottle conditioning lines wherein a continuously moving bottle carrier equipped with a plurality of longitudinally spaced-apart bottle-receiving pockets moves said pockets consecutively through an infeed station, a guide at the in-

feed station and being adapted to have bottles moved into the discharge end thereof by an elevator, a bottle elevator adapted to raise bottles through said guide and to the discharge end thereof, a shaft supported for rotation and being adapted to be rotatably driven, and a pair of pusher fingers extending radially outwardly from the longitudinal axis of said shaft and being arranged to be rotated about such axis by said shaft, said pusher fingers being disposed adjacent the discharge end of said guide for engaging bottles moved thereinto by said elevator to push the same into said pockets, means being provided for rotating said shaft at a speed such that each of said fingers is brought into engagement with each bottle positioned in the discharge end of said guide so that each finger contributes in part to the moving of a bottle into a pocket as that pocket travels through the infeed station.

10. In apparatus of the character described, an elevator equipped with a plurality of lifting fingers adapted to receive receptacles thereon for raising the same from a lower to an upper level, a carrier equipped with a plurality of pockets adapted to receive receptacles therein, a guide extending between the upper level of said elevator and said carrier and being adapted to have said pockets aligned therewith and to receive receptacles fed thereto by said elevator, arcuately spaced apart pusher fingers mounted for rotary movement adjacent said guide for engaging receptacles thereon to push the same into said pockets, and means for driving said elevator, carrier and pusher fingers, said pusher fingers being arranged to each engage every receptacle in said guide for pushing the receptacle into a pocket, said guide being arcuate and having a longitudinally extending slot therein adapted to receive said lifting fingers and permit the same to pass therethrough.

11. In apparatus of the character described, an elevator equipped with a plurality of lifting fingers adapted to receive receptacles thereon for raising the same from a lower to an upper level, said elevator being adapted to be driven continuously, a carrier equipped with a plurality of pockets adapted to receive receptacles therein and being adapted to be driven continuously, a guide extending between the upper level of said elevator and said carrier and being adapted to have said pockets align successively therewith in their path of movement and to receive receptacles fed thereto by said elevator, at least two arcuately spaced pusher fingers mounted for rotary movement about a common axis and adjacent said guide for engaging receptacles on said guide to push the same into said pockets, said pusher fingers being adapted to be continuously driven, and means for driving said elevator, said pusher fingers being arranged to each engage every receptacle fed to said guide for pushing the same completely into a pocket passing in alignment along said guide, said elevator comprising sprockets and a pair of spaced apart endless chains entrained thereabout which provide a mounting for said lifting fingers, said guide being generally arcuate and having a longitudinally extending slot therein adapted to receive and freely pass said lifting fingers therethrough.

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