Aug. 18, 1936. A. E. LADEWIG ET AL 2,051,090

BOTTLE WASHING MACHINE

Original Filed March 30, 1927 3 Sheets-Sheet 1

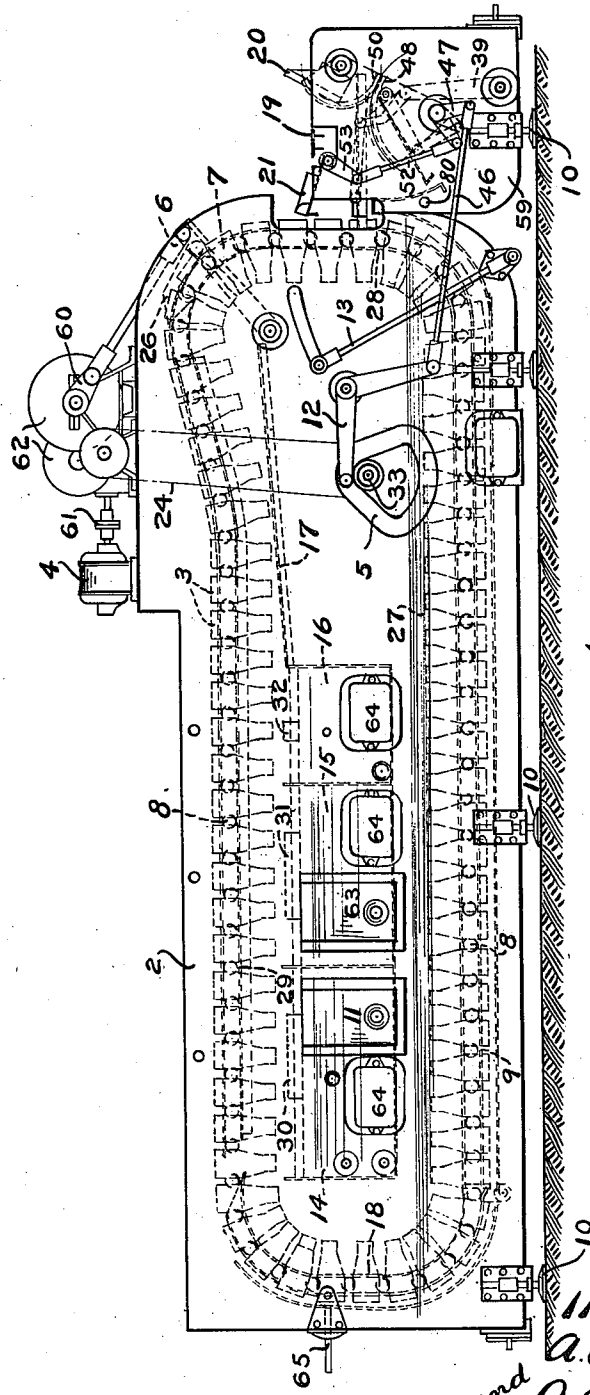


FIG. 1.

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Original Filed March 30, 1927 3 Sheets-Sheet 2

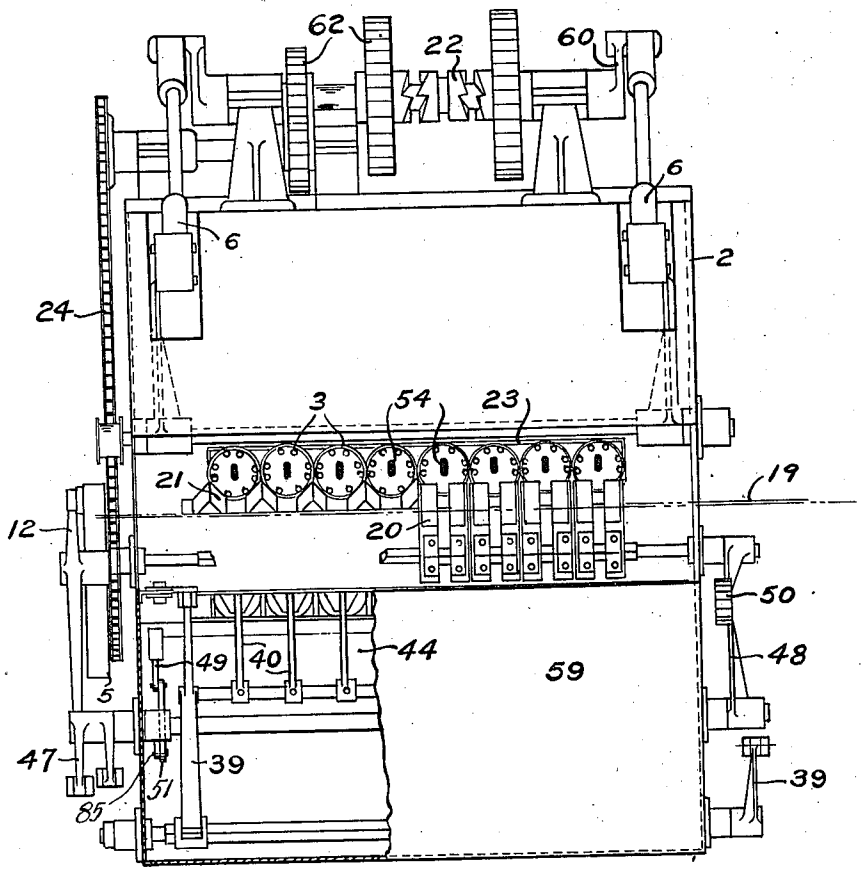


FIG. 2.

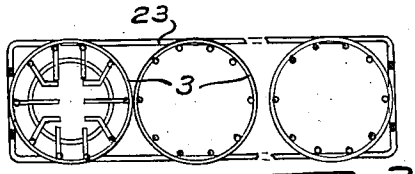


FIG. 3.

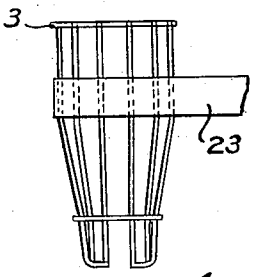


FIG. 4.

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BOTTLE WASHING MACHINE

Original Filed March 30, 1927 3 Sheets-Sheet 3

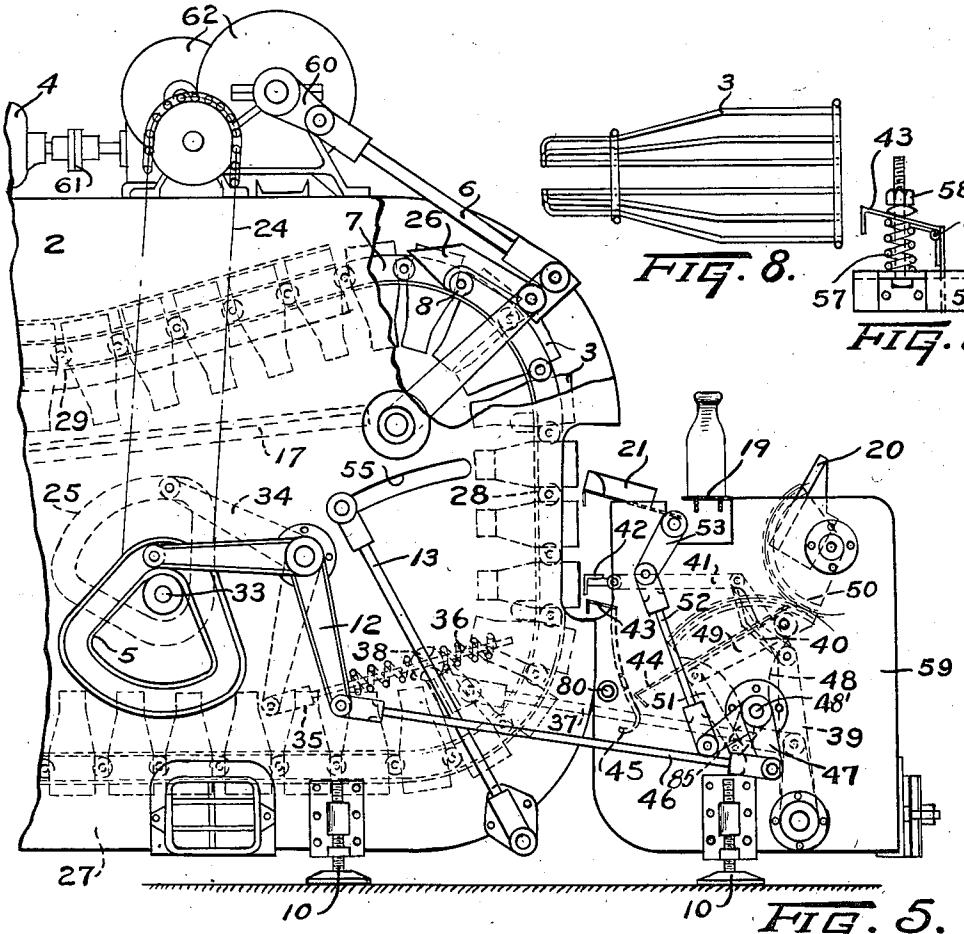


FIG. 5.

FIG. 8.

FIG. 7.

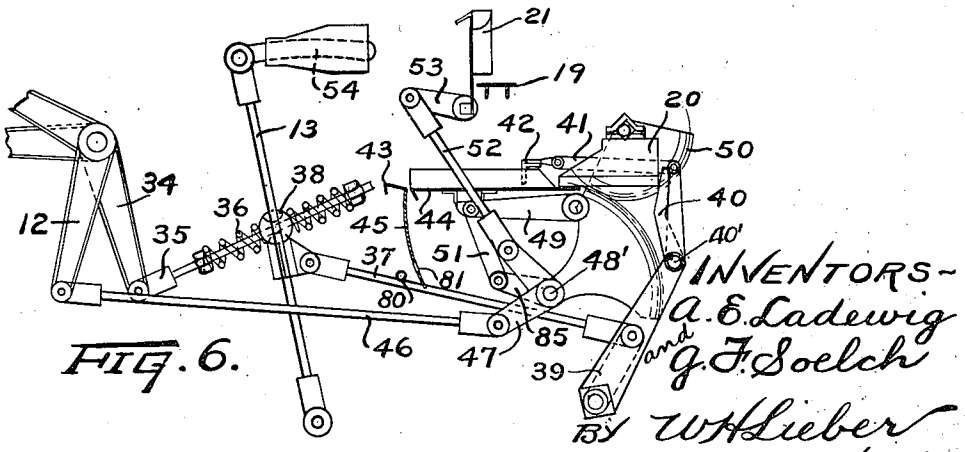


FIG. 6.

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2,051,090

BOTTLE WASHING MACHINE

Archie E. Ladewig and George F. Soelch,
Waukesha, Wis.

Application March 30, 1927, Serial No. 179,424

38 Claims. (Cl. 141—7)

This invention relates in general to improvements in bottle cleansing machinery, and relates more specifically to various improvements in the construction and operation of bottle loading and unloading mechanism especially applicable to machines for automatically washing and rinsing milk bottles or the like.

An object of the invention is to provide relatively simple and compact bottle handling mechanism especially adapted to cooperate with milk bottles or the like. Another object of the invention is to provide improved bottle supply or feeding mechanism for introducing the bottles into a washing machine. A further object of the invention is to provide improved mechanism for emptying successive bottles prior to the delivery thereof to bottle washing machines and the like. These and other objects and advantages will be apparent from the following description.

Some of the novel features of bottle washing machine structure, disclosed but not specifically claimed herein, form the subject of copending divisional applications Serial No. 337,312, now Patent No. 1,906,974, granted May 2, 1933, and Serial No. 337,313, both filed February 4, 1929.

A clear conception of an embodiment of the invention and of the operation of a machine constructed in accordance with the improvement, may be had by referring to the drawings accompanying and forming a part of this specification in which like reference characters designate the same or similar parts in the various views.

Fig. 1 is a side elevation of an improved milk bottle washing and rinsing machine.

Fig. 2 is a partly assembled front elevation of the improved milk bottle washer, with a portion of the front casing broken away.

Fig. 3 is an enlarged fragmentary top view of one of the transverse bottle carrier frames.

Fig. 4 is an enlarged fragmentary front view of the carrier frame.

Fig. 5 is an enlarged fragmentary side elevation of the inlet and discharge end of the improved milk bottle washer having a portion thereof broken away.

Fig. 6 is a side view of the bottle supply and discharge mechanism, showing the same in a different position of adjustment from that shown in Fig. 5.

Fig. 7 is an enlarged fragmentary side view of the improved bottle infeed slide.

Fig. 8 is an enlarged side view of one of the bottle carrier pockets showing the same positioned for the reception of a bottle from the infeed slide of Fig. 7.

Referring specifically to Figs. 1, 2 and 5 of the drawing, the improved milk bottle washing machine comprises generally a main soaking, washing and rinsing casing 2 resting upon adjustable supports 10 and forming a housing for an intermittently movable endless series of bottle carrier pockets 3; and an auxiliary pre-rinsing casing 59 also resting upon supports 10 and associated with the front of the main casing 2, the casing 59 providing a support for the bottle supply and discharge mechanisms.

The bottle supply mechanism is clearly shown in Figs. 2, 5 and 6, and comprises substantially a stationary, non-traveling bottle feeding table including means for sliding the bottles in succession over the table, and means also constituting part of the table for inverting the bottles to empty the same prior to delivery thereof to the main washing mechanism. The bottle inverting and transferring means shown herein by way of illustration, consists of a transverse group of bifurcated receiving pockets 20 movable from upright to horizontal position and vice versa; a tiltable plate 44 movable from inclined to horizontal position and vice versa; and a series of push arms 40 and a simultaneously operable push bar 42 for ejecting the bottles from the pockets 20 onto the plate 44 and for sliding other bottles from the plate 44 into the adjacent pockets 3. The receiving pockets 20 are oscillatable about a horizontal axis by means of a gear segment 50 which meshes with a gear segment 48. The segment 48 is secured to a transverse shaft 48' which is rockable by means of a bell crank 47 one arm of which is pivotally associated with a connection 46 and the other arm of which is likewise associated with a connection 52. The rear end of the connection 46 is pivotally associated with one arm of a bell crank 12 the other arm of which is provided with a roller cooperating with a groove in the cam 5. The tiltable plate 44 is oscillatable from inclined position as shown in Fig. 5 to horizontal position in alinement with the pockets 20 as shown in Fig. 6 and vice versa, by means of a pair of levers 85 swingably supported by the shaft 48' and cooperating with the lower ends of links 51 the upper ends of which are pivotally secured to plate carrier arms 49. The plate 44 is preferably provided with a series of parallel fins or plates forming grooves for holding the bottles in proper position. The lower ends of the push arms 40 are adjustably attached to a cross bar 40' secured to actuating levers 39, and

the upper extremities of the push arms are movable through the bifurcations of the pockets 20, the cross bar 40' being operatively connected with the push bar 42 by means of end connections 41 attached to the upper extremities of the levers 39.

A curved stop plate 45 having openings 81 through the lower portion thereof, extends along the path of travel of the rear end of the plate 44, and a pre-rinse supply pipe 80 has orifices therein formed to direct jets of water through the stop plate openings 81 and into the open ends of the downwardly tilted bottles resting upon the inclined plate 44. A resiliently supported guide plate 43 located at the upper end of the stop plate 45, is supported from the casing 59 by means of springs 57 and hinges 56, the tension of the springs 57 being adjustable by means of nuts 58, see Fig. 7. The guide plate 43 serves to properly admit the bottles regardless of their size, to the pockets 3, without breakage.

The bottle discharge mechanism is likewise clearly disclosed in Figs. 2, 5 and 6, and comprises a series of bottle ejectors 54 movable through the pockets 3 while they are horizontally disposed; a series of bottle receiving and righting members 21; and a transversely movable final conveyor 19 of ordinary construction. The ejectors 54 are carried by a transverse rod which is movable along arcuate slots 55 in the sides of the main casing 2, by means of levers 13 one of which coacts with a swivel block 38 as shown in Figs. 5 and 6. A bell crank lever 34 has one arm provided with a roller cooperating with a groove in the cam 25, and has its other arm secured to an end of the bar 35 which extends freely through an opening in the block 38. Springs 36 embrace the bar 35 on opposite sides of the block 38 and engage adjustable nuts cooperating with the bar to vary the spring tension. A connection 37 has one end pivotally associated with the block 38, and has its opposite end attached to the lever 39 which actuates the push arms 40. The bottle receiving and righting members 21 are adapted to be swung about a horizontal pivot, from inclined position as shown in Fig. 5, to upright position as shown in Fig. 6, by means of a lever 53. The swinging end of the lever 53 is connected to an arm of the bell crank lever 47, by means of a connection 52.

The mechanism for driving the machine consists of an electric motor 4 mounted upon the main casing 2. The motor 4 is connected through a flexible coupling 61, to a constantly rotating counter shaft which is interchangeably connectible by means of a manually operable jaw clutch 22, with high and slow speed gearing 62 of well known construction. The speed change gearing is operatively connected to cranks 60 which cooperate with intermittent grip devices 6 comprising hooks 26 formed to grip and to advance the successive rollers 8 along the rails 28. Motion is also transmitted from the motor 4 through a driving chain 24 to a transverse counter shaft 33 to which the cams 5, 25 are secured.

During normal operation of the machine, the dirty bottles are admitted to the stationary, non-traveling feeding table by being placed in the receiving pockets 20 when positioned as shown in Fig. 5, in substantially upright position while the motor 4 is operating continuously. Periodically, the pockets 20 are swung rearwardly to horizontal position as shown in Fig. 6 whereupon the push arms 40 are moved through the bifurcations of the pockets 20 and eject the dirty bottles therefrom onto the plate 44 with their open ends pointing toward the machine. After the bottles have been thus positioned upon the plate 44, the pockets 20 are returned to bottle receiving position as shown in Fig. 5, and the plate 44 is tilted downwardly thereby causing the dirty bottles to slide toward the openings 81 in the stop plate 45 and to discharge liquid or other undesirable substances. The bottles subsequently receive the full force of the pre-rinsing jets discharged from the pipe 80. The plate 44 is eventually again returned to horizontal position as shown in Fig. 6, whereupon the push bar 42 becomes effective to slide the pre-rinsed bottles from the rear end of the plate 44 over the guide plate 43 and into the horizontally disposed group of pockets 3 positioned with respect to the plate 43 as shown in Figs. 7 and 8. Simultaneously with the removal of the pre-rinsed bottles by the bar 42, the push arms 40 are ejecting other dirty bottles from the pockets 20. The intermittent grip device 6 urges the loaded pockets 3, step by step, along the successive rails 28, 9, 18, 29. As the bottles travel through the basin 27, they are subjected to the soaking and washing action of the hot caustic soda solution. While traveling along the end rail 18, the bottles are inverted and the caustic soda solution is delivered therefrom into the basin 27. The bottles are subsequently subjected to jets of washing and rinsing liquid delivered from the nozzles 30, 31, 32 during their travel along the rails 29 and over the basins 14, 15, 16. The pockets containing the finally washed and rinsed bottles are eventually again brought into horizontal position at the front of the machine, whereupon the ejectors 54 are brought forward through the bottoms of the pockets 3 and push the clean bottles from the pockets upon the members 21, while these members are positioned as shown in Figs. 1 and 5. The members 21 are subsequently swung forward to upright position thereby setting the clean bottles upon the chain conveyor 19 which delivers them from the machine.

From the foregoing description, it will be apparent that the bottles are automatically successively pre-rinsed, washed, finally rinsed, and removed from the machine at the loading end thereof. The improved loading and unloading mechanism insures admission and discharge of the bottles without breakage, and functions to automatically maintain the machine supplied with a sufficient number of dirty bottles and to deliver the finally cleansed bottles therefrom.

It should be understood that it is not desired to limit the invention to the exact details of construction and operation herein shown and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

It is claimed and desired to secure by Letters Patent:—

1. In combination, a pocket movable from bottle receiving position to substantially horizontal bottle discharge position and vice versa, a plate movable from a position of substantial alinement with said pocket while in bottle discharge position to an abruptly inclined position and vice versa, means for ejecting a bottle open end foremost from said pocket upon said plate while said pocket and plate are in alined position, a stop coacting with said plate, means for tilting said plate to said inclined position to advance the bottle against said stop with the open end of the bottle foremost, and for subsequently returning said plate with the advanced bottle thereon to said position of alinement, and means for dis-

charging the advanced bottle from said plate and away from said ejecting means.

2. In combination, a bifurcated pocket tiltable about an axis from bottle receiving position to substantially horizontal bottle discharge position and vice versa, a plate tiltable from horizontal position in alinement with said pocket to an inclined position and vice versa, means movable within the bifurcation of said pocket for ejecting a bottle open end foremost from said pocket upon said plate while in horizontal position of alinement, a stop coacting with said plate, means for tilting said plate to said inclined position to advance the bottle downwardly against said stop with the open end of the bottle foremost and for subsequently returning said plate with the advanced bottle thereon to said horizontal position, and means for discharging the advanced bottle from said plate and away from said movable means.

3. In combination, a pocket movable from bottle receiving position to substantially horizontal bottle discharge position and vice versa, a carrier element movable from a position of substantial alinement with said pocket while in bottle discharge position to an abruptly inclined position and vice versa, means for ejecting a bottle open end foremost from said pocket upon said element while said pocket and element are in alined position, means for tilting said element to said inclined position and for subsequently returning the same with the bottle thereon to said alined position, a carrier pocket movable past said element, and means for transferring said bottle from said element in said alined position to said carrier pocket.

4. In combination, a bifurcated pocket tiltable about an axis from bottle receiving position to horizontal bottle discharge position and vice versa, a plate tiltable from horizontal position in alinement with said pocket to an inclined position and vice versa, means movable through the bifurcation of said pocket for ejecting a bottle from said pocket upon said plate while in horizontal position of alinement, means for tilting said plate and for subsequently returning the same to said horizontal position of alinement, a carrier pocket movable past the tilting end of said plate, and means for transferring the bottle from said plate to said carrier pocket.

5. In combination, a series of laterally adjacent open ended carrier pockets movable along a definite path, means for simultaneously pushing a series of bottles into the open ends of said pockets while said pockets are in substantially horizontal position, and a guide bar over which the bottles pass while being pushed into said pockets, said bar being spring supported and provided with a bottle engaging surface inclined upwardly toward said open pocket ends and terminating above the lower edges of the openings for insuring proper entry into said pockets of bottles having different shapes and diameters.

6. In combination, a loading pocket movable from bottle receiving to bottle discharge position and vice versa, a carrier element movable from bottle receiving position with respect to said loading pocket to a position so that the bottle thereon is disposed below said receiving position and vice versa, a carrier pocket movable past said element, and means for simultaneously transferring said bottle from said element to said carrier pocket and a bottle from said loading pocket to said element.

7. In combination, a loading pocket movable from bottle receiving to bottle discharge position and vice versa, a carrier element movable from bottle receiving position with respect to said loading pocket to a position so that the bottle thereon is disposed below said receiving position and vice versa, a carrier pocket movable past said element, and means for simultaneously transferring said bottle from said element to said carrier pocket and a bottle from said loading pocket to said element when said element is in said bottle receiving position.

8. In combination, a loading pocket movable from bottle receiving to horizontal bottle discharge position and vice versa, a carrier element tiltable from horizontal bottle receiving position in alinement with said loading pocket to an inclined position so that the bottle thereon is moved forwardly and downwardly, said element being subsequently returnable to said horizontal position, a carrier pocket movable past said element, and means for simultaneously transferring a bottle horizontally from said element to said carrier pocket and from said loading pocket to said element.

9. In combination, a loading pocket movable from bottle receiving to horizontal bottle discharge position and vice versa, a carrier element tiltable from horizontal bottle receiving position in alinement with said loading pocket to an inclined position so that the bottle thereon is advanced forwardly and downwardly, said element being subsequently returnable to said horizontal position, a carrier pocket movable past said element, and means for simultaneously transferring a bottle horizontally from said element to said carrier pocket and from said loading pocket to said element when said element is in horizontal bottle receiving position.

10. In combination, a loading pocket movable from bottle receiving to bottle discharge position and vice versa, a carrier element movable from bottle receiving position with respect to said loading pocket to a position so that the bottle thereon is advanced forwardly and is moved downwardly, said element being subsequently returnable to said bottle receiving position, a series of carrier pockets movable along a definite path in proximity to said carrier element, means for pushing bottles in succession from said carrier element into said carrier pockets, and a resiliently supported guide bar over which the bottles pass while being transferred from said carrier element to said carrier pockets.

11. In combination, a loading pocket, a carrier element adapted to receive bottles in succession from said loading pocket, a series of carrier pockets movable along a definite path in proximity to said carrier element, means for simultaneously pushing bottles from said loading pocket upon said carrier element and from said carrier element to the successive carrier pockets of said series, and a resiliently supported guide bar interposed between said carrier element and said carrier pockets.

12. In combination, a bottle support for receiving bottles in succession, carrier pockets disposable in proximity to said support, a forwardly and rearwardly movable pusher for transferring bottles in succession from said support to said pockets, means for moving said support away from the path of movement of said pusher after each forward bottle transferring movement thereof to permit rearward movement of said pusher to a position to the rear of a subsequent bottle delivered to said support and for subse-

quently returning said support toward said path to position said subsequent bottle in front of said pusher, and means for moving said pusher forwardly along said path to transfer said bottle to one of said pockets and for subsequently moving said pusher rearwardly to bottle transferring position.

13. In combination, a loading element for initially receiving successive bottles, a bottle support for receiving the bottles in succession from said loading element, carrier pockets disposable in proximity to said support, a forwardly and rearwardly movable pusher having front and rear portions for simultaneously transferring bottles in succession from said support to said pockets and subsequent bottles in succession from said element to said support, means for moving said support away from the path of movement of said pusher after each forward bottle transferring movement thereof to permit rearward movement of said front pusher portion to a position to the rear of a subsequent bottle delivered to said support and for subsequently returning said support toward said path to position said subsequent bottle in front of said front pusher portion, and means for moving said pusher forwardly to transfer said bottles successively from said element to said support and from said support to said pockets and for moving said pusher rearwardly to bottle transferring position after each transfer movement.

14. In combination, a loading pocket movable from bottle receiving to bottle discharge position and vice versa, a carrier element tiltable with respect to said loading pocket to advance bottles therealong, a series of carrier pockets movable past the end of said element remote from said loading pocket, means for simultaneously transferring successive bottles from said loading pocket to said carrier element and from said carrier element to the successive carrier pockets of said series, and means for tilting said carrier element away from said transferring means and for moving the latter past said element during periods of inactivity thereof.

15. In combination, a loading pocket, a carrier element adapted to receive bottles from said loading pocket, carrier pockets movable in proximity to said carrier element, means for delivering bottles from said loading pocket upon said carrier element and from said carrier element to successive carrier pockets, and resilient means interposed between said carrier element and said carrier pockets over which the bottles pass during delivery thereof to said carrier pockets.

16. A bottle feeding mechanism for bottle washing machines and the like comprising a stationary non-traveling bottle feeding table, means for sliding the bottles over the table, and means forming part of the table tiltable for inverting the bottles to empty them and returning them to their original position.

17. A bottle feeding mechanism for bottle washing machines and the like comprising a stationary non-traveling bottle feeding table, means for sliding the bottles over the table, means forming part of the table tiltable for inverting the bottles to empty them and returning them to their original position, and bottle spray mechanism registering with the mouths of the bottles in their inverted position for rinsing them.

18. A bottle feeding mechanism for bottle washing machines and the like comprising a stationary non-traveling bottle feeding table, means for intermittently advancing bottles over the table, said table having a swinging section for lowering the bottles supported thereon to invert them and empty the contents therefrom and returning them to their original position between the advances, and a trough in position to receive the material leaving the bottles.

19. A bottle loading mechanism for bottle washing machines and the like comprising a stationary non-traveling loading table, means for intermittently advancing bottles thereon, said table having a swinging section for lowering the bottles thereon to an inverted position for emptying them and returning them to their original position between the advances, a trough in position to receive the material leaving the bottles, and a sprayer in position to inject sprays of water into the bottles for rinsing them while they are inverted.

20. A bottle feeding mechanism for bottle washing machines, comprising, means forming a non-traveling bottle feeding table, said table having a part thereof tiltable for inverting bottles to empty the same and for returning said bottles to substantially horizontal position, mechanism for moving said table part to bring the successive bottles resting thereon into substantially horizontal position just prior to delivery of said bottles therefrom, and means for sliding the bottles over said table and into the washing machine when said table portion has been moved to horizontally position said bottles.

21. A bottle feeding mechanism for bottle washing machines, comprising, means forming a non-traveling bottle feeding table including a tiltable part for inverting the bottles to empty the same and for returning said bottles to substantially horizontal position, bottle spray mechanism registerable with the open ends of the bottles while inverted, and means for sliding bottles in succession over said table and into the bottle washing machine.

22. A bottle feeding mechanism for bottle washing machines, comprising, means forming a non-traveling bottle feeding table including a swinging section for lowering the bottle supported thereon to invert the same and empty the contents therefrom and for subsequently returning the bottles to substantially horizontal position between advances, means for intermittently advancing bottles over said table, and a trough in position to receive the material leaving the bottles.

23. A bottle feeding mechanism for bottle washing machines, comprising, a pocket formed to receive a bottle in substantially upright position, means cooperating with said pocket for receiving the bottle therefrom and for inverting the bottle to empty the same, means for injecting liquid into the bottles while inverted, mechanism for receiving the successive bottles from said inverting means, and means for directly transferring the bottle from said inverting means to said mechanism, said inverting and transferring means being operable to tilt and to transport the bottle in a common plane.

24. A bottle feeding mechanism for bottle washing machines, comprising, an element formed to receive a bottle with its open end uppermost, means cooperating with said element to receive the bottle therefrom and to invert the bottle, means for pre-rinsing the bottle while inverted, mechanism including an endless carrier for conveying bottles through the washing machine, and means for automatically transferring the pre-

rinsed bottle directly from said inverting means to said carrier, said inverting and transferring means and said carrier being operable to tilt and to transport the bottle in a common plane.

25. A bottle feeding mechanism for bottle washing machines, comprising, a bottle receiving element, means for pre-rinsing a bottle, a carrier pocket movable along a definite path to transport a bottle during subsequent washing, a movable member for supporting a bottle in cooperative relation to said pre-rinsing means and for transferring said bottle from said pre-rinsing means to a position permitting delivery thereof to said carrier pocket, and means for ejecting a bottle from said receiving element onto said member and for simultaneously delivering another bottle from said member into said carrier pocket, said carrier pocket and said member and ejecting means being operable to move the bottle in a common plane.

26. A bottle feeding mechanism for bottle washing machines, comprising, a tiltable bottle receiving element, means for pre-rinsing a bottle discharged from said receiving element, a carrier pocket intermittently movable in the plane of tilting of said receiving element and in proximity to said pre-rinsing means, a movable member for supporting a bottle during pre-rinsing and for subsequently moving the bottle to a position permitting delivery thereof to said carrier pocket, means for ejecting a bottle from said receiving element toward said pre-rinsing means, and means for simultaneously delivering another bottle from said member into said carrier pocket.

27. A bottle feeding mechanism for bottle washing machines, comprising, an intermittently driven endless conveyor having a series of successive carrier pockets movable along a closed path, an element formed to receive successive bottles with their open ends uppermost, common driving means for intermittently tilting said receiving element to swing the open ends of said bottles toward said pockets and for intermittently advancing said carrier pockets step by step in the plane of tilting of said receiving element, means for pre-rinsing said bottles after partial inversion following said swinging movement thereof by said receiving pocket, and means for partially inverting said bottles to pre-rinsing position and for subsequently returning said bottles to substantially horizontal position after pre-rinsing thereof and for directly transferring the same to said carrier pockets while at rest.

28. A bottle feeding mechanism for bottle washing machines, comprising, an intermittently driven endless conveyor having an odd number of successive carrier pockets, an element formed to receive bottles in succession with their open ends uppermost, common driving means for intermittently tilting said receiving element to swing the open ends of said bottles toward said pockets and for intermittently advancing said conveyor by steps equal to twice the distance between successive carrier pockets in the plane of tilting of said receiving element, means for pre-rinsing said bottles after partial inversion following said swinging thereof by said receiving pocket, and means for returning said bottles to horizontal position after pre-rinsing thereof and for directly transferring the successive bottles to alternate carrier pockets of said conveyor while at rest.

29. A bottle feeding mechanism for bottle washing machines, comprising, an element formed to receive successive bottles with their open ends uppermost, a series of carrier pockets movable in proximity to said receiving element, common driving means for periodically tilting said receiving element to swing the open ends of said bottles toward said pockets and for advancing said carrier pockets in the plane of tilting of said receiving element, means for pre-rinsing said bottles after partial inversion following said swinging thereof by said receiving element, and means for partially inverting said bottles to pre-rinsing position and for subsequently transferring the pre-rinsed bottles to said carrier pockets.

30. A bottle feeding mechanism for bottle washing machines, comprising, an element formed to receive successive bottles with their open ends uppermost, carrier pockets disposable in proximity to said element, means for moving said element about an axis to swing the open ends of the bottles toward said pockets, supporting means for receiving the successive bottles from said element with the open ends of the bottles nearest said pockets, forwardly and rearwardly movable means movable forwardly to transfer the successive bottles from said element to said supporting means and to subsequently transfer said bottles from said supporting means to said carrier pockets, and means for swinging said supporting means away from the path of travel of said transferring means to permit unobstructed rearward movement of the latter.

31. A bottle feeding mechanism for bottle washing machines, comprising, a tiltable element formed to receive successive bottles with their open ends uppermost, an endless series of carrier pockets movable in close proximity to said receiving element, means for periodically tilting said receiving element to swing the open ends of said bottles toward said pockets, means for subsequently further tilting the successive bottles to position their open ends lowermost, means for simultaneously advancing said carrier pockets step by step and in the plane of tilting of said bottle tilting means, pre-rinsing means coacting with said bottles after complete tilting thereof, and means for directly transferring the pre-rinsed bottles to said carrier pockets while at rest.

32. A bottle feeding mechanism for bottle washing machines, comprising, means forming a non-traveling bottle feeding table including a tiltable bifurcated pocket and a movable support for inverting the bottles to empty the same and for returning the bottles to non-inverted position, bottle spray mechanism registerable with the open ends of the bottles while inverted, and means movable within the bifurcation of said pocket for sliding the successive bottles from said pocket onto said support.

33. In combination, a series of laterally adjacent open ended carrier pockets movable along a definite path, means for simultaneously pushing a series of bottles open ends foremost into the open ends of said pockets when the latter have been displaced from vertical position, and a guide bar over which the bottles pass while being pushed into said pockets, said bar being resiliently supported and having a bottle engaging portion directed toward the centers of said pockets and terminating above the lower edges of the pocket openings so as to insure proper entry into said pockets of bottles having different diameters.

34. In combination, a bifurcated element formed to receive successive bottles with their open ends uppermost, means for moving said element to swing the bottles therein forwardly to

substantially horizontal position and for subsequently returning said element to bottle receiving position, means movable through the bifurcation of said element to remove the bottles therefrom when the same have been swung forwardly, and means for moving said removing means forwardly through said element bifurcation and for subsequently returning said removing means when said element has been returned to bottle receiving position.

35. A bottle supplying mechanism, comprising, an oscillatory element having a single transverse row of pockets each formed to initially receive successive bottles with the open end of each bottle uppermost, bottle carrier pockets disposable in proximity to said element, means for moving said element in one direction to swing said ends of the bottles toward said carrier pockets and for subsequently moving said element in the opposite direction to directly return the same to bottle receiving position, supporting means for receiving the successive bottles from said element with said ends of the bottles nearest said pockets, a pusher movable between said element and said pockets, and means for moving said pusher forwardly to transfer the successive bottles from said supporting means into said pockets and for subsequently moving said pusher rearwardly to position the same near said element and in back of subsequent bottles deposited upon said supporting means.

36. A bottle supply mechanism comprising, an oscillatory bottle receiving element having a single transverse row of pockets each formed to initially receive successive bottles with the open end of each bottle uppermost, bottle carrier pockets successively movable in proximity to said element, means for swinging said element in one direction to move said ends of the bottles toward said carrier pockets and for subsequently swinging said element in the opposite direction through the same arc to directly return said element to bottle receiving position, a member movable forwardly and rearwardly between said element and said pockets, and means for moving said member forwardly to transfer the successive bottles away from said element and toward said pockets and for subsequently moving said member rearwardly to position the same near said element and in back of subsequent bottles to be transferred from said element to said pockets.

37. A bottle supply mechanism comprising, an oscillatory element having a pocket formed to initially receive successive bottles with the open end of each bottle uppermost, bottle carrier pockets disposable in proximity to said element, means for swinging said element downwardly to swing said ends of the bottles downwardly toward said carrier pockets and for subsequently swinging said element upwardly to directly return the same to bottle receiving position, a transfer member movable between said element and said pockets, and means for moving said member forwardly when said element is in lowermost position to transfer the successive bottles away from said element and toward said pockets and for subsequently moving said member rearwardly to position the same in back of subsequent bottles to be transferred from said element to said pockets.

38. A bottle supply mechanism comprising, a reversely movable element having a pocket formed to initially receive successive bottles with the open end of each bottle uppermost, bottle carrier pockets disposable forwardly of said element, means for moving said element downwardly to move said ends of the bottles downwardly toward said carrier pockets and for subsequently moving said element upwardly to directly return the same to bottle receiving position, a transfer member movable between said element and said pockets, and means for moving said member forwardly when said element is in lowermost position to advance the successive bottles with said ends foremost away from said element and toward said pockets and for subsequently moving said member rearwardly to position the same adjacent subsequent bottles to be transferred from said element to said pockets.

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