

(No Model.)

H. LA CASSE.
BOTTLE WASHER.

2 Sheets—Sheet 1.

No. 518,322.

Patented Apr. 17, 1894.

Fig. 1.

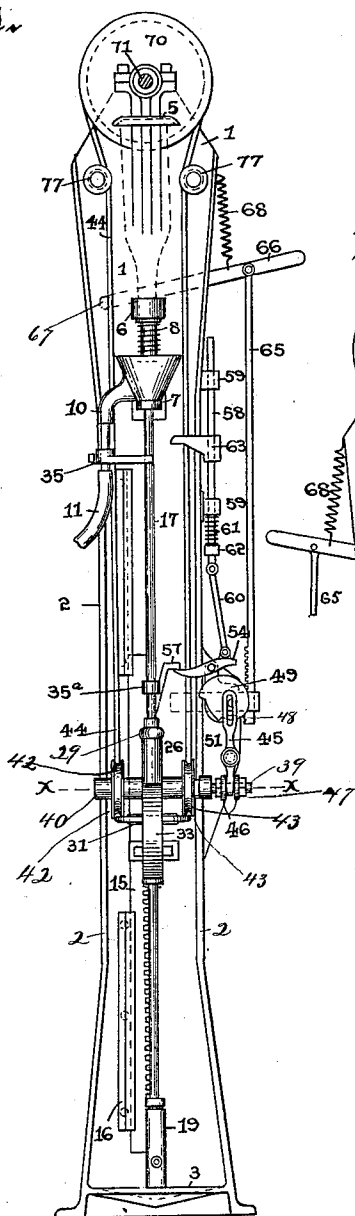


Fig. 2.

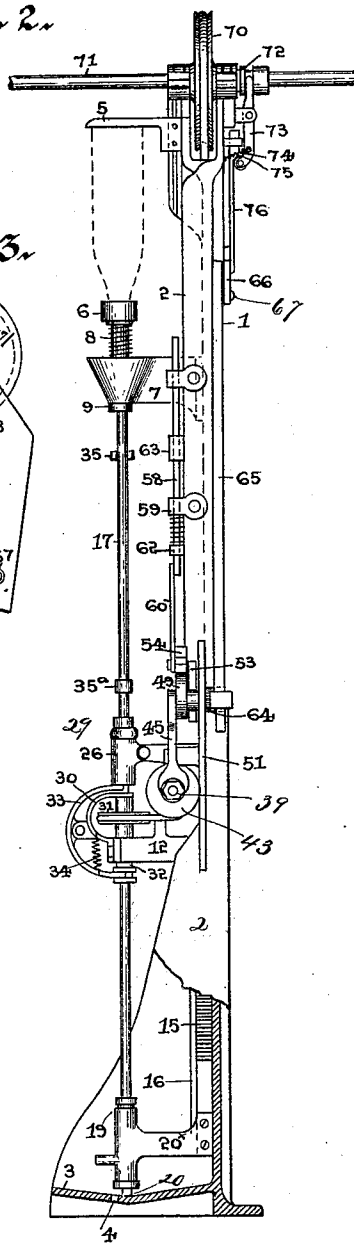
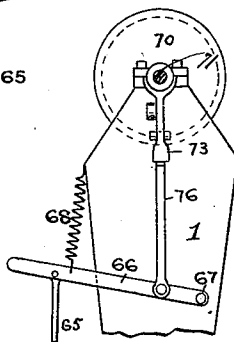


Fig. 3.



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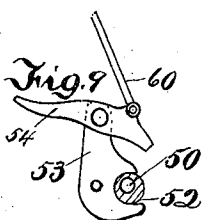
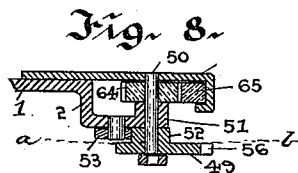
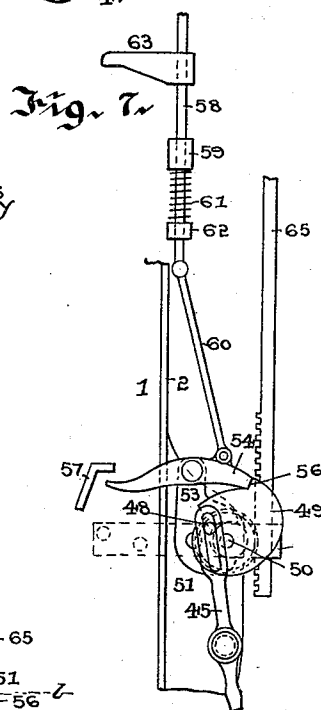
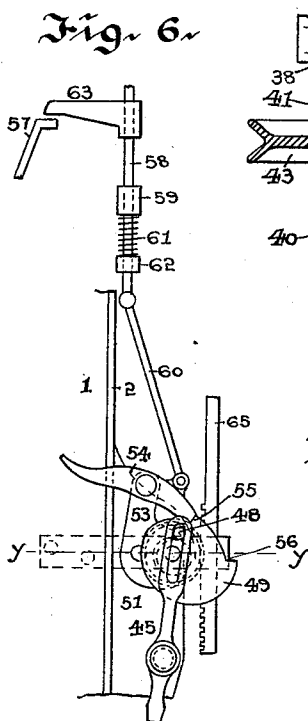
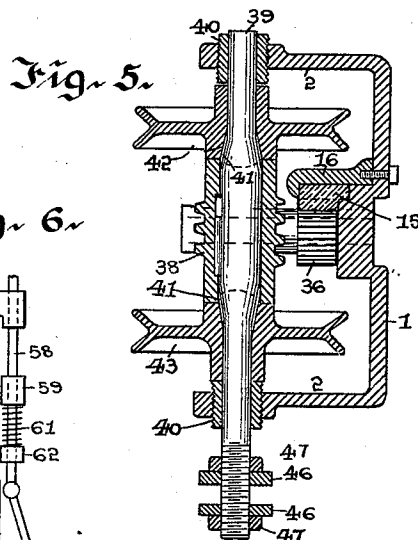
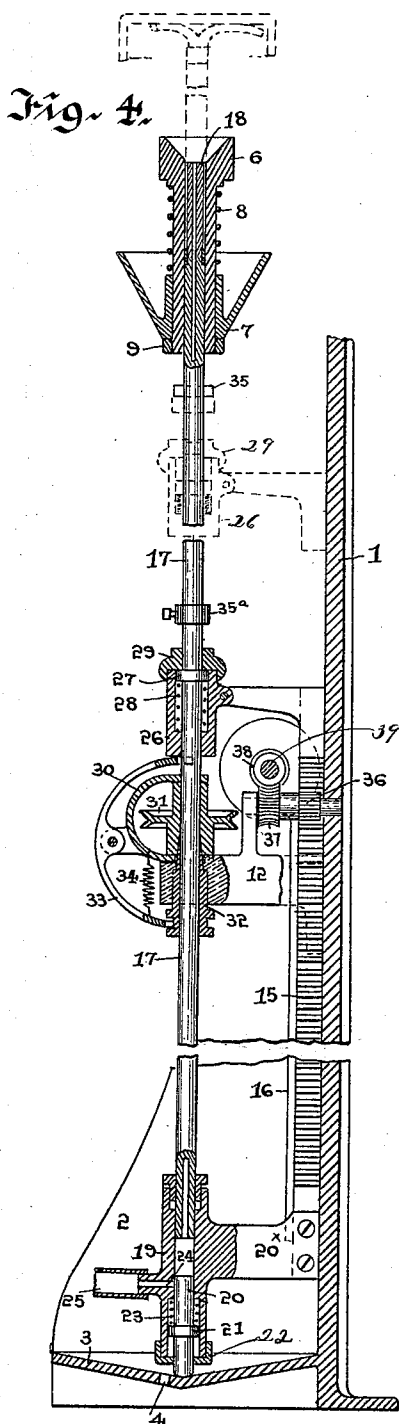
(No Model.)

2 Sheets—Sheet 2.

H. LA CASSE.
BOTTLE WASHER.

No. 518,322.

Patented Apr. 17, '1894.



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UNITED STATES PATENT OFFICE.

HENRY LA CASSE, OF ROCHESTER, NEW YORK.

BOTTLE-WASHER.

SPECIFICATION forming part of Letters Patent No. 518,322, dated April 17, 1894.

Application filed June 26, 1893. Serial No. 478,882. (No model.)

To all whom it may concern:

Be it known that I, HENRY LA CASSE, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Bottle-Washing Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to machines for cleansing and rinsing bottles and similar receptacles and has for its object particularly to provide one that is automatic in its operation and after the bottle is placed in position and the machine started will continue until the washing and rinsing operations are completed and will then stop; and parts of said machine are well adapted for use on machines that are not automatic in their action.

To these and other ends the invention consists in certain improvements in construction and operation, all as will be hereinafter fully described and the novel features pointed out particularly in the claims at the end of this specification.

In the accompanying drawings: Figure 1 is a front view of a machine constructed in accordance with my invention; Fig. 2, a side elevation of the same; Fig. 3, a rear view of the upper part of the machine; Fig. 4, a longitudinal sectional view; Fig. 5, a cross section on the line $x-x$ of Fig. 1; Fig. 6, a view of the clutch device when the brush is entering the bottle; Fig. 7, a similar view when leaving it; Fig. 8, a sectional view on the line $y-y$ of Fig. 6; Fig. 9 is a sectional view on the line $a-b$ of Fig. 8.

Similar reference numerals indicate similar parts.

The main frame of the machine indicated by 1 is composed in the present construction of a single casting having the side stiffening wings or webs 2, and the bottom 3 preferably depressed at the center as shown and provided with an aperture 4 for waste water connected with some suitable outlet. At the upper portion of the frame 1 a suitable bracket 5 is provided, secured adjustably to the said frame between which and a spring-supported sleeve 6 the bottle to be washed is held, said

sleeve passing through a bracket 7 also adjustably connected to the main frame and it is held in elevated position by means of a spiral spring 8 encircling it, and is prevented from extreme upward movement by a collar or nut 9 screwed thereon beneath the bracket 7. The bracket 7 is recessed in its upper side forming a receptacle for waste water and is provided with an outlet 10 to which any suitable flexible pipe 11 may be connected, all as in Fig. 1.

Sliding in suitable ways in the back or body of the main frame 1 is a vertically-movable rack 15, held in position by suitable plates 16, said rack forming part of a movable frame carrying the hollow rotating spindle 17 to the upper end of which the washing brush 18, of any ordinary construction, is attached. The brush, I prefer to use, is of rubber, hollow, with loose flexible ends adapted to fly out by centrifugal force to come in contact with the sides and bottom of the bottle while being washed, and also to permit the passage through it of water. The lower end of the spindle passes loosely through a stuffing-box 19 in a bracket 20^x attached to the lower end of the rack-bar 15, said bracket being provided with a longitudinal aperture, the lower end of which is closed by a plug-valve 20 provided with a collar 21 and held pressed outward, when the spindle is moving upward, against a confining cap 22, by means of a spring 23 arranged between the collar and bracket. The bracket is also provided with a lateral aperture 24 and a nipple to which a flexible water-pipe 25 is connected for supplying water to the interior of the spindle, the arrangement of the valve being such that when the spindle is in lowermost position, the end of the valve will close the aperture 24 shutting off the supply of water to the spindle and preventing waste, but when the frame carrying the spindle is raised the valve will open automatically and supply the necessary water for the washing operation. The upper portion of the spindle is supported in a bracket 26 also secured to the rack-bar 15 and the portion of the spindle passing through said bracket is provided with a collar 27 between which and the lower end of a recess in the bracket is a spiral spring 28 holding the spindle normally pressed upward with said collar against a confining cap

29, but permitting a limited upward movement of the bracket independently of the collar for the purpose of causing the washing-brush to operate for a moment on the bottom of the bottle, as will be farther on explained.

Secured to the main frame is a stationary bracket 30 partially encircling a driving pulley 31 around the spindle 17 but not connected therewith, and co-operating with the tapering interior of said pulley is a sleeve 32 having the tapering upper end and splined to the said spindle, but permitting the latter to move through it freely, said sleeve constituting a clutch-section adapted to be operated by a fork on one end of a curved lever 33 pivoted on the bracket 30, the other end of said lever projecting over in proximity to the bracket 26, on the movable frame, when the frame is in lowermost position, so that the bracket will then strike said lever, and disengage the clutch-sections stopping the rotation of the spindle until the movable frame is again raised and the spring 34 permitted to move the lever to cause the engagement of the clutch-sections and the rotation of the spindle.

Fastened upon the spindle 17 is a stationary collar 35^a adapted to engage an adjustable stop 35 supported preferably upon the outlet pipe 10 on the stationary bracket 7 when the spindle has reached its highest position and is operating on the bottom of the bottle, to arrest the movement of the spindle, though the movement of the movable frame may continue for a short distance as before described.

The present means for actuating the movable spindle-carrying frame up and down embody two oppositely moving driving pulleys and clutch mechanism operated automatically and mediately from said frame, the direct actuating device being a pinion 36 formed upon or secured to a stud operating in a bearing in the main frame and in a bracket 12 secured to the main frame, said pinion engaging the rack 17 and having formed upon or secured to it a worm-wheel 37, which latter is in turn actuated by a worm 38 splined to an arbor 39 movable longitudinally through it, said worm constituting in effect a driving-wheel. This shaft 39 is supported and is longitudinally movable in thimbles 40 screwed in the webs or wings 2 of the main frame and outside of the spline or key 90 connecting it with the worm, it is provided with tapered portions 41 adapted to co-operate with the tapered interiors of the pulleys 42 and 43 revolving loosely on the shaft between the worm and the thimbles 40, when the shaft is moved longitudinally in one or the other direction, that is, as the pulleys are driven in opposite directions by a belt 44, when the shaft is moved one way, it will be engaged with the pulley 42 rotating the worm, worm-wheel and pinion, moving the rack up or down as the case may be and when moved in the opposite direction, the other pulley 43

will be engaged and the rack moved in the opposite direction. The shaft 39 is operated by a shipper lever 45 having a forked end arranged between two adjustable collars 46 on the shaft, secured by set-nuts 47, said lever being actuated by a crank-pin 48 operating in its slotted end arranged on the face of an oscillatory disk 49, said crank-pin when vertically in line with its center of oscillation holding the shipper lever in mid-way position and the clutches disconnected, and when at either extreme, the shaft will be engaged with one or the other of the pulleys 42, 43.

The disk 49 is formed upon or secured to a short shaft 50 journaled in a bracket 51 secured to the main frame and having also an eccentric cam 52 thereon operating in the bifurcated end of a bell-crank lever 53 pivoted on said bracket 51, and carrying a pawl 54, the outer end of which latter is adapted to engage one or the other of the teeth 55, 56 on the disk 49.

The disk 49 may be called a ratchet-disk by reason of the teeth formed thereon, but as far as the function of operating the clutch-lever is concerned, the crank-pin might be connected otherwise to the shaft 50. The inner or forward end of said pawl 54 (when the machine is at rest as in Fig. 1) normally projects in the path of an adjustable stop or arm 57 on the bracket 26 carrying the spindle, but is adapted to be moved out of the path of the said stop to the position in Fig. 6, when the shaft 50 and the cam 52 are rotated.

58 indicates a bar sliding in the bearings 59 on the main frame and connected by a link 60 with the outer end of the pawl 54, a spring 61 arranged between a collar 62 and the bearing 59 tending to press said pawl into engagement with the teeth of the ratchet-disk 49. Upon the bar 58 is an adjustable stop or bracket 63 adapted to be engaged by the stop 57 on the movable spindle-frame to raise said bar and release the pawl from the teeth of the ratchet-disk when said frame reaches its highest position.

The shaft 50 carrying the cam and ratchet-disk is further provided with a pinion 64 engaging a rack-bar 65 pivoted at its upper end to a lever 66 pivoted at 67 to the main frame, said lever and rack-bar being raised and the shaft 50 rotated, when free, by a spring 68 connecting the lever and main frame. This rack and pinion is merely one form of connecting device, and the spring moving the lever, as far as the operation is concerned, could be connected to the disk.

The main driving pulley 70 is mounted loosely upon a rotary shaft 71 journaled in bearings in the upper part of the main frame and is adapted to be connected to said shaft by a clutch member 72 splined on the shaft and co-operating with the pulley, by means substantially such as shown between the spindle 17 and its driving pulley, said clutch member 72 being actuated by a lever 73 operated to effect the disengagement by a spring 74,

and having a roller on its end with which co-operates an incline 75 on a bar 76 pivoted to the operating lever 66. The connection of these parts is such that when the lever 66 is in the position in full lines Figs. 1, 2 and 3, the clutch is thrown out of engagement and the machine is at rest, but when the lever is moved down to actuate the short shaft 50, as will be described, the clutch member 72 is moved and the whole machine thrown into operation. This arrangement may be used in lieu of, or in connection with, the clutch device for throwing the spindle out of operation, as will be understood. The belt 44 passes around the main driving pulley 70, guide pulleys 77 on the front of the frame, thence around the pulleys 42, 43, rotating the latter in opposite directions and then around the pulley 31 for actuating the spindle 17.

The operation of the parts will now be understood. With the machine in the position indicated in Figs. 1 and 2, the clutch member is out of connection with the main driving pulley 70, and the clutch-sleeve 32 on the spindle is held disengaged from the pulley 31. The stop or arm 57 engages the end of the pawl 54, which is held out of engagement with the ratchet-disk. The operator now takes a bottle and places it between the sleeve 6 and the bracket 5 as shown in dotted lines Figs. 1 and 2, where it will be held by the spring operating the sleeve, he then pulls the lever 66 downward against the tension of its spring 68 and this through the rack-bar and pinion will turn the shaft 50 and the parts connected with it to the position shown in Fig. 6, that is, the crank-pin will have moved in the slot of the clutch-operating lever 45, moving it from its mid-way position shown in Fig. 1 to that shown in Fig. 6, moving the arbor 39 so that the incline thereon will engage one of the pulleys 42 or 43 and this through the worm and rack and pinion will move the spindle-carrying frame upward causing the brush to move out of the sleeve 6 and into the bottle above it. At the same time that the clutch lever is operated the cam will throw the bell-crank lever carrying the pawl around so that the pawl will be engaged with the tooth 55 being held in this position by the spring 61, thereby throwing the inner end of the pawl out of the path of the projection 57. The pawl will retain the parts in these positions and the spindle-carrying frame will immediately be moved upward, the valve 20 at the lower end of the frame being opened and water supplied to the interior of the spindle, and as soon as the bracket 26 leaves the upper end of the lever 33 the spindle will be rotated and the brush moved up in the bottle, centrifugal force causing the ends to fly out as usual, and the water supplied will cause the thorough cleansing. Just before the movable frame reaches the limit of its movement the collar 35^a on the spindle engages the stop 35 and though the movement of the frame continues, the spin-

dle is arrested at this point, being revolved all the time and the position of the stop 35 is such that the brush will be operating on the bottom of the bottle where the sediment and dirt is most liable to collect, allowing more thorough washing of this portion. When the carriage reaches the limit of its upward motion, the stop 57 engages the bracket 63 on the bar 58 connected to the pawl, and moves said bar upward against the tension of its spring, thereby releasing the pawl 54 from the tooth 55 of the ratchet-disk, allowing the latter to be rotated (through the spring and rack and pinion) until the tooth or projection 56 on said disk engages the pawl, as shown in Fig. 7, the rotation of the shaft 50 turning the bell-crank carrying the pawl inward again so that the inner end of the pawl will project again in the path of the stop 57. The crank-pin 48 is now nearly in a horizontal line with the center (see Fig. 7), and the shipper lever 45 is operated in a direction to cause the engagement of the shaft 39 with the other pulley 43, which is moving in the opposite direction from 42, thereby causing the downward movement of the movable frame and when said frame reaches its lowermost position the stop 57 disengages the inner end of the pawl from the tooth 56 on the ratchet-disk and allows the spring, operating through the rack and pinion and shaft 50, to turn said disk to the position shown in Fig. 1, the crank pin 48 then moving the shipper lever 45 to mid-way position and out of engagement with either of the driving pulleys. At the same time the clutch of the main driving shaft 70 is permitted to disengage said shaft on the main driving pulley, and the lever 33 being struck by the bracket 26 on the frame disengages the spindle from the driving mechanism and the operation is completed. When the spindle-frame reaches its lowest position the valve 20^x at its lower end is closed by engaging the bottom of the main frame, and the supply of water is cut-off. By supporting the bottle with its neck downward and moving the spindle and washing-brush supplied with water in and out of it, not only is the bottle washed thoroughly during the upward movement of the spindle, but while the latter is moving down, the stream of water strikes the bottom of the bottle and rinses it with clear water, and by the time the spindle has left the bottle the majority of the water will be drained out of the bottle so that the latter can be readily removed by pressing the sleeve 6 downward, and another substituted. It will, of course, be understood that the relative movements of the spindle and bottle could be changed, but I prefer to maintain the bottle stationary in order that the operator may at all times have a clear view through it to see that it has been properly cleansed.

These machines are adapted to be arranged in a single line along the main shaft which may co-operate with all of them and a number being attended by two operators, one of

whom places the bottles in the machine and starts it, while the other may remove them as soon as the machine has come to rest, the machines all being automatic in their operation, as will be understood.

Though I prefer to employ the forms of clutch-device shown herein, I do not wish to be confined to these, or to any particular form, as other and well-known equivalents could be applied by skilled workmen. And I regard belt shifters as the mechanical equivalents of clutches, broadly considered.

I claim as my invention—

1. In a bottle-washing machine, the combination with the main frame and a bottle support, of a rotary hollow spindle having a brush and connected to a water supply, a spindle-carrying frame, said frame and bottle support being separated when the machine is at rest, driving mechanism for causing their relative approach and separation, and clutch devices actuated by the movable part for causing their arrest after a predetermined movement, substantially as described.

2. In a bottle-washing machine, the combination with the main frame and the bottle-support thereon, of a rotary spindle carrying a brush, a movable spindle-carrying frame, driving mechanism for causing the movement of the frame in opposite directions, a stop operated by the frame governing the driving mechanism and adapted to permit the complete reciprocation of the spindle-frame and then disconnect it from the driving mechanism, substantially as described.

3. The combination with the stationary main frame, and a bottle-support thereon, of a rotary spindle having a brush, a movable spindle-carrying frame, two oppositely moving driving pulleys, and clutch devices actuated medially by the carrying frame for connecting said frame with one or the other of the pulleys, substantially as described.

4. The combination with the stationary main frame, and a bottle-support thereon, of a rotary spindle having a brush, a reciprocating spindle-carrying frame, two oppositely moving driving pulleys and clutch devices for engaging one or the other pulley with the frame, an automatic clutch-operating device, a pawl controlling it and a stop on the spindle frame cooperating with said pawl when the frame is at the extremes of movement, substantially as described.

5. The combination with the reciprocating frame, two oppositely moving pulleys, a clutch for engaging one or the other with the frame, an automatic clutch-operating device, a pawl for controlling it and a stop on the spindle-frame cooperating with said pawl when the frame is at the extremes of its movement, substantially as described.

6. The combination with the reciprocating frame, two oppositely moving pulleys and a clutch for engaging one or the other with the frame, of an automatic clutch-operating device, a pawl for controlling it, a stop on the

spindle-frame cooperating with the pawl when the frame is at the extremes of its movement, and a movable support for the pawl for disengaging the pawl from the stop on the spindle-frame, substantially as described.

7. The combination with the reciprocating frame, two oppositely moving pulleys and a clutch for engaging one or the other with the frame, of an automatic clutch-operating device, a pawl for controlling it, a stop on the frame cooperating with the pawl when the frame is at the extremes of its movement and a movable support for the pawl actuated by the clutch-operating device for disengaging the pawl from the stop on the frame, substantially as described.

8. The combination with the reciprocating frame, two oppositely moving pulleys and a clutch for engaging one or the other with the frame, of a clutch-operating device, a spring for actuating it in one direction, a pawl retaining the device when either of the pulleys is engaged with the frame, and a stop on the frame disengaging the pawl from the clutch-operating device when the frame is at the extremes of its movement, substantially as described.

9. The combination with the reciprocating frame, two oppositely moving pulleys and a clutch for engaging one or the other with the frame, of a clutch-operating device, a spring for actuating it in one direction, a pawl retaining the device when either of the pulleys is engaged with the frame, a stop on the frame disengaging the pawl from the clutch-operating device when the frame is at the extremes of its movement, and a movable support for the pawl actuated by the clutch-operating device for disengaging the pawl from the stop on the frame, substantially as described.

10. The combination with the reciprocating spindle-carrying frame, two oppositely moving pulleys and a clutch for engaging one or the other with the frame, of the ratchet disk having the cam thereon and controlling the clutch, the pawl support actuated by the cam, the pawl engaging the ratchet disk, the stop on the frame cooperating with the pawl when the frame is at the extremes of its movement and the spring for actuating the ratchet disk in one direction, substantially as described.

11. The combination with the reciprocating spindle-carrying frame, two oppositely moving pulleys and a clutch for engaging one or the other with the frame, of the ratchet disk having the crank-pin and cam thereon, the spring for actuating the disk, the clutch lever actuated by the crank pin, the pawl engaging the ratchet disk, the movable pawl-support actuated by the cam, and the stop on the movable frame engaging the pawl when the frame is at the extremes of its movement to disengage said pawl from the disk, substantially as described.

12. In a bottle-washing machine, the combination with the reciprocating frame having

the rack thereon, the pinion and the connected worm-wheel, of the longitudinally movable arbor having the tapered portions, the worm splined thereto, the pulleys rotating in opposite directions, loose on the arbor, and correspondingly tapered, the adjustable collars on the arbor and the shipping lever operating between the collars for moving the shaft in either direction to engage one or the other of the pulleys, substantially as described.

13. In a bottle-washing machine, the combination with the main frame, the thimbles secured adjustably therein, the arbor journaled in said thimbles having the driving wheel splined upon it and provided with the tapering portions, of the two pulleys on the arbor between the driving-wheel and thimbles, each having tapering portions corresponding to those on the arbor and a shipper lever for operating said arbor longitudinally to engage one or the other of the pulleys, substantially as described.

14. In a bottle-washing machine, the combination with the bottle-support, of the reciprocating frame, the rotary spindle carrying a cleaning brush, a spring connection between the spindle and frame permitting an independent relative movement of the spindle and a stop for arresting the longitudinal movement of the spindle, substantially as described.

15. In a bottle-washing machine, the combination with the main frame, an adjustable abutment for the bottom of a bottle, a bracket arranged below the abutment having a water receptacle and an outlet therefrom, a spring-pressed sleeve on the bracket supporting the neck of the bottle, of the hollow, rotary spindle having the cleaning brush on its upper end, connected to a water supply and passing through the sleeve and the reciprocating frame on which the spindle is mounted, substantially as described.

16. In a bottle-washing machine, the combination with the bottle-support embodying two relatively movable members, and a spring for operating them toward each other, of a hollow, rotary spindle connected to a water supply and having a cleaning brush on its upper end, a reciprocating frame on which the spindle is mounted arranged below the bottle-support, driving mechanism for moving the frame up and down, and a stop device actuated from the frame for causing the disconnection of the driving mechanism and the arrest of the frame when moved down, substantially as described.

17. In a bottle-washing machine, the combination with the main frame, the main driving pulley thereon, the reciprocating frame, the two pulleys arranged on horizontal axes, a wheel operating on the frame to reciprocate it, and clutch devices between it and

said two pulleys, of the spindle driving pulley in a stationary support, the spindle supported in the movable frame and splined to said pulley and a single belt passing around all said pulleys, substantially as described.

18. In a bottle-washing machine, the combination with the reciprocating frame, two oppositely moving pulleys, and a clutch device for connecting either pulley with the frame, of the clutch-operating lever, the disk having the crank pin operating the lever, and a pawl or detent for holding the disk with the crank pin on either side of the center to hold the clutch in engagement with one or the other of the pulleys, substantially as described.

19. In a bottle-washing machine, the combination with the reciprocating frame, two oppositely moving pulleys, and a clutch device for connecting either pulley with the frame, of the clutch-operating lever, the disk having the crank pin operating the lever, a detent or pawl for holding the crank-pin on either side of the center and a stop on the frame for releasing the detent when at the extremes of movement, substantially as described.

20. In a bottle-washing machine, the combination with the main shaft, the main driving pulley thereon and a clutch between them, of the reciprocating frame, reversing devices for moving the frame in opposite directions, a lever controlling the reversing devices and connections between said lever and the clutch on the main shaft causing their simultaneous operation, whereby when the machine is set in operation the reversing device is actuated to move the reciprocating frame in one direction, substantially as described.

21. In a bottle-washing machine, the combination with the main shaft, the main driving pulley thereon and a clutch between them, of the reciprocating frame, reversing devices for moving the frame in opposite directions, a lever controlling the clutch, a spring operating the lever in a direction to disconnect the clutch, reversing devices for moving the frame in opposite directions connected to said lever, a pawl or detent for holding the lever when moved to cause the operation of the frame in one direction, and a stop on the frame for releasing said detent and allowing the spring to actuate the lever and stop the machine when the frame reaches the extreme of movement in one direction, substantially as described.

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