

No. 870,730.

PATENTED NOV. 12, 1907.

P. D. LAIBLE.
BOTTLE WASHING MACHINE.

APPLICATION FILED OCT. 19, 1906.

4 SHEETS—SHEET 1.

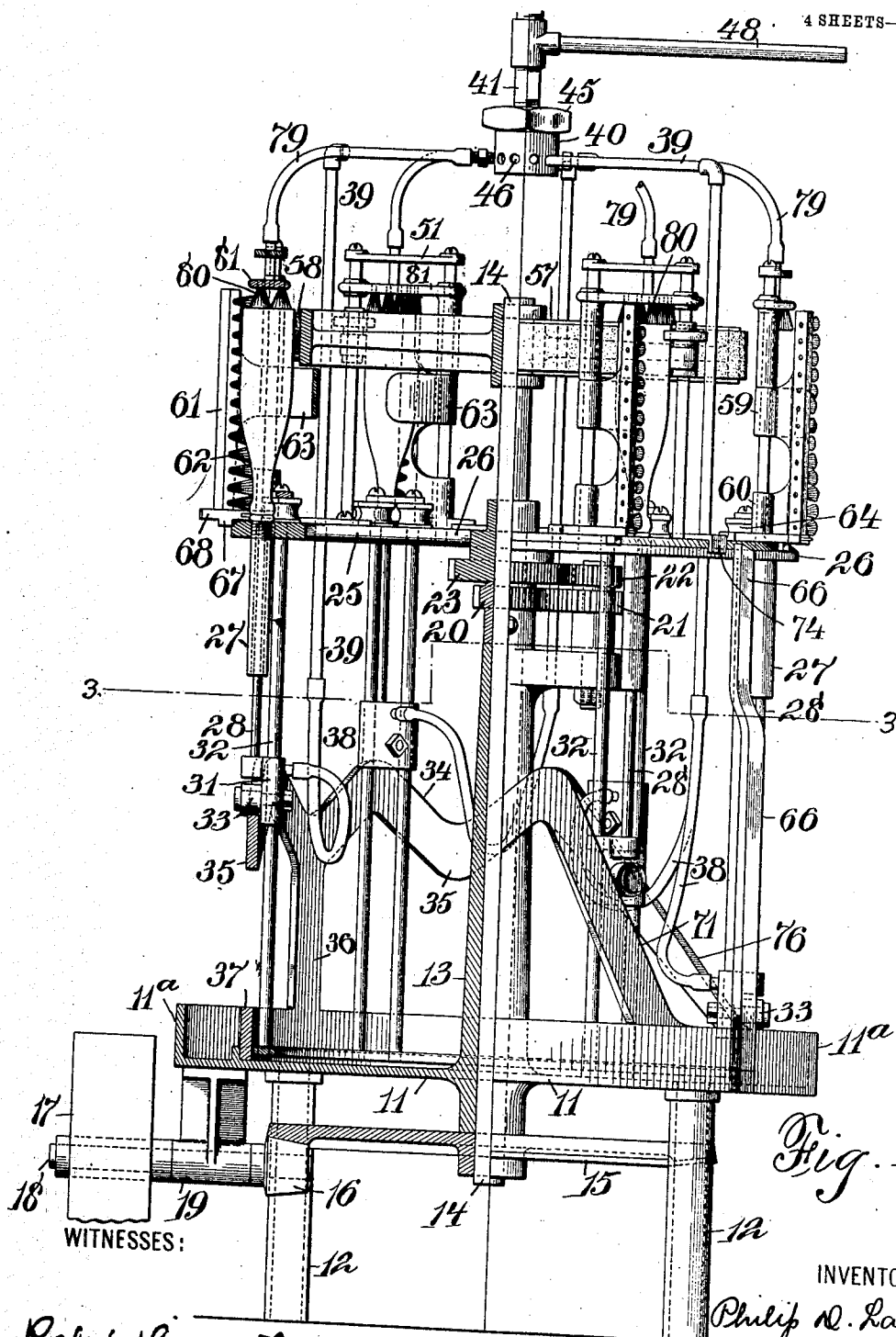


Fig. 1

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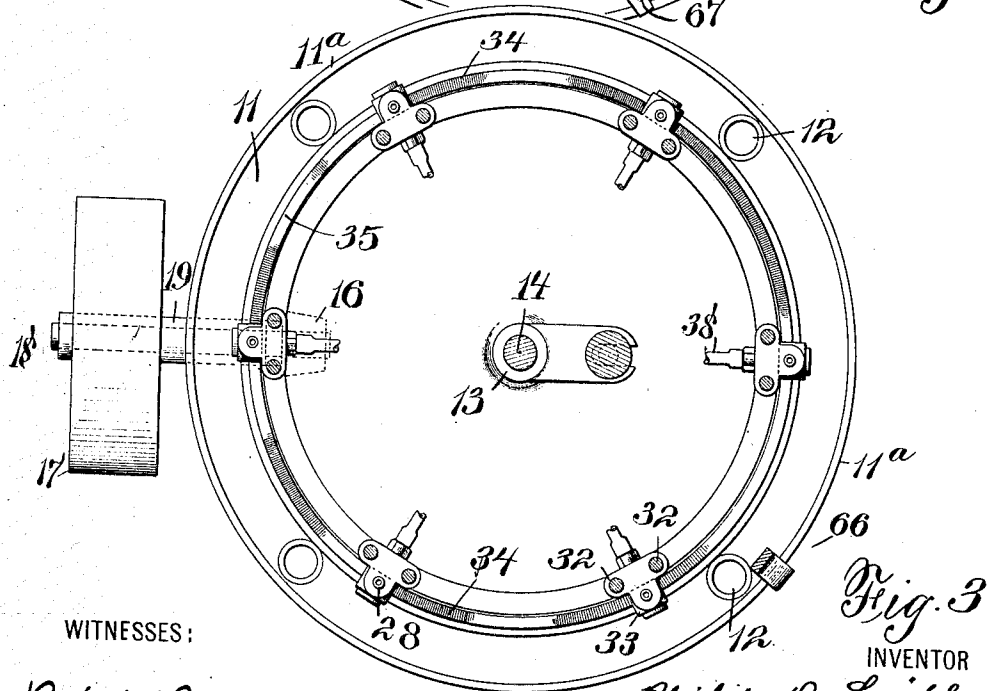
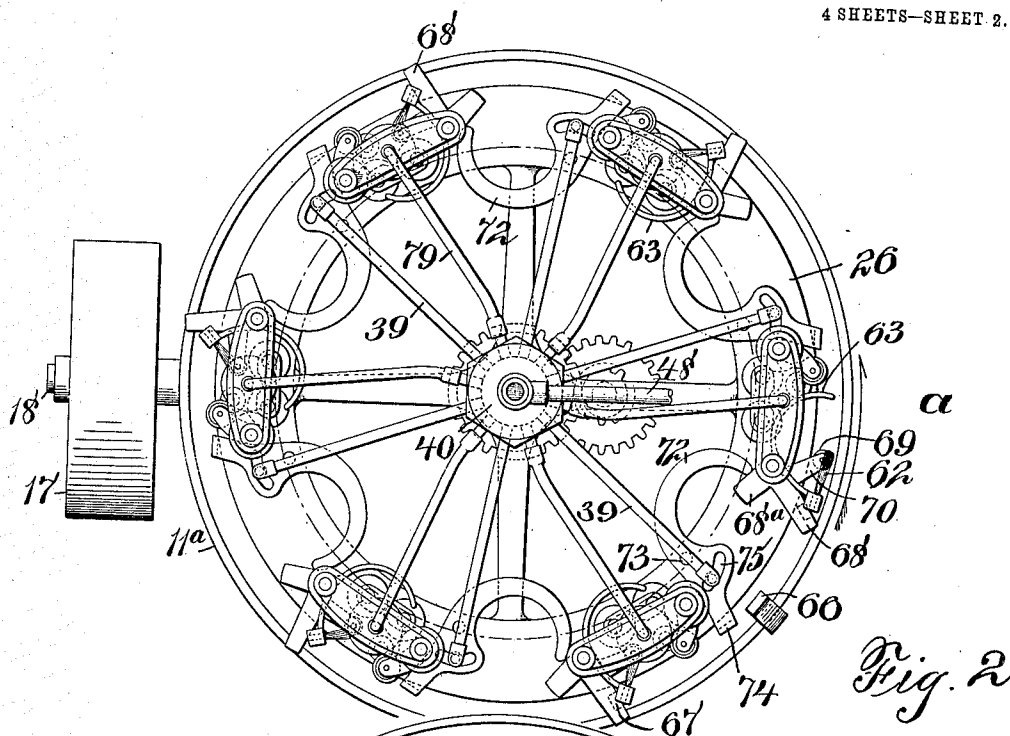
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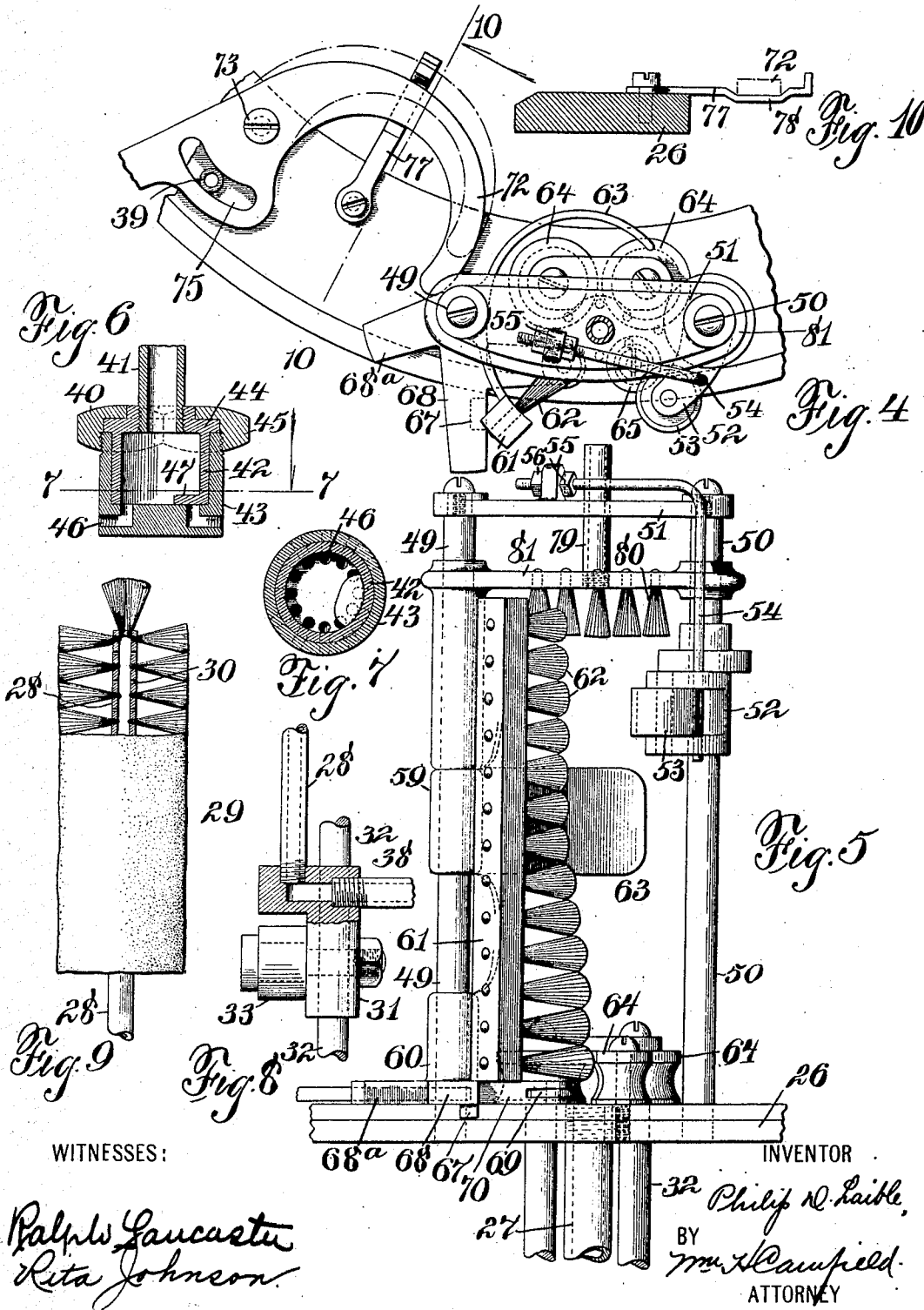
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4 SHEETS—SHEET 4.

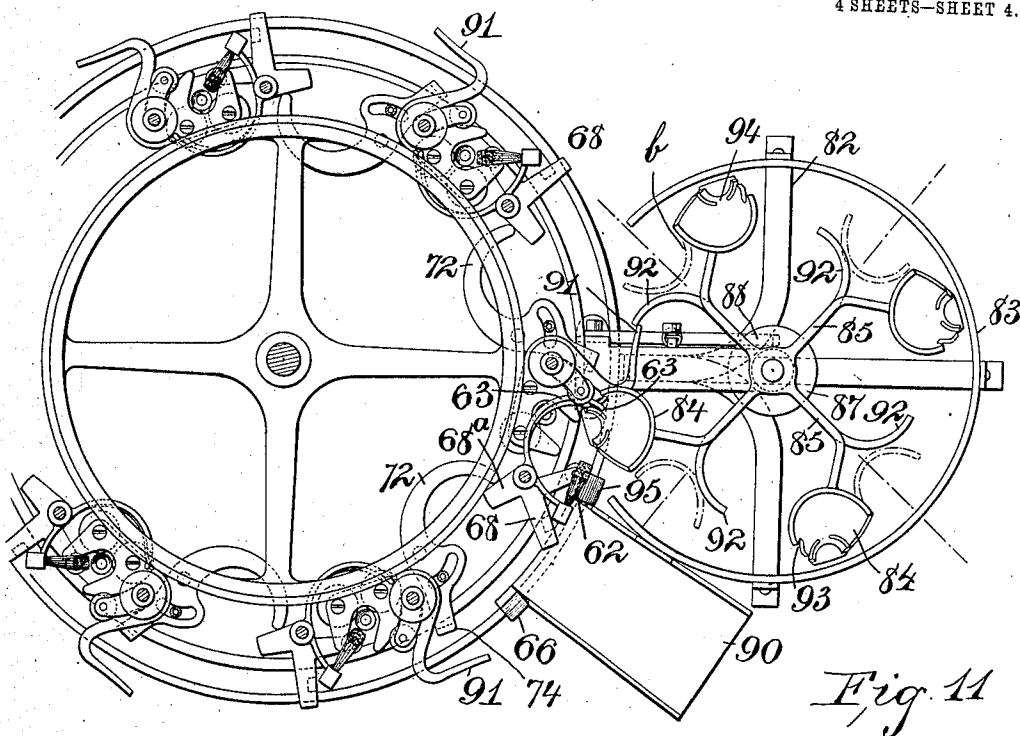


Fig. 11

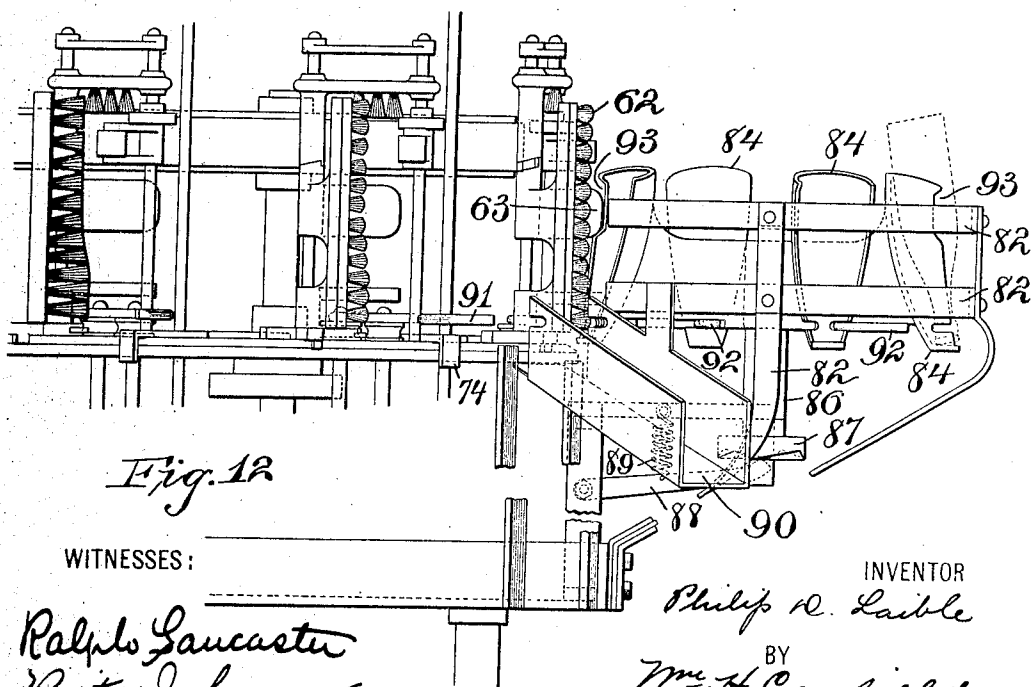


Fig. 12

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UNITED STATES PATENT OFFICE.

PHILIP D. LAIBLE, OF NEWARK, NEW JERSEY.

BOTTLE-WASHING MACHINE.

No. 870,730.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Application filed October 19, 1906. Serial No. 339,657.

To all whom it may concern:

Be it known that I, PHILIP D. LAIBLE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, 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 invention, such as will enable others skilled in the art to which it appertains to make and the use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This machine is designed to provide a device for washing bottles, and one that washes them by means of a brush on the inside and the outside, at the same time feeding water to both these surfaces to thoroughly cleanse the bottle.

The machine is further designed to provide a means for locking the bottle in place, and turning it while it is being washed, so that all points are scrubbed, and a means is also furnished for ejecting the bottle when it has passed through the machine, this ejecting means remaining open long enough to allow the insertion of another bottle to be cleaned.

This machine provides also, reciprocating brushes that travel in and out of the bottle while it is being washed, these brushes withdrawing entirely from the bottle at the point where the bottle is ejected from the machine.

Another feature of the machine is the shutting off of the water supply to the bottle cleaning means, when the bottle is at the point of its travel where it is removed from the machine and a new one inserted. At the base of the machine is arranged a trough, and a means for carrying off the water that drips from the bottles while they are being cleaned.

The invention is also designed to provide a carrier for bottles that is actuated by the machine, and feeds a bottle into the machine with certainty and facilitates the insertion of bottles to the machine. This carrier is actuated by the machine and enables greater speed to be maintained as bottles are fed to the carrier, and the bottles that have been washed are delivered into a trough that conducts them away from the machine.

The invention is illustrated in the accompanying drawings, in which

Figure 1 is a half section and half elevation of the bottle washing machine. Fig. 2 is a top view, and Fig. 3 is a horizontal section taken in line 3, 3, in Fig. 1. Fig. 4 is a top view, in detail, of the bottle holding and ejecting means, and Fig. 5 is a face view of the same. Fig. 6 is a section of the device for supplying water to the machine, and Fig. 7 is a section on line 7, 7, in Fig. 6. Fig. 8 is a detail, partly in section, of the carrier for the brush that travels inside the bottle,

and Fig. 9 is a detail of the brush. Fig. 10 is a section on line 10, 10, in Fig. 4, illustrating a locking means for the bottle holding device. Fig. 11 is a top view of the machine with a slight modification, and a top view of the carrier to feed bottles to the machine, and Fig. 12 is a side view of the top portion of the machine and also of the carrier.

The machine is formed with the body portion 11 that has a peripheral rim 11^a and is supported on the hollow standards or posts 12, and projecting upward is the integral bearing sleeve 13 that supports the shaft 14. This shaft 14 is secured to the gear wheel 15 which meshes and is driven by the gear wheel 16, this being operated by means of a suitable belt on the drive pulley 17 which operates on the shaft 18, journaled in the bearing 19.

Fastened to the shaft 14 is a gear wheel 20, which rotates a gear 21, this gear running idle and on the same shaft with the gear wheel 22, which in turn operates a gear wheel 23, the ratios of the gears being such that the gear wheel 23 rotates slower than the shaft 14 and the gear wheel 20, this being possible by the gear wheel 23 being loose on the shaft. The gear wheel 23 serves to operate, by means of the spokes 25, the flat ring 26, and screwed in this ring are the sleeves 27 in which reciprocate the pipes 28, on the end of which are secured the bristles or brush 29 (see Fig. 9). This brush is mounted on the pipe, and the pipe is provided with the perforations 30 to feed water to the brushes during the cleansing operation. The lower end of these pipes 28 project into the carriers 31 which are shown in detail in Fig. 8, these carriers being carried upon the rods 32 on which they reciprocate and which turn with the ring 26. The carriers are caused to reciprocate by means of the roller 33, each roller traveling on the cam surface 34 of the track 35, this track being supported on the uprights 36 integral with the rim 37. A flexible pipe 38 supplies water to the pipe 28 through the carrier, and each of these flexible pipes is attached to a rigid metallic pipe 39, these pipes and others to be hereinafter described, being attached to a head 40. This head 40 goes on to the end of the main water supply pipe 41 and has screwed thereto the thimble 42. A sleeve 43 is adapted to rotate on the thimble 42 and bears up against a flange 44 on the thimble, all the parts being held together and in their relation by the nut 45, this structure being shown particularly in Figs. 6 and 7. Suitable outlets 46 in the rotatable sleeve 43 provide passage for the water into the pipes to supply the brushes. The water is expected to be shut off, from the brushes, at a certain point in their rotation, and to accomplish this, I provide the interior of the thimble 42 with a lip 47, which shuts off the water from the outlets while they are passing this point. The shut off can be regulated by means

of the lever 48 which is adapted to be manually operated, and this lever turns the pipe 41 and consequently the thimble 42 with its lip 47.

The means for holding the bottle is illustrated in detail in Figs. 4 and 5, and in a general way in Figs. 1 and 2. The bottle holding attachments are duplicates, and I will describe one which will suffice for all of them. From the ring 26 project two upright posts 49 and 50 which are braced, at the top, by the plate 51. On one of these posts is arranged the lever 52, in the end of which rotates the roller 53, this roller being so positioned that it assists in holding a bottle, and it is adjustable, as to different sizes of bottles, by means of the bent rod 54 working through a lug 55 on the plate 51, the end of the rod being screw-threaded and receiving the nuts 56. The inner side of the bottle is held by the ring 57, (see Fig. 1), which is provided with a strip of felt or similar material 58, and this ring, as before described, rotating faster than the bottle holding means, causes the bottles to be spun around while they are traveling in the machine. On the other post 49 are arranged the eyes 59 and 60 which rotate on the post and support a brush 61 provided with the bristles 62 to wash the outside of the bottle on the sides. Integral with this structure is a hook 63 which is used to eject the bottle, the operation of which will be described hereinafter.

When the bottle is in place, it is held at the bottom, that is, at the neck, as the bottle is inverted, by the smaller rollers 64 which fit the neck and the small flat roller 65, which the bottle can be passed over, and a roller 69 to be hereinafter described.

Referring to Fig. 2, the point of delivery and insertion of the bottles is at *a*, and slightly to one side of this point is arranged a stop piece 66. A lug 67 on the lever 68, of the bottle holding means, when the bottle is in place, is so arranged that the stop piece 66 is in the path of its travel, and when this lug hits the stop, the lever is thrown around from the position shown in Fig. 4, to the position of the bottle holder at *a* in Fig. 2, the hook 63 swinging the bottle out so that it is in position to be lifted away from the machine, and as the machine is traveling, another bottle is inserted against the hook 63 and pushed in part way, and in the meantime the ejection of the previous bottle has operated, by means of the lever 68*, to swing a nose 72 that is pivoted at 73 and projects out beyond the edge of the ring 26, and is turned down as at 74. When the bottle is ejected, this turned down part 74 is thrown in the path of the stop 66, and when it engages this stop, the nose 72 is operated, consequently the levers 68* and 68, the hook 63 retreats, and the brush 62 is swung to assist in holding the bottle and to bear against it for cleaning, and at the same time the small roller 69 engages the neck of the bottle, this roller being operated on account of its being attached to the end of the lever 70 on the lever 68. This roller 69 holds the neck of the bottle snug up against the rolls 64 and 65. The arrangement is such that the bottle is held against displacement, but the rollers allow it to turn by reason of its contact with the covering of the ring 57.

On the top of the bottle is arranged the brush 80 arranged on the plate 81, and the pipe 79 feeds the water on the top of the bottle and to these brushes, and consequently to the side brushes 62 from the head 40 of the water pipe 41. When the bottle is in place, and hold-

ing means are locked to hold it, the nose 72 is prevented from swinging back by reason of its entering a detent 78 in the spring 77. This holds the nose 72, but not tight enough to prevent its being operated and swinging back to the dotted position shown in Fig. 4, when the lug 67 engages the stop 66. When the bottle is ejected from the machine, at the point *a*, or immediately before arriving at that point, the brush 29 must necessarily be out of the bottle, and this is done by allowing the carrier to run down the incline 71 and travel along the top edge of the rim 37. After another bottle has been inserted, in the machine, the carrier holding that bottle, then passes up the incline 76 and the brush for the inside of the bottle is again in place for cleaning, and then receives the reciprocations due to the sinuous track 35. The drippings from the bottles, for the most part, will go into the groove formed between the flange 11* of the frame 11 and the ring 37, and the posts 12 are preferably made hollow, and can be connected to a suitable system of piping to carry off this water from the machine.

In Figs. 11 and 12 is shown a carrier, mounted on the machine, to which bottles are fed, and which inserts the bottles in the machine positively and securely. The mechanism consists of a frame 82 which holds a series of circular strips 83 which tend to hold the bottles from falling out of the holders 84, except where they approach the machine. These holders 84 are mounted on the arms 85 and rotate on a shaft 86, this shaft being provided, at its bottom, with a detent 87, and an arm 88 actuated by a spring 89 fits in this detent and holds the carrier arms with the bottle holders in the normal positions shown in dotted outline in Fig. 11, the machine being illustrated in full lines at one point in its operation, the carrier thus having a mechanism to allow it to have a rotary step by step movement and prevent its spinning.

In Fig. 11 the arm 68, passing the trough 90 has been operated by the stop 66 and has ejected a bottle into the trough 90. This bottle receptacle on the machine then passes on and the arm 91 of the receptacle preceding engages a cam surface 92 of the arm 85 of the bottle holder 84 preceding, and rotates the carrier to bring a bottle holder 84 opposite the bottle receptacle to be filled. By reason of this bottle holder traveling on a smaller radius than the bottle receptacle; and thus a little faster, the cut-away portion 93 in the bottle holder allows the hook 63 to enter the bottle holder and engage the bottle therein and in this way slides the bottle into the grasp of the hook 63. By this time the elements have passed slightly beyond the positions shown in Fig. 11 and are close together. The neck of the bottle is thus caused to slide down between the rollers to engage it, as previously described, the bottle now being free of the carrier and resting in the receptacle with its neck in place and being slightly out of the perpendicular. A second stop piece 95 is secured to the machine to engage the turned down portion 74 which operates, as hereinbefore described, to close the bottle holding means on the machine, by means of the levers 68* and 68, and at the same time throws the brushes 62 into place, and these brushes are utilized to complete the fixing of the bottle in the bottle holding means of the machine, by forcing it into place in a vertical position. The bottle is now locked into the machine, and the bottle holder 84 that it previously occupied is in the position *b* in Fig. 11, be-

ing held there by the action of the end of the arm 88 in the detent 87. The carrier will thus be seen to have a step by step motion allowing ample time for the insertion of bottles in the holders 84, and the apparatus securely feeding the bottles to the machine without any liability of failure.

Each bottle holder as soon as emptied is in a position to cause its cam surface 92, to be engaged to rotate the holder the required distance, by the arm 91 of the bottle receptacle it has filled. In this way the carrier is operated as the washing machine is operated, that is, simultaneously therewith.

It will be obvious too, that I have devised a structure that is automatic in its operation, and that thoroughly scrubs the inside and the outside of the bottles, at all points, and furnishes a steady supply of water for this purpose.

Having thus described my invention, what I claim is:—

1. A bottle washing machine comprising a bottle holding means, a rotating circular carrier for the bottle holding means, means for spinning the bottle while being rotated, means for supplying water to the exterior of the bottle during its rotation, means for supplying water to the interior of the bottle during its rotation, a brush arranged to reciprocate inside the bottle during its rotation, means to reciprocate the inside brush means for ejecting the bottle at the completion of the rotation, and automatic means for shutting off the water supply, the reciprocating means withdrawing the brush from the bottle when the bottle is ejected.

2. A bottle washing machine comprising a bottle holding means, brushes on the exterior of the bottle, brushes reciprocating on the interior of the bottle, means to reciprocate the inside brush means for rotating the bottle holding means, means for ejecting the bottle, means for withdrawing the brush from the bottle before the bottle is ejected, mechanism for supplying water to the inside and outside of the bottle, automatic means for shutting off the water supply, and manually operated means for adjusting the point of shut off.

3. A bottle washing machine comprising a shaft, a ring on the shaft, a bottle holding means on the ring, a second ring supporting the bottle on the inside, means for supplying water to the exterior and interior of the bottle, a reciprocating brush in the bottle, means to reciprocate the inside brush a latch for withdrawing the brushes from the exterior of the bottle, means for withdrawing the brush from the interior of the bottle, a hook arranged to swing to eject the bottle when the brushes are withdrawn, and automatic means for actuating the hook.

4. A bottle washing machine comprising a circular frame provided with bottle holding means, a shaft to rotate the frame, means for scrubbing the bottle while it is being rotated, a circular trough under the frame, hollow posts supporting the trough and the machine for removing the water from the machine.

5. A bottle washing machine comprising a rotating frame, a bottle holding means on the frame, a reciprocating brush to enter the bottle, means to reciprocate the inside brush a brush on the outside of the bottle, a brush bearing on the bottom of the bottle, a pipe feeding water to the last mentioned brush, a pipe supporting the reciprocating brush and feeding water thereto, a hook to engage the bottle to eject it, mechanism for automatically actuating the hook means for shutting off the water supply when the bottle is ejected, means for withdrawing

the brush on the outside of the bottle, and means for withdrawing the reciprocating brush when the bottle is ejected.

6. In a bottle washing machine, a bottle holder comprising a frame, a set of rolls for holding the neck of a bottle, a pair of supports, an adjustable roller on one support, a right angled lever on the other support, a brush on the lever, a hook on the lever, a lug on the lever, and a lock to hold the elements in engagement with a bottle.

7. In a bottle washing machine, a means for holding an inverted bottle, comprising a support, a pair of posts, an adjustable roller on one post, a brush and a hook swinging on the other post, and a lever to operate the brush and the hook.

8. In a bottle washing machine, a means for holding an inverted bottle comprising a support, a pair of posts, a roller on one post, means for adjusting the roller, a brush and a hook swinging on the other post, a lever to operate the brush and the hook, a roller on the lever, and rollers on the support for engaging the neck of a bottle.

9. In a bottle washing machine, a means for holding an inverted bottle comprising a support, a roller on one post, means for adjusting the roller, a brush and a hook swinging on the other post, a lever to operate the brush and the hook, a second lever to operate the first lever in one direction and be operated by it in the other direction, and a lug on each lever to cause them to be tripped.

10. In a bottle washing machine, a means for holding an inverted bottle comprising a support, a roller on one post, means for adjusting the roller, a brush and a hook swinging on the other post, a lever to operate the brush and the hook, a second lever to operate the first lever in one direction and be operated by it in the other direction, a lug on each lever to cause them to be tripped, a brush spanning the posts, and a pipe feeding the brushes.

11. A bottle washing machine comprising a circular frame provided with bottle holding means, cleaning means on the machine, a rotary carrier provided with bottle holders, means on the machine to rotate the bottle holders, and means for operating the bottle holding means on the machine to remove a bottle from the holders to the bottle holding means.

12. A bottle washing machine comprising a circular frame provided with bottle holding means, a pivoted hook to eject the bottle from the machine, a stop on the machine to engage the hook and cause it to assume its normal position, a brush pivoted in the bottle holding means to follow the hook, a carrier arranged to rotate adjacent to the frame having bottle holders arranged to rotate therein, means on the machine to rotate the carrier on the holders, the retreating of the hook of the machine, and the movement of the brush being adapted to remove a bottle from the bottle holder to the bottle holding means of the machine.

13. In a bottle washing machine, a carrier comprising arms having bottle holders, means to retain bottles in the holders, a detent on the carrier, a lever to engage the detent, and means for causing an intermittent rotary motion of the carrier.

14. In a bottle washing machine, a carrier comprising arms having bottle holders on the ends, circular strips to retain bottles in the holders, the bottle holders having cut-away portions to allow the introduction of the ejector for the bottle, means for driving the carrier with an intermittent rotary motion, and means for normally holding the carrier in a fixed position.

In testimony, that I claim the foregoing, I have hereto set my hand this 17th day of October 1906.

PHILIP D. LAIBLE.

Witnesses:

E. A. PELL,
WM. H. CAMFIELD.

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