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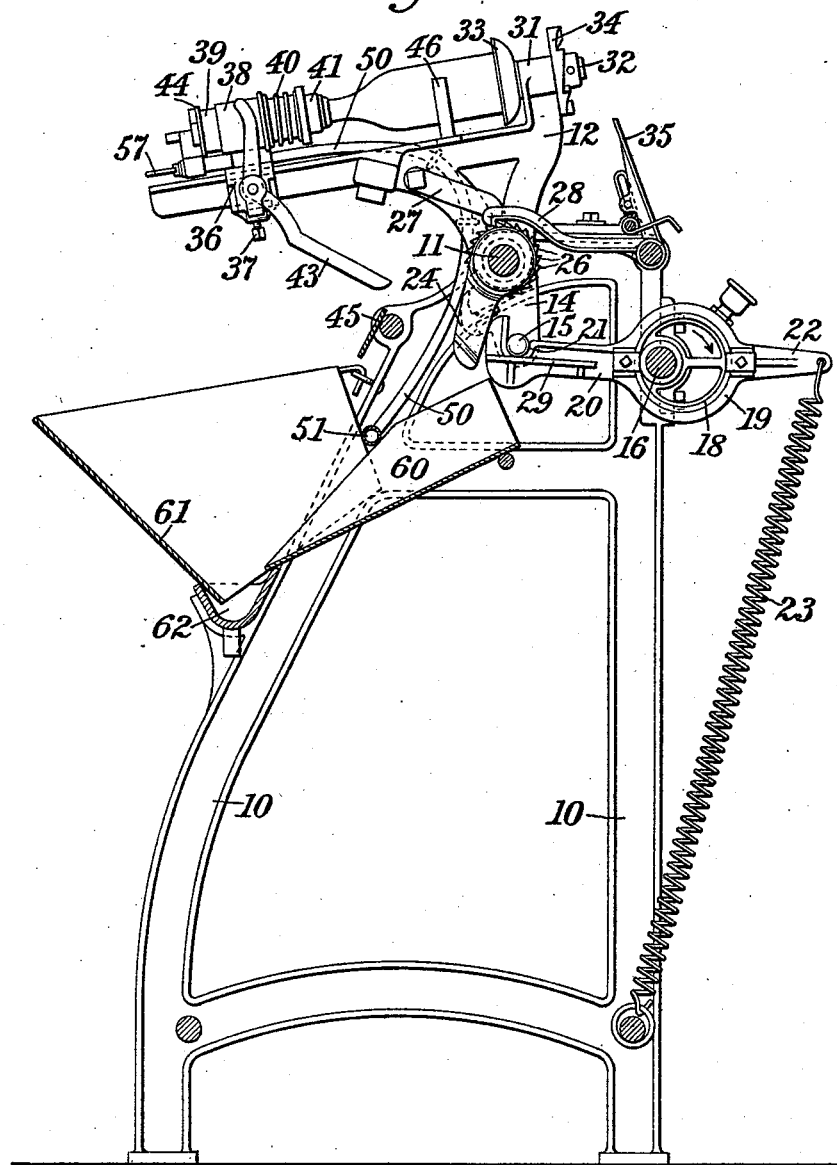
3 Sheets—Sheet 1.

M. E. DONALLY.
BOTTLE WASHER.

No. 525,139.

Patented Aug. 28, 1894.

Fig. 1.



Attest:
A. N. Jespersen.
A. Hidden.

Inventor:
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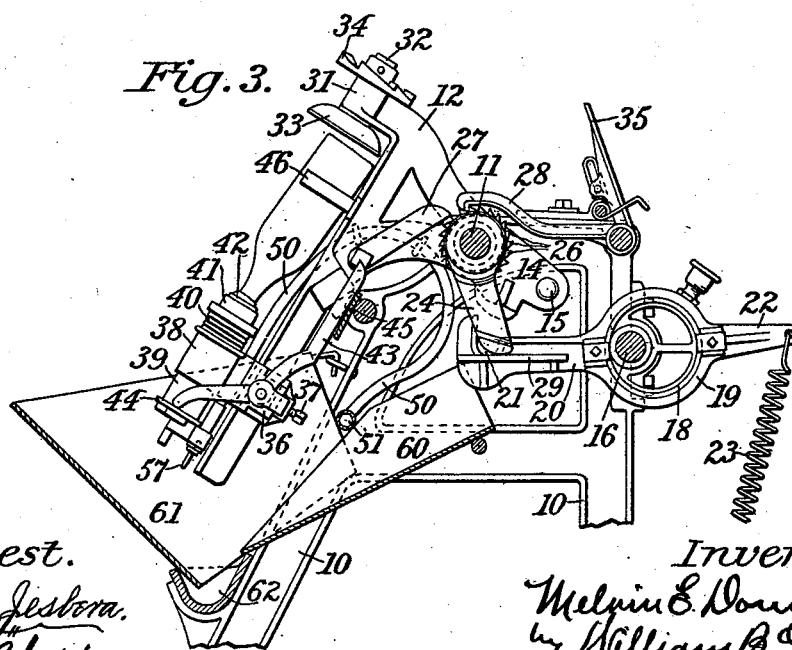
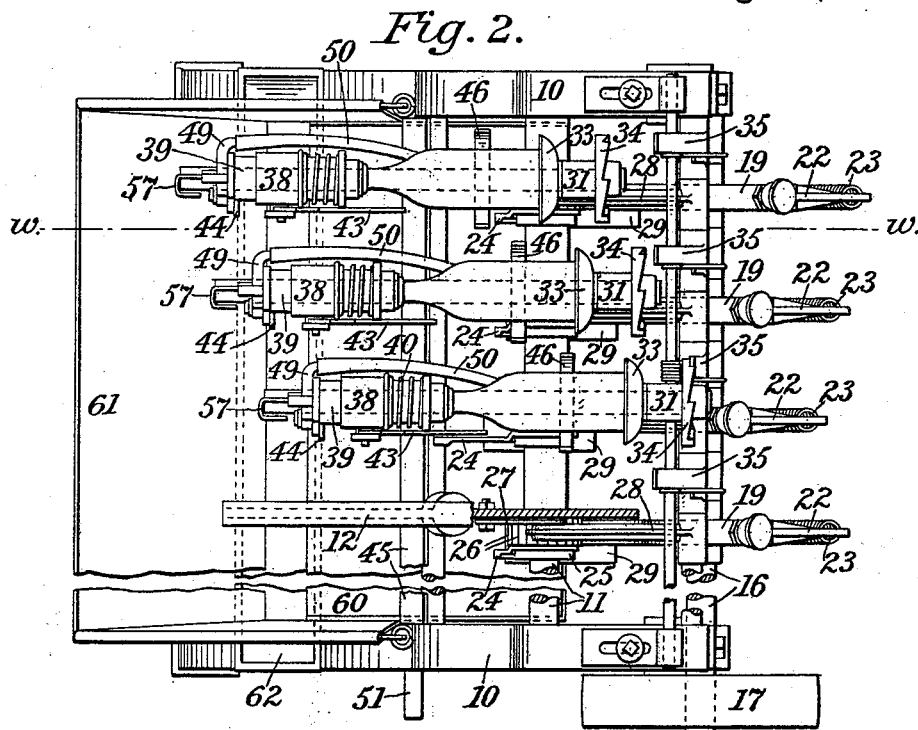
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M. E. DONALLY.
BOTTLE WASHER.

No. 525,139.

Patented Aug. 28, 1894.



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M. E. DONALLY.
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3 Sheets—Sheet 3.

No. 525,139

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Fig. 4.

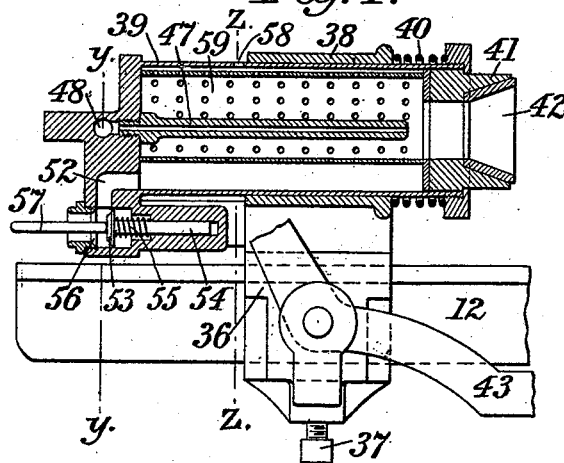


Fig. 5.

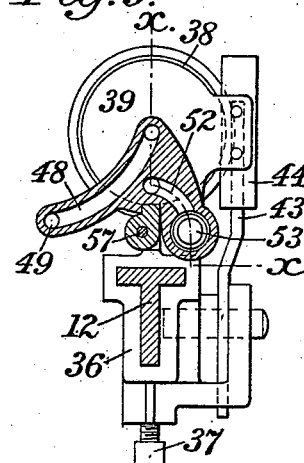


Fig. 6.

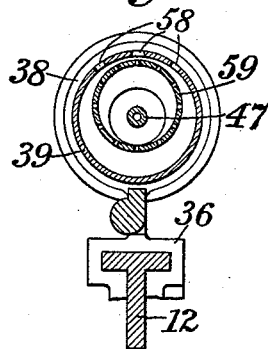


Fig. 7.

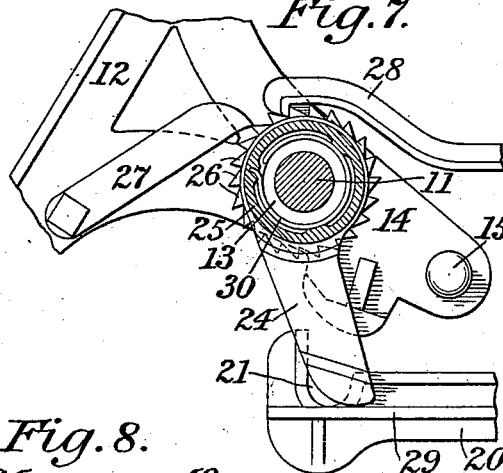
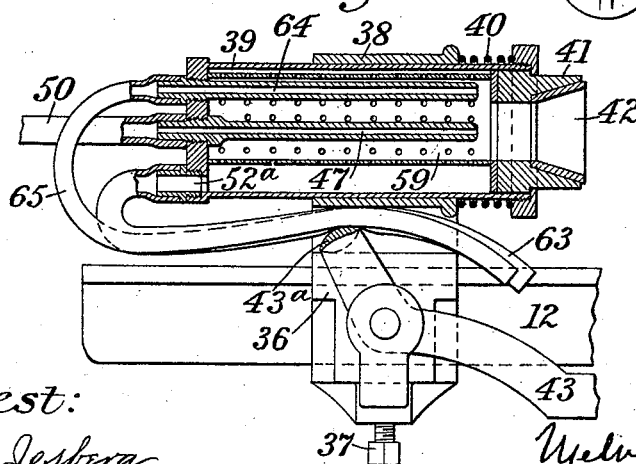


Fig. 8.



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UNITED STATES PATENT OFFICE.

MELVIN E. DONALLY, OF BROOKLYN, NEW YORK, ASSIGNOR TO AMALIA M. DONALLY, OF SAME PLACE.

BOTTLE-WASHER.

SPECIFICATION forming part of Letters Patent No. 525,139, dated August 28, 1894.

Application filed December 12, 1893. Serial No. 493,461. (No model.)

To all whom it may concern:

Be it known that I, MELVIN E. DONALLY, a subject of the Queen of Great Britain, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Bottle-Washing Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the figures of reference marked thereon, making a part of this specification.

This invention relates in general to bottle washing machines of that class in which the cleansing of the interior of the bottle is effected by agitation of the bottle with water and with shot or other like material. More particularly does it relate to a machine in which a number of bottles can be washed at the same time and any one bottle be removed without stopping the agitation of the others, and while the several features of my invention are not restricted in their application to this particular form of machine, yet the main object which I have had in view has been to overcome certain objections to the machine referred to and to produce a machine which shall be more acceptable to the users and generally more practical, efficient and durable. In the machine referred to it is necessary for the attendant to disconnect each bottle holder from its actuating means and then by the exercise of his own strength to release the bottle from the holder so that he may remove it and substitute another for it. In the improved machine each holder is disconnected automatically from its actuating means and the bottle is also released automatically from its holder and is left free to be lifted by the attendant, thereby saving the time and strength of the attendant and increasing the capacity of the machine. In the old machine the water was allowed to run out during the shaking with the result that an insufficient quantity remained in the bottle to effect the cleansing thereof; in the improved machine the water is not allowed to run out during the shaking but provision is made for the rapid emptying of the bottle as soon as the shaking ceases.

Other features of improvement will be re-

ferred to hereinafter and will be illustrated in the accompanying drawings in which is shown a machine embodying the several features of my invention.

In the drawings: Figure 1 is a vertical section of the machine on the line $w-w$ of Fig. 2, looking toward the left. Fig. 2 is a plan view of the machine partly broken out and with some parts removed to show the construction more clearly. Fig. 3 is a section of the upper part of the machine similar to Fig. 1 but showing the bottle holder thrown forward to release the bottle. Fig. 4 is a detail view in longitudinal section on the line $x-x$ of Fig. 5, illustrating the construction of the shot receiving cup and the means for controlling the water. Fig. 5 is a transverse section on the line $y-y$ of Fig. 4. Fig. 6 is a transverse section on the line $z-z$ of Fig. 4. Fig. 7 is a detail view, partly in section, illustrating the means for releasing the bottle from its holder. Fig. 8 is a view similar to Fig. 4, but illustrating a modification of the means for controlling the water.

As represented in Figs. 1, 2, and 3 of the drawings a suitable frame-work 10 supports a fixed shaft 11 upon which the bottle-holders 12 are mounted to oscillate. Any convenient number of holders may be employed according to the capacity which it is desired the machine to have, six being a suitable number for one attendant. The bottle-holders will be described more in detail hereinafter but for present purposes they may be described as adapted to receive and hold a bottle and to be rocked or shaken to and fro upon the axis of the shaft 11 on which they are mounted. Each holder is independent of the others and is adapted to be connected to or disengaged from the means for shaking it to and fro independently of the others. It is provided with a hub 13 which is sleeved loosely upon the shaft 11 and, as represented in Figs. 1, 3 and 7, has an arm 14 projecting below the shaft 11 and bearing a pin 15 with which the actuating means engages. In suitable bearings in the frame-work 10 a shaft 16 is mounted to rotate and may be provided with a driving pulley 17. To the shaft 16 and in corresponding position with the bottle holders are secured eccentrics 18, one for each bottle holder,

the several eccentrics being differentially disposed about the shaft. The strap 19 of each eccentric bears a forwardly projecting arm 20 having a notch 21 to engage the pin 15 and a rearwardly extending arm 22 to which is connected a spring 23 for the purpose of holding the arm 20 in engagement with the pin 15 while permitting it to be disengaged therefrom for the purpose of disconnecting the bottle holder from its actuating means. The clutch or coupling which is interposed between the bottle holder and the means for effecting its oscillation, may be of the form just described or of any other suitable form and might be disconnected by the attendant if desired, but in order that he may devote his entire attention to the removal of the clean bottles and the replacing of others in the holders it is desirable to provide means whereby the clutch shall be automatically disconnected when the bottle has been shaken to and fro a sufficient number of times to effect its cleansing. For this purpose I have provided means which are actuated step by step with the oscillation of the bottle holder and which effect the disengagement of the arm 20 from the pin 13 after a predetermined number of oscillations. The means referred to comprise a cam arm 24 carried by a sleeve 25 which is mounted on one end of the hub 13 of each holder. The sleeve is formed with ratchet teeth 26 which are engaged by a push pawl 27 pivoted on the holder 12 and a hook pawl 28 pivoted on the frame-work of the machine (see particularly Figs. 1, 2, 3 and 7). The end of the cam arm 24, in the course of its revolution, comes in contact with the arm 14, or with a web 29 which is formed thereon and depresses the arm, thereby releasing the holder 12 and allowing it to fall forward by its own weight. The sleeve 25 is mounted loosely on the hub 13 but in order that it may not move too freely a friction device is interposed between the two parts consisting, as represented in Fig. 7, of a flat spring 30 which embraces the hub snugly and has one end fast to the sleeve. Each bottle holder is adapted to receive and hold a bottle in such manner that it may be shaken to and fro, the bottle being retained in the holder by a clamp which is opened at a predetermined time by means provided for the purpose so that the attendant has simply to lift the bottle from its place without exertion. In a bearing 31 on the rear end of the holder 12 is mounted a short shaft 32 having on one end a cup 33 which forms a rotatable but longitudinally immovable support for the bottom of the bottle. The other end of the shaft 32 has a ratchet wheel 34 which is engaged as the holder swings backward, by a spring pressed pawl 35 pivoted on the frame of the machine, whereby the shaft 32 and cup 33 are rotated step by step during the shaking of the bottle. The forward end of the holder 12 supports a slide 36 which may be held in adjusted position by a set screw

37. The slide carries a sleeve 38 within which is mounted a cup 39 free to slide in the sleeve 38 to a limited extent and held normally toward the cup 33 by a spring 40, whereby every bottle, notwithstanding a slight difference in length, may be properly seated and held securely between the longitudinally immovable support 33 and the longitudinally movable support 39 which together form a clamp which may be opened to release the bottle. The cup 39 is not rotatable within its bearing but in order that the bottle may rotate upon its own axis with the cup 33, a ring 41, having an inwardly tapering mouth, is seated within the end of the cup with as little friction as possible and is provided with a rubber or other elastic lining 42 for contact with the mouth of the bottle. Upon one side of the slide 36 is pivoted a lever 43, one end of which is adapted to bear against a plate 44 fixed to the outer end of the cup 38 while the other end bears upon a suitable fixed stop 45 when the holder 12 is released and falls forward. The movement of the lever draws the cup 39 back against the tension of the spring 40 and thereby releases the bottle from the holder, leaving it standing free, as represented in Fig. 3, so that it can be readily removed by the attendant, the bottle being kept from falling off on one side or the other by arms 46. The cup 39 not only serves as a longitudinally movable support for the top of the bottle but it receives the shot from the bottle when the holder is thrown forward in the position represented in Fig. 3, returns the shot to the bottle which replaces the one removed when the holder is again connected operatively with its actuating means, and conducts to and away from the bottle the water which is used with the shot to effect the cleansing of the bottle. For the purpose of conducting water to the bottle the cup is provided with a nozzle 47 which is connected by a channel 48 with a suitable coupling 49 to which may be attached a pipe 50. As represented in the drawings the several pipes 50 are connected to a common header 51 to which water is supplied under suitable pressure. The nozzle 47 is so disposed within the cup 38 as to direct a stream of water continuously into a bottle while the latter is supported by the holder. While the bottle is being shaken the quantity of water is constantly increased, its outflow being prevented meanwhile by means hereinafter referred to. As soon as the holder is disconnected from its actuating means and drops forward to effect the release of the bottle by the movement of the cup 39 against the tension of the spring 40, the water in the bottle is permitted to escape while the stream of clean water continues to be thrown into the bottle, so long as the latter stands in the position shown in Fig. 3, and effects a thorough rinsing thereof. The means for permitting the water to escape from the cup and bottle as soon as the holder

falls forward comprise a valve which normally closes the outlet 52 but is opened automatically as the holder falls forward. As represented in Figs. 4 and 5 of the drawings a valve 53 is mounted upon a stem 54 and is normally pressed by a spring 55 against its seat 56 to close the outlet 52. To the slide 36 is fixed a bent rod 57 against the end of which, as shown clearly in Fig. 4, the valve 53 strikes as the cup 39 is pushed back by the lever 43 and the continued movement of the cup further effects the opening of the valve and permits the water to escape. In order that the bottle and cup may be emptied quickly it is necessary that an air-inlet should be provided through which the air may enter to take the place of the escaping water, while at the same time the inlet must be closed during the shaking of the bottle in order to prevent the escape of water at that time. For this purpose I form one or more holes 58 in the upper side of the cup 39 in such position with reference to the length of the cup that they just clear the sleeve 38 when the cup is thrust back to its extreme position, as in Fig. 4. Through this inlet the air enters freely while the water escapes through the outlet 52, the inlet being higher than the outlet. In order that the shot used may not clog the outlet from the cup 39 and may not interfere with the free flow of the water from the cup I dispose within the cup a perforated shell or sieve 59, which is preferably placed somewhat out of the center, as shown in Fig. 6, and receives the shot as they are discharged from the bottle while permitting the water to escape readily. It will be obvious that the stream of water continues to issue from the nozzle 47 after the bottle has been lifted from the holder, but as the attendant will remove the clean bottle with one hand and substitute an unwashed bottle with the other hand the operation will be performed very quickly and the waste of water will be slight.

The operation of the machine will be readily understood. In beginning operations all of the holders are disconnected and are dropped forward to the position represented in Fig. 3. The water is then admitted to the header 51 and a bottle is placed in the first holder in the position shown in Fig. 3. This holder is then thrown back into the position represented in Fig. 1 in which movement the connection of the holder with its actuator, that is to say, the eccentric arm 20, is automatically effected and the shaking of the bottle to and fro immediately commences, the bottle being held firmly between the two cups 33 and 39 by reason of the release of the cup 39 from the pressure of the lever 43 as soon as the holder is thrown up. As already described the step by step rotation of the bottle commences as soon as the shaking commences. The bottles are then placed in the remaining holders in succession and the connection of each to its actuator effected in succession in a similar

manner. By the time the last holder has received its bottle the cam arm 24 will have completed its rotation to disconnect the first holder from its actuator, permitting the holder to fall forward to release the bottle, so that it can be removed readily by hand, and to open the valve for the escape of the water from the cup 39. The clean bottle in this holder is then replaced by an unwashed bottle, the holder is thrown up to effect its connection with the actuator and the attendant devotes his attention to the next holder which meanwhile has been disconnected from its actuator and has fallen forward. The water which may escape during the substitution of an unwashed bottle for a clean one and which runs from the cup 39 is directed by shields or pans 60, 61, into a gutter 62 by which it is conducted from the machine.

Various modifications may be made in the construction of the machine without departing from the spirit of the invention. In Fig. 8 is illustrated a modification of the means for controlling the escape of water from the cup 39 and the ingress of air. In this construction the outlet 52^a is connected to a flexible discharge pipe 63. The air inlet is a tube 64 which is fixed in the closed end of the cup 39 and terminates near the other end thereof. A flexible pipe 65 is attached to the outer end of the tube 64 and both pipes 63 and 65 are led over a shoulder 43^a of the lever 43. When the bottle is being shaken the weight of the long arm of the lever 43 causes the shoulder 43^a to compress the pipes 63 and 65 between itself and the under side of the sleeve 38, thereby closing the outlet like a valve and closing also the air inlet and preventing the escape of water either from the outlet or from the vent. When the holder falls forward and the lever 43 is rocked on its pivot the pipes are released, permitting the water to escape and the air to enter.

Various other changes of construction will suggest themselves as within the scope of my invention and need not be referred to more particularly herein.

I claim as my invention—

1. The combination of a bottle holder, mechanism for shaking said bottle, a clamp to retain the bottle in the holder, and means actuated by the shaking mechanism to effect the opening of the clamp and the release of the bottle at a predetermined time, substantially as shown and described.

2. The combination of a bottle holder, means for shaking it, a coupling for said holder whereby it can be disconnected from its actuating means, and means to automatically release the bottle from its holder as the latter is disconnected from the actuating means, substantially as shown and described.

3. The combination of a bottle holder, means for shaking said bottle to and fro, a coupling for said bottle holder whereby it can be connected to or disconnected from its actu-

ating means, a clamp carried by said holder and having a movable member and a lever operated to open said clamp as the holder is disconnected from its actuating means, substantially as shown and described.

4. The combination of a bottle holder mounted to oscillate upon an axis, means for shaking said holder to and fro, a coupling for said holder whereby it can be connected to or disconnected from said means, a lever mounted upon said holder, and a stop in the path of said lever whereby as the holder is disconnected and falls forward the lever is rocked to release the bottle from the holder, substantially as shown and described.

5. The combination of a bottle holder, means for shaking it, a coupling for said holder whereby the holder can be connected to or disconnected from its actuating means, and means actuated by the movements of the machine to disconnect said coupling after a number of movements of the holder, substantially as shown and described.

6. The combination of a bottle holder, means for shaking it to and fro, a coupling for said holder whereby the holder can be connected to or disconnected from its actuating means, and a cam actuated by the movements of said holder to disconnect said coupling, substantially as shown and described.

7. The combination of a bottle holder mounted to oscillate upon an axis, means for shaking it to and fro, a coupling for said holder whereby the holder can be connected to or disconnected from its actuating means, a sleeve mounted loosely upon the same axis with the holder and having ratchet teeth and bearing a cam, and a pawl carried by said holder for actuating said sleeve whereby its cam is caused to disconnect said coupling, substantially as shown and described.

8. The combination of a bottle holder mounted to oscillate upon an axis, an arm held in engagement with said holder by a spring, means to actuate said arm to rock said holder, and means to move said arm against the tension of the spring to disengage the same from the holder, substantially as shown and described.

9. The combination of a bottle holder mounted to move to and fro, a rotating shaft, an eccentric fixed upon said shaft, an eccentric strap having an arm with an open notch to engage said holder, and a spring to hold

said notched arm in engagement with said holder, substantially as shown and described.

10. The combination of a bottle holder mounted to oscillate on an axis, means to shake said holder to and fro, a rotatable support for one end of the bottle mounted on said holder, a toothed wheel carried by said rotatable support, and a pawl supported in position to engage said wheel as the holder reaches the end of its movement, substantially as shown and described.

11. The combination of a bottle holder having a cup to receive the mouth of a bottle, said cup having an outlet for water and an inlet for air, means to shake the holder, means to conduct water into the cup, and means to close said outlet and inlet when the holder is being shaken and means to open the same as the holder comes to rest, substantially as shown and described.

12. The combination of a bottle holder, means to shake the same, a support for the bottom of the bottle mounted on said holder, a cup to receive the top of the bottle, a nozzle carried by said cup and adapted to direct a stream of water into the bottle, said cup having also in its lower side an outlet for the water and in its upper side an air inlet, means to close said outlet when the holder is being shaken and means to open the same as the holder comes to rest, substantially as shown and described.

13. The combination of a bottle holder, means to shake the same, a support for the bottom of the bottle mounted on said holder, a sleeve fixed on said holder, a cup longitudinally movable in said sleeve and adapted to receive the top of a bottle, a nozzle carried by said cup and adapted to direct a stream of water into the bottle, said cup being provided with an outlet on its lower side and on its upper side with an air inlet which is covered by said sleeve while the holder is being shaken and is uncovered as the cup is moved back to release the bottle, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MELVIN E. DONALLY.

Witnesses:

A. N. JESBERA,
A. WIDDER.