July 31, 1928. 1,678,796

H. B. WILLIAMS

BOTTLE WASHING MACHINE

Filed July 26, 1926 3 Sheets-Sheet 1

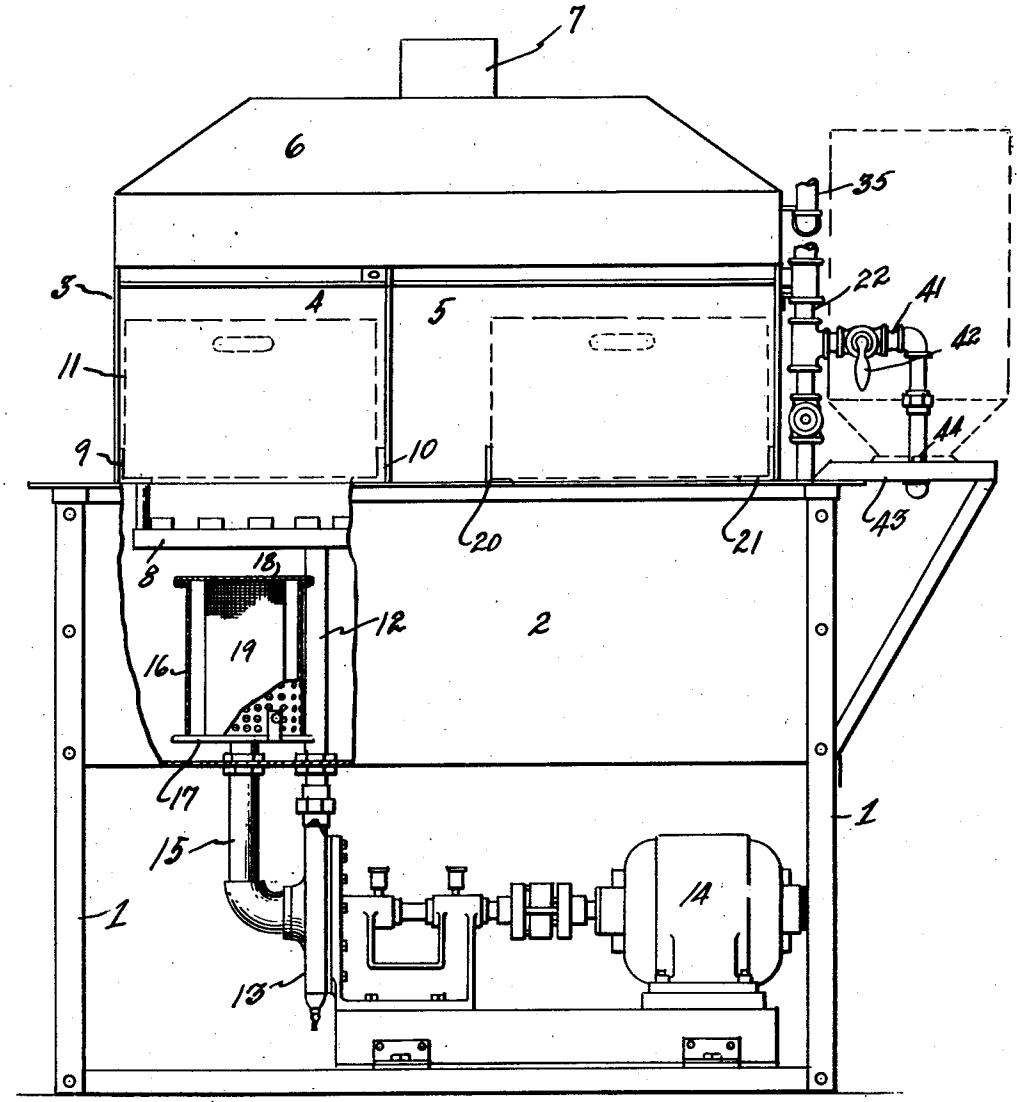


Fig. 1

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Filed July 26, 1926 3 Sheets-Sheet 2

Fig. 5

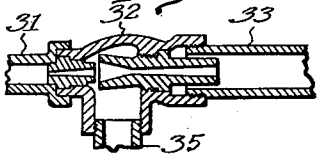


Fig. 2

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BOTTLE WASHING MACHINE

Filed July 26, 1926 3 Sheets-Sheet 3

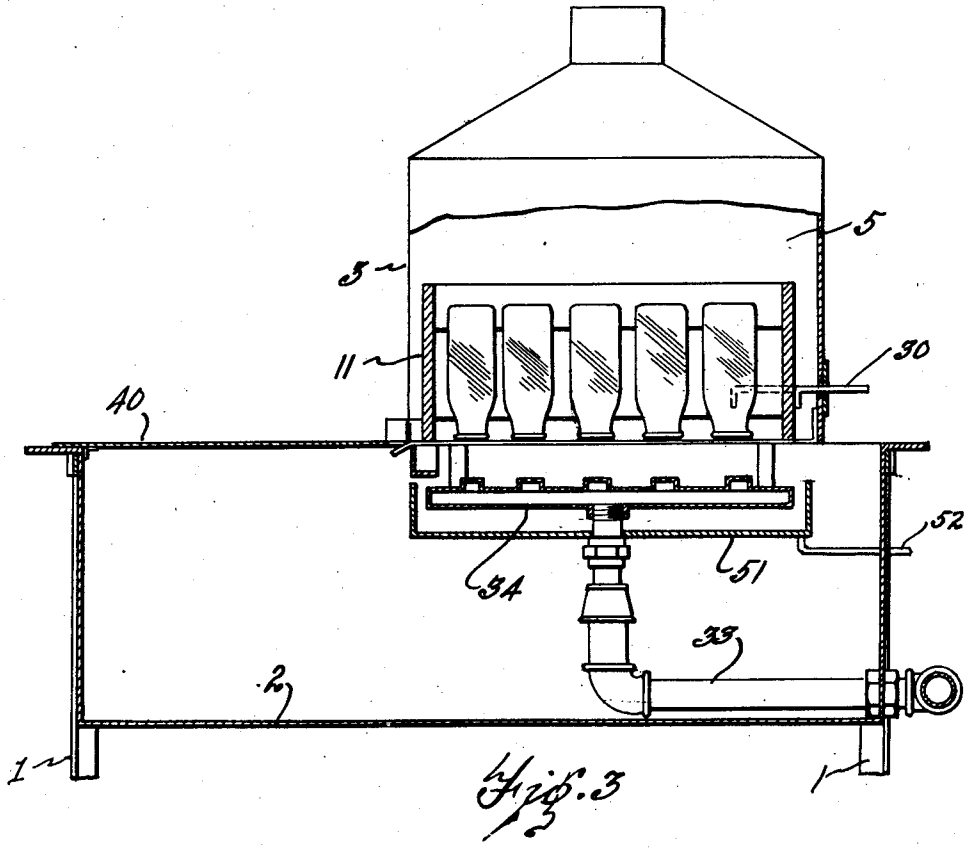


Fig. 3

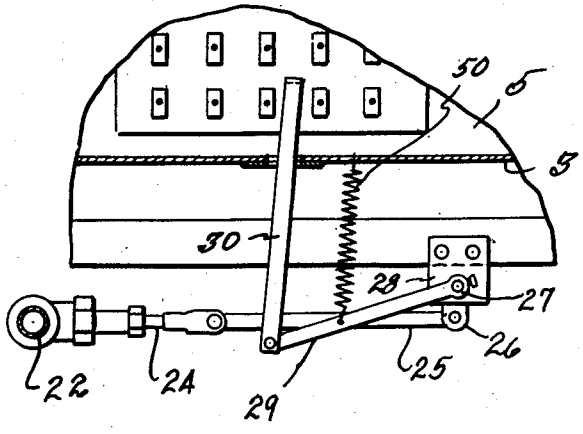


Fig. 4

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Patented July 31, 1928. 1,678,796

UNITED STATES PATENT OFFICE.

HENRY B. WILLIAMS, OF DETROIT, MICHIGAN, ASSIGNOR TO JOHN W. LADD CO., OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

BOTTLE-WASHING MACHINE.

Application filed July 26, 1926. Serial No. 124,844.

This invention relates to bottle washing machines particularly a machine for washing milk bottles, and the object of the invention is to provide an inexpensive and simple apparatus by means of which a relatively small quantity of bottles may be handled and washed economically.

Heretofore the majority of machines for washing milk bottles were continuously operating machines and were very large devices occupying considerable space and cost quite a considerable sum of money and therefore such machines were not utilized by small milk dispensing plants in small villages and country districts.

This invention seeks to provide a mechanical means for washing the bottles to relieve the hand labor involved, permitting the said bottles to be introduced into the machine in the usual case in which they are carried and thoroughly washed and finally rinsed and sterilized by subjection to a bath of saturated steam.

A feature of the invention is involved in the means whereby the saturated steam is turned onto the bottles through the action of the operator in introducing the case into position in the machine.

A further feature of the invention is involved in the arrangement of the tank and the washing heads, the tank containing the soap and cleansing solution with which the bottles are washed and the arrangement of the said heads for the wash water and saturated steam bath at one side of the tank providing an open part of the tank permitting introduction of a milk can into the cleansing solution in the tank for washing by hand and also the provision of means in conjunction with the steam connections for subjecting the washed can to a saturated steam bath.

A further feature of the invention is found in the provision of means for preventing material washed from the bottles or cans from entering the pump utilized to deliver the cleansing fluid to the spray head for washing the bottles. These and other objects and the several novel features of the invention are hereinafter more fully described and claimed, and the preferred construction of a milk bottle washing machine embodying my invention is shown in the accompanying drawings in which—

Fig. 1 is a front elevation partly in section showing my improved washing machine.

Fig. 2 is a rear elevation.

Fig. 3 is a section taken on line 3—3 of Fig. 2.

Fig. 4 is a section taken on line 4—4 of Fig. 2 showing the relationship of the saturated steam spray head and operating means and the means for discharging steam through the head by the act of inserting the bottle holding case thereover.

Fig. 5 is a section through the injector showing the steam and water lines thereto and the outlet line therefor.

The invention consists of a framework generally indicated by the numeral 1 consisting of standards or cross members of the usual form which support a tank 2 for the cleansing solution. A hood 3 is provided which is formed of two sections 4 and 5 open at the front and closed at the rear. The said openings are less than the height of the hood which has a tapered upper portion 6 and a vent stack 7 therefor connected to discharge exteriorly of the building if desired and through which excess steam is drawn from the apparatus and room in which it may be placed. Beneath the section 4 is located a holder head 8 of the usual type and this section has two runways 9 and 10 on opposite sides thereof shown in Fig. 1 providing a way on which the bottle case 11 may be moved into the section from the front and over the spray head. This bottle case is the usual rectangular frame member open top and bottom with the cross wires therein supporting the bottles with the open ends downward and the spray head is arranged with nozzle portions indicated in Fig. 3 for directing washing fluid into each of the bottles. The spray head 8 is supplied with fluid through the conduit 12 which forms the outlet for the centrifugal pump 13 operated by an electric motor 14 as shown in Fig. 1. This pump is of the usual type for this purpose and provided with an inlet at its center connected with the conduit 15 which opens to the interior of the tank 2 through the screen member 16. This screen member preferably extends a short distance above the bottom of the tank 2 and is formed with the two heads 17 and 18 and with an outer perforate metal cylinder by means of which material larger than the diameter of the apertures is prevented from passing into the screen and a central fine

screen member 19 in the interior of which opens the conduit 15. This inner screen prevents the finer material from passing through the conduits 15 and 12 and consequently into the spray head where it would tend to clog the nozzles, and I have found in practice that the double screen member is more efficient in operation than a single screen member like the member 19. I have also found it desirable to place the bottom of the screen a short distance above the bottom of the tank in which material washed from the bottles or cans may collect. The screen being above the bottom to a large extent prevents the clogging of the screen with such material and it is only the floating particles that are necessary to screen from such solution.

On submission of the bottles to the washing solution there would remain a sort of soapy film on the bottles and it is also required to sterilize the bottles. For this purpose I have provided a second section 5 in the hood which has the tracks 20 and 21, shown in Fig. 1, on which the case 11 first subjected to the cleansing spray may be introduced into the section and for the purpose of introducing a spray of saturated steam into and about these bottles to sterilize the same and further to cleanse the same of the soapy solution.

It is not desirable in a small plant to have the steam continuously discharging through the spray head, and I have therefore provided an automatic means for discharging the steam through the spray head actuated by introduction of the case on the ways 20 and 21. For this purpose I provide a steam conduit 22 which is open to a convenient steam line which line extends downward along one side of the apparatus at the rear and is provided with a valve 23, shown in Fig. 2, operable through longitudinal movement of the stem 24. This valve, it is to be understood, may open or close the steam line through movement of the stem 24. This stem is connected, as will be understood from Fig. 4, by means of a link 25 with a lever 26 attached to the stem 27 carried by a bracket 28. To this stem 27 is attached the lever 29 connected with the push rod 30 which extends through an opening in the rear of the hood into the section 5 as will be understood from Figs. 3 and 4. Normally when the valve is closed the push rod 30 extends a distance into the section 5 and by sliding the case 11 into the said section on the ways provided therefor the rear end of the case strikes the push rod moving it outwardly from the said section which causes the valve to open. This then admits steam into the line 31 and through an injector 32 with which is connected the piping 33 leading to the steam spray head 34 as shown in Fig. 3. This spray head is similar to the head 8 heretofore described being of hollow shell form provided with a series of nozzles corresponding to the bottles of an ordinary milk case and adapted to direct steam to the open ends of the bottles positioned thereover as shown in Fig. 3. The valve is again closed by means of the spring 50 upon withdrawal of the case to allow the arm 30 to return to the position shown in Fig. 4.

I have found that a far better cleansing effect as well as sterilizing effect is secured if the head be utilized with what is termed saturated steam that is, steam with more or less water injected with the steam into the bottle. For this purpose the injector 32 is provided connected to a pipe line 35 which may lead to a convenient source of water supply and this injector is adapted to add water to the steam passing through the spray head. As hereinbefore described the steam is turned on by introduction of the bottle case over the discharge head 34 and is turned off again upon removal of the case. However this does not control the water flow and the water flows continuously through the injector. By this arrangement when the steam is turned off the water will fill the pipe 33 and the head 34. With the pipe 33 and head 34 full of water the introduction of a bottle case turns on the steam which forces the water out of the pipe 33 and head 34 thus rinsing the bottles and washing the soapy solution off from the bottles before the saturated steam passes through the head for further rinsing and sterilizing the bottles. As the water flows continuously through the spray head it is necessary to prevent the water from passing into the tank 2 and diluting the washing solution. For this purpose I provide a drain pan 51 shown in Fig. 3 beneath the head 34 and this drain pan is provided with a drain pipe 52 shown in Fig. 2 which may lead to any convenient drain.

As heretofore stated, the hood is placed at the rear side of the tank as shown in Fig. 3 leaving an open space in the tank at the forward side thereof sufficiently large to permit introduction of a milk can. This space is usually closed by a metal cover member indicated at 40 so that the forward portion of the tank is covered while the apparatus is utilized for the washing of bottles in the manner described. In the event one desires to wash a milk can this cover 40 is removed and the can introduced into the cleansing solution and washed therein by hand. In small plants such as this apparatus may be provided for or wherever inexpensive apparatus is desired to be used the quantity of cans to be washed is comparatively small and it may therefore be conveniently done by hand and this apparatus being already provided with a cleansing so-

lution for the bottle washing apparatus can be conveniently used for the second purpose without particular additional expense except that the tank shall be large enough and arranged to permit introduction of the milk can as stated.

It is necessary also to remove the cleansing solution from the interior and therefore provide means for rinsing and sterilizing the same by the steam line. This is provided with the conduit 41 connected with the steam line 22 and controlled by the hand valve 42. This line 41 extends to beneath the platform 43 mounted on the side of the tank as shown, and is provided with a nozzle 44 substantially centrally of this platform thereover. The open end of the milk can is placed as indicated by dotted lines in Fig. 1. This line permits steam to be discharged into the interior of the can as will be readily understood and therefore the can may be readily sterilized and the steam bath to which these cans are subjected should be for a sufficient period of time to wash the walls thereof for removal of the cleansing solution.

The apparatus, as will be understood from the foregoing description, is compact in form, occupies but little floor space and is practically automatic in operation. The motor and pump for providing cleansing solution may run continuously while the saturate steam solution for the bottles is automatically controlled through introduction of the bottle case as described and the steam for sterilization of the cans is manually controlled in order that the apparatus will not be wasteful of steam and the whole provides a milk bottle and can washing machine as a simple mechanical unit serving all the purposes for which a small plant has use.

Having thus fully described my invention, its utility and mode of operation, what I claim and desire to secure by Letters Patent of the United States is—

1. A milk bottle washing machine consisting of a tank for cleansing solution, a hood mounted thereabove at about the upper surface thereof and at the rear side providing space in front of the hood for access to the tank, the said hood being provided with a partition dividing it in two chambers each open at the bottom and at the front side, guideways therein for bottle cases, spray heads beneath each guideway, the spray head under the first guideway being for a cleansing solution, means for circulating fluid from the tank and discharging it through the head from which it may fall again into the tank and a sterilizing head beneath the other section, a steam line connected therewith, and means operable by contact with a bottle case positioned under the hood for opening the steam line.

2. A milk bottle washing machine consisting of a tank for cleasing solution, a hood mounted at the rear side and upper surface thereof and open at the bottom to the tank, a cover for the upper end of the tank between the front thereof and the said hood, a spray head beneath the open bottom of the hood at one end, a pump, and means for operating the pump to withdraw solution from the tank and discharge it through the said head, tracks above the said head for the support of a milk bottle case, a second head similarly located at the opposite end of the hood, a steam line opening to the said head, a valve in the line, an operating means therefor actuated to open the valve by contact with a bottle case positioned over the head, and a support in the hood for the said bottle case.

3. A milk bottle washing machine consisting of a tank for cleansing solution, a hood mounted thereover at the rear side open at the bottom to the tank and the tank having an opening providing access thereto between the front side thereof and the hood, a spray head beneath the hood at one end, means for discharging cleansing solution from the tank through the said head, tracks in the hood above the head for the support of milk bottle cases, a spray head at the opposite end of the hood, a steam line opening to the said head, an injector in the steam line for introducing water into the steam as it passes to the head, a valve in the steam line, means actuated by contact with a milk bottle case positioned in the hood above the said steam head for opening the said valve, and automatic means for closing the valve through removal of the case.

4. A milk bottle washing machine comprising a tank for cleansing solution, a hood mounted at the upper surface thereof and spaced from the forward side a distance sufficient to permit introduction of a milk can into the tank, a pair of tracks at each end of said hood adjacent the bottom and the said bottom being open to the tank, a spray head for cleansing solution beneath one of the said pair of tracks, a motor, a pump operated thereby having an inlet opening to the tank, and an outlet opening to the spray head, a screen within the tank for the said inlet of the pump, and means actuated by contact with a bottle case when positioned on the other of said pair of tracks for introducing steam and water into the case, the arrangement providing that said water drains into the tank.

5. In a milk bottle washing machine, a tank for cleansing solution, a hood mounted thereover and being open at the bottom to the tank, a pair of tracks in the said hood for support of a bottle case, a spray head therebeneath, a steam line connected therewith, an injector in the steam line, a water line leading to the injector by means of which the introduction of steam through the

conduit discharges water therewith through the spray head, the said saturate steam solution rinsing and sterlizing the bottles in the case, means for opening the steam line actuated by contact with the case when positioned over the head, and means for automatically closing the steam line by withdrawal of the bottle case.

6. In a bottle washing machine, a tank for cleansing solution, a hood mounted thereover at the rear upper side of the tank, a partition in the hood dividing the same into two compartments, both said compartments being open at the front and bottom, a removable cover for the tank between the hood and the front side of the tank providing a slide for bottle cases in moving the same into the compartments or from one compartment to the other, a washing and a sterilizing head each beneath one of the compartments, means for discharging cleansing solution through one of the said heads, and means for injecting steam and water through the other of the said heads, the arrangement providing that the steam and the water from said head drain into the tank and maintain the solution heated.

7. The combination with a tank adapted to contain washing liquid, a washing spray-head adapted to drain into the tank and means for forcing liquid from the tank through the spray-head, of a rinsing spray-head, a conduit submerged in the tank and communicating with said latter head, means for admitting a restricted flow of water from a source outside the tank to said conduit to slowly fill the same, and means for admitting steam to said conduit at intervals.

8. The combination with a tank adapted to contain washing liquid, a washing spray-head adapted to drain into the tank and means for forcing liquid from the tank through the spray-head, of a rinsing spray-head, a conduit submerged in the tank and connected to said latter head, means for admitting a restricted flow of water from a source outside the tank to said conduit to slowly fill the same, a steam pipe communicating with said conduit, a normally closed valve in said pipe, and a member for opening said valve arranged adjacent said rinsing spray-head and adapted to be operated by a bottle holding crate when the crate is placed over said latter head.

9. The combination with a tank adapted to contain washing liquid, a washing spray-head adapted to drain into the tank and means for forcing liquid from the tank through the spray-head, of a rinsing spray-head, a conduit submerged in the tank and connected to said latter head, a water pipe for conveying water from a source outside the tank to said conduit, a valve in said pipe for restricting the flow of water so that the conduit will fill slowly, a steam pipe connected to the water pipe between said valve and conduit, and a valve for opening and closing the passageway in the steam pipe.

10. The combination with a tank adapted to contain washing liquid, a washing spray-head adapted to drain into the tank and means for forcing liquid from the tank through the spray-head, of a rinsing spray-head, a conduit submerged in the tank and connected to said latter head, a water pipe for conveying water from a source outside the tank to said conduit, a valve in said pipe for restricting the flow of water so that the conduit will fill slowly, a steam pipe connected to the water pipe between said valve and conduit, a normally closed valve in said steam pipe, and a member for opening said latter valve arranged adjacent said rinsing spray head and adapted to be operated by a bottle-holding crate when the crate is placed over the latter head.

In testimony whereof I sign this specification.

HENRY B. WILLIAMS.