Dec. 19, 1933. T. D. LANE 1,940,217

SUPPLY MECHANISM

Filed Nov. 7, 1931

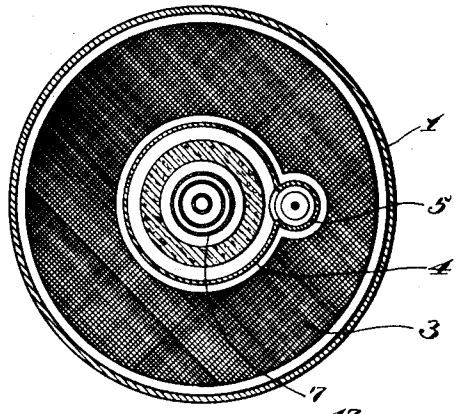


Fig. 2

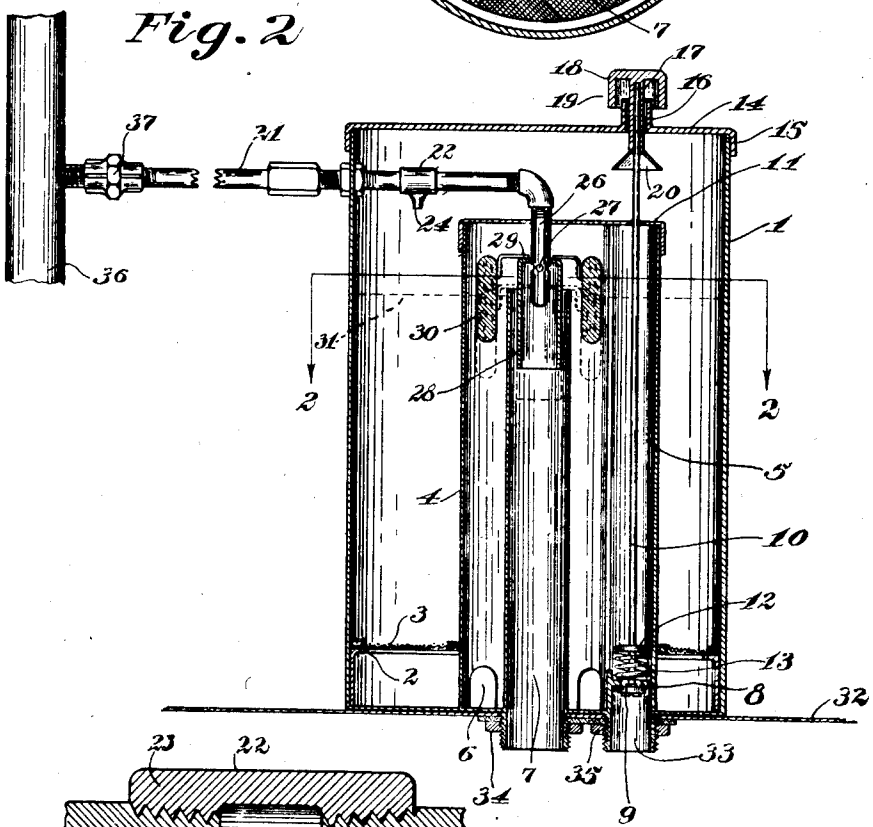


Fig. 1

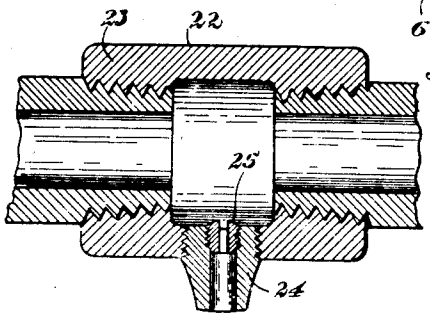


Fig. 3

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Patented Dec. 19, 1933

1,940,217

UNITED STATES PATENT OFFICE

1,940,217

SUPPLY MECHANISM

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Application November 7, 1931. Serial No. 573,713

3 Claims. (Cl. 141—9)

REISSUED

The present invention relates to a cleaning solution supply mechanism for dishwashing and industrial washing machines.

In most dishwashing machines of the type used in restaurants, a reservoir is provided for containing cleaning solution with an electrically driven pump connected from the reservoir to spray heads mounted within the dishwashing machine to spray the cleaning solution over dishes supported on a rack within the dishwashing machine, and fresh hot water is supplied through a spray head to rinse the dishes after being cleaned. Such dishwashing machines ordinarily have the cleaning solution reservoir arranged below the spray heads so that the water from the spray heads drains off the dishes being rinsed and falls into the reservoir of cleaning solution. An overflow pipe is provided at a predetermined height in the solution reservoir so that an amount of the cleaning solution equal to the amount of spray water introduced overflows at each spraying operation. This, of course, dilutes the cleaning solution upon each spraying operation and in order to maintain the solution at a proper strength for cleaning the dishes, it is necessary to add concentrated cleaning solution at frequent intervals.

Various types of mechanisms have been devised to maintain the cleaning solution at a required strength. Most of such mechanisms are not, however, associated directly with the rinsing spray.

An object of the present invention is to make an improved and simplified mechanism for maintaining a cleaning solution at a predetermined strength and to permit the introduction of a large quantity of concentrated cleaning solution to initially charge a dishwashing machine.

In order to obtain this object there is provided, in accordance with one feature of the invention, a tank adapted to contain a quantity of soluble cleaning material and a pipe connected from a rinsing spray line of a dishwashing machine to the interior of the tank. A small opening is provided to permit a predetermined quantity of water from the rinse line to enter the tank upon each rinsing operation, an overflow opening being provided interiorly of the tank to maintain the level of the liquid in said tank at a predetermined height. The overflow from said tank is conducted into the solution reservoir of a dishwashing machine with which the device is associated. A manually operable valve is provided for quickly discharging a large quantity of the contents of the tank into the solution reservoir of the dishwashing machine, and controlled inlet means are provided to rapidly fill the tank after a charging operation.

These and other features of the invention will be more fully brought out in the following description and the accompanying drawing, wherein:

Figure 1 is a vertical sectional view through a mechanism embodying the present invention.

Figure 2 is a sectional view on the line 2—2 of Figure 1; and

Figure 3 is an enlarged longitudinal sectional view of a metering outlet.

Referring to the drawing in detail, a container 1, which is here shown as being cylindrical in shape, is provided with an inwardly disposed flange 2 spaced upwardly from the bottom of said container to support a screen 3 upon which a soluble cleaning substance is adapted to be supported. A cylindrical wall 4 having an offset portion 5 on one side thereof is secured to the bottom of the container 1 and is provided with notched openings 6 in the lower end thereof to permit the free passage of liquid therethrough. A tubular central overflow pipe 7 is mounted concentrically with the cylindrical wall 4 and a valve seat 8 is mounted in the offset portion 5. A valve 9, which may be of rubber or fibre, is mounted beneath the valve seat 8 and a rod 10 connected to said valve extends upwardly through a cover member 11 which is mounted to cover the upper edge of the wall 4 and offset portion 5. A collar 12 is provided on said rod and a coil compression spring 13 is mounted below said collar to rest upon the upper surface of the valve seat 8 to hold the valve normally in a closed position. The container 1 is provided with a cover 14 having a downwardly turned flange 15 around the periphery thereof to close the upper end of the container.

An upwardly extending collar 16 is provided in the cover and is adapted to be positioned directly above the center of the offset portion 5 of the annular wall 4. Slidably mounted in this flanged collar is a valve operating member 17. This member is provided with an enlarged head portion 18 with a downwardly turned peripheral flange 19 adapted to surround the collar 16. This member is provided with a funnel-shaped skirt 20 on the lower end thereof and has a central opening of a size to freely receive the upper end of the valve operating rod 10. A water supply pipe 21 is mounted in one side of the wall 1 of the container and has a metered discharge outlet 22 mounted therein. The construction of this

metered outlet is clearly shown in Figure 3. It comprises a sleeve 23 in which the two sides of the pipe 21 are threadedly inserted. A small outlet nozzle 24 is threadedly inserted in the central portion of the sleeve and a small metering plug 25 is threadedly inserted in the top of the nozzle 24. By providing metering plugs with different sizes of central openings the rate of discharge of water therethrough can be determined with sufficient accuracy to meet the requirements of an installation in which the flow of rinse water, and pressure on the rinse line is known. This is not intended to be adjustable in use and when the proper size of metering plug has been inserted for a predetermined water pressure and a required flow of cleaning material, no further adjustment is required. A downwardly projecting pipe 26 is in open communication with the pipe 21 and this downwardly projecting pipe is closed at its lower end and is provided with radially disposed spray openings 27 therein so that water passing through the pipe 26 will be sprayed outwardly through these openings. A slidable sleeve 28 is mounted over the tube 26 and the upper end thereof is bent inwardly to slightly clear the pipe 26 to permit free slidable movement of the sleeve 28 with respect to the pipe 26. A yoke 29 is connected to the slidable sleeve 28 and this yoke is connected on its outer ends to an annular float 30 which may be of cork or other construction, as required.

The liquid level in the container is indicated by the dotted line 31 and it will be noted that as the liquid reaches this level the slidable sleeve 28 will be raised upwardly by the float 30 to cover the openings 27 in the downwardly extending pipe 26 so that water expelled from these openings will be carried downwardly inside the sleeve 28 and thence through the overflow tube 7. This flow of clean hot water through the overflow pipe prevents crystallization of the interior of this pipe by the concentrated cleaning solution. The top plate of a dishwashing machine is indicated at 32 and the extended lower end of the overflow tube 7 and also an extension 33 from below the valve 9 are inserted through openings cut in the top plate 32 of the dishwashing machine. The lower ends of the tube 7 and extension 33 are threaded and a washer of rubber or other suitable material is provided to form a water-tight seal at the point of penetration of the plate 32 by the tube 7 and the extension 33. Nuts 34 and 35 are threaded onto the lower end of the tube 7 and extension 33, respectively, to hold the container 1 rigidly in position on the dishwashing machine.

The installation of the device is accomplished by drilling and tapping a hole in a rinse pipe 36 of a dishwashing machine to receive a fitting 37 into which is threadedly inserted a tube 21. The tube 21 is then brought by the most convenient route into the interior of the container 1, as illustrated in Figure 1. With a predetermined city water pressure, which may be accurately determined for any given locality of the city, a certain size of metering plug 25 may be specified by the manufacturer for a known size and model of dishwashing machine. If desired, a pressure gauge may be threadedly inserted into the hole drilled and tapped in the pipe 36 to determine the water pressure and tables may be provided for the man doing the installing so that with a specified water pressure and specified type of dishwashing machine a certain size of metering plug 25 may be specified.

Another way of determining the pressure would be to insert a specified size of metering plug 25 and then turn on the rinse and note the time required before the container 1 overflows through the tube 7. Holes of a required size are then cut in the top plate 32 of the dishwashing machine so that the tube 7 and extension 3 will be in a position to discharge the contents of the container 1 downwardly into the solution reservoir of the dishwashing machine. If desired, and space within the dishwashing machine permits, the container 1 may be mounted interiorly of the dishwashing machine. These, however, are matters for consideration for individual installations, either method of installation being satisfactory, provided it does not interfere with the normal operation of the dishwashing machine.

In operating the device the cover 14 is removed from the container 1 and a quantity of soluble cleaning material, not shown, preferably in the form of powder or crystals is inserted in the container 1 around the wall 4. The cleaning material may be inserted to the height of the upper end of the member 4 and preferably should not be added to extend beyond this height. The cover 14 is then replaced, the skirt 20 acting to guide the rod 10 into the operating button 17. When the tank is empty of liquid, the float 30 and attached sleeve 28 will be in the downward or dotted line position indicated in Figure 1, so that upon each operation of the rinse sprays of the dishwashing machine, hot water will be discharged through the openings 27 of the pipe 26. Also, at each spraying operation a small quantity of water will be discharged through the metering plug 25 and nozzle 24. The water passes downwardly through the notched opening 6 and upwardly into the soluble cleaning substance contained in the space between the wall of the container 1 and the wall 4. Upon the rising of the liquid level in the container to the dotted line position 31, the upper edge of the sleeve 28 will be moved above the openings 27 so that the water from these openings will pass downwardly and be discharged through the overflow pipe. Therefore, as long as the liquid level remains at the height of the dotted line 31, the only water entering the container will pass through the metered orifice in the metering plug 25. This water will fill the container to the top of the overflow tube 7 and thereafter at each rinsing operation a small quantity of liquid in the container will be caused to overflow through the tube 7 and pass downwardly into the reservoir of the dishwashing machine with which the device is associated. After the reservoir of the dishwashing machine has been drained and refilled with fresh water, it is necessary to initially charge the fresh water with cleaning compound and this is accomplished by depressing the operating button 17 which opens the valve 9 and discharges the liquid in the container 1 into the reservoir of the dishwashing machine. Thereafter the container will be rapidly filled by the water passing through the openings 27 and from this point on the operation will be as above described.

The device comprises a simple and effective means for charging a dishwashing machine with concentrated cleaning material and thereafter supplying concentrated cleaning material to the reservoir of the dishwashing machine in proportion to the amount of rinse water used in the dishwashing machine.

I claim:

1. A solution tank of the character described,

comprising a container, an upstanding well therein having liquid communication with the space between the walls of the well and container, an overflow device in said well having an overflow outlet spaced upwardly from the bottom thereof, a water supply pipe entering said container and said well and having an opening therein adapted to discharge water passing through said pipe into said well, and float control means operated by a predetermined rise of liquid in said container to deflect water from the opening in said pipe into said overflow outlet.

2. A solution tank of the character described, comprising a container, an upstanding well therein, the space between the walls of said well and the container being adapted to contain a quantity of soluble cleaning material, said well having openings therein for the passage of liquid between said space and well, a comparatively large overflow means within said well, said overflow means discharging exteriorly of said container, a pipe passing through a wall of said container into the interior thereof and adapted to be connected at its opposite end to a rinse water spray line of a dishwashing machine, said line having a small opening therein positioned interiorly of said container to discharge a quantity of water from said rinse line into said container at each rinsing operation of said dishwashing machine.

3. A solution tank of the character described, comprising a container, an upstanding well therein, the space between the walls of said container and said well being adapted to contain a quantity of soluble cleaning material, said well having openings therein for the passage of liquid between said space and the well, an overflow pipe mounted in said well having an opening therein above the bottom of said container, a valve mounted in said container near the bottom thereof, and manually operable to discharge the liquid contents of said container, a pipe extending through a wall of the container into the interior thereof and having a small orifice therein interiorly of said container, the end of said pipe being positioned within said well, said pipe having openings therein to discharge water passing through said pipe into said well, float control means operated by a predetermined rise of liquid in said container to direct water passing through said last mentioned openings into said overflow opening, the other end of said pipe being adapted to be connected to the rinse water line of a dishwashing machine.

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