

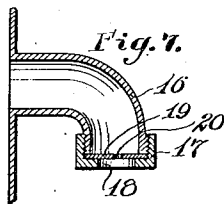
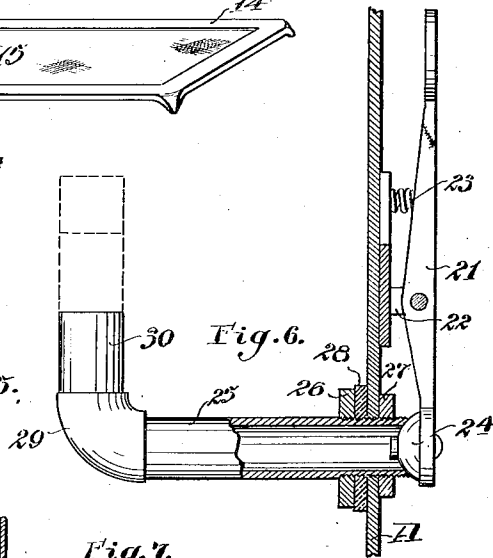
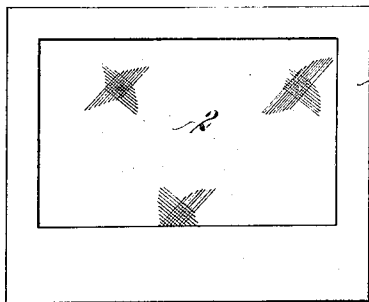
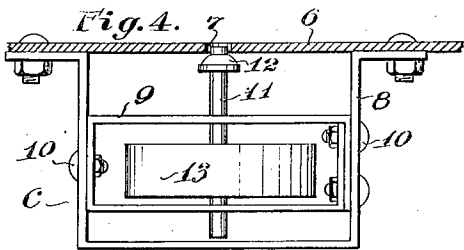
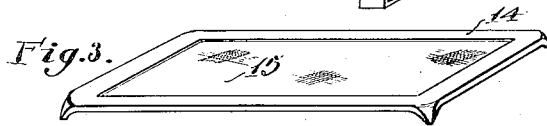
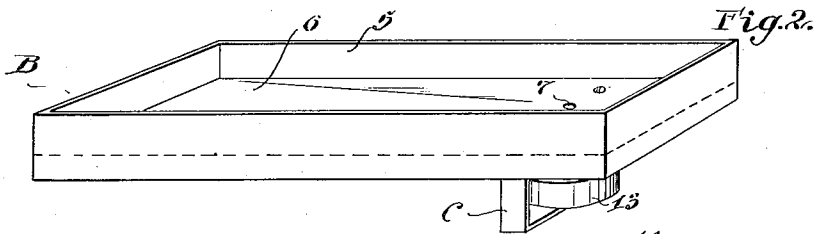
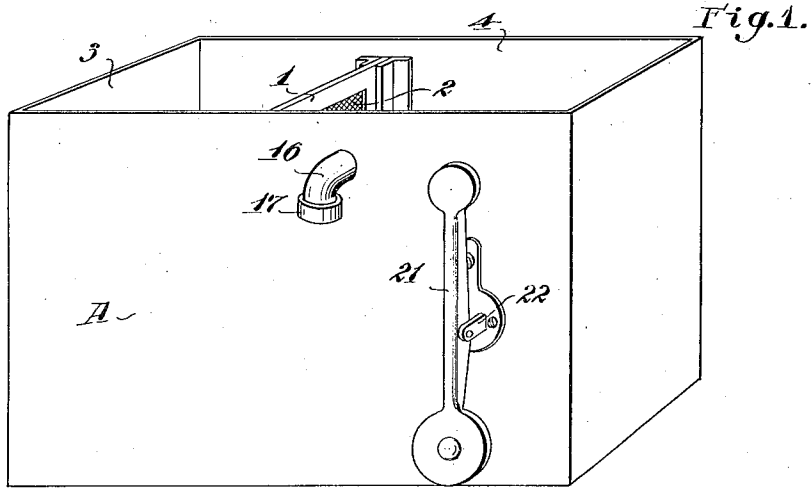
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U. S. GRANT ET AL

1,932,070

SOLUTION TANK

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# UNITED STATES PATENT OFFICE

1,932,070

## SOLUTION TANK

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7 Claims. (Cl. 141-9)

The present invention relates to a cleansing solution tank for dishwashing machines.

In dishwashing machines of the types commonly used in restaurants and other public eating places, the customary practice is to spray the dishes supported in racks with a hot solution having dissolved therein some substance to assist in the cleansing of the dishes, and to thereafter rinse the dishes with hot water.

In this type of dishwashing mechanism, the cleansing solution is kept in a tank, mounted below the spray means and the dishes so that the water from the spray means falls into said tank, and said tank is provided with an overflow pipe to maintain the solution at a substantially constant level. This being the case, an amount of solution equal substantially to the amount of rinse water will overflow out of the tank after each rinsing operation. This, together with the clear rinse water added by each rinsing operation, results in a constantly recurring dilution of the cleansing solution during use, which, in ordinary practice, is usually compensated for by throwing into the tank from time to time a cupful of a substance, such as soap powder, used in making the cleansing solution. This is more or less a haphazard process and with it it is almost impossible to keep the solution at a proper degree of concentration.

An object of the present invention is to make a metered flow, solution charging tank, for dishwashing machines.

In order to attain this object, there is provided, in accordance with one feature of the invention, a tank of a size to fit within a dishwashing machine, the tank being mounted within the dishwashing machine in a position where the spray heads of the machine will spray liquid onto the top of the tank, the tank being provided with valve mechanism to by-pass a portion of the liquid sprayed thereon into the interior of the tank, and having a compartment interiorly of the tank to contain a soluble substance used in making the dishwashing solution. A restricted opening is provided in the tank to discharge the solution contained in the tank into the tank of a dishwashing machine, and a dump valve is provided in the tank to dump a predetermined portion of the contents of the tank into the dishwashing machine to initially charge the dishwashing machine.

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 view in perspective of a tank embodying the present invention, the cover thereof being removed.

Figure 2 is a view, also in perspective, of a cover and associated mechanism for the tank shown in Figure 1.

Figure 3 is a view in perspective of a screen adapted to fit into the cover shown in Figure 2.

Figure 4 is an enlarged transverse, vertical, sectional view through an aperture in the cover, a float operated valve mechanism being shown in side elevation.

Figure 5 is a view in side elevation of a partition in the tank, said partition having a screened aperture therein.

Figure 6 is a vertical, sectional view through a dump valve and associated mechanism; and

Figure 7 is a vertical sectional view through a spout having a metered orifice therein.

Referring to the drawing in detail, a tank A is preferably constructed of a non-corrosive material. Mounted transversely of the tank is a vertical partition 1 which is provided with a screened aperture 2 therein. The portion 3 of the tank on one side of the partition 1 is used for containing a soluble substance used in making the dishwashing solution, while the portion 4 of the tank on the other side of the partition is used for containing the concentrated solution formed by the dissolving of the substance in the compartment 3 in the liquid contained in the tank.

A cover B is made in the form of a shallow tray having side walls 5 and a bottom plate 6 set up from the lower edges of the side walls 5 so that the side walls extend below the plate 6 in the form of a depending flange. This flange is of a size to fit over the top edge of the tank in overlapping position.

An aperture 7 is provided in the cover plate 6 and below this aperture is mounted a float operated valve mechanism C, as illustrated in Figure 4. This valve mechanism is supported by means of a yoke 8 of strap metal, a rectangular strap metal frame 9 being supported therein, as by means of bolts 10. This rectangular frame 9 is provided with two openings, in vertical alignment with each other, in which is slidably mounted a valve stem 11. A valve 12 is mounted on the upper end of the valve stem to be in vertical alignment with the opening 7 in the cover plate 6. A float 13 is fixedly secured to the valve stem 11 at a predetermined position to maintain the liquid level in the tank A at a prop-

er height, as will be brought out later in the specification.

A removable frame 14 is adapted to fit within the side walls of the cover, and to rest on the cover plate 6, this frame having a fine mesh screen 15 mounted therein to prevent food particles from entering the tank through the opening 7. The screen 15 is mounted to lie below the top edges of the side walls of the cover member so that in operation it will be covered with liquid, since even when the float valve 12 is open more liquid is sprayed onto the cover than can flow through the opening 7. This assists in preventing the clogging of the screen 14 as it has been found that where the screen is placed above the liquid level in the cover, food particles are forced into the mesh of the screen clogging it.

A spout 16 is mounted on a side of the tank A slightly below the water level determined by the float controlled valve and is provided with a cap member 17 threadedly secured thereto and having an enlarged opening 18 therein. A thin plate 19 is mounted within the cap 17 and is provided with a small aperture 20 therein to permit the contents of the tank to drip therethrough. The size of this opening is determined by test to provide a required flow of the liquid contained in the tank A so as to maintain the liquid in the tank of the dishwashing machine at a required degree of concentration.

A dump valve comprises a lever 21 pivotally mounted on a bracket 22 secured to a side of the tank A and having a coil spring 23 to normally urge it to a closed position. A valve 24 is secured to the lower end of the lever 21 to register with the opening in the end of a pipe 25 mounted in an opening in a side wall of the tank and secured in position therein as by means of nuts 26 and 27, a gasket 28 being used to assure a liquid tight seal. An elbow 29 may be threadedly connected to the inner end of the pipe 25 and into this elbow may be screwed a vertical pipe 30 of a desired length to determine the level to which the contents of the tank will be discharged upon operation of the dump valve. This specific construction of a dump valve, while suitable for the purpose intended, is not material to the invention, as any suitable type of dump valve may be employed.

The operation of the device is as follows:

The cover B is removed and the compartment 3 is charged with a suitable quantity of a soluble cleansing substance, such as soap powder. The tank A is then filled with hot water and the cover B is placed in position on the tank with the screened frame 14 in position therein. The device is then placed in a dishwashing machine so as not to interfere with the operation thereof, and so as to be in position to have some of the liquid from the spray heads of the dishwashing machine fall onto the tank cover. On most machines a good place for the device is on one corner of the strainer which covers the solution tank of the dishwashing machine. These features of dishwashing machine construction are well known to the art and it is, therefore, not deemed necessary to illustrate and describe them in detail.

Assuming that the tank of the dishwashing machine has just been filled with fresh, hot water, the dump valve 24 is opened and the contents of the tank A are discharged down to the level of the top of the vertical pipe 30 into the tank of the dishwashing machine, not shown. This gives the water in the tank of the dishwashing machine an initial charge of the concen-

trated soap solution contained in the tank A. The amount discharged by operation of the dump valve may be predetermined by the height of the top of the vertical pipe 30. Therefore, for a dishwashing machine having a small tank a longer vertical pipe 30 would be provided than for a dishwashing machine having a larger solution tank, a pipe of a certain length being specified for each type of dishwashing machine.

With the device in position in the dishwashing machine, as the dishwashing machine is operated, liquid from the spray heads falls on the cover B and passes down through the opening 7 into the tank. As the tank is filled to the level of the float 13, the float rises, closing the valve 12 and preventing the admission of more liquid until the liquid level falls sufficiently to again open the valve 12. Since, as previously brought out, the level of the liquid in the tank A, as determined by the float valve, is above the opening into the spout 16, the liquid in the tank will be metered out through the metered opening 20 in the member 19. In this manner a constant supply of the concentrated solution from the tank A is added to the solution in the tank of the dishwashing machine to maintain it at a required degree of concentration.

When the dishwashing machine is not in use, the contents of the tank A will be discharged through the drip opening 20 in the disk 19 down to the level of the bottom of the spout opening. The rest of the concentrated solution will remain in the tank to be available for charging the dishwashing machine, if required, when it is again put into operation. The compartment 3 is of a size to hold a supply of soluble cleansing substance sufficient for several days' normal operation of a dishwashing machine, and thus saves a considerable amount of time and trouble formerly required in attempting to keep the solution in the tank of a dishwashing machine at a required degree of concentration, since, except for charging, the device is entirely automatic in its operation as long as a supply of the soluble substance remains in the compartment 3.

The device also effects a very material saving in soap powder over the former hand charging methods, since there is a temptation on the part of an operator to put in more than is required in order not to have to add additional charges so frequently.

We claim:

1. A solution tank of the character described, comprising a container having a drip opening in a wall thereof, a compartment in said container to receive a quantity of soluble material, said compartment being in communication with the interior of the container, a removable cover for said container, said cover having an opening therein in open communication with the interior of said container, float controlled means mounted within said container adjacent said opening to control the admission of liquid into said container through said opening, and a dump valve in said container below the level of said drip opening.

2. A solution tank of the character described, comprising a container having a compartment therein for soluble material, said compartment having an overflow opening into the interior of said container, a top member having a depressed portion therein and having an opening in said depressed portion, there being a drip opening in a wall of said container spaced upwardly from the bottom of said container, a dump valve mounted below the level of said drip opening, and float

operated means mounted below said opening in said top member to control the flow of liquid through said opening to maintain the level of liquid in said container above said drip opening.

5 3. A solution tank of the character described, comprising a container having a drip outlet in a side thereof, a compartment in said container adapted to receive a quantity of soluble material, said compartment having an overflow opening into the interior of said container, a cover over said container, said cover having an opening therein, float controlled means mounted beneath said opening to control the flow of liquid there-through to maintain a liquid level in said container above said drip opening, and a dump valve mounted near the bottom of said container.

10 4. A solution tank of the character described, adapted to be positioned in a spray of water falling thereon, comprising a container having a drip opening in a wall thereof, spaced upwardly from the bottom of said container, a cover member mounted over said container and having a depression in the upper surface thereof and having an opening therein in said depression, said depression being adapted to catch water, sprayed over the cover, to maintain a head of water over said opening, and float controlled means beneath said opening to control the flow of liquid through said opening to maintain a substantially uniform liquid level in said tank above the height of said drip opening.

15 5. A solution tank of the character described, comprising a receptacle having a drip opening in a side thereof, a transverse partition therein mounted to divide the interior of said receptacle into two compartments, said partition having an overflow opening therein, a cover member mounted over said receptacle and having a depression in the upper surface thereof and having an inlet opening therein in said depression, float controlled means mounted beneath said opening to

control the flow of liquid through said opening to maintain a substantially uniform liquid level in said tank above the height of said drip opening, and a straining screen mounted over said inlet opening to lie entirely below the level of the sides of said depression.

6. A solution tank for dishwashers adapted to be positioned in a shower of water, comprising a container adapted to contain a quantity of soluble cleaning material and having an inlet and an outlet opening therein, a catch basin adjacent said inlet opening to normally divert a portion of said shower of water into said container through said inlet opening to rapidly fill said container after a dumping operation, and float means mounted within said container to control the flow of liquid therethrough, said container having a dump valve at a predetermined distance below said outlet opening to discharge the liquid contents of the tank down to the level of said dump valve.

7. A solution tank for dishwashers adapted to be positioned in a shower of water, comprising a container adapted to contain soluble cleaning material and having an opening therein, a catch basin adjacent said opening to normally divert a portion of said shower of water into said container through said opening to rapidly fill said container after a dumping operation, control means associated with said container to normally maintain a predetermined liquid level therein, said container having a dump valve therein, and an enclosure surrounding the dump valve opening and extending to a predetermined height above said opening and below the normal liquid level to determine the amount of liquid discharged from said container on an operation of said dump valve.

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