

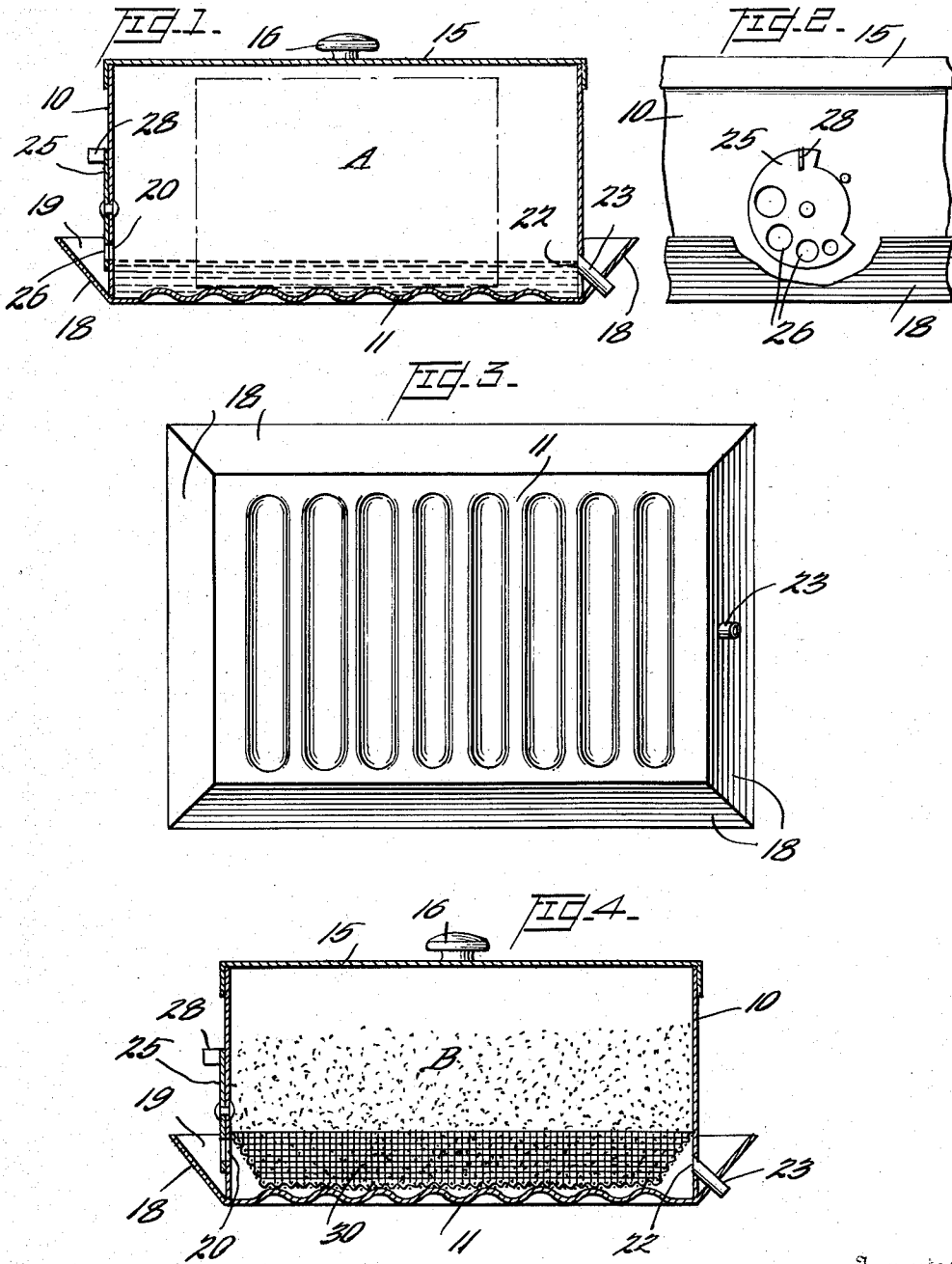
July 11, 1950

T. B. McDOW

2,514,887

CLEANING AGENT DISPENSER

Filed Nov. 5, 1946



Inventor

Thomas B. McDow

By Watson, Cole, Gundle & Watson

Attorneys

UNITED STATES PATENT OFFICE

2,514,887

CLEANING AGENT DISPENSER

Thomas B. McDow, Norfolk, Va., assignor to Edwards-Councilor Company, Norfolk, Va., a partnership

Application November 5, 1946, Serial No. 707,967

7 Claims. (Cl. 206—0.5)

1

This invention relates to improvements in dispensers for cleaning agents, and is particularly concerned with dispensers adapted for use in spray type washing machines, such as the dish washing machines commonly employed in restaurants. In such machines, dishes or other articles to be washed are passed through a spray of water or cleaning solution which contains cleaning agents, such as detergents, water softeners, builders, or mixtures of these and other agents, the solution being collected and recirculated. Since the agent is gradually consumed during the washing operation, it is common practice to provide a dispenser or container for the agent, adapted to be positioned in the machine in the path of the spray, and constructed to promote contact between the water and the agent, whereby the latter is gradually released or dissolved in the course of the washing operation.

It is an object of the invention to provide a dispenser of this general character in which the cleaning agent is uniformly released or dispersed in the cleaning solution during the period of operation of the machine only, the construction being such that the rate of dispersion remains substantially the same during successive cleaning operations and regardless of the quantity of cleaning agent in the dispenser.

In the dispensers heretofore constructed, the water or cleaning solution sprayed on the dispenser is permitted to enter the dispenser through openings in the top or upper portion thereof, the dissolved cleaning agent being discharged through openings in the lower portion of the dispenser. Thus the cleaning agent within the dispenser is penetrated throughout by the water or cleaning solution, and the rate of discharge or release of agent into the machine varies with the amount of contained agent, decreasing as the agent is dissolved or dispersed. Again, since the entire mass of agent within the dispenser is contacted with the water or cleaning solution during the operation, the detergent component of the agent tends to form a jelly, whereby the rate of discharge during successive operation depends largely on the extent to which the detergent dries or hardens in the period between washing operations. For these and other reasons, uniform and controlled release of cleaning agent is not achieved by existing dispensers.

In my improved dispenser, these objections are avoided, and various other advantages are achieved, by so constructing the dispenser that the water or cleaning solution is caused to flow within the dispenser only in the lower portion thereof, whereby only a layer of cleaning agent at the bottom of the dispenser becomes wetted and dissolved. Since the bulk of the cleaning agent is not contacted with the solution, the rate of discharge or release of cleaning agent from

2

the dispenser remains substantially uniform regardless of the amount of detergent available within the dispenser, and any tendency of the agent to form a readily soluble jelly is restricted to that portion of the agent directly contacted by the water or cleaning solution.

A further object of the invention is to provide a dispenser in which the entrance orifice through which the water or cleaning solution is admitted to the interior of the dispenser is so located and formed as to minimize clogging of the orifice by foreign material, such as scraps and debris from the washed dishes.

A further object of the invention is to provide a simple and effective means of controlling the rate of release of cleaning agent into the solution, whereby the agent may be supplied approximately at the rate at which it is consumed, even though the dispenser be employed in machines of widely varying capacity.

Further objects and features of the invention will be apparent from the following description taken in connection with the accompanying drawings, in which

Figure 1 is a longitudinal sectional view of a dispenser embodying the principles of the invention and especially designed to dispense a cleaning agent in cake or brick form;

Figure 2 is a partial elevation of one end of the dispenser shown in Figure 1, illustrating one form of means for controlling the rate of release of agent;

Figure 3 is a bottom plan of the dispenser shown in Figure 1; and

Figure 4 is a longitudinal sectional view of a modified form of dispenser adapted for the reception of powdered or granular cleaning agent.

In order to facilitate an understanding of the invention, reference is made to the embodiments thereof illustrated in the drawing, and specific language is used to describe the same. It will nevertheless be understood that limitation of the scope of the invention is not thereby intended, and that the principles of the invention are applicable to dispensers varying materially in form and structure from that illustrated.

Referring now to the embodiment of the invention shown in Figures 1 to 3, inclusive, it will be observed that the dispenser comprises a generally rectangular container, having side walls 10, and a corrugated or ribbed bottom wall 11, the container being open at the top. A removable cover 15, which may have a knob or handle 16, serves to close the container after the cleaning agent A, in cake or brick form, is introduced, the ribs or corrugations in the container bottom serving to elevate the cake of agent to permit flow of water or cleaning solution across the under surface of the cake, as hereinafter described.

Secured adjacent the lower edge of each side

3

wall 10 of the container and diverging upwardly therefrom is a plate 18, these plates being united at their ends to form with the adjacent container walls a continuous trough or reservoir 19 extending about the lower portion of the container. The plates 18 and the container are preferably made of metal and are united by soldering, welding, brazing, or other method suitable to the metal selected. While I prefer to employ a rectangular container, the container may be round, octagonal, or otherwise shaped, and both the container and the trough or reservoir may be constructed in other ways than that shown, it being important in the practice of the invention only that the container top be formed to exclude water or cleaning solution from the upper portion of the cleaning agent, and that a trough or collecting chamber be formed adjacent the lower portion of the container to receive liquid from a spray or the like. In the form of container shown, liquid sprayed on the top or cover is discharged into the trough, the latter constituting a constant level reservoir for the delivery of liquid to the lower portion of the container.

To admit liquid from the reservoir to the interior of the container, I provide one or more inlet orifices 20 in one or several of the side walls 10 of the container, and one or more discharge orifices 22, remote from the inlet orifice, are provided for the release of liquid and entrained cleaning agent, the orifice 22 communicating with a discharge tube 23 extending through the adjacent plate 18, as shown more particularly in Figure 1, whereby flow of liquid in one direction within the container is assured. I prefer to use only one inlet orifice 20, in order that this orifice may be sufficiently large to preclude blocking and clogging thereof by foreign matter, such as scraps of food from dishes. Location of the inlet orifice in a wall rather than in the container top is also helpful in minimizing stoppage of flow. While I prefer that the trough or reservoir extend about the entire periphery of the container, for some uses it may suffice to provide the trough adjacent a portion only of the container periphery, in which event the tube 23 may be eliminated, the concentrated solution being released directly through the discharge orifice in the container wall.

It will be appreciated from the foregoing description that liquid or cleaning solution collected in the reservoir 19 is admitted to the lower portion only of the container through the orifice 20, and flows across the container, contacting the lower portion only of the brick or cake A of cleaning agent, the enriched solution containing dissolved cleaning agent being discharged through orifice 22 and tube 23. Thus in the use of the dispenser in a dishwashing machine, for example, the dispenser may be located beneath a water spray and will serve to release a uniform quantity of cleaning agent regardless of the amount of water falling on the dispenser or of the amount of cleaning agent within the dispenser.

Preferably the discharge orifice 22 is located above the bottom of the dispenser, so that a certain amount of liquid remains in the lower portion of the dispenser after a washing operation. This retained liquid softens or dissolves part of the cleaning agent during the period between washing operations, and this part becomes immediately available at the beginning of the succeeding washing operation. Thus on the initiation of a washing operation, using a fresh supply of liquid, the concentration of cleaning agent

4

is quickly brought to the optimum value, and the release of further cleaning agent is thereafter maintained at a substantially uniform rate as required for continued operation, owing to the concentration of solvent action in the lower part only of the container.

In order that I may control the rate of release of cleaning agent during the washing operation, I prefer to provide a valve in association with the inlet orifice 20. In the illustrated embodiment, I use an apertured plate 25, mounted for rotation on the container wall, the apertures 26 therein varying in size from a maximum to a minimum. An outwardly directed flange 28 on the plate 25 facilitates rotation of the plate to align an aperture of the desired size with the inlet orifice 20, so that the rate of admission of liquid or cleaning solution to the interior of the container, and thereby the rate of release of cleaning agent to the machine, may be readily regulated to conform to the capacity of the machine and to compensate for variation in operating conditions.

The form of the invention shown in Figure 4 differs from that shown in Figures 1 to 3, inclusive, only by reason of the provision of a metallic screen or wire cloth 30 to receive and support powdered or granular agent. Screen 30 is secured at its peripheral edge to the inner faces of the container walls, above the inlet orifice 20 and the outlet orifice 22, and extends across and rests on the corrugations or ribs in the bottom 11 of the container, the mesh of the screen being sufficiently fine to retain granules or flakes B of cleaning agent, thereby preventing the agent from closing or clogging the inlet and outlet orifices. The construction and operation of this embodiment of the invention is otherwise similar to that shown in Figures 1 to 3, inclusive, it being observed that only the lower portion of the cleaning agent within the container is subjected to the solvent action of the liquid or cleaning solution. It will be appreciated that the dispenser illustrated herein may be employed for many purposes in which gradual and uniform dispersion of a solid in a liquid are desirable. Such further uses of the dispenser are contemplated as part of the instant invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a dispenser for cleaning agents of the type adapted to be positioned in the path of falling liquid, the combination with a container for the agent, of a removable, liquid impervious cover for the container, and a trough affording a reservoir for liquid shed by the cover, said trough being disposed adjacent the lower peripheral portion of the container and extending laterally thereof, said container having an inlet orifice in its lower portion communicating with the trough, and a discharge orifice in its lower portion removed from said inlet orifice, said inlet and discharge orifices communicating directly with the interior of the chamber, the lower portion of the chamber being unobstructed, whereby liquid may flow freely from said inlet to said outlet orifices and in contact with said agent, said trough having an effective depth for the retention of liquid to a level sufficient to immerse only the lower portion of the contained agent, whereby the rate of discharge of dissolved agent is substantially constant regardless of wide variation in the amount of contained agent.

2. In a dispenser for cleaning agents of the type adapted to be positioned in the path of fall-

5

ing liquid, the combination with a container for the agent having a top and side walls constructed to exclude liquid from the upper portion of the agent, of an open compartment affording a reservoir for receiving falling liquid, said container having an inlet orifice in its lower portion communicating with said reservoir, and a discharge orifice in its lower portion removed from said inlet orifice, said inlet and discharge orifices communicating directly with the interior of the chamber, the lower portion of the chamber being unobstructed, whereby liquid may flow freely from said inlet to said outlet orifices and in contact with said agent, said reservoir being constructed and arranged to retain liquid to a level sufficient to immerse only the lower portion of the contained agent, whereby the liquid is caused to flow within and across the lower portion only of said container.

3. In a dispenser for cleaning agents of the type adapted to be positioned in the path of falling liquid, the combination with a container for the agent having a top and side walls constructed to exclude liquid from the upper portion of the agent, of an open compartment affording a reservoir for receiving falling liquid, said container having an inlet orifice in its lower portion communicating with said reservoir, and a discharge orifice in its lower portion removed from said inlet orifice, said inlet and discharge orifices communicating directly with the interior of the chamber, the lower portion of the chamber being unobstructed, whereby liquid may flow freely from said inlet to said outlet orifices and in contact with said agent, said reservoir being constructed and arranged to retain liquid to a level sufficient to immerse only the lower portion of the contained agent, whereby the liquid is caused to flow within and across the lower portion only of said container, and adjustable valve means for regulating the size of said inlet orifice to control the rate of flow of liquid within the container.

4. In a dispenser for cleaning agents of the type adapted to be positioned in the path of falling liquid, the combination with a container for the agent having a top and side walls constructed to exclude liquid from the upper portion of the agent, of an open compartment affording a reservoir for receiving falling liquid, said container having an inlet orifice in its lower portion communicating with said reservoir, and a discharge orifice in its lower portion removed from said inlet orifice, said inlet and discharge orifices communicating directly with the interior of the chamber, the lower portion of the chamber being unobstructed, whereby liquid may flow freely from said inlet to said outlet orifices and in contact with said agent, said reservoir being constructed and arranged to retain liquid to a level sufficient to immerse only the lower portion of the contained agent, whereby the liquid is caused to flow within and across the lower portion only of said container, and a screen for retaining powdered agent, said screen being disposed within the lower portion of the container and secured peripherally to the interior of the side walls of the container above the inlet and outlet orifices.

5. In a dispenser for cleaning agents of the type adapted to be positioned in the path of falling liquid, the combination with a container for the agent having a top and side walls constructed to exclude liquid from the upper portion of the agent, and a bottom having ribs to support

6

the agent in cake form with the major part of the underside of the cake exposed, of a trough disposed adjacent the lower portion of the container and extending along the side walls, said trough being open at its upper side to afford a reservoir for receiving falling liquid, said container having an inlet orifice in its lower portion communicating with said trough, and a discharge orifice in its lower portion removed from said inlet orifice, said inlet and discharge orifices communicating directly with the interior of the chamber, the lower portion of the chamber being unobstructed, whereby liquid may flow freely from said inlet to said outlet orifices and in contact with said agent, said trough being constructed and arranged to retain liquid to a level sufficient to immerse only the lower portion of the contained agent, whereby the liquid is caused to flow within and across the lower portion only of said container.

6. In a dispenser for cleaning agents of the type adapted to be positioned in the path of falling liquid, the combination with a container for the agent having a top and side walls constructed to exclude liquid from the upper portion of the agent, of an open compartment surrounding the lower portion of said container and affording a reservoir for receiving falling liquid, said container having an inlet orifice in its lower portion communicating with said reservoir, a discharge orifice in its lower portion removed from said inlet orifice, said inlet and discharge orifices communicating directly with the interior of the chamber, the lower portion of the chamber being unobstructed, whereby liquid may flow freely from said inlet to said outlet orifices and in contact with said agent, and means affording a passage for discharging liquid from said orifice, said passage extending through said reservoir, said reservoir being constructed and arranged to retain liquid to a level sufficient to immerse only the lower portion of the contained agent, whereby the liquid is caused to flow within and across the lower portion only of said container.

7. In a dispenser for cleaning agents of the type adapted to be positioned in the path of falling liquid, the combination with a container for the agent, of a removable liquid impervious cover for the container, and a trough affording a reservoir for liquid shed by the cover, said trough being formed adjacent the lower peripheral portion of the container and extending laterally thereof, said container having an inlet orifice in its lower portion communicating with the trough, and a discharge orifice in its lower portion removed from said inlet orifice, said inlet and discharge orifices communicating directly with the interior of the chamber, the lower portion of the chamber being unobstructed, whereby liquid may flow freely from said inlet to said outlet orifices and in contact with said agent.

THOMAS B. McDOW.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,486,100	McKenney et al. -----	Mar. 4, 1924
1,640,319	Halsey -----	Aug. 23, 1927
1,961,278	Chandler et al. -----	June 5, 1934
2,317,548	Miller -----	Apr. 27, 1943
2,449,513	Schmidt -----	Sept. 14, 1948