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FEEDING MEANS FOR WASHING MACHINES

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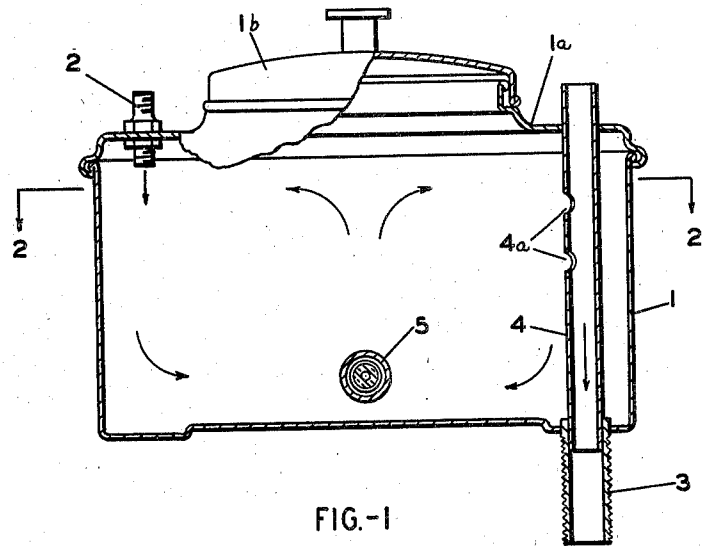



FIG.-1

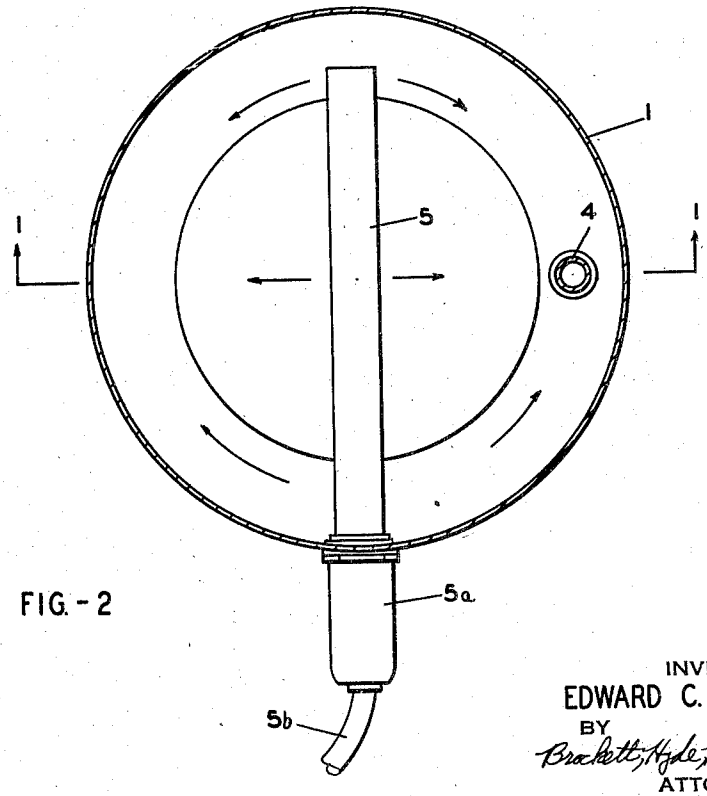



FIG.-2

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## FEEDING MEANS FOR WASHING MACHINES

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2 Claims. (Cl. 299—83)

This invention relates to means for feeding cleaning chemicals and the like to dishwashing and similar machines, and having a container for chemicals, an inlet for feeding water to the container and an outlet from the container to the washing machine to be served. The arrangement contemplates that the water and chemical will together form a solution within the container, which solution will be discharged to the washing machine as displaced by water fed to the container. Such arrangement and operation is generally old and well-known in the art, particular simplified structure and its operation being disclosed in my copending application, Serial No. 160,735, filed August 25, 1937.

The chemicals preferably employed in such a feeding device, may have solubility dependent upon temperature and some approach substantial insolubility at room temperature, so that although the water fed to the container be extremely hot, its rate of flow through the device is insufficient to maintain the container contents in solution—with consequent encrustation at openings and passageways in the device caused by deposit of the chemical; and particularly after idle periods such as an overnight shutdown the chemical may be found to have caked into a solid mass.

These operating conditions have led to the employment of means for heating the container contents, and the objects of the present invention are to provide heating means of such form and arrangement as to be more effective for the purpose at least expense, as will appear.

The exact nature of the invention together with further objects and advantages thereof will be apparent from the following description taken in connection with the accompanying drawing, in which Fig. 1 is a typical sectional elevation of a feeding device embodying the invention; Fig. 2 is a typical transverse section of the same as in the plane of line 2—2, Fig. 1, the plane of Fig. 1 being indicated by the line 1—1, Fig. 2, both views including arrows indicating directions of flow during operation.

With reference now to the drawing, 1 is a container generally of upright cylindrical form having a top wall 1*a* with a large central opening for the introduction of chemical thereto and a cover 1*b* for the opening. An inlet connection 2 is provided in the top wall 1*a* for slow feeding of water to the container, during operation of the machine to be served, through suitable piping not shown.

At its opposite side the bottom wall of the container has a discharge opening with connection 3 for attachment to the washing machine to be served and a riser 4 having a lateral opening or openings 4*a* by which the liquid level within the container is determined.

According to this invention a heating unit 5 preferably of electric type and of elongated form is provided, extending diametrically within the container adjacent its bottom, disposed transversely to the general plane of the feeding and discharging means, that is, transversely to the plane of Fig. 1. The heating unit 5 is mounted in the side wall of the container as indicated in Fig. 2, at a location substantially equidistant in the horizontal plane, from the water-feeding and solution outlet means 2 and 3 respectively, and is provided with a thermostat 5*a* which controls its connection to the line 5*b*.

Details of the heating unit 5 and its thermostat 5*a* are not material, it being sufficient for this invention that the thermostat maintain the heating unit, when the line 5*b* is connected to a suitable source of electric current, in operation to maintain the container contents at sufficient temperature to insure a fluid condition. The heating unit is, of course, sealed at its far end in Figs. 1 and 2, and its mounting in the side wall of the container is such that leakage from the container will be prevented.

In practice the inlet connection 2 is supplied with hot water through valved piping at a suitable low rate, so that the discharge connection 3, by which the container is usually secured upon the top of the washing machine, delivers solution to the washing machine at a rate dependent upon the rate of water feed to the container.

In operation heat from the unit 5 tends to maintain thermosiphonic flow of the container contents in the directions indicated by the arrows, the flow being upward from the heating unit, thence oppositely therefrom at either side with convergence toward the feeding and discharge means 2 and 3, thence downwardly along the relatively cold side walls of the container and finally divergently inwardly over the container bottom and toward the heating unit. The inlet direction of feeding water through the connection 2 assists in this flow, the flow tends to maintain the entire container contents at a uniform temperature, but particularly discharge through the openings 4*a* is of liquid at substantially maximum temperature. Also it is to be noted that due to the shape and disposition of the heating unit 5 relative to the container, the heating unit although small in volume, imparts heat

to the container contents with widely distributed effect.

Should the chemical within the container have become solidified as after a long cold shutdown period, energization of the heating unit shortly before operation of the washing machine will liquefy the chemical, the liquefaction working rapidly upwardly and at the same time somewhat laterally. Meanwhile flow of water through the container from inlet to outlet may take place above the chemical cake, this water being hot dissolving a substantial amount of the chemical, so that solution of substantial strength will be discharged from the device until the heating unit 5 has completely liquefied the chemical.

The simplicity of form, arrangement and assembly, particularly of the heating unit, is to be noted. It imparts its heat directly to its surrounding container contents yet offers no surface on which the chemical particularly tends to cake.

What I claim is:

1. In a device of the class described, a container for chemicals which are water soluble at elevated temperatures, water-feeding means located adjacent the upper portion of said container, discharge means having an elevated orifice communicating with said container through which an aqueous solution of the chemicals may be drained from said container when the surface of said solution is at a predetermined level, said water-feeding means and said discharge means being located at different side parts of said container and an electrical heating unit arranged transversely within said container, said unit being below the orifice of said discharge means.

2. In a device of the class described, a container for chemicals which are water soluble at elevated temperatures, water-feeding means located adjacent the upper portion of said container, conduit means having an orifice communicating with said container at a substantial distance above the bottom thereof through which an aqueous solution of the chemicals may be drained from said container when the surface of said solution is at a predetermined level, said water-feeding means and the orifice of said conduit means being located adjacent opposite side parts of said container and an electrical heating unit of elongated form disposed transversely within said container below said orifice.

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