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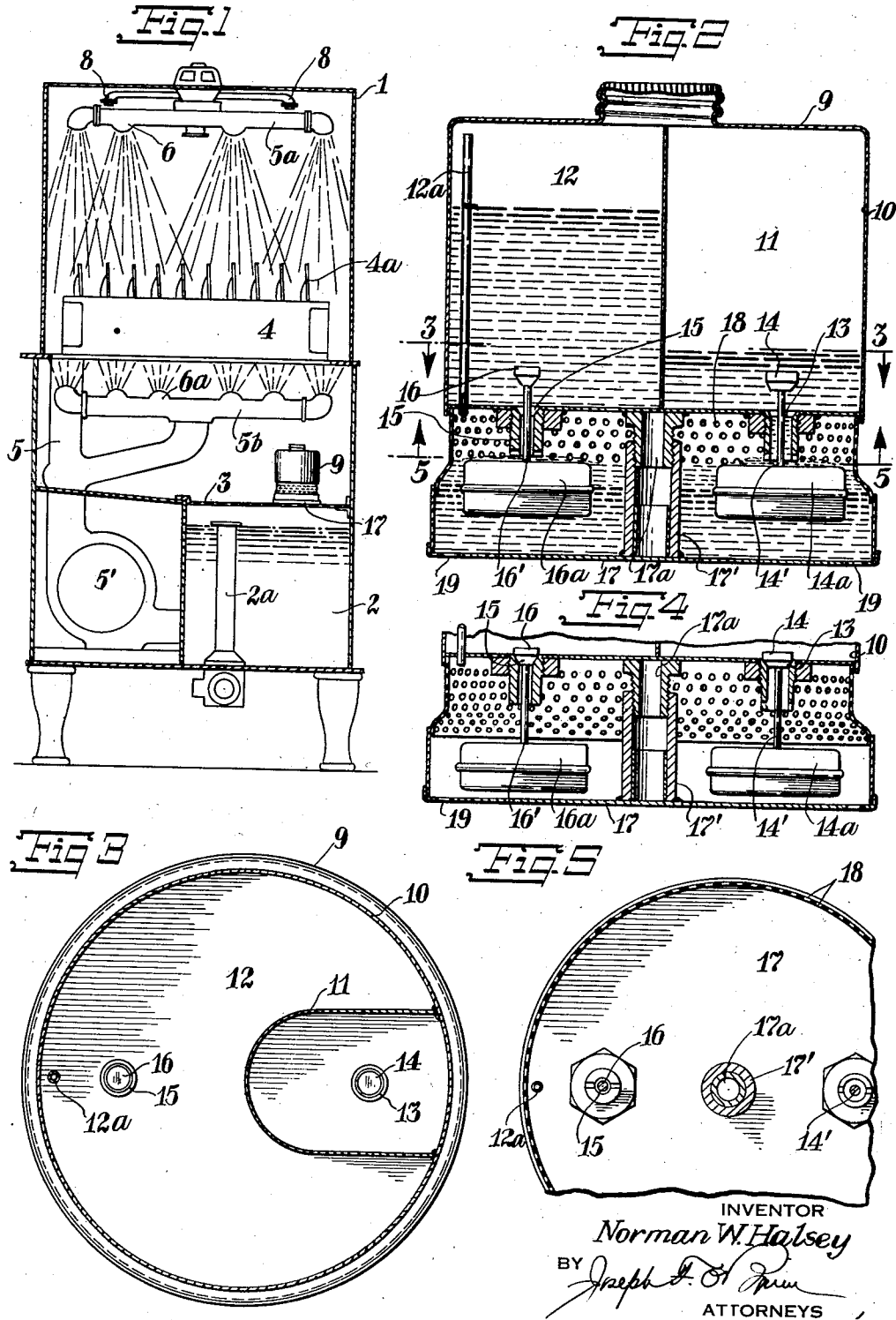
N. W. HALSEY

2,226,096

DETERGENT DISPENSER FOR WASHING MACHINES

Filed Sept. 24, 1938

2 Sheets-Sheet 1



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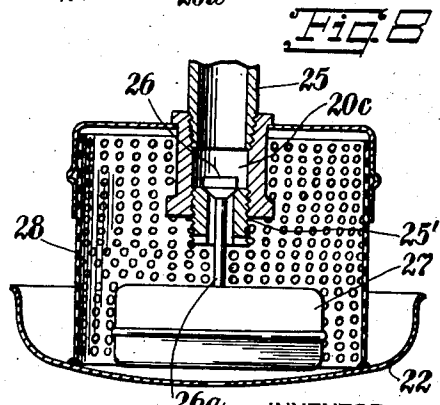
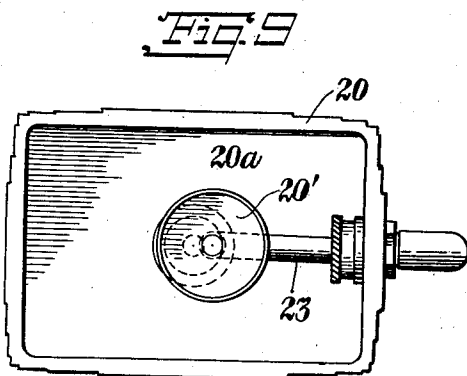
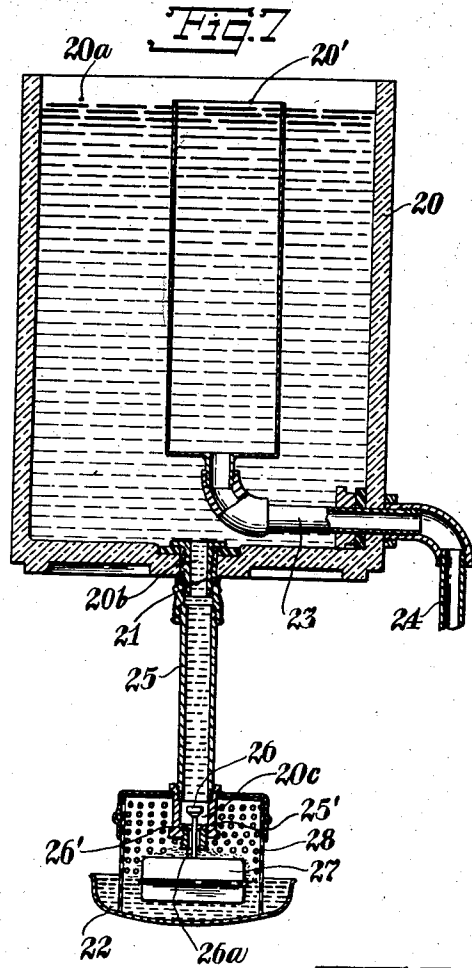
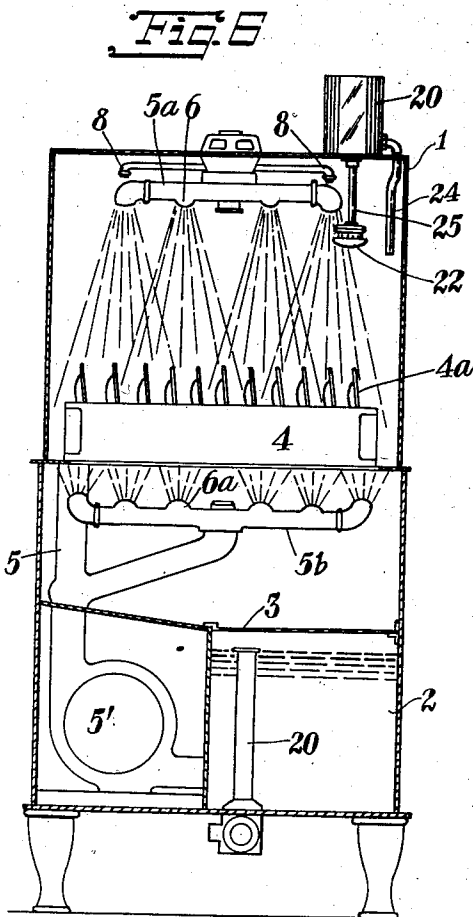
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# UNITED STATES PATENT OFFICE

2,226,096

## DETERGENT DISPENSER FOR WASHING MACHINES

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Application September 24, 1938, Serial No. 231,498

4 Claims. (Cl. 141-9)

This invention relates to improvements in detergent dispensers for washing machines and relates more particularly to dispensers for liquid-detergents.

of the washing machine will be immediately brought up to efficient working strength combined with automatic slow-feeding means for liquid-detergent which will slowly, and as the work progresses, charge the wash water in relatively small amount to compensate for the loss of strength due either to the work performed or to dilutions of such water by fresh water rinses and thus to provide means for dispensing liquid detergent in proper quantities or amounts to keep the initially charged water at all times during the operation of the machine at an efficient strength and to avoid waste and guessing as to the necessary initial charge as well as to the necessary compensating charge.

5 In my former Patent No. 1,640,318, I disclosed a cleaning material feeder for automatically charging, accordingly as the work progresses, the wash water of a dishwashing machine with a pre-determined amount of a water solution of a powdered cleaning material in order to compensate for the loss of cleaning strength of previously manually-charged water either because of dilution of such water by a fresh water rinse or, by loss of cleaning strength due to work done. This was accomplished by a feeder which fed such a solution to the washing water of the dishwashing machine by a slow-feed means operable by a portion of the water sprayed through the spraying nozzle and thus kept such water at the most efficient strength during operation; and by my Patent No. 1,640,319, I provided automatic quick-feeding means for immediately and quickly, at the start of operation, feeding an initial supply of cleaning material of sufficient strength to charge the wash water with such a solution of powdered cleaning material combined with an automatic slow-feeding means for slowly, and as the work progressed, continuously charging such initially-charged water to compensate for loss of strength due to work performed or to dilution thereof.

Another object of my invention is to provide a dispenser for liquid detergent that will speedily reach dispensing condition upon the starting of operation of the dish-washing machine and will speedily cut off the charging supply when such spraying of water is stopped, and I thus provide means that will start and stop the dispensing or charging operation in substantial synchronism with the start and stopping of the spraying operation in a dishwashing machine and consequently to prevent waste of detergent.

A common fault of many dispensers of solutions of powdered material heretofore employed is that the strength and rate of feed of the cleaning material varies in proportion with the variation of the volume of powder in the reservoir of the feeder or dispenser.

Another object of my invention is to provide a device which comprises an independent unit and is capable of operation when inserted in the machine in the path of the sprayed water and may be positioned on the strainer sieve of any standard dishwashing machine and may be so placed without the necessity of being attached to the machine or installed by skilled persons.

One of the objects of my present invention is to provide a dispensing device for washing machines and particularly for dishwashing machines which is adapted to automatically dispense to the wash water in such machines a liquid detergent as distinguished from a solution of powdered material.

With these and other objects in view, the invention comprises the combination of members and arrangement of parts so combined as to co-act and cooperate with each other in the performance of the functions and the accomplishment of the results herein contemplated, and comprises in one of its adaptations the species or preferred form illustrated in the accompanying drawings, in which—

Another object of my invention is to provide a dispenser which will feed a liquid-detergent to the wash water at a fixed rate regardless of the amount of detergent remaining in the reservoir tank of the dispenser.

Fig. 1 is a view, in vertical section, of a dishwashing machine of the spray type within which my preferred form of automatic dispenser is placed in operative position;

Another object of my invention is to provide, in a device adapted to dispense liquid-detergent, a quick-feeding or charging means whereby a relatively large initial charge of liquid-detergent will be supplied to the wash water of the washing machine so soon as the washing operation begins whereby the large volume of water in the tank

Fig. 2 is a vertical section, with the parts in dispensing position, of my automatic liquid-detergent dispenser;

Fig. 3 is a horizontal section on the line 2-3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a fragmentary vertical section of the lower portion of the dispenser shown in Fig. 2, with the parts in non-dispensing position;

Fig. 5 is a section on the line 5-5 of Fig. 2, looking in the direction of the arrows;

Fig. 6 is a vertical section of a dishwashing machine showing a modified form of dispenser mounted at the top of a dishwashing machine of the spray type;

Fig. 7 is a vertical section of the dispenser shown in Fig. 6, removed from the washing machine, the parts being shown in dispensing position;

Fig. 8 is a sectional view of the operating mechanism of the device shown in Fig. 7, with parts in non-dispensing position, and

Fig. 9 is a view in plan of the dispenser shown in Figs. 6 and 7.

Referring now to these drawings and particularly to Figs. 1 to 5 inclusive which illustrate a preferred embodiment of my invention, I indicate the outer casing of a dishwashing machine of the spray type which is provided, at its lower end, with a wash tank 2, above which is supported a strainer 3 and a dish rack 4, in which rack dishes are suitably stacked for washing. Within the casing 1 is provided a supply pipe 5 connected to a pump 5' which is in turn connected to the wash tank 2. Suitably mounted within the machine and connected to the supply pipe 5 are the usual revolvably mounted laterally-extending arms 5<sup>a</sup>, 5<sup>b</sup>, on which are mounted upper and lower wash nozzles 6, 6<sup>a</sup> respectively, which nozzles are designed to spray or diffuse water on, against and between dishes 4<sup>a</sup> in the rack 4. This sprayed or diffused water finally falls down through the strainer or sieve 3 and into the tank 2, after which such wash-water is pumped by the pump 5' upwardly through the upright pipe 5 and nozzles 6, 6<sup>a</sup>, so as to produce a continuous circulation and distribution or diffusion of the wash water into contact with the dishes. After initial washing of the dishes by such wash-water, the dishes are usually sprayed through rinsing nozzles 8. The addition of this rinsing water to the wash-water in the tank maintains the wash-water in proper freshened condition for use, and the surplus water and grease pass out of the tank 2 through a suitable overflow pipe 2<sup>a</sup>. The foregoing is a description of one form of a washing machine of the spray type and, standing by itself alone, constitutes no part of my invention.

One of the principal features of my invention consists, however, in providing a machine of the spray type with a dispenser 9 adapted to dispense a liquid-detergent and which utilizes a portion of the water distributed or sprayed by the spraying nozzle for the actuation of the dispensing mechanism which comprises float-actuated and controlled valves operable by water passing through the spraying nozzles of said machine, and preferably operable by a supply of such water in a pan, which is preferably shallow and will cause the starting and stopping of dispensing in substantial synchronisms with the dishwashing machine, and which furthermore will feed liquid-detergent to the work water at a substantially fixed rate regardless of the amount of liquid-detergent contained in the tank of the dispenser, and which will thus overcome the difficulty encountered in the operation of many dispensers of solutions of powdered cleaning or detergent material formed by the admission of water to a reservoir of powder, the rate of the feed of which dispensers and the strength of the cleaning material dispensed will vary in accord-

ance with the volume of the powder in the container.

In the preferred form of my invention illustrated in Figs. 1 to 5, I provide an automatically-actuated slow-feeding float-controlled valve which will supply a continuous feed of liquid-detergent in drops at a fixed rate to the washing water in the tank of the machine as long as the machine is in operation and regardless of the liquid detergent contained in the dispensing container, thus compensating for the dilution of such wash-water which takes place during the rinsing operation in a dishwashing machine of the spray type and for work performed, and this slow-feed mechanism will be used in combination with a quick-feeding automatically-actuated float controlled valve whereby at the start of operation of the washing machine an initial charge of liquid-detergent of proper amount will be automatically and immediately supplied to the wash-water so soon as the washing operation begins in order that the large volume of water in the tank of the washing machine will be at once brought up to an efficient or proper working strength.

In the preferred form of my invention the plural-feed dispenser 9 is adapted to feed different quantities of liquid detergent for different requirements and to this end the dispenser is provided with a liquid-detergent container portion 10 divided into a plurality of compartments and as shown in Figs. 1 to 5, said container 10 is divided in two compartments comprising a relatively small compartment 11 to which is applied the quick-feeding float-controlled valve for initially charging the tank water and a relatively large compartment 12 having the slow-feeding means for progressively feeding such liquid detergent material to the tank water as the washing operation continues, and both of these devices preferably utilize for their actuation a portion of the water distributed or sprayed by the spraying nozzles. By my invention, therefore, I am enabled to produce in a single compact unit (1) a quick-feeding float-actuated valve controlling a measured supply in a relatively small compartment which will quickly and immediately, upon start of the operation of spraying in the machine, be fed and released to the charge of new wash-water and (2) a slow-feeding float-actuating valve controlling an additional large supply in a relatively large compartment which will be progressively and slowly fed in drops at a fixed rate regardless of the amount of detergent remaining in the tank of the dispenser and thus providing a supply of material which will keep the wash-water in the tank 2 at the proper cleaning strength by compensating for that portion of the liquid-detergent which will pass out of the machine during the rinsing operation or which will be utilized with the work of cleaning dishes accomplished by the wash-water.

In said preferred embodiment of my invention, my automatic double-duty dispenser feeds liquid-detergent in the manner above specified and comprises a single unit preferably portable and independent of the other parts of the washing machine so that it may be inserted or supported at any place within the area of distribution for spraying of water by the spraying nozzles. As shown, my double-duty dispenser is mounted on the strainer pan 3 of the machine, is cylindrical in conformation and preferably formed of non-corrosive metal. Each of the quick feed and slow feed compartments 11 and 12, as shown, has its

feed outlet at its bottom portion, the float valves and floats connected with such outlets being preferably positioned in a base portion of the dispenser below the container, so that upon opening of the valves the liquid-detergent will be dispensed by gravity.

In said preferred embodiment of my invention, the relatively-small quick-feed compartment 11 is provided, in its bottom, with a large valve-controlled outlet 13 so that upon opening of the valve 14 the entire supply of liquid-detergent in said compartment 11 will be dispensed to the wash-water, while the large compartment 12 containing a relatively large supply will be provided, in its bottom, with a relatively small valve-controlled outlet 15 through which, upon actuation of the valve 16, a slow drop-by-drop feed of the liquid-detergent in this large compartment will be dispensed at a fixed rate. A float 14<sup>a</sup> is connected with the valve 14 by valve stem 14' and is suspended from the bottom of the compartment 11 and a float 16<sup>a</sup> is similarly connected with the valve 16 by valve stem 16' and similarly suspended below the compartment 12. A single drainable pan 17 for actuating both float valves is positioned in the base of the dispenser and is connected by adjustable supporting members 17', 17<sup>a</sup> to the container portion by an intermediate cylindrical perforated or screen portion 18. The pan 17 is relatively shallow and both pan 17 and screen portion 18 are of greater diameter than the container portion. Sprayed water will thus pass through the screen portion in much greater quantity than it can be drained and said pan 17 will be filled to its rim immediately upon the starting of the machine and will be kept filled as long as said water is being sprayed. Consequently, the float will rise in the water to lift the valves and immediately start the feeding operations hereinabove specified. So soon as the spraying of the water, however, is discontinued, the water in the pan will be drained out through drain apertures 19 whereupon the floats will drop by gravity and the valves will be immediately seated on the outlet orifices to stop further supply of such liquid-detergent material through such outlet orifices. The pan so drained is shown in Fig. 4. A vent tube 12<sup>a</sup> extends from the upper portion of the container to the bottom thereof to permit air to pass to the space near the top of said container.

In Figs. 6 to 8, inclusive, I have shown a modified form of my invention in which a container 20 for liquid-detergent is supported on the top of the washing machine and has an outlet pipe 21 extending through the top of the machine. This outlet pipe 21 is preferably sufficiently long to extend into the spraying zone so as to permit a catch basin or pan 22 to catch and retain a quantity of such water sufficient to actuate a float valve positioned so as to extend within the water in said pan. In this embodiment, the container 20 for liquid-detergent is preferably formed of glass and is also provided with two compartments, one being a small-area quick-feed compartment 20' and the other a large-area slow-feed compartment 20<sup>a</sup>. In the embodiment shown, the quick-feed compartment 20' is mounted upon and has an outlet through a metallic fitting 23 passing through the bottom of the glass container. This compartment acts as a measuring container and is so proportioned as to measure and deliver the necessary amount of liquid-detergent which will properly initially charge wash-water in the tank to an efficient

strength upon the starting operation of the machine. The liquid-detergent in said compartment 20' will immediately pass through the fitting 23 and pipe 24 and be dispensed to the inside of the machine, passing down to the wash-water to provide such initial charge. The large-area slow-feed compartment 20<sup>a</sup>, however, has its outlet 20<sup>b</sup> connected with a pipe 25 extending into the spraying zone of the machine and provided at its lower end with a dispensing outlet 20<sup>c</sup> controlled by a float-actuated valve 26 preferably so arranged as to cause the feeding of such liquid-detergent through the dispensing outlet 20<sup>c</sup>, drop-by-drop at a fixed rate, and this drop-by-drop feed will pass through the outlet orifice until all liquid-detergent in said compartment of the container has been exhausted. In this embodiment of my invention, I have shown, at the end of the pipe 25 a nipple 25' screwed on the outside of said surface of said pipe and this nipple is provided at its lower end with a valve seat 26' having a very small dispensing aperture which is controlled by the valve 26 connected by stem 26<sup>a</sup> to a float 27 operated by an immediately accumulated supply of water in the drainable pan 22.

In the same manner as the preferred form of my invention shown in Figs. 1 to 5, the valve and its actuating mechanism in Figs. 6 and 7 is preferably enclosed and protected by a screened cylindrical portion 28 so as to avoid the entrance of dirt, grease or the like to the operating mechanism.

In both the preferred embodiment of my invention and the embodiment shown in Figs. 6 and 7, the pan and screen are removably mounted on the dispenser to permit ready access to the valve mechanism for examination or adjustment.

In the embodiment shown in Figs. 6 and 7 it will be seen that the initial charging or feeding of liquid-detergent to the wash-water occurs almost immediately after the filling of the container and does not depend upon the starting of the machine or automatic actuation, but in other respects this device is similar to that described in Figs. 1 to 5, inclusive.

Having described my invention, I claim:

1. A liquid-detergent dispenser for washing machines operable by sprayed wash-water, comprising a liquid-soap container having a dispensing outlet, a dispensing valve for opening and closing said dispensing outlet, a float connected with said valve, and a water-receptacle within which said float is operatively positioned, said receptacle having water-receiving and drain openings, and said water-receiving opening having a water-receiving capacity much greater than the draining capacity of the drain opening, whereby during the spraying operation a water-level is produced in said receptacle to raise said float and to open and maintain in open position said valve to dispense liquid-soap and upon the stoppage of the spraying operation the water level is lowered to close said dispensing valve.

2. A liquid-detergent dispenser for washing machines operable by sprayed wash-water, comprising a liquid container having a plurality of compartments, one comprising a slow-feed compartment and the other comprising a quick-feed compartment, each of said compartments having a dispensing outlet, a float-actuated valve in each outlet movable to open and close the same, the said valve-controlled dispensing outlet in said quick-feed compartment being of relatively large dimensions to provide a quick delivery of mate-

rial from said quick-feed compartment to the wash-water and the dimensions of the valve-controlled dispensing outlet being relatively small to provide a drop-by-drop feed of material from said slow-feed compartment to said wash-water.

5 3. A liquid-detergent dispenser for washing machines operable by sprayed wash-water, comprising a liquid container having a dispensing outlet, a valve movable to open and close said  
10 dispensing outlet, a float operatively connected with said valve, and a pan for continuously, during said spraying operation, receiving and collecting a supply of water from the water sprayed  
15 in said washing machine for actuating said float to feed liquid-detergent material through said valve, said dispensing outlet being positioned in the bottom of the container and said pan being connected to said container below said outlet.

4. A liquid-detergent dispenser for washing machines operable by sprayed wash-water, comprising a liquid container having a dispensing outlet, a valve movable to open and close said dispensing outlet, a float operatively connected  
5 with said valve, and a pan for continuously, during said spraying operation, receiving and collecting a supply of water from the water sprayed in said washing machine for actuating  
10 said float to feed liquid-detergent material through said valve, said dispensing outlet being positioned in the bottom of the container, said pan being connected to said container below said  
15 outlet, and a screen connected with said pan and enclosing said float to permit entrance of water to the pan to actuate said float while screening the float against solid material.

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