

Nov. 29, 1960

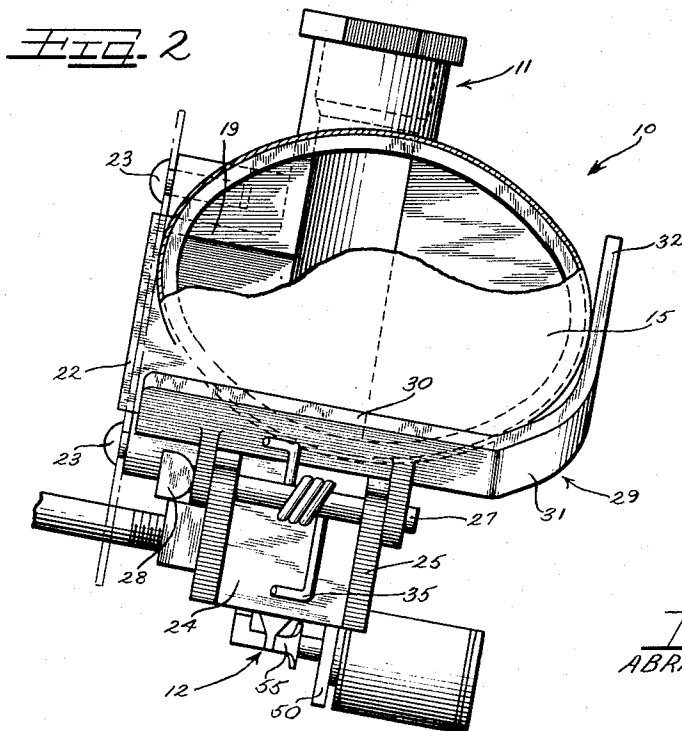
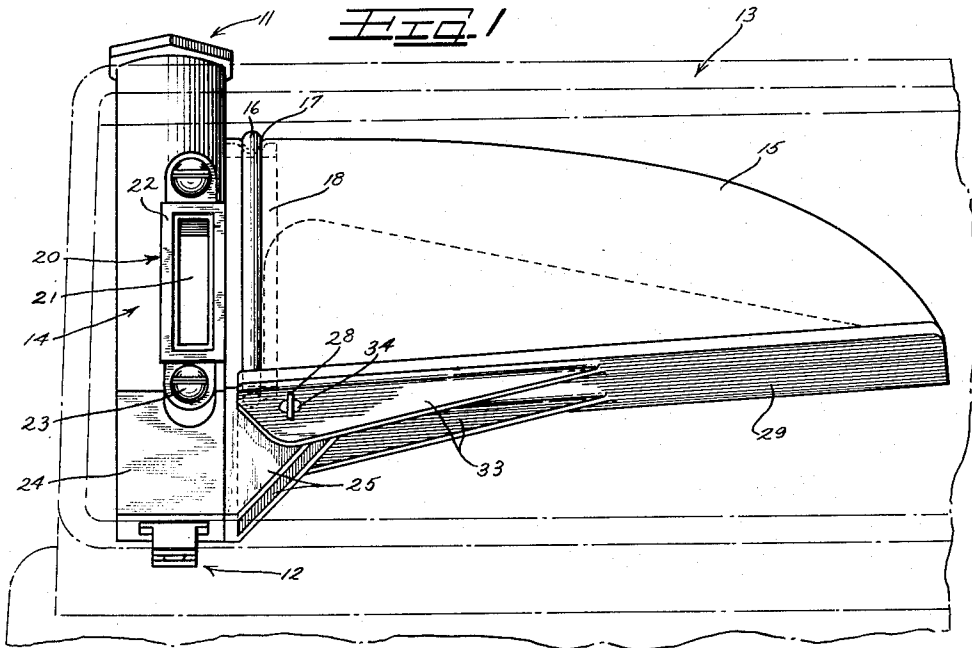
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2,962,255

VALVE FOR DETERGENT DISPENSER

Filed Oct. 17, 1957

3 Sheets-Sheet 1



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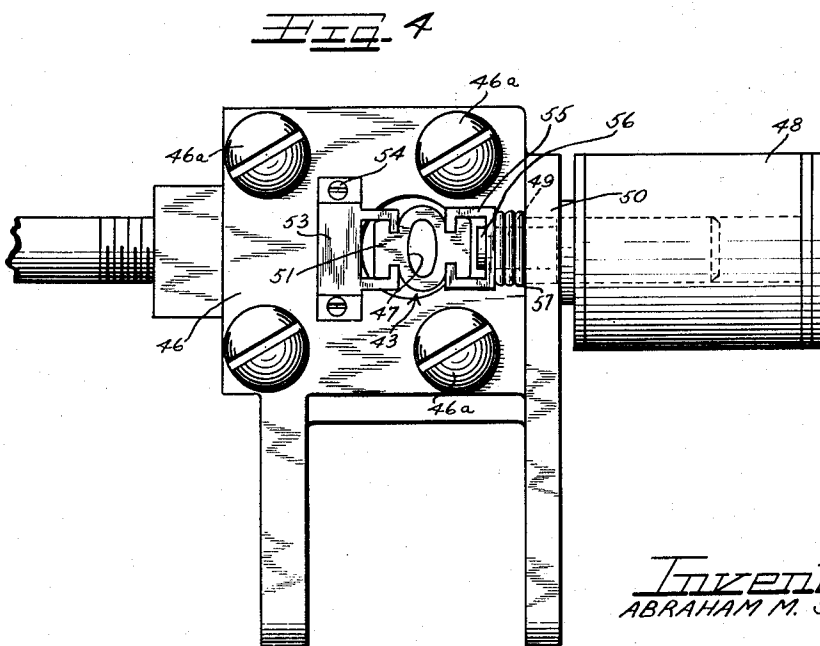
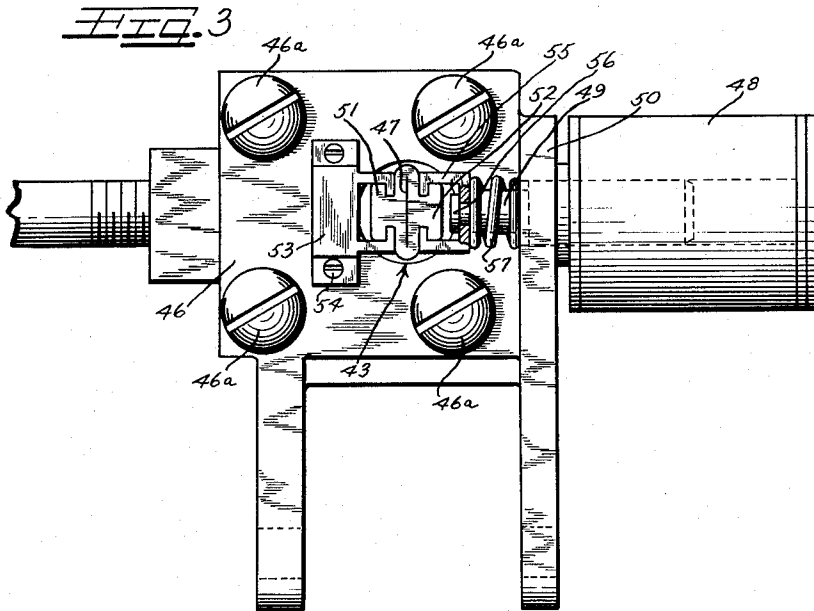
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VALVE FOR DETERGENT DISPENSER

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3 Sheets-Sheet 2



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VALVE FOR DETERGENT DISPENSER

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FIG. 5

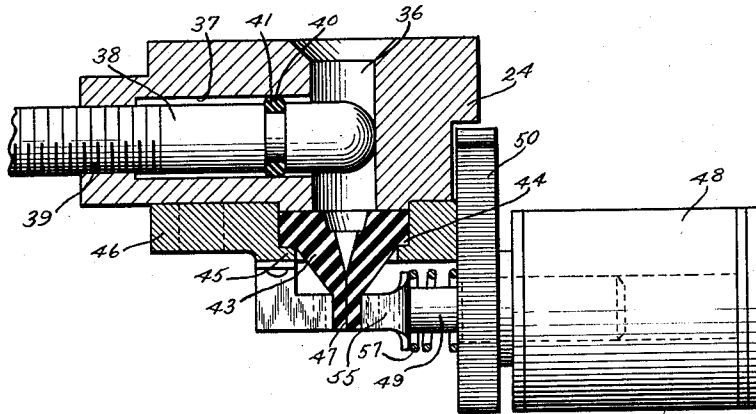
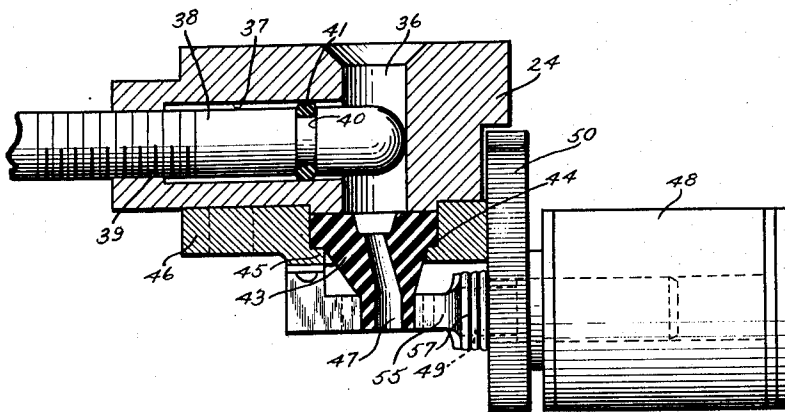


FIG. 6



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VALVE FOR DETERGENT DISPENSER

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2 Claims. (Cl. 251—7)

This invention relates to methods and apparatus for dispensing liquids, such for example as detergents and the like and more particularly relates to a device especially suitable for use in an automatic washing machine.

Dispensers of various types have, heretofore, been used to add detergents, bleach, fabric conditioners, and the like to the wash water of an automatic washing machine under the cyclic control of the machine.

It has since been found that if air can be excluded from the cleansing agent, or the like, during storage and if the cleansing agent is dispensed from an airtight container the normal deterioration and gumming up of the cleansing agent in the dispenser can be avoided. Hence, an airtight collapsible cleansing agent storage container has been developed to effect this improvement.

It has also been found that in liquid dispensers having an outlet exposed to the atmosphere, a crust of solidified fluid often forms thereon with the result that such encrustation interferes with the operation of the dispensing device.

It has, as a result, been found advantageous to provide a means for breaking loose this encrustation, thereby enhancing the operation of the dispenser.

Accordingly, it is an important object of the present invention to provide a novel method and means for controlling the flow of liquids from a dispenser.

It is a further object of this invention to provide, in a liquid dispenser having a novel means for breaking loose the encrustation which may be formed at the outlet of the dispenser.

A still further object of the invention is to provide a novel and improved form of liquid dispenser in which the means operable to open and close the outlet to the dispenser is also arranged to break loose any encrustation of solidified fluid which may be formed at the outlet to the dispenser.

That type of liquid dispenser adapted for use with automatic washing machines and as described by applicant in a copending application, is herein described also, merely to illustrate an environment where a valve constructed in accordance with the present invention may well be utilized.

The foregoing and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is a fragmentary view in side elevation of a dispenser constructed in accordance with the present invention shown mounted in the control panel of an automatic washing machine;

Figure 2 is a front elevational view of the dispenser shown in Figure 1;

Figure 3 is a bottom view of the outlet to the dispenser shown in Figures 1 and 2 wherein the valve is shown in the closed position;

Figure 4 is a bottom view of a dispenser valve constructed in accordance with the present invention similar to Figure 3 but showing the valve in an open position;

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Figure 5 is a side elevational view partly in section of the outlet to the dispenser shown in Figures 1 and 2 wherein the valve is shown in the closed position and wherein some parts are shown in section and others in side elevation; and

Figure 6 is a side elevational view partly in section of the valve shown in Figure 5 but showing the valve in an open position.

In the embodiment of the invention illustrated in the drawings there is shown a dispenser 10 having a fill inlet 11 and an outlet 12 mounted on a suitable supporting panel 13 of an automatic washing machine. The dispenser comprises generally a valve body 14 having a collapsible container 15 for containing liquid to be dispensed attached thereto, as by a sealing ring 16 securely fitted into a circumferentially grooved portion 17 of the boss 18 of the dispenser body 14.

Referring now particularly to Figures 1 and 2 the valve body 14 is shown as having a hollow boss 19 in open fluid communication with the container 15 and as having liquid level means 20 over the front end portion thereof comprising a viewing glass 21 and a bracket 22 mounted on the valve body 14 as by screws 23. The viewing glass enables the operator to readily ascertain the level of liquid within the valve body.

A second hollow boss 24 on the underside of the valve body 14, comprises an outlet chamber having legs 25 formed integrally therewith. Each of the legs 25 have openings bored, or otherwise fashioned, for receiving a pivot pin 27 therethrough. The pivot pin 27 has enlarged portions 28 on either end thereof to maintain the position of the pin in its proper location.

A liquid level compensating bar 29 is shown, fragmentarily in Figure 2, as comprising a substantially horizontal portion 30 terminating in diagonally upwardly extending portion 31 which in turn terminates in substantially vertical portion 32. The horizontal portion 30 of the liquid level compensating bar 29 is shown as having two protruding lugs 33 on the underside thereof, bored as indicated at 34 in Figure 1 to receive pivot pin 27 therethrough to enable the bar 29 to rotatably move about pivot pin 27. A spring member 35, one end of which rests against the hollow boss 24 and the other end of which rests against the underside of the horizontal portion 30 of the liquid level compensating bar 29, serves to urge the bar 29 in a substantially counterclockwise direction for reasons that will soon become apparent.

As the cleansing fluid flows from the dispenser, the volume and hence the weight of the fluid in the collapsible container 15 acting on the liquid level compensating bar 29 is reduced thus causing a spring member 35 to raise the liquid level compensating bar, and hence the container 15, so as to compensate for this change in volume and maintain a constant hydrostatic head. This makes it possible to maintain a relatively constant hydrostatic head within applicant's device thus insuring that a relatively accurate volumetric dispensing of fluid may be maintained although the volume of liquid within the container is variable.

Referring now particularly to Figures 3 through 6 of the drawings a fluid passageway 36 is shown as extending in a substantially vertical position through the boss 24 and as being in open communication with an adjustment port 37 through which slidably protrudes an adjustment member 38. The adjustment member 38 is threadably mounted in the port 37 of the boss 24 as indicated at 39 for reciprocal longitudinal movement within the port 27 and is shown as having a circumferentially grooved portion 40 adapted to receive an O-ring seal 41 to prevent the seepage of cleansing fluid or the like therepast. An adjusting knob (not shown) will normally be provided on the outer end thereof to provide a means for

shifting the position of the adjustment member 38 in the port 37, thus providing a means for regulating the volume of liquid dispensed.

The lower end of the outlet passageway 36 is normally closed by a cutoff valve 43 having an annularly flanged portion 44 adapted to abut the flanged portion 45 of the end plate 46. The end plate 46 may be attached to the valve body by any suitable means as, for instance, by screws 46a.

As may be clearly seen in Figures 3 through 6 the cutoff valve comprises a member of rubber, plastic or other resilient material having a flange portion 44 on one end thereof and having a slit opening 47 at the opposite end thereof arranged so that upon opening of the slit 47, fluid may pass through the slit 47 from the outlet passageway 36.

Referring now particularly to the novel operation of the valve itself, a solenoid 48 is shown as having an armature 49 and as being suitably connected to a mounting bracket 50, formed integrally with one of the legs 25, which is suitably connected with the end plate 46, as by screws, welding or the like.

A pair of projecting knobs 51 and 52 are shown as being formed on opposite sides of the valve member 43 and integrally therewith, for reasons to be hereinafter explained.

The knob 51 is shown as being engaged and rigidly received by a C member 53 supported on the end plate 46 as by screws 54. The knob 52 is shown as being received by C member 55 connected to the outer end of the armature 49 as by connecting button 56. As shown in the drawings, a spring member 57 encircles the armature 49 and abuts, at one end, the mounting bracket 50, and at the other end, the C member 55 to extensibly bias the armature 49 from the solenoid 48.

In the practice the valve functions substantially as follows: the adjusting knob (not shown) is turned to the desired position by the operator, thus turning adjusting member 38 in the threaded portion 39 of the boss 24 and varying the position of the member 38 within the outlet passageway 36 until it is adjusted to a position desired, to effect the dispensing of the desired volume of liquid.

Thus, it may be seen that during any given time, the amount of liquid dispensed from the dispenser when the valve is in an open position will depend upon the degree to which the adjusting member 38 is projecting into the outlet passageway 36.

It may now be seen that when the solenoid 48 is actuated, as when it is actuated under the cyclic control of the washing machine, the armature 49 will move retractibly toward the solenoid 48 causing the C member 55 to move therewith thus opening the slit 47 in the flexible cutoff valve 43 to the position indicated in Figures 4 and 6. Obviously, applicant's valve does not depend upon the relative resiliency of the substance used in making the valve since the valve is both opened and closed by purely

mechanical means. When the solenoid is deactuated, the spring member 57 will act against the mounting bracket 50 to extensibly move the armature from the solenoid 48 thus closing the slit 47 and the cutoff valve 43. Hence, it may be seen that the opening and closing motion of the valve member 43 will function to break loose any encrustation of solidified fluid which may be formed around or over the slit 47.

It will be understood that modifications and variations of the present invention may be effected without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. A fluid control valve comprising a support, a resilient member mounted in said support and having a thickened and a thin walled portion and having a flow passageway therethrough, outwardly projecting knobs formed integrally with said thin walled portion of said member in opposed relation from one another and having narrow necked portions lying adjacent said thin walled portion, gripping members extending about said narrow necked portions, means rigidly mounting one of said gripping members on said support, and means for moving another of said gripping members relative to said first-mentioned gripping member to effect opening and closure of said flow passageway.

2. A fluid control valve comprising a support, a resilient member mounted in said support and having a thickened and a thin walled portion and having a flow passageway therethrough, outwardly projecting knobs formed integrally with said thin walled portion of said member in opposed relation from one another and having narrow necked portions lying adjacent said thin walled portion, gripping members extending about said narrow necked portions, means rigidly mounting one of said gripping members on said support, spring means biasing another of said gripping members toward said first-mentioned gripping member to effect closure of said flow passageway, and electrically energizable means for moving said second-mentioned gripping member in an opposite direction to effect opening of said flow passageway.

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