DISPENSER FOR FABRIC SOFTENER

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The instant invention relates to dispensers and more particularly to a centrifugally triggered automatic dispenser of a highly effective and simplified type. The dispenser of the present invention contemplates the provision of a self-contained dispensing unit for fabric softener liquids or the like for use in an automatic washer as an unattached accessory unit adapted to be placed in the washer basket.

Fabric softeners are most generally liquid in form and are usually added to the laundry in an automatic clothes washing machine during the final rinse portion of the automatic washer cycle. The prior art discloses numerous types of liquid dispensers suitable for dispensing detergents, soap, bleach or the like. These dispensers vary greatly in form, capability, and mode of operation. A review of the art makes it abundantly clear that there is a need for a simple, economical and effective dispenser particularly well adapted for automatically dispensing a fabric softener.

The dispensing unit embodied in the present invention is adapted to be placed in the washer basket and is automatically responsive, in a manner hereinafter clearly explained, to the centrifugal force created by rotation of the washer basket at high speeds. The dispensing unit is triggered during the spin-dry portion of the automatic washer cycle. After the spin-dry portion of the cycle, the premeasured amount of fabric softener in the dispensing unit is dispersed in the rinse water of the deep-rinse portion of the automatic washer cycle. In its preferred form the instant dispensing unit is particularly advantageous for use in top loading automatic washers.

The primary object of this invention is to provide a non-complex, self-contained dispenser unit which can be placed or dropped into the washer basket and is capable of dispensing its contents in the deep-rinse portion of an automatic washer cycle.

Another object of this invention is to provide a simple, efficient and inexpensive mechanical dispenser for dispensing a fabric softener or the like which is triggered by centrifugal force when placed in the basket of an automatic washer and rotated at high speeds with the basket.

A further object of the invention is to provide a dispenser which will remain positively sealed until triggered and which will have its contents completely discharged by the flushing action of the water in the washer tub or basket.

Still an additional object of the invention is to provide a translucent dispenser of this character with calibrated volumetric measuring marks on the walls thereof such that the appropriate calibration mark indicates the volumetric content contained in the dispenser.

And still further it is an object of this invention to provide an automatically controlled dispensing device which can be used in an automatic washer without complex installation or modification of the washer, the cost of which is so reasonable as compared to any known automatic dispenser that malfunctioning of the unit can be simply cured by discarding the dispenser and obtaining a replacement.

These and other objects which will become apparent as the instant invention is described can be achieved by employing the subject dispenser in the manner hereinafter explained.

Briefly stated, the instant dispenser comprises a single hollow chamber for holding a charge of fabric softener or the like, the chamber having a plurality of valve ports in the walls thereof on each of which is seated a valve port plug. The valve port plugs are interconnected by a means capable of unseating at least one of the valve port plugs in response to the influence of centrifugal force. Preferably, the said means consists of an elastic distensible connecting member having a weight attached thereto such that the weight is suspended in the dispenser chamber when all the valve port plugs are seated on the valve ports.

The drawing illustrates the preferred embodiment of the invention, but it will be understood that the invention is not limited thereto and that such substitutions and variations as will be obvious to those skilled in the art will be included within the invention as defined in the appended claims.

FIGURE 1 is a perspective view, partly broken away, of one embodiment of the container portion of this invention;

FIGURE 2 is a perspective view of the elastic distensible connecting member assembly showing the weight and plug valve arrangement among other things;

FIGURE 3 is an elevation, partially in section, of the container of FIGURE 1 having mounted therein the elastic distensible connecting member assembly of FIGURE 2 wherein both plug valves are shown closed; and

FIGURE 4 is an elevation, partially in section, of the container of FIGURE 1 and the elastic distensible connecting member assembly of FIGURE 2 showing the position that the dispenser may assume against the wall of the washer basket when the latter is rotated during the spin-dry portion of its cycle.

Referring now to the drawing, and particularly FIGURES 1, 3, and 4, there is shown a hollow single chamber container body 11 of substantially spherical section generally symmetrical in nature having opposite recessed end walls 12 and 13. The annular walls 14 and 15 extend inwardly from the container body 11 to end walls 12 and 13, respectively. A valve port 16 is centrally located in the end wall 12. A valve port 17 is located in the end wall 13 diametrically opposite to the valve port 16. A retaining wall 18 located intermediate the valve ports 16 and 17 is provided for securing a weight 19 to the interior wall of the container body 11.

The function of the weight 19 which may be of any heavy material such as steel, brass or lead is hereinafter explained.

The hollow single chamber container body 11, including the end walls thereof can be made of any suitable material. Preferably, the container body is molded in two sections of translucent plastic material and thereafter joined together by means of heat sealing or equivalent joining means to form a unitary structure. The container body sidewalls can be decorated or reinforced in any suitable manner. The container body is spherically shaped to eliminate possible jamming of the container body between the agitator and walls of the washer basket during portions of the automatic washer cycle when either one or both of these parts of the automatic washer is in motion.

An elastic distensible connecting member 20 is illustrated in FIGURES 2, 3 and 4. This connecting member 20 can be of any material capable of recovering its size and shape after deformation. The illustrated embodiment provides a distensible connecting member of rubber.

Referring primarily to FIGURE 2, the distensible connecting member 20 for the valve port plugs 23 and 24...
is provided with a centrally located weight 21. The weight 21 can be made of any heavy material and be of any shape. A steel, brass or lead weight having a spherical shape and provided with a keyway slot 21 for fitting the weight onto the distensible connecting member 20 has been found satisfactory. The keyway slot 21 should be narrower than the width of the distensible connecting member 20 between the flanges 22 so that the weight can be securely and positively fitted into place. The flanges 22 may be molded integrally with the member 20 to maintain the substantially correct central position on the distensible connecting member 20.

Valve port plugs 23 and 24 are molded of a soft flexible material such as rubber. Both valve port plugs have a double flange arrangement having flanges greater in diameter than the diameter of the valve ports. The flanges are deformable whereby the outer deformable flange 25 can be pulled through the valve port 16 or valve port 17 from the interior of the dispenser body. The inner flanges 26 of the valve plugs 23 and 24 may be substantially larger than the outer flanges 25 so that they will not pass through the valve ports 16 and 17 in an ordinary operation. The valve port plugs 23 and 24 are held in proper position by flanges 27 and 28 which may be integral with the connecting member 20 and which abut the faces of each valve plug. Terminal flanges 29 which may be located at opposite ends of the elastic distensible connecting member 20 are each adapted to be squeezed through a hole 30 on the annular walls 14 and 15 for anchoring the distensible connecting member 20.

The diameters of the flanges 29 are larger than holes 30 so that they can be compressed and forced through each hole 30 whereupon they expand and hold the ends of member 20 tightly. Resiliences 11b in the surface of wash body 11 (FIGURES 1, 3 and 4) are provided as shown so that the flanges 29 do not protrude substantially beyond the surface of the body 11. Attaching the connecting member 20 to the annular walls of the dispenser body 11 facilitates seating the valve plugs 23 and 24 by insuring that a portion of the distensible connecting member 20 adjacent to flange 29 is readily accessible from the exterior of the chamber body 11 if either or both of the plug valves are unseated.

The instant dispensing unit is operated by first inserting one valve plug in its valve port 16. The desired amount of fabric softener is then poured into the other open valve port and the open valve port plug pulled closed. In the preferred embodiment of the dispenser, the container is made from a translucent material which permits volumetric measuring marks 11a to be placed on the side walls thereof to facilitate filling the dispenser with the requisite amount of product.

In FIGURE 3 of the drawing the dispenser is shown with both valve plugs closed. With the valve plugs closed and the container partially filled with softener, the dispenser is properly assembled for placement in the washer basket. To facilitate accurate triggering of the dispenser in response to the high speed rotation of the washer basket during the spin-dry portion of the cycle, it is preferred that the distensible connecting member 20 be taut or under a small amount of tension when valve plugs 23 and 24 are seated on valve ports 16 and 17 in order to inhibit the random movement of the weight 21 and therefore eliminate premature triggering of the dispenser. After the device has been placed in the washer basket and during the washing portions of the automatic cycle the dispenser is unaffected by the movement of the washer agitator and the filling and draining of the washer basket with water. As the spin dry portion of the automatic washer cycle commences, the instant dispensing device is moved under the influence of centrifugal force toward a point on the peripheral surface of the washer basket (FIGURE 4). The weight 19 on the side wall of the container body 11 carries the dispenser to the periphery of the washer basket 32 more quickly than if the weight were not present. When the dispenser reaches the side of the washer basket, weight 19 orients the dispenser against the side of the basket as shown in FIGURE 4. As soon as the container body 11 has assumed a position against the side of the basket, the product within the device is forced by the effects of centrifugal force to the space within the device which is furthest removed from the axis of rotation of the washer basket.

With the weight 19 oriented against the side of the washer basket as shown in FIGURE 4, the space within the container body 11 which is furthest removed from the axis of rotation of the space is directly adjacent to the weight 19. The continued acceleration of the washer basket causes weight 19 to be similarly displaced toward the wall of the washer basket and thereby exert progressively greater tension on the distensible connecting member 20. The increased tension on the distensible connecting member creates an increased inward force on the valve plugs 23 and 24. The dispenser is triggered when sufficient inward force is developed to cause deformation of flange 25 on the valve plugs 23 and 24 causing one or both of the valve plugs to be drawn into the hollow chamber body.

In FIGURE 4, valve plug 23 is shown in an open position, immediately after having been unseated from valve port 16. After either one or both of the valve plugs is opened, no product can flow from the dispenser so long as the continued influence of centrifugal force keeps the product within the container body in the space adjacent to weight 19 and thus away from the open valve port or ports. Nor does any substantial amount of water enter the container body after one or both of the ports are opened. Triggering occurs after the washer basket has been drained of water or residual water has been spun from the washer basket by the high speed rotation of the basket.

At the end of the spin dry portion of the cycle, the washer basket decelerates, comes to rest and the deep rinse portion of the cycle begins. As the spin dry portion of the cycle ceases, centrifugal force no longer holds the dispenser against the side wall of the washer basket. Thus, the dispenser is free to fall away from the basket wall. Since one or both of the valve ports are now open, the content of the hollow chamber body can flow from the dispenser to become mixed with the rinse water either before or after entering the washer basket. The content can be flushed from the dispenser by the rinse water as it enters the washer basket. Agitation of the rinse water flushes out any content thereafter remaining in the dispenser.

The weight 19 located on the side wall of the container body insures that the dispenser does not come in contact with the surface of the rinse water when either one or both valve plugs are open. Weight 19 causes the dispenser to assume a position such that the rinse water will enter the container body through the open port or ports, fill the container body and cause it to sink. Any residual product remaining in the dispenser is flushed from the dispenser by the agitated rinse water. Thus the entire content of the instant dispenser is dispersed in the rinse water of the final rinse portion of the automatic washer cycle.

One of the advantages of the present invention is the reliability of the instant dispenser. Should the dispenser at any time become entangled with the clothes in the washer basket, the content therein will not be prematurely dispensed but will be dispersed as intended in the final rinse portion of the automatic washer cycle. For example, the dispenser will generally float on the surface of the water in the washer basket during the washing portion of the automatic washer cycle. However, the dispenser may become tangled in the agitated clothes as they are being washed and pulled under the surface of the water, there to be tumbled about until freed. As the container body is positively sealed, no wash water enters the dispenser when it is under water nor does the content in the dispenser escape therefrom. On occasion, the dispenser may be similarly tangled in...
the clothes when the spin dry portion of the cycle starts and not be free to orient itself against the side of the washer basket as illustrated in FIGURE 4. Nevertheless, the high speed rotation of the washer basket will trigger one or both of the valve port plugs in the manner previously described. Should the dispenser remain caught-up in the clothes after the deep rinse portion of the cycle has commenced, the content therein will be flushed from the dispenser by the agitation of the rinse water. Moreover, the agitation of the clothes in the rinse water will ultimately untangle the dispenser.

From the above description of the preferred embodiment of the instant invention, it is apparent that the invention as illustrated fulfills all the objects related therefor, but that as described it is susceptible of modification and rearrangement without departing from the principle involved. It is to be understood that other forms as might be adapted are intended to come within the valid scope and spirit of the appended claims.

What is claimed is:

1. A dispenser for use in an automatic washing machine for dispersing fabric softener or the like comprising a single hollow chamber for storing said fabric softener, said chamber having at least two diametrically opposed valve ports in the walls thereof, a valve port plug seated in each of said valve ports, each of said valve port plugs being connected to the diametrically opposed valve port plug by an elastic distensible connecting member under a slight amount of tension, said connecting member having a weight secured thereto intermediate a pair of said valve port plugs whereby displacement of said weight responsive to centrifugal force acting on said weight will cause at least one of said valve port plugs to become unseated on its respective valve port thereby permitting the fabric softener egress from said chamber.

2. The structure of claim 1 having a weight on the wall of said chamber, said weight causing the chamber to be unfloatable when one or both of said valve port plugs is not seated on its valve port.

3. A dispenser for automatically dispensing fabric softener or the like in the final rinse portion of an automatic washing machine cycle comprising a substantially spherical hollow single chamber container body having at least two diametrically opposed recessed valve ports in the walls thereof, a weight on the interior of said wall of said container body intermediate said valve ports, a flexible valve plug seated in each of said valve ports, a weight suspended substantially in the center of said container body on an elastic distensible member attached to the inner side of each of said valve plugs whereby the tension of said connecting member is sufficient to pull at least one of said valve plugs from its said valve port during the high speed rotation of the said washer basket permitting the contents of said container body to flow and be flushed by water therefrom when the said rotation ceases.

4. A free body dispenser for use in an automatic clothes washing machine comprising a hollow chamber containing a charge of fabric softener or the like, a pair of oppositely disposed valve ports in said chamber, a valve port plug seated in each of said valve ports, an elastic distensible connecting member secured to the said valve port plugs, said connecting member being under slight tension and having a weight secured thereto intermediate said valve port ports, at least one of said valve port plugs being opened to dispense said charge by the force applied to said distensible member by said weight in response to the centrifugal force effect created by the spin-dry portion of an automatic washer cycle.

5. A free body dispenser for use in an automatic clothes washing machine comprising a single hollow chamber containing a charge of fabric softener or the like, a pair of end walls oppositely disposed and containing valve ports therein, a valve port plug seated in each of said valve ports, said plugs including an inner flange bearing against said end wall and an outer deformable flange on the outside of said end wall, an elastic distensible connecting member secured to the said valve port plugs, said connecting member being under slight tension and having a weight secured thereto intermediate said valve port plugs, at least one of said valve port plugs being opened to dispense said charge by the force applied to said distensible member by said weight in response to the centrifugal force effect created by the spin-dry portion of the automatic washer cycle.

6. A free body dispenser as claimed in claim 5 wherein one end of the elastic distensible member extends through one of the valve port plugs and has its end secured to the hollow chamber.

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