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(54) **DISPENSING DEVICE**

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(57) **ABSTRACT**

A fluid dispensing system comprises a compressible bottle having an outlet and containing a collapsible pouch. The bottle has a release control means disposed adjacent to the outlet.

DISPENSING DEVICE

[0001] The present invention is related to a detergent dispensing device, particularly for dispensing said detergent into an automatic washing or drying machine over a plurality of operating cycles.

[0002] In automatic washing machines, the detergent, whether in powder, tablet or gel form, is usually filled manually by the user into the machine, in particular into a detergent holder, before each washing operation.

[0003] This filling process is inconvenient, with the problem of exact metering of the detergent and possible spillage thereof, for powder and gel detergents. Even with detergents in tablet form, wherein the problem of accurate dosing is overcome, there is still the necessity of handling the washing detergent every time a washing cycle is started. This is inconvenient because of the usually aggressive and irritant nature of detergent compositions, because of the time wasted in the operation and because of the need to store the detergent separately from the automatic machine.

[0004] A number of devices are known for holding unit doses of a detergent composition or additive, such as detergent tablets, and for dispensing of such unit doses into a machine.

[0005] WO 01/07703 discloses a device for the metered release of a detergent composition or additive into a washing machine having a number of separate sealed chambers for holding the detergent composition or additive and means for piercing the chambers, activated by conditions within the machine. The reliable operation of this type of device is limited by the complication of the dispensing and indexing mechanism and by the variability of the actuation means described in the patent, like weight of the load or rotation of the drum.

[0006] WO 03/073906 discloses a free standing device for dispensing multiple doses of detergent into a dishwasher. The device has a plate-like construction. A round blister pack having a plurality of doses arranged around its periphery is loaded into the pack. A winder is then rotated to load mechanical energy into the device sufficient to dispense more than one dose of detergent. A thermally operated latch then moves when the device is subjected to the elevated temperatures within the dishwasher and, in cooperation with a ratchet mechanism, moves the blister pack so that the next dose of detergent is ready for dispensing. In order to dispense the detergent, either the blister pack is pierced, or the dose is ejected from its compartment within the blister pack.

[0007] WO 03/073907 discloses a similarly shaped free standing dispensing device. In order to dispense detergent, a lever is manually operated to move a blister pack either to eject the detergent from a compartment within the blister pack, or to pierce the blister pack. A door or flap initially prevents wash liquor within the machine from accessing the exposed detergent. A bi-metallic strip is provided to move the door or flap when the device is exposed to the elevated temperatures during a washing cycle to allow access of the wash liquor to the exposed detergent thereby dispensing the detergent to the machine.

[0008] Both these devices have some serious limitations:

[0009] a) complicated dispensing and indexing mechanism,

[0010] b) they require the direct intervention of the user to operate, therefore reducing the time saved by using them

[0011] c) They depend on temperature for the dispensing of the dose and temperature gradients are not reliable triggers in laundry washing cycles, since the temperature of the wash can be selected by consumers between cold water and 90C.

[0012] The present invention is related to a development of these dispensing devices and overcomes the limitations described above.

[0013] According to a first aspect of the invention there is provided a fluid dispensing system comprising a compressible bottle having an outlet and containing a collapsible pouch, the bottle having a release control means disposed adjacent to the outlet.

[0014] The present invention is advantageous because it presents a simple easy to use device which is able to dose detergent in a washing cycle.

[0015] Generally the release control means is a polymeric foam, such as a polyurethane foam.

[0016] It has been found that such a foam provides an excellent dosing release profile. Without wishing to be bound by theory it is proposed that the outstanding dosing is connected with a delay factor of the foam. This delay factor means that detergent is only dosed when an amount of wash liquor is brought into contact with the foam thus liberating detergent from the foam matrix. This effect is beneficial in that excessive contact of detergents/detergent components with items being washed by the detergent is to be avoided because of the excessive damage that can be caused by exposure of items to the detergent. In this way the device of the present invention is particularly advantageous when compared to a simple device such as a conventional detergent dosing ball which has no release control.

[0017] Preferably the release control means is mounted in an apertured cage.

[0018] Optionally there is air gap between the inside of the bottle and the pouch.

[0019] Preferably the pouch contains a detergent formulation. Most preferably the detergent formulation is liquid. The detergent formulation is commonly laundry formulation.

[0020] Optionally the pouch is replaceable.

[0021] Optionally the device may comprise a secondary release control means. Suitably this can take the form of a manual activation switch/knob, e.g. such as a twistable knob. By the use of such a twistable knob higher control over the discharge of the contents of the device can be achieved. Namely dispensing a detergent dose is only possible when the knob is manually set to the "open" position.

[0022] This is expedient to avoid that during the wash cycles an unwanted detergent discharge because of, e.g. squeezing of the device due to the weight of wet fabric or contact with/against the washing machine drum. When the knob is in the "off" position it guarantees that no dispensing occurs without the activation by consumers.

[0023] The knob preferably controls the opening of the outlet. For example the knob may function such that by rotation it is brought into and/or out of contact with the outlet thus proving a closure function. Such as closure function can be provided by the knob functioning in conjunction with a heli-

cal thread. The knob preferably has a return means [such as a spring] so that, once activated, dosing is permitted for a certain period of time, i.e. with the device in the “open” position before the knob is returned to the closed position.

[0024] It has been found that such a manual activation switch provides enhanced control over the dosing from the device, without [when compared to more convoluted systems] a requirement for connection to the operating systems of the machine or other complex operating system.

[0025] Preferably the compressible bottle has a plurality of faces with differing stiffness. This aids the provision of the correct accuracy in dosing.

[0026] Preferably the bottle has at least one face having low stiffness and thus being at least partially collapsible. In one preferred embodiment the bottle is rectangular and as such has four side faces. In this embodiment preferably two faces have low stiffness and are collapsible, preferably the other two faces are stiff and cannot be deformed under a reasonable load. The bottom face is very stiff as well.

[0027] Such a design guarantees that when a load is applied on the stiff faces, no modification of shape and change in internal volume is accomplished. However, when the load is applied on the collapsible faces, the shape changes and the internal volume is reduced by the fixed amount given by (area of the faces)×(displacement of the faces).

[0028] The faces with a low stiffness preferably have a stiffness such that they can be at least partially collapsed under a load of from 0.3 to 5 kg, preferably under a load of about 0.5 kg.

[0029] Preferably the device comprises a plastics material, e.g. such as polypropylene. With the use of such a material the overall weight of the device can be kept as small as possible. This is important to avoid/mitigate any detrimental effects such as causing an imbalance to the washing drum when in motion.

[0030] According to a second aspect of the invention there is provided the use of a fluid dispensing system comprising a compressible bottle having an outlet and containing a collaps-

ible pouch, the bottle having a release control means disposed adjacent to the outlet in a laundry washing operation.

1. A fluid dispensing system comprising a compressible bottle having an outlet and containing a collapsible pouch, the bottle having a release control means disposed adjacent to the outlet.

2. A fluid dispensing system according to claim 1, wherein the release control means is a polymeric foam.

3. A fluid dispensing system according to claim 1, wherein the foam is a polyurethane foam.

4. A fluid dispensing system according to claim 1, wherein the release control means is mounted in an apertured cage.

5. A fluid dispensing system according to claim 1, wherein there is air gap between the inside of the bottle and the pouch.

6. A fluid dispensing system according to claim 1, wherein the pouch contains a detergent formulation.

7. A fluid dispensing system according to claim 6, wherein the detergent formulation is liquid.

8. A fluid dispensing system according to claim 6, wherein the detergent formulation is a laundry formulation.

9. A fluid dispensing system according to claim 1, wherein the pouch is replaceable.

10. A fluid dispensing system according to claim 1, wherein the device comprises a secondary release control means.

11. A fluid dispensing system according to claim 1, wherein the compressible bottle has a plurality of faces with differing stiffness.

12. A laundry washing operation, comprising the step of: delivering a fluid from a fluid dispensing system according to claim 1 during the said laundry washing operation.

13. A fluid dispensing system according to claim 10, wherein the secondary release control means is a twistable knob.

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