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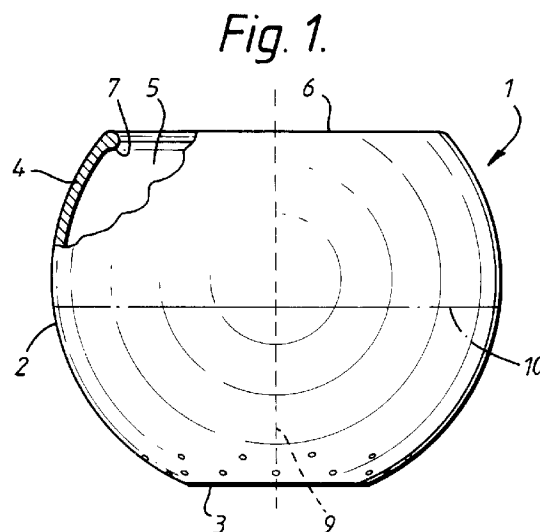
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(54) **Dispensing device.**

(57) Method and device for treating textile articles in the drum of a washing machine in which the articles are loaded into the drum together with a dispensing device containing detergent or like composition, the device having a permanently open filling and dispensing aperture (6) and holes (8) in the device through which wash liquor can enter but which are small enough to prevent the escape of the composition prior to the device being contacted by wash liquor.



This invention relates to a device for dispensing detergent or other composition in a washing machine.

There have been a number of previous proposals for the treatment of laundry in a washing machine in which a detergent or other composition with which the laundry is to be treated is placed in a dispensing device and the device placed in the machine together with the laundry before the operation of the machine is begun. The use of such dispensing devices can be useful in the washing of laundry with both liquid detergent and solid detergent such as in powdered, granular, flake or particulate form particularly when the compositions are difficult to dispense by means of automatic dosing systems incorporated into the washing machine or, even if they can be automatically dispensed by such automatic dosing systems, the dosing systems and the design of the washing machine are such that a proportion of the detergent composition flows to dead areas of the machine and is not fully drawn into the wash liquor in contact with the laundry.

It is of course necessary for the detergent composition to be dispensed from such a dispensing device at the commencement, or shortly after the commencement, of the washing cycle of the machine in order to maximise the exposure of the laundry to wash liquor containing the detergent composition. This is particularly important when the wash cycle time of the machine is relatively short.

Examples of dispensing devices for use in the washing of laundry in washing machines with a particulate detergent are proposed in EP 343070 which essentially comprise a flexible bag shaped sleeve having a mouth attached to a rigid ring member which maintains the mouth of the bag open during the wash. In certain embodiments as disclosed in EP 343070, the bag is made from material which allows the aqueous washing solution to penetrate through the bag but which is capable of retaining the particulate product while it is still solid. As described the ring member is a relatively complex plastics moulding to which the separately manufactured flexible bag has to be attached and the embodiment in commercial use in the UK corresponds substantially to the construction shown in Figure 17 which comprises three individual plastics mouldings which are assembled together with the flexible bag. Such a construction is expensive to produce and moreover the life of the device is limited by the life of the flexible bag which will be less than that of the plastics components. A further disadvantage is that the ring around the outside of the mouth of the bag presents an edge which in use can damage delicate laundry, particularly when used in a washing machine having a drum rotatable about a horizontal axis.

Dispensing devices for dispensing solid detergent in washing machines have also been proposed in JP Utility Model No. 51-47412 and US 3 400 808. JP 51-47412 describes a dispensing device for granu-

lar or liquid detergent compositions having a casing with a smooth spherical shaped exterior. The casing may be separated into two halves, one of which is provided with a plurality of outlet apertures, for filling with the detergent composition, the composition being filled into a casing half having an imperforate wall. After filling and closing the two halves together, the device is placed on laundry in the washing machine drum. To ensure that the composition is dispensed when the device is used in a washing machine have the axis of the drum vertical a float chamber is incorporated in the imperforate half so that as soon as the device floats in water in the machine, the device will adopt a position with the float chamber uppermost and the outlet apertures downwards to dispense the detergent composition into the water. This construction suffers from the disadvantage that it comprises three individual mouldings and the user is required to separate the two halves for filling which can result in one half being mislaid. Furthermore if water enters the float chamber the device will not function effectively in a washing machine in which the drum axis is vertical.

US 3 400 808 describes a dispenser for dispensing bleach powder, or powders other than bleach, or mixtures of powders in automatic washing machines which like that of JP 51-47412 is in two halves, one of which is imperforate and the other is perforated by dispensing apertures. To ensure that the powder is transferred to the perforated half during the time the dispenser is moving about in the wash of a washing machine, the perforate half is weighted. As with the device of JP 51-47412, the device is in two halves which the user has to separate and join together again when filling.

In EP 368 680, there is described a dispensing device for dispensing a detergent or like composition in a washing machine comprising a hollow body having a filling and dispensing opening and a smooth resilient wall deformable within the drum of the machine by wash liquor loaded laundry articles and resilient to return to the original shape when the deforming force is removed. Such a device is economically manufactured in a single plastics moulding and can be re-used very many times before it has to be discarded, thus minimising the amount of plastics material to be disposed of. The device does not however readily dispense all detergent or like compositions in all types of washing machines.

It is an object of the present invention to overcome the aforementioned disadvantages of dispensing devices as previously proposed.

According to the present invention there is provided a device for dispensing a detergent or other composition in a washing machine comprising a unitary hollow body for containing the composition and having a permanently open filling and dispensing aperture characterised in that the hollow body wall opposite the filling aperture is provided with one or

more unobstructed holes having a size through which wash liquor can enter and leave the hollow body whilst preventing the escape of the composition prior to the device being contacted by the wash liquor.

Such a device can be readily and economically manufactured in, eg. plastics material such as PVC or polyurethane and can be used in washing machines having the axis of the drum horizontal or vertical without damaging the laundry to maximise the effectiveness of the composition being dispensed. The hole or holes allow wash liquor to enter and leave the hollow body therethrough in addition to through the filling opening, thus facilitating the dispensing of the composition and in particular ensuring that all the composition is dispensed as early as possible in the machine cycle. Providing the hole or holes opposite the filling opening ensures that the hole or holes are submersed when the filled device is allowed to float in water. The device is thus particularly suited for use in a machine having a drum with a vertical axis in which the device is filled with the desired measure of the composition and placed on top of the laundry to be treated. As the water level in the drum reaches the top of the laundry, water contacts the underside of the hollow body and enters through the hole or holes so that the device rapidly sinks below the water level. Once the device is below the water level, the composition is effectively dispensed out through the unobstructed hole or holes and the filling aperture by even the most gentle of agitation of the wash liquor. The entry of the water to the underside of the bed of the measure of composition filled into the hollow body is effective in facilitating the dilution or dissolving of the composition and particularly in the case of a solid composition helps to dislodge the composition from the inside wall of the device.

The device according to the invention can equally be used in washing machines having the drum axis horizontal. The unobstructed hole or holes again allow ready entry of the wash liquor into the hollow body and thus facilitate the dispensing of the composition.

The exterior wall of the hollow body should preferably be smooth, that is to say free from corners, edges, re-entrant surfaces or other irregularities which could damage the laundry.

Preferably the hollow body is provided with a self-restoring flexible wall. Particularly when the device is used in a machine with the drum axis horizontal, the effect of the laundry falling into the device from time to time and deforming the resilient wall further assists in dislodging any composition, especially solid composition, from the inside wall of the body. The wall is self-restoring so that it returns to its original shape when the deforming force is removed. Whilst the deforming forces applied to the hollow body will be less in a machine with the drum axis vertical, the resilient walls also have the advantage of minimising

noise when the device contacts the drum which is of benefit in both types of washing machine.

The size of each of the hole or holes is determined by the detergent composition or like to be contained within the body. When the composition is in liquid form, the size of a hole will depend upon the thickness of the wall as well as the viscosity and structure of the liquid. The device is particularly suitable for solid compositions in particulate form and we have found that a hole having a diameter of less than 2.00 mm and preferably less than 0.75 mm in a wall thickness of 1.1 mm is effective in preventing a concentrated detergent powder from escaping from the hollow body before use. If the hole is too small, there can be a tendency for the powder to clog in the hole and prevent the ingress of water so the minimum hole diameter should be 0.1 mm and preferably 0.5 mm.

The number of holes may be varied according to the size of hole and nature of the composition but should be sufficient in number and size that the device, when filled with a measure of the composition, is filled through the holes with a quantity wash liquor to sink the device entirely below the wash liquor level in less than three minutes without any agitation, preferably less than one minute and more preferably in 30 seconds or less. If this parameter is met the device will be capable of enhanced dispensing in both types of washing machine and the number of holes required can be as low as one. Preferably at least four holes are provided to minimise any risk that a temporary blockage unduly restricts the entry of wash liquor. A suitable number of holes has been found to be between 8 and 36, conveniently 24.

The holes are preferably equispaced on one or more circles, the centres of which lie on a line passing through the centre of the filling aperture at right angles to the plane of the aperture. Arranging the holes in this way tends to ensure that compositions filled through the filling aperture covers the holes so that in use the wash liquor enters through the holes directly into the composition.

The unobstructed hole or holes can be of any shape. For example, when the composition is solid, a hole can be a slot having a width which prevents the escape of the composition and a length greater than the width. Two or more such slots may also be in intersecting relationship provided the maximum size of hole at the intersection does not allow the composition to escape.

Conveniently the device is provided with a flattened base area on which it can stand with the filling and dispensing aperture uppermost, the plurality of holes being disposed in the hollow body adjacent the base. The device can be stood on the base as it is being filled with the composition and since the holes are adjacent the base it is ensured that they are below the fill level and covered by the composition filled into the hollow body.

If desired, an insert can be disposed within the filling aperture, the insert having a number of openings therein through which the composition can be filled into the hollow body. The openings in the insert can be so shaped and arranged that whilst still allowing the filling of the hollow body, the insert nevertheless minimises the dispensing of the composition before it is at least partially diluted or dissolved in the wash liquor thus minimising the risk of the composition in concentrated form contacting the laundry when concentrated composition might damage the laundry.

According to another aspect of the invention, there is provided a device for dispensing a detergent or other composition in a washing machine comprising a unitary hollow body containing a measure of the composition to be dispensed, the device having a permanently open filling and dispensing aperture, the hollow body wall opposite the filling aperture being provided with at least one unobstructed hole having a size through which wash liquor can enter and leave the hollow body whilst preventing the escape of composition prior to the device being contacted by wash liquor, the number and position of the holes being such that when the device is floated on water with the filling aperture uppermost the device sinks below the water level in less than one minute.

The invention also provides a method of washing laundry in the drum of a washing machine in which a re-usable dispensing device is filled with a detergent or other composition and placed in the drum together with the laundry the device comprising a unitary hollow body with a smooth exterior wall and a permanently open filling and dispensing aperture and at least one unobstructed hole opposite the filling aperture the size and shape of which prevents the escape of the composition prior to contact with the water, water entering the hollow body therethrough to facilitate the dispensing of the composition.

The drum of the washing machine can be vertical, the water entering the hollow body through the hole or holes and sinking the dispensing device in less than one minute. This ensures that the composition is rapidly dispensed shortly after the commencement of the washing cycle to ensure that the laundry is subjected to the detergent composition for most of the washing cycle time.

An embodiment of the invention will now be described with reference to the accompanying diagrammatic drawings in which -

Figure 1 is a side elevation of a dispensing device according to the invention partly in section; and Figure 2 is a view from below of the device of Figure 1.

The dispensing device indicated generally by reference numeral 1 has an external smooth outer surface 2 of generally spherical shape having a flattened base area 3 on which the device can stand. As can be seen from the sectioned part of Figure 1, the

device has a thin wall 4 to form a hollow body 5 which can be filled through a filling and dispensing aperture 6 with the composition to be dispensed. The filling aperture 6 is arranged to be uppermost when the device is stood on the base area 3 with the planes of the base 3 and aperture 6 parallel to one another. The peripheral rim of the aperture 6 is slightly enlarged as shown at 7 to avoid any possibility of an edge which in use might contact and damage laundry.

As shown in Figure 2, a plurality of holes 8 are provided in the hollow body 5 which pass completely through the wall 4. The holes are equispaced on two concentric circles, the centres of which lie on a line 9 passing through the centre of the filling aperture at right angles to the plane of the aperture. This arrangement ensures that the holes are distributed around the hollow body and below the opening so that composition filled through the aperture 6 will lie over the holes 8.

One or more fill lines 10 can be marked on the hollow body to indicate to the user the quantity of composition to be filled into the device, the fill lines 10 being above the holes 8 so that all the holes 8 are covered by composition when initially filled. The wall 4 is transparent or translucent so that the user can observe the level of the composition in the hollow body and compare that level to the fill line 10.

A device as shown in the drawings can be readily made of plastics material such as polyurethane. Typical dimensions for dispensing a dose of 83.5 ml of detergent composition would be a diameter of 77 mm and a height of 60 mm giving a fill line level passing approximately through the centre of the spherical shape. A filling aperture of 56 mm diameter allows the device to be readily filled without undue risk of spilling. With 24 holes as shown on two concentric circles, each hole being 0.5 mm diameter and 1.1 mm long, the device when filled with a concentrated detergent powder to the indicated level and floated in water has sunk below the water level in less than one minute. Thus when the device has been used to dispense the composition in a washing machine having the axis of the drum vertical, the composition has been rapidly dispensed into the wash liquor. The wash liquor entered the holes 8 and wetted the composition as soon as the water level reached the underside of the device. The water tended to enter as fine jets and minimise any tendency of the composition to adhere to the inner wall surface. Any clogging of the holes 8 by the wetted composition is temporary and the holes 8 and aperture 6 ensured that the entire contents of the device were dispensed even with gentle agitation.

Claims

1. A device for dispensing a detergent or other composition in a washing machine comprising a

- unitary hollow body for containing the composition and having a permanently open filling and dispensing aperture characterised in that the hollow body wall opposite the filling aperture is provided with one or more unobstructed holes having a size through which wash liquor can enter and leave the hollow body whilst preventing the escape of the composition prior to the device being contacted by the wash liquor.
2. A device according to Claim 1 characterised in that the hollow body has a smooth exterior wall.
 3. A device according to Claim 1 or Claim 2 characterised in that the hollow body has a self-restoring flexible wall.
 4. A device according to Claim 1 or Claim 2 or Claim 3 characterised in that the hole or holes are in the shape of a slot.
 5. A device according to Claim 1 or Claim 2 or Claim 3 characterised in that the hole or holes are circular with a diameter of less than 2.00 mm.
 6. A device according to Claim 5 characterised in that the hole diameter is greater than 0.1 mm.
 7. A device according to Claim 6 characterised in that the hole diameter is between 0.5 mm and 0.75 mm.
 8. A device according to any of the preceding claims characterised in that there are provided between 8 and 36 holes.
 9. A device according to Claim 8 characterised in that the holes are equispaced on one or more circles centred on a line passing through the centre of the filling aperture at right-angles to the plane of the aperture.
 10. A device according to any one of the preceding claims characterised in that the hollow body is provided with a flattened base area on which it can stand with the filling and dispensing aperture uppermost, the hole or holes being disposed in the hollow body adjacent the base.
 11. A device for dispensing a detergent or other composition in a washing machine comprising a unitary hollow body containing a measure of the composition to be dispensed, the device having a permanently open filling and dispensing aperture, characterised in that the hollow body wall opposite the filling aperture is provided with at least one unobstructed hole having a size through which wash liquor can enter and leave the hollow body whilst preventing the escape of composition prior to the device being contacted by wash liquor, the number and position of the holes being such that when the device is floated on water with the filling aperture uppermost the device sinks below the water level in less than one minute.
 12. A method of washing laundry in the drum of a washing machine in which a re-usable dispensing device is filled with a detergent or other composition and placed in the drum together with the laundry characterised in that the device comprises a unitary hollow body with a smooth exterior wall and a permanently open filling and dispensing aperture and at least one unobstructed hole opposite the filling aperture the size and shape of which prevents the escape of the composition prior to contact with the water, water entering the hollow body therethrough to facilitate the dispensing of the composition.
 13. A method according to Claim 12 in which the drum of the washing machine is vertical, characterised in that the water enters the hollow body and sinks the dispensing device in less than one minute.

Fig. 1.

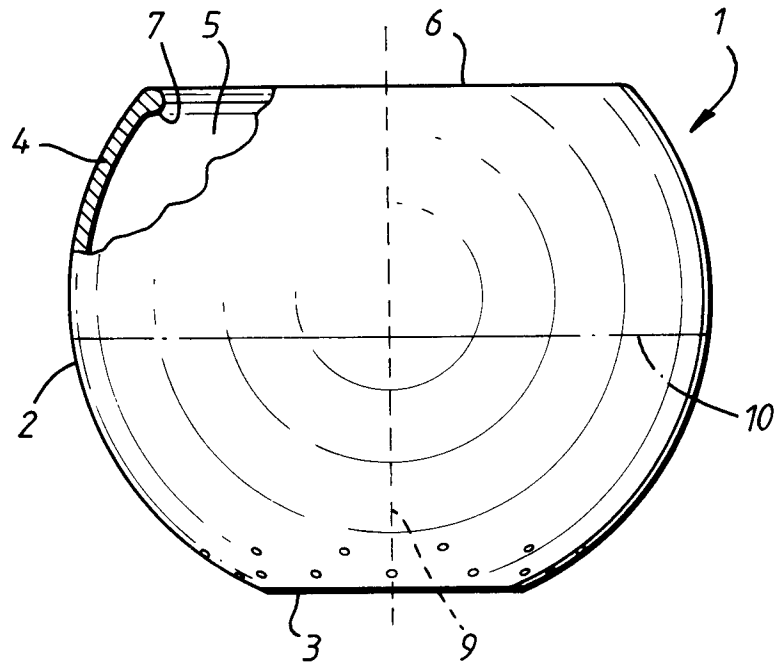
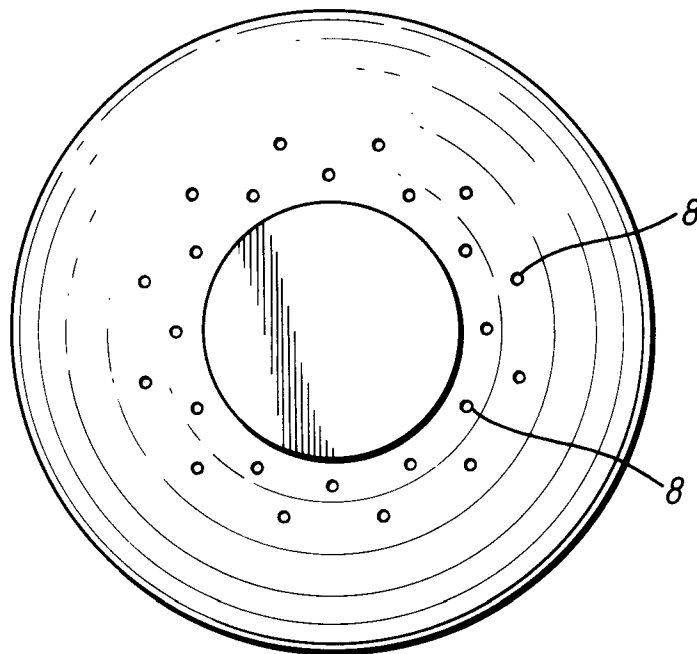


Fig. 2.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 31 1313

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,A	EP-A-0 368 680 (UNILEVER) * column 9, line 9 - line 56; figures 7-9 * ---	1-4, 10	D06F39/02
D,A	US-A-3 400 808 (RICHTER) * column 2, line 30 - line 53; figures * ---	1,5-12	
D,A	EP-A-0 343 070 (PROCTER & GAMBLE) * column 6, line 48 - line 53; figures * ---	1,5-7, 11,12	
A	EP-A-0 327 704 (HENKEL) * figures 5-9 * ---	1-5,10	
A	EP-A-0 327 716 (HENKEL) * figures 1,2 * ---	1,5,10	
A	DE-C-3 844 368 (HENKEL) * figures 1,2 * ---	1,4	
D,A	JP-A-51 047 412 (...) * figures * -----	1	
			D06F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 01 APRIL 1992	Examiner REBIERE J. L.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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