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(54) **A method and a dispensing device for washing clothes in a washing machine.**

(57) A method for washing clothes in a washing machine employs a reusable receptacle for dispensing a detergent, said receptacle having a flexible bag-like body (1) and an opening (10). A solid detergent in the form of a tablet (6) is placed in the dispensing receptacle, the latter then being put into the drum of the washing machine together with the clothes to be washed. Then the washing is started and carried out in the usual manner. During the wash cycle a substantially freely movable disintegrating body (5) is in the interior (4) of the bag (1) of the dispensing receptacle. During the wash cycle the clothes compress the flexible body (1) of the dispensing receptacle thus pressing the tablet (6) in the interior (4) of the receptacle against the disintegrating body (5), thus disintegrating said tablet. Thus the tablet (6) is disintegrated in comparatively short time, the resulting increased free surface of the solid detergent causing a faster dissolution thereof.

Moreover, the invention relates to a dispensing device for carrying out said method.

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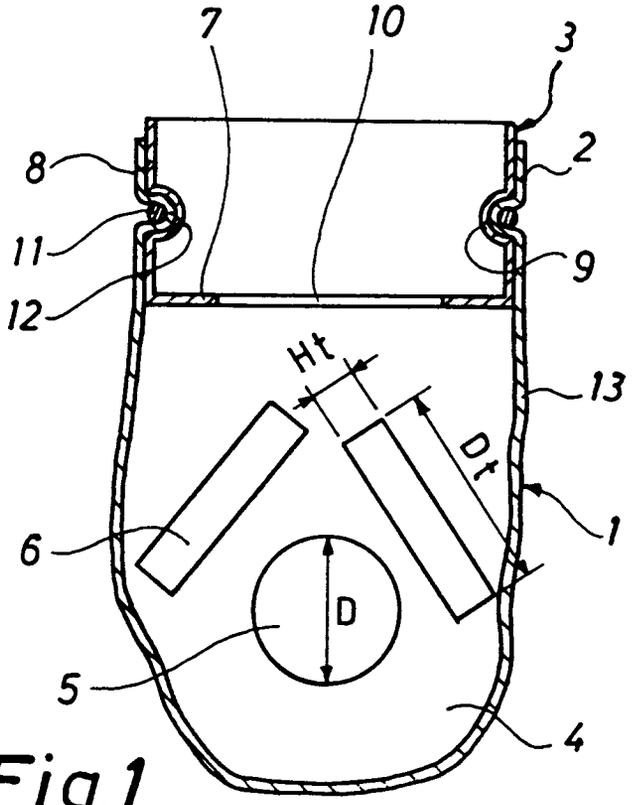

Fig.1

The invention relates to a method for washing clothes in a washing machine by employing a reusable receptacle for dispensing a detergent, said receptacle having a flexible bag-like body and an opening, said method comprising a solid detergent in the form of a tablet being placed in the dispensing receptacle, the latter then being put into the drum of the washing machine together with the clothes to be washed, whereupon the washing is started and carried out in the usual manner.

US-A 3.048.993 discloses the filling of washing powder into a bag in connection with machine washing of clothes, said bag being put into the drum of the washing machine together with the clothes to be washed. The washing bag is made of a porous material. During the wash cycle the bag comes into contact with the wash water whereby the washing powder inside the bag is dissolved and permeates through its walls.

EP-A1 0343069 and EP-A1 0343070 disclose corresponding methods employing a reusable receptacle for dispensing a detergent, said receptacle having a flexible bag-like body and an opening, the receptacle being filled with the desired amount of solid detergent prior to being put into the drum of the washing machine together with the clothes to be washed. Then the wash cycle is started and carried out in the usual manner. The dispensing receptacle disclosed in the first mentioned European patent specification comprises a closeable opening closed during the wash cycle, while the second mentioned patent specification discloses a dispensing receptacle, the opening of which is open during the wash cycle.

Using such dispensing receptacles is advantageous in that direct contact between the undissolved detergent and the clothes and thus the risk of discolouration of the latter is avoided, and that all of the detergent powder is dissolved and available for washing instead of falling directly to the bottom of the machine and leaving it via the drain system without being used during washing. A further advantage is that the annoying noise generated by known dispensing receptacles made of rigid plastics during the wash cycle is avoided.

EP-A1 0343069 indicates that the solid detergent may be in the form of tablets. If, however, the method disclosed in this patent specification is carried out without further measures, the dissolving time of the tablet is unacceptably long, especially for fine washing, i.e. a comparatively short wash cycle at low temperatures. This fact should be seen in the light of the difficulties in manufacturing detergent tablets having excellent transport and storage properties and at the same time being quickly dissolved.

The object of the invention is to provide a method of the above mentioned type allowing a quick dissolution of detergent tablets of good transport and storage properties.

In satisfaction of the aforementioned object, the method according to the invention is characterized by a substantially freely movable disintegrating body being in the interior of the bag of the dispensing receptacle during the wash cycle. During the wash cycle the clothes compress the flexible body of the dispensing receptacle thus pressing the tablet or tablets in the interior of the receptacle against the disintegrating body, thus disintegrating said tablet(s). At the same time, the disintegrating body has a wearing effect on the tablet, grinding off the detergent. Thus the tablets are disintegrated in comparatively short time, the resulting increased free surface of the solid detergent causing a faster dissolution thereof.

The invention also relates to a dispensing device to be used for carrying out the method according to the invention and comprising a dispensing receptacle with a flexible bag-like body and an opening into the interior of the bag.

The dispensing device is characterized by further comprising a disintegrating body arranged substantially freely movable in the interior of the bag.

According to the invention, the disintegrating body may be connected to the dispensing receptacle via a flexible connecting means substantially not influencing the free movability of the disintegrating body. Since the disintegrating body is thus still connected to the dispensing receptacle, it is avoided that said body is lost during the use of the dispensing device.

Moreover, the disintegrating body may according to the invention be of such a shape compared to the opening of the dispensing receptacle that it cannot leave the interior of the receptacle. Also this measure eliminates the risk of losing the disintegrating body during the use of the dispensing device

Furthermore, the disintegrating body may according to the invention be of substantially convex shape. Thus the disintegrating body is able to subject the detergent tablet to a disintegrating force regardless of the orientation of said body in relation to said tablet, as the disintegrating body and the tablet do not possess conformal surfaces

In another embodiment of the invention the disintegrating body may be substantially of spherical shape. This embodiment has given good results in practial applications.

In a further embodiment of the invention, the disintegrating body may have an uneven surface structure, thus optimizing the wear of the distintegrating body when grinding off detergent from the tablet.

In yet another embodiment of the invention, where the opening of the dispensing receptacle is formed by a mouthpiece connected to the edge of the bag, the opening of said mouthpiece may have the shape of an elongated slot of a length slightly longer than the largest dimension of the detergent tablet and a width slightly larger than the smallest dimension of

the detergent tablet. This embodiment is at the moment considered the preferred embodi-ment, as the washing tablet is easily inserted into the dispensing device by passing it through the elongated slot, the latter being of such a size that the detergent is almost completely prevented from escaping from the interior of the dispensing device before being dissolved.

In yet a further embodiment of the invention, the body of the dispensing receptacle may be of a porous material permeable for liquids, thus increasing inflow and outflow of liquid and thus the rate of dissolution of the solid detergent.

Finally, the mouthpiece of the dispensing receptacle may according to the invention be closeable, thus making sure that the solid detergent does not escape from the dispensing device undissolved.

The invention is described in greater detail below and with reference to the accompanying drawings in which

Figure 1 is a vertically sectional view of a first embodiment of a dispensing device according to the invention to be used for carrying out the method according to the invention,

Figure 2 is a top view of the device of Figure 1,

Figure 3 is a side view of a second embodiment of a dispensing device according to the invention,

Figure 4 is a sectional view along the line IV-IV of Figure 3,

Figure 5 is a sectional view of a first and second embodiment of a disintegrating body of a dispensing device, and

Figure 6 is a sectional view of a third embodiment of a disintegrating body.

The first embodiment of a dispensing device according to the invention shown in Figures 1 and 2 comprises a bag 1, the upper edge of which being connected to a mouthpiece 3, as well as a spherical disintegrating body 5 in the interior 4 of the bag. Moreover, two detergent tablets 6 in the form of cylindrical discs are placed in the interior 4 of the bag.

The mouthpiece 3 is substantially cup-shaped having a bottom wall 7 passing over into a cylindrical wall 8 at right angles to the bottom wall 7. Approx. in the middle seen in vertical direction, the cylindrical wall 8 is provided with a circumferential recess 9 substantially in the shape of a hemicircle seen in cross-sectional view. The bottom wall 7 is provided with centrally located elongated slot 10 having a lenght L_s slightly longer than the diameter D_t of the tablet(s) 6 to be placed in the dispensing device and a width B_s slightly larger than the height H_t of the tablet 6, so that the tablet 6 may be inserted through the slot without any problems.

The bag 1 is preferably made of a porous material permeable for liquids such as fabric. The bag surrounds the cylindrical wall 8 of the mouthpiece 3 by means of the upper edge 2. The bag 1 is fastened to the cylindrical wall by means of an elastic band such as an O-ring 11, the ring being of such a dimension that it presses the portion 12 of the upper edge of the bag into the recess 9 of the cylindrical wall and that it is at least partially received in the recess 9. Thus the bag 1, the part of the dispensing device to be subjected to the greatest wear, is advantageously replaced.

The spherical disintegrating body 5 is of a diamter D larger than the width of the slot B_s so that said body cannot escape from the dispensing device. Thus it is avoided that the disintegrating body 5 is lost or disappears when using the dispensing device.

When the dispensing device is to be used for washing clothes in a washing machine, one or more washing tablets are inserted through the slot 10 of the mouthpiece 3 into the interior 4 of the dispensing device, whereafter the dispensing device is put into the drum of the washing machine together with the clothes to washed. Then the wash cycle is started and carried out in the usual manner. During the wash cycle, the clothes compress the bag 1 thus pressing the washing tablet(s) 6 against the disintegrating body 5 and disintegrating them. As a result the washing tablets are quickly pulverized and thus dissolved in the wash water flowing into the interior 4 of the dispensing device, partially through the porous wall 13 of the bag 1 and partially through the slot 10. When the wash cycle is over, the dispensing device is removed from the drum of the machine and can be used again for a new wash cycle in the same way as described above.

The second embodiment of the device according to the invention shown in Figures 3 and 4 comprises a bag 21 made of a porous material permeable for liquids, preferably a fabric, and comprising an upper opening to be closed. The inner surface of the opposing upper edge portions 22 of the bag are provide with velcrobands 34, 35 having engaging means facing each other.

The interior 24 of the bag 21 comprises a spherical disintegrating body 25 connected to the wall 33 of the bag 21 by means of a flexible cord or string 36 of such a length and flexibility that the disintegrating body 25 is substantially freely movable in the interior of the bag 21. The fact that the disintegrating body 25 is tethered to the bag 21 prevents the loss of the disintegrating body.

When the dispensing device of Figures 3 and 4 is to be used, it is opened by separating the velcrobands, whereupon one or more washing tablets (not shown) are inserted through the opening into the interior 24 of the bag 21. Moreover, the disintegrating body 25 is positioned in the interior 24 of the bag 21, if it is not there already. Then the dispensing device is put into the drum of the washing machine together with the clothes to be washed. The wash cycle is carried out as described above in the usual manner, the disintegration of the tablets taking place as described above.

Figure 5 illustrates the left half of a spherical dis-

integrating body 45 having a smooth outer surface 46. On the right-hand side another spherical disintegrating body 55 is illustated, the latter having an uneven outer surface 56, as it is provided with a number of evenly distributed tooth-like projections 57. Compared to the disintegrating body 45 having a smooth surface the body 55 subjects the tablets to greater wear due to the tooth-like projections thus improving the pulverization and dissolution of said tablets.

Figure 6 illustrates a further embodiment of the disintegrating body 65 of cylindrical shape and provided with semi-spherical end surfaces 66, 67.

The disintegrating body 5, 25, 45, 55, 65 is made of a rigid material, preferably a rigid plastic material resistant to temperatures of at least 100° C. The disintegrating body may either be a hollow or massive body. Its dimensions are selected in relation to the dimensions of the tablets in such a way that said body is able to exert the intended disintegrating effect. Trials with tablets of a diameter of 30 - 40 mm have shown satisfactory results when using a spherical cylindrical disintegrating body of a diameter of between 20 and 70 mm. Larger or smaller disintegrating bodies can, however, also give correspondingly satisfactory results.

The method and device may be varied in many ways, without thereby deviating from the scope of the invention. Thus the dispensing receptacle having an opening which cannot be closed may be made of a material not permeable for liquids. Moreover, the dispensing receptacle may be provided with any known closure device for closing the opening.

Claims

1. A method for washing clothes in a washing machine by employing a reusable receptacle for dispensing a detergent, said receptacle having a flexible bag-like body and an opening, said method comprising a solid detergent in the form of a tablet being placed in the dispensing receptacle, the latter then being put into the drum of the washing machine together with the clothes to be washed, whereupon the washing is started and carried out in the usual manner, characterized by a substantially freely movable disintegrating body (5, 25, 45, 55, 65) being in the interior (4, 24) of the bag (1, 21) of the dispensing receptacle during the wash cycle.

2. A dispensing device to be used for carrying out the method according claim 1 and comprising a dispensing receptacle with a flexible bag-like body and an opening into the interior of the bag, characterized by further comprising a disintegrating body (5, 25, 45, 55, 65) arranged substantially freely movable in the interior (4, 24) of the bag (1, 21).

3. A device according to claim 2, characterized by the disintegrating body (25) being connected to the dispensing receptacle via a flexible connecting means (36) substantially not influencing the free movability of the disintegrating body (25).

4. A device according to claim 2 or 3, characterized by the disintegrating body (5) being of such a shape compared to the opening (10) of the dispensing receptacle that it cannot leave the interior (4) of the receptacle.

5. A device according to one or more of the preceding claims, characterized by the disintegrating body (5, 25, 45, 55, 65) being of substantially convex shape.

6. A device according to one or more of the preceding claims, characterized by the disintegrating body (5, 25, 45, 55) being of substantially spherical shape.

7. A device according to one or more of the preceding claims, characterized by the disintegrating body (45) having an uneven surface structure.

8. A device according to one or more of the preceding claims, where the opening of the dispensing receptacle is formed by a mouthpiece connected to the edge of the bag, characterized by the opening (10) of said mouthpiece (3) having the shape of an elongated slot of a length (L_s) slightly longer than the largest dimension (D_t) of the detergent tablet (6) and a width (B_s) slightly larger than the smallest dimension (H_t) of the detergent tablet (6).

9. A device according to one or more of the preceding claims, characterized by the body (1, 21) of the dispensing receptacle being of a porous material permeable for liquids.

10. A device according to one or more of the preceding claims, characterized by the mouthpiece of the dispensing receptacle being closeable.

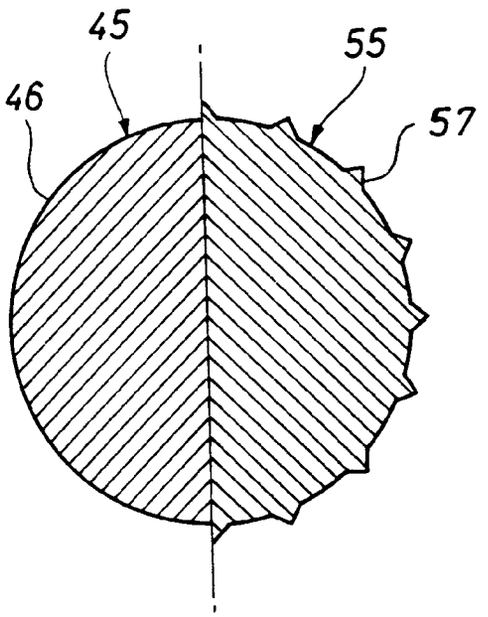

Fig.5

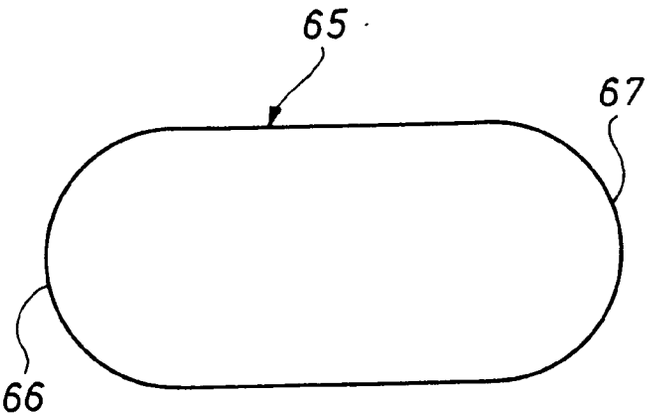

Fig.6

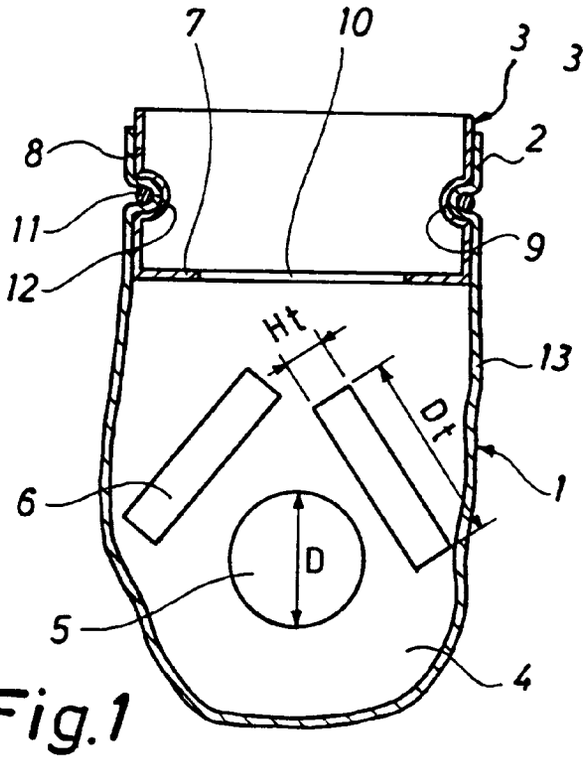

Fig.1

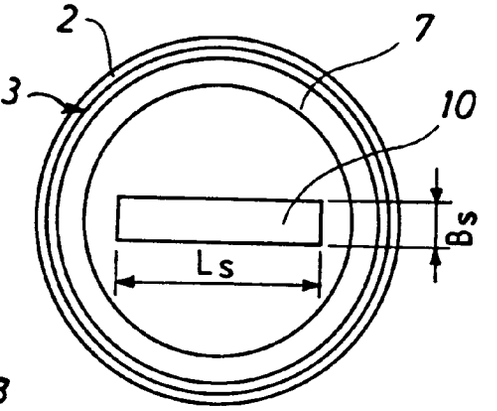

Fig.2

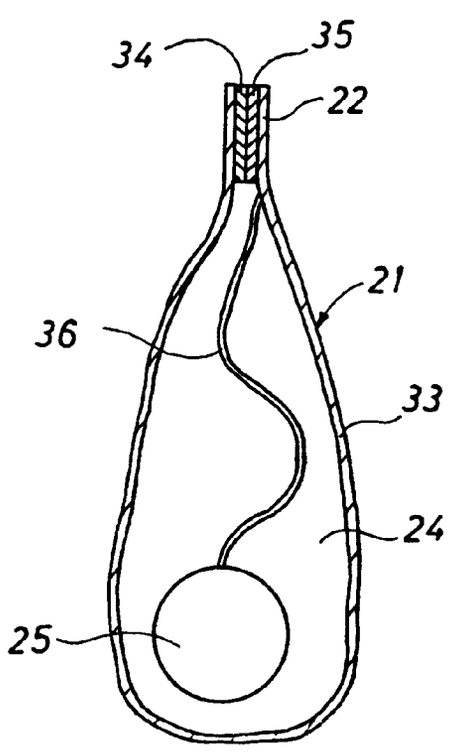

Fig.4

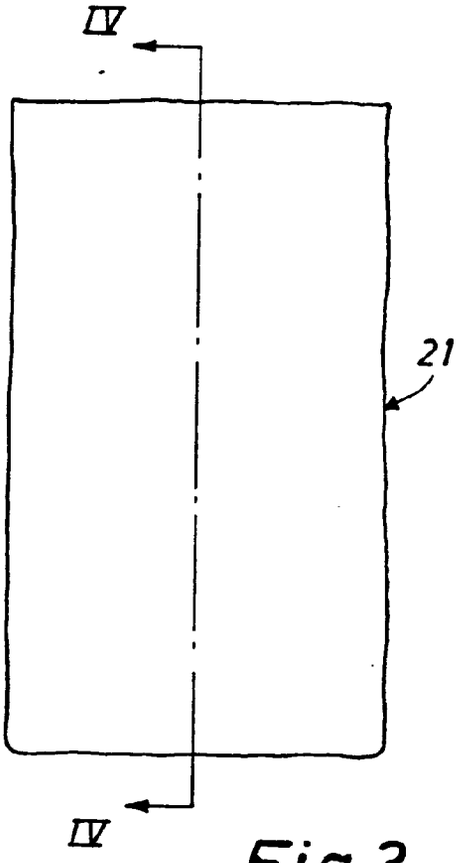

Fig.3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 61 0067

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)
A,D	EP-A-0 343 070 (THE PROCTER & GAMBLE COMPANY) * column 5, line 21 - line 34; claims; figures *	1,8,9	D06F39/02
A,D	EP-A-0 343 069 (THE PROCTER & GAMBLE COMPANY) * column 5, line 23 - line 36; claims; figures *	1,9,10	
A	US-A-3 947 971 (H. BAUER)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 NOVEMBER 1991	COURRIER G.L.A.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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