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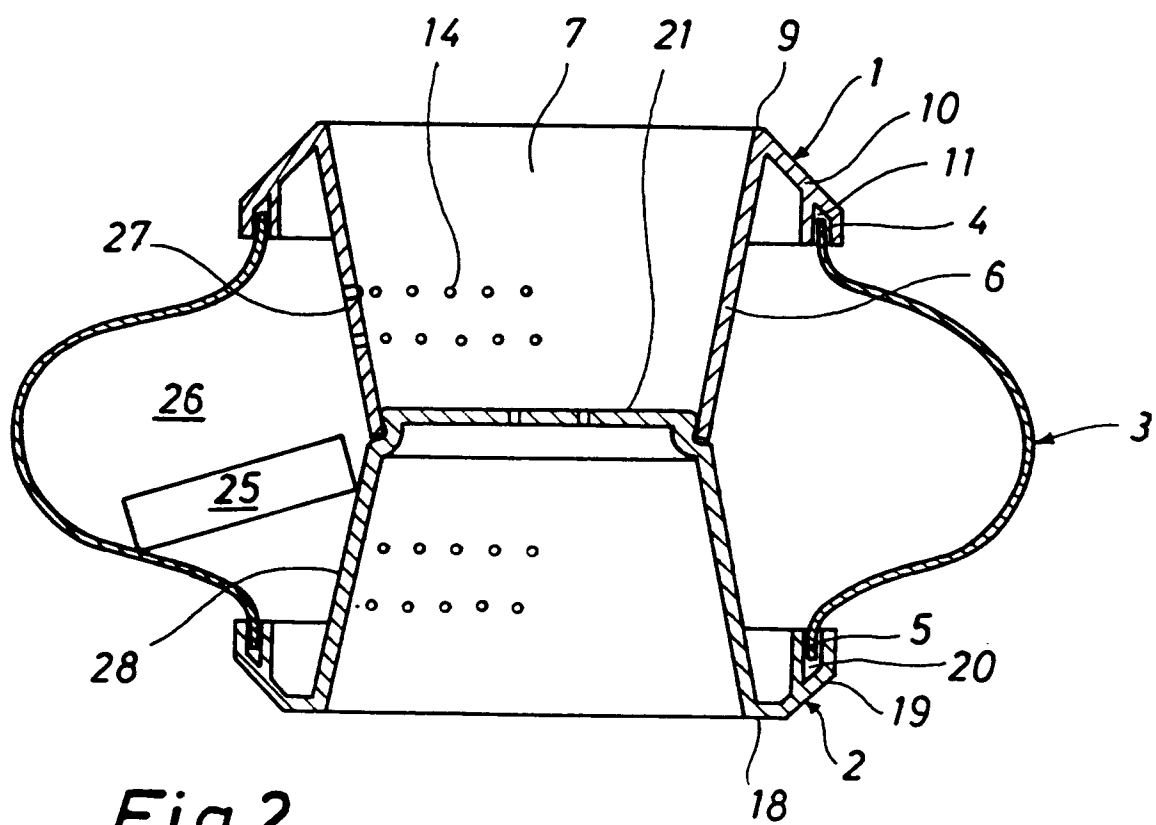
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(54) Dispensing device for dispensing a detergent when washing clothes in a washing machine by means of a solid detergent in the form of tablets.

(57) A detergent dispensing device to be used for machine washing of clothes by means of a solid detergent in the form of tablets which are inserted into the interior of the dispensing device before it is placed in the drum of the washing machine and the washing process is started, comprising a flexible fluid permeable bag (3) having a comparatively rigid mouthpiece (1), said mouthpiece defining an inlet opening (7) for the detergent. The bag (3) is further provided with a comparatively rigid closing part (2) adapted to be brought into releasable engagement with the mouthpiece (1) and having means (15, 21) for substantially closing the inlet opening (7) and that at least one of the two parts (1, 2) has means (6, 15) projecting into the bag (3) and keeping the respective adjacent portions of the bag (3) at a distance from each other when the parts (1, 2) engage each other. During use where the two parts engage each other and a detergent tablet is accommodated in the ring-shaped chamber (26) defined by the two parts (1, 2) and the flexible fluid permeable bag (3), the clothes to be washed will press the tablet against the spacer means (6, 15) with the flexible bag (3) as an intermediate layer, whereby the tablet is broken or crushed. The larger surface of the detergent provided by the crushing of the tablet causes a faster release of the detergent to the washwater.



The invention relates to a dispensing device for dispensing a detergent when washing clothes in a washing machine by means of a solid detergent in the form of tablets which are placed in the interior of the dispensing device before the latter is placed in the drum of the washing machine and the washing process is started, said dispensing device comprising a flexible fluid permeable bag having a comparatively rigid mouthpiece, defining an inlet opening for the detergent.

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

EP-A1 0343069 and EP-A1 0343070 disclose reusable receptacles for dispensing a detergent, said receptacles comprising a bag-like body having a rigid mouthpiece with an opening through which the detergent is introduced into the interior of the bag.

Using such dispensing receptacles is advantageous in that direct contact between the undissolved detergent and the clothes and thereby 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 through the drain system without being used during washing. It is furthermore an advantage that the annoying noise during the washing process generated by known dispensing receptacles made of rigid plastics is avoided.

The above European patents suggest that the solid detergent may be in the form of tablets. However, the use of detergent tablets of the type of which only one or a few tablets is used in the dispensing receptacles shown for each wash cycle will result in an unacceptably long dissolving time for the tablet or tablets, especially for fine washing, i.e. relatively short wash cycles at low temperatures. This fact should be seen in the light of the difficulties involved in manufacturing detergent tablets which have excellent transport and storage properties while at the same time being easily dissolvable.

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

The detergent dispensing device or receptacle according to the invention is characterised in that the bag has a comparatively rigid closing part adapted to be brought into releasable engagement with the mouthpiece and having means for substantially closing the inlet opening and that at least one of the two parts has means projecting into the bag and keeping

the respective adjacent portions of the bag at a distance from each other when the parts engage each other. When the mouthpiece and the closing part are disengaged, a detergent tablet is introduced into the interior of the receptacle through the inlet opening. By subsequently bringing the two parts into engagement with each other, said parts and especially at least one of their spacer means defines a chamber together with the bag, said chamber forming the interior of the receptacle and being closed in the sense that the tablet is not able to leave said chamber in its entirety. However, during the washing process the clothes press the flexible bag together thereby pressing the tablet against the spacer means whereby the tablet is broken or crushed. At the same time the spacer means exerts a certain abrasive effect on the tablet or broken off portions of the same to grind off the detergent. Therefore, the tablet is relatively quickly disintegrated and the larger free surface of the solid detergent thereby obtained causes the same to be dissolved more quickly and to leave the dispensing receptacle in dissolved condition or at least in a pulverized state.

According to the invention the closing part may have a tubular spacer means, said spacer means at its inner end being closed by means of a wall. A ring-shaped compartment is thereby formed between the tubular spacer means and the bag in the separated condition of the receptacle, the tablet being accommodated in said compartment when inserted in the receptacle and the wall at the inner end of the spacer means closes said receptacle in such a manner that a tablet inserted through the inlet opening is actually placed in the interior of the receptacle.

Furthermore, according to the invention the wall may taper from the inner end of the tubular spacer means. Because the wall tapers or inclines into the interior of the receptacle, it works as a guiding surface to guide a tablet inserted through the inlet opening into said compartment around the spacer means.

Moreover according to the invention the mouthpiece may have a tubular spacer means defining the inlet opening. In practice, said embodiment has been found to be particularly advantageous, especially in connection with a further embodiment of the invention according to which the spacer means tapers in the direction of the interior of the receptacle. As a result, the spacer means of the mouthpiece serves as a funnel to guide the tablet into the interior of the receptacle, while because of its converging or conical form the spacer means of the closing part ensures that a suitably large compartment is formed around the spacer means to accommodate the tablet in the separated condition of the receptacle.

Furthermore, according to the invention the spacer means may be provided with openings providing a connection between the interior of the receptacle and the surroundings when the two parts engage

each other. As a result, the interior of the receptacle communicates with the surroundings both through said openings and through the flexible bag, whereby a rapid renewal of the liquid in the interior of the receptacle is obtained allowing a quick dissolution of the crushed tablet therein and consequently a quick dispensing of the solid detergent to the wash water. At the same time the openings of the fluid permeable bag may have a size so as to allow minor detergent particles to leave the interior of the receptacle, thereby further increasing the dispensing rate of the detergent.

In addition, according to the invention the spacer means(s) may have a substantially convex outer form and be free from large planar outer surface areas. As a result, the end surfaces of the detergent tablet, normally having the form of a low cylinder, will not be able to be in planar surface contact with any portion of the spacer means and consequently it will quickly be crushed and pulverized.

Furthermore, according to the invention the surface of the spacer means facing towards the bag may have an uneven structure. The outer surface of the spacer means thereby has an abrasive effect on the tablet to grind off the detergent which may leave the dispensing receptacle in a pulverized or dissolved form.

Moreover, according to the invention the two parts may be adapted to engage each other by snap action, one part having a snap means at the inner end of the spacer means, said snap means being adapted to engage a complementary snap means on the other part. As a result, the two parts may be caused to engage and disengage each other in a particularly simple manner.

Finally, according to the invention the two parts may be adapted to threadedly engage each other, one part at the inner end of the spacer means having a screw thread adapted to engage a complementary screw thread on the other part.

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

Figure 1 is a side view of a first embodiment of a detergent dispensing device or receptacle according to the invention,

Figure 2 is a vertical sectional view of a first embodiment of a detergent dispensing receptacle according to the invention in a position ready for use,

Figure 3 is a vertical view of a first embodiment of a detergent dispensing receptacle according to the invention in a filling position,

Figure 4 is a vertical view of a second embodiment of a dispensing receptacle according to the invention shown in its filling position, the position ready for use being indicated by means of dotted lines,

Figure 5 is a vertical sectional view of a third

embodiment of a dispensing receptacle according to the invention, and

Figure 6 is a vertical sectional view of a fourth embodiment of a dispensing receptacle according to the invention, in a position ready for use.

The embodiment of the dispensing receptacle shown in Figures 1 to 3 comprises a mouthpiece 1, a closing part 2, adapted to be brought into releasable engagement with the mouthpiece 1, and a flexible permeable bag 3 with the form of a cylinder with a central circumferential bulge, said bag being at one end 4 firmly connected to the mouthpiece and at its second end 5 firmly connected to the closing part. The bag 3 is made of a net-like or woven material, preferably of plastics or a textile and has meshes allowing liquid and possibly small particles to pass through.

The mouthpiece 1 is a substantially ring-shaped body with a circular conical wall 6, extending convergently in the direction of the interior of the receptacle 8 and defining an inlet opening or passageway 7 for the insertion of a detergent tablet 25 into the interior of the receptacle 8 when said receptacle is in the filling position shown in Figure 3, where the two parts 1, 2 are disengaged. At an upper outer end 9 the wall 6 continues into a downwardly inclining flange 10, said flange having a downwardly open annular groove 11 near its outer periphery, wherein the upper end portion 4 of the bag is engaged and retained by suitable means, for instance by glueing, welding or mechanical locking. At its lower inner end 12 the wall is provided with a snap bead, adapted to engage a complementarily formed recess on the closing part 2. Furthermore the wall 6 is provided with a number of openings or holes 14 allowing the liquid and possibly minor detergent particles to pass through.

The closing part 2 is a substantially cup-shaped body which as shown in Figures 1 to 3, is placed bottom up and comprises a circular conical wall 15, said wall at its lower outer end in Figs 1 to 3 continues into a flange 17 comprising a planar section 18 situated closest to the wall said section serving as a support surface for the closing part and a upwardly and outwardly inclined conical section 19, said section on the top side being provided with an annular groove 20 wherein the lower end portion 5 of the bag 3 is engaged and retained by suitable means such as glueing, welding or mechanical retention. The conical wall 15 extends convergently into the interior of the receptacle 8 and has at its inner end a closing wall 21 and immediately adjacent said wall a circumferential recess 22 to engage the snap bead 13 of the mouthpiece. The conical wall 15 and the closing wall 21 are provided with a number of openings or holes 23, 24 respectively, through which liquid or possibly small detergent particles may pass.

When the detergent dispensing receptacle shown in Figures 1 to 3 is to be used, the mouthpiece 1 and the closing part 2 are disengaged, whereby the recep-

tacle will be in the filling position shown in Figure 3. One or a few detergent tablets 25 is then inserted through the inlet opening 7 of the mouthpiece 1, whereby they will fall into the ring-shaped compartment defined by the closing part 2 and the bag 3 as shown by means of the arrows in Figure 3. The mouthpiece is subsequently snapped into engagement with the closing part 2, thereby causing the detergent tablet 5 to be in a chamber 26 (see Figure 2) closed to the surroundings in the sense that the tablet cannot leave it in its entirety, but only in dissolved or pulverized form where the detergent permeated through the holes 14 and 24 of the walls 6 and 15 or the mesh openings of the bag 3. As the bag has a size so as to be able to at least substantially abut the outer surface 27, 28 of the conical wall 6, 15 of both the mouthpiece 1 and the closing part 2 when the receptacle is in a position ready for use, the clothes will press the tablet against the same with the bag as an intermediary layer, whereby the tablet 25 breaks and is successively crushed and pulverized. Because of said crushing the tablet pieces will quickly be dissolved by the water entering through the holes 14, 24 of the walls 6, 15 and the mesh openings of the bag 3 and be dispensed to the wash water.

The embodiment of the dispensing receptacle according to the invention shown in Figure 4 comprises a mouthpiece 31 with a substantially cylindrical form, a closing part 32 with substantially cylindrical cup shape and a bag 33 with a central circumferential bulge, said bag being peripherally connected to both the mouthpiece 31 and the bag 32.

The cylindrical wall 36 of the mouthpiece 31 defining an inlet opening or passageway 37 for the introduction of a detergent tablet into the interior of the receptacle 38, is provided with an outwardly facing circumferential indentation 41 near its outer end 39, said indentation having a semicircular cross section. The indentation 41 serves to retain the bag 33 to the mouthpiece 31, a portion of the upper end portion 34 of the bag being retained therein by means of an elastic band, for instance an O-ring 52. In a corresponding manner the cylindrical wall 45 of the closing part 32 has a corresponding circumferential indentation 50 near its lower end to retain the lower end portion 35 of the bag 33 thereto by means of an O-ring 52. When fastening the bag 33 to the two parts 31, 32 in this manner the bag may be replaced if necessary.

The cylindrical wall 36 of the mouthpiece 31 is provided with a number of openings 44 and its outer surface 57 is provided with a number of axial ribs. The object of said ribs is to exert an abrasive effect on a detergent tablet placed therein during the use of the receptacle to speed up the pulverization of said tablet. In stead of ribs any kind of means providing an uneven surface structure may, however, be used. Finally, the wall 36 has three short threads 48 near its lower inner end 42, of which only two are shown, said threads

being adapted to engage corresponding threads 49 formed on the outside of the outer surface 58 of the wall 45 of the closing part near the inner upper end thereof, when the two parts are brought from the filling position shown in Figure 4 to the position ready for use indicated by the dotted line. With a view to said thread-engagement, the outer wall 45 of the closing part is provided with a ledge 56 immediately below the thread parts 49, said ledge serving as an abutment surface for the lower inner end 42 of the wall 36 of the mouthpiece 31 when the two parts 31, 32 are screwed together. The wall 45 of the closing part 32 continues at its inner end into a closing wall 51 provided with openings 53. Also the wall itself 36 is provided with openings situated below the ledge 56. This portion of the wall 45 is further provided with outer axial ribs 40 serving the same purpose as the ribs 58 of the mouthpiece.

The dispensing receptacle shown in Figure 4 is used and functions in the similar manner as the dispensing receptacle shown in Figures 1 to 3.

In the embodiment of the invention shown in Figure 5 the mouthpiece 61 and the closing part 62 and their fastening to the bag 63 substantially correspond to the embodiment shown in Figures 1 to 3 and therefore only the difference between them will be discussed in greater detail.

The closing wall 81 of the closing part 62 extends conically in the direction of the interior of the receptacle 68, whereby a tablet hitting said wall is automatically guided into the compartment between the conical wall 75 of the closing part 68 and the bag 63. Adjacent the transition between the conical wall 75 and the conically closing wall 81 a hinge member 91 is formed on the latter, said hinge member together with a corresponding hinge member 92 formed at the lower end of the conical wall of the mouthpiece 61 and a pivot 93 extending through the two hinge members 91, 92, providing a hinged connection between the two parts 61, 62. Diametrically opposite this hinged connection a short snap bead 73 is formed on the inside of the conical wall 66 of the mouthpiece 61, said snap bead being adapted to releasably engage a complementary formed recess 82 formed on the conical wall 75 of the closing part 62 diametrically opposite the hinged connection. As a result, by mutually turning about the hinged connection the parts 61, 62 may be brought into a position ready for use (not shown) wherein they are held together by means of the snap engagement of the bead 73 with the recess 82.

Even though this is not shown, holes or openings may be formed in both the conical walls 66, 75 and in the closing wall 81 in the same manner as in the above embodiments. Moreover, the embodiment of the dispensing device shown in Figure 5 is used and functions in the same manner as in the embodiments described above.

The fourth embodiment of a dispensing device according to the embodiment shown in Figure 6 also comprises a mouthpiece 101, a closing part 102 adapted to releasably engage the mouthpiece 101 and a flexible fluid permeable bag 103.

The mouthpiece 1 is a substantially cylindrical body with a circular wall 106 provided with a large number of evenly distributed perforations 114, and defining an inlet opening 107 for insertion of a detergent tablet into the interior of the receptacle. At its upper end the wall 106 continues into a flange 110, said flange at its outer periphery having a downwardly open annular groove 111, wherein the upper end portion of the bag 103 is retained. At its lower end 112 the wall 106 is provided with an engagement portion adapted to releasably engage a complementary formed engagement portion of the closing part 102.

The closing part 102 is substantially of the form of a low cup placed bottom up and comprises a circular cylindrical wall 115, said wall 115 at the lower outer end 116 in Figure 6 continuing into a flange 117, said flange at its outer periphery having an upwardly open annular groove 120 wherein the lower end portion of the bag 103 is retained. At its inner end the cylindrical wall 115 is provided with a convex closing wall 121 and immediately adjacent said wall a circumferential engagement portion 122 adapted to releasably engage the engagement portion 113 of the mouthpiece 1.

The dispensing device shown in Figure 6 is used and functions in the same manner as stated for the dispensing device shown in Figures. 1 to 3.

The mouthpiece, the closing part and the flexible bag are made of a material durable up to at least 100°C and preferably the mouthpiece and the closing part are made by means of injection moulding of impact resistant plastics.

Claims

1. Dispensing device for dispensing a detergent when washing clothes in a washing machine by means of a solid detergent in the form of tablets which are placed in the interior of the dispensing device before the latter is placed in the drum of the washing machine and the washing process is started, said dispensing device comprising a flexible fluid permeable bag (3, 33, 63, 103) having a comparatively rigid mouthpiece (1, 31, 61, 101) defining an inlet opening (7, 37, 107), characterised in that the bag (3, 33, 63, 103) further has a comparatively rigid closing part (2, 32, 62, 102), adapted to be brought into releasable engagement with the mouthpiece (1, 31, 61, 101) and having means (15, 45, 75; 115, 21, 51, 81, 121) for substantially closing the inlet opening (7, 37, 107) and that at least one of the two parts (1, 31,

61; 101, 2, 32, 62, 102) has means (6, 36, 66; 106, 15, 45, 75, 115) projecting into the bag (1, 31, 61, 101) and keeping the respective adjacent portions of the bag at a distance from each other when the parts engage each other.

2. Device as claimed in claim 1, characterised by the closing part (2, 32, 62, 102) having a tubular spacer means (15, 45, 75, 115), being closed at its inner end by means of a wall (21, 51, 81, 121).

3. Device as claimed in claim 2, characterised by the wall (81, 121) extending convergingly inward from the inner end of the tubular spacer means (75, 115).

4. Device as claimed in claim 1, characterised in that the mouthpiece (1, 31, 61, 101) has a tubular spacer means (6, 36, 66, 106), defining the inlet opening (7, 37, 107).

5. Device as claimed in claim 2 or 4, characterised in that the spacer means tapers in the direction of the interior of the device.

6. Device as claimed in one or more of the preceding claims, characterised in that the spacer means (6, 36, 66; 106, 15, 45, 75) is provided with openings (23, 24; 53, 54), providing a connection between the interior of the device and the surroundings when the two members parts each other.

7. Device as claimed in one or more of the preceding claims, characterised in that the spacer means (6, 36, 66, 106; 15, 45, 75) has a substantially convex outer form and is free from planar outer surface areas.

8. Device as claimed in one or more of the preceding claims, characterised in that the surface of the spacer means (36, 45) facing towards the bag (33) has an uneven structure.

9. Device as claimed in claim 1, characterised in that the two parts (1, 61, 2, 62) are adapted to engage one another by snap action, one part (1, 61) having a snap means at the inner end of the spacer means (6, 66), said snap means being adapted to engage a complementary snap means (22, 82) on the other part (2, 62).

10. Device as claimed in claim 1, characterised in that the two parts (31, 32) are adapted to threadingly engage one another, one part (31) at the inner end of the spacer means (48) having a screw thread (49), adapted to engage a complementary screw thread on the other part (32).

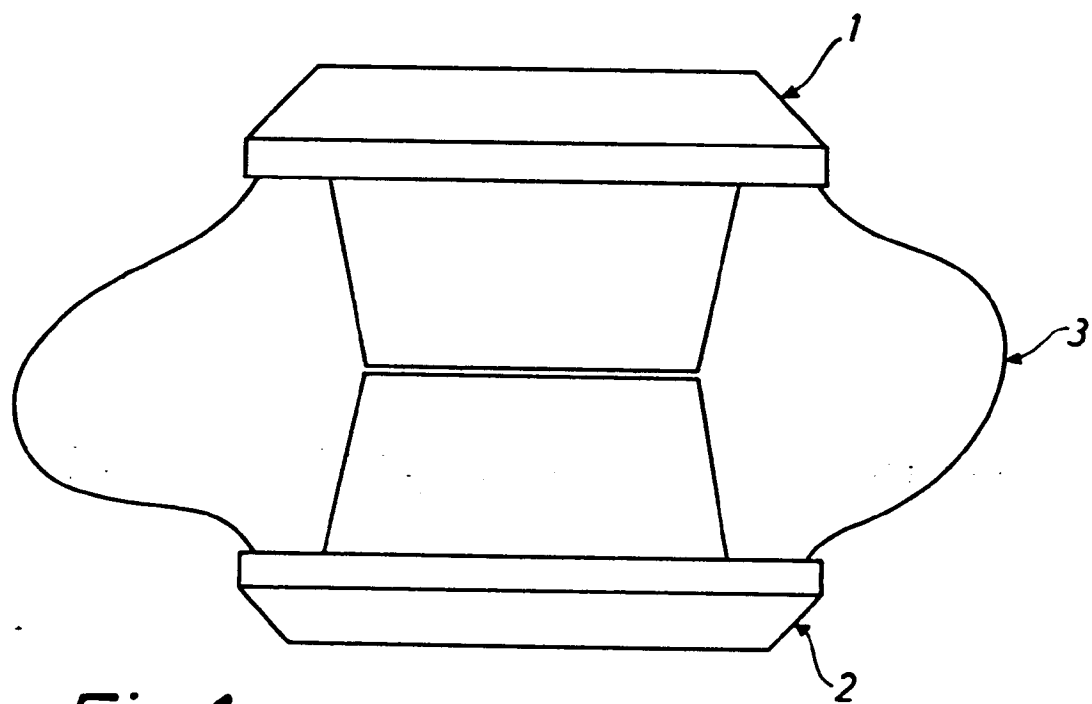


Fig.1

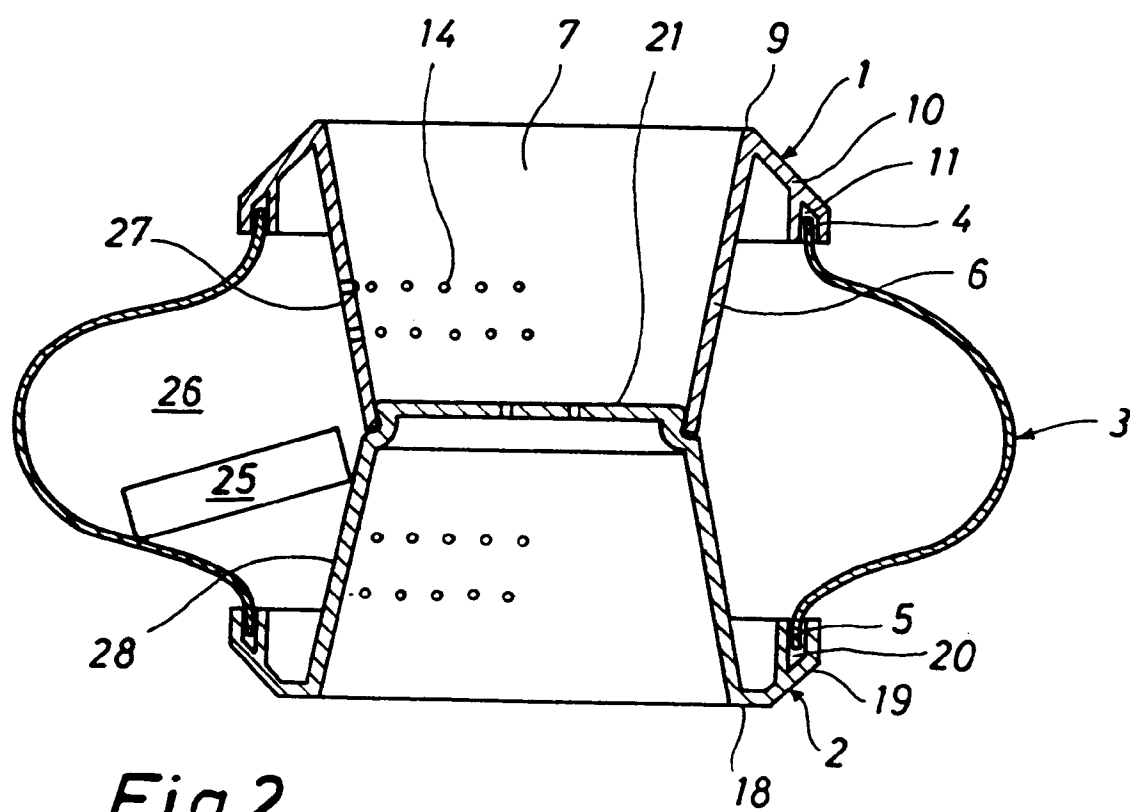


Fig.2

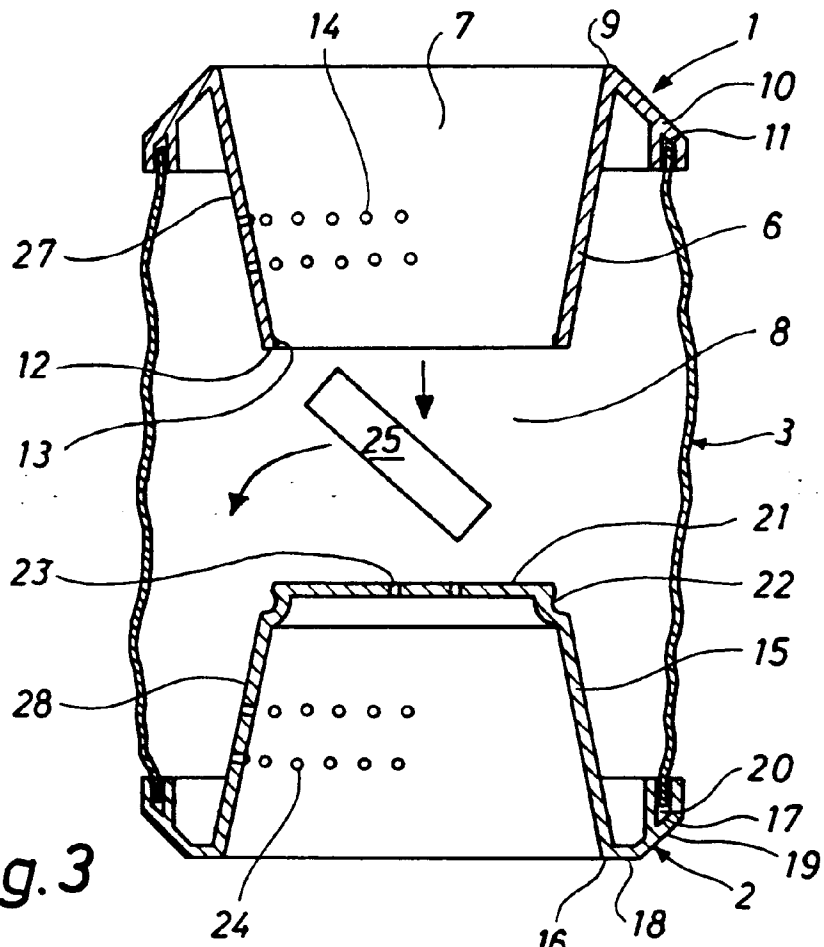


Fig. 3

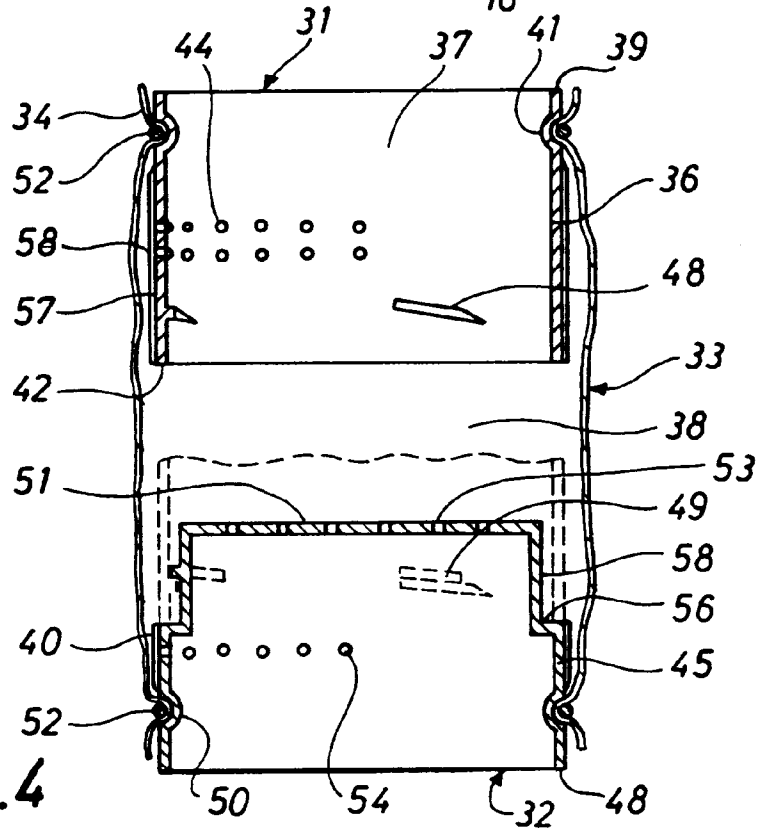


Fig. 4

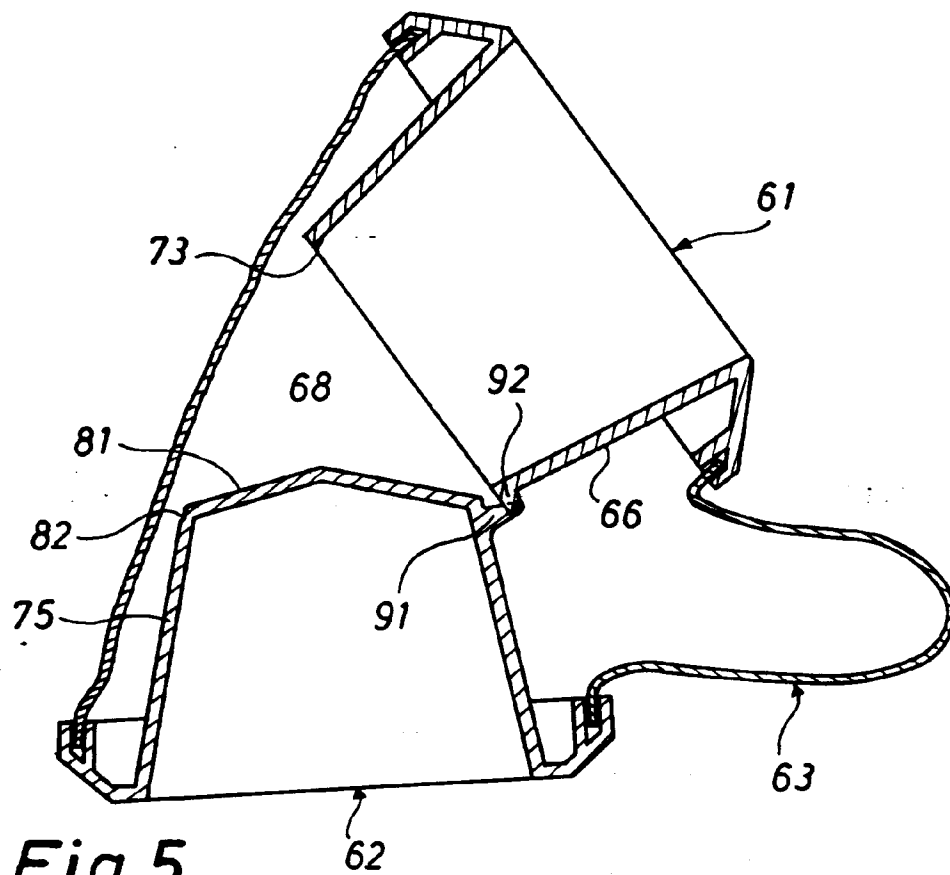


Fig. 5

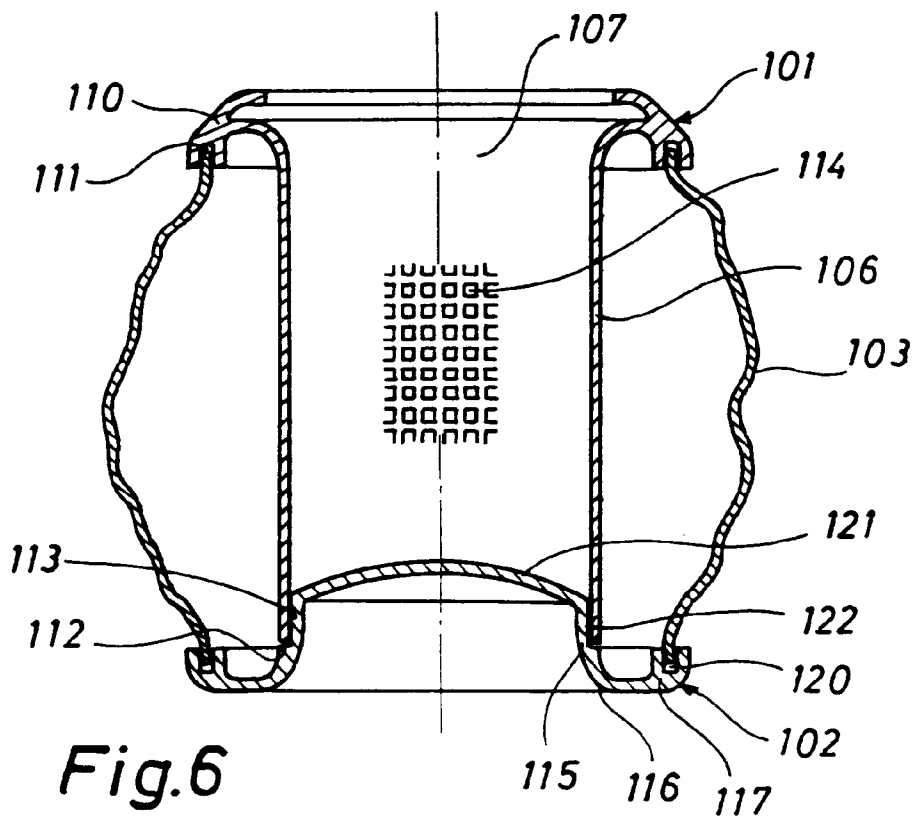


Fig. 6



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 61 0085

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	D06F39/02
A,D	EP-A-0 343 069 (THE PROCTER & GAMBLE COMPANY) * column 5, line 23 - line 36; claims; figures * ---	1	
A	DE-U-8 801 528 (ROBERT FINKE KG) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			D06F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 NOVEMBER 1991	Examiner COURRIER G. L. A.
CATEGORY OF CITED DOCUMENTS 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 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			

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