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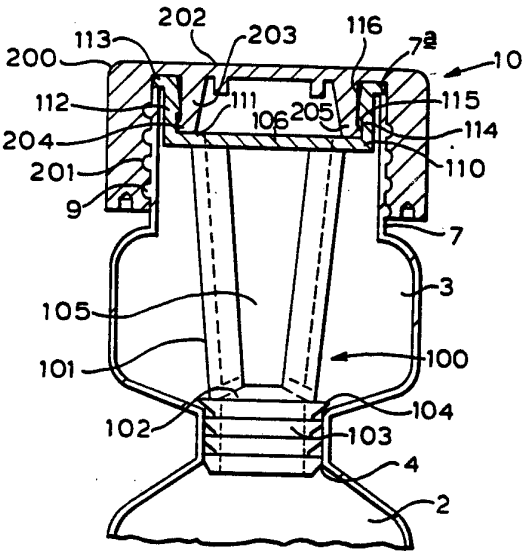
(54) Title: MIXING CONTAINER

(57) Abstract

A mixing container (1) comprises first (2) and second (3) chambers communicating through passageway (4), provided with a releasable closure means (13, 14, 15, 100), and a closable filling neck (7) extending from one said chamber (3), whereby liquids may be transported in the individual chambers and mixed when required by releasing said closure means from said passageway. In a preferred embodiment the releasable closure means (100) comprises a hollow tubular body (101) having at one end (102) a plug means (103) for fluid tight engagement in said passageway (4) and including slots (105) in the wall thereof to provide communication between the inside of the tubular body (101) and the one said chamber (3). The other end of the tubular body (101) comprises a cup-shaped portion (110) receivable in the filling neck (7) for fluid tight engagement therein under the influence of a cap member (200) releasably securable to the neck (7) to sealing close the cup portion (110), said cap member (200) being engageable with said cup (110) portion such that on removal of the cap (202) from the neck (7) the plug (103) is withdrawn from the said passageway (4).



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MIXING CONTAINER

The present invention relates to a mixing container consisting of first and second chambers joined by a communicating passageway and in which means are provided to releasably close the passageway between the chambers whereby flowable materials, such as liquids, may be transported in the individual chambers and mixed when required.

Accordingly the invention provides a container comprising a first chamber to receive a first flowable material, a second chamber communicating with the said first chamber through a passageway to receive a second flowable material, releasable closure means for said passageway and closable means for filling the said first and second chambers, whereby flowable materials may be retained separately in the said chambers and allowed to mix only by release of the said closure means to allow flowable material in one said chamber to pass through the passageway into the other said chamber.

In one embodiment the means for filling said chambers is a neck extending from said first chamber closable by a member forming the said releasable closure means for said passageway. Said member may

comprise a hollow tubular body having an upper open end integral with means releasably securable to said neck and closable by a stopper means and a closed lower end including plug means for location in said passageway when said integral means is secured to said neck, whereby said passageway can be sealed against egress of material between said chambers, said passageway being opened on release or partial release of said releasably securable means from said neck.

In another embodiment the means is a neck extending from said first chamber closable by releasable cap means and the releasable closure for said passageway comprises a member extending through the said neck to the said passageway. The said member may be in the form of a hollow tubular body the lower end of which is closed and provided with plug means for insertion into the said passageway to seal the passageway against egress of flowable material between the chambers. The upper end of the body may comprise a cup-like member having an orifice communicating with the hollow interior thereof and means to provide a fluid tight seal between the upper edge thereof and the top of the neck extending from the first said chamber. The cap member is releasably securable to the said neck and acts to sealingly close the top of the cup portion and is engageable therein in such manner that

on removal of the cap from the neck the plug means is withdrawn from the said passageway.

In both embodiments the hollow tubular member includes at least one orifice, which may be in the form of a slot, in the wall thereof to provide communication between the said first chamber and the inside of the member.

The flowable material may be liquid or powder.

Embodiments of the invention will now be described with reference to the accompanying drawings in which:-

Figure 1 is a diagrammatic representation of a section through a container of the present invention in which the passageway between the chambers is closed, and,

Figure 2 is a diagrammatic representation of the container of Figure 1 with the passageway between the chambers open.

Figure 3 is a cross-sectional representation of a second form of a plug/cap illustrated in Figure 1 along A-A of Figure 1.

Figure 4 is a cross-sectional representation of a further form of a plug/cap illustrated in Figure 1 along A-A of Figure 1.

Referring to Figures 1 and 2 of the drawings, the container comprises a blow moulded high density polyethylene body 1 providing a first upper chamber 3 and

a second smaller lower chamber 2 located to one side of the body 1 and communicating with chamber 3 through a circular passageway 4. A hollow handle 5 extends from the top of chamber 2 on the side opposite to chamber 3 and curves towards chamber 2 to which it is joined by a strengthening web 6 extending between chambers 2 and 3. A neck 7 externally threaded at 9, extends from an opening 8 formed in the top of chamber 3. A cap/plug member generally indicated at 10 screw-threadedly engages neck 7.

Cap/plug 10 comprises an outer cap portion 11 internally threaded at 12 for engagement with threads 9 of neck 7. A hollow tubular portion 13 extends, when cap 11 is screwed down onto neck 7 (Figure 1), downwardly from the top of cap 11 through neck 7 and chamber 3 into passageway 4. Tubular member 13 is closed at its lower end 14 and includes resilient outwardly extending chevron ribs 15 that make a liquid-tight seal with the walls of passageway 4. The upper end 16 of tubular member 13 is open and a closure member 17 is provided to close said open end preferably non-releasably. Four orifices 18 are formed in the lower end 14 of tube 4 to provide communication between chamber 3 and the inside of tubular member 13 and four orifices 19 are formed towards the upper end of tubular member 13 adjacent neck 7 also

providing communication between the inside of tubular member 13 and chamber 3.

In use the cap/plug member 10 is removed from the container and chamber 2 filled, through chamber 3 and passageway 4, with a first liquid to the required level. Tubular member 13 of cap/plug 10 is inserted through neck 7 and the cap 11 screwed fully down to provide a liquid-tight seal at the top of neck 7, chevron ribs 15 providing a liquid-tight seal in passageway 4. A second liquid is then poured into tubular portion 13 whence it flows out through orifices 18 into chamber 3. Closure member 17 is then inserted to permanently close the upper end of tubular member 13. The container is now in the condition shown in Figure 1 and can be transported without the liquids in chambers 2 and 3 mixing.

When it is desired to mix the liquids from chambers 2 and 3 cap 11 is partially unscrewed from neck 7 thereby raising the lower end of tubular member 13 into chamber 3 and permitting the liquid therein to flow through passageway 4 into chamber 2 and into contact with the liquid contained therein. Cap 11 may then be screwed back down onto neck 7 and the container shaken to thoroughly mix the two liquids.

The mixed liquids are dispensed from the container by removing cap/plug member 10 and pouring out through neck 7.

An alternative form of cap/plug member 10 is illustrated in Figure 3. In this arrangement the tubular member 13 includes four longitudinally directed slots 20 to allow chamber 3 to be filled with liquid. The lower end 14 of tubular member 13 contains an upwardly directed orifice 21 shaped to receive the stem 22 of a bung 23 having chevrons 24 which act to close passageway 24 when cap 11 is fully secured down. Stem 22 includes an upper portion 25 that is a snap fit through orifice 21 to enable the bung 23 to be moved upwardly and downwardly by member 13. Member 13 is rotatable about stem 23 with the result that the bung 23 is pushed or pulled into or out of passageway 4 and is not subjected to a "turning" motion as is the plug portion (15) of the arrangement shown in Figures I and II.

A further form of cap/plug member 10 is illustrated in Figure 4, in which the plug and cap portions are discrete elements and are not integral as in the arrangements described with reference to Figures 1-3.

Plug 100 comprises a hollow frusto-conical portion 101 extending downwardly from a cup-shaped portion 110 and is closed at its lower end 102 by a bung portion 103

having resiliently outwardly directed chevrons 104 that make a liquid tight seal with the walls of passageway 4 when inserted therein (as illustrated). Portion 101 includes four longitudinally extending passageways 105 communicating with cup portion 110 through orifice 106 formed in the base 111 thereof. Cup portion 110 includes walls 112 extending upwardly from base 111 and having a flange 113 extending outwardly from the top, the lower face of flange 113 engaging the top edge 7A of neck 7.

A recess 114 is contained within the inner side of wall 112 and is defined by base 111 and inwardly directed annular shoulder 115, the upper inner side 116 of wall 112 above shoulder 115 being outwardly flared.

The overall length of plug 100 is dimensioned such that flange 113 engages edge 7A of neck 7 when chevrons 104 of bung 103 are sealingly engaged in passageway 4.

Cap 200 is internally threaded at 202 for engagement with threads 9 of neck 7. Outwardly flared annulus 203 extends downwardly from the inner top portion 202 into cup portion 110 and include an outwardly directed flange 204 extending from end 205 for engagmement in recess 114 of cup 110. The positioning and dimensioning of annulus 203 and flange 204 is such that with flange 204 engaging in recess 114 the lower face of flange 204 engages the base 111 of cup 110 and

the top surface of flange 113 of cup portion 110 engages the underside of top portion 202 of cap 200 to provide a fluid-tight seal therebetween when cap 200 is screwed down onto neck 7.

In use, a first liquid is introduced into chamber 2 via chamber 3 and passageway 4. Plug 100 is then inserted through neck 7 and bung 103 engaged in passageway 4 in order that chevrons 104 provide a fluid-tight seal, the underside of flange 113 engaging the top edge 7A of neck 7. A second liquid is then introduced into cup member 110 to enter chamber 3 via elongate slots 105 in the walls of tubular member 101. Cap member 200 is then screwed down onto neck 7, annular member 203 and flange 115 being forced inwardly by inwardly flared walls 116 of cap 110 until the flange member 204 clips into the recess 114 contained in walls 112 of cap 110. Cap 200 is screwed down sufficiently firmly to ensure a fluid tight seal between the top 7A of neck 7, flange 113 of cup 110 and the underside of top 202 of neck 200.

When it is desired to mix the liquids from chambers 2 and 3, cap 200 is partially unscrewed from neck 7 thereby raising tubular member 101 and bung 103 to allow liquid from chamber 3 to pass into chamber 2 and to be mixed with the liquid contained thereon. Cap 200 may

then be screwed back down onto neck 7 and the container shaken to thoroughly mix the two liquids.

The mixed liquids are dispensed from the container by removal of cap 200 together with plug 100 and pouring out through neck 7.

Although the container of the present invention has been described as being blow-moulded from high density polyethylene other materials and methods of manufacture may be used.

CLAIMS

1. A container comprising; first and second chambers communicating through a closable passageway, releasable closure means for said passageway, and filling means for said chambers provided with closure means, whereby a first flowable material may be introduced into one said chamber through said filling means and via said passageway and contained therein by the application of said releasable closure means, and a second flowable material may be introduced into the other said chamber through said filling means and contained therein by said closure means, the flowable materials being allowed to mix only by release of said releasable closure means from said passageway to allow material to flow through the said passageway from one chamber into the other chamber.

2. A container according to claim 1 wherein said filling means comprises a neck extending from one said chamber and said releasable closure means and said means to close said filling means comprise a single member securable to said neck, said member including a hollow tubular body having at its upper end an opening closable by a stopper means, said upper end being integral with means releasably securable to said neck, the lower end of

said tubular body being closed and providing plug means for fluid tight engagement in said passageway whereby said passageway can be sealed against egress of material between said chambers, said passageway being opened on release, or partial release, of said releasable securing means from said neck.

3. A container according to claim 2 wherein the said stopper means non-releasably engages the open upper end of said tubular body.

4. A container according to claim 1 wherein said filling means comprises a neck extending from one said chamber; said releasable closure means comprises a hollow body having an upper cup-shaped portion receivable in said neck, said portion including flange means extending outwardly therefrom to sealingly engage the upper edge of said neck and an annular recess formed within the wall thereof and a hollow tubular member depending downwardly from said portion and having a closed lower end provided with a plug means for fluid tight engagement in said passageway to seal said passageway against egress of material between the said chambers; said closure means for said filling means comprising a cap member releasably securable to the said neck and acting to sealingly close the top of the said cup portion of said releasable closure

means for said passageway and being engageable therewith in such manner that on removal of the cap from the neck the plug means is withdrawn from the said passageway.

5. A container according to claim 4 wherein said cup-shaped member includes an annular recess and said cap member includes a downwardly extending annular member including an annular flange for clip-fit engagement in said annular recess in said cup-shaped member.

6. A container according to claim 4 or claim 5 wherein the cup-shaped portion flange means extends over the upper edge of said neck and is brought in sealing engagement therewith by securing said cap member to said neck.

7. A container according to any one of claims 1-6 wherein said plug means of said hollow tubular body comprises resilient outwardly directed chevron rib elements.

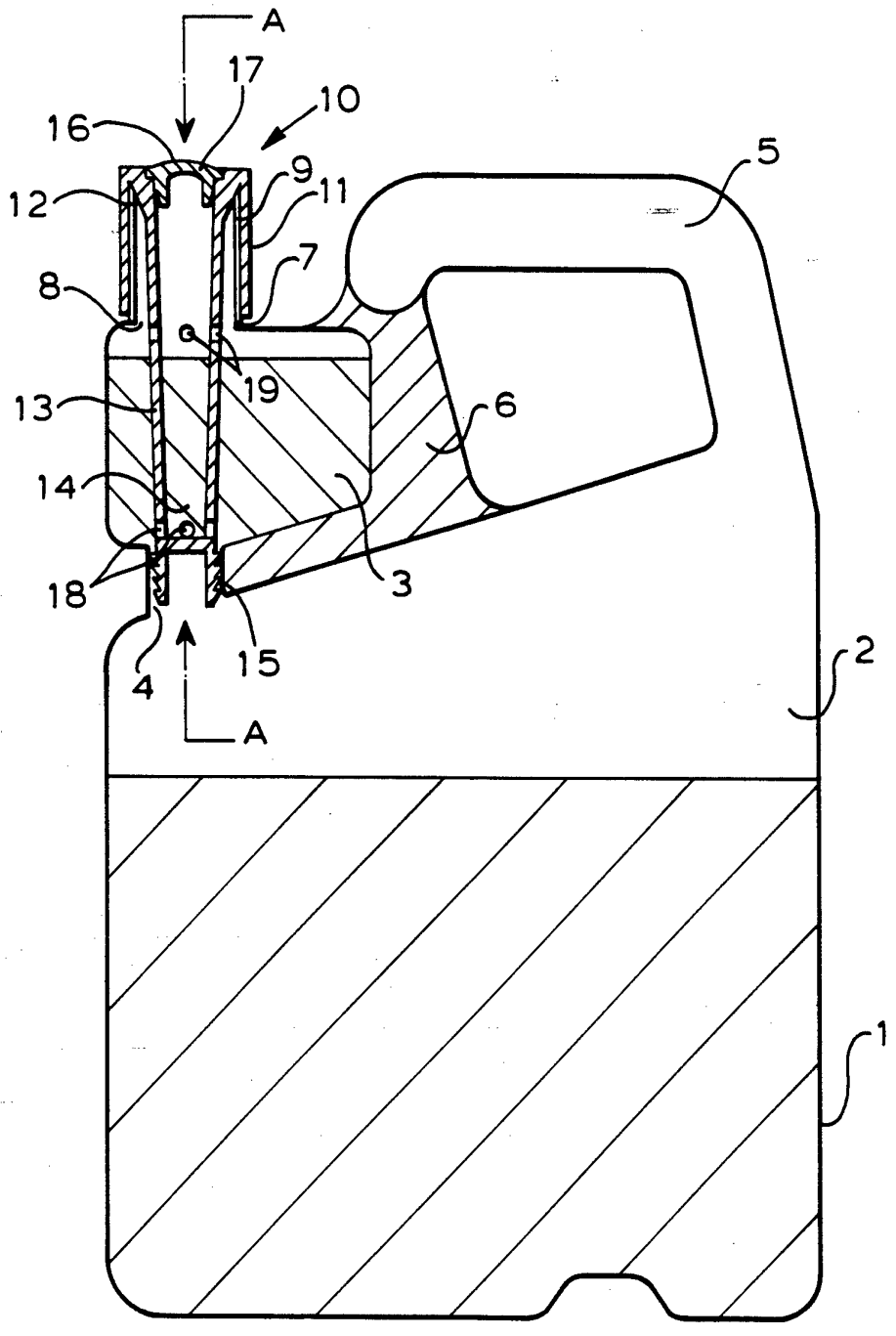
8. A container according to any one of claims 2-7 wherein said hollow tubular member includes at least one orifice in the wall thereof to provide communication between said first chamber and the inside of said member.

9. A container according to claim 8 wherein said orifice is in the form of a longitudinal slot.

10. A container as herein described with reference to Figures 1 and 2 of the drawings.

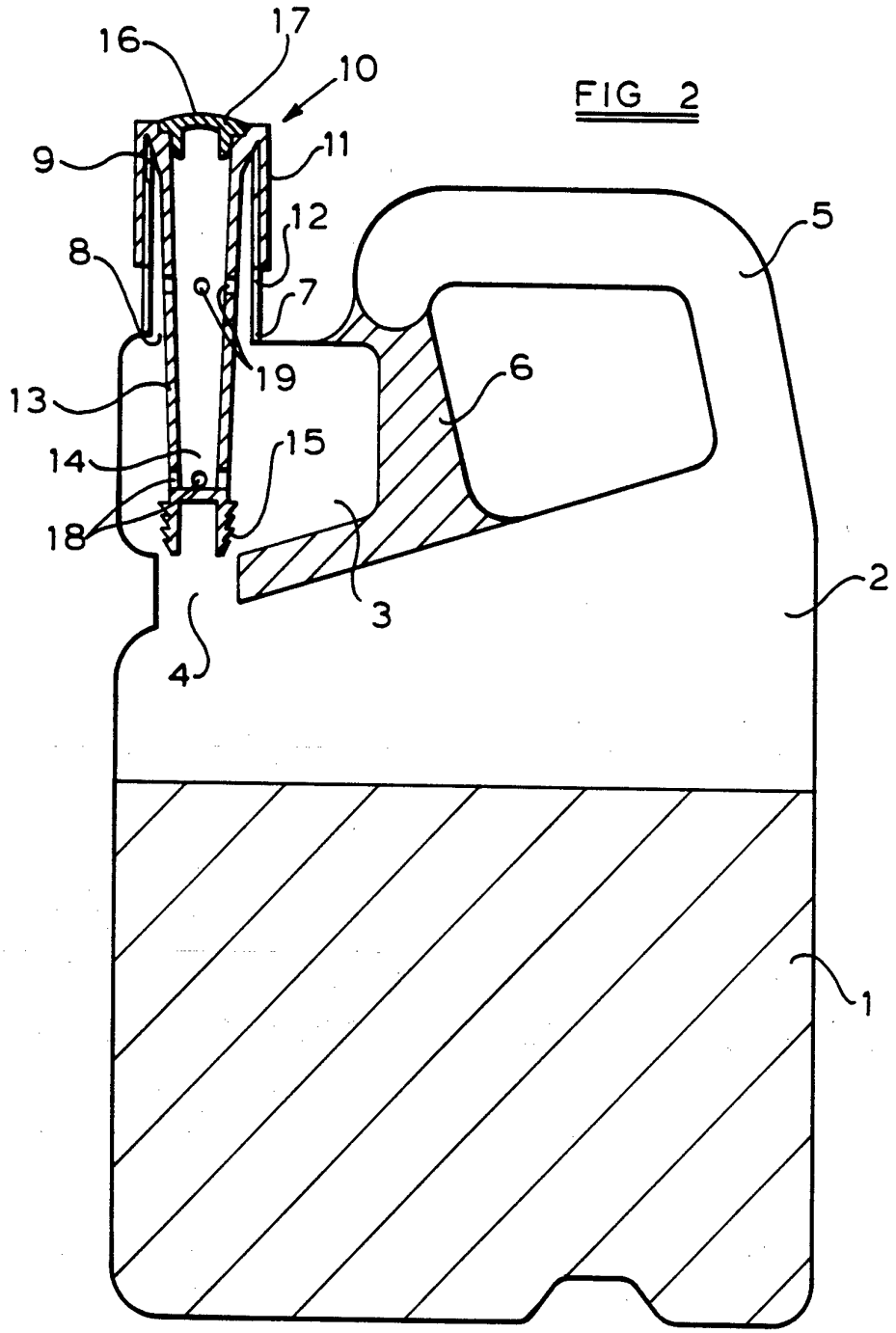
11. A container as herein described and including the releasable closure member/closing means as described with reference to Figure 3 or Figure 4 of the drawings.

FIG 1



SUBSTITUTE SHEET

FIG 2



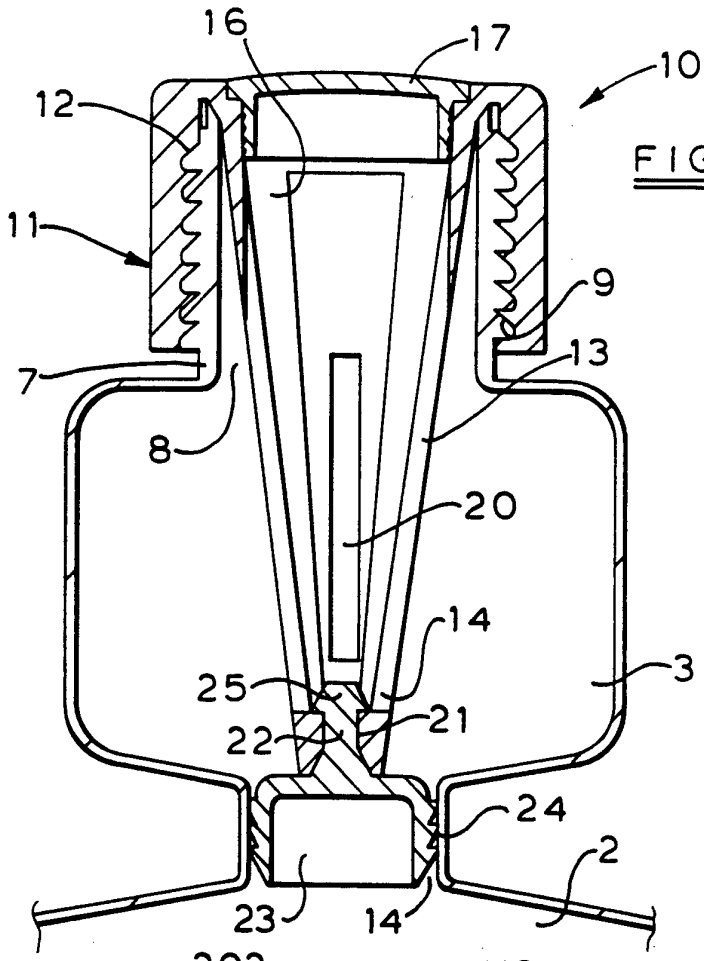

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FIG 3

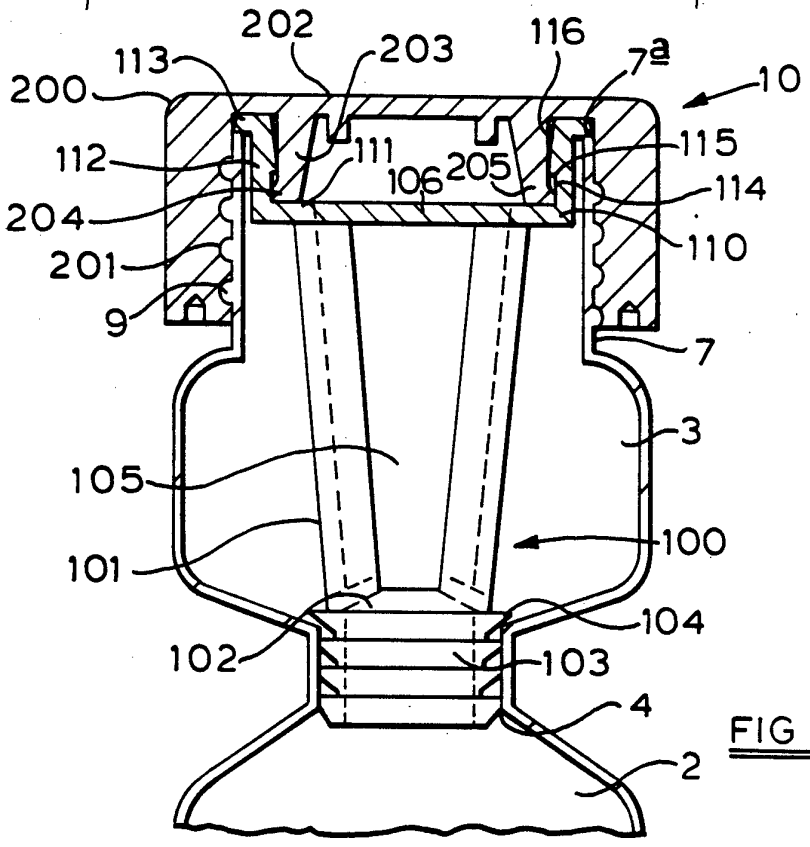
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FIG 4

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 93/01275

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 B65D25/08

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	B65D

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
X A	FR,A,1 364 111 (VERIGOUD) 11 May 1964 see the whole document	1,2,8, 10,11 3-6
X A	US,A,5 088 627 (MUSEL) 18 February 1992 see column 3, line 48 - column 5, line 35; figures 1-4	1,2,7-11 3
A	US,A,3 651 990 (CERNEI) 28 March 1972 see column 2, line 50 - line 61; figures	3

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
22 SEPTEMBER 1993	- 8. 10. 93
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	NEWELL P.G.

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. GB 9301275 SA 75335

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FR-A-1364111		None	
US-A-5088627	18-02-92	None	
US-A-3651990	28-03-72	None	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82