



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) **EP 0 909 718 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**21.04.1999 Bulletin 1999/16**

(51) Int. Cl.<sup>6</sup>: **B65D 47/24**

(21) Application number: **98101168.7**

(22) Date of filing: **23.01.1998**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC  
NL PT SE**  
Designated Extension States:  
**AL LT LV MK RO SI**

(30) Priority: **14.10.1997 IT PD970225**

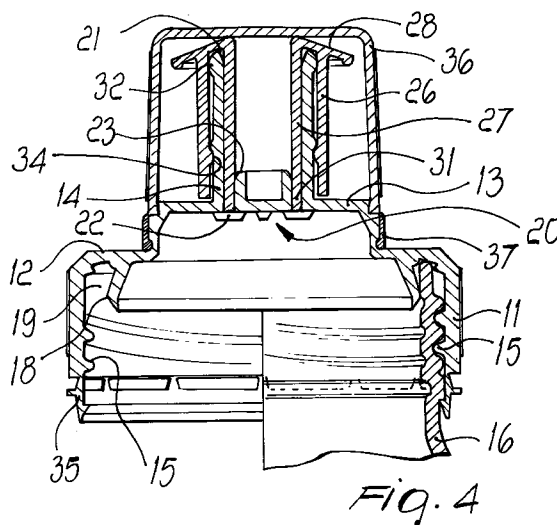
(71) Applicant:  
**ACQUA MINERALE SAN BENEDETTO S.p.A.  
I-30037 Scorze' (Prov. of Venezia) (IT)**

(72) Inventor: **De Polo, Giuliano  
31015 Conegliano (Prov. of Treviso) (IT)**

(74) Representative:  
**Modiano, Guido, Dr.-Ing. et al  
Modiano & Associati SpA  
Via Meravigli, 16  
20123 Milano (IT)**

(54) **Aseptic cap for containers of liquids**

(57) An aseptic cap for containers of liquids comprising a main body (11) shaped like a threaded ring, meant to be associated with the neck (16) of a container, from which a tubular extension (14) protrudes and is coupled to an upper cap (25). Radial bridges (22) protrude from the inside wall of the extension (14) proximate to the main body (11) to support an internal element (23) so as to form, with the element, axial passage channels for a liquid contained in the container. The upper cap (25) has a tubular structure and is provided with an internal obturator (27) for closing the passage channels. The upper cap (25) can slide axially along the extension (14) from a lowered position, closing the channels owing to a sealing action of the obturator (27) between the inside wall of the extension (14) and the outside wall of the element (23), to a raised position for opening the channels for the passage of the liquid.



EP 0 909 718 A1

## Description

[0001] The present invention relates to an aseptic cap for containers of liquids, particularly beverages.

[0002] The need is strongly felt to equip some beverage containers with aseptic caps which allow to draw part of the contents and subsequently ensure an adequate seal when closed again.

[0003] This is the case, for example, of containers for sodium replenishment beverages, i.e., beverages that are rich in mineral salts and are widely used and appreciated by people who practice sports and need to replenish the substances lost through perspiration.

[0004] In particular, the user must not be forced to drink all at once, but the cap, after being opened, must be closeable again so that the beverage can be preserved and consumed within a short time without altering its characteristics.

[0005] Containers are usually constituted by a bottle-shaped body having a neck and an opening through which the beverage is automatically introduced during packaging; a cap for aseptic closure is subsequently fixed.

[0006] These caps are currently constituted by a main body, shaped like a threaded ring, which must be screwed onto the neck of the container and from which a tubular extension protrudes axially.

[0007] Said extension is coupled to an upper cap which is also tubular and can slide externally along the extension.

[0008] The upper cap is shaped complementarily to the extension and has a flat wall wherein a central hole is provided and through which the beverage can flow out.

[0009] Radial bridges protrude from the inside walls of the extension, proximate to its upper end, and support an inner element which is coaxial to the extension and whose dimensions conveniently correspond to those of the hole formed on the upper cap and are such that no play occurs.

[0010] In this manner, the aseptic cap is closed perfectly when the upper cap, which can slide along the extension, is lowered fully and the hole formed in the wall is closed hermetically by the element located inside the extension.

[0011] In order to make the beverage flow out of the container, it is instead sufficient to slide the upper cap upward so as to release the internal element, disengaging it from the edges of the hole.

[0012] After lifting the upper cap, the user can drink directly by bringing the upper cap to his mouth.

[0013] The main body of the cap is usually screwed onto the neck of the container, and in order to ensure the integrity of the package the body can be disengaged from the neck only after breaking a conventional tearaway ring inserted so as to wrap around the neck of the container.

[0014] The upper cap is also provided with a hood-like

covering element which covers it in order to protect the region that is placed in the user's mouth.

[0015] The described cap performs its task effectively, but unfortunately it entails the drawback that it makes sterilization difficult.

[0016] According to statutory provisions, the beverage must in fact be stored in a fully sterilized environment and for this purpose the inside of the cap must be sterilized before it is screwed onto the neck of the container.

[0017] This sterilization is usually performed by spraying sanitizing liquid, which however, owing to the presence of the radial bridges and of the internal disk that protrude monolithically from the upper end of the extension, is never able to reach all the internal points of the cap.

[0018] This drawback has been remedied so far by separating the liquid, which must be confined exclusively inside the container, from the cap by providing on the opening of the neck a disk made of mated paper and aluminum sheets which acted as a diaphragm which was fixed for example along the edges by gluing.

[0019] In this manner, the liquid remains inside the container and cannot access the internal region of the cap unless the paper-aluminum disk is removed after breaking the tearaway ring and unscrewing the main body of the cap.

[0020] This operation is in any case awkward for the user.

[0021] The aim of the present invention is to provide an aseptic cap for liquid containers which solves all the drawbacks noted above in conventional types.

[0022] A consequent primary object of the present invention is to provide a cap which can be easily sterilized internally with sanitizing liquid according to conventional methods.

[0023] Another object of the present invention is to provide a cap for containers which allows repeated opening and closing operations.

[0024] Another object of the present invention is to provide an aseptic cap for containers which can be manufactured with a very simple structure.

[0025] Another object of the present invention is to provide an aseptic cap which does not require the use of paper-aluminum disks.

[0026] Another object of the present invention is to provide a cap for containers which ensures good durability and resistance over time in accordance with the requirements of the user.

[0027] Another object of the present invention is to provide an aseptic cap for containers which can give assurance to the user, at the time of purchase, as to the integrity of the container so that it is certain that the package has never been opened before.

[0028] Another object of the present invention is to provide an aseptic cap for containers which can be manufactured at a cost which is comparable to that of conventional caps.

[0029] This aim, these objects and others which will

become apparent hereinafter are achieved by an aseptic cap for liquid containers comprising a main body shaped like a threaded ring, meant to be associated with the neck of said container, from which a tubular extension protrudes, said extension being coupled to an upper cap, said aseptic cap being characterized in that radial bridges protrude from an inside wall of said extension proximate to the main body to support an internal element so as to form, with said element, axial passage channels for a liquid contained in said container, said upper cap having a tubular structure, being provided with an internal obturator for closing said passage channels, and being able to slide axially along said extension from a lowered position, closing said channels owing to a sealing action of said obturator between the inside wall of said extension and the outside wall of said element, to a raised position for opening said channels for the passage of the liquid.

**[0030]** Further characteristics and advantages of the present invention will become apparent hereinafter from the following detailed description of a preferred embodiment, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a side view of an aseptic cap for liquid containers according to the present invention in its active configuration;

figure 2 is a perspective view of the aseptic cap shown in figure 1 during closure;

figure 3 is a perspective view of the cap of figure 1 during opening;

figure 4 is a sectional view, taken along a longitudinal plane, of the aseptic cap of figure 1 during closure;

figure 5 is a bottom view of the aseptic cap shown in figure 4;

figure 6 is a sectional view, taken along a longitudinal plane, of the aseptic cap during opening, as shown in figure 3.

**[0031]** With reference to the above figures, an aseptic cap for containers, according to the invention, is generally designated by the reference numeral 10 and comprises a main body 11 which is shaped like a threaded ring and from one end whereof a first annular plane 12 and a second annular plane 13, which is raised and arranged coaxially with respect to said first plane, extend.

**[0032]** A tubular extension 14 protrudes monolithically from the second annular plane 13, is coaxial to the main body 11, and is conveniently smaller than the second plane 13.

**[0033]** A thread 15 is formed on the inside wall of the main body 11 for screwing against the neck 16 of a container 17, while a lip 18, also having a cylindrical annular shape, protrudes internally from the first annular plane 12. The lip 18 forms, together with the body 11, a seat 19 for accommodating the end edges of the neck 16.

**[0034]** On the extension 14 a base region 20, which is contiguous to the main body 11, and an upper end 21 are provided.

**[0035]** Four radial bridges 22 protrude, in this case, at the base region 20 from the inside wall of the extension 14 and support an internal element 23 which is cylindrical and coaxial to the extension 14.

**[0036]** The radial bridges, in combination with the internal element 23 and with the tubular wall of the extension 14, form axial passage channels 24 from the main body 11 to the extension 14.

**[0037]** The extension 14 is coupled to a tubular upper cap 25 which is constituted by a cylindrical wall 26 and is provided with an internal obturator 27 which is also cylindrical and coaxial to the wall 26.

**[0038]** Both the wall 26 and the obturator 27 are monolithic with respect to an annular upper flange 28, which centrally forms a circular hole 29 for the outflow of the liquid.

**[0039]** An annular guiding slot 30 is formed between the wall 26 and the obturator 27, the dimensions thereof being adapted to contain the extension 14 for the sliding of the upper cap 25 along the extension 14.

**[0040]** The lower end portion 31 of the obturator 27 hermetically closes the passage channels 24 between the inside of the wall of the tab 14 and the outside wall of the element 23, since it is conveniently shaped complementarily thereto.

**[0041]** A first annular stroke limiting raised portion 32 is formed at the upper end 21 of the extension 14 and protrudes outward.

**[0042]** Correspondingly, a second annular raised portion 33 protrudes inward from the wall 26 of the upper cap 25 so as to limit said annular guiding slot 30.

**[0043]** In this manner, the upper cap 25 can slide along the extension 14, rising until the second raised portion 33 abuts against the first stroke limiting raised portion 32 and is locked by it in order to prevent its disengagement from the extension 14.

**[0044]** However, this locking is not fixed, since by applying an appropriate forcing action the upper cap 25 can be removed.

**[0045]** A third annular raised portion 34, smaller than the first annular raised portion 32 and the second annular raised portion 33, protrudes outward at an intermediate portion of the wall of the extension 14 so as to limit the guiding slot 30 and constitutes a retainer for the closing and opening of the passage channels 24.

**[0046]** When the aseptic cap 10 is closed, the upper cap 25 is in fact lowered and the lower end portion 31 of the obturator 27 locks the channels 24, producing the appropriate seal between the inside wall of the extension 14 and the outside wall of the element 23.

**[0047]** In order to open the cap 10, it is necessary to lift the upper cap 25, making it slide along the extension 14, whose wall is accommodated in the annular guiding slot 30, after making the second raised portion 33 pass beyond said third retaining raised portion 34.

[0048] Likewise, in order to close the cap 10 it is necessary to lower the upper cap 25, moving the second raised portion 33 beyond the third retaining raised portion 34, so that the lower end portion 31 of the obturator 27 closes the passage channels 24, moving simultaneously so as to rest on the radial bridges 22.

[0049] The main body 11 is fixed to a first tearaway ring 35, which is conveniently inserted so as to wrap around the neck 16 of the container 17, so that it ensures the integrity of the container 17.

[0050] Finally, the cap 10 is completed by a hood-shaped covering element 36 which is adapted to cover the upper cap 25 and whose edges rest at the outside profile of the second annular plane 13 of the main body 11.

[0051] The covering element 36 is also fixed to a second tearaway ring 37, which is associated so as to wrap around the raised portion of the second annular plane 13 of the main body 11.

[0052] The second tearaway ring 37 gives the user of the container 17 an assurance as to the integrity of the container, since the upper cap 25 cannot be lifted without breaking the covering element 26 away from the second tearaway ring 37.

[0053] Thanks to the structure of the aseptic cap 10, sterilization can be performed in a very simple way.

[0054] When the upper cap 25 is lowered, the passage channels 24 are in fact closed by the end portion 31 of the obturator 27 and the sanitizing liquid sprayed inside the cap 10 encounters, at the base region 20 of the extension 14, a flat surface which is constituted by the internal element 23, by the radial bridges 22 and by the end portion 31 of the obturator 27.

[0055] In practice, it has been observed that the present invention fully achieves its intended aim and all its objects.

[0056] In particular, an important advantage is achieved with the present invention in that an aseptic cap for liquid containers has been devised which allows repeated closing and opening actions and a sterilization process performed according to conventional methods and with conventional equipment.

[0057] Another advantage is achieved with the present invention in that an aseptic cap is provided which has a simple and reliable structure.

[0058] Another advantage is achieved in that an aseptic cap has been provided which can be manufactured at costs which are comparable to those of conventional-type caps.

[0059] The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the same inventive concept.

[0060] The materials employed, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to requirements.

[0061] All the details may be replaced with other technically equivalent elements.

[0062] Where technical features mentioned in any

claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

1. An aseptic cap for containers of liquids comprising a main body shaped like a threaded ring, meant to be associated with the neck of said container, from which a tubular extension protrudes, said extension being coupled to an upper cap, said aseptic cap being characterized in that radial bridges protrude from an inside wall of said extension proximate to the main body to support an internal element so as to form, with said element, axial passage channels for a liquid contained in said container, said upper cap having a tubular structure, being provided with an internal obturator for closing said passage channels, and being able to slide axially along said extension from a lowered position, closing said channels owing to a sealing action of said obturator between the inside wall of said extension and the outside wall of said element, to a raised position for opening said channels for the passage of the liquid.
2. An aseptic cap according to claim 1, characterized in that said internal obturator has, at least at a lower end portion, a tubular structure which is coaxial to the extension of a cylindrical outside wall forming said upper cap.
3. An aseptic cap according to claim 1, characterized in that said internal element has a cylindrical structure.
4. An aseptic cap according to claim 2, characterized in that an annular guiding slot is formed between said obturator and the cylindrical outside wall of the upper cap and is adapted to contain the cylindrical wall of said extension, said upper cap being able to slide along said extension.
5. An aseptic cap according to claim 4, characterized in that a first annular stroke limiting raised portion protrudes outward from said tubular extension at an upper end and in that a second annular raised portion protrudes inward from the cylindrical wall of said cap at an intermediate portion, said cap being able to slide along said extension so as to rise until said second annular raised portion abuts against said first one in order to avoid its disengagement.
6. An aseptic cap according to claim 5, characterized in that a third annular raised portion protrudes, at an intermediate region, from said tubular extension

and is meant to retain said second raised portion when said upper cap is fully lowered.

7. An aseptic cap according to claim 1, characterized in that said main body is fixed, at its free end, to a tearaway ring which is inserted so as to wrap around the neck of said container in order to ensure its integrity. 5
8. An aseptic cap according to claim 1, characterized in that said tubular extension is provided with a hood-shaped covering element the edges of which abut, during closure, against an annular plane which is monolithic to said main body. 10
9. An aseptic cap according to claim 8, characterized in that said covering element is fixed to a tearaway ring which is inserted so as to laterally wrap around a portion of said main body so as to ensure the integrity of said cap. 15 20

25

30

35

40

45

50

55

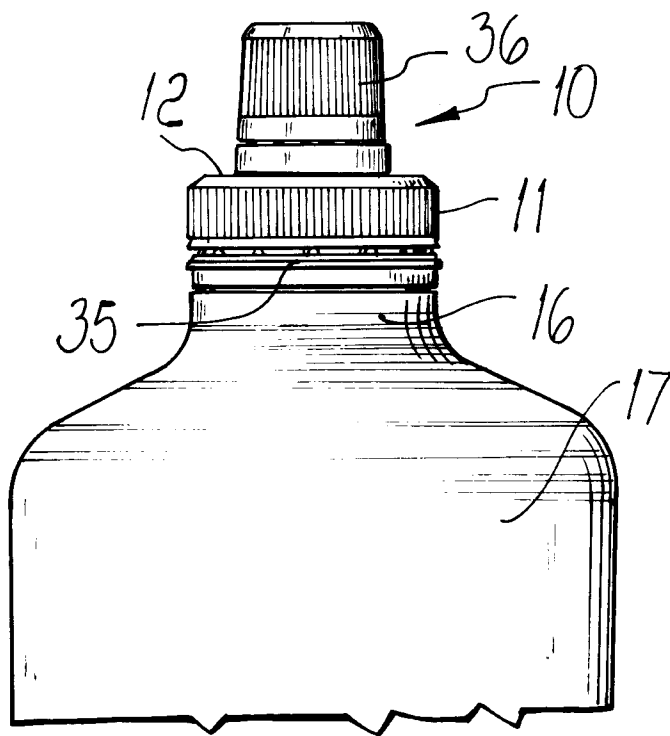


Fig. 1

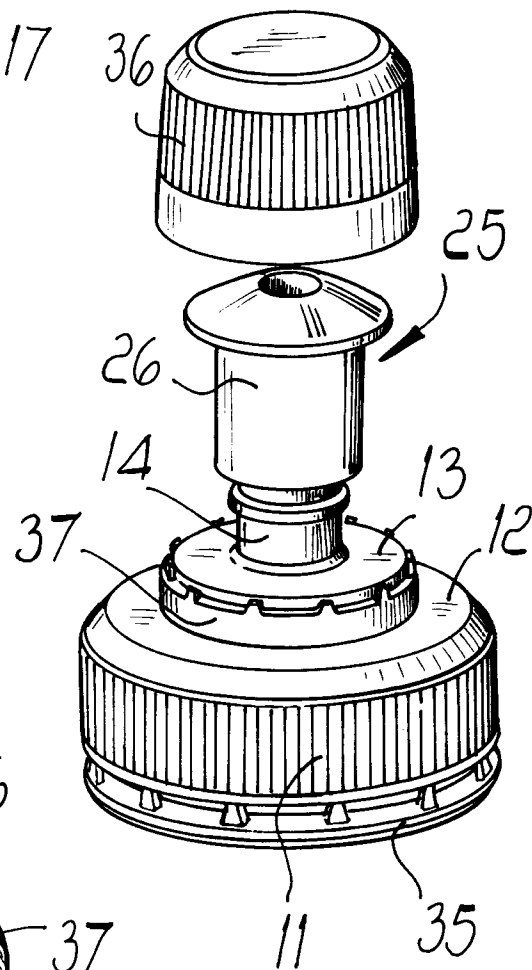


Fig. 3

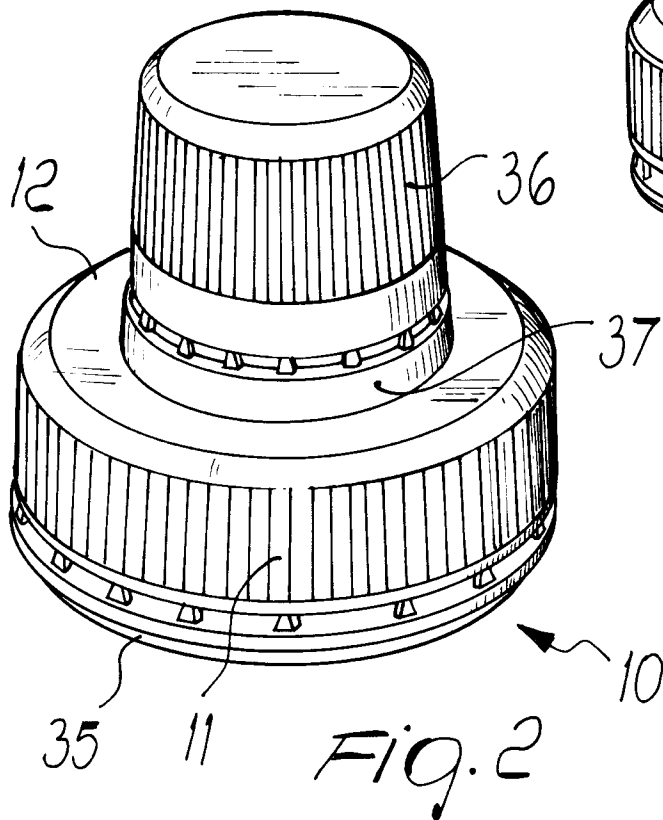


Fig. 2

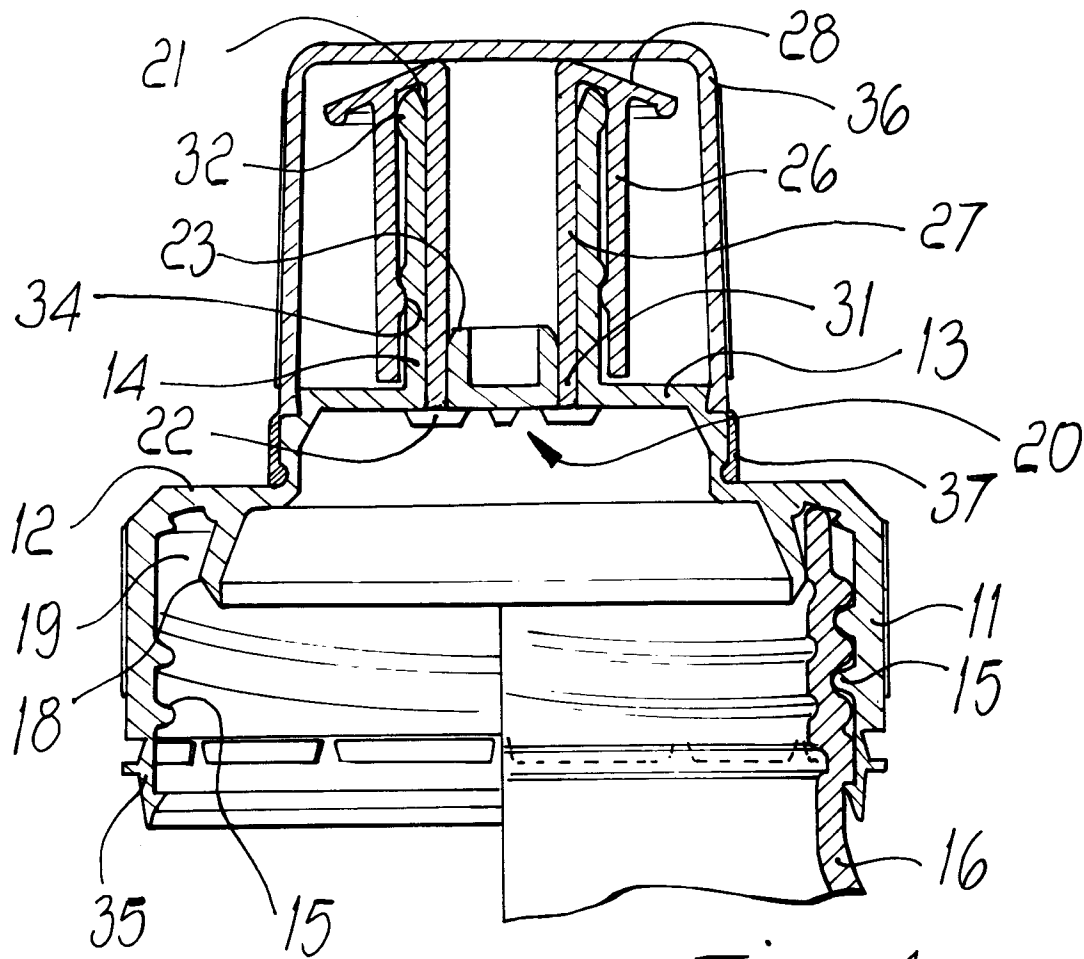


Fig. 4

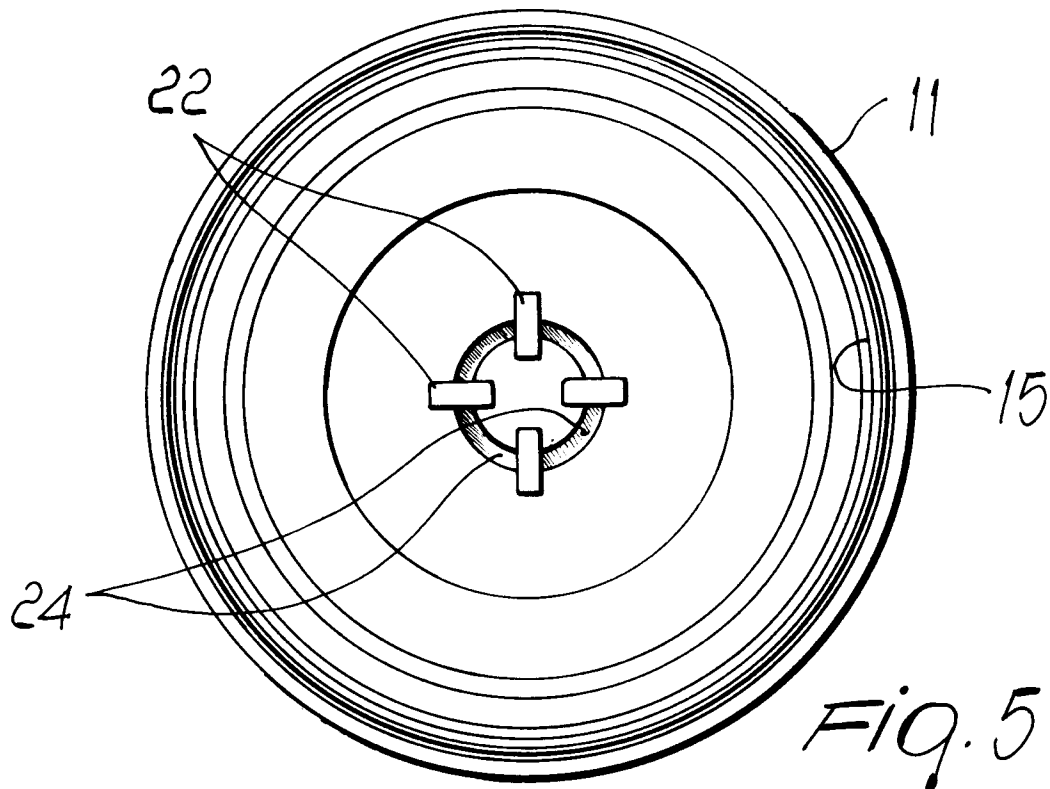


Fig. 5

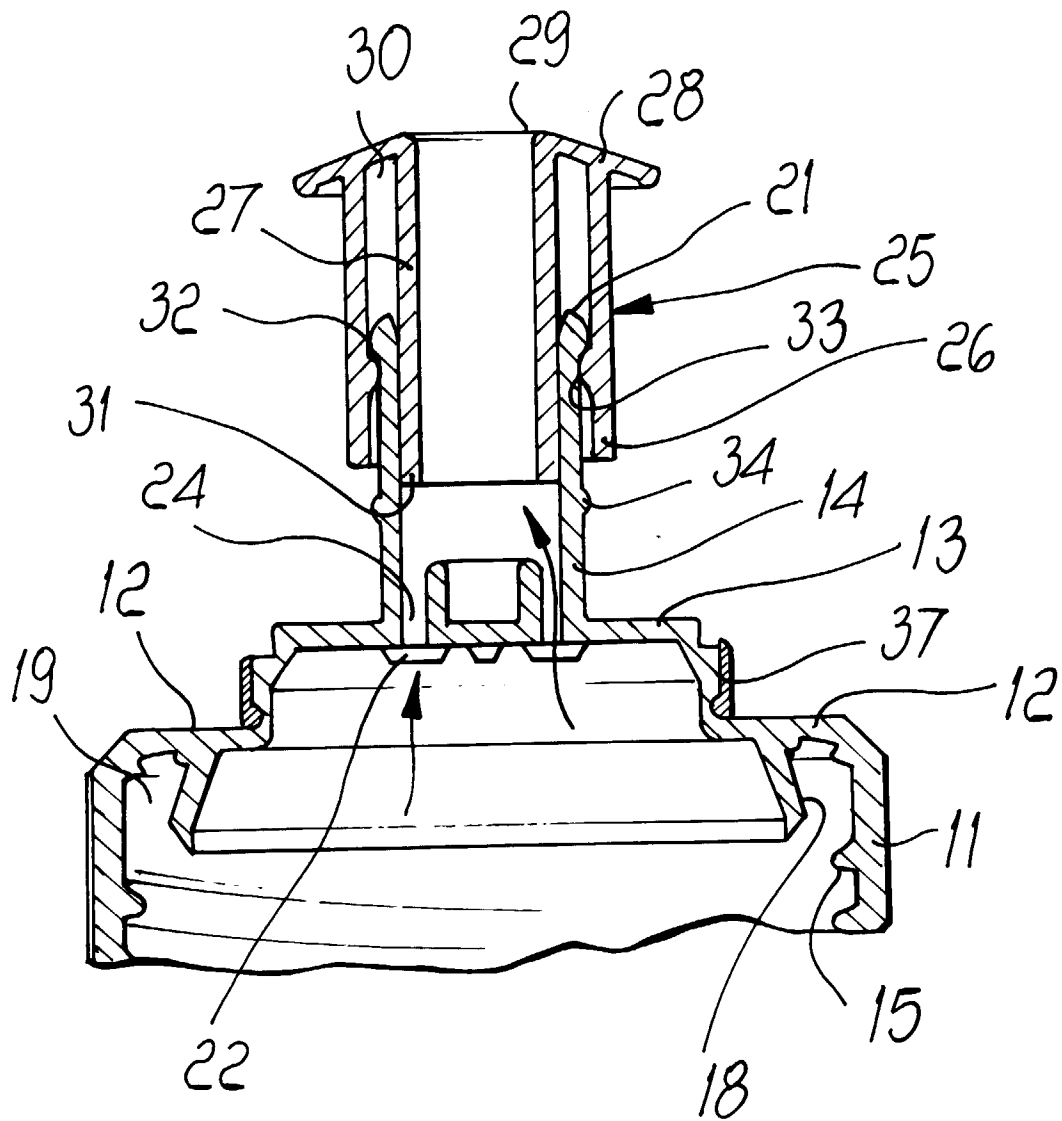


Fig. 6





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 98 10 1168

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.6)
X	US 4 979 653 A (MON THOMAS) 25 December 1990	1-5, 8	B65D47/24
Y	* column 3, line 49 - line 68; figures 7, 9, 10 *	6, 7, 9	
X	DE 195 14 793 C (HENKEL KGAA) 21 November 1996	1-5	
X	WO 91 08166 A (CREATIVE PACKAGING CORP) 13 June 1991	1-3	
Y	* figures 12, 13 *	6	
Y	EP 0 709 301 A (MEYER UWE F ; SANDER DIETER (CA)) 1 May 1996	7, 9	
Y	* column 1, line 49 - column 2, line 30; figures 1, 2 *		
Y	US 5 662 247 A (RAPCHAK THOMAS P ET AL) 2 September 1997	9	
	* claim 1; figure 1 *		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65D
Place of search		Date of completion of the search	Examiner
THE HAGUE		15 January 1999	Bridault, 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			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 10 1168

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-01-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4979653 A	25-12-1990	US 5052595 A	01-10-1991
DE 19514793 C	21-11-1996	EP 0846627 A	10-06-1998
WO 9108166 A	13-06-1991	US 5016787 A	21-05-1991
		AU 6756090 A	26-06-1991
		CA 2015195 A,C	09-11-1990
		EP 0502891 A	16-09-1992
		US 5197634 A	30-03-1993
EP 0709301 A	01-05-1996	US 5588562 A	31-12-1996
		AU 3934495 A	23-05-1996
		BR 9509544 A	23-12-1997
		CN 1175234 A	04-03-1998
		WO 9613442 A	09-05-1996
US 5662247 A	02-09-1997	US 5657906 A	19-08-1997