

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number:

0 654 417 A1

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **93870223.0**(51) Int. Cl.⁶: **B65D 47/12**(22) Date of filing: **22.11.93**(43) Date of publication of application:
24.05.95 Bulletin 95/21(84) Designated Contracting States:
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B-1853 Strombeek-Bever (BE)(54) **Refillable package.**

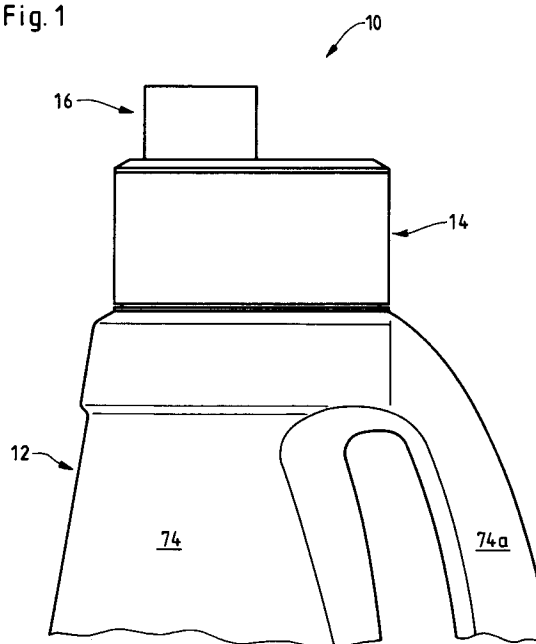
(57) The present invention provides a package which is suitable for mess-free handling, easy pouring and secure storage, and which additionally can be easily refilled from a lightweight container.

The refillable package (10) of the present invention comprises three elements:

- a. a rigid or semi-rigid container (12) having an aperture (80) in its surface for refilling said package;
- b. a transition collar (14); and
- c. a closure (16).

The transition collar covers the aperture and is releasably attached to the container in the region around the aperture. The transition collar further comprising a pouring orifice (50), which is covered by the closure the closure being releasably attached to the transition collar in the region around the pouring orifice.

Fig. 1

**EP 0 654 417 A1**

The present invention concerns a refillable package comprising a rigid or semi-rigid container, a transition collar; and a closure.

Plastic bottles are very widely used as a convenient method for packaging products of all types in order to transport and store the product throughout the distribution chain, from the manufacturers factory to the hands of the ultimate consumer. However recent environmental concerns have lead manufacturers to look for alternative means of packaging that require less plastic.

One such approach is to provide the customer with lightweight packages. Such a package must still be sufficiently strong to protect the product during transport and storage up to the point where it reaches the ultimate consumer. The package is designed to use little or no plastic. However a package of this type is usually not well-suited to the requirements of the consumer. Such a lightweight package may be non-rigid which makes it difficult to pour from, or it may have only a rudimentary pouring spout, or no spout at all, which tends to result in messiness after use. Furthermore it may not be possible to reseal the lightweight package after a part of its contents have been used, which may result both in product deterioration due to exposure in the air, and to the increased risk of accidental spillage.

Consequently it has been suggested that the consumer should be able to purchase a lightweight package and then to transfer the product from the lightweight package into a refillable, reusable container.

Some containers which can be refilled are known in the prior art: DE2711591, published on 10th November 1977 discloses a sauce bottle having a pouring spout and a cap which seals off the spout and the opening from the atmosphere. The spout is located on a sealing cover which fits around the upper periphery of a container.

EPA109704, published on 30th May, 1984 discloses a package particularly suited to liquid laundry detergents. The package comprises a bottle; a transition collar with a pouring spout and drain-back feature; and a cap. The transition collar is fixed on to the bottle by a set of locking teeth and cannot be readily removed.

The present invention provides a package which is suitable for easy handling, mess-free pouring and secure storage, and which additionally can be easily refilled from a lightweight container.

The refillable package of the present invention gives the consumer the benefits of good handling characteristics, and at the same time significantly reduces the amount of plastic which must be discarded and disposed of due to the packaging. The lightweight package which is used to refill the con-

tainer may be any of a number of package types including paperboard cartons, pouches, bags etc. Furthermore the product may be either a liquid product or a granular product.

The refillable package of the present invention ensures that the refilling step is easy for the consumer to do without mess, that the product in the package is protected from the air, the product is not likely to be spilled accidentally, and the package is easy to pour from when product is required.

SUMMARY OF THE INVENTION

The refillable package of the present invention comprises three elements:

- a. a rigid or semi-rigid container having an aperture in its surface for refilling said package;
- b. a transition collar; and
- c. a closure.

The transition collar covers the aperture and is releasably attached to the container in the region around the aperture. The transition collar further comprising a pouring orifice, which is covered by the closure the closure being releasably attached to the transition collar in the region around the pouring orifice.

In order to facilitate refilling of the package the aperture has a cross-sectional area which is greater than the cross-sectional area of the pouring orifice. Most preferably the diameter of the refilling is greater than 35mm, even more preferably greater than 50mm. Alternatively this may be defined as preferred minimum cross-sectional areas of at least 962mm², preferably at least 1970mm² for non-circular orifices.

By "releasably attached" it is meant herein that the transition collar is secured to the container during normal use, but that the transition collar and the container may be easily separated when it is desired to refill the container. Furthermore the transition collar and the container may be easily attached together again after the container has been refilled. It is most preferred that a first screw thread connection is used between the transition collar and the container.

The closure must also be "releasably attached" to the transition collar by a suitable means, so that the closure may be removed when product is to be dispensed from the container through the pouring orifice, and reattached to fully close the package after product dispensing. It is most preferred that a second screw thread connection is used between the closure and the transition collar.

In a preferred embodiment of the present invention the pouring orifice is positioned "off-centre" with respect to the transition collar, and consists of a spout which extends above the transition collar. Furthermore, the torque required to unscrew

the first screw thread connection should be greater than the torque required to unscrew the second screw thread connection.

A means for positive locking between transition collar and container is particularly advantageous. Such a locking mechanism enables the consumer to feel and/or hear the transition piece when it locks into position indicating to the user that the first screw thread is fully engaged.

A stop means is also advantageous to prevent overtightening of the first screw thread and to maintain the correct orientation of the pouring orifice relative to the rest of the package.

In a preferred embodiment of the present invention, the package has a bottom surface on which it is free-standing and vertical plane of symmetry.

Preferably the ratio of the height of the spout to the diameter of the pouring orifice is less than 1:1 in order to guarantee "glug-free" pouring. If the spout does not have a uniform height all around its perimeter, then the height of the spout for this purpose is considered to be its highest point relative to the transition collar.

In a most preferred embodiment of the present invention, the container has a plurality of side walls, and a means for gripping and lifting the container positioned the side walls which has a line of symmetry which is essentially vertical; the line of symmetry of the gripping and lifting means, a centre line of the refilling aperture and a centre line of the pouring orifice all lying in the vertical plane of symmetry of the package; the centre of the pouring orifice and the line of symmetry of the lifting and gripping means lying on opposite sides of the centre line of the refilling aperture.

Whilst the package of the present invention is suitable for a wide variety of products, it is particularly well-suited to granular products.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a front elevation of a preferred embodiment of the present invention.

Figure 2 is an exploded front elevation of the embodiment of Figure 1.

Figure 3 is a vertical cross-sectional view of the closure taken along the line 3-3 of Figure 2.

Figure 4 is a vertical cross-sectional view of the transition collar taken along the line 4-4 of Figure 2.

DETAILED DESCRIPTION OF THE INVENTION

In a preferred embodiment the first threaded connection (between the transition collar and the container) and the second threaded connection (between the closure and the transition collar) are

not aligned on the same axis. Preferably the second threaded connection is "off-centre" relative to the transition collar. One important result of this is that the torque applied to the closure by the consumer when opening the package is not transmitted directly to the first threaded connection which would have the effect of unscrewing the transition collar from the container.

In order to provide a package in which the torque required to release the closure from the transition collar is less than the torque required to release the transition collar from the container, it is also desirable to have different pitches of thread on the first threaded connection and the second threaded connection. This also helps to ensure that the closure is easily removable without accidentally unscrewing the transition collar from the container.

Another preferred feature of the present invention is a positive locking means acting between the transition collar and the container. Such a locking mechanism ("snap-lock") enables the consumer to feel and/or hear the transition piece when it locks into its closed position which indicates that the first screw thread connection has been sufficiently tightened. An example of a suitable positive-locking mechanism consists of a continuous or segmented snap-ring positioned around the periphery of the aperture of the container, with corresponding continuous or segmented snap-ring positioned around the periphery of the transition collar. A radial interference between the two snap rings causes the container and the transition collar to "click" and lock together at the point at which the two snap rings are pushed over on another by the action of the tightening screw threads indicating that the screw threads are fully engaged. Preferably the radial interference is about 1 mm.

Still another preferred feature of the present invention is a means to ensure that the orientation of the pouring spout relative to the remainder of the package is always correct. This is particularly important when the pouring spout is located off-centre relative to the transition collar. An example of a suitable means is a stop notch. A stop-notch is a region of the circumference, preferably close to the screw thread, which has a greater radial extension than the rest of the circumference. Two stop notches, the first located adjacent to the external thread, and the second located adjacent to the internal thread interfere with each other and prevent the screw thread from being tightened further. The stop notches are located in order to ensure that the transition collar can be tightened up to the point at which the pouring spout has the correct orientation relative to the container, but no further.

The diameter of the pouring orifice and the height of the pouring spout should be optimised for convenience in pouring the particular product in-

volved.

The height, diameter and position of the pouring spout relative to the container and transition collar define certain characteristics of the package. Two such characteristics are aligned angle and

By "aligned angle" it is meant the angle through which the package must be tipped from its rest position until it reaches the position at which the most outwardly extending part of the spout is vertically above the most outwardly extending part of the package.

By "pouring angle" it is meant the angle through which the package must be tipped from its rest position until it reaches the position at which the first product is discharged from a normally filled container.

The aligned angle is important because it defines the point at which the product, when poured, will fall clear of the package, and will not simply drop on to the container or transition piece. It is preferred that the aligned angle should be small, preferably less than 30° , and more preferably less than 20° . The pouring angle must be greater than the aligned angle in order to avoid messiness in pouring. Preferably the difference between the aligned angle and the pouring angle is at least 20° .

Referring now to the drawings in detail, wherein like numerals indicate the same elements throughout the views, there is illustrated a preferred embodiment of the refillable package of the present invention. The refillable package 10 includes a container 12, a transition collar 14 to be releasably attached to the container 12 by means of a first screw thread connection 53, 75, and a closure 16, to be releasably attached to the transition collar by means of a second screw thread connection 40, 58.

The container 12 is constructed of any moldable polymeric material, such as polyethylene or polypropylene, and has a body portion 74, an upwardly extending finish 72 and, as shown in Figure 2, a flat annular lip 70 on the upper surface of the finish 72 defining a refilling aperture 80. The balance of the body portion 74 which is not shown in Figure 1 may be of any desired configuration and provides a closed-end chamber suitable for containing the product to be dispensed. The preferred embodiment of said body portion 74 shown has an integrally molded handle 74a to provide a prominent or recognizable gripping or hand hold means to facilitate dispensing and to properly orient the transition collar 14 during pouring of the product, as will be more fully understood from the subsequent description. The orientation effect could also be achieved by other hand hold means known to those skilled in the art. For example, a discrete, palm-fitting area of the container which is ribbed or

provided with knurl-like embossments could be molded into the body portion 74 to aid in gripping. Transition collar 14 is preferably injection molded of a thermoplastic material, such as polypropylene or the like and desirably is slightly harder than the material of either the container 12 or the cup 16. This preferred variance in hardness provides better sealing between the collar and the container, and the cup and the collar, as will be discussed below. While even harder materials such as polystyrene materials can be used for the transition collar, polypropylene is preferred due to its better stress crack resistance.

Transition collar 14 is best shown in Figures 2 and 4 as having a segmented snap-ring which "snaps" over the corresponding complete ring 62 on the container 12 to indicate that the screw threads are fully engaged. A stop-notch (not shown) prevents further tightening of the screw threads thereby maintaining the correct orientation of the pouring orifice 50.

The pouring orifice is surrounded by a pour spout 52 which terminates in a lip 56.

The extended pouring spout 52 is "off-centre" with respect to the transition collar 14 in the embodiment shown. The spout could also be formed in a bent position, if desired to aid in pouring.

The closure 16 is shown in Figure 3 as being generally cup-shaped with a bottom wall 34, a depending skirt-like sidewall 36 and an open mouth 37 terminating in a lip 39. Preferably the cup 16 is injection molded of a fairly dense polymer, such as medium to high density polyethylene, for compressive strength. As discussed earlier, the preferred embodiment utilises softer material for the container 12 and cup 16 to allow the sealing surfaces on the collar 14 to slightly deform or cut into the mating surfaces.

In the embodiment illustrated the aligned angle is 21° and the pouring angle is 65° .

Alternative embodiments (not shown in the Figures)

Whilst the preferred embodiment described above is particularly well-suited to the packaging of granular products including granular laundry detergents and automatic dish washing products, it will be appreciated that the present invention is also suitable for liquid products.

Additional features which may be incorporated into the package design for use with liquids include a drain means. A drain means such as that described in EP109704 ensures that any liquid product which is left in the closure, after the closure has been used as a measuring cup, will drain back into the bottle and not drain down the outside of the container which is both messy and unsightly.

The embodiment shown in EP109704 comprises a closure having an external thread which is used as a measuring cup. The external thread mates with an internal thread on a circumscribing wall of the transition collar. An inclined annular surface between the base of the internal thread and the pouring spout leads, at its lowest point to an opening which allows any spilt product to drain directly back into the container. The drain-back opening may be a separate hole to the pouring orifice, or, alternatively, the pouring orifice may also serve to allow spilt product to drain back into the container.

Furthermore, for liquid applications, it is preferred that the uppermost surface of the spout includes a lip designed to minimise dripping action. Preferably, the lip is formed by beveling or rounding-off the inner surface of the distal end of the spout to create a sharper conformation.

Claims

1. A refillable package (10) comprising:

- a. a rigid or semi-rigid container (12) having an aperture (80) in its surface for refilling said package (10);
- b. a transition collar (14);
- c. a closure (16);

the transition collar (14) covering the refilling aperture (80) and being releasably attached by means of a first screw thread connection to the container (12) in the region around the refilling aperture (80); the transition collar (14) further comprising a pouring orifice (50);

the closure (16) covering the pouring orifice (50) and being releasably attached by means of a second screw thread connection to the transition collar (14) in the region around the pouring orifice (50);

the pouring orifice (50) having an cross-sectional area which is less than the cross-sectional area of the refilling aperture (80).

2. A refillable package according to claim 1 wherein the pouring orifice (50) is positioned off-centre on the transition collar (14), relative to the axis of symmetry which is perpendicular to the plane of the refilling aperture (80).

3. A refillable package according to either of claims 1 or 2, wherein the torque required to unscrew the first screw thread connection is greater than the torque required to unscrew the second screw thread connection.

4. A refillable package according to any of claims 1 to 3, further comprising a means for positive locking between transition collar (14) and con-

tainer (12), said positive locking means providing an audible and / or tactile indication that the first screw thread has been fully engaged.

5. A refillable package according to any of claims 1 to 4, further comprising a stop means preventing over-tightening of the first screw thread, said stop means being positioned such that it maintains the correct orientation of the pouring orifice (50) to the container (12).

6. A refillable package according to any of claims 1 to 5, having a bottom surface on which it is free-standing, and a vertical plane of symmetry.

7. A refillable package according to claim 6, wherein the shape of the pouring orifice (50) is a spout (52) extending from the transition collar (14), the ratio of the height of the spout to its diameter being less than 1:1, the aligned angle being less than 30° and the pouring angle being at least 20° greater than the aligned angle.

8. A refillable package according to claim 6, the container (12) having a plurality of side walls, and a means for gripping and lifting the container (74, 74a) positioned in the side walls having a line of symmetry which is essentially vertical; the line of symmetry of the gripping and lifting means (74a), a centre line of the refilling aperture (80) and a centre line of the pouring orifice (50) all lying in the vertical plane of symmetry of the package; the centre of the pouring orifice (60) and the line of symmetry of the lifting and gripping means (74a) lying on opposite sides of the centre line of the refilling aperture (80).

9. A package (10) according to any of the previous claims having a granular product contained therein.

Fig. 1

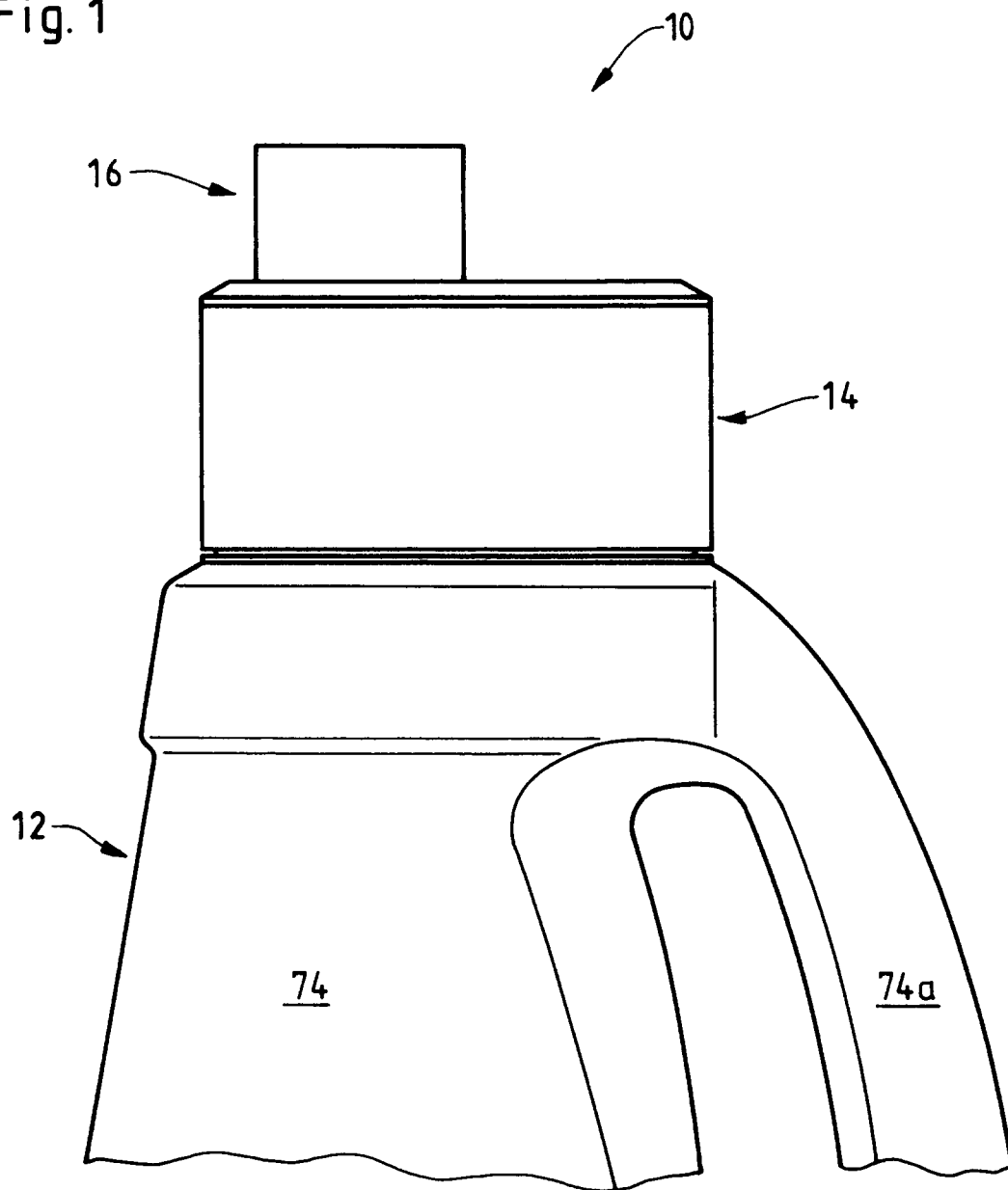


Fig. 2

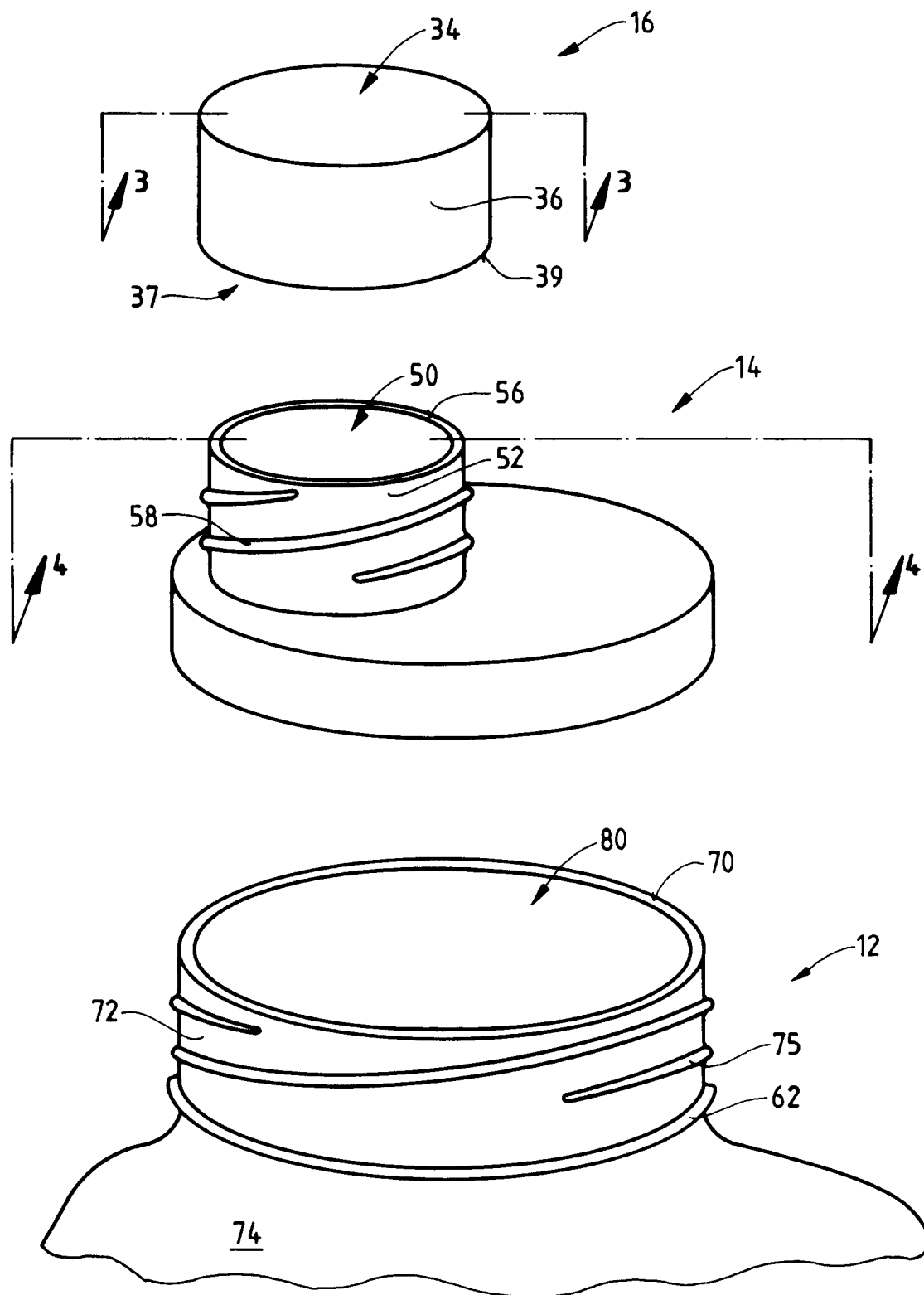


Fig. 3

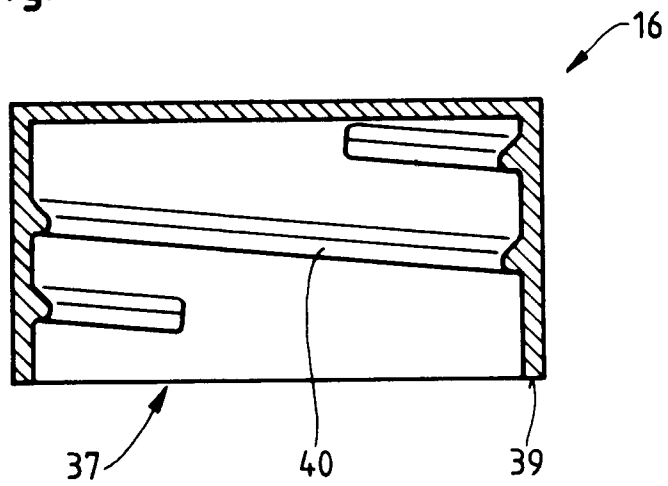
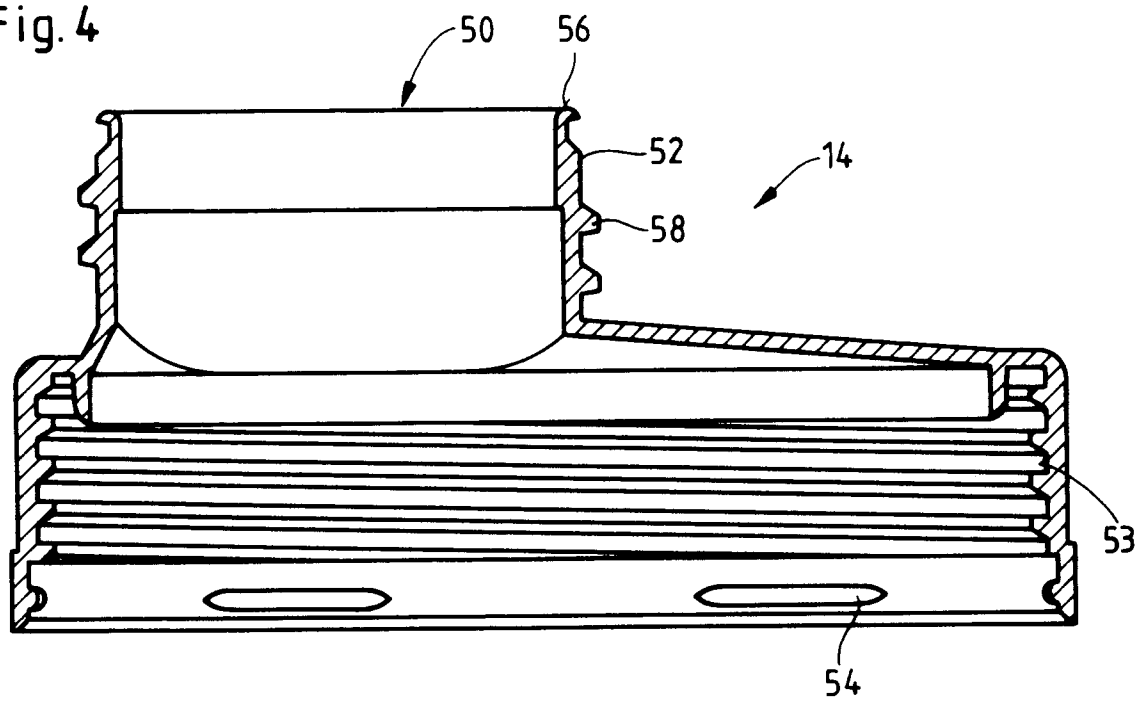


Fig. 4





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 93 87 0223

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-A-5 111 979 (ATHAR) * the whole document *	1-3,6,8	B65D47/12
Y	---	4,5,7,9	
Y	US-A-5 145 080 (IMBERY) * figures *	4,5,7	
A	---	1	
Y	FR-A-2 360 872 (SAEKI) * page 1, paragraph 1; figure 14 *	9	
A	---	1	
X	FR-A-560 239 (SOCIETE ANONYME DES PETROLES JUPITER) * figure 2 *	1-3	
A	---	4	
X	GB-A-426 726 (CHAPMAN) * figure 1 *	1	
D,A	EP-A-0 109 704 (THE PROCTER & GAMBLE COMPANY)		
D,A	DE-A-27 11 591 (DART INDUSTRIES) -----		
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
BERLIN		4 May 1994	Spettel, J
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	