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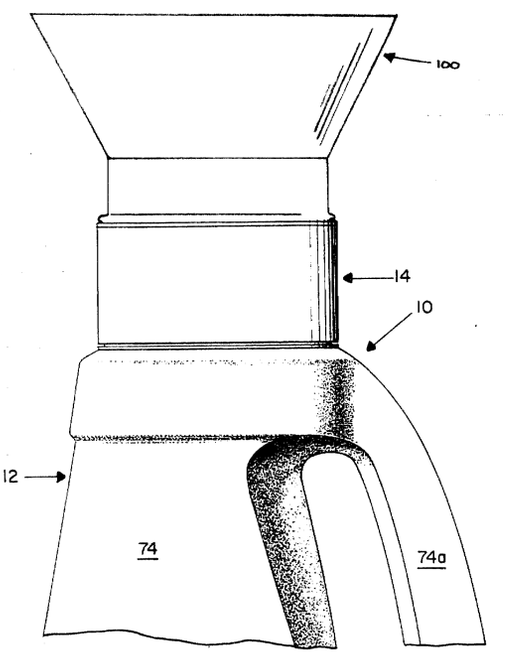
(54) Package comprising a closure for a liquid container and a refill means, and a method for refilling the package

(57) The present invention relates to a package (10) comprising a closure for a liquid container (12) and a refill means (100), the closure comprising a transition collar (14) and a cap (16) wherein the transition collar (14) and the cap (16) are removably engaged by first fastening means (40, 58), and wherein the transition collar (14) comprises a pouring spout (52) wherein the refill means (100) comprises a funnel which is removably engaged by second fastening means (140, 58) with the transition collar (14).

The present invention further relates to a method of refilling a package (10) wherein the package (10) comprises a closure for a liquid container (12) and wherein the closure comprises a transition collar (14) and a cap (16), wherein the transition collar (14) and the cap (16) are removably engaged by first fastening means (40, 58), and wherein the transition collar (14) comprises a pouring spout (52), the method comprises the steps of: disengaging the cap (16) from the transition collar (14); engaging a refill means (100) by means of a second fastening means (140, 58), wherein the refill means comprises a funnel; and pouring liquid into the package (10) through the transition collar (14) with the aid of the funnel.

Fig. 1B



EP 1 120 354 A1

Description

[0001] This invention relates to a dispensing package for liquid products, such as liquid detergents. More particularly this invention relates to a refill means, and to a method for refilling the package.

[0002] A great deal of work has been directed to cleaning up the messiness generally inherent in dispensing liquid products from their containers. One design which has found considerable commercial success is based upon a closure which has a self-draining mechanism, such as is provided by the closure which is disclosed in US-A-4 550 862, issued on November 5th 1985, and the closure which is disclosed in US-A-4 696 416, issued on September 29th 1987; both of these US patents being assigned to The Procter & Gamble Company.

[0003] More recently, environmental considerations have lead to the increased desire to re-use the primary package, and to refill this package when it is empty. Typically the liquid product needed to refill is provided in a secondary container which is a lighter weight container than the primary container. Consequently less packaging material is needed. Particular examples of suitable secondary containers include the pouch (also called the "Doy-pack"), and the carton (such as those commercially available under the trade-name "Tetra Pak"). An example of a particularly suitable refill pouch is disclosed in EP-A-0 626 319, published on November 30th 1994.

[0004] However, the operation of refilling a primary container from a lightweight secondary container can still be an awkward and messy job.

[0005] Various other prior art disclosures have suggested refill aids, notably funnels.

US-A-5 762 120, issued on June 9th 1998, discloses a threaded jar funnel. The funnel has an internal thread which is dimensioned such as to engage with the neck of a standard jar.

US-A-4 823 848, issued on April 25th 1989, discloses a multipurpose funnel comprising interchangeable neck portions so that, for example, two containers can be filled at the same time.

[0006] However, the problem remains of refilling a primary container from a lightweight secondary container without messiness. This problem is addressed by a package comprising a closure for a liquid container and a refill means, the closure comprising a transition collar and a cap wherein the transition collar and the cap are removably engaged by a first fastening means, and wherein the transition collar comprises a pouring spout.

Summary of the Invention

[0007] The object of the invention is achieved by a refill means which comprises a funnel, the funnel being removably engaged by a second fastening means with the transition collar. Preferably each of the first and second fastening means are mutually engaging screw threads. More preferably the transition collar comprises inwardly facing screw threads, and the cap and the funnel comprise outwardly facing screw threads. In a particular embodiment of the invention the cap is a measuring cup.

[0008] In another aspect of the present invention, a method is provided comprising the steps of:

- disengaging the cap from the transition collar;
- engaging a refill means by means of a second fastening means, wherein the refill means comprises a funnel; and
- pouring liquid into the package through the transition collar with the aid of the funnel.

Brief Description of the Drawings

[0009]

Figure 1A is a fragmentary front elevation view of one embodiment of the package of the present invention, shown with the cap in place;

Figure 1B is a fragmentary front elevation view corresponding to Figure 1A, shown with the refill funnel in place;

Figure 2 is a fragmentary, exploded, perspective view of the embodiment of Fig 1A;

Figure 3 is a vertical cross-sectional view of the cap taken along the line 3-3 of Figure 2;

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

Figure 5 is a vertical cross-sectional view of the refill funnel shown in Figure 1B;

Figure 6 is a horizontal cross-sectional view through the container finish taken below the means for attachment on the finish and showing the interlock means of the preferred embodiment;

Figure 7A is a fragmentary, partial cross-sectional view of another preferred embodiment of the package of the present invention, shown with the cap in place;

Figure 7B is a fragmentary partial cross-sectional view corresponding to Figure 7A, shown with the refill funnel in place;

Figure 8 is a fragmentary, exploded, vertical cross-sectional view of the package of Figure 7A; and

Figure 9 is a top view of the transition collar of figs 7A and 7B.

Detailed Description of the Invention

[0010] Referring now to the drawings in detail, wherein like numerals indicate the same elements throughout the views, there is illustrated a preferred embodiment of a refillable liquid pouring package of the present invention. The package 10 includes a liquid product container 12, a transition collar 14 to be mounted on the container 12, and a cap 16.

[0011] The container 12 is constructed of any moldable polymeric material, such as polyethylene, polypropylene, polyester or PET and has a body portion 74, an upwardly extending finish 72 and, as shown in FIG. 2, a flat annular lip 70 on the upper surface of the finish 72 defining orifice 80. The balance of the body portion 74 which is not shown in FIG. 1A 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.

[0012] In the particular embodiment of the invention shown in the drawings, an interlock means, comprising a plurality of locking teeth 82, is located at the base of the container finish 72. These locking teeth 82 are shown best in FIG. 6 as being disposed in two diametrically opposed groups of several juxtaposed ratchet-type teeth 82 each, integrally molded around the base of the container finish 72 adjacent and below the thread convolutions 75 illustrated in FIG. 2. Since the preferred manner of forming the container 12 is blow-molding and since following the blow-molding process the two halves of the mold must be separated, the locking teeth 82 are formed so as not to interfere with the mold separation. As shown most clearly in FIG. 6, the locking teeth of the preferred embodiment are formed in two sets of 10 teeth 82, with the teeth 82 radially spaced ten degrees (10°) from each other. The sets are located apart on opposite sides of the mold parting line at the base of said container finish 72.

[0013] 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 cap 16. This preferred variance in hardness provides better sealing between the collar and the container, and the cap 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.

[0014] Transition collar 14 is best shown in FIGS. 2 and 4 as having a circumscribing cylindrical outer wall portion 50, an outwardly projecting tubular pouring spout 52, a drain-back shoulder 57 having a frusto-conically configured upper surface and an inclined drain back partition 55. The drain back partition 55 and shoulder 57 essentially create a transverse partition which separates the outer wall portion 50 into top and bottom sections and has a vent/drain hole 54 extending through the lowermost portion of drain back partition 55. If desired, the vent/drain hole 54 can extend through the contiguous portion of wall 51 instead of through the drain back partition.

[0015] In the bottom section of transition collar 14, as best shown in FIG. 4, on the inner surface of the circumscribing wall 50 along the lowermost edge are a multiplicity of inwardly extending uniformly spaced locking teeth 68. The locking teeth 68 are integrally molded in the form of thin planar sections of material each of which lies at an angle of about 65° with a radial line intersecting its outermost extremity. The lower surfaces of the teeth 68 are upwardly inclined in an inward direction and the innermost surface of each is truncated at an angle which is approximately tangent to a circle connecting the inner ends of the teeth 68. The diameter of the circle is smaller than the diameter of a circle connecting the outer tips of the teeth 82 so that as the collar is applied, the teeth 68 must flex to slide past teeth 82. An interference of approximately 1.0 mm. between the teeth 68 and 82 has been found satisfactory. The teeth 68 are adapted to interlock with the locking teeth 82 of the container 12 and, in effect, perform a pawl-like function. It will be understood, however, that any means for fastening or interlocking the transition collar 14 against rotational movement relative to the container 12 in the unfastening direction may be employed. For example, a vertically oriented rib and groove interlock arrangement can be used. In the embodiment shown in FIG. 4, there are 24 locking teeth 68 uniformly spaced at 15° intervals around the inner periphery of the lower portion of circumscribing wall 50, so that when said collar is securely tightened into said container, every other locking tooth 68 of the transition collar will interlock with a locking tooth 82 in the container 74 and, therefore, restrict any rotation in the loosening direction. The resultant interlock action between said container and said collar will allow the cap 16 to be removed and replaced on the upper portion of transition collar 14 without causing rotation of collar 14.

[0016] Adjacent and above locking teeth 68 in the bottom section of transition collar 14 are threads 64 which cooperate with threads 75 on container finish 72. Again, any means of mounting collar 14 on container 12 may be employed; however, where collar 14 has a drain back partition with a drain hole, such as vent/drain hole 54, the collar 14 desirably should be oriented so that users will not pour the contained liquid from both the spout 52 and the vent/drain hole 54 simultaneously, which would

prevent proper venting and make it difficult to control the stream of product. In the described embodiment the threads 64 of the collar 14 and the threads 75 of the container 12 are designed and matched so as to mount the transition collar 14 onto container 12 and orient the vent/drain hole 54 so that it is generally radially aligned with and adjacent, e.g. within about 30° of, the hand hold means (handle 74a) when tightened. In tightened condition the annular sealing ring 62 on the lower surfaces 60 of drain back shoulder 57 of the collar 14 will contact and slightly deform or cut into the softer material of the flat lip 70 of container 12, thus creating a tight seal. As shown in FIG. 4, the annular lower surface 60 of the drain back shoulder 57 is substantially flat and at right angles with the axis of collar 14, so that the sealing ring 62 can fully contact flat lip 70.

[0017] Drain back shoulder 57 is integrally attached on its outer periphery to the inner surface of circumscribing wall 50, and its upper surface is inclined steeply toward the central axis of transition collar 14. The angle of inclination of the surface of shoulder 57 is not critical, but should be steep enough to facilitate gravitational movement of any residual liquid placed thereon toward the vent/drain hole 54. In the preferred embodiment the shoulder 57 is sloped at approximately 30° relative to the horizontal. The inclined drain back partition 55 is integrally attached to both the inner periphery of drain back shoulder 57, and the outer surface of the extended pouring spout 52. Because of the inclined nature of the partition 55, a truncated cylindrical drain back wall 51 provides the connection between the partition 55 and the inner periphery of said drain back shoulder 57 to complete the separation of the top and bottom sections of collar 14 in locations other than through vent/drain hole 54.

[0018] In the top section, extended pouring spout 52 is coaxial of the transition collar 14 in the embodiment shown, however, the spout 52 could be located off-center or could be formed in a bent position, if desired, to aid in pouring. The diameter of pouring spout 52 is not critical and can be sized for convenience in pouring the particular liquid involved. The overall height of said spout 52 is also not critical, but must fit within said inverted cap 16 in the sealed position, and should extend outwardly from collar 14 a sufficient distance to insure maximum dispensing and mess control, whether the container is completely full or partially empty.

[0019] The uppermost surface of spout 52 in the illustrated embodiment includes a lip 56 designed to minimize dripping action of liquid. In the preferred embodiment, lip 56 is formed by beveling or rounding-off the inner surface of the distal end of spout 52 to create a sharper conformation, as best seen in FIG. 4.

[0020] Adjacent to and above drain-back shoulder 57 and formed on the inner surface of the circumscribing wall 50, is an annular interior wall 53. Interior wall 53 has a diameter slightly smaller than the internal passageway elements formed above it and can be sized as to form an annular contact seal with cap 16 when it is engaged with collar 14. Preferably annular wall 53 is tapered, so that its diameter adjacent shoulder 57 is smaller than its diameter at higher levels, to enhance its sealing capability. Above annular wall 53, also on the inner surface of said circumscribing wall 50 and adjacent its top surface, are formed a fastening means, inwardly facing threads 58, to receive the corresponding outwardly facing threads 40 of cap 16 to be described. The top surface of circumscribing wall 50 is formed with a sealing ring 59 to contact and form a tight seal with cap 16 when the same is threadedly attached to collar 14. The heights of sealing rings 59 and 62, of course, should be designed to compensate for the various tolerances of the molded parts. Both will seal because of the interaction of the hard sealing ring pressing against or into softer sealing surfaces, as described above.

[0021] The funnel 100 is shown in FIG. 5. Preferably, the funnel 100 is injection molded of a fairly dense polymer, such as polypropylene or medium to high density polyethylene. Particularly suitable is clarified polypropylene which is commercially available as Borealis Taplan MSC C006A. The stem of the funnel is illustrated with outwardly facing fastening means, threads 140, adapted to cooperate with the inwardly facing threads 58 of collar 14. While other types of fastening means can be employed, threads are preferred to insure a tight seal between the collar 14 and cap 16. The number and spacing of such threads is not critical so long as a reliably secure closed arrangement results.

[0022] The cap 16 is shown in FIG. 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 cap 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 utilizes softer material for the container 12 and cap 16 to allow the sealing rings 62 and 59 on the collar 14 to slightly deform or cut into the mating surfaces.

[0023] As best shown in FIG. 3, lip 39 is formed as a drip-prevention lip for cap 16 when the same is used as a cap, and to be an inner seal in contact with annular interior wall 53 of the collar 14 when cap 16 is used as the closure for the package 10. This is accomplished by having the lip 39 flare outwardly and terminate in a sharp edge. The particular configuration of the lip 39 can be modified by those skilled in the art to suit particular applications and need not be of an anti-drip variety.

[0024] Adjacent lip 39 on the external surface of said cap is an outwardly facing fastening means, threads 40, adapted to cooperate with the inwardly facing threads 58 of collar 14.

[0025] A coaxial shoulder 38, located adjacent the side of the threads 40 spaced from the lip 39, projects outwardly from the exterior surface of sidewall 36 and provides a sealing surface 35 adapted to contact sealing ring 59 on the upper surface of circumscribing wall 50

of collar 14 when the cap 16 is fastened in inverted condition on the collar 14. In the preferred embodiment, as can best be seen in FIG. 3, the substantially flat, annular sealing surface 35 of shoulder 38 extends radially from said sidewall 36 at approximately a 90° angle. The seal between cap 16 and collar 14 could also be accomplished in other ways such as providing an annular gasket (not shown) on the surface 35 or attaching such a gasket to transition collar 14. Such alternate methods of sealing would be preferred if cap 16 was snap-fitted or otherwise attached than by threads.

[0026] The width of projecting shoulder 38 should be sufficient to insure complete surface contact between ring 59 and sealing surface 35. The thickness of shoulder 38 is not critical, but should be such as to provide sufficient rigidity for surface 35 to insure a tight seal with the collar 14 as described above.

[0027] The portion of cap 16 extending below sealing surface 35, as shown in FIGS. 2 and 3, including threads 40 and drip prevention lip 39, are dimensioned so that the surface 35 will contact and seal with sealing ring 59 prior to any substantial contact of drip-prevention lip 39 with drip back shoulder 57 when cap 16 is threadedly attached to collar 14.

[0028] The dimensions and overall shape of cap 16 are functionally related to the dosage requirements of the liquid involved. The cap 16 should preferably have a volume slightly greater than the volume required as the dosage, and the exterior of said cap may be textured or formed in some way to facilitate tactile manipulation. For example, cap 14 can be provided with external ribs or other embossments to aid in gripping for removal or replacement. The interior of said cap can be formed with indicia (not shown with respect to cap 16) which indicates fill levels for measurement of the liquid product.

[0029] While the preferred embodiment shows the cap 16 to be of substantially annular cross-section throughout, such annular cross-section is only essential in the areas near its open mouth where it must attach and seal with collar 14. Therefore, the configuration of the bottom wall 34 and the depending sidewall 36 above the sealing shoulder 38, as shown in FIGS. 2A and 3, could be varied as desired.

[0030] In use, the liquid product is placed in the container 12 and the transition collar 14 and cap 16 are screwed down to sealing condition. During application of the cap 16 onto collar 14, the seals there-between are created by annular contact between sealing ring 59 and sealing surface 35, and between drip-prevention lip 39 and annular wall 53. The cap 16 can thereafter be removed by a user and employed as a cap for dispensing liquid product.

[0031] When cap 16 is filled to a desired level, container 12 is brought to an upright position and spout lip 56 will minimize the liquid which might otherwise drip therefrom. Any liquid which does drip from pouring spout 52 will run down its exterior surface and collect on the inclined drain back partition 55 and from there gravitate to the vent/drain hole 54 through which it will be returned to container 12 via orifice 80.

[0032] When the liquid which was measured into cap 16 is dispensed therefrom, the drip-prevention lip 39 will minimize dripping over its edge. The user then inverts and replaces cap 16 on transition collar 14, screwing it down tightly. The resulting seal formed between sealing ring 59 and lip 35 and between the drip-preventing lip 39 and the annular wall portion 53 will prevent liquid product from escaping. It can be seen that if the package in the closed position, as shown in FIG. 1A, were knocked over, there would be no resulting leakage, and upon being returned to an upright position, any liquid in the collar 14 area would drain back into container 12.

[0033] The vent/drain hole 54 can be provided of various sizes and configurations, and, if desired, can be provided with baffles to interfere with product flow therethrough or to prevent visual access to the interior of the container 12. The size of the vent/drain hole 54, however, should be designed taking into consideration the liquid product viscosity and desired flow rate of the product to allow for sufficient influx of air during the pouring operation to facilitate smooth and steady dispensing, and to allow any collected residual liquid to be returned to said container relatively quickly after the package is returned to an upright position.

[0034] FIGS. 7 through 9 illustrate an alternate and equally preferred refillable liquid product pouring measuring package. Particularly, FIGS. 7 through 9 illustrate package 200 comprising container 212, transition collar 214 to be mounted on container 212, and cap 216.

[0035] Container 212 corresponds substantially identically to container 12, as described with regard to package 10, with the exception that the upwardly extending finish 272 of container 212 extends upwardly somewhat higher than did the corresponding finish 72. Interlocking teeth 282 and thread convolutions 275 correspond exactly to parts 82 and 75 of package 10.

[0036] Likewise, transition collar 214 corresponds substantially identically to transition collar 14, described above, except that pouring spout 252 is formed with an open backside 290, and drain/vent hole 254 extends from the open bottom of spout 252. Pouring spout 252 is shown as being located centrally with respect to the central axis of transition collar 214; however, it is contemplated that spout 252 could be located slightly off-center (not shown) to aid in pouring accuracy and convenience. Locking teeth 268 correspond exactly to locking teeth 68 described above with regard to transition collar 14.

[0037] The lower portion of outer wall 250 of transition collar 214 is flared outwardly and downwardly to better conform to the shape of the upper portions of container 212. It is further contemplated that spout 252 and drain/vent 254 (and correspondingly spout 52 and drain/vent 54, as described above) could be formed with a thin removable membrane or tear strip (not shown) over their open portions for sealing of the package prior to initial

use.

[0038] Cap 216 also corresponds substantially identically with cap 16, as described above. In FIG. 7A cap 216 has been only partially sectioned in order to show vent groove 241, which represents one means of venting and thus preventing or minimizing pressure buildup within package 200 during reattachment of cap 216 onto transition collar 214. Pressure buildup is preferably avoided as it may tend to force residual product through the cooperating fastening means between cap 216 and transition collar 214 and onto the outer surface of package 200. Vent groove 241 is simply a channel or interruption of the external threads 240 of cap 216, which is of sufficient depth to permit air to escape from package 200 at least during the initial stages of application of cap 216 to transition collar 214. Other means of venting the package 200, such as a one-way valve, can also be used to prevent such pressure buildup. Similar grooves could also be incorporated on package 10, as described above. The interior of cap 216 is illustrated as including several fill level lines 295 as examples of indicia which can be used to indicate fill levels for measurement of the liquid product.

[0039] FIG. 7B shows the funnel 100 mounted in position on the transition piece 214 of this embodiment of the invention, in preparation for refilling the primary container from a secondary container.

[0040] In a particularly preferred embodiment of the present invention the inverted funnel is designed to be an interference fit, or a snap fit, over the cap. This provides for ease of storage and ensures that the funnel is readily at hand whenever it is needed for the refill operation.

[0041] Various modifications of the described invention will be apparent to those skilled in the art. Examples of several such variations have been mentioned above, such as alternate means of non-rotatably mounting the transition collar on the container, and alternative ways of sealing various elements in a closed position.

Claims

1. A package (10) comprising a closure for a liquid container (12) and a refill means (100), the closure comprising a transition collar (14) and a cap (16) wherein the transition collar (14) and the cap (16) are removably engaged by first fastening means (40, 58), and wherein the transition collar (14) comprises a pouring spout (52)
   characterised in that the refill means (100) comprises a funnel which is removably engaged by second fastening means (140, 58) with the transition collar (14).

2. A package (10) according to claim 1 wherein each of the first and second fastening means (40, 58 and 140, 58) consist of mutually engaging screw threads.

3. A package (10) according to claim 2 wherein the transition collar (14) comprises inwardly facing screw threads (58), and the cap (16) and the funnel (100) each comprise outwardly facing screw threads (40, 140).

4. A package (10) according to any of the previous claims wherein the transition collar (14) comprises an outwardly projecting pouring spout (52), a circumscribing wall (50) with first fastening means (40) formed on its interior surface, the spout (52) extending above and being spaced from the circumscribing wall (50) to provide dispensing and mess control and drain means for returning spilled liquid, and for directing refill liquid into the package (10).

5. A package (10) according to any of the previous claims wherein the cap (16) is a measuring cup.

6. A method of refilling a package (10) wherein the package (10) comprises a closure for a liquid container (12) and wherein the closure comprises a transition collar (14) and a cap (16), wherein the transition collar (14) and the cap (16) are removably engaged by first fastening means (40, 58), and wherein the transition collar (14) comprises a pouring spout (52),
   charcterised in that the method comprises the steps of:

   disengaging the cap (16) from the transition collar (14);
   engaging a refill means (100) by means of a second fastening means (140, 58), wherein the refill means comprises a funnel; and
   pouring liquid into the package (10) through the transition collar (14) with the aid of the funnel.

7. A method (10) according to claim 6 wherein each of the first and second fastening means (40, 58 and 140, 58) consist of mutually engaging screw threads.

8. A method (10) according to claim 7 wherein the transition collar (14) comprises inwardly facing screw threads (58), and the cap (16) and the funnel (100) each comprise outwardly facing screw threads (40, 140).

Fig. 1A

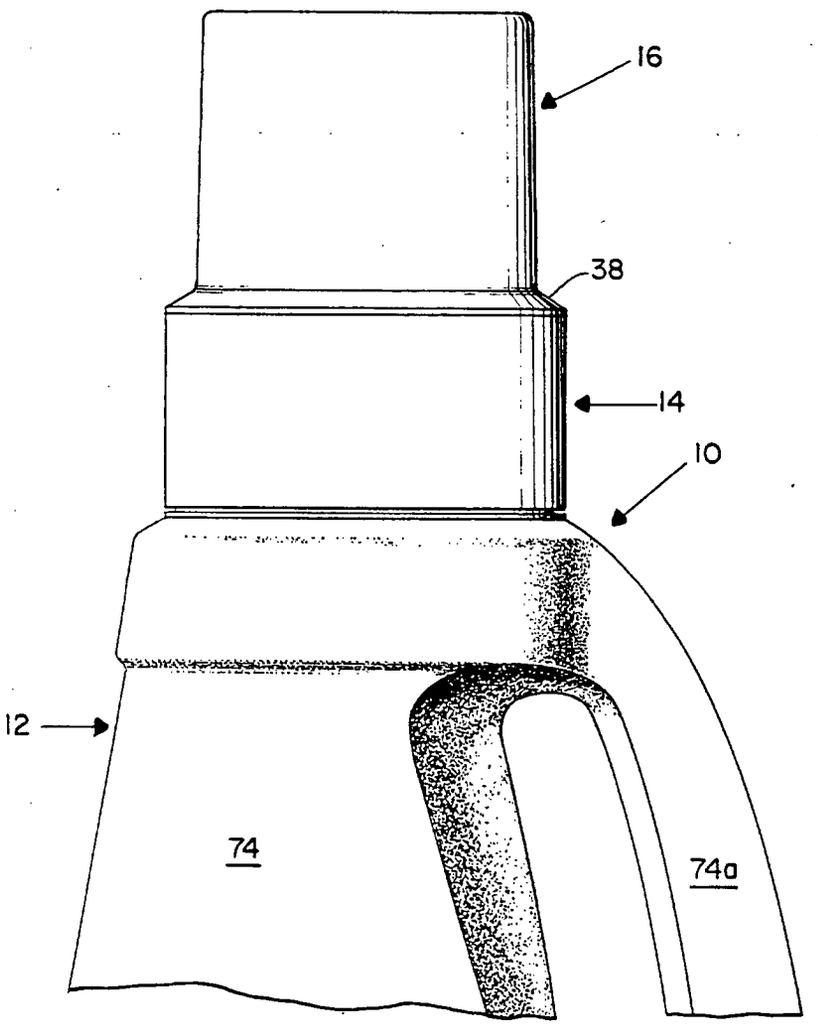
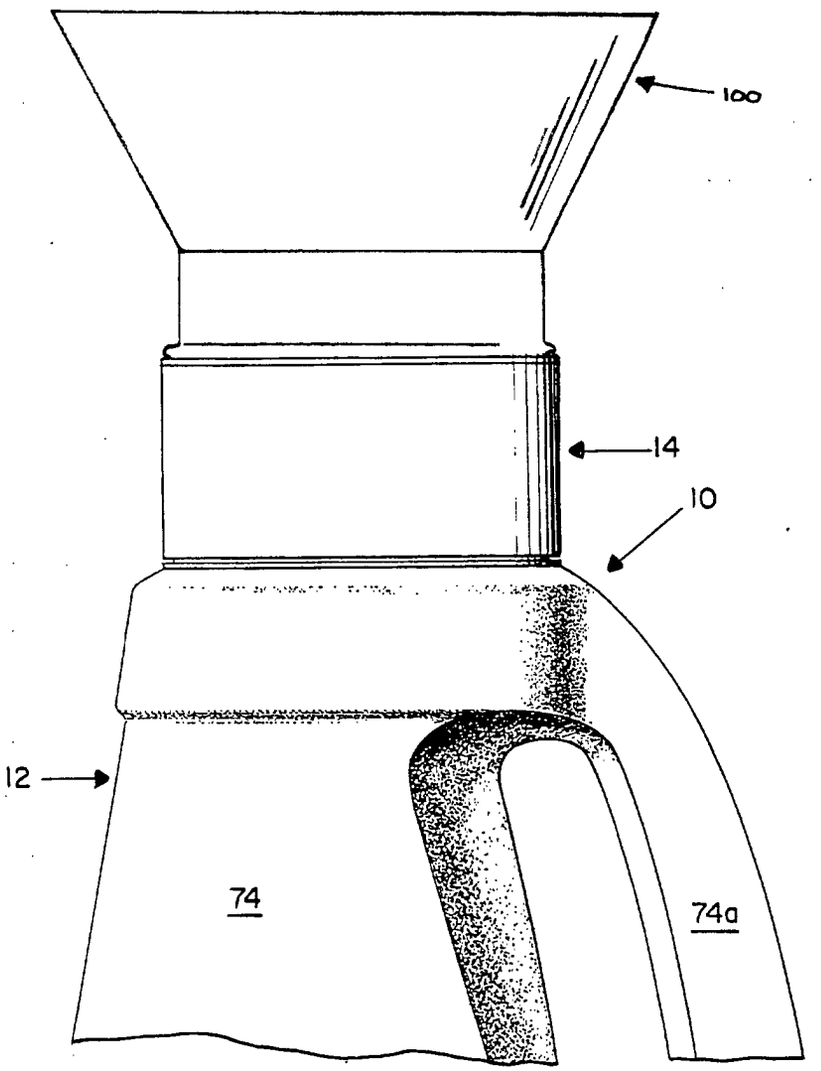
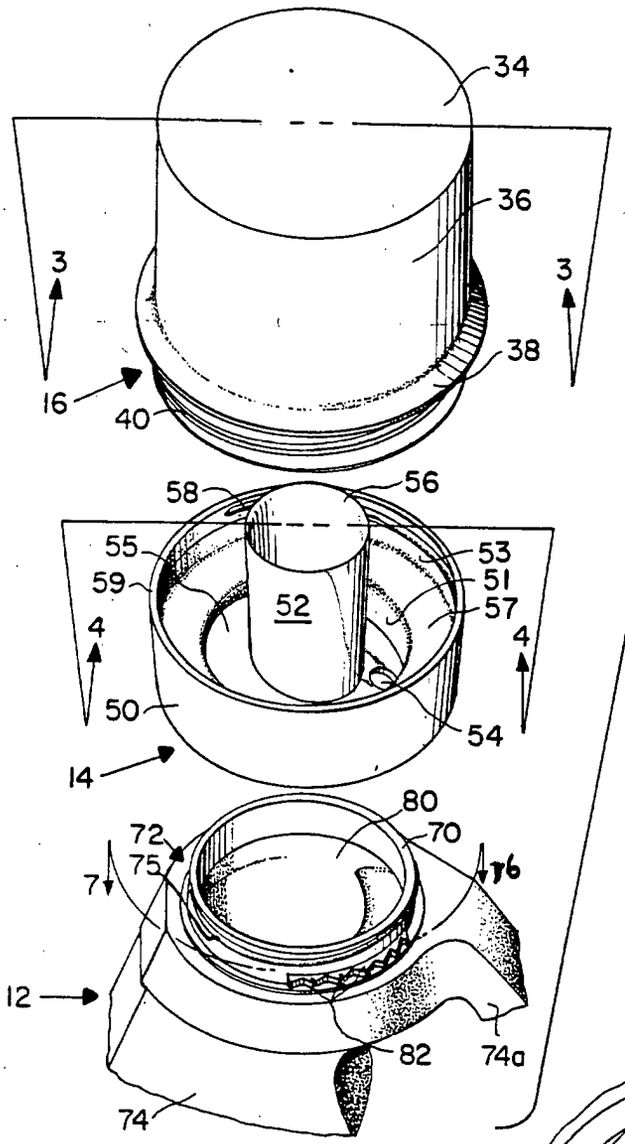


Fig. 1B

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74a
74

Fig. 2

Fig. 6

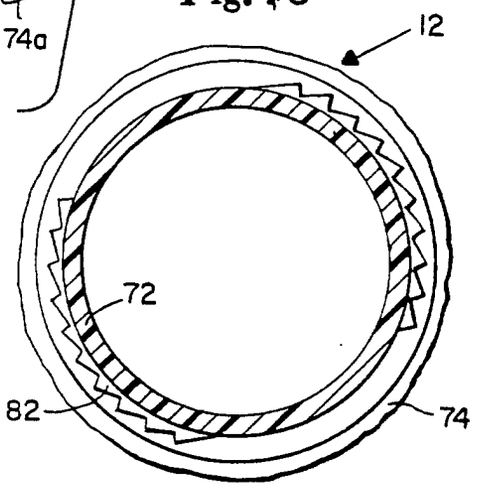
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Fig. 3

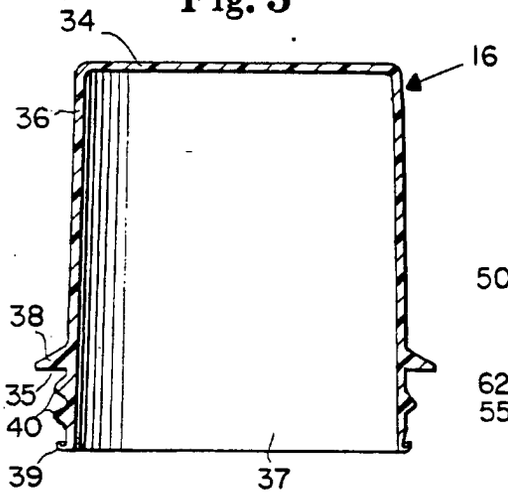


Fig. 4

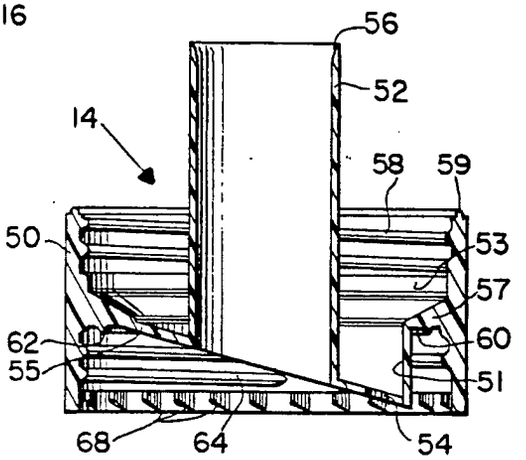


Fig. 5

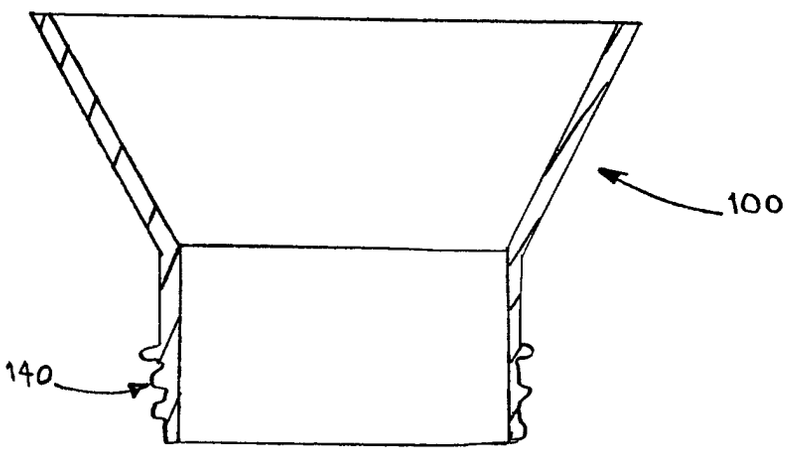


Fig. 7A

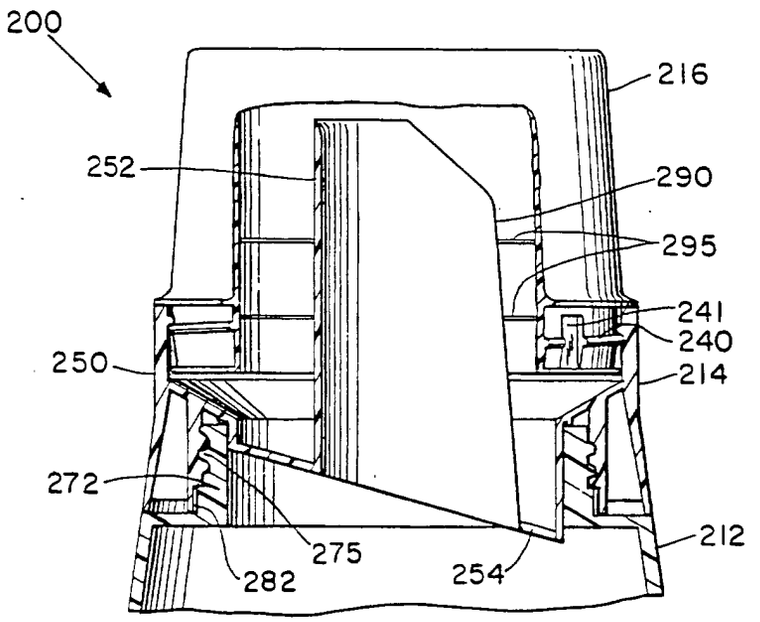
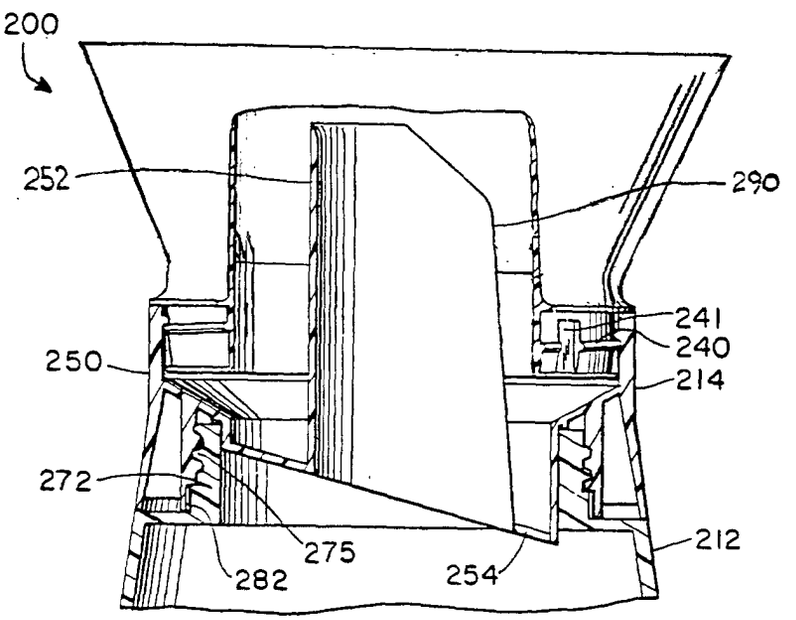
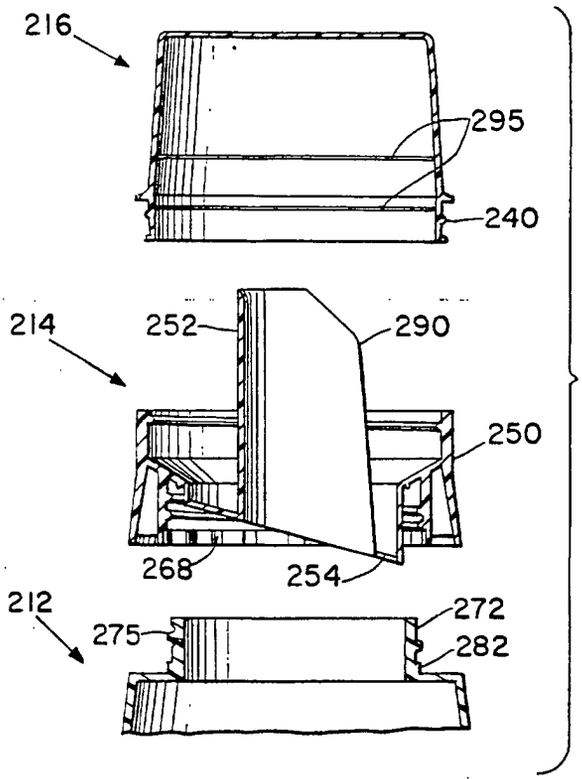


Fig. 7B

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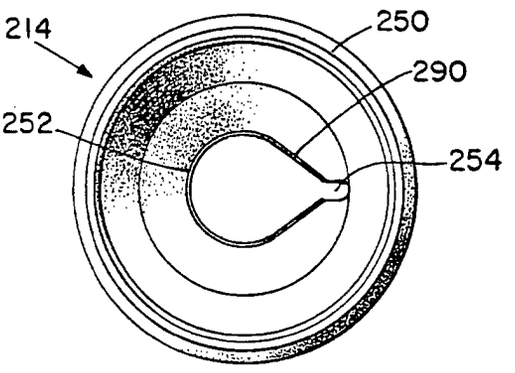
282

Fig. 8

Fig. 9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EUROPEAN SEARCH REPORT

Application Number
EP 00 10 1821

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	23 June 2000	Mr Luca del Monte

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