(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 269 920**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 87116573.4

(51) Int. Cl.⁴: B65D 51/14 , B65D 55/08

(22) Date of filing: 10.11.87

(30) Priority: 20.11.86 US 932676

(43) Date of publication of application:
08.06.88 Bulletin 88/23

(84) Designated Contracting States:
BE DE FR GB IT LU NL

(71) Applicant: ANCHOR HOCKING CORPORATION
109 North Broad Street
Lancaster Ohio 43130(US)

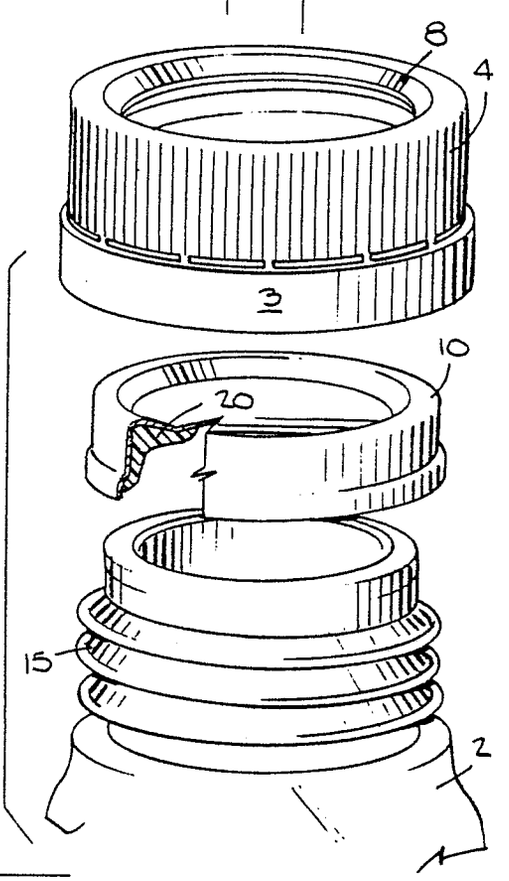
(72) Inventor: Ochs, Charles S.
2625 Graham Drive N.E.
Lancaster Ohio 43130(US)

(74) Representative: Leiser, Gottfried, Dipl.-Ing. et al
Pätentanwälte Prinz, Leiser, Bunke & Partner
Manzingerweg 7
D-8000 München 60(DE)

(54) An improved composite closure cap and package.

(57) A composite closure is described comprising a molded plastic ring (4) and a separate disc-like cover (10). The cover includes a gasket (20) providing both top and side sealing for preventing loss of vacuum during retorting or other package handling and a tamper indicating band (3) on the plastic ring is positioned for being moved to its tamper indicating position well before closure removal breaks the seal and releases the package vacuum.

Fig.2.



EP 0 269 920 A1

AN IMPROVED COMPOSITE CLOSURE CAP AND PACKAGE

BACKGROUND OF THE INVENTION

The present invention relates to closure caps for sealing glass or plastic containers and more particularly to an improved composite closure cap having a metal cover and molded plastic container engaging ring.

Composite closure caps are well known and are widely used which include a disc-like cover portion inserted into circular molded plastic ring with the ring providing threaded or other means for attaching the composite cap to the container. A sealing gasket is provided on the metal cover and tamper indicating means are provided sometimes in the form of a vacuum indicator button on the cover with or without an additional tamper indicating band provided as a portion of the molded plastic ring.

While such composite closures have found acceptance in various packaging uses, including vacuum packaging of food, prior composite closures have proven unsatisfactory for certain food packages where heat is applied during the sealing operations in retorting and otherwise. Additionally, the composite closures which rely on a tamper indicating band on the plastic ring have also presented problems resulting from a loss of vacuum and a breaking of the seal before the tamper indicating band was torn free to give a proper tamper indication.

Another present problem encountered with composite and other closures has resulted from possible contamination where bits of broken glass and other impurities have been able to enter into the product through openings between the closure and the container mouth. The improved closure of the present invention provides means for minimizing this difficulty.

Accordingly, an object of the present invention is to provide an improved composite closure cap.

Another object of the present invention is to provide a composite closure capable of maintaining its seal through retorting or other heating operations.

Another object of the present invention is to provide an improved composite closure with more effective tamper indicating means including a positive tamper indication before loss of the seal or the package vacuum.

Other and further objects of the present invention will become apparent upon an understanding of- the illustrative embodimetns abot to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a perspective view of the composite closure cap and package in accordance with the present invention.

FIG. 2 is an exploded perspective of the closure cap and container of the package of FIG. 1.

FIG. 3 is a vertical cross-sectional view of a preferred embodiment of the composite closure cap of the invention.

FIG. 4 is a vertical cross-sectional view of the sealed package in accordance with the present invention.

FIG. 5 is a vertical sectional view illustrating the initial portion of the closure cap removal with the cover maintaining a seal with the container.

FIG. 6 is a vertical sectional view illustrating the closure cap after removal from the container with the cover seal broken.

FIG. 7 is a vertical sectional view of an alternative embodiment of the composite closure illustrating a cover inserted through the top of the plastic ring.

Composite closures, as noted above, are in wide use particularly for sealing food packages. The following United States patents, for example, have been issued to the assignee of the present invention and these illustrate prior composite caps with a plastic sealing ring mounting a metal or plastic disc-like cover, i.e. Patents 3,930,589 of January 6 1976; 3,913,772 and 3,913,771 both of October 21, 1975.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the improved closure and package will now be described with particular references to FIGS. 1 thru 4.

The closure 1 is applied to and seals a glass or plastic container 2 with the integrity of the seal being indicated by a tamper indicating band 3 forming the lower portion of the plastic ring 4. As best illustrated in FIGS. 3 and 4 the molded plastic

ring 4 is formed with a skirt portion 5 including inwardly directed threads 6 for engaging cooperating threads 7 at the container mouth. A radially inwardly directed flange or partial cover 8 is formed at the top of the plastic ring 4. Together with the skirt portion 5 it forms a cover engaging corner with the inner cover edge 9 engaging and forcing the cover 10 into sealing engagement with the container rim 11. The tamper indicating band 3 forms the lower portion of the plastic ring 4 and it is attached to the skirt portion 5 of the plastic ring 4 at a line of weakness comprising an interrupted cut 12. The cut 12 extends completely around the plastic ring 4 and is interrupted periodically by break-away ridges 13. Other lines of weakness such as grooves or others may be used. The tamper indicating band 3 has an inwardly directed bead 14 for engaging a cooperating outwardly directed bead 15 on the container 2. The bead 14 has a sharply tapered lowered surface 16 to facilitate its passage over the container threads 7 and the container bead 15 during the container sealing operation. The upper surface 17 of the bead 14 is relatively horizontal to insure its engagement with the container bead 15 and to insure an adequate breaking force to tear the band 3 free when the closure 1 is removed in the manner illustrated in FIGS. 5 and 6. The lower edge of the tamper indicating band 3 has a downwardly projecting thin skirt portion 18 which acts as a barrier for glass particles or dirt or other contaminants during package shipment and storage to keep the contaminants out of any space behind the plastic ring 4 such as the circular space illustrated at 19 (FIG. 4).

FIG. 3 illustrates the preferred cover 10 and sealing gasket 20 positioned at the outer portion of the cover 10. The preferred material for the cover is tin plate although various rigid plastics including composites may be used to form the cover. The preferred cover 10 has a downwardly and inwardly tapered outer edge portion 21 and terminates at the outer edge of the cover 10 in a depending cover skirt 22. The plastisol or other flowed-in sealing gasket 20 is positioned in the corner between the skirt 22 and the tapered portion 21. It has a substantially vertical and relatively thick side sealing portion 23 covering the skirt 22 from its lower edge and has a radially inwardly directed top sealing portion of decreasing thickness towards its radial inner edge 24.

FIG. 4 illustrates the closure 1 in its sealed position with the cover 10 held tightly against the container rim 11 by the flange 8 of the band 4 with the top sealing portion of the gasket 20 pressed into sealing engagement with the container rim 11 and with the side sealing portion pressed into sealing engagement with a generally cylindrical and smooth side sealing surface 25 at the container rim.

This form of cover 10 and seal has a number of advantages. One advantage is the resistance of the closure 1 to vacuum loss or other loss of seal due to minor dimensional changes in the closure ring 4 or cover 10 during handling and particularly during retorting where the package is subjected to a raised temperature. Even though the plastic ring 4 may move outwardly and/or upwardly with a corresponding upward or radial movement of the cover 10, either the top sealing portion or the side sealing portion of the gasket 20 will remain in sealing contact with the container 2. If the cover 10 is formed with a raw edge at the lower edge of its skirt 22, the edge is preferably coated with a rust preventing coating.

At the lower portion of the plastic ring 4, FIG. 4 illustrates the tamper indicating band 3 having its bead 14 engaged with a cooperating bead 15 on the container. FIG. 4 also illustrates the preferred plastic ring 4 threads 6 being in firm engagement with the container threads 7 and having substantial cross-sections for providing an effective and stable threaded connection between container 2 and closure 1. The lower surface of the bead 14, as well as the lower surfaces of the threads 6 on the plastic ring 4, have a sharp taper or acute angle with the verical facilitating the application of the closure 1 and in particular permitting the tamper indicating band 3 to move readily downwardly into its engaged position without fracturing during closure 1 application. The generally horizontal upper surface of the bead 14 as well as the upper surfaces of the plastic ring threads 6 assist in providing a firm sealing action.

FIG. 4 also illustrates the downwardly depending skirt 18 provided on the tamper indicating band 3 which acts as a barrier preventing the entry of glass particles or other contaminants behind the tamper indicating band 3 or other portions of the plastic ring 4. The preferred shape of the container 1 neck adjacent the tamper indicating band 3 has a steeply inclined upper portion 26 as well as a steeply inclined connecting portion 27 between the portion 26 and the remainder of the container 1 whereby the upper portion permits the tamper indicating band skirt 18 to be positioned immediately adjacent to the container 1 surface as a barrier and to prevent any accumulation of particles on the container 1 at 27.

FIG. 5 illustrates an initial opening of the package as the closure 1 is turned only slightly upwardly to the position illustrated where the plastic ring 4 is clear of the cover 1 and the tamper indicating band 3 has been broken free. The tamper indicating band 3 drops to the position illustrated giving a clear indication that the closure 1 has been tampered with or lifted itself from the package. An

abutment ring 28 in the ring 4 is still positioned slightly below the lower edge of the cover skirt 22 so that it is ineffective in lifting the cover 10 to break the package vacuum. The upper portion of the plastic ring 4 therefore has a "floating action" permitting a short vertical movement before the cover 10 is lifted clear of the container 1 to break the vacuum thereby assuring a clear indication by the downward movement of the tamper indicating band 3.

FIG. 5 illustrates the package after the closure has been further removed and as the abutment ring 28 on the plastic ring 4 has lifted the cover 10 clear of the container rim 11 to break the seal and release the package vacuum.

FIGS. 3 thru 6 illustrate a cover with a vacuum indicating button 29 providing a secondary tamper indication and FIG. 6 shows the button 29 in its raised or vacuum released position.

FIG. 7 illustrates another embodiment of a composite closure cap 30 in which the plastic ring 31 has a modified upper portion which permits the cover to be inserted in the plastic 31 ring from the top. In this embodiment the cover 32 is pressed downwardly permitting its flexible outer hooked edge 33 to snap under the top bead 34 on the plastic ring 31. The cover 32 includes the above described top and side seal gasket shape, as well as the cover spacing which permits the floating action described above and the positive tamper indicator band action for indicating tampering before the package vacuum has been destroyed.

It will be seen that an improved composite closure is provided which gives protection against loss of seal or vacuum during package handling and/or retorting and additionally provides a package which gives a positive tamper indicating ring action in advance of package vacuum loss. The improved closure also provides a package with increased resistance to the entry of glass particles or other contaminants which may lodge behind closure cap skirts and thus enter the package during package opening.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Claims

1. A composite closure cap for sealing a container comprising the combination of a molded plastic ring and a separate closure cover contained in said plastic ring, said container having top and side sealing surfaces at its rim, and said cover having a sealing means forming a seal with both said top and side sealing surfaces.

2. The closure cap as claimed in Claim 1 in which said top sealing surface comprises a flat circular sealing surface and said side sealing surface comprises a right circular cylindrical surface.

3. The closure cap as claimed in Claim 1 in which said cover comprises a generally circular disc with the depending flange at its edge mounting for the sealing means for said side sealing surface.

4. The closure cap as claimed in Claim 1 which further comprises a tamper indicating band positioned at the lower edge of said plastic ring and detachably connected thereto for removal during removal of the closure cap from the container.

5. The closure cap as claimed in Claim 4 which further comprises lift means for engaging said cover flange positioned on said plastic ring and spaced downwardly from the lower edge of said flange.

6. The closure cap as claimed in Claim 5 in which said lift means comprises a radially inwardly directed circular bead on said plastic ring.

7. The closure cap as claimed in Claim 4 in which said tamper indicating band has a downwardly extending relatively narrow skirt forming its bottom portion and for acting as a contaminant barrier with the container.

8. The closure cap as claimed in Claim 4 in which said tamper indicating band includes a radially inwardly directed container engaging bead positioned to engage a cooperating bead on the container for tearing the tamper indicating band free of the plastic ring during closure cap removal.

9. The closure cap as claimed in Claim 3 which further comprises a corrosion resisting coating on the lower edge of said cover flange.

10. The closure cap as claimed in Claim 4 in which the means for detachably connecting said tamper indicating band comprises an interrupted circular slot.

11. The closure cap as claimed in Claim 4 in which the means for detachably connecting said tamper indicating band comprises a circular groove extending partially through said plastic ring.

12. A composite cap for vacuum sealing a container comprising the combination of a molded plastic ring and a separate closure cover contained in said plastic ring and having a tamper indicating band positioned at the lower edge of said plastic ring and detachably connected thereto for removal during removal of the closure cap from the container having sufficient free travel between the molded plastic ring and the separate closure cover to cause the breaking of the detachably connected

tamper indicating ring for indicating tampering before the vacuum seal of the separate closure cover is released.

13. The closure cap as claimed in Claim 12 which further comprises lift means for engaging said cover positioned on said plastic ring and spaced downwardly from the lower edge of said cover.

14. The closure cap as claimed in Claim 13 in which said lift means comprises a radially inwardly directed circular bead on said plastic ring.

15. A sealed package comprising a composite closure cap sealing a container, said closure cap comprising the combination of a molded plastic ring having container engaging threads and a separate closure cover contained in said plastic ring, said container having top and side sealing surfaces at its rim and closure engaging threads, said cover having a sealing means forming a seal with both said top and side sealing surfaces.

16. The package as claimed in Claim 15 in which said top sealing surface comprises a flat circular sealing surface and said side sealing surface comprises a right circular cylindrical surface.

17. The package as claimed in Claim 15 in which said cover comprises a generally circular disc with the depending flange at its edge mounting for the sealing means for said side sealing surface.

18. The package as claimed in Claim 17 which further comprises lift means for engaging said cover flange positioned on said plastic ring and spaced downwardly from the lower edge of said flange.

19. The package as claimed in Claim 18 in which said lift means comprises a radially inwardly directed circular bead on said plastic ring.

20. The package as claimed in Claim 15 which further comprises a tamper indicating band positioned at the lower edge of said plastic ring and detachably connected thereto for removal during removal of the closure cap from the container.

21. The package as claimed in Claim 20 in which said tamper indicating band has a downwardly extending relatively narrow skirt forming its bottom portion and for acting as a contaminant barrier with the container.

22. The package as claimed in Claim 20 in which said tamper indicating band comprises a radially inwardly directed container engaging bead positioned to engage a cooperating bead on the container for tearing the tamper indicating band free of the plastic ring during closure cap removal.

23. The package as claimed in Claim 17 which further comprises a corrosion resisting coating on the lower edge of said cover flange.

24. The package as claimed in Claim 20 in which the means for detachably connecting said tamper indicating band comprises an interrupted circular slot.

25. The package as claimed in Claim 20 in which the means for detachably connecting said tamper indicating band comprises a circular groove extending partially through said plastic ring.

26. The package as claimed in Claim 22 in which said container has relatively steeply inclined side walls below said cooperating bead.

27. A sealed package comprising the combination of a composite closure sealing a container and said closure having a molded plastic ring and a separate closure cover contained in said plastic ring and having a tamper indicating band positioned at the lower edge of said plastic ring and detachably connected thereto for removal during removal of the closure cap from the container having sufficient free travel between the molded plastic ring and the separate closure cover to cause the breaking of the detachably connected tamper indicating ring for indicating tampering with the package before the vacuum seal of the separate closure cover is released.

28. The sealed package as claimed in Claim 27 which further comprises lift means for engaging said cover positioned on said plastic ring and spaced downwardly from the lower edge of said cover.

29. The sealed package as claimed in Claim 28 in which said lift means comprises a radially inwardly directed circular bead on said plastic ring.

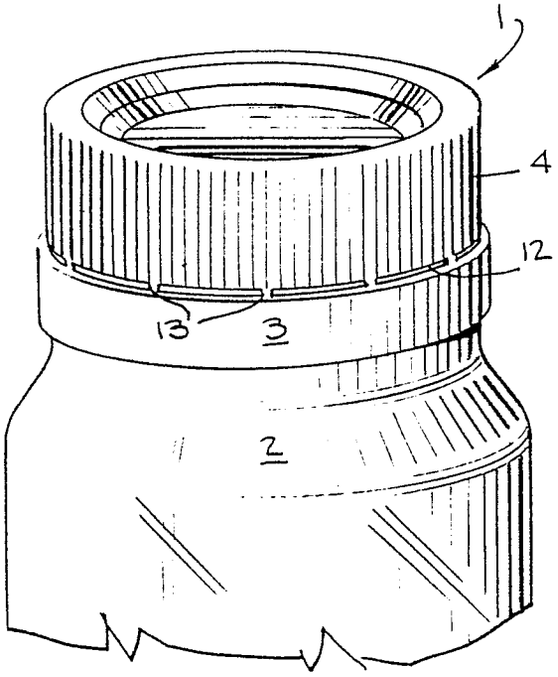


Fig. 1.

Fig. 2.

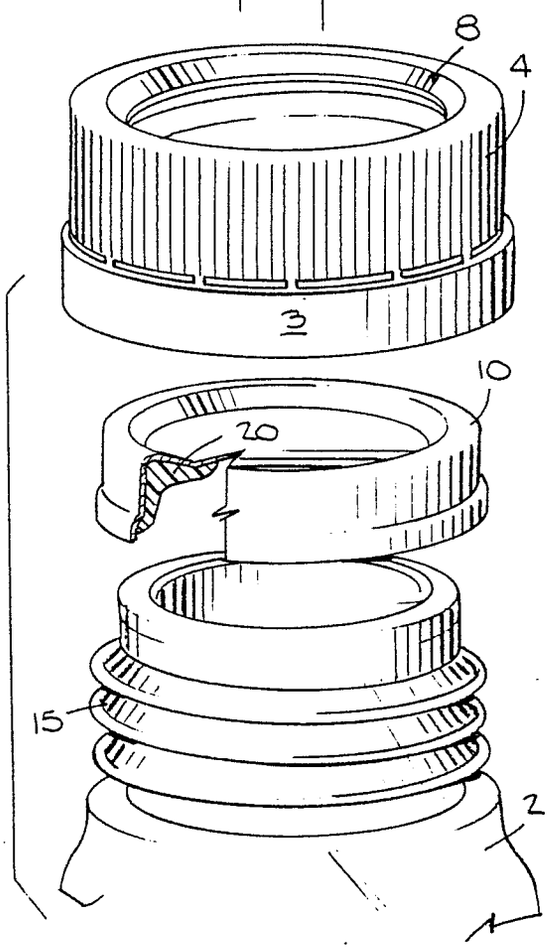
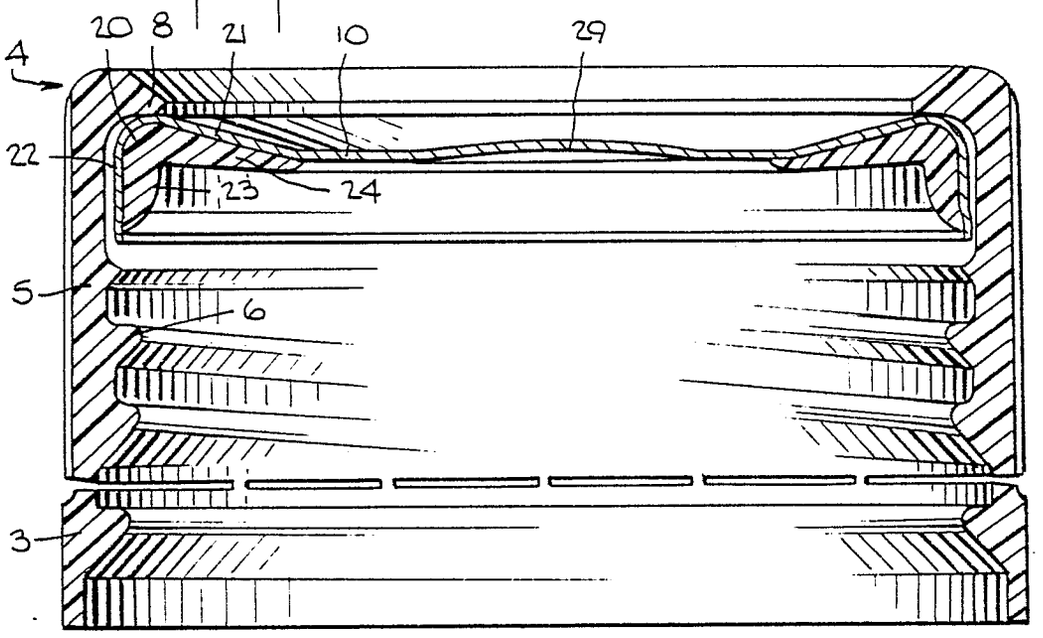


Fig. 3.



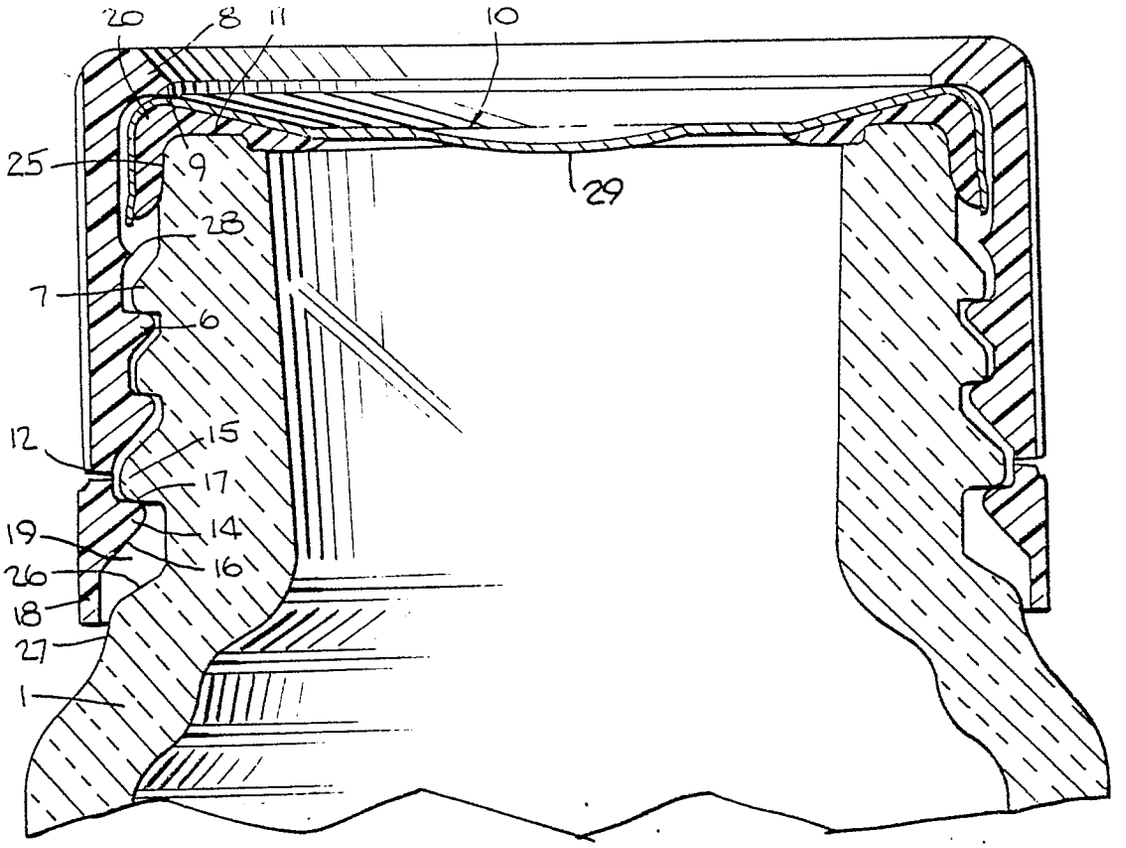

20
8
11
10
25
9
29
28
7
6
12
15
17
19
14
26
16
18
27
1

Fig.4.

Fig.5.

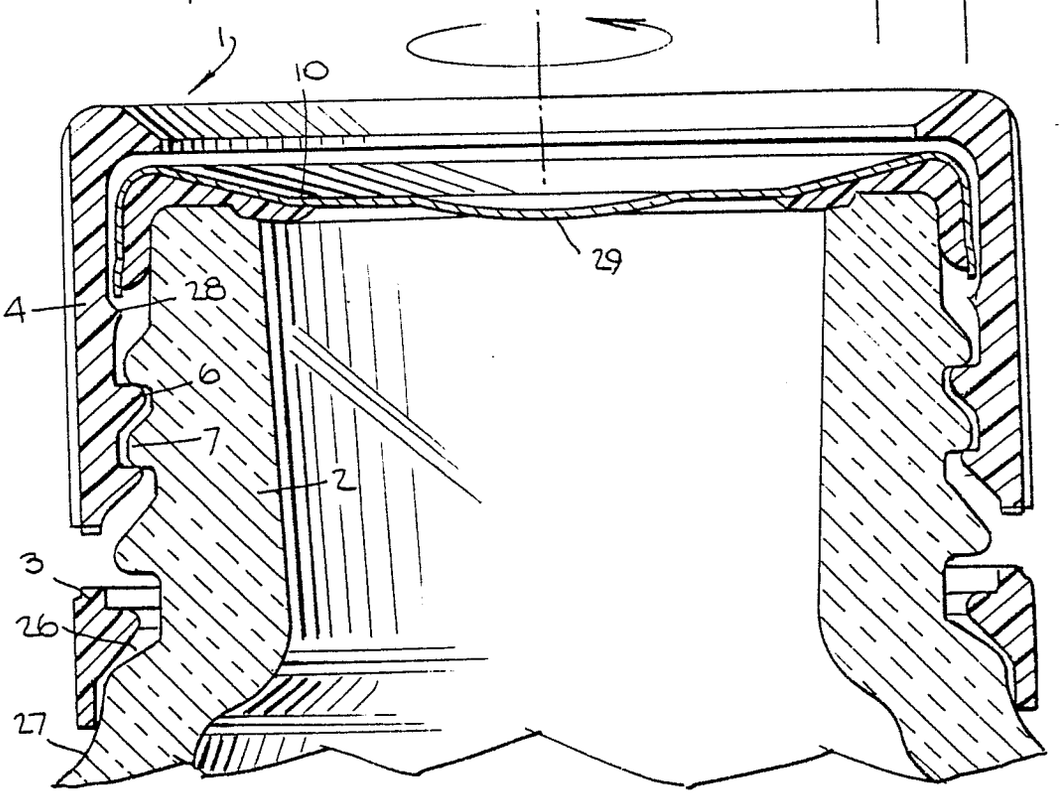

1
10
29
4
28
6
7
2
3
26
27

Fig. 6.

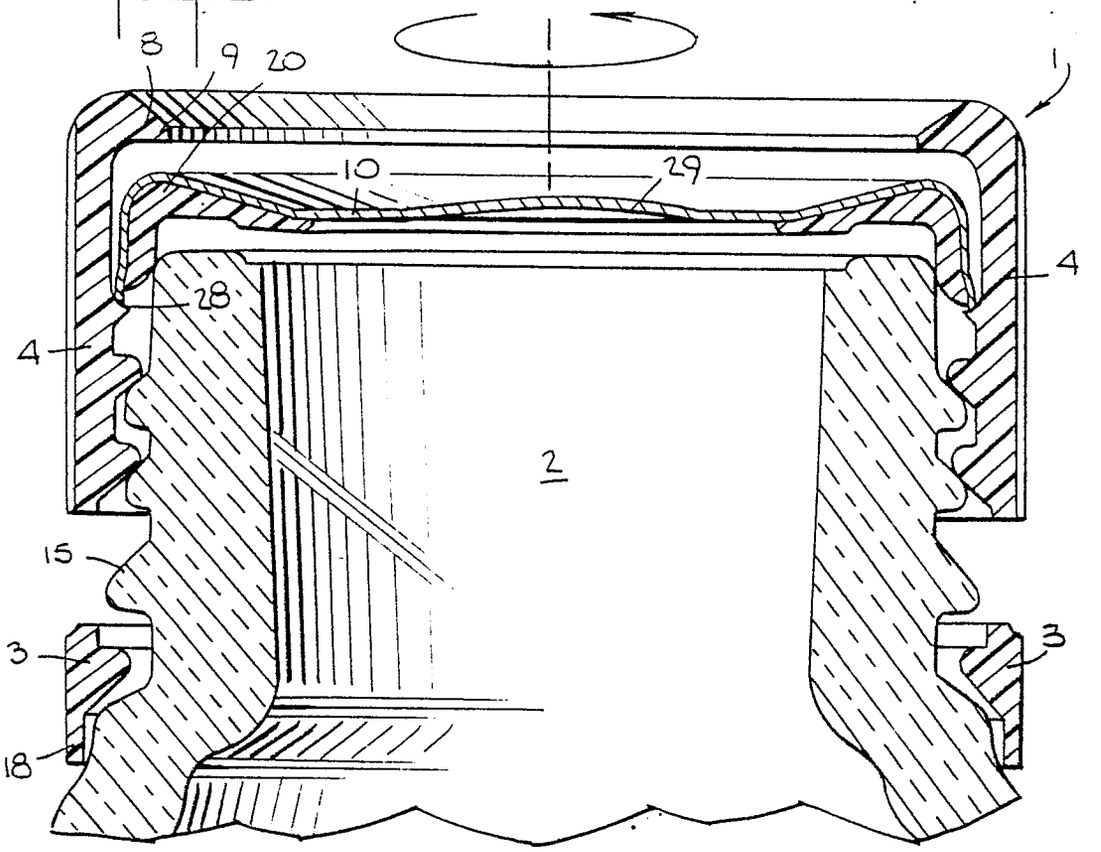
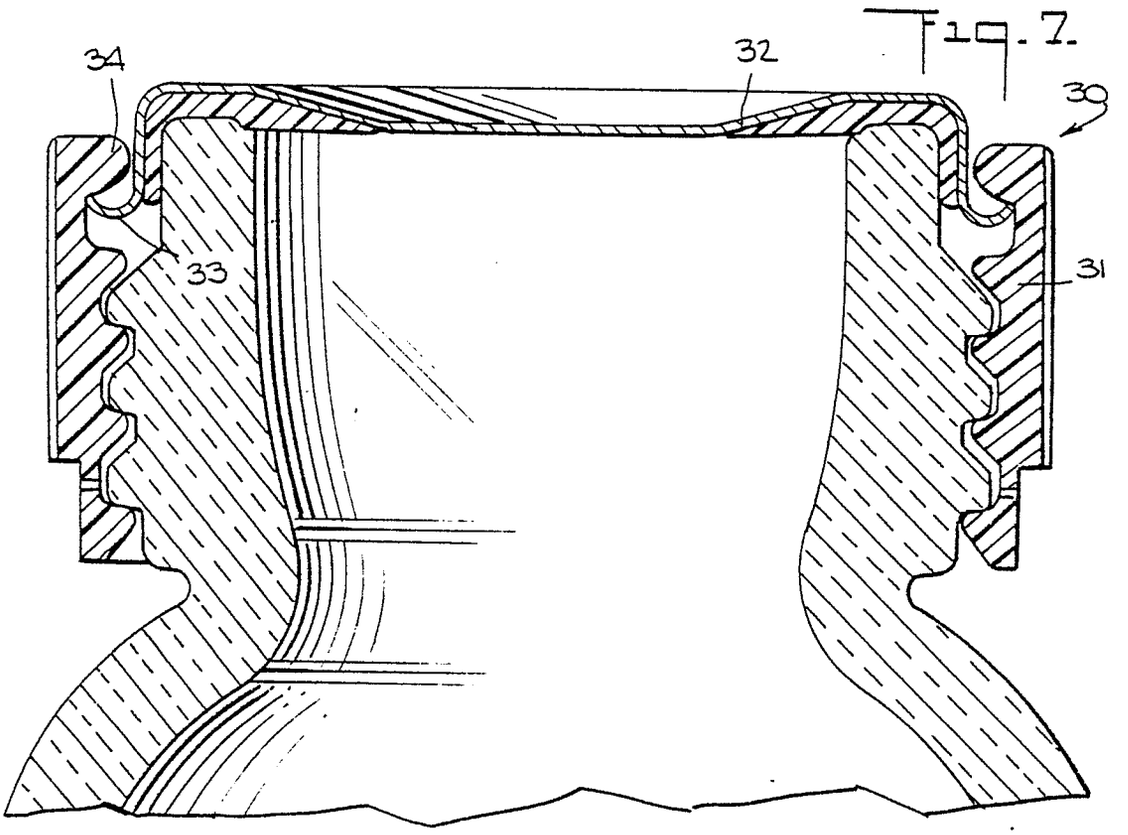


Fig. 7.



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 87 11 6573

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.4)
X	EP-A-0 080 142 (ERNST) * Page 1, line 19 - page 2, line 6; page 3, lines 19-35; page 6, line 13 - page 7, line 18; page 8, line 22 - page 9, line 15; figures *	1-6,8, 12-20, 22,26-29	B 65 D 51/14 B 65 D 55/08
X	EP-A-0 096 582 (CONTINENTAL WHITECAP) * Page 2, line 11 - page 3, line 19; page 5, lines 1-36; figures *	1-3,5,6 ,9,15-19,23	
P,X	EP-A-0 201 613 (ACI AUSTRALIA LTD) * Abstract; page 2, lines 6-14; page 5, line 30 - page 6, line 14; page 10, line 24 - page 11, line 15; page 12, line 27 - page 13, line 15; figures 1,2,4,6 *	1-8,10-22,24-26	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	16-02-1988	NEWELL P.G.

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 (P0401)