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(56) Documents cited

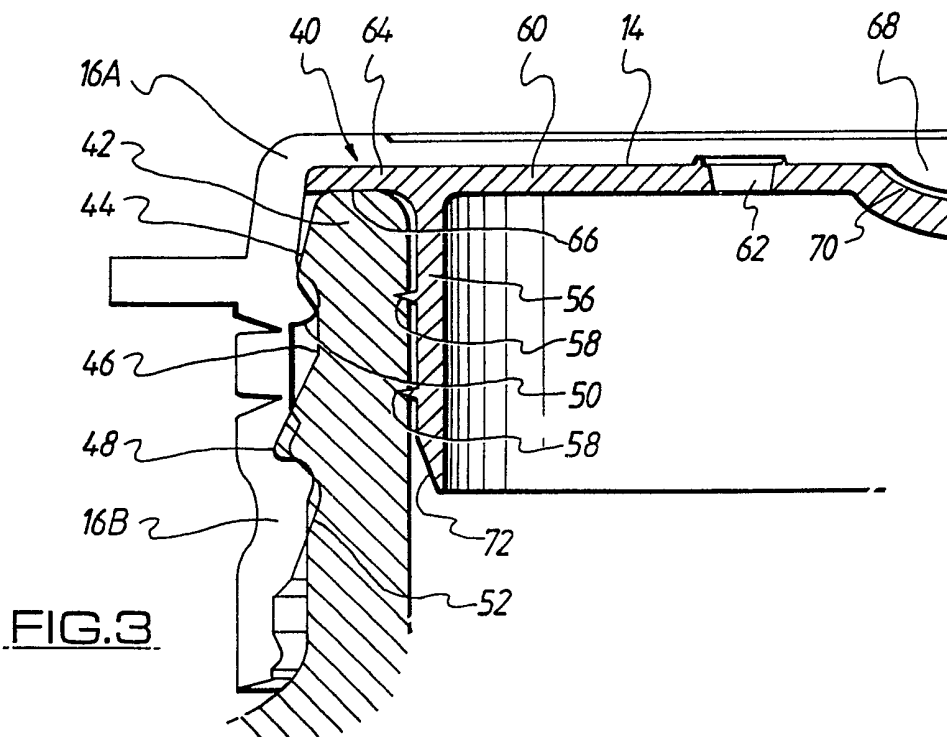
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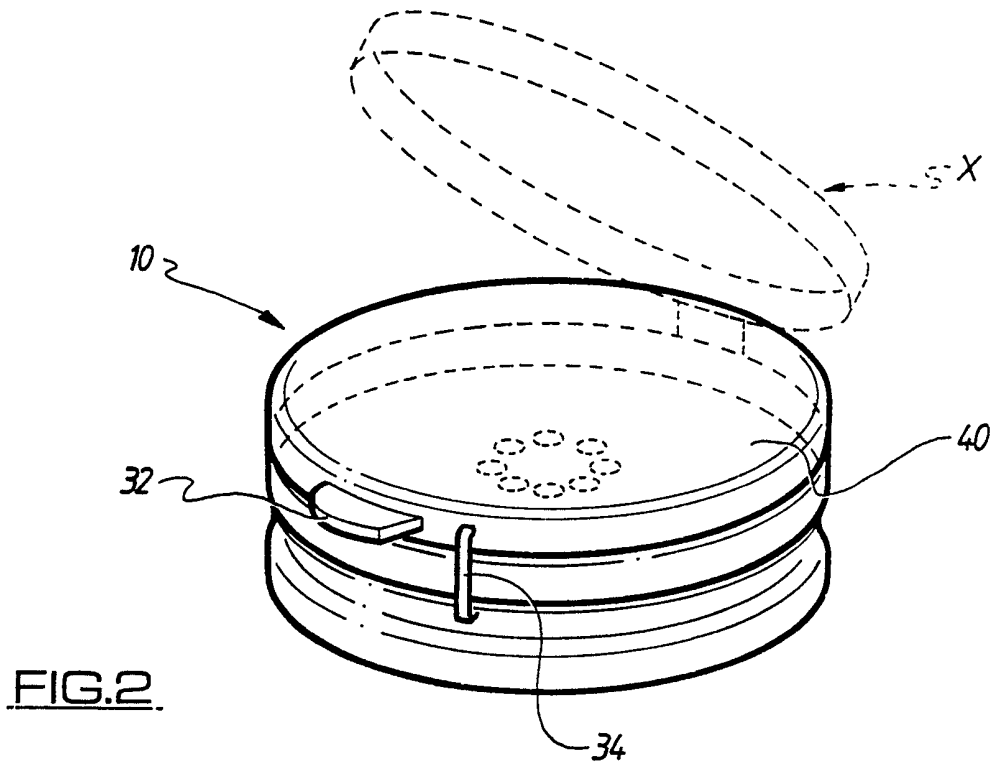
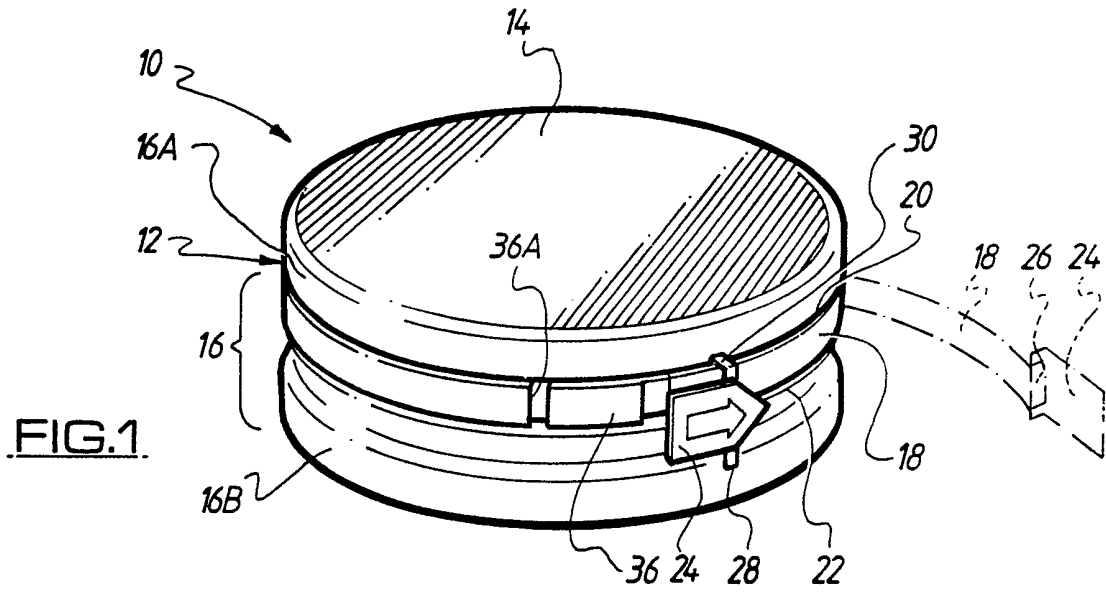
(58) Field of search

UK CL (Edition K) B8T TCM TDAX TRE TTB TWX  
INT CL<sup>5</sup> B65D 39/00 39/04 41/28 41/58 51/18

(54) Closures

(57) A closure comprises a cap 16A, 16B and a plug 40 loosely located inside the cap so that when the closure is applied by push fitting, the plug is forced into a mouth 42 of a container and the cap fits over the mouth. A tear band (18, fig 1) may be provided part of the way round the cap, enabling the top of the cap 16A to be hinged open to expose the plug which may have apertures 62 enabling the container's contents to be dispensed by being sprinkled through the apertures. The plug may be retained in the mouth by circumferential ribs 58, and the cap may have a retention band 52 which snaps under a ring 48 on the container. The band may also serve to retain the plug in the cap before the closure is applied. The top part 60 of the plug may have a smaller radius than the outside of the container mouth (fig 8), to allow removal of the top of the cap without interfering with the top of the plug.





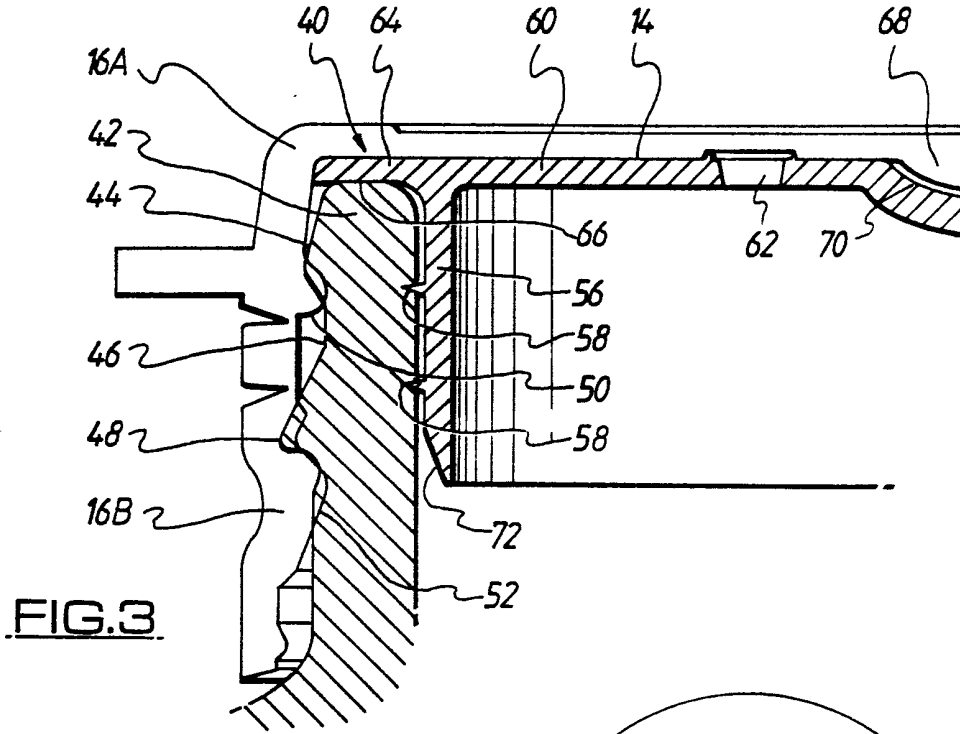


FIG. 3.

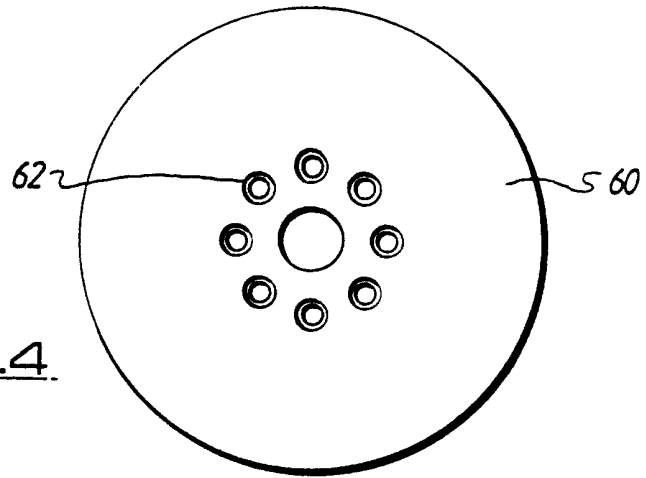


FIG. 4.

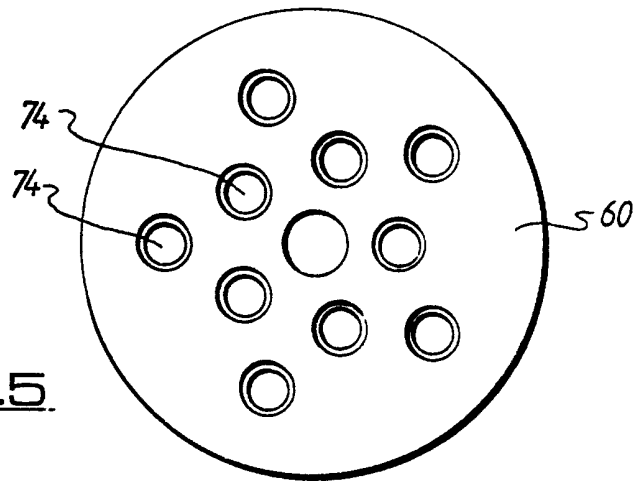


FIG. 5.

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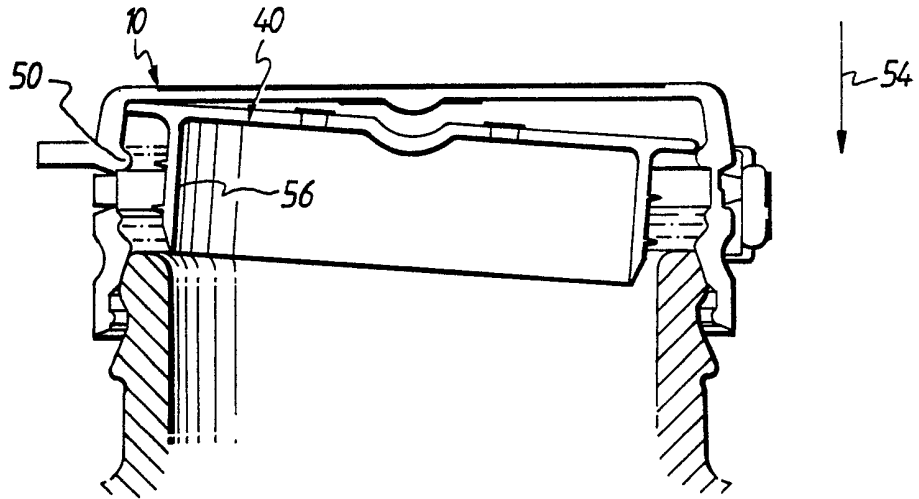


FIG. 6

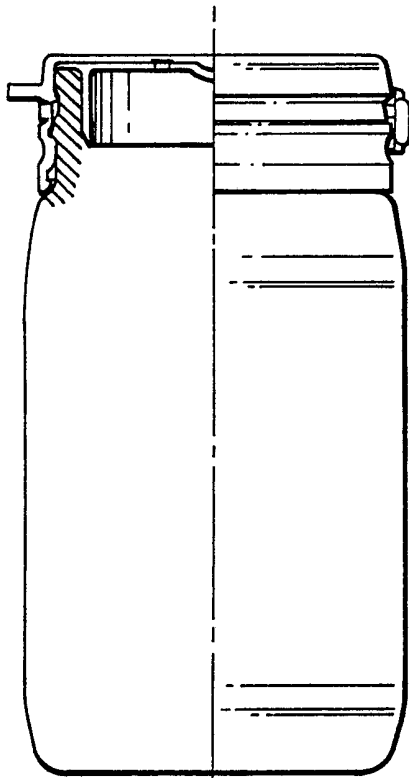


FIG. 7

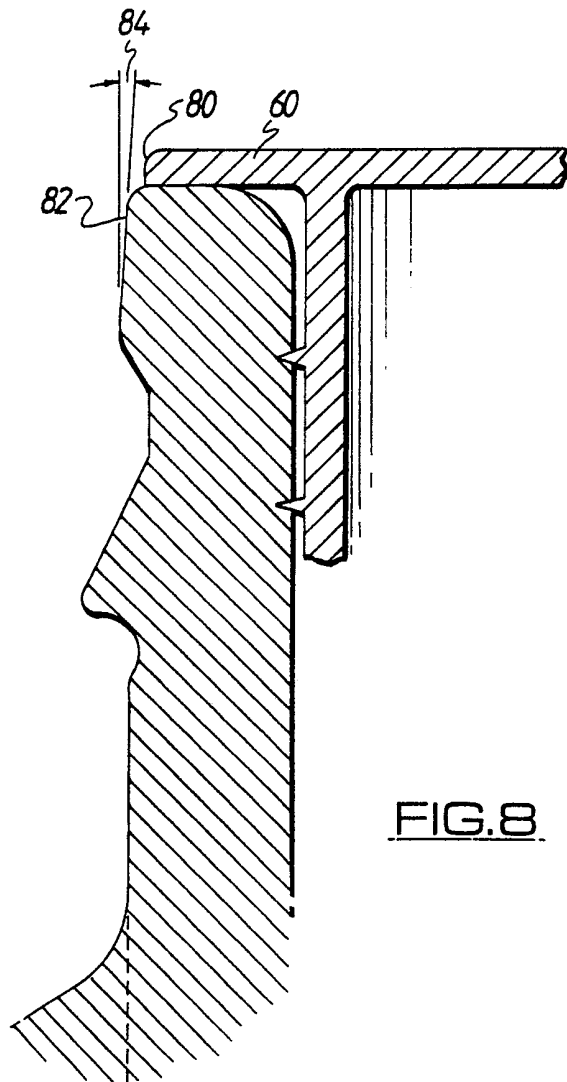


FIG. 8

## Improvements Relating to Closures

This invention relates to (TE) closures such as tamper evident, which are in the nature of caps embodying means whereby the cap will show any to unauthorised removal.

There are many forms of TE closures currently utilised for the closing of the tops of bottles and containers, and the present invention although relating to TE closures, is not specifically concerned with the TE feature, at least not in the general concept, although in the other forms of the invention a TE closure having specific constructional features is envisaged.

TE closures may be applied to bottle necks either by a screwing or pushing action, or by a combination of both, and they all have the common feature that once applied, it is difficult to remove the closure without the said TE means indicating that the closure has been opened or in the case of unauthorised opening, has been tampered with.

The present invention in fact comprises the combination of a TE closure cap in combination with a closure plug which fits into the mouth of the bottle when the closure is applied, said plug being loosely retained in the cap prior to application to the bottle or other container.

Preferably, the closure plug will be provided with one or more apertures, whereby when the closure is used with a bottle or other container in which is contained a sprinklable material or liquid, the said material can be sprinkled or poured or squeezed through said aperture or apertures when the closure cap is opened. Where squeezing takes place, the container preferably will be flexible.

The closure plug may comprise simply a sleeve portion which fits frictionally into the bottle or other container mouth, and a plate portion which blanks off one end of the sleeve except for said aperture or apertures, said plate portion being of a larger size than the sleeve portion so as to provide an overhanging lip or ledge which seats upon the top edge of the bottle or other container mouth when the closure is applied.

The said sleeve portion may have on its outer surface circumferential interference ribs which frictionally engage the inner surface of the bottle or other container on the inner surface thereof at the mouth region.

The said closure plug plate may be of a size only slightly smaller than the size of the outer edge of the bottle mouth end so that in the subsequent removal of the closure cap or a portion thereof, for example in the manner hereinafter defined, the said plate portion will not interfere with the removal of the cap and hence the cap will remain in position frictionally fitted into the bottle or other container mouth as the cap is removed.

Preferably, the cap comprises a top and a skirt, said skirt embodying intermediate the ends thereof a tear band defined by spaced lines of weakening in the skirt, said tear band comprising a finger grip portion which is grasped and pulled for removal of the band in order to open the closure, said band dividing the skirt into an upper portion which remains integral with the top, and a lower band which remains on the bottle or other container neck in that said lower portion is provided with an inwardly directed retention bead which engages to the underside of a retention bead on the bottle neck on the outer surface thereof. The tear band does not extend completely around the skirt, so that a hinge portion

connects the upper and lower skirt portions when the tear band has been removed so that the cap top and upper skirt portion can be hinged as a unit clear of the top of the container mouth to expose the dispensing plug so that the sprinklable material inside the bottle or other container can be dispensed through the plug. The cap top and upper skirt portion can be rehinged to reclose the container mouth and once more to cover the dispensing plug when the container is not in use.

The inner bead provided on the lower skirt portion of the cap preferably serves the several functions of retaining the plug loosely fitted in the cap prior to application of the closure to the container, as well as serving as the means for engaging the underside of the retaining bead on the outer surface of the container mouth to prevent unauthorised removal of the closure cap from the container.

The closure cap and dispensing plug preferably are formed from synthetic plastics material of suitable rigidity to enable the closure to perform its function, but also to enable the closure to be applied springingly to the container mouth.

An embodiment of the present invention, and a modification of the dispensing plug, will now be described, by way of example, with reference to the accompanying drawings, wherein:-

Fig. 1 is a perspective view of a dispensing closure according to the embodiment of the invention from a first direction;

Fig. 2 is a view similar to Fig. 1, but from another direction;

Fig. 3 is a sectional elevation of the closure of Figs. 1 and 2 when applied to a container mouth;

Figs. 4 and 5 respectively are plan views of two closure plug dispensing aperture arrangements;

Fig. 6 is a sectional elevation showing how the closure is positioned prior to application to the container neck;

Fig. 7 shows a container with the closure applied to the neck thereof, the figure being in half section; and

Fig. 8 shows to a greater scale, and in section, the closure plug when fitted in the container neck and when provided with a modified construction.

Referring to the drawings, in Fig. 1 is shown a closure 10 which comprises a cap 12 having a top 14 and a skirt 16 extending from the top 14.

The skirt 16 is provided with a tear band 18 defined by a pair of parallel circumferential lines 20, 22 of weakening. The tear band 18 splits the skirt 16 into an upper portion 16A which is integral with top 14 and a lower portion 16B which as will be explained hereinafter remains on the container when the cap is opened.

The tear band 18 is provided with an integral finger grip 24 connected thereto by a connecting portion 26 and frangible bridges 28 and 30 respectively connect the finger grip 24 to the lower skirt portion 16B and the upper skirt portion 16A.

To the other side of the cap 10 as shown in Fig. 2, the upper skirt portion 16A has a lifting tab 32, and a further frangible bridge 34 adjacent tab 32 bridges the upper and



lower skirt portions 16A and 16B.

To open the cap of Figs. 1 and 2 after it has been applied to the container mouth, the user grips finger grip 24 and tears away band 18 as shown in dotted lines in Fig. 1. The band 18 does not extend entirely around the closure cap, but stops at location 36A so that in fact a hinge portion 36 connects the upper and lower skirt portions after the tear band 18 has been removed. This enables the top 14 and the integral upper skirt portion 16A to be hinged to an open position as shown at X in Fig. 2 in dotted lines, exposing a plug portion 40 of the closure which is positioned and functions in the manner hereinafter described.

As can be appreciated, the outer profile of the container mouth and the inner profile of the cap 10 are significant in terms of the connection of the cap to the container mouth, to enable the cap to perform its functions, and referring to Figs. 3 and 8, these drawings show details of the container mouth and cap.

As can be seen from Fig. 3, the container mouth 42 in outer profile comprises a first retention ledge 44 followed by a recess 46, followed by a tamper prevention bead 48 in a top to bottom direction.

The cap 10 on its inner surface is provided with a first retention bead 50 integral with the upper skirt portion 16A, and the lower skirt portion 16B is provided with a tamper resistant bead 52. In Fig. 3, the outer profile of the container and the inner profile of the cap 10 are shown as overlapping to indicate the degree of interference which takes place, but obviously the cap will be stressed so that the bead 50 will be retained under the projecting bead 44, and the bead 52 will be retained under the projecting rim 48.

The closure is adapted to be applied to the bottle mouth 42 by being pushed onto the bottle mouth as indicated by arrow 54 in Fig. 6.

Also shown in Fig. 3 is the closure plug 40, which comprises a sleeve portion 56 which as shown fits into the container mouth 42, and is provided with interference with ribs 58 which frictionally engaged the inner surface of the mouth, and which extend circumferentially of the sleeve 56. The closure plug also has a top plate 60 which in the embodiment of Fig. 4 is provided with a ring of dispensing apertures 62. The plate 60 is of a greater diameter than the sleeve 56 so as to define an overhanging ledge 64, which in the position of Fig. 3 rests upon the upper edge 66 of the container mouth 42. The plug 40 in fact reaches the Fig. 3 position in the application of the closure to the container mouth, and in this connection for the centralising of the plug the inner surface of the top 14 of the cap is provided with a protuberance 68 which engages a centrally located recess 70 in the plug 40.

When the cap and plug are fitted together, as shown in Fig. 6, the plug 40 is in fact a loose fit inside the cap but the bead 40 has an inner dimension which is slightly smaller than the outer dimension of the plate 60 of the plug, so that whilst the plug fits loosely in the cap it cannot fall therefrom during the application of the closure to the container. In the arrangement of Fig. 6, the plug is shown in the worst misalignment position and with the cap prepositioned on the bottle mouth prior to final application of the closure. In this connection, the outer surface of the container mouth at the end thereof is chamfered, and this chamfered face engages a correspondingly chamfered face on the inner profile of the cap as will be apparent from Fig. 6 to facilitate pushing home of the closure. Also, the lower

edge of the sleeve 56 of the plug is tapered as indicated by reference 72 in Fig. 3, which also facilitates pressing home of the closure to the Fig. 3 position.

Fig. 5 shows an alternative closure plug to that shown in Fig. 4, wherein the dispensing apertures 74 are arranged slightly differently in that they are arranged to lie on two different diameters of concentrically arranged circles. In the circumstances any hole arrangement may be adopted as required.

The use of the closure cap thus far described will be apparent from the above, but it is mentioned that the closure cap is applied to the mouth of the container by pressure application, which forces the plug frictionally to engage the inner surface of the container mouth, and for the cap to engage in a tamper resistant manner on the neck of the container.

In the use of the container with closure applied, the user first of all removes the tear band 18 as described and then the top 14 and integral skirt portion 16A can be flipped upwardly as shown in Fig. 2 to expose the plug 40 so that the container contents can be sprinkled therefrom. The flipped up top portion can be re-applied to the container mouth at the top end by clipping the top back to the position in which the bead 50 lies under the rim 44.

In the modified arrangement of Fig. 8, the plate 60 of the plug is made of slightly lesser diameter, and its top corner is rounded as indicated at 80, whilst the chamfered face 82 of the container mouth at the outer side thereof is made of a shallower chamfer angle 84, for example in the order of  $5^{\circ}$  compared with the  $15^{\circ}$  or thereabouts arrangement of the previous embodiment.

By adopting this particularly suitable arrangement, when the top with the skirt portion 16A is flipped to the open position, there is no danger of the flipped portion interfering with the plate 60, causing upwards displacement of the plug from the mouth of the container which can happen if such interference does occur. It is therefore a specific advantage of this feature that the plug top plate and the container mouth extremity are designed to avoid this interference.

The plug and cap may be formed by injection moulding in any suitable plastics or the like material.

The present invention provides an extremely effective closure for a container from which the product is to be sprinkled, in that the sprinkling plug is applied as part of the closure along with a cap which provides tamper resistance and evidence.

CLAIMS

1. A closure for a bottle, jar or the like container having a mouth, said closure comprising a closure plug adapted to fit into the mouth of the bottle, jar or the like container when the closure is applied, said plug being loosely retained in said cap prior to application to the bottle or other container.
2. A closure according to Claim 1, wherein the closure plug comprises one or more apertures, whereby when the closure is used with a bottle or other container in which is contained a sprinklable material or liquid, the said material can be sprinkled or poured or squeezed through said aperture or apertures when the closure cap is opened.
3. A closure according to Claim 1 or 2, wherein the closure plug comprises a sleeve portion which fits frictionally into the bottle or other container mouth, and a plate portion which blanks off one end of the sleeve except for said aperture or apertures, said plate portion being of a larger size than the sleeve portion so as to provide an overhanging lip or ledge which seats upon the top edge of the bottle or other container mouth when the closure is applied.
4. A closure according to Claim 3, wherein said sleeve portion has on its outer surface circumferential interference ribs which frictionally engage the inner surface of the bottle or other container on the inner surface thereof at the mouth region.
5. A sleeve according to any of Claims 1 to 4, wherein the cap comprises a top and a skirt, said skirt embodying intermediate the ends thereof a tear band defined by spaced lines of weakening in the skirt.

6. A closure according to Claim 5, wherein said tear band comprises a finger grip portion which is grasped and pulled for removal of the band in order to open the closure, said band dividing the skirt into an upper portion which remains integral with the top, and a lower band which remains on the bottle or other container neck.

7. A closure according to Claim 6, wherein the said lower portion is provided with an inwardly directed retention bead which is adapted to engage the underside of a retention bead on the neck of the bottle or like container.

8. A closure according to Claim 7, wherein said retention bead on the closure serves to hold the closure plug loosely in the cap.

9. A closure according to Claim 7 or 8, wherein the tear band does not extend completely around the skirt and a hinge portion connects the upper and lower skirt portions when the tear band has been removed so that the cap top and upper skirt portion can be hinged as a unit clear of the top of the container mouth to expose the dispensing plug so that the sprinklable material inside the bottle or other container can be dispensed through the plug.

10. A closure substantially as hereinbefore described with reference to Figs. 1 to 6 of the accompanying drawings.

11. The combination of a bottle, jar or the like container having a mouth closed by a closure according to any one of the preceding claims, the plug of the closure being a friction fit inside the mouth of the container.

12. The combination according to Claim 11, wherein the said closure is according to Claim 3 or any claim when dependent

upon Claim 3, wherein the closure plug plate is of a size only slightly smaller than the size of the outer edge of the bottle mouth end so that in the subsequent removal of the closure cap or a portion thereof.

13. The combination according to Claim 12, wherein the container mouth on the outer surface thereof is chamfered at an angle of approximately  $5^{\circ}$ .

14. The combination according to Claim 13, wherein the chamfered surface of the mouth leads to a flat support surface on which the plate portion rests, the outer edge of the plate portion lying inwardly of where the chamfered surface meets the flat surface.

15. The combination according to Claim 14, wherein the said outer edge is radiussed into the top surface of the plate portion.

16. The combination of a closure and container whose mouth is closed by the closure, substantially as hereinbefore described with reference to Figs. 7 and 8 of the accompanying drawings.

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

9208278.3

**Relevant Technical fields**

- (i) UK Cl (Edition K ) B8T (TTB, TCM, TRE, TWX, TDAX)
- (ii) Int Cl (Edition 5 ) B65D: 39/00, 39/04, 41/28, 41/58, 51/18

Search Examiner

J D STEVENS

**Databases (see over)**

(i) UK Patent Office

(ii)

Date of Search

21 JULY 1992

Documents considered relevant following a search in respect of claims

1-6

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
Y	GB 1316163 (CAPTOCAP) - see especially Figure 3, tear strip 13, circumferential rib 34	4-7
X,Y	GB 1225889 (DUKESS) - see especially Figure 1, page 2 lines 40-54	X: 1 Y: 2-7, 11,12
Y	GB 701766 (HOPF) - see especially Figure 2, sleeve t, plate f	2-7,11,12





Category	Identity of document and relevant passages	Relevant to claim(s)

### Categories of documents

**X:** Document indicating lack of novelty or of inventive step.

**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.

**A:** Document indicating technological background and/or state of the art.

**P:** Document published on or after the declared priority date but before the filing date of the present application.

**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).