

[54] CLOSURE CAP WITH TAMPER INDICATOR

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[52] U.S. Cl. 215/256; 215/274

[51] Int. Cl.² B65D 43/02

[58] Field of Search 215/274, 256

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Primary Examiner—George T. Hall

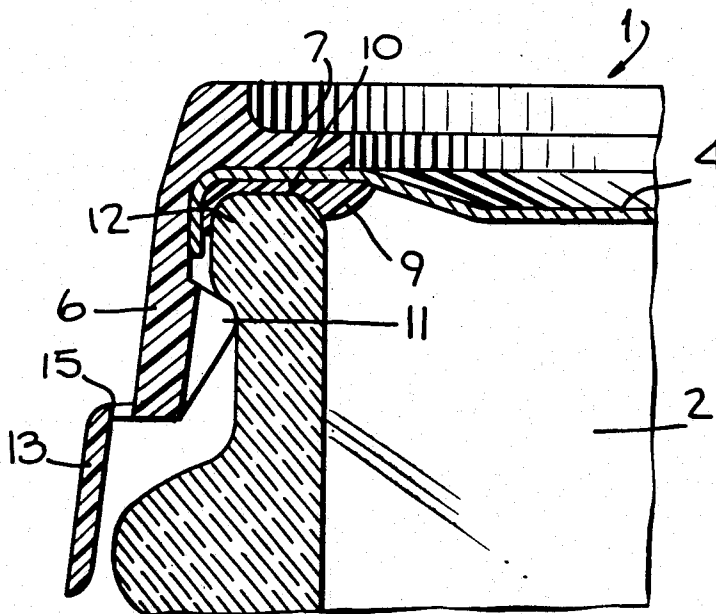
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[57] ABSTRACT

The invention comprises a closure cap with a tamper indicating band. The cap has a cover portion and a molded plastic ring portion including a skirt portion with container engaging means which permits the cap to be pressed onto a container and to be thereafter lifted off of the container. A plastic tamper indicating band is formed as an integral portion of the ring surrounding the bottom of the cap skirt with the upper edge of the band being lightly attached to the skirt by small fracturable bridges or by a thin score line. In order to lift the cap off of the container, it is necessary to apply the lifting force to the edge of the cap skirt. This cannot be done without disconnecting all or a portion of the tamper indicating band. The position of the tamper indicating band clearly shows whether or not the container has been opened or if an attempt has been made to open it.

22 Claims, 25 Drawing Figures



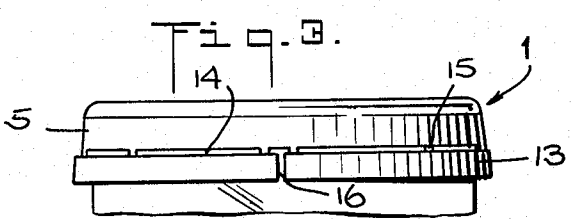
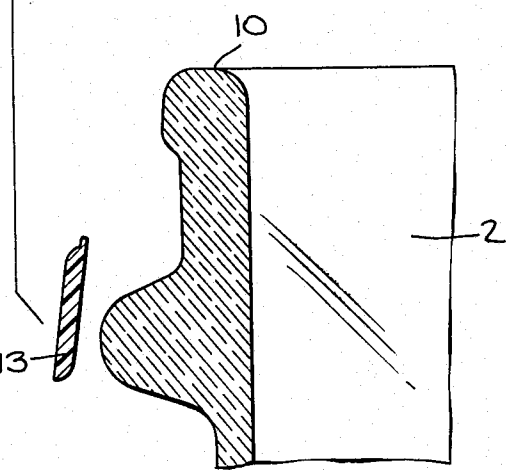
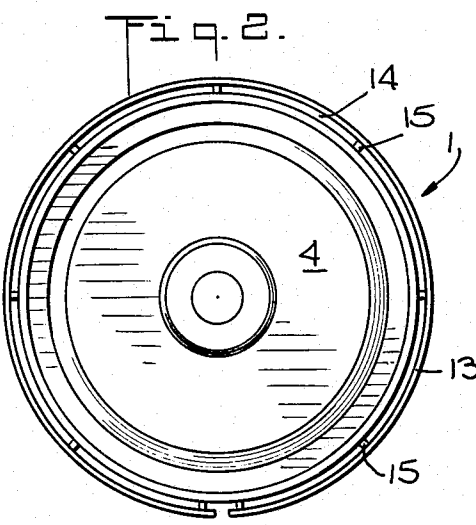
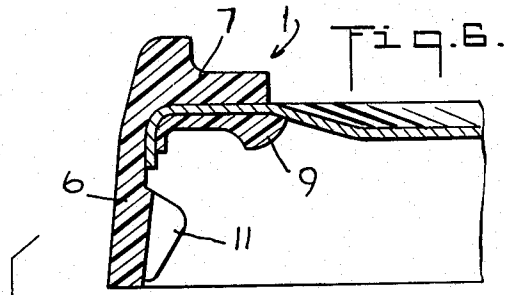
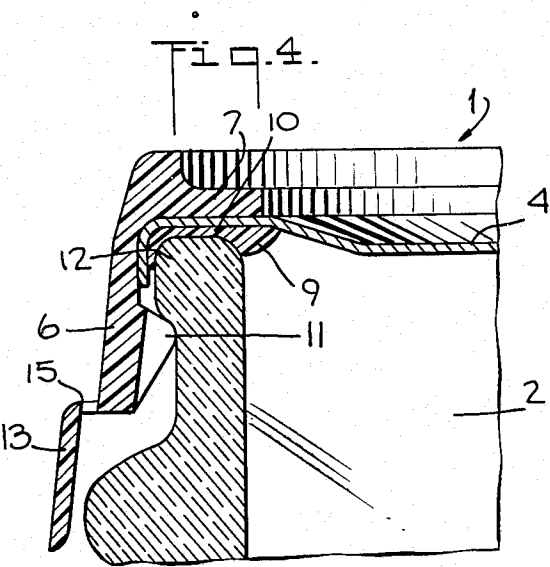
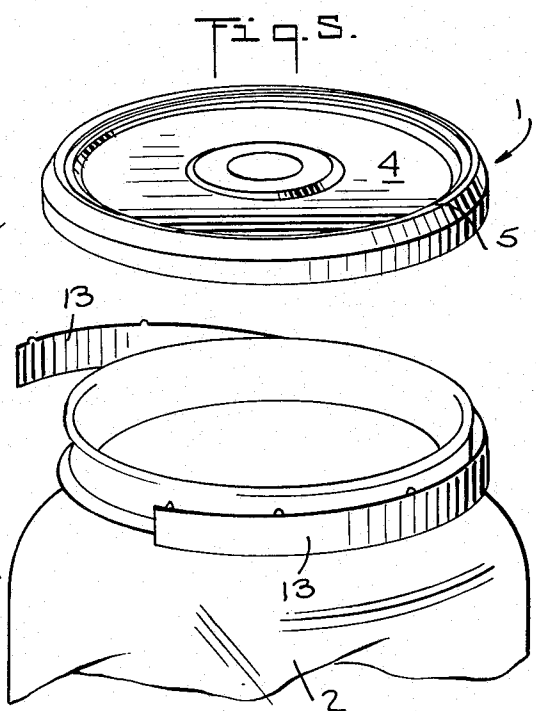
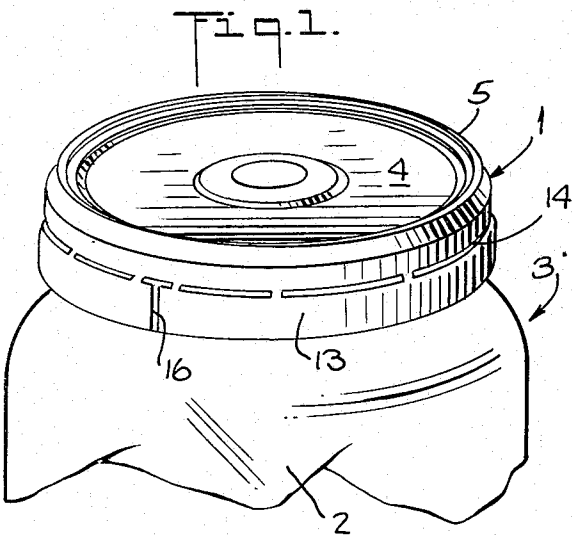


Fig. 7.

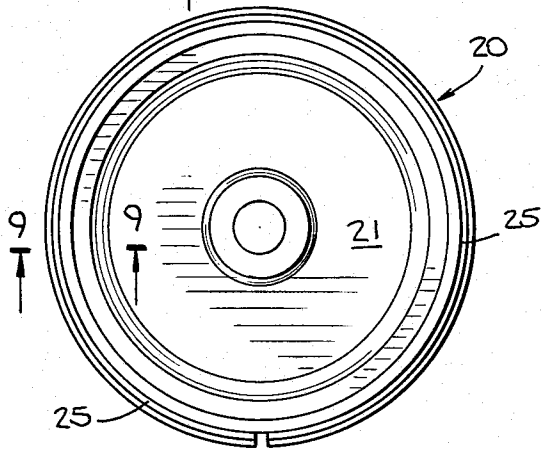


Fig. 8.

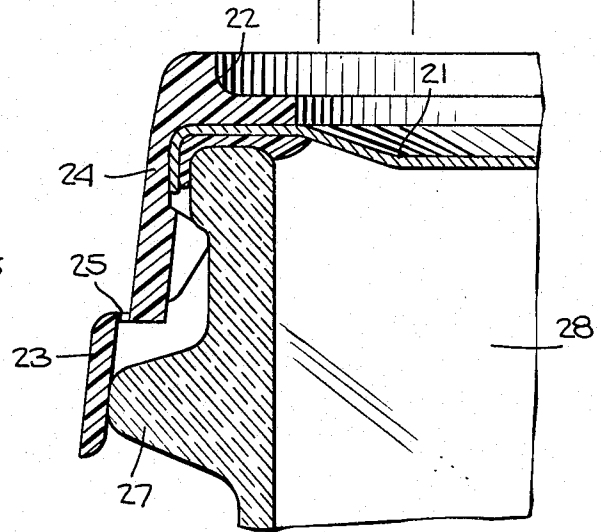


Fig. 9.

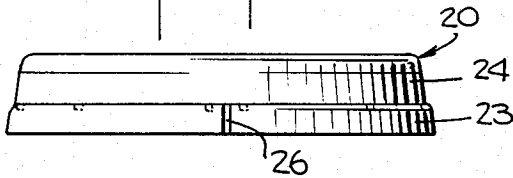


Fig. 10.

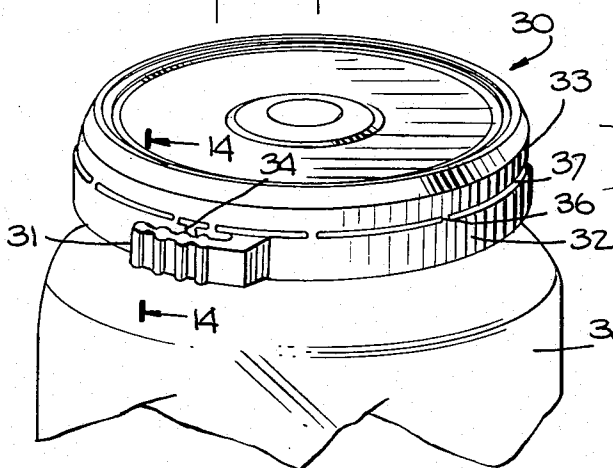


Fig. 11.

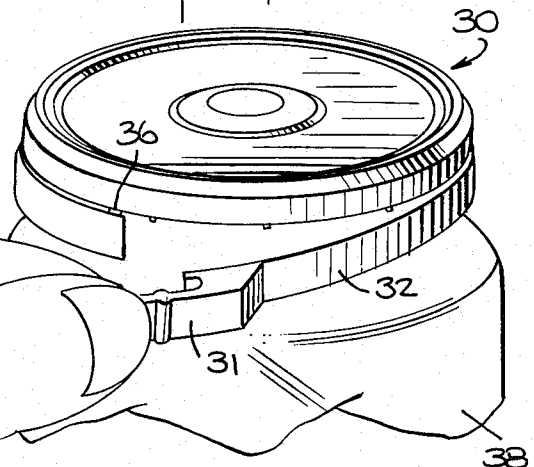


Fig. 12.

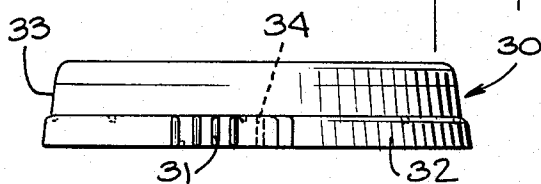
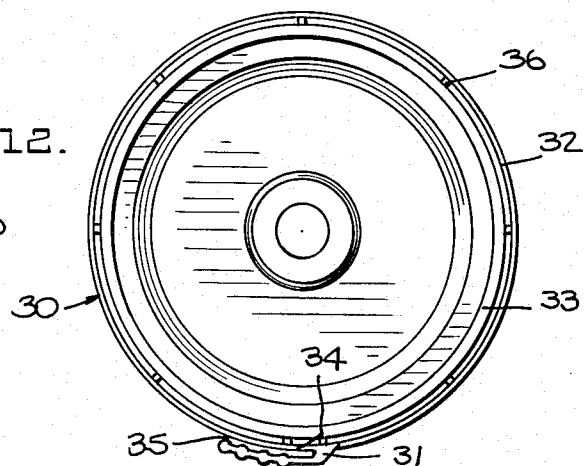


Fig. 11.



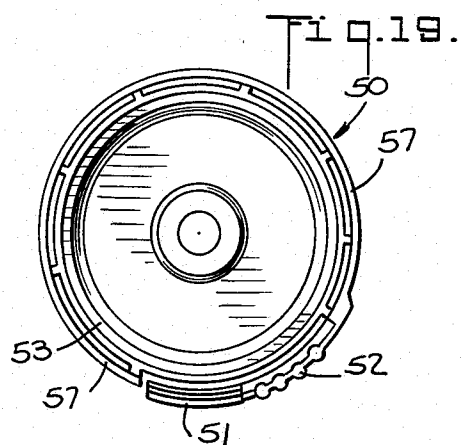
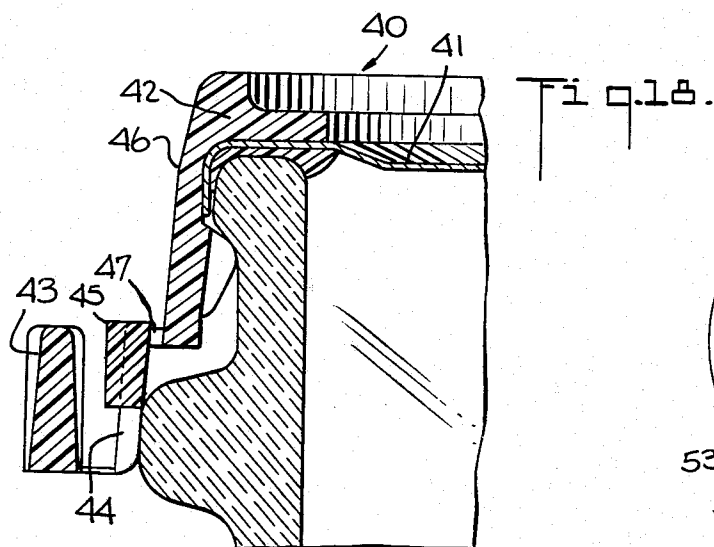
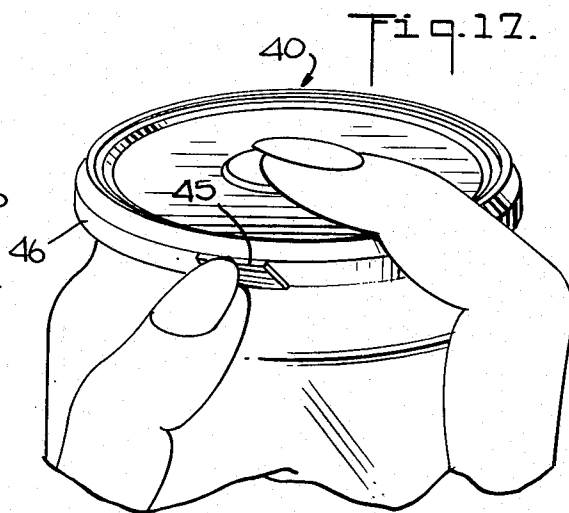
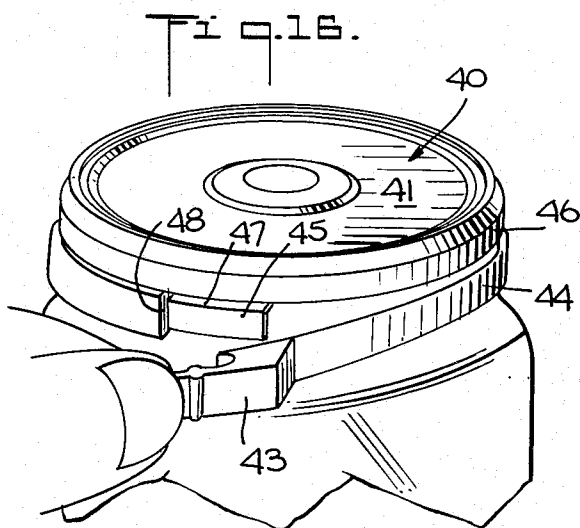
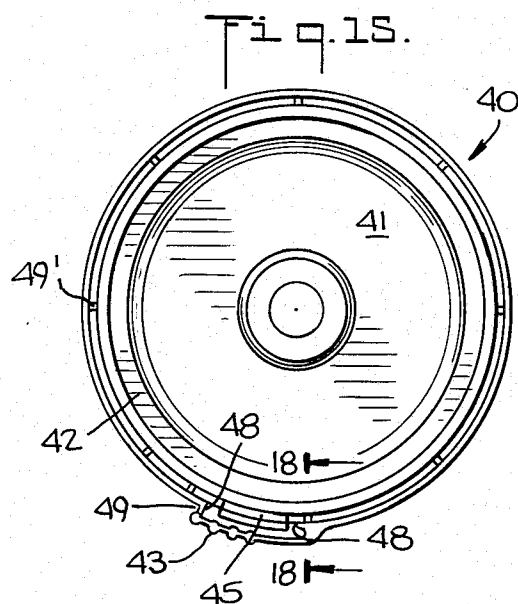
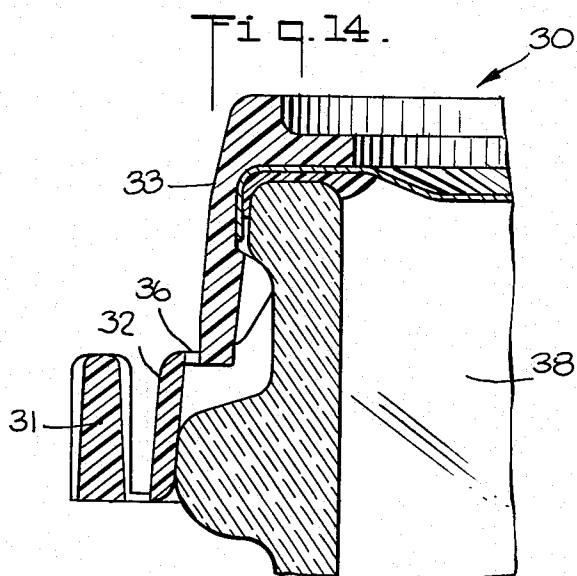


Fig. 20.

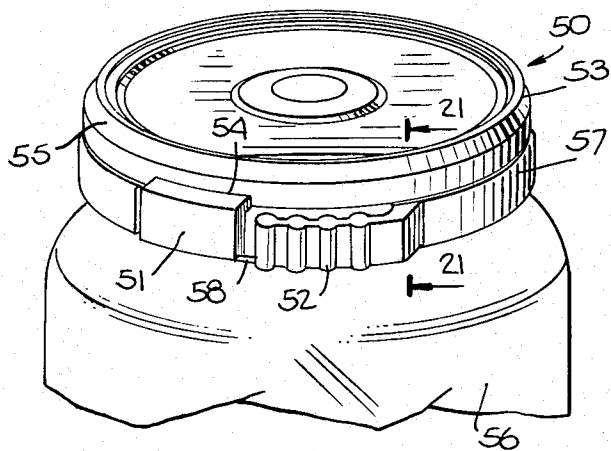


Fig. 21.

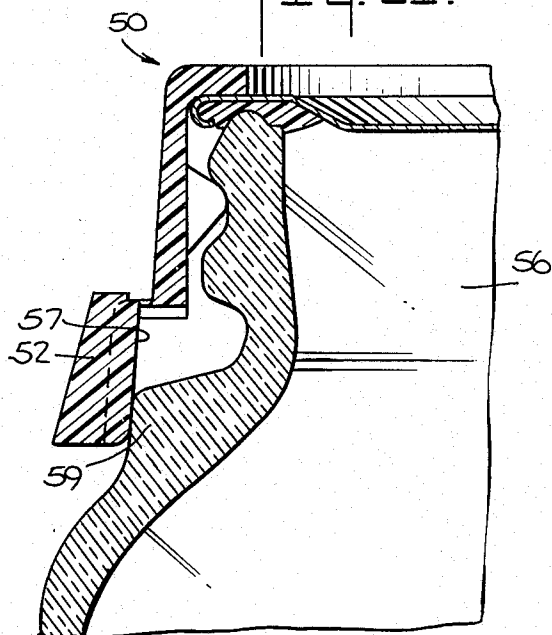


Fig. 22.

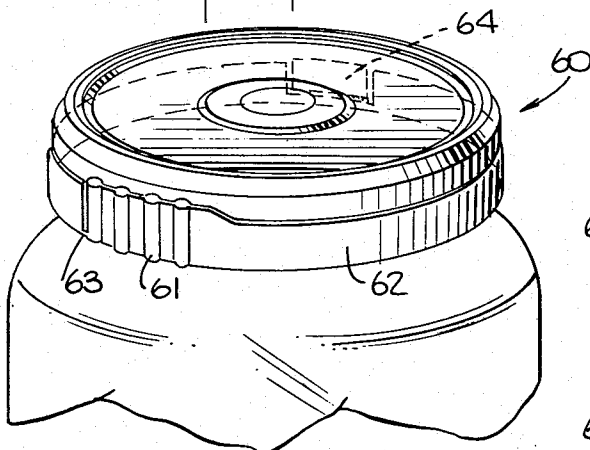


Fig. 24.

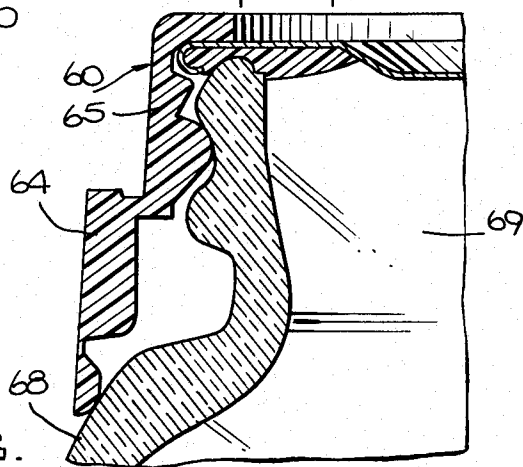


Fig. 25.

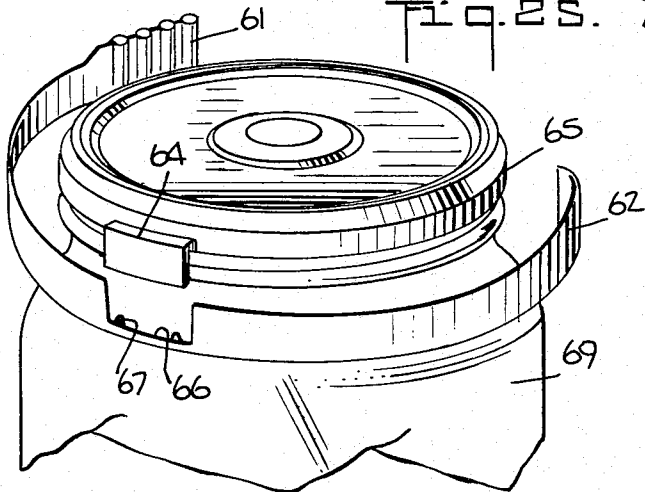
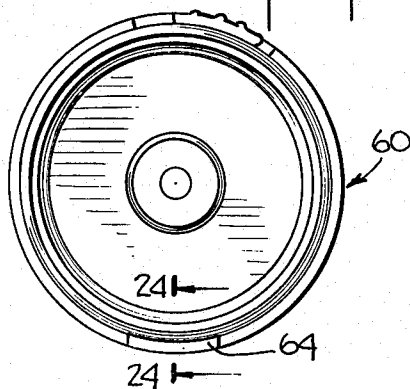


Fig. 23.



CLOSURE CAP WITH TAMPER INDICATOR

BACKGROUND OF THE INVENTION

The present invention relates to the container sealing art and more particularly to a press-on closure cap having an integral indicator for showing whether or not there has been an unauthorized opening of or an attempt to open a sealed container.

The indicator comprises a band encircling the closure cap which, in its normal position, prevents the application of an opening force to the cap and which is at least partially torn clear of the cap during any attempt to open the container.

There is an increasing use of convenience closure caps which provide a secure seal for glass and other containers and which at the same time are easily applied by the packer and removed by the consumer. These caps present a problem as their ease of removal makes it easy for unauthorized persons to tamper with sealed containers thereby causing a possible destruction of the seal and a possible loss of vacuum in the sealed package. There have been a number of prior tamper indicating devices used or suggested including tear-off strips or frangible seals used in the sealing operation. The use of the prior additional seals has added an additional operation in the package sealing line and the use of tear strips also further complicates sealing operations, particularly in the case of press-on closures where an additional operation is normally required for placing a tear-off band in a locking position with respect to the container.

The tamper indicating device of the present invention provides an indicating band which is easily formed during the regular cap molding operation and which requires no additional steps in connection with the sealing operation since the closure caps may be fed to and pressed onto containers using regular high speed press-on sealing machinery.

Accordingly, an object of the present invention is to provide an improved closure cap with an effective and simple tamper indicating device.

Another object of the present invention is to provide a closure cap with an improved tamper indicating means.

Another object of the invention is to provide a closure cap with an improved tamper indicating means which permits cap application by regular press-on sealing apparatus.

Another object of the invention is to provide an improved composite plastic and metal closure cap with a tamper indicating band.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about 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 DRAWING

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 a container sealed with a preferred embodiment of a tamper indicating closure cap in accordance with the present invention.

FIG. 2 is a top plan view of the closure cap of FIG. 1.

FIG. 3 is a side elevational view of the sealed package of FIG. 1.

FIG. 4 is an enlarged vertical sectional view of the sealed package of FIG. 1.

FIG. 5 is a perspective view of the package of FIG. 1 illustrating the removal of the closure cap.

FIG. 6 is an enlarged vertical sectional view of an opened package corresponding to FIG. 5.

FIG. 7 is a top plan view of another embodiment of the closure cap.

FIG. 8 is a side elevational view of the closure cap of FIG. 7.

FIG. 9 is an enlarged sectional view of the closure cap taken along line 9—9 on FIG. 7.

FIG. 10 is a perspective view of another embodiment of the closure cap including a pull tab.

FIG. 11 is a side elevational view of the cap of FIG. 10.

FIG. 12 is a top plan view of the closure cap of FIG. 10.

FIG. 13 is a perspective view illustrating the removal of the tamper indicating band from the package of FIG. 10.

FIG. 14 is an enlarged sectional view of the package of FIG. 10 taken along line 14—14 on FIG. 10.

FIG. 15 is a top plan view of an additional embodiment of the closure cap including a concealed lift tab.

FIGS. 16 and 17 are perspective views illustrating successive steps in the removal of the closure cap of FIG. 15 from a container.

FIG. 18 is an enlarged vertical sectional view of the closure cap taken along line 18—18 on FIG. 15.

FIG. 19 is a top plan view of another embodiment of the closure cap with spaced pull and lift tabs.

FIG. 20 is a perspective view of the closure cap of FIG. 19.

FIG. 21 is an enlarged vertical sectional view of the closure cap taken along line 21—21 on FIG. 20.

FIG. 22 is a perspective view of an additional embodiment of the closure cap with a modified pull tab and lift tab arrangement.

FIG. 23 is a top plan view of the closure cap of FIG. 22.

FIG. 24 is an enlarged vertical sectional view of the closure cap taken along line 24—24 on FIG. 23, and

FIG. 25 is a perspective view showing the tamper indicating band removed from the sealed package of FIG. 22.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1 through 6 illustrate a preferred embodiment of the cap. The cap 1 is used to seal glass or other containers 2 to form a sealed package 3. FIG. 1 illustrates the cap 1 in accordance with the invention pressed into sealing position on the container 2. The closure cap 1 comprises a disc-like metal cover 4 contained in an outer plastic ring 5. The plastic ring 5 has a skirt 6 and a circular top portion 7. The top portion 7 and the skirt 6 combine to form a corner for receiving the metal cover 4. The cover 4 includes a gasket 9 for forming a seal with the finish 10 of the container 2 when the cap 1 is pressed onto the container 2. Any suitable seal may be used such as a flowed-in plastisol gasket or a cut ring

gasket or a paper lining or an integral seal or other sealing means.

While the preferred embodiment has a separate metal cover 4, other forms of the cap incorporating the skirt structure of the invention may have an integrally molded plastic cover.

The plastic ring 5 includes means for attaching the closure cap 1 to the container 2. In the preferred embodiment this comprises a number of inwardly directed lugs 11 which lock underneath a bead 12 at the rim of a container 2 when the cap 1 is pressed onto the container 2. A continuous inwardly projecting bead may be used for engaging the container. FIG. 4 illustrates the sealed package 3 with the closure cap 1 pressed into sealing engagement with the container 2 with the gasket 9 forming a seal with the container finish 10 and with the lugs 11 positioned beneath the bead 12 at the container rim.

In order to lift the closure cap 1 from the container 2 in the manner illustrated in FIGS. 5 and 6, it is necessary to press or to pry the cap skirt 6 upwardly from the container rim by inserting a tool under the skirt or by pressing upwardly with the thumbs.

A tamperproofing or tamper indicating band 13 is attached to the lower edge of the cap skirt 6 by a frangible connecting means in the position illustrated. The band 13 when thus positioned prevents the above described removal action without first detaching at least a portion of the band. Any attempt to press or pry the cap 1 upwardly without removing the band 13 requires at least a portion of the band 13 to be pressed upwardly and thus torn clear of the cap skirt 6 in the manner illustrated in FIGS. 5 and 6. The embodiment of the band 13 illustrated in FIGS. 1 through 6 is molded integrally with the plastic ring 5. The frangible connection between the band 13 and the adjacent portions of the skirt 6 comprises a narrow slot 14 between the top of the band 13 and the bottom of the skirt 6 formed during the molding action and interrupted at a number of spaced points by coupling bridges 15 which hold the band 13 in place during sealing, shipment and storage. The bridges 15 have sufficient strength for these purposes but are relatively thin in a circumferential direction, as illustrated, so that they are torn when any attempt is made to remove the closure cap 1 from the container 2.

The band 13 provides its tamper indicating function whether or not it engages the container 2 surface. The band 13 may therefore be spaced from the container surface or proportioned to only lightly engage the surface. This facilitates cap application as no sealing operation other than the regular press-on sealing action is required. When the band 13 is positioned at or near the container 2 surface, it prevents an insect infestation of food packages.

When the cap is removed by the user, the band 13 is torn clear using the accessible band ends at the slot 16. The skirt 6 edge is then exposed so that it may be pressed or pryed upwardly to lift off the cap 1 as illustrated in FIGS. 5 and 6.

ALTERNATE EMBODIMENT WITH THE TAMPERPROOFING BAND ATTACHED BY A SCORE LINE

As indicated above, the tamper indicating band extends downwardly from the lower edge of the closure cap skirt and is lightly attached to the skirt so that any

attempt to lift the cap from the container results in a release of the band from the cap skirt.

The closure cap 20, illustrated in FIGS. 7, 8 and 9, has an upper cap portion including a metal cover 21 and a plastic ring 22 generally similar to those described above. In the closure cap 20, however, the tamper indicating band 23 is releasably attached to the cap skirt 24 by a thin web portion 25 which comprises or resembles a score line releasably connecting the substantially thicker adjacent portions of the cap skirt 24 and the tamper indicating band 23.

The tamper indicating band 23 bars access to the lower edge of the cap skirt 24 thereby preventing cap removal without first removing the tamper indicating band 23. Preferably a notch 26 is formed in the band 23 permitting the package user to grip an exposed end of the band 23 to tear it free from the cap 20. The tamper indicating band 23 may be proportioned to take a position slightly outwardly of an adjacent bead 27 or other surface on the glass container 28. The band 23 may also be proportioned to lightly engage the glass surface. No substantial engagement between the band 23 and the container is required and is avoided to assure that the band 23 is not unintentionally detached from the closure cap 20 during the normal sealing operation when the closure cap 20 is pressed downwardly onto the container 28.

EMBODIMENT INCLUDING A PULL TAB ON THE TAMPER INDICATING BAND

FIGS. 10 through 14 illustrate another embodiment of the cap 30 which includes an integral pull tab 31 on the tamper indicating band 32. The pull tab 31 is molded integrally with the outer plastic cap ring 33 so that it projects outwardly from the tamper indicating band 32 adjacent a slot 34 in the band 32. To further insure a positive indication that the cap 30 may have been tampered with, the outer end of the pull tab 31 is releasably attached to an adjacent portion of the tamper indicating band 32 by a small plastic bridge 35. When the tamper indicating band 32 is removed during the closure removal from container 38, as illustrated in FIG. 13, the bridge 35 is first torn. Then the tamper indicating band 32 is removed by pulling it clear thereby severing the remaining bridges 36 in slot 37 which couple the tamper indicating band 32 to the plastic ring 33.

EMBODIMENT WITH A LIFT TAB

In order to facilitate the removal of the closure cap after the tamper indicating band has been torn clear of the plastic ring, a lift tab may be provided in the manner illustrated in the embodiment of FIGS. 15 through 18.

This embodiment of the closure cap 40 includes a metal cover 41 and a plastic ring 42 of the general form already described including a pull tab 43 to facilitate the removal of the tamper indicating band 44. The opposite ends of the tamper indicating band 44 are spaced apart a sufficient distance to permit a lift tab 45 to be provided at the lower edge of the cap skirt portion 46. The lift tab 45 is also formed as an integral portion of the molded plastic ring 42. It is hingedly connected by means of a plastic web 47 which permits the lift tab 45 to be pressed upwardly during cap removal in the manner illustrated in FIG. 17.

The opposite ends of the lift tab 45 are spaced from the ends of the tamper indicating band 44 by slots 48.

With the lift tab 45 positioned behind the pull tab 43, it is necessary to tear the pull tab 43 away from the adjacent edge portions of the tamper indicating band 44 and to break plastic bridge 49 thereby clearly showing any attempt to remove the closure cap 40 by means of the lift tab 45. Attempts to remove the closure cap 40 other than using the pull tab 43 or the lift tab 45 will break all or a portion of the band connecting plastic bridges 49'.

EMBODIMENT WITH CONNECTED PULL TAB AND LIFT TAB

FIGS. 19 through 21 illustrate a closure cap 50 in accordance with the present invention having a lift tab 51 and a pull tab 52 positioned adjacent to one another. In this embodiment, a lift tab 51 is integrally formed as a portion of the molded plastic ring 53 with its upper portion being hingedly connected at 54 to the cap skirt portion 55 permitting the lift tab 51 to be used to press the closure cap 50 off of the container 56. The pull tab 52 for removing the tamper indicating band 57 is releasably connected to the lift tab 51 by means of one or more plastic bridges 58. This bridge 58 prevents the lift tab 51 from being turned outwardly to its cap removing position without the pull tab 52 being torn clear of the lift tab 51 thereby breaking the bridge 58. This embodiment of the closure cap also provides for a physical barrier for preventing insect infestation beneath the cap skirt 55. This barrier is provided by a light engagement between the lower edge of the band 57 and a generally vertical shoulder portion 59 provided on the sealed container 56.

EMBODIMENT WITH SPACED PULL TAB AND LIFT TAB

Another embodiment of the closure cap is illustrated at 60 in FIGS. 22 through 25. This embodiment includes a pull tab 61 formed on one end of the tamper indicating band 62 with a plastic bridge 63 releasably connecting the pull tab 61 to the opposite end of the tamper indicating band 62. A lift tab 64 is hingedly attached to the plastic ring 65 and it projects into a slot 66 in the tamper indicating band 62. The lower edge of the lift tab 64 is releasably attached to the tamper indicating band 62 by spaced plastic bridges 67. An attempt to swing the lift tab upwardly to remove the closure 60 ruptures these bridges 67 thereby indicating that the package has been tampered with. When the tamper indicating band 62 is torn free from the plastic ring 65 during regular cap removal, the tearing action at the lift tab bridges 67 tends to swing the lift tab 64 at least partially upwardly towards its lift position to facilitate cap removal. As illustrated in FIG. 24, an insect barrier is provided by a light engagement between the lower edge of the tamper indicating band 62 and the adjacent sloped surface 68 of the container 69.

It will be seen that an improved tamper indicating closure cap and tamperproof package has been provided. The improved tamper indicating cap in accordance with the invention has its tamper indicating means easily formed during the regular molding steps accompanying the cap manufacture. Additionally, the tamper indicating means is so arranged that it becomes effective after a normal package sealing operation without additional steps being required during the sealing operation. These advantages are obtained in a rela-

tively simple and attractive closure which may also incorporate means for preventing insect infestation.

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.

Having thus described our invention, we claim:

1. A tamperproof press-on and lift-off closure for sealing a container having a closure engaging bead at its rim comprising the combination of:
 - a molded annular plastic resin skirt;
 - a cover;
 - said skirt having an upper portion mounting the cover at a top portion of the skirt;
 - container engaging means on a radial inner portion of said upper portion of the skirt positioned below said cover and extending radially inwardly of the outer edge of said cover for engaging a container bead providing a snap fit;
 - a circular downwardly facing pry-off lower edge on the bottom of said upper portion of said skirt for use in pressing said closure upwardly and off of said container;
 - an annular tamper indicating band attached to said upper portion of said skirt by an integral molded frangible connection; and
 - said band being positioned radially outwardly of and extending downwardly from the said lower edge thereby preventing access thereto when said closure is on a container.
2. The closure as claimed in claim 1 in which said frangible connections comprise a generally circular slot interrupted by a plurality of bridges connecting said upper portion of said skirt to said tamper indicating band.
3. The closure as claimed in claim 1 in which said tamper indicating band has a generally rectangular elongated and vertically oriented cross-section positioned for sliding engagement with adjacent portions of the finish of the container.
4. The closure as claimed in claim 1 in which said container engaging means on the upper portion of said skirt comprise a plurality of spaced, elongated, horizontal, and inwardly directed lugs.
5. The closure as claimed in claim 1 in which said cover comprises a metal disc having its outer circular edge in engagement with said upper portion of the skirt.
6. The closure as claimed in claim 5 which further comprises an annular plastisol sealing gasket positioned in the outer portion of said cover.
7. The cap as claimed in claim 1 in which a slot is formed in said band defining two spaced ends of said band, and in which a pull tab is positioned on one of said band ends radially outwardly of said band.
8. The cap as claimed in claim 7 in which said pull tab is releasably connected to the other of said band ends by a breakable bridge.
9. The cap as claimed in claim 7 which further comprises a downwardly depending lift tab hingedly connected to said skirt and positioned in said slot between the spaced ends of said band and inwardly of said pull tab.

10. The cap as claimed in claim 1 in which a lift tab is hingedly connected to the bottom of said skirt and is positioned between the spaced ends of said band.

11. The closure as claimed in claim 1 which further comprises a lift tab hingedly connected to said pry-off lower edge of said skirt and positioned in a slot in said band.

12. The closure as claimed in claim 1 in which said frangible connection comprises a relatively thin plastic web connecting the top of said band to the bottom of said skirt.

13. A sealed package comprising the combination of: a container;

a closure engaging bead at a rim on said container; a tamperproof press-on and lift-off closure sealing the container;

said closure having a molded annular plastic resin skirt;

said skirt having an upper portion including means for mounting a cover at a top portion of the skirt;

a cover mounted on said top portion;

container engaging means on a radial inner portion of said upper portion of the skirt positioned below said cover and engaging said bead and extending radially inwardly of the outer edge of said cover for

engaging a container bead providing a snap fit; a circular downwardly facing pry-off lower edge on the bottom of said upper portion of said skirt for use in pressing said closure upwardly and off of said container;

an annular tamper indicating band attached to said upper portion of said skirt by an integral molded frangible connection; and

said band being positioned radially outwardly of and extending downwardly from the said lower edge and being in non-locking engagement with said container thereby preventing access to said lower edge when said closure is on a container.

14. The closure as claimed in claim 13 in which said

frangible connections comprise a generally circular slot interrupted by a plurality of bridges connecting said upper portion of said skirt to said tamper indicating band.

15. The closure as claimed in claim 13 in which said tamper indicating band has a generally rectangular elongated and vertically oriented cross-section positioned for sliding engagement with adjacent portions of the finish of the container.

16. The closure as claimed in claim 13 in which said container engaging means on the upper portion of said skirt comprise a plurality of spaced, elongated, horizontal, and inwardly directed lugs.

17. The closure as claimed in claim 13 in which said cover comprises a metal disc having its outer circular edge in engagement with said upper portion of the skirt.

18. The closure as claimed in claim 17 which further comprises an annular plastisol sealing gasket positioned in the outer portion of said cover.

19. The sealed package as claimed in claim 13 which further comprises a lift tab hingedly connected to said pry-off lower edge of said skirt and positioned in a slot in said band.

20. The sealed package as claimed in claim 13 in which said frangible connection comprises a relatively thin plastic web connecting the top of said band to the bottom of said skirt.

21. The sealed package as claimed in claim 13 in which a slot is formed in said band defining two spaced ends of said band, and in which a pull tab is positioned on one of said band ends radially outwardly of said band.

22. The sealed package as claimed in claim 13 which further comprises a downwardly depending lift tab hingedly connected to said skirt and positioned in said slot between the spaced ends of said band and inwardly of said pull tab.

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