

[54] COMPOSITE PLASTIC BOTTLE AND
TAMPERPROOF CLOSURE THEREFOR

[75] Inventor: Harold Byron Smith, Sr.,
Barrington, Ill.

[73] Assignee: Illinois Tool Works Inc., Chicago,
Ill.

[22] Filed: Jan. 14, 1974

[21] Appl. No.: 433,337

[52] U.S. Cl. 215/216, 215/218, 215/221

[51] Int. Cl. B65d 55/02, B65d 85/56, A61j 1/00

[58] Field of Search 215/9, 216, 217, 218, 221

[56] References Cited

UNITED STATES PATENTS

3,426,931	2/1969	Jensen	215/218
3,700,133	10/1972	Bagguley	215/221
3,744,655	7/1973	Nixdorpf, Jr.	215/216

Primary Examiner—George T. Hall
Attorney, Agent, or Firm—Robert W. Beart; Edward
L. Benno

[57] ABSTRACT

This application contemplates the use of a composite container consisting of a relatively thin plastic body portion having an open neck portion around which is rotatably mounted a separate and rigid annular ring member with threads or other fastening means for co-operative association with a complementary closure member; the container body portion being initially a plastic preform with an outwardly extending flange rim at the open end and the annular ring member being assembled with the preform to a position around the neck portion and in engagement with the flange rim; and with the preform then reformed with the body well expanded beneath the adjacent end of the ring member to rotatably trap the ring member between the expanded well portion of the reform and the flange rim.

4 Claims, 5 Drawing Figures

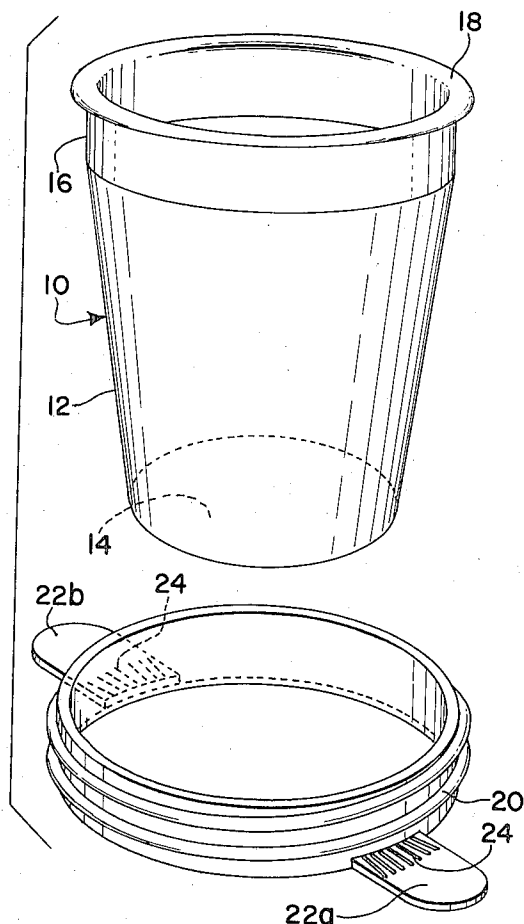


Fig. 1

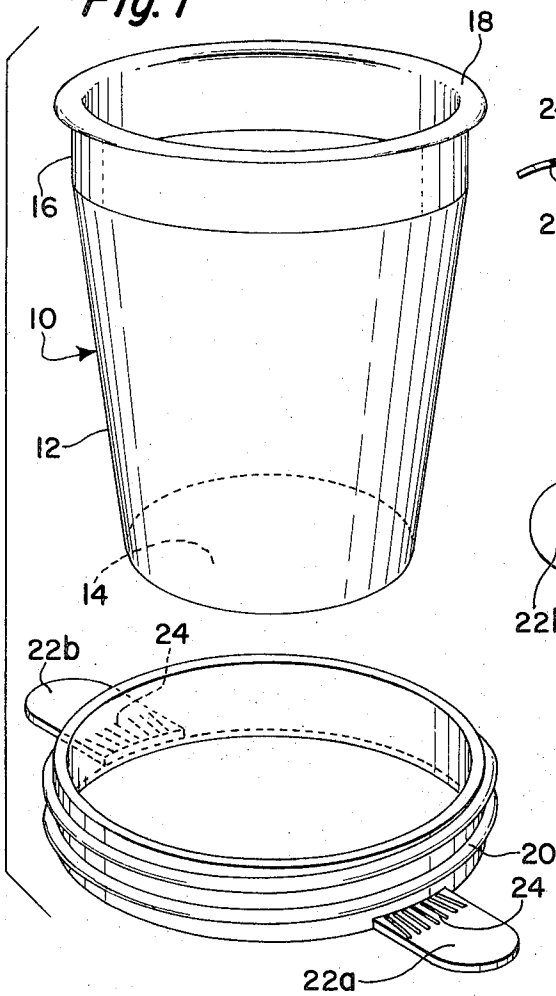


Fig. 2

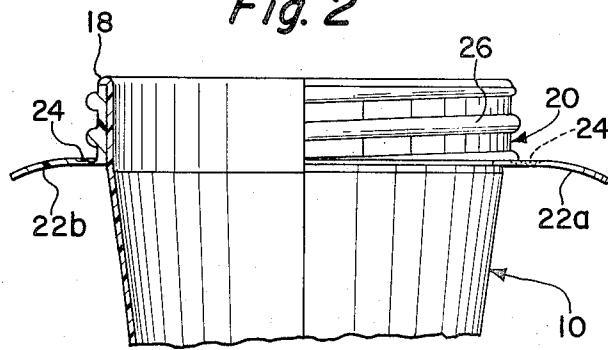


Fig. 3

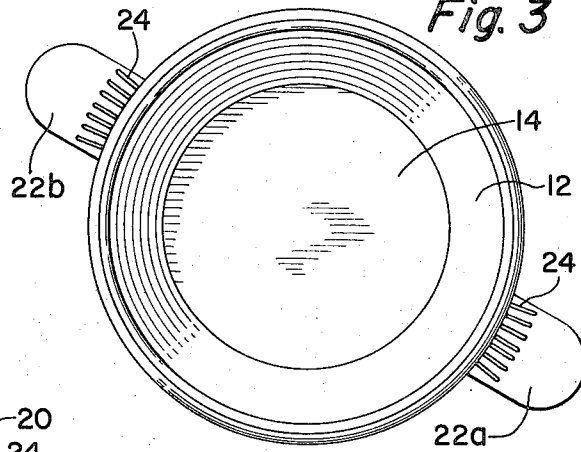


Fig. 4

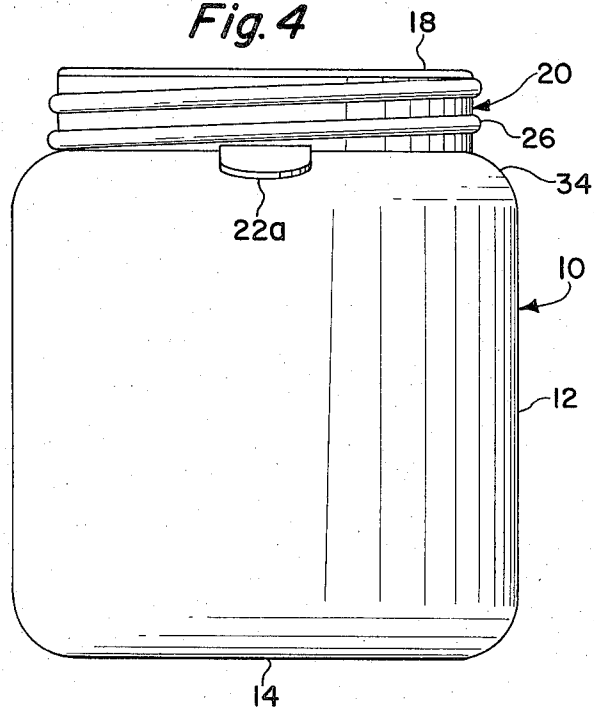
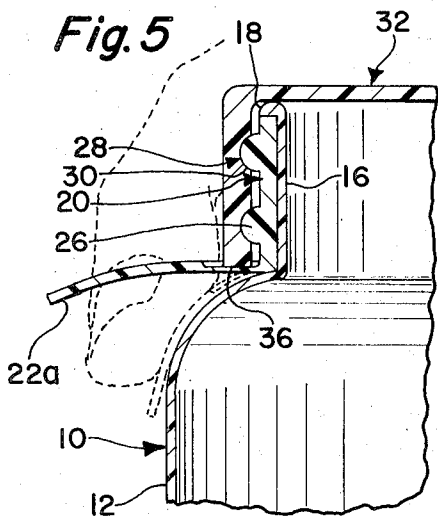


Fig. 5



COMPOSITE PLASTIC BOTTLE AND TAMPERPROOF CLOSURE THEREFOR

BACKGROUND OF THE INVENTION

According to the present invention, there is provided a composite container with a necked body well and a ring member rotatably secured around the neck and provided with thread or other formations for attachment of a complementary closure cap therewith; the type of composite container which I have in mind can be made by the method contemplated in the U.S. patent application presently pending in the name of Leslie Stephen Marco and identified by U.S. Ser. No. 232,456. This application is presently being issued and the contents of that application known to me.

An object of the invention is to provide a composite container of the type generally contemplated by the above application wherein the ring member is mechanically trapped between the rim of the container and the shoulder on the body of the container in rotatable association with preferably the laterally outwardly extending flange being configured to provide a sealing surface to provide with the complementary closure member.

Another object of the invention is to utilize a composite container of the type described in the previous paragraph wherein the ring member is provided with one or more tab elements extending integrally from and laterally outwardly from the body of the ring in a position spaced from the flange of the container which serves to rotatably trap the ring member on the container body. In association with the ring member and tab or tabs is contemplated the use of a closure member of such dimension that it may be mounted on the ring member and present a surface or margin having indents or undulations which will cooperate with complementary indents or undulations provided on the body of the tabs to interlock the ring member and closure in such a fashion that when a user attempts to remove the closure, the ring member and closure will rotate relative to the body and be incapable of being removed. It is contemplated that the aforementioned tab or tabs will be flexible and when flexed in a direction parallel to the axis of the ring member sufficiently to unseat the undulations thereon from the undulations on the cap, the cap thereafter will be removable as the tab or tabs are held in a downwardly flexed position and in a manner stationary to the container on which it is mounted.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a container body preform and a perspective view of a ring member to be associated with it prior to assembly.

FIG. 2 is a partial sectional view showing the ring member and container body after assembly but before re-shaping of the preform.

FIG. 3 is a top view of the ring member shown in FIGS. 1 and 2 in association with the container body before re-shaping.

FIG. 4 is a side view of the assembled ring member and container body after re-shaping of the reform with the ring being appropriately trapped on the container and rotatably mounted thereon.

FIG. 5 is a side view in section showing a partial view of the reform container, the ring member rotatably mounted thereon on the closure member in mounted and locked position on the ring member and in sealed relation relative to the container.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In describing the invention, FIG. 1 shows clearly a preform container device designated by the numeral 10 having an upwardly and outwardly sloping side wall 12 and a bottom or end wall 14 which can be of any configuration. The preform adjacent its open end is provided with a substantial cylindrical portion 16 which will hereinafter be understood to have an axial dimension parallel to the axis of the preform approximating that of the axial height of the ring member 20. A flange or rim 18 is provided which can either be of a planar configuration or in certain instances where sealing is desired (the exact operation to be hereinafter described), can consist of a convex rim and flange combination which can cooperate with the closure member hereinafter to be described to provide a seal.

The ring member shown in FIG. 1 prior to its preassembly on the preform 12 consists of a body member 20 having a configuration and dimension complementary to the surface 16 on the preform. It should be understood that the ring member is so dimensioned that it may be preassembled on the preform immediately beneath the rim or flange 18 and should have an axial or height dimension substantially equal to the axial or height dimension of the surface 16. The ring member is also provided with one or more tab members 22a, and where a multiplicity is desired 22b, one or both of which tab elements are provided with a surface which is formed or configured to provide a series of undulations, notches or other formations that ultimately can cooperate with a similarly configured element on the closure 32 to cause the closure and ring member to interlock and to cause them when in mounted position to serve as a unitary element which is rotatable relative to the container body with which it is associated.

In FIG. 2 is shown the ring member 20 mounted on the container body 10 in rotary association with surface 16. The container has not yet been re-shaped as shown in FIG. 4 to trap the ring element 20 between the shoulder of the container 34 and the flange or rim of the container 18. Laterally outwardly extending tabs 22a and 22b as will be noted are integrally extending elements from the ring member 20 and are positioned in spaced relation to the rim 18 of the container in a substantially horizontal position. Each of these tabs 22a and 22b are provided with the aforementioned configured surfaces to accomplish locking with the complementary closure hereinafter discussed.

In FIG. 4 is shown the assembled ring member 20 and container 10 with the tab 22a shown as extending outwardly from the ring member and spaced upwardly from the configured re-shaped container body 10, and specifically the laterally extending trapping shoulder 34, so that the tab may be flexed downwardly for purposes hereinafter discussed.

FIG. 5 in section shows the assembled ring member 20 finally positioned in a rotatable fashion on the surface 16 of the container with a closure element 32 in mounted position on the ring member and being so proportioned with the bottom margin 36 of the closure which is configured with undulations or other complementary configurations to the elements provided on tabs 22a and 22b and identified by the numeral 24 to afford an interlocking action which will assure coupling of the closure 32 and the ring member 20 relative to

each other. The closure has also been configured with a height dimension such when in seated position relative to the tabs **22a** and **b** the internal surface of the closure cooperates with the rim or flange **18** to provide a seal. It is within my contemplation that when a liner is placed in closure members of foil or paperboard or cork or other materials used for liners, that the cap can be dimensioned to give the same type of sealing action.

What I have described heretofore is the container, its associated ring member and the closure element. This combination of three elements affords what I perceive to be an ideal tamperproof or childproof cap which will avoid entry into the container readily. The function of the container and its closure is as follows:

As shown in FIG. 5, any effort to remove the closure from the container would be countered by reason of the fact that the ring member **20** will rotate in coupled relation with the cap **32**. The only manner in which entry can be accomplished to get at the contents in the container is for the user to depress tab **22a** or if there are a plurality of tabs such as is shown in FIGS. 1, 2 and 3, to depress both tabs and at the same time to retain the tabs immobile relative to the side wall of the container. As this downward depression of the tabs is accomplished, the interlocking elements **24** and **36** are separated and as the collar is held in a nonrotatable position relative to the container, the closure can be readily removed.

In reclosing the container, I have found that it is best to retain at least one of the tab elements in depressed relation against the container side wall to restrain relative rotation so that the closure member **32** can be seated in an interlocking position relative to the tabs and in sealed relation relative to the rim of the container where the sealing function is necessary or desired.

I propose that one material from which the ring element **20** can be made is nylon or the like preferably would withstand the temperatures necessary to reform the polyethylene or polypropylene container body. Further, while I do not care to be limited to the type of materials from which the closure is manufactured, I would suggest that the cap closure can be made of any materials presently on the market and used for such purposes which can be either a thermo-setting resin or a thermoplastic resinous plastic material. I should also like to suggest that metal caps can be used with this configuration providing the indentations or undulations **36** are formed at the bottom margin of the cap in order to cooperate with the complementary locking portions **24** on the tabs **22a** and **b**.

I claim:

1. A substantially tamperproof package including a container body having a rim adjacent its open end, a threaded collar member rotatably mounted on said container body in the vicinity of said rim, said container body having an enlarged shoulder spaced from said rim and beneath said threaded collar member to permanently mount said collar member on said container, said collar member having at least one integral flexible tab means extending laterally outwardly from said collar and positioned axially downwardly from the rim of said container and a closure device of hollow body configuration provided with an internally threaded body portion complementary to the threads on said collar member, said tab means presenting a series of locking elements facing in a direction toward the rim of the container, and said closure member having a plurality of complementary locking elements adapted to cooperate with said locking elements on said tab to couple said threaded collar and said closure member rotatably relative to said container whereby to prevent inadvertent or unauthorized removal of said cap from said container body.

2. A tamperproof package of the type contemplated in claim 1 wherein said collar element is provided with two laterally extending tab means in spaced apart relation about the periphery of the collar member.

3. A tamperproof package of the type contemplated in claim 1 wherein the rim portion of the container is configured to present an upwardly facing convex surface designed to cooperate with the internal surface of the cover surface of the closure to provide a seal when the closure member is in mounted position on said collar.

4. A tamperproof package including a container body having a collar member rotatably mounted on the container in the vicinity of its upper open end which is provided with a rim, a cover element consisting of a hollow body providing a cover surface and a depending skirt, said skirt being internally configured to cooperate with a configuration on the outer surface of the collar member to permit rotary association of the two elements, tab means provided on the collar which extend laterally outwardly therefrom and provided with locking projections which are exposed in a direction toward the rim of the container, and complementary locking projections on the bottom open margin of the skirt adapted to cooperate with the locking projections on the tab to rotatably couple said cover element and said collar in mounted position on said container to provide the aforesaid tamperproof package.

* * * * *