

[54] CLOSURE FITMENT

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[51] Int. Cl. **B65d 51/08**

[58] Field of Search.....215/41, 56, 95

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[57] **ABSTRACT**

A two-piece closure cap for a container having an unthreaded neck with an outwardly projecting rim portion adjacent its open end. The cap includes inner and outer fitments each having an end panel with a downwardly depending peripheral skirt. The outer fitment is telescoped onto the inner fitment, with the inner surface of the skirt of the outer fitment engaging and camming the inner fitment skirt inwardly beneath the outwardly projecting rim of the neck to releasably retain the cap on the container. Vent openings formed and the inner fitment panel are closed by seal means on the outer fitment when the closure cap is installed on the container.

43 Claims, 14 Drawing Figures

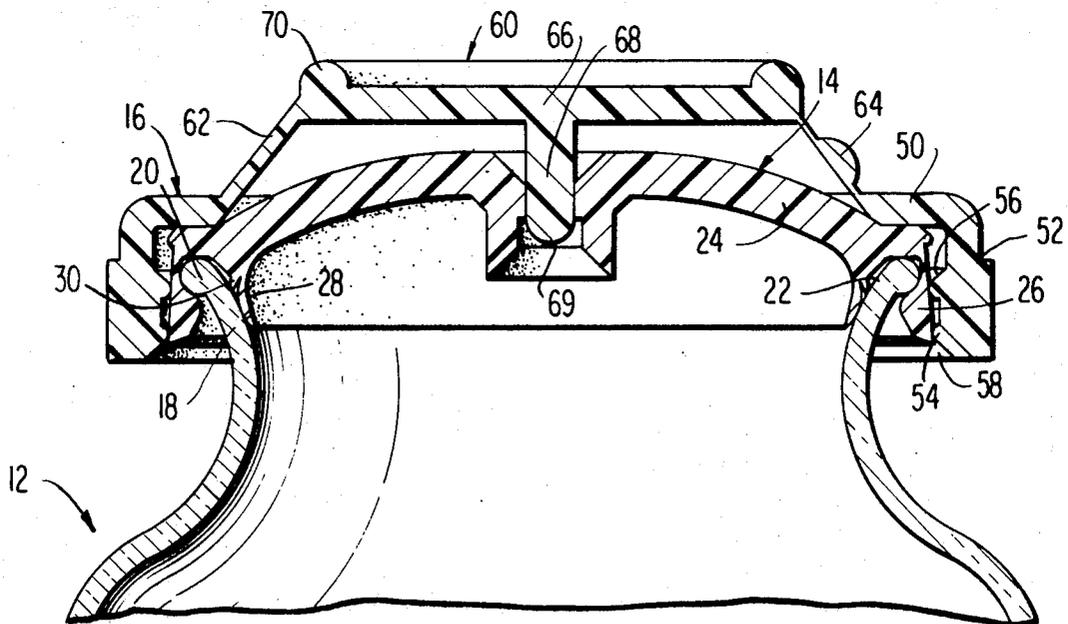


FIG1

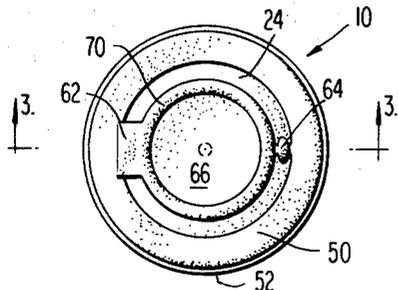


FIG2

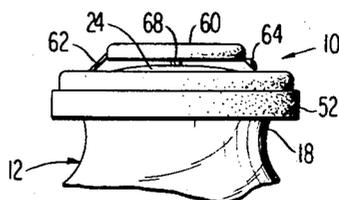


FIG3

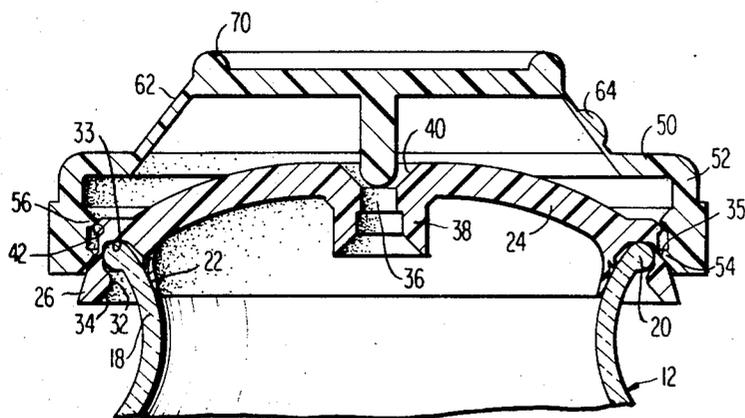
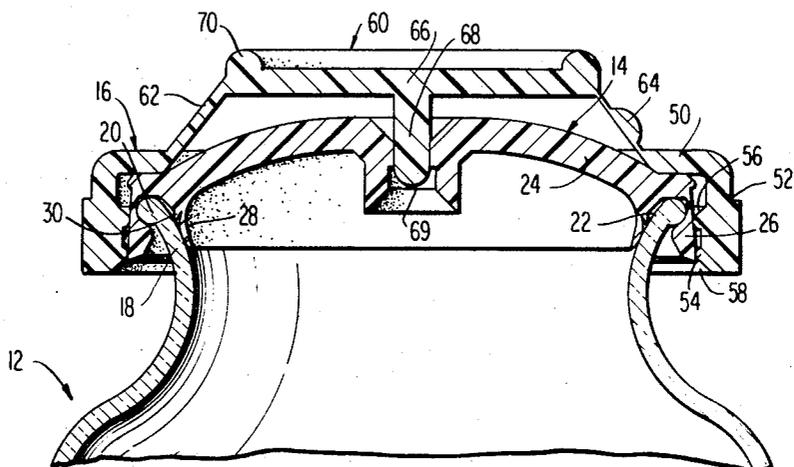
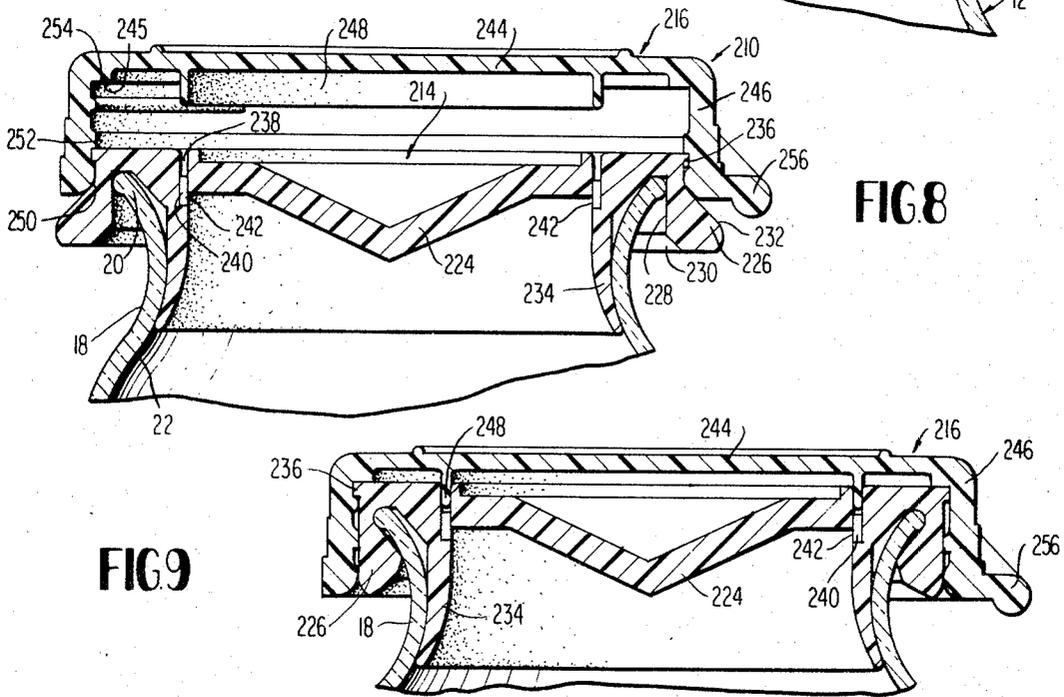
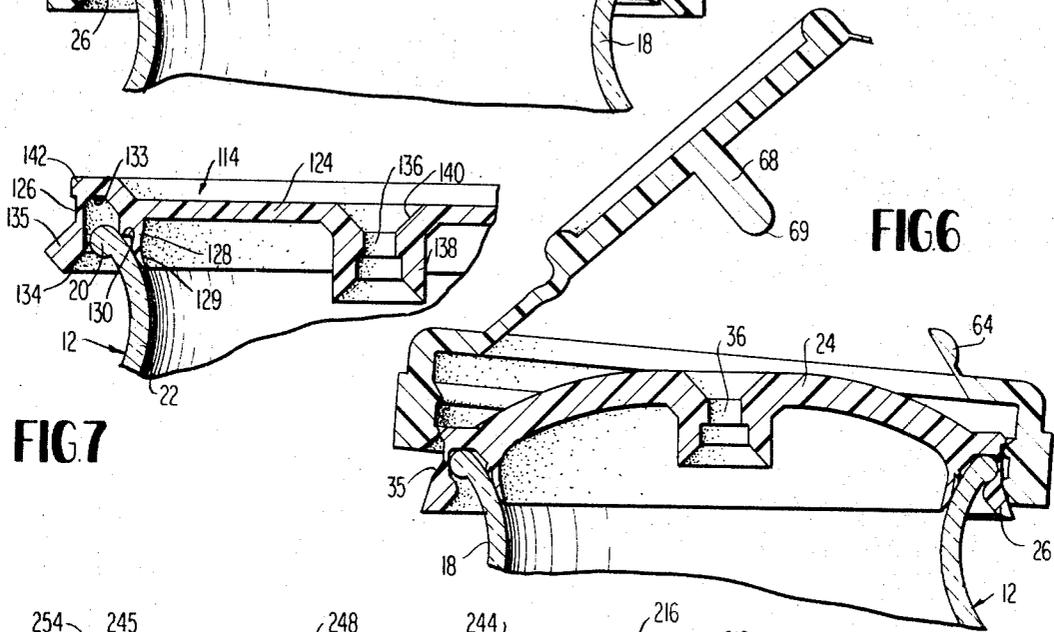
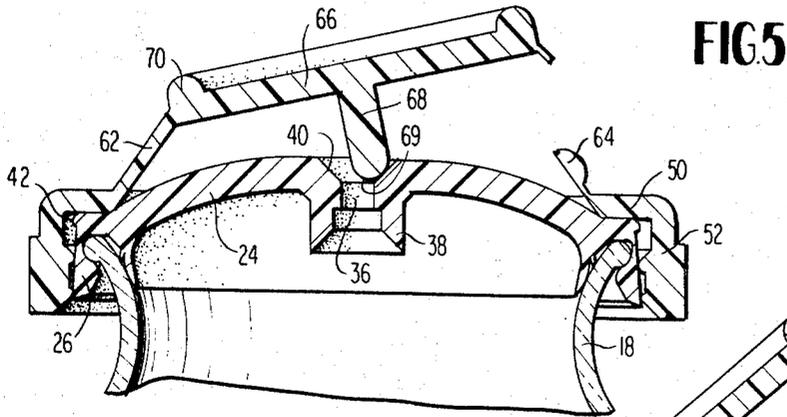


FIG4

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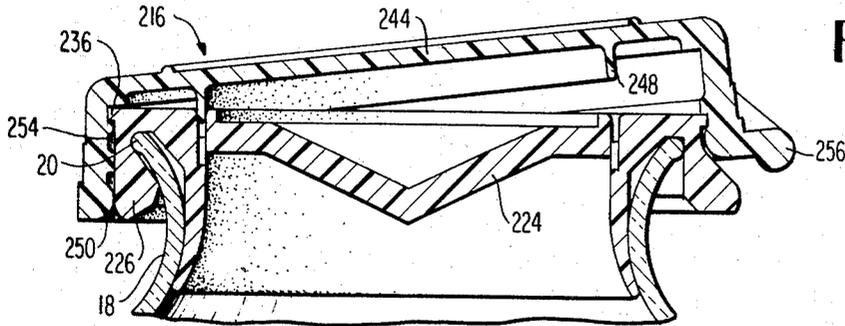


FIG 10

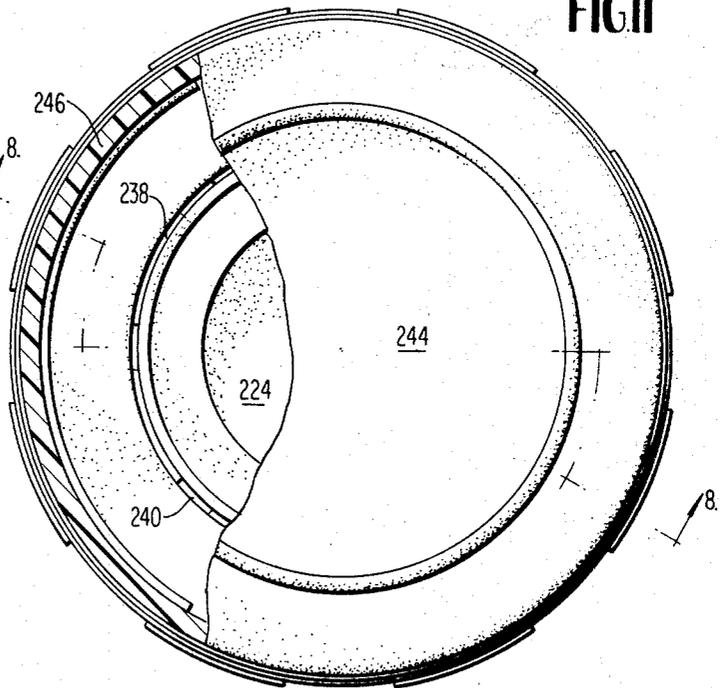


FIG 11

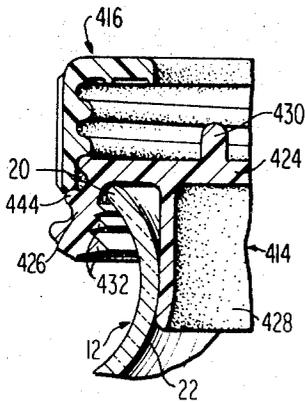


FIG 13

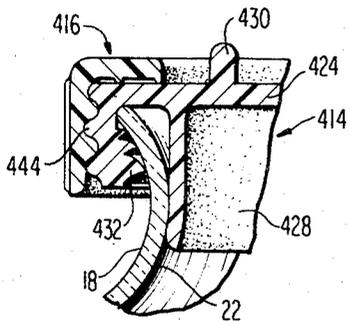


FIG 14

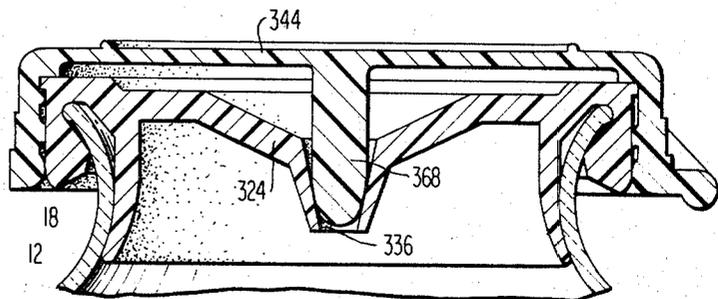


FIG 12

CLOSURE FITMENT

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an improved composite closure for a container and, more specifically to a composite closure for sealing the unthreaded neck of bottles of the type having an undercut portion around their outer periphery adjacent the top rim thereof. The closure is particularly well adapted for closing containers of the type illustrated in U.S. Pat. No. 3,372,826.

2. Description of the Prior Art

Numerous closures have been developed for sealing the open end of an unthreaded bottle neck, the most common closure of this type being the conventional crown closure employing a resilient sealing gasket positioned within a cup-shaped metal shell adapted to be crimped onto the end of the bottle neck. In addition, numerous closures have been formed from resilient synthetic resin, or plastic, materials. While many of these prior art devices have met with substantial success, they have not been entirely satisfactory for various reasons. For example, the conventional crown closure can generally only be removed with the aid of an opening device, while the resilient plastic closures have generally been unreliable in sealing bottles containing liquids under pressure such as beer, carbonated soft drinks, or the like.

The advent of the thin walled, paste molded glass container of the type illustrated in the above-mentioned United States Patent has presented unique problems in closing and sealing. While containers of this type possess exceptionally high bursting strength, their thin walls cannot generally withstand the crushing or impact loads of the conventional thick walled bottles. This reduced crushing and impact strength makes it impractical to employ conventional crown cap closing apparatus to apply closures to such containers. Further, the known resilient plastic closures have not been reliable and providing a seal for such containers when the containers are used to package pressurized liquid. Another defect of the known closures, particularly the resilient plastic closures which might be removed by hand without the use of an opener, it is the tendency of the closure to be blown off with substantial force as soon as sufficient external force is applied to initiate the opening operation.

SUMMARY OF THE INVENTION

Among the objects of the present invention is to provide a composite closure cap which may be applied to a bottle having an unthreaded neck opening to reliably seal the bottle, and which may readily be removed by hand without aid of an opening tool.

Another object is to provide such an improved closure which may be employed to reliably seal such a bottle containing fluid under pressure, and which is adapted to safely vent the pressure as the closure is opened.

Another object is to provide such a closure which will reliably seal an unthreaded bottle neck opening despite variations in the size of the opening resulting from usual manufacturing tolerances.

The foregoing and other objects are attained in a bottle closure according to the present invention which comprises a sealing fitment and a retaining fitment

adapted to be telescopically received onto the end of a bottle neck. The inner, sealing fitment includes a closure panel adapted to overlie the open end of the bottle neck, with a downwardly depending skirt integrally formed around the outer periphery of the closure panel adapted to telescopically receive the outwardly projecting rim of the bottle and to project downwardly there below. An annular, resilient sealing ring is integrally formed on the closure panel, in inwardly spaced, concentric relation to the annular skirt, and is adapted to project into and sealingly engage the inner surface of the bottle neck. The skirt on the sealing fitment has a radially outwardly projecting portion below the rim of the container when the fitment is installed on the container neck.

The retaining fitment is adapted to telescope onto the sealing fitment, and comprises an end panel adapted to overlie and engage at least a portion of the closure panel adjacent the outer periphery thereof, and a downwardly depending skirt formed around the outer periphery of the end panel. The inner surface of the skirt on the retaining fitment is adapted to engage and compress, or cam the resilient skirt on the sealing fitment inwardly into the undercut portion of the container neck beneath the rim to form a second seal and releasably retain the sealing fitment on the end of the bottle neck.

One or more vent openings are formed in and extend through the closure panel of the sealing fitment, and mating tongues formed on the retaining fitment are adapted to project into the vent openings when the closure is installed to seal the vents. These vents are opened as the retaining fitment is telescoped upward off the sealing fitment to open the container so that pressure within the container is vented before the retaining fitments is completely removed to thereby prevent the sealing fitment from being forceably blown off by the pressure within the container upon removal of the retaining fitment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of a closure fitment according to the present invention mounted on the open neck of a bottle;

FIG. 2 is an elevational view of the structure shown in FIG. 1;

FIG. 3 is an enlarged sectional view taken along line 3-3 of FIG. 1;

FIG. 4 is a view similar to FIG. 3, with the retaining fitment only partially installed on the sealing fitment;

FIG. 5 is a view illustrating the manner of opening a bottle sealed with the fitment shown in FIGS. 1-4;

FIG. 6 is a view similar to FIG. 5 and showing a further step in opening the bottle;

FIG. 7 is a fragmentary sectional view illustrating an alternate embodiment of the invention;

FIG. 8 is a sectional view similar to FIG. 4 and illustrating a further embodiment of the closure only partially assembled onto a bottle;

FIG. 9 is a sectional view of the structure shown in FIG. 8 and illustrating the closure fully installed on a bottle;

FIG. 10 is a view illustrating the initial step in opening the closure shown in FIGS. 8 and 9;

FIG. 11 is a fragmentary top plan view of the structure shown in FIGS. 8-10;

FIG. 12 is a sectional view similar to FIGS. 3 and 9, and illustrating a further modification of the closure;

FIG. 13 is a fragmentary sectional view illustrating a still further modification of the closure in the partially installed position; and

FIG. 14 is a fragmentary sectional view of the closure shown in FIG. 13 illustrated in the fully installed position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings in detail, a two-piece closure cap assembly according to the present invention, indicated generally by the reference numeral 10, is illustrated in FIGS. 1-6 as employed on the open end of a glass container 12. The closure cap 10 comprises an inner sealing fitment 14 adapted to engage and seal the open neck of container 12, and a retainer fitment 16 adapted to telescope onto the sealing fitment 14 to retain the assembly on the container. The container 12 illustrated in the drawings is of the thin wall paste molded type having an outwardly flared neck 18 terminating at its open end in a smooth rim 20 and having a reduced outside diameter immediately below the rim, thereby producing an undercut outer surface adjacent rim 20. The inner surface 22 of the neck 18 is a smooth convex surface in vertical cross section, and the closure cap of this invention forms a primary pressure seal with this smooth surface in the manner to be described hereinbelow. It is understood, of course, that the closure cap could be employed to seal more conventional containers of the type conventionally employed in connection with crown closures to package soft drinks, beer, or the like.

The sealing fitment 14 comprises an end panel 24 adapted to overlie and engage the top of rim 20, and a downwardly depending skirt 26 integrally molded around its outer periphery. A resilient sealing ring 28 is integrally molded on the inner surface of panel 24 and projects downwardly therefrom in radially inwardly spaced relation to skirt 26. Ring 28 is dimensioned to be received in and be slightly compressed by the inner surface 22 of the bottle 12 to form a primary high pressure seal for the container. Pressure fluid in the container acting on the inner surface of the ring 28 will tend to expand the ring radially to maintain a positive seal when the sealing fitment is installed on the open mouth of the container.

A second, shorter resilient ring 30 is integrally formed on panel 24 and projects downwardly therefrom adjacent the base of and outwardly spaced from ring 28. This ring 30 is adapted to engage and be radially compressed by the surface 22 in a manner similar to the ring 28 to provide a secondary, low pressure seal for the container. Rings 28 and 30 are of sufficient diameter to engage and form a positive seal with the inner surface of a container of maximum diameter allowed by the normal manufacturing tolerances, yet are sufficiently resilient to be compressed by a container having a minimum allowable diameter. Thus, a positive seal is formed with any container whose neck dimensions fall within normal manufacturing tolerances which, in the case of paste molded glass containers of the type illustrated in U.S. Pat. No. 3,372,826 may result in a variation of neck diameter of 0.010 inches or more.

As best seen in FIGS. 4 and 6, skirt 26 has a radially inwardly extending bead 32 formed on its inner surface in vertically spaced relation to the inner surface 33 of panel 24. The inner diameter of skirt 26 at bead 32 is slightly less than the diameter of neck 18 at rim 20. Below bead 32, the inner surface of skirt 26 flares outward to provide a cone-shaped surface 34 having a maximum diameter slightly larger than that of rim 20 to facilitate telescoping fitment 14 onto the open container. The outer surface of skirt 26 flares outward from a shoulder 35 spaced above bead 32 to the bottom end of the skirt for the purpose to be more fully explained hereinbelow.

The end panel 24 is outwardly convex or slightly dome-shaped to provide maximum strength and resistance to deflection under pressure from within the container 12. A vent opening 36 is formed in the center of the panel, with the panel being reinforced in the area of opening 36 by an inwardly directed annular sleeve 38 surrounding the opening. The outer end of the opening 36 is cone shaped, flaring outwardly as at 40 to act as a guide for a vent seal member carried on the retaining fitment 16. An outwardly directed bead 42 is formed on and extends around the peripheral edge of skirt 26 adjacent its top.

The outer, retaining fitment 16 is made up of an end panel in the form of an annular flange 50 adapted to overlie and engage the top outer surface of panel 24 above the rim 20 of container 12, and a downwardly depending annular skirt 52 integrally formed around the outer periphery of the flange 50. Skirt 52 has a pair of axially spaced annular beads 54, 56 integrally formed around its inner periphery, with beads 56, 56 having a diameter substantially equal to the minimum outside diameter of flange 26. The bead 54 is spaced from the lower edge of skirt 52, and the inner surface of skirt 52 flares outwardly therebelow to provide a substantially cone shaped surface 58 extending to the bottom edge of skirt 52 to facilitate telescoping the fitment 16 onto the sealing fitment 14.

A combined tamper proof pull tab and vent seal assembly 60 is mounted within the annular opening of flange 50 by an integrally molded hinge element 62 and a frangible tab 64. The assembly 60 includes an annular, rigid disk element 66 having a cylindrical post 68 integrally molded on its inner surface in position to fit within the vent opening 36 in panel 24, and a raised rim 70 around its periphery to add rigidity to the tab and to facilitate grasping the disk to open the container. The lower end 69 of post 68 is rounded to facilitate insertion of the post into the vent opening, and the diameter of the post 68 is slightly larger than the diameter of the vent opening to provide a positive seal when the post is inserted through the opening.

To assemble the closure cap 10 onto the container 12, the sealing fitment 14 is positioned on top of the rim 20 of the container, and a slight vertical pressure is applied to the top of the panel 24 to snap the bead 32 on the skirt 26 over the rim 20 to the position shown in FIG. 4. In this position, web 28 engages the inner surface 22 of the container neck to form a primary, high pressure seal for the container. At the same time, the short web 30 also engages the inner surface 22 of the container neck to form a secondary, low pressure seal. This short web 30 provides reinforcing for the base of

the web 28 to add strength to the closure and prevent high pressure within the container from distorting the web and thereby permitting leakage.

With sealing fitment positioned on the rim 20 of container 12, retaining fitment 16 is telescoped onto sealing fitment 14 by placing the beveled surface 58 on the top inclined surface of bead 42 and applying a pressure to snap bead 54 over bead 42 and into engagement with shoulder 35. In this position, bead 56 is in engagement with bead 42, and the bottom end 69 of cylindrical post 68 is positioned immediately above and in alignment with vent opening 36. If desired, fitments 14 and 16 may be preassembled to this extent before mounting on the container.

Further vertical pressure applied to disk 66 and to flange 50 will simultaneously force the post 68 into vent opening 36 to close and seal the vent opening, and cam the outwardly flaring skirt 26 inwardly to force the bead 32 into a tight engagement with the undercut outer surface of rim 20. This coming action, in cooperation with the interaction between bead 32 and rim 20, applies an axial, tensile force to the skirt 26 between bead 32 and panel 24 to form further sealing contact between the inner surface of panel 24 and rim 20 and the rim 20 and bead 32. In this fully assembled position, illustrated in FIG. 3 of the drawings, bead 54 is positioned adjacent the bottom of skirt 26, and bead 56 is positioned below the plane of the maximum diameter of rim 20, with the undersurface of flange 50 in firm contact with the outer surface of panel 24.

Returning now to FIGS. 5 and 6, it is seen that the closure may be opened safely without the use of any tools, even when used to seal a container filled with liquid under pressure, by merely breaking the frangible tab 64, and grasping and lifting the annular disk 66 to withdraw the post 68 from the vent 36. Thus, pressure within the container 12 is permitted to escape while the closure is still firmly retained on the open end of the bottle as illustrated in FIG. 5. By further pulling on the tab 66, the retaining fitment 16 is lifted upwardly off the sealing fitment 14 as illustrated in FIG. 6. Upon removal of the retaining fitment 16, the sealing fitment 14 may easily be lifted from the open end of the bottle 12 with fingers.

Referring now to FIG. 7, a modification of the above-described embodiment of the invention is illustrated as employing an inner sealing fitment 114 of slightly different construction. Sealing fitment 114 comprises a substantially planar end panel 124 having a downwardly depending skirt 126 integrally molded around its outer periphery and an annular sealing ring 128 depending downwardly from the inner surface of panel 124 in radially spaced relation to skirt 126. Ring 128 includes a primary high pressure sealing web 129 and a secondary, low pressure sealing shoulder 130, each adapted to engage and form a seal with the inner surface 22 of the neck of the container 12 in a manner similar to that described above.

A vent opening 136 is formed in the center of panel 124, and the panel is reinforced around opening 136 by an annular sleeve 138. A cone-shaped guide surface 140 is provided to facilitate insertion of the cylindrical vent seal post 68 of fitment 16 into opening 136.

The lower, inner surface of skirt 126 flares outwardly to provide a cone-shaped surface 134 to facilitate cam-

ing the fitment 114 over rim 20 of the container 12, and the outer surface of skirt 126 flares outwardly to provide a cone-shaped cam surface from a point spaced below the inner surface of the panel 124 to the bottom edge of the skirt 126 to engage the beads 54, 56 of fitment 16 to cam the lower edge of the skirt 126 beneath the undercut outer surface of the rim 20 in the manner described hereinabove.

Referring now to FIGS. 8-11, a further embodiment of the invention is illustrated in which the closure assembly 210 comprises an inner sealing fitment 214 and an outer retaining fitment 216 adapted to be mounted on the open neck 18 of the bottle 12 in a manner similar to that described above. The sealing fitment 214 comprises a closure panel 224 having a downwardly depending skirt 226 integrally molded around its outer periphery and an outwardly extending rim 136 formed around its peripheral edge. Skirt 226 has a substantially cylindrical, smooth inner surface 228 terminating at its lower edge in an outwardly flaring cone-shaped surface 230 to facilitate telescoping the fitment over the rim 20 of the container 12. The lower portion of skirt 226 is thickened, flaring outwardly from a point below the inner surface of panel 224 at the juncture of the panel with the skirt 226 to a point adjacent its lower edge, thereby providing a substantially cone-shaped outer cam surface 232 for engagement with the retaining fitment to cam the skirt 226 beneath the undercut portion of the rim 20.

A single, elongated sealing ring 234 is integrally molded on the inner surface of panel 224 and extends downwardly therefrom in inwardly spaced concentric relation to the skirt 226. The resilient sealing ring 234 is adapted to extend axially below the minimum diameter portion of the neck 18 of the container 12, with the configuration of the sealing ring being such as to engage and form a seal with the inner surface 22 of the container neck in the area of and below this minimum diameter portion.

The central portion of panel 224 is generally cone-shaped, being depressed inwardly in the direction of the open mouth of the bottle 12. An annular groove 238 is formed in the outer surface of panel 224 and extends partially therethrough, with the innermost wall of the groove 238 being in axial alignment with the inner surface of the resilient ring 234. A plurality of notches, or depressions, 240 are formed in the bottom of the annular groove 238, with the notches 240 extending below the inner surface of the panel 224 and into the ring 234 to provide a plurality of vent openings 242 through panel 224.

The retaining fitment 216 comprises a substantially flat end panel 244 having a downwardly depending skirt 246 integrally molded around this peripheral edge, and an annular sealing ring 248 integrally molded on and depending downwardly from its inner surface in position to fit in the annular groove 238 when fitment 216 is installed on fitment 214 to thereby sealingly close the vents 242.

The skirt 246 of fitment 216 has a pair of annular beads 250, 252 formed around its inner surface, with the bead 250 being positioned adjacent the bottom of the skirt and the bead 252 being spaced vertically thereabove a distance sufficient to receive the flange 236 on fitment 214 between the beads 250 and 252. A

pivot flange 254, in the form of an inwardly directed bead, is molded on the inner surface of skirt 246 between bead 252 and the inner surface 245 of panel 244. This pivot flange, which extends only approximately 120° around the periphery of skirt 246, is spaced from surface 245 a distance sufficient to receive the flange 236 therebetween. A lifting tab 256 formed on the outer surface of skirt 246 projects radially outwardly therefrom at a position approximately diametrically opposed to the pivot flange 254.

The embodiment of the closure cap illustrated in FIGS. 8-11 is assembled on the container 12 in substantially the same manner as the previously described embodiments. Thus, fitment 214 is initially positioned on the open mouth of the container 12 with the inner surface of the panel 224 engaging the rim 20, then the retaining fitment 216 is telescoped onto the fitment 214 with the beads 250, 252 camming the skirt 226 inwardly to form a seal between the rim 220 and the panel 224. In the fully assembled position illustrated in FIG. 9, the outer surface of the radially compressed skirt 226 is engaged at axially spaced points by the beads 250, 252 to positively maintain the seal and yet provide only minimum contact between the two fitments to facilitate removal.

Since the vent openings 242 are spaced around the circular groove 238, all vents will be simultaneously sealed by insertion of the flange 248 into the groove 238, regardless of the orientation of the fitments 214 and 216. The radial thickness of flange 248 is, of course, slightly greater than the radial width of groove 230 to provide a position seal.

Since the lifting tab 256 is positioned on the opposite side of fitment 216 to the pivot flange 254, the engagement of the pivot flange with the flange 236 will tend to retain the two fitments in their assembled relation on this side of the closure cap at the beginning of the opening operation as illustrated in FIG. 10.

From FIGS. 10 and 11, it should be apparent that, as the closure of this embodiment is opened, pressure within the container will initially be vented by the vent closest to lift tab 256, then progressively through other vent openings as the separation of the two fitments continues. This manner of venting, i.e., initially slow, then progressively faster, has been found desirable for some carbonated beverages in that it minimizes the tendency of such beverages to foam, or spew, upon opening. Engagement of the pivot flange 254 with the flange 236 on the fitment 214 prevents the retaining fitment from being removed too rapidly, thereby assuring complete venting before the retaining fitment is forceably lifted from the container.

A slight modification of this described embodiment is illustrated in FIG. 12 wherein a single vent opening 336 is formed in the end panel 324, which vent opening is closed by a cylindrical post 368 integrally molded on the underside of panel 344. In this embodiment, it is noted that pressure within the sealed container acting on the inner surface of the panel 324 will tend to force the cone-shaped opening of vent 336 into progressively tighter engagement with the post 368 as pressure is increased within the container. Venting of this embodiment is similar to that of the first described embodiment illustrated in FIGS. 1-6.

Referring now to FIGS. 13 and 14, a further modification of the invention will be described. In this embodiment, the sealing fitment 414 comprises an end panel 424 having a downwardly depending skirt 426 integrally molded around its outer periphery. A resilient sealing ring 428 is integrally molded on the inner surface of panel 424, and extends axially therefrom in concentric, inwardly spaced relation to flange 426 in position to engage and form a seal with the inner surface 22 of the container 12 in the manner described hereinabove. A plurality of upwardly extending holding lugs 430 are molded on the outer surface of panel 424 whereby the fitment 414 may be retained against rotation during assembly of the retaining fitment 416.

Skirt 426 is inclined outwardly from its juncture with panel 424, and a plurality of inwardly and slightly downwardly directed resilient annular fins 432 are formed on the inner surface of the skirt in position to engage and form a plurality of independent seals with the undercut outer surface of the container neck. A progressive screw thread 444 is formed on the outer surface of skirt 426 to receive the mating screw thread 446 on the skirt 448 of retaining fitment 416. While no vent is illustrated in this embodiment, it is understood that the venting feature of certain of the above described embodiments could readily be incorporated therein.

To install the closure cap assembly of FIGS. 13 and 14 on a container, the sealing fitment 414 is positioned on the open end of the container and pressed downwardly until the lower edge of the sealing ring 428 passes the minimum diameter portion of the container neck, and the rim 20 comes into engagement with the lower surface of panel 424. The retaining fitment 416 is then positioned on top of the sealing fitment, and threaded downwardly thereover to progressively cam the flange 426 inwardly to force the fins 432 into sealing engagement with the undercut outer surface of the container neck below the rim 20. This camming action applies a tensile force to the skirt 426 to draw the panel 424 into sealing engagement with the top of rim 20. The inner fitment 414 is retained against rotation during this threading operation by the lugs 430. To open the assembly, the retaining fitment 416 is threaded off of the sealing fitment, and the sealing fitment is then simply lifted from the open neck.

While a number of specific embodiments of the invention have been described in detail, it should be apparent that various other modifications could readily be made. Further, specific elements of the described embodiments could readily be combined in different configurations than those illustrated without departing from the inventive concept. Accordingly, while preferred embodiments have been illustrated, we wish it understood that we do not intend to be restricted solely thereto, but that we do intend to include all embodiments thereof which would be apparent to one skilled in the art, and which come within the spirit of the scope of our invention.

We claim:

1. A sealed package comprising, a container having an unthreaded outwardly flared neck terminating at its open end in a substantially smooth rim, and a closure cap mounted on and sealing said open end, said closure cap including a sealing fitment including an end panel

adapted to engage said smooth rim and overlay said open end of the container, a downwardly depending annular skirt integrally formed on said end panel adjacent the outer periphery thereof telescoping downwardly over and encircling the outer surface of said smooth rim, a first downwardly depending annular sealing ring integrally formed on said end panel in inwardly spaced concentric relation to said skirt, said first sealing ring being dimensioned to engage and form a first seal with the inner surface of said outwardly flared neck along a first seal line spaced below said smooth rim, and a second downwardly depending annular sealing ring integrally formed on said end panel between said first sealing ring and said skirt, said second sealing ring being dimensioned to engage and form a second seal with the inner surface of said outwardly flared neck along a second seal line spaced above and radially outwardly from said first seal line, and a retaining fitment adapted to telescope onto and retain said sealing fitment on said open end, said retaining fitment and said skirt having cooperating cam surfaces thereon adapted to engage one another and compress said skirt radially inwardly beneath said smooth rim when said retaining fitment is telescoped onto said sealing fitment to thereby releasably retain said sealing fitment on said open end of said outwardly flared neck.

2. The sealed package defined in claim 1 wherein said second sealing ring comprises a shoulder integrally molded on said first sealing ring and projecting outwardly therefrom at a point spaced above the bottom edge of said first sealing ring.

3. The sealed package defined in claim 1 wherein said first and second sealings rings are molded from a resilient synthetic resin material.

4. The sealed package defined in claim 3 wherein said first and second sealing rings are dimensioned to engage and form a seal with said container neck having a maximum allowable diameter, and wherein said resilient material is capable of radial compression sufficiently to permit the sealing rings to be inserted into and seal a container having a minimum allowable diameter less than said maximum allowable diameter whereby said sealing fitment may be employed to seal containers having neck diameters varying within predetermined limits.

5. The sealed package defined in claim 1 wherein said retaining fitment comprises an end panel adapted to overlay at least a portion of the end panel of said sealing fitment adjacent the outer periphery thereof, and a downwardly depending skirt dimensioned to telescope onto said annular skirt on said sealing fitment, said cam surfaces being formed on the radially opposed surfaces of said downwardly depending skirt portion of said retaining fitment and said annular skirt of said sealing fitment, said cam surfaces cooperating to compress said annular skirt on said sealing fitment inwardly to contact and form a seal with the outer surface of said outwardly flared neck beneath said smooth rim.

6. The sealed package defined in claim 1 further comprising a vent opening in said end panel of said sealing fitment, and vent sealing means carried on said retaining fitment, said vent sealing means being operable to seal said vent when said closure cap is installed on said container and to vent said container when said retaining fitment is removed therefrom.

7. The sealed package defined in claim 6 wherein said vent sealing means is adapted to vent said container prior to releasing said sealing fitment upon telescoping movement of said retaining fitment in a direction to release said sealing fitment.

8. A sealed package comprising, a container having an unthreaded outwardly flared neck terminating at its open end in a substantially smooth rim, and a closure cap assembly mounted on and sealing said open end, said closure cap assembly including a molded plastic sealing fitment having an end panel adapted to engage said rim and overlay said open end, a downwardly depending annular skirt integrally molded on said end panel adjacent the outer periphery thereof and dimensioned to telescope downwardly over and closely encircle the outer surface of said rim, radially extending cam means on said skirt, a first downwardly depending annular sealing ring integrally molded on said end panel in inwardly spaced concentric relation to said annular skirt and dimensioned to engage and form a first seal with the inner surface of said outwardly flared neck along a first seal line spaced below said rim, and a retaining fitment adapted to telescope onto said sealing fitment when said sealing fitment is positioned on said container neck, said retainer fitment including an end panel adapted to overlay at least a portion of said end panel on said sealing fitment adjacent the outer periphery thereof, and a downwardly depending annular skirt having an inner surface dimensioned to engage said cam means and radially compress said skirt on said sealing fitment when said retaining fitment is telescoped thereon to retain said retaining fitment on said neck.

9. The sealed package defined in claim 8 wherein said end panel on said retaining fitment comprises an end flange overlaying the peripheral edge portion only of said end panel on said sealing fitment, said end flange having a central opening therein, and pull tab means integrally formed with said end flange and extending into said central opening to facilitate removal of said retaining fitment.

10. The sealed package defined in claim 9 further comprising a frangible taper-proof web normally retaining said pull tab means in an inoperative position, said taper-proof web being readily broken to permit said pull tab to be manually lifted to remove said retaining fitment from said sealing fitment to thereby permit said sealing fitment to be removed from said container.

11. The sealed package defined in claim 10 wherein said pull tab comprises a disc member positioned within said central opening and having one side secured to said end flange by an integrally formed hinge member, said frangible web being integrally formed with and joining said disc member and said end flange at a point spaced from said hinge member, whereby a lifting force applied to said disc will initially break said frangible web then progressively lift said retaining fitment commencing at the side thereof adjacent said hinge.

12. The sealed package defined in claim 11 and further comprising a vent opening in said end panel of said sealing fitment, and vent plug means integrally formed on said disc in position to project into and seal said vent opening when said retaining fitment is telescoped onto said sealing fitment, said vent plug being dimensioned to be withdrawn from said vent

opening upon lifting of said disc to thereby vent the interior of said container before said retaining fitment is lifted to open the container.

13. The sealed package defined in claim 8 and further comprising vent means in said end panel of said sealing fitment, and vent sealing means normally engaging and sealing said vent means when said closure cap is installed on said container, said vent sealing means being disengaged from said vent means to thereby vent said container when said retaining fitment is removed from said sealing fitment.

14. The sealed package defined in claim 13 wherein said vent means comprises a vent opening in said sealing fitment, and said vent sealing means comprises plug means integrally formed on said retaining fitment in position to project into said vent opening when said closure cap is installed on said container.

15. The sealed package defined in claim 13 wherein said vent means comprises a plurality of vent openings, and wherein said vent sealing means is adapted to disengage said vent openings successively to thereby progressively increase the rate of venting said container as said retaining fitment is progressively removed.

16. The sealed package defined in claim 8 wherein said sealing fitment further comprises a second downwardly depending annular sealing ring integrally formed on said end panel between said first annular sealing ring and said annular skirt, said second sealing ring being dimensioned to engage and form a seal with the inner surface of said container neck along a second seal line spaced above and radially outwardly from said second seal line.

17. A two-part closure cap assembly for a container having an outwardly flared unthreaded neck terminating at its open end in a substantially smooth rim overhanging a portion of the outer surface of the neck, said closure cap assembly comprising, in combination, a sealing fitment and a retaining fitment, said sealing fitment being molded from a single mass of plastic material and including an end panel adapted to overlay said open end and engage said rim to close said container, a first annular skirt depending downwardly from the peripheral edge of said second end panel, said first annular skirt being dimensioned to telescopingly receive and encircle said rim and to project downwardly therebelow, and cam means including a radially thickened portion extending around the outer surface of said first annular skirt in vertically spaced relation to said end panel and spaced below said rim when said sealing fitment is positioned on said container, said retaining fitment being adapted to be forced downwardly onto said retaining fitment to seal said container and to be lifted therefrom to open the container, said retaining fitment including an end panel adapted to overlay at least a portion of the end panel of said sealing fitment adjacent the outer periphery thereof and a second downwardly depending annular skirt dimensioned to closely encircle said first annular skirt and to telescope over and force said radially thickened portion inward to compress said first annular skirt inward beneath said rim when said retaining fitment is forced downward onto said sealing fitment to thereby releasably retain said closure cap assembly on the container.

18. The closure cap assembly defined in claim 17 further comprising an annular inwardly directed sealing bead formed on and extending around the inner periphery of said first annular skirt in position to project beneath said rim and form a seal with the outer surface of the container when said cap assembly is installed thereon.

19. The closure cap defined in claim 18 wherein said annular bead is positioned and dimensioned to engage said rim as said first annular skirt is being compressed to thereby cam said sealing fitment tightly onto said open end.

20. The closure cap defined in claim 17 comprising a plurality of concentric axially spaced annular sealing fins integrally molded on the inner surface of said first annular skirt in position to engage and form a seal with the outer surface of said container neck.

21. The closure cap as defined in claim 17 further comprising lifting tab means on said retaining fitment to facilitate lifting said retaining fitment off said sealing fitment to open the container, said lifting tab being eccentrically secured on said retaining fitment to initially lift one side thereof upon application of a lifting force to said tab.

22. The closure cap as defined in claim 21 further comprising an outwardly directed flange formed on said sealing fitment and projecting outwardly from said first annular skirt at the peripheral edge of said end panel, and pivot flange means formed on and extending part way only around the inner surface of said second annular skirt in substantially opposed relation to lifting tab means, said pivot flange being adapted to snap over said outwardly directed flange when said retainer is installed on said sealing fitment and to resist vertical movement of the side of said retaining fitment opposite said lifting tab upon initial lifting thereof.

23. The closure cap as defined in claim 22 wherein said end panel on said retaining fitment comprises an end flange overlaying the peripheral edge portion only of said end panel on said sealing fitment, said end flange having a central opening therein and pull tab means integrally formed with said end flange and extending into said central opening to facilitate removal of said retaining fitment.

24. The closure cap as defined in claim 23 further comprising a frangible taper-proof web normally retaining said pull tab means in an inoperative position, said taper-proof web being readily broken to permit said pull tab to be manually lifted to remove said retaining fitment from said sealing fitment to thereby permit said sealing fitment to be removed from said container.

25. The closure cap as defined in claim 24 wherein said pull tab comprises a disc member positioned within said central opening and having one side secures to said end flange by an integrally formed hinge member, said frangible web being integrally formed with and joining said disc member and said end flange at a point spaced from said hinge member, whereby a lifting force applied to said disc will initially break said web then progressively lift said retaining fitment commencing at the side thereof adjacent said hinge.

26. The closure cap defined in claim 25 further comprising a vent opening in said end panel of said sealing fitment, and vent plug means integrally formed on said disc in position to project into and seal said vent open-

ing when said retaining fitment is telescoped onto said sealing fitment, said vent plug being dimensioned to be withdrawn from said vent opening upon lifting of said disc to thereby vent the interior of said container before said retaining fitment is lifted to open the container.

27. The closure cap defined in claim 17 further comprising vent means in said end panel of said sealing fitment, and vent sealing means normally engaging and sealing said vent means when said closure cap is installed on said container, said vent sealing means being disengaged from said vent means to thereby vent said container when said retaining fitment is removed from said sealing fitment.

28. The closure cap defined in claim 27 wherein said vent sealing means comprises a vent opening in said sealing fitment, and plug means integrally formed on said retaining fitment in position to project into said vent opening when said closure cap is installed on said container.

29. The closure as defined in claim 28 wherein said vent means comprises a plurality of vent openings, and wherein said vent sealing means is adapted to disengage said vent openings successively to thereby progressively increase the rate of venting said container as said retaining fitment is removed.

30. The closure cap as defined in claim 17 wherein said sealing fitment further comprises a first downwardly depending annular sealing ring integrally formed on the inner surface of said end panel in concentric inwardly spaced relation to said annular skirt, said first sealing ring being dimensioned to engage and form a seal with the inner surface of said neck along a first seal line spaced below said open end.

31. The closure cap as defined in claim 30 wherein said sealing fitment further comprises a second downwardly depending annular sealing ring integrally formed on said end panel between said first sealing ring and said first annular skirt, said second sealing ring being dimensioned to engage and form a seal with the inner surface of said container neck along a second seal line spaced above and radially outwardly from said first seal line.

32. The closure cap as defined in claim 31 wherein said second sealing ring comprises a shoulder integrally molded on said first sealing ring and projecting outwardly therefrom at a point spaced above the bottom edge of said first sealing ring.

33. The closure cap defined in claim 32 wherein said first and second sealing rings are molded from a resilient synthetic resin material.

34. The closure cap defined in claim 33 wherein said first and second sealing rings are dimensioned to engage and form a seal with said container neck having a maximum allowable diameter, and wherein said resilient material is capable of radial compression sufficiently to permit the sealing rings to be inserted into and seal a container housing a minimum allowable diameter less than said maximum allowable diameter, whereby said sealing fitment may be employed to seal container having neck diameters varying within predetermined limits.

35. A two-part closure cap assembly for a container having an outwardly flared unthreaded neck terminating at its open end in a substantially smooth rim over-

hanging a portion of the outer surface of the neck, said closure cap assembly comprising, in combination, a sealing fitment and a retaining fitment, said sealing fitment being molded from a single mass of plastic material and including an end panel adapted to overlay said open end and engage said rim to close said container, a first annular skirt depending downwardly from the peripheral edge of said second end panel and having an outwardly and downwardly tapering outer surface in the general configuration of a frustum of a cone, said first annular skirt being dimensioned to telescopically receive and encircle said rim and to project downwardly therebelow, said generally conical outer surface defining radially extending cam means on said first annular skirt in vertically spaced relation to said end panel, said retaining fitment being adapted to be forced downwardly onto said sealing fitment to seal said container and to be lifted therefrom to open the container, said retaining fitment including an end panel adapted to overlay at least a portion of the end panel of said sealing fitment adjacent the outer periphery thereof and a second downwardly depending annular skirt dimensioned to closely encircle said first annular skirt and to engage said force said cam means radially inward to compress said first annular skirt inward beneath said rim when said retaining fitment is forced downward onto said sealing fitment to thereby releasably retain said closure cap assembly on the container.

36. The closure cap defined in claim 35 further comprising male screw threads formed on said conical outer surface, said second annular skirt being substantially cylindrical and having female screw threads formed on the inner surface thereof adapted to mate and cooperate with said male screw threads to compress said first annular skirt inward as said retaining fitment is threaded onto said sealing fitment.

37. The closure cap as defined in claim 36 further comprising restraining means on said sealing fitment adapted to be engaged to restrain said sealing fitment against rotation as said retaining fitment is threaded downward thereover.

38. The closure cap defined in claim 37 comprising at least one radially inwardly extending annular sealing fin on the inner surface of said first annular skirt in position to engage and form a seal with the outer surface of a container when the closure cap assembly is installed thereon.

39. A two-part closure cap assembly for a container having an outwardly flared unthreaded neck terminating at its open end in a substantially smooth rim overhanging a portion of the outer surface of the neck, said closure cap assembly comprising, in combination, a sealing fitment and a retaining fitment, said sealing fitment being molded from a single mass of plastic material and including an end panel adapted to overlay said open end and engage said rim to close said container, a first annular skirt depending downwardly from the peripheral edge of said second end panel, said first annular skirt being dimensioned to telescopically receive and encircle said rim and to project downwardly therebelow, radially extending cam means on the outer surface of said first annular skirt in vertically spaced relation to said end panel, said retaining fitment being adapted to be forced downwardly onto said sealing fit-

ment to seal said container and to be lifted therefrom to open the container, said retaining fitment including an end panel adapted to overlay at least a portion of the end panel of said sealing fitment adjacent the outer periphery thereof and a second downwardly depending annular skirt dimensioned to closely encircle said first annular skirt and to engage said force said cam means radially inward to compress said first annular skirt inward beneath said rim when said retaining fitment is forced downward onto said sealing fitment to thereby releasably retain said closure cap assembly on the container, an annular concentric channel formed in said end panel of said sealing fitment and extending only part way therethrough, a plurality of circumferentially spaced apertures formed in and extending through said end panel from within said channel, an annular concentric ring formed on said end panel of said retaining fitment and adapted to fit into said channel and seal said apertures when said cap assembly is mounted on said container, and eccentric lifting tab means on said retaining fitment for applying a lifting force to one side of said retaining fitment to progressively lift said retaining fitment upward from one side and thereby progressively withdraw said annular concentric ring from said channel.

40. The closure cap defined in claim 39 further comprising an outwardly directed flange formed on said sealing fitment and projecting outwardly from said first annular skirt at the peripheral edge of said end panel, and pivot flange means formed on and extending part way only around the inner surface of said second annular skirt in substantially opposed relation to lifting tab means, said pivot flange being adapted to snap over said outwardly directed flange when said retainer is installed on said sealing fitment and to resist vertical movement of the side of said retaining fitment opposite said lifting tab upon initial lifting thereof.

41. A two-part closure cap for a pressurized container having an unthreaded neck terminating at its open end in a substantially smooth rim having a diameter greater than the outside diameter of the neck at a point spaced below said rim, said closure cap comprising, in combination, a sealing fitment and a cooperating retaining fitment, said sealing fitment being formed from a resilient material and including an end panel having a downwardly depending annular skirt integrally formed thereon adjacent its outer periphery and a downwardly depending annular sealing ring inwardly spaced from and concentric with said skirt, a vent opening formed in and extending through said end panel, said skirt including a radially extending flange portion extending therearound below said end panel, said flange portion having an outside diameter greater than the maximum diameter of said end panel, said sealing ring having an outer radial surface dimensioned to engage and form a seal with the inner surface of said neck, said retaining fitment being adapted to telescope onto said sealing fitment when said sealing fitment is positioned on said container neck and including an end panel adapted to overlay at least a portion of the end panel of said sealing fitment adjacent the outer

periphery thereof and a downwardly depending skirt having an internal diameter less than the outside diameter of said radially extending flange and adapted to engage said flange and cam said annular skirt of said sealing fitment inwardly beneath said smooth rim of said neck when said retaining fitment is telescoped downwardly onto said sealing fitment, and vent sealing means carried on said retaining fitment and adapted to engage and close said vent opening when said closure cap is installed on the container.

42. A two-part closure cap for a container having an unthreaded neck terminating at its open end in a substantially smooth rim having a diameter greater than the outside diameter of the neck at a point spaced below said rim, said closure cap comprising, in combination, a sealing fitment and a cooperating retaining fitment, said sealing fitment being formed from a resilient material and including an end panel having a downwardly depending annular skirt integrally formed thereon adjacent its outer periphery and a downwardly depending annular sealing ring inwardly spaced from and concentric with said skirt, said annular skirt being adapted to telescope over and project beneath the container's smooth rim, said sealing ring having an outer radial surface dimensioned to engage and form a seal with the inner surface of the container neck, said retainer fitment being adapted to be telescoped downwardly onto said sealing fitment when said sealing fitment is positioned on the container neck to releasably retain said closure cap on the container neck and to telescope upwardly to release said sealing fitment and thereby permit easy removal of said cap from the container, said retainer fitment including an end panel adapted to overlay at least a portion of the end panel of said sealing fitment adjacent the outer periphery thereof and a downwardly depending skirt having an internal surface adapted to engage and releasably retain said skirt of said sealing fitment beneath the smooth rim of the container neck when said retaining fitment is telescoped downwardly onto said sealing fitment, at least one vent opening formed in and extending through said end panel of said sealing fitment, and cooperating vent sealing means carried on said retainer fitment and adapted to close said at least one vent opening when said retainer fitment is telescoped fully downward onto said sealing fitment, said vent sealing means being adapted to open said at least one vent opening to vent the container upon limited upward telescoping movement of said retainer fitment on said said sealing fitment, said limited upward telescoping movement being insufficient to release and thereby permit removal of said retaining fitment from the container neck.

43. The closure cap as defined in claim 42 wherein said at least one vent opening comprises a plurality of apertures formed in and extending through said end panel of said sealing fitment, said vent sealing means being adapted to successively vent said apertures upon upward telescoping movement of said retaining fitment.

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