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(54) **BEVERAGE CONTAINER CLOSURE WITH PRESSURE RELEASE**

(52) **U.S. Cl. .... 220/254.1**

(57) **ABSTRACT**

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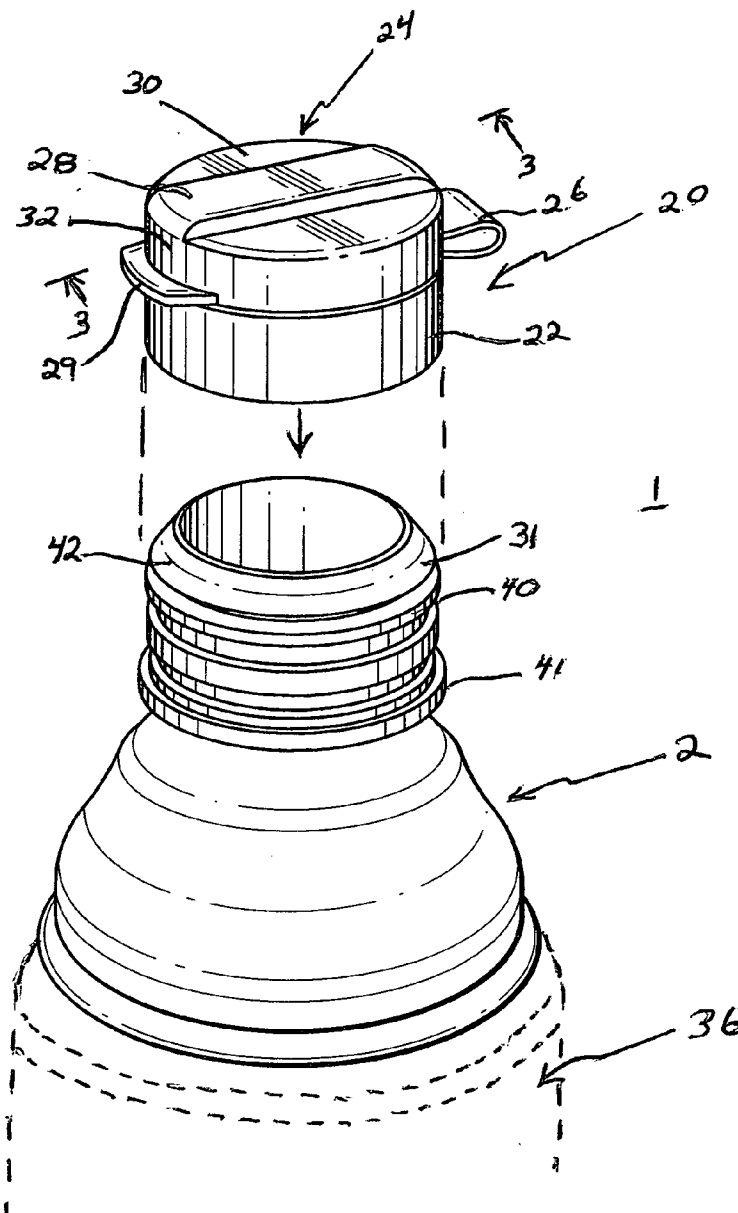
A beverage container closure with pressure release, includes a generally funnel-shaped device body having an upper portion and a lower portion, a snap ring extending around an inner periphery of said lower portion, wherein the snap ring can be releasably attached to a beverage container for maintaining a leak-proof and airtight seal with an edge of the beverage container and a snap cover releasably attached to the upper portion of the device body, wherein the snap cover is designed to release from the upper portion of the device body prior to the device body releasing from the beverage container when pressure builds up within the beverage container.

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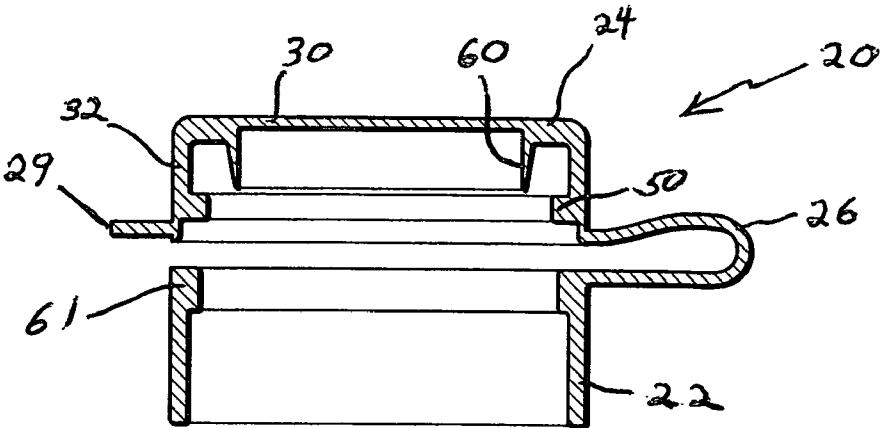
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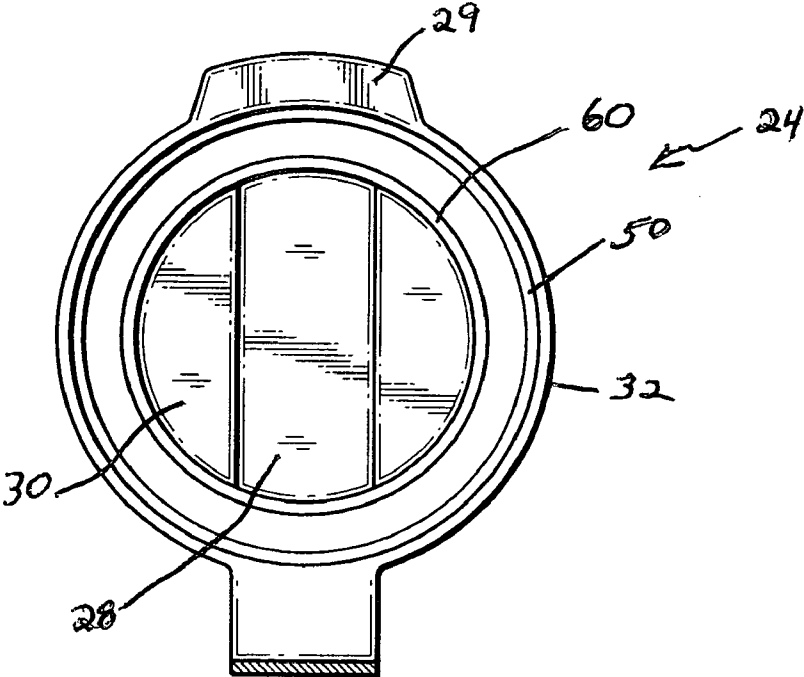
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**FIG. 3**



**FIG. 4**

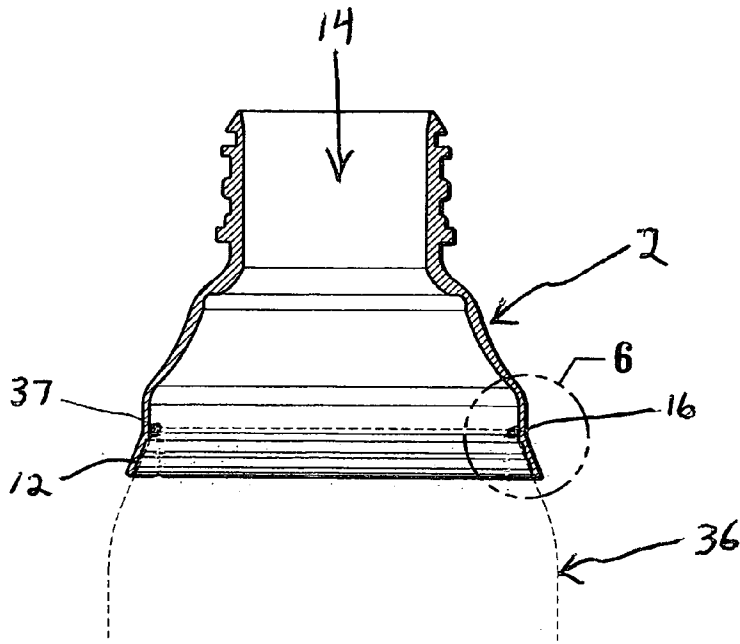


FIG. 5

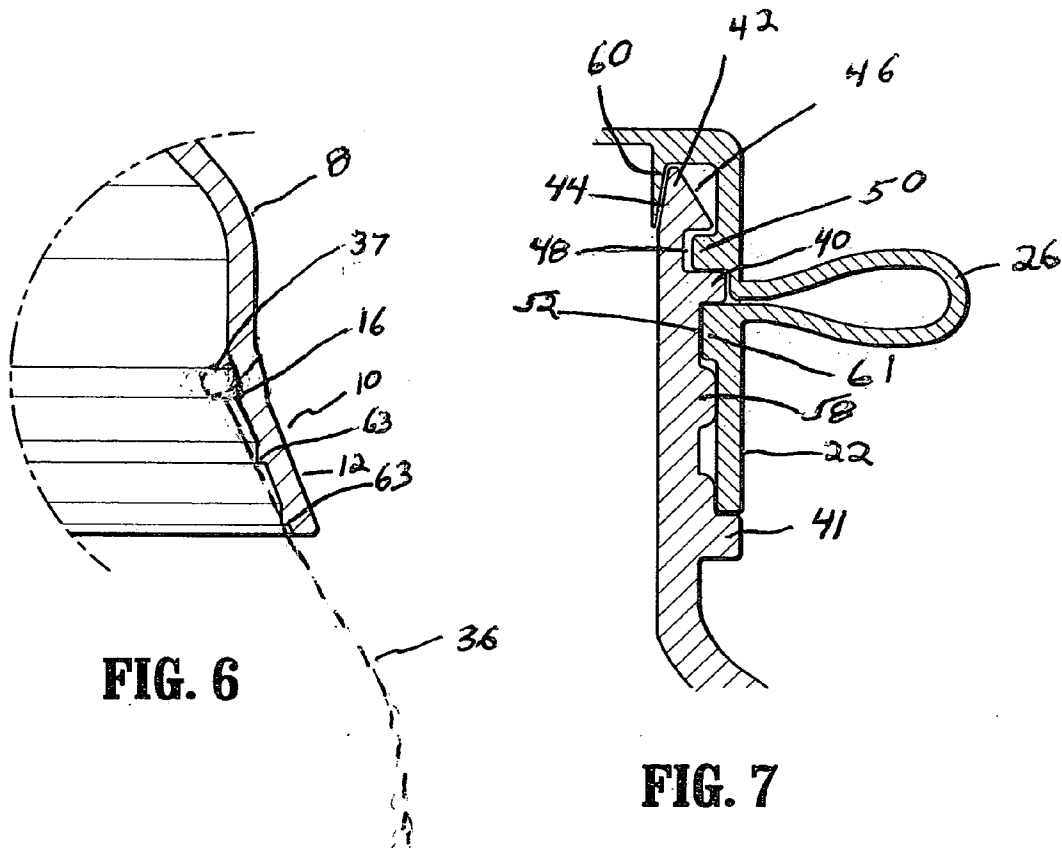


FIG. 6

FIG. 7

**BEVERAGE CONTAINER CLOSURE WITH PRESSURE RELEASE**

**BACKGROUND OF THE DISCLOSURE**

[0001] 1. Field of the Disclosure

[0002] The present disclosure relates generally to beverage container closures and in particular, to beverage container closures with pressure release.

[0003] 2. Description of the Related Art

[0004] Beverage containers are generally formed from cylindrical aluminum cans which contain a soft drink, beer or other liquid beverage. Such containers are usually available in 12-ounce and 16-ounce volumes, although various volumes of beverage containers may be available. A conventional beverage container includes a pull tab which initially seals an opening in the top of the container and can be pulled to expose the opening and facilitate access to the beverage contents of the container. However, one of the limitations of conventional can-type beverage containers is that once the pull tab has been used to open the container, the container cannot be re-sealed in the event that some of the beverage in the container is not consumed. This causes carbonated beverages to become flat due to the escape of carbon dioxide from the beverage container and allows insects or other debris to enter the container.

[0005] Various types of covers exist for preventing carbonated beverages in opened containers from becoming flat and for preventing insects from entering the container. Examples of covers that fit onto the top of containers are described in U.S. Pat. Nos. 5,947,324, 5,071,042 and 4,883,192. These covers snap onto the top of the container and include caps that allow the container to be opened and closed as desired.

[0006] These patents are only exemplary of the many devices disclosed in the art. No representation is made that these are the only or most relevant patents to the present disclosure. Although such snap-fit covers provide a convenient and easy way of resealing an opened container, it has been found that a very serious problem exists with their use. As a carbonated beverage warms or the container is shaken or otherwise disturbed, carbon dioxide is released from the carbonated beverage which causes a buildup of pressure within the now sealed container. When the pressure builds to a certain psi (pounds per square inch), the snap fit covers are forcefully ejected from the top of the container. Applicant has found that snap fit covers when ejected, can reach speeds close to roughly twice the speed of a cork being ejected from a bottle of champagne. The thus ejected snap fit cover can cause serious injury to person or property.

**SUMMARY**

[0007] A beverage container closure with pressure release, includes a generally funnel-shaped device body having an upper portion and a lower portion, a snap ring extending around an inner periphery of said lower portion, wherein the snap ring can be releasably attached to a beverage container for maintaining a leak-proof and airtight seal with an edge of the beverage container and a snap cover releasably attached to the upper portion of the device body, wherein the snap cover is designed to detach from the upper portion of the device body prior to the device body detaching from the beverage container when pressure builds up within the beverage container.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0008] A more complete appreciation of the present disclosure and many of the attendant advantages thereof will be

readily obtained as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

[0009] FIG. 1 is a view of a perspective view of container closure with pressure release, with a cap assembly detached from the device with a portion of a beverage container shown in phantom, according to an embodiment of the present disclosure;

[0010] FIG. 2 is a side view of the container closure with pressure release according to an embodiment of the present disclosure;

[0011] FIG. 3 is a cross sectional view, taken along section lines 3-3 in FIG. 1 of the cap assembly according to an embodiment of the present disclosure;

[0012] FIG. 4 is a bottom view of a snap cover portion of the cap assembly according to an embodiment of the present disclosure;

[0013] FIG. 5 is a sectional view, taken along section lines 5-5 in FIG. 2, with the device attached to a beverage container (shown in phantom);

[0014] FIG. 6 is an enlarged sectional view of an illustrative embodiment of the container closure and dispensing device, taken along section line 6 in FIG. 5 with a portion of a beverage container shown in phantom; and

[0015] FIG. 7 is a sectional view of the cap assembly attached to a neck portion of the beverage container closure with pressure release according to an embodiment of the present disclosure.

**DETAILED DESCRIPTION**

[0016] In describing preferred embodiments of the present disclosure illustrated in the drawings, specific terminology is employed for sake of clarity. However, the present disclosure is not intended to be limited to the specific terminology so selected and it is to be understood that each specific element includes all technical equivalents which operate in a similar manner.

[0017] Referring to FIG. 1, a beverage container closure with pressure release according to an embodiment of the present disclosure is shown and is generally referred to herein as device 1. Device 1 includes a body 2 which is adapted to detachably and sealingly engage the top of a beverage container 36 (shown in phantom). A cap assembly 20 mounts onto body 2 of device 1 via mounting loop 22 and includes a snap cover 24. Snap cover 24 is attached to mounting loop 22 via tether 26. Snap cover 24 snap fits onto a top edge 42 of body 2 of device 1, to facilitate selective closure and sealing of the beverage container 36 and/or dispensing of a beverage from the beverage container 36. The beverage container 36 may be a conventional can-type beverage container, for example, that generally includes an outwardly-rolled container rim 37 (See FIG. 5) and a pull tab (not shown). According to an embodiment of the present disclosure, in order to avoid device 1 from forcefully ejecting from the beverage container 36 when pressure builds up within the container and possibly causing injury, the device is designed so that snap cover 24 will release from top edge 42 (“burp”) prior thereto, thus safely releasing the pressure. The user can then press snap cover 24 back onto device 1 if desired.

[0018] Device 1 prevents insects, dirt, debris and other contaminants from entering the beverage container 36 and preserves the freshness and integrity of the beverage remaining in the beverage container 36 after initial opening of the

beverage container. The device 1 is re-usable and can be readily detached from one beverage container 36, washed and/or rinsed and attached to another beverage container 36 for example, after the contents of the first beverage container 36 have been consumed.

[0019] According to an embodiment of the present disclosure, device body 2 is resilient plastic. Cap assembly 20 is also resilient plastic, although a material generally softer and more flexible than that forming device body 2 is desirable. It should be understood that device 1 may be formed of any suitable alternative resilient material(s). Device 1 may be a dishwasher-safe material, for example. Examples of materials which are suitable for fabrication of device 1 include, without limitation, polyethylene, rubber, etc. However, some characteristics of the particular material(s) used to fabricate device 1 may vary depending on the specific nature of the application of device 1. For example, characteristics which affect seal ability; resiliency; stretch; rigidity; elasticity; application force; translucence; and luminescence may determine selection of the material(s) used.

[0020] Referring to FIG. 2, device body 2 is generally funnel shaped and includes a neck portion 3. Neck portion 3 includes a top edge 42, neck ring 40, ring 58 and flange 41. A middle wall portion 8 extends outwardly from the neck portion 3. A lower wall portion 10 extends from the middle wall portion 8 and includes a lip 12 extending therefrom which flares outwardly, as shown. The neck portion 3, the middle wall portion 8 and the lower wall portion 10 define a device body interior 14 as shown in FIG. 5. A snap ring 16 circumscribes the interior 14 of device body 2 and generally delineates the middle wall portion 8 from lower wall portion 10, as shown in close-up in FIG. 6. One or more rings 63 may extend around the inner periphery of lip 12. As used herein, relative terms such as “upper”, “middle” and “lower” are intended to be descriptive non-limiting terms since they are not necessarily intended to denote the positions of the indicated components during use of the device 1.

[0021] Cap assembly 20 mounts to neck portion 3, allowing the device 1 to be selectively opened and closed. As shown in FIGS. 3 and 4, cap assembly 20 includes mounting loop 22 with snap ring 61 which allows mounting loop 22 to be mounted to neck portion 3 of device 1. Snap cover 24 is attached to mounting loop 22 via tether 26. Snap cover 24 includes a generally flat or planar cap top 30 with a raised portion 28 (see FIG. 1) extending therefrom for providing structural support to cap top 30 as well as a decorative quality to the cap. Cylindrical flat sides 32 extend from cap top 30. Snap ring 50 extends around an inner periphery of cylindrical flat sides 32 as shown. Flexible seal ring 60 extends from cap top 30. Flip tab 29 extends from a portion of the cylindrical flat side 32 providing an easy and efficient way of flipping open snap cover 24.

[0022] Mounting loop 22 is dimensioned to press fit onto neck portion 3 into the area between neck ring 40 and flange 41. Snap cover 24 can then be pressed down onto top edge 42 of neck portion 3, so that snap cover 24 is detachably attached to neck portion 3 of device body 2. As shown in closeup in FIG. 7, a lock slot 52 is formed on neck portion 3 between neck ring 40 and retaining ring 58, for receiving lock ring 56 of mounting loop 22. Snap ring 61 fits snugly into lock slot 52 of neck portion 3 so that cap assembly 20 is attached firmly to device body 2. A snap lock slot 48 is formed between the lower portion of outside beveled edge 46 and neck ring 40. Snap lock slot 48 is dimensioned for receiving snap ring 50 of

snap cover 24 as shown, when cap assembly 20 is mounted to neck portion 3. Snap ring 50 and snap lock slot 48 are designed so that snap cover 24 will release from the neck portion 3 when the pressure within device body 2 reaches between 7.5 psi-12.5 psi (approximately 9.75 psi on average) and more preferably approximately 12 psi. In general, this provides sufficient holding force so that even if a container sealed with device 1 is accidentally tipped over, the force of the liquid in the container will not inadvertently force the snap cover 24 open. However, should sufficient pressure build up in the interior 14 of device body 2, the snap cover 24 will pop off of the neck portion 3 prior to device body 2 being forcefully ejected from the top of container 36.

[0023] Top edge 42 of the neck portion 3 includes an inside beveled edge 44 and an outside beveled edge 46. Flexible seal ring 60 of snap cover 24 is shaped to complement the inside beveled edge 44 and is positioned to provide a snug leak-proof seal along inside beveled edge 44 of top edge 42 of neck portion 3 when snap cover 24 is pressed closed. As snap cover 24 is being pressed down onto top edge 42 of neck portion 3, snap ring 50 engages outside beveled edge 46 and forces cylindrical flat sides 32 outward until snap ring 50 snaps into snap lock slot 48, thereby securing snap cover 24 in its closed position.

[0024] As illustrated in FIGS. 1, 5 and 6, in use of device 1, the device 1 is snap-fit onto the beverage container 36. As illustrated in FIG. 5, the interior surface of flared lip 12 of device body 2 guides the rolled upper container rim 37 of the beverage container 36 (shown in phantom) beyond and into engagement with the catch ring 16, which snugly engages the container rim 37. Container rim 37 is thus snap-fit into engagement with catch ring 16 and provides an airtight seal between the interior of the device 1 and the beverage container 36. The snap-fit airtight seal between the device 1 and container 36 is designed so that it can withstand pressure buildups within interior 14 of device body 2 between 17 psi-21 psi and more preferably approximately 20 psi. As noted above, the snap-fit between snap cover 24 and top edge 42 of neck portion 3 of device 1 is designed to withstand pressures no more than approximately 12.3 psi. Accordingly, snap cover 24 will pop off of neck portion 3 prior to sufficient pressure building up and forcefully ejecting device 1 from container 36 in a dangerous manner.

[0025] Referring to FIGS. 1, 5 and 7, in typical application of the device 1, the beverage container 36 is initially opened by pulling the pull tab (not illustrated), in the conventional manner. The device body 2 of the device 1 is attached to the beverage container 36 by lowering the device body 2 over the beverage container 36 and pressing down on device 1 until container rim 37 of the beverage container 36 snaps past catch ring 16. As shown in FIG. 6, the interior surface of flared lip 12 guides the container rim 37 into engagement with the catch ring 16. Because of the resiliency of flared lip 12, the catch ring 16 stretches to accommodate the diameter of the container rim 37 and then recoils against the container rim 37 to achieve a snug, airtight fit between the catch ring 16 and the container rim 37.

[0026] For temporary storage of the beverage container 36 prior to dispensing of the beverage (not illustrated) from the beverage container 36, snap cover 24 is pressed onto top edge 42 of neck portion 3 until snap ring 50 engages snap lock slot 48 and snaps into place. If beverage in the beverage container 36 is a carbonated beverage, carbon dioxide gas from the beverage is initially unable to escape from the device body

interior 14 through the capped neck portion 3 or from the lip portion 16 of the device body 2 due to the airtight seals provided. This prevents the carbon dioxide from escaping from the device 1 and maintains the carbonation integrity and freshness of the beverage. Furthermore, the snap cover 24 prevents insects, dirt, debris and other contaminants from entering the device body interior 14 and the beverage container 36 through neck portion 3 of device 1. However, if too much pressure builds up in the device body interior 14, the snap cover 24 will gently open or "burp" thus preventing the device 1 from being forcefully ejected from the container 36.

[0027] When dispensing of the beverage from the beverage container 36 is desired, snap cover 24 is removed from the neck portion 3 of the device body 2 by pressing flip tab 29 in an upward direction. Accordingly, the beverage can be selectively dispensed from the beverage container 36 through device body interior 14 (FIG. 5) of device body 2.

[0028] When additional beverage remains in beverage container 36 after the desired quantity of beverage has been dispensed from beverage container 36, snap cover 24 can again be attached to neck portion 3 to seal interior 14 of device body 2 by firmly pressing down on snap cover 24 until snap ring 50 engages snap lock slot 48. After the beverage has been completely dispensed from the beverage container 36, device 1 can be removed from the beverage container 36 and attached to another beverage container 36 for further use.

[0029] The device body 2 and/or cap assembly 20 may be in any of various colors to differentiate multiple devices 1 from each other to aid in container identification when multiple devices 1 are attached to multiple respective beverage containers 36 simultaneously. In addition, although the cap assembly 20 has been described as being press fit into neck portion 3, it could of course be attached in other ways. For example, mounting loop 22 and neck portion 3 of device 1 can be provided with threads, allowing cap assembly 20 to be screwed onto neck portion 3. In this case, snap cover 24 would still snap onto the top edge of neck portion 3 as described above.

[0030] While the illustrative embodiments of the disclosure have been described above, it will be recognized and understood that various modifications can be made in the disclosure and the appended claims are intended to cover all such modifications which may fall within the spirit and scope of the disclosure.

[0031] Numerous additional modifications and variations of the present disclosure are possible in view of the above teachings. It is therefore to be understood that within the scope of the appended claims, the present disclosure may be practiced other than as specifically described herein.

What is claimed is:

1. A beverage container closure with pressure release, comprising:

a generally funnel-shaped device body having an upper portion and a lower portion;

a snap ring extending around an inner periphery of said lower portion, wherein the snap ring can be releasably attached to a beverage container for maintaining a leak-proof and airtight seal with an edge of the beverage container; and

a snap cover releasably attached to the upper portion of the device body, wherein the snap cover is designed to release from the upper portion of the device body prior to the device body releasing from the beverage container when pressure builds up within the beverage container.

2. The beverage container closure with pressure release as recited in claim 1, further comprising:

a wall portion extending from the upper portion and a lip portion flaring outwardly from the lower portion; and  
a device body interior defined by the upper portion, the wall portion and the lower portion.

3. The beverage container closure with pressure release as recited in claim 2, wherein pressure builds up within the device body interior when a pressure buildup occurs within the beverage container.

4. The beverage container closure with pressure release as recited in claim 1, further comprising a cap assembly including a mounting loop attached to the snap cover via a tether.

5. The beverage container closure with pressure release as recited in claim 4, wherein the mounting loop is mounted to the upper portion of the device body by press fit.

6. The beverage container closure with pressure release as recited in claim 4, wherein the mounting loop is mounted to the upper portion of the device body by threaded connection.

7. The beverage container closure with pressure release as recited in claim 1, wherein the snap cover is releasable from the upper portion of the device body by a user for allowing the user access to contents of the beverage container.

8. The beverage container closure with pressure release as recited in claim 1, wherein the snap cover is pressed onto an upper edge of the upper portion of the device body by the user to protect contents of the beverage container.

9. The beverage container closure with pressure release as recited in claim 1, wherein the snap cover is designed to release from the upper portion of the device body when pressure within the device body reaches between approximately 7.5 psi-12.3 psi and more preferably less than approximately 12 psi and the device body is designed to release from the beverage container when pressure builds up to at least approximately 17 psi-21 psi within the device body.

10. A beverage container closure with pressure release, comprising:

a generally funnel-shaped device body having a generally cylindrical upper portion, a generally cylindrical middle portion extending from the neck portion, a lower portion extending from the middle portion and a lip portion flaring outwardly from the lower portion;

a device body interior defined by the upper portion, the middle portion, the lower portion and the lip portion;

a snap ring extending around the device body interior; and

a snap cover releasably attached to the upper portion of the device body, wherein the snap cover is designed to release from the upper portion of the device body prior to the device body releasing from the beverage container when pressure builds up within the device body interior.

11. The beverage container closure with pressure release as recited in claim 10, wherein pressure builds up within the device body interior when a pressure buildup occurs within the beverage container.

12. The beverage container closure with pressure release as recited in claim 10, further comprising a cap assembly including a mounting loop attached to the snap cover via a tether.

13. The beverage container closure with pressure release as recited in claim 12, wherein the mounting loop is mounted to the upper portion of the device body by press fit.

14. The beverage container closure with pressure release as recited in claim 12, wherein the mounting loop is mounted to the upper portion of the device body by threaded connection.

15. The beverage container closure with pressure release as recited in claim 10, wherein the snap cover is releasable from the upper portion of the device body by a user for allowing the user access to contents of the beverage container.

16. The beverage container closure with pressure release as recited in claim 10, wherein the snap cover is pressed onto an upper edge of the upper portion of the device body by the user to protect contents of the beverage container.

17. The beverage container closure with pressure release as recited in claim 10, wherein the snap cover is designed to release from the upper portion of the device body when pressure within the device body reaches between approximately 7.5 psi-12.3 psi and more preferably less than approximately 12 psi and the device body is designed to release from the beverage container when pressure builds up to at least approximately 17 psi-21 psi within the device body.

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