

CLOSURE CAP WITH FLOW RESTRICTION MEMBER

BACKGROUND

1. Field of the Inventive Concepts

[0001] The inventive concepts disclosed and claimed herein relate to container sealing, and more particularly, but not by way of limitation, to a closure cap with a flow-restriction member for optionally reducing the otherwise free flow of material from a container, such as a flexible container for flowable foods and liquids.

2. Brief Description of Related Art

[0002] Flexible pouches for containing food and beverage products are frequently marketed for use by infants and small children. The flexible pouches are convenient, inexpensive, and provide ease of use. Typically, the flexible pouches include a spout for discharging the material and a removable closure cap for sealing the pouch. With the closure cap removed, product is able to flow freely from the spout of the pouch by the user pouring or squeezing the pouch. In packaging foods and juices for infant and child consumption, however, a container with a spout providing a free flowing product may have drawbacks in terms of spills and delivering the product at a rate that it cannot be consumed without risk of choking.

[0003] To this end, a need exists for a closure cap with a flow restricting member for optionally reducing the otherwise free flow of product from the container. It is to such a closure cap that the inventive concepts disclosed herein are directed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIG. 1 is a perspective view of a closure cap constructed in accordance with the inventive concepts disclosed herein shown positioned on a container.

[0005] FIG. 2A is a vertical sectional view of the closure cap taken along line 2A-2A of FIG. 1.

[0006] FIG. 2B is a sectional view of the closure cap taken along line 2B-2B of FIG. 2A.

[0007] FIG. 3 is an elevation view of the closure cap shown removed from the container to expose a spout of the container.

[0008] FIG. 4A is a perspective view illustrating the closure cap in a depressed position.

[0009] FIG. 4B is an elevation view, in partial section, of the closure cap taken along line 4B-4B of FIG. 4A.

[0010] FIG. 4C is an elevation view showing a flow restriction member of the closure cap attached to the spout of the container.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0011] In the following detailed description of embodiments of the inventive concepts, numerous specific details are set forth in order to provide a more thorough understanding of the inventive concepts. However, it will be apparent to one of ordinary skill in the art that the inventive concepts disclosed and claimed herein may be practiced without these specific details. In other instances, well-known features have not been described in detail to avoid unnecessarily complicating the instant disclosure.

[0012] As used herein, the terms "comprises," "comprising," "includes," "including," "has," "having" or any other variation thereof, are intended to cover a non-exclusive inclusion. For example, a process, method, article, or apparatus that comprises a list of elements or steps is not necessarily limited to only those elements or steps and may include other elements, steps, or features not expressly listed or inherently present therein.

[0013] Unless expressly stated to the contrary, "or" refers to an inclusive or and not to an exclusive or. For example, a condition A or B is satisfied by anyone of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

[0014] In addition, use of the "a" or "an" are employed to describe elements and components of the embodiments herein. This is done merely for convenience and to give a general sense of the inventive concepts. This description should be read to include one or at least one and the singular also includes the plural unless it is obvious that it is meant otherwise.

[0015] Throughout this disclosure and the claims, the terms "about," "approximately," and "substantially" are intended to signify that the item being qualified is not limited to the exact value specified, but includes some slight variations or deviations therefrom, caused by measuring error, manufacturing tolerances, stress exerted on various parts, wear and tear, or combinations thereof, for example.

[0016] The use of the term "at least one" will be understood to include one as well as any quantity more than one, including but not limited to each of, 2, 3, 4, 5, 10, 15, 20, 30, 40, 50, 100, and all integers there between. The term "at least one" may extend up to 100 or 1000 or more, depending on the term to which it is attached; in addition, the quantities of 100/1000 are not to be considered limiting, as higher limits may also produce satisfactory results. Singular terms shall include pluralities and plural terms shall include the singular unless indicated otherwise.

[0017] The term "or combinations thereof" as used herein refers to all permutations and/or combinations of the listed items preceding the term. For example, "A, B, C, or combinations thereof" is intended to include at least one of: A,

B, C, AB, AC, BC, or ABC, and if order is important in a particular context, also BA, CA, CB, CBA, BCA, ACB, BAC, or CAB. Continuing with this example, expressly included are combinations that contain repeats of one or more item or term, such as BB, AAA, AAB, BBC, AAABCCCC, CBBAAA, CABABB, and so forth. The skilled artisan will understand that typically there is no limit on the number of items or terms in any combination, unless otherwise apparent from the context.

[0018] Finally, as used herein any reference to "one embodiment" or "an embodiment" means that a particular element, feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment. The appearances of the phrase "in one embodiment" in various places in the specification are not necessarily referring to the same embodiment, although the inventive concepts disclosed herein are intended to encompass all combinations and permutations including one or more of the features of the embodiments described herein.

[0019] Referring now the drawings, and more particularly to FIGS. 1, 2A, and 2B, a closure cap 10 constructed in accordance with the inventive concepts disclosed herein is illustrated in sealing engagement with a spout 12 of a container 14, such as a flexible pouch. The closure cap 10 is particularly well suited for sealing containers used for flowable foods and juices which are marketed for infants and children where the user, i.e., a parent desires to limit the otherwise free flow of the product from the container for ease of consumption and to avoid spills. Flexible pouches are well known by those having ordinary skill in the art and, therefore, will not be described in detail herein. In general, the container 14 may be comprised of any non-permeable flexible material. For example, the container 14 may be made of one or more flexible sheets, such as polymer sheets or foil sheets. The container 14

may be used to contain any flowable material. Non-exclusive examples of flowable material include food, beverages, granules, and gases. In one example, the flowable material may be pureed food products or beverages designed for consumption by children.

[0020] In one embodiment, the closure cap 10 includes a rigid tubular base 16, a flexible cover 18, and a flow restriction member 20 that may be optionally deployed by a user to reduce or restrict the otherwise free flow of product from the container 14.

[0021] The tubular base 16 is shown to be generally a circular cylinder having an upper end 22 and a lower end 24. The tubular base 16 can be molded from a variety of suitable rigid polymers and plastics, such as, for example, polyethylene. The tubular base 16 may include internal threads 26 for threaded sealing engagement with corresponding external threads 28 of the spout 12. However, it should be appreciated that the lower end of the tubular base 16 may engage with the spout in other ways, such as snap-fit.

[0022] Referring now to FIGS. 1-4, the flexible cover 18 extends over the upper end 22 of the tubular base 16 and is movable between a non-depressed position (FIGS. 1, 2A, and 3) and a depressed position (FIGS. 4A and 4B). The flexible cover 18 can be over-molded onto the tubular base 16 from a variety of rubber or soft plastic materials.

[0023] The flow restriction member 20 has an annular wall 30 forming an aperture 32 and is positionable over and engageable with the spout 12 of the container 14. The aperture 32 is illustrated as being a central slot, but the aperture 32 may be a variety of shapes and sizes, such as a circular hole, a slit, a cross-slit, or a hole with a fanciful shape, such as star shaped, or more than one aperture,

which will restrict the otherwise free flow of material from the container 14 when the flow restriction member 20 is positioned on the spout 12 as described below. The aperture 32 of the flow restriction member 20 is fabricated to function as a flow-restricting passage and thus is of smaller diameter than the flow passage of the spout 12. Thus, when the flow restriction member 20 is positioned securely over the spout 12, the otherwise free flow of material through the spout is restricted.

[0024] As illustrated in FIGS. 2A and 2B, the flow restriction member 20 is housed by the tubular base 16 and the flexible cover 18. In one embodiment, the flow restriction member 20 is mounted to the tubular base 16 such that the flow restriction member 20 is in a spaced, coaxial relationship with the spout 12 of the container 14 when the tubular base 16 is sealingly engaged with the spout 12 and when the flexible cover 18 is in the non-depressed position.

[0025] The flow restriction member 20 is further mounted to the tubular base 16 such that the flow restriction member 20 is detached from the tubular base 16 and positioned on and engaged with the spout 12 of the container 14 when the flexible cover 18 is moved to the depressed position, as illustrated in FIGS. 4A and 4B. In one embodiment, the tubular base 16 and the flow restriction member 20 may be formed as a one piece unit from a suitable polymer or plastic such that the flow restriction member 20 is connected to the tubular base 16 with a plurality of frangible bridges 34. Alternatively, it should be appreciated that the flow restriction member 20 may be formed as a separate component and detachably mounted to the tubular base 16 with a suitable adhesive or by press-fit, or detachably mounted to the underside of the flexible cover 18 with a suitable adhesive or by press-fit.

[0026] As best illustrated in FIGS. 4B and 4C, the flow restriction member 20 may terminate in an inwardly projecting peripheral edge 36 for engaging a

corresponding annular groove 38 formed about the periphery of the spout 12 in response to pressure being applied to flexible cover 18. Alternatively, the peripheral edge 36 may engage an annular bead or detent (not shown) of the spout 12. To facilitate the flow restriction member moving over the distal end of the spout 12, the peripheral edge 36 may be beveled.

[0027] As can be seen with reference to FIG. 2A, when the spout 12 is sealed with the closure cap 10, the flow restriction member 20 in a co-axial, spaced relationship to the spout 12. A user has the option to remove the closure cap 10 and dispense the flowable product unhindered (FIG.3). However, if flow restriction is desired, the user can depress the flexible cover 18 while the closure cap 10 is engaged with the spout 12 and thereby detach the flow restriction member 20 from the tubular base 16 and secure the flow restriction member 20 on the spout 12 of the container 14 (FIGS. 4A and 4B). The frangible bridges 34 are broken and the inwardly projecting peripheral edge 36 of the flow restriction member 20 engages corresponding groove 38 of the spout 12. The flow restriction member 20 is thereby positioned securely on the spout 12 to restrict the flow of product from the container 14.

[0028] From the above description, it is clear that the inventive concepts disclosed and claimed herein are well adapted to carry out the objects and to attain the advantages mentioned herein, as well as those inherent in the invention. While exemplary embodiments of the inventive concepts have been described for purposes of this disclosure, it will be understood that numerous changes may be made which will readily suggest themselves to those skilled in the art and which are accomplished within the spirit of the inventive concepts disclosed and claimed herein.

What is claimed is:

1. A closure cap for a container having a spout, comprising:
a rigid tubular base having an upper end and a lower end, the tubular base positionable about and sealingly engageable with the spout of the container;
a flexible cover extending over the upper end of the tubular base and being movable between a non-depressed position and a depressed position;
and
a flow restriction member having an annular wall forming an aperture and being positionable over and engageable with the spout of the container, the flow restriction member detachably mounted to the tubular base such that the flow restriction member is in a spaced, coaxial relationship with the spout of the container when the tubular base is engaged with the spout of the container and when the flexible cover is in the non-depressed position and such that the flow restriction member is detached from the tubular base and positioned on and engaged with the spout of the container when the flexible cover is moved to the depressed position.
2. The closure cap of claim 1, wherein the flow restriction member and the tubular base are formed as a one piece unit.
3. The closure cap of claim 2, wherein the flow restriction member is connected to the tubular base with a plurality of frangible bridges.

4. The closure cap of claim 1, wherein the annular wall of the flow restriction member terminates in an inwardly projecting peripheral edge engageable with the spout of the container.

5. The closure cap of claim 1, wherein the tubular base is threadingly engageable with the spout of the container.

6. A closure cap in combination with a spout for a container, the spout defining a flow passage, the closure cap comprising:

a rigid tubular base having an upper end and a lower end, the tubular base positionable about and sealingly engageable with the spout;

a flexible cover extending over the upper end of the tubular base and being movable between a non-depressed position and a depressed position; and

a flow restriction member having an annular wall forming an aperture and being positionable over and engageable with the spout, the flow restriction member detachably mounted to the tubular base such that the flow restriction member is in a spaced, coaxial relationship with the spout of the container when the tubular base is engaged with the spout of the spout fitment and when the flexible cover is in the non-depressed position and such that the flow restriction member is detached from the tubular base and positioned on and engaged with the spout of the spout fitment when the flexible cover is moved to the depressed position.

7. The combination of claim 6, wherein the flow restriction member and the tubular base are formed as a one piece unit.

8. The combination of claim 6, wherein the flow restriction member is connected to the tubular base with a plurality of frangible bridges.

9. The combination of claim 6, wherein the spout has an annular groove, and wherein the annular wall of the flow restriction member terminates in an inwardly projecting peripheral edge receivable in the annular groove of the spout.

10. The combination of claim 6, wherein the tubular base is threadingly engageable with the spout.

11. A method of restricting the flow of material from a container having a spout defining a flow passage from the container, the method comprising:

pressing a flexible cover of a closure cap, which is sealingly engaged with the spout of the container, in a way to cause a flow restriction member incorporated into the closure cap to detach from the closure cap and be positioned on and engaged with the spout of the container, the flow restriction member having a aperture; and

removing the closure cap from the spout to permit material to flow through the flow passage of the spout and the aperture of the flow restriction member.