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(54) **MULTI-STAGE OPENING AND DISPENSING CLOSURE**

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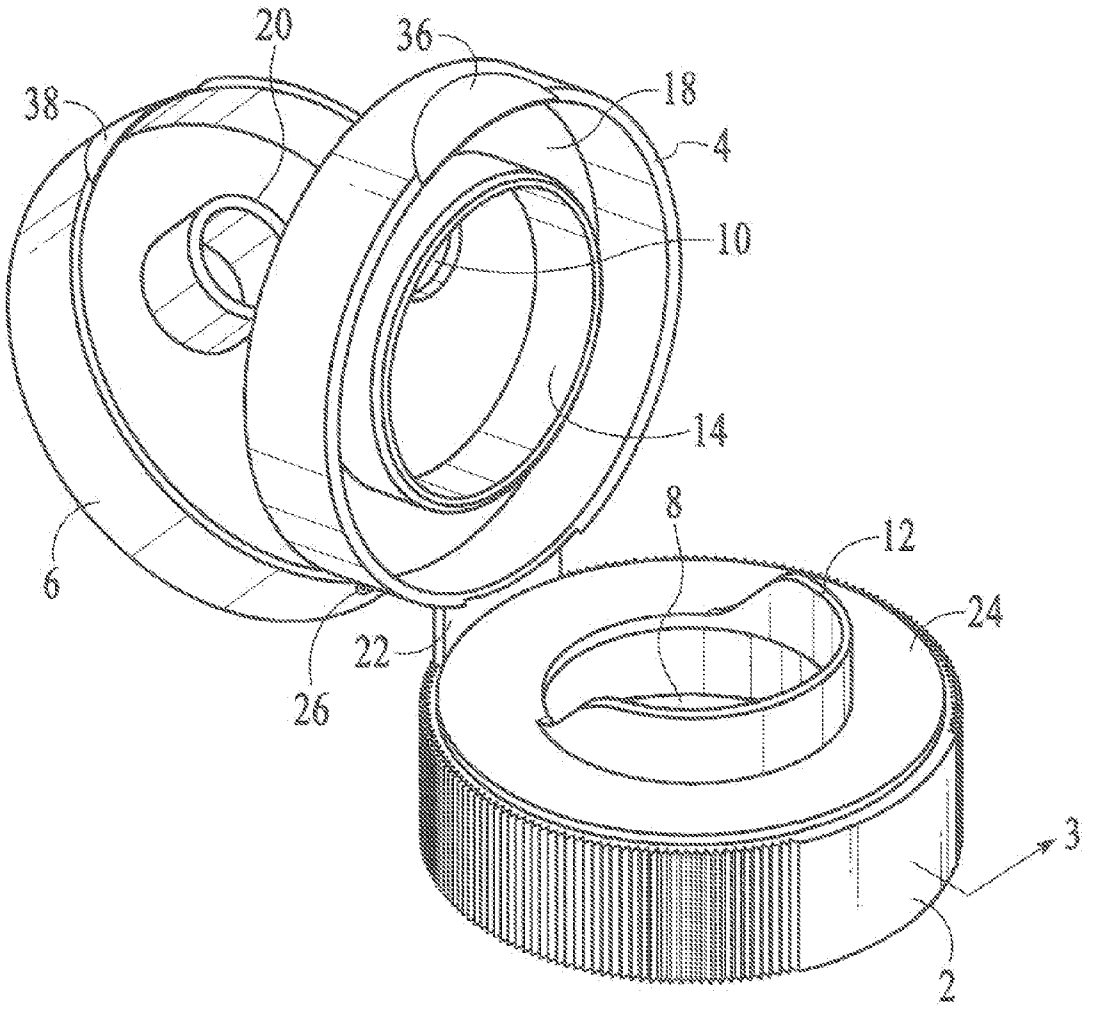
(57) **ABSTRACT**

Described is a multi-stage opening and dispensing closure including a base portion configured to couple the closure to a container and including a first opening having a first diameter, an intermediate portion hingedly coupled to the base portion and including a second opening having a second diameter, and a cap portion configured to couple to the intermediate portion. Also described is a container including a body having at least one wall defining an internal cavity, a neck coupled to the body and defining an opening for access to the internal cavity, and a v-shaped seal coupled to a rim of the neck. Other embodiments may also be disclosed and claimed.



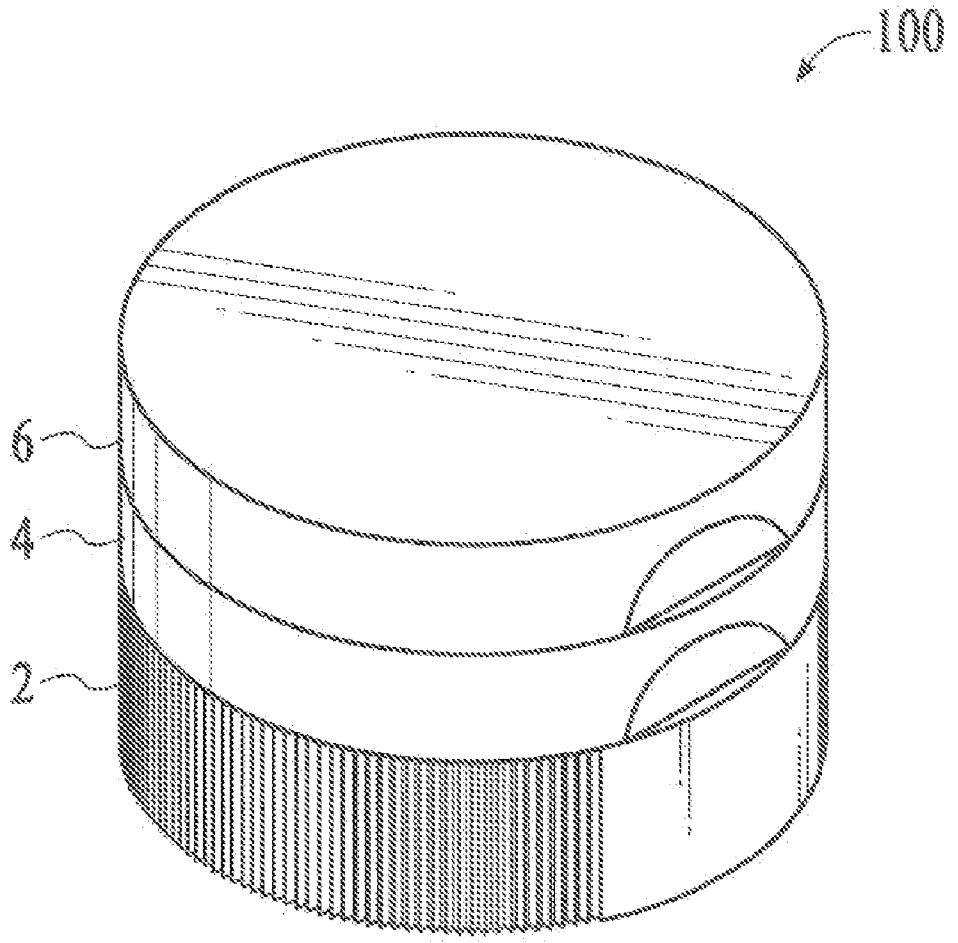


FIG. 1

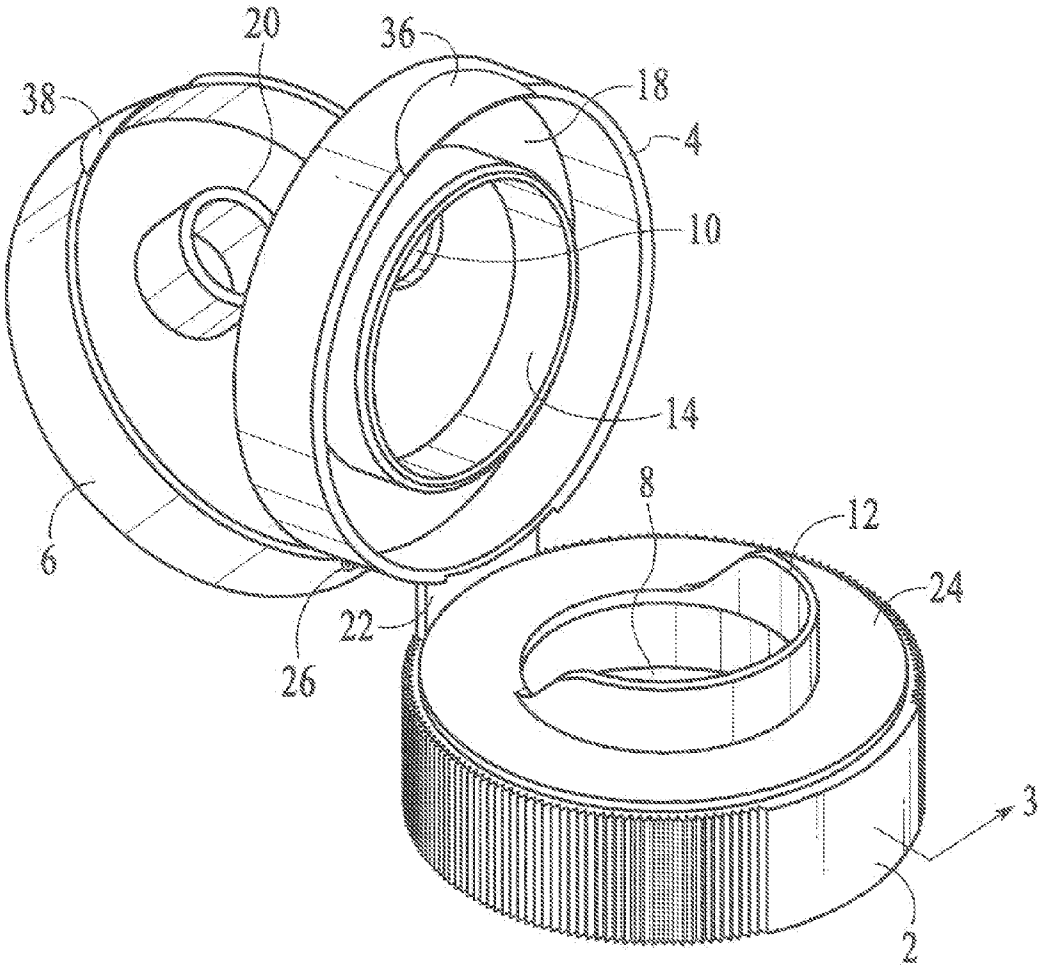


FIG. 2

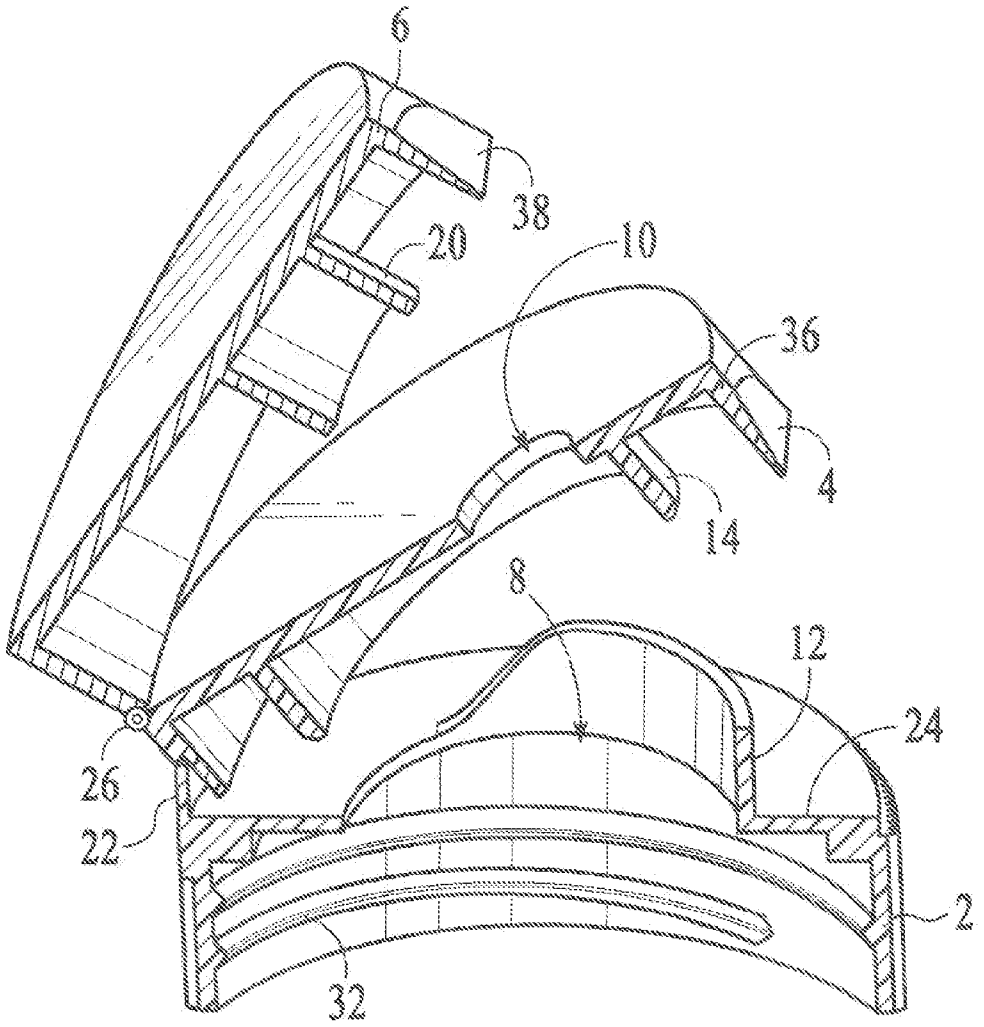


FIG. 3

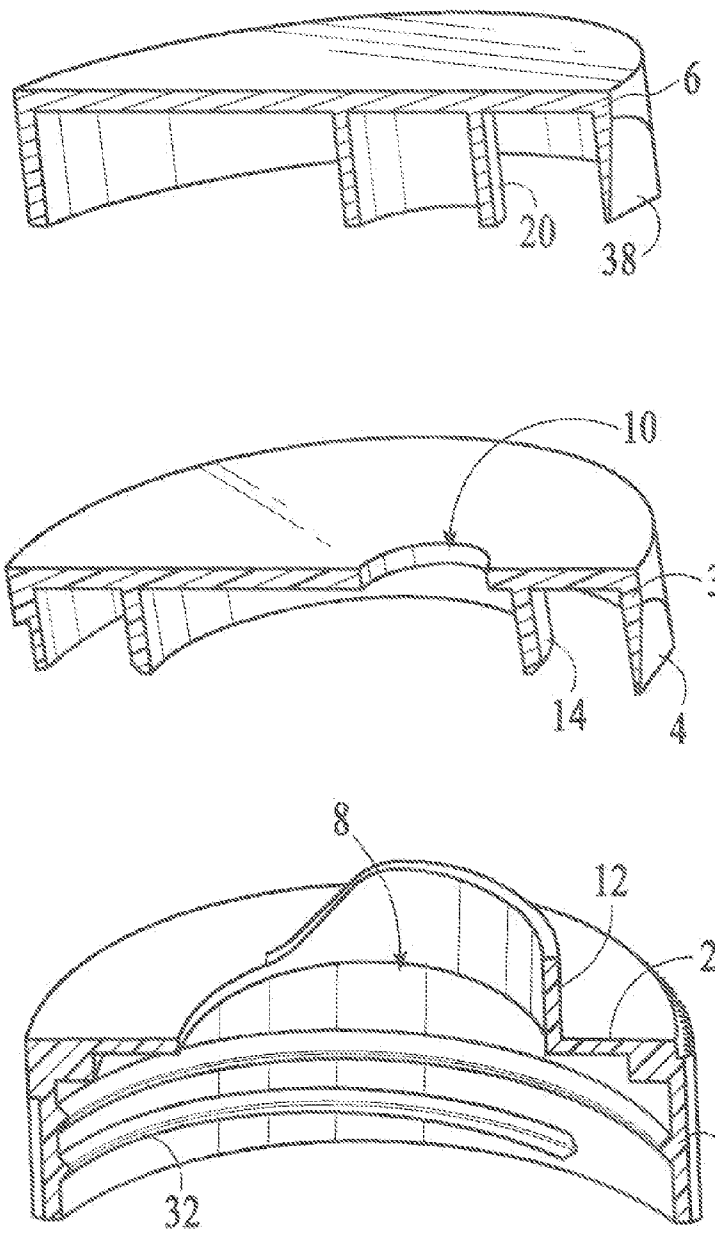


FIG. 4

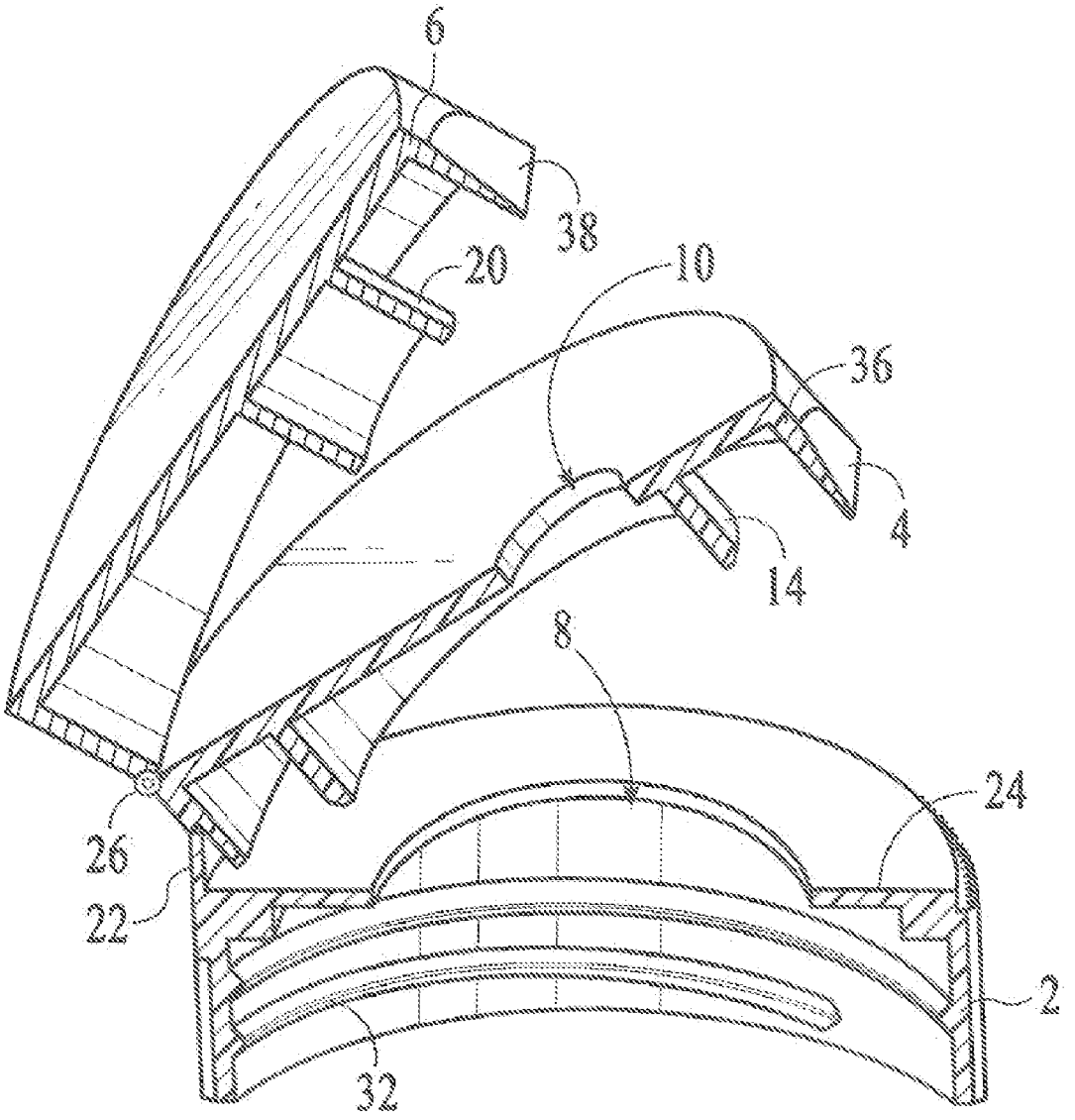


FIG. 5

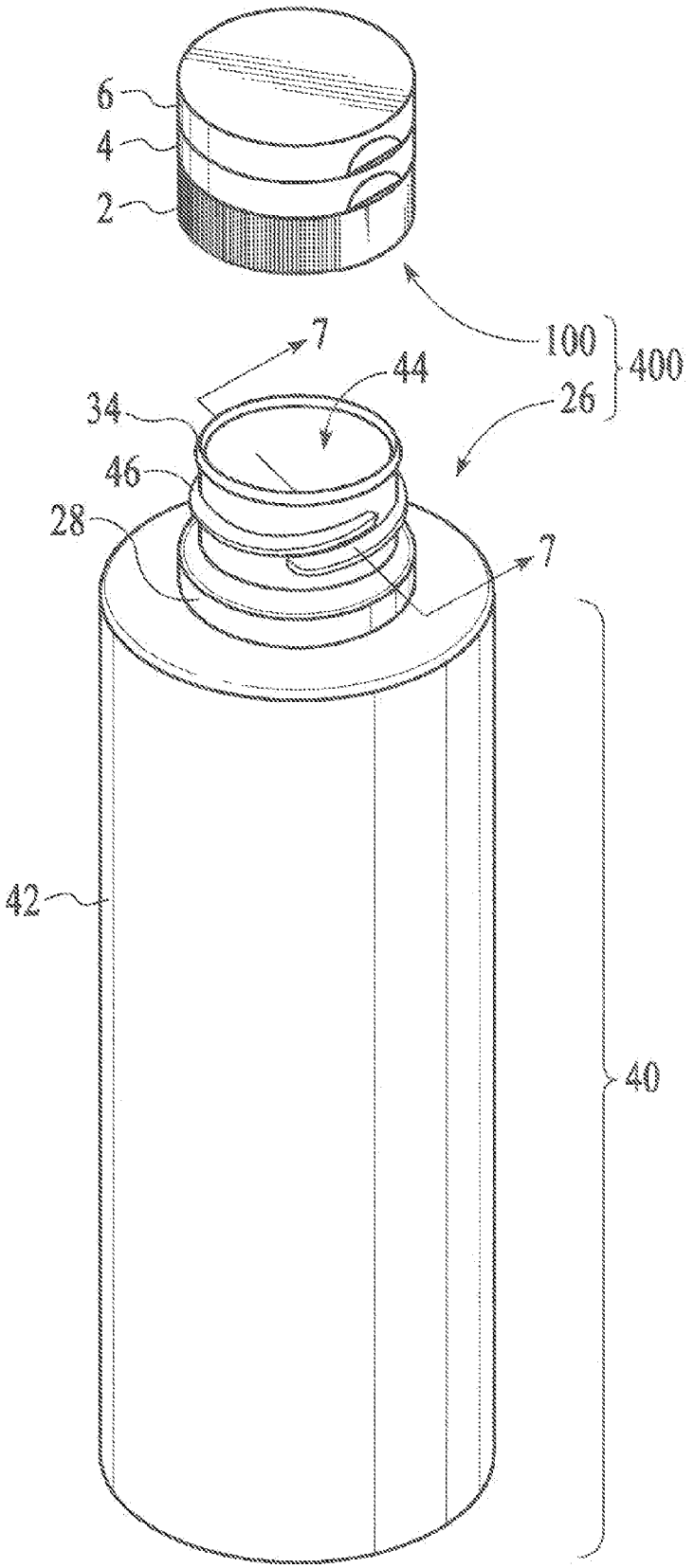


FIG. 6

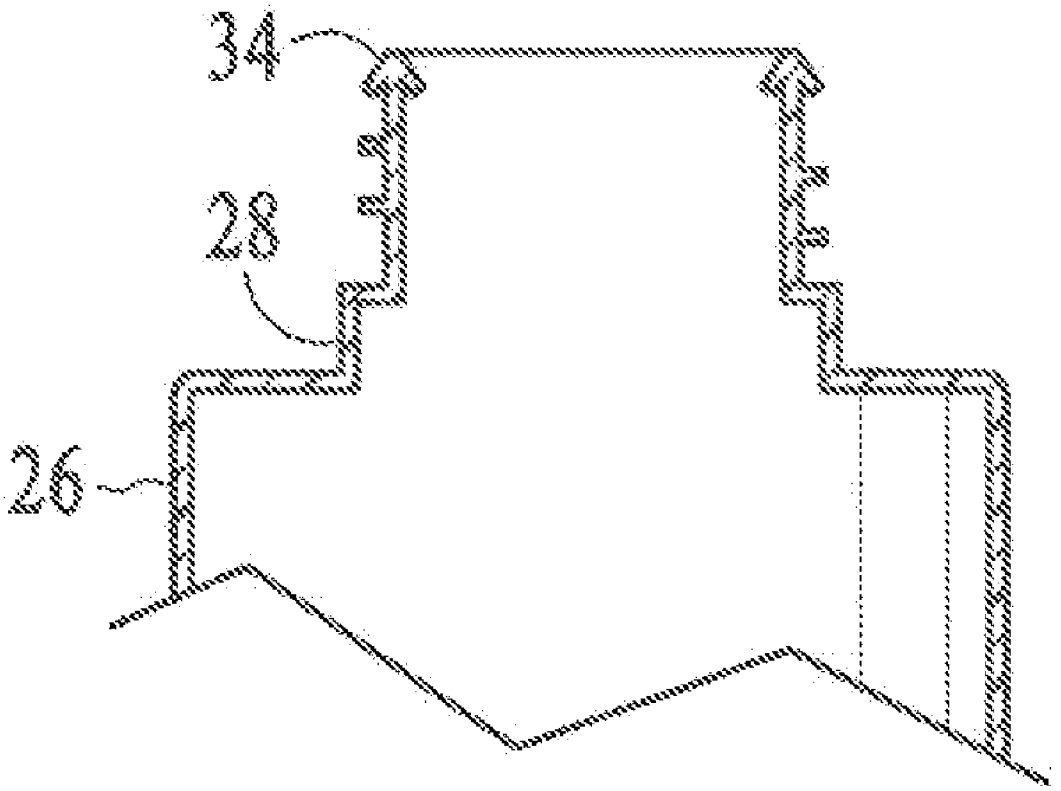


FIG. 7

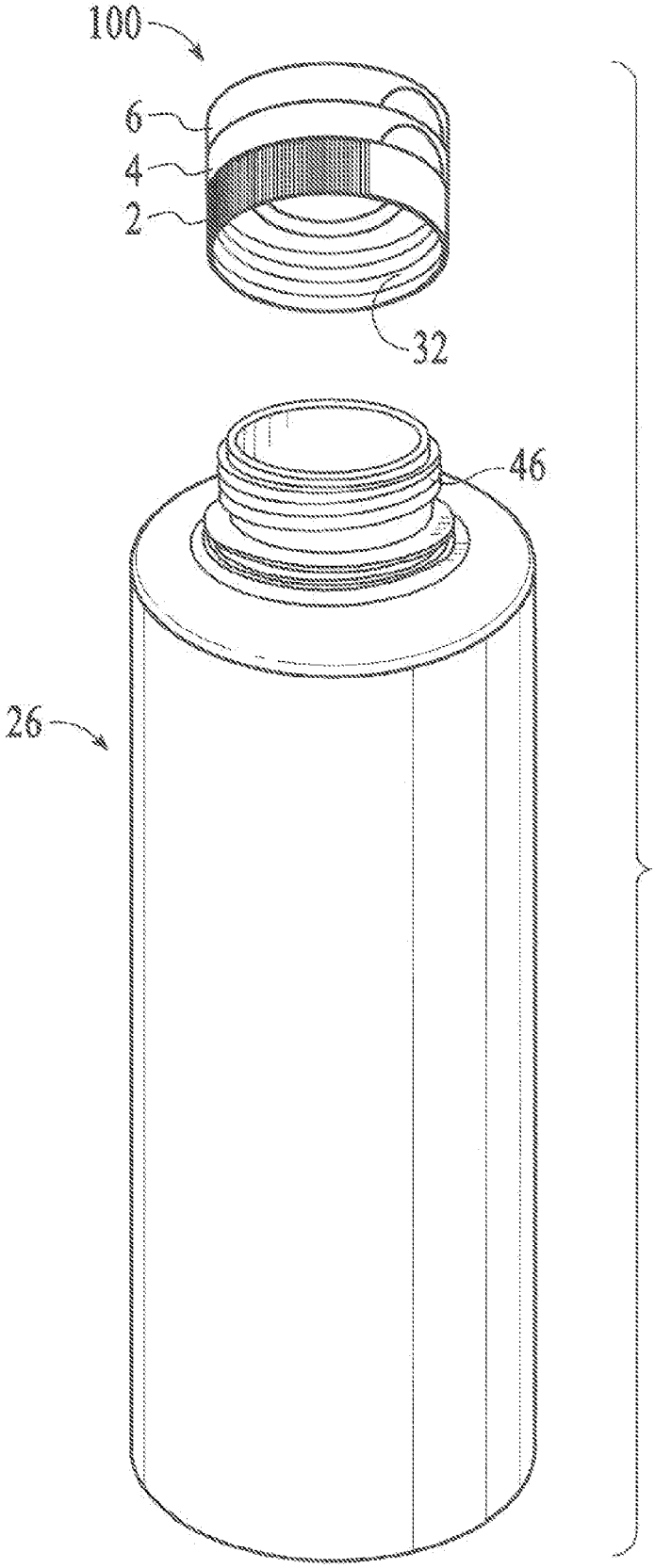


FIG. 8

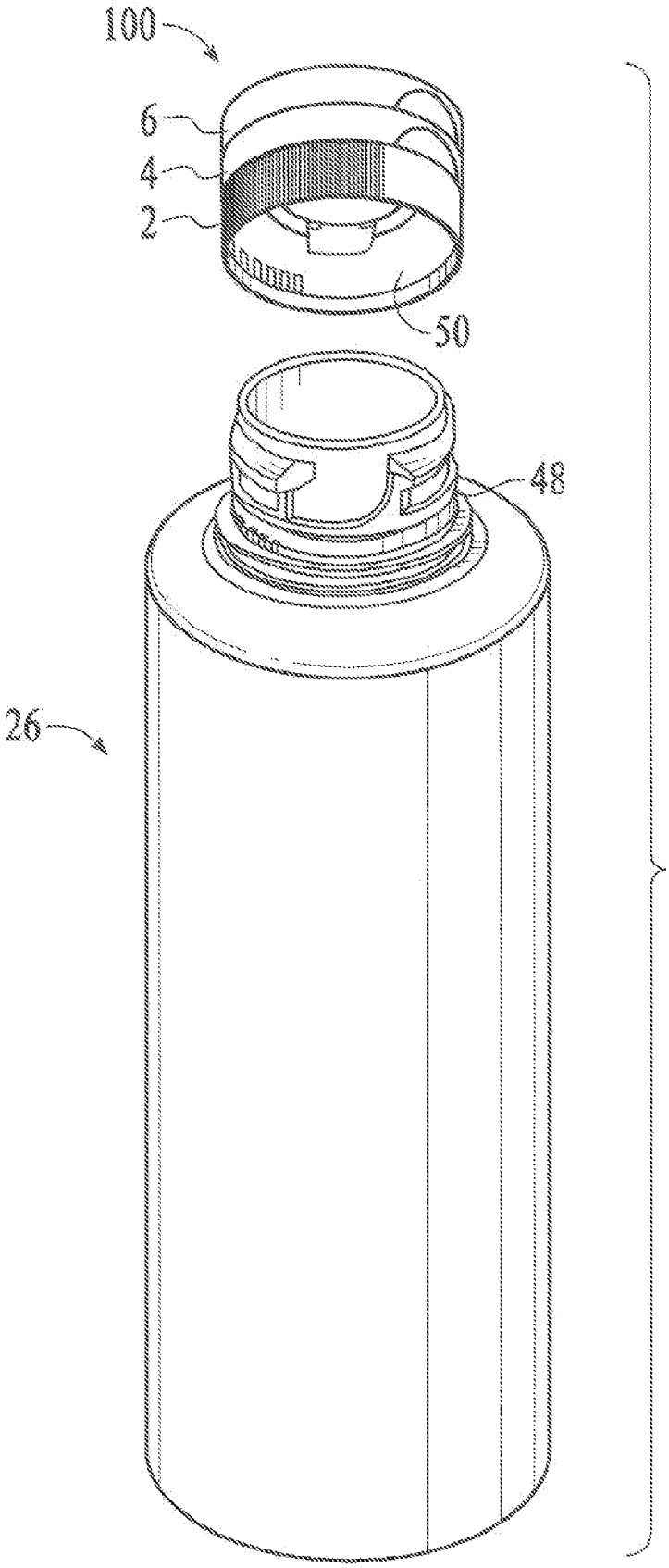


FIG. 9

MULTI-STAGE OPENING AND DISPENSING CLOSURE

BACKGROUND

[0001] 1. Field of the Invention

[0002] Embodiments of the present disclosure relate to a closure having a first opening stage with an opening of a first diameter, and a second opening stage with an opening of a second diameter that is smaller than the first diameter.

[0003] 2. Description of the Related Art

[0004] Many products are packaged in containers (e.g., bottles) having flip-top closures. Typically, a flip-top closure is coupled to the opening of container, and when the lid is flipped open, the spout is revealed. The spout allows the product contained within the container to be poured out of the container. The lid may then be flipped closed to plug the spout to prevent spillage.

[0005] Although the conventional flip-top closure may be suitable for various applications, there may be situations in which the spout provides a pour rate that is less than desirable. Applications in which only a small amount of the product is needed, a spout may be too large, requiring controlled pouring to prevent over-pour. On the other hand, a high-volume pour may be needed in cases of a large amount of the product being needed. If the spout is fairly small, a high-volume pour may require more time to pour out the required amount of product.

SUMMARY OF THE INVENTION

[0006] The present disclosure provides a multi-stage opening and dispensing closure comprising a base portion configured to couple the closure to a container and including a first opening having a first diameter, an intermediate portion hingedly coupled to the base portion and including a second opening having a second diameter, and a cap portion configured to couple to the intermediate portion. The first diameter may be larger than the second diameter.

[0007] The multi-stage opening and dispensing closure may include a v-shaped seal coupled to the bottom side of the base portion, the v-shaped seal being configured to abut a rim of an opening of the container.

[0008] The present disclosure also provides a container comprising a body having at least one wall defining an internal cavity, a neck coupled to the body and defining an opening for access to the internal cavity, and a v-shaped seal coupled to a rim of the neck.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Subject matter is particularly pointed out and distinctly claimed in the concluding portion of the specification. The foregoing and other features of the present disclosure will become more fully apparent from the following description and appended claims, taken in conjunction with the accompanying drawings. Understanding that these drawings depict only several embodiments in accordance with the disclosure and are, therefore, not to be considered limiting of its scope, the disclosure will be described with additional specificity and detail through use of the accompanying drawings, in which:

[0010] FIG. **1** shows a perspective view of a multi-stage opening and dispensing closure, in accordance with a first embodiment of the present disclosure, wherein the closure is in a closed position;

[0011] FIG. **2** shows another perspective view of the closure of FIG. **1**, in accordance with the first embodiment of the present disclosure, wherein the closure is in an open position exposing multiple openings;

[0012] FIG. **3** shows a cross-sectional view of the closure of FIG. **1**, in accordance with the first embodiment of the present disclosure, corresponding to the view of FIG. **2**, wherein the closure is in an open position exposing multiple openings;

[0013] FIG. **4** shows a cross-sectional view of a multi-stage opening and dispensing closure having removably coupled cap and intermediate portions, in accordance with a second embodiment of the present disclosure;

[0014] FIG. **5** shows a cross-sectional view of a multi-stage opening and dispensing closure without pour spouts, in accordance with a third embodiment of the present disclosure;

[0015] FIG. **6** shows a perspective view of the closure of FIG. **1** and a container, in accordance with various embodiments of the present disclosure, wherein the closure is shown in a closed position, but removed from the container;

[0016] FIG. **7** shows a fragmentary cross-sectional view of the opening portion of the container of FIG. **6**;

[0017] FIG. **8** shows a perspective view of an example package including a container and a closure, in accordance with various embodiments of the present disclosure, wherein the closure is shown in a closed position, but removed from the container, and wherein the container has a threaded fitment; and

[0018] FIG. **9** shows a perspective view of an example package including a container and a closure, in accordance with various embodiments of the present disclosure wherein the closure is shown in a closed position, but removed from the container, and wherein the container has a bayonet-type fitment.

DETAILED DESCRIPTION OF EMBODIMENTS

[0019] Reference will now be made to the drawings wherein like numerals refer to like parts throughout. For ease of description, the components of embodiments of the present invention are described in the normal (upright) operating position, and terms such as upper, lower, horizontal, etc., are used with reference to this position. It will be understood, however, that the components of embodiments of the present invention may be manufactured, stored, transported, used, and sold in an orientation other than the position described.

[0020] Figures illustrating the components of embodiments of the present invention show some conventional mechanical elements that may be known and that may be recognized by one skilled in the art. The detailed descriptions of such elements that are not necessary to an understanding of the invention, and accordingly are herein presented only to the degree necessary to facilitate an understanding of the novel features of the present invention.

[0021] As used herein and in the appended claims, the term "comprising" is inclusive or open-ended and does not exclude additional unrecited elements, compositional components, or method steps. Accordingly, the term "comprising" encompasses the more restrictive terms "consisting essentially of" and "consisting of."

[0022] It must be noted that, as used in this specification and the appended claims, the singular forms "a," "an," and "the" include plural references unless the content clearly dictates otherwise. Similarly, the use of substantially any plural terms herein may be translated by those having skill in the art from the plural to the singular as is appropriate to the

context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[0023] In those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (e.g., "an apparatus having at least one of A, B, and C" would include but not be limited to apparatuses that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[0024] As will be understood by one skilled in the art, for any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any and all possible subranges and combinations of subranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, etc. As a non-limiting example, each range discussed herein can be readily broken down into a lower third, middle third and upper third, etc. As will also be understood by one skilled in the art all language such as "up to," "at least," "greater than," "less than," and the like include the number recited and refer to ranges which can be subsequently broken down into subranges as discussed above. Finally, as will be understood by one skilled in the art, a range includes each individual member. Thus, for example, a group having 1-3 elements refers to groups having 1, 2, or 3 elements. Similarly, a group having 1-5 elements refers to groups having 1, 2, 3, 4, or 5 elements, and so forth.

[0025] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which embodiments of the present invention pertain. Although a number of methods and materials similar or equivalent to those described herein can be used in the practice of the present invention, the preferred materials and methods are described herein.

[0026] The term "container" or "bottle," as used herein, is meant to mean and include any container for holding a fluid material. A container or bottle may be made of any suitable material, depending upon the product therein. For example, a container or bottle may be made of plastic.

[0027] Broadly, embodiments of the present invention provide a multi-stage opening and dispensing closure for use with a container. The closure includes a base portion configured to couple the closure to a container and including a first opening having a first diameter, and an intermediate portion hingedly coupled to the base portion and including a second opening having a second diameter. A cap portion is configured to couple to the intermediate portion. Embodiments of the present invention also provide a v-shaped seal for sealing between a container and a closure.

[0028] Referring to FIG. **1** and FIG. **2**, there are shown perspective views of an example multi-stage opening and dispensing closure **100** in accordance with various embodiments of the present disclosure. The closure **100** may include a base portion **2**, an intermediate portion **4**, and a cap portion **6**. The base portion **2** may be configured to couple the closure **100** to a container, and may include a first opening **8** having a first diameter. The intermediate portion **4** may be hingedly coupled to the base portion **2**, and may include a second opening **10** having a second diameter.

[0029] The closure **100** may be configured to provide options for at least two pour rates. To that end, the first opening **8** and the second opening **10** may be provided with different diameters (or opening sizes in the case on non-circular openings), as shown. As noted above, the first opening **8**, for example, may be provided with a first diameter while the second opening **10** may be provided with a second diameter. To facilitate two different pour rates, the first diameter may be larger than the second diameter. To provide a high pour rate, the first opening **8** may be used by flipping open the cap portion **6** and the intermediate portion **4** to expose the first opening **8** of the base portion **2**. To provide a pour rate that is slower and more controlled, the second opening **10** may be used by flipping open only the cap portion **6**, leaving the intermediate portion **4** coupled to the base portion **2**.

[0030] Although the illustrated embodiments depict a closure **100** including only a first opening **8** and a second opening **10**, it is contemplated that a closure **100** within the scope of the present invention may include more than two pour-rate options. For example, a closure may include a base portion **2**, a cap portion **6**, and multiple intermediate portions **4**, each intermediate portion **4** having an opening **10** of various diameters.

[0031] Refer now to FIG. **3**, with continued reference to FIG. **1** and FIG. **2**. FIG. **3** illustrates a cross-sectional view of the closure **100** of FIG. **1** and FIG. **2**. As shown, the intermediate portion **4** is coupled to the base portion **2** by a hinge **22**, and the cap portion **6** is coupled to the intermediate portion **4** by a hinge **26**. As shown, the hinges **22**, **26** may be located on the same side of the closure **100**. In various other embodiments, the hinges **22**, **26** may instead may located in different locations (i.e., not aligned with each other).

[0032] Although there may embodiments in which the base portion **2**, the intermediate portion **4**, and the cap portion **6** are integrally molded with each other, for ease of manufacture, some embodiments may comprise the intermediate portion **4** (along with the hinge **22**) being integrally molded with the base portion **2**, while the cap portion **6** may be hingedly coupled to the intermediate portion **4** by a hinge pin **26**. In various other embodiments, the intermediate portion **4** may be integrally molded with the cap portion **6**, while the intermediate portion **4** is hingedly coupled to the base portion **2** by a hinge pin. In still further embodiments, the cap portion **6**, the intermediate portion **4**, and the base portion **2** (and their corresponding hinges) may all be integrally molded as one piece.

[0033] FIG. **4** shows a cross-sectional view of a multi-stage opening and dispensing closure having removably coupled cap portion **6** and intermediate portion **4**. Rather than hingedly coupling the intermediate portion **4** to the base portion **2** and/or the intermediate portion **4** to the cap portion **6**, the cap portion **6** may be removably coupled to the intermediate portion **4** and/or the intermediate portion **4** may be removably coupled to the base portion **2**.

[0034] A pour spout **12** may be coupled to one or both of the openings **8**, **10** to facilitate dispensing of fluid product from the openings **8**, **10**. In general, a pour spout **12** may provide for a more directed flow of product from the opening **8** or **10**. In various embodiments, one or both of the intermediate

portion **4** and the base portion **2** may exclude a pour spout. FIG. **5** shows a cross-sectional view of a multi-stage opening and dispensing closure without pour spouts.

[0035] For embodiments including the pour spout **12** on the opening **8** of the base portion, a plug **14** may extend downwards from to bottom side **18** of the intermediate portion **4** toward a top side **24** of the base portion **2**, as shown. The plug **14** may be shaped to correspond to the shape of the first opening **8** such that when base portion **2** is capped by the intermediate portion **4**, the plug **14** seals the first opening **8** while allowing flow of product to the second opening **10**. The cap portion **6** may also include a plug **20** for sealing the second opening **10**.

[0036] One or both of the intermediate portion **4** and the cap portion **6** may include gripping features **36**, **38**, respectively, to facilitate flipping open the intermediate portion **4** and the cap portion **6**. In general, the features **36**, **38** may allow a user to push against the features **36**, **38** to manually lift the intermediate portion **4** and the cap portion **6**, respectively.

[0037] The closure **100** may be configured to be coupled to a container. As shown in FIG. **3**, the closure **100** may include an attachment connector **32** on the bottom side of the base portion **2**. The attachment connector **32** may be a threaded connector, as shown, configured to couple the closure **100** to a container having a threaded fitment. Alternatively, the attachment connector **32** may be a bayonet-type connector or snap-fit connector configured to couple the closure **100** to a container having a bayonet-type fitment or snap-fit fitment, respectively.

[0038] FIG. **6** illustrates an example package **400** in accordance with various embodiments of the present invention. The package **400** includes a container **26** and the closure **100** described herein. The base portion **2** of the closure **100** may be configured to couple the closure **100** to the neck **28** of the container **26**.

[0039] The container **26** may generally be any sort of conventional container including, for example, a bottle. As shown, the container **26** may comprise a body **40** having at least one wall **42** defining an internal cavity **44**. A neck **28** may be coupled to the body **40**, and may define an opening for access to the internal cavity **44**.

[0040] The container **26** may include a v-shaped seal **34** coupled to a rim of the neck **28** of the container **26**, as shown in FIG. **6** and FIG. **7**. The seal **34** may be an elastomeric material or the like to provide a leak-resistant seal with the closure **100**. As shown, as the seal **34** is v-shaped, one side of the seal **34** is a continuous channel, while the other side of the seal **34** is a continuous ring. The side of the seal **34** having the channel may be coupled to the rim of the neck **28** of the container **26** such that at least a portion of the rim is disposed within the continuous channel. In this configuration, when the closure **100** is coupled to the container **26**, the bottom side of the closure **100** abuts the side of the seal **34** having the continuous ring to provide a leak-resistant seal.

[0041] Alternatively, the seal **34** may instead be coupled to the bottom side of the closure **100** such that the bottom side of the closure **100** abuts and is coupled to the side of the seal **34** having the continuous ring (not illustrated). In this configuration, when the closure **100** is coupled to the container **26**, the rim of the neck **28** of the container **26** abuts the side of the seal **34** having the continuous channel to provide a leak-resistant seal.

[0042] As discussed herein, the closure **100** may include an attachment connector **32** (FIG. **3**) configured to couple the closure **100** to the container **26**. The container **26** may be complementarily configured to couple to the attachment connector **32** of the container **100**. As shown, for example, the container **26** may include a threaded fitment **46** for coupling to a threaded attachment connector **32** of the closure **100**. Alternatively, the container **26** may include a bayonet-type or snap-fit fitment for coupling the container **26** to a closure **100** have a complementary attachment connector **32**.

[0043] FIG. **8** shows an example of a container **26** and complementarily configured closure **100**, in accordance with various embodiments. As shown, the container **26** may include a threaded fitment **46** for coupling to a threaded attachment connector **32** of the closure **100**.

[0044] Alternatively, FIG. **9** shows another example of a container **26** and complementarily configured closure **100**, in accordance with various embodiments. As shown, the container **26** may include a bayonet-type fitment **48** for coupling the container **26** to a closure **100** have a complementary bayonet-type attachment connector **50**.

[0045] While various aspects and embodiments have been disclosed herein, other aspects and embodiments will be apparent to those skilled in the art. The various aspects and embodiments disclosed herein are for purposes of illustration and are not intended to be limiting, with the true scope and spirit being indicated by the appended claims.

What is claimed is:

1. A multi-stage opening and dispensing closure comprising:

a base portion configured to couple the closure to a container and including a first opening having a first diameter;

an intermediate portion hingedly coupled to the base portion and including a second opening having a second diameter; and

a cap portion configured to couple to the intermediate portion.

2. The multi-stage opening and dispensing closure of claim **1**, wherein the first diameter is larger than the second diameter.

3. The multi-stage opening and dispensing closure of claim **1**, wherein the base portion further comprises a pour spout coupled to the first opening.

4. The multi-stage opening and dispensing closure of claim **1**, wherein the intermediate portion further comprises a pour spout coupled to the second opening.

5. The multi-stage opening and dispensing closure of claim **1**, wherein the cap portion is hingedly coupled to the intermediate portion.

6. The multi-stage opening and dispensing closure of claim **5**, wherein the cap portion is hingedly coupled to the intermediate portion by a hinge pin.

7. The multi-stage opening and dispensing closure of claim **5**, wherein the cap portion is removably coupled to the intermediate portion.

8. The multi-stage opening and dispensing closure of claim **1**, wherein the intermediate portion is integrally molded with the base portion.

9. The multi-stage opening and dispensing closure of claim **1**, wherein the intermediate portion is hingedly coupled to a top side of the base portion, and wherein a bottom side, opposite the top side, of the base portion is configured to couple the closure to the container.

10. The multi-stage opening and dispensing closure of claim **9**, further comprising a v-shaped seal coupled to the

bottom side of the base portion, the v-shaped seal being configured to abut a rim of an opening of the container.

11. The multi-stage opening and dispensing closure of claim **10**, wherein the v-shaped seal includes a first side having a continuous channel, and a second side having a continuous ring.

12. The multi-stage opening and dispensing closure of claim **11**, wherein the second side of the v-shaped seal is coupled to bottom side of the base portion, and wherein the first side of the v-shaped seal is configured to abut the rim of the opening of the container.

13. The multi-stage opening and dispensing closure of claim **1**, wherein the base portion includes a bayonet-type connector configured to couple the closure to a container having a bayonet-type fitment.

14. The multi-stage opening and dispensing closure of claim **1**, wherein the base portion includes a threaded connector configured to couple the closure to a container having a threaded fitment.

15. The multi-stage opening and dispensing closure of claim **1**, wherein the base portion and the intermediate portion are coupled by a first hinge, wherein the intermediate portion and the cap portion are coupled by a second hinge, and wherein the first hinge and the second hinge are disposed on a same side of the closure.

16. A container comprising:

a body having at least one wall defining an internal cavity;

a neck coupled to the body and defining an opening for access to the internal cavity; and

a v-shaped seal coupled to a rim of the neck, wherein the v-shaped seal includes a first side having a continuous channel, and a second side having a continuous ring.

17. The container of claim **16**, wherein the continuous channel is coupled to the rim of the neck such that at least a portion of the rim is disposed within the continuous channel.

18. The container of claim **15**, wherein the neck includes a bayonet-type fitment.

19. The container of claim **15**, wherein the neck includes a threaded fitment.

20. The container of claim **11**, wherein the neck includes a snap-fit fitment.

* * * * *