CONTAINER HAVING A CLOSURE-ORIENTING FEATURE AND RELATED METHOD

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ABSTRACT

The present invention relates to a container having a body defining an interior volume of the container and having an opening; a finish extending around the opening and defining an axis; a thread located on the finish for securing a closure to the finish; and a first orientation surface on the container for engaging a second orientation surface on the closure to orient the closure at a predetermined angle with respect to the body about the axis. A method of securing a closure to a body of a container in a predetermined angular orientation with respect to the body is also disclosed.
FIG. 4

FIG. 6
CONTAINER HAVING A CLOSURE-ORIENTING FEATURE AND RELATED METHOD

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates generally to containers, and more particularly, to containers having a feature for orienting a closure with respect to the container.

[0003] 2. Related Art

[0004] It is becoming more common for containers to include closures that are preferably aligned with respect to the container at a particular orientation. For example, a closure may have a spout that is preferably aligned with the front of the container. Shampoo bottles often have such a requirement. As another example, a closure may have a spout that is preferably aligned with the handle of the container, as is sometimes the case with detergent containers.

[0005] One known technique of orienting a closure with respect to a container includes orienting the thread start on the closure and/or container. Another known technique includes forming a portion of the threads on the closure and/or container. These techniques, however, often provide an undesirable level of tolerance in the orientation of the closure with respect to the container; sometimes the tolerance is as high as 30 degrees. In addition, these techniques don’t readily allow for use of a conventional, non-oriented closure in the instance where orientation of the closure with respect to the container is not needed or desired; thus requiring container manufacturers to make and store different containers for use with oriented and non-oriented closures.

[0006] Thus, there remains a need in the art for a container that has a feature for accurately orienting a closure with respect to the container. In addition, there remains a need in the art for a container that accepts a conventional, non-oriented closure when orientation of the closure with respect to the container is not needed or desired.

BRIEF SUMMARY OF THE INVENTION

[0007] In summary, the present invention relates to a container including a feature for accurately orienting a closure with respect to the body of the container, and a related method.

[0008] According to one exemplary embodiment, the container can include a body defining an interior volume of the container, the body having an opening; a finish extending around the opening, the finish defining an axis; a thread located on the finish for securing a closure to the finish; and a first orientation surface on the container for engaging a second orientation surface on the closure to orient the closure at a predetermined angle with respect to the body about the axis. The first orientation surface can be defined by a recess on the container and the second orientation surface can be defined by a protrusion on the closure. Alternatively, the first orientation surface can be defined by a protrusion on the container and the second orientation surface can be defined by a recess on the closure. Still alternatively, the first orientation surface can be defined by a first protrusion on the container and the second orientation surface can be defined by a second protrusion on the closure. The finish can be adapted and configured to accept a non-oriented closure without substantial engagement between the non-oriented closure and the first orientation surface.

[0009] According to another exemplary embodiment, the container can include a body defining an interior volume of the container, the body having an opening; a finish extending around the opening, the finish defining an axis; and a thread located on the finish for securing a closure to the finish; wherein the container includes a recess and the closure includes a protrusion for engaging the recess to orient the closure at a predetermined angle with respect to the body about the axis. The finish can include an upper region bounding the opening, and the recess can be located on the upper region. In addition, the closure can include an upper surface having an interior portion and an exterior portion, and the protrusion can be a lug located proximate the interior portion of the upper surface. Alternatively, the recess can be located on the shoulder of the container. In addition, the protrusion can be a lug extending from the skirt. The finish can be adapted and configured to accept a non-oriented closure without substantial engagement between the non-oriented closure and the recess.

[0010] The present invention also relates to a method of securing a closure to a body of a container in a predetermined angular orientation with respect to the body. In one exemplary embodiment, the method includes placing the closure onto a finish attached to the body; and turning the closure about an axis to engage threads on the closure with threads on the finish until a first orientation surface on the container engages a second orientation surface on the closure to orient the closure at a predetermined angle with respect to the body about the axis. The method can further include placing a non-oriented closure onto the finish; and turning the non-oriented closure about the axis to engage threads on the non-oriented closure with threads on the finish; wherein the non-oriented closure does not substantially engage the first orientation surface.

[0011] Further objectives and advantages, as well as the structure and function of preferred embodiments will become apparent from a consideration of the description, drawings, and examples.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The foregoing and other features and advantages of the invention will be apparent from the following, more particular description of a preferred embodiment of the invention, as illustrated in the accompanying drawings wherein like reference numbers generally indicate identical, functionally similar, and/or structurally similar elements.

[0013] FIG. 1 is a side view of a first exemplary embodiment of a container and closure according to the present invention;

[0014] FIG. 2 is a front view of the container and closure of FIG. 1;

[0015] FIG. 3 is an exploded, perspective view of the container and closure of FIG. 1, with portions of the closure shown in hidden lines;

[0016] FIG. 4 is a bottom view of the closure of FIG. 1;

[0017] FIG. 5 is an exploded, perspective view of a second exemplary embodiment of a container and closure according to the present invention, with portions of the closure shown in hidden lines;

[0018] FIG. 6 is a bottom view of the closure of FIG. 5;
FIG. 7 is an exploded, perspective view of a third exemplary embodiment of a container and closure according to the present invention; and

FIG. 8 is an exploded, perspective view of a fourth exemplary embodiment of a container and closure according to the present invention, with portions of the closure shown in hidden lines.

DETAILED DESCRIPTION OF THE INVENTION

Embodiments of the invention are discussed in detail below. In describing embodiments, specific terminology is employed for the sake of clarity. However, the invention is not intended to be limited to the specific terminology so selected. While specific exemplary embodiments are discussed, it should be understood that this is done for illustration purposes only. A person skilled in the relevant art will recognize that other components and configurations can be used without parting from the spirit and scope of the invention.

Referring to FIGS. 1 to 3, a first exemplary embodiment of a container 10 and closure 12 is shown. Container 10 generally includes a body 14 that defines an interior volume for storing a wide variety of liquid, viscous or solid products including, for example, juices, beverages, yogurt, sauces, puddings, lotions, soaps in liquid or gel form, lubricants such as motor oil, and bead shaped objects such as candy. A person skilled in the art will recognize that body 14 can be shaped and dimensioned to fit a particular application. For example, body 14 can have a symmetrical cross-section such as circular or square, or alternatively, an asymmetrical cross-section such as oval or rectangular. In addition, body 14 can have other features, such as a handle 16, as shown in FIGS. 1 and 3, to facilitate gripping of the container 10. Body 14 can alternatively be in the form of a preform for blow molding a container, or in another preliminary stage requiring further processing to become a fully-formed container.

Container 10 can also include a finish 18, shown in FIG. 3, that extends around an opening 20 in the body 14. Finish 18 can be generically cylindrical in shape and include one or more threads 22, or other known features, for securing closure 12 to container 10. Finish 18 can have an upper region 24 that bounds the opening 20, and a lower region 26 opposite the upper region 24. In addition, finish 18 can define an axis 28. Body 14 can include a shoulder portion 30, best shown in FIG. 3, that extends from adjacent lower region 26 of the finish 18 to the sidewalls of the body 14.

Container 10 can have a one-piece construction and can be prepared from a monolayer plastic material, such as a polyamide, for example, nylon; a polyolefin such as polyethylene, for example, low density polyethylene (LDPE) or high density polyethylene (HDPE); or polypropylene; a polyester, for example polyethylene terephthalate (PET), polyethylene naphthalate (PEN); or others, which can also include additives to vary the physical or chemical properties of the material. For example, some plastic resins can be modified to improve the oxygen permeability. Alternatively, the container can be prepared from a multilayer plastic material. The layers can be any plastic material, including virgin, recycled and reground material, and can include plastics or other materials with additives to improve physical properties of the container. In addition to the above-mentioned materials, other materials often used in multilayer plastic containers include, for example, ethylvinyl alcohol (EVOH) and tie layers or binders to hold together materials that are subject to delamination when used in adjacent layers. A coating may be applied over the monolayer or multilayer material, for example to introduce oxygen barrier properties. Container 10 can be made by conventional blow molding processes including, for example, extrusion blow molding, stretch blow molding and injection blow molding, although other methods of making container 10 are possible, as will be recognized by one skilled in the art.

Still referring to FIGS. 1 to 3, closure 12 can include an upper portion 32 and a skirt 34 extending away from the upper portion 32. Skirt 34 can have threads 35 (shown in FIG. 4) or other known features for securing closure 12 onto finish 18. For example, in the exemplary embodiment shown, closure 12 can be screwed onto finish 18 by placing closure on finish 18 and turning closure 12 clockwise with respect to container 10 about axis 28.

Closure 12 can also include a spout 36 or other known feature to facilitate dispensing of the contents of container 10. In the exemplary embodiment shown in FIGS. 1 to 3, spout 36 is of the flip-up type, known to those skilled in the art, although other types of spouts or pourers known to those skilled in the art can be used instead. In an alternative embodiment, closure 12 can be without a spout. For example, closure 12 can have a plain, flat upper portion 32. Alternatively, closure 12 can take the form of an ornamental design, such as an animal figurine. One skilled in the art will appreciate that any number of shapes and configurations of closure 12 are possible.

Referring now to FIG. 3, container 10 can include a feature that positively orient the closure 12 with respect to body 14 in a predetermined angular relationship about axis 28. This can be beneficial, for example, in the instance where closure 12 includes a feature that needs to be aligned with respect to the body 14. For example, closure 12 may include a spout 36 that is preferably aligned with the spout 36 of the body 14, or alternatively, opposite a handle 16 provided on the body 14. Alternatively, closure 12 may include an ornamental feature that is preferably aligned with a label or other decorative feature on the body 14. One skilled in the art will recognize that there are many other instances where it may be desirable to orient the closure 12 at a specific orientation with respect to the body 14.

Still referring to FIG. 3, container 10 can include a first orientation surface 38, and closure 12 can include a corresponding second orientation surface 40. The first orientation surface 38 and second orientation surface 40 can be configured to contact one another once the closure 12 has been sufficiently threaded onto the finish 18, and the closure 12 is in a predetermined angular position with respect to the body 14 about axis 28. The engagement between the first orientation surface 38 and the second orientation surface 40 then substantially prevents further turning of the closure 12 (in the direction of tightening), thereby positively orienting the closure 12 in the desired angular position with respect to body 14. This structure provides a higher degree of accuracy in the orientation of the closure 12 with respect to the body 14 than has been achieved with known prior art techniques. In addition, this structure provides consistent orientation of the closure 12 with respect to the body 14 regardless of how the closure 12 is initially placed on the finish 18.
in the upper region 24 of finish 18. Recess 42 can start out shallow and gradually become deeper as it approaches first orientation surface 38, as shown in FIG. 3, however other configurations are possible. As shown in FIGS. 3 and 4, the second orientation surface 40 can be defined by a protrusion, in the form of a lug 44, that extends from the closure 12. In the exemplary embodiment shown in FIGS. 3 and 4, the upper portion 32 of closure 12 has an interior surface 32A and an exterior surface 32B, and lug 44 is located proximate the interior surface 32A. One skilled in the art will recognize that other locations and configurations of recess 42 and lug 44 are possible. In addition, while interior surface 32A and exterior surface 32B are shown as substantially flat in FIGS. 1 to 4, other configurations are possible.

[0030] Referring to FIGS. 5 and 6, a second exemplary embodiment of a container and closure according to the present invention is shown. According to this embodiment, container 110 can include a first orientation surface 138 defined by a protrusion, or lug 145, and closure 112 can include a corresponding second orientation surface 140 defined by a recess 141. Lug 145 can be formed on the upper region 124 of finish 118. Recess 141 can be formed in the inner surface 132A of the upper portion 132 of closure 112. Recess 141 can gradually taper, or become deeper, as it progresses towards the second orientation surface 140, although other configurations are possible. One skilled in the art will recognize that other locations and configurations of the first and second orientation surfaces 138, 140 and/or lug 145 and recess 141 are possible.

[0031] Similar to the embodiment of FIGS. 1 to 3, the first orientation surface 138 and second orientation surface 140 can be configured to contact one another once the closure 112 has been turned onto the finish 118 to a predetermined angular position, thereby positively orienting the closure 112 in the desired angular position with respect to body 114. According to an alternative embodiment, the second orientation surface 140 can be defined on closure 112 by a second protrusion or lug formed on container 110, such as the lug 44 formed on the finish in FIG. 3 and described in the accompanying disclosure. However, the location of the second lug is not limited to those shown in the figures, and can alternatively be located, for example, on the inner or outer side of finish 118. The second lug can contact lug 145 to positively orient the closure 112 with respect to the body 114.

[0032] Referring to FIG. 7, a third exemplary embodiment of a container and closure according to the present invention is shown. According to this embodiment, container 210 can include a first orientation surface 238 defined by a recess 239 in shoulder portion 230, and closure 212 can include a corresponding second orientation surface 240 defined by a protrusion, or lug 247. Recess 239 can gradually taper, or become deeper, as it progresses toward the first orientation surface 238, although other configurations are possible. Lug 247 can be formed on the lower edge 250 of the skirt 234 of closure 212, although other locations are possible. As described above with respect to the previous exemplary embodiments, first orientation surface 238 and second orientation surface 240 can engage one another to positively orient the closure 212 with respect to the body 214 of container 210 at a predetermined angle.

[0033] Referring to FIG. 8, a fourth exemplary embodiment of a container and closure according to the present invention is shown. According to this embodiment, container 310 can include a first orientation surface 338 defined by a protrusion, or lug 353, in shoulder portion 330, and closure 312 can include a corresponding second orientation surface 340 defined by a recess 351. Recess 351 can be formed on the lower edge 350 of the skirt 334 of closure 312. Also, recess 351 can gradually taper, or become deeper, as it progresses towards the second orientation surface 340, although other configurations are possible. As described above with respect to the previous exemplary embodiments, first orientation surface 338 and second orientation surface 340 can engage one another to positively orient the closure 312 with respect to the body 314 of container 310 at a predetermined angle. According to an alternative embodiment, the second orientation surface 340 can be defined on closure 312 by a second protrusion or lug, as shown in FIG. 7 and described in the corresponding disclosure. The second lug can contact lug 353 to positively orient the closure 312 with respect to the body 314.

[0034] The present invention is also directed to a method of securing a closure to a body of a container in a predetermined angular orientation with respect to the body. Referring back to FIG. 3 for illustrative purposes only, one exemplary embodiment of the method includes placing the closure 12 onto the finish 18 and turning the closure 12 about axis 28 causing the threads 35 on the closure 12 to engage the threads 22 on the finish 18. Once the closure 12 has been rotated a sufficient distance about axis 28, the first orientation surface 38 on the finish 18 contacts the second orientation surface 40 on the closure and substantially prevents further turning of the closure 12 with respect to the finish 18 (in the tightening direction). Due to the orientation of the first and second orientation surfaces 38, 40 with respect to the body 14 and closure 12, the closure 12 will then be oriented at a predetermined angle with respect to the body 14 about axis 28. For example, the spout 36 may be oriented opposite the handle 16 of the body 14. In the instance where a particular orientation of the closure is not needed or desired, the method may also include the step of applying a second, non-oriented closure (e.g., without a second orientation surface, corresponding recess, lug, or other structure) onto the finish 18 and turning the non-oriented closure to engage threads on the non-oriented closure with threads on the finish 18, without the non-oriented closure substantially engaging the first orientation surface 38.

[0035] While the above-described method was discussed in connection with FIGS. 1 to 4, the method is not limited to use with that particular embodiment.

[0036] As discussed above, the present invention provides a container that is capable of positively orienting a closure with respect to the body of the container to a higher degree of accuracy than is achieved with known prior art designs. In addition, in some embodiments the container can still be used with a conventional, non-orienting closure (e.g., without a second orientation surface, corresponding recess, lug, or other structure) in the instance where orientation of the closure with respect to the body is not needed or desired. For example, the containers shown in FIGS. 1 to 3, and FIG. 7 can alternatively be used with a conventional, non-orienting closure without requiring any modification to the containers; and with these embodiments, the first orientation surfaces and any related structure will not substantially interfere with the non-oriented closure. This can provide the bottle manufacturer with additional flexibility in that only one container may be needed for use with both oriented and non-oriented closures.
The embodiments illustrated and discussed in this specification are intended only to teach those skilled in the art the best way known to the inventors to make and use the invention. Nothing in this specification should be considered as limiting the scope of the present invention. All examples presented are representative and non-limiting. The above-described embodiments of the invention may be modified or varied, without departing from the invention, as appreciated by those skilled in the art in light of the above teachings. It is therefore to be understood that, within the scope of the claims and their equivalents, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A container comprising:
   a body defining an interior volume of the container, the body having an opening;
   a finish extending around the opening, the finish defining an axis;
   a thread located on the finish for securing a closure to the finish; and
   a first orientation surface on the container for engaging a second orientation surface on the closure to orient the closure at a predetermined angle with respect to the body about the axis.

2. The container of claim 1, wherein the first orientation surface is defined by a recess on the container and the second orientation surface is defined by a protrusion on the closure.

3. The container of claim 2, wherein the finish includes an upper region bounding the opening and the recess is located on the upper region of the finish.

4. The container of claim 3, wherein the closure includes an upper surface having an interior portion and an exterior portion, and the protrusion is located adjacent the interior portion of the upper surface.

5. The container of claim 2, wherein:
   the container includes a shoulder portion adjacent to a lower portion of the finish and the recess is located on the shoulder portion; and
   the closure includes a skirt and the protrusion is located on the skirt.

6. The container of claim 1, wherein the first orientation surface is defined by a protrusion on the container and the second orientation surface is defined by a recess on the closure.

7. The container of claim 1, wherein the first orientation surface is defined by a first protrusion on the container and the second orientation surface is defined by a second protrusion on the closure.

8. The container of claim 1, further comprising a closure having a spout.

9. The container of claim 1, wherein the body is a preform.

10. The container of claim 1, wherein the container is blow molded.

11. The container of claim 1, wherein the finish is adapted and configured to accept a non-oriented closure without substantial engagement between the non-oriented closure and the first orientation surface.

12. A method of securing a closure to a body of a container in a predetermined angular orientation with respect to the body, the method comprising:
   placing the closure onto a finish attached to the body; and
   turning the closure about an axis to engage threads on the closure with threads on the finish until a first orientation surface on the container engages a second orientation surface on the closure to orient the closure at a predetermined angle with respect to the body about the axis.

13. The method of claim 12, wherein the first orientation surface is defined by a recess on the container and the second orientation surface is defined by a protrusion on the closure.

14. The method of claim 12, wherein the first orientation surface is defined by a protrusion on the container and the second orientation surface is defined by a recess on the closure.

15. The method of claim 12, wherein the first orientation surface is defined by a first protrusion on the container and the second orientation surface is defined by a second protrusion on the closure.

16. The method of claim 12, further comprising the steps of:
   placing a non-oriented closure onto the finish; and
   turning the non-oriented closure about the axis to engage threads on the non-oriented closure with threads on the finish;

wherein the non-oriented closure does not substantially engage the first orientation surface.

17. The method of claim 12, wherein the container is blow molded.

18. A container comprising:
   a body defining an interior volume of the container, the body having an opening;
   a finish extending around the opening, the finish defining an axis; and
   a thread located on the finish for securing a closure to the finish;

wherein the container includes a recess and the closure includes a protrusion for engaging the recess to orient the closure at a predetermined angle with respect to the body about the axis.

19. The container of claim 18, wherein the finish includes an upper region bounding the opening, and the recess is located on the upper region.

20. The container of claim 19, wherein the closure includes an upper surface having an interior portion and an exterior portion, and the protrusion is a lug located proximate the interior portion of the upper surface.

21. The container of claim 18, further comprising a shoulder portion adjacent to a lower region of the finish, wherein the recess is located on the shoulder.

22. The container of claim 21, wherein the closure includes a skirt, and the protrusion is a lug extending from the skirt.

23. The container of claim 18, further comprising a closure having a spout.

24. The container of claim 18, wherein the container is blow molded.

25. The container of claim 1, wherein the finish is adapted and configured to accept a non-oriented closure without substantial engagement between the non-oriented closure and the recess.

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