MULTI-FACETED CONTAINER AND RECLOSABLE LID FOR FOOD PRODUCTS

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ABSTRACT
A container for food products, such as nuts, is provided, wherein the container includes a body defining an interior of the container. The body has a neck surrounding an access opening that is adapted to be covered with a lid. A sidewall of the container has a plurality of facets narrowing toward a longitudinal axis of the body, and the lid has the same number of facets formed in a skirt thereof that are generally aligned with the facets of the body of the container when the lid is in a closed position covering the access opening. The material of the body is preferably formed from a polyethylene terephthalate resin with an oxygen scavenger additive and with an average wall thickness of between about 0.012 and 0.035 inches and up to about 0.05 inches, preferably between about 0.015 inches and 0.040 inches, and between about 10% and 35% crystallinity to provide both barrier properties and translucency.
MULTI-FACETED CONTAINER AND RECLOSEABLE LID FOR FOOD PRODUCTS

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from U.S. Pat. Appl. No. 61/240,291, filed Sep. 7, 2009, which is hereby incorporated by reference in its entirety.

FIELD

[0002] This disclosure relates generally to containers for food products, such as nuts, and, in particular, to containers for food products formed from polymers and having a lid selectively removable from a neck of the container.

BACKGROUND

[0003] In providing a container for commercial packaging of food products, such as nuts, among the considerations that must be addressed are the handling of the container by a user, the storage of the container by the user, and the packaging of the container. Containers also should have an aesthetically pleasing appearance and be capable of inexpensive mass production. Often, containers have bodies that are formed from polymers using blow molding techniques. Access to the interior of the bodies can be provided through an opening that can be selectively covered by a removable lid. However, certain types of food products, such as nuts, can be more susceptible to the ingress of gasses, such as oxygen, as compared to other food products, when made using conventional materials.

[0004] In the packaging of nuts, containers are often formed at least in part from cardboard or cardboard. Both have their disadvantages. The cardboard or cardboard containers require liners to provide barrier properties, adding to the complexity and expense of manufacture. Glass containers can be heavier and thus can result in increased shipping costs.

SUMMARY

[0005] A food container having a body with a neck surrounding an access opening is provided. A lid can attach to the neck to cover the access opening to permit selective access to the body disposed within the interior of the body. The body of the container has a plurality of facets about its periphery. Preferably, the number of facets exceeds four and, more preferably, is between six and ten in number and, even more preferably, is eight in number. The lid can have the same number of facets as the body, such that a uniform appearance is provided. Further, the facets on the lid can provide improved gripping of the lid for rotating or otherwise causing the removal of the lid from the body, particularly compared to a circular lid. The body of the container is formed from a polymer, and may be either translucent or transparent such that the contents of the interior of the body are visible from exteriorly of the container.

[0006] The food product can be packaged with a generally hermetic seal, such as with a removable flexible membrane sealed to a periphery of the neck. The lid can then be attached to the neck, such as with threads, lugs or a snap-fit, with the membrane therebetween. To initially open the container, the lid is removed, followed by the membrane. Access to the food products within the interior can then be accomplished through the access opening of the neck. Following removal of a desired quantity of food product from the interior of the body, the lid can be reattached to the neck to cover the access opening and restrict access to the interior of the body.

[0007] The body can be formed of a material and in a manner that provides both suitable translucency while maintaining barrier properties to restrict the ingress and egress of gasses. This can be accomplished using a material and blow molding manufacturing techniques which result in the body having an average wall thickness of between about 0.012 and 0.035 inches and up to about 0.05 inches, and more preferably between about 0.015 inches and 0.040 inches or between 0.015 inches and 0.025 inches; and between about 10% and 35% crystallinity, and more preferably between about 15% and 30% crystallinity, and even more preferably between about 25% and 30% crystallinity. Preferably the material is a polyethylene terephthalate resin with an oxygen scavenger additive.

[0008] The shape of the container body has a narrowed waist at its center portion in order, and can be of a size suitable to permit ready grasping of the container by a user. Preferably, the maximum inward extent of the facets is between 85% and 95% of the maximum overall extent of the facets. Also preferably, the diameter of the neck may be between 70% and 80% of the maximum overall extent of the facets measured perpendicularly to the longitudinal axis of the container body.

[0009] In one aspect, the body of the container has a generally circular neck, a bottom, and a sidewall extending between the neck and the bottom. The sidewall has between six and ten facets, and preferably eight facets, extending between the neck and the bottom and surrounding a circumference of the container. The shape of the facets may optionally be identical. The facets are inwardly curved toward a longitudinal axis of the body, with the maximum inward extent being at a center portion of the axial length of the body. The lid may have a top wall with an external skirt depending about its periphery and a generally circular internal skirt depending from a bottom side of the top wall, the external skirt having a plurality of facets corresponding in number to the facets of the body. Optionally, the lid does not extend beyond an outer perimeter of the body when seated thereon.

[0010] In another aspect, a stop is provided between the lid and the neck of the body to limit rotation of the lid relative to the neck of the body so that the facets of the outer skirt of the lid and the facets of the body are generally aligned, e.g., between 3 and 5 degrees of rotation in either direction of being precisely aligned, when the stop is engaged. The stop may be formed by engagement of the under surface of the top wall of the lid with an upper peripheral rim of the neck. The stop may alternatively or in addition be formed by engagement of lugs position on both the lid and the neck of the container.

[0011] In yet another aspect, the top wall of the lid may be provided with a re closable feature. The re closable feature may be a hinged cover that can be selectively moved between a position covering an opening in the top wall and a position at least partially spaced from the opening to permit access to the opening in the top wall. This can provide access to the interior of the container without removal of the lid, other than initially when the aforementioned membrane is present.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a front elevation view of a first embodiment of a container for food products having a body and a first embodiment of a lid;
FIG. 2 is a perspective view of the container of FIG. 1; FIG. 3 is a top plan view of the container of FIG. 1; FIG. 4 is a perspective view of the body of the container of FIG. 1 with the lid removed; FIG. 5 is a front elevation view of the body of the container of FIG. 1 with the lid removed; FIG. 6 is a bottom plan view of the body of the container of FIG. 1; FIG. 7 is a top plan view of the body of the container of FIG. 1 with the lid removed; FIG. 8 is a perspective view of a second embodiment of a container for food products having a body and a lid, showing just the body; FIG. 9 is a front elevation view of the container body of FIG. 8; FIG. 10A is perspective view of an alternative embodiment of a lid suitable for use with the container bodies of either the first or second embodiments, showing a cover of the lid in a closed position; FIG. 10B is a perspective view of the lid of FIG. 10A showing the cover in an open position permitting access to an opening in the top wall of the lid; FIG. 10C is a sectional view of the alternative embodiment of the lid taken from line X-X of FIG. 10A with the cover in its closed position; FIG. 10D is a sectional view of the alternative embodiment of the lid taken from line X’-X’ of FIG. 10B with the cover in its open position; FIG. 11A is a perspective view of the lid of FIG. 1 shown without the container body; and FIG. 11B is a sectional view of the lid of FIG. 1 taken along line XI-XI of FIG. 11A.

DETAILED DESCRIPTION OF THE DRAWINGS

With reference to a first exemplary embodiment of FIGS. 1-7, the container 10 includes a translucent, preferably transparent, polymer body 20 with a neck 28, a bottom 24 opposite the neck 28 and a sidewall 22 extending between the neck 28 and the bottom 24. A lid 60 is provided for attachment to the neck 28, such as by use of threads 32, lugs or the like, to cover an access opening 30 surrounded by the neck 28. The lid 60 has a top wall 62 with an outer depending skirt 64 and is configured to engage the neck 28, as will be described in greater detail herein. The container 10 is suitable for food products. As used herein, the term food product refers to food products that are liquid, solid or spoonable. The food product may be loose in the container 10, and may comprise nuts or other small food products.

The body 20 has multiple portions which combine to contribute to stability of the container 10, ease of handling, visibility of labeling, as well as egress of food product from within the interior of the body. More specifically, the body 20 has a plurality of facets 40 extending about its periphery. The facets 40 are preferably eight in number, but greater than four facets can also be used, as well as between six and ten facets. The facets 40 are preferably each generically identical and can be generally linear at any given point along their elevation, accounting for minor variations such as due to typical manufacturing tolerances and the like as well as slight arcuate curves, such that corners are formed at their intersections. The facets 40 extend from the bottom 24 of the body 20 to the neck or finish 28. However, the facets 40 transition through several different regions having differing spacings from a longitudinal axis of the body 20 passing through the opening 30 in order to provide a narrowed waist 38 to the body 20. Moving from the bottom 24 of the body 20 to the neck 28, there is a bottom region 48 having a maximum and consistent width d1, an intermediate region 42 having a minimum width d2, and a top region 46 having a maximum and consistent width d1. The width of the intermediate region 42 transitions from the same widths d1 and d3 of the top and bottom regions 46 and 48 to the minimum width d2 in an arcuate manner, resulting in the narrowed waist 38. Disposed between the neck 28 and the top region 46 of the sidewall 22 of the body 20 is a sloped region 44, where an inclined portion 26 of the sidewall 22 slopes inwardly at an acute angle θ toward the neck 28. Thus, the diameter d2 of the neck 28 is less than the maximum width d1 of the top region 46. While the facets 40 are depicted as extending throughout all four regions 42, 44, 46 and 48, they can optionally extend through less than all four regions or even by spaced by intermediate, non-faceted, e.g., circular, regions.

A second exemplary embodiment of the body 120 is illustrated in FIGS. 8 and 9, with the top and bottom being substantially the same as depicted in FIGS. 6 and 7. This embodiment differs from the first in that it is substantially taller as well as skinner. As with the first embodiment, the body 120 has multiple portions which combine to contribute to stability, ease of handling, visibility of labeling, as well as egress of food product from within the interior of the body. The body 120 has eight facets 140 extending about its periphery and extending from the bottom 124 of the body 120 to the neck 128. As in the first embodiment, the facets 140 transition through several different regions having differing spacings from a longitudinal axis of the body 120 passing through the opening 130 in order to provide a narrowed waist 138 to the body 120. Moving from the bottom 124 of the body 120 to the neck 128, there is a bottom region 148 having a maximum and consistent width D1, an intermediate region 142 having a minimum width D2, and a top region 146 having a maximum and consistent width D1. The width of the intermediate region 142 transitions from the same widths D1 and D3 of the top and bottom regions 146 and 148 to the minimum width D2 in an arcuate manner, resulting in the narrowed waist 138. A sloped region 144 has an inclined portion 126 of the sidewall 122 sloping inwardly at an acute angle α toward the neck 128. Thus, the diameter D2 of the neck 128 is less than the maximum width D1 of the top region 146.

Turning now to details of the lid 60, and with reference to FIGS. 11A and 11B, the outer depending skirt 64 is provided with a plurality of facets. The facets are preferably identical in number to the facets 40 or 140 of the container body 20 or 120. An inner skirt 66 is generally cylindrical and depends from an underside of the top wall 62 of the lid 60, as depicted in FIG. 11B. The inner skirt 66 is configured to engage the neck 28 or 128 of the container body 20 or 120, such as by using threads, lugs or the like. The threads or lugs are preferably positioned and configured so that a stop is formed to limit rotation on the lid 60 in a closing direction such that at the limit of the rotation the facets of the outer skirt 64 of the lid 60 are generally aligned with the facets 40 or 140 of the body 20 or 120. The stop may be formed between lugs or other protruding structures on the lid 60, neck 28 or 128 or both, by engagement of the underside of the top wall 62 of the lid 60 with an upper peripheral rim of the neck 28 or 128. By generally aligned, what is meant is that there is no more than about 5 degrees of rotation in either direction between
being precisely aligned. This can present a visually appealing container 10 when the lid 60 is secured. Also, it may be possible to force the lid 60 past the limit of rotation when over-torqued, but such is not intended in the description herein. An audible indication may be provided to signal when the limit of rotation has been reached. The torque required for removal of the lid 60 is preferably less than 50 pounds-force-inch. Although the inner skirt and outer skirt are depicted as being spaced, they may be connected by webs or a solid portion.

[0031] A flexible membrane (not shown) may be sealed to the neck 28 or 128 to provide a substantially hermetic seal of the body 20 or 120 and food product therein. The lid 60 is sized to cover at least a portion of the flexible membrane when in place. After initial removal of the lid 60, the flexible membrane can be removed by the end user and discarded, then the lid 60 replaced to reclose the container 10.

[0032] The lid may be provided with its own selectively re closable opening, thereby permitting access to the interior of the container 10 without removal of the lid 60. In one exemplary version, illustrated in FIGS. 10A-10D, the lid 160 includes a cover 166 connected to the top wall 162 of the lid 160 via a hinge 170. When in its closed position, the cover 166 can block access to an opening 168 of the top wall 162. Optionally, a protuberance 172 on the underside of the cover 166 can engage with the periphery of the opening 168. When in its open position, the cover 166 is pivoted about the hinge 170 and spaced from the opening 168.

[0033] The body 20 or 120 of the container 10 is preferably manufactured using blow molding techniques. The material is preferably a polyethylene terephthalate resin (PET), and the resultant container is transparent. Unlike conventional PET, however, the preferred PET resin has an oxygen scavenger additive to provide enhanced barrier properties as compared to a typical PET resin. Suitable oxygen scavenger additives include Monoxbar V6 (added at about 2.5%) or V10 (added at about 4%), available from Constar International Inc., Philadelphia, Pa. Also differing from traditional blow molding techniques, a short perform as compared to a long perform is used to make the container body 20 or 120. The short perform can stretch between 2.4 and 2.6 times in length during the blow molding process, as compared to a long perform which may stretch between 1.7 to 1.9 times its length, by way of example. This can result in greater stretching of the perform in the axial direction and radial direction, and thus higher crystallinity. An increase in crystallinity of 4% is believed to correspond to a wall thickness increase of 0.001 inches. Thus, the greater the crystallinity the less thick the container walls need to be. Increased crystallinity can also provide increased barrier properties, but with an increase in crystallinity can disadvantageously come a decrease in transparency. Advantageously, the PET resin with additive and the short perform can result in a container body 20 or 120 with an average wall thickness of between about 0.012 and 0.035 inches and up to about 0.05 inches, preferably between about 0.015 inches and 0.040 inches or between about 0.015 inches and 0.025 inches, and more preferably about 0.02 inches, and between 10% and 35% crystallinity, and preferably about 15% and 30% crystallinity, and more preferably about 26% crystallinity. The crystallinity can be measured, for example, using ASTM test method D 1505-85.

[0034] In the first exemplary embodiment of the body 20 of the container 10, the height of the body 20 is between about 3.75 inches and 4.25 inches, and preferably about 4 inches. The height of the neck 28 is between about 0.25 and 0.50 inches, and preferably about 0.4 inches. The maximum widths \(d_1\) and \(d_2\) of the top and bottom regions 46 and 48 are between about 3.5 and 4 inches, and preferably about 3.7 inches. The minimum width \(d_3\) of the intermediate region 42 is between about 3 and 3.5 inches, and preferably about 3.3 inches. The diameter \(d_4\) of the opening 30 of the neck 28 is between about 2.5 and 3 inches, and preferably about 2.8 inches. The angle \(\theta\) of the inclined portion 26 relative to horizontal is between about 0 and 45 degrees, and preferably between about 17 and 20 degrees.

[0035] In the second exemplary embodiment of the body 120, the height of the body 120 is between about 6.75 and 7.5 inches, and preferably about 7.2 inches. The height of the neck 128 is between about 0.25 and 0.50 inches, and preferably about 0.4 inches. The maximum widths \(d_1\) and \(d_2\) of the top and bottom regions 146 and 148 are between about 3.0 and 3.5 inches, and preferably about 3.2 inches. The minimum width \(d_3\) of the intermediate region 142 is between about 2.75 and 3.25 inches, and preferably about 3.0 inches. The diameter \(d_4\) of the opening 130 of the neck 128 is between about 2.0 and 2.75 inches, and preferably about 2.3 to 2.4 inches. The angle \(\theta\) of the inclined portion 126 relative to horizontal is between about 0 and 45 degrees, and preferably between about 17 and 20 degrees.

[0036] In one aspect, either in combination or separate from the aforementioned dimensions, the diameter \(d_4\) of the neck 28 or 128 is preferably between about 75% and 90%, and may be between about 79% and 86%, of the minimum width \(d_2\) of the intermediate region 42 or 142. Further, the minimum width \(d_3\) of the intermediate region 42 or 142 can be between about 85% and 95%, and preferably between about 88% and 93%, of the maximum width \(d_1\) or \(d_2\) of either or both of the top and bottom regions 46 or 48 146 or 148. The diameter \(d_4\) of the neck 28 or 128 is preferably between about 70% and 80%, and preferably between about 72% and 76%, of the maximum width \(d_1\) or \(d_2\) of either or both of the top and bottom regions 46 or 48 146 or 148.

[0037] Although specific embodiments are described above and depicted in the accompanying figures, the invention is not limited to those embodiments.

1. A container for food products comprising:
an at least translucent polymer body having a generally circular neck, a bottom opposite the neck and a sidewall extending between the neck and the bottom, the sidewall having a plurality of facets extending between the neck and the bottom and surrounding a circumference of the container, the number of facets being greater than four, being generally equal, being inwardly curved toward a longitudinal axis of the body with the maximum inward extent being at a center portion of the axial length of the body, and being generally linear in a direction measured perpendicular to the longitudinal axis;
a lid having a top wall with an outer skirt depending from a bottom side of the top wall, the outer skirt having a plurality of facets corresponding in number to the facets of the body; and
a stop between the lid and the neck of the body to limit rotation of the lid relative to the neck of the body so that the facets of the outer skirt of the lid and the facets of the body are generally aligned when the stop is engaged.

2. The container of claim 1, wherein the neck has an external thread and the inner skirt has an internal thread configured...
to threadingly mate with the external thread of the neck, the threads being configured such that the stop is formed between an upper peripheral rim of the neck and the bottom side of the top wall of the lid.

3. The container of claim 1, wherein the neck has an external thread and the inner skirt has an internal thread configured to threadingly mate with the external thread of the neck, at least one lug provided on each of the external surface of the neck of the body and the internal surface of the inner skirt of the lid, the lugs being positioned to provide the stop when abutting.

4. The container of claim 1, wherein the material of the body is formed from a polyethylene terephthalate resin with an oxygen scavenger additive and has an average wall thickness of between about 0.015 inches and 0.040 inches and has between about 10% and 35% crystallinity.

5. The container of claim 1, wherein the sidewall slopes inwardly at an acute angle from the maximum extent of the facets to the neck.

6. The container of claim 5, wherein the slope is at an angle of between about 17 and 20 degrees relative to a line perpendicularly intersecting the longitudinal axis.

7. The container of claim 1, wherein the maximum inward extent of the facets is between about 85% and 95% of the maximum overall extent of the facets and wherein the diameter of the neck is between about 70% and 80% of the maximum overall extent of the facets measured perpendicularly to the longitudinal axis.

8. The container of claim 1, wherein there are between six and ten facets of the sidewall of the body of the container.

9. The container of claim 1, wherein the container is filled with a food product and a flexible membrane is sealed to a peripheral rim of the neck and positioned between the neck and the lid to seal the container with food products therein.

10. The container of claim 1, wherein the top wall of the lid has an opening accessing that is selectively coverable by a cover connected to the top wall via a hinge.

11. The container of claim 1, wherein the body has an average wall thickness of between about 0.012 and 0.045 inches.

12. The container of claim 11, wherein the inner and outer skirts of the lid are joined.

13. A container for food products comprising:
   a body having a generally circular neck, a bottom opposite the neck and a sidewall extending between the neck and the bottom, the sidewall having a plurality of facets extending between the neck and the bottom and surrounding a circumference of the container, the number of facets being greater than four, being generally equal, being inwardly curved toward a longitudinal axis of the body with the maximum inward extent being at a center portion of the axial length of the body, and being generally linear in a direction measured perpendicularly to the longitudinal axis, the material of the body being formed from a polyethylene terephthalate resin with an oxygen scavenger additive and with an average wall thickness of between about 0.015 inches and 0.025 inches and between about 10% and 35% crystallinity; and
   a lid having a top wall with an external skirt depending about its periphery and a generally circular internal skirt depending from a bottom side of the top wall, the external skirt having a plurality of facets corresponding in number to the facets of the body.

14. The container of claim 13, further comprising a stop between the lid and the neck of the body to limit rotation of the lid relative to the neck of the body so that the facets of the outer skirt of the lid and the facets of the body are generally aligned when the stop is engaged.

15. The container of claim 13, wherein a sidewall between the maximum extent of the facets and the neck slopes inwardly at an acute angle from the maximum extent of the facets to the neck at an angle of between about 17 and 20 degrees relative to a line perpendicularly intersecting the longitudinal axis.

16. The container of claim 13, wherein the maximum inward extent of the facets is between about 85% and 95% of the maximum overall extent of the facets and wherein the diameter of the neck is between about 70% and 80% of the maximum overall extent of the facets measured perpendicularly to the longitudinal axis.

17. The container of claim 13, wherein there are six and ten facets of the sidewall of the body of the container.

18. The container of claim 13, wherein the container is filled with a food product and a flexible membrane is sealed to a peripheral rim of the neck and positioned between the neck and the lid to seal the container with food products therein.

19. The container of claim 1, further comprising means for selectively covering an opening access in the top wall of the lid.

20. A container containing food products comprising:
   a body having a generally circular neck, a bottom, and a sidewall extending between the neck and the bottom, the sidewall having a plurality of facets extending between the neck and the bottom and surrounding a circumference of the container, the number of facets being greater than four, being generally equal, being inwardly curved toward a longitudinal axis of the body with the maximum inward extent being at a center portion of the axial length of the body, and the material of the body being formed from a polyethylene terephthalate resin with an oxygen scavenger additive and with an average wall thickness of between about 0.015 inches and 0.045 inches and between about 10% and 35% crystallinity, wherein the maximum inward extent of the facets is between about 85% and 95% of the maximum overall extent of the facets;
   a lid having a top wall with an external skirt depending about its periphery and a generally circular internal skirt depending from a bottom side of the top wall, the external skirt having a plurality of facets corresponding in number to the facets of the body, the lid not extending beyond an outer perimeter of the body when seated thereon;
   a stop between the lid and the neck of the body to limit rotation of the lid relative to the neck of the body so that the facets of the outer skirt of the lid and the facets of the body are generally aligned when the stop is engaged; and
   a flexible membrane being sealed to a peripheral rim of the neck and positioned between the neck and the lid to seal the container with food products therein.

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