CONTAINER WITH BUTTERFLY LID CLOSURE

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ABSTRACT

A container with a butterfly lid closure has a base portion and two overlapping hinged lid portions for providing a secure vented closure. The container has a base with a top peripheral edge at an open top end. Two hinged butterfly lid portions are secured to the upper peripheral edge at sides of the base. The lid portions are secured to the base in a closed position by locking recesses on the lid portions that engage locking formations on the upper peripheral edge. A groove on one lid portion engages a groove on another lid portion to form a seal where the lid portions overlap. Venting channels formed on the locking formations allow air to pass in and out of the container, but prevent liquids from entering the container. Arched ridges on the container's sidewalls increase the container's rigidity and resistance to top loading.
Fig. 3
CONTAINER WITH BUTTERFLY LID CLOSURE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority under 35 U.S.C. §119(e) to U.S. provisional Application No. 61/877,376, filed on Sep. 13, 2013, the entire content of which is incorporated herein by reference thereto.

Background

[0002] The invention relates generally to containers, such as those in the configuration of packages and tubs, which may or may not have a lid. More specifically, the present invention relates to such containers that are used to store articles, such as food.

[0003] It is well known in the art that containers are commonly used to store food, but it should be understood that the invention relates to any type of container for any type of purpose.

[0004] For storing foods such as salad, it is desirable to use a container that has an air vent, while it is also desirable to prevent fluid from entering the container. Storing salad and other produce in vented containers allows air to circulate through the container, allowing the food to stay fresher for a longer period of time. However, vents often create openings for liquids to enter the container. For example, vents are commonly formed as simple holes in the container walls, which allow both air and water to pass through the container wall. While the venting of air can benefit the produce within the container, there is a risk that a liquid will enter the container and contaminate or damage the produce, negating any benefit offered by the air vent. Thus, there is a need to provide a container with a vent that allows air to circulate through a container but prevents liquids from entering the container.

[0005] Additionally, for many types of containers, there is a desire to make the structure, including the walls, as rigid as possible. However, there needs to be some additional elements or materials to achieve this, which adds cost. For example, it is common to include carbon fiber or metal reinforcement members, which not only adds complexity to the manufacturing process but also adds significant cost. Also, it is possible to simply make the walls of the container thicker, which, similarly, adds costs in view of the use of additional material usage. Thus, there is a balancing between cost and nature of material used and the rigidity of the container. This is particularly true with containers that are made of plastic material using a forming process, such as thermoforming or injection molding.

[0006] In view of the above, the prior art attempts are not adequate, as they do not provide a container having a vented closure that allows air to circulate through the container while preventing liquids from entering the container.

[0007] There is a need for a container that allows air to enter the container but does not allow liquid to easily enter the container.

[0008] There is a need for a container that is the same as or less expensive than prior art containers yet are more rigid with an increased resistance to top load which allows for an increase in stack weight on the top of the container or tub.

[0009] There is a need for a container that uses less material with thinner walls yet provides superior rigidity for increased top load capability, i.e. ability to support larger weight with more items stacked thereon.

[0010] There is also a desire to provide a container that includes a closure that secures the container closed a certain times, such as during shipping. However, there is also a need for a container to be easily opened when access to the contents is desired.

[0011] There is even a further need for a container that is attractive in appearance.

SUMMARY OF SELECTED FEATURES

[0012] The container described herein preserves the advantages of prior art containers and tubs. In addition, it provides new advantages not found in currently available containers and tubs and overcomes many disadvantages of such currently available containers and tubs.

[0013] The container described herein is a novel and unique container (i.e. a tub) that has one or more venting channels that allows air to enter and exit the container, yet still prevents liquid from entering the container.

[0014] More specifically, the container provides a butterfly lid including two hingedly connected doors for a container having a base having a bottom, side walls, corners and a top peripheral edge defining an open top end. The side walls of the container are reinforced by ridges in the form of arches. A butterfly lid forms a closure on the top end of the base. The butterfly lid has two lid portions that are each secured to the upper peripheral edge of the base by a hinge that can be provided by perforation, or the like.

[0015] A user can move the lid portions to a closed position in which they overlap. The lids can overlap in any order. In an embodiment, the lid portion having a non-directional tab can be moved to the closed position first, and the lid portion having a directional tab (has directions thereon) can be moved to the closed position second. In the closed position, the lid portions form a seal on the base, and locking recesses on the lid portions are frictionally secured to locking formations on the upper peripheral edge of the base. The lid portions overlap at the center of the top end of the container, and a groove on one lid portion is received in a groove on the other lid portion to form a seal that prevents liquid from entering the container. A pull tab on each lid portion allows a user to hingedly pivot the lids to thereby open the container.

[0016] While the lid portions and base form a seal, venting channels are, respectively defined between the lid portions and the base to allow air to enter and exit the container.

[0017] Ridges are formed in at least one of the side walls. The ridges are in the configuration of at least one arch having an apex where the apex of the at least one arch is proximal to the open top end of the base. The arches provide reinforcement to the base of the container to increase top load resistance.

[0018] Many different configurations of the present container are possible. It is possible to have a single lock recess on each side of each lid portion, or there may be multiple lock recesses on each side of each lid portion. It is also possible to have a single venting channel on the container, or there may be multiple venting channels on the container. Preferably, there is one venting channel for each lid.

[0019] Described herein is a container that has a butterfly lid and a venting channel that prevents liquid from entering the container.
In addition, the container can have thinner walls than prior art containers yet still provides top load resistance.

Moreover, the container can include an engineered geometry so that superior top load capability can be achieved with thinner material walls.

The container can also securely contain its contents therein yet is easy to open.

In addition, the container is an attractive container that is functional superior to prior art containers.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features which are characteristic of the container described herein are set forth in the appended claims. However, the container’s preferred embodiments, together with further objects and attendant advantages, will be best understood by reference to the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of the container, with the butterfly lid in the closed position;

FIG. 2 is a top view thereof;

FIG. 3 is a bottom view thereof;

FIG. 4 is a front view thereof;

FIG. 5 is a right view thereof;

FIG. 6 is a left view thereof;

FIG. 7 shows a left view of the container with the butterfly lid in an open position;

FIG. 8 shows a perspective view of the container being opened;

FIG. 9a shows the left portion of the butterfly lid over-lapping the left portion;

FIG. 9b shows the right portion of the butterfly lid over-lapping the right portion;

FIG. 10 shows a front elevation view of FIG. 9b;

FIG. 11a shows the venting channel with the butterfly lid in a closed position;

FIG. 11b shows another view thereof;

FIG. 11c shows the venting channel with the butterfly lid in the open position;

FIG. 11d shows another view thereof;

FIG. 12a shows the container in the open position;

FIG. 12b shows another view thereof;

FIG. 13 shows a top view thereof, with possible dimensions;

FIG. 14 shows a front view thereof, with possible dimensions;

FIG. 15 is a top view of another embodiment of a container in an open position as described herein;

FIG. 16 is a top view of the container of FIG. 15 in a closed position;

FIG. 17 is a cross-sectional view of the container along line H-H of FIG. 16;

FIG. 18 is a front view of the container of FIG. 15;

FIG. 19 is an enlarged view of a hinge shown in FIG. 18;

FIG. 20 is a side view of the container of FIG. 15; and

FIG. 21 is a perspective view of the container of FIG. 15.

DETAILED DESCRIPTION

Referring to FIG. 1, a container 10 of the present invention is shown to include a base 12 and a butterfly lid 14. The butterfly lid 14 includes a first lid portion 16 and a second lid portion 18. The butterfly lid 14 provides a vented closure for the container 10, as explained herein.

The container 10 is provided with the items to be stored residing therein, such as food or the like (not shown). Preferably, the lid portions 16, 18 rotate towards the base 12 and engage the peripheral top edge 20 of the base 12 with a peripheral lid edge 58 (shown in FIG. 15) on each lid portion 16, 18 to provide a seal. As shown in FIGS. 15 and 16, in an embodiment, a weld strip 52 can be positioned along at least a portion of a length of the peripheral top edge 20 of the base 12 to strengthen the container 10. Preferably, the weld strip 52 is along an edge of the base 12 that does not include a hinge with one of the lid portions 16, 18. The weld strip 52 can be about 0.20 inch to about 0.50 inch in width, preferably about 0.25 inch.

The first lid portion 16 and the second lid portion 18 of the butterfly lid 14 are integrally formed with the base 12, and are each connected to the base 12 by a hinge 24 at the peripheral top edge of the base. As shown in FIG. 1, the hinge 24 can be a perforated hinge. It should be under that perforation is one of many different ways to hingedly connect the lid portions 16, 18 to the base. In another embodiment, as shown in FIGS. 18 and 19, the hinge 24 can aid in abating buckling of the sidewalls 26. The first lid portion 16 and the second lid portion 18 may be moved from an open position to a closed position. In the closed position, as shown in FIG. 2, the first lid portion 16 and the second lid portion 18 together span the open top end of the base 12.

The butterfly type of lid improves the filling process because the lid portions 16, 18 can serve as a funnel for the container 10. When the lid portions 16, 18 are angled 45°-60° from the horizontal, a product such as a salad can be dispensed from above and guided into the container 10 by the lid portions 16, 18. Filling prior art containers can be a messy process, unless additional funnelling equipment is used to contain the salad being placed in the container.

To improve the structural rigidity of the container 10, the side walls 26 of the base 12 have ridges that are in the form of an arch 28 having an apex that is near the top end of the base 12. In the bottom view of FIG. 3, the arched ridges extend upwardly from a bottom of the base 12 along the angled side walls 26 of the container 10.

The container 10 can include a number of arches 28, shown in FIGS. 1, 4, 5, 6, 7, 17, 20 and 21, that are integrated into a wall geometry of the base 12 where the apex of the arches 28 receives the downward forces from the weight of any object stacked on the top thereof. The arches 28 can be formed by creating ridges in the wall using thermoforming techniques, such as providing the appropriate tooling to create such ridges, where desired. The container 10 incorporates the structural advantages of arches, such as in bridges, into a container for improving the structural integrity thereof.

FIGS. 4-17 provide additional views of the container 10 showing the arched ridges 28 on the side walls 26. In the example shown in the figures, the container 10 is generally rectangular in shape so one side is longer than the other. To illustrate this, FIGS. 3 and 4 show front and rear views of the shorter sides (front and back of the container) while FIGS. 5 and 6 show views of the long sides (sides of the container).

This rectangular configuration is just one example of how the container 10 can be used. For example, the container 10 can be formed into a square, round, oval or other shapes depending on the need and application at hand. Moreover, the geom-
tery of the fingers 42 and arches 28 can be altered and the number on each of the side walls changed to form a container 10 having appropriate strength and appearance.

[0058] To facilitate opening of the butterfly lid 14 of the container 10, the first and second lid portions 16, 18 each have a pull tab 30 that has a surface that a user can grip. When gripping the pull tab 30, the user rotates the respective lid portion 16, 18 away from the base 12. FIG. 8 shows a user opening the exemplary embodiment of the container 10 of the present invention by gripping the pull tab.

[0059] FIGS. 9a and 9b show more clearly the pull tabs 30 on the lid portions 16, 18, with the lid portions 16, 18 in a partially open position. FIG. 9a shows the first lid portion overlapping the second lid portion, while FIG. 9b shows the second lid portion 18 overlapping the first lid portion 16. The pull tabs 30 on the lid portions 16, 18 are symmetrical, so it does not matter which lid portion 16, 18 is closed over the other. In another embodiment, the pull tab 30 on the first lid portion 16 can be a directional pull tab, and the pull tab 30 on the second lid portion 18 can be a non-directional pull tab. In this embodiment, the second lid portion 18 can be closed first and the first lid portion 16 can be closed second.

[0060] When the lid portions 16, 18 are in the closed position, they are frictionally secured to the base by a frictional locking structure, forming a seal at the peripheral edge of the base 12. FIG. 10 provides another view of the lid portions 16, 18 in a partially open position, to show more clearly the frictional locking structure. Locking recesses 32 formed at the sides of the lid portions 16, 18 frictionally receive locking formations 34 formed near the peripheral edge of the base. As shown in FIG. 1, the locking formations can be positioned at the peripheral edge 20 of the base 12. Alternatively, the locking formations 34 can be positioned inward of the peripheral edge 20 of the base to further abate tampering as shown in FIGS. 15 and 16, and the weld strip 52 can be positioned at the peripheral edge 20. In use, once the first lid portion 16 and the second lid portion 18 are closed, the first and second lid portions 16, 18 can be sonic welded at the weld strip. In addition, perforation can be added to the area of the first and second lid portions 16, 18 to be sonic welded so as to allow for the lid portions 16, 18 to disengage from the base 12 at a predetermined pull force.

[0061] In the exemplary embodiment, there are four locking formations 34 on the peripheral edge 20 of the base 12, one for each end of each lid portion 16, 18. More or fewer locking formations 34 and locking recesses 32 can be used without departing from the scope of the present invention.

[0062] The locking formations 34 substantially prevent tampering with the contents of the container 10.

[0063] In an embodiment, the container 10 can be wrapped by a pre-perforated label (not shown). A user intending to tamper with the products within the container 10 would need to tear the pre-perforated label in order to disengage the locking recesses 32 from the locking formations 34 and to disengage the first and second lid portions 16, 18 from the base 12 at the weld strip 52.

[0064] While the locking formations 34 provide a seal at the ends of the container 10, the lid portions 16, 18 form a seal at the center of the top of the container. FIG. 10 shows a groove 36 that is formed along the long side of each lid portion 16, 18. In the area of the groove, each lid portion has a convex lower surface and a concave upper surface. Thus, when the lid portions overlap, the convex face of the groove on one lid portion is received in faceting relation with the concave face of the groove of the other lid portion. This engagement of the grooves forms a closure on the upper surface of the container, along the long side of each lid portion. It also prevents liquid from flowing into the container where the butterfly lid portions meet. In an embodiment, as shown in FIGS. 16 and 17, when the lid portions 16, 18 are in the closed position, a U-shaped center bar (or groove) 60 can be formed to increase rigidity of the container 10. The center bar 60 can be made deeper for increased rigidity.

[0065] Additionally, the groove 36 helps keep the lid portions centered on the base, and provide additional structural stability on the upper surface of the container.

[0066] Furthermore, the grooves 36 are useful when a user is ready to open the container. The container 10 of the present invention may be secured in the closed position by a product label (not shown) that extends across the lid 14. The product label can have a perforated line that is adjacent or aligned with the groove. Thus, the user can press the perforated line on the label downwardly into the groove. The label will tear along the perforated line, and the user can cleanly remove the label from the container.

[0067] While the lid portions 16, 18 otherwise form a seal on the container 10 when the container 10 is in the closed position, a venting channel 38 ensures that air can pass in and out of the container 10. FIGS. 11a-11d show a venting channel 38 defined on an upper surface of a locking formation 34. The venting channel 38 is formed between the base 12 and at least one of the lid portions 16, 18 when the lid 14 is closed. In the exemplary embodiment, a depression 40 extends from the interior wall of the base 12 to the peripheral edge of the base, as shown in FIGS. 11c and 11d. The gap between this depression 40 and the lid portion 16, 18 form the venting channel 38 when the lid portion 16, 18 is closed, as shown in FIGS. 11a and 11b.

[0068] When the lid portions 16, 18 are closed, a liquid cannot easily enter the container 10 through the venting channel 38 without sufficient pressure applied to the fluid, because the venting channels 38 extend inwardly and upwardly over the locking formations 34. In contrast, prior art containers with simple venting holes allow both air and liquid to easily enter a container without any additional pressure required. FIGS. 11a-11d show the venting channel 38 of the exemplary embodiment extending upwardly over the locking formation 34, rather than horizontally or downwardly as it enters the container 10. With the container 10 shown of a transparent material, the venting channels 38 can be seen when the lids 16, 18 are in a closed position.

[0069] Adjacent to the locking formations 34 are elongated fingers 42 extending down the short side walls 26 of the container at a front and rear of the container 10. These fingers 42 form a convex surface on the outer walls of the container 10 and a concave surface on inner walls of the container.

[0070] These fingers 42 serve two functions. First, they form arches that provide structural stability and increase the rigidity of the container 10. Because they extend partially into the locking formations 34, they increase the rigidity of both the walls 26 and the locking formations 34 in the same way the arches 28 increase the rigidity of the base 12. Second, they have a concave inner surface that allows the venting channel 38 to extend through the locking formations 34 and into the container 10, as shown in FIGS. 11a-11d. As shown in FIG. 17, in an embodiment, the container can also include a single central U-shaped structure 45 that is concave from an exterior 51 of a front wall 50 of the container 10. The inclusion of a
single, central U-shaped structure 45 can increase top load resistance to form a stronger container. The U-shaped structure 45 can be wider at a top of the base 12 than at a bottom of the base 12. In other embodiments, the container 10 can include one or more U-shaped structures 45 and/or one or more arches 28.

[0071] The container 10 of the exemplary embodiment is configured to facilitate stacking of multiple containers. The locking recesses 32 form convex ridges on the upper surfaces of the lid portions 16, 18, which facilitate stacking. Additional stacking ridges can be formed on the long sides of the upper surface of the lid portions 16, 18 adjacent to the perforated hinges 24.

[0072] The container 10 is particularly well suited for being thermoformed out of plastic, which may be transparent, translucent or opaque. Thermoforming, using the appropriate tooling, is so well known in the art that it need not be discussed in detail herein. Suffice it to say that the tooling would be appropriately manufactured to provide the desired wall profiling to achieve the ridged arch formations, venting, locks and the like. Containers 10 made out of other materials by other methods can also be achieved.

[0073] The container 10 may be molded in an open position, shown in FIGS. 12a, 12b, 15 and 18. In one embodiment, the container may be dimensioned as shown in FIGS. 13 and 14. For example, the base can be about 6.640 inches and the container can be about 8.813 inches long. In addition, the container can be about 3.000 inches when the container is in the open position and about 3.280 inches when the container is in the closed position. In another embodiment, the container can be about 9.68 inches long, about 6.5 inches wide and about 3.22 inches high in the open position, and the container can include a weld strip that is about 6.29 inches long.

[0074] When the word "about" is used in this specification in connection with a numerical value, it is intended that the associated numerical value include a tolerance of ±10% around the stated numerical value. Moreover, when reference is made to percentages in this specification, it is intended that those percentages are based on weight, i.e., weight percentages.

[0075] Moreover, when the words "generally" and "substantially" are used in connection with geometric shapes, it is intended that precision of the geometric shape is not required but that latitude for the shape is within the scope of the disclosure. When used with geometric terms, the words "generally" and "substantially" are intended to encompass not only features which meet the strict definitions but also features which fairly approximate the strict definitions.

[0076] It would be appreciated by those skilled in the art that various changes and modifications can be made to the illustrated embodiments without departing from the spirit of the present invention. All such modifications and changes are intended to be covered by the present invention and any appended claims.

What is claimed is:

1. A container with a butterfly lid closure, comprising:
   a base having a bottom, side walls, and a top peripheral edge defining an open top end;

   a plurality of ridges formed in at least one of the side walls;
   a butterfly lid having a first lid portion and a second lid portion for releasably closing the open top end of the base; the first lid portion and second lid portions being integrally formed with the base; the first lid portion being connected to the top peripheral edge by a first hinge;

   the second lid portion being connected to the top peripheral edge by a second hinge; the first and second lid portions being movable from an open position to a closed position; the first and second lid portions being configured such that they overlap when in the closed position;

   a first groove formed at an edge of the first lid portion, and a second groove formed at an edge of the second lid portion; the first groove and the second groove each having a convex lower face and a concave upper face;

   at least one locking recess formed on the first lid portion; at least one locking recess formed on the second lid portion;

   a plurality of locking formations formed near the peripheral edge of the base for engaging the locking recesses of the first lid portion and second lid portion when the first and second lid portions are in the closed position; and a venting channel defined on an upper surface of each locking formation when the first and second lid portions are in the closed position so that air can pass in and out of the container;

   the first and second lid portions each having a pull tab extending therefrom for opening the container;

   whereby a user may close the container by overlapping the first and second lid portions so that the convex lower face of the first groove engages the concave upper face of the second groove or the convex lower face of the second groove engages the concave upper face;

   whereby the arches provide reinforcement to the base of the container to increase top load resistance.

2. The container of claim 1, wherein the container is formed of plastic.

3. The container of claim 1, wherein the container is transparent.

4. The container of claim 1, wherein the container is translucent.

5. The container of claim 1, wherein the container is opaque.

6. The container of claim 1, wherein each of the plurality of ridges includes at least one arch having an apex, the apex of the at least one arch being proximal to the open top end of the base.

7. The container of claim 1, wherein the container is square, round, oval or rectangular in shape.

8. The container of claim 1, wherein the pull tabs on the first and second lid portions are symmetrical.

9. The container of claim 1, wherein the first hinge and the second hinge are perforated hinges.

10. The container of claim 1, further including a weld strip along a top peripheral edge of the base.

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