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(54) **LIQUID CONTAINER**

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(57) **ABSTRACT**

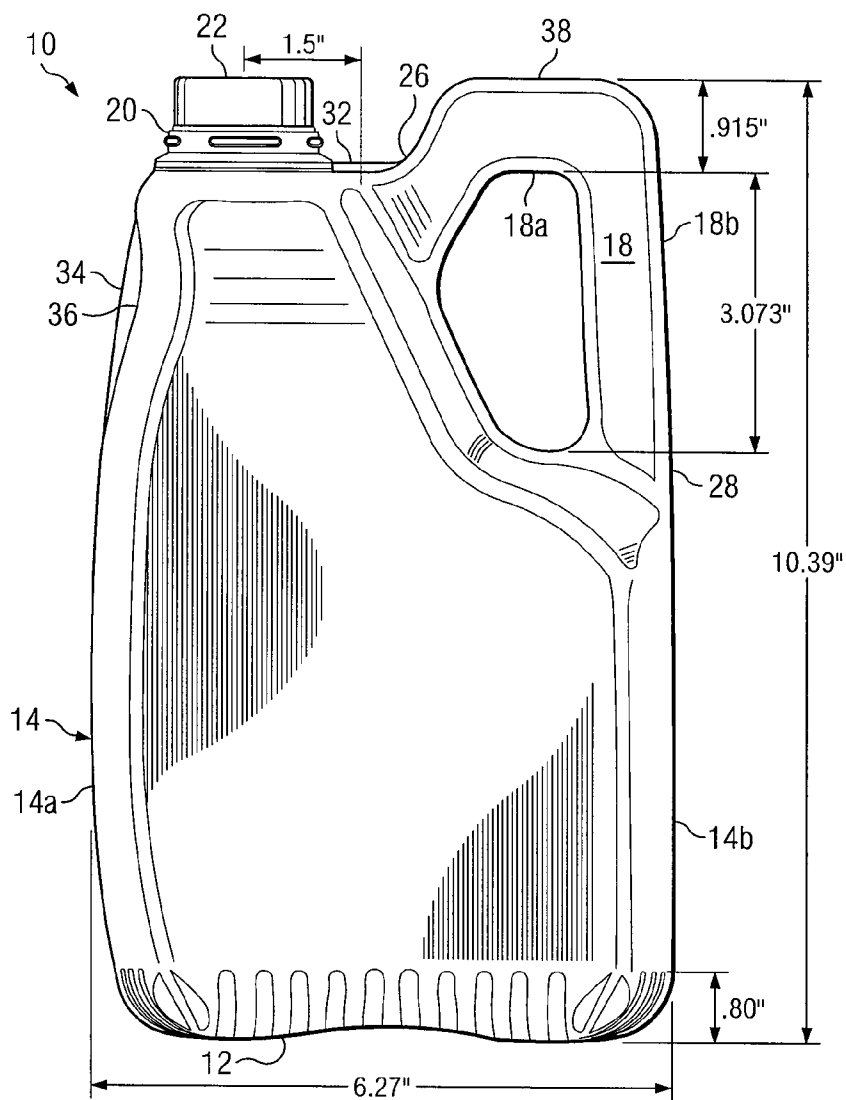
According to one embodiment of the disclosure, a container includes a base portion, a spout, an annular sidewall portion, an upwardly converging portion, and a handle portion that are integrally formed together. The spout has an associated closure cap that has a first height from the base portion when disposed on the spout. The handle portion has an upper support surface that has a second height from the base portion that is approximately equal to the first height. The handle portion has a generally vertically extending member and a generally horizontally extending member. The generally vertically extending member extends from the annular sidewall to the generally horizontally extending member.

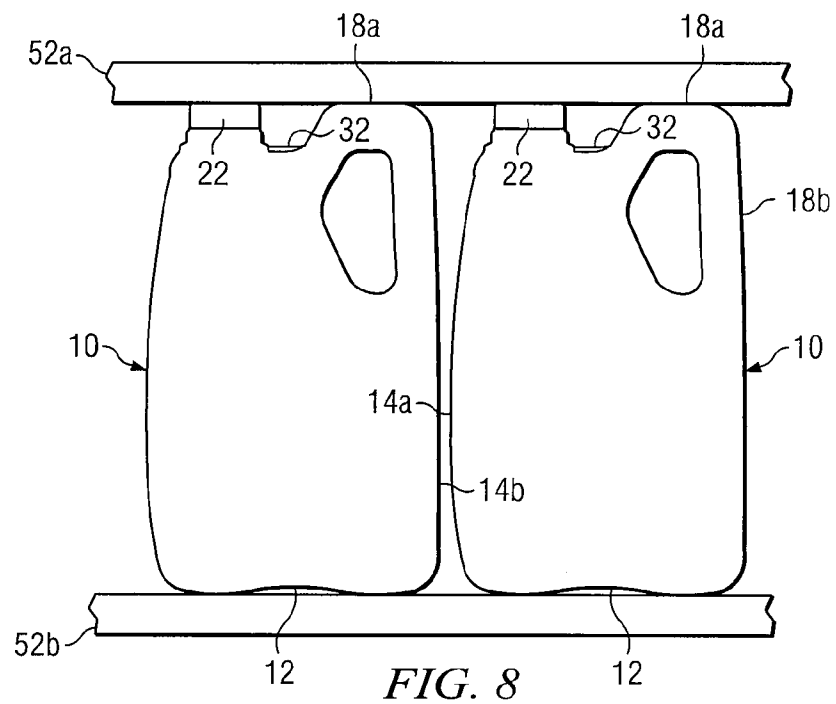
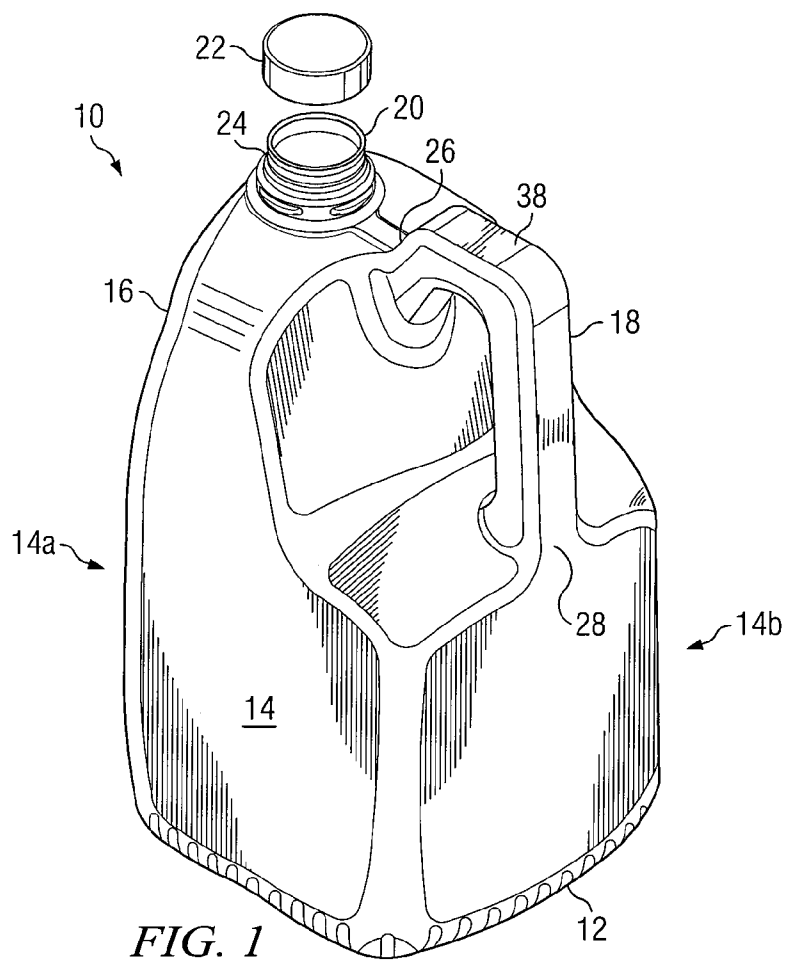
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Related U.S. Application Data

(60) Provisional application No. 60/786,055, filed on Mar. 23, 2006, provisional application No. 60/892,461, filed on Mar. 1, 2007.





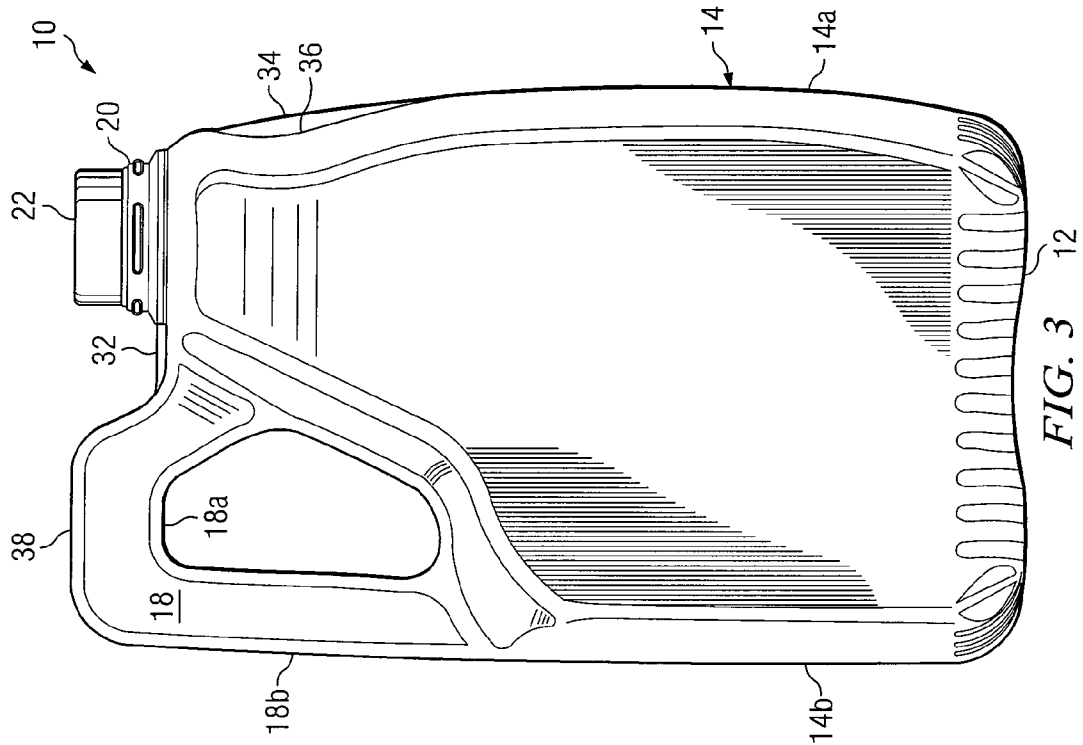


FIG. 3

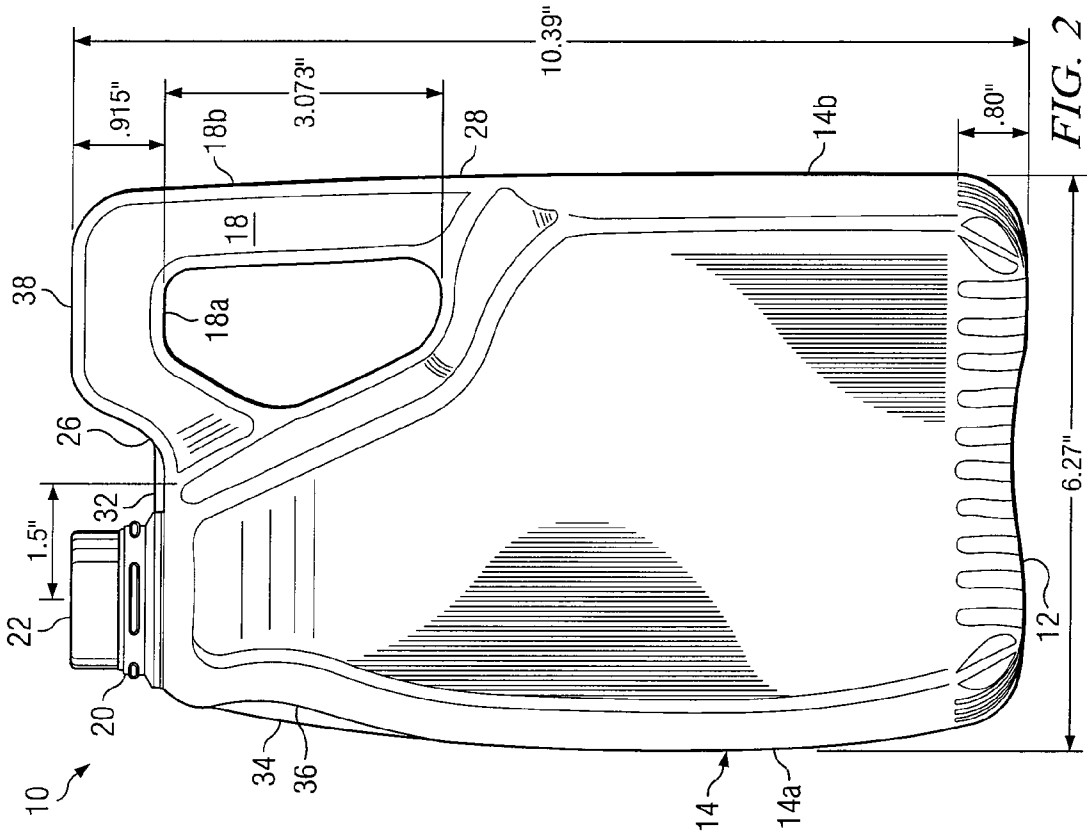
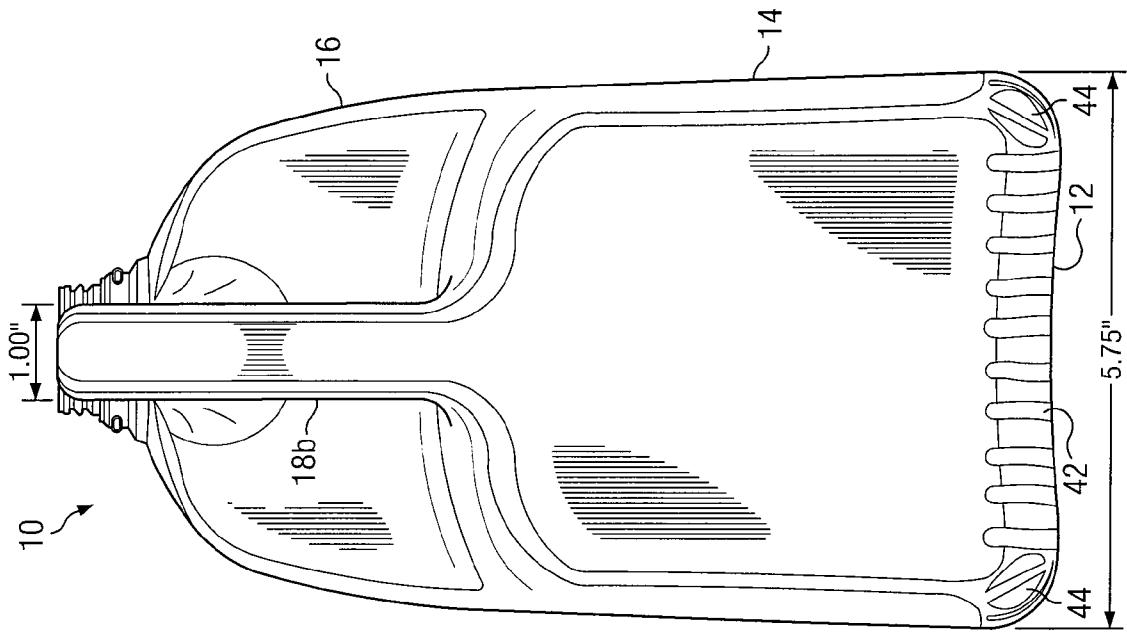
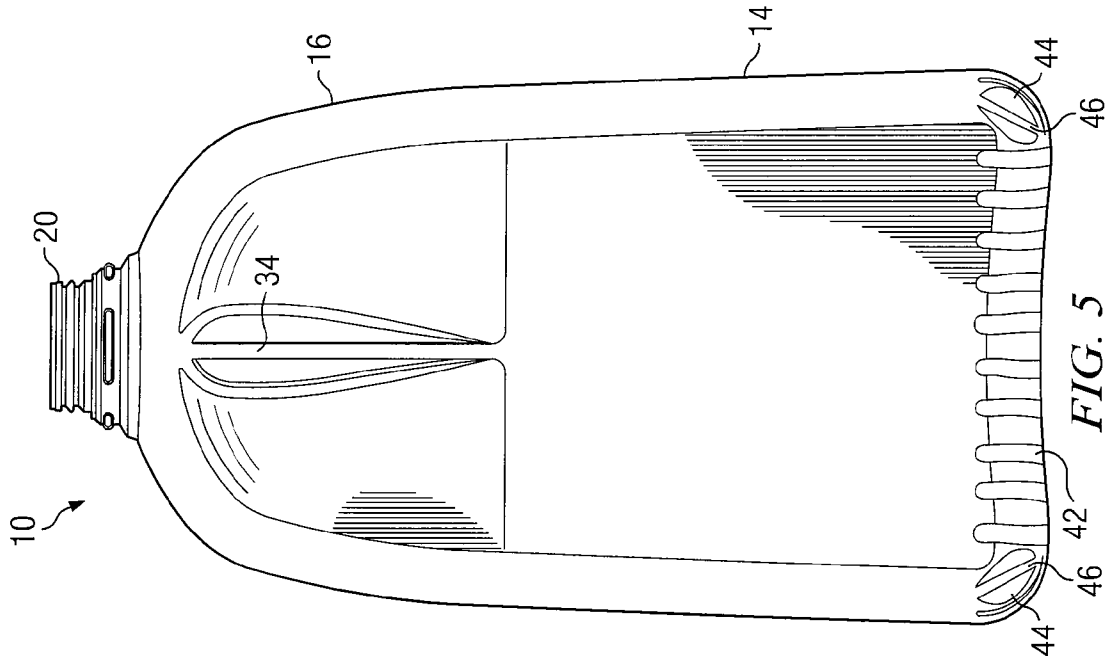


FIG. 2



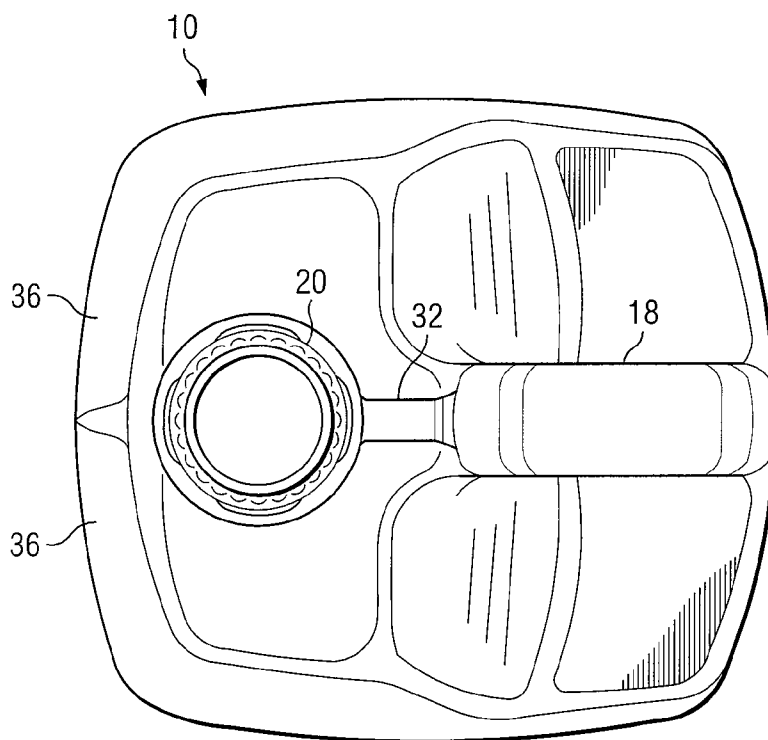


FIG. 6

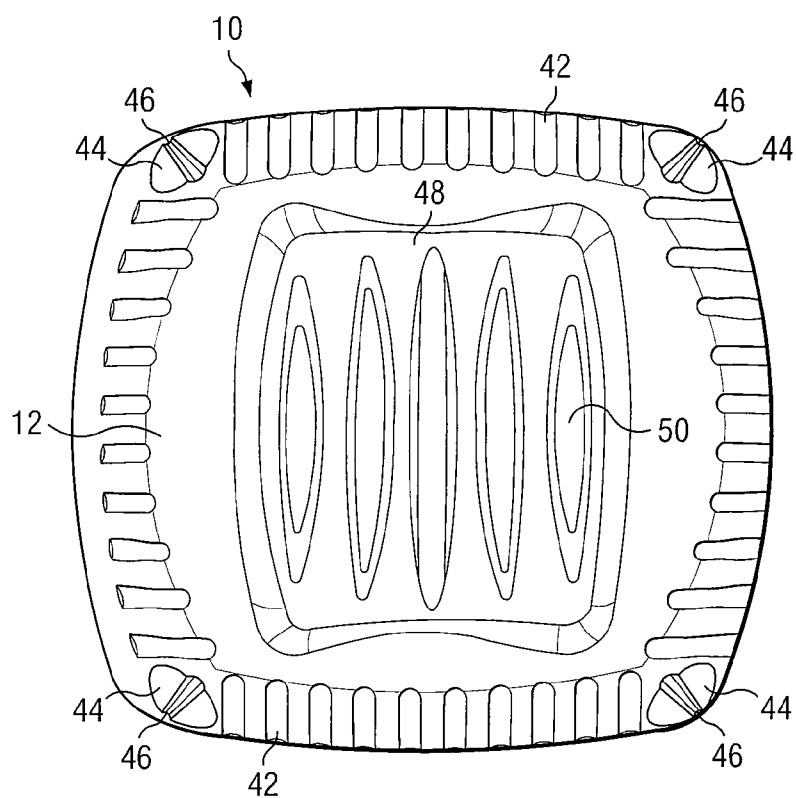


FIG. 7

LIQUID CONTAINER

RELATED APPLICATIONS

[0001] This application claims the benefit of priority under 35 U.S.C. §119(e) of U.S. Provisional Application Ser. No. 60/786,055, filed Mar. 23, 2006, and entitled "LIQUID CONTAINER," and U.S. Provisional Application Ser. No. 60/892,461, filed Mar. 1, 2007, and entitled "LIQUID CONTAINER."

TECHNICAL FIELD OF THE DISCLOSURE

[0002] This disclosure relates in general to containers and, more particularly, to a liquid container providing enhanced structural integrity.

BACKGROUND OF THE DISCLOSURE

[0003] Various types of containers have been developed for the distribution of liquids to consumers. Liquids stored in these containers may include consumable liquids, such as milk, juice, or water, or may include other types of non-consumable liquids, such as detergents, automotive products, or the like. These containers may be integrally formed from various formulations of thermoplastic resins in order to form a generally thin-walled container having a storage capacity that may include one-gallon, half-gallon, one-quart, and other sizes. For distribution of these containers from the manufacturer to consumer, multiple containers may be stacked together in a crate or other type of mass packaging mechanism.

SUMMARY OF THE DISCLOSURE

[0004] According to one embodiment of the disclosure, a container includes a base portion, a spout, an annular sidewall portion, an upwardly converging portion, and a handle portion that are integrally formed together. The spout has an associated closure cap that has a first height from the base portion when disposed on the spout. The handle portion has an upper support surface that has a second height from the base portion that is approximately equal to the first height. The handle portion has a generally vertically extending member and a generally horizontally extending member. The generally vertically extending member extends from the annular sidewall to the generally horizontally extending member.

[0005] Embodiments of the disclosure may provide numerous technical advantages. Some, none, or all embodiments may benefit from the below described advantages. According to one embodiment, the liquid container may have a handle portion that operates in conjunction with the spout to provide structural support for other items placed upon the liquid container. The spout and handle portion are formed on the container such that downward directed forces may be distributed through the container in a generally even manner.

[0006] Other technical advantages will be apparent to one of skill in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] A more complete understanding of embodiments of the disclosure will be apparent from the detailed description taken in conjunction with the accompanying drawings in which:

[0008] FIG. 1 is a perspective view of one embodiment of a liquid container according to the teachings of the present disclosure;

[0009] FIG. 2 is a right side elevational view of the embodiment of FIG. 1;

[0010] FIG. 3 is a left side elevational view of the embodiment of FIG. 1;

[0011] FIG. 4 is a rear elevational view of the embodiment of FIG. 1;

[0012] FIG. 5 is a front elevational view of the embodiment of FIG. 1;

[0013] FIG. 6 is a top view of the embodiment of FIG. 1;

[0014] FIG. 7 is a bottom view of the embodiment of FIG. 1; and

[0015] FIG. 8 is a side elevational view of several liquid containers of the embodiment of FIG. 1 shown between two slip sheets.

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS OF THE DISCLOSURE

[0016] Known implementations of liquid containers are typically stacked together in order to enable distribution from manufacturer to consumer in a relatively efficient manner. The structural design of these containers however, do not provide sufficient structural integrity for stacking one upon another. FIGS. 1 through 7 show one embodiment of a liquid container 10 that may provide a solution to this problem as well as other problems associated with known liquid containers.

[0017] Liquid container 10 generally includes a base portion 12, an annular sidewall portion 14, a neck portion 16, a generally hollow handle portion 18, a spout 20, and a closure cap 22. The annular sidewall portion 14 is integrally formed with and extends upwardly from the base portion 12. Neck portion 16 has a generally upwardly converging shape and is integrally formed with the annular sidewall portion 14 and spout 20. The handle portion 18 is integrally formed on the neck portion 16 proximate the rear side 14b of the annular sidewall 14. The base portion 12, annular sidewall portion 14, neck portion 16, and handle portion 18 together form a cavity for the storage of various types of liquids inside. As will be described in detail below, the handle portion 18 has an upper support surface 38 that may provide structural support for multiple liquid containers 10, one upon another.

[0018] Closure cap 22 may be removably secured on the spout 20 for enclosing the contents of liquid container 10. The liquid container 10 may incorporate any suitable type of industry standard closure cap 22. Caps of this nature may be available from Portola, located in Batavia, Illinois. The container 10 as shown has thread-like ridges 24 that are adapted for use with screw-on caps, however, it will be understood that a snap-on removable securing mechanism, or other similarly known removable securing mechanisms may provide a viable alternative.

[0019] The handle portion 18 has an upper end 26 and a lower end 28. The upper end 26 is integrally formed with the neck portion 16 proximate the spout 20 and the lower end 28 is integrally formed with the neck portion proximate the annular sidewall portion 14. In one embodiment, the handle portion 18 has a generally hollow shape that may provide a portion of the cavity used for storage of liquid inside.

[0020] FIGS. 2 and 3 are side elevational views of the embodiment of FIG. 1. During storage, the spout 20 exists

at a higher elevation relative to the base portion 12 and the base portion 12 exists in a generally horizontal orientation when the liquid container 10 is in an upright orientation. Handle portion 18 includes an upper support surface 38 that is disposed a height from base portion 12 that is approximately equal to the height of closure cap 22 from base portion 12. When in the upright orientation, upper support surface 38 is generally at the same elevation as the upper surface of the closure cap 22 when secured on the spout 20. In accordance with a particular embodiment of the present disclosure, the closure cap 22 and upper support surface 38 cooperate to form a support structure for items that are placed on top of the container 10. This feature distributes weight over the periphery of the annular sidewall portion 14, and thus increases the amount of weight which may safely be placed above the container during storage.

[0021] In one embodiment, the handle portion includes a generally horizontally extending member 18a and a generally vertically extending member 18b that are joined together at a relatively perpendicular angle. The upper support surface 38 is formed in the generally horizontally extending member 18a such that the upper support surface 38 may be generally flat in shape and extend to essentially to a corner formed by the generally horizontally extending member 18a and generally vertically extending member 18b.

[0022] The generally vertically extending member 18b extends from the annular sidewall portion 14 to a height above the base portion 12 approximately equal to the height of closure cap 22 when secured on the spout 20. FIG. 4 shows a rear elevational view of the embodiment of FIG. 1. As can be seen, a portion of the generally vertically extending member 18b is generally co-planar with a portion of the annular sidewall portion 14 in order to efficiently transfer downward directed forces from the upper support surface 38 to the annular sidewall portion 14.

[0023] FIG. 5 is a front elevational view of the embodiment of FIG. 1. In one embodiment, at least one vertically oriented rib member 34 may be formed on the neck portion 16 for transferal of downward directed forces from the spout 20 through the neck portion 16. The vertically oriented rib member 34 extends from the spout 20 to the annular sidewall portion 14. The neck portion 16 has a generally frusto-conical shape that converges from the annular sidewall portion 14 to the relatively smaller spout 20. The vertically oriented rib member 34 may be included to reinforce the neck portion 16 for enhanced distribution of downward directed forces on the spout 20. In the illustrated embodiment of FIG. 5, vertically oriented rib member 34 extends between one-third and one-half of the height of the neck portion 16 and annular sidewall portion 14. In alternative embodiments, the vertically oriented rib member 34 may extend the full height of neck portion 16 and annular sidewall portion 14. In another embodiment, an inwardly extending cavity 36 may be formed in the neck portion such that the vertically oriented rib member 34 is disposed in the inwardly extending cavity 36.

[0024] In another embodiment, base portion 12 may have a number of corners 44 that are each chamfered with a portion of the annular sidewall portion 14. In another embodiment, the chamfered portion of the corners 44 may include ribs 46 for enhanced structural rigidity.

[0025] In one embodiment, a gusset 32 may be provided between the spout 20 and the handle portion 18 as best

shown in FIG. 6. Gusset 32 may enhance the structural rigidity of the container 10 by preventing unwanted elongation or contraction between the spout 20 and handle portion 18 when weight is placed upon the container 10.

[0026] FIG. 7 shows a bottom view of the embodiment of FIG. 1. In one embodiment, a plurality of generally L-shaped base to sidewall ribs 42 may be included that extend from the base portion 12 to the annular sidewall portion 14. Among other things, the base to sidewall ribs 42 may reinforce the annular sidewall portion 14 relative to base portion 12 under varying levels of loading conditions placed upon the container 10. In another embodiment, an upwardly extending cavity 48 may be formed in the base portion 12. Downward forces placed upon the upwardly extending cavity 48 by internally contained liquid tends to strain the base portion 12 downwards. This downward straining action causes the base to sidewall ribs 42 to be rotated inwardly, thereby retarding a bulging effect upon the annular sidewall portion 14 due to outward forces of the internally contained liquid. Therefore, the base to sidewall ribs 42, in conjunction with the upwardly extending cavity 48 cooperate together in order to maintain the generally planar shape of the annular sidewall portion 14 and thus increase the overall load bearing capability of the container 10.

[0027] In another embodiment, a number of generally horizontal ribs 50 may be formed in the upwardly extending cavity 48 to enhance the structural rigidity of the base portion 12. The generally horizontal ribs 50 may exist in any configuration that reinforces the point loading strength of the base portion 12. This optional feature may be particularly useful when several containers 10 are stacked one upon another without the use of slip sheets or other such intermediary devices.

[0028] FIG. 8 shows a side elevational view of several liquid containers 10 that are disposed between two slip-sheets 52a and 52b. As described above, the handle portion 18 in conjunction with the spout 20, evenly distributes weight from objects placed on top of the container 10. This feature may be beneficial when multiple containers are to be stacked in layers, one upon another. Many presently used storage practices incorporate a stacking scheme in which a block or number of containers may be stored with relative secure placement on a conventional pallet. This block may be formed from a number of vertically ascending layers, each layer having a number of liquid containers that are stacked side-by-side. In turn, each of the layers may be stacked one upon another such that the layer disposed below supports the weight of one above. In many cases, a high-strength, dairy industry, standard cardboard slip-sheet 52 may be placed in between each layer in order to evenly distribute the weight of the upper layer to the layer below as well as to provide further structural integrity for the block. As shown, two liquid containers 10 are disposed between two slip-sheets 52a, and 52b. Both the closure cap 22 and upper support surface 38 are in contact with upper slip-sheet 52a in order to distribute the weight through the liquid container 10. The present embodiment provides enhanced structural rigidity for such a block structure by causing the weight of the planar-shaped cardboard slip-sheet and containers above to be distributed upon the closure caps 22 as well as the handle portion 18 of the containers 10 below.

[0029] The particular liquid container 10 as disclosed is configured to store approximately one U.S. gallon of liquid.

It will be understood however, that a container having other capacities could be constructed using the teachings of this disclosure. The container **10** as best shown in FIGS. **2** and **4**, has an overall height of approximately 10.39 inches, a width of approximately 5.75 inches, and a depth of approximately 6.27 inches. The center of the spout is offset from the center of the container **10** by approximately 1.0 inches. The handle portion **18** has a thickness of approximately 1.0 by 0.915 inches. A cavity formed between the handle portion **18** and the neck portion **16** has a height of approximately 3.073 inches. The base to sidewall ribs **42** extend upwards from the base portion **12** to a height of approximately 0.80 inches. It should be understood that these dimensions may vary widely, within the teachings of the present disclosure. Moreover, containers having different sizes, configurations, and/or storage capacities other than one U.S. gallon may have dimensions other than those previously described.

[0030] The liquid container **10** may be constructed of a high density polyethylene (HDPE) plastic material, which is generally "food safe", for storage of human consumable liquids. However, the liquid container **10** may be formed from any suitable plastic material appropriate for the type of liquid it is adapted to contain. Nevertheless, the present embodiment may be formed using conventional blow molding techniques, which are well known to those skilled in the art.

[0031] Although an embodiment of the present disclosure has been described using specific terms, such description is for illustrative purposes only. The words used are words of description rather than of limitation. It is to be understood that changes and variations may be made by those of ordinary skill in the art without departing from the spirit or scope of the present disclosure, which is set forth in the following claims. Therefore, the spirit and scope of the appended claims should not be limited to the description of the embodiments disclosed therein.

What is claimed is:

1. A container comprising:

- a base portion that is generally rectangular in shape;
- a spout having an associated closure cap which is adapted for removable placement on the spout, a distance from an upper surface of the closure cap to the base portion defining a first height when selectively placed on the spout, the upper surface of the closure cap being substantially parallel to the base portion;
- an annular sidewall portion integrally formed with and extending upwardly from the base portion;
- an upwardly converging neck portion that is integrally formed with the annular sidewall portion and the spout;
- a handle portion integrally formed with the container proximate the neck portion, the handle portion having an upper support surface, wherein the upper support surface being flat in shape and having a second height above the base portion that is approximately equal to the first height, the handle portion having a generally vertically extending member and a generally horizontally extending member that are joined together at an upper corner such that the upper support surface extends essentially to the upper corner;
- at least one vertically oriented rib member that is integrally formed with the neck portion and extends from the spout generally downwards along the annular side-

wall, the at least one vertically oriented rib member being disposed on the neck portion generally opposite the handle portion;

a plurality of generally L-shaped base to sidewall ribs extending from the base to the annular sidewall; and an upwardly extending cavity formed in the base portion, the upwardly extending cavity having a plurality of generally horizontal ribs.

2. The container of claim **1**, wherein the base portion has a plurality of corners, each of the corners being chamfered with a portion of the annular sidewall.

3. The container of claim **1**, further comprising a gusset integrally formed between the spout and the handle portion.

4. A container comprising:

- a base portion;
- a spout having an associated closure cap for removable placement on the spout, a distance from an upper surface of the closure cap to the base portion defining a first height when disposed on the spout;

- an annular sidewall portion integrally formed with and extending upwardly from the base portion;

- an upwardly converging neck portion that is integrally formed with the annular sidewall portion and the spout; and

- a handle portion integrally formed with the container proximate the neck portion, the handle portion having an upper support surface, the upper support surface being flat in shape and having a second height above the base portion which is approximately equal to the first height, the handle portion having a generally vertically extending member and a generally horizontally extending member, the generally vertically extending member extending from the annular sidewall to the generally horizontally extending member, the upper support surface forming the upper portion of the generally horizontally extending member.

5. The container of claim **4**, further comprising a gusset integrally formed between the spout and the handle portion.

6. The container of claim **4**, wherein the base portion is generally rectangular in shape.

7. The container of claim **4**, further comprising a plurality of generally L-shaped base to sidewall ribs extending from the base to the annular sidewall.

8. The container of claim **4**, further comprising an upwardly extending cavity formed in the base portion.

9. The container of claim **8**, further comprising a plurality of generally horizontal ribs formed in the upwardly extending cavity.

10. The container of claim **4**, wherein the base portion has a plurality of corners, each of the corners being chamfered with a portion of the annular sidewall.

11. A container comprising:

- a base portion;
- a spout having an associated closure cap for removable placement on the spout, a distance from an upper surface of the closure cap to the base portion defining a first height when disposed on the spout;

- an annular sidewall portion integrally formed with and extending upwardly from the base portion;

- an upwardly converging neck portion that is integrally formed with the annular sidewall portion and the spout;

- a handle portion integrally formed with the container proximate the neck portion, the handle portion having an upper support surface, the upper support surface

having a second height above the base portion which is approximately equal to the first height; and at least one vertically oriented rib member that is integrally formed with the neck portion and extends from the spout generally downwards to the annular sidewall, the at least one vertically oriented rib member being disposed on the neck portion generally opposite the handle portion.

12. The container of claim **11**, wherein the upper surface of the closure cap is generally parallel to the base portion.

13. The container of claim **11**, further comprising an inwardly extending cavity formed in the neck portion such that the at least one vertically oriented rib member is disposed in the inwardly extending cavity.

14. The container of claim **11**, further comprising a plurality of generally L-shaped base to sidewall ribs extending from the base to the annular sidewall.

15. The container of claim **11**, further comprising an upwardly extending cavity formed in the base portion.

16. The container of claim **15**, further comprising a plurality of generally horizontal ribs formed in the upwardly extending cavity.

17. The container of claim **11**, wherein the base portion has a plurality of corners, each of the corners being chamfered with a portion of the annular sidewall.

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