BOTTLE HAVING AXIALLY OPPOSED FRUSTOCONICAL PORTIONS

A bottle (20, 120) extends along a longitudinal axis (L, Z) and includes a base (22, 122), a body (24, 124) extending from the base, a shoulder (26, 126) extending from the body, and a neck (28, 128) extending from the shoulder and having a neck finish (30, 130). The body has lower and upper frustoconical portions (42, 142, 44, 144) axially opposed to one another and having straight external surfaces.
BOTTLE HAVING AXIALLY OPPOSED FRUSTOCOMCAL PORTIONS

The present disclosure is directed to containers and, more particularly, to bottles.

Background and Summary of the Disclosure

Bottles typically include a body, a shoulder, a neck, and a neck finish. U.S. Patent Application Publication 2012/0000878 illustrates an example glass bottle of this general type. Such bottles may be produced using a blow-and-blow manufacturing process, a press-and-blow manufacturing process, or a narrow-neck press-and-blow manufacturing process.

A general object of the present disclosure, in accordance with one aspect of the disclosure, is to provide a bottle that includes a body with axially opposed frustocomcal portions for improved ergonomics and label retention, and increased label area.

The present disclosure embodies a number of aspects that can be implemented separately from or in combination with each other.

A bottle extending along a longitudinal axis in accordance with one aspect of the disclosure includes a base, a body extending from the base, a shoulder extending from the body, and a neck extending from the shoulder and having a neck finish. The body has a waist, and lower and upper frustocomcal portions axially opposed to and spaced apart from one another on either axial side of the waist and having straight external surfaces. The waist sets off the frustocomcal portions from one another as two separate and distinctive label panels.

In accordance with another aspect of the disclosure, there is provided a bottle having a body surrounding a central axis, the body having a geometry surrounding the axis that is complementary to a bow tie shape and includes a lower frustocomcal portion having one side longer
than another side of the lower frustoconical portion, and an upper frustoconical portion having one side that is longer than another side of the upper frustoconical portion, wherein the frustoconical portions have straight external surfaces.

**Brief Description of the Drawings**

The disclosure, together with additional objects, features, advantages and aspects thereof, will be best understood from the following description, the appended claims and the accompanying drawings, in which:

FIG. 1 is a perspective view of a bottle in accordance with an illustrative embodiment of the present disclosure;

FIG. 2 is a front elevational view of the bottle of FIG. 1;

FIG. 3 is bottom view of the bottle of FIG. 1;

FIG. 4 is a top view of the bottle of FIG. 1; and

FIG. 5 is a front elevational view of a bottle in accordance with another illustrative embodiment of the present disclosure.

**Detailed Description of Preferred Embodiments**

FIGS. 1 and 2 illustrate a bottle 20 in accordance with one illustrative embodiment of the present disclosure. The bottle 20 extends along a longitudinal central axis Z and may include a closed base 22, a body 24 extending longitudinally from the base 22 at one end of the body 24, a shoulder 26 extending longitudinally and radially inwardly from another end of the body 24, and a neck 28 extending longitudinally from the shoulder 26 and terminating in neck finish 30 axially spaced from the shoulder 26. The bottle 20 may be used for containing a liquid, for example, a beverage, for instance, beer, soda, or any other any suitable beverage.
In one embodiment, the bottle 20 may be a twelve ounce bottle, and may be a narrow neck bottle having a thread diameter (so-called "T" dimension) or a crown diameter (so-called "A" dimension) not more than 38 mm. As used herein, the term twelve ounce narrow neck bottle includes a bottle that has a neck narrower in size than its body and carries, by design intent, twelve ounces of liquid. In other embodiments, the bottle 20 may be a 40 ounce bottle, or a 220, 330, or 750 ml bottle. As will be described in greater detail below, the bottle 20 may include three separate and distinct label areas; on the neck 28 and on the body 24.

With reference to FIG. 3, the base 22 may be circular and may include a rest surface 21 and a central portion 23 disposed radially within the rest surface 21. The rest surface 21 may include circumferentially spaced ribs, and the central portion 23 may include a push-up or raised portion.

With reference to FIG. 2, the base 22 also may include a toe in or heel 32 between the rest surface and the body 24. The heel 32 may be a curved transition zone between the rest surface and the body 24 and may be excurvate in shape. The heel 32 may include a parting line from a seam of a bottom plate and a blow mold (not shown), and an intersection of the body 24 and the heel 32 may be what is known in the art as a contact line or surface.

At the other end of the bottle, the neck finish 30 may be the portion of the bottle 20 that is above a parting line that may be created during manufacturing from a seam of a neck ring and a blank mold (not shown). The neck finish 30 may include a capping flange or collar 34, one or more features 36 for attachment of a closure (not shown), and an axial sealing surface or lip 38. More specifically, and as illustrated, the neck finish 30 may be a threaded finish with a capping flange and one or more closure engagement elements to cooperate with corresponding container
engagement elements on a threaded type of twist-off closure (not shown). In other embodiments, the
neck finish 30 can instead include a standard finish thereon for engagement with a crimping type of
pry-off closure (for example closure 112 in FIG. 5), or any other suitable closure attachment features.

Between the base 22 and the finish 30, the body 24 surrounds the axis Z and includes
a waist 40, lower and upper axially opposed frustoconical portions 42, 44 on either axial side of the
waist 40, a lower axial spacer portion 46, and an upper axial spacer portion 48. As used herein, the
term "frustoconical" includes a conical shape extending along a longitudinal axis and truncated by a
plane disposed at any angle non-parallel to the axis and wherein a base of the conical shape may be
disposed at any angle non-parallel to the axis. The waist 40 may be the narrowest portion of the
body 24, may be a substantially axially central portion of the body 24, and may have an exterior
surface that may be incurvate and, more specifically, may be radiused. The waist 40 may be
centrally located with respect to the body 24 within plus or minus four percent of the height of the
body 24. The lower frustoconical portion 42 may extend between the lower axial spacer portion 46
of the body 24 and the waist 40. Likewise, the upper frustoconical portion 44 may extend between
the waist 40 and the upper axial spacer portion 48 of the body 24. The frustoconical portions 42, 44
are circular in cross-section perpendicular to the axis Z. The lower axial spacer portion 46 may be
cylindrical, with a straight external surface, and may extend between the heel 32 and the lower
frustoconical portion 46. As used herein, the terminology "straight external surface" includes a flat
as opposed to curved surface, regardless of whether the surface is cylindrical or frustoconical. The
upper axial spacer portion 48 may be cylindrical, with a straight external surface, and may extend
between the upper frustoconical portion 44 and the shoulder 26.
Prior unconventional non-cylindrical bottle body designs have surfaces that require use of shrink labels. But the frustoconical portions 42, 44 have straight external surfaces that facilitate ready acceptance and good retention of flat labels, for instance, flat paper or polymeric labels 50a, 50b that may be partially or fully wrapped around the bottle 20 and may be coupled to the bottle 20 with a pressure-sensitive adhesive backing.

Accordingly, the axially opposed frustoconical portions 42, 44 may establish a quasi hourglass shape. Also, the waist 40 and/or the spacer portions 46, 48 set off the frustoconical portions 42, 44 from one another and/or from the rest of the bottle 20 as distinctive label panels of frustoconical shape.

The straight external surface of the lower frustoconical portion 42 is configured in the form of a taper; decreasing in radial size with distance from the base 22 of the bottle 20 and, thus, the portion 42 faces outwardly at an upward angle. Accordingly, at a point of sale, the label 50b applied to that surface will be well lit by overhead lighting, for instance, lights on a ceiling of a store.

Conversely, the straight external surface of the upper frustoconical portion 44 is configured in the form of a reverse taper; increasing in radial size with distance from the base 22 of the bottle 20 and, thus, the portion 44 faces outwardly at a downward angle. Accordingly, at a point of sale, the label 50a applied to that surface will be well lit by underneath lighting, for instance, lights on a shelf in a store.

In one embodiment, the frustoconical portions 42, 44 may be substantially symmetrical about a plane bisecting the waist 40 and perpendicular to the axis Z. For example, the height or length of each of the frustoconical portions 42, 44 may be the same or within plus or minus
four percent of one another, and the major widths of each of the frustocomcal portions may be the same or within plus or minus four percent of one another.

In another embodiment, the frustocomcal portions need not be substantially symmetrical. For example, the frustocomcal portions may have longer and shorter sides.

The shoulder 26 may include an excursive portion 52 that extends from the body 24, and an incurve portion 54 that extends from the excursive portion 52 to a base of the neck 28. In the illustrated embodiment, the shoulder 26 also includes a straight frustocomcal portion between the excursive and incurve portions. The excursive portion 52 of the shoulder 26 may have a relatively tight radius, for instance, 12 to 14 mm.

The neck 28 may include a frustocomcal portion 56 extending from the shoulder 26 and, more particularly, extending from the incurve portion 54 of the shoulder 26. The neck frustocomcal portion 56 may terminate at or just below the neck finish 30. For example, the neck 28 may include a cylindrical portion 58 between the neck frustocomcal portion 56 and the neck finish 30. The cylindrical portion 58 may include a straight external surface and a neck parting line (not shown). Like the body frustocomcal portions 42, 44, the neck frustocomcal portion 56 has a straight external surface that facilitates ready acceptance and good retention of a label 50c.

The bottle 20 has an overall height A, and the body 24 has a height B, including heights or lengths C, D of the frustocomcal portions 42, 44, heights E, F of the spacer portions 46, 48, and the height of the waist 40, which may have a radius G. In illustrative embodiments of the present disclosure, the body height B may be in the range of 58% to 62% of the bottle height A. Also, the combined length C and D of the frustocomcal portions 42 and 44 may be in the range of 52% to 56% of the bottle height A. That is in contrast to standard longneck bottles where bottle
body label panel heights are typically about 36% of the bottle heights. Accordingly, compared to a standard longneck bottle of similar major diameter and similar volume capacity, the body 24 of the presently disclosed bottle 20 provides an increased label area. For purposes of the present disclosure, the terminology "standard longneck bottle" is defined as a comparison bottle of the same volumetric capacity as the bottle 20 and having a bottle neck height that is at least 30% of the overall bottle height.

The shoulder 26 has a height H that may be in the range of 10% to 12% of the height A of the bottle 20, and the excursive portion 52 of the shoulder 26 has a radius I that may be less than 40% of the height of the shoulder 26 and less than 15% of the major diameter of the bottle 20.

The neck 28 including the neck finish 30 has a height J that may be in the range of 20% to 24% of the height A of the bottle 20, including a height or length K of the neck frustoconical portion 56 that may be about 12% to 16% of the height A of the bottle 20. The neck 28 may be shorter than that of a standard longneck bottle.

The bottle 20 may have a major diameter M, which may be established by one or both of the portions 46, 48, and the bottle body 24 may have a minor diameter L at the waist 40 that may be 83% to 87% of the major diameter M. The major diameter M may be a standard major diameter for a standard longneck bottle, for example, 2.1 to 2.7 inches, or about 2.4 inches.

Also, the overall height A of the bottle 20 may be the same as an overall height of a standard longneck beverage bottle, for example, 8.7 to 9.3 inches or about nine inches. As used herein, the term "about" includes standard container manufacturing tolerances. The body height B may be 6.3 to 6.9 inches, in contrast to a 4.6 inch body height of a standard longneck bottle.
Compared to a standard longneck bottle, the dimensions and relationships between
the dimensions of the presently disclosed bottle 20 enable an increase in label area. For example, the
label area of each portion 42, 44 may be 10,269 square millimeters for a total body label area of
20,538 square millimeters. This is in contrast to a body label area of a standard longneck bottle of
16,022 square millimeters, for an increase in body label area of 28%. In any case, the label area of
the body 24 may be at least 10%, and preferably at least 20%, greater than a body label area of a
standard longneck bottle. The label area of the neck 28 may be smaller than that of a standard
longneck bottle, for example, 3,821 square millimeters for the neck 28 in contrast to a neck label
area of a standard longneck bottle of 5,734 square millimeters.

The bottle 20 may be of one-piece integrally formed construction, for, example, of
glass, ceramic, metal, or plastic construction. (The term "integrally formed construction" does not
exclude one-piece integrally molded layered glass constructions of the type disclosed for example in
U.S. Patent 4,740,401, or one-piece glass or metal bottles to which other structure is added after the
bottle-forming operation.) Glass bottles can be fabricated by press-and-blow, blow-and-blow, or
narrow-neck press-and-blow manufacturing operations, or by any other suitable technique(s). The
body may be formed by incorporating corresponding features in blow molds.

FIG. 5 shows another illustrative embodiment of a bottle 120. This embodiment is
similar in many respects to the embodiment of FIGS. 1-4 and like numerals among the embodiments
generally designate like or corresponding elements throughout the several views of the drawing
figures. Accordingly, the descriptions of the embodiments are incorporated into one another, and
description of subject matter common to the embodiments generally may not be repeated here.
The bottle includes a closed base 122, a body 124 surrounding an axis Z, a shoulder 126, and a neck 128 terminating in neck finish 130. The bottle is part of a package 110 including a closure 112 coupled to the neck finish 130 in any suitable manner.

In this embodiment, the body 124 may comprise two conic sections integrally connected to each other at a narrow waist 140. The waist 140 is disposed in a plane at a non-zero angle with respect the axis Z, such that one side (or partially circumferential portion) of a lower frustoconical portion 142 of the body 124 is longer than another side (or partially circumferential portion) of the lower frustoconical portion 142, and one side (or partially circumferential portion) of an upper frustoconical portion 144 of the body 124 is longer than another side (or partially circumferential portion) of the upper frustoconical portion 144. For example, an index finger on a user's hand may grip a low side 139 of the waist 140 and a thumb of the user's hand may grip a high side 141 of the waist 140.

Also in this embodiment, the body 124 has a body geometry surrounding the axis Z that may be complementary to a bow tie shape that may be carried by the body 124. an embossment or a debossment of an external surface of the body 124, or labeling printed on or secured to the external surface of the body 124. For example, the bottle 120 may accept a shrink label 150 carried by and between the frustoconical portions 142,144. The hourglass shape of the frustoconical portions 142, 144 may aid in preventing the shrink label 150 from sliding up or down relative to the body 124 and, thus, may aid in retaining the label 150 to the body 124. The same applies to the embodiment of FIGS. 1-4.

There thus has been disclosed bottles that fully satisfy one or more of the objects and aims previously set forth. The disclosure has been presented in conjunction with several illustrative
embodiments, and additional modifications and variations have been discussed. Other modifications and variations readily will suggest themselves to persons of ordinary skill in the art in view of the foregoing discussion.
Claims

1. A bottle (20, 120) extending along a longitudinal axis (L, Z) and that includes,
a base (22, 122);
a body (24, 124) extending from the base;
a shoulder (26, 126) extending from the body; and
a neck (28, 128) extending from the shoulder and having a neck finish (30, 130);
the body having:
   a waist (40, 140), and
   lower and upper frustoconical portions (42, 142, 44, 144) axially opposed to
   and spaced apart from one another on either axial side of the waist and having straight external
   surfaces,
   the waist setting off the frustoconical portions from one another as two
   separate and distinctive label panels.

2. The bottle set forth in claim 1, wherein the neck includes a frustoconical portion (56)
   having a straight external surface to establish a third label panel.

3. The bottle set forth in claim 1, that includes the base having a toe in (32) from which
   the body extends and the body further having:
a lower axial spacer portion (42) between the lower frustoconical portion and
the toe in of the base, and
an upper axial spacer portion (48) between the upper frustoconical portion and
the shoulder,
the spacer portions further setting off the frustoconical portions from the rest
of the bottle as distinctive label panels.

4.
The bottle set forth in claim 3, wherein the neck includes a frustoconical portion (56)
having a straight external surface to establish a label panel, such that the bottle includes three
separate and distinct label panels of frustoconical shape.

5.
The bottle set forth in claim 3, wherein the toe in is excurvate and the lower axial
spacer portion is cylindrical with a straight external surface.

6.
The bottle set forth in claim 3, wherein the upper axial spacer portion is cylindrical
with a straight external surface and the shoulder has an excurvate portion (52) extending from the
upper axial spacer portion.
7.

The bottle set forth in claim 6, wherein the excurvate portion of the shoulder has a radius of less than 40% of the height of the shoulder and less than 15% of a major diameter of the bottle.

8.

The bottle set forth in claim 6, wherein the shoulder has an incurvate portion (54) extending from the excurvate portion of the shoulder and the neck has a frustoconical portion (56) extending from the incurvate portion and including a straight external surface to establish a third label panel.

9.

The bottle set forth in claim 1, wherein the waist is disposed in a plane perpendicular to the axis and is incurvately shaped with a radius (G).

10.

The bottle set forth in claim 1, wherein the waist is disposed in a plane at a non-zero angle with respect the axis, such that one side of the lower frustoconical portion is longer than another side of the lower frustoconical portion and one side of the upper frustoconical portion is longer than another side of the upper frustoconical portion.
11.

The bottle set forth in claim 1, wherein the bottle is composed of glass and the frustoconical portions carry separate flat labels (50a, 50b).

12.

The bottle set forth in claim 1, wherein the bottle is composed of glass, and a shrink label (150) is carried by and between the frustoconical portions.
### C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>GB 1 074 162 A (METAL BOX CO LTD) 28 June 1967 (1967-06-28) page 3, line 29 - line 33; figures 20,21</td>
<td>1-9</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>10-12</td>
</tr>
<tr>
<td>X</td>
<td>GB 1 340 676 A (METAL BOX CO LTD) 12 December 1973 (1973-12-12) page 1, line 86 - line 89; figures 1,2</td>
<td>1-9</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>10-12</td>
</tr>
</tbody>
</table>

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "Z" document member of the same patent family

Date of the actual completion of the international search: 11 June 2014

Date of mailing of the international search report: 20/06/2014

Name and mailing address of the ISA:
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer: Sundell, 01 li
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB 1074162</td>
<td>A 28-06-1967</td>
<td>NON E</td>
<td></td>
</tr>
<tr>
<td>GB 1340676</td>
<td>A 12-12-1973</td>
<td>NON E</td>
<td></td>
</tr>
</tbody>
</table>