This invention provides for expandable and cleanable containers for storing materials for human consumption.
FIGURE 1

110
109
107
106
105
100
FIGURE 3
MULTI-PURPOSE EXPANDABLE CONTAINER SYSTEM

[0001] This application claims the benefit of U.S. Provisional Application No. 61/306,345, filed Feb. 19, 2010, the entire content of which is hereby incorporated by reference herein.

[0002] Throughout this application various publications are referenced. Full citations for these references may be found at the end of the specification immediately preceding the claims. The disclosures of these publications in their entirety are hereby incorporated by reference into this application to more fully describe the state of the art to which this invention pertains.

FIELD OF INVENTION

[0003] This invention relates to containers for liquids and/or solids for human consumption or storage.

BACKGROUND OF THE INVENTION

[0004] Plastic is typically used for portable containers containing water, milk and other liquid consumables. Regular store-purchased plastic water bottles can be refilled and used repeatedly. However, these plastic bottles are typically discarded within a week because they get dirty and bacteria-infested over time.

[0005] A typical consumer throws away over 100 plastic bottles a year. There are commercially available bottles which are more robust than the disposable store-bought version, however, they are not easy to clean. In addition, these bottles are generally plastic, and may contain Bisphenol A (BPA), a very toxic substance. BPA is nearly ubiquitous among many common household products. It is used in baby bottles, water bottles, medical and dental devices, lenses, food storage containers, household electronics, compact discs and DVDs. Epoxy resins containing BPA are used to coat the inside of beverage cans, as well as aluminum water bottles not made from stainless steel.

[0006] Many researchers and environmental organizations now list plastic as the number one threat to our environment. In addition, chemicals in some plastics have been linked by researchers to a laundry list of diseases, including breast cancer, heart disease, obesity, diabetes, liver abnormalities, and prostate cancer.

[0007] Since the stainless steel bottle is reusable and recyclable, and therefore more environmentally friendly than the typical plastic bottle, it has been gaining popularity. However, commercially available stainless steel containers, such as those available from Klean Kanteen (www.kleankanteen.com), only come in one size. Multiple containers must be purchased if bottles of varying sizes are desired. Another drawback of these containers is that they are difficult to clean, since the opening of the container is much smaller than the largest diameter of the container. As a result, a typical consumer would rinse the bottle with soapy water to clean and leave unwanted residue inside the container.

SUMMARY OF THE INVENTION

[0008] The subject application provides for a container for storing materials for human consumption, comprising: i) a bottom piece comprising i) a cylindrical side wall portion, ii) a bottom portion, iii) an opening opposite the bottom portion, iv) a threaded section of the cylindrical side wall portion towards the opening, b) a first expansion piece threadedly connectable to the bottom piece, having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece, comprising i) a cylindrical outer surface, ii) a first opening oriented towards the opening of the bottom piece, iii) a second opening opposite the first opening, iv) a first threaded section towards the first opening complementary to the threaded section of the cylindrical side wall portion of the bottom piece, v) a second threaded section towards the second opening, c) a top piece threadedly connectable to the first expansion piece having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece and the outer diameter of the cylindrical outer surface of the first expansion piece, comprising i) a cylindrical side wall portion, ii) a first opening oriented towards the second opening of the first expansion piece, iii) a second opening smaller than the first opening and opposite the first opening, and iv) a threaded section of the cylindrical sidewall portion towards the first opening and complementary to the second threaded section of the expansion piece.

[0009] The subject application also provides for a container for storing materials for human consumption, comprising: a) a bottom piece comprising i) a cylindrical side wall portion, ii) a bottom portion, iii) an opening opposite the bottom portion, iv) a threaded section of the sidewall portion towards the opening, b) a first expansion piece threadedly connectable to the bottom piece, having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece, comprising i) a cylindrical outer surface, ii) a first opening oriented towards the opening of the bottom piece, iii) a second opening opposite the first opening, iv) a first threaded section towards the first opening and complementary to the threaded section of the cylindrical side-wall portion of the bottom piece, v) a second threaded section towards the second opening, c) a first sectional piece threadedly connectable to the first expansion piece, having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece, and the outer diameter of the cylindrical outer surface of the expansion piece, comprising i) a cylindrical side wall portion, ii) a first opening oriented towards the second opening of the first expansion piece, iii) a second opening opposite the first opening, iv) a first threaded section of the cylindrical side wall portion towards the first opening and complementary to the second threaded section of the expansion piece, and v) a second threaded section of the cylindrical side wall portion towards the second opening and substantially similar to the threaded section of the bottom piece.

BRIEF DESCRIPTION OF THE FIGURES

[0010] FIG. 1 is an exploded perspective view of one embodiment of the bottle container disclosed herein:

[0011] 105: bottom piece
[0012] 106: gasket
[0013] 107: expansion piece
[0015] 110: bottle cap

[0016] FIG. 2 is a side view of one embodiment of the bottle container disclosed herein depicting an assembled bottle with the base (bottom piece), mid section (sectional piece), and bottle top (top piece):

[0017] 105: bottom piece
FIG. 3 is a photograph showing various embodiments of the bottle container disclosed herein:

- 107: expansion piece
- 109: top piece
- 110: bottle cap
- 208: sectional piece

Fig. 4 is a photograph showing various embodiments of the storage container disclosed herein:

- 105: bottom piece
- 107: expansion pieces
- 208: sectional piece
- 311: lid piece

**Detailed Description of the Invention**

**Embodiments of the Invention**

The subject application provides for a container for storing materials for human consumption, comprising: a) a bottom piece comprising i) a cylindrical side wall portion, b) a top piece, c) an opening opposite the bottom portion, and d) a threaded section of the cylindrical side wall portion towards the opening, b) a first expansion piece threadably connectable to the bottom piece, having an outer diameter substantially similar to the inner diameter of the cylindrical side wall portion of the bottom piece, comprising i) a cylindrical outer surface, ii) a first opening oriented towards the opening of the bottom piece, iii) a second opening opposite the first opening, iv) a first threaded section towards the first opening complementary to the threaded section of the cylindrical side wall portion of the bottom piece, v) a second threaded section towards the second opening, c) a top piece threadably connectable to the first expansion piece having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece and the outer diameter of the cylindrical outer surface of the first expansion piece, comprising i) a cylindrical side wall portion, ii) a first opening oriented towards the second opening of the first expansion piece, iii) a second opening smaller than the first opening and opposed to the first opening, and iv) a threaded section of the cylindrical sidewall portion towards the first opening and complementary to the second threaded section of the expansion piece.

In one embodiment, the container further comprises a gasket between the bottom piece and the first expansion piece. In another embodiment, the second opening of the top piece is adapted to accept a removable cap. In yet another embodiment, the container comprises a removable cap configured to close with the second opening of the top piece.

In one embodiment, the side wall portion of the bottom piece and the bottom portion of the bottom piece are integrally formed. In another embodiment, the threaded section and the side wall portion of the bottom piece integrally formed. In yet another embodiment, the first and the second threaded section of the first expansion piece and the cylindrical outer surface portion of the expansion piece are integrally formed.

In one embodiment, the container further comprises a second expansion piece similar to the first expansion piece, b) a first sectional piece threadably connectable to the first and the second expansion pieces, having an outer diameter substantially similar to the outer diameter of the cylindrical outer surface of the first and second expansion pieces, comprising i) a cylindrical side wall portion, ii) a first opening oriented towards an opening of the first expansion piece, iii) a second opening opposite the first opening, iv) a first threaded section of the sidewall portion towards the first opening, and v) a second threaded section of the sidewall portion towards the second opening. In yet another embodiment, the container further comprises a j) one or more additional expansion pieces similar to the first and second expansion pieces, and b) one or more additional sectional piece similar to the first sectional piece.

The subject application also provides for a container for storing materials for human consumption, comprising: a) a bottom piece comprising i) a cylindrical side wall portion, b) a top piece, c) an opening opposite the bottom portion, d) a threaded section of the bottom portion towards the opening, b) a first expansion piece threadably connectable to the bottom piece, having an outer diameter substantially similar to the inner diameter of the cylindrical side wall portion of the bottom piece, comprising i) a cylindrical outer surface, ii) a first opening oriented towards the opening of the bottom piece, iii) a second opening opposite the first opening, iv) a first threaded section towards the first opening and complementary to the threaded section of the cylindrical side wall portion of the bottom piece, v) a second threaded section towards the second opening, c) a first sectional piece threadably connectable to the first expansion piece, having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece, comprising i) a cylindrical side wall portion, ii) a first opening oriented towards the second opening of the first expansion piece, iii) a second opening opposite the first opening, iv) a first threaded section of the cylindrical side wall portion towards the first opening and complementary to the second threaded section of the expansion piece, and v) a second threaded section of the cylindrical side wall portion towards the second opening and substantially similar to the threaded section of the bottom piece.

In one embodiment, the container further comprises a gasket between the bottom piece and the first expansion piece.

In one embodiment, the side wall portion of the bottom piece and the bottom portion of the bottom piece are integrally formed. In another embodiment, the threaded section and the side wall portion of the bottom piece integrally formed. In one embodiment, the container further comprises a) a second expansion piece similar to the first expansion piece, and b) a second sectional piece, similar to the first sectional piece and threadably connectable to the first and second expansion pieces. In yet another embodiment, the container further comprises a) one or more additional expansion pieces, and b) one or more additional sectional pieces.

In one embodiment, the threaded section of each piece of the container has a diameter smaller than the corresponding outside diameter of the same piece.
The subject application also provides for a container for storing materials for human consumption, comprising: a) a top piece threadedly connectable to a lid piece, the top piece comprising i) a cylindrical side wall portion, ii) a first opening, iii) a second opening smaller than the first opening and opposite the first opening, iv) a threaded section of the cylindrical side wall portion towards the first opening, b) the lid piece threadedly connectable to the top piece and having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the top piece, the lid piece comprising i) a cylindrical outer surface, ii) a bottom portion, iii) an opening opposite the bottom portion, and iv) a threaded section towards the opening and complimentary to the threaded section of the top piece.

All combinations of the various elements are within the scope of the invention. The Container

This invention provides for a multi-purpose expandable container system made from food safe materials, e.g., stainless steel, polypropylene, and silicone, which has removable sectional pieces for increasing or decreasing the size/volume of a given container. This sectional design facilitates the ease of cleaning the inside of the container.

The claimed bottle or storage container has the ability to expand and contract to whatever size and volume is desired. The container can be adjusted to as little as 0.25 liters, and expanded by 0.5 liter increments to an unlimited size. The user can build larger containers by simply screwing on the mid-section expansion piece to the base (bottom piece). As many mid-section expansion pieces as needed can be screwed together (see FIGS. 1-4). A drink opening or lid piece can be screwed onto the top, depending on the purpose of the container being assembled.

Since all parts of the claimed container system are detachable, this container system is also very easily cleanable. All of its components can be cleaned with a towel or sponge without any interference. These parts can also be inserted into a dishwasher, and reassembled after being cleaned. A lid can be used for storing solids or other food. The lid is water and air tight, so it can be used for storage in refrigerated environments or at room temperature.

FIG. 1 shows a first embodiment of the present invention which is particularly suitable for holding drinking fluids. FIG. 1 depicts the assembly of a bottle (100), whereby the user screws on the top piece (109) to the bottom piece (105). To do this, an intermediate expansion piece (107) is used with a gasket (106). The gasket 106 is inserted into the expansion piece 107. The expansion piece 107 is then screw fitted onto the bottom piece 105. Top piece 109 is then screwed into expansion piece 107 with gasket 106.

In this embodiment, the top piece is configured to have a top opening narrower than the largest diameter of the container, adapted to accept a removable bottle cap configured to close the top opening of the fully assembled bottle.

The gasket 106 is used to ensure air and water tight seals. A bottle top cap (110) can be used to seal the opening. It should be understood that any bottle top cap or lid can be used to seal the opening.

FIG. 2 depicts another embodiment of the present invention. Specifically, FIG. 2 shows the container 100 with the addition of sectional piece 208 screwed in place between bottom piece 105 and top piece 109. Again, gaskets (106) and expansion pieces (107) are used to allow for the sectional piece (208) to fit together with the top and the bottom pieces (109 and 105).

FIG. 3 depicts four different size bottle containers of various volumes. The smallest bottle 312 has the top piece (109) screwed onto the lid piece (311) which serves as the bottom of the container in this embodiment. Bottle 313 has a top piece (109) screwed into the bottom piece (105) via an expansion piece (107). Bottle 314 has a top piece (109) screwed into the sectional piece (208), which is screwed into the bottom piece (105), via the use of the expansion pieces (107). Bottle 315 has a top piece (109) screwed into the mid sectional piece (208), which is screwed into another mid sectional piece (208), which is screwed into the bottom piece (105), once again, via the use of expansion pieces (107). In this manner, an unlimited container volume can be achieved.

FIG. 4 depicts three different size storage containers, of various volumes. Instead of screwing on top piece
a lid piece can be used (311). These containers can be used for storage purposes. Again, any size container can be achieved.

As discussed supra, the present invention is advantageous over prior art designs because it is easily cleanable and can be adapted to various sizes. In addition, the cylindrical shape of the fully assembled container is also advantageous. Some prior art containers require parts which protrude from the completed assembly. (See, U.S. Patent Application Publication No. 2010/0288759 A1) The protruded portion of the container can interfere with the use of the container in combination with other house hold items, e.g., coffee cup sleeves, cup holders, or beverage chillers. For example, the claimed container can be used with the Cooper Cooler™, which operates by rotating the container. The prior art containers cannot be used in conjunction with such an appliance because it would be unable to rotate properly.

A further advantage of the sectional design is that it can be easily adapted to incorporate additional elements. For example, the container can be adapted to further comprise a water filter similar to Brita® filters. In one embodiment, filter can be screwed into the assembly and then a funnel attachment can be added. Water from the tap can be poured into the funnel and the water can be allowed to filter down into the container.

The container can also be adapted to hold hot liquids with a thermal barrier. An attachment can be screwed down and fit inside the container. This will create a double wall with an air gap. This air gap will act as insulation to keep hot liquids hot and also prevent an user from burning himself/herself.

The container can also be adapted to include an induction heater specific to the container which can quickly heat the contents inside the container. As a result of the induction heater, the claimed container can be adapted to be a single serve coffee maker or a single serve tea maker as follows:

1. The user inserts water into the bottom half of the container and heat the water using the induction heater.
2. The user can insert a hot holding attachment onto another container.
3. A coffee grind pouch or coffee holder is attached to the hot holding attachment. The coffee holder is screwed into the top.
4. The entire part of item 3) is screwed into the bottom half that was heated in item 1).
5. The assembly is inverted, and hot water drips down through the coffee grinds into the coffee holder.

The container can further be adapted to make soda. An attachment can be made to add a CO₂ cartridge. The user screws on the attachment, inserts a CO₂ cartridge, inverts the ingredients (water, sugar, flavor), and then inserts CO₂ into solution. The expansion of the liquid CO₂ into a gas should cool the ingredients and allow more CO₂ into solution.

An attachment can also be made to make single serve ice cream. Specifically, ice, salt and water can be inserted into the container. Ice cream attachment can be screwed into the container. To use, ice cream ingredients are inserted into the attachment and sealed. The container can then be shaken or rotated until the ingredients solidifies.

In the same manner, the disclosed invention can be adapted to include a vacuum seal for wine and food, a wine aerator, juicer attachments (e.g., oranges), grinder (e.g., coffee), and blender attachments.

REFERENCES


1. A container for storing materials for human consumption, comprising:
a) a bottom piece comprising
   i) a cylindrical side wall portion,
   ii) a bottom portion,
   iii) an opening opposite the bottom portion,
   iv) a threaded section of the cylindrical side wall portion towards the opening,
b) a first expansion piece threadedly connectable to the bottom piece, having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece, comprising
   i) a cylindrical outer surface,
   ii) a first opening oriented towards the opening of the bottom piece,
   iii) a second opening opposite the first opening,
   iv) a first threaded section towards the first opening complementary to the threaded section of the cylindrical side wall portion of the bottom piece,
   v) a second threaded section towards the second opening,
   v) a top piece threadedly connectable to the first expansion piece having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece and the outer diameter of the cylindrical outer surface of the first expansion piece, comprising
   i) a cylindrical side wall portion,
   ii) a first opening oriented towards the second opening of the first expansion piece,
   iii) a second opening smaller than the first opening and opposite the first opening, and
   iv) a threaded section of the cylindrical sidewall portion towards the first opening and complementary to the second threaded section of the expansion piece.
2. The container of claim 1, further comprising a gasket between the bottom piece and the first expansion piece.
3. The container of claim 1, wherein the second opening of the top piece is adapted to accept a removable cap.
4. The container of claim 3, further comprising a removable cap configured to close the second opening of the top piece.
5. The container of claims 1, further comprising:
a) a second expansion piece similar to the first expansion piece,
b) a first sectional piece threadedly connectable to the first and the second expansion pieces, having an outer diameter substantially similar to the outer diameter of the cylindrical outer surface of the first and second expansion pieces, comprising
   i) a cylindrical side wall portion,
   ii) a first opening oriented towards an opening of the first expansion piece,
   iii) a second opening opposite the first opening,
   iv) a first threaded section of the sidewall portion towards the first opening, and
   v) a second threaded section of the sidewall portion towards the second opening.
6. The container of claim 5, further comprising:
   a) one or more additional expansion pieces similar to the first and second expansion pieces, and
   b) one or more additional sectional piece similar to the first sectional piece.
7. A container for storing materials for human consumption, comprising:
   a) a bottom piece comprising
      i) a cylindrical side wall portion,
      ii) a bottom portion,
      iii) an opening opposite the bottom portion,
      iv) a threaded section of the sidewall portion towards the opening,
   b) a first expansion piece threadedly connectable to the bottom piece, having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece, comprising
      i) a cylindrical outer surface,
      ii) a first opening oriented towards the opening of the bottom piece,
      iii) a second opening opposite the first opening,
      iv) a first threaded section towards the first opening and complementary to the threaded section of the cylindrical sidewall portion of the bottom piece,
   c) a second threaded section towards the second opening,
   c) a first sectional piece threadedly connectable to the first expansion piece, having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the bottom piece and the outer diameter of the cylindrical outer surface of the expansion piece, comprising
      i) a cylindrical side wall portion,
      ii) a first opening oriented towards the second opening of the first expansion piece,
      iii) a second opening opposite the first opening,
      iv) a first threaded section of the cylindrical side wall portion towards the first opening and complementary to the second threaded-section of the expansion piece, and
   v) a second threaded section of the cylindrical side wall portion towards the second opening and substantially similar to the threaded section of the bottom piece.
8. The container of claim 7, further comprising a gasket between the bottom piece and the first expansion piece.
9. The container of claim 7, further comprising a lid piece threadedly connectable to the first sectional piece, comprising:
   a) a cylindrical outer surface,
   b) a top portion,
   c) an opening opposite the top portion, and
   d) a threaded section towards the opening and complementary to the second threaded section of the first sectional piece.
10. The container of claim 7, further comprising:
    a) a second expansion piece similar to the first expansion piece, and
    b) a second sectional piece, similar to the first sectional piece and threadedly connectable to the first and second expansion pieces.

11. The container of claim 10, further comprising
    a) one or more additional expansion pieces, and
    b) one or more additional sectional pieces.
12. A container for storing materials for human consumption, comprising:
    a) a top piece threadedly connectable to a lid piece, the top piece comprising
      i) a cylindrical side wall portion,
      ii) a first opening,
      iii) a second opening smaller than the first opening and opposite the first opening,
      iv) a threaded section of the cylindrical side wall portion towards the first opening,
    b) the lid piece threadedly connectable to the top piece and having an outer diameter substantially similar to the outer diameter of the cylindrical side wall portion of the top piece, the lid piece comprising
      i) a cylindrical outer surface,
      ii) a bottom portion,
      iii) an opening opposite the bottom portion, and
      iv) a threaded section towards the opening and complimentary to the threaded section of the top piece.
13. A container for storing materials for human consumption, comprising:
    a) a bottom piece comprising
      i) a cylindrical side wall portion,
      ii) a top portion,
      iii) an opening opposite the top portion,
      iv) a threaded section of the sidwall portion towards the opening,
    b) a lid piece threadedly connectable to the bottom piece, having an outer diameter substantially similar to an outer diameter of the cylindrical side wall portion of the bottom piece, comprising
      i) a cylindrical outer surface,
      ii) a top portion,
      iii) an opening opposite the top portion, and
      iv) a threaded section towards the opening and complimentary to the threaded section of the bottom piece.
14. The container of claim 1, having a substantially cylindrical shape.
15. The container of claim 1, wherein one or more pieces of the container are made from stainless steel, polypropylene, aluminum, plastic or silicone.
16. The container of claim 1, further comprising a filter, a thermal barrier, an induction heater, a coffee grind pouch, a carbon dioxide cartridge, an ice cream maker, a vacuum seal, an wine aerator, a grinder or a blender.
17. The container of claim 7, having a substantially cylindrical shape.
18. The container of claim 7, wherein one or more pieces of the container are made from stainless steel, polypropylene, aluminum, plastic or silicone.
19. The container of claim 7, further comprising a filter, a thermal barrier, an induction heater, a coffee grind pouch, a carbon dioxide cartridge, an ice cream maker, a vacuum seal, an wine aerator, a grinder or a blender.

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