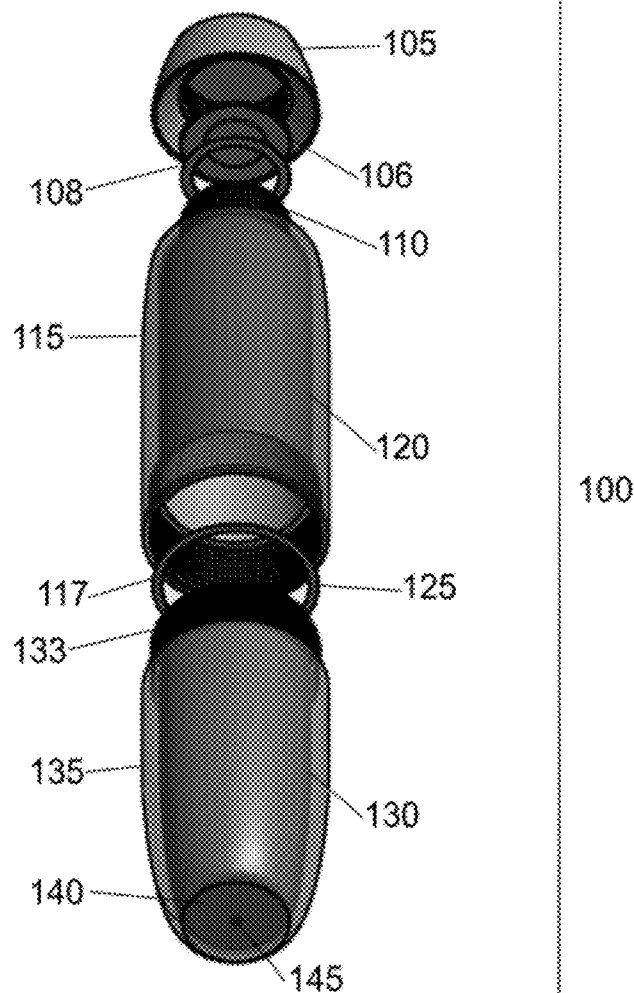




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(19) **United States**(12) **Patent Application Publication**  
**Schwartz**(10) **Pub. No.: US 2012/0241446 A1**(43) **Pub. Date: Sep. 27, 2012**(54) **MULTI-PART THERMAL DISHWASHER  
COMPLIANT REUSABLE LIQUID DRINKING  
BOTTLE**(52) **U.S. Cl. .... 220/4.21; 220/739; 220/682; 220/601**(76) **Inventor: Michael H. Schwartz, Atlanta, GA  
(US)**(21) **Appl. No.: 13/429,475**(22) **Filed: Mar. 26, 2012****Related U.S. Application Data**(60) **Provisional application No. 61/467,361, filed on Mar.  
24, 2011.****Publication Classification**(51) **Int. Cl.**  
**B65D 8/04 (2006.01)**  
**B65D 8/02 (2006.01)**  
**B65D 25/00 (2006.01)**(57) **ABSTRACT**

Embodiments herein describe a separable, multi-sectioned reusable liquid drinking bottle that can be disassembled for cleaning. The drinking bottle has detachable upper and lower sections and a bottle top. The upper and lower sections are engageable and separable from one another. Both the upper and lower portions of the drinking bottle may be separately encased in a vacuum-sealed insulating layer of insulating material. The bottle portions are designed to engage each other in a leak-proof fashion to create a liquid containment vessel. The upper and lower portions of the drinking bottle create a containment vessel made of stainless steel, such that any liquids placed in the bottle only come in contact with this material that comprises the liquid containment vessel.



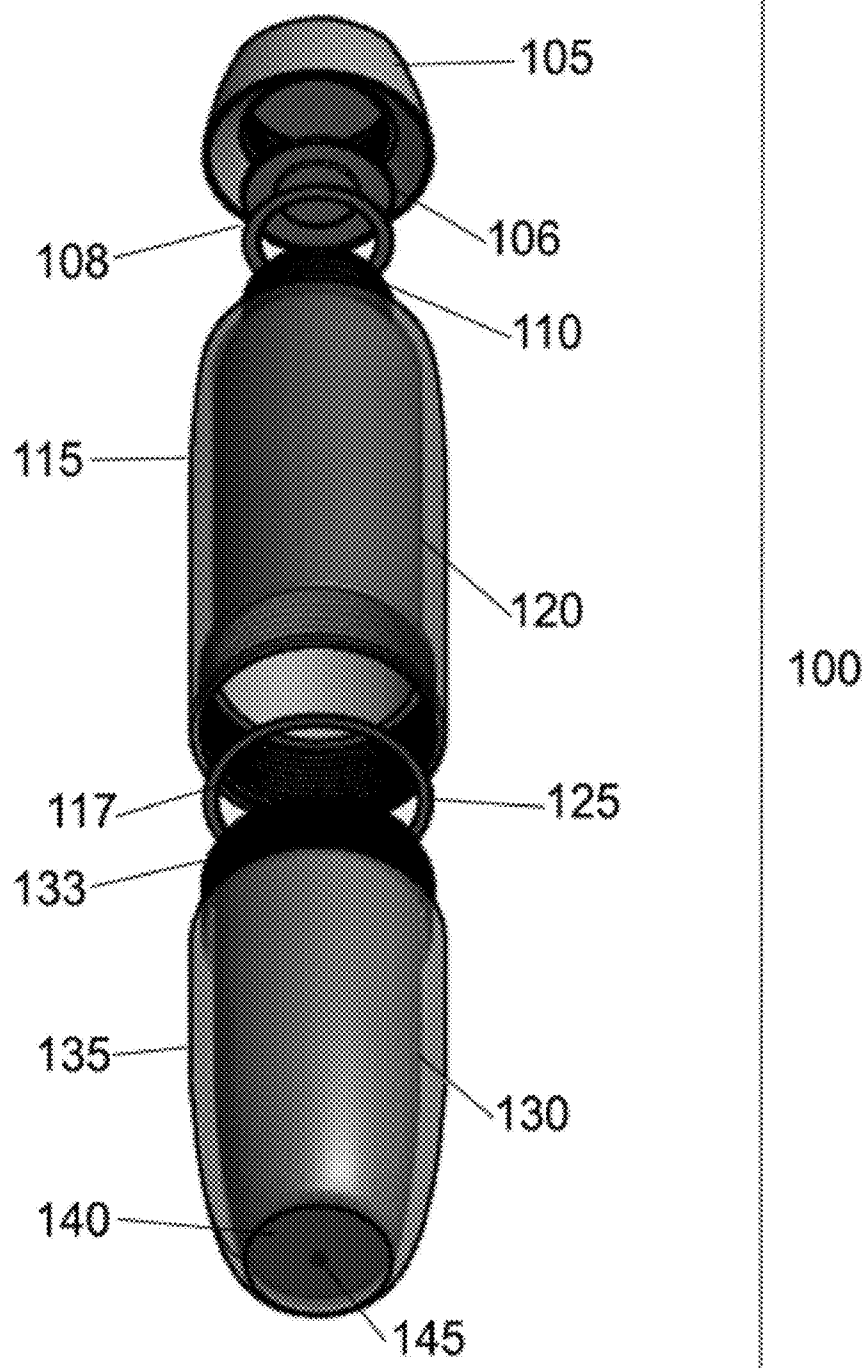


FIG. 1

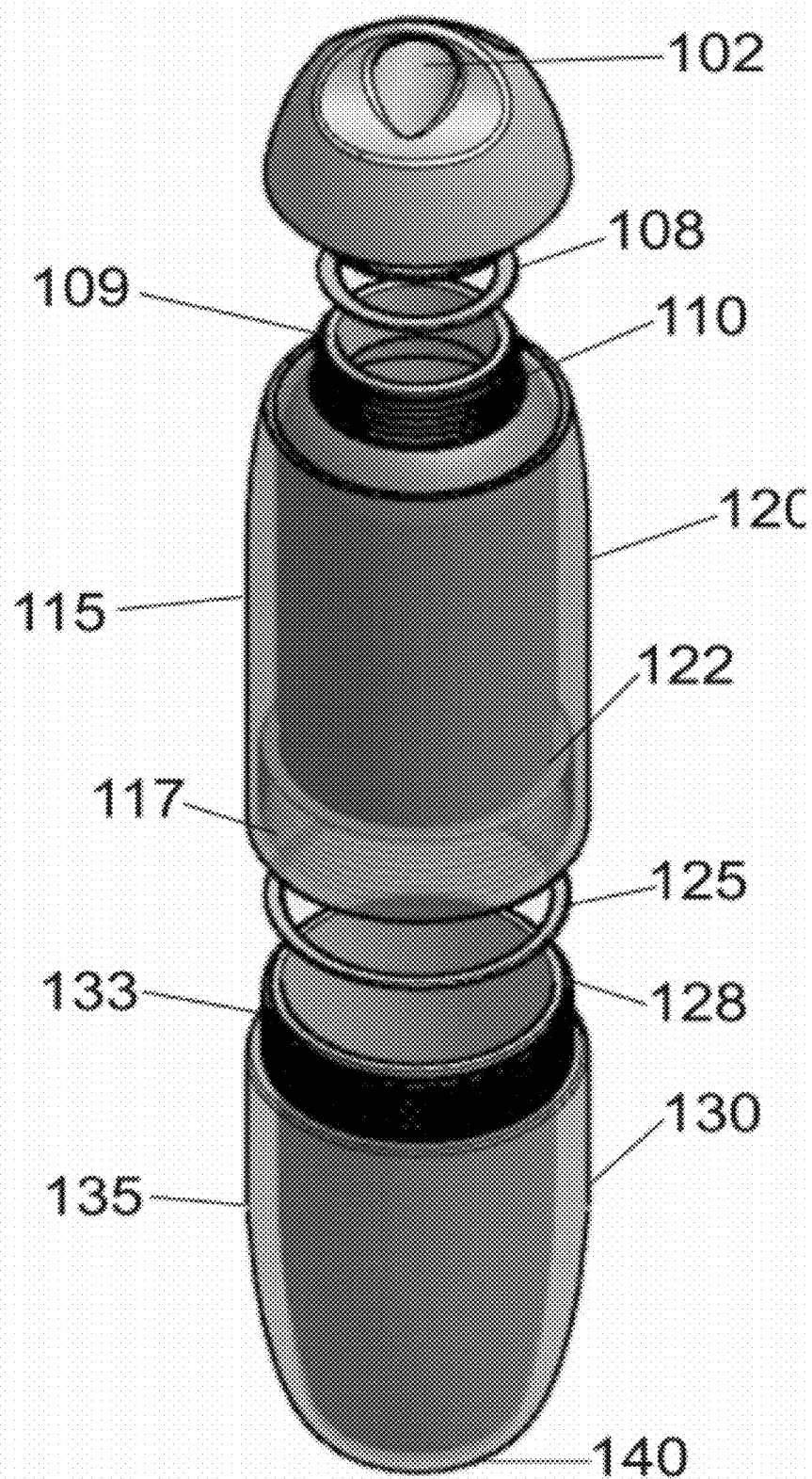


FIG. 2

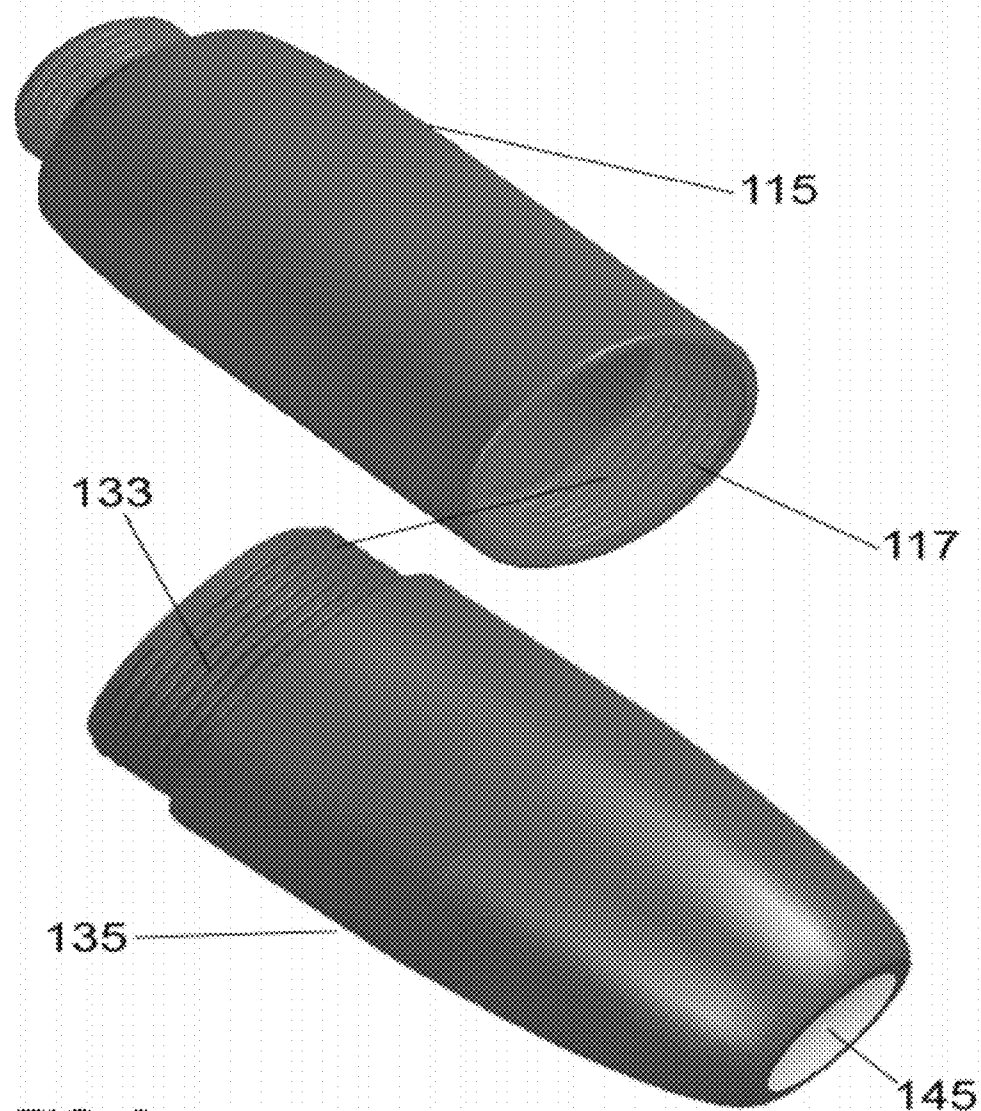
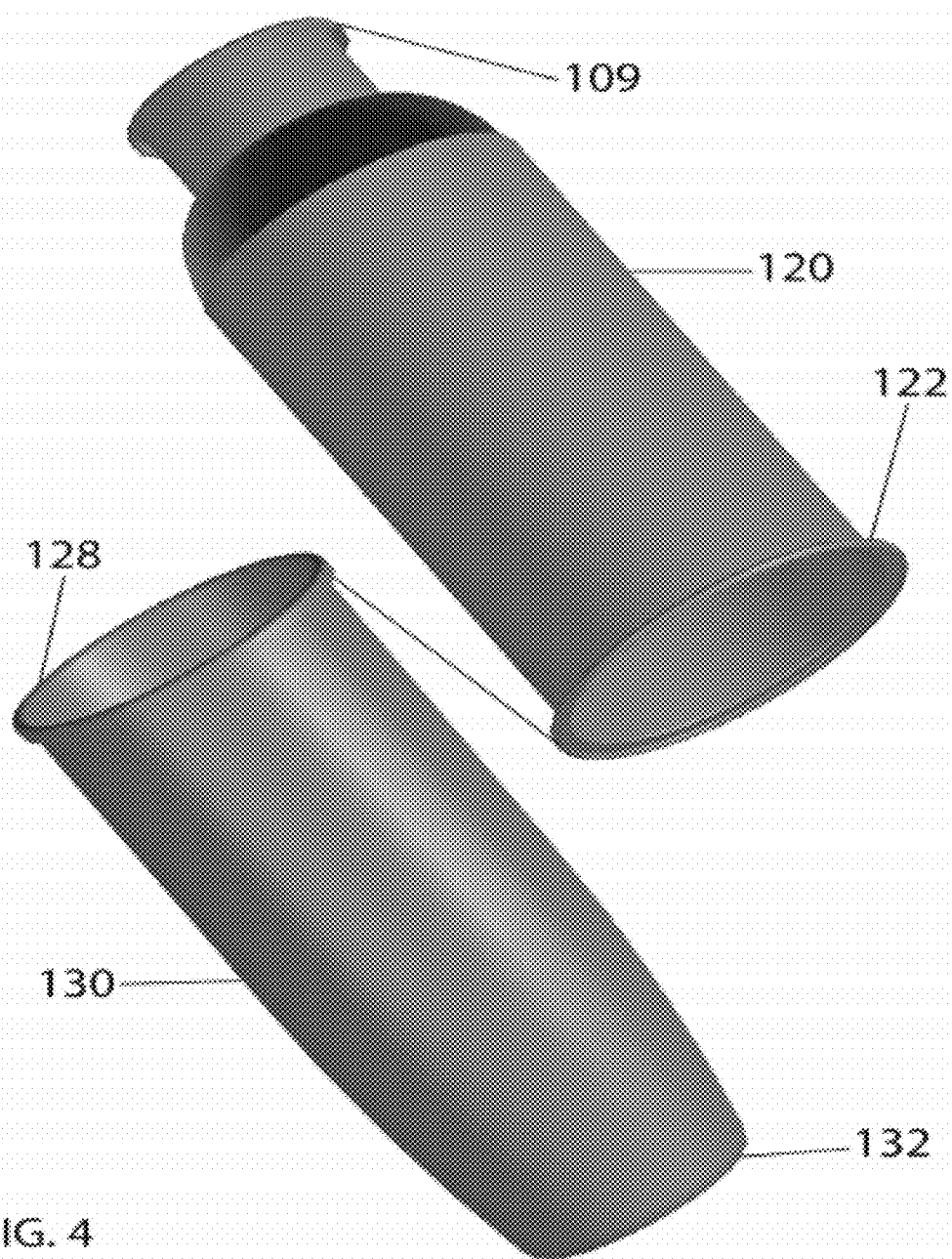


FIG. 3



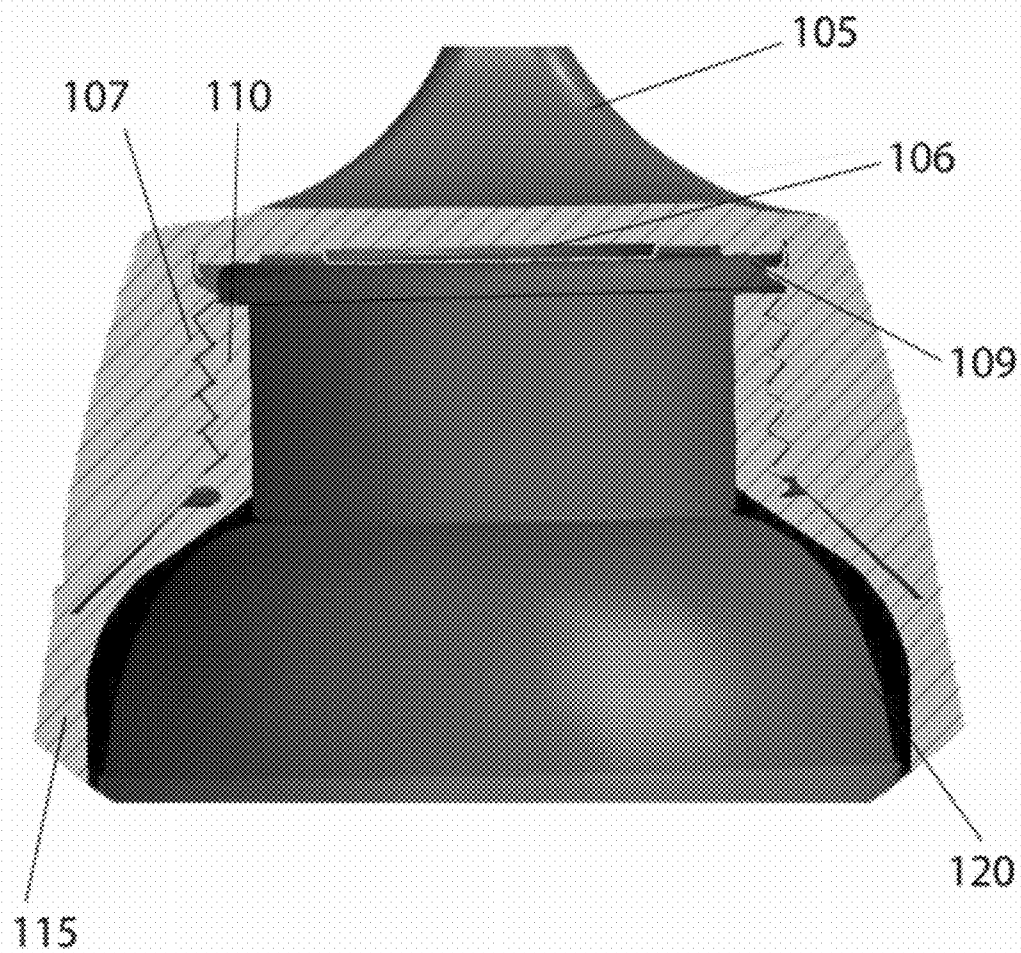
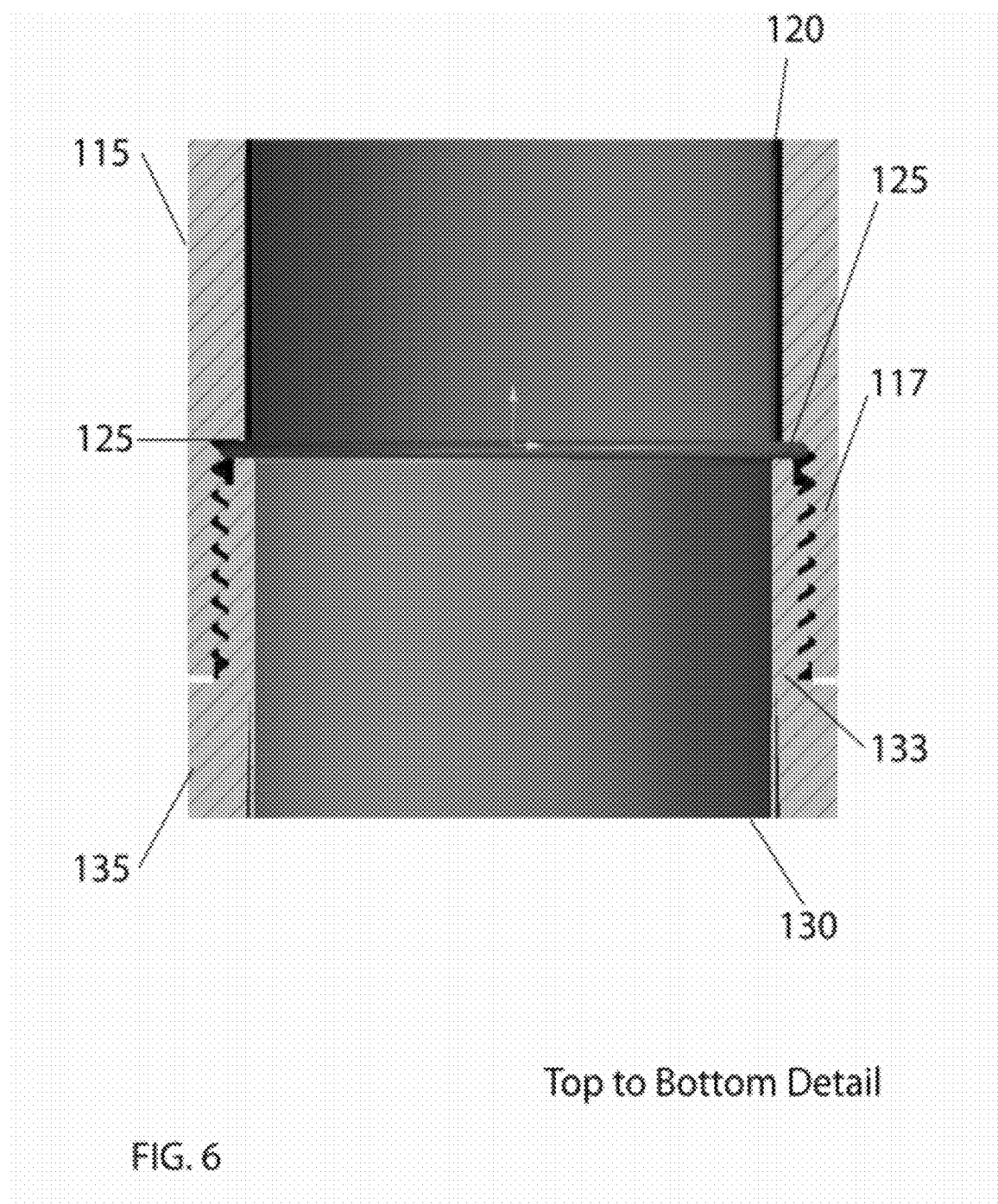


FIG. 5

Cap Detail



# **MULTI-PART THERMAL DISHWASHER COMPLIANT REUSABLE LIQUID DRINKING BOTTLE**

## **CROSS-REFERENCE TO RELATED APPLICATIONS**

**[0001]** This application claims priority under 35 U.S.C. §119(e) to provisional U.S. Patent Application No. 61/467,361, filed on Mar. 24, 2011, the disclosure of which is expressly incorporated by reference herein in its entirety.

## **BACKGROUND OF THE INVENTION**

**[0002]** 1. Technical Field

**[0003]** The invention is directed generally to a reusable liquid drinking bottle. Specifically, the invention is a multi-part, thermal reusable liquid drinking bottle that can be separated into multiple parts so that it can be easily cleaned by a user's personal physical actions, such as hand cleaning, or with mechanical methods, such as the top and bottom racks within residential and commercial automatic dishwashers.

**[0004]** 2. Background of the Invention

**[0005]** Reusable liquid drinking bottles, sometimes known as water bottles, are well known in the art. Exclusive of the open and closing cap, they are typically one piece, substantially cylindrical liquid containment vessels with flat bottoms and having a narrow funnel-shaped drinking spout that engages either a screw-on or pop-up cap. Many of these bottles are comprised of plastic-like material or metal. However, there are a number of problems with these bottles. For example, one cannot effectively clean inside a reusable-drinking bottle given the narrow drinking spout opening where the liquid exits for consumption. Furthermore, and even with top or bottom access to a bottle's inside, the depth and contour of the bottle makes its even more difficult to clean by manual or automatic efforts. This inability to clean inside of a reusable liquid drinking bottle allows dangerous residue, such as mold or bacteria, to grow and reside within the liquid containment vessel, with secondary exposure to the unwanted residual even after cleaning attempts.

**[0006]** Typically, users will attempt to clean the internal volume of a bottle using a bottlebrush, sponge or dishcloth, among other manual methods. However, these methods are unproductive, inefficient and unsanitary. Furthermore, broad surface cleaning devices such as sponges or scrubbing pads, propelled by the force of the human hand, cannot effectively reach the inner liquid containment vessel of the bottle, again due to the narrow drinking spout and/or the depth of the vessel. The inside lining of these bottles may also be damaged or deteriorated by repeat hand cleanings or originally made of potentially dangerous materials. Also, the hot water and soap cleaning action of an automatic dishwasher is impeded by the same restrictions to the internal volume as the manual means identified above.

**[0007]** An additional concern of many prior, and current, art plastic-like liquid drinking bottles is that they are made using Bisphenol A (BPA), and other harmful distillates. There is a concern among health care advocates that BPA, and other similar substances, may have detrimental effects on a person's health due to components of the substances leaching into the consumable liquid, sometimes accelerated by exposure to sunlight, heat, repeated handling and manipulation. Therefore, many health care advocates recommend that BPA, and other plastic-like materials, should be removed from

reusable liquid drinking bottles or alternatively, that the user should choose, although impractical, glass, or more appropriately high-quality metal liquid drinking bottles, therefore avoiding any malleable plastic-like materials for fear of components or particles thereof leaching into the consumable liquid. Many advocates believe the continued reuse, manipulating and cleaning of these bottles will make it easier for the BPA chemical, and other related plastic-like residuals, to be released into the liquid consumable, and ingested and absorbed by the user's body and is evidenced by the substantial marketing efforts of the status quo to advertise, promote and market "BPA Free", or words to that effect, reusable liquid drinking bottles.

**[0008]** There exists a need for a reusable liquid drinking bottle that is free of any potentially harmful chemicals, that is resistant to bacterial growth and other residue due to a feature set that allows the user to implement effective cleaning methods and is practical for primarily human use. Additionally, a liquid drinking bottle that is fully residential and commercial dishwasher safe (top and bottom rack) and easily cleanable by the user is desired and practical for every day and sport related use.

## **SUMMARY OF THE INVENTION**

**[0009]** Therefore, embodiments of the present invention to provide a drinking bottle with an upper and a lower portion that includes a plurality of separable sections. The separable sections may be horizontally aligned to horizontally separate sections or vertically aligned to vertically separate sections. The liquid drinking bottle body may have a drinking spout that is integral to the drinking bottle body upper and lower portions combined. The bottle is made of top and bottom rack residential and commercial dishwasher, and hand washable, safe materials.

**[0010]** Embodiments include a drinking bottle that has a top portion integrally attachable to an upper portion of the drinking bottle, commonly called a cap. The drinking bottle top may be removably integral to the drinking bottle. The drinking bottle may have a lower portion that is integrally and removably attachable to the drinking bottle upper portion. The upper portion of the drinking bottle may be comprised of an outer insulating component, combined with an inner liquid containment vessel section. Similarly, the bottom portion of the drinking bottle may be comprised of an outer insulating portion and inner liquid containment vessel section. Once the upper and lower portions of the drinking bottle are fully engaged, the outer insulating portions create an outer insulating shell around the inner liquid containment vessel. Furthermore, once the upper and lower portions of the drinking bottle are fully engaged, a leak proof liquid containment vessel is created.

**[0011]** Embodiments further include a reusable liquid drinking bottle having multiple sections that can be disengaged and re-engaged to allow for a liquid drinking bottle that can be taken apart, cleaned and put back together. In one embodiment, the liquid drinking bottle is comprised of a top, upper portion, and a bottom portion that are removably attachable to one another. In that embodiment, all three sections can be disengaged from one another and placed in a dishwasher or hand cleaned.

**[0012]** Other embodiments herein further include a reusable liquid drinking bottle having an upper inner liquid containment vessel and a lower inner liquid containment vessel comprised of stainless steel, or other high quality material



that is chemically inert or free of any potential to leach its components into the stored liquid. When the upper inner liquid containment vessel and the lower inner liquid containment vessel are fully engaged a leak proof liquid containment vessel is created. Therefore, once filled, the liquid only comes in contact with the stainless steel, or other safe material, within the liquid containment vessel's top. The stainless steel creates a liquid containment vessel that is resistant to dangerous residue such as mold, bacteria, etc. and is free from leaching issues from plastic-like materials as exemplified by BPA issues now commonly known to consumers and mentioned above.

[0013] Additional features, advantages, and embodiments of the invention may be set forth or apparent from consideration of the following detailed description, drawings, and claims. Moreover, it is to be understood that both the foregoing summary of the invention and following summary of the invention and the following detailed description are exemplary and intended to provide further explanation without limiting the scope of the invention as claimed.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The accompanying drawings, which are included to provide a further understanding of the invention, are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the detailed description serve to explain the principle of the invention. No attempt is made to show structural details of the invention in more detail than may be necessary for a fundamental understanding of the invention and the various ways in which it may be practiced. In the drawings:

[0015] FIG. 1 illustrates an expanded view of the multi-part thermal dishwasher compliant reusable liquid drinking bottle according to an embodiment of the invention;

[0016] FIG. 2 illustrates an exploded view of the multi-part thermal dishwasher compliant reusable liquid drinking bottle according to an embodiment of the invention;

[0017] FIG. 3 illustrates the upper and lower outer thermal portions of the multi-part thermal dishwasher compliant reusable liquid drinking bottle according to an embodiment of the invention;

[0018] FIG. 4 illustrates the upper and lower inner liquid containment portions of the multi-part thermal dishwasher compliant reusable liquid drinking bottle according to an embodiment of the invention;

[0019] FIG. 5 illustrates an example of the bottle top, or cap, attached to the multi-part thermal dishwasher compliant reusable liquid drinking bottle according to an embodiment of the invention;

[0020] FIG. 6 illustrate components of the upper and lower portions of the multi-part thermal dishwasher compliant reusable liquid drinking bottle according to an embodiment of the invention.

#### DETAILED DESCRIPTION

[0021] Embodiments of the invention and the various features and novel details thereof are explained more fully with reference to the non-limiting embodiments and examples that are described and/or illustrated in the accompanying drawings and details in the following description. It should be noted that the features illustrated in the drawings are not necessarily drawn to scale, and features of one embodiment may be employed with other embodiments, as the skilled

artisan would recognize, even if not explicitly stated herein. The examples and embodiments disclosed herein are intended merely to facilitate and understanding of ways in which the invention may be practiced and to further enable those of skill in the art to practice the embodiments of the invention, which is defined solely by the appended claims and applicable law. Moreover, it is noted that like reference numerals represent similar parts throughout the several views of the drawings.

[0022] FIG. 1 shows an expanded view of the multi-part thermal dishwasher compliant reusable liquid drinking bottle (drinking bottle) 100. The drinking bottle 100 contains several components that are discussed in further detail below. For example, when in ordinary use, liquid is sealed in the drinking bottle with the top (also known as "cap") 105. This seal is accomplished with an "O" ring or gasket 108 and in tandem with a cap insert 106 made of the same, or similar, material to the inner liquid vessels 120 and 130 to create a vacuum seal whereby the liquid is also never in contact with the material that makes up the outer layers. A drinking spout 110 typically narrower than the upper portion of the bottle itself is provided for consumption of the stored liquid. An outer upper insulating sleeve 115 surrounds an upper liquid containment vessel 120. A lower edge 122 of the upper liquid containment vessel 120 engages "O" ring or gasket 125 and along an upper edge 128 of the lower liquid containment vessel 130. Surrounding the lower liquid containment vessel 130 is the lower insulating sleeve 135. The lower insulating sleeve 135 has a flat bottom 140 upon which the drinking bottle rests when placed vertically on a flat surface. Along the flat base 140 of the lower insulating sleeve 135 is an affixed flexible expansion point 145 for the insulating sleeve 135 responsive to temperature variations due to liquids in the lower inner liquid containment vessel 130 and extended via thermal conductivity to 115 and 120.

[0023] FIG. 2 illustrates an exploded view of the multi-part thermal dishwasher compliant reusable liquid drinking bottle. For example, as shown in the illustration an outer insulating sleeve 115 can encapsulate the upper portion of the liquid containment vessel 120. In an embodiment, the upper portion of the liquid containment vessel 120 may be comprised of stainless steel. The stainless steel liquid containment vessel 120 is formed of a seamless contiguous cylindrical tube of steel that tapers off into a significantly narrower drinking spout 110 at the top of the vessel 120. Note, the drinking spout 110 is manufactured using a roll over edge manufacturing process to create a roll over edge 109 that facilitates contact with the "O" rings or gasket 106 and to facilitate a liquid drinking bottle where the user's lips, or any other part of their mouth, only touches the stainless steel roll over edge 109 of the liquid containment vessel 120. In an embodiment, the stainless steel containment vessels 120 and 130 are spun manufactured as a single piece of steel. This means that no welding or other materials are used in the making of liquid containment vessels 120 and 130. The spun manufacturing process further allows for the liquid containment vessels 120 and 130 to have a contiguous design that no surfaces for mold, mildew, bacteria, dirt or debris to build up.

[0024] FIGS. 2 and 4 illustrate the lower portion of liquid containment vessel 120 is open and with a flared flange 122 around the edges for engagement with both a "O" ring or gasket 125 and a top edge 128 of the lower liquid containment vessel 130. In an embodiment, the "O" ring or gaskets 108 and 125 are comprised of pure, medical grade silicon. The silicon

of the “O” rings **108** and **125** along with the stainless steel of the containment vessels **120**, **130** and the stainless steel cap insert **106** are the only materials on the bottle that comes into contact with the consumable liquids stored in the containment vessels **120**, **130**. Although the embodiment discloses the upper portion of the liquid containment vessel **120** being comprised of one continuous portion stainless steel, in other embodiments the upper portion of the liquid containment vessel **120** may comprised of other materials such as a non-toxic plastic material, bamboo, hemp, etc.

**[0025]** The lower portion of the liquid containment vessel **130** is illustrated in FIGS. **2** and **4**. The lower portion of the liquid containment vessel **130** includes a narrow cylinder tube with a large opening at the top and a flat bottom **132** along the bottom of the container. As described above, in an embodiment, the stainless steel containment vessels **120** and **130** are spun manufactured as a single piece of steel. The liquid containment vessel **130** has a smooth contiguous surface that also has no crevices, creases, etc for mold, mildew, bacteria, dirt or other debris to build up. The upper opening edge of the lower liquid containment vessel **130** is also flared along its top edge **128**, for engaging and compressing both an “O” ring or gasket **125** and a lower edge **122** of the upper liquid containment vessel **120**. In an embodiment, the “O” ring or gasket **125** is comprised of pure, medical grade silicon. This design allows the upper **120** and lower **130** portions of the liquid containment vessel to be detachable from each other for cleaning. However the combination of the gasket **125** and the lower edge **122** of the upper liquid containment vessel engaging and compressing against the upper edge **128** of the lower liquid containment vessel creates a leak proof sealed containment vessel that can easily be taken apart for cleaning.

**[0026]** The upper **115** and lower **135** insulating sleeves enable the upper **120** and lower **130** portions of the liquid containment vessels to be connected together as illustrated in FIGS. **2**, **3** and **6**. The upper **115** and lower **135** insulating sleeves may be comprised of high-heat resistant nylon or polycarbonate outer shells, which are similar to materials used in cooking utensils. For example, FIGS. **2** and **3** illustrates the upper insulating sleeve **115** encapsulates the upper liquid containment vessel **120** and is substantially the same shape of as the liquid containment vessel **120**, but scaled a bit larger. The upper insulating sleeve **115** further includes threading **117** along its bottom edge for engaging treading along an upper edge of the lower insulating sleeve **135**.

**[0027]** Similarly the lower insulating sleeve **135** illustrated in FIGS. **2** and **3** is substantially the same shape as the lower liquid containment vessel **130** but a scaled a bit larger. Similar to the upper insulating sleeve **115**, the lower insulating sleeve **135** has an outer threaded portion **133**. The outer threaded portion **133** is designed to engage threading **117** along the bottom edge of the upper insulating sleeve **115**. Along the base **140** of the lower insulating sleeve **135**, a thermal expansion point **145** can be found. The thermal expansion point may be comprised of a silicon “pug” that fills a small opening **145** in the base **140** of the lower insulating sleeve **135**. The thermal expansion point **145** aids in accommodating for the difference in size among the steel liquid containment vessel **130** and the outer insulating sleeve **135** when exposed to varying temperatures associated with the contained liquid and ambient temperatures.

**[0028]** FIG. **6** illustrates the connected engagement of the upper **115** and lower **135** insulating sleeves. Once the upper and lower insulating sleeves are engaged or screwed together,

the upper **120** and lower **130** liquid containment vessels is able to create a leak proof seal with the aid of the “O” ring gasket **125** that is force compressed between a lower edge **122** of upper liquid containment vessel **120** and an upper edge **128** of the lower liquid containment vessel **130**. Once the upper **115** and lower **135** insulating sleeves are screwed together, the force of the compression of the “O” ring or gasket **125** creates a leak proof seal between the upper and lower portions of the of the drinking bottle.

**[0029]** The insulating sleeves **115** and **130** shown in FIGS. **1-3**, may be comprised of high-heat nylon polycarbonate, plastic, glass, metal or some other material and may encapsulate the drinking vessels **120** and **130** by being heat fused or glued in order to create a seal about its edges. In an embodiment the upper **115** and lower **135** insulating sleeves are thermal (vacuum) sealed relative the to the upper **120** and lower **130** liquid containment vessels to reduce heat transfer between the liquid containment vessel an the ambient environment or the user’s hands. Although the connecting threads are shown on an inner portion of the upper inner insulating sleeve **117** they may also be placed along an outer portion of the lower insulating sleeve with corresponding treading **133** on inner portion of the lower insulating sleeve **135**.

**[0030]** The drinking bottle is sealed using a top or cap **105** as illustrated in FIGS. **1** and **5**. The top **105** has a threaded inner portion **107**. An outer edge of the upper outer insulating sleeve **115** is treaded **110** along exterior portion for engaging the drinking bottle top **105**. The bottle top **105** may further include a silicon “O” ring or gasket **125** for to create a leak proof seal on the between the top and the bottle. The bottle top **105** may includes a hoop opening **102** for engagement with a faster for transport. In another embodiment the bottle top **105** may be tethered to the bottle. Still in other embodiments the bottle top **105** may be a pop up drinking cap that securely screws onto the bottle. In still another embodiment, the bottle top **105** may be a flip top that screws on to the drinking bottle **100** and having a lid that seals tightly onto the bottle. In fact the bottle top **105** may be any bottle top that securely fastens on the drinking bottle **100** to seal it, while allowing the user to easily access the liquid contained therein. In another embodiment, a vacuum seal cap insert **106**, may be employed atop the drinking spout **110** and resting atop a roll over edge **109** of the drinking spout and an “O” ring or gasket **108**. The cap insert **106** is comprised on surgical grade stainless steel and further prevents the consumed liquids from coming into contact with any material other than stainless steel and silicon. This would allow liquids to be vacuum-sealed in their containers to allow the liquids to maintain their temperatures longer and while reducing the likelihood of growth of mold or bacteria in the bottle.

**[0031]** Therefore, the drinking bottle **100** is designed such that the liquids never actually come into contact with the outer insulating sleeves of the bottle. In an exemplarily embodiment, the inner liquid containment vessel **120**, **130** is made of stainless steel and the lip of the containment vessel is designed such that the roll over edge **109** of the upper portion of the liquid containment vessel **120** covers the top of the thread drinking spout **110** edge the upper insulating sleeve **115**. Therefore, when a user drinks from the drinking bottle **100**, the liquid in the bottle only come into contact with the liquid containment vessel **120** and **130**, the bottle top **105** stainless seal insert **106** and the user’s mouth. Thus, if there are any harmful chemicals used to manufacture the outer insulating sleeves **115** and **135** of the drinking bottle **100**, they

do not come into direct contact with the liquids stored in the bottle **100** and consumed by the user.

**[0032]** In an exemplary embodiment, the insulating sleeves **115** and **135** are formed using high heat nylon polycarbonates, fixed over the inner stainless steel containment vessel components **120** and **130**, along with a thermal equalization feature, which allows for use with liquids that are hot (up to 50 degrees Fahrenheit below the boiling point of tap water) to cold (up to 10 degrees Fahrenheit above the freezing point of tap water). However, other high-impact, heat-resistant plastics, glass, metal, bamboo, hemp, etc. materials and manufacturing processes may also be used. Similarly these materials and manufacturing process may be used to manufacturing the inner liquid containment vessel portions **120** and **130**. In an exemplary embodiment, however, the inner liquid containment vessels **120** and **130** are formed from surgical grade stainless steel using spun steel processes. In an embodiment, the containment vessels **120**, **130** are manufactured using the highest quality, non-welded (spun manufacturing) stainless steel (18/8 minimum) during normal use. The “O” rings or gaskets **108**, **125** may be any rubber, plastic, or other waterproof malleable material. However, in the exemplary embodiment, the “O” ring or gasket **108**, **125** is a surgical grade silicone material. In another exemplary embodiment, the outer upper **115** and lower **135** insulating sleeves are vacuum fused and sealed with the upper **120** and lower **130** portions to create vacuum chambers between outer upper **115** and outer lower **135** insulating sleeves along with the corresponding components of the liquid containment vessel **120** and **130** respectively. In an embodiment, the aspect ratio of the drinking bottle can be anywhere from 1×1 to 1×14. In other words, it can be tall and thin, or short and fat. In still another embodiment, the drinking bottle’s **100** capacity can be anywhere from 1 to 5000 milliliters.

**[0033]** When the components of the drinking bottle **100** are separated, they may be hand washed. Alternatively, the separate components of the drinking bottle **100** may be machined washed in a dishwasher. The components of the drinking bottle **100** are fully dishwasher compatible on both the top and bottom racks.

**[0034]** While the invention has been described in terms of exemplary embodiment, those skilled in the art will recognize that the invention can be practiced with modifications in the spirit and scope of the appended claims. These examples given above are merely illustrative and are not meant to be an exhaustive list of all possible designs, embodiments, application or modifications of the invention.

We claim:

1. A multi-part thermal dishwasher compliant reusable liquid drinking bottle comprising:

a substantially cylindrical drinking bottle with two or more separable sections that may be horizontally and or vertically aligned to create a sealable liquid containment vessel for storing liquids which may be consumed by a user.

2. A drinking bottle according to claim 1, wherein the two or more separable sections comprise a top portion of the sealable liquid containment vessel.

3. A drinking bottle according to claim 2, wherein the upper top portion of the sealable liquid containment vessel is encased in an outer insulating sleeve.

4. The drinking bottle according to claim 3, wherein said upper portion of the outer insulating sleeve is vacuum-sealed with the top portion of the sealable liquid containment vessel.

5. The drinking bottle according to claim 3, wherein said top portion of the outer insulating sleeve contains a closable drinking spout for receiving a connectable drinking cap.

6. A drinking bottle according to claim 1, wherein the two or more separable sections comprise a lower portion of the sealable liquid containment vessel.

7. A drinking bottle according to claim 6, wherein the lower portion of the sealable liquid containment vessel is encased in a lower portion of an outer insulating sleeve.

8. The drinking bottle according to claim 7, wherein said lower portion of the outer insulating sleeve is vacuum-sealed with the lower portion of the sealable liquid containment vessel.

9. The drinking bottle according to claim 1, wherein said sealable liquid containment vessel this is formed such that a top portion of the sealable liquid containment vessel and a separable lower portion of the sealable liquid containment vessel engage to form a leak proof liquid containment vessel of stainless steel and wherein the top portion of the sealable liquid containment vessel has an edge lip protruding from a drinking spout such that any liquids stored in the liquid containment vessel only contact the liquid containment vessel, a drinking bottle cap and a drinking bottle user.

10. The drinking bottle having a plurality of separable sections comprising:

substantially cylindrical sections that may be horizontally aligned to create vertically separable sections, wherein the upper portion is integral to with the drinking bottle spout;

a detachable bottom portion have a flat bottom is capable of engaging said upper portion to create a liquid containment vessel; and

a detachable bottle cap for engaging the drinking bottle spout.

11. The drinking bottle according to claim 10, wherein the bottle is made of materials that are dishwasher safe and hand washing safe.

12. The drinking bottle according to claim 10, wherein the upper portion is encased in a top portion of a separable outer insulating sleeve.

13. The drinking bottle according to claim 10, wherein the bottom portion is encased in a lower portion of a separable outer insulating sleeve.

14. The drinking bottle according to claim 10, wherein said upper and lower portions are comprised of stainless steel, nylon polycarbonate, bamboo, hemp, BPA-free plastic, or polymer materials.

15. A washable drinking bottle comprised of dishwasher safe and hand washing safe materials that can be washed by hand or by utilizing a dishwasher, comprising:

a drinking bottle body with a top and a bottom that includes a plurality of separable sections;

said separable sections can be horizontally aligned to horizontally separate said sections or vertically aligned to vertically separate said sections, said drinking bottle body has two separable sections that are of equal size and dimensions;

a top portion that is integral with said drinking bottle body top; and

a bottom portion that is integral with said drinking bottle body bottom.

16. The bottle according to claim 15, wherein said top portion can be removably integral.

17. The bottle according to claim 15, wherein said bottom portion can be removably integral.

**18.** The bottle according to claim **15**, wherein said bottle is comprised of stainless steel, nylon polycarbonate, bamboo, hemp, BPA-free plastic, or polymer materials.

**19.** The bottle according to claim **15**, wherein said top portion comprises an upper stainless steel liquid containment vessel encased in a nylon polycarbonate, plastic or glass insulating layer.

**20.** The bottle according to claim **15**, wherein said bottom portion comprises a lower stainless steel liquid containment vessel encased in a nylon polycarbonate, plastic or glass insulating layer.

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