(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
6 December 2007 (06.12.2007)

PCT

(10) International Publication Number
WO 2007/139906 A2

(51) International Patent Classification:
B65D 6/00 (2006.01)

(21) International Application Number:
PCT/US2007/012428

(22) International Filing Date: 25 May 2007 (25.05.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/809,141 25 May 2006 (25.05.2006) US

(71) Applicant *(for all designated States except US)*: **WASATCH ICE WATER, LLC** [US/US]; P.O. Box 4654, Park City, UT 84060 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **BINKS, Craig, C.** [US/US]; P.O. Box 4654, Park City, UT 84060 (US). **SASSER, Robert, L.** [US/US]; P.O. Box 4654, Park City, UT 84060 (US).

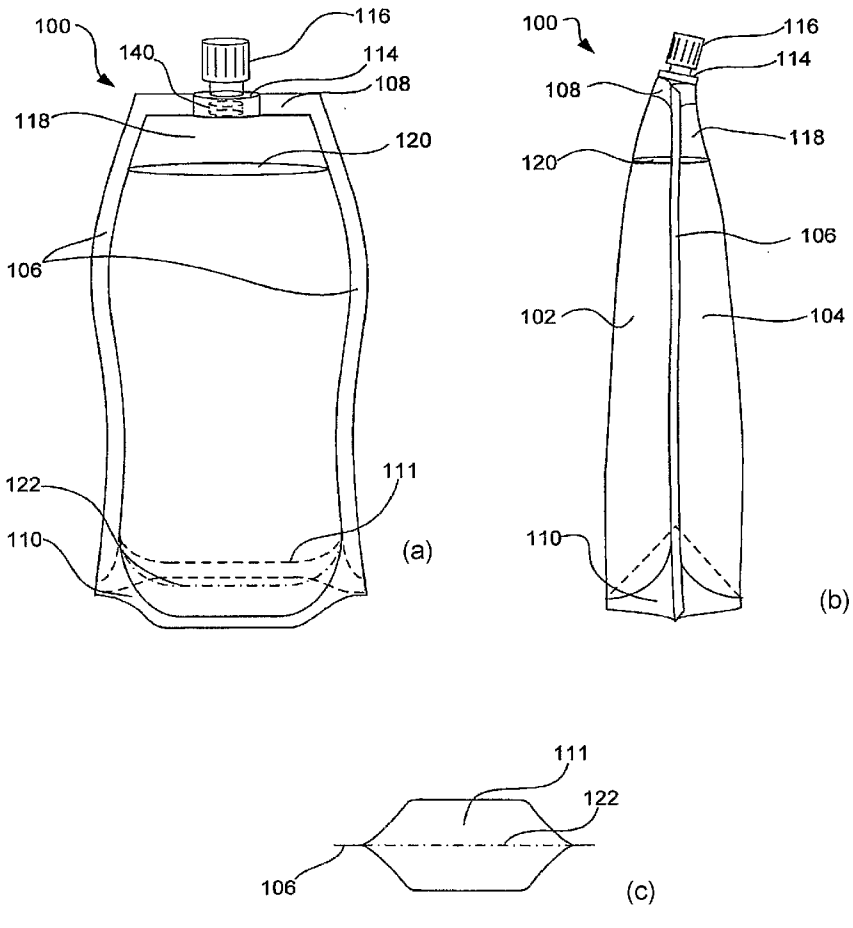
(74) Agents: **JONES, Jason, R.** et al.; THORPE NORTH & WESTERN, LLP, P.O. Box 1219, Sandy, UT 84091-1219 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: FLEXIBLE BEVERAGE CONTAINER



(57) Abstract: A beverage container 100 includes a pair of flexible sidewalls 102, 104 defining therebetween a pouch area 216 for containing a beverage 120. The flexible sidewalls are comprised of a material having at least two material layers coupled to, or integrated with, one another. The layers include at least an outer layer 130 comprised of an outer barrier material and an inner layer 138 including an inner barrier material. The inner barrier material is operable to be exposed to the beverage contained in the pouch area while resisting migration of contaminants through the sidewalls and into the beverage.

WO 2007/139906 A2

European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Flexible Beverage Container

Priority Claim

This application claims benefit of copending U.S. Provisional Patent Application Serial No. 60/809,141, filed May 25, 2006, which is hereby incorporated herein in its entirety.

Background of the Invention

Field of the Invention

The present invention relates generally to beverage containers for use in containing and dispensing fluids such as water, juice and the like. More particularly, the present invention relates to a collapsible beverage container well suited for containing and dispensing drinking water.

Related Art

Plastic beverage containers are widely used as a means for containing water, carbonated beverages, alcohol, juices, and a variety of other beverage substances. Plastic containers have replaced glass containers for many commercial and residential purposes because they are generally lighter in weight and more shatter-resistant than are many glass containers. One material commonly used in plastic beverage containers, polyethylene terephthalate (PET), has been found to provide enhanced clarity, recyclability, and ease of manufacture at a competitive price.

While the use of plastic for beverage bottles has proved commercially viable, the widespread use of plastic beverage bottles has resulted in a large volume of waste that must be recycled, treated in a land fill, incinerated, or otherwise managed after use of the bottles. Semi-rigid or "firm" plastic containers made of PET, such as carbonated beverage containers, generally occupy the same volumetric space whether empty or full, and are often not easily compressed after use. Even when partially compressed, these bottles do not easily collapse completely, resulting in a large, empty volume within the plastic containers that consumes unnecessary space when the container is discarded.

In addition, many conventional beverage bottles must be shipped empty to a filling facility where the bottles are filled with the beverage. As such, the bottles often must be cleaned at the filling facility, and rinsed thoroughly to ensure that all cleaning materials/chemicals are removed from the bottles, prior to filling the bottles with the beverage. Also, in many cases, these beverage containers must be labeled after filling (or

very shortly before filling), in a facility separate from the one in which the containers were manufactured.

Also, when drinking water is provided to consumers in beverage containers, issues with transparency of packaging, and taste migration from the packaging to the beverage (water) being contained, are greatly enhanced in comparison to other beverages. For example, many juices and sports drinks exhibit a sufficiently robust color that packages that are meant to be transparent may not need to be perfectly transparent, as the juice or other drink is not itself transparent and thereby masks imperfections in the packaging. Also, juices and sports drinks generally exhibit a sufficiently robust taste such that migration of minor amounts of taste from the packaging into the juice or sports drink may not be detectable by most consumers. However, due to the exceptional clarity and subtle taste of drinking water, even the slightest cloudiness present in packaging, or the slightest migration of taste from packaging, can generally be detected by most consumers, and can leave them with a negative impression of the product.

Summary of the Invention

The invention provides a beverage container, including a pair of flexible sidewalls defining therebetween a pouch area for containing a beverage. The flexible sidewalls can be comprised of a material having at least two material layers coupled to, or integrated with, one another. The layers can include at least an outer layer comprised of an outer barrier material; and an inner layer including an inner barrier material. The inner barrier material can be operable to be exposed to the beverage contained in the pouch area while resisting migration of contaminants through the sidewalls and into the beverage.

In accordance with another aspect of the invention, a beverage container is provided, including a pair of flexible sidewalls defining therebetween a pouch area for containing a beverage. A valving assembly can be coupled between edges of the sidewalls and can be operable to allow flow of the beverage from the pouch area while resisting flow of fluid into the pouch area. The valving assembly can include a membrane having at least one slit formed therein. The membrane can have a curvature that causes the slit to open when subject to flow of beverage from the pouch area and causes the slit to close when subject to flow of fluid into the pouch area.

In accordance with another aspect of the invention, a collapsible beverage container is provided, including a pair of flexible sidewalls defining therebetween a

pouch area for containing a beverage. A valving assembly can be installed between the sidewalls adjacent a top of the beverage container. A pair of side seams can extend generally upwardly along side edges of the container. A bottom gusset frame can be expandable when the container is filled with at least some of the beverage to provide a stable support for the beverage container such that the container is substantially free-standing when at least partially filled with the beverage.

In accordance with another aspect of the invention, a collapsible beverage container suitable for containing and dispensing drinking water is provided, including a pair of flexible sidewalls defining therebetween a pouch area for containing drinking water. A valving assembly can be coupled between edges of the sidewalls and can be operable to allow flow of the drinking water from the pouch area while resisting flow of fluid into the pouch area. A bottom gusset frame can be expandable when the container is filled with at least some of the drinking water to provide a stable support for the beverage container such that the container is substantially free-standing when at least partially filled with the drinking water. The container can be operable to collapse as water is removed from the pouch area and to retain its collapsed configuration such that a volume of the pouch area is constantly and automatically reduced as the drinking water is expelled from the pouch area.

Additional features and advantages of the invention will be apparent from the detailed description which follows, taken in conjunction with the accompanying drawings, which together illustrate, by way of example, features of the invention.

Brief Description of the Drawings

FIG. 1A is a front view of a flexible beverage container containing a liquid in accordance with an embodiment of the invention;

FIG. 1B is a side view of the container of FIG 1A;

FIG. 1C is a bottom view of the container of FIG. 1A;

FIG. 2 is a front view of an unfilled (or empty) flexible beverage container in accordance with an embodiment of the invention;

FIG. 3 illustrates a series of flexible beverage containers, shown in varying degrees of filled or unfilled conditions;

FIG. 4 is a cross-sectional view of a layer of material used to form a flexible beverage container in accordance with an embodiment of the invention;

FIG. 5 is a schematic, partially sectioned side view of a portion of a valving assembly in accordance with an embodiment of the invention (a membrane portion is shown as sectioned);

FIG. 6A is a top view of the membrane of the portion of the valving assembly of FIG. 5; and

FIG. 6B is a top view of the membrane portion of FIG. 6A, shown with another slit configuration.

Detailed Description

As used herein, the terms "top," "bottom," "sides," and the like are used to aid in describing the various features of the invention in easily understandable terms. It is to be understood, however, that such terms in no may limit the present invention. For example, while a valving structure may be described and claimed herein as being located at a "top" of the beverage container, a container having valving structure operably similar to the presently claimed invention would be considered as infringing the claimed invention, even if the infringing container had valving structured located in what would be considered a side of that container.

When discussing the beverage containers of the present invention, one or more side, top, bottom, end, etc., walls may be referenced. It is to be understood that each of the various distinct walls can be formed from a single piece of material folded, crimped, sealed, or otherwise manipulated to form the various walls. Thus, while multiple walls may be referenced, the walls can be formed from an integral piece of material. Of course, each of the walls can also be formed from distinct pieces of materials as well.

Various abbreviations are used herein to identify various material types. One of ordinary skill in the relevant art will readily understand the abbreviations used. For the sake of clarity, however, some of the abbreviations used herein are accorded the following meanings: LLDPE refers to linear low density polyethylene; EVOH refers to ethylene vinyl alcohol; LDPE refers to low density polyethylene; EVOH refers to ethylene vinyl alcohol; PE refers to polyethylene; and PP refers to polypropylene; PP refers to polypropylene. It is to be understood that, while various materials may be listed independently in the claims, the invention can include combinations of those listed as well as known variants thereof.

Reference will now be made to the exemplary embodiments illustrated in the drawings, and specific language will be used herein to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended. Alterations and further modifications of the inventive features illustrated herein, and additional applications of the principles of the inventions as illustrated herein, which would occur to one skilled in the relevant art and having possession of this disclosure, are to be considered within the scope of the invention.

As illustrated in FIGs. 1A-1C, a stand-alone flexible beverage container, indicated generally at 100, in accordance with the present invention is shown for containing a beverage illustratively indicated at 120. The container can be formed of two sheets of flexible material: a front sheet 104 and a rear sheet 102. While the front and rear sheets are shown in the figures as two distinct sheets of material, it is to be understood that the two sheets can be formed from, or can form a part of, a single sheet of material folded or otherwise manipulated to form a pouch 118.

Two generally vertical side seams 106 can be formed by joining the edges of the flexible sheets in a substantially inseparable manner. The flexible sheets can be cut, punched or otherwise dimensioned to form a substantially rectangular shape. A top seam 108 can be formed by further joining the top edged of the flexible or plastic sheets to form a seam. This top seam can include an opening for a closable valve 114. The closable valve can further include a cap 116. The closable valve and cap can be similar in many aspects to the valve, cap and "boat" assembly shown in U.S. Patent No. 6,273,307, which is hereby incorporated herein by reference to the extent it is pertinent hereto, but not to the extent it is inconsistent herewith.

Between the sheets of flexible material 102, 104, and further enclosed by the seams 106, 108 and valve 114, a pouch (or pouch area) 118 can be defined for containing a beverage. The combination of seams can provide sufficient structural support to enable the container/pouch to be freestanding through a range of filled conditions. For example, the container can be freestanding when the pouch is substantially filled with a beverage; it can be freestanding when the pouch is only partially filled with a beverage; and can also be freestanding when the pouch is voided of the beverage. In this manner, the present invention provides a container that can be sufficiently flexible so as to be relatively easily compacted when empty, and yet be capable of freestanding when placed on a shelf or other surface when offered for sale. As presenting such beverages for sale in an orderly

manner is a significant consideration for vendors, the present invention allows single units of beverages packaged in flexible containers to be presented for sale without undue risk that the containers will tip over under normal storage conditions.

FIG. 3 includes a series of photographs of a container in accordance with the present invention: shown at 300 in a substantially filled configuration; at 310 in a substantially empty configuration and at least partially collapsed; and at 320 in an empty configuration and rolled into a compacted configuration to minimize the volume of the container that is consumed when discarding the container.

The vertical seams 106 can overlap a bottom seam 110 in order to form a bottom support structure, or a gusset frame. In the present embodiment of the invention, a supporting bottom 111 can be joined to the two vertical sheets 102 and 104, to form the bottom seam. The supporting bottom can be in the shape of an elongated hexagon with a fold line 122 longitudinally bisecting the hexagon, as shown in FIG. 1C. The supporting bottom 111 with the elongated hexagonal shape can be joined to the two vertical sheets in an inverted-V fashion, as best shown in FIG. 1B. In this manner, the bottom seam can provide good structural support to the sides, balancing the container 100 and providing stability to the base. When the container is filled with a beverage 120, the volume of the pouch 118 can increase, narrowing the base width and increasing the base depth. In this manner, a full container can expand the base to give maximum vertical support to the container to provide freestanding capabilities to the container. As the liquid is dispensed from the container (and thus the weight on the bottom seam is reduced), the supporting bottom can reduce in width accordingly. The elongated hexagon-shaped supporting bottom joined in an inverted-V fashion can facilitate ease of collapsibility of the container as the beverage in the container is emptied.

In one aspect of the invention, the closable valve 114 can be a unidirectional (e.g., "one-way") valve in order to prevent air or other fluids from flowing into the container 100 as the container is emptied. In this manner, as the beverage is emptied or dispensed from the container, the supporting bottom or gusset frame is pulled inward along the fold line 122 by way of the vacuum created in the container as the beverage in emptied. The container can thus automatically collapse during the process of emptying the beverage from the container. The one-way valve also serves to restrict or prevent contaminants from entering the beverage container, either as the beverage is dispensed from the container, or prior to the container being filled with the beverage.

As previously discussed, a large volume of waste can be produced by conventional empty beverage containers that retain their shape after use. By incorporating a one-way valve within the present container, a vacuum can be created inside the pouch 118 as it is emptied, which can cause the container to collapse to a small volume while it is emptied. Thus, once the container is emptied, no further manipulation of the container is necessary to collapse or compress the container prior to disposal. Accordingly, the present a container has a less negative impact on the environment due to its low volumetric waste.

The closable valve 114 can be associated with or bonded to the top seam 108 in a variety of manners. The valve may be part of a fitment that includes a valve, or other sealed valve configurations that will be practical for use with the container. The top seam can be joined to the closable valve using a variety of means, including heat sealing, use of adhesives, plastic welding, etc.

In one aspect of the invention, the flexible sheets 102, 104 and supporting bottom 111, can include multiple layers of material coupled or joined to form a single sheet of flexible material. Currently, a large variety of suitable flexible materials are available in the art to produce multilayered flexible sheets for various purposes. The choice of plastics used in the present invention will vary depending upon the type of beverage contained, the environment in which the containers will be stored, shipped, used, etc. Other considerations that may affect the choice of materials include: reaction tendencies with various adhesives, odor, thickness, material strength, color, clarity, and a variety of other factors. Multiple layers of differing material can be combined to include two or more plastics each having a desired attribute. For example, a strong plastic may be layered with a plastic that has a desired adhesive quality for receiving ink and other printed decorations.

Typical materials that can be used as layers to create a flexible sheet of plastic include, without limitation, PET, nylon, and Cast Nylon. Typical sealants may include EVOH and EVOH Coex. The corresponding thicknesses for each layer may vary according to their respective combinations. In one embodiment a multiple layered flexible plastic can include a layer of PET joined to a layer of nylon. These layers can be joined by a sealant including, without limitation, EVOH or EVOH Coex sealant. In one embodiment, a multiple layered flexible plastic can include multiple layers of PET joined

by an EVOH or EVOH Coex sealant. The manner of joining the various layers can also vary, and can include, without limitation, lamination, adhesives, plastic welding, etc.

While the present container can be used for a variety of beverages, in one embodiment it is particularly well suited for use as a container for drinking water. Packaging of drinking water in containers generally presents difficulties not often associated with packaging of other beverages such as sports drinks, fruit juices, etc. This is at least in part due the fact that the presence of materials that alter the taste, sight and smell of a beverage can be much more easily detected in drinking water than in other types of beverages that can "mask" the presence of such contaminants.

It has been found that the problem of contaminating drinking water with matter from the packaging of the container can be greatly exacerbated by heat. That is, when containers storing drinking water are exposed to relatively high degrees of heat, the migration of taste- or appearance-altering matter from packaging materials can be greatly increased. Various embodiments of the present invention have been found to maintain drinking water in an un-contaminated in temperatures approaching the melting point of the packaging materials.

As illustrated in FIG. 4, in one aspect of the invention, the material used to form the present container can include multiple layers of materials. In one embodiment, the outer layer 130 of the material can be formed from about .48 ga. PET which can provide toughness and clarity to the outside layer of the material. A second layer 132 can be formed of .75 ga. nylon and can serve as a barrier to outside flavors entering the beverage. A third layer 134 can consist of printing ink displaying information such as product name, logo, nutritional information, manufacturer's contact information, etc. A fourth layer 136 can be a relatively thin layer of adhesive. An innermost (e.g., the layer in contact with the beverage), fifth layer 138 can be 5.25 EVOH (co-extruded) that can stop flavors from the ink from entering the beverage. While not so limited, an overall thickness of the material can be from about 5.5 mils to about 6 mils.

In one embodiment of the invention, the structure of the container can be composed of layers of materials as follows:

.48 ga PET/ink/adhesive/1.1 mil Nylon/1.8 mil PE/.35 EVOH/1.9 mil PE.

In one embodiment of the invention, the structure of the container can be composed of layers of materials as follows:

.75 ga Cast/Nylon/ink/adhesive/5.25 EVOH Coex.

In one embodiment, the layers of material can be as follows:
PET12/PA15/LLPE125, with an OTR value of about 23cc/m^2.24h.
In one embodiment, the layers of material can be as follows:
PET12/PA15/(LDPE/EVOH/LLDPE)125, with an OTR value of about 23cc/m^2.24h.

Turning now to FIG. 2, in one aspect of the invention, an unfilled flexible plastic beverage container 200 can include a closable valve 114, a cap 116, two vertical seams 106, a top seam 108, and a bottom seam 110, and a pouch 216 similar to previously described embodiments. The container can include a substantially rectangular shape, with a container width 204 being at least one-half of the container height 202. The container depth can be determined by the height of the folded bottom 208, which can be calibrated to allow a container depth of at least one-half the container width, when filled.

To provide sufficient structural support to enable the container to be freestanding when the container is at least partially filled, the pouch 216 can be enclosed with two vertical seams 106, a top seam 108, and a bottom seam 110. These seams may be formed as a single seam, or as multiple overlapping seams. The thickness of the seam 206 can affect the strength of the structural support of the container. A thin seam may not provide sufficient support to enable freestanding capabilities, while a relatively thick seam may be bulky, uncomfortable when held, and create excess waste when the container is disposed of. Typical vertical and bottom seam widths can be between 5 mm and 7 mm, but a seam width greater than 7 mm can also be effective. Typical top seam widths can likewise be between 5 mm and 7 mm but may be greater than 7 mm to accommodate incorporation of a valve in the top seam. In one aspect of the invention, the minimum seam width is on the order of 3/16 of an inch, or about 4.75 mm. As shown in FIG. 2, the sides of the bottom seam can be thicker than the center of the bottom seam, to provide structural support to the container.

FIGs. 2 and 1A-1C also illustrate features of the invention than can aid in providing a free-standing container. In this embodiment, the container is formed from three pieces of material, sheet 102, sheet 104 and supporting bottom 111 (shown in detail in FIGs. 1A-1C). The side sheets 102 and 104 are joined at side seams 106. These portions of the side seams 106 extend downwardly along the sides of the container and terminate at the approximate location of the fold line 122. The supporting bottom is then folded and inserted between the side sheets and the side seams are continued downwardly

along the sides of the container to the bottommost portion of the container, with each side seam coupling a portion of the side sheets to the supporting bottom 111. In this manner, the supporting bottom and lower portions of the side sheets form a lower gusset that can expand and contract accordingly to the volume of beverage in the container.

In one aspect of the invention, one or more compressed areas 212 can be formed, e.g, "stamped," in either or both of one of the side sheets and the supporting bottom 111. The compressed areas can serve to add rigidity to the lower portions of the side sheet, supporting bottom, and/or gusset to aid in providing a stand-alone container. Also shown in FIG. 2 is one method by which the lower portions of the side seams (to which the supporting bottom is attached) can be coupled to one another. As will be appreciated, in the areas where the side seams couple the supporting bottom to the side sheets, two finished seams will face each other in the inner portion of the gusset (e.g., the outer edges of the supporting bottom are folded against one another while the inner edges of the supporting bottom are coupled to the inner edges of the side sheets). As it may be difficult to bond or attach the outer portions of the side seams to one another in these locations, the present inventor has found that a crescent shaped void 214 can be left in the outer portions of the supporting bottom such that as the supporting bottom is coupled to the side sheets, a crescent shaped piece of the side sheets is left exposed. In one embodiment, this exposed piece will be formed of EVOH. In order to attach the sides of the gusset to one another, these exposed pieces of EVOH can be pressed or bonded together to attach the sides of the gusset to one another, even in the case where the sides are formed of a finished seam.

The present invention provides many advantages over conventional beverage container systems. For example, as the containers can be shipped to a filling facility in a reduced volume state (e.g., a generally "flat" configuration), the costs of shipping empty containers can be reduced and the efficiencies can be increased. Also, in the embodiments of the invention in which a unidirectional valve is incorporated into the container, internal portions of the container can be maintained in a clean state from the point in time in which the container is manufactured to the point it is filled with a beverage. In this manner, the present containers need not be cleaned at the filling location, leading to great cost savings at the filling site. The present inventor has found that the filling plant used for the present container can be up to 1/5 smaller than an equivalent plant used for conventional bottles.

In addition, the present container is generally much easier to transport and store than conventional bottles, as the present container will "form-fit" to a pocket, backpack, purse, glove-box, etc., in which the container is stored.

Also, label information such as branding, content information, nutritional information, etc., can be applied to the present package at the time of forming the package. This aspect of the invention can completely eliminate the step of applying a label to the container, which is necessary in most conventional processes. Also, as the label information is applied directly to the present package (or within two layers of material), the risk of having the label fall off the packaging, of become illegible, is greatly reduced with the present system.

The embodiment of the invention illustrated in FIG. 1A includes valving assembly or closable valve 114 that includes an internal gate 140. The gate portion 120 of the valving assembly can include a flexible membrane 142, best appreciated from FIGs. 5, 6A and 6B. The membrane can be attached within the gate portion (which can itself be attached within the valving assembly) to regulate flow into and out of the container. As shown in FIGs. 6A and 6B, the membrane can include one or more slits or cuts 142 formed therein that are maintained in a normally closed configuration. The membrane can also include a curvature, as shown in FIG. 5. The curvature and slits can cooperate to allow flow through the valving assembly when flow is induced from inside the pouch area and out of the container, as the drinking water or beverage applies force to the underside of the membrane and "open" the slits or cuts and pass through.

However, in the event flow tends toward the pouch area (e.g., if the container were attempted to be filled after the membrane were installed), the curvature and the slits would work toward maintaining the slits closed in response to this "backward" flow, and the valve would resist flow. The membrane is thus one manner in which the containers can be configured to be easily evacuated (as the drinking water or beverage is dispensed), yet be maintained in a substantially collapsed configuration after dispensing (as the entry of air into the empty container is resisted or prevented by the valve).

It is to be understood that the above-referenced arrangements are only illustrative of the application for the principles of the present invention. Numerous modifications and alternative arrangements can be devised without departing from the spirit and scope of the present invention. While the present invention has been shown in the drawings and fully described above with particularity and detail in connection with what is presently

deemed to be the most practical and preferred embodiment(s) of the invention, it will be apparent to those of ordinary skill in the art that numerous modifications can be made without departing from the principles and concepts of the invention as set forth herein.

Claims

We claim:

1. A beverage container, comprising:

a pair of flexible sidewalls defining therebetween a pouch area for containing a beverage;

the flexible sidewalls being comprised of a material having at least two material layers coupled to, or integrated with, one another, the layers including at least:

an outer layer comprised of an outer barrier material; and an inner layer including an inner barrier material, the inner barrier material being operable to be exposed to the beverage contained in the pouch area while resisting migration of contaminants through the sidewalls and into the beverage.

2. The container of claim 1, wherein the outer barrier material includes PET.

3. The container of claim 1, wherein the outer barrier material includes nylon.

4. The container of claim 1, wherein the inner barrier material includes EVOH.

5. The container of claim 1, wherein the inner barrier material includes PE.

6. The container of claim 1, wherein the inner barrier material includes LLDPE.

7. The container of claim 1, wherein the inner barrier material includes a combination of LDPE, EVOH and LLDPE.

8. The container of claim 1, wherein the inner barrier material includes PP.

9. The container of claim 1, further comprising an intermediate layer, disposed between the outer layer and the inner layer, the intermediate layer including printed information visible through the outer layer.

10. The container of claim 1, further comprising an intermediate layer, disposed between the outer layer and the inner layer, the intermediate layer including nylon.

11. A beverage container, comprising:

a pair of flexible sidewalls defining therebetween a pouch area for containing a beverage;

a valving assembly, coupled between edges of the sidewalls and being operable to allow flow of the beverage from the pouch area while resisting flow of fluid into the pouch area;

the valving assembly including a membrane having at least one slit formed therein, the membrane having a curvature that causes the slit to open when subject to flow of beverage from the pouch area and causes the slit to close when subject to flow of fluid into the pouch area.

12. The container of claim 11, wherein the membrane includes a plurality of slits, arranged at substantially equal angles relative to one another and extending outwardly from a center of the membrane toward one or more edges of the membrane.

13. The container of claim 12, wherein the plurality of slits comprises three slits.

14. The container of claim 12, wherein the plurality of slits comprises five slits.

15. A collapsible beverage container, comprising:

a pair of flexible sidewalls defining therebetween a pouch area for containing a beverage;

a valving assembly installed between the sidewalls adjacent a top of the beverage container;

a pair of side seams extending generally upwardly along side edges of the container;

a bottom gusset frame, expandable when the container is filled with at least some of the beverage to provide a stable support for the beverage container such that the container is substantially free-standing when at least partially filled with the beverage.

16. The container of claim 15, wherein the gusset frame defines a hexagon when fully expanded.

17. The container of claim 15, wherein the container includes a ratio of height:width:depth of about four:two:one.

18. The container of claim 15, wherein the side seams extend from a bottommost portion of each side to an uppermost portion of each side and include a width from about 5 mm to about 7 mm.

19. The container of claim 15, wherein a width of the side seams is greater than a width of seams used to form the gusset frame.

20. A collapsible beverage container suitable for containing and dispensing drinking water, comprising:

a pair of flexible sidewalls defining therebetween a pouch area for containing drinking water;

a valving assembly, coupled between edges of the sidewalls and being operable to allow flow of the drinking water from the pouch area while resisting flow of fluid into the pouch area;

a bottom gusset frame, expandable when the container is filled with at least some of the drinking water to provide a stable support for the beverage container such that the container is substantially free-standing when at least partially filled with the drinking water;

the container being operable to collapse as water is removed from the pouch area and to retain its collapsed configuration such that a volume of the pouch area is constantly and automatically reduced as the drinking water is expelled from the pouch area.

21. The beverage container of claim 20, wherein the valving assembly includes a membrane having at least one slit formed therein, the membrane having a curvature that causes the slit to open when subject to flow of the drinking water from the pouch area and causes the slit to close when subject to flow of fluid into the pouch area.

22. The container of claim 21, wherein the membrane includes a plurality of slits, arranged at substantially equal angles relative to one another and extending outwardly from a center of the membrane toward one or more edges of the membrane.

23. The container of claim 22, wherein the plurality of slits comprises three slits.

24. The container of claim 22, wherein the plurality of slits comprises five slits.

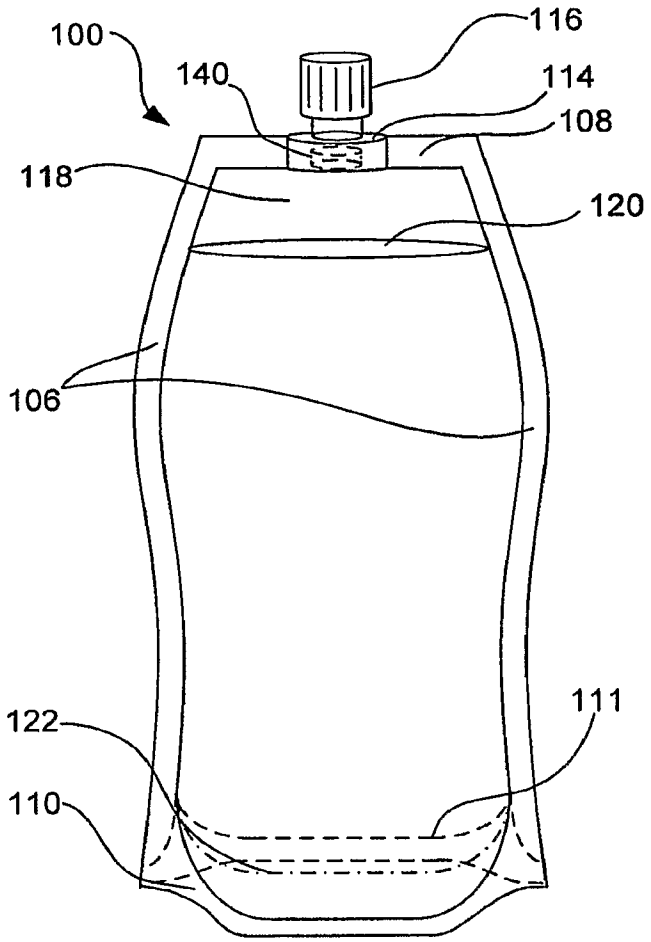


FIG. 1A

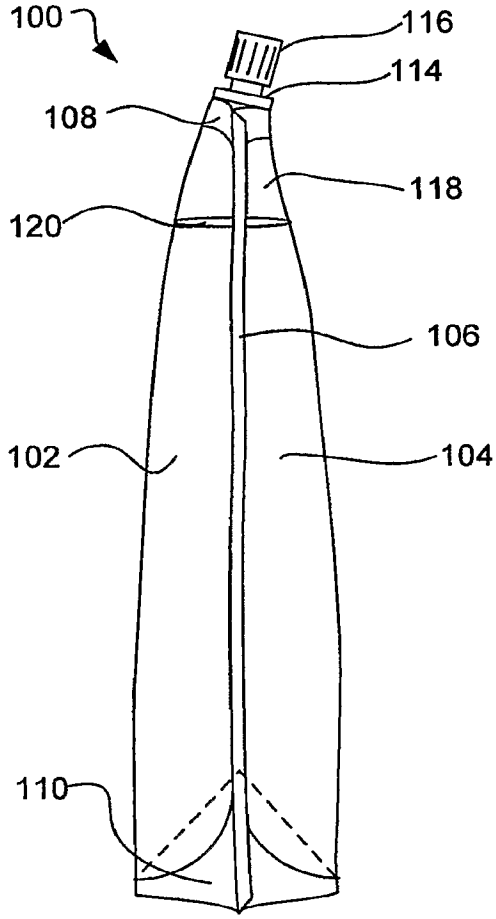


FIG. 1B

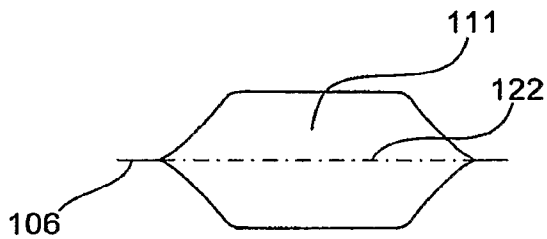
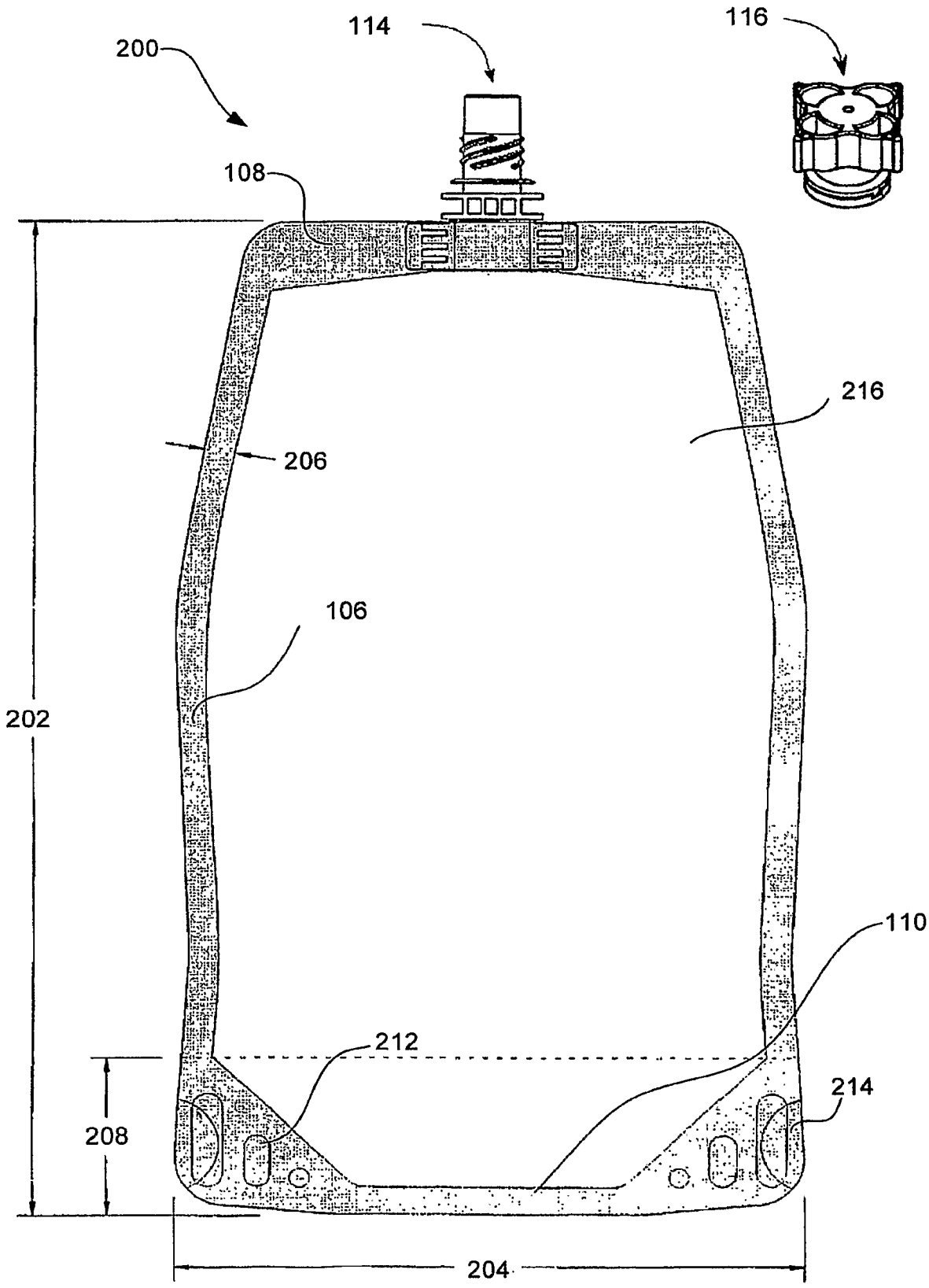


FIG. 1C

FIG. 2



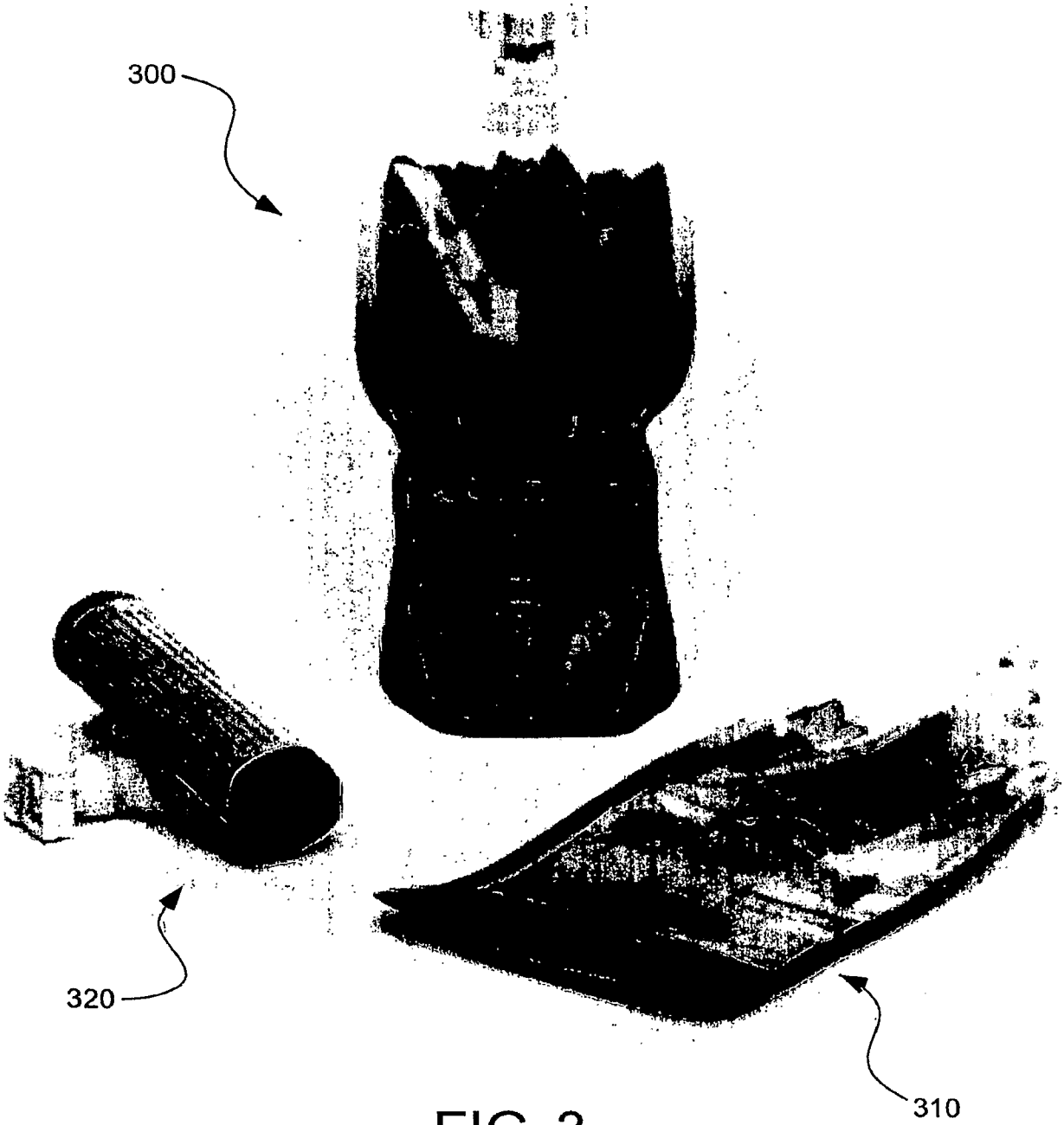


FIG. 3

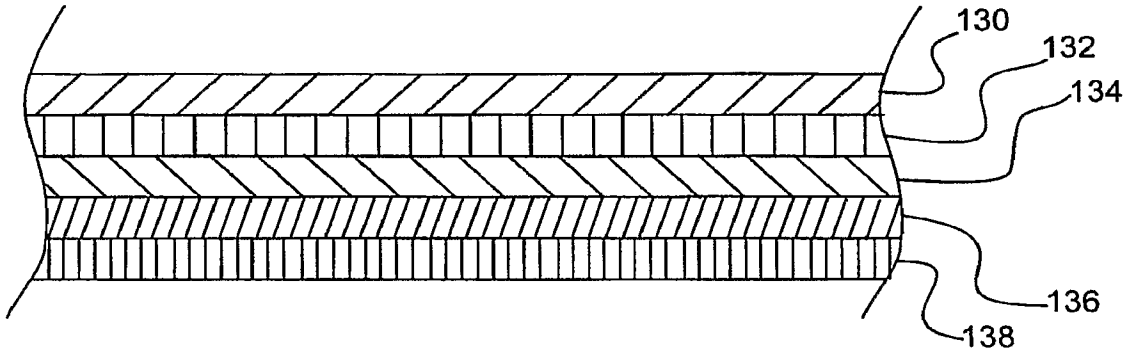


FIG. 4

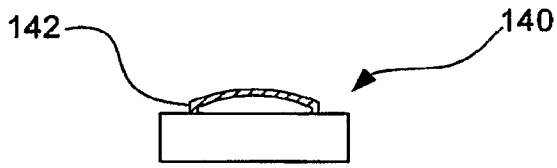


FIG. 5

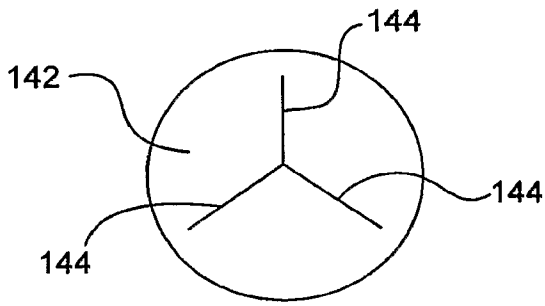


FIG. 6A

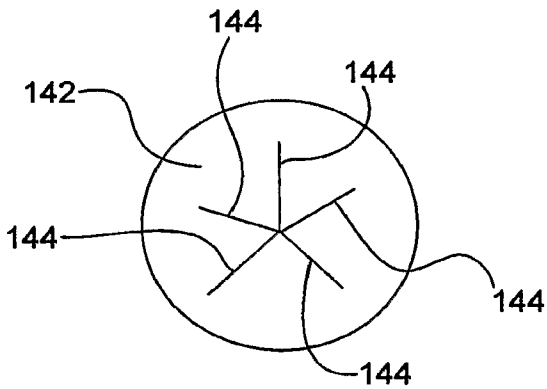


FIG. 6B