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(54) **ULTRASOUND GEL CONTAINER**

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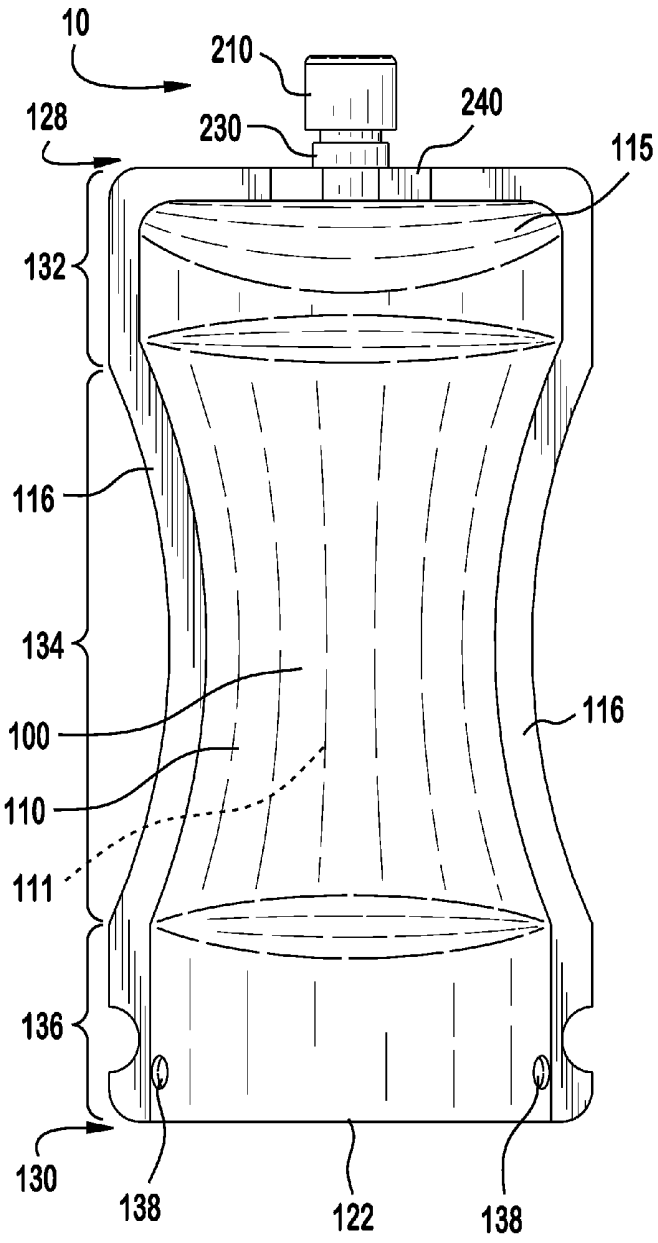
CPC *A61B 8/4281* (2013.01)

(57) **ABSTRACT**

An ultrasound coupling gel container is provided and includes a flexible body having front wall, back wall, an outlet end, a planar bottom gusset, and a dispensing assembly. The back wall is positioned adjacent and opposes the front wall. The back wall is sealed to the front wall along a periphery thereof and provides a cavity receiving section. An outlet end is formed from a front wall top section and a back wall bottom section. The planar bottom gusset includes a central portion formed from sealed peripheral edge portions along the front wall and of the back wall. The dispensing assembly is sealed to a peripheral edge of the front wall and of the back wall at the outlet end of the flexible body.



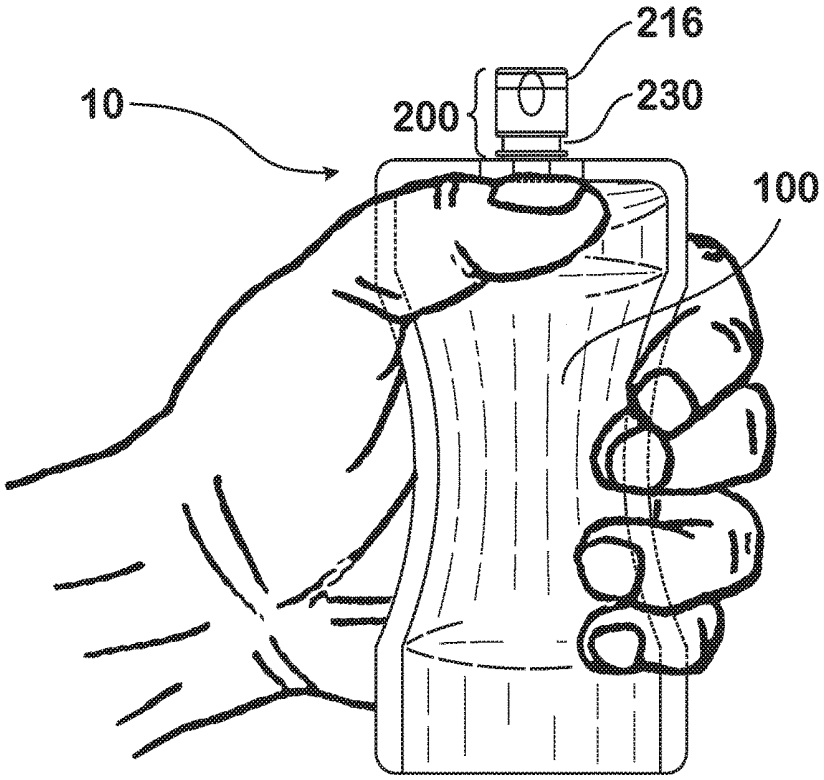


FIG. 1

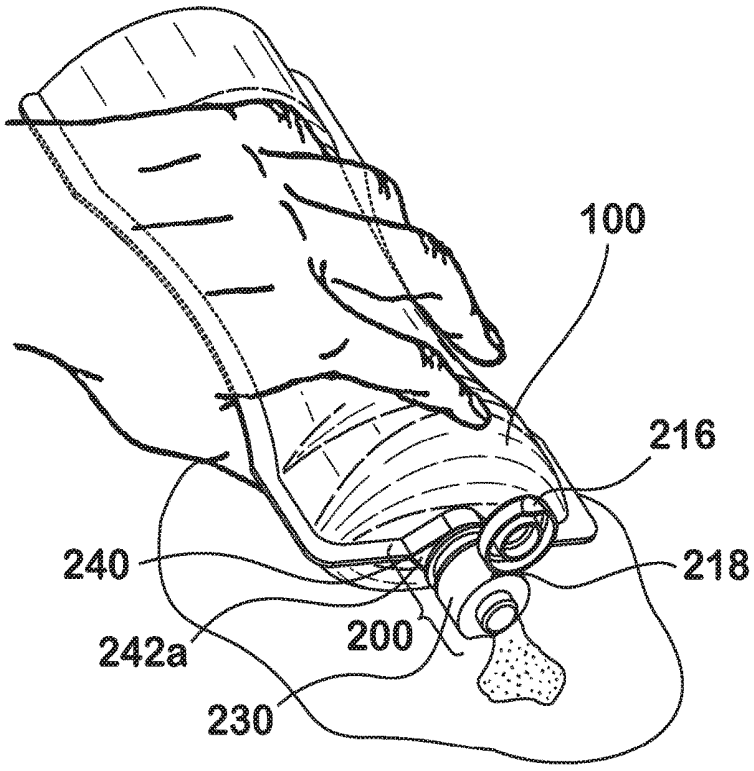
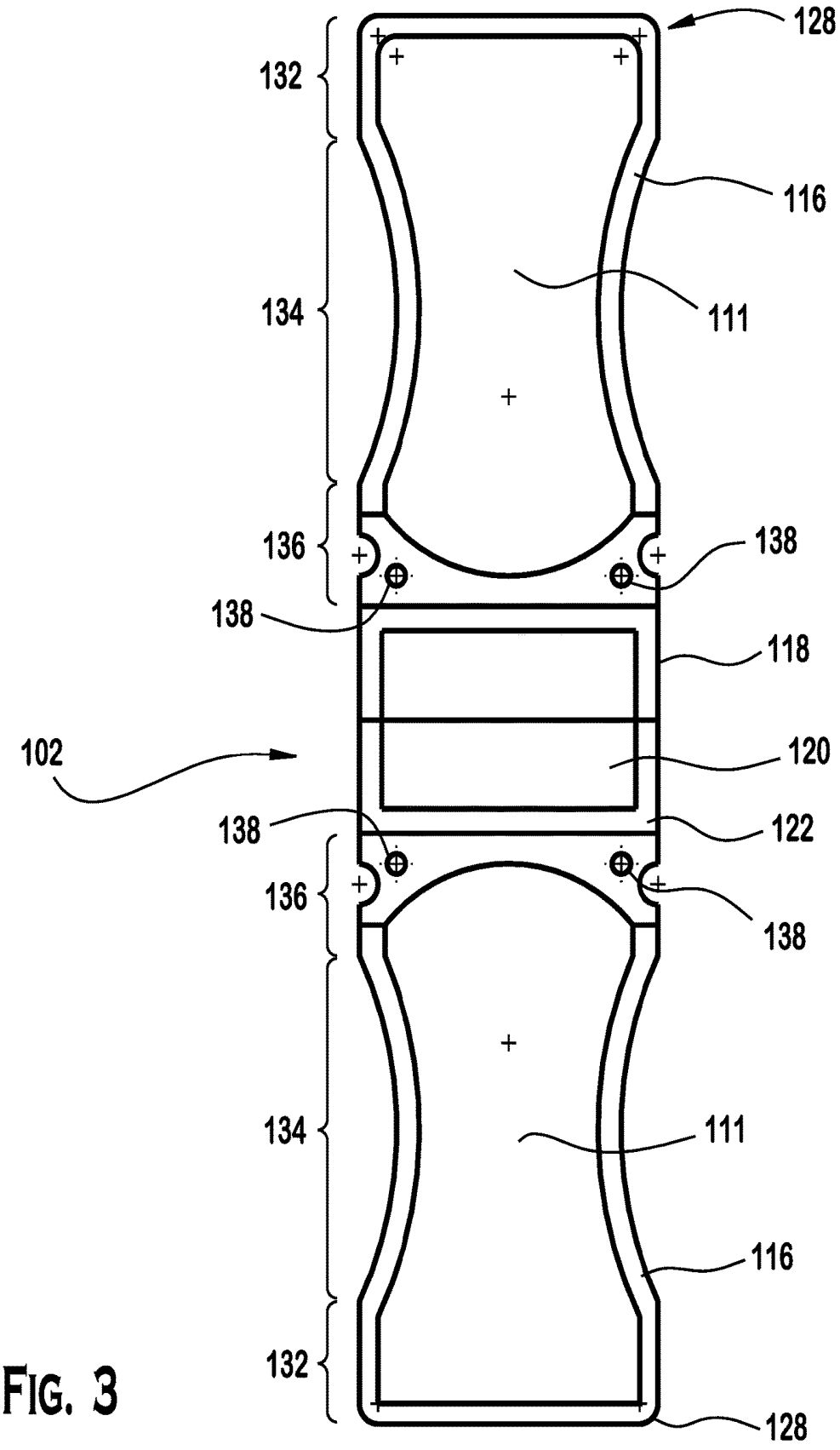


FIG. 2


128
132
116
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102
120
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FIG. 3

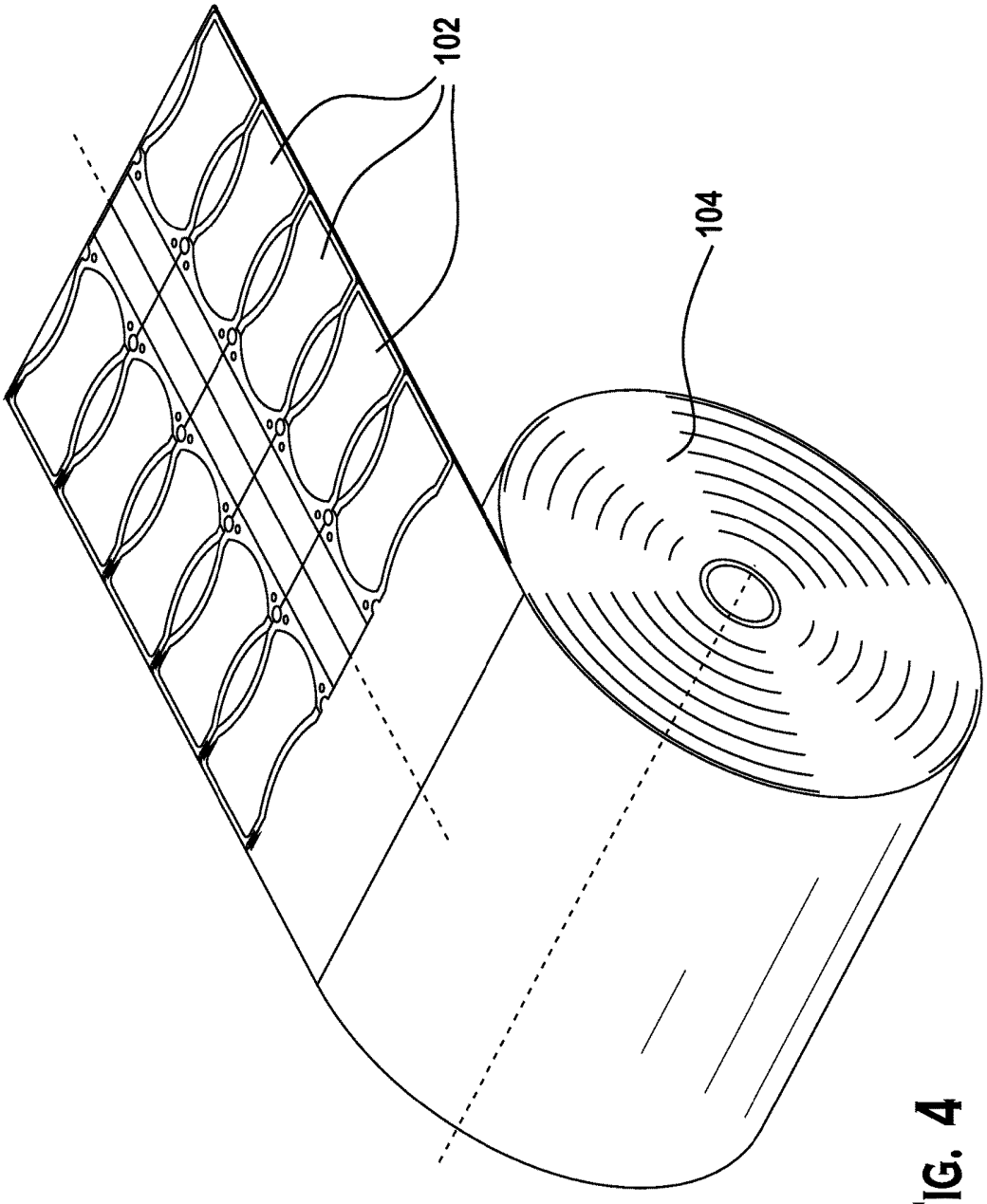


FIG. 4

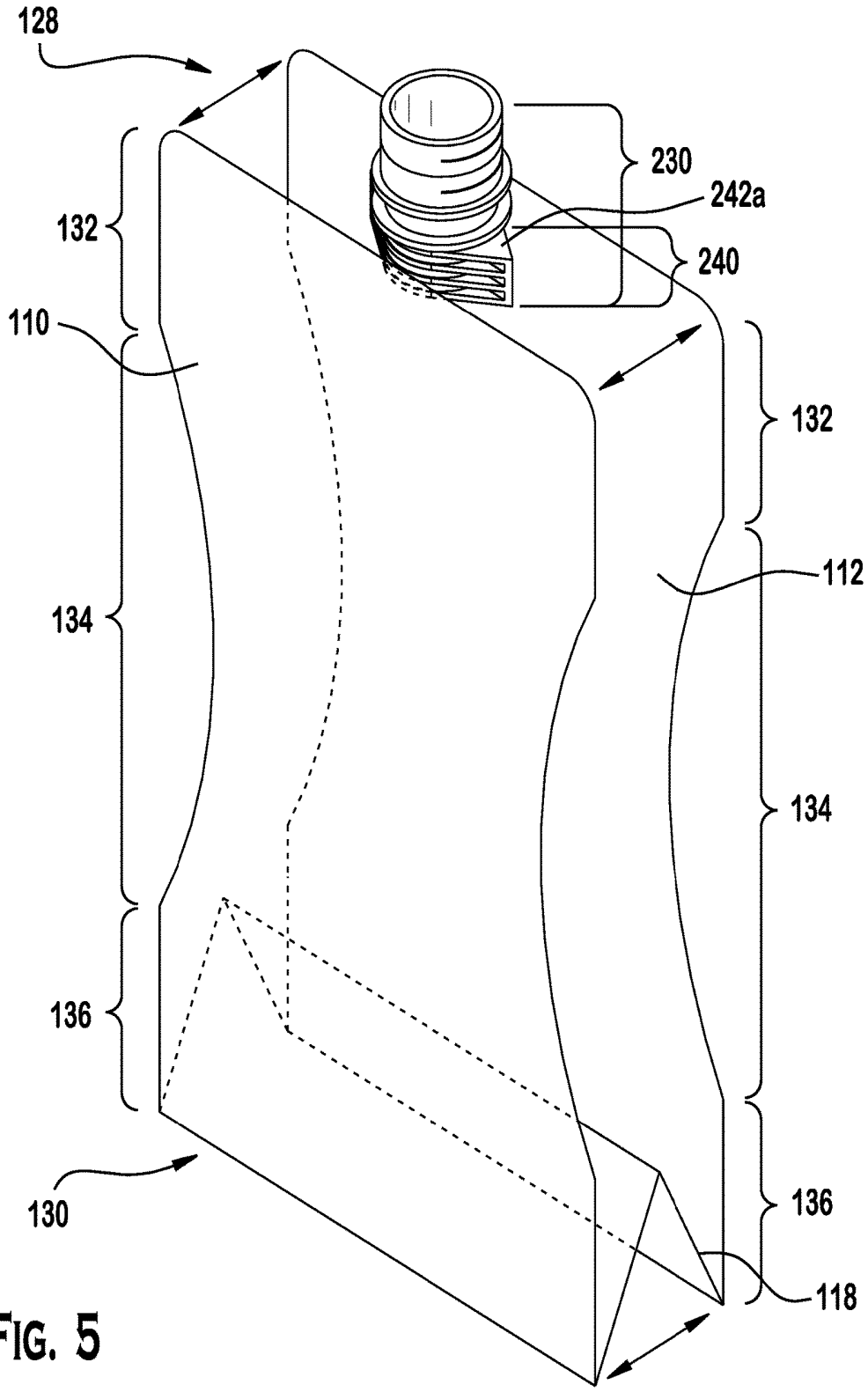
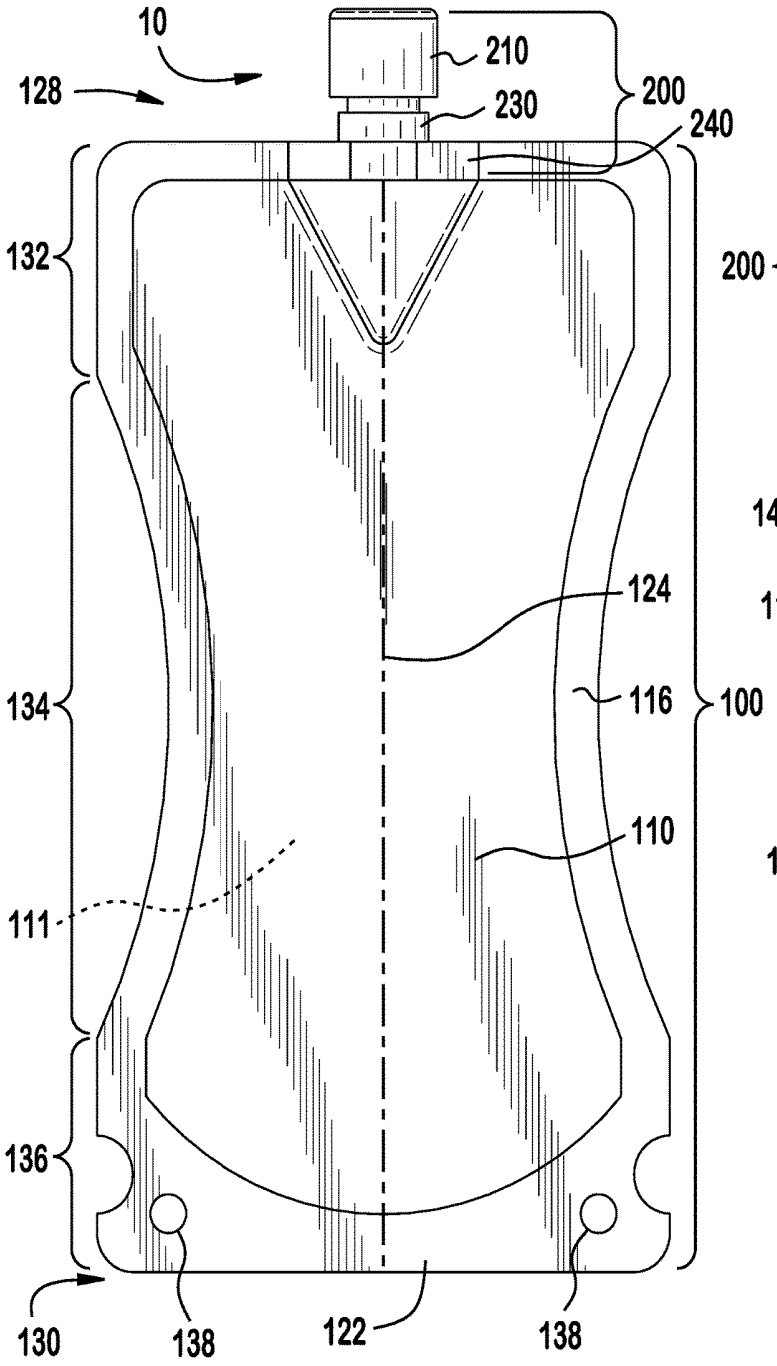


FIG. 5


10
128
210
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124
116
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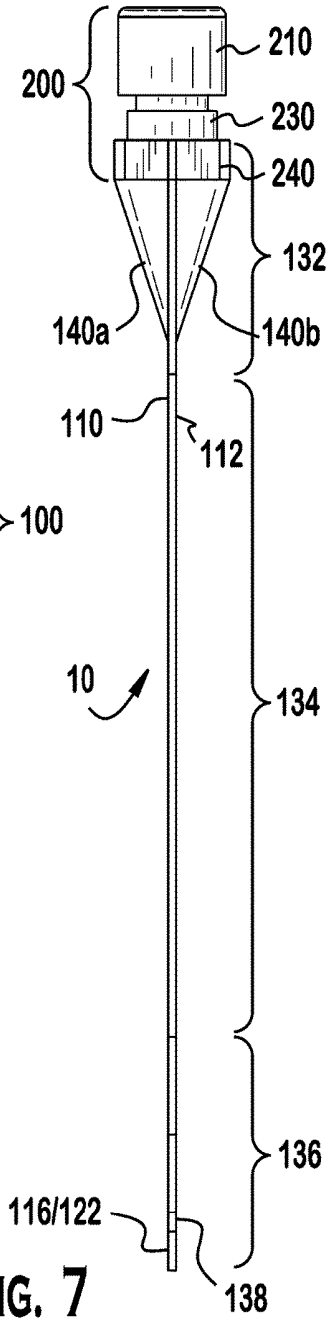
110

FIG. 6


200
210
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140a
140b
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112
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134
136
116/122
138

FIG. 7

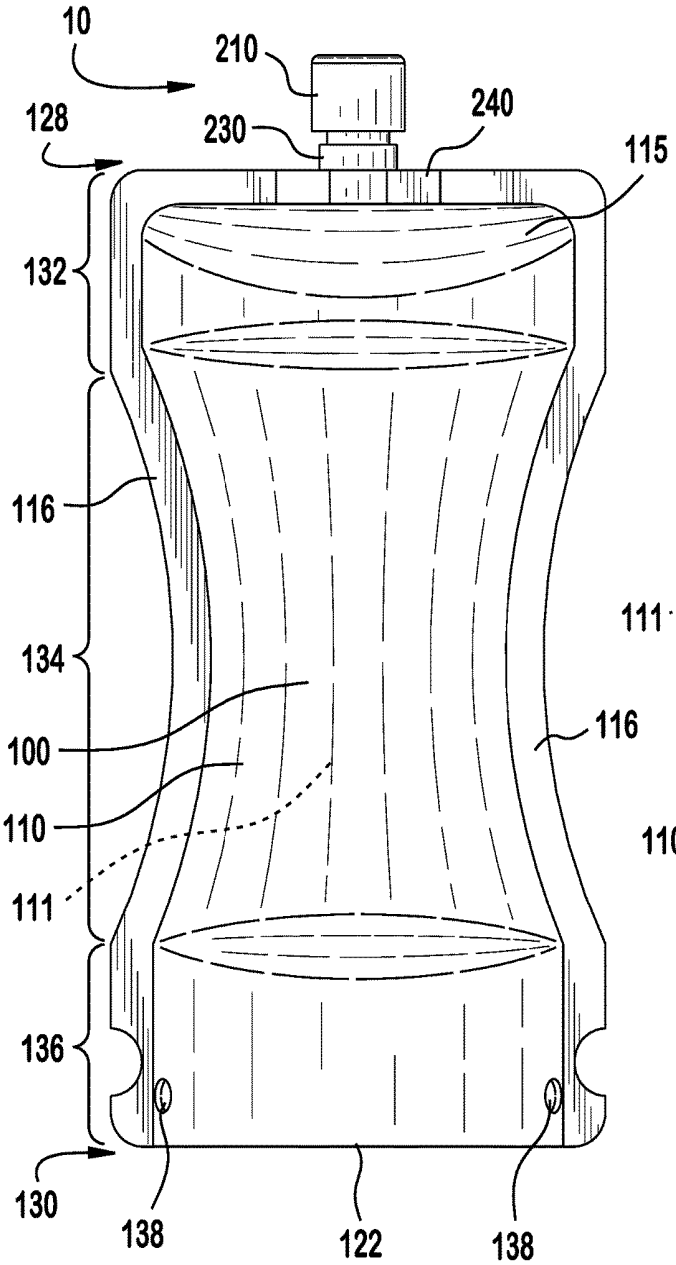
10
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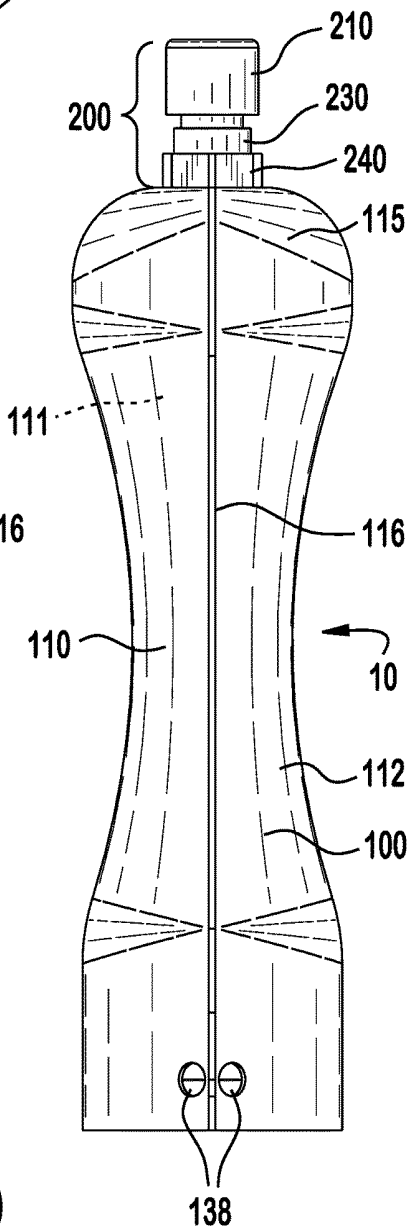
FIG. 8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138

FIG. 9

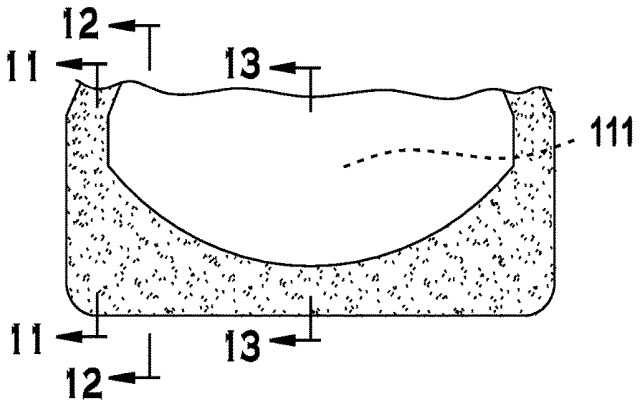

FIG. 10

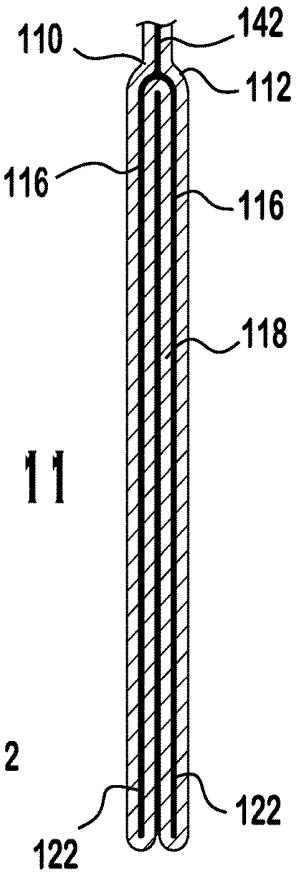

FIG. 11

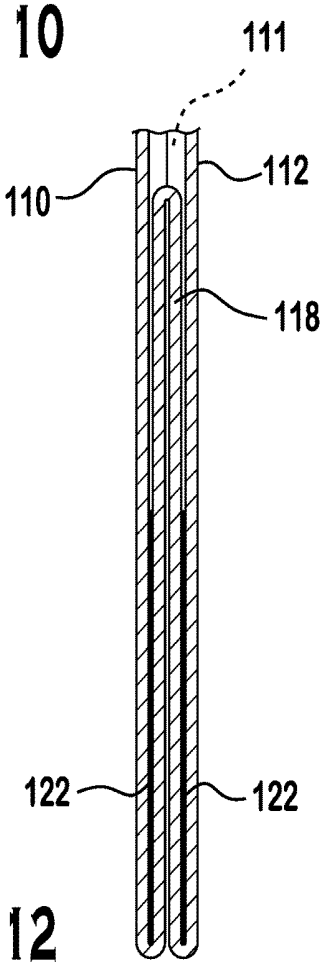

FIG. 12

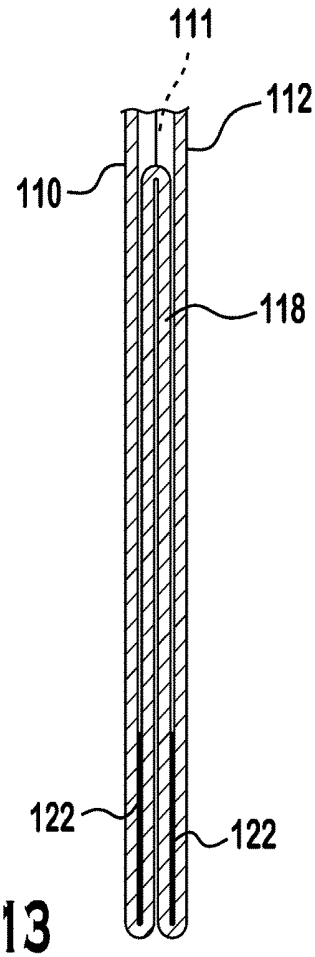

FIG. 13

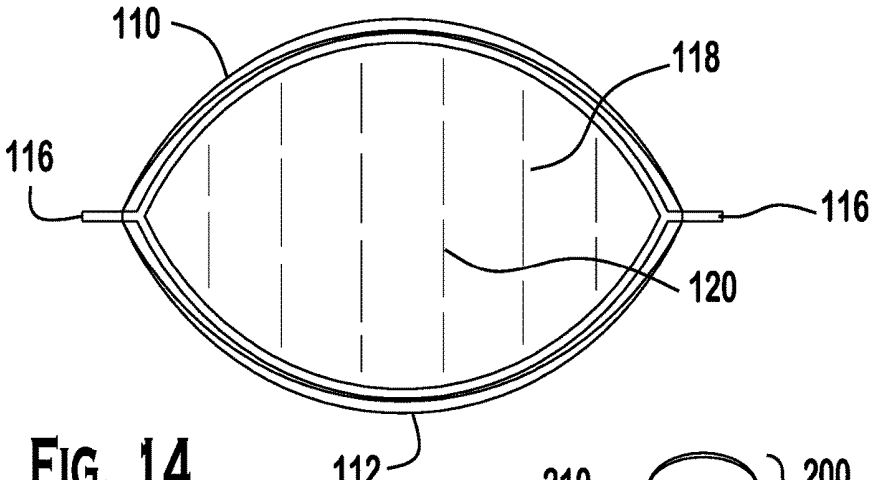
110
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FIG. 14

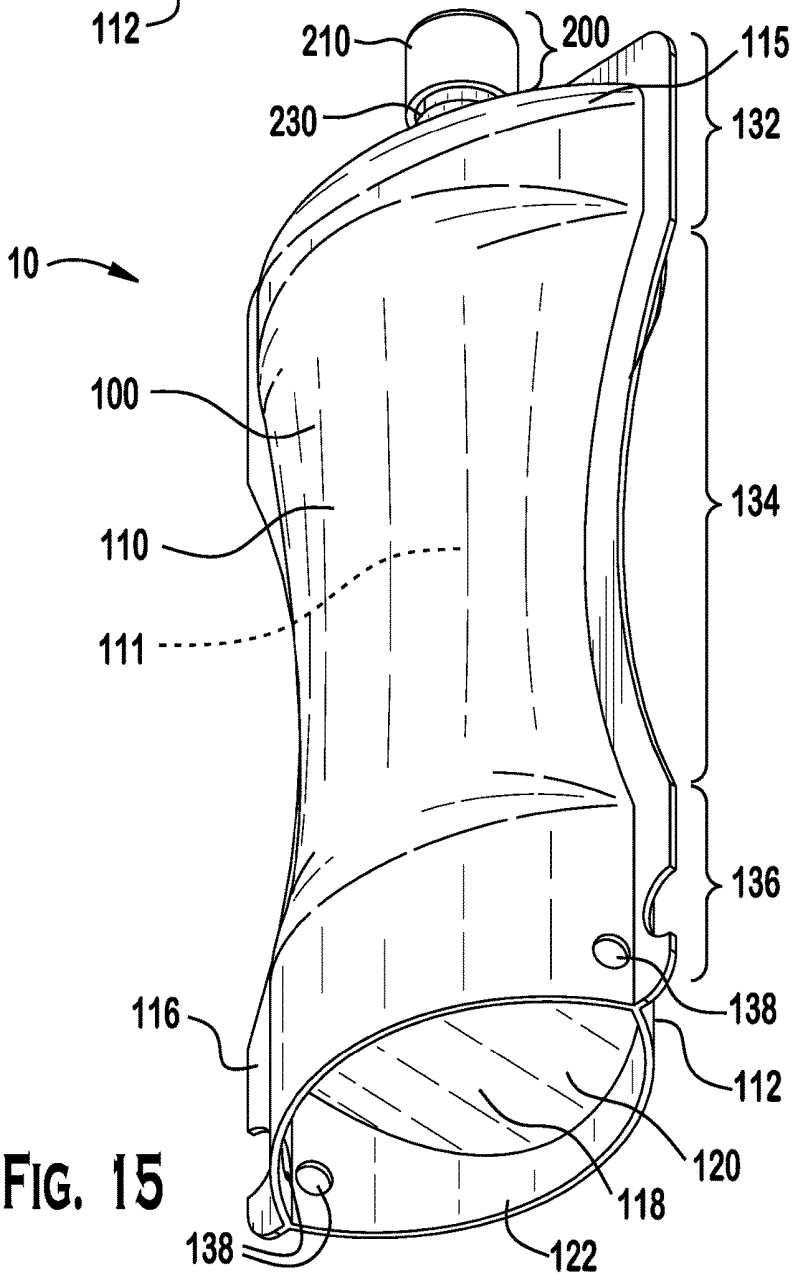
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FIG. 15

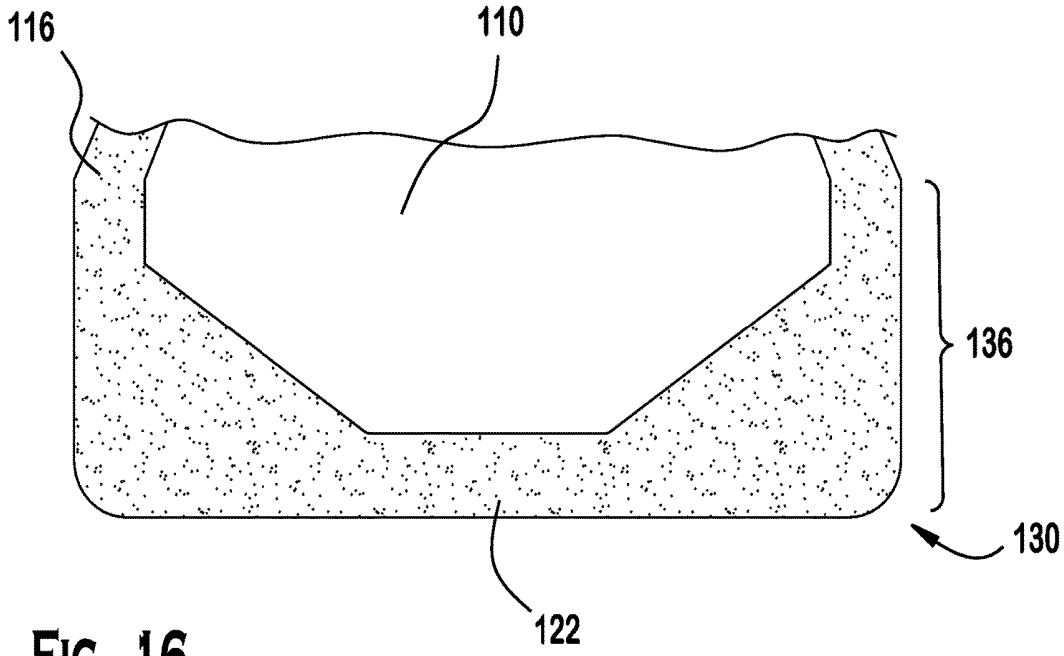


FIG. 16

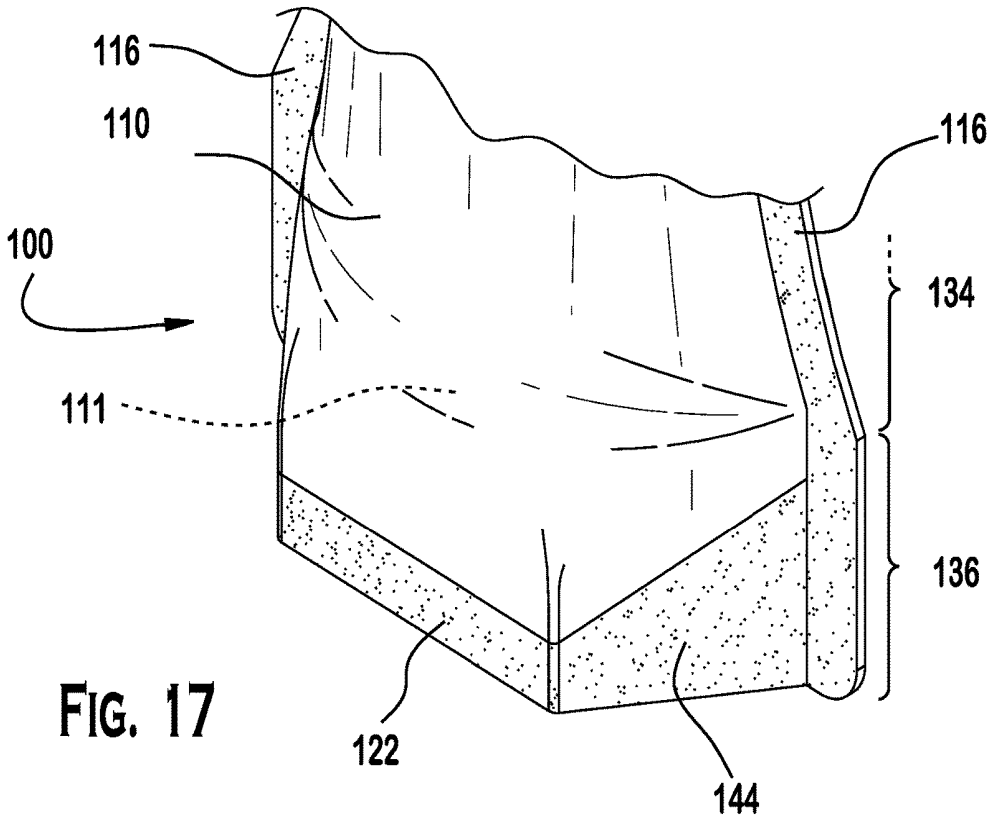
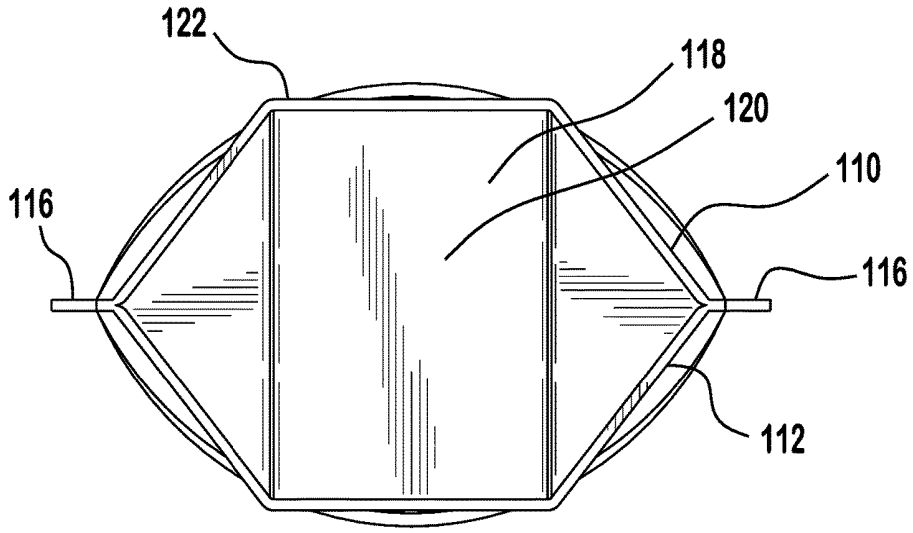


FIG. 17


122
118
120
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112

FIG. 18

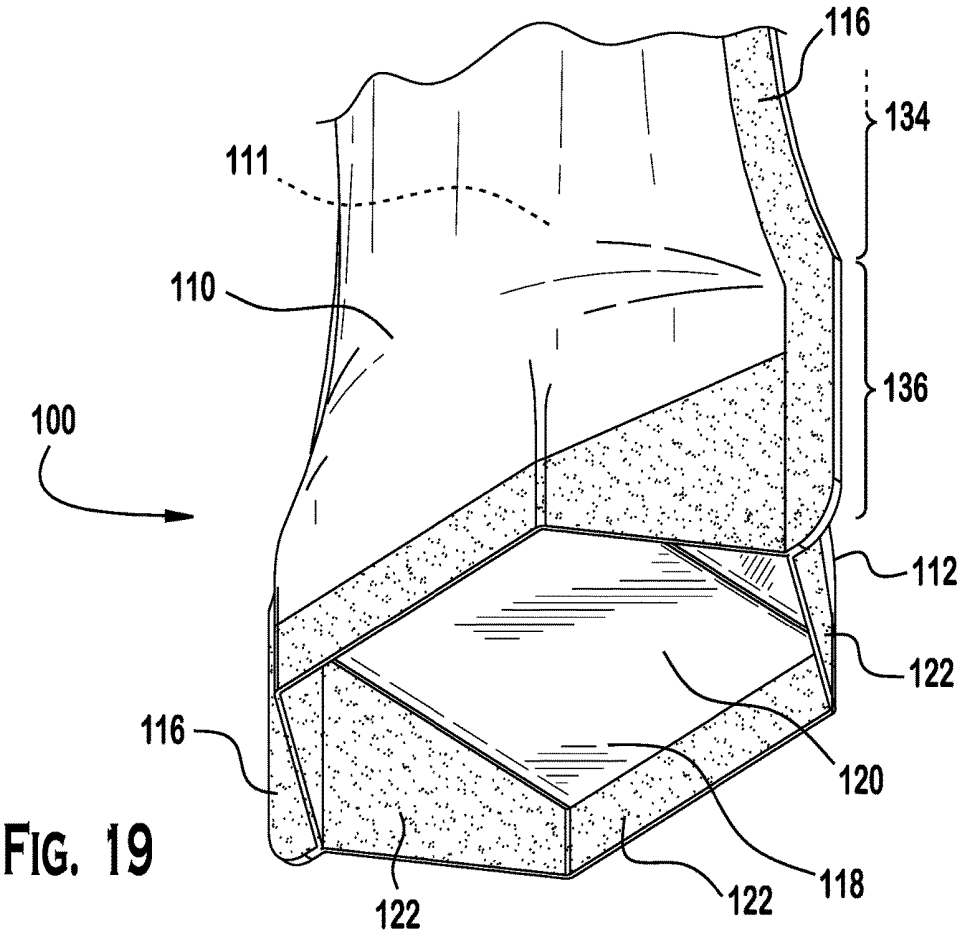
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FIG. 19

ULTRASOUND GEL CONTAINER

FIELD OF THE INVENTION

[0001] This invention relates to a flexible container and, more particularly, to a flexible, collapsible container for dispensing an ultrasound coupling gel composition.

BACKGROUND

[0002] Ultrasound diagnostic procedures are used in assessing and diagnosing a wide variety of medical conditions related to internal organs. These procedures are widely used in obstetrics and cardiology, among other medical specialties.

[0003] An ultrasound coupling agent, otherwise known as a "gel", is designed to act as a conductive barrier between an ultrasound probe and the outer layer of skin, known as the epidermis. The application of a gel to the patient's body lubricates the skin and prevents the sound waves from being trapped or reflected by air pockets that might distort the image and lead to an incorrect diagnosis.

[0004] Known ultrasound coupling gel containers have disadvantageous features that interfere with storage, transport, and the optimal application of coupling gel. Flexible containers with dispensing ports are known. U.S. Pat. No. 6,050,451 (Hess et al.) describes a dispensing structure adaptable for use with thin-walled, flexible, containers used for beverages.

SUMMARY

[0005] An ultrasound coupling gel container is provided and includes a flexible body having front wall, back wall, an outlet end, a planar bottom gusset, and a dispensing assembly. The back wall is positioned adjacent and opposes the front wall. The back wall is sealed to the front wall along a periphery thereof and provides a cavity receiving section. An outlet end is formed from a front wall top section and a back wall bottom section. The planar bottom gusset includes a central portion formed from sealed peripheral edge portions along the front wall and of the back wall. The dispensing assembly is sealed to a peripheral edge of the front wall and of the back wall at the outlet end of the flexible body.

[0006] Improved ultrasound gel container products are desirable for better container transport, storage, and use in dispensing ultrasound gel product. A compact and easily graspable shape is desirable in order to facilitate the handling and storage of full and empty gel containers. An improved gel container would have features that allowed for convenient storage and display. The container would advantageously have a dispensing assembly sealed to the container. The dispensing assembly used in the gel container would maintain a desirable gullet at the entrance to the dispensing cap to permit the optimal dispersal of ultrasound gel. The body of the gel container would be manufactured of a polymeric multi-layered material to provide desirable characteristics of flexibility and printability. The gel container holds a volume of gel that is sufficient and easily dispersed by the operator for a particular procedure or treatment, preferably in an amount sufficient for a single procedure that prevents microbial contamination.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] These and other features, aspects, and advantages of the invention will become better understood with regard to the following description, appended claims, and accompanying drawings which form a part of the specification and in which like numerals are used to identify like parts throughout and where:

[0008] FIG. **1** is a perspective view of a gel container in use;

[0009] FIG. **2** is another perspective view of the gel container in FIG. **1**, showing a user dispensing a gel stored therein;

[0010] FIG. **3** is a plan view of a gel container body according to the invention, shown before assembly;

[0011] FIG. **4** is a perspective view of a blank sheet of gel containers according to the invention, before assembly thereof;

[0012] FIG. **5** is a perspective exploded view of a gel container according to the invention, shown prior to assembly.

[0013] FIG. **6** is a front view of a gel container according to the invention;

[0014] FIG. **7** is a left side view of the gel container of FIG. **6**;

[0015] FIG. **8** is a front view of the gel container of FIG. **6**, shown filled with a gel;

[0016] FIG. **9** is left side view of the gel container of FIG. **8**;

[0017] FIG. **10** is a partial front, plan view of a base of a gel container according to the invention;

[0018] FIG. **11** is a sectional view of the gel container of FIG. **10** along line **11-11**.

[0019] FIG. **12** is a sectional view of the gel container of FIG. **10** along line **12-12**.

[0020] FIG. **13** is a sectional view of the gel container of FIG. **10** along line **13-13**.

[0021] FIG. **14** is a bottom view of a gel container according to the invention, shown filled with a gel;

[0022] FIG. **15** is a perspective view of the gel container of FIG. **14**;

[0023] FIG. **16** is a front view of a base end of another gel container according to the invention;

[0024] FIG. **17** is a perspective view of the gel container of FIG. **16**;

[0025] FIG. **18** is a bottom view of the gel container of FIG. **16**; and

[0026] FIG. **19** is a perspective view of the gel container of FIG. **16**.

DETAILED DESCRIPTION OF THE EMBODIMENT(S)

[0027] The following text sets forth a broad description of various exemplary embodiments of the invention. The description is to be construed as exemplary only and does not describe every possible embodiment since describing every possible embodiment would be impractical, if not impossible. It will be understood that any feature, characteristic, component, composition, ingredient, product, step or methodology described herein can be deleted, combined with or substituted for, in whole or part, any other feature, characteristic, component, composition, ingredient, product, step or methodology described herein. Numerous alternative embodiments could be implemented, using either current

technology or technology developed after the filing date of this patent, which would still fall within the scope of the claims. All publications and patents cited herein are incorporated herein by reference.

[0028] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. In case of conflict, the present application including the definitions will control. In addition, unless otherwise required by context, singular terms shall include pluralities and plural terms shall include the singular. All publications, patents, and other references mentioned herein are incorporated by reference in their entireties for all purposes.

[0029] Now, with reference to FIGS. **1-19**, an ultrasound coupling gel the container **10** (hereinafter referred to as "the container **10**") according to the invention is shown. An exemplary embodiment of the container **10** includes the following major components: a body **100** and a dispensing assembly **200**.

[0030] As shown, the body **100** is a substantially planar, enclosed flexible container having a front wall **110**, a back wall **112**, and a bottom gusset **118**. The front wall **110** and the back wall **112** are positioned so that they oppose and mirror each other. The body **100** extends between an outlet end **128** and a base end **130**. The outlet end **128** is considered an upper end of the container **10**, while the base end **130** is considered as a lower end of the container **10**. This is not the only operable orientation and the container **10**. Rather, the container can be used in any position, such as inverted, on its side, or the like. FIGS. **1** and **2** show two options for handling and use of the container **10**.

[0031] FIG. **3** shows a single blank **102** from which the body **100** is constructed. FIG. **4** shows a continuous length of polymeric material **104** on which multiple blanks **102** are fitted for construction of individual bodies **100**.

[0032] As shown in FIGS. **1-6**, **8-9**, and **15**, the width of the body **100**, along a lateral axis, is less at a mid-point on along a longitudinal axis **124** than at the outlet end **128** and at the base end **130**. As a result, the body has an arcuate shape in an exemplary embodiment of the invention. The blank **102** includes a shoulder portion **132** along an outlet end **128**, an arcuate-shaped waist portion **134**, and a hip portion **136** along the base end **130**. The hip portion **136** is a section of the front wall **110** and the back wall **112**. The front wall **110** and the back wall **112** are sealed to each other along a peripheral edge **116** to form a cavity receiving section **111**. Curvatures of front wall **110** and back wall **112** and the curvatures of the side peripheral edges **116** have certain orientations relative to planes passing through the center of symmetrical body of the container **10**. When constructed, the container's shape is sized such that it may be griped along the waist portion **134** by a hand, in order to permit convenient single-handed dispensing of a gel by the user.

[0033] The construction of the base end **130** allows for easy storage and handling of both filled and unfilled gel containers **10**, and will now be described.

[0034] In an exemplary embodiment of the invention, the planar bottom gusset **118** is substantially planar and rectangular. The planar bottom gusset **118** includes a central portion **120** and peripheral edge portions **122**. In the shown embodiment, the planar bottom gusset **118** is sonically or heat sealed along the peripheral edge portions **122**. As shown, two opposing peripheral edges **122** are sealed to peripheral edges **116** of lower front wall **110** and of lower back wall **112** along the base end **130** thereof. The central portion **120** of bottom gusset **118** remains unsealed. A portion of the remaining two opposing peripheral edges **122** of bottom gusset **118** are respectively laminated between and sealed to the lower peripheral side edges **116** of front wall **110** and of back wall **112**. This arrangement of sealing of the peripheral edges is especially shown in FIGS. **10-13** and **17-19**.

[0035] Sealing of the planar bottom gusset **118** to the front wall **110** and the back wall **112** is performed such that the unsealed central portion **120** lies generally flat and perpendicular to the longitudinal plane of body **100** as the container **10** is filled. This design configuration enables the container **10**, when filled, to be positioned upright along its base end **130**.

[0036] Additionally, this configuration enables the container **10**, when empty, to be folded so that the planar bottom gusset **118** will lie flat along a common plane with the front wall **110** and the back wall **112**. In an exemplary embodiment of the invention, the container **10** has a substantially elliptical cross-sectional shape when filled, as shown in FIG. **15**. The sealed peripheral side edges **116** are positioned parallel to a major longitudinal axis **124** of the ellipse. However, when the container **10** is not filled, the front wall **110** and the back wall **112** are positioned adjacent, and oppose each other, along a common plane.

[0037] In an exemplary embodiment and as shown in FIGS. **6** and **7**, the outlet end **128** is three-dimensional structure, formed by the front wall **110** with a first inset gullet **140***a* and back wall **112** with a second inset gullet **140***b* positioned about the longitudinal central line **124**, respectively. This three-dimensional structure is designed to accommodate the dispensing assembly **200**, which is then surrounded by and sealed to the body **100**, as described below. The first inset gullet **140***a* and second inset gullet **140***b* are triangular and planar and are sized to be fitted and sealed within notches cut in front wall **110** and back wall **112** using sonic or heating methods known to one of ordinary skill in the art. More specifically, upper edges of first inset gullet **140***a* and of second inset gullet **140***b* are sufficiently longer than the notch formed along the upper edge of front wall **110** and back wall **112**. This design permits a collar **240** of the dispensing assembly **200**, as described below, to be sealed along the outlet end **128**. The first inset gullet **140***a* and second inset gullet **140***b* maintain an unobstructed dispensing point **126** for the application of a gel through the dispensing assembly.

[0038] In yet another embodiment, the front wall **110** and back wall **112** include pleats **115** as shown in FIGS. **8-9** and **15**. During filling, the pleats unfold to accommodate increasing gel volume.

[0039] Additionally, as seen in FIGS. **3**, **6**, **8**, **9**, and **15**, the body **100** includes receiving passageways **138** along the sealed peripheral edges of base end **130**. These receiving passageways **138** are useful for receiving a hanging device, such as fastener, hook, clamp, or other known devices for suspending products during storage or use. Exemplary receiving passageways **138** include, but are not limited to, an eye, a hole, a slit, a hook, a loop, a grommet, a clamp, or other feature to suspend the container **10**.

[0040] The dimensions of the container **10**, including the width of the sealed peripheral edges **116**, **122**, are chosen

relative to a desired container volume and to permit the container **10** to rest upright on sealed peripheral edges of base end **130** when filled or at least partially filled with gel.

[0041] The outlet end **128** of body **100** is proportioned to accommodate the sealing of a dispensing assembly **200** as described below. As illustrated in FIGS. **1-2**, **5-9**, and **15**, the container **10** additionally includes a dispensing assembly **200** hermetically sealed to the outlet end **128**. The dispensing assembly **200** provides a sealable closure for the container **10**. The dispensing assembly **200** is selected by one of ordinary skill in the art of packaging in light of the properties of the particular gel to be contained and the gel's application conditions. Dispensing assembly **200** is positioned between first inset gullet **140***a* of front wall **110** and second inset gullet **140***b* of back wall **112** along the outlet end **128** of the container **10**. The dispensing assembly **200** is positioned along the perimeter edges of the container **10**. The dispensing assembly **200** may be sonically or heating sealed to the container. One skilled in the art should appreciate that the other known methods to seal the dispensing assembly may be used.

[0042] In a further embodiment of the invention, the dispensing assembly **200** may additionally include a tamper-revealing purity seal (not shown) applied at the upper edge of nozzle **230**. The tamper-revealing purity seal is removed by the user before dispensing gel from the container **10**.

[0043] The dispensing assembly **200** may include a snap or flip cap, a threaded screw cap, a peel off seal, or a stopper, and may be resealable. The dispensing assembly **200** preferably includes a threaded screw cap **210** or a flip cap **216**. An embodiment of the dispensing assembly **200** using a flip cap **216** is shown in FIGS. **1** and **2**. An embodiment of the dispensing assembly **200** using a threaded screw cap **210** is shown in FIGS. **6-9** and **15**.

[0044] Threaded screw cap **210** or flip cap **216** are preferably unitary and formed of a semi-rigid plastic that fits to a nozzle **230**. Nozzle **230** is preferably unitary and formed of a semi-rigid plastic in a tube configuration to mate or connect effectively with a cap or other resealing mechanism. The nozzle **230** has a cylindrical receiving passageway and is formed by injection molding from plastic or by other suitable methods and materials known to those of ordinary skill in the art. The nozzle **230** is adapted to connect to a flip cap **216** or threaded screw cap **210**. In another embodiment, the flip cap **216** may be connected to the nozzle **230** with a hinging element **218**.

[0045] As shown in FIGS. **1-2**, **5-9**, and **15**, nozzle **230** has a collar **240** at its lower end. The collar **240** may be described as "boat-shaped" with a first flange **242***a* and a second flange **242***b* extending opposite each other. When in position, first flange **242***a* and second flange **242***b* are positioned in a plane generally perpendicular to the longitudinal central line **124** through the center axis of nozzle **230**. The outside surface of first flange **242***a* and second flange **242***b* are sealed within the peripheral edge of first inset gullet **140***a* and second inset gullet **140***b* of front wall **110** and back wall **112**, respectively. Flanges **242***a, b* may optionally have a ribbing **244** to improve sealing to first and second inset gullets **140***a, b*. The vertical heights of first flange **242***a* and of second flange **242***b* are uniform and correspond to the width of the peripheral edge **116** of first inset gullet **140***a* and second inset gullet **140***b*. One suitable choice for a collar **240** may be found in U.S. Pat. No. 6,050,451.

[0046] The front wall **110**, back wall **112**, and bottom gusset **118** are preferably made of the same material. Preferably, the walls of the container **10** are formed of a flexible packaging laminate material having a thickness that is uniform or at least uniformly symmetrical about the longitudinal central line **124** so that the walls **110**, **112**, the outlet end **128**, and the base end **130** will develop stresses uniformly.

[0047] According to the invention, the polymeric material **104** is a multi-layered flexible polymeric material, such as Winpack WCS100, produced by and available from Winpack (21919 Dumberry Road, Vaudreuil-Dorion, Quebec, Canada J7V 8P7, www.winpack.com). The multi-layered flexible polymeric material allows for hermetic sealing and permits easy filling. In one exemplary embodiment, the multi-layered flexible polymeric material includes a coextruded layer, a tempered foil layer, a low density polyethylene (LDPE) layer, and a polyethylene terephthalate (PET) layer. In an exemplary embodiment of the invention, the coextruded layer is a coextruded layer of more than one polymers and, more particularly, an 18 lb/ream coextruded layer of more than one polymers. In an exemplary embodiment of the invention, tempered foil is about 0.000285" thick. In an exemplary embodiment of the invention, the LDPE layer is a 7.0 lb/ream white sheet. In an exemplary embodiment of the invention, the PET layer is a 48 ga sheet of material. In an exemplary embodiment of the invention, the multi-layered flexible polymeric material has a total thickness of 2.40 mil+/−20%. Similar polymeric materials available from the same manufacturer can be printed using reverse rotogravure and surface flexography. Other similar polymeric flexible packaging laminates are known to those of ordinary skill in the art

[0048] Now, use of the container **10** according to the invention will be described. In operation and as illustrated in FIGS. **1-2**, the user removes the threaded screw cap, flip cap, or other cap, removes the tamper-revealing purity seal, if any, and positions the gel the container **10** so as not to obstruct the dispersal of gel. The user exerts pressure, typically with one hand, on the front wall **110** and back wall **112** of the container **10** at its waist portion **134** to create an inwardly directed pressure. In response to this pressure, gel is dispensed out of the dispensing assembly **200** to a location as directed by the user that is appropriate for the diagnostic or treatment ultrasound procedure. The contents of the container **10** are forced outwardly through nozzle **230** by the dispensing pressure. The user then discontinues the dispensing pressure inward on front wall **110** and back wall **112**. The dispensing cycle is repeated as indicated by the procedure.

[0049] In an exemplary embodiment of the invention, as the container **10** is emptied of gel, the opposing front wall **110** and back wall **112** are urged inward, towards each other. This can be seen by comparing FIGS. **1**, **2**, **9**, **14-15**, and **17-19** when filled with FIGS. **6-7** and **10-13** when unfilled and collapsed. A fully emptied container **10** may be folded as described above for convenient disposal.

[0050] The container **10** according to the invention is preferably disposable. It is preferably designed for one time use to reduce opportunities for microbial contamination of equipment and patients. The volume of the container is chosen relative to the ultrasound procedure undertaken and preferably ranges from 0.5 oz. to 600 oz.

[0051] The claimed invention also includes a kit including at least one gel container containing ultrasound coupling gel.

[0052] The foregoing illustrates some of the possibilities for practicing the invention. Many other embodiments are possible within the scope and spirit of the invention. It is, therefore, intended that the foregoing description be regarded as illustrative rather than limiting, and that the scope of the invention is given by the appended claims together with their full range of equivalents.

What is claimed is:

1. An ultrasound coupling gel container, comprising

a flexible body having:

a front wall;

a back wall positioned adjacent and opposing the front wall, the back wall sealed to the front wall along a periphery thereof and providing a cavity receiving section;

an outlet end formed from a front wall top section and a back wall bottom section, the outlet end a planar bottom gusset having a central portion formed from sealed peripheral edge portions along the front wall and the back wall;

a dispensing assembly sealed to a peripheral edge of the front wall and of the back wall along the outlet end.

2. The ultrasound coupling gel container according to claim **1**, wherein a width of the flexible body is less about at a longitudinal mid-point thereof than a width of the outlet end and the planar bottom gusset.

3. The ultrasound coupling gel container according to claim **1**, wherein the front wall and the back wall include an arcuate edge.

4. The ultrasound coupling gel container according to claim **1**, wherein the front wall includes an inset gullet positioned along the outlet end and secured to the dispensing assembly.

5. The ultrasound coupling gel container according to claim **4**, wherein the back wall each further comprise an inset gullet at the outlet end and sealed to the dispensing assembly.

6. The ultrasound coupling gel container according to claim **1**, wherein the dispensing assembly includes a closure.

7. The ultrasound coupling gel container according to claim **6**, wherein the closure is a snap-off closure.

8. The ultrasound coupling gel container according to claim **1**, wherein the flexible body is a continuous sheet of a multi-layered flexible polymeric material.

9. The ultrasound coupling gel container according to claim **8**, wherein the planar bottom gusset is formed from a folded and laminated bottom section of the front wall and a folded and laminated top section of the bottom wall.

10. The ultrasound coupling gel container according to claim **9**, wherein the multi-layered flexible polymeric material includes a composition having a tempered foil layer, a low-density polyethylene (LDPE) layer, and a polyethylene terephthalate (PET) layer.

11. The ultrasound coupling gel container according to claim **10**, wherein a thickness of the multi-layered flexible polymeric material has a total thickness of about 2.40 mil.

12. The ultrasound coupling gel container according to claim **1**, wherein the flexible body includes a receiving passageways extending through one of the sealed peripheral edge portions.

13. The ultrasound coupling gel container according to claim **1**, further comprising an ultrasound coupling gel positioned in the cavity receiving section.

14. The ultrasound coupling gel container according to claim **13**, wherein the planar bottom gusset can expands outwardly as the ultrasound coupling gel is positioned in the cavity receiving section.

15. The ultrasound coupling gel container according to claim **14**, wherein the front wall and back wall are urged toward each other when the ultrasound coupling gel is positioned in the cavity receiving section.

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专利名称(译)	超声波凝胶容器		
公开(公告)号	US20180360415A1	公开(公告)日	2018-12-20
申请号	US15/624096	申请日	2017-06-15
[标]发明人	DOHM RYAN		
发明人	DOHM, RYAN		
IPC分类号	A61B8/00		
CPC分类号	A61B8/4281 B32B1/00 B32B3/02 B32B3/08 B32B15/085 B32B15/09 B32B27/08 B32B27/32 B32B27/36 B32B2250/24 B32B2307/732 B32B2439/06 B32B2439/46 B65D75/008 B65D75/566 B65D75/5883 B65D2575/583 B65D2575/586		
外部链接	Espacenet USPTO		

摘要(译)

提供了一种超声耦合凝胶容器，其包括具有前壁，后壁，出口端，平面底部角撑板和分配组件的柔性主体。后壁位于前壁附近并与前壁相对。后壁沿其周边密封到前壁，并提供空腔接收部分。出口端由前壁顶部和后壁底部形成。平面底部角撑板包括中央部分，该中央部分由沿着前壁和后壁的密封外围边缘部分形成。分配组件在柔性主体的出口端处密封到前壁和后壁的外围边缘。