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Gonzales

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(54) **INFANT FORMULA RECEPTACLE WITH PLIABLE POUCH, AND INFANT FEEDING SYSTEMS**

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B65D 75/00	(2006.01)
A61J 11/00	(2006.01)
B65D 75/58	(2006.01)
A61J 11/04	(2006.01)

(52) **U.S. Cl.**

CPC ***B65D 81/3266*** (2013.01); ***A61J 9/00*** (2013.01); ***A61J 9/001*** (2013.01); ***A61J 11/002*** (2013.01); ***A61J 11/008*** (2013.01); ***A61J 11/04*** (2013.01); ***B65D 75/008*** (2013.01); ***B65D 75/5883*** (2013.01)

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CPC ... A61J 9/00; A61J 9/001; A61J 11/002; A61J 11/008; A61J 11/04; B65D 75/008; B65D 75/5583; B65D 81/3266

See application file for complete search history.

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(57) **ABSTRACT**

A disposable receptacle useful with an infant feeding system, including a pliable pouch. The pliable pouch may have a single compartment, or a pair of compartments wherein a first compartment is filled with powdered formula, and a second compartment is filled with distilled water. When compartmentalized, the compartments are separated by a burst seal designed to fail upon subjection to pressure of between about 1-3 lbs. The receptacles include a cylindrical fitment with a one-way valve removably positioned therewithin. A top seal of the pliable pouch is secured about the body of the fitment. The receptacles may be used with an infant feeding system having a support disc with an aperture to receive and secure the fitment, and a nipple having an internal chamber sized and configured to tightly and removably receive a portion of the fitment. The infant feeding system may optionally include a bottle and a securing ring.

10 Claims, 7 Drawing Sheets

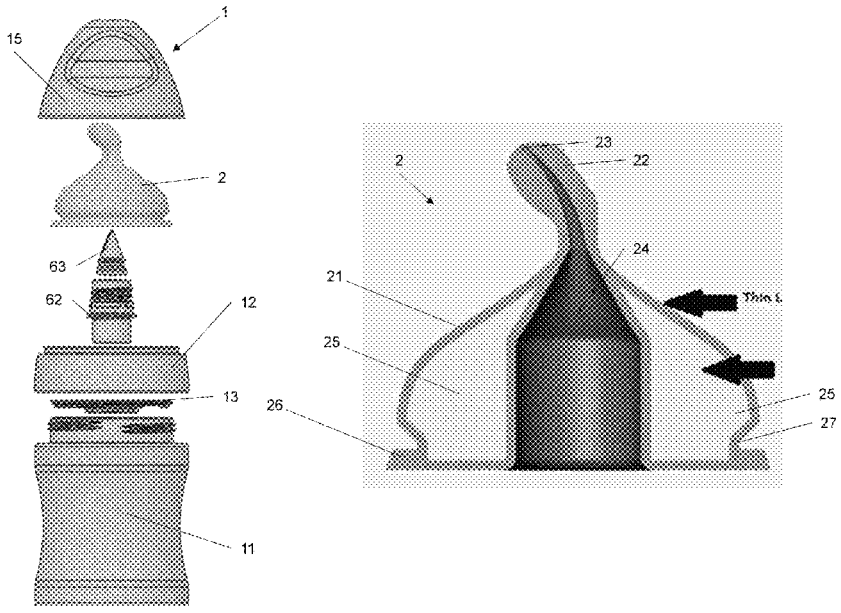

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FIG 1B

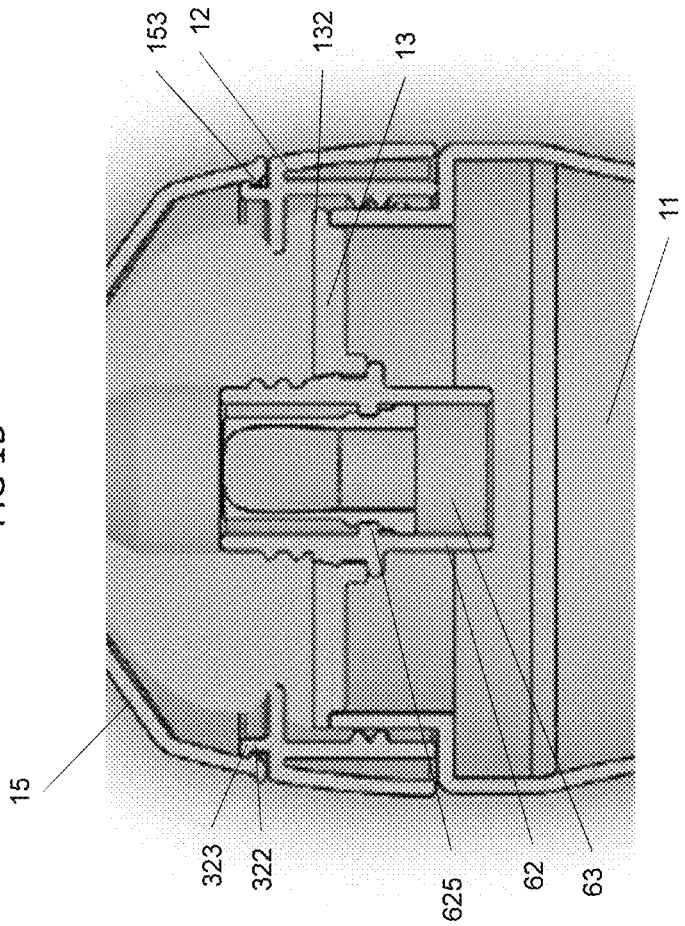


FIG 1A

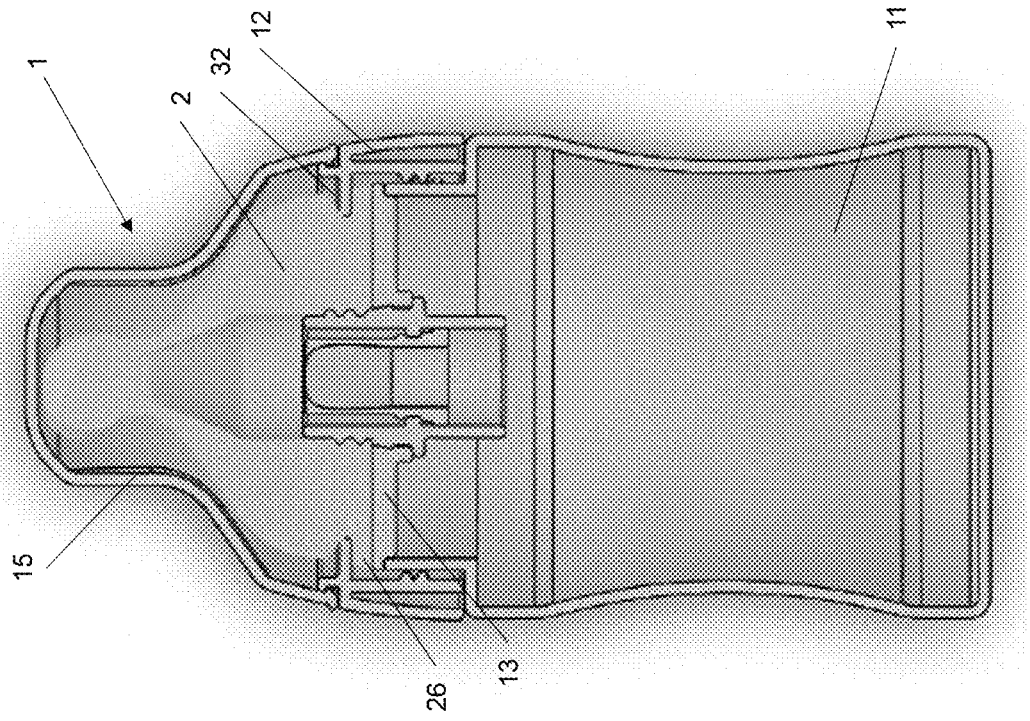
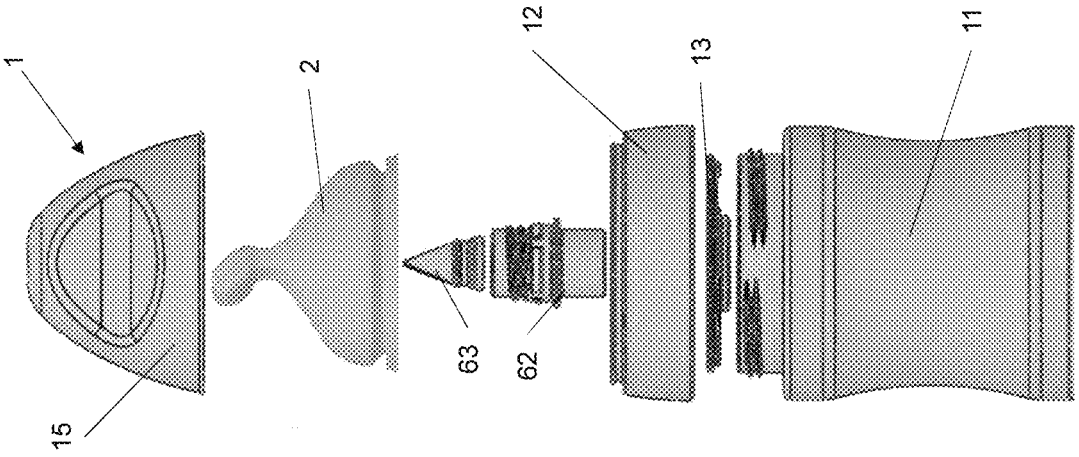


FIG 2



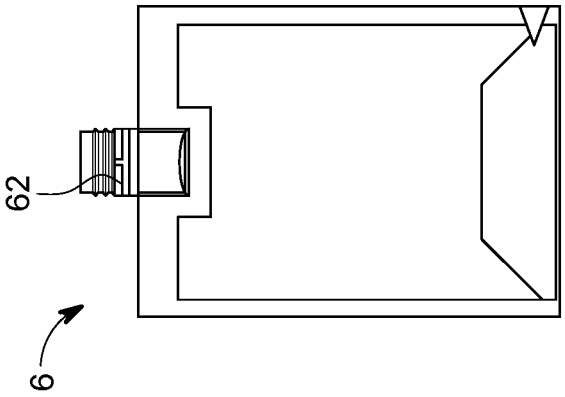


FIG. 3C

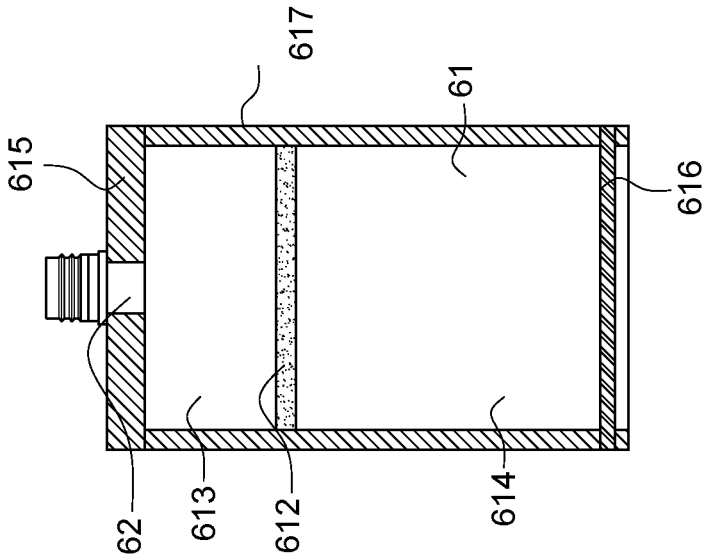


FIG. 3B

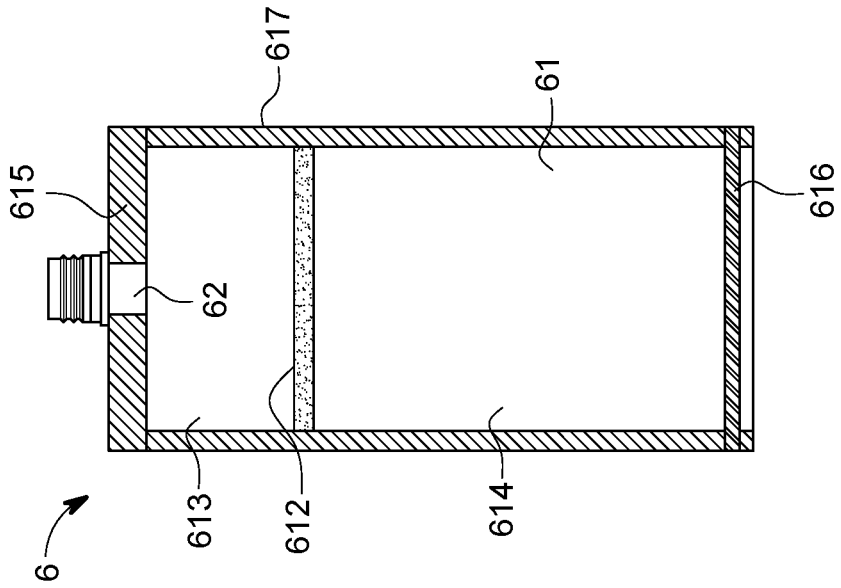


FIG. 3A

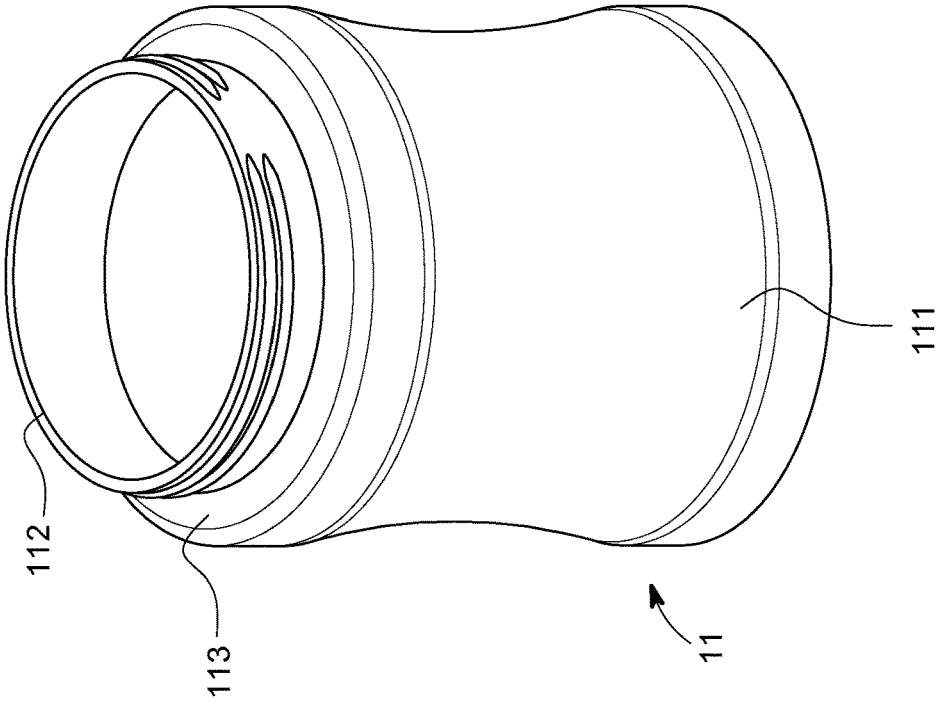


FIG. 5

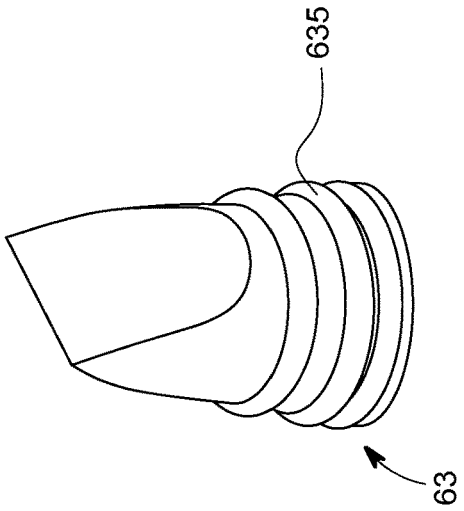


FIG. 4B

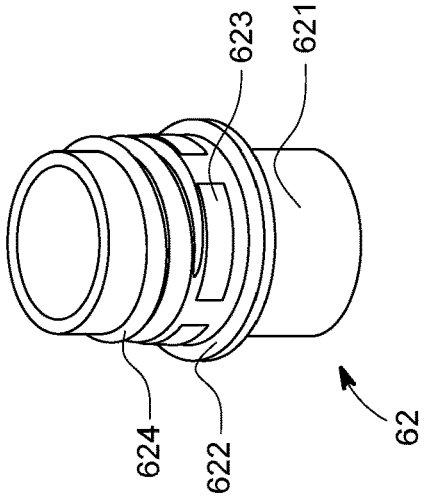


FIG. 4A

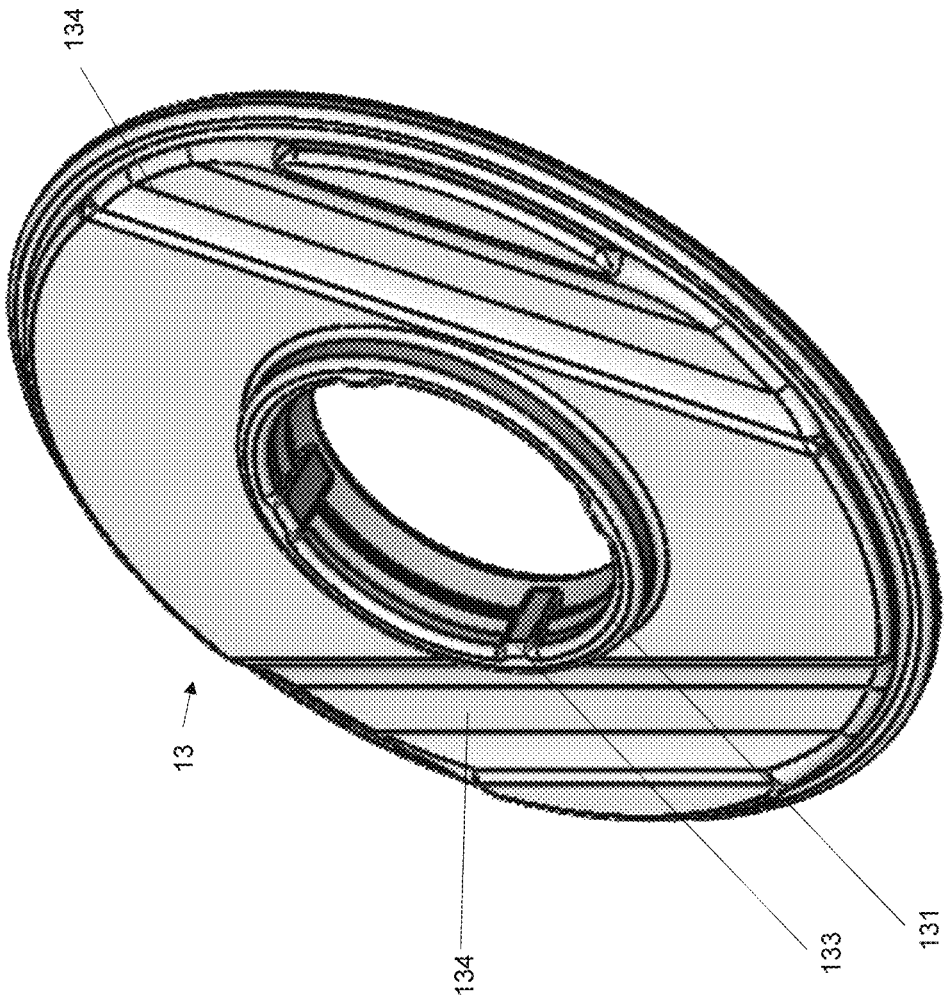


FIG 6

FIG 7B

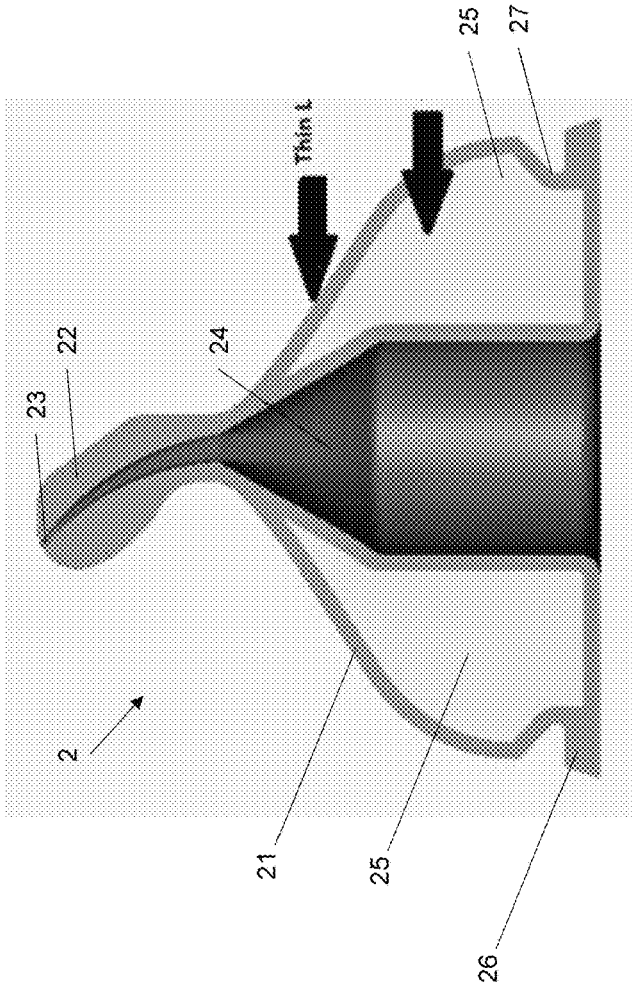
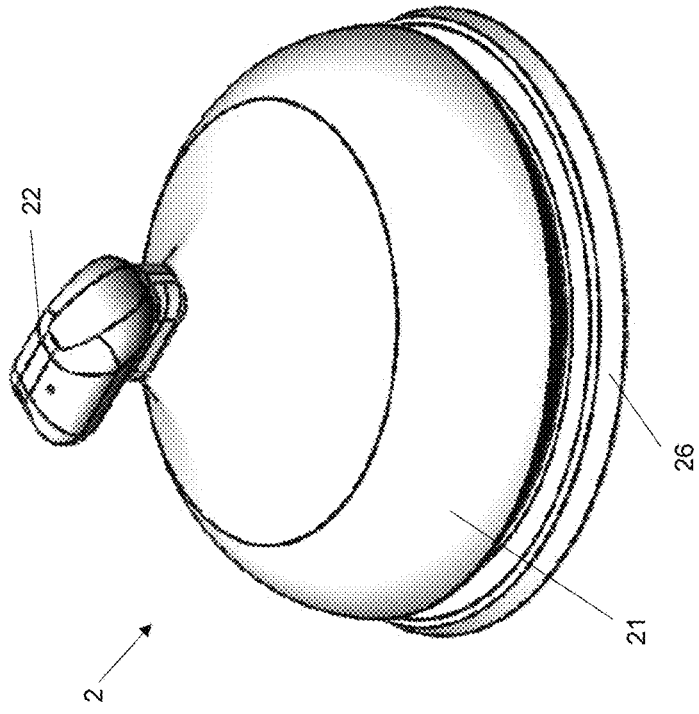


FIG 7A



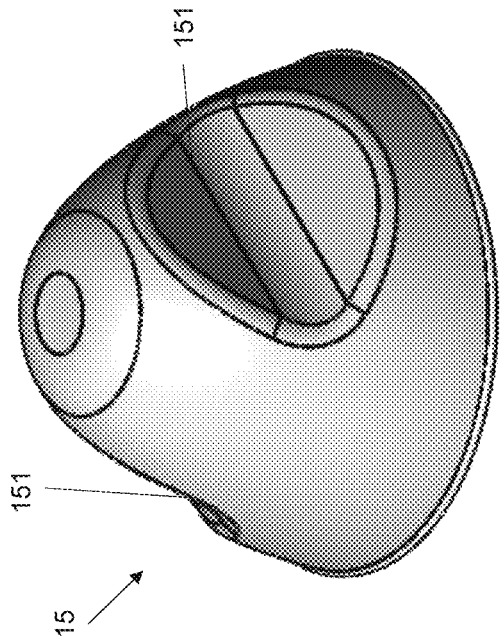


FIG 9A

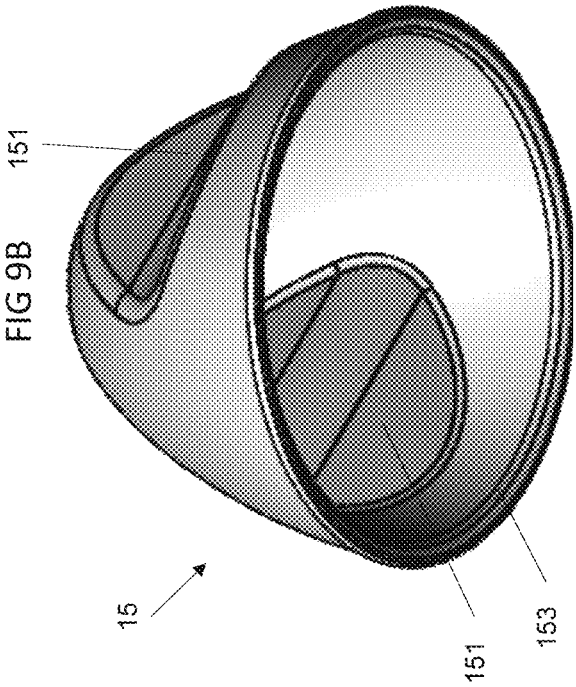


FIG 9B

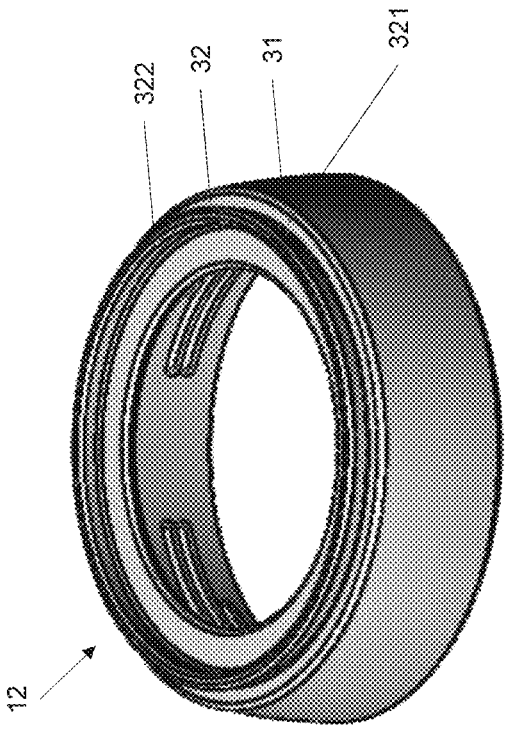


FIG 8A

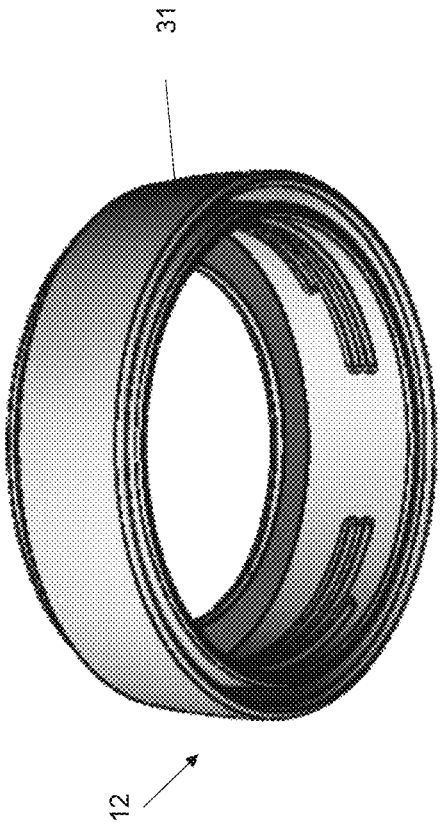


FIG 8B

INFANT FORMULA RECEPTACLE WITH PLIABLE POUCH, AND INFANT FEEDING SYSTEMS

BACKGROUND

The disclosed technology regards a disposable infant formula or breast milk receptacle useful with an infant feeding system or as a component of an assemblable baby bottle.

Various attempts have been made to create a disposable ready-to-use nursing container i.e., a nursing container which the consumer receives with the nursing formula therein.

At present, commercial disposable nursing systems most frequently include a flexible liner which is inserted into a rigid plastic holder. The liner includes an open end which must be wrapped about one end of the rigid holder. A separate container of infant formula must be purchased and opened, and the contents placed in the flexible liner along with distilled or purified water. The operator must then stretch a pre-sterilized nipple over the flexible liner and the top of the holder. The operator must have also performed the nipple sterilization procedure. After the nipple is secured to the holder, a securing ring is typically placed about the nipple to hold it more securely to the holder.

This known prior art has several disadvantages. The operator must go to great lengths to ensure cleanliness, especially where the nursing formula is for a very young infant. Contamination is possible during the transfer of the formula into the liner. Spillage is common, especially during the step of mounting the nipple on the holder, and once the infant is suckling on the nipple there is possibly of air ingestion, which in turn can lead to discomfort and pain.

While these difficulties are not insurmountable, they do require much time and care to avoid. The whole operation is made even more difficult when away from the home or hospital. Furthermore, the procedure must be performed frequently, given the feeding schedule of infants.

The present invention solves these problems presented by the prior art by providing a portable, disposable, more convenient receptacle and feeding system. In an embodiment of the disclosed technology, a pliable pouch already has the nursing formula and distilled/purified water stored therein, in separate compartments divided by a burst seal. The formula and water can be combined once the seal between the compartments has been burst (by applying 1-3 pounds of pressure on the part of the bag containing water, and after the seal has been burst shaking and/or massaging the bag to cause the water and powder to fully combine for consumption). In another embodiment of the disclosed technology, the pliable pouch can receive and store breast milk and/or liquid infant formula (or other liquid, e.g. apple juice). In each of these embodiments, a cap on the bag may be removed, and the bag can be squeezed to remove any air in the bag through a one-way valve. Once the nipple is mounted to the pliable pouch, a high degree of sterility is achieved. The pliable pouch as herein described can be either dropped into a shell bottle or used directly with the nipple, without the bottle or securing ring.

GENERAL DESCRIPTION

The disclosed technology regards a disposable receptacle useful with an infant feeding system, which receptacle includes a pliable pouch having a first compartment filled with powdered formula, and a second compartment filled with distilled water, the compartments being separated by a burst seal designed to fail upon subjection to pressure of between about 1-3 lbs. The receptacle further includes a cylindrical, threaded fitment, having a body, with a collar and a segmented locking ring on the exterior of the body, and a one-way valve removably positioned within the fitment. A top seal of the pliable pouch is secured about the body of the fitment.

The disclosed technology further regards an infant feeding system including a pliable pouch having a first compartment filled with powdered formula, and a second compartment filled with distilled water, the compartments being separated by a burst seal designed to fail upon subjection to pressure of between about 1-3 lbs. The pliable pouch further has a cylindrical, threaded fitment, including a body, with a collar and a segmented locking ring on the exterior of the body, and a one-way valve removably positioned within the fitment. A top seal of the pliable pouch is secured about the body of the fitment. The infant feeding system of the disclosed technology further includes a support disc having a threaded aperture to receive and secure the fitment of the pliable pouch, and a nipple having an internal chamber sized and configured to tightly and removably receive a portion of the fitment.

Optionally, the system may further include a bottle and a securing ring configured to be removably secured about a neck of the bottle. When used with a bottle, the support disc of the system has a recessed lip formed about its circumference to receive the top of the bottle neck.

The disclosed technology further regards a disposable receptacle useful with an infant feeding system, including a pliable pouch for receiving breast milk, the top of which receives and is sealed about a cylindrical, threaded fitment. The fitment includes a body, with a collar and a segmented locking ring on the exterior of the body. A one-way valve is removably positioned within the fitment. Threadably attached to the fitment is a support disc, including a cylinder protruding through the support disc, and forming an aperture to receive the fitment. Protrusions are positioned on an interior of the disc cylinder corresponding with spaces in the segmented locking ring of the fitment, to removably secure the fitment to the ring in a twist-lock manner when in use.

DESCRIPTION OF THE DRAWINGS

The above mentioned features of the invention will become more clearly understood from the following detailed description of the invention read together with the drawings in which:

FIG. **1**A is a view of an embodiment of the infant feeding system of the disclosed technology;

FIG. **1**B is an expanded view of the interconnectedness of the components of the infant feeding system of FIG. **1**A;

FIG. **2** is an assembly view of the components of the infant feeding system of FIG. **1**A;

FIG. **3**A is a view of an embodiment of a disposable receptacle of the disclosed technology;

FIG. **3**B is a view of another embodiment of a disposable receptacle of the disclosed technology;

FIG. **3**C is a view of another embodiment of a disposable receptacle of the disclosed technology;

FIG. **4**A is a view of an embodiment of a fitment of the disclosed technology;

FIG. **4**B is a view of a duckbill valve useful in the disclosed technology;

FIG. **5** is a view of an embodiment of a bottle of the disclosed technology;

FIG. **6** is a view of an embodiment of a support disc of the disclosed technology;

FIG. **7**A is a peripheral view of an embodiment of a nipple of the disclosed technology;

FIG. **7**B is a cut-away view of another embodiment of a nipple of the disclosed technology;

FIG. **8**A is a peripheral top view of an embodiment of a securing ring of the disclosed technology;

FIG. **8**B is a peripheral bottom view of the securing ring of FIG. **8**A;

FIG. **9**A is a peripheral top view of an embodiment of a cap of the disclosed technology; and

FIG. **9**B is a peripheral bottom view of the cap of FIG. **9**A.

DETAILED DESCRIPTION

Referring now to the embodiments shown in the Figures, the disclosed technology is a disposable infant formula or breast milk receptacle **6** useful with or as a component of an assemblable baby bottle **1** or an infant feeding system. As hereinafter described in greater detail, the assemblable baby bottle of the disclosed technology generally includes a bottle **11**, a securing ring **12**, a support disc **13**, a nipple **2** and a removable cap **15**. In some embodiments, the receptacle is used without the assemblable baby bottle, and only with the support disc **13** and the nipple **2**.

As shown in FIGS. **3**A, **3**B and **3**C, the disposable receptacle **6** of the disclosed technology generally includes a pliable pouch **61** and a cylindrical, threaded fitment **62**. The pliable pouch **61** may be sized for different amounts of formula or breast milk, and is defined by a top seal **615**, a closure seal **616**, and side seals **617**. The top seal may have a height of about ½", and the side seals may have a height of about ¼"; in the embodiments shown, the closure seal is about ¼" in height, and is positioned about ¼" above the bottom of the side seals. The bottom of the disposable receptacle may be gusseted. An aperture at the top and center of the pliable pouch is secured about the circumference of the fitment **62**.

When the disposable receptacle is used to store liquid formula or breast milk, the pliable pouch may have a gusseted bottom, as shown in FIG. **3**C. In this embodiment, the fitment may receive coupling means such as a funnel to couple the same with a breast pump, facilitating the delivery of breast milk from the breast pump to into the receptacle.

When the disposable receptacle is used to store powder formula, the pliable pouch may have a burst seal **612** integrated across a width thereof, to separate a first compartment **613** for powder formula from a second compartment **614** for distilled water. In the exemplary embodiment shown in FIG. **3**A, the pliable pouch has a length of about 8", and a width of about 4", wherein the burst seal **612** may be about ¼" in depth and positioned about 1.875" below the top seal; this embodiment accommodates about 26.4 g powder formula and about 170.4 ml distilled water in the respective compartments **613**, **614**. In another exemplary embodiment as shown in FIG. **3**B the pliable pouch has a length of about 6.625", and a width of about 4", wherein the burst seal may be about 1.5" below the top seal; this embodiment accommodates about 17.6 g powder formula and about 113.6 ml distilled water in the separate compartments. Other dimensions and compartment sizes would be suitable for use with the disclosed technology.

The burst seal suitable for use in the disclosed technology is intended to fail at a relatively low pressure, about 1-3 lbs., or about 2 lbs., whereas the seals forming the top, sides and closure seals are not intended to fail (although they will, at a much higher pressure). Clearly the intended pressure at failure of the burst seal should be sufficiently high so that it will not rupture in transit or otherwise prior to intended use. Eastern States Packaging, Inc., out of Stoughton, Mass., manufactures compartmentalized bags with burst seals suitable for use in the disclosed technology.

The pliable pouch may be constructed from 0.0025 clear polyster/poly film, or similar, durable, food grade material.

As shown in FIG. **4**A, the fitment **62** of the disposable receptacle includes a body **621**, a collar **622**, a segmented locking ring **623** and threads **624**. As hereinabove discussed, the pliable pouch is secured about the circumference of the body **621**, directly below the collar **622**. As shown in FIG. **1**B, the interior of the fitment **62** comprises an interior collar **625** protruding from the inner surface thereof, wherein the interior vacuous area of the fitment is sized to receive a one-way valve **63**, such as a duckbill valve as shown in FIG. **4**B. To secure the one-way valve in the interior of the fitment, the one-way valve includes a recessed ring **635** about its exterior to receive the interior collar **625** of the fitment. A cap, not shown, can be threadingly and removably engaged with the fitment to seal the receptacle as necessary.

The support disc **13** of the disclosed technology, shown separately at FIG. **6** and with other components of the assemblable baby bottle in FIGS. **1**A, **1**B and **2**, comprises a cylinder **131** protruding through the support disc, and forming an aperture to receive the fitment. Protrusions **133** on the interior of the disc cylinder correspond with the spaces in the segmented locking ring **623** of the fitment, to secure the fitment to the ring in a twist-lock manner when in use. As shown in FIG. **1**B, the undersurface of the threaded central ring further has a recessed lip **132** so that when positioned on a baby bottle, the lip rests on the top surface of the threaded neck, and the remainder of the disc **13** is partially received in the vacuous area of the top of the bottle, thereby seating the disc on the top of the bottle. Further, the top surface of the support disc includes a pair of depressions **134**, extending at angles, to receive fingers when the support disc is used with a disposable receptacle and nipple, but independent of the assemblable bottle.

As shown in FIGS. **1**A, **1**B, **7**A and **7**B, a nipple **2** of the disclosed technology has a body **21** and a teat **22**, with a pinhole aperture **23** extending from the top of the teat and in fluid communication with an internal chamber **24** extending into the nipple body. In one embodiment, as shown in FIG. **7**A, the nipple is formed from food grade silicone. In another embodiment, as shown in FIG. **7**B, the exterior surfaces of the nipple body and internal chamber are formed from food grade silicone, and the space **25** between such surfaces are filled with a non-toxic, soft gel In both of these embodiments, the nipple further includes a flange **26** forming a base of the nipple and a neck **27** where the body of the nipple angularly extends upwards from the flange. When assembled as part of an assemblable baby bottle, the nipple sits on top of the support disc as shown in FIGS. **1**A and **1**B, and the flange is compressed by the securing ring, the internal collar of the securing ring being positioned within the nipple neck. The nipple may also be used with the support disc and disposable receptacle, apart from the bottle and remaining components of the assemblable baby bottle. In this manner of use, the internal chamber **24** of the nipple is sized to fit snuggly on the fitment, above the support disc, so that it will not come loose therefrom when an infant is suckling the nipple.

Turning now to the assemblable baby bottle **1** of the disclosed technology, the same including the disposable receptacle, support disc, and nipple as hereinabove

described, and further including a bottle, a securing ring and a removable cap. In the embodiment shown in FIG. **5**, the bottle **11** of the assemblable baby bottle includes a cylindrical body **111** with a threaded neck **112**, having a ledge **113** between the body and the neck.

The securing ring **12** of the assemblable baby bottle, an embodiment of which is shown in FIGS. **1**A, **1**B, **2**, **8**A and **8**B, includes a cylindrical wall **31**, with a ledge **32** extending radially inward from the cylindrical wall. The securing ring includes internal threading to engage with the threaded neck **112** of the bottle. The outside of the ledge may have a lip **321**. A collar **322** with a protuberance **323** extending radially outwards is positioned on the top of the securing ring, and with the lip is designed to removably secure the cap **15** to the securing ring. The portion of the ledge **32** extending radially inward from the collar **322** receives and supports the flange **26** of the nipple, about the nipple base neck **27**.

Finally, as shown in FIGS. **1**, **2**, **9**A and **9**B, the removable cap **15** includes a vacuous area sized to receive the nipple when the bottle is assembled. Two finger indentations **151** are positioned on opposing sides of the cap, for ease of securing the cap to the bottle, and removing the same. The bottom circumference of the cap is sized to be removably secured to the securing ring, wherein an internal collar **153** is positioned slightly above the bottom edge of the cap to lockingly engage with the protuberance **323** of the second ring of the securing ring, as shown in detail in FIG. **1**B.

In a first embodiment, the disposable receptacle is provided, filled with powdered formula and distilled water, in separate compartments as hereinabove described. In an alternate embodiment, the disposable receptacle with a single compartment is coupled with a breast pump by means of a funnel or similar delivery means, and fresh breast milk is delivered into the disposable receptacle, a cap is secured to the fitment, and the filled receptacle is prepared for storage and later use. In yet another alternate embodiment, the disposable receptacle with a single compartment is filled with liquid formula. In the first embodiment, when ready for use pressure is applied to the liquid compartment, such as by squeezing between fingers, and the burst seal is broken, causing the powdered formula and distilled water to mix. In any of these embodiments, when ready for use, the cap is removed from the fitment, and a one-way valve is secured within the fitment (it is acknowledged that the valve may be secured within the fitment prior to securing the cap and storing the receptacle). The fitment is secured within the aperture of the support disc. At this point a nipple may be fittedly and removably secured to the fitment, above the support disc. Alternatively, the disposable receptacle and support disc may be positioned within a bottle of the disclosed technology, with a nipple positioned to receive the fitment, above the support disc, and a securing ring secured to the bottle, thereby securing the nipple and the support disc. A bottle cap may be removably secured to the securing ring, if desired.

While certain embodiments of the disclosed technology have been shown and described, it will be understood that it is not intended to limit the disclosure, but rather it is intended to cover all modifications and alternate methods falling within the spirit and the scope of the invention as defined in the appended claims.

The invention claimed is:

1. A disposable receptacle useful with an infant feeding system, the disposable receptacle comprising:

a pliable pouch having a first compartment filled with powdered formula, and a second compartment filled with distilled water, the compartments being separated by a burst seal designed to fail upon subjection to pressure of between about 1-3 lbs,

a cylindrical, threaded fitment, the fitment comprising a body, with a collar on the exterior of the body and an interior collar, and

a one-way valve removably positioned within the fitment, the one-way valve having a recessed ring about its exterior to receive the interior collar of the fitment, and wherein the one way valve is a duckbill valve; and

wherein the size and shape of the fitment corresponds with the size and shape of an internal chamber of a nipple, to removably secure the nipple to the fitment;

wherein a top seal of the pliable pouch is secured about the body of the fitment; and

wherein the nipple comprises a flange about its outer circumference to optionally secure the nipple to a baby bottle by means of a securing ring.

2. The disposable receptacle of claim **1**, wherein the nipple further comprises a body and a teat, with a pinhole aperture extending from the top of the teat and in fluid communication with the internal chamber of the nipple, and wherein the nipple is formed from food grade silicone.

3. The disposable receptacle of claim **1**, wherein the nipple further comprises a body and a teat, with a pinhole aperture extending from the top of the teat and in fluid communication with the internal chamber of the nipple, and wherein an exterior surface of the nipple body and a surface of the internal chamber are formed from food grade silicone, and the space between the exterior surface of the nipple body and the surface of the internal chamber are filled with a non-toxic, soft gel.

4. The disposable receptacle of claim **1**, wherein the flange forms a base of the nipple and a neck, and wherein a body of the nipple angularly extends upwards from the flange.

5. An infant feeding system comprising:

a pliable pouch having a first compartment filled with powdered formula, and a second compartment filled with distilled water, the compartments being separated by a burst seal designed to fail upon subjection to pressure of between about 1-3 lbs,

a cylindrical, threaded fitment, the fitment comprising a body, with a collar on the exterior of the body, and a one-way valve removably positioned within the fitment, wherein the one-way valve is a duckbill valve, and wherein a top seal of the pliable pouch is secured about the body of the fitment; and

a nipple having an integral internal chamber of silicon sized and configured to tightly and removably receive a portion of the fitment.

6. The infant feeding system of claim **5**, further comprising:

a bottle having a threaded neck, and

a securing ring configured to be removably secured about a neck of the bottle.

7. The infant feeding system of claim **5**, wherein the nipple further comprises a body and a teat, with a pinhole aperture extending from the top of the teat and in fluid communication with the internal chamber of the nipple, and wherein the nipple is formed from food grade silicone.

8. The infant feeding system of claim **5**, wherein the nipple further comprises a body and a teat, with a pinhole aperture extending from the top of the teat and in fluid communication with the internal chamber of the nipple, and wherein an exterior surface of the nipple body and a surface of the internal chamber are formed from food grade silicone,

and the space between the exterior surface of the nipple body and the surface of the internal chamber are filled with a non-toxic, soft gel.

9. The infant feeding system of claim **5**, wherein the nipple comprises a flange forming a base of the nipple and a neck, where the body of the nipple angularly extends upwards from the flange.

10. An infant feeding system comprising:

a cylindrical fitment and a one-way valve removably positioned within the fitment, the one-way valve having a recessed ring about its exterior to receive an interior collar of the fitment and thereby removably secure the one way valve within the fitment, wherein the one-way valve is a duck-bill valve, the fitment further comprising a threaded exterior surface to receive a removable cap having a corresponding threaded interior surface;

the cylindrical fitment being positioned within and secured by a top seal of a pliable pouch, the pliable pouch having a first compartment filled with powdered formula, and a second compartment filled with distilled water, the compartments being separated by a burst seal designed to fail upon subjection to pressure of between about 1-3 lbs.; and

a unitary nipple with an exterior surface of silicone, the nipple having an internal chamber of silicone sized and shaped to receive, be directly in contact with and be removably secured to the fitment by means of the threaded exterior surface of the fitment, and further having a flange to optionally secure the nipple to a baby bottle by means of a securing ring.

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