

Dec. 19, 1967

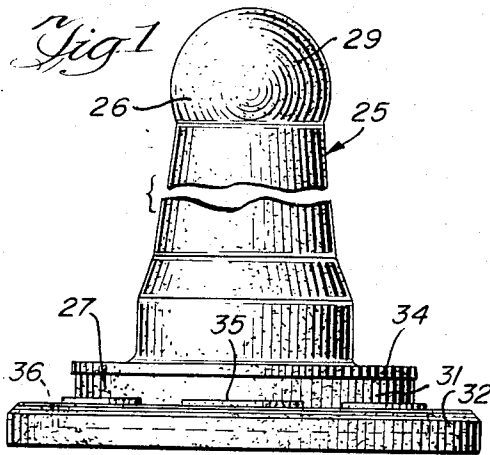
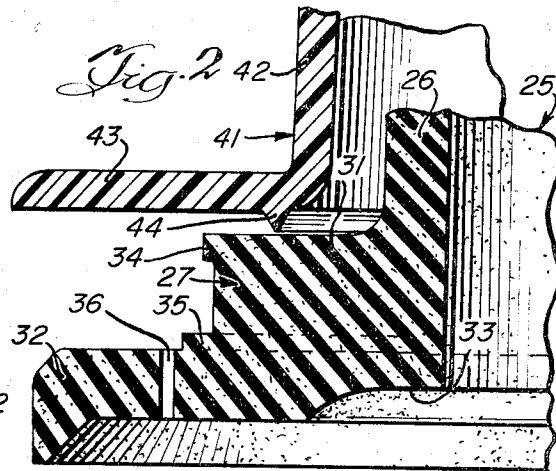
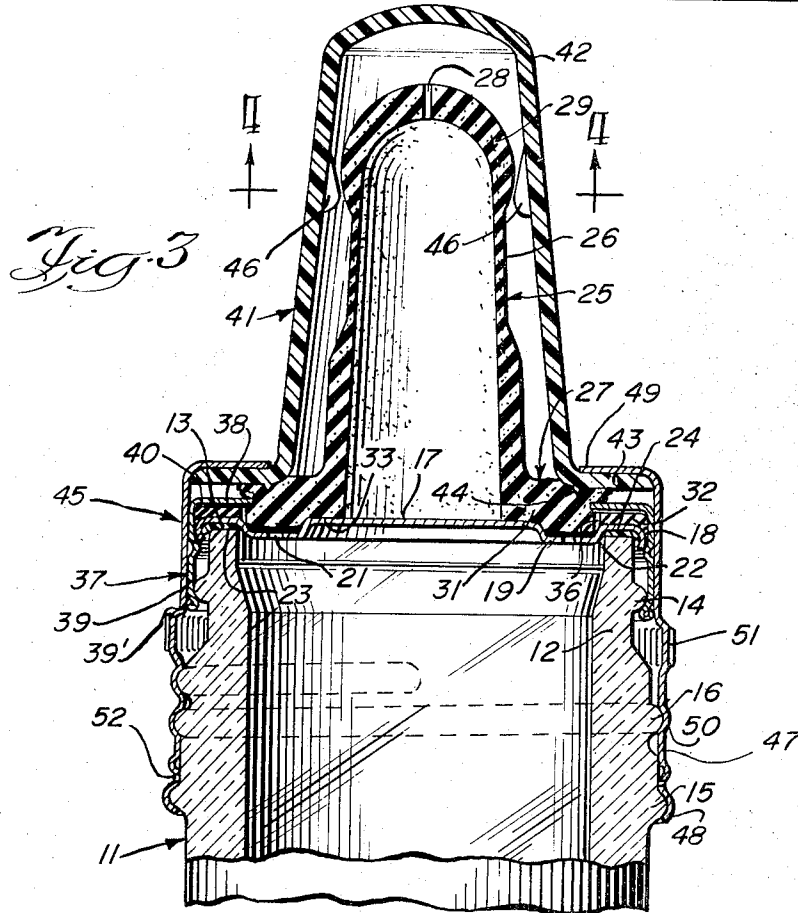
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3,358,864

SEALED FEEDING BOTTLE ASSEMBLY

Filed Nov. 29, 1965

2 Sheets-Sheet 1



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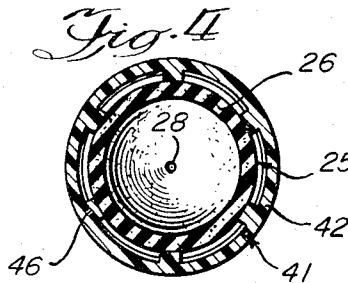
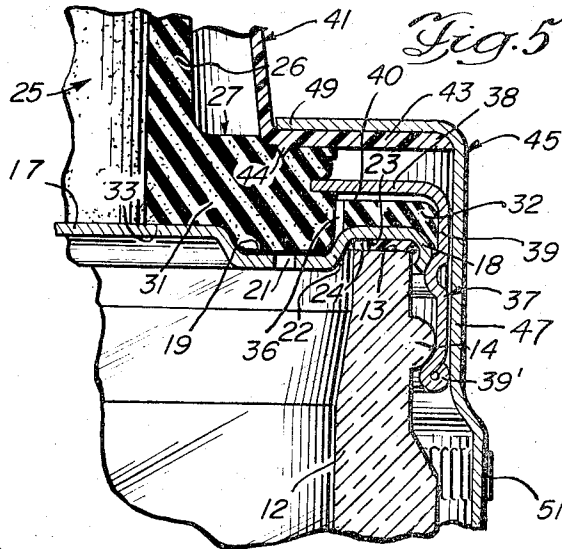
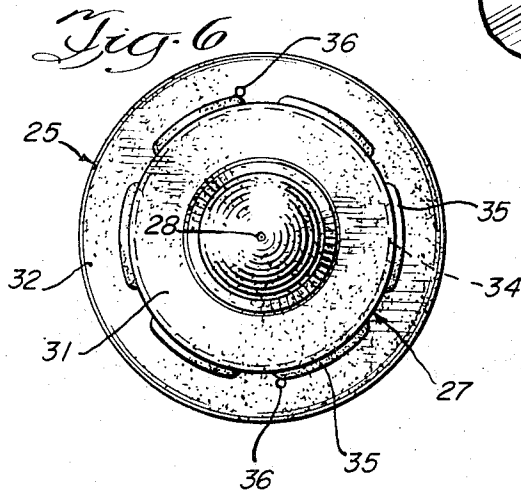
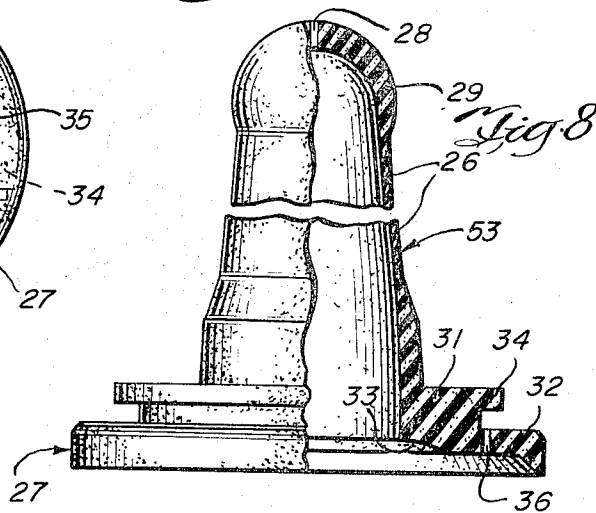
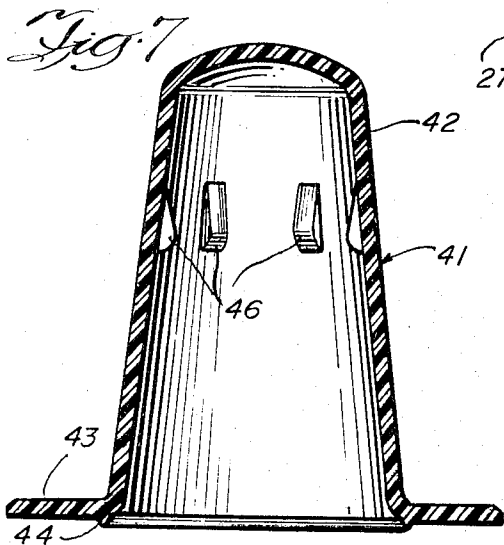
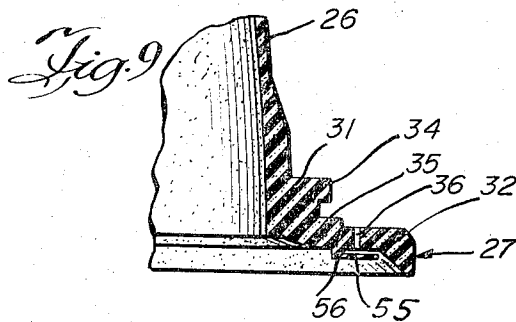
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SEALED FEEDING BOTTLE ASSEMBLY

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2 Sheets-Sheet 2



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SEALED FEEDING BOTTLE ASSEMBLY
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11 Claims. (Cl. 215-11)

ABSTRACT OF THE DISCLOSURE

A sealed feeding bottle assembly comprising a nipple having an annular flange secured to the top of a bottle by an inner ferrule. The nipple has an annular lip above the flange that is adapted to be clamped over the inner edge of the ferrule to seal it against leakage. A shroud fitting over the nipple is provided with integral lugs projecting inwardly so as to engage the upper end of the nipple and exert an axial outwardly directed pull on the nipple when the shroud is removed to prevent adhesion of the flange of the nipple to a sealing disk extending over the top of the bottle.

This invention relates to a sealed feeding bottle assembly adapted to hold an individual serving of water, a liquid milk product, or other liquid food, etc., in which the contents and all components within the confines of the package are sterilized and held in a sterilized condition, and is particularly concerned with an improved seal for such assemblies including a novel nipple construction, which construction provides for visually detecting any imperfections in the package.

The feeding bottle assembly of the present invention comprises a bottle, a sealing disk and a feeding nipple secured to the finish of the bottle by an inner ferrule, a shroud having a dome enclosing the teat portion of the nipple, and an outer ferrule clamping the shroud in place. The nipple is preferably rubber, but may be made of any plastic material having the elastomeric property and characteristics of rubber. The shroud may also be made of rubber, but a transparent plastic material is preferred because of certain special advantages, hereinafter described, which accrue from the use of such material. The plastic material may be rigid, or may possess certain degrees of flexibility.

For example, it is customary to ship glass containers containing vacuum packed liquids upside down to avoid hydrodynamic destruction. The shroud should be firm enough to protect the nipple from damage and from deflection when the assembly is shipped or stored in an inverted position. When a rigid shroud is employed, there is provided a plurality of integral lugs projecting inwardly from the inner surface of its dome. These lugs facilitate alignment of the nipple during assembly and serve as gripping means for the teat portion of the nipple when the shroud is removed from the assembly to ready it for use.

The lugs on the inside of the dome of the shroud engage the upper end of the teat portion of the nipple and exert an axially directed outward pull on the teat when the shroud is removed from the assembly. This pull on the teat is desirable in that it breaks any adhesion that may occur between the bottom surface of the nipple flange and the top surface of the sealing disk if the assembly is stored for a long period of time. In shrouds made of flexible material, any adhesion that may occur between the bottom surface of the nipple flange and the top surface of the sealing disk may be broken by squeezing the shroud, hence the nipple, inwardly as the shroud is removed, to exert an axially directed outward pull on the nipple. Although the adhesion may be broken by pulling the nipple outwardly

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in an axial direction, either with one's fingers, or with forceps, such methods are objectionable. If the nipple is pulled outwardly manually, the sterility of the assembly is destroyed, and the use of forceps requires an additional tool in addition to the additional work required to sterilize the forceps.

The transparency of the shroud enhances the appearance of the assembly, and also facilitates the visual detection of defects, such as leakage, misalignment, or misapplication of the nipple, blisters, or foreign matter in the nipple material, before the assembly is shipped to a dealer, or consumer.

The feeding nipple of the present assembly is provided with an annular lip extending laterally from the upper edge of a thick inner section of the nipple flange and spaced from the top surface of the thinner outer section of the flange through which the air vents extend. In the assembly, the inner edge of the inner ferrule extends inwardly and terminates under the annular lip. The air vents are located adjacent the lip, but are spaced outwardly of the thick section of the nipple flange and are covered by the inner ferrule. When the outer ferrule clamps the flange of the shroud against the top of the inner ferrule, the flange of the shroud forces the annular lip downwardly into sealing engagement with the upper surface of the inner ferrule. The annular lip seals the inner edge of the inner ferrule and prevents any leakage of processing media that might otherwise occur into the nipple area, or through an air vent and around the inner edge of the inner ferrule. If desired, the nipple may be provided with a flutter valve located on its base to cover the lower end of the air vent to minimize the possibility of leakage. The flutter valve may be integral with the nipple, or may be secured thereto in any suitable manner.

The nipple flange is provided with a plurality of integral bosses that project upwardly from the outer section adjacent the periphery of the inner section. The bosses are preferably spaced uniformly around the circumference of the thick inner section of the nipple flange and extend outwardly from the periphery of the inner section a distance slightly greater than the width of the annular lip. Each air vent is located in the thin outer section of the nipple flange adjacent the outer edge of one of the bosses. The bosses maintain a predetermined spacing between the underside of the annular flange of the inner ferrule and the upper surface of the nipple flange in the area contiguous to the air vent, to provide a more positive airflow path to the air vents, and thus facilitate proper feeding.

The structure by means of which the above noted and other advantages of the invention are attained will be fully described in the following specification, taken in conjunction with the accompanying drawings showing illustrative embodiments of the invention, in which:

FIGURE 1 is a fragmentary elevational view of a nipple constructed in accordance with the present invention;

FIGURE 2 is an enlarged fragmentary cross-sectional view of the nipple of FIGURE 1 with a shroud positioned on the nipple flange;

FIGURE 3 is a fragmentary vertical sectional view of a sealed feeding bottle assembly;

FIGURE 4 is a cross-sectional view, taken along the line 4-4 of FIGURE 3;

FIGURE 5 is an enlarged fragmentary sectional view showing the assembly in sealed position;

FIGURE 6 is a top plan view of the nipple;

FIGURE 7 is a cross-sectional view of the shroud;

FIGURE 8 is a view, partly in section and partly in elevation of a modified embodiment of the nipple; and

FIGURE 9 is an enlarged fragmentary cross-sectional view of a modified form of nipple provided with a flutter valve extending across the lower end of the air vent.

In the drawings, a bottle 11, which may be made of glass, plastic, or any other suitable material, is provided with a finish 12 having a flat top surface 13. The finish also includes an upper bead 14, a lower bead 15, and a helical thread 16 between the beads. The helical thread extends around the finish slightly more than one complete turn.

A sealing disk 17, which may be made of metal, plastic, or any other suitable material, is seated on the flat top surface 13 of the finish 12. It should be understood that although the various elements of the structure for sealing the bottle assembly may be applied to the bottle piece by piece, it is preferred to assemble all of the separate components into a subassembly which is applied as a unit to a bottle previously filled with the liquid contents it is intended to hold. The bottle assembly and its contents are preferably sterilized after the bottle assembly is sealed.

The sealing disk 17 has a depending annular flange 18 at its outer edge, and an annular feed groove 19 spaced inwardly of the finish. The feed groove is provided with a plurality of circumferentially spaced apertures 21 that form part of a passageway for the flow of the liquid contents of the bottle from the bottle to a nipple, hereinafter described, when the assembly is used to feed a recipient. The feed groove 19 has an outer sidewall 22 that cooperates with the annular flange 18 to form an inverted annular channel 23 into which the upper edge of the finish fits. A gasket 24 is positioned in the channel 23 between the underside of the disk 17 and the top surface 13 of the finish to provide a seal. The gasket may be preformed, or may be flowed into the channel. When the assembly is in sealed condition, the sealing disk prevents the liquid contents of the bottle from flowing into the nipple. The apertures 21 in the feed groove 19 are sealed in a manner hereinafter described.

A nipple 25 comprises a teat 26 and an annular flange 27 extending laterally outwardly from the base of the teat. In the assembly, the nipple is positioned with its flange seated on top of the sealing disk 17. The upper end of the teat, in which one or more discharge openings 28 are located, is thickened, as indicated at 29, for a purpose hereinafter disclosed. The thickened portion 29 of the teat has an outer circumference larger than the circumference of the intermediate section of the teat adjacent to the enlarged section. The nipple flange 27 comprises a thick annular inner section 31 and a thinner annular outer section 32. The underside of the inner section 31 is recessed, as shown at 33, to provide a space communicating with the apertures 21 and forming part of a liquid flow passageway. When the assembly is being used to feed a recipient, the liquid contents of the bottle flow from the bottle through the apertures 21 and the recess 33 into the nipple 25. When the assembly is in sealed position, the inner section 31 fits against the feed groove 19 and seals the apertures 21.

An annular lip 34 projects outwardly from the upper portion of the periphery of the inner section 31 in spaced relationship to the top surface of section 32. A plurality of circumferentially spaced bosses 35 project upwardly from the top surface of the outer section 32 adjacent the periphery of the inner section 31. Air vents 36 extend through section 32 adjacent the outer edge of the bosses 35 spaced circumferentially around the inner section 31 of the nipple flange.

The nipple flange is clamped against the disk 17 by an inner ferrule 37, which may be made of aluminum, plastic, or other suitable materials, and comprises a flat annular flange 38 and a depending skirt 39. The lower edge of the skirt 39 terminates in a bead 39' that is crimped under the upper bead 14 to secure the inner

ferrule to the finish of the bottle 11 with the flange 38 overlying the annular outer section 32 of the nipple flange. The bead 39' is preferably preformed on the lower edge of the skirt 39 and is engaged with the lower edge of the bead 14 by deformation of the skirt 39 when the inner ferrule 37 is positioned on the bottle.

The annular flange 38 extends over the upper end of each air vent 36, and its inner edge is seated on the top surfaces of the bosses 35. Each boss 35 projects above the top surface of section 32 to form an air space 40 between the underside of the annular flange 38 and the top surface of the outer section 32 of the nipple flange. The gaps between the bosses 35 insure airflow communication between the air space 40 and the atmosphere when the assembly is not in its sealed condition to facilitate the feeding operation. Each of the vents 36 is located closely adjacent to the outer edge of a boss 35 and is in airflow communication with the air space 40.

The nipple is protected by a shroud 41, which in the embodiment illustrated is made of a rigid transparent plastic material, comprising a dome 42 and an annular flange 43 extending laterally outwardly from the open end of the dome. However, as previously mentioned, the shroud could be made of a flexible material without lugs. In the bottle assembly, the shroud 41 is positioned with its dome 42 enclosing teat 26 of the nipple, and its flange 43 seated on the upper surface of inner section 31 of the nipple flange. The outer portion of the flange 43 overhangs the flange 38 but is spaced above it. Preferably, the lower surface of the flange 43 is provided with an integral depending annular rib 44 adapted to bite into the top of the nipple flange to prevent accidental displacement of the dome before it is clamped into position by an outer ferrule 45, hereinafter described.

The shroud 41 is also provided with a plurality of circumferentially spaced integral lugs 46 extending inwardly from the inner surface of its dome 42 and spaced from the upper end of the dome. The circumferential spacing of the lugs 46 is preferably uniform, but uniformity is not essential. The lugs have an identical configuration, and the inner surface of each lug is curved inwardly from each end to an intermediate point of maximum thickness. A line touching the innermost surface of each lug circumscribes a circle having a circumference smaller than the largest outer circumference of the upper thickened portion of the teat 26. The lugs 46 are so located in the dome 42 that when the bottle assembly is in its sealed condition, the thickest portion of each lug is below the maximum outer circumference of the upper thickened portion of the teat 26.

Preferably, the nipple, sealing disk, shroud, and inner and outer ferrules are preassembled and secured to the bottle as a unit. During the assembly of the shroud and the nipple, the lugs 46 help align the teat 26 axially with respect to the dome of the shroud. Furthermore, the transparency of the dome permits visual inspection of the assembly, so that any misalignment may be corrected before the nipple and shroud are secured to a filled bottle. The thickened upper end of the teat 26 is sufficiently resilient so that it can be temporarily deformed to force it past the lugs 46, and will spring back into its normal upstanding position within the dome 42.

The shroud is held in place by the outer ferrule 45. The outer ferrule has a skirt 47 adapted to be secured to the finish 12 by forming a thread 50 in skirt 47 around the helical thread 16 and simultaneously crimping one end 48 of the skirt around the lower bead 15 of the finish 12. When the end 48 is crimped to the bead 15, an annular flange 49 extending inwardly from the opposite end of the skirt 47 overlies the flanges 43 of the shroud to clamp it against the upper surface of inner section 31 of the nipple flange. This clamping action forces the nipple flange 27 downwardly so that the underside of the nipple flange, including the portion defining the recess 33, is held tightly against the sealing disk 17 to block the

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liquid flow passageway. The clamping action of the outer ferrule also forces a portion of the nipple flange into the feed groove 19 and apertures 21, and squeezes the lip 34 downwardly over the inner edge of the annular flange 38 of the inner ferrule. The interengagement of the lip 34 with the flange 38 seals the inner edge of the flange against any possible leakage that might otherwise seep through an aperture 21 and an air vent 36 into the air space 40, and from there around the inner edge of the flange 38.

The interengagement of the thread 50 in the intermediate portion of the skirt 47 and the helical thread 16 of the finish 12 causes rotational movement of the outer ferrule in one direction to exert a lifting force on the outer ferrule. A portion of the outer surface of the skirt 47 is knurled, as indicated at 51, to facilitate application of rotational force to the outer ferrule. The skirt 47 is weakened, in any suitable manner, between the thread 50 and the crimped lower end 48, along a line 52 extending completely around the circumference of the skirt. When rotational force is applied to the outer ferrule in the proper direction, the lifting force, due to the rise of the helical thread 16, severs the skirt 47 along the line 52 and separates the major portion of the outer ferrule from the crimped end 48.

It will be understood that the skirt 47 may be weakened along a pair of parallel lines defining a strip that may be removed from the skirt of a pull tab, instead of by the threaded interengagement of the skirt and the finish. If desired, the tearing strip may extend vertically of the skirt, instead of circumferentially. Complete severance of the outer ferrule circumferentially or vertically releases the clamping pressure on the annular flange 43 of the shroud and permits easy removal of the shroud and the major portion of the outer ferrule from the bottle assembly.

When the outer ferrule is severed along a circumferential line, the shroud 41 may be removed from the bottle assembly by an axially directed pulling movement, and will carry the lower portion of the outer ferrule with it. As soon as the clamping pressure against the flange 43 of the shroud is released, the resiliency of the nipple flange is usually sufficient to urge its inner section 31 to return to its unrestrained condition and cause it to break the seal between it and the inner edge of the flange 38, as well as the seal between surface 33 and mating parts of disk 17, such as feed groove 19 and apertures 21. Breaking this seal reestablishes airflow communication between air space 40 and the atmosphere, thereby making the air vents 36 operative. Even if the flange 38 is deformed by the clamping pressure of the outer ferrule, the deformation is not sufficient to keep the airflow passageway closed after release of the clamping pressure of the outer ferrule.

In addition to making the air vent 36 operative, it is necessary to open the passageway for the flow of liquid from the bottle to the nipple before the assembly can be used to feed a recipient. In its unrestrained condition, the inner section 31 of the nipple flange is spaced from the feed groove 19, and the portion of the lower surface of the inner section defining the recess 33 is spaced from the top surface of the sealing disk 17 to open the passageway for the flow of liquid from the bottle to the nipple.

Sometimes, however, particularly if a sealed bottle assembly has been stored for a long time, the lower surface of the nipple flange becomes adhered to the sealing disk, and the passageway for the flow of liquid is not open even when the shroud and the outer ferrule are removed from the bottle assembly. In cases where such adhesion occurs, the teat of the nipple may be pulled in an axial direction to break the adhesion and thus open the passageway for the flow of liquid between the bottle and the nipple. If the nipple is pulled with one's fingers, its sterility is destroyed, and the use of forceps or any simi-

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lar instrument involves the handling of another instrument and the added trouble of keeping it sterilized.

As shown best in FIGURE 3, the lugs 46 engage the peripheral surface of the teat below the maximum circumference of the thickened upper portion of the teat. When the outer ferrule has been severed along the line 52, a simple axial pull of the shroud, in addition to removing the shroud and the major portion of the outer ferrule from the bottle, also pulls the teat outwardly with sufficient force to break any adhesion that may exist between the meeting surfaces of the nipple flange and the sealing disk. If the shroud is flexible, it may be pressed inwardly to provide a more positive gripping force against the teat as the shroud is pulled off the assembly, thus breaking any adhesion that may exist between the meeting surfaces of the nipple flange and the sealing disk. The interengagement of the lugs 46 and the teat enables the assembly to be made ready for feeding a recipient without the use of any additional instrument and without destroying the sterility of the nipple before it is put into the recipient's mouth.

In FIGURE 8, there is shown a nipple 53 that may be substituted for the nipple 27 in the bottle assembly hereinabove described. In order to simplify the description, the same reference numerals are used to identify identical structure.

The nipple 53 differs from the nipple 27 only in that it does not have any bosses projecting from the upper surface of the thin outer section 32 of the nipple flange. In the sealed position of the assembly using the nipple 53, the annular flange 38 of the inner ferrule rests directly on the top of the outer section 32 of the nipple flange, and the annular flange 43 of the shroud compresses the annular lip 34 downwardly into engagement with the flange 38 to provide an effective seal around the inner edge of the flange 38.

In the embodiment of FIGURE 8, no air space is provided between the underside of the flange 38 and the top surface of section 32 of the nipple flange. However, the inner edge of the flange 38 is located so closely to the vent 36, which it covers, that when a recipient sucks the nipple, the nipple flange is intermittently distorted to separate a portion of the nipple flange from the flange 38. The vents 36 are so spaced that one of them is opened to the atmosphere substantially every time a portion of the nipple flange is distorted, thus allowing atmospheric air to flow into the bottle as the liquid contents flow out of the bottle into the nipple.

In the embodiment of FIGURE 9, the nipple structure is essentially the same as the structure shown in FIGURES 1 to 7, and identical structure will be indicated by the same reference numerals. It should be understood also that the modified structure of FIGURE 9 can be applied to the embodiment of FIGURE 8, as well as to the embodiments of FIGURES 1 to 7. The only structural change introduced into the embodiment of FIGURE 9 over that shown in FIGURES 1 to 7 is a flutter valve 55, which may be integral with the nipple, or may be permanently secured thereto in any suitable manner, as, for example, by heat sealing. The flutter valve is hinged to the underside of the annular flange 27, preferably along its edge that is located between the aperture 21 and the vent 36, as indicated at 56.

The bottle is normally filled with a liquid feeding of predetermined volume and then sealed by applying the nipple closure thereto, either as a subassembly, or as separate parts. After the assembly is sealed, it is sterilized.

During the feeding operation, the flutter valve serves a distinctive purpose. Sometimes a recipient may suck the nipple irregularly during the feeding operation and cause the liquid to pulse out through the air vent. If the recipient blows air through the discharge opening, or otherwise creates a slight internal pressure, the pressure cannot force liquid from the bottle through the air vent. As long as the pressure within the bottle exceeds the atmospheric

pressure, the valve 55 is held closed by the excess pressure, and the liquid cannot pulse out through the air vent 36. When the recipient reduces the pressure within the bottle to less than atmospheric pressure by sucking liquid out of the bottle, air from the atmosphere will force its way past the valve into the bottle, thus providing the desired venting action.

Although various embodiments of the invention have been described in considerable detail, it will be understood that the description thereof is intended to be illustrative, rather than restrictive, as many details of construction may be modified or changed without departing from the spirit or scope of the invention. Accordingly, it is not desired to be restricted to the exact construction desired.

What is claimed is:

1. A feeding bottle assembly comprising a nipple and a shroud removably secured to said nipple, said nipple comprising a teat portion and an annular flange, said teat portion having an open lower end, an intermediate section, and an upper end having an outer circumference larger than the outer circumference of the intermediate section adjacent thereto, said annular flange extending laterally outwardly from the lower end of said teat portion, said shroud comprising a rigid transparent dome having an open lower end and an annular flange extending laterally outwardly from the lower end of said dome, the open lower end of said dome fitting over said teat portion to provide an outer protective covering therefor, a ferrule adapted to hold the flange of said shroud against the flange of said nipple with said dome in protective position relative to said teat portion, and means in said dome below the upper end of said teat portion for exerting axial force against the upper end of said teat portion of said nipple as said shroud is removed from said nipple.

2. A feeding bottle assembly as recited in claim 1 in which said means comprises a plurality of circumferentially spaced lugs extending inwardly from said dome and the innermost surfaces of said lugs define a circumference below and smaller than the maximum outer circumference of the upper end of said teat portion.

3. A feeding container comprising a bottle having a finish, a sealing disk positioned on top of said finish, a nipple comprising a teat portion and an annular flange having a thick inner section and a thinner outer section, said nipple flange being seated on said sealing disk, said outer section defining a vent extending therethrough, inner ferrule means comprising a skirt portion secured to said finish and an annular flange extending laterally inwardly from the upper edge of said skirt portion, said inner ferrule means clamping said nipple flange and said sealing disk against the top of said finish, the flange of said inner ferrule means being seated on said nipple flange with its inner edge portion covering said vent, an annular lip extending laterally from said nipple, and outer ferrule means secured to said finish and clamping said annular lip in sealing engagement with the inner edge portion of the flange of said inner ferrule means.

4. A feeding container as recited in claim 3 in which a plurality of embossments project upwardly from said outer section adjacent the periphery of said inner section and the inner edge portion of the flange of said inner ferrule means is seated on said embossments.

5. A feeding container as recited in claim 3, said feeding container having a shroud comprising a dome forming a protective covering for said teat and an annular flange seated on said lip, and in which said outer ferrule means clamps said shroud in its teat protecting position.

6. A feeding container as recited in claim 5 in which said dome has means engageable with said teat to align said teat axially with said bottle as said shroud is removed from its teat protecting position.

7. A bottle assembly in which liquid contents may be sterilized and held in a sterilized condition, said assembly comprising a bottle having an open mouth and a feeding nipple, said nipple comprising a teat portion having an

open lower end in alignment with said open mouth and a flexible annular flange extending laterally outwardly from the lower edge of said teat portion, said flange defining an air vent extending through it, a sealing disk covering said open mouth, means securing said annular flange and said sealing disk to said bottle to provide a primary seal between said bottle and said nipple and to seal said air vent, said sealing disk defining an aperture extending through it in alignment with said open mouth to provide a passageway for the flow of fluid contents from said bottle to said nipple, a transparent shroud comprising an open-bottom dome fitting over said teat portion and an annular flange extending laterally outwardly from the lower edge of said dome and overlying the flexible annular flange of said nipple, said shroud providing a protective outer covering for said nipple, and ferrule means securing said shroud in place in said assembly and clamping the flexible annular flange of said nipple into sealing engagement with the aperture in said sealing disk, said transparent shroud permitting visual detection of leakage in the sealed bottle assembly.

8. A bottle assembly as recited in claim 7 in which said ferrule means comprises a skirt portion secured to said bottle and an annular flange extending inwardly from the upper edge of said skirt portion to overlie the annular flange of said shroud and said dome has a plurality of circumferentially spaced lugs extending inwardly and positioned to engage said teat portion of said nipple.

9. A bottle assembly as recited in claim 8 in which said teat portion has a circumferentially enlarged upper end and said lugs define an inner circumference smaller than the maximum outer circumference of the enlarged upper end of said teat portion whereby said lugs exert axial force against said enlarged upper end of said teat portion during removal of said shroud from said bottle assembly to insure release of said nipple flange from sealing engagement with said aperture.

10. A bottle assembly in which liquid contents may be sterilized and held in a sterilized condition, said assembly comprising a bottle, a feeding nipple and a shroud removably secured to said assembly, said nipple comprising a teat and a flexible annular flange comprising a thick inner section and a thinner outer section, said outer section defining an air vent extending through it, a sealing disk seated on said bottle, a portion of the underside of said nipple flange being recessed to define a space between said nipple flange and said sealing disk forming part of a passageway for the flow of liquid from said bottle to said nipple, a ferrule securing said annular nipple flange and said sealing disk to said bottle, said ferrule having an inner edge portion overlying and sealing one end of said air vent and terminating adjacent the periphery of said inner section, an annular lip extending laterally outwardly from the peripheral edge of said inner section and overlying the inner edge of said ferrule, said sealing disk defining an aperture extending through it to provide part of said passageway for the flow of fluid contents from said bottle to said nipple, means clamping said nipple flange in sealing engagement with said aperture, and means in said shroud engageable with said nipple to insure release of said nipple flange from sealing engagement with said aperture as said shroud is removed from said assembly.

11. A bottle assembly in which liquid contents may be sterilized and held in a sterilized condition, said assembly comprising a bottle having an open top and a feeding nipple adapted to fit on said bottle, said nipple having an annular flange defining an air vent extending therethrough, a sealing disk interposed between said flange and the top of said bottle, and an annular lip above said flange, ferrule means clamping said flange against said sealing disk, means holding said lip over the inner edge portion of said ferrule, means to protect against leakage around said edge, and a flutter valve covering the lower end of said vent.

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