United States Patent [19]

Yamauchi

[11] **3,718,140**

[45] **Feb. 27, 1973**

[54] **NURSING BOTTLE NIPPLE**

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[22] Filed: **Oct. 13, 1971**

[21] Appl. No.: **188,841**

Related U.S. Application Data

[62] Division of Ser. No. 23,681, March 30, 1970, Pat. No. 3,651,973.

[52] **U.S. Cl.** **128/252**

[51] **Int. Cl.** **A61j 9/00**

[58] **Field of Search** ..... 215/11 E; 128/252

[56] **References Cited**

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Primary Examiner—Donald F. Norton
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[57] **ABSTRACT**

An improved nursing bottle nipple particularly adaptable for use with a nursing bottle assembly of the collapsible milk bag type. In such an assembly, the nipple and milk bag full of milk are secured by a fastening ring overlaying the mouth end of a milk bag and bottle housing wherein the open mouth end of the bag is folded outwardly over the housing mouth. The improvement in the nipple structure resides in a novel fluid-passing outlet portion of non-return, self-closing character regardless of the attitude of the nursing bottle assembly. More particularly, the fluid-passing outlet includes a small generally hemispherically convex membrane of thinner material than the rest of the bulbous end body portion of the nipple, which membrane constitutes a miniature form of nipple recessed within and generally not extending beyond the outer surface of the bulbous end portion of the nipple, and is punctured in a Y-shape or X-shape to form a valve of the self-closing character when not in nursing use. The convex membrane has a thicker radially flaring peripheral margin connecting it with a substantially thickened portion of the bulbous end body portion of the nipple, which collectively contribute to both reenforce the non-return type outlet as well as to preclude inward collapse of the convex, nipple-like membrane even under increased negative pressure within the interior of a bottle assembly when in use therewith.

4 Claims, 5 Drawing Figures

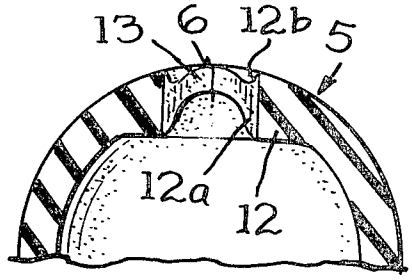


FIG. 1.

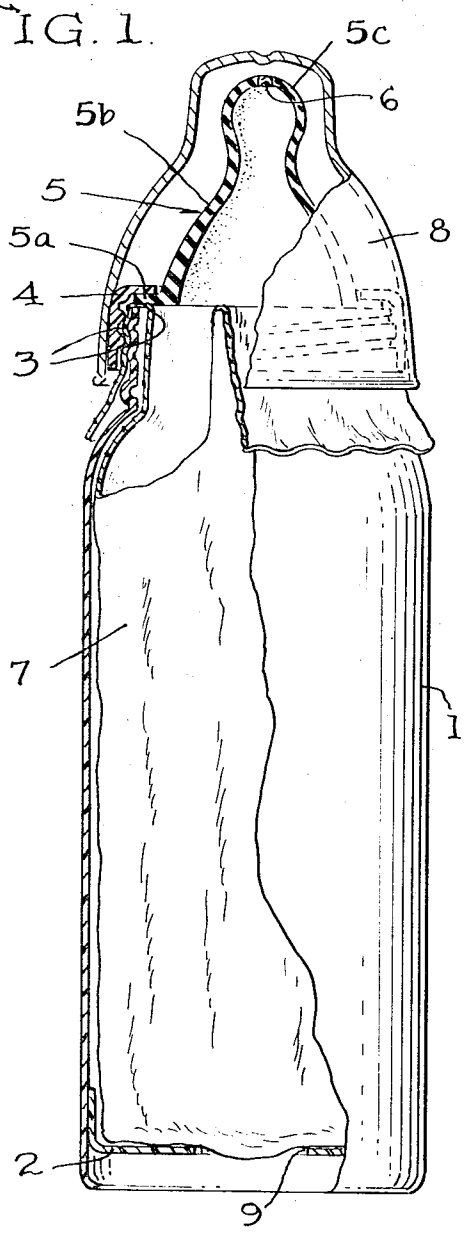


FIG. 4.

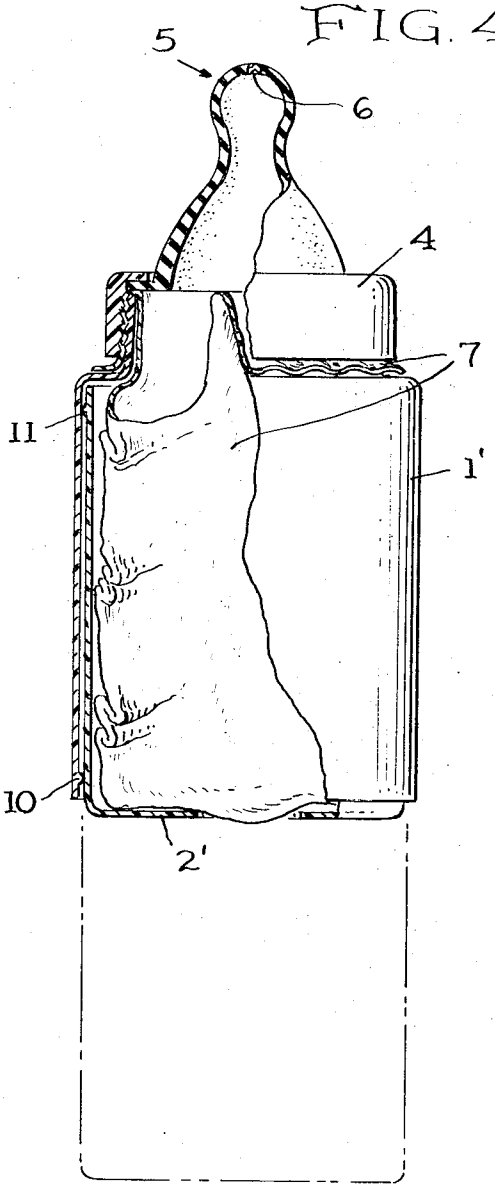


FIG. 2.

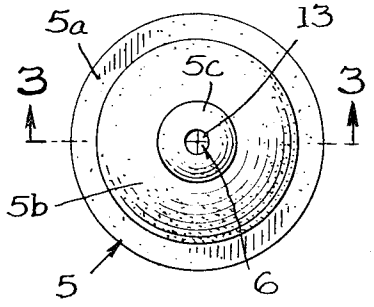
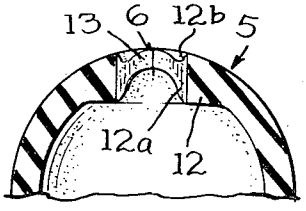


FIG. 3.



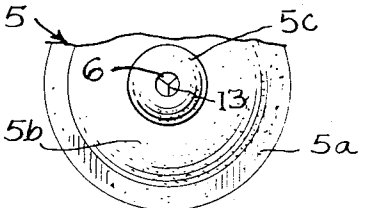


FIG. 5.

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NURSING BOTTLE NIPPLE

This application is a division of my co-pending application Ser. no. 23,681 filed Mar. 30, 1970, **now U.S. Pat. No.** 3,651,973.

The present invention relates to an improvement in a nursing bottle nipple to be used generally for infants.

According to a conventional nursing bottle assembly, a nursing bottle is provided with a nipple attached directly to the mouth of a bottle of a non-variable shape. Another type of nursing bottle assembly more recently in use comprises a bottle shell, a collapsible tubular container such as a sack made of a polyethylene film placed in the bottle shell and having an opening portion adapted to be folded over the mouth of the bottle, and an annular fastening member for securing the folded portion to the mouth together with a nipple.

When a nursing bottle of the type described is used for feeding an infant, the bottle must be so positioned that the interior of the nipple is filled with milk. Accordingly, there is a need to incline the bottle sufficiently to direct the nipple downward with the face of the infant upward. In addition, the inclination of the bottle, if it is to excess, causes a greater amount of the milk to flow out to choke the infant, while if, on the other hand, the bottle is not sufficiently inclined, outflow of the milk consequently decreases along with increase in sucking resistance. Furthermore, the conventional nursing bottle is found disadvantageous in that continuous sucking action reduces the pressure within the bottle or milk container thereby making suction difficult to cause the milk container, which is normally in cylindrical form, to wrinkle near the shoulder of the bottle during sucking action, and thereby hinders flow of the milk.

A primary object of the present invention is to provide an improved nursing nipple for use with a nursing bottle assembly which is provided with a bottom member adapted to be generally telescopically moved upward or downward so as to keep the interior of the nipple filled with milk without inverting the bottle, the nursing bottle assembly thus insuring feeding operation regardless of the posture of the infant to be nursed.

Another object of the present invention is to provide a nursing bottle nipple having a milk or liquid passing outlet of a special nonreturn formation for completely preventing inflow of air even when the pressure in the milk container decreases due to outflow of the milk, so as to keep the interior of the bottle free of air.

Another object of the present invention is to provide a sanitary nursing bottle nipple of improved character, which is relatively simple in structure and easy to use.

The present invention will hereinafter be described with reference to the accompanying drawings, in which:

FIG. 1 is a view showing a nursing bottle assembly of the collapsible bag type showing the nipple and portions of the assembly partially in vertical cross-section and partly in elevation;

FIG. 2 is a plan view of one form of the improved nipple useable in a nursing bottle assembly of the flexible bag type, which nipple is provided with an outlet of non-return structure;

FIG. 3 is an enlarged fragmentary view shown in cross-section taken along the line 3—3 in FIG. 2;

FIG. 4 is a view showing another form of collapsible bag type bottle assembly shown also partly in elevation and partly in vertical cross-section; and

FIG. 5 is a fragmentary plan view of an alternate nipple opening.

Referring now to FIG. 1, an outer shell designated at 1 constitutes a main body of a nursing bottle, and an inner shell or member 2 constitutes a bottom member formed substantially in cyclindrical shape which is adapted to be moved slidably upward or downward by being telescopically guided by the outer shell of the main body 1 at its outer peripheral wall. In the illustrated embodiment, the bottom member 2 is disposed inside the main body 1 for vertical movement in contact with the inner wall of the main body 1. Body 1 is provided with a mouth 3 on which the flange of the nipple seats to be held in place by a nipple fastening ring 4. The nipple 5 is provided with a particular form of self-closing, non-return outlet structure 6 for preventing inflow of air. The collapsible milk bag 7 is made, for example, of a soft polyethylene film. The milk bag 7 is placed in the main body 1 with the mouth portion thereof folded over the mouth 3 of the main body 1 along its peripheral edge and the nipple fastening ring 4 is fitted over the nipple 5 placed on the folded portion so as to secure the upper end of the milk bag 7 to the mouth 3.

The structure of the improved nipple 5 in accordance with the present invention is shown in greater detail in FIGS. 2 and 3. It will be seen from these drawings that the generally designated nipple 5 is generally made of soft rubber and embodies an enlarged open end bottle-mouth-cooperating portion *5a*, a generally inverted funnel-shape intermediate portion *5b* connecting the portion *5a* with a constricted generally oval-shape bulbous nipple end *5c*. The bulbous nipple end *5c* further comprises a center top membrane portion 13 formed in hemispherical convex shape, has a definite predetermined radius, and is generally of much lesser thickness than the wall of the bulbous end *5c*. The nipple further embodies a substantially thicker wall portion 12 surrounding the top membrane portion 13, the latter of which is formed integrally therewith and does not project in any substantial manner above the bulbous end portion.

As clearly seen in FIG. 3, the membrane 13 at its marginal juncture with the thickened wall portion 12 is enlargingly flared in both axial directions with the axially inward margin *12a* having a notably greater flared thickness than that of the axially outward margin of *12b*. These flared portions, particularly that of portion *12a* taken in combination with the substantially thickened wall portion 12, serve not only to reenforce the nonreturn outlet 6 to preclude inflow of air, but also to preclude inward collapse of the nipple-like membrane portion 13, even under increased negative pressure within the interior of the bottle assembly when in use. The top center membrane portion 13 is provided with an outlet 6 which is formed by cutting the portion vertically in at least three radial directions in a Y-shape, as shown in FIG. 5, or in the cross-shape, as shown in FIG. 2.

The outlet 6 formed in this manner can be readily opened when subjected to suction externally exerted thereon, while when the interior pressure decreases, the respective parts provided by cutting are brought closer together inward with tight-fit contact effected between cut surfaces, with the result that the inflow of air can be prevented with a high degree of certainty.

Indicated at 8 is a hood or nipple cover, and at the opposite end of the assembly in bottom member 2 an air venting aperture 9 is provided to vent air from the main body 1. The lower peripheral portion of the main body 1 is slightly turned inward to preclude bottom member 2 from dropping therefrom.

To use the nursing bottle of the described character, the bottom member 2 is first brought to the lowermost position of the main body 1. The milk bag 7 with a suitable amount of milk powder placed therein previously or at the time of use is inserted into the main body 1 through the mouth 3 of the milk bottle. The upper end portion of the milk bag 7 is then folded over the peripheral edge of the mouth 3, a desired amount of hot water is poured into the bag 7, and the nipple fastening ring 4 is fitted over the folded portion of the bag 7 with the nipple 5 interposed therebetween so as to secure the folded portion to the upper peripheral edge of the main body 1.

When the bottom member 2 is slowly moved upward, the liquid level is also elevated, causing the air within the milk bag to escape through the outlet 6 in the nipple 5, with the result that the interior of the nipple 5 is completely filled with milk. The nursing bottle thus prepared now enables the infant to suck the milk in an amount in proportion to the suction force, regardless of the degree of inclination and the posture of the infant. Upon suction of an amount of milk, the pressure within the milk bag decreases due to reduction in the interior volume corresponding to the amount, but the nipple outlet 6, which is provided with the special non-return structure described hereinabove, perfectly prevents inflow of air to keep the interior free of air. The milk bag thereby continues to contract and continuously maintains milk within the nipple 5. Even when nursing is discontinued, such state is always ensured for further sucking action. Choke-free feeding with low suction resistance is therefore insured which has not been the case with conventional nursing bottles. This is particularly aided by use of the improved nipple hereof. As nursing proceeds, contraction of the milk bag 7 takes place immediately below the fastening ring 4, and further develops downward, drawing the inner opposite faces of the bag toward each other. In this condition the portion of the milk retained in the nipple 5 and the other portion of the milk in the lower part of the milk bag 7 are communicated through a decreasing passageway formed between the inner faces as the latter are brought closer toward each other by the suction action, with the passage consequently serving as a straw to feed the lower portion of the milk with ease and to effect complete drainage of the milk. For this reason the difficulties heretofore encountered such as wrinkles produced beneath the shoulder of the bottle to hinder the flow of milk can be prevented for smooth and perfect nursing. The improved nursing nipple of the present invention operates to preclude the inflow of air into the milk bag 7, even when sucking action is discontinued, and not only enables the infant to resume nursing under the same conditions as when interrupted, but also precludes invasion of germs to protect milk from decomposition for sanitary preservation.

The FIG. 4 modified assembly embodiment provides for a bottom member 2' of greater skirt length which is telescopically fitted within a main body 1' of the nursing bottle shell. Designated at 10 is an inner projection corresponding generally to the flange formed on the inner wall of the main body 1', said projection 10 being disposed at the lower portion to be engaged with an outwardly projecting complemental flange-like part 11 formed on the outer wall of the bottom member 2' at its upper portion so as to keep the bottom member 2' retained in the main body 1'. With this modified construction the bottle requires only about one-half the volume of the bottle of a regular size.

In addition to the advantages described, the nursing bottle nipple of the present divisional application is unique and efficient and competitively economical to manufacture. Reference should be made to the appended claims for a scope of the invention hereof.

What is claimed is:

1. An improved nursing bottle nipple particularly adaptable for use with a nursing bottle assembly of the flexible, collapsible bag type, said nipple composed of a rubber or similar essentially permanently elastic material having one enlarged open-end bottle-mouth-cooperating portion, a generally funnel-shaped intermediate portion connecting said first-mentioned portion with a constricted generally oval-shaped nipple end portion having a bulbous body portion and punctured so as to form a nursing fluid-passing outlet of an improved non-return and self-closing character when not in use, regardless of the attitude of the nursing bottle, said nipple punctured end comprising a small generally hemispherically convex-shaped punctured membrane formed of substantially thinner material than the rest of the bulbous body portion, the material of the bulbous body portion in the area directly adjacent and completely surrounding an outer margin of said membrane being substantially thicker than that of said bulbous body portion, said membrane having a thicker radially flaring peripheral margin connecting it with said substantially thicker area of the bulbous portion, said membrane thicker peripheral margin being flared in both an axially inward and axially outward manner with said axially inward flared margin having a thickness greater than said axially outward flared margin, said thicker flared marginal portion of said membrane together with the substantially thicker portion of the bulbous body portion surrounding said membrane collectively serving to give added strength thereto to preclude inwardly collapse of said nipple and membrane portion, even when subjected to a negative pressure from within the assembled bottle and nipple, whereby the fluid outlet closes in a tighter more effective leakproof manner, and wherein said hemispherically convex membrane portion is at least partially recessed below the exterior bulbous surface of the nipple at least in its marginal area connecting it with said thicker portion of the bulbous body portion, thereby forming a smaller scale hemispherical nipple-like fluid-passing portion within the exterior bulbous portion of the nipple.

2. A nipple as defined in claim 1 wherein said membrane is punctured in at least three radially diverse directions such as in a generally Y-shape to form a valve of said improved self-closing character for passage of the nursing fluid when sucked upon during nursing use.

3. A nursing bottle assembly as defined in claim 1 wherein said membrane is punctured by cutting through same diametrically in two directions at 90° apart to form a valve of said self-closing character for passage of the nursing fluid when sucked upon during nursing use.

4. A nipple as defined in claim 1 wherein said convex membrane portion does not project and substantially beyond the outer surface of the bulbous body nipple end portion.

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