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NURSING NIPPLE

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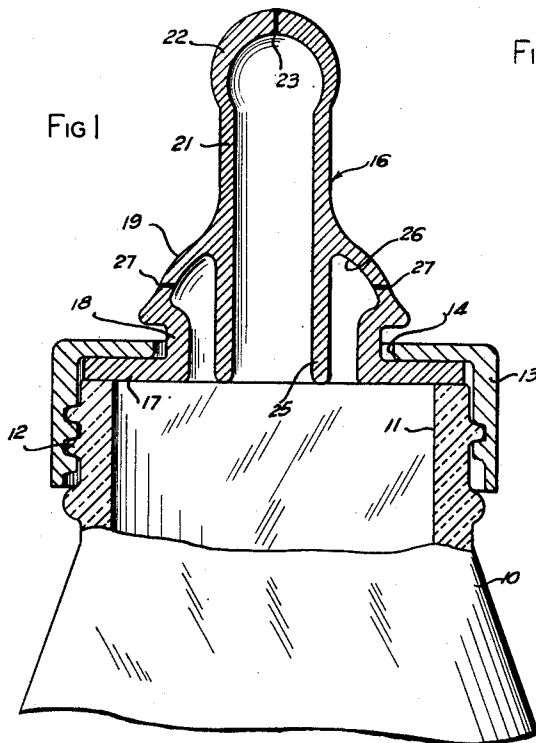


Fig 2

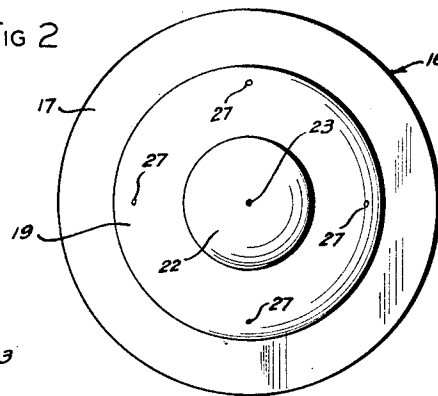


Fig 5

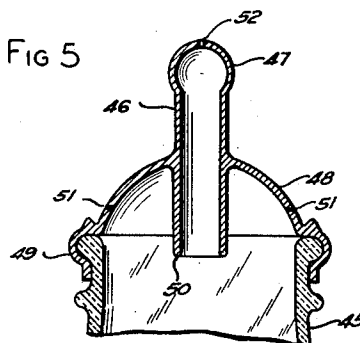


Fig 4

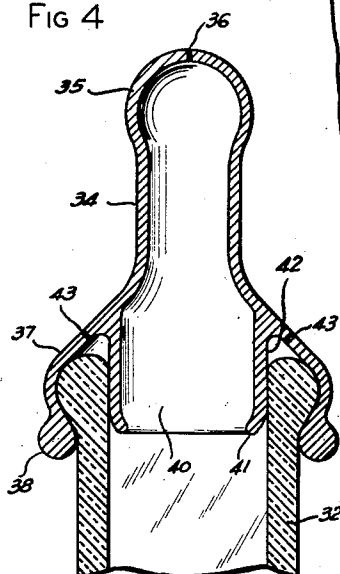
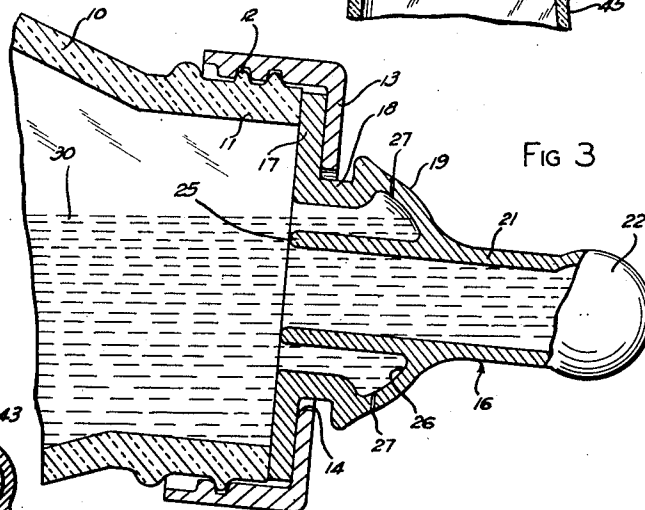


Fig 3



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NURSING NIPPLE

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This invention relates to nursing nipples, and more especially it relates to nursing nipples of the vented type wherein air is admitted automatically to the nursing bottle as the withdrawal of liquid therefrom creates sub-atmospheric pressure therein.

An important consideration in the design of nursing nipples of the character mentioned is that the air passing through the nipple and into the bottle is not trapped in the stream of liquid being drawn from the bottle, since in such cases the air is swallowed by the infant, and colic results. In nursing nipples heretofore provided this problem has been met by the provision of more or less complex valve means in or near the base of the nipple for admitting air therethrough.

The chief objects of this invention are to provide in an improved manner for venting nursing nipples. More specifically, the invention aims to provide for the admission of air to the interior of the bottle as suction is applied to the nipple, in such a manner that said air not be trapped, in the form of bubbles, in the stream of liquid being withdrawn from the bottle through the nipple. A further object is to admit air to the bottle as soon as differential air pressure is established between the interior and exterior of the bottle, without requiring said differential pressure to attain such magnitude as is necessary to collapse the nipple or otherwise to actuate valve mechanism associated with the nipple. Another object is to avoid causing colic due to the swallowing of air while nursing from a bottle. Other objects will be manifest as the description proceeds.

Of the accompanying drawing:

Fig. 1 is a diametric longitudinal section through a nipple embodying the invention, and a bottle on which the nipple is mounted by means of a securing cap, said nipple and bottle being shown in upright position, on an enlarged scale;

Fig. 2 is a plan view of the nipple shown in Fig. 1;

Fig. 3 is a view of the structure shown in Fig. 1 in tilted or nursing position;

Fig. 4 is a diametric longitudinal section through a nipple constituting another embodiment of the invention, and a fragmentary portion of a bottle on which it is mounted, on an enlarged scale; and

Fig. 5 is a similar view of still another embodiment of the invention, shown on a smaller scale.

Referring first to Figs. 1 through 3 of the drawing, there is shown a bottle 10 of the wide mouthed type having a neck portion 11 that is

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exteriorly threaded at 12. Receivable on the bottle neck 11 is a threaded cap 13 that overlies the top of said bottle neck and is formed with a relatively large axial aperture 14.

A nursing nipple of resilient, elastic rubber or rubber-like composition and designated as a whole by the numeral 16 extends through the axial aperture 14 of the cap 13 and is retained upon the bottle neck 11 by said cap. To this end the base or lower extremity of the nipple 16 is formed with a relatively thick, radially outwardly extending circumferential flange 17, which flange rests upon the upper margin of the neck 11, and is clamped thereagainst by the cap 13. The nipple has a neck portion 18 that extends freely through the aperture 14 in cap 13, and is of somewhat greater length than the thickness of the cap in the region of the latter through which the said neck passes, said neck terminating in a bulbous breast portion 19 at the large end of the latter. The greatest outside diameter of the breast portion 19 is substantially larger than the aperture 14 in cap 13, but the resiliency of the material of which the nipple is composed enables said breast portion to be deformed to the extent necessary to pass it through the cap aperture 14. When the cap and nipple are assembled as described they may be handled as a unit.

Formed integral with the breast portion 19 at the small end thereof is a tubular axial extension or body portion 21 that has a closed outer end of somewhat bulbous shape that constitutes a mouthpiece 22. The latter is formed with an axially disposed delivery aperture 23 of small dimension through which liquid is withdrawn from the bottle by suction applied externally to the mouthpiece 22, as is well understood.

The previously described structure is prior art, and no claim to the structure per se is made herein. The present invention, as distinguished from the prior art, is characterized by a tubular structure 25 disposed interiorly of the breast portion 19 of the nipple, concentrically thereof. Said structure 25 is an integral part of the nipple 16, being united therewith at its upper end, the remainder of the structure being free and unattached in spaced relation to the neck 18 of the nipple. As shown in Figs. 1 and 3, the tubular structure 25 is of the same diameter and thickness as the body portion 21 so as to constitute in effect an inwardly extending extension of the latter. The inner end of the structure 25 as shown is substantially coincident with the plane of the bottom face of the flange 17, but it will be understood that the end of the structure may be

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somewhat above or below this plane if desired. The arrangement is such as to provide an annular internal cavity 26 in the nipple, which cavity surrounds the body extension 25 and opens onto the bottom face of the nipple. The cavity 26 is vented to the atmosphere by a plurality of venting apertures 27, 27, which apertures are of small dimension and extend through the breast portion 19 of the nipple. In the drawing, the size of apertures 23, 27 is exaggerated for clarity of illustration.

The operation of the invention readily will be understood by reference to Fig. 3 wherein the bottle 10 is shown with a quantity of milk 30 or other liquid food therein, the bottle being tilted sufficiently for the liquid to fill the body 21 and extension 25 of the nipple. Obviously, some of the liquid enters the cavity 26 of the nipple and covers one or more of the apertures 27 in the wall of the cavity. The liquid, however, does not escape through the vent apertures 27 since they, like the aperture 23 are of extremely small dimension, and the surface tension of the liquid prevents such escape in view of the low head of liquid. As liquid is sucked from the bottle through aperture 23, a condition of sub-atmospheric pressure is established in the bottle, and as the result thereof air is drawn into the bottle through one or more of the vent apertures 27 to replace the withdrawn liquid. This is so even though all the apertures 27 are covered by the liquid 30. Air entering the cavity 26 ascends to the highest point thereof, and because the vent apertures 27 are located relatively remote from the inlet end of the body extension 25, none of the air bubbles is drawn into the said extension with the liquid 30 entering the same. When the bottle is tilted only to the extent shown in Fig. 3, air in the upper part of cavity 26 will move freely into the bottle and come in contact with the air therein. If the bottle is tilted to such an extent that the liquid obstructs the open end of cavity 26, the accumulating air in the latter may move, in the form of bubbles, along the highest surface of the cavity until it enters the bottle. In neither case do air bubbles pass close enough to the inlet end of extension 25 so as to be drawn thereinto with the stream of liquid.

The nipple operates automatically and continuously in the manner described, and at no time is there sufficient differential pressure between the inside and outside of the bottle to collapse the nipple. The nipple is of relatively simple construction and may be manufactured at low cost. It obviates the common cause of colic in infants, and achieves the other advantages set out in the foregoing statement of objects.

In Fig. 4 the invention is depicted in its application to nipples of the conventional snap-on type designed for small-mouth nursing bottles, such as the bottle 32. The nipple, composed of elastic rubber or rubber-like composition comprises the conventional tubular body portion 34 formed at one end with a bulbous mouthpiece 35 that has an axial aperture 36 of extremely small dimension therethrough by way of which liquid is withdrawn from the bottle. At its other end the body 34 is formed with an enlarged or flared base 37 that has a thickened marginal bead 38. Normally the base 37 and bead 38 are of smaller diameter than the outside diameter of the neck of the bottle 32, thus requiring to be stretched over the bottle neck when the nipple is operatively mounted thereon. Formed integral with the flared base, interiorly thereof and concentric

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therewith, is a tubular skirt 40 that constitutes, in effect, a downward extension of the body portion 34. The length of the skirt portion 40 is such that it will enter the mouth of the bottle 32, its diameter being such that it has light frictional engagement with the inner surface of the bottle neck. The free end of the skirt is somewhat constricted or reduced, as shown at 41, so as to be spaced from the surface of the bottle neck, to facilitate the mounting of the nipple on the bottle, and for another purpose presently to be explained. When the nipple is mounted upon a bottle, as shown in Fig. 4, there is formed an annular cavity 42 bounded by the base 37, the skirt 40 and the upper end of bottle 32. A plurality of vent apertures 43 extend through the base 37 and provide communication between the cavity 42 and the atmosphere. The vent apertures 43 are of relatively small size, which is exaggerated in the drawing for purpose of illustration.

In operation, liquid passes through the skirt 40 and body portion 34 and is withdrawn through aperture 36 in mouthpiece 35. Contact of the skirt 40 with the bottle neck prevents liquid from entering the cavity 42. As liquid is withdrawn from the bottle 32 sub-atmospheric pressure is created therein, with the result that the skirt 40 is forced slightly away from the surface of the bottle neck, and air from the cavity 42 is admitted to the bottle to equalize the pressures on the interior and exterior thereof. Such air upon entering the bottle neck will move, in the form of bubbles, along the highest point of the surface thereof, and thus will be spaced from the entrance to skirt 40 because of the constriction of the inner or inlet end of the latter. Thus, not any of the air bubbles will pass through the body 34 with the liquid being withdrawn, and the important objects of the invention are achieved.

In Fig. 5 the invention is shown in its application to nipples of the snap-on type designed for wide-mouth bottles, such as the bottle 45. The nipple comprises the usual body portion 46 with bulbous mouthpiece 47 at one end, and a breast portion 48 at the other end, the free margin of said breast portion being formed with a bead structure 49 adapted to be stretched over the mouth of bottle 45. An axial tubular extension 50 of the body portion 46 extends into the breast portion 48 substantially to the plane of the beaded edge 49 of the latter. A plurality of vent apertures 51 of small dimension are formed in the breast portion 48, near the bottom or larger end thereof, and a similar delivery aperture 52 is formed in the mouthpiece 47.

This embodiment of the invention functions essentially in the same manner as the embodiment first described, so that further explanation of the operation thereof is not believed necessary.

Modification may be resorted to without departing from the spirit of the invention, or the scope thereof as defined by the appended claims.

What is claimed is:

1. A nipple for a nursing bottle, said nipple consisting of a one-piece structure comprising a tubular body portion formed at one end with a bulbous axially apertured mouthpiece and formed at its other end with an enlarged flared portion having means on the margin thereof by which the nipple is attached to a bottle, a tubular skirt spaced from and located interiorly of said enlarged portion concentrically thereof and constituting an extension of said tubular body portion, the arrangement being such that the space

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between said skirt and said enlarged portion constitutes a substantially annular cavity within the extremities of the nipple, which cavity is maintained when the nipple is mounted on a bottle, and a plurality of vent apertures of small dimension formed in the wall of said enlarged portion, said vent apertures communicating at one end with the atmosphere and at the other end with said cavity intermediate the ends of the latter, said skirt constituting means preventing the passage of air bubbles into the stream of liquid being withdrawn from the bottle through the nipple.

2. A nipple for a nursing bottle adapted to contain fluid to be withdrawn therefrom through said nipple, said nipple consisting of a one-piece structure of elastic material comprising a tubular body, an outwardly flared structure circumscribing said body in spaced relation thereto and united to the latter intermediate the ends thereof so as to divide said body into inner and outer portions, said outer portion of said body being axially apertured at one end to form a mouth-piece, said flared structure having marginal means to attach the nipple to a bottle neck, and said inner portion of said body being spaced from said flared structure, the arrangement being such that

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the space between said inner portion and said flared structure constitutes a substantially annular cavity within the extremities of the nipple, which cavity is maintained when the nipple is mounted on a bottle, and a plurality of vent apertures formed in the wall of said flared structure, said vent apertures communicating at one end with the atmosphere and at the other end with said cavity intermediate the ends of the latter, said inner portion of said body constituting means preventing the passage of air bubbles into the stream of liquid being withdrawn from the bottle through the nipple.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
280,656	Morris	July 3, 1883
411,794	Eggers	Oct. 1, 1889
1,735,670	Blumenfeld	Nov. 12, 1929
2,093,130	Kurkjian	Sept. 14, 1937
2,204,448	Schmid	June 11, 1940