Sept. 25, 1956 L. J. MEYERS 2,764,155

DEVICE INHIBITING AIR FROM BEING SUCKED FROM INVERTED NURSING BOTTLES

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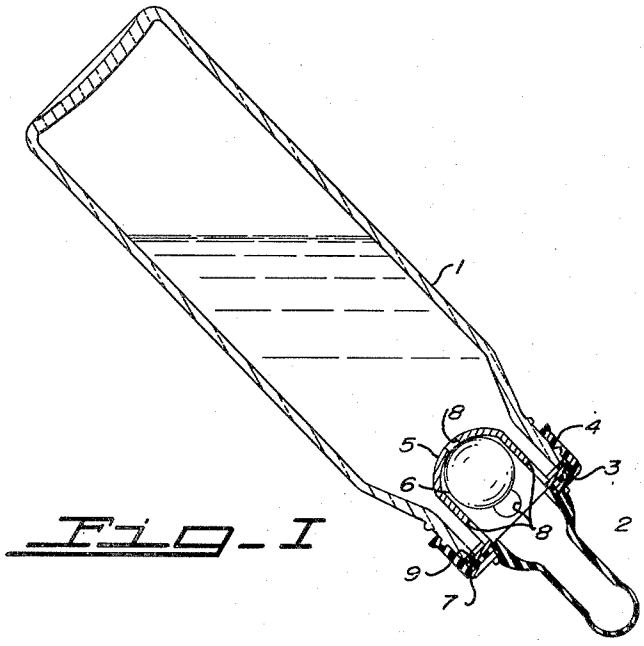


Fig. I

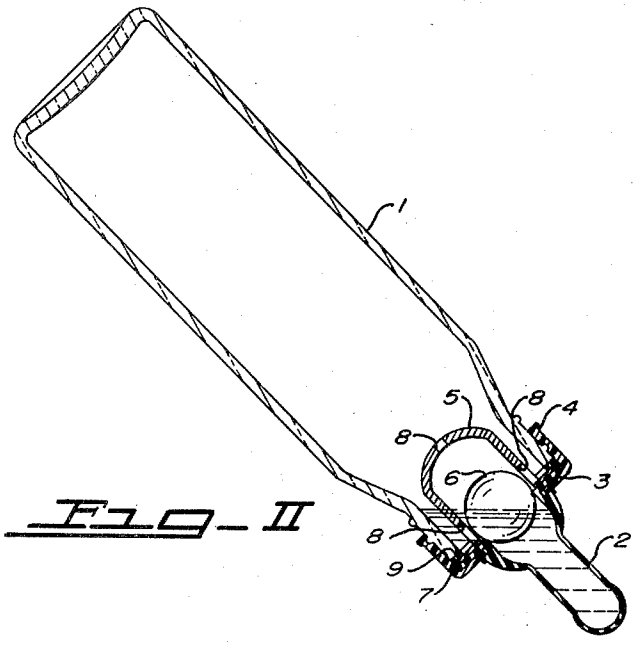


Fig. II

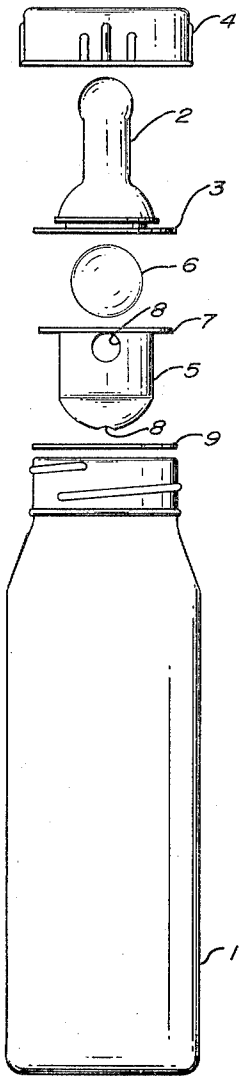


Fig. III

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DEVICE INHIBITING AIR FROM BEING SUCKED FROM INVERTED NURSING BOTTLES

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This invention relates to nursing bottles and in particular to means for preventing air from being sucked from bottles after their supply of milk has been depleted or exhausted.

When milk is being withdrawn by a child through the nipple of a nursing bottle of the type most commonly used in the decade during which the instant invention was conceived the bottle is held wholly or partly inverted with the milk covering the base of the nipple to a depth depending upon how much milk remains in the bottle. As the milk becomes depleted the nipple becomes more or less uncovered permitting air to get into the nipple and to be withdrawn by the suction applied by the child.

After the supply of milk has been exhausted the child may continue to apply suction to the nipple and to swallow further quantities of air which may distend its stomach and cause distress or pain. While the distress or pain often can be relieved by belching soon after swallowing the air or by expelling it after it has passed entirely through the intestinal tract, it sometimes becomes entrapped in a pocket or fold and causes intense agony.

An object of this invention is to provide means for inhibiting air from being withdrawn by suction through the nipple of an inverted nursing bottle.

Another object is to provide means which may be readily incorporated with a common type of nursing bottle and its nipple to inhibit air from being drawn by suction through the nipple when the nursing bottle is inverted.

Another object is to provide such means which while inhibiting the withdrawal of air does not interfere with the withdrawal of liquid so long as the liquid is not so far depleted as to partly or wholly uncover the base of the nipple.

Another object is to provide such means in simple form such as can be economically manufactured and easily assembled with and disassembled from a nursing bottle and nipple.

And still another object is to provide such means in a form which can be kept clean and sanitary.

Other objects, features and advantages will appear upon perusual of the following specification illustrated by the accompanying drawing wherein:

Fig. I is a sectional elevational view showing an inverted nursing bottle containing sufficient liquid to submerge the means for inhibiting withdrawal of air through the nipple.

Fig. II is a similar view showing the supply of liquid as depleted, and

Fig. III is an exploded elevational view showing the elements of the device as separated.

A nursing bottle 1 and a soft rubber nipple 2 having a soft rubber gasket 3 integral therewith are held in assembled relation by means of a hard cap 4 having an open top through which the nipple 2 protrudes. The cap 4 is internally threaded and is screwed onto the externally threaded mouth of the bottle 1.

The means for inhibiting the withdrawal of air through the nipple comprises a cage 5 containing a ball 6 the

specific gravity of which is less than that of milk. The cage 5 has an integral flange 7 which is clamped between the gasket 3 of the nipple 2 and the top of the bottle 1. The cage 5 has perforations 8 adjacent the flange 7 and may have other perforations 8 elsewhere so that liquid can flow freely through it. The cage may be formed of rubber, molded artificial resin, metal or other material which is capable of withstanding the effects of sterilization. If its flange 7 is relatively hard a soft washer 9 may be interposed between the flange 7 and the top of the bottle 1.

The principal function of the cage 5 is to prevent the ball 6 from floating away from the base of the nipple while the bottle contains a substantial quantity of liquid and then lodging at the side and failing to descend into the base of the nipple when the bottle becomes empty. Hence, while preferably the cage 5 is dome shaped, it may be of any other desired shape or it may consist of network or prongs.

The ball 6 may be hollow or solid but its overall weight must be less than the weight of an equal volume of milk, preferably not greater than two thirds the weight of an equal volume of milk.

As long as the inverted bottle 1 contains enough milk to float the ball 6 the flow of milk into the nipple 2 is not impeded but when the bottle becomes empty the ball 6 settles into the opening in the base of the nipple and seals it against the passage of air.

The surface of the ball 6 is smooth and the diameter of the ball is enough greater than the diameter of the opening in the base of the nipple to prevent the ball from jamming into the opening and the internal dimensions of the cage 5 are great enough to permit the ball 6 to move freely therein. Whenever the bottle is righted while empty or nearly empty the ball will fall away from its seat in the base of the nipple so that the residue of milk can run into the nipple when the bottle again is inverted.

The ball 6, like the other parts, should be made of a material capable of withstanding the effects of sterlization. If the ball is solid, it must be made of a gum rubber, plastic or other material which has a lower specific gravity than milk.

It is to be understood that the foregoing description and the accompanying drawings are exemplary only and that the invention is susceptible to variation and modification within the spirit and scope of the subjoined claims.

Having described the invention, I claim:

1. In a device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a dome-shaped cage of yieldable material having a flanged end adapted to be clamped between the gasket-like base of such nipple and the top of such nursing bottle, and a smooth-surfaced ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its flanged end to register with the opening through the gasket-like base of such nipple, the inside diameter of the open end of said cage being greater than the diameter of said ball and the diameter of said ball being greater than the diameter of the opening through the gasket-like base of such nipple, said cage having perforations adjacent its flanged end to admit milk from without said cage.

2. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is

equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a dome-shaped cage of yieldable material, and a smooth-surfaced ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its end to register with the opening through the gasket-like base of such nipple, the diameter of said ball being greater than the diameter of the opening through the gasket-like base of such nipple, said cage having perforations adjacent its end to admit milk from without said cage.

3. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a cage of yieldable material having a flanged end adapted to be clamped between the gasket-like base of such nipple and the top of such nursing bottle, and a smooth surfaced ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its flanged end to register with the opening through the gasket-like base of such nipple, the inside diameter of the open end of said cage being greater than the diameter of said ball and the diameter of said ball being greater than the diameter of the opening through the gasket-like base of such nipple, said cage having perforations to admit milk from without said cage.

4. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a dome-shaped cage having a flanged end adapted to be clamped between the gasket-like base of such nipple and the top of such nursing bottle, and a ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its flanged end to register with the opening through the gasket-like base of such nipple, the inside diameter of the open end of said cage being greater than the diameter of said ball and the diameter of said ball being greater than the diameter of the opening through the gasket-like base of such nipple, said cage having perforations adjacent its flanged end to admit milk from without said cage.

5. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a dome-shaped cage of yieldable material having a flanged end adapted to be clamped between the gasket-like base of such nipple and the top of such nursing bottle, and a smooth-surfaced ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its flanged end to register with the opening through the gasket-like base of such nipple, the inside diameter of the open end of said cage being greater than the diameter of said ball, said cage

having perforations adjacent its flanged end to admit milk from without said cage.

6. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a cage of yieldable material, and a smooth-surfaced ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its end to register with the opening through the gasket-like base of such nipple, the diameter of said ball being greater than the diameter of the opening through the gasket-like base of such nipple, said cage having perforations to admit milk from without said cage.

7. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a dome-shaped cage, and a ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its end to register with the opening through the gasket-like base of such nipple, the diameter of said ball being greater than the diameter of the opening through the gasket-like base of such nipple, said cage having perforations adjacent its end to admit milk from without said cage.

8. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a dome-shaped cage of yieldable material and a smooth-surfaced ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its end to register with the opening through the gasket-like base of such nipple, said cage having perforations adjacent its end to admit milk from without said cage.

9. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a cage having a flanged end adapted to be clamped between the gasket-like base of such nipple and the top of such nursing bottle, and a ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its flanged end to register with the opening through the gasket-like base of such nipple, the inside diameter of the open end of said cage being greater than the diameter of said ball and the diameter of said ball being greater than the diameter of the opening through the gasket-like base of such nipple, said cage having perforations to admit milk from without said cage.

10. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped

with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an opening through which the nipple protrudes, said device comprising a cage of yieldable material having a flanged end adapted to be clamped between the gasket-like base of such nipple and the top of such nursing bottle, and a smooth-surfaced ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its flanked end to register with the opening through the gasket-like base of such nipple, the inside diameter of the open end of said cage being greater than the diameter of said ball, said cage having perforations to admit milk from without said cage.

11. A device for inhibiting air from being sucked from an inverted nursing bottle of the type that is equipped with a nipple having a gasket-like base with a round central opening therethrough and a cap adapted to be screwed over the mouth of the bottle, the cap having an

opening through which the nipple protrudes, said device comprising a cage and a ball having a total weight less than the weight of a volume of milk equal to the volume of said ball, said ball being adapted to be confined within said cage, the internal dimensions of said cage being sufficient to permit said ball to move freely therein, said cage being open at its end to register with the opening through the gasket-like base of such nipple, the diameter of of said ball being greater than the diameter of the opening through the gasket-like base of such nipple, said cage having perforations to admit milk from without said cage.

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