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NURSING UNIT

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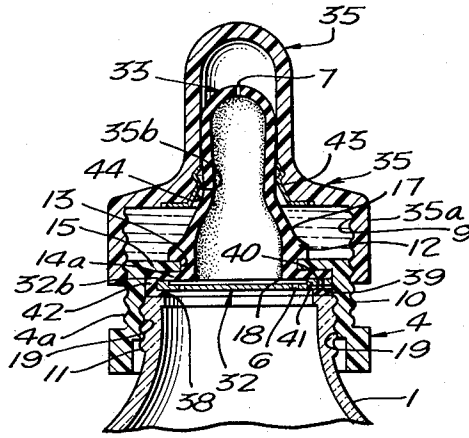
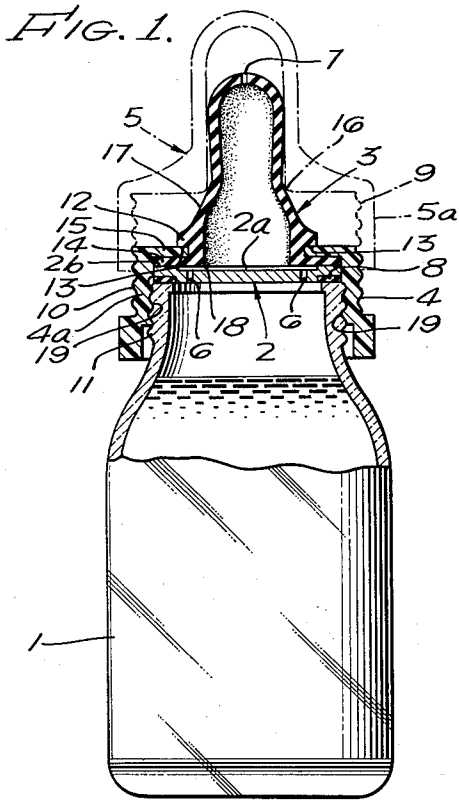


FIG. 4.

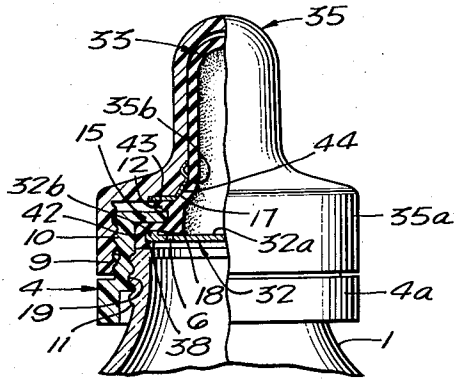


FIG. 5.

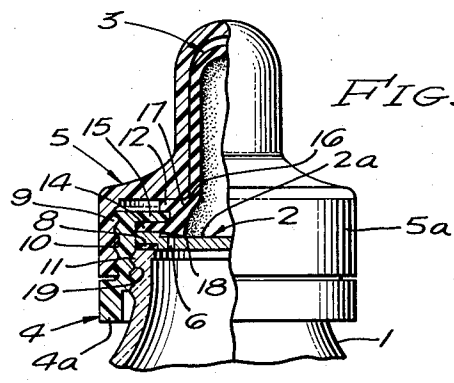


FIG. 2.

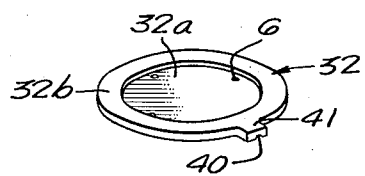


FIG. 6.

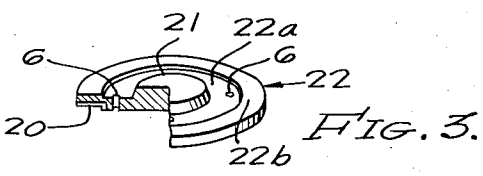


FIG. 3.

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11 Claims. (Cl. 215-11)

This invention relates to nursing bottle devices and, more particularly, to a nurser which makes possible a removable, sterile cap which seals the nipple from leaking in any position and, further, which is so constructed that when the sterile cap is removed, the filled bottle and nipple assembly is ready for use.

In the prior art, there has been an age old problem in the sterilization of a baby's nipple in the nurser in that there has been no satisfactory prior device by which the nipple could be sterilized in the useable position and at the same time be sealed from the bottle. One of the prior art methods to seal the nipple has been by means of a cap being placed over the nipple and so as to be made to contact the aperture at the top of the nipple and thereby attempt to seal it. This has not been successful as sufficient pressure cannot be applied to the top of the nipple to seal the aperture because the nipple material is extremely resilient and it tends to move away from the sealing position when the cap is tightened thereon. In so moving, the nipple aperture is then not in sealing position and the space between the exterior of the nipple and the interior of the cap is allowed to fill with fluid in the bottle if the bottle is not kept in an upright position.

Another device for sealing the sterile nipple makes it possible to invert the nipple in the bottle and seal it therein. This however, presents the problem of having to reverse the nipple in the cap before it is ready for use.

Still other means have been provided to cover the sterile nipple in the useable position, but they do not provide a seal between the bottle and the interior of the cap covering the nipple or, in other words, between the bottle and the nipple in the useable position.

According to the present invention, a seal is formed between the bottle and the nipple by means of a disc in the bottle cap at the top of the bottle. The disc has holes therethrough and the holes are sealed by the nipple when the sealing cap is placed over the nipple and is engaged with the bottle cap. The sealing disc also acts as a check valve when the baby is taking formula therefrom. That is, the disc permits substantially only one-way flow, that is, from the bottle into the nipple, thence into the baby's mouth. Without such a check valve, a portion of the formula or other liquid tends to return to the bottle as the baby exerts biting and sucking action on the nipple. This results in excessive straining to draw the formula through the nipple holes and may lead to an excessive amount of air entering the baby's stomach, tending to cause air colic. By means of the substantial one-way flow provided in the present invention, the baby doesn't have to strain to obtain the proper amount of formula. In thus preventing excessive sucking action, air swallowing is greatly reduced and the most common cause of colic is substantially eliminated.

In order that a vacuum is not created in the bottle while the baby is taking formula therefrom, an air intake means may be provided, according to the present invention, to allow air to flow into the bottle by means of a

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vent through the sealing disc. To allow air to enter into the vent, the bottle cap can be loosened a slight amount and a sufficient amount of air will enter through the vent so as to prevent a vacuum in the bottle.

5 It is, therefore, an object of the present invention to provide an improved nurser.

A principal object of the present invention is to provide a nurser in which the nipple may be completely sealed and sterilized in its useable position.

10 It is another object of the present invention to provide a nurser which has a disc between the nipple and the bottle to prevent the fluid in the nipple from returning to the bottle when the baby's mouth applies pressure and which thereby prevents exerted sucking action which in the prior art produces excessive air swallowing by the baby.

These and other objects and advantages of the present invention will become better understood when considered with the following description taken in connection with the accompanying drawings made a part of this specification. The device of the present invention is by no means limited to the specific embodiments illustrated in the drawings, since they are shown merely for purposes of description. In the drawings, like reference numerals designate similar parts in the various views.

Fig. 1 is an elevational view of the bottle and nipple, showing the sealing cap in phantom lines;

Fig. 2 is a fragmentary view of the nurser and bottle showing the nipple in the sealed position;

Fig. 3 is a perspective view of a sealing washer;

Fig. 4 is a fragmentary cross-sectional view of another embodiment of the invention;

Fig. 5 is a fragmentary view of the embodiment shown in Fig. 4 in the sealing position; and

Fig. 6 is a perspective view of the sealing disc shown in Figs. 4 and 5.

Referring to the drawings, one embodiment of the invention is shown in Figs. 1 and 2. In Fig. 1, bottle 1 is shown with the nipple 3, of conventional rubber material and configuration, in the useable position. It is inserted in bottle cap 4 through a centrally located opening in the top thereof, said opening being defined by the inner circumferential surface of the top flange 15. A conventional nipple 3, having an aperture 7 at the top of its teat portion, may be snugly but resiliently secured on flange 15 by means of the short nipple flange 12 extending over flange 15 and the lower and larger diameter base flange 14 under flange 15, flanges 12 and 14 forming annular groove 13.

Flange 14 extends substantially radially across the inner diameter of bottle cap 4. Immediately below flange 14 is upper surface 2b of sealing disc 2. Surface 2b extends radially inward from the outer periphery of disc 2 a sufficient amount to provide a sealing means with the lower side of rubber flange 14.

Inwardly of raised surface 2b may be a recessed surface in disc 2 which may serve as the sealing surface. Holes 6 extend through the recessed portion of disc 2, immediately inward of raised portion 2b, so as to provide passages between the bottle and the nipple. These holes may be located so as to be directly under and vertically spaced from the base of the nipple and outwardly of the inner peripheral edge 18 of the nipple which defines the open end thereof. The holes may also be located in a raised portion of the disc but below the sealing contact made thereon by the inwardly depressed nipple.

Gasket 8 may be inserted in a lower recessed portion adjacent the outer periphery of disc 2 and it forms a seal with the top of the neck of bottle 1 when cap 4 is tightened thereon. Cap 4 may be so secured on the bottle by means of the engagement of its internal threads 19 in skirt 4a with the external threads 11 of the bottle.

In Fig. 2, sealing cap 5 is shown in sealing position, being secured to the outer surface of cap 4 by means of the latter's external threads 10 on skirt 4a in engagement with the former's internal threads 9 in skirt 5a. Sealing cap 5 has an interior configuration which is generally complementary to the exterior configuration of the nipple. Inwardly and vertically above the threads in cap 5 is an inwardly directed annular pressure surface 16 which is, in effect, a small diameter portion of the interior of the cap and which makes contact with the external enlarged diameter surface 17 on the teat portion of the typical conventional nipple. As may be seen in Fig. 2, when sealing cap 5 is tightened on bottle cap 4, small diameter annular surface 16 forces the enlarged diameter portion 17 of the nipple inward and downward and by so doing, also forces the lower inner edge 18, which defines the inner periphery of the open end of the nipple, downward so as to be in pressure-sealing contact with sealing surface 2a of the sealing disc, inwardly of passages 6. By this means, then, bottle 1 is sealed from the nipple and after the assembly has been sterilized with the formula in it, it may be carried in any position without any of the formula going into the nipple.

Fig. 3 illustrates a modification of the disc 2 shown in Figs. 1 and 2. Here another type of sealing disc 22 is shown having a raised surface 22b adjacent the outer periphery thereof and passages 6 immediately inward of the raised portion. Again, the passages 6 extend through the recessed portion of the disc which forms the sealing surface 22a comparable to the sealing surface 2a in Figs. 1 and 2. Inwardly of the sealing surface is a centrally located raised portion 21 which serves as a guide, fitting loosely in the open end of the nipple, when the disc 22 is inserted into the bottle cap 4 in abutment with the lower surface of the base of the nipple. Air vent 20 is shown extending from the outer periphery of disc 22 into an inner portion of the lower face of the disc so as to be in communication with the inside of the bottle. The purpose of vent 20 is to allow air into the bottle to prevent a partial vacuum when liquid has been removed as the creation of a partial vacuum would make it difficult, if not impossible, for the baby to suck liquid out of the nipple through aperture 7. Air is permitted to enter vent 20 by merely turning bottle cap a fraction of a turn in the loosening direction. Sufficient air is permitted to enter the bottle through the threads without causing a liquid leak, the pressure on the exterior of the bottle being greater than in the interior. Disc 22 may be substituted at will for a typical disc 2 whereby upper surface 22b will be made to contact the lower surface of flange 14 and gasket 8 would fit into the lower recessed portion of the disc so as to seal vent 20 when cap 4 is tight on the bottle.

Passages 6 may be made through the vertical side of guide 21, for example, and the sealing surface could then be the top or top edge of the guide. The exact sealing surface is determinable by the shape of the teat portion, the pressure surface on the sealing cap, and the configuration of the disc.

In Figs. 4-6, other variations and embodiments of the invention are shown. As in Figs. 1 and 2, a bottle cap 4 is threadedly engaged with bottle 1 and the short upper flange 12 of the nipple extends over the top of the inwardly directed flange 15 of the bottle cap. The lower part of the nipple in the embodiment shown does not terminate in flange 14a. Extending downwardly from flange 14a is a vertically directed annular wall 42 from which extends inwardly directed lip 38. Lip 38 replaces gasket 8 in Fig. 1, forming a seal on the neck of bottle 1.

Sealing disc 32 is held by the rubber nipple base extension formed between flange 14a and lip 38. Disc 32 is similar to disc 2 and 22 in that it has a raised portion 32b on the upper side thereof extending inwardly from the outer periphery and has passages 6 which extend through the recessed surface 32a, said passages being

spaced vertically from flange 14a of the nipple directly above it. In order to provide a vent through the bottle or nipple, similar to vent 20 in Fig. 3, there may be a slotted opening 39 in wall 42 for the insertion of the lip 41 of the disc. Vent 40, through lip 41 on the underside of disc 32, provides a passage from the bottle to the interior of skirt 4a. This embodiment provides the advantage of a nipple which is integral with the sealing disc.

This embodiment also shows the use of a swivel washer 43 which is rotatably engaged on the inner surface 35b of sealing cap 35 which is adapted to fit over the exterior of nipple 33. As shown in Fig. 5, the interior annular pressure surface 44 on swivel washer 43 depresses the typical enlarged diameter annular surface 17 which, in turn, causes the edges 18 of the nipple to contact recessed surface 32a inwardly of the passages 6 so as to seal the interior of the bottle from the nipple. The advantage provided by the swivel washer 43 is that it reduces friction between cap 35 and the nipple 33 when the cap is being rotatably tightened thereon, by means of the engagement of complementary threads 9 and 10 on skirts 35a and 4a, respectively. That is, it is very easy to rotate washer 43 on surface 35b in that the latter is, typically, a smooth, low-friction surface in contrast to the high-friction rubber surface 17. The resulting action is that while cap 35 is being tightened, if washer 43 tends to stick on rubber surface 17, it rotates freely on surface 35b so that cap 35 will be screwed onto cap 4 with little effort. The sealing caps and the bottle caps may be made of the typical plastics now used in the manufacture of the conventional caps.

In operation, after the filled bottle and caps have been sterilized and the sealing cap has been tightened so as to force the inner edge of the open end of the nipple into contact with the upwardly directed recessed surface on the sealing disc, the nurser may be carried in any manner and there is no possibility of any leakage into the nipple and outwardly into the cap. Further, when the cap is removed, the invention also provides the advantage of having the nipple in position for use. The sealing feature of this assembly prevents any contamination of the bottle contents on the exterior of the nipple or on the interior of the sealing cap.

While the nipple and bottle are in use as a means of feeding a baby, the bottle cap 4 may be loosened so as to allow air to bleed into the vents 20 or 40 and, thus control the bleed rate of the air displacing liquid removed from the bottle through the nipple orifice 7 from zero to the maximum amount allowed by the size of the vent grooves.

A further salient feature of the invention is that holes 6 in the sealing disc 2 may be made of a diameter so that they restrict the flow of liquid trapped in the chamber between the disc and the nipple from flowing back into the bottle when the nipple is pressed by an infant during the feeding. Restrictive flow through holes 6 causes a more uniform flow of liquid through the nipple orifice 7 and thus, considerably reduces the amount of air swallowed by the infant.

It is readily apparent that the present invention permits the nipple on a baby nurser bottle to be installed in its functional position, sealed against leakage for any position of the bottle, and renders the nipple and contents sterile until the sealing cap is removed, at which time the nurser is immediately ready for use. In addition, the sealing disc acts as a check valve and restricts the discharge of milk from the interior of the nipple back into the bottle when the baby is sucking on it. This tends to eliminate two undesirable results which occur with the use of the conventional nursers; namely, the excessive swallowing of and filling the stomach with air instead of the liquid contents in the bottle, and air colic which occurs when the child's stomach is filled with too much air.

While several forms of the invention have been shown

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and described, it is obvious that further changes may be made without affecting the essential characteristics of the invention as defined in the appended claims.

What is claimed is:

1. In a nursing device, a bottle having an externally-threaded neck and an internally-threaded skirted bottle cap that screws on said neck; said bottle cap having an inwardly extending top flange and defining a central opening therein; an open-ended, flexible nipple having a hollow apertured teat portion projecting upwardly through said opening in said bottle cap; a lower portion of said nipple forming said open end and having means extending outwardly therefrom being fitted on said top flange; a disc in said cap having an upper surface thereof on its upper face in contact with the lower surface of said nipple; said upper surface being on a raised portion of said disc and extending inwardly from the outer periphery thereof; said disc having a recessed portion radially inward from said raised portion; said disc having a lower surface on its lower face generally below said raised portion in sealing relationship with the top of the neck of said bottle; means forming a passage through said recessed portion to allow liquid to pass from said bottle into said nipple; said passage means being adjacent said lower surface of said nipple and being spaced therefrom; a sealing cap having an interior configuration adapted to fit over said nipple and being adapted to be engaged with said bottle cap; and means within said sealing cap to force said lower portion of said nipple forming said open end into sealing relationship with said disc when said caps are engaged so as to prevent the flow of liquid from said bottle into said nipple.

2. For use as a nurser, a skirted, bottle-engaging cap having a top flange extending inwardly and defining a central opening therein; an open-ended nipple having a hollow, flexible apertured teat portion projecting upwardly through said opening in said bottle cap; a short flange of said nipple extending radially outward on the surface of said top flange and a large diameter lower flange extending radially outward under said top flange so as to hold said nipple in said bottle cap; said open end of said nipple being defined by the inner peripheral edge of said lower flange; a disc in said cap radially inward of its skirt and having an upper surface in contact with the lower surface of said lower nipple flange within said cap; said upper surface being on a raised portion of said disc and extending inwardly from the outer periphery thereof; said disc having a recessed portion radially inward from said raised portion; circumferentially spaced holes extending through said recessed portion to form passages from the lower side of said disc into said nipple; said holes being under said lower surface of said lower flange and being spaced vertically therefrom; a sealing cap having an interior configuration adapted to fit over said nipple and having a lower portion thereof adapted to engage the exterior of said bottle cap; said sealing cap having an inwardly directed annular surface in position to inwardly and downwardly depress a corresponding annular exterior surface of said nipple above said short flange when said caps are engaged; said annular exterior surface of said nipple being vertically above said inner edge of said lower flange so that when said last-mentioned surface is depressed, said inner edge of said lower flange is depressed and contacts said disc inwardly of said holes.

3. The invention according to claim 2 in which means extending downwardly on said lower flange retains said disc in said bottle cap.

4. The invention according to claim 2 in which a vent extends from the lower face of said disc generally radially outward to the interior face of the skirt of said bottle cap.

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5. The invention according to claim 2 in which said disc has a central raised upwardly directed guide portion extending into said open end of said nipple and being spaced from the walls thereof.

6. The invention according to claim 2 in which said inwardly directed annular surface in said sealing cap is formed on the exterior of an annular swivel washer which is rotatably engaged in said sealing cap.

7. In an infant nursing bottle having an externally-threaded neck and an internally-threaded skirted bottle cap that screws on said neck; said bottle cap having a top flange extending inwardly and defining a central opening therein; an open-ended, flexible nipple having a hollow apertured teat portion projecting upwardly through said opening in said bottle cap; a short flange of said nipple extending radially outward on the surface of said top flange and a large diameter lower flange extending radially outward under said top flange so as to hold said nipple in said bottle cap; the lower surface of said lower flange forming a bottom surface of said nipple; said open end of said nipple being defined by the inner peripheral edge of said lower flange; a disc in said cap radially inwardly of its skirt and having an upper surface of its upper face in contact with the lower surface of said lower nipple flange within said cap; said upper surface being on a raised portion of said disc and extending inward from the outer periphery thereof; said disc having a lower surface on its lower face generally below said raised portion being in a sealed relationship with the top neck of said bottle; said disc having a recessed portion radially inward from said raised portion; circumferentially spaced holes extending through said recessed portion to form passages between the lower side of said disc in said bottle and the upper side of said disc adjacent said nipple; said holes being under said lower surface of said lower flange and being spaced vertically therefrom; a sealing cap having an interior configuration complementary to the exterior of said nipple so as to fit thereon and having a lower portion thereof adapted to be threadedly engaged with the exterior of said bottle cap; said sealing cap having an inwardly directed annular surface in position to inwardly and downwardly depress a corresponding annular exterior surface of said nipple above said short flange when said caps are threadedly engaged; said annular exterior surface of said nipple being vertically above the inner edge of said lower flange so that when said last-mentioned surface is depressed, said inner edge of said lower flange contacts said disc inwardly of said holes and forms a seal between said bottle and the interior of said nipple.

8. The invention according to claim 7 in which means extending downwardly on said lower flange retain said disc in said bottle cap.

9. The invention according to claim 7 in which a vent extends from the lower face of said disc radially outward to the interior face of the skirt of said cap.

10. The invention according to claim 7 in which said disc has a central raised upwardly directed guide portion extending into said open end of said nipple and being spaced from the walls thereof.

11. The invention according to claim 7 in which said inwardly directed annular surface in said sealing cap is formed on the exterior of an annular swivel washer which is rotatably engaged in said sealing cap.

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