

Nov. 4, 1952

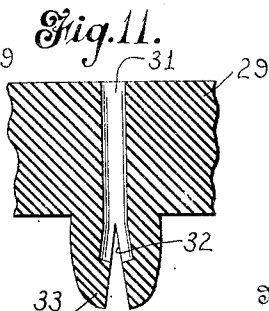
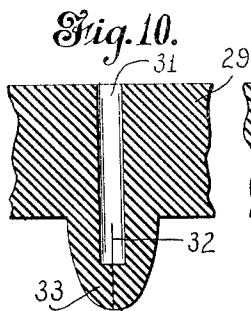
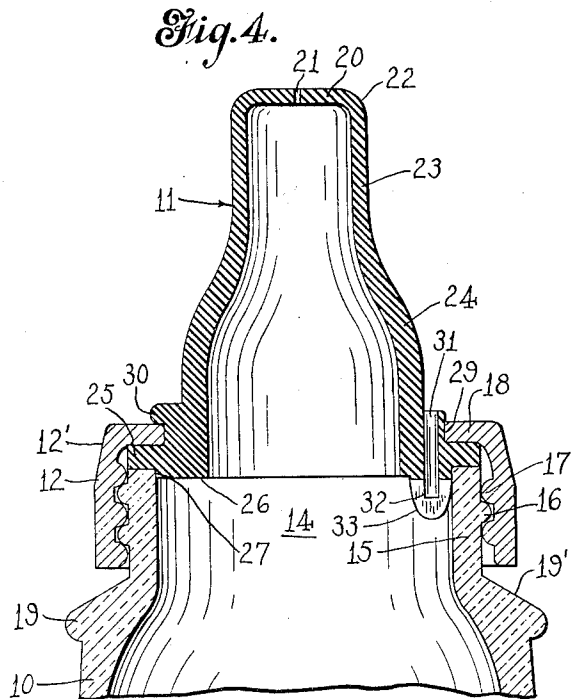
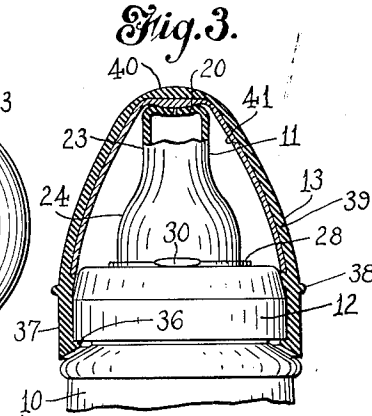
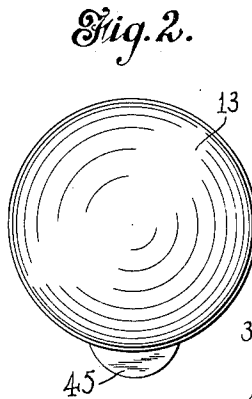
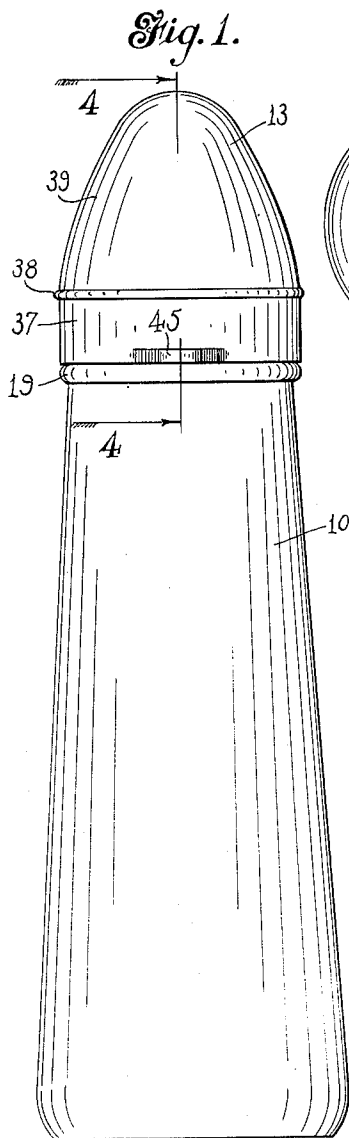
P. S. MADSEN ET AL

2,616,581

NURSING OUTFIT

Filed Oct. 8, 1945

3 Sheets-Sheet 1



Inventors

Paul S. Madsen
George W. Goodson

By *Rockwell & Bartholomew*
Attorneys

Nov. 4, 1952

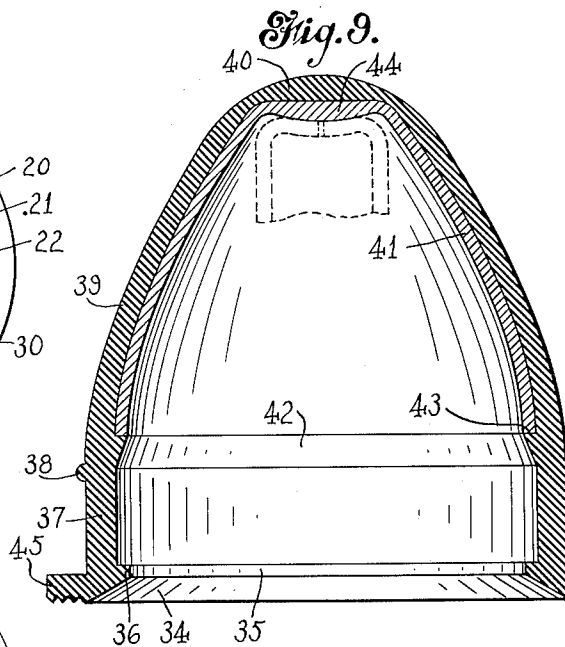
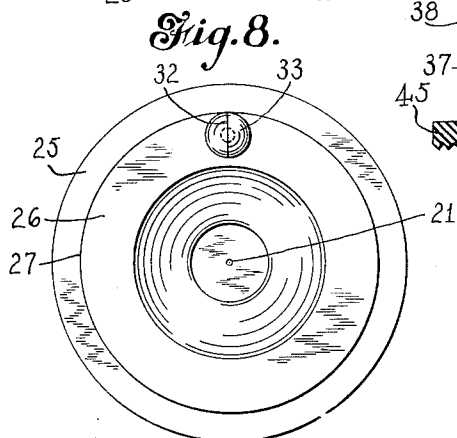
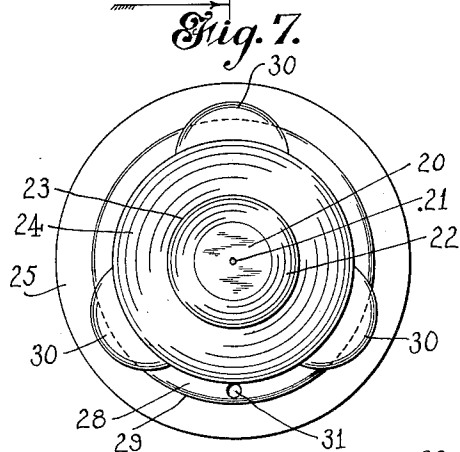
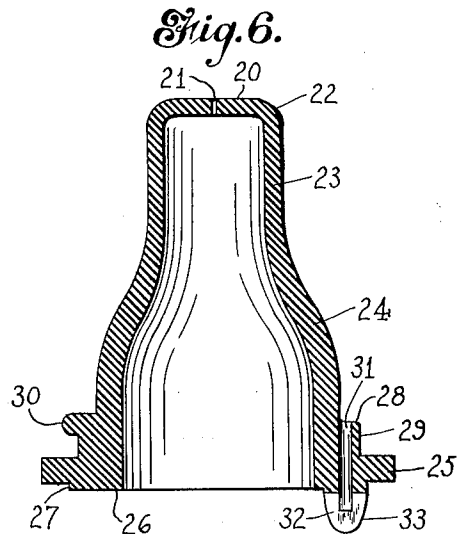
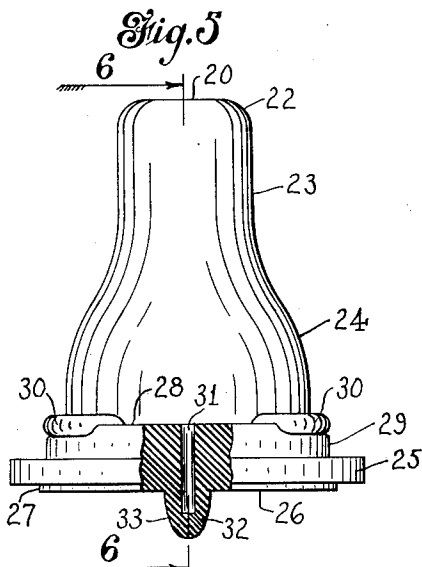
P. S. MADSEN ET AL

2,616,581

NURSING OUTFIT

Filed Oct. 8, 1945

3 Sheets-Sheet 2



Inventors

Paul S. Madsen
George W. Goodson

By Rockwell & Barlow

Attorneys

Nov. 4, 1952

P. S. MADSEN ET AL

2,616,581

NURSING OUTFIT

Filed Oct. 8, 1945

3 Sheets-Sheet 3

Fig. 12.

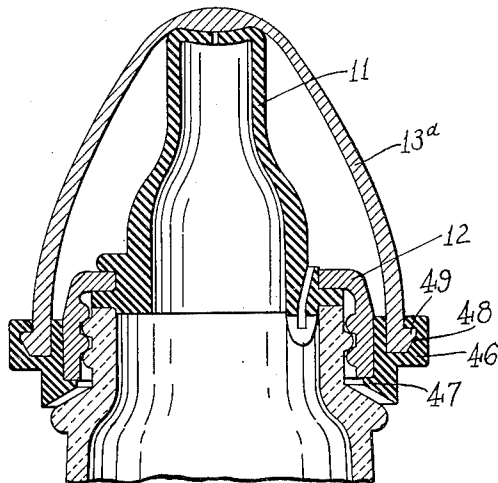


Fig. 13

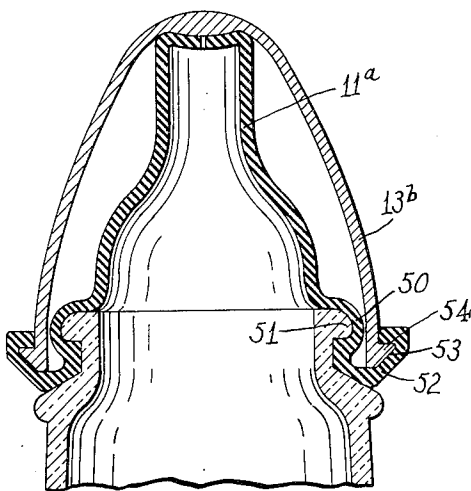
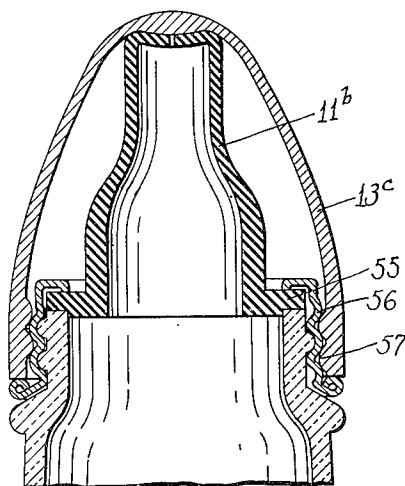


Fig. 14.



Inventors

Paul S. Madsen
George W. Goodson

By *Rockwell & Bartholomew*

Attorneys

UNITED STATES PATENT OFFICE

2,616,581

NURSING OUTFIT

Paul S. Madsen, Bethany, and George W. Goodson, North Haven, Conn., assignors to The Seamless Rubber Company, New Haven, Conn., a corporation of Connecticut

Application October 8, 1945, Serial No. 620,878

5 Claims. (Cl. 215-11)

1

This invention relates to nursing outfits, and has particular reference to a nursing bottle assembly or outfit in which the bottle itself has a relatively wide mouth, so as to facilitate cleansing.

This invention also relates in one aspect to a nursing bottle in which a removable protective means is applied over the nipple.

One of the objects of the invention is to provide effective sanitary protection for the nipple-equipped bottle filled with milk during the period between the preparation of the formula and the feeding of the infant, such protection being effective also in making the bottle more readily portable, both in the home and in travelling, for example, the protection being such as to prevent leakage as well as soiling of the nipple and adjacent parts.

Another object is to provide a protective cap easily applied and removed and yet securely held in the protective position.

Another object is to provide an improved nipple which is non-collapsing and is easy to clean.

A further object of the invention is to provide the nipple with a valve having an effective and sure action in admitting air from the atmosphere when the pressure within the bottle is lowered, so that the collapse of the nipple is prevented.

In the accompanying drawings:

Fig. 1 is an elevation of a nursing bottle embodying our invention, showing the bottle with the protective cap applied to it;

Fig. 2 is a top plan view of the bottle;

Fig. 3 is a vertical section of the upper part of the bottle structure;

Fig. 4 is an enlarged section on line 4-4 of Fig. 1, the protective cap being removed;

Fig. 5 is an elevation of the nipple, partly in section;

Fig. 6 is a section on line 6-6 of Fig. 5;

Figs. 7 and 8 are, respectively, a top plan view and a bottom plan view of the nipple;

Fig. 9 is a detail section of the protective cap;

Figs. 10 and 11 are enlarged detail sections of a portion of the nipple respectively showing the valve in closed position and in open position; and

Figs. 12, 13 and 14 are sectional views illustrating modified forms of the assembly.

In the drawings, the outfit or assembly is shown as including a bottle 10, a nipple 11 applied thereto by means of a retaining ring or screw ring 12, and a removable protective cap 13 of rubber or similar material. It is preferred, as illustrated in this instance, to have the protective cap 13 engageable with and disengage-

2

able from the retaining ring 12. The cap 13 is used for sanitary protection of the nipple and adjacent parts and for preventing the spillage of milk or other liquid contents from the nipple.

The bottle 10 is preferably made of glass and has a relatively wide mouth over which the nipple is seated by means of the retaining ring. The bottle 10, in this instance, has a wide mouth 14 defined by a substantially cylindrical wall 15 upon which integral external screw threads 16 are provided. The ring 12 is preferably made of plastic material, and is provided with interior threads 17 engageable with the screw threads 16. The retaining ring has a retaining flange 18 at the upper part thereof overlying the base of the nipple in the manner hereinafter described, the nipple base in the operative portion being clamped between the upper edge of the bottle neck and the flange of the retaining ring.

Below the mouth portion 15, the bottle is provided with an integral outstanding shoulder 19 which preferably extends laterally beyond the retaining ring and has a surface 19' sloping upwardly and inwardly. The retaining ring 12 is preferably provided externally at its upper part with an inwardly and upwardly sloping surface 12' for a purpose which will hereinafter appear.

The nipple 11 is preferably made of molded rubber, and it preferably has, in longitudinal section, the shape or profile illustrated in Figs. 4 and 6. Preferably the upper wall portion 20 of the nipple lies substantially perpendicularly to the nipple axis, this wall portion being provided with a hole 21. The wall portion 20 is integrally joined by a fillet portion 22 with a wall portion 23, which is substantially cylindrical. The cylindrical wall portion 23 merges into a bulbous body 24, the thickness of the rubber being gradually increased in the merging zone. The bulbous portion 24 of the nipple is integrally joined to a lateral flange 25 that is adapted to rest on the upper edge of the bottle. This flange 25 is preferably spaced upwardly to a slight extent from the base surface 26 of the nipple, so as to provide a slight shoulder portion 27 extending into the bottle mouth for the purpose of centralizing the nipple.

Between the base flange 25 and the body portion 24 is a shoulder 28 of greater diameter than the nipple body having a substantially vertical round face 29 which is of a diameter substantially equal to that of the round opening defined by the edge of the flange 18, the shoulder 28

being of a height substantially equal to that of the flange. It will be noted that in this portion of the nipple where the shoulder and the base flange are provided, the wall of the nipple is relatively thick, as will be seen from Fig. 4, for example. The nipple extends through the opening of the retaining ring with the shoulder engaged with the surface of the ring opening, and, for securely holding the nipple in place, suitable means are provided, such as three lugs 30 formed integral with the shoulder and slightly overlying the upper surface of the retaining ring. These lugs are spaced upwardly from the base flange to an extent such that the upper wall of the retaining ring fits in the space between the base flange and the lugs. In this manner the nipple is firmly held in the retaining ring. The nipple can be readily placed in operative position by pushing it upwardly into the retaining ring from below in order that the lugs may catch over the rim of the ring for securely locating the nipple, and, on the other hand, the nipple can be readily disassembled from the ring merely by grasping the nipple and forcing it downwardly out of the ring.

As will be seen from Fig. 4, the base flange 25 in the form illustrated has a diameter which approximates the external diameter of the bottle mouth, and the diameter of the round shoulder portion 29 approximates the inner diameter of the bottle mouth. The sharply inturred flange 18 on the ringlike screw cap is of relatively small area, extending inwardly to a relatively slight extent but lying flatwise against the upper surface of the nipple base flange for effective clamping action. The upper surface of the flange of the screw cap is engaged only by the lugs 30 of the nipple. The chief function of these lugs is to hold the nipple and screw cap in assembled relation before the cap has been applied to the bottle and after the cap has been removed from the bottle, and for this purpose the lug engagement with the cap is quite sufficient, while, on the other hand, making it extremely easy and convenient to install the nipple in the cap and remove it therefrom. When the nipple is pushed upwardly into the cap, the lugs readily snap into engaging position, and in disassembly the lugs are quickly and easily disengaged by a downward push on the nipple. It will be apparent, also, that the assembly consisting of the cap and nipple can be easily sterilized in a thorough manner, and that in applying it to the bottle it is unnecessary to touch the nipple.

For preventing collapse of the nipple when the infant is feeding, suitable air inlet means are provided, and we prefer to provide an air inlet opening through the base flange of the nipple. Such an opening is indicated at 31, this being in the form of a hole leading through the shoulder 29 and open to the atmosphere at the top of the shoulder. For the purpose of preventing spilling of the liquid contents through this hole, it is preferred to have the lower end of the hole in communication with a diametrical kerf 32 provided in a small downwardly projecting member 33 formed integral with the base structure of the nipple. The arrangement is preferably as shown in Fig. 4, where the downward projection 33 extends into the mouth of the bottle to a slight extent and where the surface of the projection is rounded so that it will not catch on other objects.

The hole 31 preferably extends downward into the projection 33, and the kerf or slit 32 prefer-

ably extends somewhat above the lower end of the hole, as shown in Figs. 10 and 11. Under the effect of air pressure on the projection 33 the opposing surfaces of the slit are held closely together, as shown in Fig. 10, to prevent the contents of the bottle from passing into the hole 31. However, should the pressure within the bottle drop below that of the atmosphere, atmospheric air can pass down through the hole, thus opening the projection or valve to incoming air, which air separates the side portions of the projection or valve in the manner indicated in Fig. 11. The valve has a flutter action under the changing air pressure, and this is important for preventing leakage of the liquid and/or collapse of the nipple.

The protective cap 13 is preferably made of elastic plastic material such as vulcanized rubber, which material possesses considerable resiliency. The wall of the cap is of appreciable thickness and it is inherently resilient, and the resiliency is utilized for the retention of the cap in its protective position, in which position it is interlocked with the retaining ring 12 in a detachable manner. It is preferred also that the protective cap be so arranged that when it is in position it will prevent spillage of the contents out of the discharge hole 21 of the nipple. It is also preferred to have the protective cap of tapering shape, the lower end being open and being of considerable width, so as to fit over the retaining ring, and the upper end being of somewhat reduced cross section so as to embrace and conform generally to the shape of the nipple at the upper end of the latter. The protective cap may also, if desired, be somewhat reinforced internally in the upper portion thereof, for example, in the manner hereinafter described.

In the drawings, the cap 13 constructed, for example, of vulcanized rubber, has a side wall which, in the lower portion of the cap, is, generally speaking, of greater thickness than the upper portion. The cap is illustrated as having at the lower open mouth portion a downward and outward flare, this being provided by an inclined surface 34. The maximum diameter of the surface 34 is shown as being about equal to the diameter of the main portion of the cap. The surface 34 leads to a cylindrical surface 35 at the inner edge of a narrow ledge or rib 36. Immediately above the ledge or shoulder 36, the internal diameter of the cap is increased, the cap having in this region a side wall 37 with a substantially cylindrical inner surface. The wall 37 itself in this region is preferably substantially cylindrical, and it may be provided with an integral horizontal external bead 38 which facilitates the gripping of the cap by the fingers. Above the bead 38 a wall portion 39 is provided, the same being reduced in thickness as compared to the portion 37, this wall portion 39 being on a slant and leading integrally to a summit portion 40. The portions 37, 39 and 40 in conjunction provide a cap in the shape of a dome, this being the preferred form, although other forms may be used. The part of the cap defined by the portions 39 and 40 may be reinforced as by an inner lining 41. The lining 41 may be formed of plastic material having considerably more rigidity than the rubber wall, so as to support the cap strongly from within and prevent the nipple from being collapsed or damaged by any ordinary shocks or blows to which the assembly may be subjected.

In the form shown, there is provided on the inner surface of the cap just above the lower cylin-

5

drical portion a slanting inner surface 42 providing an internal shoulder 43 upon which rests the lower open end of the cup-like liner 41. The liner 41 extends across the cap under the summit portion 40 of rubber, as shown at 44, and this portion 44 has a somewhat bulged lower surface which, when the cap is in the operative position on the bottle, presses against the top wall of the nipple in the manner indicated in Fig. 9. In this condition, there is some pressure of the cap against the upper wall of the nipple, and the nipple is thereby held in position with respect to the cap, and, at the same time, the cap effectively closes the hole in the nipple and prevents under most conditions the spillage of the contents from the nipple into the cap. The portion 44 has a convex lower surface to which the normally flat or planar upper surface of the nipple is adapted to conform, as shown in Figs. 3 and 9. For convenience in manipulating the protective cap, the latter may be provided with one or more laterally projecting integral tabs, and, in the present assembly, one of these tabs is shown at 45, the same having a lower face which, in this instance, is flush with the lower boundary of the cap, and is suitably roughened so that a good grip can be obtained on the tab.

When the parts of the nursing bottle are all assembled, the relation of the protective cap to the other parts is as shown in Fig. 3. The cap is locked to the ring 12 by having the ledge 36 engaged with the lower edge of the ring 12 in the manner shown. The inner surface of wall portion 37 is engaged with the external surface of the ring, said ring having an external cylindrical surface received against a corresponding cap surface. The sloping surface 12' of the ring is preferably cleared by the shoulder portion 43 of the cap, and preferably, as shown, the lower edge of the liner 41 extends downwardly to a region adjacent the upper surface of the retaining ring in order that the cap may be reinforced in the entire region above the retaining ring. It will be noted, furthermore, that the lower portion of the cap and the shouldered portion 19 of the bottle are about the same diameter, there being sufficient room between the bottle shoulder and the lower part of the retaining ring to receive the shouldered lowered edge of the cap. There is preferably a certain amount of clearance between the sloping upper surface of shoulder 19 and the correspondingly inclined surface 34 of the cap when the retaining ring is screwed up as far as possible on the bottle neck.

In the improved nipple 11, as herein illustrated, the top wall is substantially normal to the nipple axis, and this top wall is relatively thin, being at any rate not substantially thicker than the wall of the adjacent cylindrical portion of the nipple, and the two wall portions being joined on a gradual fillet, as previously described. This nipple has an easier action in nursing than some previous nipples, there being a notable absence of the sharply crowned thick nipple summit which has made some previous nipples objectionably tough and quite difficult to compress. Also, in the present case, the nipple hole is fully open under compressive action from the respective sides. On the other hand, the nipple, while easy to compress, is not subject to weakness or lack of durability owing to the provision of the wall of molded rubber which is very strong and durable and profiled to give the necessary strength.

It will be evident that the bottle, the retaining ring, and the nipple can be easily cleaned and

6

sterilized. The nipple can be easily mounted upon the ring and the ring mounted upon the bottle. After sterilizing the bottle and its contents, the previously sterilized protective cap can be readily applied by simply placing it over the nipple and forcing it downward into a position in which it will be locked in place. In forcing the cap into place the action is facilitated by the fact that the flaring mouth portion of the cap engages the sloping surface 12' on the screw ring. When the cap is forced down, its lower edge portion is somewhat distended, and the shoulder carried by the cap moves quickly into locking position as it passes the lower boundary of the screw ring. In this operation, there is no contact of the hands with the nipple or the upper part of the bottle. After the protective cap has been applied, the capped bottle may be placed in the refrigerator until needed for use, and, when needed for use, the cap can be easily removed by grasping the tab and pulling it off, it being unnecessary to touch any of the sterilized parts at the upper portion of the bottle. The protective cap is also very useful in the event that the bottle has to be carried from place to place outside the home, as it renders the bottle more easily portable, providing against soiling and against leakage. Under any ordinary conditions, the cap pressing against the top of the nipple will maintain the latter in a closed condition and prevent leakage of milk out of the nipple into the cap. In case there is slight leakage out of the nipple into the cap, there will not be leakage out of the cap owing to the sealing engagement between the flexible encircling lower part of the cap and the adjacent side surface of the retaining ring. The cap also prevents physical injury to the nipple, as has been brought out above.

As shown in Fig. 3, the push-on cap, when in the operative position, with the cap in a predetermined axial relationship to the screw ring, has sealing engagement with the nipple top, the nipple being held under some yielding or cushioned axial pressure by the engagement of the shoulder of the protective cap with the screw ring, and the lower part of the protective cap being somewhat distended and extended and in sealing engagement with the screw ring at the side of the latter. A somewhat flexible covering cap of resilient rubber or rubbery material is particularly useful for these purposes. Such a cap is also useful in providing a simple and satisfactory means of securement of the cap to the ring.

One of the prime advantages, however, is in the sanitary cleanliness which can be maintained throughout the period from the preparation of the formula up to the time the contents of the bottle are consumed by the infant. After feeding, the cap is replaced on the bottle and the empty bottle put aside or carried about, as may be necessary, until the bottle is refilled.

It will be noted that in applying the protective cover to the bottle and in removing the same, it is unnecessary to give the cover any turning movement. Should, however, the user, in applying or removing the cover, give the same a turning movement while the cover is in contact with the nipple end, no harm will be done because of the fact that the interior of the cover is provided with a smooth surface engaging a smooth surface on the nipple, so that, under such conditions, no twist will be imparted to the nipple end.

The means for preventing the collapse of the nipple is also important. Where a small air-inlet

hole is provided through a base flange of a nipple, the action is not satisfactory, as there is apt to be objectionable leakage of the liquid contents, and also a condition where the entrance of sufficient air into the bottle is not provided for, thus causing the nipple to collapse, which is very objectionable. In the present structure there is, in addition to a hole provided in the nipple flange, a valve provided by the slit projection in communication with the hole, said valve being self-acting so as to respond to the prevailing pressure conditions, the parts of the slit valve being urged apart or separated when the pressure within the bottle is less than that of the atmosphere, and said parts being forced together and brought into sealing contact with each other to prevent outward movement of the liquid contents, when and as the pressure within the bottle is equalized with that of the atmosphere.

In Fig. 12 there is shown a modified form of the assembly, in which the nipple 11 is of the same structure previously described, and the ring 12 is also of the structure previously described. However, in this example the cap 13^a is a relatively rigid structure engaging a resilient member 46 having a resilient shoulder 47 engaging under the lower edge of the screw ring. The resilient member 46, which may be made of rubber or like material, has a grooved upper portion 48 in which is received the lower edge of the cap or shell 13^a. The cap or shell is provided at the lower edge with a lateral shoulder 49 fitting the groove in the flexible member 46. Upon deformation of the flexible rubber member 46, the same may be readily separated from the remainder of the cap structure.

In the modified form shown in Fig. 13, the nipple 11^a has a portion 50 engaging over a bead 51 at the mouth of the bottle. At its lower end the nipple is extended integrally to provide a resilient portion 52 with an upwardly facing groove or trough 53. In this groove or trough of the nipple extension is engaged a shouldered rim 54 provided at the lower edge of the relatively stiff cap 13^b.

In the modified form shown in Fig. 14 the nipple 11^b has a base flange 55 resting on a plain edge provided at the mouth of the bottle. A metallic screw ring 56 is used in this instance for holding the nipple on the bottle, said screw ring being relatively thin and having its screw threads formed by pressing of the metal. The thread projections, therefore, extend to the exterior of the screw ring, and they are engaged by interior threads, generally indicated at 57, which are provided upon the lower portion of a relatively stiff cap or shell 13^c. It will be understood that this cap or shell screws onto the screw ring at the exterior of the ring. The cap 13^c is preferably made of plastic material, but not necessarily so.

In this description the term "rubber" is used in a broad and general sense.

It will be understood from the foregoing that the invention can take many and various forms, and that various changes may be made in the structural details without departure from the principles of the invention or the scope of the claims.

What we claim is:

1. In a nursing bottle, the combination of a bottle having a mouth, a nursing nipple, a retaining screw ring holding the nipple over the bottle mouth, and a protective cap of the push-on type extending over the nipple and over the retaining ring, said cap having a resilient rubber

portion engaged with the ring to seal off the space within the cap, said resilient portion having a shoulder engaged with the lower edge of the ring to secure the cap in place, said bottle having an outstanding shoulder with an upper face spaced from the lower edge of the ring when the ring is screwed up on the bottle, and the shouldered part of the cap being disposed in the space thus provided, the cap being so dimensioned that when the cap is so secured said cap assumes a predetermined axial position with respect to the nipple structure.

2. In a nursing bottle, the combination of a bottle having a mouth, a nursing nipple, a retaining ring holding the nipple over the mouth, and a protective cap of the push-on type extending over the nipple in a sealing relation thereto and over the retaining ring and having its lower end portion interlocking with the ring to hold the cap securely in position, the cap being so dimensioned that when the cap is slipped over the ring and secured thereto, said cap assumes a predetermined axial position with respect to the nipple structure, in which position the cap under tension in an axial direction, exerts a predetermined sealing pressure against the summit of the nipple, the nipple in its normal condition having a flat upper face of substantial area, and the cap engaging means for the nipple summit being shaped slightly to depress said upper face and create a liquid seal.

3. In a nursing bottle, the combination of a bottle having a mouth, a nursing nipple, a retaining ring holding the nipple over the mouth, and a protective cap of the push-on type extending over the nipple in a sealing relation thereto and over the retaining ring and having a stretchable lower end portion adapted to be distended by the sliding engagement of the cap with the ring to provide a liquid seal between the cap and ring adjacent the open end of the cap, said stretchable portion having means positively interlocking with the ring to hold the cap securely in position, the cap being so dimensioned that when the cap is slipped over the ring and secured thereto, said cap assumes a predetermined axial position with respect to the nipple structure, in which position the cap under tension in an axial direction, exerts a predetermined sealing pressure against the summit of the nipple, whereby the cap not only has sealing engagement with the ring but also the upper end of the nipple is effectively sealed.

4. In a nursing outfit, the combination of a bottle having a relatively wide mouth defined by a neck having an external screw thread, a nipple of elastic material having a body and extending laterally from the body a base flange of approximately the diameter of the bottle mouth supported upon said mouth, said nipple having immediately above the base flange an integral round shoulder portion of greater diameter than the body and of approximately the same diameter as the bottle neck space, lugs formed integrally with said body and with said shoulder portion extending in a lateral and radially outward direction, and a screw ring for holding the nipple on the bottle mouth having an internally threaded side wall engaging the bottle thread and having at the upper part a sharply inturned relatively narrow flange engaging at its under surface with the base flange of the nipple and having an inner edge portion engaging said round shoulder portion on the nipple, the upper surface of said round shoulder portion being ex-

posed, and said lugs having their outer extremities only slightly overlying and engaging the upper surface of said ring flange to hold the nipple in place in the ring but permit ready separation of nipple and ring when said parts are removed from the bottle.

5. A nursing nipple having a body, a base flange integral with the body at the lower portion of the latter, an outer shouldered portion of greater diameter than the body integral with the body above the base flange and disposed at the side of the body and having a round side surface, lugs formed integrally with the body and with said shouldered portion extending in a lateral and radially outward direction and adapted to overlie the upper surface of a retaining ring having an inner surface engaging said round side surface, and air-inlet means associated with the base portion of the nipple in the interval between certain of said lugs, including a slitted elastic protuberance extending downwardly from the base so as to be disposed within the bottle mouth, said protuberance having its slit in communication with an air-inlet passage extending upwardly through the base and through said shouldered portion and having its upper end at the top of said shouldered portion inwardly of said ring.

PAUL S. MADSEN.

GEORGE W. GOODSON.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
362,554	Suydam	May 10, 1887
411,794	Eggers	Oct. 1, 1889
712,157	Tatum	Oct. 28, 1902
805,641	Gallagher	Nov. 28, 1905
1,421,877	Weissheir	July 4, 1922
1,429,585	Hagerty	Sept. 19, 1922
1,430,685	Sampson	Oct. 3, 1922
1,510,571	Ware	Oct. 7, 1924
1,623,544	Kushner	Apr. 5, 1927
1,716,262	Dishart	June 4, 1929
1,749,313	Burtchaell	Mar. 4, 1930
1,749,432	Kriege	Mar. 4, 1930
2,090,749	Corsi et al.	Aug. 24, 1937
2,093,130	Kurkjian	Sept. 14, 1937
2,093,730	Kurkjian	Sept. 21, 1937
2,096,961	Condon	Oct. 26, 1937
2,172,544	Panter	Sept. 12, 1939
2,223,179	Lougheed	Nov. 26, 1940

FOREIGN PATENTS

Number	Country	Date
44,914	Switzerland	Oct. 31, 1908