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W. F. WARE

NURSING NIPPLE

Filed Nov. 2, 1923

Fig. 1.

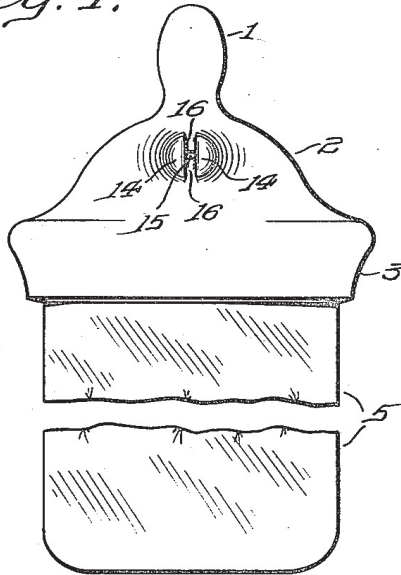


Fig. 2.

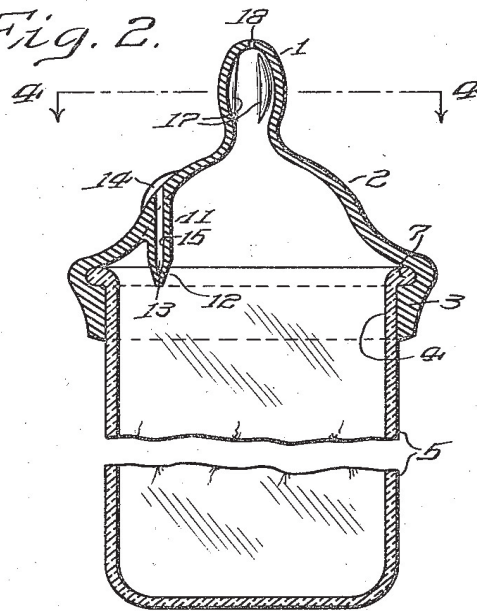


Fig. 3.

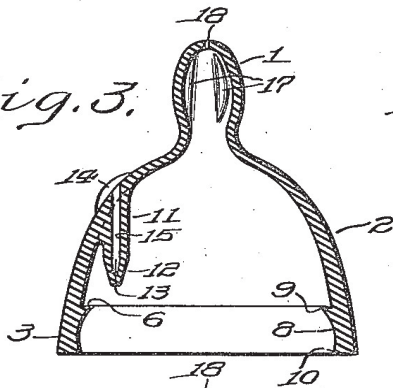


Fig. 4.

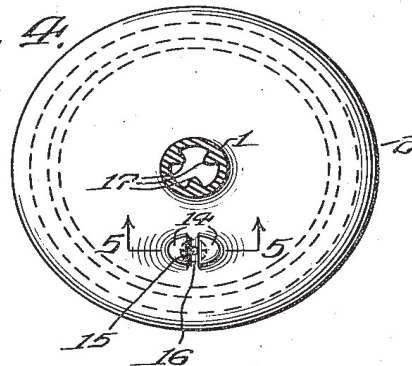


Fig. 7.

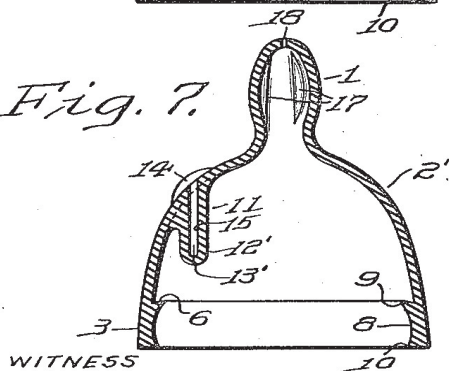


Fig. 5.

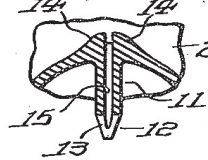
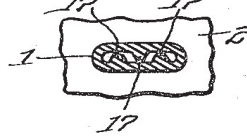


Fig. 6.



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UNITED STATES PATENT OFFICE.

WALTER F. WARE, OF HADDONFIELD, NEW JERSEY, ASSIGNOR TO THE WALTER F. WARE COMPANY, A CORPORATION OF NEW JERSEY.

NURSING NIPPLE.

Application filed November 2, 1923. Serial No. 672,237.

To all whom it may concern:

Be it known that I, WALTER F. WARE, a citizen of the United States, and a resident of Haddonfield, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Nursing Nipples, of which the following is a specification.

My invention relates to rubber nipples which are adapted to be detachably secured to the neck or mouth of a nursing bottle, and the objects of my invention are to provide a nipple which closely approximates the form and softness of a mother's breast; which will not collapse or be drawn, by outside air pressure, down into the mouth or neck of the bottle to which it may be attached; which will not leak; which cannot be removed from the bottle by the infant by pulling outwardly on the nipple away from the bottle, but which may be easily removed by the attendant when desired; which will permit the ingress of air into the bottle to replace the liquid contents removed in nursing; and in which the ingress of air cannot be interrupted or choked or stopped by the lips of the infant when using the same.

A further object of my invention is to provide a nipple with a band or rim or collar which is so shaped and which so fits over the end of the bottle or other receptacle to which it may be attached, that it tends to grip the bottle more firmly when the nipple is pulled axially away from the receptacle.

A further object of my invention is to provide a safe, noncollapsible, non-leakable, durable, easy nursing nipple for nursing bottles, which is very soft and pliable at the upper part of the breast portion, nearly approaching the softness of the mother's breast, and which at the same time will not collapse.

When the nipple as a whole is stretched over the mouth of the nursing bottle, the top part of the breast portion is substantially hemispherical and outwardly arched in longitudinal cross-section, thus being of a form which does not easily collapse, but the lower half of the breast portion is curved inwardly in longitudinal cross-section and is more easily collapsed or flexed inwardly if and when a partial vacuum is formed in the bottle. It is an object of my invention to stiffen the lower part of the

breast portion by increasing the thickness of the wall thereof so that it will resist any tendency to flex inwardly substantially as much as the arched top portion resists such tendency, thereby making both parts of the breast of substantially equal strength in this particular.

A further object of my invention is to stiffen the lower part of the wall of the breast portion of the nipple as it approaches the point of its attachment to the bottle to assist in preventing the nipple, as a whole, from collapsing if the inlet for air should become accidentally temporarily closed.

A further object of my invention is to provide the nipple with an air inlet valve which will offer a minimum amount of resistance to the admission of air to the bottle.

The valve should invariably open before the breast portion of the nipple collapses or yields inwardly. By making the most easily collapsed portion of the breast relatively thicker than the more or less spherical top of the breast portion, and by making the sides of the valve thin, tapering and flexible, the valve should invariably open before the walls of the breast portion start to flex inwardly or collapse. A further purpose or object then of my invention is to provide a construction in which the above features are incorporated for the purpose of making a device which, generally speaking, never collapses and is never drawn down into the mouth of the bottle.

A further object of my invention is to so construct and arrange the nipple proper that the side walls thereof cannot be compressed so closely together as to prevent or cut off the passage of the liquid food there-through.

Other objects of my invention will appear in the specification and claims below.

In the drawings forming a part of this specification and in which the same reference characters are used throughout the various views to designate the same parts,

Fig. 1 is a side elevational view of a nursing bottle with my improved nipple attached thereto.

Fig. 2 is a vertical section of the construction shown in Fig. 1.

Fig. 3 is a vertical sectional view of the nipple shown in Figs. 1 and 2 but detached from the bottle.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 2.

Fig. 5 is a section taken on the line 5—5 of Fig. 4.

Fig. 6 is a horizontal section taken on the line 4—4 of Fig. 2, when the nipple is flattened in the mouth of a nursing infant; and

Fig. 7 illustrates a modified construction in which the end of the air valve is not tapered and in which the walls of the breast portion are of uniform thickness. In other respects the construction is the same as that shown in the preceding figures.

My improved nursing nipple comprises, in general, three parts, namely, the nipple proper 1, the substantially heavy spherical breast portion 2 and the band 3, the latter being adapted to tightly clasp around the upper end or mouth or neck 4 of a nursing bottle or receptacle 5 when stretched thereover.

All the parts of this nipple are preferably made of the finest pure gum rubber to provide a soft texture or feel thereto, to provide a great resiliency, and for durability. The entire nipple is made of a single molded piece of resilient rubber.

The thickness of the wall of the breast portion preferably varies. The said wall is thinnest at the spherical top thereof below the nipple proper 1 to make it substantially as soft as a natural breast. This is possible because the arched or dome shaped top best resists the tendency to collapse when the air pressure in the bottle is reduced. As the wall curves downwardly approaching the cylindrical shape (see Fig. 3) and merging into the band portion 3, the wall is gradually thickened. This makes the approximately vertical wall of the breast portion stronger and less flexible than it would be if the wall were made of uniform thickness with the result that no part of the breast portion will readily flex inwardly or collapse before another part. All the parts of the breast portion are thus made of substantially the same strength in so far as the tendency to flex inwardly and to collapse are concerned.

The band 3 is made considerably thicker than the breast portion 2 and is of substantial width. The interior diameter of the band is substantially smaller than the diameter of the neck or mouth of the bottle to which it is adapted to be attached so that the band must be stretched over the mouth of the bottle to be applied thereto with the shoulder 6 thereof immediately under the bead or rim 7 around the mouth of the bottle. The inner surface 8 of the band 3 is preferably concave longitudinally (see Fig. 3), and when this relatively wide band 3 is stretched over and around the neck of the bottle this interior surface becomes flat, that

is to say, by reason of the resiliency and tension of the rubber the inner surface of the band 3 lies flat against the outer surface of the bottle throughout the entire interior surface thereof. By reason of this construction, the edges 9 and 10 of the band will tend to stick or remain in tight engagement with the outer walls of the bottle when an attempt is made to pull the nipple off the bottle and the lifting of the interior or middle portion of the band away from the bottle in an attempt to remove it from the bottle tends to produce a vacuum between the band and the bottle and between the bottle and the edges 9 and 10 of the band, which holds the nipple firmly to the bottle. The band tends to stick or cling to the bottle so tightly that it cannot be removed by the infant by pulling on the nipple proper 1 or by compressing the breast portion 2. The band 8 is relatively wide and therefore it cannot be readily rolled up or off or over the bead 7 at the mouth of the bottle.

Molded integrally with the breast portion 2 of the nipple is an air tube 11 extending preferably a short distance downwardly from the inner surface of the breast portion 2 and when first molded its lower tapering end 12 is closed. This closed end is then slit or cut in any suitable way longitudinally of the tube to provide a valve 13 which will permit air to be drawn there-through into the bottle on account of the partial vacuum which may be formed in the bottle by the removal of the contents thereof in nursing and which will prevent any air or liquid from passing outwardly past the valve and through the tube 12 even when the bottle is inverted and the tube is covered with liquid.

Often, when nursing, the infant does not confine himself to the nipple but bites on up to the breast. With the air tube 11 located near the nipple proper 1, the lips of the infant will often cover and tend to close the outer end of the air tube 11 and cut off the ingress of air into the bottle through the air tube 11 and valve 13 as the contents of the bottle become depleted. To prevent this, I provide a pair of spaced projections 14—14, having substantially upper spherical surfaces, on opposite sides respectively of the outer end of the bore or passage 15 through the air tube 11 as clearly shown in Figs. 1 to 5 inclusive. With this construction, that is to say, these projections on either side of the outer end of the passage through the tube 11, air cannot be cut off from the passage 15 even when the lips of the infant extend upwardly and over the outer end of the passage 15, because the spaced projections will provide, under such circumstances, a transverse passage or channel 16 from the outside between the projec-

tions to the hole or passage through the air tube 11.

The inner lower end of the bore 15 in the tube 11 is preferably tapered as is more clearly shown in Fig. 5. The bottom or inner end of the passage 15 through the air tube is also preferably tapered, thus making the walls of the tapering end of the tube slightly thinner than the wall of the cylindrical sides of the tubes. The purpose of this is to make the ends of the tube on either side of the cut or slit very flexible so that air will immediately open the valve and enter the bottle when the air pressure in the bottle is but slightly reduced and long before any degree of partial vacuum may be formed in the bottle tending to collapse the breast portion thereof. As above stated, the wall of the breast portion is preferably so thickened and proportioned that it would take a considerable partial vacuum in the bottle to cause it to flex inwardly.

The nipple proper 1 is preferably provided with a plurality of longitudinally extending ridges 17 projecting slightly inwardly from the inner surface of the nipple proper so that however hard an infant may bite or compress the nipple he cannot bring the interior surfaces thereof into such close proximity that there will be no passage for liquid through the nipple proper. The ridges 17 will keep the inner sides of a flattened nipple sufficiently separated to always provide a passage through the nipple through which the liquid may freely pass. I prefer to employ three of such ribs or ridges spaced equally apart, because when the nipple proper is flattened they will usually be disposed in the manner shown in Fig. 6, and will maintain a substantial passage through the nipple proper for the flow of the liquid contents of the bottle.

The vent 18 at the end of the nipple is small so that substantially no liquid will leak therethrough even when the bottle is placed upon its side and the level of the liquid is above the vent 18.

In Fig. 7 I have shown a modified construction wherein the wall 2' of the breast portion is of uniform thickness throughout up to the band portion 3 and in which the end or valve 13' of the air inlet tube 11 is not tapered but is spherical. This nipple is provided with the same band 3 as that embodied in the first described embodiment of my invention. The band 3 prevents the accidental detachment of the nipple from the bottle and the projections 14, 14 prevent the lips of the infant from closing the inlet 15 into the tube 11 and the consequent collapsing of the breast portion. The ribs 17 similarly prevent the absolute closure of the passage through the nipple proper 1.

The improved nipple above described is preferably adapted for use in connection

with a wide mouth nursing bottle shown in the accompanying drawing wherein there is no ridge or corner which cannot be readily reached for cleaning and in which food might accumulate. But with such wide mouth bottles the breast portion 2 of the nipple will not be drawn inwardly into the bottle by reason of the forming therein of any partial vacuum during the act of nursing, because the ingress of air into the bottle can never be cut off and because of thick walls. Air will flow in through the air tube 11 just as fast as the contents of the bottle are withdrawn and therefore there will be no tendency for the breast portion to be collapsed or drawn into the bottle.

Moreover, if a child should press upon the breast portion forcing the rubber nipple down into the mouth of the bottle, the instant that pressure is relieved the nipple will reassume its original shape because of the resiliency of the walls of the breast portion.

By reason of the relatively long or wide or heavy band 3 and by reason of the concavity of the inner surface thereof, the outer edge 10 of the band cannot be lifted up or rolled back over the bead when the breast portion 2 is tightly compressed. Any tendency of the edge 10 to lift tends to overcome the vacuum under the band between the edges 9 and 10 which vacuum holds the band to the bottle. This feature is of considerable importance in preventing the accidental removal of the nipple from the end of the bottle by the child in nursing.

But my invention is not to be construed as limited solely to use in connection with wide mouth nursing bottles. It may be made of a size to readily fit over a constricted neck or mouth of any type of nursing bottle and substantially all of the advantages of my improved construction may be availed of except perhaps the breast portion of the nipple will be considerably smaller than that shown in the accompanying drawings.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:

1. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion and a relatively wide substantially flat band portion slightly concave on its inner side and adapted to be stretched over and to clasp tightly around the neck or mouth of a bottle.

2. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion and a relatively wide substantially flat band portion slightly concave on its inner side and adapted to be stretched over and to clasp tightly around the neck or mouth of a bottle, said nipple being integrally molded of soft highly resilient rubber.

3. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion, and a relatively wide substantially flat band portion adapted to be stretched over and to clasp tightly around the neck or mouth of a bottle, the wall of said breast portion being of gradually increasing thickness as it approaches said band portion.

4. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion and a relatively wide substantially flat band portion, slightly concave on its inner side and adapted to be stretched over and to clasp tightly around and to lie flat against the neck or mouth of a bottle, the wall of said breast portion being of gradually increasing thickness as it approaches said band portion.

5. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion, a relatively wide substantially flat band portion adapted to stretch over and to clasp tightly around the neck or mouth of a bottle, and an air tube having walls thinner than the breast portion and extending inwardly from the inner surface of said breast portion and provided with a tapering inner end having a slit or cut longitudinally dividing the tip or end thereof into two like flexible flaps to provide a valve to open which requires less air pressure than is required to cause any substantial inward flexing of the walls of said breast portion, and means to prevent the lips of an infant from closing said air tube.

6. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion, a relatively wide substantially flat band portion adapted to be stretched over and to clasp tightly around the neck or mouth of a bottle, the wall of said breast portion being of gradually increasing thickness as it approaches said band portion, and an air tube extending inwardly from the inner surface of said breast portion and provided with a tapering end having a longitudinal slit or cut dividing the tip thereof into two like flexible flaps forming a valve, the parts of said tube on opposite sides of said cut or slit being thin and more flexible than the other parts of said tube and more flexible than the wall of said breast portion.

7. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion, a relatively wide substantially flat band portion slightly concave on its inner side and adapted to be stretched over and to clasp tightly around the neck or mouth of a bottle, and an air tube extending inwardly from the inner surface of said breast portion and provided with a valve to permit air to be drawn into

said bottle and to prevent the exit of air and other fluids outwardly therethrough.

8. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion, a relatively wide substantially flat band portion slightly concave on its inner side and adapted to be stretched over and to clasp tightly around the neck or mouth of the bottle, said breast portion being provided with a passage therethrough, and a valve in said passage arranged to permit air to be drawn therethrough into the bottle and to prevent the passage of fluids outwardly therethrough.

9. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion, a relatively wide substantially flat band portion slightly concave on its inner side and adapted to be stretched over and to clasp tightly around the neck or mouth of a bottle, said breast portion being provided with a passage therethrough, a valve in said passage arranged to permit air to be drawn therethrough into the bottle and to prevent the passage of fluids outwardly therethrough, and means on the outer side of said breast portion adjacent the outer end of said passage to prevent the lips of a nursing infant from closing the outer end of said passage.

10. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion, a relatively wide substantially flat band portion slightly concave on its inner side and adapted to be stretched over and to clasp tightly around the neck or mouth of a bottle, said breast portion being provided with a passage therethrough, a valve in said passage arranged to permit air to be drawn therethrough into the bottle and to prevent the passage of fluids outwardly therethrough, and a pair of projections on the outer side of said breast portion on opposite sides of the outer end of said passage providing a passage therebetween and having outer substantially spherical surfaces to prevent the lips of a nursing infant from closing the outer end of said passage.

11. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion and a relatively wide substantially flat band portion slightly concave on its inner surface and adapted to be stretched over and clasped tightly around the neck or mouth of a bottle, the interior surface of said nipple proper portion being provided with longitudinal corrugations or ridges to maintain a passage for liquid therethrough when the nipple proper is flattened in nursing.

12. A nipple for nursing bottles comprising a nipple proper portion, a substantially hemispherical breast portion, a relatively wide substantially flat band portion adapted

to be stretched over and clasp tightly around the neck or mouth of a bottle, said breast portion being provided with a passage therethrough, a valve therein to permit air to be drawn into said bottle and to prevent air or liquid from passing outwardly therethrough, and means on the outside of said breast portion and on opposite sides of the outer end of said passage for preventing the lips of an infant from closing the outer end of said passage, the interior of said nipple proper portion being provided with longitudinally extending corrugations or ridges to maintain a passage for liquids therethrough when said nipple proper is flattened in nursing.

In witness whereof, I have hereunto set my hand this first day of November, 1923.

WALTER F. WARE.