March 4, 1952 A. M. ALLEN 2,588,069

NURSING UNIT

Filed Dec. 27, 1948 2 SHEETS—SHEET 1

Fig. 2.

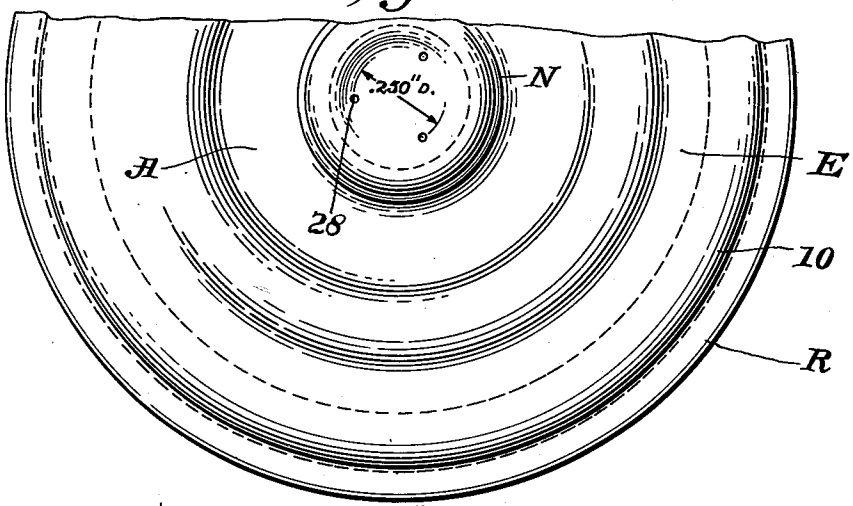

Fig. 1.

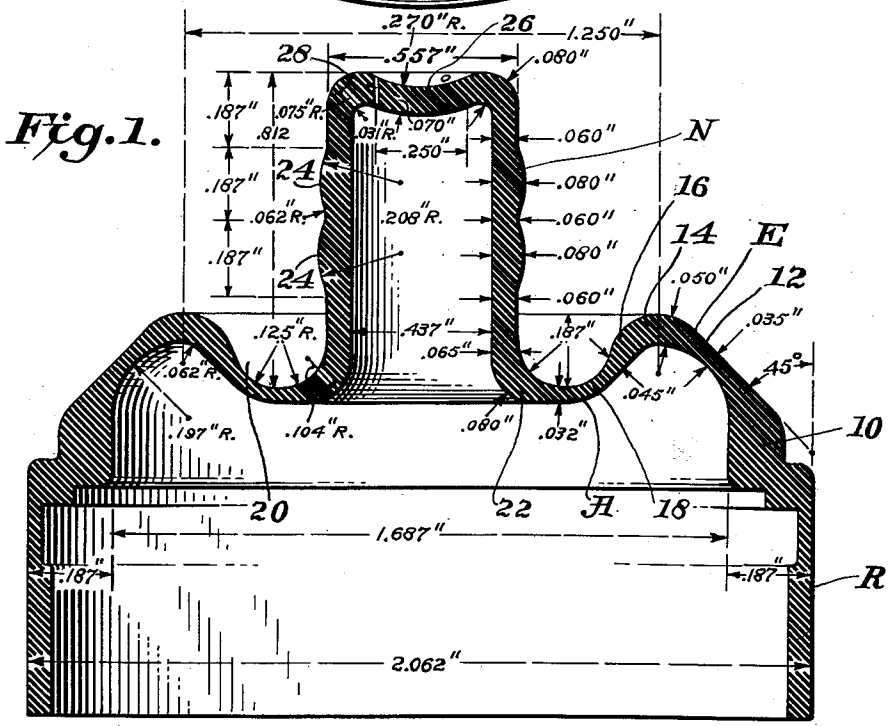

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Fig. 3.

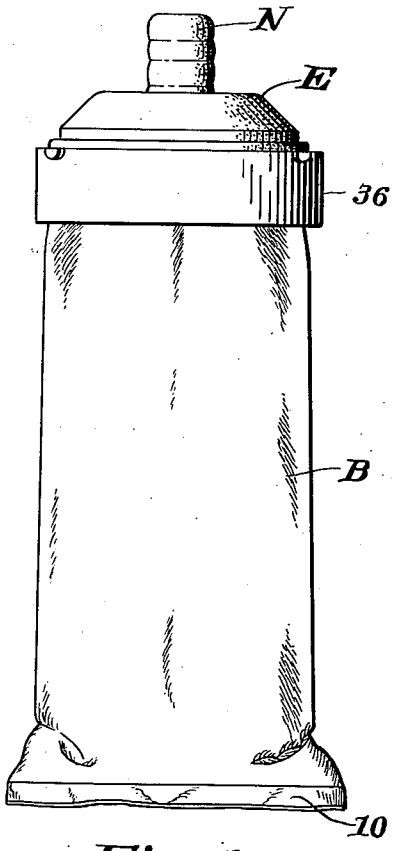


Fig. 4.

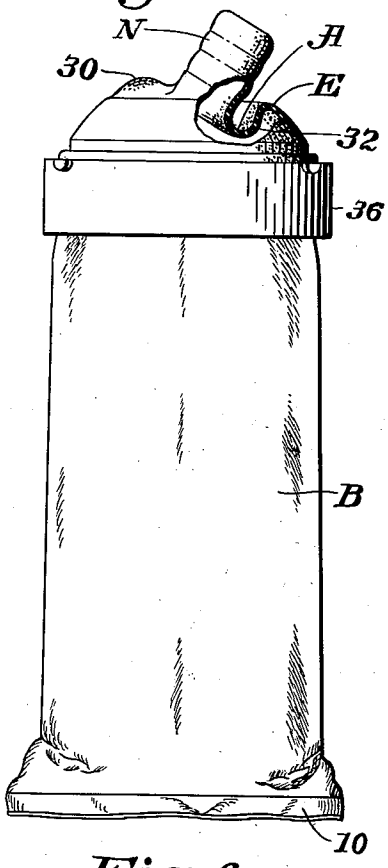


Fig. 5.

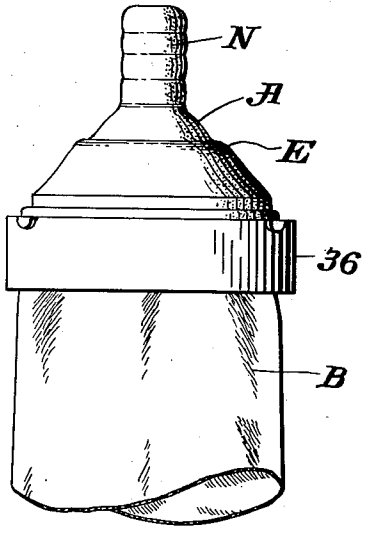
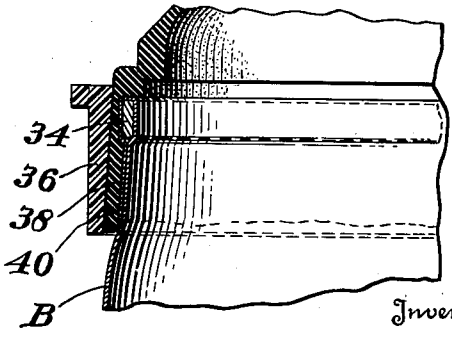


Fig. 6.



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UNITED STATES PATENT OFFICE

2,588,069

NURSING UNIT

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Application December 27, 1948, Serial No. 67,345

4 Claims. (Cl. 128—252)

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The present invention relates to a nursing unit having a nursing device of rubber or the like including a peripheral rim for attachment to a container, a central outwardly presented nipple of relatively thick section and semi-rigid nature, and an areola portion connecting said rim and said nipple and merging into the latter. The areola portion comprises a thin collapsible rubber membrane of such nature as to be substantially incapable in itself of normally supporting said nipple in distended position above the mouth of the container, whereby the relaxation of said areola portion normally permits said nipple to retract toward the mouth of the container, the membrane permitting the nursing baby to freely draw said nipple outwardly and to elongate said nipple depending on his size and strength.

The nursing device is further characterized by an areola portion immediately adjacent said nipple and where it merges therewith consisting of a thin collapsible rubber membrane of sufficient area when in its relaxed condition to form a plurality of folds between the nipple and the rim, including an outwardly bent fold at the base of the nipple and a surrounding reversely bent fold adjacent the rim. As stated, the membrane is of such nature as to be normally incapable of supporting the nipple in its distended position beyond said reversely bent fold, whereby the relaxation of the areola portion permits the nipple to collapse inwardly within the reversely bent fold. The membrane is of such nature as to permit a nursing baby to freely draw the nipple outwardly toward its distended position by unfolding the membrane material without necessarily stretching it in a direction parallel to its surface.

The invention also relates to an improved nursing device of the above type which is associated with a flexible, pliant, disposable container bag sealed to the rim of the nursing device, both of the opposed container and nursing device portions being of a flexible or collapsible nature, whereby the retractible action of the nursing device is facilitated by the action of the pliant container, in that the pliant container presents little or no resistance to the elongation of the nipple of the nursing device, as will be apparent as the specification progresses. In a nursing unit of the type described, the nipple of the nursing device may be flexed inwardly and outwardly to assist the baby during nursing by applying pressure by hand to the container bag, thus distending the nipple portion of the nursing device and forcing the formula through the openings therein, to accomplish forced feeding of the infant. It will also be apparent, as the specification progresses, that the nipple may be distended and thus presented to the infant for feeding, with facility, by applying hand pressure to the pliant container bag.

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The present application is an improvement in the nursing device and the associated container bag, as described and claimed in my copending application, Serial No. 672,474, filed May 27, 1946, which issued as Patent 2,517,457, August 1, 1950, and the objects and advantages of the present invention include those of the apparatus of my said copending application, with additional advantages as described herein.

The principal object of the invention is to provide a nursing device having a nipple which may be moved between distended and retracted positions, the design of the device being such that the nipple is constantly maintained in such position as to be freely available to the lips of the infant, even in its retracted position, to facilitate the commencement of the nursing operation.

A further object of the invention is to provide a nursing device designed to provide for the positive retraction of the nipple to its relaxed position in the absence of a force tending to distend the nipple, but with the nipple in convenient position to be engaged by the lips of the infant when in its relaxed position.

A further object of the invention is to provide a nursing device of such design that the nipple may be distended by application of hand pressure to the filled container bag, to present the nipple to the infant at the commencement of feeding, the design being such that the nipple tends to positively retract toward its relaxed position as the feeding progresses and as the infant intermittently relaxes his suction when swallowing, whereby the resulting nursing action closely approaches that of natural breast feeding, with all of the benefits to the infant which result therefrom. Such benefits include stimulation of the flow of saliva important to the digestive processes.

In the drawings, which are illustrative of an improved design of the nursing device and which show one manner in which the nursing device may be attached to a pliant container bag in assembling the nursing unit:

Figure 1 is an enlarged central vertical sectional view through the nursing device, indicating the various dimensions of a device which has been found to be satisfactory in use. Precise dimensions of the particular design are given in order to teach those skilled in the art how to construct such a device, but it will be understood

that there may be variations in the dimensions disclosed, while still retaining the benefits of the invention. It will be understood that the peripheral rim of the nursing device may be subject to wide variation in construction, depending on the type of container to which it is attached, and the manner of attachment, particularly with respect to the manner of attachment of the nursing device to the open end of a pliable container bag;

Figure 2 is a partial top plan view of the nursing device illustrated in Figure 1;

Figures 3, 4 and 5 are side elevational views of the assembled nursing unit comprising the nursing device and the pliable container bag, illustrating different positions of the nipple of the nursing device, from its collapsed or retracted position to its fully distended position, Figure 4 being partially in section in order to illustrate a manner of transition of the nipple between relaxed and distended positions;

Figure 6 is a partial vertical sectional view through the rim of the nursing device, showing one manner in which the latter is secured to the open end of a pliable container, in such manner as to form a seal therewith.

It will be understood that the container bag B (Figs. 3, 4 and 5) may be made of thin, pliant, retractible, preferably transparent, material, which is thin enough to have its shape altered by the presence of liquid therein, and to be retractible toward and into the collar of the nursing device or the rim thereof, as the infant withdraws formula from the container bag. Such a container bag and the manner in which the same functions is disclosed in my prior Patent 2,446,451, dated August 3, 1948. A type of material which is suitable for the container bag and the general construction thereof is as described in more detail in my copending application, Serial No. 771,329, filed August 29, 1947, which issued as Patent 2,508,481, May 23, 1950. The container bag has a lower end which is closed by a seam **10**, and its opposite end is open so that it may be secured to the collar of the nursing device or the rim thereof, as will be apparent from consideration of the aforesaid patent, and from the description which follows. It will be understood, however, that any effective means may be used to secure the open end of the container bag to the rim of the nursing device, either by making the rim of the nursing device of sufficient rigidity to provide for effective sealing attachment of the open end of the container bag or by providing a separate stiffening skirt or collar around which the open end of the bag may be wrapped, the nursing device being attached to this separate stiffening collar or skirt, as disclosed herein.

Referring to Figure 1, the nursing device has a rim portion R, a breast comprising a ridge portion E and an areola portion A, and a central nipple portion N.

The rim portion R is shown as a straight cylindrical flange, adapted, for instance, to surround any type of inner neck ring or skirt around which the open end of the container bag might be wrapped or folded, but it will be understood that the design of the rim may vary widely depending on the type of connection to the container bag which is being used.

It is desirable that the rim should have adequate thickness to secure a proper attachment to the container, and for this reason, the upper end of the rim may include an inwardly offset portion **10** which may be of somewhat thick section as compared with the rest of the nursing device. The annular ridge E is located closely adjacent to the rim and inwardly thereof and is positioned above said rim, or above the open end of the container. This ridge consists of an upwardly and inwardly tapered relatively thin portion **12**, and an outwardly convex portion **14** which is of relatively thick section, the portion **14** including a downwardly bent portion **16** which merges with the relatively thin membrane **18** of the areola portion. The areola portion is annular, being located between the ridge E and the nipple N, and it is outwardly concave, thus providing an annular well **20** around the nipple when the nursing device is in its relaxed condition as shown in Figure 1. The inner zone of the areola portion widens in section as it merges into the nipple as at **22**, and the nipple is of relatively thick section as shown, for instance, as compared with the areola portion **18**, so that the nipple is stable and remains erect in both the retracted position, as shown, and its distended position as hereinafter referred to.

The nipple is of considerable length as shown with respect to the depth of the well **20**, whereby the major portion of its length protrudes upwardly beyond the top of the ridge E even when the nipple is in its relaxed position, whereby the infant may always have available a substantial portion of the length of the nipple to grasp with his lips, at the commencement of and during the nursing action.

Two or more smooth annular protruding rings **24** may be provided on the exterior of the nipple to assist the infant in grasping same, and in retaining a hold on the nipple, whereby to facilitate easy nursing action. The end of the nipple staff may be made concave as at **26**, and several nursing openings **28** are provided extending through the end wall of the nipple staff.

It will be apparent from Figure 1 that the area of the areola portion of the nursing device is somewhat greater than the annular overlying area in any plane between the ridge E and the nipple N, whereby there is available a sufficient amount of material to permit an unfolding action of the areola portion outwardly and inwardly through the ridge portion E, depending on the pull which the infant applies to the nipple.

For instance, when an infant applies a pulling force to the nipple N, the areola portion A, which is not visible in Figure 3, will unfold outwardly, for instance, in the manner shown in Figure 4, passing through the ridge portion E until it is in the distended position shown in Figure 5. The nursing device is formed by a conventional molding operation in which it takes a set or assumes the condition as shown in Figure 1, having the capability and tendency to return to that molded or set condition when it is distorted therefrom. That is to say, in the case of rubber or the like, the nursing device is formed using the necessary heat and pressure to cure it to the stabilized condition of Figure 1, the molecular structure of the device as formed positively holding it in this condition until sufficient force is applied to distort it therefrom. When in the condition of Figure 1, the downwardly concave bend **18** of the areola portion tends to maintain itself, and tends to pull the nipple downwardly if it is moved upwardly from this position. Similarly, the outwardly convex ridge E, with its downward bend **16**, tends to retain the nipple in its downward or inward position. When the nipple is pulled outwardly, the

ridge E is straightened out, and that portion 16 of the ridge, as well as the portion 18 of the areola, are brought substantially to a position where they are in line with the more stable portion 12 of the nipple, i. e., the convexity of the ridge is eliminated, as well as the concavity of the areola. The ridge tends to assume its convex condition and the areola tends to assume its concave condition, and both of these forces act to positively bring the nipple back to its retracted position of Figure 1, when outwardly directed force is removed from the nipple. It will be understood that such outwardly directed force may be the pull applied to the nipple by the infant, as well as pressure exerted on the nipple from the interior of the unit by applying pressure to the filled container bag as previously mentioned.

Referring still to Figure 1, it will be noted that in the retracted condition, the nipple has much more than half of its length extending outwardly beyond the top of the ridge E. Thus, it can always be grasped with facility by the lips of the infant. It will also be noted that the lower end of the nipple, even in retracted position, is above the upper end of the rim R, so that it is at all times adequately presented to be so grasped.

When pressure is applied by hand to the filled container bag B, the resulting action constitutes moving the relatively large area of the areola through the relatively confined overlying annular area in a plane transverse to the axis of the nipple between the ridge E and the nipple. Because of this necessary movement of the area of the areola A through the ridge E, the nipple will tilt out of its usual vertical position in order that its base may pass through the opening through the ridge E. This action is illustrated in Figure 4 where the nipple N is tilted, there being a distortion 30 in the areola portion which has initially bulged beyond the rim E whereas there is a corresponding inner distortion or exaggerated concavity of the areola portion as at 32 which becomes straightened out when the nipple continues in its movement to assume the erect position shown in Figure 5.

While irregular folds are thus caused to be present in the areola portion when it moves through the condition of Figure 4, when it is distended in Figure 5, and when retracted as in Figure 1, the design and area of the areola portion is such that it is in smooth condition. Particularly, when the device is retracted as in Figure 1, the symmetrically designed areola portion is of such limited area as to hold the nipple in erect position extending beyond the ridge E, with no irregular folds in the material of the areola portion, there being, of course, the symmetrical folds 22 at the base of the nipple and at 16 where the areola portion turns convex to form the ridge E. By reason of the symmetrical molding of the ridge E and the areola A, directional stability is given to the nipple and it maintains itself in its axial direction both in the retracted and distended positions, although it is capable of being displaced as described in connection with Figure 4.

Precise dimensions of the various parts of the nipple have been indicated in Figure 1 in order to assist in the practice of the invention, it being understood that such a nursing unit as described is sensitive, and precise features of design and relative thicknesses are of importance. For example, it is desirable to regulate the thickness of

the nursing device in accordance with the thickness of the film container bag with which the nursing device is intended to be used, and the dimensions given in Figure 1 are suggested for use with a film container bag of thickness .002 inch. In general, if the film bag is made thinner, the nursing device should be thicker in its overall dimensions to prevent too rapid feeding. Of course, if both the nursing device and the container bag are too thin, the nipple might collapse in the sense of having the walls of the nipple collapse toward one another and fail to normally expand from one another during nursing. If the container bag is of relatively great thickness, the thickness of the nursing device should be correspondingly reduced in order to assist the baby in the nursing operation. While it will be understood that the nursing device disclosed herein may be used on rigid bottles such as glass bottles, it provides outstanding advantages when used on the film containers as disclosed herein.

The nursing device may be made of rubber or various of the well-known rubber or other compounds, such as referred to in my application, Serial No. 672,474. The length of the nipple is important as it should be long enough to be conveniently grasped by the child, but not so long as to cause choking of the child when in its distended position. The nursing device of the present application, as in my application, Serial No. 672,474, normally assumes a relaxed condition comparable to that of the mother's breast when the child is not nursing. It will yield to the movements, pull, or nursing action of the child depending on his vigor, whereby the device is useful for babies of varying ages. The nipple is capable of being elongated by the suction applied by the infant and by drawing additional material into the nipple proper from the areola portion of the device.

As in application 672,474, the container bag might be filled from the bottom, or filled from the top by the use of a suitable rack or support.

Furthermore, the manner of connection of the nursing device with the container bag may be of various constructions. In Figure 6, a commercial form of such attachment is shown wherein there is a relatively narrow collar for the container consisting of an inside neck ring or skirt 34 and a concentric outside retaining ring 36, the rim of the nipple, as at 38, constituting a circular gasket which forms a part of the collar and being disposed to seal against the outer surface of the open end of the container bag. As shown, the inner ring or skirt 34 is arranged to enter the open end of the container bag, said open end being bent outwardly over the skirt as indicated at 40, the outer ring 36 encircling the open end of the container bag and clamping the same in sealing relation against the inner ring 34.

As in the case of my Patent 2,446,451, the length of the collar comprising the inner and outer neck rings and the rim of the nipple, which in effect consists of a gasket, is relatively narrow with respect to the length of the container bag, whereby the unit can be rested on its side and the nipple tilted downwardly toward the infant's mouth.

I claim:

1. A nursing device of rubber or the like capable of being distended and retracted comprising a peripheral rim with means for attaching same to a container, a breast of relatively large diameter positioned to be exposed to the lips of the in-

fant and located within said rim and merging into a central nipple comprising a substantially cylindrical staff of relatively small diameter which is of sufficient rigidity when in distended and retracted positions to maintain itself presented axially upwardly from the center of said breast, said breast being molded to provide when in its retracted condition an outwardly convex annular ridge portion extending upwardly beyond said rim and adjacent thereto and a relatively thin inwardly concave annular areola portion merging with and between said ridge portion and said nipple, the material of said areola portion being of sufficient area within said ridge portion to permit an infant by pulling on the nipple to draw it outwardly through said ridge portion in an unfolding action, said areola portion being molded to positively return itself, in the absence of an outwardly directed force on the nipple, to its downwardly retracted position with the base of said nipple maintained within and below said ridge portion, said nipple being of such length and the material of said areola portion being of such limited area as to maintain a major portion of the length of said nipple above said ridge when said areola portion is in its downwardly retracted position.

2. A nursing device of rubber or the like capable of being distended and retracted comprising a peripheral rim for attachment to a container, a breast of relatively large diameter located within said rim merging into a central nipple comprising a substantially cylindrical staff of relatively small diameter which is of sufficient rigidity when in distended and retracted positions to maintain itself presented axially upwardly from the center of said breast, said breast being molded to provide when in its retracted condition an outwardly convex annular ridge portion extending upwardly beyond said rim and adjacent thereto and a relatively thin inwardly concave annular areola portion merging with and between said ridge portion and said nipple, the material of said areola portion being of area substantially greater than the overlying annular area between said nipple and said ridge portion in a plane transverse to the axis of said nipple whereby an infant may pull on the nipple and draw it outwardly through said ridge portion in an unfolding action tending to straighten out the convexity of said ridge portion, said ridge portion being molded to retain its convex formation whereby to positively return said areola portion, in the absence of an outwardly directed force on the nipple, to its downwardly retracted position with the base of said nipple maintained within and below said ridge portion, the material of said areola portion being of such limited area as to maintain the base of said nipple above said rim and the upper end of said nipple a sufficient distance above said ridge portion as to be easily grasped by the lips of the infant when said areola portion is in its downwardly retracted position.

3. A nursing device of rubber or the like capable of being distended and retracted comprising a peripheral rim for attachment to a container, a breast of relatively large diameter located within said rim merging into a central nipple comprising a substantially cylindrical staff of relatively small diameter which is of sufficient rigidity when in distended and retracted positions to maintain itself presented axially upwardly from the center of said breast, said breast being molded to provide when in its retracted condition an outwardly convex annular ridge portion extending upwardly beyond said rim and adjacent thereto and a relatively thin inwardly concave annular areola portion merging with and between said ridge portion and said nipple, the material of said areola portion being of area substantially greater than the overlying annular area between said nipple and said ridge portion in a plane transverse to the axis of said nipple whereby an infant may pull on the nipple and draw it outwardly through said ridge portion in an unfolding action tending to straighten out the convexity of said ridge portion, the material of said ridge portion being substantially thicker than that of said areola portion and being molded to return to its convex formation, in the absence of an outwardly directed force on said nipple, whereby to positively return said areola portion to its downwardly retracted position with the base of said nipple maintained within and below said ridge portion, the material of said areola portion being so formed and of such limited area as to assume an unwrinkled concave condition when in its downwardly retracted position while maintaining the upper end of said nipple a sufficient distance above said ridge portion as to be easily grasped by the lips of the infant.

4. A nursing unit comprising a container bag of thin film-like pliant material having a closed bottom end and an open top end and a nursing device of rubber or the like having a peripheral rim sealed to the open end of said container bag, said nursing device comprising a breast of relatively large diameter located within said rim merging into a central nipple capable of being distended and retracted when said bag is filled with liquid and upon application of pressure to said bag, said nipple comprising a substantially cylindrical staff of relatively small diameter which is of sufficient rigidity when in distended and retracted positions to maintain itself presented axially upwardly from the center of said breast, said breast being molded to provide, when in its retracted condition, an outwardly convex annular ridge portion adjacent to and within said rim and a relatively thin inwardly concave annular areola portion merging with and between said ridge portion and said nipple, the material of said areola portion being of sufficient area within said ridge portion to permit said areola portion to be forced outwardly through said ridge portion in an unfolding action upon application of pressure to the filled container bag, said areola portion being molded to positively return itself, upon removal of the pressure from the filled container bag, to its downwardly retracted position with the base of said nipple maintained within and below said ridge portion, said nipple being of such length and the material of said areola portion being of such limited area as to maintain a major portion of the length of said nipple above said ridge when said areola portion is in its downwardly retracted position.

ADDA M. ALLEN.

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