Dec. 18, 1956 D. J. BUDIANI 2,774,500

INFANT NURSING DEVICE

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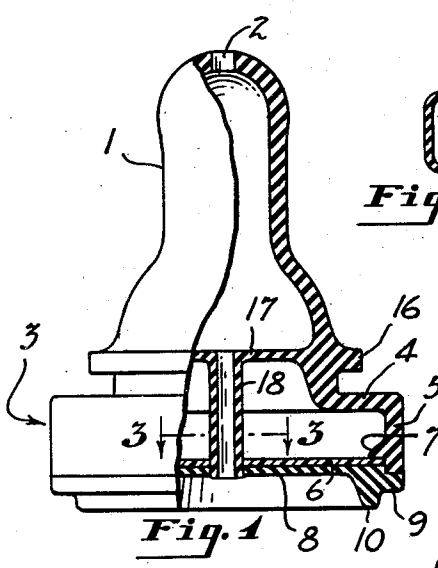


Fig. 1

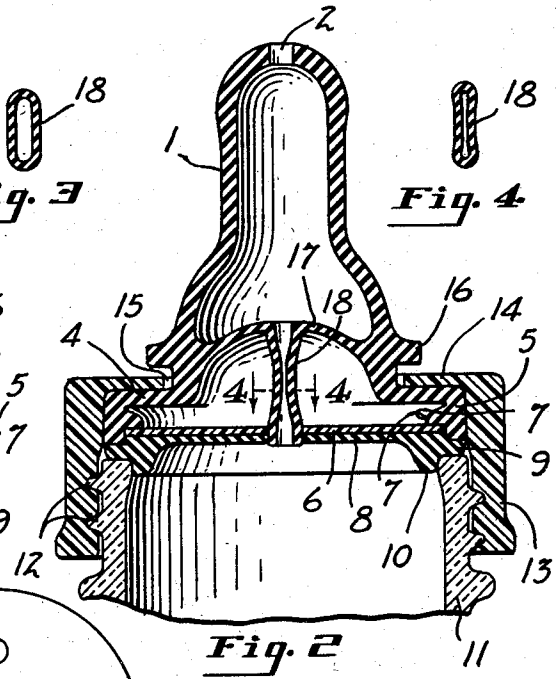


Fig. 2



Fig. 3



Fig. 4

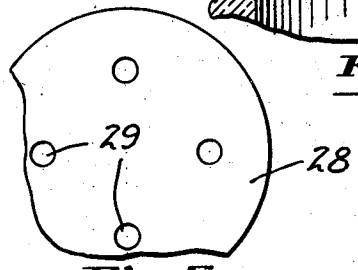


Fig. 6

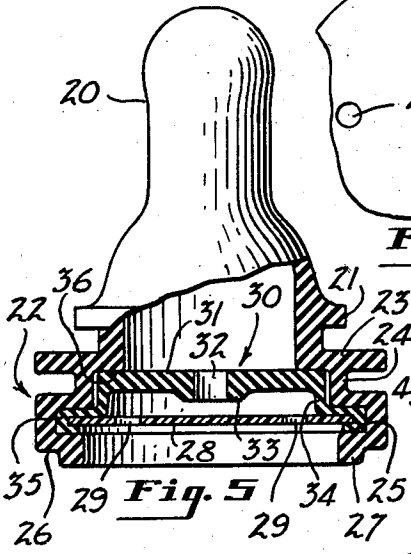


Fig. 5

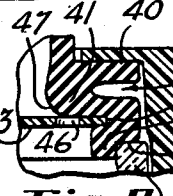


Fig. 9

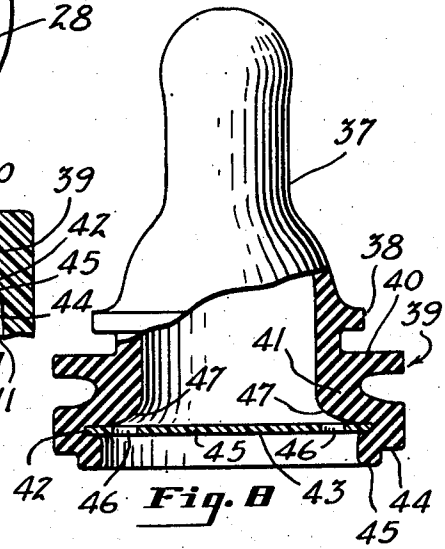


Fig. 8

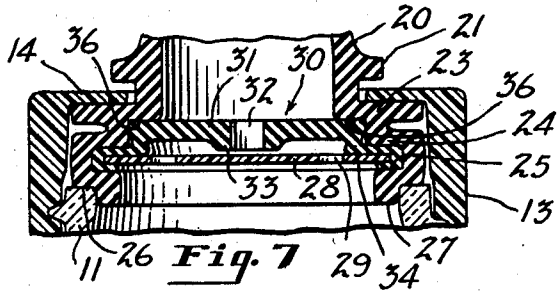


Fig. 7

INVENTOR
Deno J. Budiani

BY McCoy, Greene & DeGrotevelis
ATTORNEYS

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# INFANT NURSING DEVICE

Deno J. Budiani, Cleveland, Ohio

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10 Claims. (Cl. 215—11)

This invention relates to infant nursing devices and more particularly to a device in which means is provided for regulating the flow of liquid through the nipple.

In the device of the present invention the nipple is of the type provided with a base shoulder that is adapted to be clamped to the top of a bottle by means such as a clamping ring that has a screw threaded connection to the bottle top and that has a central opening in its top through which the teat portion of the nipple projects.

In the device of the present invention flow of liquid through the nipple is controlled by the pressure exerted by the nipple clamping means on the base shoulder of the nipple, which is collapsible under applied pressure and which controls a passage through which liquid flows from the bottle into the nipple.

The base portion of the nipple is formed to provide a bottom closure for the nipple and a passage for flow of liquid through the base into the teat portion of the nipple and means is provided for progressively restricting the liquid passage as the base shoulder is collapsed by clamping pressure, so that the desired flow of liquid may be obtained by tightening or loosening the nipple clamping means.

The base shoulder is provided with a top wall portion that is engaged by the clamping means and a tubular elastic and collapsible peripheral wall that is interposed between the top wall and the bottle top so that it is subjected to pressure tending to collapse it when the clamping means is tightened. Pressure applied to the top wall of the shoulder progressively collapses the tubular wall and means is provided for progressively restricting the liquid passage as the tubular wall is collapsed.

Flow of liquid through the base may be controlled by the pressure applied to the nipple base by the clamping means in various ways. The base portion may be so formed that the collapsible shoulder walls serve as confining walls of a closed air chamber in which the air pressure is increased by compression of the collapsible shoulder and the passage may have a flexible and elastic wall within the air chamber that is acted upon by the air pressure to progressively restrict the passage as the pressure of the air is increased. The collapsible shoulder may be operatively connected to a flow controlling valve or the collapsible tubular shoulder may itself form a part of a passage which is progressively restricted as the wall is collapsed.

Reference should be had to the accompanying drawings forming a part of this specification, in which:

Figure 1 shows a nipple embodying the invention, partly in elevation and partly in vertical section;



Fig. 2 is a vertical section showing the nipple clamped to a bottle and the tubular passage through the nipple base restricted by air pressure created by collapse of the nipple shoulder under pressure applied by the nipple clamp;

Fig. 3 is a section taken on the line indicated at 3—3 in Fig. 1;

Fig. 4 is a section taken on the line indicated at 4—4 in Fig. 2;

Fig. 5 shows a modified form of the nipple embodying the invention, the nipple being shown partly in side elevation and partly in vertical section;

Fig. 6 is a fragmentary top plan view of the closure disk;

Fig. 7 is a fragmentary sectional view showing the nipple in Fig. 5 clamped to a bottle and the liquid passage restricted by clamping pressure applied to the nipple shoulder;

Fig. 8 shows another modified form of nipple embodying the invention, the nipple being shown partly in side elevation and partly in vertical section; and

Fig. 9 is a fragmentary vertical section showing the nipple of Fig. 8 clamped to a bottle, the liquid passage being restricted by clamping pressure on the collapsible nipple shoulder.

As shown in Figs. 1 to 4 of the drawings, the nursing device of the present invention includes an elastic nipple of rubber or plastic, having a teat portion **1** provided with a tip aperture **2** and a base portion **3** which provides a shoulder of larger diameter than the tip portion of the nipple which may be clamped to the top of a bottle. The shoulder of the base portion **3** has a top wall **4** and a flexible and elastic tubular wall **5** that is adapted to be collapsed by pressure applied to the top wall **4**. A closure disk **6**, which may be formed of a relatively rigid plastic, is secured within the lower end of the tubular wall **5**.

The tubular wall **5** is provided with an internal shoulder **7** against which the closure disk **6** is positioned. The disk **6** may be secured to the top face of a rubber disk **8** that has a marginal projection **9** that underlies the bottom edge of the tubular wall **5** and that may be cemented thereto. The rubber disk **8** is provided with an annular rib **10** that is spaced inwardly from its periphery to provide a marginal shoulder for engagement with the top of a bottle **11**, the rib **10** being engageable with the interior of the bottle **11**.

In order to provide suitable means for clamping the nipple to the bottle, the bottle may be provided with an exterior screw thread **12** upon which an internally threaded clamping ring **13** may be screwed. The ring **13** has a flat top flange **14** for engagement with the top wall **4** of the nipple shoulder, the flange **14** surrounding a central opening **15** through which the teat portion **1** of the nipple extends. The nipple is provided with a short circumferential flange **16** spaced a short distance above the wall **4** for retaining the base of the nipple in the clamping ring **13**.

In order to provide the base of the nipple with a closed air chamber, an integral diaphragm **17** forms a second closure member above the disk **6** and a tube **18** connected centrally to the diaphragm **17** and disk **6** provides a passage for liquid through the base portion **3** of the nipple. The diaphragm **17** and tube **18** may be molded integrally with the body of the nipple and the lower end of the tube **18** may extend through a central opening in the disks **6**

and 8 and be secured to the disk 8 by a suitable cement.

As shown in Fig. 3, the tube 18 has a relatively thin wall which is flexible and elastic and the tube is transversely elongated in cross section so that air pressure created within the hollow base can collapse the tube, as shown in Figs. 2 and 4.

As shown in Fig. 2, clamping pressure applied by the flange 14 of the clamping ring and shoulder wall 5 forces the wall 5 downwardly toward the base 6, collapsing the tubular wall 5 and reducing the volume of the air chamber in the base portion 3. This increased air pressure collapses the transversely flattened tube 18 to restrict the passage through which liquid may pass from the bottle into the teat portion 1 of the nipple. By tightening or loosening the clamping ring 13, the desired flow of liquid may be obtained.

Nursing nipples tend to soften and become more flexible when used repeatedly and the openings through which the liquid is drawn tend to become enlarged. In the device of the present invention, however, the pressure applied by the clamping ring can be regulated to provide the desired flow even after the nipple has become softened by long use.

In Figs. 5 to 7 of the drawings a modified form of nipple is shown which has a teat portion 20 with a short retaining flange 21 above the enlarged base portion 22 which provides a collapsible shoulder which fits within the clamping ring 13. The base shoulder has a flat top wall 23 that is engaged by the under side of the flange 14 of the clamping ring and a collapsible tubular wall 24 that extends downwardly from the top wall 23 and that can be collapsed by pressure exerted by the clamping ring 13. The tubular wall 24 is provided with an internal groove 25 adjacent its lower end and is formed to provide a bottle top engaging portion 26 and an edge portion 27 that fits within the top portion of the bottle. The base closure is formed by a disk 28 having circumferentially spaced openings 29 and a valve member 30 which is a molded flexible and elastic cup-shaped member having a flat top wall 31 provided with a central opening 32 and a boss 33 surrounding the opening on the under side of the wall 31. The valve member 30 has a collapsible tubular wall 34 that has a flange portion 35 at its lower end that is formed to receive the periphery of the disk 28.

The tubular wall 24 of the collapsible base shoulder is of an internal diameter greater than the portion of the nipple which extends through the opening 15 of the clamping ring and the nipple is formed to provide a flat shoulder 36 that engages the top wall 31 of the valve member, so that when the tubular wall 24 is collapsed as shown in Fig. 7, the boss 33 is forced downwardly to a position closely overlying the top of the disc 28, so that the passage for liquid flowing from the openings 29 of the disk to the central opening 32 of the valve member is restricted by the boss 33. By adjusting the clamping ring 13, the valve member 30 may be adjusted with respect to the disk 28 to provide the desired flow of liquid to the nipple. The valve member 30 and the body portion of the nipple may be molded separately, the disk 28 is detachably secured in the valve member 30 and the valve member and disk are detachably secured in the groove 25 of the collapsible shoulder wall 24, so that the disk 28 and valve member 30 can be readily separated from the nipple and from each other for cleaning purposes.

In Figs. 8 and 9 of the drawings, another modified form of nipple is shown, which has a teat portion 37, a retaining flange 38 above an enlarged base portion 39 which provides a shoulder having a flat top wall 40 and collapsible tubular wall 41 that is provided with an internal groove 42 to receive and retain a flat disk 43. The lower end of the tubular wall 42 is formed to provide a shoulder 44 for engagement with the top of a bottle and an edge portion 45 for engagement with the interior of the bottle opening. The disk 43 is provided wih circumferentially spaced openings 46 near its margin and the tubular wall 41 has a curved inner face 47 which overlies the openings 46. The curved face portion 47 of the collapsible shoulder wall forms part of the liquid passage and when the tubular wall 41 is collapsed by pressure as shown in Fig. 9, the inner face portion 47 thereof is forced downwardly toward the disk 43 and serves to progressively restrict the liquid passage.

It is to be understood that in accordance with the provisions of the patent statues, variaions and modifications of the specific devices herein shown and described may be made without departing from the spirit of the invention.

What I claim is:

1. In an infant nursing device, the combination with a bottle having an externally threaded neck and an internally threaded clamping ring that screws on said neck and that has a top flange that overlies the top of the bottle and defines a central opening, of a nursing nipple having a hollow flexible apertured teat portion that projects through said opening and a base portion within said ring that forms a partition between the bottle and said teat portion and that includes a collapsible annular shoulder that underlies said flange and that is disposed between said flange and said bottle top, means providing a passage for liquid through said base portion to said teat portion, and means controlled by collapse of said shoulder by pressure applied thereto by said clamping ring for regulating the flow through said passage.

2. A nursing device as set forth in claim 1 in which the base portion of the nipple is hollow and forms a closed air chamber, in which the liquid passage through the base has a flexible elastic wall within said air chamber, and in which collapse of the nipple shoulder increases the air pressure in said chamber to collapse said flexible wall and restrict said passage.

3. A nursing device as set forth in claim 2 in which the passage through the base is in the form of a tube of transversely elongated cross section.

4. A nursing device as set forth in claim 1 in which the base portion of the nipple includes a disk connected at its periphery to the base shoulder, in which the liquid passage through the base includes an opening in said disk and in which the flow regulating means is a valve member operably connected to said shoulder and movable toward and away from said disk.

5. A nursing device as set forth in claim 4 in which the disk and the valve member are detachably connected to the base shoulder.

6. A nursing device as set forth in claim 1 in which the base portion of the nipple includes a disk detachably connected at its periphery to the collapsible shoulder portion of said base, in which the liquid passage through the base includes an opening in said disk adjacent its periphery and in which the collapsible shoulder portion includes an inwardly collapsible peripheral wall that is moved inwardly over and downwardly toward said opening to restrict the same when the cap is screwed downwardly.

7. A nursing nipple for use with a bottle having nipple clamping means comprising a hollow apertured flexible and elastic teat portion and a base portion forming a closure for the lower end of the nipple and a shoulder around the lower end of said teat portion, said shoulder having a top wall integral with said teat portion and a tubular wall extending downwardly from said top wall, said base including a relatively rigid disk spaced downwardly from said top wall and attached at its periphery to said tubular wall, said tubular wall being elastic flexible and collapsible under downwardly applied pressure to permit movement of said top wall toward said disk, means forming a passage for liquid through said base portion to said teat portion, and means controlled by collapse of said tubular shoulder wall for progressively restricting said passage as said tubular wall is collapsed by pressure.

8. A nursing nipple as set forth in claim 7 in which the base portion of the nipple has a closed air chamber with walls formed by the disk and the top wall and collapsible walls of said shoulder, in which the liquid passage through the base has a flexible elastic wall within said chamber and subjected to the air pressure within said chamber whereby said passage is restricted when air pressure in said chamber is increased by collapse of said tubular wall.

9. A nursing nipple as set forth in claim 7 in which



the liquid passage includes an opening in said disk and in which the means for restricting the liquid passage is a valve member movable with the top wall of the shoulder.

10. A nursing nipple as set forth in claim 7 in which the liquid passage includes an opening in the disk adjacent its periphery and in which the means for restricting the liquid passage is a portion of the tubular shoulder wall that is bowed inwardly over said opening.

No references cited.