Jan. 6, 1953 F. E. BOSTON 2,624,485

NURSER

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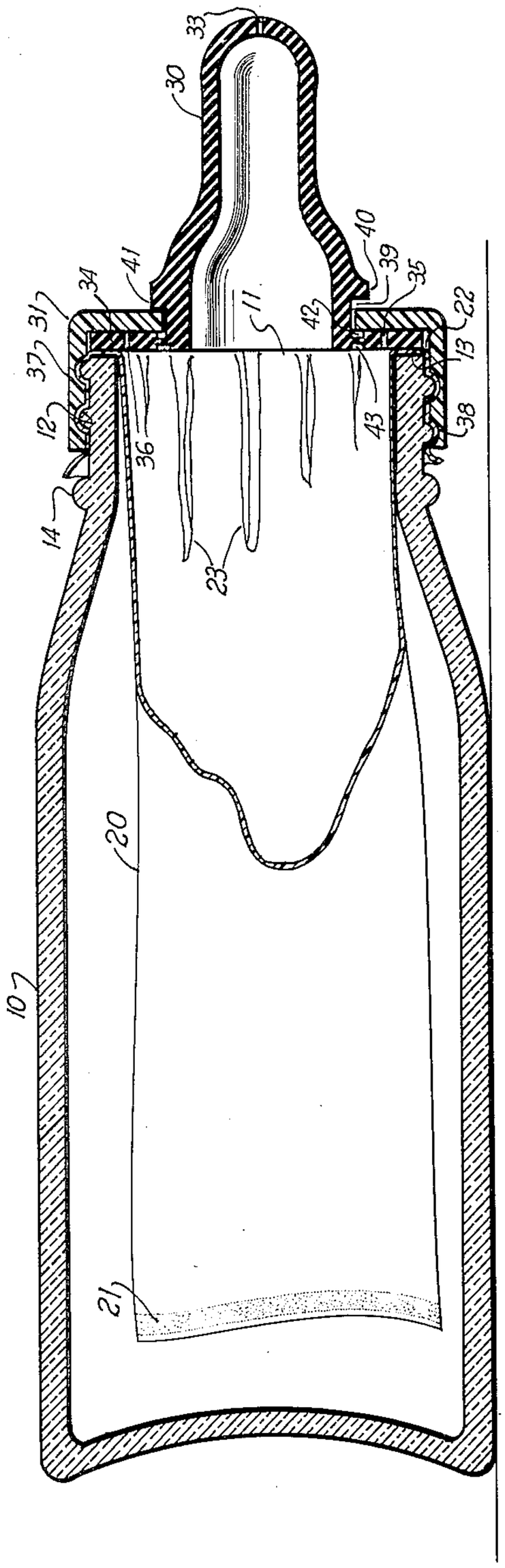

Fig. 1

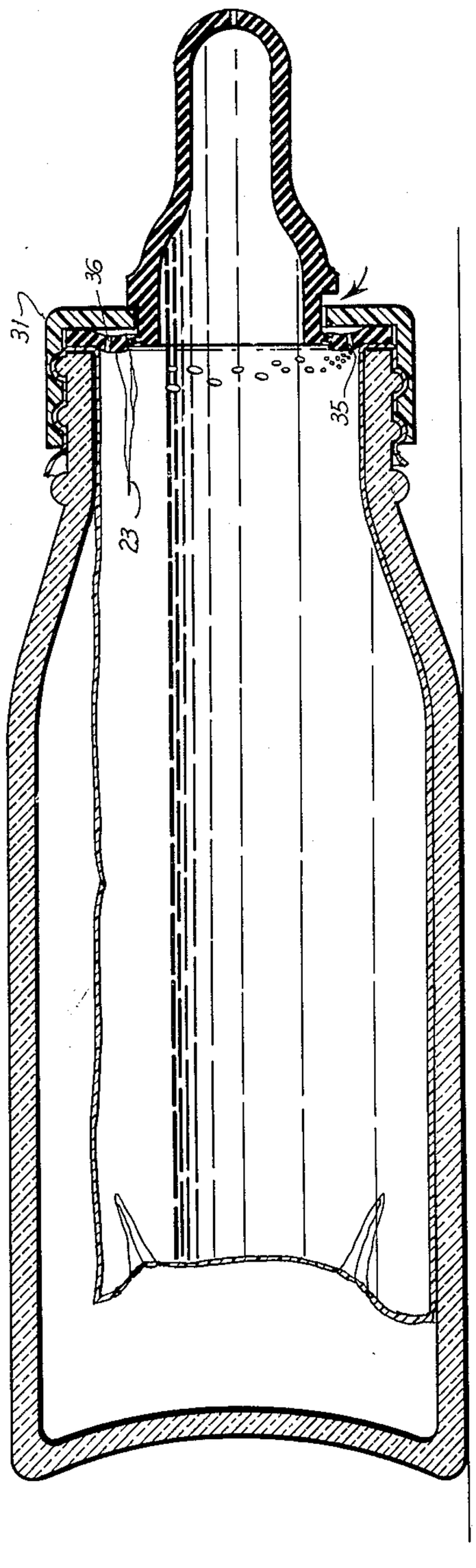

Fig. 2

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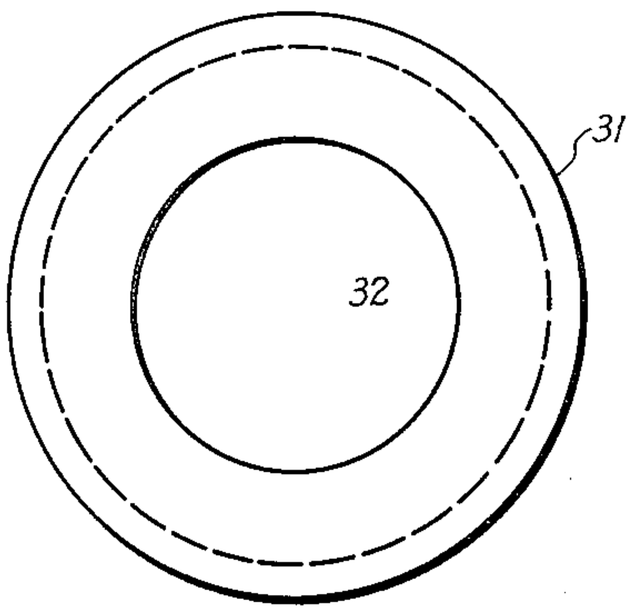

Fig. 7

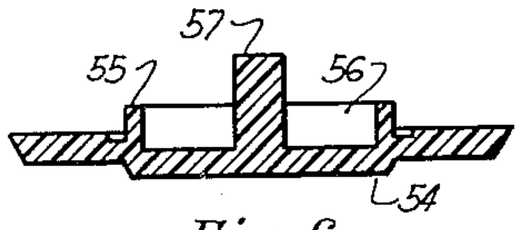

Fig. 6

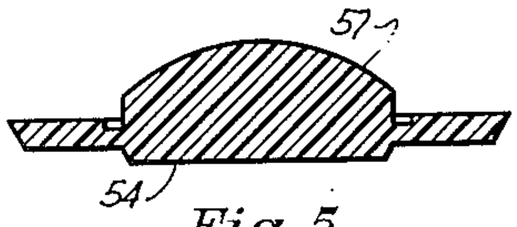

Fig. 5

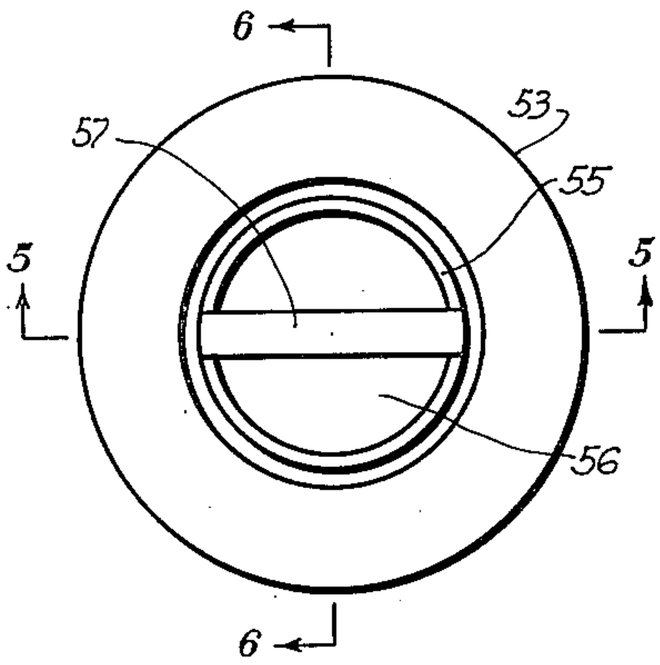

Fig. 4

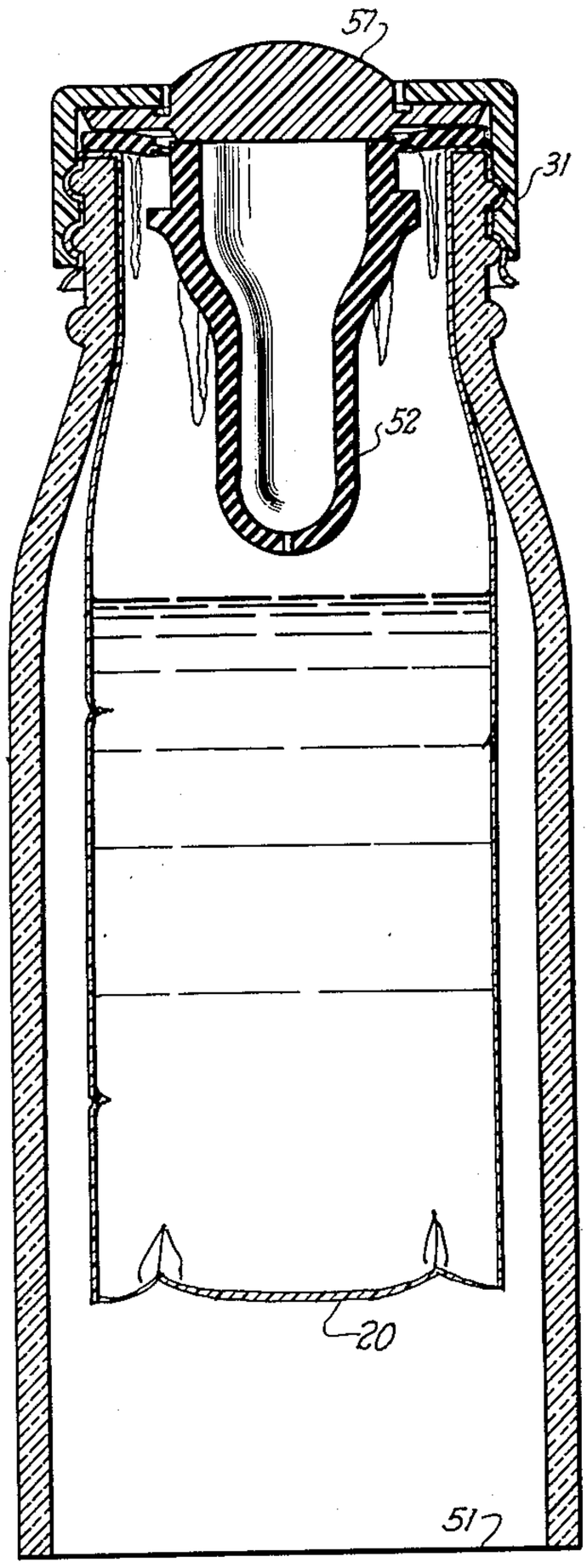

Fig. 3

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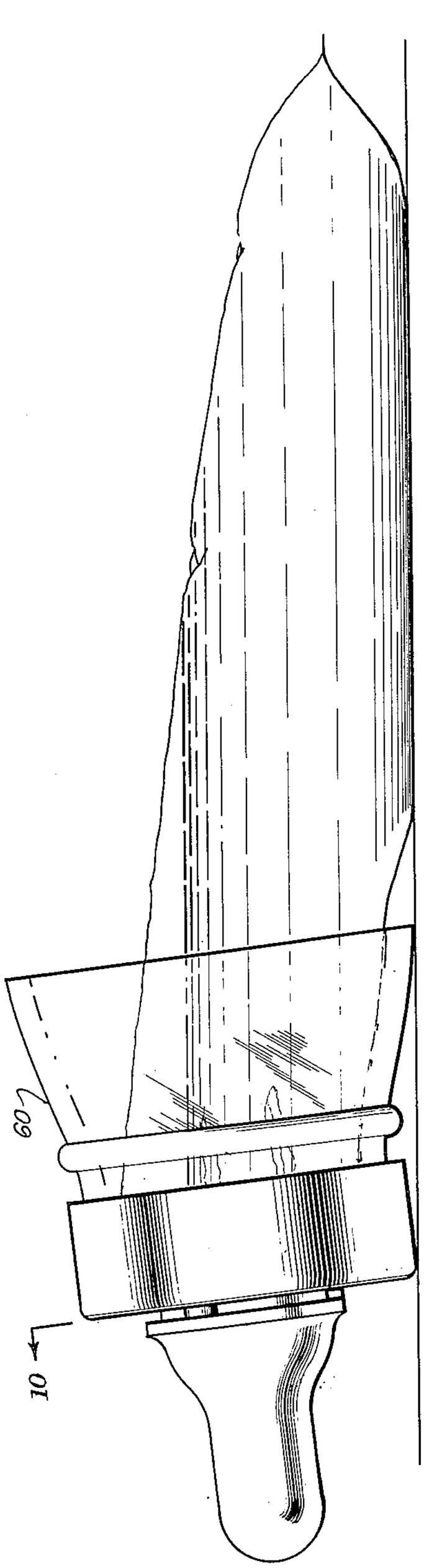

Fig. 8

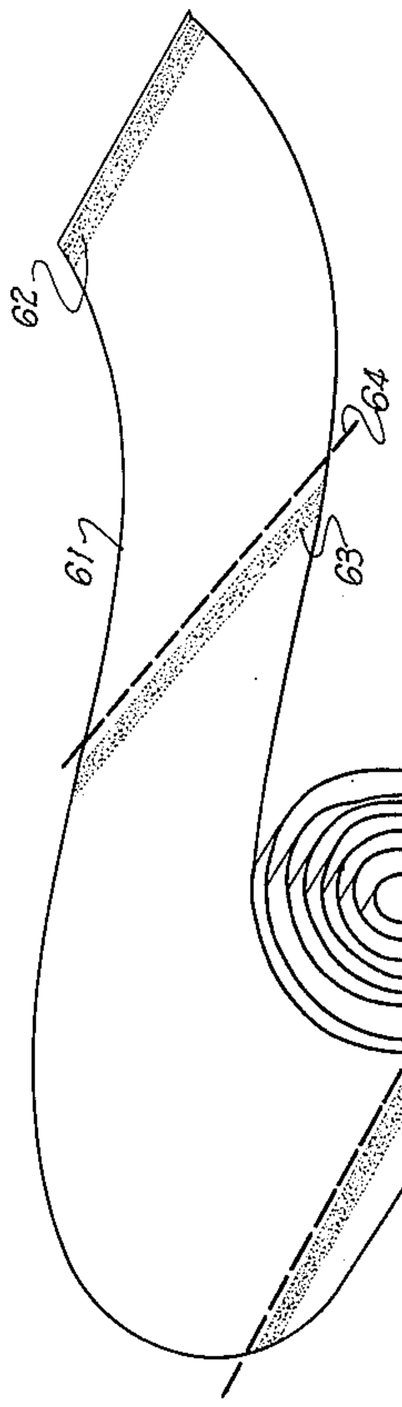

Fig. 9

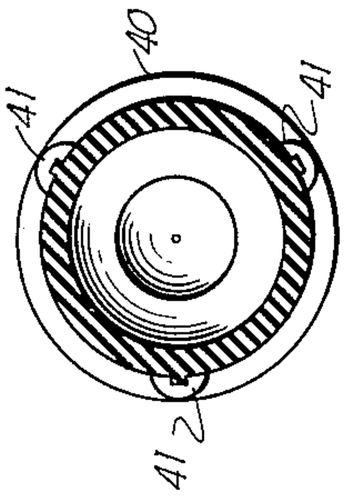

Fig. 10

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NURSER

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Application July 5, 1949, Serial No. 103,089

1 Claim. (Cl. 215—11)

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This invention pertains to infant feeding equipment and more particularly to a nurser for the liquid feeding of suckling babies.

It is the principal object of the invention to provide such a nurser which will approximate as closely as possible to natural feeding.

A further object of the invention is to provide a nurser which can be maintained clean, sterile, and sanitary with a minimum of effort.

Another object of the invention is to provide a nurser that will not leak either in storage, transport or use.

Still another object of the invention is to provide a nurser which will be rugged, strong, and durable.

A further object of the invention is to provide a nurser which is easy to assemble, readily stored, and conveniently used.

Other objects and advantages of the invention will appear from the following detailed description of a preferred embodiment of the invention, in which:

Figure 1 is a vertical section through the nurser showing it assembled ready for use, but without any liquid therein.

Figure 2 is a view similar to Figure 1 showing the nurser partially filled with liquid and illustrating the position of the nipple flange during air intake.

Figure 3 is a view similar to Figure 1 showing a modified form of nurser employing an open bottomed vessel or semi-container and a non-vented nipple and illustrating the assembly of the nurser for storage and transport.

Figures 4 and 7 are plan views of the seal disc and nipple retaining cap.

Figures 5 and 6 are sections through the seal disc on lines 6—6 and 5—5 of Figure 4.

Figure 8 is a side view of a further modified form of nurser according to the invention employing a threaded cuff instead of a container or semi-container.

Figure 9 is a side view of a roll of sterile bags used in the invention.

Figure 10 is a section through a nipple on the line 10—10 of Figure 8.

Referring now to Figure 1 there is shown a nurser comprising a rigid container or bottle 10 that is preferably made of a strong transparent heat and milk resistant material such as glass. The bottle is only slightly necked down at the top leaving a wide mouthed opening 11. The top of the bottle is circular in cross-section and is provided with a screw thread 12 on its outer surface. The top edge or lip 13 of the bottle is

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smooth and flat. Just beneath the thread 12 on the outside of the bottle there is an annular guard flange 14.

Within the bottle 10 is disposed a collapsible container or bag 20 that is preferably made of a milk and watertight strong, transparent, heat and milk resistant material such as a synthetic resin. The bottom edge of the bag is sealed at 21. The open top of the bag is turned back over the top of the bottle as shown at 22. The diameter of the bag when the bag is in circular shape is just great enough to fit snugly over the thread on the top of the bottle. If the material has a low modulus of elasticity, that is, in lay language it is fairly elastic, it may have an unstressed diameter a little less than that of the bottle top so that it can be stretched to fit over the thread and pull itself into close engagement with it. However, even with material having a low modulus the unstretched perimeter of the bag will usually be a little greater than the inner perimeter of the opening in the top of the bottle so that there will be a few axial wrinkles in the bag on the inside as shown at 23. Preferably, however, there should be no such wrinkles on the outside, the bag conforming closely to the bottle.

The top of the nurser is provided with a nipple 30 held in place by a screw cap 31. The screw cap, also shown in Figure 7, has a circular hole 32 in its top through which protrudes the end of the nipple. The tip end of the nipple is perforated at 33. The base of the nipple is provided with a flange 34 adapted to rest on the mouth of the bottle on top of the turned back top of the bag. Radially inward a short distance from the inner edge of the bag and bottle top are one or more air vents 35, 36. As shown in Figure 1, the vents are normally closed at their tops by the cap 31.

The cap 31 has a downturned annular flange 37 having an internal thread 38 which engages the thread on the bottle top to hold the cap in place. When the cap is screwed all the way on it makes a water and milk and airtight seal with the bottle top and the edge of the nipple, the rubber nipple and the plastic bag serving as gaskets. The bottom edge of the cap is near the guard flange 14 so that the edge of the bag extending beyond the cap is protected against tearing. The cap 31 extends radially into an annular groove 39 in the nipple near the base, the groove forming an overhanging shoulder 40 which prevents the nipple from being pushed inside out into the bottle and bag. A plurality of lugs such as that shown at 41 (see, also, Figure

10) projecting downwardly from the under side of the shoulder keep the shoulder spaced from the top of the cap leaving passages for air to enter under the shoulder.

In Figure 2 the nurser is shown with the bag containing liquid. The weight of the liquid causes the bottom of the bag to assume the shape shown. The nipple shown in Figure 2 is in the position it assumes when a partial vacuum has been created in the nurser due to removal of liquid therefrom. The outside air pressure causes the nipple flange to stretch inwardly slightly at the point just below the cap. The inward motion is facilitated by the reduction of thickness of the flange immediately adjacent the body of the nipple as shown by the annular grooves **42**, **43**. The flexure of the flange uncovers the vents **35** and **36**. This admits air to the nurser along the path indicated by the arrow starting in under the shoulder, then around the inner edge of the cap, and finally through the vents. As shown by the bubbles, all or some of the air also travels through the liquid in the bottle depending on the angle at which the bottle is placed. As soon as enough air has been admitted to equalize the inner and outer pressures the nipple flange returns to its initial position and the cap seals the vents to prevent leakage of the liquid in the bag.

Referring now to Figure 3 there is shown a modified form of nurser. The bottle **50** is generally the same as bottle **10** except the bottom thereof is open as shown at **51**. The nipple **52** is the same as nipple **30** except that it has no vents in the flange thereof. Due to the fact that the bag **20** is flexible it will partially collapse as the contents thereof are withdrawn, the open bottom **51** of the bottle maintaining the interior of the bottle at atmospheric pressure. Therefore with this construction there is no need for vents in the nipple. As fast as the fluid is withdrawn from the bag the bag collapses under the external pressure preventing any partial vacuum from being built up therein.

In Figure 3 the nurser is shown assembled in position for transport or storage. The nurser of Figures 1 and 2 will be assembled in the same way for storage and transport and the nurser of Figure 3 will be assembled as shown in Figures 1 and 2 for use.

In Figure 3 the nipple **52** is inverted, the perforated tip thereof extending into the bottle. A seal disc **53**, also shown in Figures 4, 5 and 6, is placed on top of the nipple beneath the cap **31**. The disc has a cylindrical extension **54** extending therebeneath which bears against the inner edge of the nipple flange and prevents the leakage of fluid from the nurser that might otherwise occur. The annular grooves **42** and **43** in the nipple flange facilitate the creation of a slight pressure against the bottom of the seal disc due to the downward stretching of the nipple without pulling the nipple flange out from between the disc and the lip of the bottle.

As best shown in Figures 4, 5, and 6, the seal disc is provided with an annular rib **55** rising from the top thereof. This rib fits inside of and closely adjacent the walls of the opening **32** in the cap so as to center the disc. Inside the rib there is a slight depression **56** in the top of the disc into the cylindrical extension **54** on the bottom. Across this depression extends a finger tab **57** with which the disc may be handled. When it is desired to use the nurser the cap is unscrewed and held in one hand upside down. Then the disc and nipple are lifted together with the fingers placed at the outer edge of the disc and

nipple flange and dropped into the cap so that the tip of the nipple extends through the opening **32** therein. This leaves the disc in the cap on top of the flange. By grasping the tab **57** the disc can be used to push the shoulder **40** of the nipple through the cap until it expands again after passing through and the nipple is locked in the cap. The fact that the groove **39** is wider than the thickness of the cap **30** by the height of the bags **41** not only leaves an air space thereunder, which is important for the operation of the Figure 1 embodiment of the invention, but also facilitates the passage of the shoulder through the opening since the shoulder can flex more easily between the lugs. After the nipple has been locked in the cap the cap can be screwed back on to the bottle and the nurser is ready for use.

In Figure 8 there is shown a further modification of the invention. The nurser of Figure 8 is in all respects similar to that of Figure 3 except that in place of the bottomless semi-container of Figure 3 there is provided merely a threaded cuff **60** for connecting the plastic bag to the nipple. A somewhat heavier weight of plastic bag may be used in this modification since there is no bottle to support the bag while in storage or protect it while in use. The threaded cuff, however, does keep the end of the bag from being torn and the nipple from being pulled off the bag, the same as in the other forms of the invention, and occupies less space.

Figure 9 shows a roll of flattened plastic tubing **61** having equally spaced seal areas **62**, **63** thereacross. When a new bag is needed for a nurser the roll is cut close to the seal next to the one nearest the end thereof, for example along the line **64** in the drawing. This provides a plastic bag closed at one end, by the seal **62** in the example given. The next seal **63** keeps the remainder of the roll closed and hence clean and ready for use. After each use of the nurser the empty plastic bag is discarded and a new sterile bag cut from the roll. In this way it is unnecessary to wash and sterilize the bottle itself after each use. The bottle or semi-container or threaded cuff, however, provides a strong leakproof means for readily securing the bag to the nipple and protecting it in use and storage.

While a preferred embodiment of the invention and the two modifications thereof have been shown and described, it is obvious that many other modifications can be made by one skilled in the art. It is intended to protect by Letters Patent all forms of the invention falling within the scope of the following claim.

I claim:

A nurser comprising a liquid container made of a thin tube of uniform thickness throughout and made of flexible material of relatively inextensible as distinguished from rubberlike quality having a uniform peripheral length at transverse sections thereof and closed at one end and open at the other, an annular member having a helical thread formed on its outer periphery at the top end thereof, said container passing through said member with the open end of the tube folded back over the top and threaded exterior of said member, said member being untapered on its external surface from the bottom of the screw threaded part thereof all the way to the top of the member, said peripheral length of transverse sections of said container when unstressed being greater than the inner circumference of the top end of said member and substantially the same as the outer cir-

cumference of the threaded part of said member, a nipple having a flange resting upon the open end of the tube where it passes over the top of said member; and a cap comprising a disc having a central opening and depending skirt spaced outwardly from said opening, said skirt having an internal helical thread of slightly greater diameter than correlative parts of the thread on said member to provide a slight clearance therebetween sufficient to accommodate said tube, said cap being screwed onto said member over said tube and the flange of said nipple clamping the flange between the tube and the cap in sealing engagement, the thread of said cap meshing with that of said member through said tube to secure and seal said tube to said member.

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