July 25, 1933. A. J. STOCK, JR 1,919,537

NURSERY NIPPLE

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Fig. 1

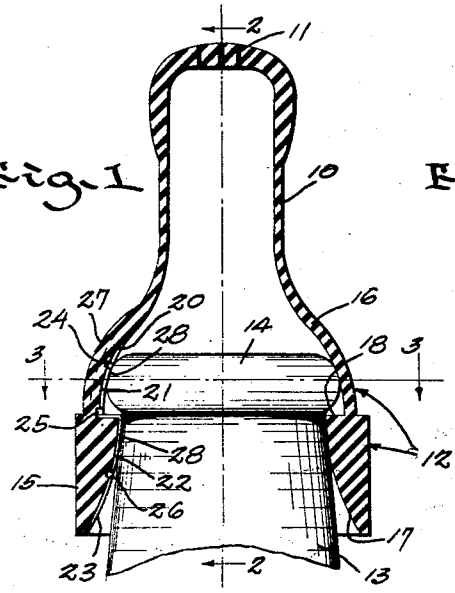


Fig. 2

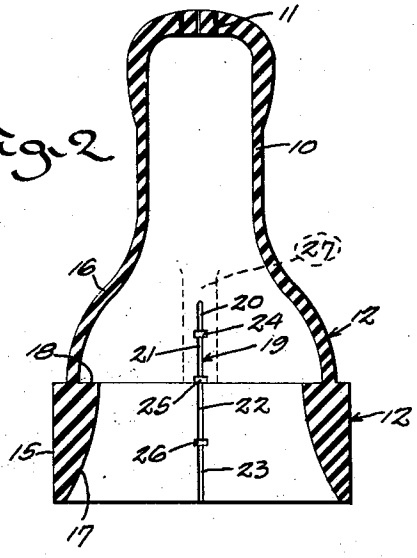


Fig. 3

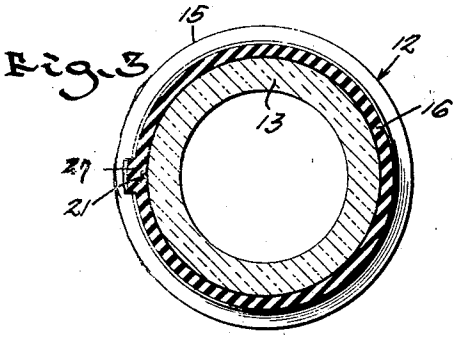


Fig. 5

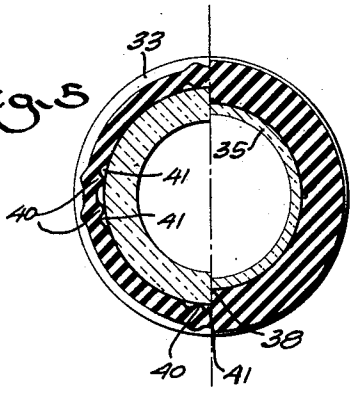
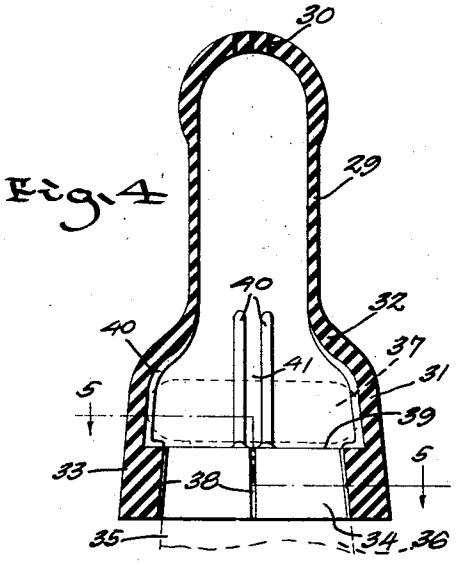


Fig. 4



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Fig. 6

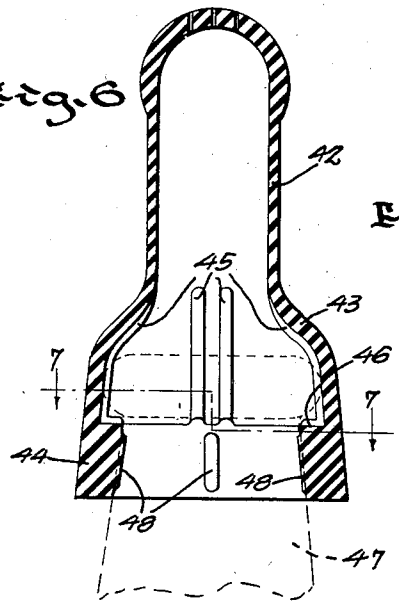


Fig. 7

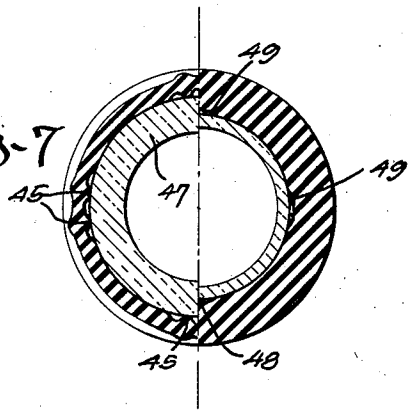


Fig. 8

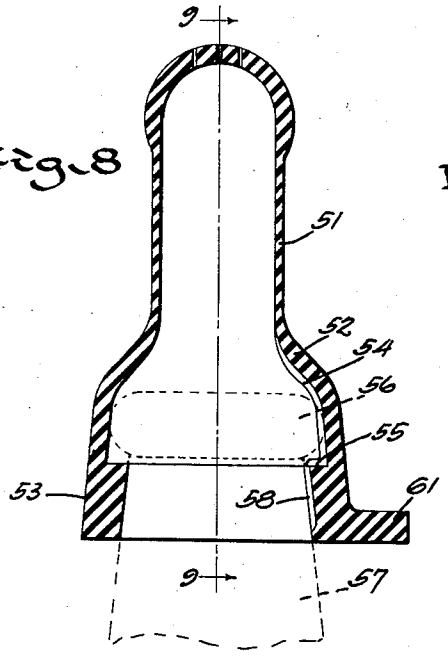
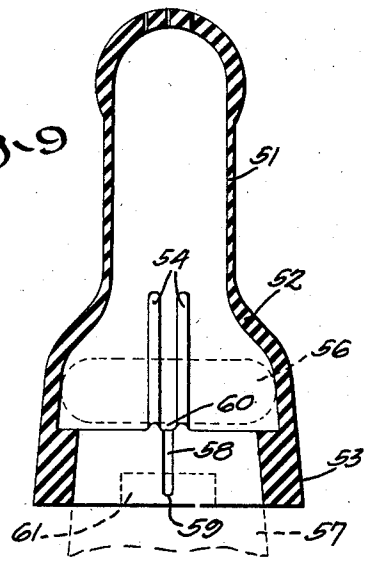


Fig. 9



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UNITED STATES PATENT OFFICE

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NURSERY NIPPLE

Application filed June 14, 1930. Serial No. 461,127.

This invention relates to nursery nipples and the like, and has for its principal object the provision of a new and improved device of this type.

Heretofore it has been necessary to remove the nipple from the infant's mouth at intervals in order to allow air to enter into the bottle to compensate for the amount of liquid removed; otherwise reduction of pressure within the bottle causes the nipple to collapse and shut off the supply of liquid. In my invention I furnish valve means embodying the principles of capillarity, which admits air to the interior of the nipple and thence to the bottle, but which prevents the liquid escaping from the bottle except through the regular discharge openings.

In the drawings accompanying this specification and forming a part of this application I have shown, for purposes of illustration, one form which my invention may assume, and in these drawings:

Figure 1 is a vertical sectional view of an embodiment of the invention,

Figure 2 is a vertical sectional view corresponding to the line 2—2 of Figure 1,

Figure 3 is a horizontal sectional view corresponding to the line 3—3 of Figure 1,

Figure 4 is a vertical sectional view of another embodiment,

Figure 5 is a composite horizontal sectional view corresponding to the line 5—5 of Figure 4,

Figure 6 is a vertical sectional view of another embodiment,

Figure 7 is a composite horizontal sectional view corresponding to the line 7—7 of Figure 6,

Figure 8 is a vertical sectional view of another embodiment, while

Figure 9 is a vertical sectional view corresponding to the line 9—9 of Figure 8.

Referring first to Figures 1 to 3 a nipple, as of rubber, is shown, comprising a hollow body section 10 forming the nipple proper, provided with discharge openings 11 in its end, and having a bottle engaging portion indicated generally at 12, adapted to be engaged with the upper end of a bottle, a fragment of which is indicated at 13, the bottle having a bead 14. The body engaging portion 12 comprises an annular section 15 and a tapered section 16, the interior surface of the annular section 15 flaring outwardly as indicated at 17, and an interior annular shoulder 18 provided intermediate the annular section 15 and tapered section 16.

As thus described the flared surface 17 of the annular section 15 at least partially engages the neck wall of the bottle 13 with the shoulder 18 beneath the bead 14 of the bottle, and the tapered section 16 extending upwardly in engagement with the bead 14.

The nipple is provided with valve means for admitting air to the nipple, while preventing escape of liquid from the bottle. These valve means, indicated broadly by the reference character 19, are preferably disposed longitudinally along the inner surface of the nipple, and comprise a plurality of grooves arranged in alignment, including sections 20, 21, 22, and 23, separated by recesses 24, 25, and 26, the outer surface of the nipple along these grooves being reenforced as indicated at 27.

These valve means are so disposed that when the nipple is in engagement with the bottle, one or more of the grooves 20, 21, 22, cooperate with the adjacent surface of the bottle, as at 28, to define capillary channels capable of admitting air to the nipple, and thus to the bottle, while preventing escape of liquid therethrough, this latter function resulting from the well known action of capillarity, wherein the surface tension of the liquid in traversing a small tube resists the tendency of the liquid to flow from the tube.

In effect each of the grooves 20, 21, 22, and 23, whenever contact is effected with the surfaces of the bottle, provides a separate capillary tube, since the recesses 24, 25, and 26 interrupt the continuity of the groove, and provide a plurality of capillary channels, at intervals, in series, which communicate with the interior of the nipple and the exterior atmosphere.

Referring to Figures 4 and 5, a nipple is provided having a hollow body portion 29, outlet openings 30, bottle engaging portion 31, curved section 32, and annular section 33.

The annular section 33 is formed differently from the annular section 15 heretofore described, comprising an interior annular surface 34 adapted to engage the neck portion 35 of the bottle 36, the latter having the usual bead 37. The annular surface 34 of the annular section 33 is provided with capillary valve means in the form of a plurality of grooves, forming with the adjacent surface of the bottle, channels 38 which extend from a point at the lower end of the nipple upwardly, and terminate at the interior annular shoulder 39, which engages the under surface of the bead 37 of the bottle. Above each groove is a pair of ribs 40, these ribs serving as spacing means with reference to the head 37 of the bottle and providing relatively large passages 41 which communicate with the channels 38, these ribs not being intended to provide valve means, but merely a medium of communication between the channels 38 and the interior of the nipple.

In operation while liquid from within the bottle can more or less freely traverse the channels 41 nevertheless when it enters the channels 38, these channels acting as capillary tubes prevent escape of liquid from the bottle.

Referring to Figures 6 and 7, a nipple is provided having a hollow body portion 42, tapered section 43, annular section 44, ribs 45, and interior annular shoulder 46, adapted to engage a bottle 47, all as described in connection with Figures 4 and 5; however, instead of providing the grooves which define the channels 38 as shown in Figure 4, ribs 48 are arranged at intervals about the interior periphery of the annular section 44, and each of said ribs engages the adjacent surface of the bottle, providing small capillary channels 49 which communicate with the outside atmosphere. These ribs 48 may or may not extend all the way to the ends of the annular section 44; as shown, they terminate short of the ends of the annular section 44, but the capillary channels are not sealed, as the portions of the annular section beyond the ribs 48 are held spaced by the ribs 48, from engagement with the bottle surface a sufficient distance to produce the required function of the construction.

Referring to Figures 8 and 9 the nipple comprises a hollow body portion 51, curved section 52, annular section 53, ribs 54, and an annular shoulder 55 adapted to be disposed beneath the bead 56 of the bottle 57. In this construction the interior periphery of the annular section 53 is provided with a vertical groove 58 terminating short of the lower end of the annular section 53, as shown at 59, communicating, however, at its upper end with the channel 60 defined by the ribs 54 when in engagement with the bottle. The outer surface of the annular section 54 is provided with a finger piece 61, radially in line with the groove 58. In this construction when the nipple is on the bottle neck, it is normally entirely sealed; however, when the finger piece 61 is slightly flexed air is admitted to the groove 58, passing thence into the channel provided by the ribs 54, into the nipple and thus to the bottle.

It will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention; it will also be appreciated that the invention is susceptible of other uses than those herein pointed out, and may be variously changed and modified without departing from the spirit of the invention; accordingly those skilled in the art will appreciate that the embodiments herein described are illustrative only, and that the invention is not limited thereto.

I claim:

1. In combination with a bottle; a nipple having a bottle engaging portion and a hollow nipple section; and a capillary valve comprising means defining an elongated capillary channel divided by a recess into sections to form a plurality of capillary channels in series, communicating with said hollow nipple section, and operable to admit air to said hollow nipple section and to check egress of liquid therefrom.

2. A bottle nipple having a bottle engaging portion and a hollow nipple section, and a capillary valve comprising: an elongated recess in said bottle engaging portion of said nipple communicating with said hollow nipple section and extending to the free end of said bottle engaging portion, the edges of said recess adapted to engage the adjacent portion of the bottle, a part of said recess being of sufficiently small magnitude to admit air to said hollow nipple section but to prevent escape of liquid therefrom.

3. In combination, a bottle; a nipple having a bottle engaging portion and a hollow nipple section; and a capillary valve situated intermediate said bottle engaging portion and said bottle and comprising: an elongated recess extending to the free end of said bottle engaging portion and to said hollow nipple section, the ends of said recess being unobstructed by said nipple, said recess having a part thereof of sufficiently small magnitude to admit air to said hollow nipple section but to prevent escape of liquid therefrom, without manipulating said nipple.

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