

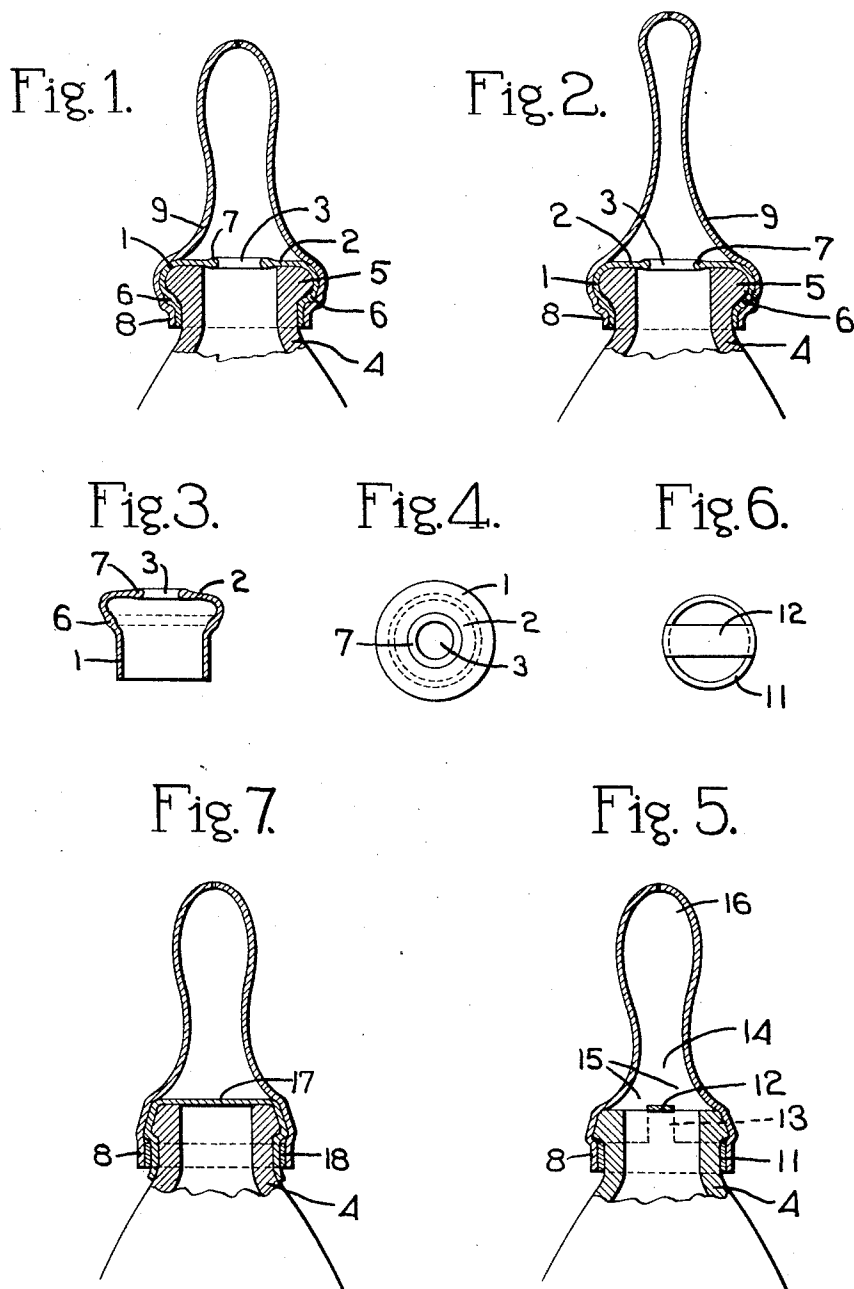
July 18, 1933.

W. A. CARSTENSEN

1,918,633

DEVICE FOR PREVENTING COLLAPSE OF NURSING NIPPLES

Filed Nov. 16, 1931



Inventor:
William A. Carstensen
by *Harold Smith Stearns*
Attys.

UNITED STATES PATENT OFFICE

WILLIAM A. CARSTENSEN, OF WINTHROP, MASSACHUSETTS

DEVICE FOR PREVENTING COLLAPSE OF NURSING NIPPLES

Application filed November 16, 1931. Serial No. 575,299.

This invention relates to a device for preventing collapse of nursing nipples, and the object thereof is to provide means adapted to be detachably secured to the neck of a bottle which when engaged by the base of the nipple will hold the nipple against slippage on the bottle neck, and which is also provided with means for causing unequal tension upon different portions of the wall of the nipple when extended which will prevent contact of opposite portions of the inner face of the wall of the nipple, thereby insuring continuous flow of milk from the bottle upon each draft made by the infant thereupon.

It is well known that usual types of nipples when extended during the nursing operation will frequently so collapse that portions of the inner face of the wall of the nipple will be drawn into such contact as to stop the flow of milk through the nipple, thereby not only preventing the infant from obtaining its expected supply of milk, to the annoyance of the infant, but also causing the infant, in its effort to obtain the milk, to draw in from around the nipple more or less air which when accumulated in its stomach in considerable quantities will cause colic.

It is found that the collapsing of the nipples in this manner is mainly due to the slippage of the nipple upon the bottle, particularly the slippage of the portion which passes over the bead of the bottle, as the nipple is extended, so that the elongation of the central portion of the nipple, when extended, during nursing, is sufficient to enable opposite portions of the wall of the nipple to be brought in such close contact as to shut off the flow of milk.

The present invention is designed to overcome this defect and comprises broadly means detachably secured to the neck of a nursing bottle presenting an outer adherent face to be engaged by the nipple and an inner adherent face to engage the neck and bead of the bottle which functions to prevent slippage of the nipple upon the bottle neck, and which is so constructed that during the nursing operation the degree of tension in the lower free conoidal portion of the nipple above the bead of the nursing bottle will re-

main unmodified by a change in area of the free portion. Consequently, since a maximum tension is maintained in the lower conoidal portion of the nipple, opposite portions of the inner face of the nipple walls will be maintained out of contact and an unimpeded flow of milk will be insured.

A preferred form of the device comprises an elastic collar of rubber material which is stretched over the neck and bead of the nursing bottle in such a manner that its inner adherent surface firmly engages the neck of the bottle and its outer adherent surface presents an anchoring means which acts to prevent relative movement between the nipple and the neck of the bottle. To provide additional assurance that the collar will not slip upon the bottle neck an annular rib is formed upon the collar which engages the bead upon the neck of the bottle. The collar also is constructed to extend laterally across the mouth of the bottle, such lateral portion being provided with an opening to permit a flow of milk from the bottle. This lateral portion of the collar is put under tension when the collar is applied to the bottle, and therefore acts to cause the upper portion of the collar to contact firmly with the bead at the upper end of the neck of the bottle. To maintain the tension produced by the lateral portion of the collar a reinforcing bead is formed upon the periphery of the opening provided for the flow of milk, thereby preventing any tendency of the rubber material from fraying or tearing which might result in reducing the pressure developed by the collar upon the bead of the bottle. When the nipple is applied over the collar all tendency for the skirt portion thereof to slip relatively to the bottle neck is effectually counteracted by the firm union of the collar upon the neck of the bottle, and the union between the collar and the nipple.

The adhesion between the inner face of the nipple and the outer face of the collar upon the bottle, and also the adhesion of the nipple to the portion of the band which extends over the bead of the bottle is increased materially as tension is imposed upon the nipple during the nursing operation, not only be-

cause the increase in tension upon the nipple contacts the base of the nipple upon the collar, but also because of the generation of heat in the elastic material by stretching which, in turn, increases the adhesive properties of the contacting surfaces of the nipple and collar.

Preferred embodiments of the invention are shown in the accompanying drawing, in which,

Fig. 1 is a vertical sectional view of the neck portion of a bottle having a nipple applied thereto with the device embodying the present invention interposed between the nipple and the neck of the bottle.

Fig. 2 is a sectional view similar to that shown in Fig. 1 showing the nipple in its extended condition caused by the nursing operation.

Fig. 3 is a vertical cross sectional view of the elastic collar embodying the principles of the invention detached from the bottle neck.

Fig. 4 is a top plan view of the device embodying the invention detached from the nursing bottle.

Fig. 5 is a vertical sectional view of the bottle neck, having a nipple applied thereto with a modified form of a device embodying the present invention interposed between the nipple and the neck of the bottle.

Fig. 6 is a plan view of the modified form of the device illustrated in Fig. 5 detached from the bottle neck.

Fig. 7 illustrates a modified form of the invention in which the device for preventing collapse of the nipple is formed in two parts instead of one.

The device for preventing collapse of nipples illustrated in Figs. 1 to 4 inclusive comprises a collar 1 of elastic material having an adherent outer and inner surface which are preferably continuous and an inner integral lateral portion 2 which extends across the mouth of the bottle neck when the device is applied thereto. The lateral portion 2 is provided with an aperture 3 to provide for flow of milk from the bottle to the nipple. The elastic collar 1 may be of any suitable composition, but desirably is of rubber, the inner face being adapted to adhesively engage the neck of the bottle while the outer face will adhesively engage the inner face of the cylindrical or skirt portion of the usual rubber nipple and form a hermetic seal therefor. The collar 1 is of sufficiently smaller diameter than the neck of the bottle, not only to grip the neck 4 of the bottle under tension, but also to maintain the lateral portion 2 under tension across the mouth of the bottle. The tension of the lateral portion 2 across the neck of the bottle also serves to hold the upper end of the collar 1 in firm engagement with the surface of the bead 5 of the bottle neck. An annular rib 6 is formed upon the collar 1 in such position that when the collar is applied

to the bottle neck the rib will be situated near the base of the bead 5 of the bottle neck. In order to strengthen and prolong the usefulness of the device, the periphery of the opening 3 in the lateral portion 2 is reinforced with a rib 7. The rib 7 serves to prevent the edges of the opening 3 from becoming frayed or torn as a result of the tension in the lateral portion 2, thereby maintaining this tension constant.

After the device has been applied to the bottle the nipple is placed upon the bottle in the usual manner with its cylindrical base portion 8 engaging the outer surface of the collar 1. It will be noted that when the nipple is thus applied to the bottle a certain tension is set up in the lower conoidal portion 9 of the nipple adjacent to the bead 5 of the bottle neck. The stress developed by this tension at the point where the nipple first engages the upper portion of the collar 1 is resisted by the adhesive engagement between the nipple and the collar. It has been found in usual constructions that during the nursing operation when additional tension is imposed upon the portion 9 of the nipple, there is a tendency for this additional stress to cause the nipple to slip upon the bottle neck, thereby relieving the tension in the nipple to such an extent that the partial vacuum caused within the nipple by the nursing operation will collapse the nipple, thereby cutting off the supply of milk. In the present invention the adhesion between the skirt of the nipple and the collar is such that during the nursing operation it will prevent slippage over the bead at the mouth of the bottle and will maintain such tension upon the free conoidal portion of the nipple above the bead as will prevent the contact of opposite portions of the inner wall of the nipple which if permitted would result in cutting off the supply of milk.

The rib 6 on the collar 1 projecting outwardly engages the skirt 8 of the nipple anchoring it firmly against movement relatively to the collar 1. The location of the rib 6 at the base of the bead 5 acts most effectively to prevent slipping of the nipple for the reason that when in this position the rib acts downwardly upon the nipple directly counteracting the tendency of the nipple to slip upwardly. Furthermore, such location of the rib is more effective because it anchors the nipple at a point substantially midway between the upper and lower extremities of the skirt 8, thereby adding to the total friction of the surface engaging the bottle neck and not detracting from or interfering therewith which might be the case if the rib were situated near the lower or upper extremity of the skirt portion. If the rib were located near the upper extremity an excessive strain upon the nipple directly above the bead of the bottle neck might render the rib ineffective.

Should there be a tendency for the collar 1 to slip upwardly upon the bottle neck, the rib 6 would tend to ride over the bead 5 and in doing so would of necessity be expanded in diameter. This expansion would be counteracted by the reinforcement afforded by the rib thereby effectually preventing slippage.

As above pointed out by preventing slippage the tension in the conoidal portion of the nipple remains unmodified because of the fact that the area of the free portion of the nipple remains unchanged. Since a maximum tension is always maintained within the conoidal portion of the nipple its collapse is thereby prevented.

An undesirable feature of the use of nipples not employing the present invention is the tendency of the nursing infant to draw air into the nipple from between the neck of the bottle and the skirt of the nipple. When this condition arises, an accumulation of air results in the stomach of the child who suffers an attack of colic. It has been found that the admission of air to the nipple in this manner is caused by an ineffectual seal between the nipple and the bottle neck and such condition very often arises from the slipping of the nipple upon the bottle neck. Obviously the present invention completely eliminates this possibility.

Fig. 5 illustrates a modified construction of the device which comprises a collar 11 of the elastic material having adherent inner and outer surfaces, and an integral band 12 extending diametrically thereof. The elastic collar 11 may be of any suitable composition, but is desirably of rubber, the inner face being adapted to engage the neck of the bottle, while the outer face will adhesively engage the inner face of the skirt portion 8 of the usual nipple. The collar 11 is of sufficiently smaller diameter than the neck of the bottle to set up an appreciable tension upon the bottle neck when it is applied thereto. When the collar 11 is applied to the bottle, the band 12 is also put under tension and extends diametrically across the mouth of the bottle.

The nipple is placed over the collar 11 upon the bottle in the usual manner with its skirt portion 8 engaging the outer surface of the collar 11. It will be noted that when thus engaged the portions 13 of the nipple which engage the band 12 are somewhat extended outwardly by reason of the thickness of the band relatively to the remaining portion of the skirt of the nipple. In the operation of the device when the nipple is extended during the nursing operation as shown in dotted lines Fig. 5, the adhesion between the collar 11 and the skirt 8 of the nipple will impose greater tension upon diametrically opposite areas 14 shown in Fig. 5 extending from the portions of the band 2 which lie over the bead 5 of the bottle neck to the end of the

nipple than the tension which is applied upon the remaining portions of the nipple, thereby providing a slightly greater lesion of the opposite portions 15 of the wall of the nipple which will permit the milk to flow freely into the dome 16 of the nipple.

The diametrical band 12 also divides the milk drawn from the bottle into two streams which flowing along paths engaging the walls of the nipple which are under less tension also serves to expand these walls outwardly thereby further aiding and preventing the collapse of the nipple.

In Fig. 6 a further modification of the invention is illustrated in which a band 17 preferably a rubber band, but which may be a string or other suitable means is held under tension by an elastic collar 18 of rubber or other suitable material having an outer adherent face which is engaged by the skirt 8 of the nipple in the manner above described. This construction operates in the same manner to prevent the collapse of the nipple during the nursing operation.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A device for preventing collapse of nursing nipples comprising a tubular rubber collar of less diameter than the outer neck of the bottle adapted to be applied under tension to the neck of the bottle and having integral means extending across the mouth of the bottle restricting the outlet thereof, said collar presenting an outer adhesive surface adapted when engaged by the elastically-contracted skirt of the nipple to form a hermetically-sealed closure at the base of the nipple and acting also during nursing by such adhesion to prevent slippage over the mouth of the bottle and to maintain such tension upon the free conoidal portion of the nipple above the bead thereof as will prevent contact of opposite portions of the inner wall of the nipple.

2. A device for preventing collapse of nursing nipples, comprising an elastic collar, provided with an opening, detachably secured to and entirely covering the neck and bead of a nursing bottle beneath the skirt of the nipple, the collar being smaller in diameter than the outer neck of the bottle, and composed of rubber material having adhesive inner and outer surfaces, said collar being applied to the bottle by stretching the rubber and secured thereon by the tension thus developed, means on the skirt engaging beneath the bead of the bottle acting when the nipple is applied thereto to prevent slippage thereof.

3. A device for preventing collapse of nursing nipples comprising an elastic tubular collar detachably secured to and covering the neck and bead of a nursing bottle beneath the skirt of the nipple, said collar

being of smaller diameter than the outer neck of the bottle and being applied by stretching and secured thereon by the tension thus developed, said collar having a lateral apertured portion extending across the mouth of the bottle, an annular rib upon the collar engaging the bead of the bottle and the nipple, acting to prevent slippage of the nipple upon the bead whereby the free conoidal portion thereof above the bead will be maintained under tension unmodified by a change in area of said free portion.

4. A device for preventing collapse of nursing nipples, comprising a collar of elastic rubber material having adhesive inner and outer surfaces and adapted to be detachably secured upon and covering the neck and bead of a nursing bottle, said collar being of smaller diameter than the outer neck of the bottle and having a transverse apertured upper portion extending over the peripheral area of the opening at the neck of the bottle beneath a skirt of a nipple, an annular rib upon the collar engaging the bead of the bottle and the nipple acting to prevent slippage of the nipple thereon whereby the free

conoidal portion of the nipple above the bead will be maintained under tension unmodified by a change in area of said free portion.

5. A device for preventing collapse of nursing nipples comprising a collar of elastic rubber material having adhesive inner and outer surfaces and adapted to be detachably secured upon and covering the neck and bead of a nursing bottle beneath the skirt of the nipple, said collar being of smaller diameter than the outer neck of the bottle and having a lateral apertured portion extending across the mouth of the bottle, the aperture in said lateral portion being of less area than the mouth of the bottle, a reinforcing rib situated at the periphery of said aperture, an annular rib upon the collar engaging beneath the bead of the bottle and the nipple acting to prevent slippage of the nipple upon the bead whereby the free conoidal portion of the nipple above the bead will be maintained under tension unmodified by a change in area of said free portion.

WILLIAM A. CARSTENSEN.

30

95

35

100

40

105

45

110

50

115

55

120

60

125

65

130