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2,628,616

VENTED NURSING NIPPLE

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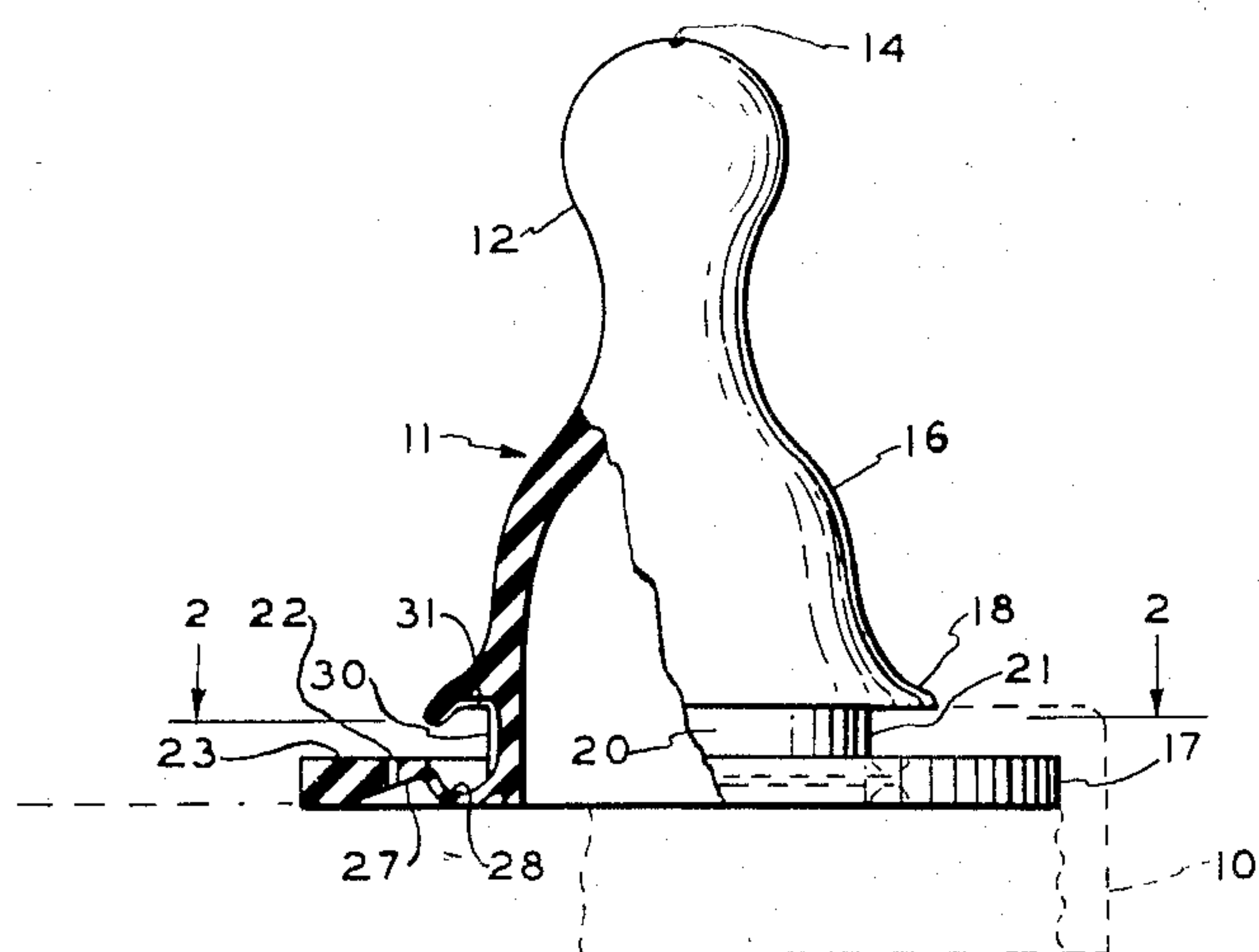


Fig. 1

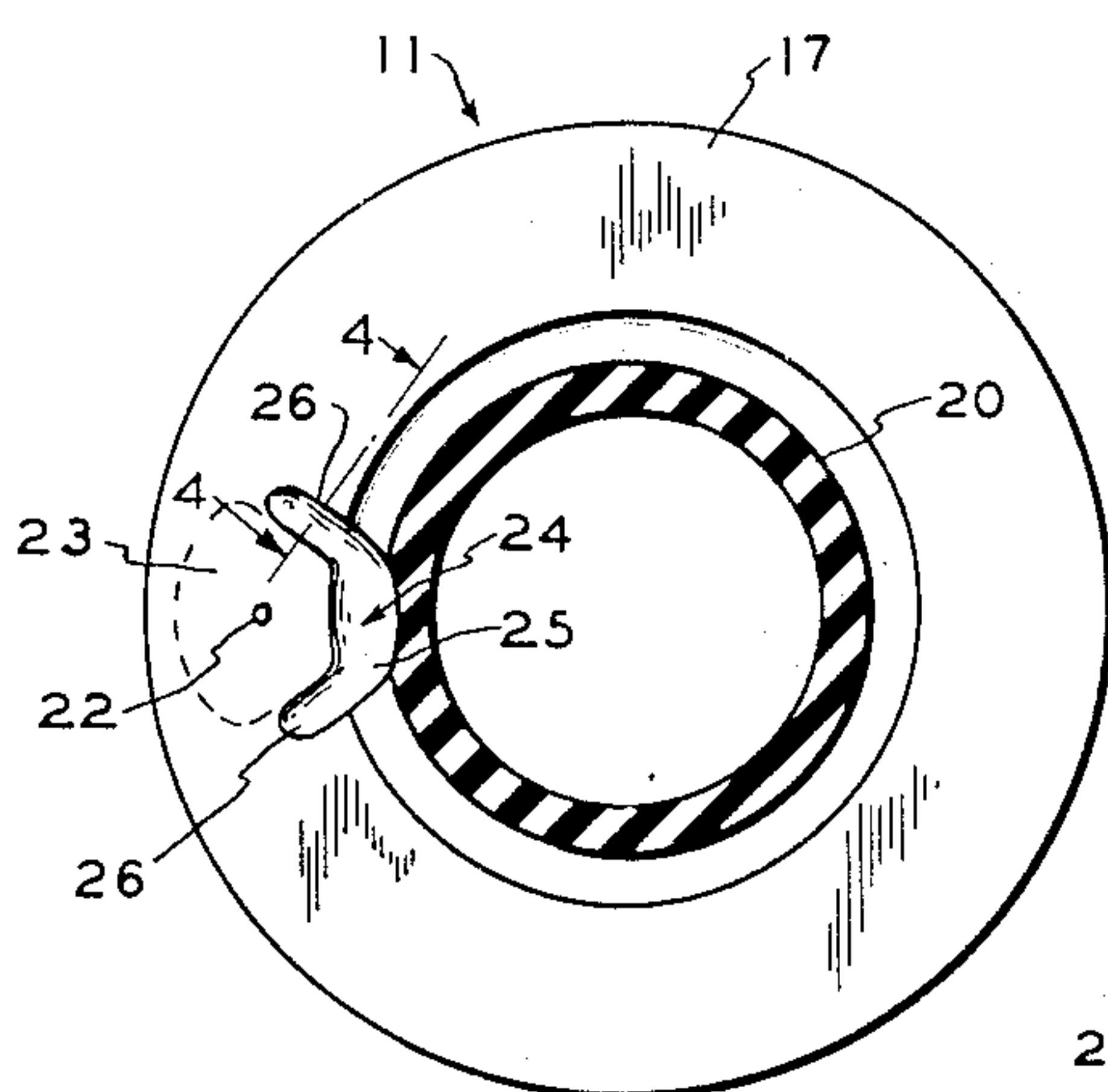


Fig. 2



Fig. 4

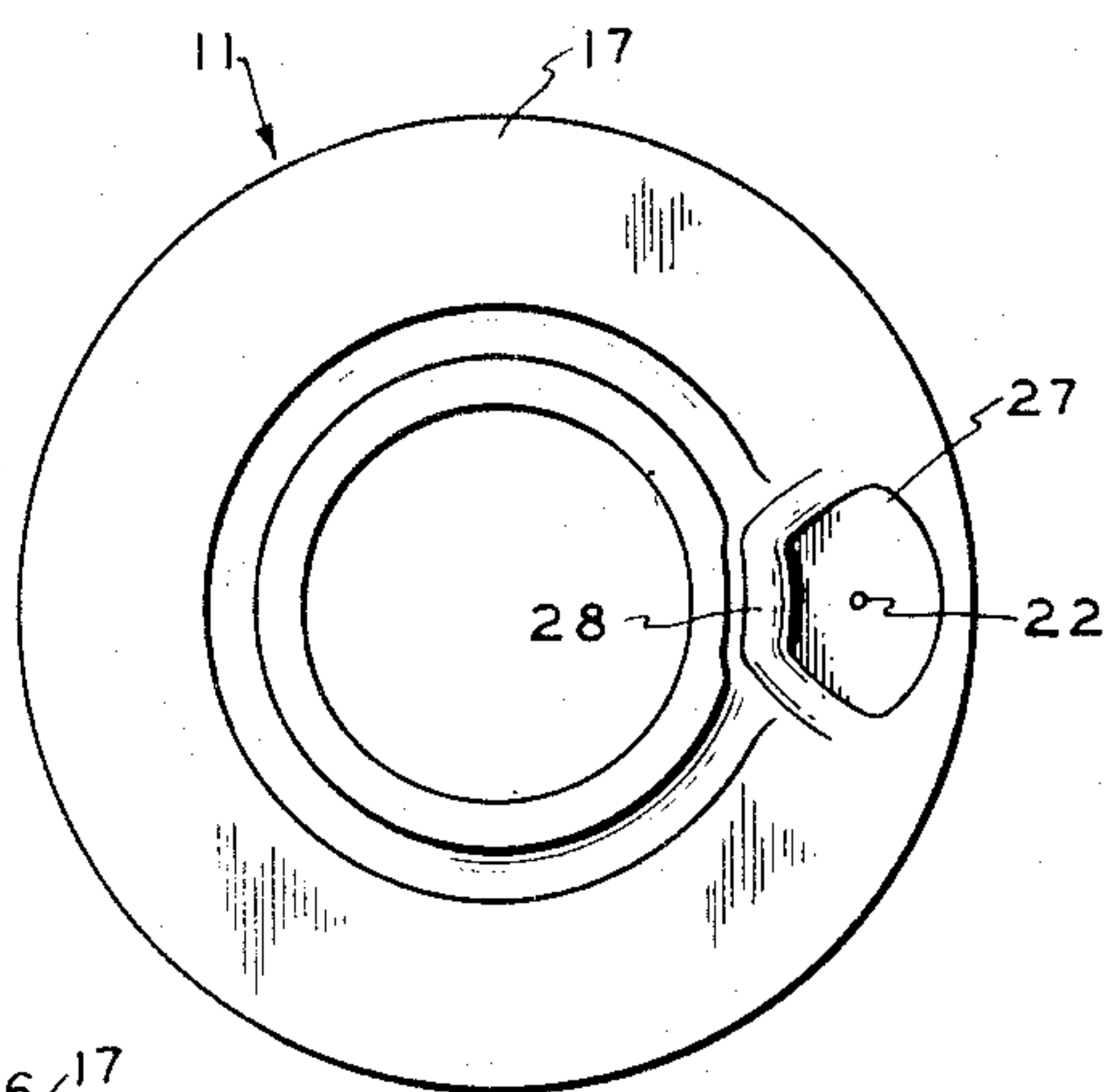


Fig. 3

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VENTED NURSING NIPPLE

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9 Claims. (Cl. 128—252)

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This invention relates to a vented nursing nipple and has for an object to provide an improved nursing nipple having means for automatically venting the same under the action of the vacuum created by the baby nursing from the bottle, thereby controlling the flow of air into the nursing bottle, preventing the nipple from flattening, and providing a proper, free flow of fluid without leakage through the nipple to the baby nursing from the bottle.

This invention is particularly intended for use in connection with wide mouthed nursing bottles and is improvement over applicant's co-pending application, Serial No. 173,796, filed July 14, 1950, now abandoned, and over the nipples shown in the U. S. Patents Nos. 2,093,130 and 2,093,730.

A further object of this invention is to provide an improved venting means for a wide mouthed nursing nipple of the form shown in the above mentioned patents.

A further object of this invention is to provide a vent in the flange of a wide mouthed nursing nipple wherein the vent is automatically operated under the action of the vacuum created by the baby sucking the milk and connected to a passage leading to the atmosphere.

With the foregoing and other objects in view, this invention comprises the combination, construction and arrangement of parts hereinafter set forth, claimed and disclosed in the accompanying drawings, wherein:

Fig. 1 is a side elevation, partly in section, of the improved vented nursing nipple of this invention showing the manner in which the same cooperates with the securing cap for attaching it to a nursing bottle.

Fig. 2 is a sectional view on line 2—2 of Fig. 1, and

Fig. 3 is a bottom plan view of Fig. 1.

Fig. 4 is a sectional view on line 4—4 of Fig. 2.

There is shown at 10 a conventional wide mouthed nursing bottle cap of the nature shown in the above mentioned patents, for cooperation with the wide mouthed nursing bottle, and it is intended for securing a nursing nipple such as shown at 11 in operative position on the nursing bottle.

The nipple 11 has the usual nursing tip 12 and the usual tip opening 14 through which the baby sucks the milk. Extending from the nursing tip 12 is an enlarged portion 16 terminating in the radially extending flange 17, a downwardly tapered shoulder 18 being provided above the flange 17 and connected thereto by a reduced neck 20. In the preferred form, as shown, the diameter of the radially extending flange 17 is substantially equal to the internal diameter of the securing flange of the cap 10 with which it is to be used, and the diameter of the recessed neck 20 is substantially equal to the diameter of the aperture 21 in the bottle cap 10 through which it extends, and the height of the neck 20 is substantially equal to the thickness of the bottle

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cap 10, thus providing a snug fit of the nipple 11 in the cap 10. However, a fairly snug and secure fit will be provided so long as the diameter of the radially extending flange 17 is equal to the internal diameter of the cap flange while the diameter of the reduced neck 20 and the diameter of the cap aperture 21 may be slightly unequal, or vice versa if the diameter of the reduced neck 20 and the cap aperture 21 are equal while the radially extending flange 17 may have a slightly less diameter than the diameter of the cap securing flange.

The essence of this invention is in providing a vented portion in the flange 17 which normally seals directly or indirectly against the under surface of the cap 10 but which breaks away from such sealing contact under the slight vacuum, such as produced by the baby sucking the milk, to allow air to enter thereto from the atmosphere into the bottle, a passage being provided from the vent in the flange to the aperture.

The vent through the radially extending flange 17 is shown at 22 and is located in a portion 23 within the inner outline of a U-shaped thin walled diaphragm 24 also U-shaped in cross-section having the outer outline of its bight 25 located at and joining the reduced neck 20, beneath the downwardly tapered shoulder portion 18 while its legs 26 extend outwardly from each other and toward but stopping short of the edge of the flange 17. The portion 23 thus located within the U-shaped flexible diaphragm 24 is thus flexible, and its flexibility may be enhanced by having its lower surface 27 taper upwardly toward the bight 25 as shown. At the outline bight 25, the diaphragm extends downwardly from the edge of the portion 23 to provide a space 28 below the cap 10 and connecting to the reduced neck 20. When the reduced neck 20 is of a diameter substantially equal to the diameter of the cap aperture 21, there is provided a recessed axially extending groove 30 connecting from the space 28 upwardly past the cap 10 and thence by way of a groove 31 through or under the downwardly extending shoulder 18 in the body 16 of the nipple 11 to the atmosphere.

In operation as the baby sucks milk from the bottle through the tip opening 14, a vacuum is created in the nursing bottle. This slight vacuum in the nursing bottle causes the vented portion 23 to flex downwardly into the bottle within the limit permitted by the flexible diaphragm 24, thus breaking the seal between its top surface and the bottom of the cap and thus connecting the vent 22 from the bottle to the space 28 and thus through the grooves 30 and 31 to the atmosphere permitting air to enter from the atmosphere to replace the milk that has been drawn through the nursing nipple by the baby.

Obviously, instead of providing the grooves 30 and 31, the diameter of the reduced neck 20 may be made slightly less than the diameter of the cap aperture 21, thus using only groove 31 with

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the shoulder otherwise fitting snugly on the top of cap 10, thus providing a passage to the atmosphere. In either case, suction of milk from the bottle creates a vacuum therein and causes the vented portion 23 to flex downwardly and connect the vent 22 to the space 28 and thus through the passage to the atmosphere relieving the vacuum in the nursing bottle and preventing the nipple from flattening or the baby from sucking air and allowing more milk to flow into the nipple and freely replace that portion of milk which has been sucked therefrom.

When the nursing tip 12 is either bent toward the flange 23, or axially pushed in toward the flange 17, as may often happen when in use by the baby, there would be a tendency for the tension so created to be transmitted to the vent flange 23 and cause undesired leakage of the milk, but this tendency is prevented first, by the thin walled diaphragm 24 being also U-shaped in cross section, so that it will unfold rather than transmit such bending strain to the vent flange 23, and additionally, if needed, by the downwardly tapered shoulder portion 13 which tends to absorb such tension.

While the device has been shown and the structure described in detail, it is obvious that this invention is not to be considered as being limited to the exact form disclosed, and that changes in detail and construction may be made therein within the scope of what is claimed, without departing from the spirit of this invention.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange, said body having a reduced neck at the cap aperture of a diameter substantially equal to the diameter of the cap aperture, the height of said neck being substantially equal to the cap thickness thereby providing a snug fit of said body in the cap, said reduced neck having a recessed groove therein extending from below the cap aperture providing a passage to the atmosphere, a thin walled diaphragm in said radially extending flange substantially U-shaped in outline having its bight connected to said passage and having its legs extending outwardly toward but stopping short of the edge of said flange, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped diaphragm, the upper surface of said portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, whereby said portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage to the atmosphere.

2. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange, said body having a reduced neck at the cap aperture of a diameter substantially equal to the diameter of the cap aperture, the height of said neck being substantially equal to the cap thickness thereby providing a snug fit of said body in the cap, said reduced neck having a recessed groove therein extending from below the cap aperture upwardly through said neck providing a passage to the atmosphere, a thin walled diaphragm in

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said radially extending flange substantially U-shaped in outline having its bight connected to said passage and having its legs extending outwardly toward but stopping short of the edge of said flange, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped diaphragm, the upper surface of said portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, whereby said portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage through said neck and body to the atmosphere.

3. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange, said body having a reduced neck at the cap aperture of a diameter substantially equal to the diameter of the cap aperture, the height of said neck being substantially equal to the cap thickness thereby providing a snug fit of said body in the cap, said reduced neck having a recessed groove therein extending from below the cap aperture providing a passage to the atmosphere, a thin walled diaphragm in said radially extending flange substantially U-shaped in outline having its bight connected to said passage and having its legs extending outwardly toward but stopping short of the edge of said flange, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped diaphragm, the upper surface of said portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, the lower surface of said portion tapering toward the U-bight thereby increasing its flexibility, whereby said portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage to the atmosphere.

4. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange, said body having a reduced neck at the cap aperture of a diameter substantially equal to the diameter of the cap aperture, the height of said neck being substantially equal to the cap thickness thereby providing a snug fit of said body in the cap, said reduced neck having a recessed groove therein extending from below the cap aperture upwardly through said neck and through said body providing a passage to the atmosphere, a thin walled diaphragm in said radially extending flange substantially U-shaped in outline having its bight connected to said passage and having its legs extending outwardly toward but stopping short of the edge of said flange, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped diaphragm, the upper surface of said portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, the lower surface of said portion tapering toward the U-bight thereby increasing its flexibility, whereby said portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage through said neck and body to the atmosphere.

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5. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange having a diameter substantially equal to the internal diameter of the bottle cap, said body having a reduced neck at the cap aperture thereby providing a snug fit of said body in the cap, said reduced neck providing a passage to the atmosphere, a thin walled diaphragm in said radially extending flange substantially U-shaped in outline having its bight connected to said passage and having its legs extending outwardly toward but stopping short of the edge of said flange, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped diaphragm, the upper surface of said portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, whereby said portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage to the atmosphere.

6. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange having a diameter substantially equal to the internal diameter of the bottle cap, said body having a reduced neck at the cap aperture of a diameter substantially equal to the diameter of the cap aperture, the height of said neck being substantially equal to the cap thickness thereby providing a snug fit of said body in the cap, said reduced neck having a recessed groove therein extending from below the cap aperture upwardly through said neck and through said body providing a passage to the atmosphere, a thin walled diaphragm in said radially extending flange substantially U-shaped in outline having its bight connected to said passage and having its legs extending outwardly toward but stopping short of the edge of said flange, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped diaphragm, the upper surface of said portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, the lower surface of said portion tapering toward the U-bight thereby increasing its flexibility, whereby said portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage through said neck and body to the atmosphere.

7. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange having a diameter substantially equal to the internal diameter of the bottle cap, said body having a reduced neck at the cap aperture providing a snug fit of said body in the cap, said reduced neck providing a passage to the atmosphere, a thin walled diaphragm in said radially extending flange substantially U-shaped in outline and in cross-section having its outline bight connected to said passage and having its outline legs extending outwardly toward but stopping short of the edge of said flange, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped

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diaphragm, the upper surface of said portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, whereby said portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage to the atmosphere.

8. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange having a diameter substantially equal to the internal diameter of the bottle cap, said body having a reduced neck at the cap aperture and a downwardly extending shoulder portion about at least part of said neck thereby providing a snug fit of said body in the cap, said reduced neck providing a passage to the atmosphere, a thin walled diaphragm in said radially extending flange substantially U-shaped in outline and in cross-section having its outline bight connected to said passage and having its outline legs extending outwardly toward but stopping short of the edge of said flange, said flange extending from beneath said shoulder portion, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped diaphragm, the upper surface of said portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, whereby said portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage to the atmosphere.

9. In a nursing unit including a wide mouthed nursing bottle centrally apertured bottle cap; a nursing nipple having a nursing tip, an enlarged body and a radially extending flange, said body having a reduced neck at the cap aperture of a diameter to fit within the diameter of the cap aperture, the height of said neck being substantially equal to the cap thickness, providing a snug fit of said body in the cap, said reduced neck having a recessed groove therein extending from below the cap aperture upwardly through said neck and through said body providing a passage to the atmosphere, a thin walled diaphragm in said radially extending flange substantially U-shaped in outline and in cross-section having its outline bight connected to said passage and having its outline legs extending outwardly toward but stopping short of the edge of said flange, said flange having a vent therethrough in the portion located within the inner outline of said U-shaped diaphragm, the upper surface of said flange portion being in the plane of the top surface of said flange and thus normally sealing against the bottom surface of the cap, the lower surface of said flange portion tapering toward the U-bight thereby increasing its flexibility, a shoulder portion on said nipple body extending downwardly over said neck adjacent said flange area, whereby said flange portion may flex downwardly under vacuum in the nursing bottle to break the seal between said portion and the cap bottom and connect its vent to said passage through said neck and body to the atmosphere, and whereby bending strains from said nursing tip will not be transmitted to said vent flange to cause undesired leakage.

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No references cited.