

March 27, 1945.

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2,372,281

DISPENSERS AND CONTROL FOR THE SAME

Filed Jan. 29, 1942

2 Sheets-Sheet 1

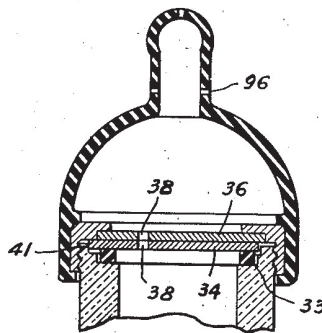
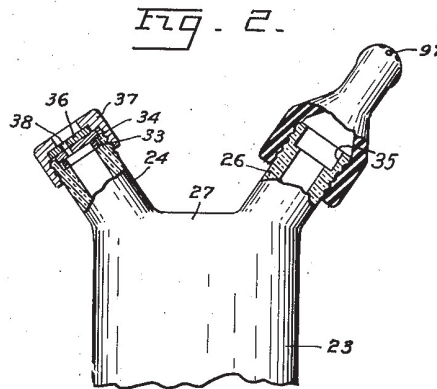
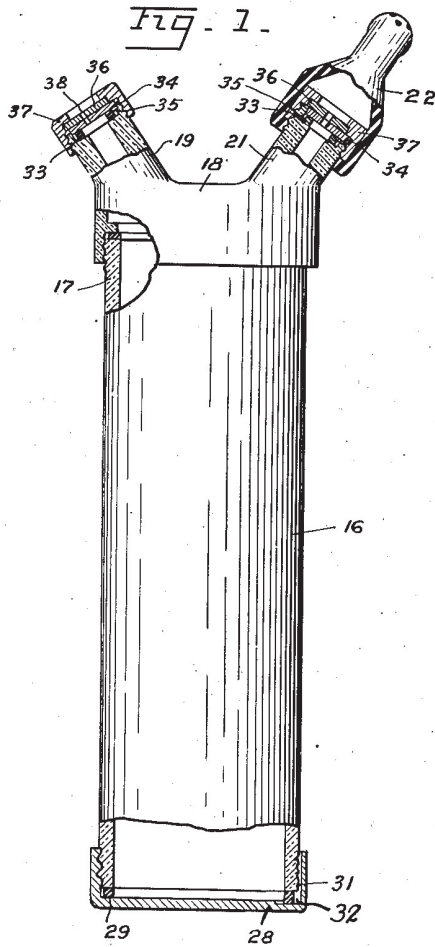


Fig. 3.

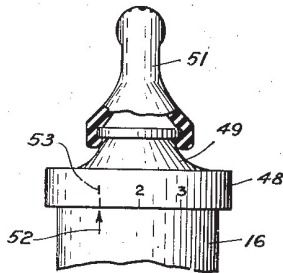


Fig. 5.

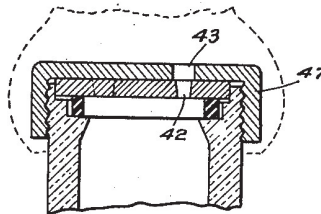


Fig. 4.

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2 Sheets-Sheet 2

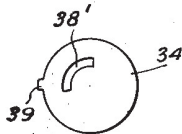


Fig. 6.

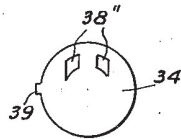


Fig. 7.

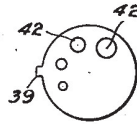


Fig. 8.

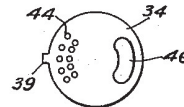


Fig. 9.

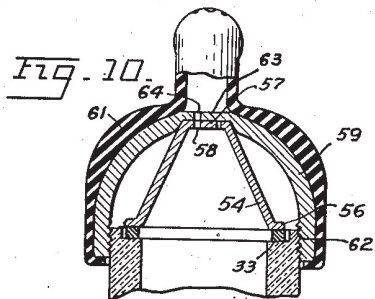


Fig. 10.

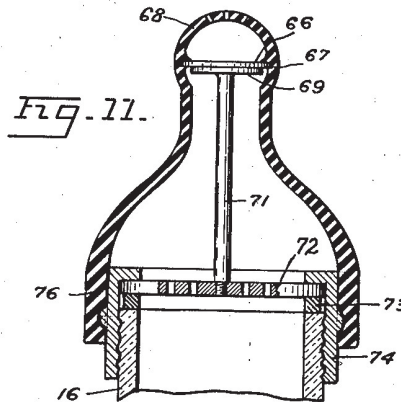


Fig. 11.

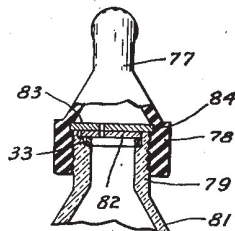


Fig. 12.

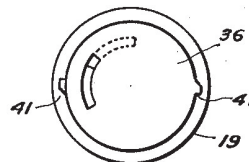


Fig. 13.

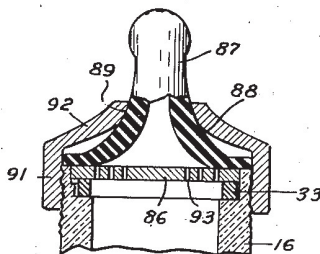


Fig. 14.

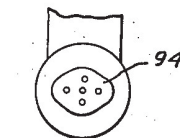


Fig. 15.

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UNITED STATES PATENT OFFICE

2,372,281

DISPENSER AND CONTROL FOR THE SAME

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Application January 29, 1942, Serial No. 428,683

2 Claims. (Cl. 215-11)

This invention relates to bottles and dispensing spouts and nipples for bottles, particularly to the types of bottles and nipples used for nursing.

An object of the invention is to provide a novel construction for nursing bottles and nipple holders as well as nursing bottle nipples which can be used without unduly clogging the passage for dispensing the contents of the bottle, and in which atmospheric pressure is admitted to the fluid level of the bottle without bubbling through or otherwise filling the fluid in the bottle with small air bubbles, and whereby the dispensing of liquid as well as emulsified vegetable or food are facilitated.

Particularly it is an object of the invention to provide a nursing bottle in which air is admitted above the level of the liquid while the bottle is held in a natural dispensing position, or in such a way that a nipple in use is filled with the contents of the bottle under atmospheric pressure admitted into the bottle at a point other than the passage of the nipple in use. This is an important feature of my invention because when, as in the previous practice, air is admitted through the holes at the nipple in use, such air forms bubbles in the bottle. Frequently these bubbles do not break. Such small bubbles when swallowed by an infant in nursing remain mixed with the liquid in the digestive tract and are frequently the cause of colic or similar disorder.

Another object of this invention is to provide convenient, easy, and adjustable means for regulating the flow of liquid from the bottle through the dispensing spouts or nipples of the bottles. In the present illustration this regulation is accomplished by adjustable partial obstruction across the path through which liquid from the bottle is dispensed.

A still further object of the invention is to provide an attachment for bottles of the character described whereby a bottle of a single opening or neck can be converted into a bottle with a double neck or two spouts so arranged that air is admitted through one of the spouts while the other is in use; each of these necks or spouts being adapted to accommodate a suitable dispensing element such as the usual nursing nipple; the necks or spouts being divergent at such an angle that the liquid will not spill out of either the spout or neck when the other spout is in use, in other words the liquid level will not reach over and above the spout used for venting when the other spout is in use for dispensing in usual dispensing or nursing position.

A still further object of the invention is to

provide a nursing nipple the connection of which with the spout or neck of a dispensing bottle is such as to allow easy regulation of coacting elements to regulate the speed of flow through said nipple, the means for such regulation being also provided with passages which are self-cleaning.

Another object of this invention is to provide a nursing bottle and nipples which are highly useful and simple in construction. Convenience of arrangement, lightness, and comparative in-expense of manufacture are further objects which have been borne in mind in the production and development of the invention.

I am aware that some changes may be made in the general arrangements and combinations of the several devices and parts, as well as in the details of the construction thereof without departing from the scope of the present invention as set forth in the following specification, and as defined in the following claims; hence I do not limit my invention to the exact arrangements and combinations of the said device and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts as illustrated in the accompanying drawings.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, reference is had to the accompanying drawings for the illustrative embodiment of the invention, wherein:

Fig. 1 is a side view, partly in section, of a nursing bottle and an attachment on the same with double neck and regulator, constructed in accordance with my invention.

Fig. 2 is a fragmental view of a double neck bottle for accommodating nursing nipple on one of said necks.

Fig. 3 is a sectional detailed view of a nipple on a dispenser neck showing relative position of the regulating discs between the nipple and the neck of the bottle.

Fig. 4 is a fragmental sectional view of a modified form of regulator showing self-cleaning holes.

Fig. 5 is another form of the invention wherein the cap of the bottle is used as a reducer so as to provide a smaller neck for smaller type nipples.

Fig. 6 is a form of a dispensing regulator disc.

Fig. 7 is another form of a regulator disc.

Fig. 8 is another form of a regulator disc.

Fig. 9 is another form of a regulator disc.

Fig. 10 is a fragmental sectional view of the neck of a bottle showing another form of regulator inside the nipple.

Fig. 11 is a fragmental sectional view of a nipple on the neck of a bottle wherein the flow regulating elements are in the mouthpiece of the nipple.

Fig. 12 is another form of nipple connection for flow regulation between the neck of the bottle and the nipple.

Fig. 13 is a plan view showing a pair of regulating discs arranged in their relative operating position.

Fig. 14 is a fragmental sectional view showing cap control for the covering of the dispensing holes by the base of the nipple.

Fig. 15 is a fragmental plan view of a substantially oval shaping of the mouthpiece of a nipple on applicant's invention for locating the bottle at the correct angle.

In carrying out my invention, as shown in the illustrative embodiments I make use of a cylindrical bottle 16, the ends of which are open so as to facilitate the cleaning of the bottle 16. At the top end 17 of the bottle 16 a dispenser device is provided which in the forms shown in Figs. 1 and 2 allows for the automatic maintenance of atmospheric pressure above the level of the contents of the bottle during the dispensing from said bottle 16. In the form shown in Fig. 1 a cap 18 is removably attached to the top end 17 of the bottle 16. In this illustration the cap 18 is secured in place by threaded engagement. The cap 18 has two dispensing spouts or necks 19 and 21 which are located diametrically opposite on the top of the cap 18. The necks 19 and 21 diverge outwardly of the cap 18 and at such angles that when the bottle is in tilted position, the level of the liquid or emulsified food in the bottle is below the rim of the neck 19 or 21 whichever is not in use for dispensing. This is accomplished by making the necks 19 and 20 of suitable length in addition of having them at suitable angles for convenient use.

This cap 18 as well as the necks 19 and 21 may be made of glass, plastic, or Lucite, rubber or synthetic rubber, or of other material suitable for the particular liquid or emulsions. A nursing nipple 22 is detachably connected to one of said necks in the herein illustration to neck 21. During feeding the other neck 19 functions as the air vent so that the feeding through the nipple 22 is accomplished under atmospheric pressure on the liquid, which pressure is admitted at a point remote from the cavity of the nipple 22. In this manner the formation of air bubbles and the circular motion or eddying of the air within the cavity of the nipple 22 is obviated and a continuous flow of the contents of the bottle 16 through said nipple 22 facilitates the feeding through such nipples.

In the form shown in Fig. 2 a nursing bottle 23 is formed with integral necks 24 and 26 which extend from the closed top 27 of the bottle 23 to such a distance and at such diverging angles as to permit the use of one of said necks as a vent when the other neck is at dispensing angle.

This double neck arrangement on the bottle 23 may be also used in the same manner as heretofore described in the first form of the invention, although it is believed that the use of a cap attachment on a tubular bottle is more practical in view of the greater facility for cleaning and disinfecting both the bottle and the dispensing device on the bottle.

In order to further facilitate the admission of air above the level of the contents of such container and to further facilitate the cleaning of

the bottle 16, or the bottle 23, the bottom of such bottle is provided with a removable bottom cap 28. This cap 28 is preferably threadedly secured on the exterior of the bottom end of the bottle 16. A resiliently compressible gasket 29 is provided between the bottom cap 28 and the bottom 31 of the bottle 16, so as to seal the cap 28 in place at various adjustments. The admission of air at the bottom of the bottle is regulated by turning the bottom cap 28. In the herein illustration a groove 32 extends partly in the bottom of the cap 28 and then across the threads on the side vertically to the rim of the cap 28. The resilient gasket 29 completely fills the groove 32 at the bottom of the cap 28 when the cap 28 is tightened so as to seal the bottom of the bottle. When the cap 28 is loosened the gasket 28 is gradually withdrawn from the groove 32 according to the degree of turning of the cap 28 and thus allows the passage of air through said groove 32. In this manner the air pressure admitted therethrough is regulated which in turn regulates the speed of flow through the outlet nipple at the top of the container or the bottle 16 or 23.

In connection with the various modifications of the regulating and dispensing devices and nipples shown in this application, the admission of air may be accomplished either by the use of a double neck structure as heretofore described, or by the use of an air vent regulating device at the bottom of the bottle, or by other suitable air vents at points outside of the cavity of the nipples and above the level of the contents of said bottle during dispensing. The various modifications of my invention are illustrated on a neck fragmentally shown, but it is to be understood that such nipples and regulating devices, per se, may be used directly on the single neck of a usual bottle as well as on either of the double necks of a structure heretofore described.

Feeding or nursing through such bottles must be frequently accomplished at varying rates of speed to suit the food or the conditions of feeding. In order to provide for easy adjustment and regulation for light liquids as well as for more dense food emulsions, I provide an adjustable regulating device herein whereby the opening of the passage through the necks of the containers or bottles can be quickly and accurately changed and determined.

In the form shown in Fig. 1 this regulation is accomplished by providing a recess 35 in each neck 19 and 21. A resiliently compressible gasket 33 is placed in this recess 35. The recess is larger than the gasket 33 to provide clearance for a comparatively large degree of compression of the gasket 33 within the recess 35. This gasket 33 is of a frictional material. Over this gasket 33 is placed an apertured disc 34 which is held against rotation relatively to the neck by the frictional engagement of the gasket 33 both with the recess 35 and with the disc 34. Upon this comparatively stationary disc 34 is superimposed a second relatively movable apertured disc 36, which latter in turn is held in a small cap 37 threadedly secured on each neck 19 and 21. It is to be noted that the movable disc 36 is so located inside of the cap 37 that it turns with the cap 37. The meeting surfaces of the discs 34 and 36 are smooth so as to allow relative adjustment of the disc 36 while the discs are held against each other by the resiliently compressible gasket 33. The apertures in the discs 34 and 36 are so offset relatively to each other that they register to a degree determined by the relative positions of said

discs. The aperture of the cap 37 is located opposite the area of the apertures of the stationary disc 34 so as to allow a clear passage through the adjusted registering apertures of the super-imposed discs 34 and 36.

In the form shown in Fig. 1, the same regulation is provided both on the neck 21 used for dispensing as well as on the neck 19 which is shown in use as an air vent. By adjusting the discs under the nipple 22 the rate of flow into the nipple can be regulated. By adjusting the other set of discs on the other neck 19 the rate of air inflow is regulated so as to control accurately the rate of feeding through the nipple 22.

In the form illustrated in Fig. 2 the regulation is shown as accomplished solely by the adjustment of the air intake. In this form the nipple is attached to the neck 26 which is provided with a wide unobstructed passage into the nipple. On the other hand the other neck 24 of this form has on it the regulating device heretofore described whereby the air intake can be regulated for controlling the flow into the nipple.

In the above forms the necks are interchangeable in use. In the form in Fig. 1 the interchanging can be accomplished by simply transferring the nipple 22 from the neck 21 to the neck 19 or vice versa. In some instances a nipple may be placed on both of the necks and the nipples could be used interchangeably. In the illustration shown in Fig. 2 the regulating device and its cap are transferred to the neck 26 and the nipple is placed on the neck 24 and vice versa for interchange of function. The feature of interchanging these openings especially the interchanging of the use of the regulating devices has the advantage of dislodging of any particles that might stop up the opening through said discs. For instance, if the device on the neck 21 is clogged up by some small solid or coagulated particles, then, upon the interchanging of the use of the necks 19 and 21, the suction inwardly through the neck 21 when it is used as an air vent will dislodge such particles from the disc openings.

The apertures 38 in the discs 34 and 36 may be either of the types shown in the Figures 6, 7, 8, and 9. It is to be noted that these discs may be either used as a lower or as an upper disc. Each of these discs has an ear 39 of irregular, such as trapezoidal outline, which is engaged by a suitable slot 41 in the side of the neck or in the side of the cap in the manner illustrated in Fig. 13, so as to properly locate the respective discs. The lower disc 34 is thus held against movement relatively to the neck 19 or 21 by this engagement of its ear 39 with the corresponding slot 41 in said neck. The upper disc 36 is similarly held in operative connection with the cap or with the nipple by its ear 39 connected to corresponding slot 41 in said cap or nipple. The apertures 38 on the two discs are arranged circumferentially on the same radius so that the registering of the respective apertures is regulated by turning the top disc 36 relatively to the lower disc 34. For instance in the form shown in Fig. 6 the discs 34 and 36 have elongated arcuate slots 38' on the same radius. These arcuated slots 38' are in registry with each other according to the rotative or angular adjustment of the top disc 36 relatively to the bottom disc 34. The aperture in the form shown in Fig. 7 is in the form of a pair of larger spaced but also arcuate holes 38''. The openings of the top disc then align with both of these openings in accordance with the relative angular adjustment. In the form shown in Fig.

4 and Fig. 8 the lower disc is provided with a series of arcuatedly arranged spaced holes 42 of progressively increasing size. As shown in Fig. 4 the top disc in this case has only one single opening 43 which aligns with a smaller or a larger hole 42 according to the angular adjustment of the top disc relatively to the bottom disc. In this form the flow is regulated according to the size of the hole 42 which is aligned with and uncovered by the controlling upper aperture 43. This form also shows the tapering of the holes 42 inwardly of the bottle so as to facilitate the dislodging of coagulated or other clogging particles from said holes. Another form, as shown in Fig. 9, has a group of smaller holes 44 on one side and one large hole 46 diametrically opposite therewith, which are aligned and opened and closed by a single control aperture in a top disc such as the type of holes 43 of Fig. 4 and by the angular adjustment herein before described. Other suitable aperture arrangements may be provided to accommodate the type, the density or consistency of the substance, or food or liquid to be dispensed through said regulating device. In connection with nursing bottles the regulation of such apertures allow variable control for the various types of formulas for feeding infants, and each such formula can be fed at a suitable rate of speed. These discs may be made of transparent or any plastic or similar suitable material.

In the form shown in Fig. 4 the upper disc is formed by the top of the cap 47 in other respects the device operates as heretofore described.

Fig. 5 illustrates the use of a cap 48 on the neck of a tubular bottle 16 so as to provide a smaller or reducing neck 49 for a smaller nipple 51. In the neck 49 of this cap 48 the same flow control is used as heretofore described. This cap 48 is shown to illustrate also another feature which can be used in connection with all the arrangements herein described. This feature is the exterior indication of the flow adjustment. A mark 52 is provided on the neck of the bottle 16 or on the neck adjacent to a disc carrying cap 48. On the flange of the cap 48 are provided a series of markings 53 which are graduated in accordance with the relative position of the opening of the upper disc on the lower disc in the regulating device heretofore described. For instance, the marking and graduation "1" indicates alignment for the smallest opening, and the subsequent markings indicate alignments for correspondingly larger openings. By such exterior markings the passage can be regulated by turning the cap or the nipple so that the desired indicia on the flange are brought into alignment with the fixed marking 52 on the neck and thus the flow can be controlled without the necessity of taking the device apart or in some instances even without removing the nipple.

In Fig. 10 I show a modified form wherein the superimposed discs are formed as the closed ends of substantially conical or dome-like members extended inside the nipple. In this form the inner cone 54 is open at the bottom and has its flange 56 resting on the usual resiliently compressible gasket 33 as heretofore described. The closed end 57 of this cone 54 is flat so as to form a disc with apertures 58 therethrough. A dome-like cap 59 fits inside a so-called breast nipple 61 so as to reenforce the same and prevent its collapsing. The open end of this dome-like cap 59 is interiorly threaded at 62 so that it can be screwed on the top of a neck of a bottle or on any neck for the nipple. The apex of this dome-like cap 59 is flat

so as to form a control disc 63 which is provided with an opening 64 for regulating the flow through the openings 58 of the lower disc 57 in the manner heretofore described. In this form an adjustment of the flow can be accomplished by turning the nipple and its dome-like lining cap 59 relatively to the inner stationary cone 54.

In the form shown in Fig. 11 the control arrangement is extended to the inside of the mouthpiece of the nipple. It is advisable in this structure to have the discs slightly compressible or flexible. The upper disc 66 is held in a suitable annular slot 67 in the passage of the mouthpiece 68 of the nipple so that it turns with the nipple. A stationary disc 69 is held against the lower side of the upper disc 66 by means of a bar 71, which latter in turn extends from a perforated disc 72 resting on a suitable resiliently compressible gasket 73. In this form, in order to hold the base of the lower disc 69, I provide a cap 74 which, when screwed on the bottle neck, forces the perforated disc 72 on the gasket 73 and holds it and the disc 69 therewith in place. The nipple in this case is attached over the cap 74 and the control is accomplished and regulated by the turning of the nipple or the cap under it. The nipple is fitted over the cap in such a manner that the upper disc 66 is firmly held by the tension of the resilient nipple on the lower disc 69 as the nipple and cap are turned to change the relative position of discs 66 and 69. As in other forms shown, the cap may be turned for adjustment without danger of leakage, since the resiliently compressible gasket permits considerable up or down movement of the screw cap without losing sealing contact and without losing the necessary pressure against the discs. If desired the nipple may be used without the control disc 69 and its supporting base. In that case the screw cap is screwed down until it contacts, the gasket, and a disc with suitable hole or holes is inserted in place of the disc 66. A single disc control would make it possible to have a doctor prescribe certain discs for proper feeding which could be inserted. This would leave the control in the hands of the doctor. Such single discs can also be used with all other controls herein shown. Discs being of non-swelling material would permit finer holes, which would not change because of swelling or deterioration.

In the form shown in Fig. 12 the nipple 77 has a tubular comparatively stiff base 78 which is threadedly or otherwise attached in the usual manner to the neck 79 of a bottle 81. The lower disc 82 in this form rests on a compressible gasket 33 in the neck 79 as heretofore described. The upper or control disc 83 is inserted into suitable slots 84 on the inside of the thick base flange 78 of the nipple 77.

In the form shown in Fig. 14 a disc 86 containing one or more perforations is supported on the gasket 33 in the neck of a bottle 16 in the manner heretofore described. In this form the nipple 87 is provided with a flexible thicker base portion 88. The tubular portion of the nipple 87 extends through a hole 89 of a cap 91 which latter is threadedly secured to the outside of the neck of the bottle 16. The top 92 of the cap 91 is conical and is so shaped that it presses the thickened base portion 88 of the nipple 87 inwardly when the cap 91 is tightened or screwed upon the neck of the bottle 16, and allows said base portion 88 of the nipple 87 to expand when the cap 91 is unscrewed from the bottle. The apertures 93 in the disc 86 are arranged in ra-

dially spaced circumferential series toward the periphery of the disc 86 so that as the nipple base 88 is partly collapsed onto the disc 86 by the cap top 92 it covers these apertures 93 in accordance with the relative positions of the cap top 92. In this form the flow to the nipple is controlled, therefore, by positioning the cap so as to exert greater or lighter pressure by the cap top 92 upon the lower portion 88 of the nipple 87, and thereby to hold said nipple compressed to a desired degree.

In all the forms herein described and especially in connection with the double neck structure first described, it is advisable that the nursing bottle be held in a predetermined position for feeding so as to prevent spilling of fluid out through the vent neck. Both the efficiency of the feeding as well as the proper holding of the nursing bottle is facilitated by shaping the mouthpiece of the nipple in an oval or elongated form as shown in 94 in Fig. 15. The shape of this nipple is such that the corners of it fit the corners of the mouth of the infant and regulate the sucking in of the air by the infant. This also facilitates the holding of the nursing bottle at that desired angle. The nipple is placed upon one of the necks of such double neck or upon the neck of the bottle so that the elongation of this nipple 94 is on an axis substantially at right angles to the portion of the nursing bottle which is to be at the top during the feeding.

It is to be further noted that nipples may be perforated in the mouth piece to provide additional suction holes, as shown in Fig. 3. Such suction holes serve to prevent collapsing by equalizing the suction force exerted by the infant on the inside of the nipple with the suction force inside of the infant's mouth. Thus very soft nipple tips may be used as long as the portion of the nipple on which the lips rest and seal themselves is firm enough to withstand suction without collapsing. In connection with the devices herein described more or larger openings and slots can be provided on the mouth piece of the nipples, than in previous nipples, because the control of the flow is accomplished by regulation independent of the cavity or openings of the nipple. Such larger openings on the mouth piece of the nipple will obviate a common disadvantage of previous nipples namely the closing of the nipples on account of swelling or the like action of the material of the nipple. In nursing with applicant's device the rate of speed of feeding is substantially independent of the size of the opening in the mouth piece of the nipple and may be controlled accurately by holes in the discs which are not subject to change by swelling.

In operation the adaptor cap or nipple and the regulator device can be easily and quickly removed and cleaned. The device allows greater facility in sterilization and cleaning than devices heretofore used. When the bottle is filled with the desired formula or liquid than either the adaptor cap or the regulator, as the case may be, is put in place as heretofore described and the vent holes are adjusted to the desired degree of air intake. If a regulator is used also in the nipple then the same is also adjusted to the desired degree of passage and the bottle is ready for use. There is no air bubbling though the liquid because the air pressure is provided above the liquid level in the bottle when in feeding position. In case of clogging of the nipple or of the passages when the double neck structure is

used, the same can be cleared promptly by interchanging the feeding to the other neck which theretofore was used as a vent. The use of the first clogged nipple as a vent accomplishes the self-cleaning of the clogged apertures therein. 5 The device can be made in the form of an attachment to standard nursing bottles or containers, although it is preferable to use a tubular bottle open at both ends to further facilitate cleaning and sterilization. The arrangement and size of the holes is such that they are self-cleaning, and this is so especially in the type shown in Fig. 4. The manipulation of the regulator is very simple. It does not require any special tools or fittings; it is of unitary character; it can be easily assembled, handled, and adjusted and used by the 10 average layman.

The device can be completely closed so as to prevent all leakage when the bottle is out of use, or one or the other neck of the double neck type 15 arrangement may be closed when required, thus affording greater flexibility of the regulation as to the mode and rate of feeding.

I claim:

1. In a nursing bottle having a dispenser neck, a nipple, means threaded on the neck for holding the nipple thereon, a supporting ledge in the dispenser neck, a resiliently compressible frictional element resting on the ledge of the dispenser neck, a disc supported on said compressible 20 element so as to be held by friction against turning movement relatively to said dispensing neck,

a second disc engaged face to face with the first disc and being rotatable with said threaded means relatively to the first disc, said discs having apertures thereon alignable by turning adjustment of the second disc so as to regulate the passage through said discs, and means to connect said second disc with said threaded means for turning the said second disc with said threaded means.

2. In combination a nursing bottle, said bottle having an open end, a substantially rigid cap detachably secured over said open end, a pair of hollow necks extended from said cap in different directions, each neck having a recess formed around said opening, a resiliently compressible friction pad in said recess being so proportioned as to leave space into which the pad expands when compressed, a disc resting on said pad, a second disc resting on said first disc in face to face 25 sealing contact therewith, the superimposed faces of said discs being smooth to form relatively movable sealing surfaces, said discs having apertures therethrough so arranged as to be covered by the opposite disc and to be in registry according to the relative positions of said discs, an apertured cap rotatable on said container and pressing said discs against each other and against said pad, means to connect said second disc to said cap for turning movement with the cap, 30 each cap being adapted to hold a nipple thereon.

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