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(56) Documents cited
GB 0444024 A **DE 2836150 A1** **US 3511407 A**
US 1146639 A

(58) Field of search
 UK CL (Edition K) **B8D DCD DCE DCW10 DCW22,**
B8T TWG TWQ
 INT CL⁵ **A61J 11/00, B65D 23/00 23/04**

(54) **Child feeding bottle**

(57) A child feeding bottle comprises a liquid container (4, fig 3), a teat whereby the child can suck liquid from the container and an one-way air inlet valve 2 operable automatically. The valve comprises a flexible membrane having an opening 3 which admits air into the container when the air pressure within the container becomes depressed relative to the external air pressure, as a result of the feeding action of the child.

The valve may be integral with the teat or a separate component removable from teat or bottle. The valve when separate may be removed and replaced to aid cleaning and is constructed in two parts (fig 2). The membrane of the valve is concave and protruding inwardly and is substantially u-shaped in longitudinal section and may be produced in silicone or similar material.

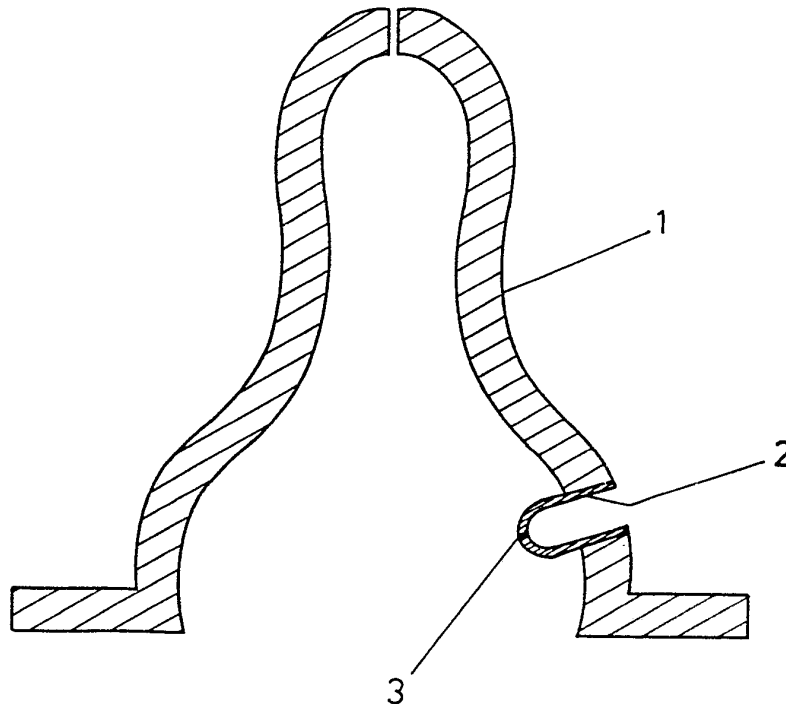


FIG. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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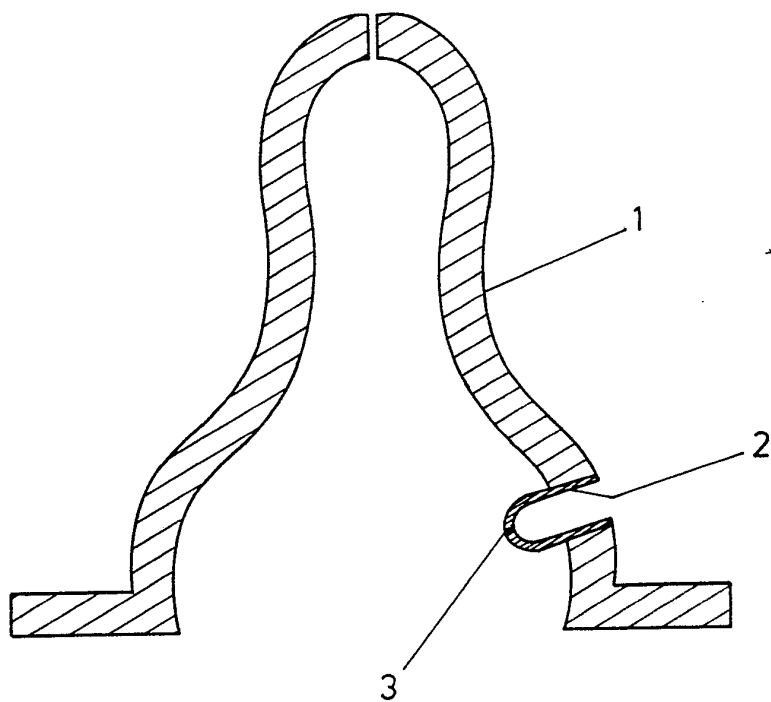


FIG. 1

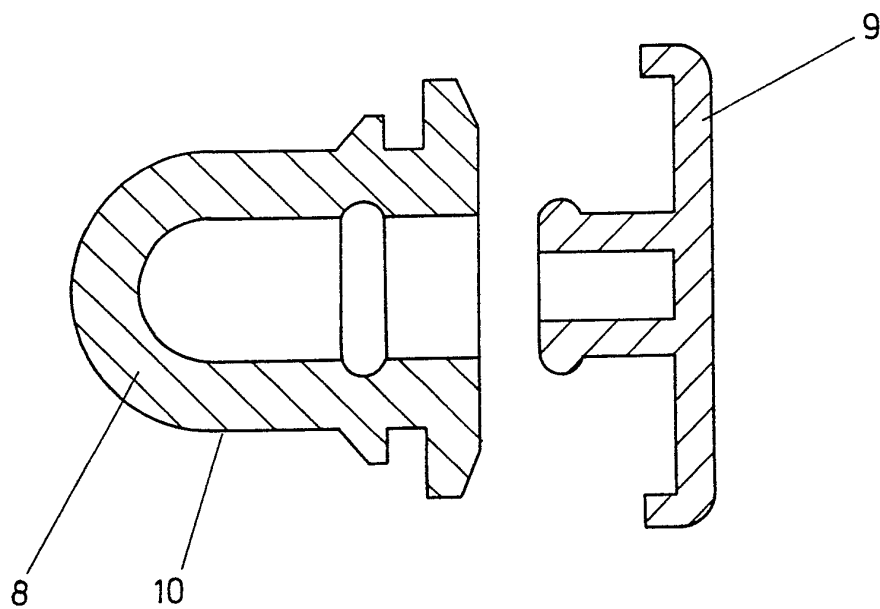


FIG. 2

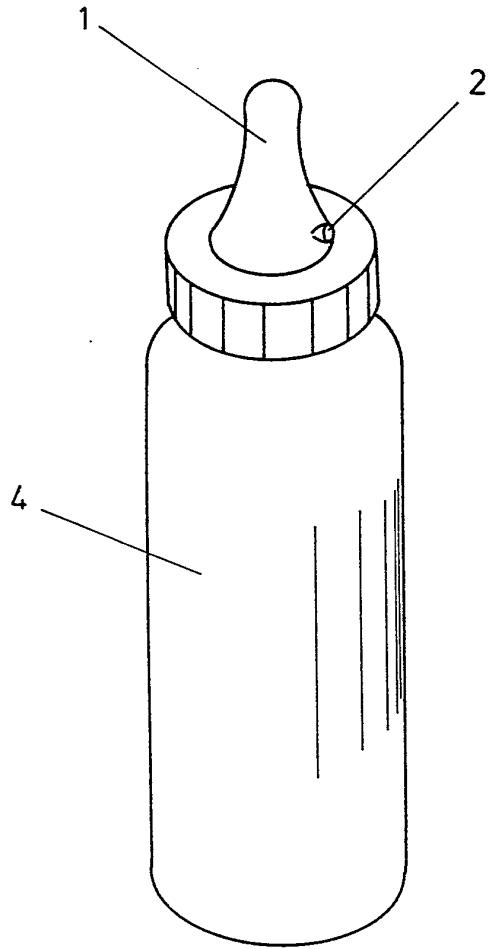


FIG. 3

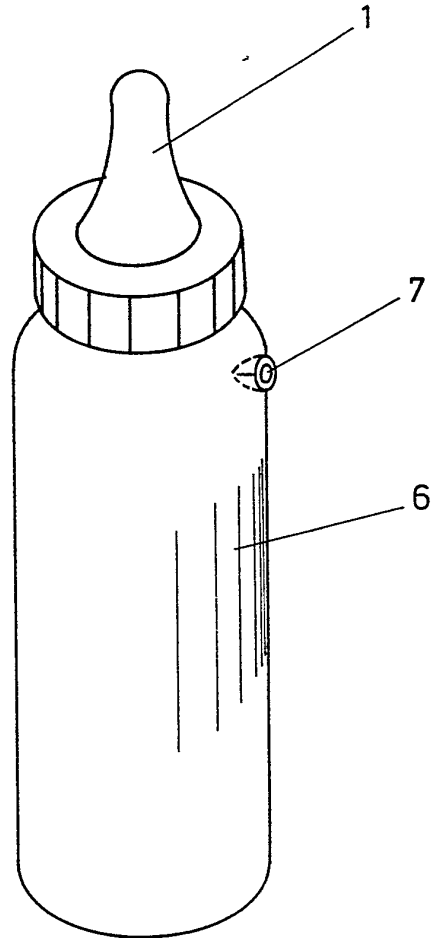


FIG. 4

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CHILD FEEDING BOTTLE

5 This invention relates to nursing bottles and teats, and more particularly to an improved nursing bottle and teat with a removable automatic air inlet valve on the bottle and/or a permanently and integrally produced automatic air inlet valve as an integral part of the teat.

10 Conventional baby feeding bottles have a major disadvantage in that, as the baby withdraws milk or any desired liquid a vacuum is created within the bottle often causing severe pain in the stomach. The reason is that, babies tend to continue their sucking until a vacuum is formed within the bottle, whereby they cannot
15 avoid sucking false air from outside the bottle which frequently creates areophagia, the basic cause of colic.

Many attempts have been made to overcome the problem of formation of vacuum within the bottle by permitting air
20 to enter the baby bottle from a manual or automatic valve mechanism, or the use of a collapsing bag of the disposable type, inserted into a simulated baby bottle which exposes the collapsible bag into atmospheric pressure, whereby as an infant sucks milk from the bag,
25 the bag gradually collapses, and the milk may be withdrawn without the formation of a vacuum in the bag. However, collapsing bag baby feeding systems have disadvantages such as extra cost of bags, having a sufficient amount of bags always in reserve and the
30 whole process of preparing the feed can be time consuming.

Furthermore, existing manual or automatic valve incorporated baby bottles have distinct disadvantages as
35 commercial acceptability of such approaches to the

solution requires low cost of production, assured sealing, proper functioning and maintained sanitation.

5 According to the present invention, there is provided an automatic air inlet valve (hereinafter called the valve) which can be employed to be used removably in connection with a baby feeding bottle and/or produced as an integral part of the teat in order to prevent formation of vacuum within a baby feeding bottle, thus preventing collapse of
10 nipple during a feeding process and reducing the chance of the infant developing colic due to excess air intake.

The valve according to the present invention is composed of a concave elongate semi spherical shape with a slit at
15 its dome which can be produced of silicone or any similar material in a single mould during a manufacturing process and has the aforesaid characteristics and which readily can be boiled and cleaned after each use.

20 In accordance with the present invention, since the valve operates on the principal of pressure difference between inside and outside the baby bottle it may be located at any part of the bottle. Alternatively, one or more valves may be produced as integral part(s) of the teat
25 which has low cost of production and can easily be cleaned together with the teat following each use.

The invention will be further described by way of example, with reference to the accompanying drawings in
30 which:

- Figure 1 is a cross section of the baby feeding teat and the valve in accordance with the present invention;
- Figure 2 is an enlarged cross section of a valve in
35 accordance with the invention, which is designed to be

inserted into an opening on a baby bottle;

- Figure 3 is a perspective view of a bottle and the valve shown in Figure 1, produced as an integral part of the teat; and

5 - Figure 4 is a perspective view of a bottle with the removable valve of Figure 2 in position.

With reference to the drawings, Figure 1 represents a teat 1 for a child feeding bottle, together with an
10 automatic valve 2 produced as an integral part of teat 1 which has a slit 3 across the valve 2 in order to allow the air to enter the bottle when a vacuum is formed within it and a pressure difference between inside and outside the bottle is established. Clearly, when a baby
15 withdraws milk, a vacuum is formed within the bottle resulting in the formation of a pressure difference outside the valve 2 which causes the flow of air through the slit 3 into the bottle, hence, maintains easy flow of milk or any desired liquid during feeding.

20 One of the main advantages of the present invention is the valve 2 is produced as an integral part of the teat 1 of bottle 4 (see Figure 3) therefore, it can easily be boiled and hygenically cleaned following each use.

25 Figure 2 shows a valve 10 which can be used in a bottle, by inserting the valve in an opening in either the teat or the main body (see Figure 4) of the bottle. The valve can be removed and replaced, e.g. for cleaning. In
30 Figure 2, the valve 10 comprises two separate components, 8 and 9. The valve has an air inlet slit (not shown) through which air may pass into the bottle in use.

Figure 4 shows valve 10 in use, as a separate and
35 independent unit, in a feeding bottle. The valve 10 can

be inserted into the opening 7 of bottle 6 before filling it with milk or any other liquid.

5 After each feeding, the valve 10 can easily be pulled out, boiled and cleaned and then reinserted into the bottle opening 7 for further use.

10 The principle of operation of the valve 10 in this embodiment is also based on the formation of pressure difference in both sides of the valve 10 during feeding which results in passing of air into the bottle 4 or 6 through the slit automatically.

15 While the invention has been described in connection with two preferred embodiments, it is not intended to limit the scope of the invention to the particular forms set forth, but on the contrary it is intended to cover such alterations, modifications and equivalents as may be included within the scope and the spirit of this
20 invention.

CLAIMS

1. A child feeding bottle comprising a liquid
5 container, means whereby a child can suck liquid from the
container and an air inlet valve operable automatically
to admit air into the container should the air pressure
within the container become depressed relative to the
external air pressure, as a result of the feeding action
10 of the child.
2. A bottle according to claim 1, wherein the valve
is a one-way valve, allowing air to enter but not leave
the bottle through the valve.
15
3. A bottle according to claim 1 or claim 2, wherein
the valve comprises a flexible membrane having an opening
through which air can pass into the bottle when the
pressure inside the bottle becomes depressed relative to
20 the external air pressure as a result of the feeding
action of the child.
4. A bottle according to claim 3, wherein the valve
membrane is concave and protrudes inwardly into the
25 bottle in use.
5. A bottle according to claim 4, wherein the valve
membrane is, in longitudinal section, substantially U-
shaped.
30
6. A bottle according to any one of the preceding
claims, wherein the air inlet valve is located in the
teat of the bottle.
- 35 7. A bottle according to claim 6, wherein the valve

is integral with the teat.

8. A bottle according to any one of claims 1-5,
wherein the air inlet valve is located in the main body
5 of the bottle.

9. A bottle according to any one of the preceding
claims, wherein the air inlet valve is a separate
component which may be removed from and replaced in the
10 bottle.

10. An air inlet valve for use in a child feeding
bottle according to any one of the preceding claims.

11. A child feeding bottle substantially as herein
described with reference to the accompanying illustrative
drawings.
15

12. An air inlet valve for use in a child feeding
bottle, substantially as herein described with reference
20 to the accompanying illustrative drawings.

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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

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Relevant Technical fields

- (i) UK Cl (Edition K) B8D:DCW10,DCD,DCE,DCW22
B8T:TWG,TWQ
- (ii) Int Cl (Edition 5) B65D:23/00,23/04 A61J:11/00

Search Examiner

ALAN O'DONNELL

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

7 FEBRUARY 1992

Documents considered relevant following a search in respect of claims

1-9,11

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 0444024 A (MACOY) see Figures 3 and 5	1,2,3, 4,10
X	US 3511407 A (PALMA) see Figure 4	1,2,3, 8,9
X	US 1146639 A (MILLER) see Figures 1 and 2	1,2,3, 6,7
X	DE 2836150 A1 (MAPA GMBH GUMMI) see Figure 1	1,2,3,4, 5,6,7

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Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).