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(51) INT CL:
A61J 9/04 (2006.01)

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US 5607074 A	**US 4928836 A**
US 4828126 A	**US 4723668 A**
US 3768682 A	**US 3134495 A**

(58) Field of Search:
INT CL **A61J**
Other: **EPODOC & WPI**

(54) Title of the Invention: **Dual opening nursing bottle**
Abstract Title: **Nursing bottle with an opening at each end and an inlet valve in the base**

(57) A nursing bottle 1 has an open neck 11 and an open base 12. The base is sealed by an element incorporating a one—way air inlet valve 124; the element may be a disc 123 in which a valve 124 is seated, or it may be a teat (113, figure 12) extending into the bottle. The element is secured by an annular bottom cap 121 which screws onto the base of the bottle. The neck of the bottle is closed by a teat 112 secured by an annular top cap which engages with a screw thread on the bottle neck. The inlet valve may have arms of resilient silicone rubber (figure 2) or may be a ball valve (figures 7 and 8). There may be three inlet valves in the base of the bottle (figure 4).

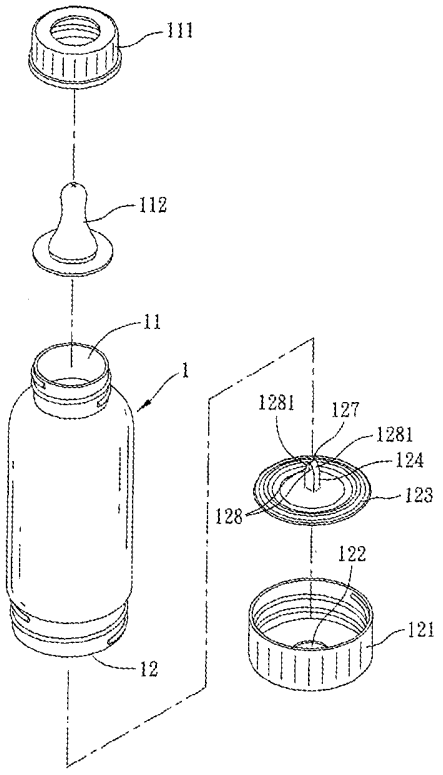


FIG. 1

GB 2477185 A

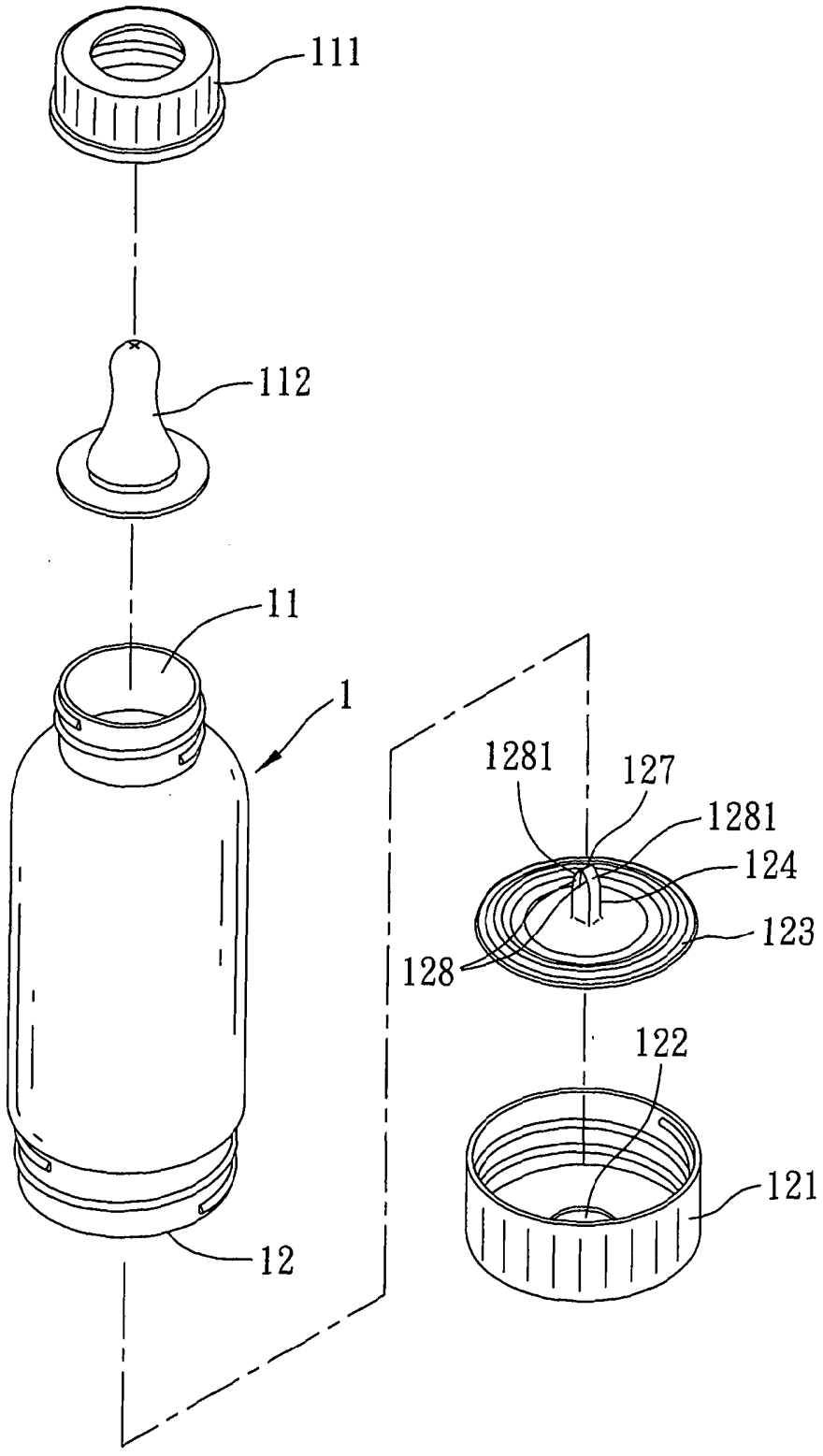


FIG. 1

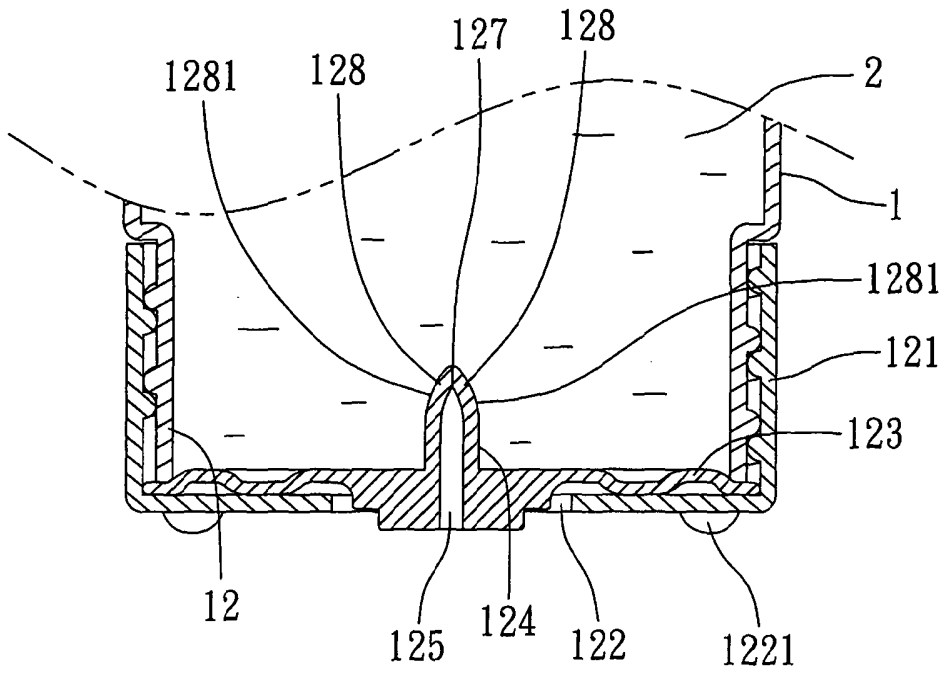

1281
128
127
128
2
1
1281
121
123
12
125
124
122
1221

FIG. 2

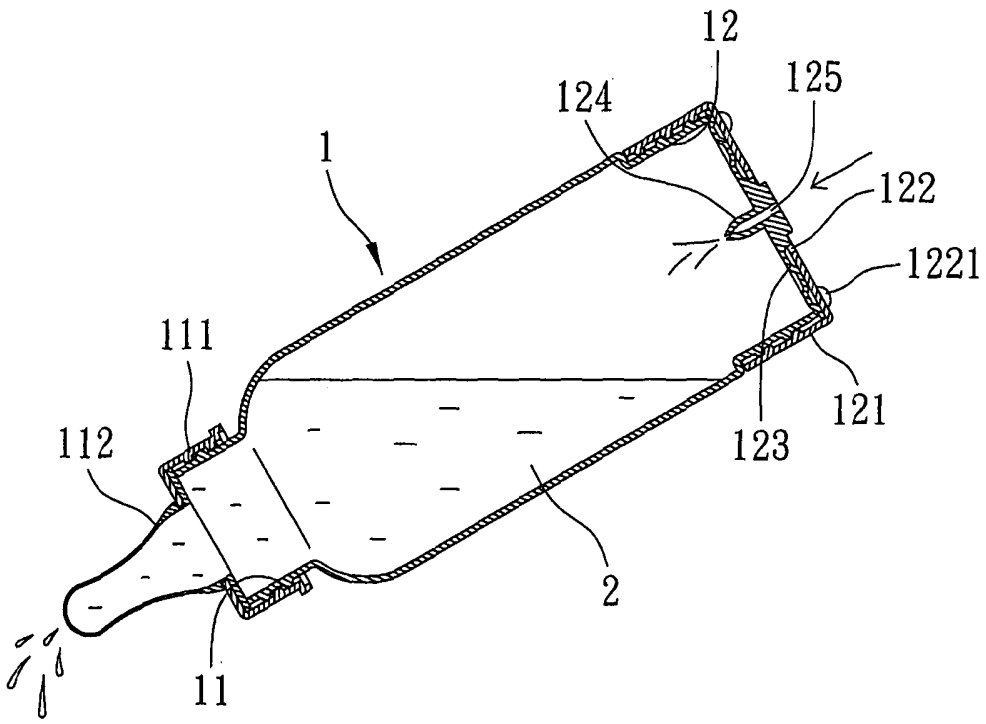

12
125
124
1
122
1221
111
121
112
123
2
11

FIG. 3

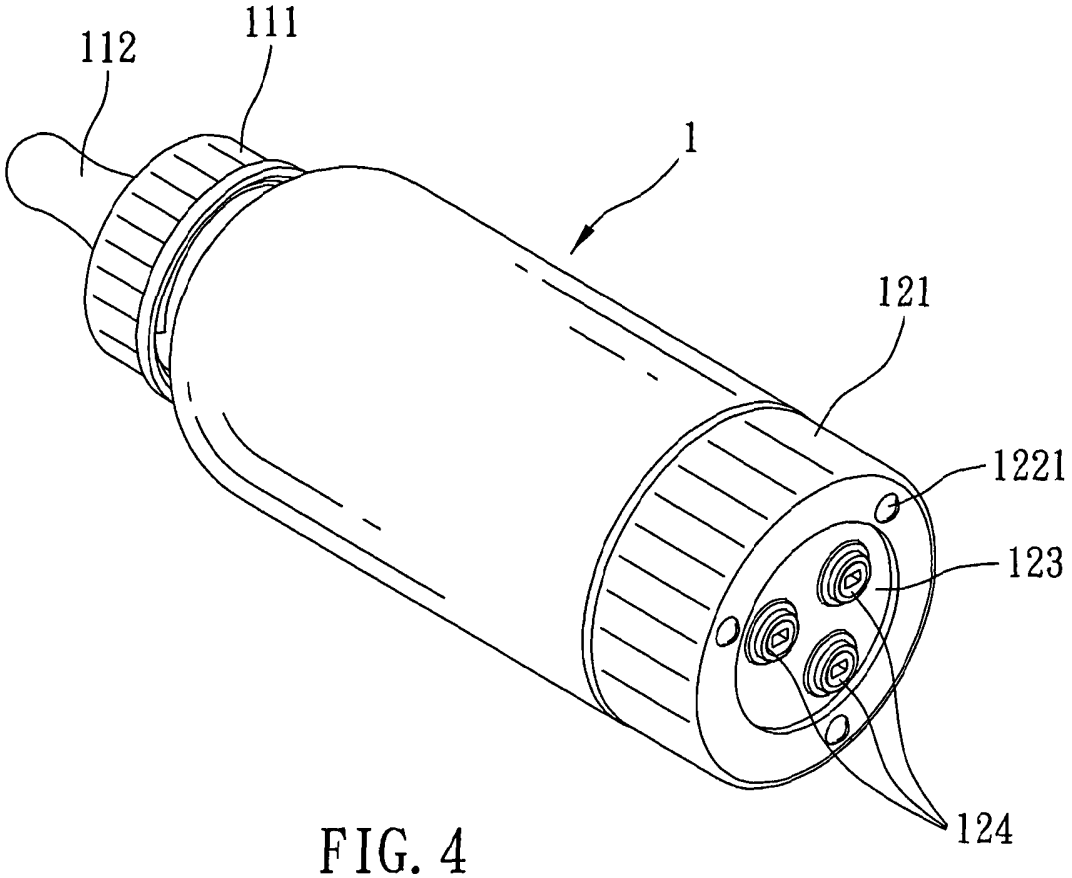

112
111
1
121
1221
123
124

FIG. 4

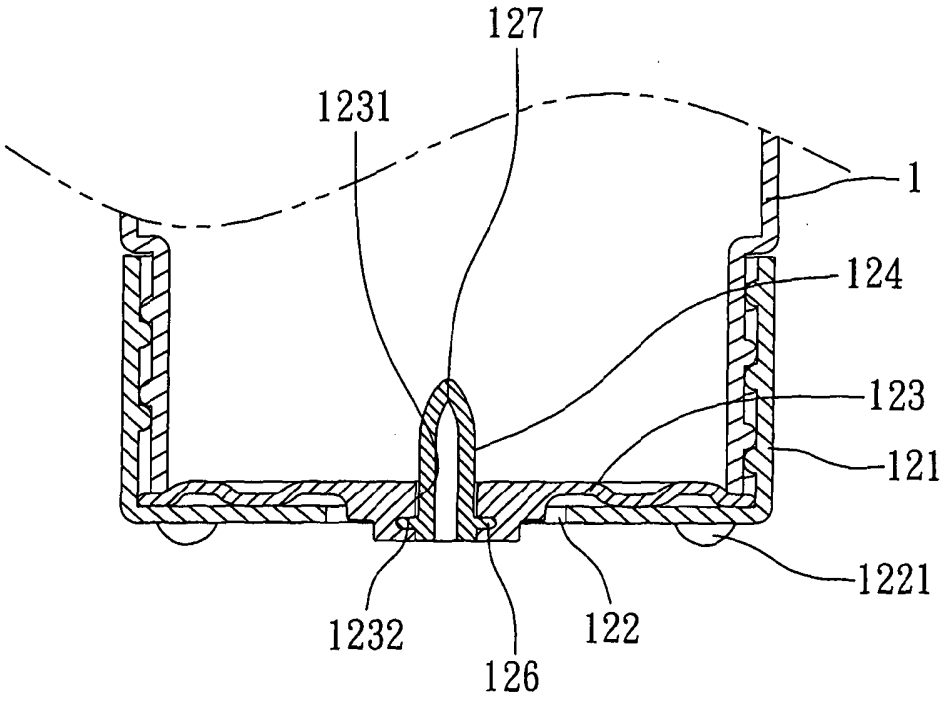

127
1231
1
124
123
121
1221
1232
126
122

FIG. 5

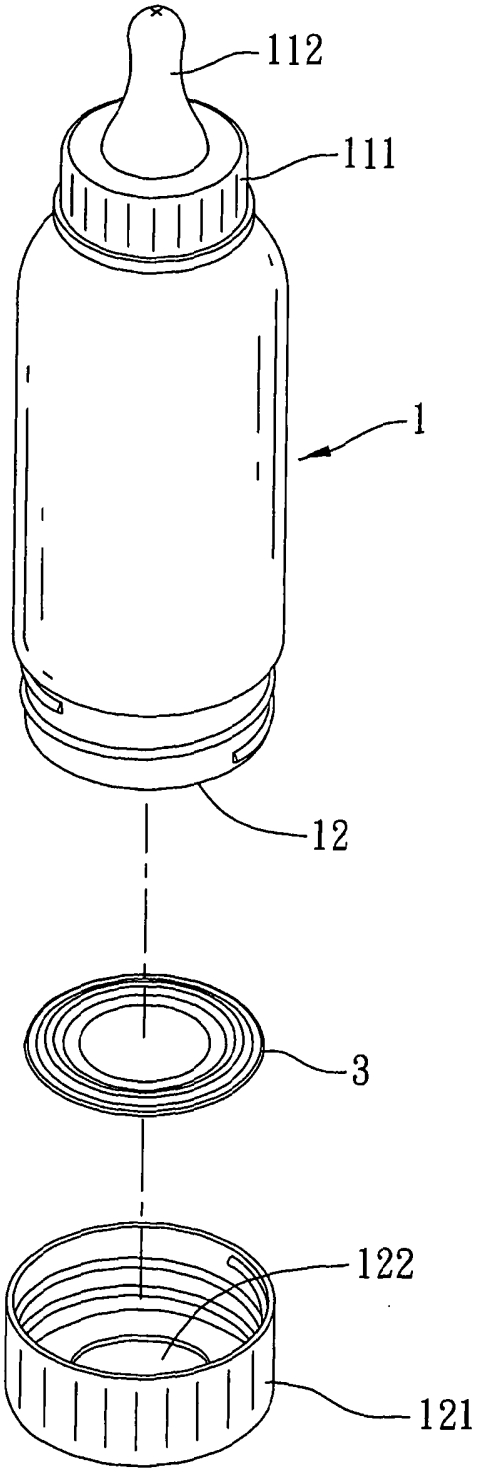


FIG. 6

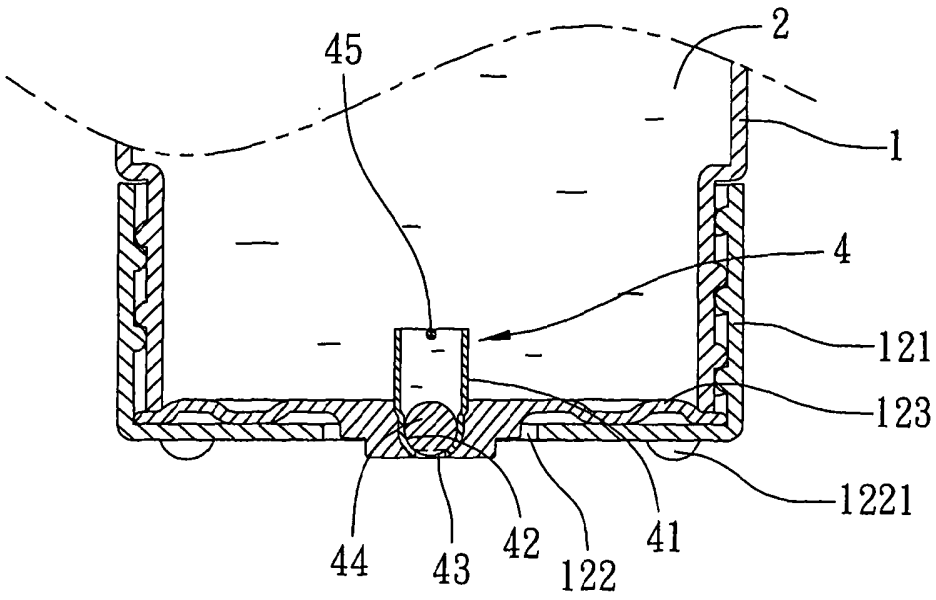


FIG. 7

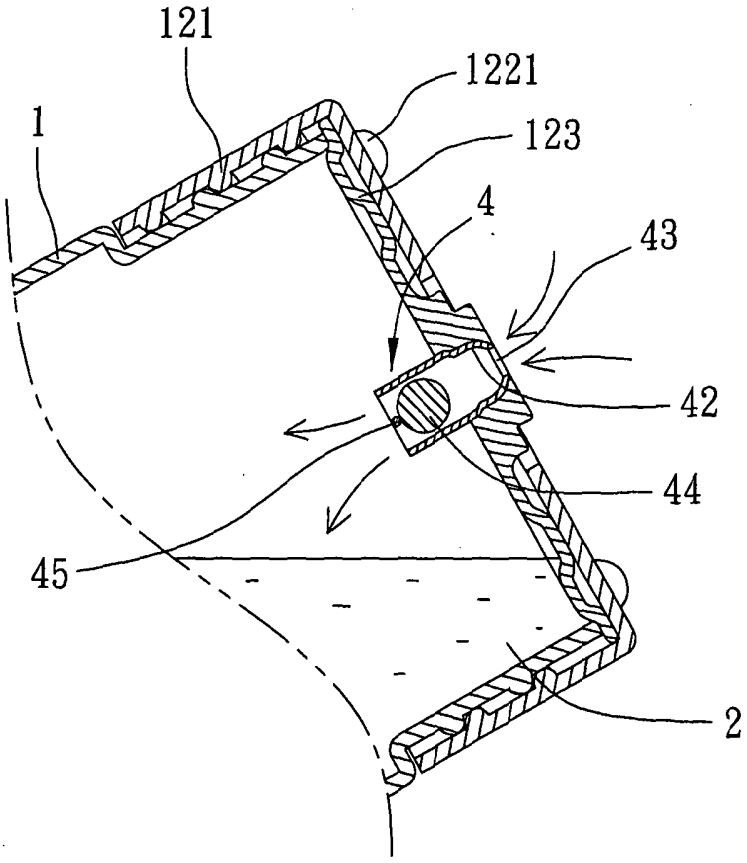


FIG. 8

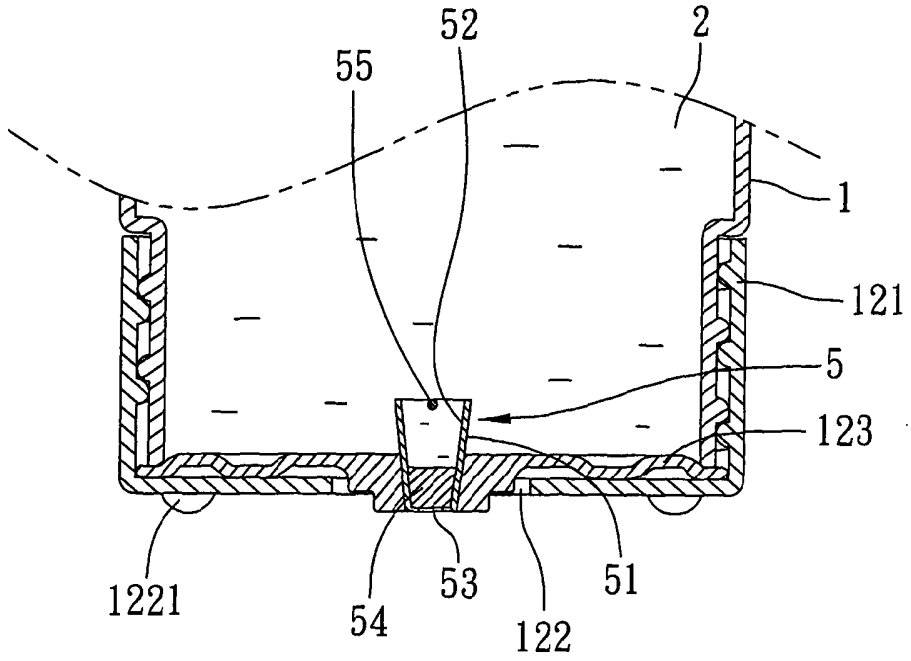

52
2
55
1
121
5
123
1221
54
53
122
51

FIG. 9

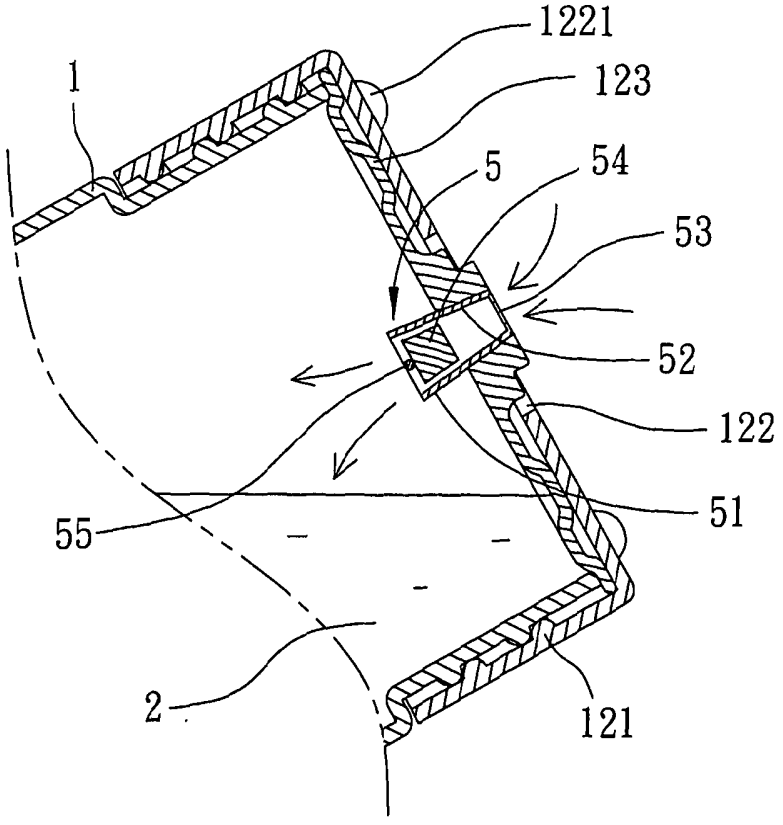

1221
1
123
5
54
53
52
122
55
51
2
121

FIG. 10

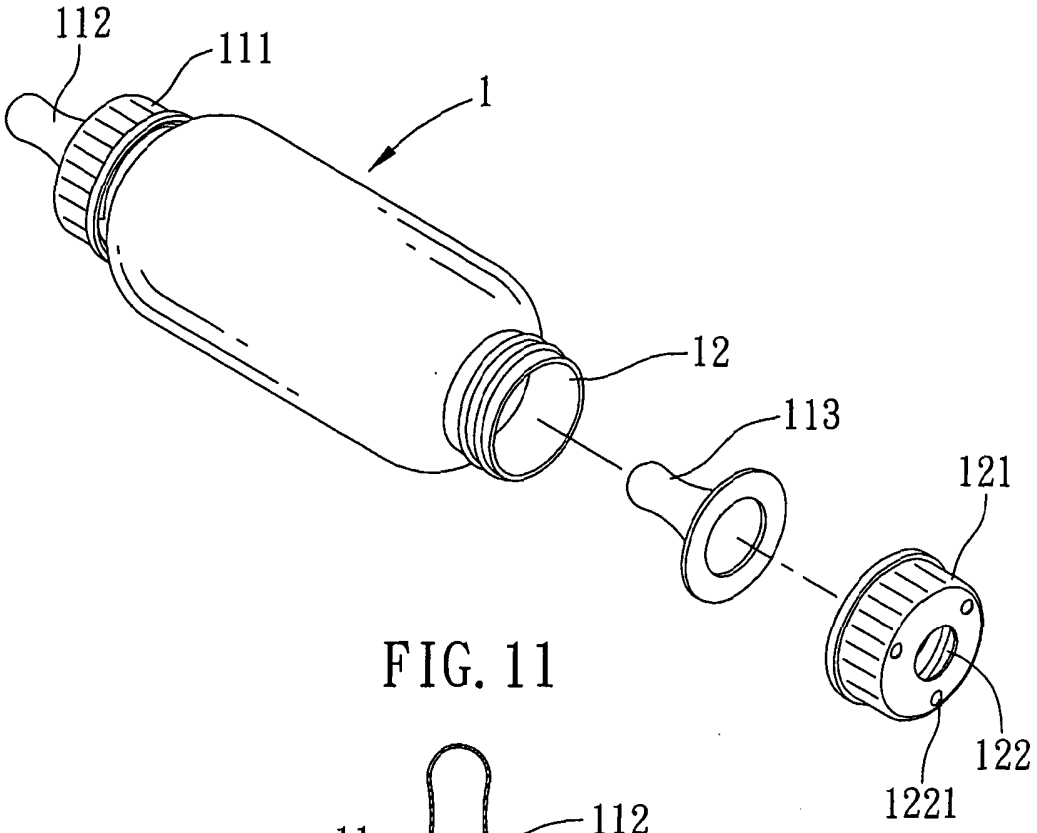

112
111
1
12
113
121
122
1221

FIG. 11

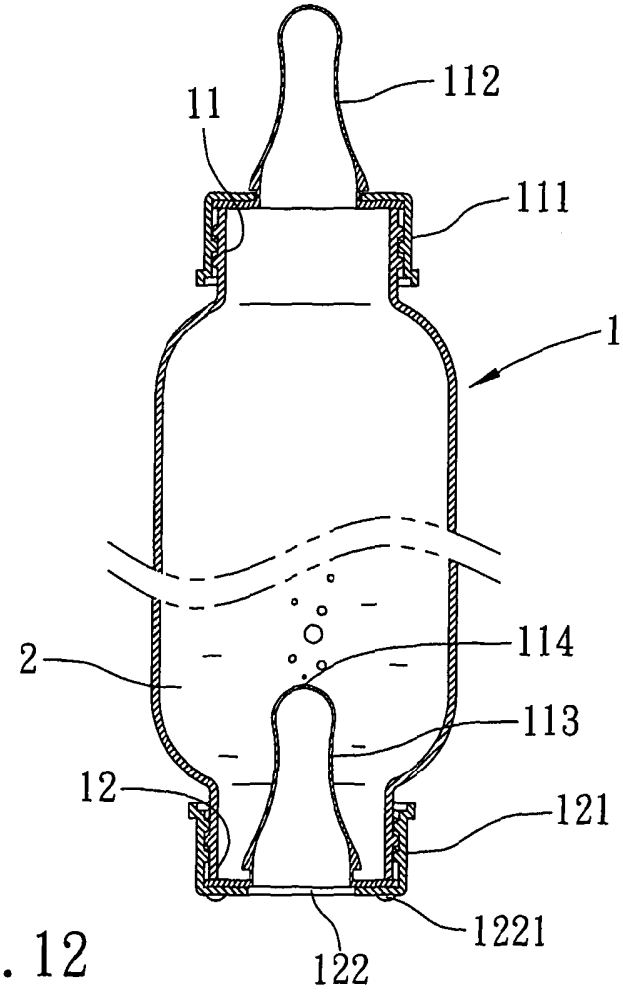
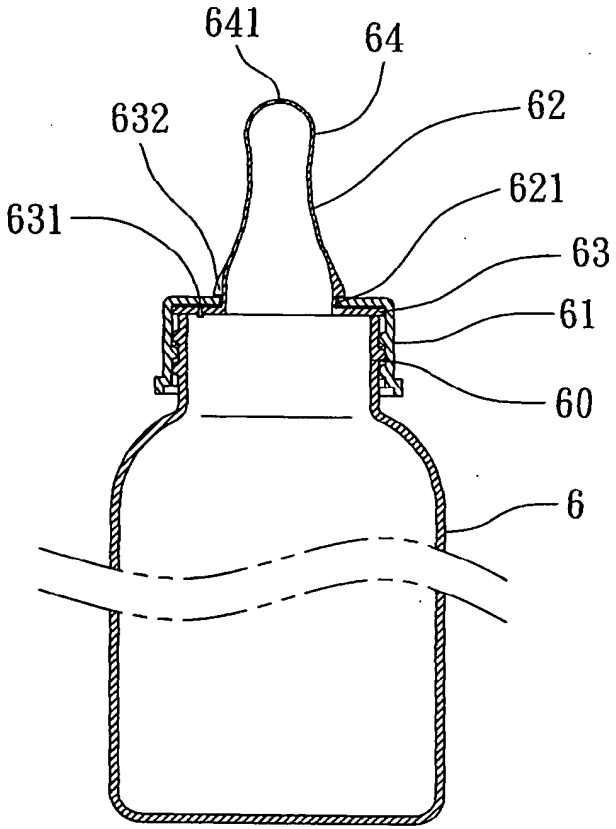
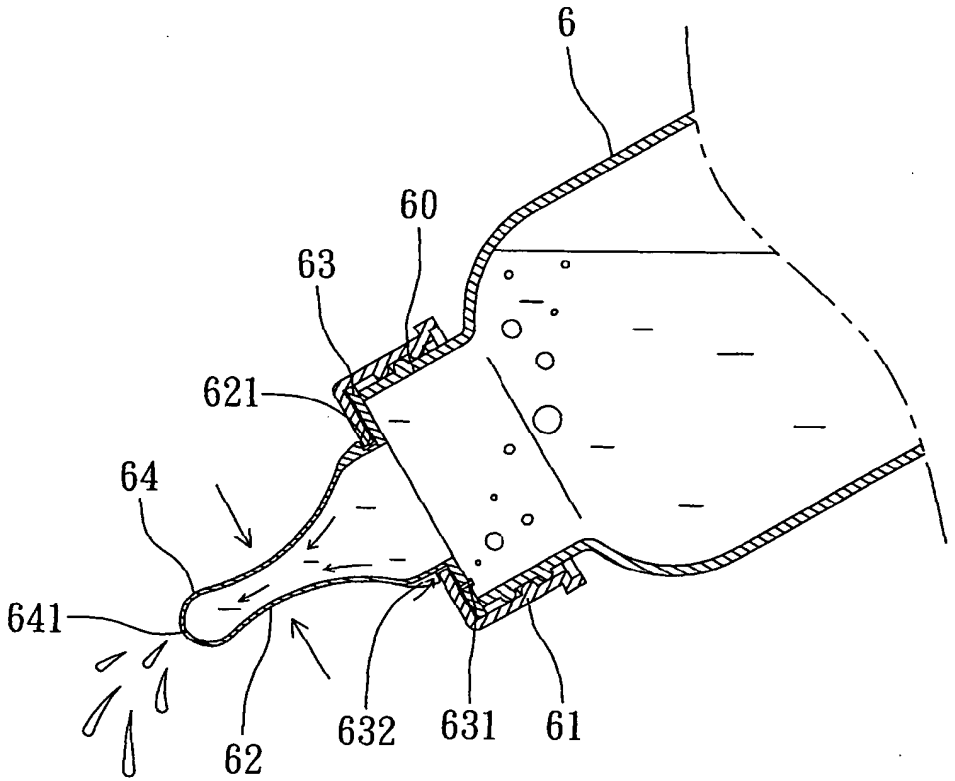

112
11
111
1
2
114
113
12
121
1221
122

FIG. 12



PRIOR ART
FIG. 13



PRIOR ART
FIG. 14

DUAL OPENING NURSING BOTTLE

BACKGROUND OF THE INVENTION

1. Field of the Invention:

The present invention relates to nursing bottles and more particularly, to a dual opening nursing bottle, which facilitates the baby's suction action and cleaning of the component parts.

2. Description of the Related Art:

A conventional nursing bottle, as shown in FIGS. 13 and 14, comprises a bottle body **6** having a bottleneck **60**, a nipple **62** attached to the bottleneck **60** and suspending outside of the bottle body **6** and a cap **61** fastened to the bottleneck **60** to hold down the nipple **62** in place. The nipple **62** has a front tip end **64**, a rear base end **63**, a split **641** formed in the front tip end **64**, air holes **631** formed in the rear base end **63**, air grooves **632** respectively extended from the air holes **631** and a locating groove **621** located on the connection area between the front tip end **64** and the rear base end **63** for the positioning of the cap **61**. The air holes **631** may be opened in factory. Alternatively, the air holes **631** may be closed in factory and selectively opened by the consumer.

When the baby sucks on the front tip end **64** of the

nipple **62**, outside air is drawn through the air grooves **632** and the air holes **631** into the inside of the bottle body **6** so that the baby can suck in the contained fluid out of the bottle body **6**. When the baby releases the mouth from the front tip end **64** of the nipple **62**, the elastic material property of the nipple **62** causes the front tip end **64** to close the split **641** and the air holes **631**. However, if the air holes **631** are opened by the consumer with a piercing member, the air holes **631** may be not equal in size, causing the baby unable to suck in the contained fluid from the bottle body **6** smoothly. Further, because the bottle body **6** has only one opening defining in the bottleneck **60**, it is difficult to clean the inside of the bottle body **6** thoroughly.

SUMMARY OF THE INVENTION

The present invention has been accomplished under the circumstances in view. It is one object of the present invention to provide a dual opening nursing bottle, which facilitates the baby's suction action and cleaning of the component parts.

To achieve this and other objects of the present invention, a dual opening nursing bottle comprises a bottle body having a top opening and a bottom opening, a nipple attached to the top opening of the bottle body, a top cap fastened to the top opening of the bottle body to hold down the nipple in place, a

bottom cap fastened to the bottom opening of the bottle body and having a center through hole, a pad detachably mounted inside the bottom cap to seal the bottom opening of the bottle body, and a one-way air valve installed in the pad for allowing outside air to be sucked into the inside of the bottle body and prohibiting the contained fluid from flowing out of the bottom body through the bottom opening.

To achieve this and other objects of the present invention, a dual opening nursing bottle comprises a bottle body having a top opening and a bottom opening, a first nipple attached to the top opening of the bottle body and suspending outside the bottle body, a top cap fastened to the top opening of the bottle body to hold down the first nipple in place, a second nipple attached to the bottom opening of the bottle body and suspending inside the bottle body, and a bottom cap fastened to the bottom opening of the bottle body to hold down the second nipple in place.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of a dual opening nursing bottle in accordance with a first embodiment of the present invention.

FIG. 2 is a schematic sectional view of a part of the dual

opening nursing bottle in accordance with the first embodiment of the present invention, showing a fluid contained in the bottle body and the one-way air valve closed.

FIG. 3 is a schematic sectional view of the first embodiment of the present invention, showing the dual opening nursing bottle tilted and the one-way air valve opened.

FIG. 4 is an elevational view of a part of the dual opening nursing bottle in accordance with the first embodiment of the present invention, showing the structure of the one-way valve.

FIG. 5 is a schematic drawing of a part of a second embodiment of the present invention, showing the connection arrangement between the one-way valve and the pad.

FIG. 6 is an exploded view of a dual opening nursing bottle in accordance with a third embodiment of the present invention.

FIG. 7 is a schematic sectional view of a part of a dual opening nursing bottle in accordance with a fourth embodiment of the present invention.

FIG. 8 corresponds to FIG. 7, showing the bottle body tilted, outside air drawn through the one-way air valve into the inside of the bottle body.

FIG. 9 is a schematic sectional view of a part of a dual opening nursing bottle in accordance with a fifth embodiment of the present invention.

FIG. 10 corresponds to FIG. 9, showing the bottle body tilted, outside air drawn through the one-way air valve into the inside of the bottle body.

FIG. 11 is an exploded view of a dual opening nursing bottle in accordance with a sixth embodiment of the present invention.

FIG. 12 is a schematic sectional assembly view of the dual opening nursing bottle in accordance with the sixth embodiment of the present invention.

FIG. 13 is a sectional view of a nursing bottle according to the prior art.

FIG. 14 is a schematic sectional view showing a status of use of the nursing bottle according to the prior art.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1~3, a dual opening nursing bottle in accordance with a first embodiment of the present invention is shown comprising a bottle body **1** having a top opening **11** and a bottom opening **12** respectively located on the top and bottom sides thereof, a nipple **112** attached to the top opening **11** of the

bottle body **1** and suspending outside the bottle body **1**, a top cap **111** fastened to the top opening **11** of the bottle body **1** by means of, for example, a screw joint, to hold down the nipple **112** in place, a bottom cap **121** having a center through hole **122** fastened to the bottom opening **12** of the bottle body **1** by means of, for example, a screw joint, a pad **123** mounted inside the bottom cap **121** and at least one one-way air valve **124** installed in the pad **123** for allowing outside air to pass through the center through hole **122** of the bottom cap **121** into the inside of the bottle body **1** and prohibiting flowing of inside milk out of the bottle body **1** through the center through hole **122** of the bottom cap **121**. The pad **123** and the one-way air valve **124** are made from rubber or silicon rubber for the advantage of excellent elastic material property. According to this embodiment, as shown in FIG. 4, three one-way air valves **124** are installed in the pad **123**. Each one-way air valve **124** has a valve flap **128** defining therein a vertically extending cylindrical blind hole **125** in air communication with the atmosphere and a split **127** formed in the valve flap **128** at the top side of the vertically extending cylindrical blind hole **125** between two flat wall portions **1281** of the valve flap **128**. When the bottle body **1** is filled with a fluid (such as water, milk or beverage), the

pressure of the contained fluid forces the two flat wall portions **1281** of the valve flap **128** against each other, thereby closing the split **127**, and therefore the fluid does not leak out of the bottle body **1** through the vertically extending cylindrical blind hole **125** of the valve flap **128** of the one-way air valve **124**. When the bottle body **1** is tilted and the baby is sucking in the fluid **2** through the nipple **112**, the two flat wall portions **1281** of the valve flap **128** are released from the pressure of the fluid **2**, allowing the suction force to draw outside air into the inside of the bottle body **1** through the vertically extending cylindrical blind hole **125** and the split **127**, keeping the pressure inside the bottle body **1** in balance with the atmospheric pressure and facilitating the baby's suction action. Further, when cleaning the dual opening nursing bottle, the user can remove the top cap **111** and the bottom cap **121** from the top opening **11** and bottom opening **12** of the bottle body **1**. Thus, the user can clean every component part of the dual opening nursing bottle thoroughly.

FIG. 5 is a schematic drawing of a part of a second embodiment of the present invention, showing the connection arrangement between the one-way valve and the pad. As illustrated, the one-way air valve **124** and the pad **123** according to this second embodiment are separately made and then

fastened together by means of forcing an outside annular flange **126** of the one-way air valve **124** into engagement with an inside annular groove **1232** in the pad **123**.

FIG. 6 is an exploded view of a dual opening nursing bottle in accordance with a third embodiment of the present invention. According to this third embodiment, the dual opening nursing bottle comprises a bottle body **1** having a top opening **11** and a bottom opening **12** respectively located on the top and bottom sides thereof, a nipple **112** attached to the top opening **11** of the bottle body **1**, a top cap **111** fastened to the top opening **11** of the bottle body **1** to hold down the nipple **112** in place, a bottom cap **121** having a center through hole **122** fastened to the bottom opening **12** of the bottle body **1** and a seal pad **3** detachably mounted inside the bottom cap **121** to seal the center through hole **122** of the bottom cap **121**.

FIGS. 7 and 8 illustrate a dual opening nursing bottle in accordance with a fourth embodiment of the present invention. This fourth embodiment is substantially similar to the aforesaid first embodiment with the exception of the structure of the one-way air valve. According to this fourth embodiment, the one-way air valve, referenced by **4**, comprises a tubular valve body **41** having a semispherical bottom end **42** and a hole **43** in

the semispherical bottom end **42**, a stop member **45** suspending in the top open side of the tubular valve body **41** and a ball **44** movably accommodated in the tubular valve body **41** and adapted for stopping the hole **43** in the semispherical bottom end **42**. When the bottle body **1** holds a fluid **2** therein and is kept in vertical, the ball **44** is forced by the pressure of the fluid **2** to seal the hole **43**. On the contrary, when the bottle body **1** is tilted, the ball **44** moves away from the semispherical bottom end **42** and is stopped inside the tubular valve body **41** by the stop member **45** for allowing outside air to be sucked into the inside of the bottle body **1** through the hole **43**.

FIGS. 9 and 10 illustrate a dual opening nursing bottle in accordance with a fifth embodiment of the present invention. This fifth embodiment is substantially similar to the aforesaid first embodiment with the exception of the structure of the one-way air valve. According to this fourth embodiment, the one-way air valve, referenced by **5**, comprises a valve body **51** having a conical air passage **52** extending through the top and bottom ends thereof, a stop member **55** suspending in the top open side of the conical air passage **52** and a cone **54** movably accommodated in the valve body **51** and adapted for sealing the bottom opening **53** of the conical air passage **52**. When the

bottle body **1** holds a fluid **2** therein and is kept in vertical, the cone **54** is forced by the pressure of the fluid **2** to seal the bottom opening **53** of the conical air passage **52**. On the contrary, when the bottle body **1** is tilted, the cone **54** moves away from the bottom opening **53** of the conical air passage **52** and is stopped inside the tubular valve body **51** by the stop member **55** for allowing outside air to be sucked into the inside of the bottle body **1** through the conical air passage **52**.

FIGS. 11 and 12 illustrate a dual opening nursing bottle in accordance with a sixth embodiment of the present invention. According to this sixth embodiment, the dual opening nursing bottle comprises a bottle body **1** having a top opening **11** and a bottom opening **12** respectively located on the top and bottom sides thereof, a first nipple **112** attached to the top opening **11** of the bottle body **1** and suspending outside the bottle body **1**, a top cap **111** fastened to the top opening **11** of the bottle body **1** by means of, for example, a screw joint, to hold down the first nipple **112** in place, a second nipple **113** attached to the bottom opening **12** of the bottle body **1** and suspending inside the bottle body **1** and a bottom cap **121** fastened to the bottom opening **12** of the bottle body **1** by means of, for example, a screw joint, to hold down the second nipple **113** in place. The bottom cap **121**

has a center through hole **122** and a plurality of raised portion **1221** protruded from the bottom wall and equiangularly spaced around the center through hole **122** for supporting the dual opening nursing bottle on a flat surface. When the bottle body **1** is tilted and the baby sucks the first nipple **112**, outside air is sucked into the inside of the bottle body **1** through the split **114** in the top end of the second nipple **113**. When wishing to clean the dual opening nursing bottle, the user can remove the top cap **111**, the first nipple **112**, the bottom cap **121** and the second nipple **113** from the top opening **11** and bottom opening **12** of the bottle body **1**. Thus, the user can clean every component part of the dual opening nursing bottle thoroughly.

Although particular embodiments of the invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

What the invention claimed is:

1. A dual opening nursing bottle, comprising:

a bottle body adapted for holding a fluid, said bottle body having a top opening and a bottom opening respectively located on top and bottom sides thereof;

a nipple attached to said top opening of said bottle body;

a top cap fastened to said top opening of said bottle body to hold down said nipple in place;

a bottom cap fastened to said bottom opening of said bottle body, said bottom cap having a center through hole;

a pad detachably mounted inside said bottom cap to seal said bottom opening of said bottle body; and

at least one one-way air valve installed in said pad for allowing outside air to be sucked into the inside of said bottle body and prohibiting a contained fluid from flowing out of said bottom body through said bottom opening.

2. The dual opening nursing bottle as claimed in claim 1, wherein each said one-way air valve has a valve flap defining therein a vertically extending cylindrical blind hole in air communication with the atmosphere, and a split formed in said valve flap at a top side of said vertically extending cylindrical blind hole between two flat wall portions of said valve flap;

when said bottle body is filled with a fluid, the pressure of the contained fluid forces said two flat wall portions of said valve flap against each other to close said split; when said bottle body is tilted and said nipple is sucked by a baby, said two flat wall portions of said valve flap are released from the pressure of the contained fluid, allowing the suction force to draw outside air into the inside of said bottle body through said vertically extending cylindrical blind hole and said split.

3. The dual opening nursing bottle as claimed in claim 1, wherein each said one-way air valve is made from a material group consisting of rubber and silicon rubber.

4. The dual opening nursing bottle as claimed in claim 1, wherein each said one-way air valve is formed integral with a part of said pad.

5. The dual opening nursing bottle as claimed in claim 1, wherein said pad has an inside annular groove formed in each of at least one hole thereof; each said one-way air valve has an outside annular flange extending around the periphery thereof and forced into engagement with the respective inside annular groove of said pad.

6. The dual opening nursing bottle as claimed in claim 1, wherein said pad is a seal pad.

7. The dual opening nursing bottle as claimed in claim 1, wherein said bottom cap has a plurality of raised portions protruded from a bottom wall thereof and equiangularly spaced around said center through hole.

8. The dual opening nursing bottle as claimed in claim 1, wherein each said one-way air valve comprises a tubular valve body, said tubular valve body having a semispherical bottom end and a hole in said semispherical bottom end, a stop member suspending in a top open side of said tubular valve body and a ball movably accommodated in said tubular valve body and adapted for stopping the hole in said semispherical bottom end of said tubular valve body; when said bottle body holds a fluid therein and is kept in vertical, said ball is forced by the pressure of the contained fluid in said bottle body to seal said hole in said semispherical bottom end of said tubular valve body; when said bottle body is tilted, said ball moves away from said semispherical bottom end and is stopped inside said tubular valve body by said stop member for allowing outside air to be sucked into the inside of said valve body through the hole in said semispherical bottom end of said tubular valve body.

9. The dual opening nursing bottle as claimed in claim 1, wherein each said one-way air valve comprises a valve body,

said valve body having a top open side, a bottom opening and a conical air passage extending between said top open side and said bottom opening, a stop member suspending in said top open side of said tubular valve body and a cone movably accommodated in said tubular valve body and adapted for sealing the bottom opening of said tubular valve body; when said bottle body holds a fluid therein and is kept in vertical, said cone is forced by the pressure of the contained fluid in said tubular bottle body to seal the bottom opening of said valve body; when said bottle body is tilted, said cone moves away from said bottom opening of said tubular valve body and is stopped inside said tubular valve body by said stop member for allowing outside air to be sucked into the inside of said bottle body through said conical air passage.

10. A dual opening nursing bottle, comprising:

a bottle body adapted for holding a fluid, said bottle body having a top opening and a bottom opening respectively located on top and bottom sides thereof;

a first nipple attached to said top opening of said bottle body and suspending outside said bottle body;

a top cap fastened to said top opening of said bottle body to hold down said first nipple in place;

a second nipple attached to said bottom opening of said bottle body and suspending inside said bottle body; and

a bottom cap fastened to said bottom opening of said bottle body to hold down said second nipple in place.

11. A dual opening nursing bottle substantially as hereinbefore described and with reference to Figures 1-12.

Application No:	GB1021951.7	**Examiner:**	Andrew Hughes
Claims searched:	1-11	**Date of search:**	22 February 2011

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,P	1-11	CN201609504 U (FENG) same disclosure
X	1-4,6,7	GB 2318573 A (SIDI & DENBY-SIDI) whole document
X	1-4,6,7,10	US 3134495 A (CARBONEL) particularly figure 1 and lines 30-34 of column 1
X	1-4,6,10	US 6209736 B1 (CHEN & CHENG) whole document
X	1-4,6,7,10	WO 2004/002397 A1 (NOVATEX GMBH) whole document
X	1-4,6	US 5699921 A (RODRIGUEZ) whole document
X	1,3,4,6,10	US 4723668 A (CHENG) whole document
X	1,3,4,6	GB 2238729 A (SIDI & DENBY-SIDI) whole document
X	1,5,9	US 5607074 A (DE GENNARO) whole document
Y	5	GB 2342646 A (MCGANTY) flanged valve 1; combine with any of the 'X' documents
Y	5	US 4828126 A (VINCINGUERRA) combine with any of the 'X' documents

Y	8	US 3768682 A (MEYERS & MIOLLA) particularly figure 2; combine with any of the 'X' documents
Y	8	CN2136659 Y (WANG) combine with any of the 'X' documents
Y	8	DE 19951846 A1 (ROIDER) combine with any of the 'X' documents
Y	9	US 4928836 A (WU & WU) combine with any of the 'X' documents
Y	9	JP51015479 U valve 30; combine with any of the 'X' documents

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

A61J

The following online and other databases have been used in the preparation of this search report

EPODOC & WPI

International Classification:

Subclass	Subgroup	Valid From
A61J	0009/04	01/01/2006