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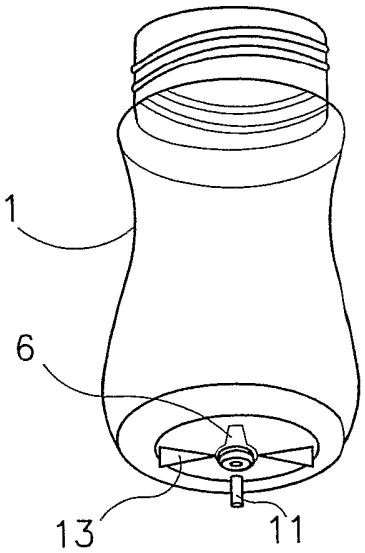
Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** METHOD FOR THE MANUFACTURE OF A BABY FEEDING BOTTLE BEING PROVIDED WITH A ONE-WAY VALVE



(57) **Abstract:** The present invention relates to a method for the manufacture of a baby feeding bottle being provided with a one-way valve. The one-way valve carries at its end a tail. The bottle has an opening at the top through which said valve is inserted by any suitable inserting means. Said valve is inserted up to the end through a small round opening having a suitable size corresponding to the groove of the valve being located at the bottom of said bottle. Through the round opening the valve is pulled by any suitable pulling means inside the bottle until the bottom of the bottle is closed hermetically by the valve. Finally the tail of the valve is cut off by any cutting means.

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Method for the Manufacture of a Baby Feeding Bottle Being Provided with a One-Way Valve

The present invention relates to a method for the manufacture of a baby feeding bottle being provided with a one-way valve.

There are known many bottles for feeding infants. Such bottles are mainly made of a soft material, e.g. an elastomer, rubber or plastic. When using said bottles the infant sucks on the nipple which is located at the top of the bottle. Since the bottle is a closed container, during nursing a vacuum is formed, as a result of this the infant is forced, while eating, to release his mouth from the nipple and to adjust the pressure in order that the food can come out. During the relaxation from the nipple, the infant swallows air, and thus causes, according to a widespread theory, colic pain.

Many attempts were made to solve the problem of the vacuum, by using a tubule, situated inside the bottle and connected to an external conduit on the cap. The tubule balances in a fixed manner the air pressure in the bottle known as "Dr. Brown method" which is described *inter alia* in U.S. Patent No. 5,570,796 and U.S. Patent No. 5,779,071. The main deficiency of this method is the multiplicity of parts required due to which the assembly, disassembly and cleaning of the bottle are complicated.

An additional system of such bottle which is more widespread is to use a nipple which is located at the top of said bottle and provided with a number of valves, which valves penetrate air from the outside inward. The main deficiency in this system is that the penetration of the air occurs when it passes through the baby food, which is blended with it, is swallowed and permeates to the stomach.

There are known many baby feeding bottles, *inter alia*, being provided with one-way valves, e.g. such described in British Patent Application No. 2422646. However there is not known any suitable method to manufacture such a baby feeding bottle provided with a one-way valve of an easy and cheap mechanism. i.e. with easy insertion of the on-way valve. It was thus an important object to find such a method.

The present invention thus relates to a method for the manufacture of a baby feeding bottle being provided with a one-way valve (hereinafter: "valve") which valve carries at its end a tail, said bottle having an opening at the top through which said valve is inserted by any suitable inserting means, e.g. any

suitable tool such as tweezers etc, which valve is inserted up to the end through a small round opening having a suitable size corresponding to the groove of the valve being located at the bottom of said bottle, through which round opening the valve is pulled by any suitable pulling means, e.g. manual or automatic mechanical tool inside the bottle until the bottom of the bottle is closed hermetically by the valve, finally the tail of the valve being cut off, e.g. by any cutting means e.g. cutting tools such as scissors, a knife etc.

More specifically, the insertion of the valve is suitably performed by means of holding the valve with a suitable tool, e.g. tweezers, from the direction of the top opening of the bottle until it reaches said round opening, which is located at the bottom of the bottle. The valve is then pulled with the aid of said pulling means inside the bottle opening and thus passes the basis of the round opening located at the bottom of the bottle. During the passage it is contracted, due to the force of gravity. The groove, which was arranged in the valve for this purpose, eases its entry, and expands after passing the basis. In the next stage the tail of the valve extending outwards is cut off, with the help of a cutting tool, e.g. scissors or a knife. As a result of said action the bottle is hermetically closed.

The valve is advantageously made from a soft material, e.g. an elastomer, rubber or plastic, in such a manner that it fulfills two functions simultaneously:

a. causes the valve to be one-way; and

b. seals the bottom opening of the bottle with no need for sealing material.

The advantage of said one-way valve is that the air in the bottle comprising same does not blend with the food and the cleaning of said bottle is simple.

In a preferred embodiment of the present invention the valve of the present invention is composed of a common one-way valve having the addition of a tail e.g. the valve having a close trimmed triangle structure ending in two plates in which the upper plate is larger then the lower plate; and between both plates a groove being present; which lower plate being connected to an open cylinder which is being a tail. The inside space of the valve is closed in the triangle structure and open beneath the lower plate in the cutting section.

The patent comprises the planned addition of a valve's "tail", which enables pulling it inward through the round opening and its location. In contrast

to the pulling system as suggested here, due to the soft material, from which the valve is made, there is no other possibility to push it inward, inside the round opening. Such a pushing attempt would cause expansion of the elastomer and impenetrability. The addition of the tail to the valve enables its pulling inward, its location and the cutting off of the excess tail later on.

The present invention will now be illustrated with reference to the accompanying drawings without being limited by them. Identical parts appearing in separate figures are being indicated by the same numerals. In said drawings:

Fig. 1 shows a side view of the closed bottle according to the present invention without the valve;

Fig. 2 shows a side view of the bottle according to the present invention in the insertion stage of the valve;

Fig 2a shows a detailed view of the valve of Fig. 2 according to the present invention;

Fig. 3 shows a perspective view of the bottle provided with a valve, according to the present invention, in the pulling stage;

Fig 3a shows a detailed view of the valve of Fig. 3 being part of the bottle, according to the present invention;

Fig. 4 shows a perspective view of the bottle being provided with a valve, according to the present invention in the cutting position; and

Fig 4a shows a detailed view of the valve of Fig. 4 according to the present invention.

Fig. 1 shows empty bottle (1) closed with cover (2) having round opening (3) at the bottom of bottle (1).

Fig. 2 shows empty bottle (1) being provided with opening (4) at the top and with round opening (3) at the bottom. Upon opening (4) is shown tweezers (5) holding at its bottom valve (6). Valve (6) is shown in an enlarged structure as Fig. 2a. Valve (6) is composed of a close trimmed triangle structure (7). Said structure (7) is provided with two plates (8) and (9) in which upper plate (8) is larger then lower plate (9). Between both plates (8) and (9) groove (10) is present. Lower plate (9) is connected to an open cylinder being tail (11).

Fig. 3 shows a perspective view of bottle (1) and Fig. 3a shows a bottom view of valve (6) being part of bottle (1), valve (6) being inserted into bottom opening (3) and pulled downwards with the aid of tail (11) by hand (12)

Figs. 4 and 4a show the final position, i.e. valve (6) is extending through round opening (3) and closes same hermetically. Tail (11) extends outwards and is cut by a cutting tool (13), e.g. scissors, a knife etc. Then the bottle is ready to be used.

CLAIMS

1. A method for the manufacture of a baby feeding bottle being provided with a one-way valve (hereinafter: "valve") which valve carries at its end a tail, said bottle having an opening at the top through which said valve is inserted by any suitable inserting means, which valve is inserted up to the end through a small round opening having a suitable size corresponding to the groove of the valve being located at the bottom of said bottle, through which round opening the valve is pulled by any suitable pulling means inside the bottle until the bottom of the bottle is closed hermetically by the valve, finally the tail of the valve being cut off by any cutting means.

2. A method according to Claim 1, wherein the valve is a close trimmed triangle structure ending in two plates in which the upper plate is larger than the lower plate; and between both plates a groove being present; which lower plate being connected to an open cylinder being a tail, the inside space of the valve being closed in the triangle structure and open beneath the lower plate in the cutting section.

3. A method according to Claim 1 or 2, wherein the inserting means are tweezers.

4. A method according to any of Claims 1 to 3, wherein the cutting means are selected among scissors and a knife.

5. A method according to any of Claims 1 to 4, wherein the pulling means are selected among manual means and automatic mechanical pulling tools.

6. A method for the manufacture of a baby feeding bottle according to any of Claims 1 to 5, substantially as hereinbefore described with reference to the Figures.

7. A baby feeding bottle being provided with a one-way valve being manufactured by a method according to any of Claims 1 to 6.

8. A one-way valve having a tail.

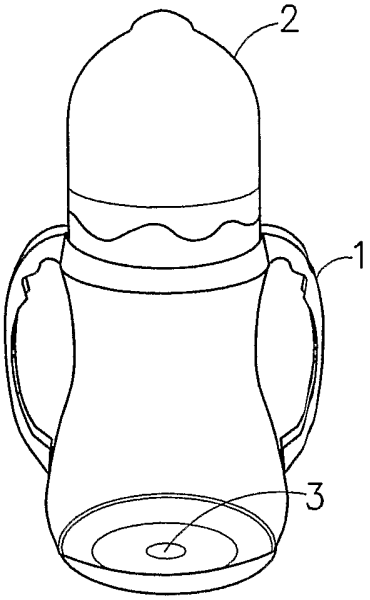

FIG.1

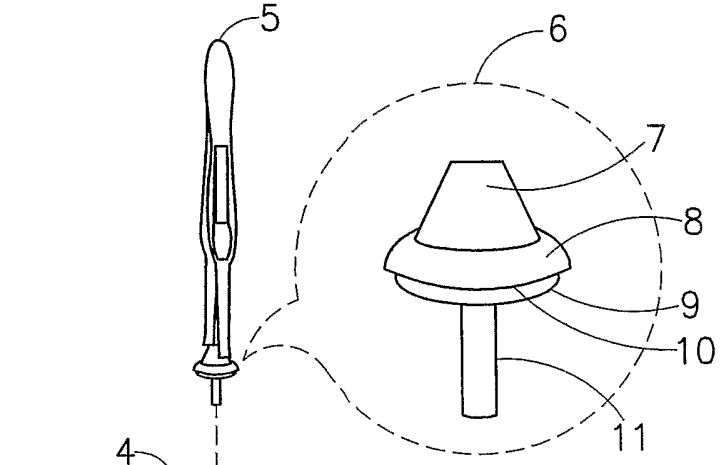

FIG.2A

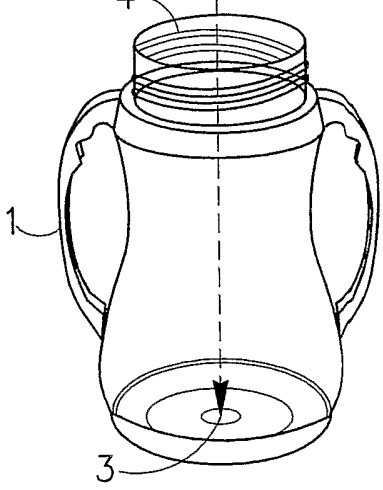

FIG.2

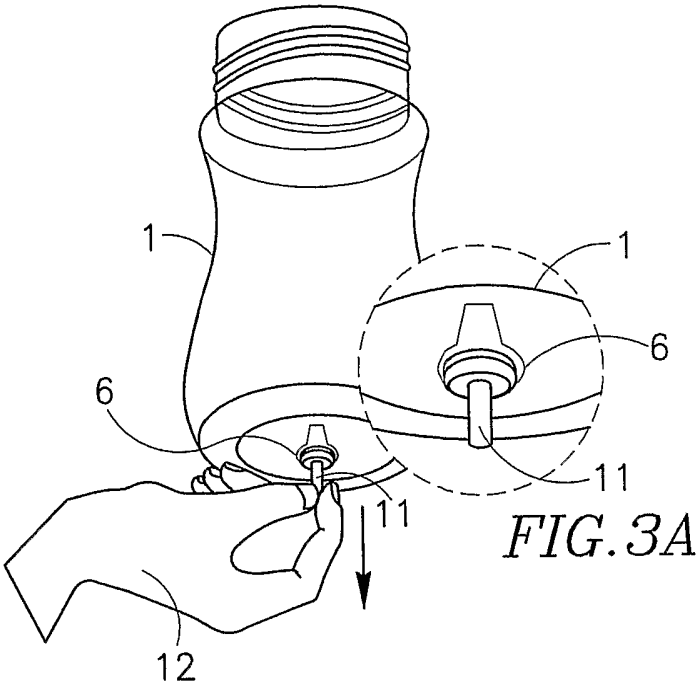

FIG.3A

FIG.3

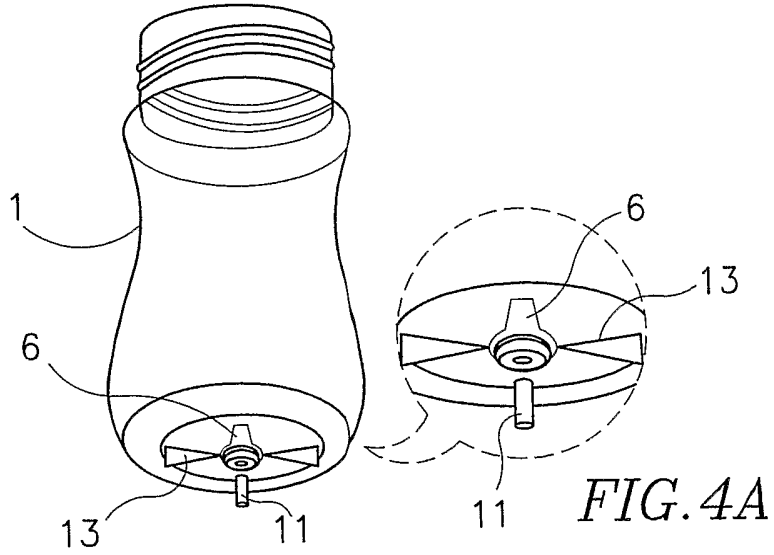

FIG.4A

FIG.4

INTERNATIONAL SEARCH REPORT

International application No
PCT/IL2006/000382

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61J9/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61J B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 323 838 A (THOMAS GERRARD PETER * CASEY; MARIE HELEN ZETA * CASEY) 7 October 1998 (1998-10-07)	7,8
A	page 3, paragraph 3 page 4, paragraph 4; figures 1,2	1
X	US 4 401 224 A (ALONSO ET AL) 30 August 1983 (1983-08-30)	7
A	column 3, lines 21-39; figures 3,5	1
X	GB 2 342 646 A (DANIEL MICHAEL * MCGANTY) 19 April 2000 (2000-04-19) the whole document	7
A	WO 02/070933 A (HUGHES, WARWICK, LEONARD, RONALD) 12 September 2002 (2002-09-12) the whole document	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 July 2006	11/07/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Birlanga Pérez, J-M

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL2006/000382

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.: 6
because they relate to subject matter not required to be searched by this Authority, namely:

Rule 6.2(a) PCT

2. [ ] Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 6

Rule 6.2(a) PCT

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IL2006/000382

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2323838 A	07-10-1998	NONE	
US 4401224 A	30-08-1983	NONE	
GB 2342646 A	19-04-2000	NONE	
WO 02070933 A	12-09-2002	NONE	