

FEEDING BOTTLES

TECHNICAL FIELD OF THE INVENTION

5 The present invention relates to bottle feeding and more particularly to feeding bottles and feed containers especially suited for feeding infants.

BACKGROUND OF THE INVENTION

 A significant effort is being invested in the development of methods and
10 systems promoting the flexibility and convenience of bottle feeding and providing the level of hygiene as suitable for infants. US patent 4801007 discloses a mountable nipple that provides for transforming a container of sterilized liquid, the container being made of plastic or laminated paper, into a feed bottle. However such a device is limited to such cases in which the suitable formulae
15 are available in liquid form and are packaged accordingly. Furthermore the packaging of such liquids addresses mainly the integrity of the contained materials. Such packaging does not necessarily provide for dispensing additional ingredients to the baby.

 US patent 5579935 discloses a baby feed bottle with a disposable bag
20 liner. The ready made feed which is packaged in such disposable bags or containers may assume various formulae and breast milk as well. However such

bags or containers have to be stored at low temperatures for a limited time prior to use.

Both above mentioned examples mainly simplify the process of food preparation. On the other hand US patent application 20050040128A1 aims to
5 simplify of the feeding process itself. This disclosure describes a feeding bottle having a flexible fluid container supported by a dispenser body and an elongated flow tube which allows for continuous feeding at any virtual orientation. However the process of food preparation when employing such a device suffers from the same limitations associated with common feed bottles.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front side view of a nipple retaining device (NRD) in combination with a feeding bottle according to a preferred embodiment of the present invention;

Fig. 2 is a sectional frontal view of the NRD in combination with a feeding bottle of Fig. 1;

Fig. 3 is an isometric view of the partially opened NRD of Fig. 1;

Fig. 4 is an isometric view of a fully folded expandable container (EC) according to a preferred embodiment of the present invention;

Fig. 5 is an isometric view of a fully expanded EC of Fig. 4;

Fig. 6 is an isometric view of the partially expanded EC of Fig. 4 at an initial stage of expansion;

Fig. 7 is an isometric view of the partially expanded EC of Fig. 4;

DETAILED DESCRIPTION OF THE PRESENT INVENTION

The present invention provides a method and systems especially suited for bottle feeding of infants. A nipple retaining device (NRD) is provided for use in combination with a commonly available feed bottle as well as with a novel expandable container (EC) as is described infra. The NRD of the invention facilitates an individual carrying a baby with one hand to prepare food or drink, in a feed bottle or in an EC, using the other hand. The EC of the invention is especially useful for outdoor use.

10

Nipple retaining device

Reference is first made to **Figs 1 – 2** in which a front side view and a frontal sectional view of a NRD in combination with a feed bottle according to a preferred embodiment of the present invention are respectively shown. For the purpose of simplicity same parts shown in different figures are indicated hereinafter with same numerals unless otherwise indicated. A NRD **8** is attached on top of a feed bottle **10**. The NRD **8** consists of base ring **12** attached to the feed bottle **10** and an upper ring **14** to which nipple **16** is attached. A cover **18** is placed on top of the upper ring **14** for protecting the nipple from contaminants.

20 An optional base plate **20** is attached to the bottom of feed bottle **10** for its stabilization. The feed bottle **10** and the cover **18** are typically made of transparent materials sustaining sufficiently high temperatures as required for sterilization. Suitable transparent materials are polyethylene, polypropylene, or

other plastic resins employed in the manufacturing of feed bottles and or devices for storing food. Gradation marks, not shown, are optionally marked on a surface of feed bottle **10** indicating the volume of a contained liquid. Both rings of the NRD are typically made of the same material as the feed bottle is made of, whereas the nipple **16** and the base plate **20** are typically made of a flexible material such as latex or silicone rubber. As shown in **Fig. 2**, The nipple **16** has a mouthpiece **21** having a perforated surface at its top end, not shown, and a circumferential flange **22** located at its bottom. The base ring is threaded to facilitate fastening to the equivalent threaded surface **23** on the feed bottle. The base ring is either attached or formed as an integral part of the feed bottle.

Reference is now made to **Fig. 3** in which an isometric view of a partially opened NRD according to a preferred embodiment of the present invention is shown. Base ring **12** is attached to the feed bottle **10** surrounding neck **24**. Upper ring **14** is pivotally attached to base ring **12**. Upper ring **14** is rotatable between a functionally closed and a functionally open position. In the closed position the upper ring is secured on top of the base ring **12** as is shown in **Figs 1** and **2**. In the opened position the upper ring **14** is rotated away from the base ring **12**. At the closed position, the upper ring **14** is secured to the base ring **12** by means of a latch. Pawl **28** of the latch fits into notch **26** in the upper ring **14**. The latch according to this preferred embodiment of the invention is biased into notch **26** by the biasing support **30**. As the upper ring is pressed into the closed position, pawl **28** slides into notch **26** and circumferential flange **22** is pressed against the rim of neck **24**. Hence the NRD becomes securely locked and the connection between the rim of the neck **24** and the nipple **16** is sealed

off at this position. By pushing pawl **28** inwards, the pawl disengages from the notch **26** and the NRD can snap open by the force applied by the deformed flange **22** and or by means of a biasing spring. Subsequently, a solid instant feed or formula can be dispensed into the feed bottle and a measured portion of liquid
5 such as water, milk and or any appropriate liquid, either warm or cold, is further dispensed into the feed bottle. Subsequently, the upper ring is forced back into the closed position. In the overall process by using the bottle of the invention, the preparation of the food in the feed bottle can be accomplished using a single hand. These activities include: (i) snap open the NRD, (ii) dispensing measured
10 portions of dry instant feed and corresponding liquids, and further (iii) close the NRD, (iv) placing a cover, and (v) shaking the covered feed bottle for a better mixing of the various ingredients.

Expandable container

15 Reference is now made to **Figs 4 - 7** showing an expandable container (EC) of the invention at different stages of expansion. In **Fig 4** an isometric view of a EC folded to the utmost is shown. EC **100** has a lid **102** which covers an aperture, not shown, located at the topside wall **104** of the EC. Topside wall **104** is located above a firm compartment **106**. In **Fig. 5** an isometric view of a fully
20 expanded EC is shown. In **Fig. 6** and **Fig. 7** isometric views of a partially expanded EC are shown respectively. The EC further includes at least one foldable portion disposed between the topside wall **104** on the one hand and a firm compartment such as compartment **106** and on the other hand. For

expanding EC **100**, firstly lid **102** is slightly rotated to vent the lumen of the EC as it is being expanded. Then topside wall **104** at the top of the foldable portion **112** and the bottom wall of the EC sealing the foldable portion **114**, which is appended beneath the firm compartment **106**, are pulled apart as indicated by
5 arrows **120** and **122** respectively. When all foldable compartments are unfolded, one common lumen is formed.

At a stage in which the EC is fully expanded the lid **102** is removed from the aperture and is replaced by a NRD of the invention having a nipple installed. Preparing food for a baby is accomplished by implementing a process
10 such as described herein above. Firstly, the upper ring of the NRD is sprung open and measured portions of corresponding liquids are dispensed into the lumen of the EC. Then the upper ring is forced back into its locking position and the EC is shaken for a better mixing of the contained ingredients.

Optionally various types of instant food and or formulae and or instant
15 drinks, which are suitable for mixing with compatible liquids, are hermetically packaged in an EC according to the present invention. Such instant food or drinks are sterilized and packaged in the EC prior to a stage of completely folding its upper foldable portion. ECs containing sterilized food or drink are useful for outdoor use. Alternately an instant feed and or additives are poured
20 into the EC prior to the dispensing of the liquids. Following the dispensing of liquid the upper ring of the NRD is forced into the locked position, a cover is further placed on top of the NRD and the EC is shaken. At this stage the EC is ready for feeding. A spout, which is suitable for drinks such as hot chocolate,

optionally replaces the nipple of the NRD of the invention. The NRD is optionally replaced by any nipple, or a spout, physically attachable.

The EC is typically made of foldable materials which are relatively firm and are commonly employed for storing instant food, such as laminated thin
5 cardboard. Therefore the fully expanded EC is firm and stable when placed over an even surface. Optionally the foldable portions of an EC are flexible and are made of laminated paper and or plastic resins such as polyethylene. However, at least the firm compartment, the topside wall and bottom wall of an EC of the invention, are made of firm materials providing for hermetically sealing its
10 content. Therefore the EC of the invention practically serves as a disposable feed bottle. Furthermore the folded EC provides for relatively long term storage of a food portion at an ambient temperature. Such features of the EC of the invention are especially suited for outdoor use.

CLAIMS

1. A nipple retaining device (NRD) for feed bottle comprising:
 - a base ring attachable to said feed bottle;
 - 5 • an upper ring to which a nipple is attachable, wherein said upper ring is pivotally connected to said base ring;
 - a latch for securing said upper ring to said base ring, and wherein said upper ring is rotatable between a closed position in which said upper ring is secured to said base ring and an opened position in
10 which said upper ring is disengaged from said base ring.
2. A NRD for a feed bottle as in claim 1, wherein a circumferential flange of said nipple seals off the connection between the rim of the neck of said bottle and the nipple.
15
3. A NRD for a feed bottle as in claim 2, wherein said base ring is screwable onto said feed bottle.
4. A method for preparing baby food in a bottle comprising:
20 a. snapping open a NRD by releasing a pawl securing an upper ring to a lower ring, both of said NRD;
 b. dispensing at least a measured portion of liquid into said feed bottle;
 c. forcing said upper ring into a closed position thereby closing
25 said NRD, and wherein said upper ring is pivotally connected to said base ring,.
5. A method for preparing baby food in a bottle as in claim 4, further comprising dispensing dry baby food into said feed bottle.

6. An expandable container (EC) for instant feed especially suited for feeding infants comprising:

- a coverable aperture located on top of said EC accommodated for attachment of a nipple;
- at least one foldable portion;
- a firm compartment appended to said at least one foldable portion, and

wherein a volume of said EC is changeable between a first value in which said at least one foldable portion is folded and a second value in which said at least one foldable portion is fully expanded.

7. An expandable container (EC) for instant feed especially suited for feeding infants as in claim 6, also including a nipple retaining device (NRD), wherein said NRD comprises:

- a base ring attachable to said aperture;
- an upper ring at which a nipple is attachable, wherein said upper ring is pivotally connected to said base ring, and

wherein said upper ring is rotatable between a first position in which said upper ring is placed on top of said base ring and a second position in which said upper ring is disengaged from said base ring.

8. An expandable container (EC) for instant feed especially suited for feeding infants as in claim 6, also including a nipple attached to said aperture.

9. An EC for instant feed especially suited for feeding infants as in claim 6, in combination with a spout attached to said aperture.

10. An EC for instant feed especially suited for feeding infants as in any of claims 8, or 9 in combination with a cover placed on top of said aperture.