April 22, 1969 R. K. MERRILL, JR., ET AL 3,439,824

STERILE NURSING BOTTLE PACKAGE

Filed July 8, 1964

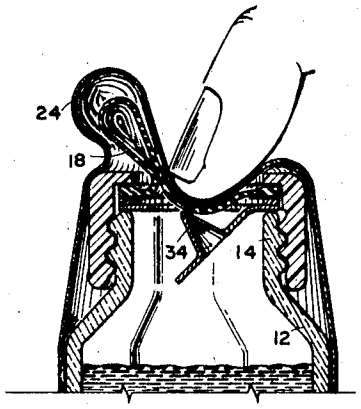


Fig. 6.

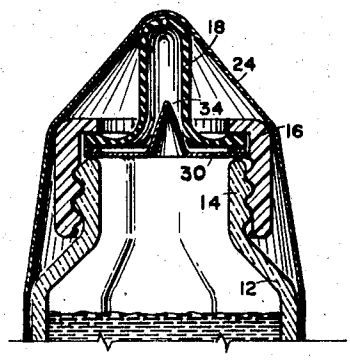


Fig. 4.

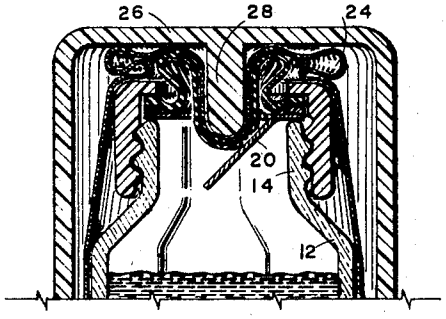


Fig. 3.

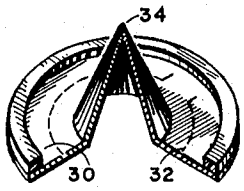


Fig. 5.

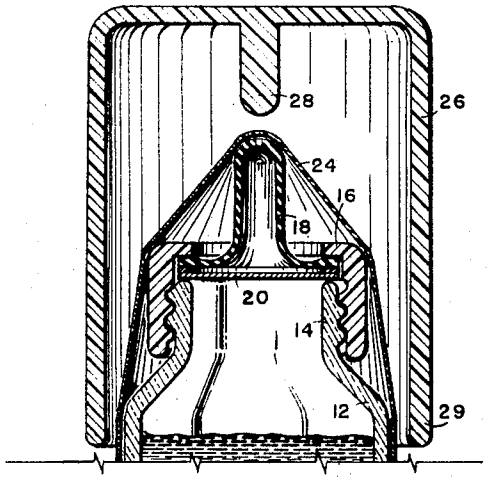


Fig. 1.

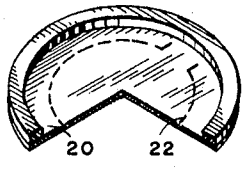


Fig. 2.

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3,439,824

STERILE NURSING BOTTLE PACKAGE

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Int. Cl. A61j 9/00
U.S. Cl. 215—11 1 Claim

This invention relates to a sterile nursing bottle package in which the contents of the bottle are sealed and in which the entire assembly is covered with a contaminant-impervious cover, which cover need not be removed until just prior to feeding of an infant.

The need for sterilization of bottles, nipples, and the contents of the bottle that are used in feeding extremely young infants is well known, and is particularly acute in hospitals where a number of infants are typically fed simultaneously. The principal object of the present invention is to provide a sterile package including a bottle in which the formula may be placed, which package can be sterilized and enclosed until just prior to feeding. Additionally the contents of the bottle are sealed within the bottle to prevent spilling during transport and to isolate further the contents from ambient contamination.

The present invention, in one satisfactory form, includes a bottle having a neck on which a conventional nipple is mounted, and a yieldable disc spanning the neck of the bottle in sealing relation thereto for preventing egress of the contents of the bottle. The assembly is then completed by wrapping the sealed bottle in a contaminant-impervious covering, such as polyethylene, or like plastic which is sufficiently flexible to permit the yieldable disc to be punctured or forced open without removal of the plastic covering. Therefore the contents of the bottle can be heated upon puncturing the yieldable disc without removal of the covering, and the covering can be left in place until just prior to administering the bottle to an infant.

An advantage of enclosing the bottle, nipple, and contents in a contaminant-impervious covering is that the contents can be heated to room temperature simply by letting the bottle stand in the room without fear of contamination from deleterious airborne matter.

Another object of this invention is to provide a sealing disc for a nursing bottle which can be conveniently opened without removal of the disc or the nipple from the bottle.

Attainment of this object is made possible by providing a disc which spans the neck of the bottle and which disc has centrally thereof a score line or the like for defining the yieldable portion therein. Therefore, force on the yieldable portion causes the portion to partially separate from the remainder of the disc and to establish communication from the interior of the bottle to the nipple.

The present invention is described herein in two forms. In one form the yieldable disc is opened or caused to yield by a tool which includes a rounded protrusion for applying force to the disc. In the second form of the invention, the yieldable disc has a projection integral therewith which projection can be pressed against any flat surface or by finger pressure in order to cause the disc to yield.

A feature and advantage of the present invention is that a plurality of bottles can be filled, sterilized, covered, and refrigerated, and then the bottles can subsequently be warmed and transported without loss of the sterile condition until immediately prior to feeding to an infant.

Another feature and advantage of the present invention is that, in the case of a nursery, a plurality of bottles can be removed from refrigeration and can be opened,

heated, and transported in a group without removal of the sterile covers. As each bottle is administered to a particular infant, the sterile cover of only the particular bottle being administered is removed, as a consequence of which the remainder of bottles in the group remain in a sterile state. Therefore, the spreading of contagious diseases in hospital nurseries is materially reduced by the present invention.

These and other objects, features and advantages will be more apparent after referring to the following specification and accompanying drawings in which:

FIG. 1 is a fragmentary cross-sectional view of a sterile nursing bottle package made according to the present invention;

FIG. 2 is a fragmentary perspective view of part of the device of FIG. 1;

FIG. 3 is a cross-sectional view of the device of FIG. 1 after the yieldable disc has been opened or ruptured;

FIG. 4 is a cross-sectional fragmentary elevation view of a modified form of the present invention;

FIG. 5 is a fragmentary view of part of the embodiment of FIG. 4; and

FIG. 6 is a cross-sectional view of the device of FIG. 4 after the yieldable disc has been opened.

Referring more particularly to the drawing, reference numeral **12** indicates a conventional nursing bottle having a reduced neck portion **14**, shown by way of example in the drawings as including a threaded portion for attachment of a cap **16**. Cap **16** is centrally apertured in a conventional way to mount on bottle **12** a nipple **18**, typically made of pliable material, such as rubber. Intermediate neck **14** and nipple **18** is a liquid-impervious disc **20**, which is secured on the neck in sealing relation thereto by nipple **18** cooperating with cap **16**.

As can be seen most clearly in FIG. 2, disc **20** has in the central region thereof, a score line **22**, or the like, defining a yieldable portion in the center of the disc. Score line **22** is shown in general by circular form, but such shape is merely exemplary. Score line **22** can be formed with a die or like percussion tool, or alternatively can be molded or cast into the disc when it is formed. Materials suitable for disc **22** include aluminum, stainless steel and various semirigid plastic materials. The disc can be provided with a peripheral stiffener as shown.

In typical use, bottle **12** is filled with formula F and sterilized, after which cap **16**, disc **20**, and nipple **18** are placed on the neck of the bottle. Thereupon the nipple and bottle are covered by a contaminant-impervious flexible sheet **24**, which is preferably polyethylene or like transparent plastic material. Cover **24** is sealed by any known technique whereupon the bottle and contents can be stored in refrigerated conditions without fear of contamination to the bottle or the contents.

An opener **26** is provided for rupturing disc **20** which opener includes a depending protrusion **28** so rounded that sufficient force can be applied to flex nipple **18** and permit the protrusion to rupture disc **20** without puncturing contaminant-impervious cover **24** and/or the nipple. Opener **26** can include a depending skirt portion **29** for guiding protrusion **28** centrally of disc **16**. Rupture of disc **22** is brought about by downward movement of opener **26** so that protrusion **28** can be forced against the yieldable area delineated by score line **22** of the disc. In FIG. 3 there is shown a typical disc after rupture by protrusion **28**.

It will be noted that in the condition shown in FIG. 3 the flow between the bottle interior and nipple **18** is virtually unimpeded and that the contents of the bottle may now be warmed. It will also be observed that, since cover **24** is still intact, the nipple and the contents of the bottle remain in a sterile condition. Not until the bottle

is ready for administration to an infant, is the cover removed, as a consequence of which a sterile bottle is available to the infant.

Referring now to FIG. 4, a modification of the present invention includes a disc **30** that has a score line **32** and a projection **34** affixed to or integral with the portion of the disc within score line **32**. Projection **34** extends from the disc surface by an amount sufficient to clear the upper extremity of cap **16**, wherefore the disc can be made to yield merely by pressing the top of the package against a flat surface, or even by finger pressure on the projection as shown in FIG. 6. Because contaminant-impervious cover **24** is in place during the procedure referred to next above, disc **30** yields along score line **32** without necessity for contacting the nipple or the contents. The embodiment shown in FIGS. 4 and 5 is otherwise identical to that described in more detail above in connection with FIGS. 1–3. That is to say, the bottle or bottles can be filled, sterilized, sealed and covered, and will retain the uncontaminated condition until the flexible cover sheet is removed just prior to feeding the infant.

Thus it will be seen that the present invention provides a completely sterile nursing bottle package which can be retained in the sterile condition until the last moment before feeding. Thus the likelihood of disease is materially

reduced, and the health and welfare of the infant thereby promoted. While several embodiments of the present invention have been shown and described by way of example, it will be apparent that other adaptations and modifications may be made without departing from the true spirit and scope of the present invention.

We claim:

1. In combination, a nursing bottle having a neck defining an opening communicating the interior thereof with the exterior thereof, a nipple mounted on said neck, a frangible fluid impervious disc mounted in sealing relation to said opening interior of said nipple, said disc having a projection integral therewith extending into said nipple and above the neck of the bottle, whereby said disc can be ruptured by pressure against said projection while said nipple is in place on said neck.

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