

EXHIBIT 1023:

U.S. PATENT NUMBER 5,474,028 223TO LARSON. (“LARSON (‘028)’)

Munchkin, Inc. & Toys “R” Us, Inc.: 1023



US005474028A

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Larson et al.

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[54] ANIMAL FEEDING NIPPLE

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[73] Assignees: **Merrick's, Inc.**, Middleton; **Hi-Life Rubber Inc.**, Johnson Creek, both of Wis.

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[21] Appl. No.: **187,445**

[22] Filed: **Jan. 25, 1994**

[51] Int. Cl.⁶ **A01K 9/00**

[52] U.S. Cl. **119/71; 215/11.5**

[58] Field of Search **119/71; 215/11.4, 215/11.5**

Primary Examiner—Robert P. Swiatek
Attorney, Agent, or Firm—Reinhart, Boerner, Van Deuren, Norris & Rieselbach

[57] ABSTRACT

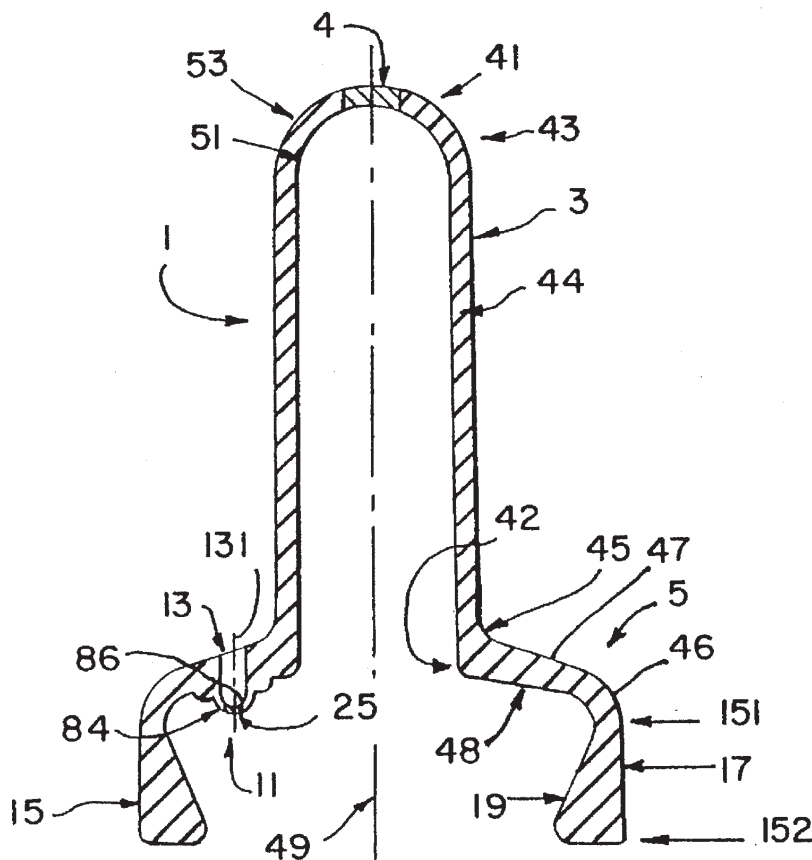
A nipple for feeding liquids to domesticated mammals.

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9 Claims, 2 Drawing Sheets



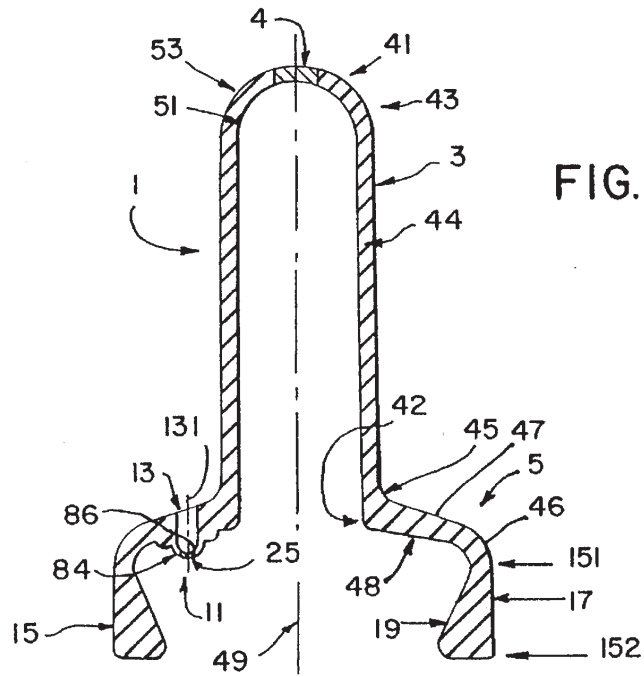


FIG. 1

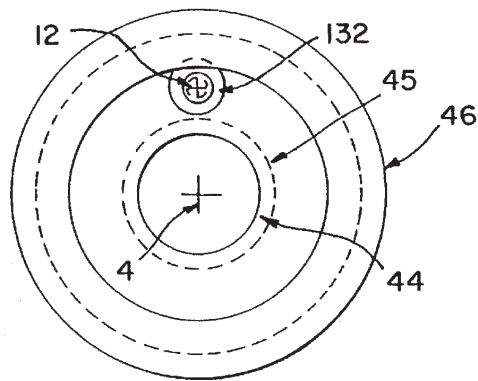


FIG. 2

FIG. 1A

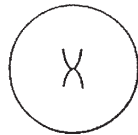


FIG. 1B

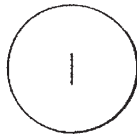


FIG. 1C

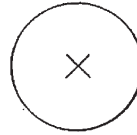


FIG. 1D

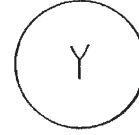
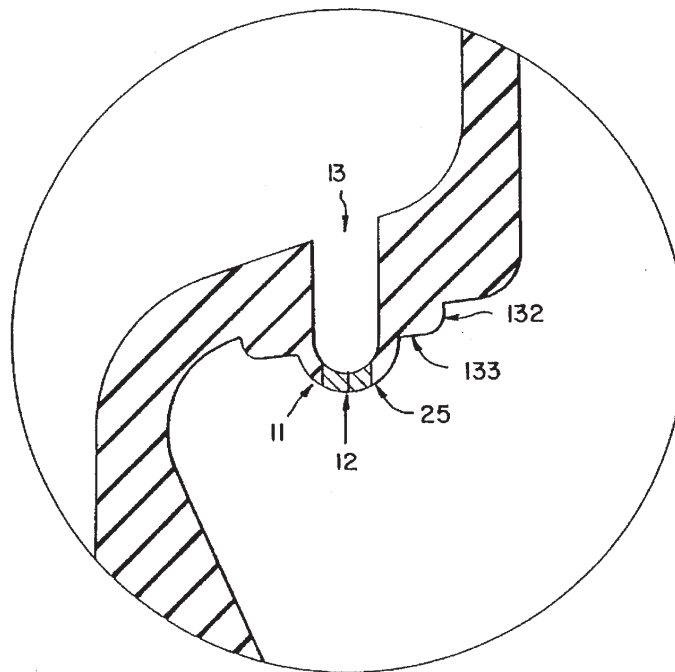


FIG. 3



ANIMAL FEEDING NIPPLE

TECHNICAL FIELD

This invention relates to a nipple for feeding liquids, such as milk or milk replacer, to domesticated mammals, particularly young mammals such as calves, piglets, lambs, foals, puppies, kittens, or the like.

BACKGROUND OF THE INVENTION

A conventional animal feeding nipple for feeding liquids, such as milk or milk replacer, to domesticated mammals is formed out of a flexible, elastomeric or resilient material, such as natural or synthetic rubber or flexible plastic. The conventional nipple will comprise a nipple tube, on which the mammal will suckle to withdraw liquid, connected to a means for attaching the nipple tube to a liquid-feed receptacle or container. See, for example, U.S. Pat. Nos. 2,628,591, 2,699,778 and 3,042,002.

The conventional nipple may be attached, via the attachment means, to a liquid-feed receptacle or container, such as a closed plastic or glass bottle, carboy, barrel, pail, or the like, in which the liquid feed is sealed from atmospheric pressure and from which the liquid feed can flow into the inside of the nipple tube. Typically the nipple will be attached to the closed liquid-feed receptacle or container at a position such that the liquid feed will flow under the influence of gravity into the inside of the nipple tube.

The conventional nipple comprises proximate the distal end (i.e., the end furthest from the receptacle) of the nipple tube a self-sealing orifice or aperture. In response to sucking by a mammal on the nipple tube during suckling, this aperture opens and allows liquid to flow into the mammal's mouth. Then, when the mammal, during the suckling cycle, discontinues sucking on the nipple tube, the aperture spontaneously seals and stops the flow of liquid.

Conventionally, before a mammal begins to remove liquid feed from a closed receptacle (e.g., a plastic bottle) through a nipple, where the inside of the receptacle and nipple is substantially sealed from atmospheric pressure, the liquid inside the receptacle and nipple will be at or close to atmospheric pressure. When liquid is removed from the closed receptacle through the nipple, by sucking by the mammal on the nipple tube, the pressure inside the nipple and the receptacle is reduced and, consequently, a pressure differential is created between the inside and outside of the receptacle and nipple. The pressure outside will typically be the local atmospheric pressure.

This pressure differential is a problem that impairs the efficiency of feeding liquids to domesticated mammals, especially milk or milk replacers to young mammals. The pressure differential causes low flow of liquid feed to the animal and may cause collapse or breakage of the liquid-feed receptacle.

Prior art nipples have a vent through the wall of the nipple, at a position which is not blocked from exposure to the atmosphere when the mammal is suckling on the nipple tube. The vent is present to overcome the problem of the pressure differential that is created during sucking of liquid out of the receptacle through the nipple. This vent may be located for example on a transverse portion of the nipple that joins the proximal end of the nipple tube (the end closest to the receptacle when the nipple is attached to a liquid-feed receptacle) to the means for attaching the nipple to the liquid-feed receptacle. During and after suckling, air is

drawn into the nipple and feed receptacle through this vent to reduce and eventually eliminate this pressure differential. The vent in prior art nipples is simply a hole that traverses the wall of the nipple from the outside (the side exposed to the atmosphere) to the inside. The hole has the shape of a cylinder or a truncated cone, with the narrower cross-section of the cone at the inside surface of the nipple.

The vents in prior art nipples do not restrict flow of air or liquid to one direction, i.e., from outside to inside the nipple. A prior art vent with a cross-sectional area at the inside wall of the nipple that is large enough to be useful in relieving the pressure differential developed during suckling invariably allows leakage of liquid feed. Consequently, animal feeding nipples of the prior art that are effective in solving the problem of the pressure differential, discussed above, disadvantageously allow leakage of liquid feed out from the nipple-receptacle combination.

The present invention is directed to avoiding this problem of liquid feed leakage from vents present in prior art animal feeding nipples to relieve pressure differentials between the inside and outside of the nipples caused by suckling.

SUMMARY OF THE INVENTION

The present invention provides an improved nipple for feeding a liquid to a domesticated mammal from a receptacle in which (together with the attached nipple) the liquid is sealed from atmospheric pressure unless the mammal is sucking on the nipple tube. The nipple of the invention comprises a check valve which opens unidirectionally to allow air to flow from outside to inside the nipple to substantially eliminate pressure differentials across the nipple wall due to sucking by the mammal of liquid from the nipple. Because the check valve opens unidirectionally, liquid does not leak out of the nipple when the valve is open to allow pressure equalization.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view, in a longitudinal section, of an animal nipple for feeding animals, showing an embodiment of the invention.

FIGS. 1A, 1B, 1C and 1D show a top view illustrating alternative variants for the check valve slit 12 as shown in FIG. 2.

FIG. 2 is a top view, in an horizontal section, of an animal nipple for feeding animals in accordance with the invention.

FIG. 3 is an enlarged detail portion of the animal nipple illustrated in FIG. 1 showing the check valve.

DETAILED DESCRIPTION OF THE INVENTION

The invention entails an improved nipple for feeding liquids to domesticated mammals. The improvement of the invention is especially useful when the liquid needs to be drawn by suckling by the mammal from a receptacle, such as a bottle, the inside of which, together with the inside of the attached nipple, is not in communication with the atmosphere such that the pressure inside the receptacle (with attached nipple) drops as the mammal suckles liquid out.

More particularly, the invention entails, in a nipple for feeding liquids to a domesticated mammal, said nipple comprising an elastic molded body comprising:

(A) a nipple tube having a distal end and a proximate end, a length between the distal end and the proximate end and a wall with a thickness that are suitable for suckling by the

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