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No-Spill Drinking Products

Related Applications

The present application claims the priority of U.S. Provisional Application Serial No. 60/400,669 filed August 5, 2002, which is fully incorporated herein by reference.

Field of the Invention

The present invention relates to no-spill drinking products.

Background of the Invention

No-spill drinking products are well known in the art. In the past, a variety of such products have been developed and marketed. In general, the goal of a no-spill cup is to provide a construction which minimizes or prevents liquid from emerging out of the cup when liquid flow is not desired, i.e. when the user is not drinking. However, though the assemblies of the prior art are intended to avoid such accidents, their construction is such that they generally do not provide a secure enough protection against undesirable spilling or leakage. Thus, when such cups are inverted, or more significantly, when they are shaken vigorously, liquid will often emerge from them. This can be a particular problem with young children, for whom these cups are usually intended.

To address this problem, the present inventor has previously provided various advances in the art, as disclosed for example in U.S. Patent Nos. 6,321,931 and 6,357,620, both of which are

fully incorporated herein by reference. Further thereto, yet further improvements in the art of such no-spill drinking products are provided herein.

Moreover, while such drinking products have been generally sold as products for older children, leakage is currently also major problem with present baby bottles and bottle nipples. Most nipples have a hole in the top that fluid is drawn out of. If the bottle is not in an upright position, however, the bottle will leak. For example, if a mother mixes the contents of a baby bottle and then places that baby bottle into her diaper bag, the bottle will leak if the bottle falls over on its side or if the diaper bag is not standing straight up. The liquid from the bottle will then spill into the bag or into the bottle's cap.

Similarly, if a baby takes the bottle out of his or her mouth and lays it down, or if the bottle falls out of the baby's mouth, liquid will leak out of the nipple onto the surrounding floor, carpet, car seat, or so forth. Various different kinds of nipples are known in the art, the nipples varying depending on the type of liquid that the nipple is intended to be used with. Thus, nipples exist for use with water, milk, juice, and formula. Yet, leakage is a very significant problem with all of the various nipples currently available commercially.

If the baby falls asleep with a bottle, the milk can leak out of the bottle. This liquid could undesirably leak onto the baby and/or surrounding area. Furthermore, if the bottle were in the baby's mouth when he or she fell asleep, any liquid that leaked out could potentially choke the baby.

Accordingly, it would be a significant improvement in the art to provide a design allowing the construction of nipples and baby bottles which would eliminate leakage. It would be a further

improvement to provide nipples which adjust to the various consistencies of the different liquids provided to children.

Summary of the Invention

It is an object of the present invention to provide a drinking products which prevent liquid from flowing out of the cup when the user is not drinking.

It is a further object of the invention to provide an improved construction for no-spill drinking products.

It is a further object of the invention to provide a drinking products which minimize and/or eliminate accidental or undesirable liquid flow or spillage.

It is a further object of the invention to provide a drinking products which prevent liquid flow from a spout or nipple even upon very vigorous shaking of the drinking product.

It is a further object of the invention to provide a cup product which provides the ability to regulate the flow rate of liquid out of the cup.

It is a further object of the invention to provide a product which can be used by young children, to avoid accidental spilling of liquid therefrom.

It is a further object of the present invention to provide no-spill baby bottles and bottle nipples.

It is a further object of the invention to provide baby bottles and nipples that do not spill when placed on their side or inverted.

It is a further object of the invention to provide baby bottles and nipples that do not spill liquid therefrom even when shaken vigorously.

It is a further object of the invention to provide drinking products which minimize and/or

eliminate accidental or undesirable liquid flow or spillage, while obtaining an easier flow of liquid with less draw or vacuum.

Further objects of the invention will become apparent in conjunction with the disclosure herein.

To accomplish the above objectives, no-spill products are provided for feeding infants, young children, and any other user, as shown in the attached figures. In several embodiments, these no-spill products include baby bottle nipples and their associated baby bottles. In further embodiments, these products include no-spill drinking cups, sports bottles, and any other desired drinking vessel.

In accordance with a first series of embodiments of the invention, improved drinking products are described which provide an extremely secure seal against accidental liquid flow from a cup spout. Further to the invention, a user places his or her mouth against the spout of the product to bite down on the soft material of the spout and to drink liquid out when desired. The spout includes a valve therein, such that the act of biting on the soft spout and/or compression of the soft spout with the tongue causes the valve to open. Upon opening, a user can suck liquid out of the spout (i.e. apply negative pressure), to drink comfortably therefrom. In contrast, when not in use, the valve sits in a resting, closed position. In this resting or relaxed state, with no compression applied, the valve sits in a configuration in which fluid is securely blocked from passage out of the drinking product. Thus, when the membrane is placed into the user's mouth, the opening within a depression in the nipple or spout tip is forced open, to allow drinking therefrom. At other times (when a user is not drinking), the configuration of the depression forces the opening closed, sealing the membrane into a no-spill position.

In the preferred embodiments of the invention, the valve consists of an depression (also referred to herein as an indentation or dimple) in a flexible material, the depression having an opening therein. The depression is especially configured to maximize its effectiveness as a no-spill valve to prevent undesired liquid flow therefrom.

In several embodiments of the invention, these membranes form the nipple of a baby bottle. In other embodiments, these membranes can be provided as part of another drinking vessel, whether for children or for adults; such as a trainer cup, a sports bottle or so forth. In such drinking vessels, the membranes can be provided as part of a spout or other component of the drinking vessel. In each of these products, the unique construction prevents leakage of fluid when the product is not upright, or when shaken.

With respect to the opening of the membrane (whether of the baby bottle nipple or soft lid portion of a drinking vessel), any form of desired opening suitable for passage of a desired level of liquid can be utilized in the valve. The opening can be, for example, a hole, a slit, a slot, an orifice, or so forth. Preferred embodiments for use in conjunction with various embodiments are disclosed below. The opening is preferably located in the surface of the membrane within the area of the depression.

In the preferred embodiments of the invention, the drinking product further includes a dual valve configuration (i.e. at least two valves), wherein the second valve is likewise provided with an opening. Upon application of negative pressure at the top of the valve (i.e. when sucking at the spout), this second valve opens to allow air into the drinking product. In so doing, the second opening acts as an air vent, preventing the formation of a vacuum within that drinking product, which would prevent liquid from flowing out of the product. The opening of this second valve thereby facilitates fluid flow from the spout when negative pressure is applied at the spout. In

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