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Struckmeier(10) **Pub. No.: US 2005/0167437 A1**(43) **Pub. Date: Aug. 4, 2005**(54) **DRINKING AID****Publication Classification**(76) **Inventor: Hans Struckmeier, Pattensen (DE)**(51) **Int. Cl.⁷ A47G 19/22**(52) **U.S. Cl. 220/705; 220/709; 220/717**

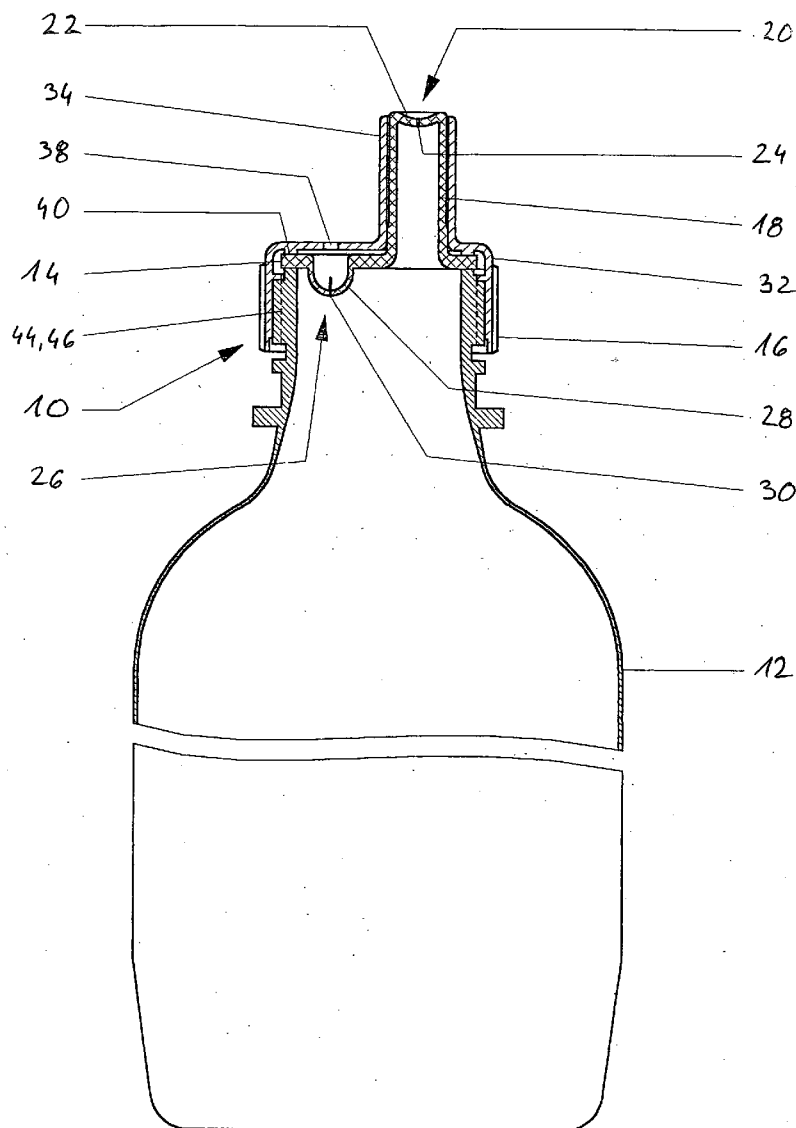
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Scott A. McCollister**Fay, Sharpe, Fagan, Minnich & McKee, LLP****Seventh Floor****1100 Superior Avenue****Cleveland, OH 44114-2518 (US)**(57) **ABSTRACT**

A drinking aid for removable attachment to a drinking vessel (12), especially for attachment to a drinking cup or a beverage bottle, is described. The drinking aid has a top piece (14), which can be connected in a liquid-tight manner to the drinking vessel (12). The top piece has a mouthpiece (18), to which suction can be applied, and an anti-leak device (20) for sealing the mouthpiece (18) toward the outside. The drinking aid is characterized in that it has a pressure-equalization valve (26) adjacent to the mouthpiece (18).

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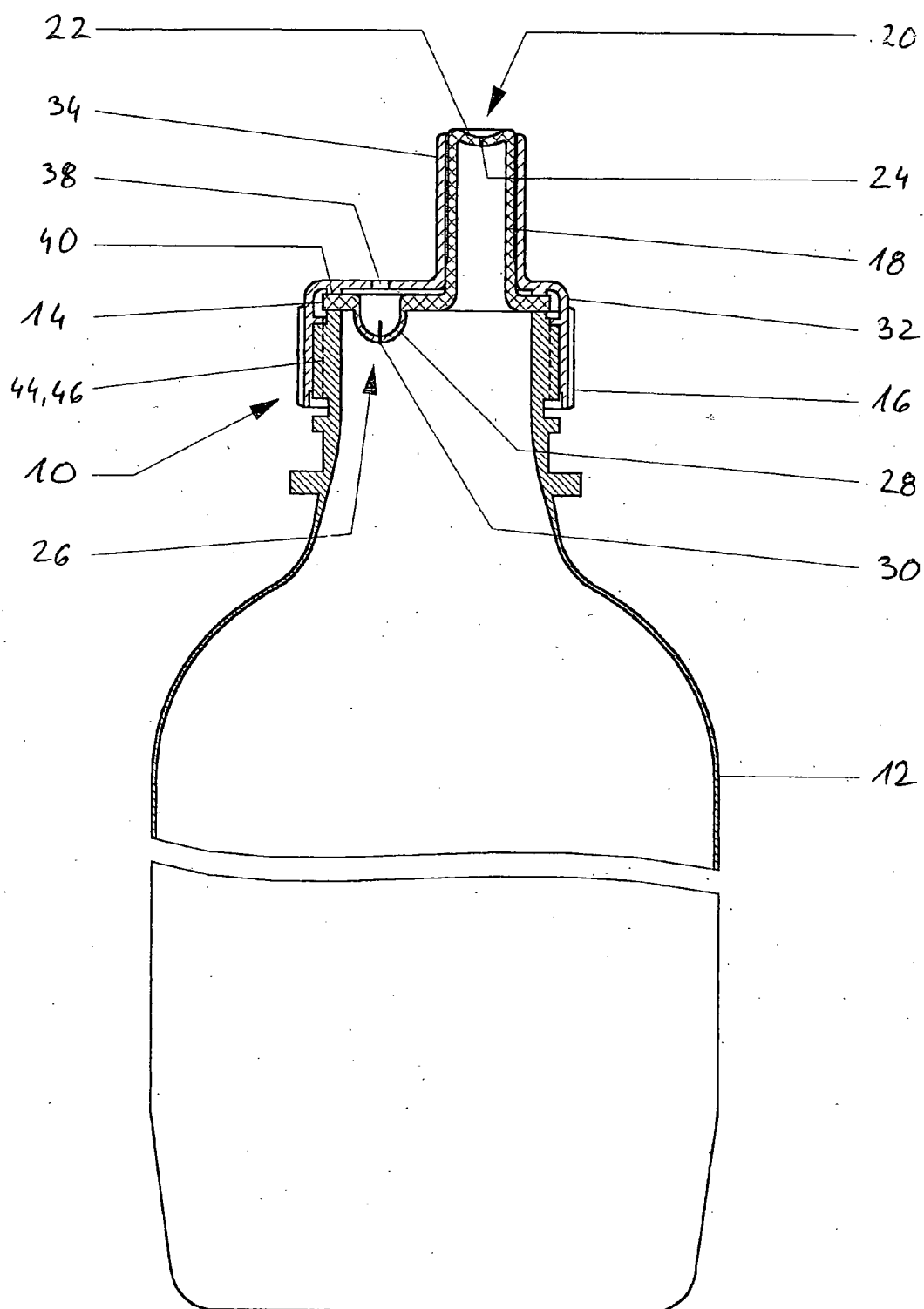


Fig. 1

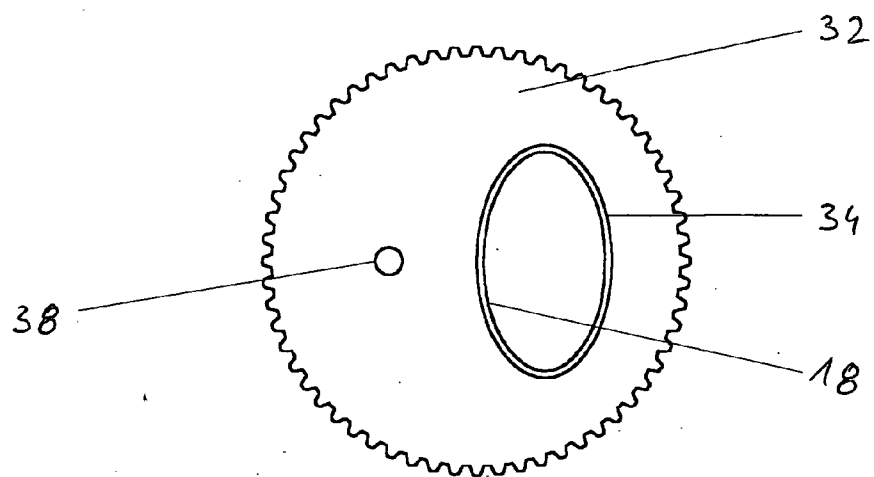


Fig. 2

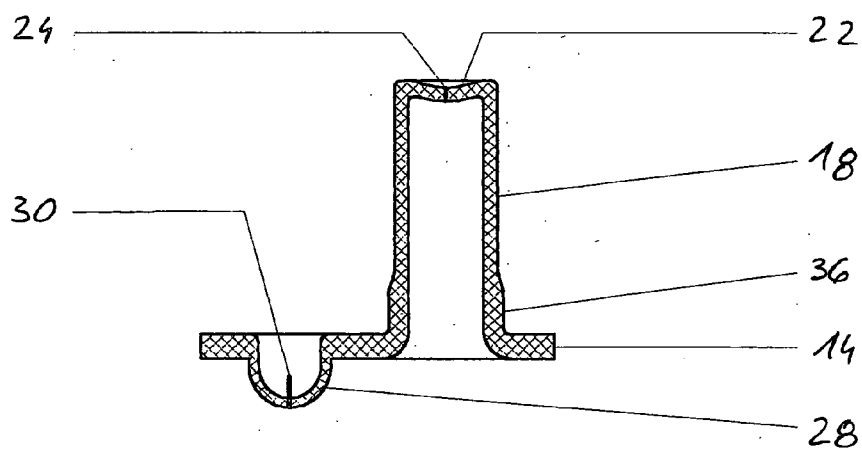


Fig. 3

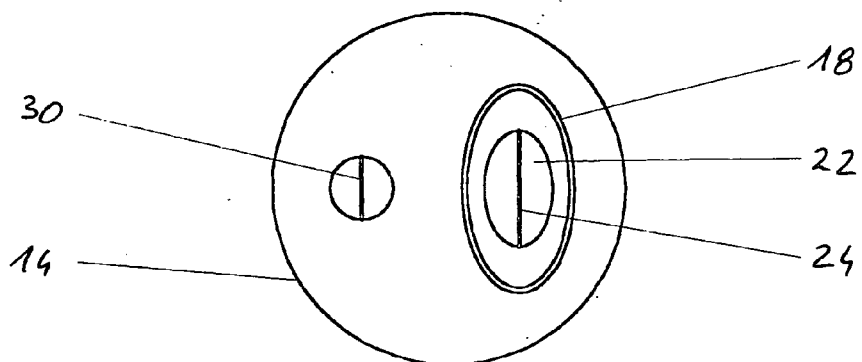


Fig. 4

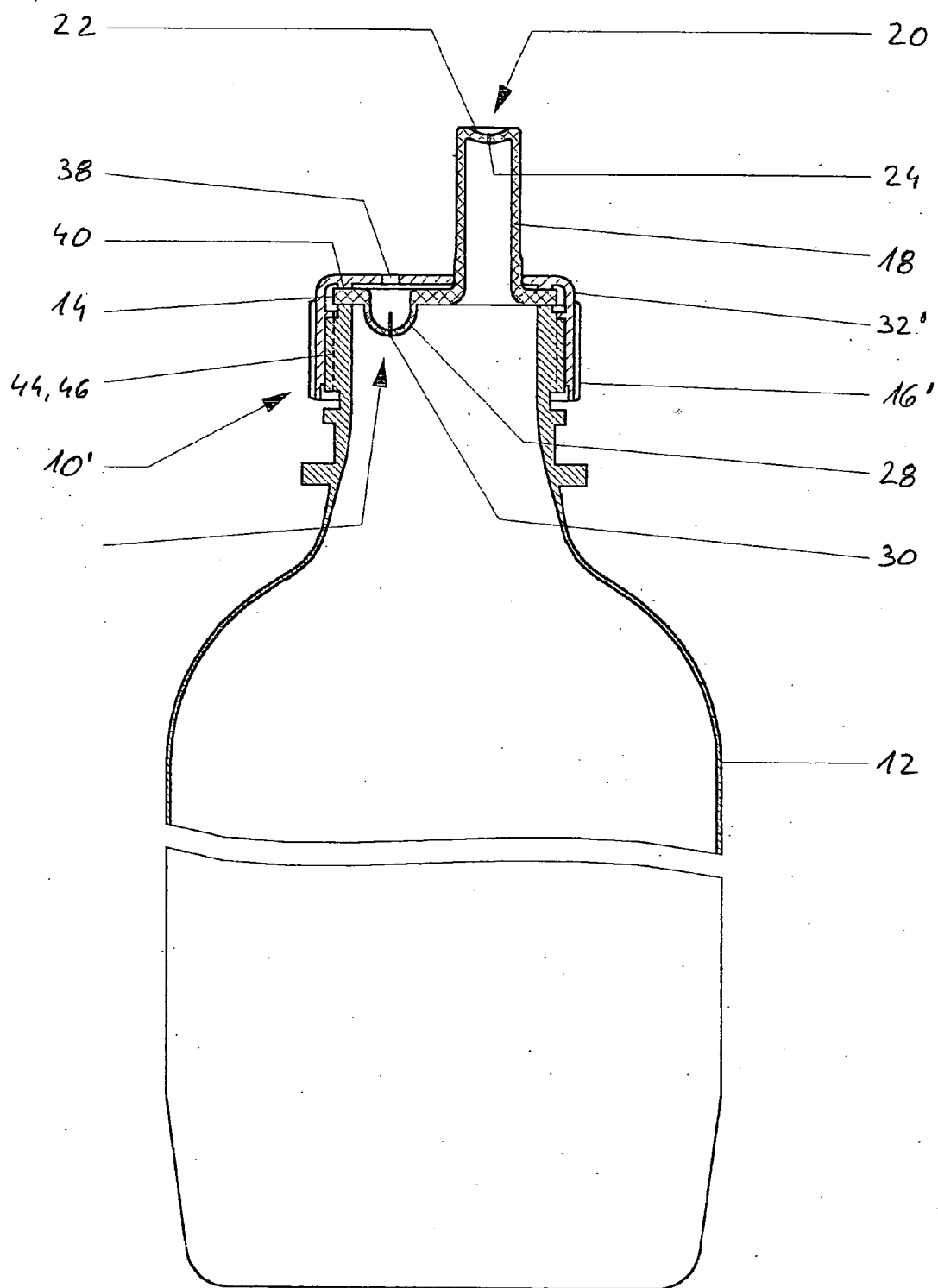


Fig. 5

DRINKING AID

[0001] The invention pertains to a drinking aid for removable attachment to a drinking vessel, especially to a drinking cup or a beverage bottle.

[0002] A drinking aid of the type indicated above is generally known and is frequently used to make it easier for small children, elderly people, and sick people to drink from containers. The drinking aid has for this purpose a top piece, which is connected detachably to the drinking vessel. A mouthpiece, through which the small child or person can suck liquid or thin nutritive broth, is formed on the top piece. To prevent leakage from the drinking vessel during the time that the mouthpiece is not being held in the mouth, the mouthpiece is usually equipped with an anti-leak device in the form of a valve.

[0003] These known drinking aids suffer from the disadvantage that, while the person is drinking, a negative pressure or vacuum builds up inside the container, which makes drinking quite difficult and which can even lead to the complete interruption of the flow of liquid. To reduce the vacuum which has been produced, the person must stop drinking and release the drinking slot on the mouthpiece to allow the pressure in the drinking vessel to equalize.

[0004] The task of the present invention is to improve the drinking aid of the type indicated above in such a way that the pressure inside a drinking vessel equipped with the inventive drinking aid can equalize during the drinking process itself, whereas the escape of liquid from the drinking vessel can be more-or-less completely prevented at the same time.

[0005] The invention accomplishes this task by means of a drinking aid with the features according to a drinking aid for removable attachment to a drinking vessel, especially to a drinking cup or a beverage bottle, with a top piece, which can be connected to the drinking vessel to form a liquid-tight seal, which top piece has a mouthpiece for drawing up the liquid and an anti-leak device for sealing the mouthpiece toward the outside, characterized in that the drinking aid has a pressure-equalization valve adjacent to the mouthpiece.

[0006] To solve the problem, the inventive drinking aid is equipped not only with an anti-leak device on the mouthpiece but also with a pressure-equalization valve, by means of which the pressure inside the drinking vessel can be equalized, where the inventive drinking aid can be applied to any type of drinking vessel (cup, bottle, etc.). Providing the pressure-equalization valve makes it possible for the pressure to be equalized very effectively even when the difference between the pressure in the drinking vessel and the outside pressure is very small.

[0007] The top piece and the mouthpiece are usually made of a soft, elastic material such as a plastic or natural rubber material.

[0008] Additional advantages of the invention can be derived from the following description, from the drawing, and from the subclaims.

[0009] So that the top piece of the drinking aid can be cleaned, the top piece is preferably designed so that it can be removed from and reattached to the drinking aid.

[0010] The anti-leak device preferably forms a single unit with the mouthpiece and has a drinking slot, which closes by

itself when not in use as a result of the natural tension of the material out of which the anti-leak device is made. As a result, the drinking slot is sealed very effectively as soon as the small child or the patient is no longer sucking on the mouthpiece.

[0011] It is especially preferable for the pressure-equalization valve to be designed in the form of a dome, especially in the form of a hemispherical shell. The valve preferably projects into the drinking vessel and has a valve slot. Because the dome-shaped pressure-equalization valve projects into the drinking vessel, the ambient pressure acting from the outside pretensions the dome inward, i.e., toward the interior of the drinking vessel, whenever a negative pressure is present inside the container. This pretensioning facilitates the opening of the valve slot. By varying the shape of the valve slot, the shape of the dome, and the thickness of the material, it is possible to predetermine the negative pressure at which the pressure-equalization valve will open and vent the drinking vessel.

[0012] It is especially preferable for the closing behavior of the anti-leak device and the closing behavior of the pressure-equalization valve to be coordinated with each other in such a way that a slight negative pressure remains in the drinking vessel even after the pressure has equalized. As a result, the anti-leak device will close reliably, and no liquid will drip out of the mouthpiece after use.

[0013] In an especially preferred embodiment, the inventive drinking aid has a cap which can be removably attached to the drinking vessel and which at least partially encloses the top piece. After it has been attached to the container, this cap pretensions the top piece against the edge of the opening of the drinking vessel to form a liquid-tight seal.

[0014] In this embodiment, it is especially advantageous for the cap to cover the top piece completely and to have a spout, into which the mouthpiece is inserted. As a result, the mouthpiece, which is usually made of an elastic material, is protected from the teeth of the small child and will accordingly have a longer life-span.

[0015] In this elaboration, it is also advantageous for an outward-projecting sealing section to be formed on the mouthpiece, which sealing section rests under pretension against the inside wall of the spout to form a seal. As a result, the remaining liquid running down the mouthpiece cannot get between the cap and the top piece. In addition, air is prevented from being drawn in through the gap between the outside surface of the mouthpiece and the inside surface of the spout.

[0016] There follows now a description of two exemplary embodiments, based on the drawing:

[0017] FIG. 1 shows a partial, cross-sectional side view of a first exemplary embodiment of an inventive drinking aid, which is removably attached to a beverage bottle;

[0018] FIG. 2 shows a top view of the threaded cap of the inventive drinking aid according to FIG. 1;

[0019] FIG. 3 shows a cross-sectional side view of the top piece;

[0020] FIG. 4 shows a top view of the top piece according to FIG. 3; and

[0021] FIG. 5 shows a partial, cross-sectional side view of a second exemplary embodiment of an inventive drinking aid with a mouthpiece, which is removably attached to a beverage bottle.

[0022] FIG. 1 shows a partial, cross-sectional side view of a first exemplary embodiment of an inventive drinking aid 10, which is removably attached to a beverage bottle 12, serving as a drinking vessel.

[0023] The drinking aid 10 has a top piece 14, made of an elastic grade of plastic or of a rubber material, which is attached removably by means of a threaded cap 16 to the beverage bottle 12.

[0024] The top piece 14 is designed with a mouthpiece 18, which is oval in cross section (see FIG. 2). The mouthpiece merges into the flat side of the top piece 14, which rests on the beverage bottle 12.

[0025] As can be seen especially clearly in FIGS. 3 and 4, the free end of the mouthpiece 18 projecting from the beverage bottle 12 is closed by an anti-leak device 20 in the form of a membrane, which forms a concave recess 22 in the mouthpiece 18. In the concave recess 22, a drinking slot 24 is provided, which opens when suction is applied to the mouthpiece 18 and which closes again afterwards through the natural elasticity of the material of the anti-leak device 20, as long as the negative pressure produced by sucking on the mouthpiece 18 is not too strong. The escape of liquid from the beverage bottle 12 is thus effectively prevented.

[0026] An inward-projecting pressure-equalization valve 26 in the form of a hemispherical shell 28 is provided on the bottom surface of the top piece 14, adjacent to the opening in the mouthpiece 18. The pressure-equalization valve 26 has a valve slot 30, by means of which negative pressure in the interior of the beverage bottle 12 can be equalized whenever suction is applied to the mouthpiece 18.

[0027] The closing behavior of the drinking slot 24 of the anti-leak device 20 and the closing behavior of the valve slot 30 of the pressure-equalization valve (26) are coordinated with each other in such a way that, after the pressure has equalized, there is still a slight negative pressure in the beverage bottle 12, which prevents liquid from dripping out of the drinking slot 24.

[0028] The threaded cap 16 has a cover 32, which almost completely covers the flat surface of the top piece 14. A spout 34, into which the mouthpiece 18 of the top piece 14 is inserted, projects upward from the cover 32, the end of the mouthpiece 18 being more-or-less flush with the open end of the spout 34. So that liquid can be prevented from intruding into the area between the top piece 14 and the bottom surface of the cover 32 and so that air can be prevented at the same time from being drawn in through the gap between the outside surface of the mouthpiece 18 and the inside surface of the spout 34, a circumferential sealing section 36 is provided on the outside surface of the mouthpiece 18, which section rests under pretension against the inside surface of the spout 34.

[0029] In addition, a pressure-equalization opening 38 is provided in the cover 32. After the threaded cap 16 has been attached to the beverage bottle 12, this opening is aligned with the pressure-equalization valve 26. Air can thus enter

through the pressure-equalization valve 26 and resupply the interior of the beverage bottle 12.

[0030] A sealing surface 40 is provided on the bottom part of the top piece 14. When the threaded cap 16 is screwed by its internal thread 42 onto the external thread 44 of the beverage bottle 12, this sealing surface comes to rest in a fluid-tight manner against the top end of the beverage bottle 12, i.e., against the edge which forms the boundary around the opening of the beverage bottle 12.

[0031] FIG. 5 shows a modified embodiment of the drinking aid 10 according to the invention. In this modified drinking aid 10', the threaded cap 16' is not equipped with a spout 34. The threaded cap 16' serves here only to attach the top piece 14 to the beverage bottle 12. The liquid is taken up only through the soft mouthpiece 18 of the top piece 14.

[0032] How the invention functions:

[0033] When suction is applied to the mouthpiece 18, the drinking slot opens under the effect of the negative pressure in the mouth, as a result of which liquid flows out of the beverage bottle 12 into the mouth. The negative pressure produced inside the beverage bottle 12 as a result of the decrease in the volume of liquid is equalized from the outside by way of the pressure-equalization opening 38 and the valve slot 30 of the pressure-equalization valve 26 even if the pressure differences are very small.

[0034] A drinking aid 10 with a high level of functionality is obtained as a result of the special design of the pressure-equalization valve 26 in the form of a hemispherical shell 28, which offers both a highly effective sealing properties against the escape of liquid and good pressure-equalizing behavior. As a result of the coordination between the drinking slot 24 and the valve slot 30, a slight residual vacuum or slight negative pressure remains in the beverage bottle 12, as a result of which liquid is prevented from leaking out of the beverage bottle 12.

1. Drinking aid for removable attachment to a drinking vessel (12), comprising a top piece (14), which can be connected to the drinking vessel (12) to form a liquid-tight seal, said top piece having a mouthpiece (18) for drawing up the liquid and an anti-leak device (20) for sealing the mouthpiece (18) toward the outside, wherein the drinking aid (10) includes a pressure-equalization valve (26) adjacent to the mouthpiece (18).

2. Drinking aid according to claim 1, wherein the top piece (14) can be removed from and reattached to the drinking aid (10).

3. Drinking aid according to claim 1, wherein the anti-leak device (20) forms a single unit with the mouthpiece (18) and has a drinking slot (24), which, when not in use, closes by itself as a result of the natural tension of the material out of which the anti-leak device (20) is made.

4. Drinking aid according to claim 1, wherein the pressure-equalization valve (26) comprises a dome, which projects into the drinking vessel (12) and includes a valve slot (30), which opens to vent the drinking vessel (12) as soon as a predetermined negative pressure is reached in the drinking vessel (12).

5. Drinking aid according to claim 1, wherein the pressure-equalization valve (26) does not open until a predetermined negative pressure is reached in the drinking vessel (12) and closes again at a pressure in the drinking vessel (12).

which is greater than or equal to the predetermined negative pressure in the drinking vessel (12).

6. Drinking aid according to claim 1, wherein a closing behavior of the anti-leak device (20) and the a closing behavior of the pressure-equalization valve (26) are coordinated such that a slight negative pressure remains in the drinking vessel (12) after the pressure has been equalized.

7. Drinking aid according to claim 1, wherein the top piece (14) forms a single unit with the pressure-equalization valve (26).

8. Drinking aid according to claim 7, wherein the top piece (14), is comprised of a soft, elastic material.

9. Drinking aid according to claim 1, wherein, the drinking aid (10) includes a cap (16) for the removable attachment of the drinking aid to the drinking vessel (12), said cap at least partially enclosing the top piece (14) and which, after it has been attached to the drinking vessel (12), pretensions the top piece (14) against an edge of the a container opening of the drinking vessel (12) to form a liquid-tight seal.

10. Drinking aid according to claim 9, wherein the cap (16) completely covers the top piece (14) and has a spout (34), into which the mouthpiece (18) is inserted.

11. Drinking aid according to claim 10, wherein an outward-projecting sealing section (36) is formed on the mouthpiece (18), which section rests under pretension against an inside wall of the spout (34) to form a seal.

12. Drinking aid according to claim 9, wherein cap (16) includes a pressure-equalization opening (38), which, after the cap has been attached to the drinking vessel (12), is aligned with the pressure-equalization valve (26).

13. Drinking aid according to claim 4, wherein said dome comprises a hemispherical ball (28).

14. Drinking aid according to claim 8, wherein said material comprises plastic, synthetic rubber or natural rubber.

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