Description

This invention relates to a package for the dispensing of liquids as specified in the pre-characterising part of claim 1.

The dispensing of a liquid under a substantially constant or constant head, referred to herein as "constant head", is desirable in applications where liquid is to run from a container at a rate which will give the same unit volume or mass of liquid discharged per unit time, and a particular application envisaged for this invention is the discharge of flavouring concentrate or syrup from a container containing the concentrate for mixing with a diluent such as still or carbonated water to provide a drinking beverage in a small individual drinking vessel such as a cup. Specifically, the intention is that there should be provided a package comprising a container containing the flavouring concentrate, which package is adapted to be inserted into a machine for producing beverages of concentrate and diluent, and by operation of the machine, concentrate flows from the package under constant head whilst diluent flows from another source resulting in mixed diluent and concentrate in a collecting, drinking vessel, the diluent and concentrate being in a predetermined ratio to provide a pleasingly palatable beverage. It is important that the package should be capable of removal from the machine, even although all of the concentrate in the package may not have been consumed, and the same package subsequently should be capable of re-insertion in the machine for concentrate discharge.

A package and machine operable in the manner described are set forth in European Patent Application No. 80200611.4 (EP-A2-0 022 589).

Packages designed for constant head discharge are known, and indeed examples are illustrated in said European Patent Application, and such constant head discharge packages comprise essentially a package body inside of which is a compensating chamber. The package has an outlet for the concentrate, and an inlet for air to compensate for the concentrate which flows from the package. The packages are used in inverted condition, hence the need to provide a separate inlet for air to compensate for the concentrate which flows from the package. When the package is in use in inverted condition, the top end of the compensating chamber is closed, whilst the lower end is in open communication with the interior of the package. When the machine is operated to cause concentrate to flow from the package, air which passes into the package passes to the compensating chamber so that the compensating chamber is at atmospheric pressure and the level of concentrate in the compensating chamber falls to such an extent that air can escape past a lower edge of the compensating chamber into the interior of the package, and can then bubble upwards through the liquid into a head space.

The package remains essentially in this condition during the subsequent discharge of concentrate therefrom, and the constant head dispensing is achieved in that during each subsequent dispensing operation, there is a liquid level whose position remains constant, and of which the pressure of the atmosphere above this level remains constant. The liquid level is that established by the lower edge of the compensating vessel and past which the bubbles of air move in travelling to the head space. The pressure in the head space does not remain constant, but will in fact be sub-atmospheric to an extent sufficient to support the body of the concentrate above the constant head level.

In packaging containers of this type, it is desirable to have the compensating chamber of generous volume, but on the other hand it is also desirable that the compensating chamber should be kept as free as possible of concentrate, and that the concentrate should not flow back through the air inlet and this can be difficult where the package is removable from the machine and repositionable therein as it will inevitably be inverted and reinverted at least once during this procedure.

The present invention is concerned with a design of a package for the dispensing of liquid, in particular concentrate, therefrom which is of the constant head type described herein, but also wherein the difficulty of the compensating chamber filling with liquid when the package is removed from a machine is obviated or mitigated.

In accordance with the present invention there is provided a package for the dispensing of liquid under constant head comprising a package body comprising a bottom, a wall and a top, the top having an outlet for the discharge of liquid from the body, and an inlet for air to compensate for the discharge of liquid from the body, a compensating chamber inside the body having a bottom, a wall and a top, the compensating chamber being located in relation to the said air inlet so that when the package is in inverted, in-use, position the compensating chamber is inverted and the interior communicates with said air inlet, and in addition the interior of the body communicates with the interior of the compensating chamber via the top of the compensating chamber, whereby air can bubble out of the compensating chamber through the top thereof into a head space in the body when the package is in use, characterised in that the opening in the top of the compensating chamber to permit compensating air to pass thereinto, and to permit air to bubble from the compensating chamber into the head space of the body is of a smaller cross sectional area than the maximum cross sectional area of the compensating chamber, and wherein the air inlet comprises a tube which leads through a cap closing the top of the body and into the compensating chamber, the tube being adapted to sealingly engage the bottom of the compensating chamber in a first position, and in a second position being displaceable therefrom to permit the air to flow into the compensating chamber.

Preferably, the top of the compensating

chamber is defined by a frusto conical portion of which the larger diameter end connects with the compensating chamber wall, and the smaller diameter end forms said opening in the top wall.

Preferably the tube is carried by the cap, and the cap has a means serving to sealingly close the top of the body, but the cap is displaceable relative to the body to cause, on the one hand, the seal between the end of the air tube and the bottom of the compensating chamber tube to be opened, and also to cause on the other hand a flow of liquid from the body through an aperture in the cap.

The method and means of mounting and displacing the cap relative to the body may be as any of the embodiments disclosed in the said European Patent Application.

The compensating chamber preferably is integral with the body by being welded thereto or integrally moulded therewith, in the case where, as will be usual, the body and compensating chamber are of plastics material.

By arranging that the inlet in the top of the compensating chamber is of smaller dimension than the maximum cross section dimension of the compensating chamber ensures that an adequate volume compensating chamber is provided but the size of the aperture through which liquid can flow into the compensating chamber when the package is removed from the machine and reinverted, is kept as small as possible and also the provision of the compensating chamber which increases in cross sectional area from the aperture in the top means that shoulders are formed interiorly of the compensating chamber which forms air traps and prevent all of the air from being displaced from said compensating chamber when the package is reinverted. This means that when the package is again positioned in the machine for use, the residual air in the compensating chamber will surround the top end of the air inlet tube, and when the said seal is broken, there will be no possibility of liquid weeping back through the air inlet tube, or a bubble forming on the end of the air inlet tube which by surface tension prevents more air entering the chamber.

Embodiments of the invention will be described, and an explanation of the operation of a constant head dispenser package is given by way of example, with reference to the accompanying drawings, wherein:—

Figs. 1 to 4 show diagrammatically a constant head dispensing package in the in-use position and in various stages of operation;

Fig. 5 is a sectional elevation of the compensating chamber and closure cap arrangement of a first embodiment of the invention;

Fig. 6 is a perspective view of the compensating chamber of the arrangement shown in Fig. 5;

Fig. 7 is an elevation similar to Fig. 5, but showing another embodiment of the invention;

Fig. 8 is an elevation similar to Fig. 5, but showing another embodiment of the invention;

Fig. 9 is a sectional plan of the arrangement shown in Fig. 8, the section being taken on the line V—V of Fig. 8;

Fig. 10 is an underneath view of the arrangement shown in Fig. 8;

Fig. 11 is a view similar to Fig. 5, but showing a further embodiment of the invention; and

Fig. 12 is a view similar to Fig. 11 showing how the compensating chamber may be formed in an alternative method.

Referring to the drawings, and firstly to Figs. 1 to 4 in these figures is shown a gravity operated, constant head dispenser package when in the in-use position. The in-use position is in fact an inverted position, and the package, at least that according to the invention, is adapted to be inserted into the equipment in the inverted position, and removed therefrom even although there still remains some liquid in the package. Care must therefore be taken when referring to "top" and "bottom" of the package, but for the purposes of clarity of description the convention which is adopted in this specification is that the words "top" and "bottom" refer to those parts of the package when it is in the storage or uninverted position, and "upper" and "lower" are used to indicate those portions when the package is in the inverted, in-use position.

Figs. 1 to 4 are included in order to explain the principle of gravity, constant head dispensing.

In the package of Figs. 1 to 4 the package comprises a container or outer body 10 which has a bottom 12, a wall 14 and a top 16. The top 16 is shown as having a reduced diameter neck 18 closed by a stopper or plug 20 so that in fact the body 10 is sealed except for an air inlet defined by an air inlet tube 22 and a liquid outlet 24. Inside the body 10 is a compensating chamber 26 having a closed bottom 28 and a wall 30 leading to an open top 32. The chamber 26 is maintained in position by suitable means such as struts 34. The outlet 24 is provided with a valve 36 which can be opened or closed to allow the discharge of liquid 38 from the interior of the package. The package is shown in Fig. 1 as being completely full of the liquid 38, including the inside of the compensating chamber 26. The sizing of the air inlet tube 22 and liquid outlet 24 should be selected in relation to the viscosity of the liquid being dispensed, because if the liquid is concentrated and thick, then the outlet and tube must be enlarged accordingly, or otherwise an air bubble could form at the end of the tube 22 as explained herein.

When the package shown in Fig. 1 is operated for the dispensing of liquid therefrom, the valve 36 is opened and the liquid 38 flows out of outlet 24 as shown in Fig. 2. It is to be mentioned that valve 36, is shown as being in outlet 24 for illustration purposes only. In fact it could be incorporated in the stopper 20 or in a closure cap as will be explained later in relation to the embodiments of the invention to be described.

As the liquid 38 discharges from the outlet 24 so compensating air flows in through the pipe 22 and collects in the upper end of the compensating vessel 26 as shown in Fig. 2, and the liquid level

40 in the compensating chamber 26 falls. The discharge continues until the level 40 reaches the lower edge of the compensating vessel as shown in Fig. 3. Up to this time, the discharge of the liquid has not been at constant head, because the level 40 which determines the head for discharge of the liquid from outlet 24 has been constantly falling i.e. changing. From the time the level 40 reaches the Fig. 3 position however subsequent dispensing apart from draining of a minor amount when the concentrate level in body 10 falls below level 40, from the package is at constant head, and this arises in that if the valve 36 is opened to discharge liquid 38 from the interior of the body 10, air continues to flow in through tube 22 to compensate for the liquid discharged, and surplus air flows around the lower edge of the compensating chamber 26 and bubbles, as shown by bubbles 42 in Fig. 4 upwardly through the liquid 38 in the body 10 and into an upper head space 44 which will in fact be at sub-atmospheric pressure in that the level 40 is at atmospheric pressure and remains constantly at that pressure as long as liquid flows from the outlet 24. This means that discharge of the liquid from the outlet 24 takes place under constant head in that the pressure at the level 40 remains constant during discharge. As the head space 44 progressively fills up, so the pressure therein rises until such times as the head space 44 reaches level 40 when the head space will be at atmospheric pressure. Very little concentrate remains in the package at this time.

If the package, when in the partly emptied state illustrated in Fig. 4 is removed, and inverted to the normal upright position, then there is a possibility that the compensating chamber 26 will at least partly fill with the liquid 38 and that liquid may flow out of tube 22 when the package is again used. When the package is reinverted for use in the machine, therefore the level 40 may be higher than as shown in Fig. 4, and there will be some initial dispensing at a head which is not constant, but the container will soon achieve the constant head dispensing position. It is a disadvantage however if the compensating chamber does fill with liquid, because then there can be backflow along the inlet pipe 22, or the container may not function as efficiently as required. It is also to be noted that bubble formation on the end of the inlet tube or where the air escapes from the compensating chamber to the main body of the container can cause blockage flow problems and these apertures and passages must be dimensioned accordingly. The embodiments of the present invention now to be described are designed to overcome the difficulty of the filling of the compensating chamber.

Also, it is desirable that the passages or spaces by which the interior of the compensating chamber 26 communicates with the interior of the body be as large as possible because if the liquid 38 is a beverage concentrate its viscosity and surface tension effects may be such as to prevent effective flow of air, as indicated in Fig. 4 past the lower edge of the compensating chamber and into the head space. Again, the present invention as indicated by the embodiments to be described aims at overcoming this problem.

Referring now to the drawings, in each of Figures 5, 7, 8, 11 and 12 there is shown only that part of the package in the vicinity of the top of the body, each Figure also showing fully the compensating chamber.

Referring firstly to Fig. 5, the top end of the body 10 is shown in this Figure, and the top is necked to receive an insert 13 of plastics material. The compensating chamber 26 is integral with the insert 13 in that it is connected thereto by equiangularly spaced bridge pieces 51 as shown in Fig. 6. Between the bridge pieces are slot apertures 49 which establish the hydraulic communication between the interior of the chamber 26, and the interior of the body 10. Chamber 26 comprises a bottom 41, 43 of the configuration shown, and a cylindrical wall 39. A frusto conical baffle insert 53 completes the chamber 26, and the baffle insert 53 is provided with a central aperture 55 through which the air inlet tube 22 passes. The air inlet tube 22 sealingly engages at the upper end with a sealing gasket 47 on the inside of the bottom portion 43, the gasket 47 being located in a recess 45. Tube 22 passes through aperture 55 with clearance as shown. Insert 13 is provided with a through aperture 37 through which tube 22 passes, and is also provided with a flange 15 which is received in a cylindrical groove in a closure cap 11 through which the tube 22 passes; tube 22 is fast with cap 11. The cap 11 has an offset concentrate outlet 25, and on a surface 31 thereof facing the insert 13 there is a sealing ring 29 which sealingly engages the insert 13 prevent flow of concentrate past the ring 29 to the outlet 25. Such communication is established when the cap 11 is displaced relative to the insert 13, and such displacement can take place in the manner as set forth in the said European Patent Application. When such displacement does take place, the cap 11 moves downwards as shown in Fig. 5 detaching the upper end of tube 22 from the sealing washer 47 permitting compensating air to flow into the compensating chamber 26, and permitting concentrate to flow out of the outlet 25. The ports 49 are made large to ensure free communication between the interior of the chamber 26 and the interior of the body 10, but the use of the baffle 53 with an aperture 55 of less cross sectional area than that of the chamber 26 prevents the chamber 26 from filling up with concentrate when the package is removed and reinverted to the normal position.

In the recess 17 which receives the portion 15 there is a sealing ring 21 received in a circumferential recess 19.

Typically, the ports 49, in order to ensure good hydraulic communication between the interior of the compensating chamber 26 and the interior of the body 10 should have a width of .225 inches (5,7 mm) and a length of .605 inches (15,4 mm).

The insert 13 may be press fitted into the top of the body 10 and subsequently welded thereto, because it is usually desired in this construction that the package should be a sealed package which is disposed of after the concentrate has been dispensed therefrom.

Fig. 7 illustrates an alternate embodiment of the present invention which eliminates the O-ring seals of Fig. 5. Parts which perform the same function are given the same number followed by the letter "a".

The construction in Fig. 7 is adapted to be an all molded construction and to minimize the amount of assembly required. As illustrated, the cap 11a has molded integrally with it, the tube 22a. The cap is essentially as before except that the part 15 which fits into the annular opening in the cap is part 15a of the container 10 and not a separate insert. This then simplifies construction. Also shown is a projection 18 fitting into a slot 20 on each side. These are used to cause a relative movement of the cap with respect to the container to permit dispensing in the manner discussed, in detail, in said European Application. The container is molded with a lip 21a to insure sealing against the recess 17a in the cap to take the place of the O-ring seal. The chamber 26 is made of two parts. It includes a cylindrical part 39a which has press fitted into it the baffle 53a. The wall 39a has molded into it an annular seal 54 which seals the cap 11a avoiding the O-ring seal at that point. The cylindrical part 39a has a flange 33a which press fits into a suitable recess 34 formed in the neck 15a of the container. Snapped over the bottom of the cylindrical part and retained in place by a flange is a part 44 which includes the truncated conical portion 41a and top 43a. This part 44 is provided with a flange 46 which snaps around and sealingly engages with a flange 48 on the top of the cylindrical part 39a. Through this construction, it is possible to mold the part 39a in a single molding operation. As in the previous embodiment, there are the cutouts 49a to permit the ingress of syrup and the egress of air.

Fig. 8 is an embodiment which is particularly simple to manufacture. Shown is a portion of the body 10 having tabs 113 which fit in appropriate slots in a dispensing valve as described in the said European Application. These tabs and a tab 115 on a cap portion 117 cooperate to achieve relative rotation of the cap and bottle. The cap contains slanted slots 120 into which projections 118 on the neck of the bottle fit to achieve the relative movement of the cap with respect to the container to permit dispensing. In the illustrated embodiment, cap 117 is provided with an outlet opening 123. The cap also has an air inlet 125 leading into a tubular projection 127. The tubular projection or tube 127 extends into the compensating chamber 26 having an essentially cylindrical side wall and a bottom wall 135 with a partially conical shape. The centre portion 137 of the bottom wall is flat on the outside and contains a sealing projection 139 on the inside which locates and seals against the inner diameter of the tube 127 when the cap is in the position shown. Rotation of the cap on the neck of the body 10 will result in the tube moving away from the projection 139 to permit air to flow into the chamber 26 as described.

The chamber side wall is supported on a plurality of struts 141, which in turn are supported in an annular flange member 143 which is press fitted into the neck of the container. As is particularly visible with reference to Fig. 9, there are relatively large gaps 145 between the struts 141. This permits a free flow of air out into the container without viscosity or surface tension becoming a problem. As with the previous embodiments, to prevent an undesired accumulation of syrup in the chamber 26, a baffle 147, which snaps into grooves formed at the inside of the side wall, is provided and provides the top of the chamber 26. It has a circular opening 149 at its centre to permit flow of air out through the openings 145.

Directly below the flange 143 is a sealing disc 151 which has projections 153 at its circumference which snap into a groove 155 in the neck of the body 10. The sealing disc 151 has an inner central opening 157 into which a step portion 159 on the cap fits sealingly at this point. This prevents any outflow of syrup through the outlet 123 when in the closed position. The snapping in place of the sealing disc makes a seal at its circumference preventing leakage at that point. With the exception of the cap, the remaining parts of the chamber are preferably made of high density polyethylene with the cap of low density polyethylene. This then permits a good seal between the projection 139 and tube 127 and between the step portion 159 and the sealing disc 151 at the opening 157 since one is of the softer and the other of a harder material. To prevent leakage during operation when step portion 157 is separated from disc 151 and concentrate is flowing out of outlet 123, an annular seal 160 is formed in cap portion 117.

It has also been discovered that in operation under certain conditions resulting from temperature variations there is a surge problem and a certain amount of syrup will tend to surge into the chamber 26 when the outlet is opened. If this surge was sufficient to permit syrup to reach the top of the tube 127, a problem of a bubble forming at that point could exist. It has been found that, with a 500 millilitre container making the compensating chamber 26 of a capacity of about 10—20 millilitre avoids this problem and all embodiments of the invention may be of these dimensions.

Fig. 11 illustrates a further embodiment according to the present invention. In this embodiment, which is particularly adapted for the fitting of the chamber 26 into the neck of a body on an automatic assembly line, the container 10 has a simple cylindrical neck with an annular groove 213. A three-part assembly comprising, in general, a chamber part 215, a cap part 217 and a

baffle 219 snaps onto the neck 221 of the container 211. The chamber part 215 is generally as described in connection with Fig. 8 in terms of a chamber 231 with side walls 233 and bottom wall 235 with an inner projection 239. Once again, struts 241 support the chamber. However, in this case the struts rather than terminating in a flange continue into a solid cylindrical portion 243 of U-shaped cross section having a base portion 245 and another cylindrical portion 247 which snaps onto the neck 221 of the bottle. The part 247 has a radial portion 249 extending to enlarged outwardly extending lugs 251 at opposite sides performing the same function as tabs 113 of Fig. 8.

The cap portion includes tube 227 opening into a wider conical portion 229 which extends to the other end of the cap. At the point where this meets the outer end, a sealing surface 253 is formed sealing against the inside of the part 243. The cap has a flat, annular top 255 with the outlet opening 258 in this top part. The side wall 257 of the cap surrounds part 247 with an integrally molded seal 260 to prevent flow of concentrate between the two parts. A tab 261 is formed on the cap. As in the previous embodiment, there is a cooperating groove 263 and tab 265 to obtain relative movement between the cap and the remainder of the structure.

As noted above, this embodiment is particularly simple in terms of molding and in terms of insertion onto the neck of a bottle which needs no special molding, i.e. it does not need separately molded tabs since these are formed by the insert, nor does it have to be molded with projections which cooperate with a cap to obtain relative motion. In addition, since the length of the outlet passage 258 is shorter, improved starting and stopping of the flow without delay becomes possible and the possibility of syrup remaining in the outlet opening is considerably reduced.

Fig. 12 illustrates an even simpler manner of making a part 215a corresponding to the part 215 of Fig. 11. Here, the part 315 shown in solid lines is first molded and then, through blow molding is caused to take the shape 315a shown in dotted lines, thereby integrally forming the compensating chamber top 319a. Used with the cap part of Fig. 11, this results in a simple two part insert to the bottom which performs the function of outlet valve and air inlet.

In the various embodiments of the invention described, the compensating chamber and various parts mounting same are variously described as being push fitted, or snap fitted into the mouth of the body. When these parts are in position, they can be permanently attached by welding or sealing, or adhesive, as it is desired that the package should be a sealed unit not capable of being opened and re-filled.

The connections between the cap and the body and/or any insert should be such as to permit relative movement between the cap and the parts mounting same, but the cap should not be such as to be readily detachable and replaceable in that if an attempt is made to remove the cap, it is preferable that irreparable damage be done thereto.

Any of the features of any embodiment may be used in conjunction with any of the other embodiments, if appropriate.

Tests with the gravity dispenser package of the present invention have been successfully conducted under varying conditions and have provided good results in that constant head conditions have prevailed throughout the dispensing of substantially all of the liquid from the package. When a package is used in conjunction with a beverage dispensing machine, only a small proportion of the liquid in the package will be dispensed for each drink, along with an appropriate amount of diluent as explained in the said European Patent Application.

A number of advantages attached to the utilisation of a gravity feed system, and these include but are not necessarily limited to the following:

1. It is not necessary to use a low pressure regulator as is necessary when pressurised dispensing from a package is adopted.
2. Because of the absence of pressure in the system, the seals can be reduced in number or quality.
3. Dispensing is simplified as there is no need to bring a propelling gas supply to the package.
4. The package shape and size can be varied within wider limits.
5. Cheaper plastic material can be used as there is no requirement to provide barrier properties needed to retain pressurised gas inside a container.

Claims

1. A package for the dispensing of liquid under constant head comprises a package body (10) comprising a bottom, a wall and a top, the top having an outlet for the discharge of liquid from the body (10), and an inlet for air to compensate for the discharge of liquid from the body, a compensating chamber (26) inside the body having a bottom, a wall and a top, the compensating chamber (26) being located in relation to the said air inlet so that when the package is in inverted, in-use, position the compensating chamber 26 is inverted and the interior communicates with said air inlet, and in addition the interior of the body (10) communicates with the interior of the compensating chamber (26) via the top of the compensating chamber (26), whereby air can bubble out of the compensating chamber (26) through the top thereof into a head space in the body (10) when the package is in use, characterised in that the opening (55) in the top of the compensating chamber (26) to permit compensating air to pass thereinto, and to permit air to bubble from the compensating chamber (26) into the head space of the body (10) is of a smaller cross sectional area than the maximum cross sectional area of the compensating chamber (26), and wherein the air inlet comprises a tube (22)

baffle 219 snaps onto the neck 221 of the container 211. The chamber part 215 is generally as described in connection with Fig. 8 in terms of a chamber 231 with side walls 233 and bottom wall 235 with an inner projection 239. Once again, struts 241 support the chamber. However, in this case the struts rather than terminating in a flange continue into a solid cylindrical portion 243 of U-shaped cross section having a base portion 245 and another cylindrical portion 247 which snaps onto the neck 221 of the bottle. The part 247 has a radial portion 249 extending to enlarged outwardly extending lugs 251 at opposite sides performing the same function as tabs 113 of Fig. 8.

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In the various embodiments of the invention described, the compensating chamber and various parts mounting same are variously described as being push fitted, or snap fitted into the mouth of the body. When these parts are in position, they can be permanently attached by welding or sealing, or adhesive, as it is desired that the package should be a sealed unit not capable of being opened and re-filled.

The connections between the cap and the body and/or any insert should be such as to permit relative movement between the cap and the parts mounting same, but the cap should not be such as to be readily detachable and replaceable in that if an attempt is made to remove the cap, it is preferable that irreparable damage be done thereto.

Any of the features of any embodiment may be used in conjunction with any of the other embodiments, if appropriate.

Tests with the gravity dispenser package of the present invention have been successfully conducted under varying conditions and have provided good results in that constant head conditions have prevailed throughout the dispensing of substantially all of the liquid from the package. When a package is used in conjunction with a beverage dispensing machine, only a small proportion of the liquid in the package will be dispensed for each drink, along with an appropriate amount of diluent as explained in the said European Patent Application.

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1. A package for the dispensing of liquid under constant head comprises a package body (10) comprising a bottom, a wall and a top, the top having an outlet for the discharge of liquid from the body (10), and an inlet for air to compensate for the discharge of liquid from the body, a compensating chamber (26) inside the body having a bottom, a wall and a top, the compensating chamber (26) being located in relation to the said air inlet so that when the package is in inverted, in-use, position the compensating chamber 26 is inverted and the interior communicates with said air inlet, and in addition the interior of the body (10) communicates with the interior of the compensating chamber (26) via the top of the compensating chamber (26), whereby air can bubble out of the compensating chamber (26) through the top thereof into a head space in the body (10) when the package is in use, characterised in that the opening (55) in the top of the compensating chamber (26) to permit compensating air to pass thereinto, and to permit air to bubble from the compensating chamber (26) into the head space of the body (10) is of a smaller cross sectional area than the maximum cross sectional area of the compensating chamber (26), and wherein the air inlet comprises a tube (22)

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which leads through a cap (11) closing the top of the body (10) and into the compensating chamber (26), the tube (22) being adapted to sealingly engage the bottom of the compensating chamber (26) in a first position, and in a second position being displaceable therefrom to permit the air to flow into the compensating chamber (26).

2. A package according to Claim 1, characterised in that the top of the compensating chamber is defined by a frusto conical portion (53) of which the larger diameter end connects with the compensating chamber wall (39), and the smaller diameter end forms said opening (55) in the top.

3. A package body according to Claim 1 or 2, characterised in that the tube (22) is carried by the cap (11) and the cap has a means (29, 19) serving to sealingly close the top of the body (10), but the cap (11) is displaceable relative to the body (10) to cause, on the one hand, the seal between the end of the air tube (11) and the bottom of the compensating chamber (26) to be opened, and also to cause on the other hand a flow of liquid from the body (10) through an aperture (25) in the cap.

4. A package body according to any preceding Claim, characterised in that the compensating chamber (26) is formed as a unit and is inserted into the body.

5. A package according to Claim 4, characterised in that the compensating chamber (315a) is formed from a cup-shaped member (315) which is partially blow-moulded or otherwise increased in volume above a neck region (319a) which defines said opening in the top of the compensating chamber.

6. A package according to any preceding Claim when sealed and filled with flavouring concentrate.

Patentansprüche

1. Behälter zur Abgabe einer Flüssigkeit mit Konstantdruck, mit einem Behältergehäuse (10), welches eine Bodenfläche, eine Wand und eine Oberseite aufweist, wobei die Oberseite einen Auslaß für die Abgabe von Flüssigkeit aus dem Gehäuse (10) und einen Einlaß für Luft aufweist, um die aus dem Gehäuse abgegebene Flüssigkeit zu kompensieren; mit einer Ausgleichskammer (26) innerhalb des Gehäuses mit einer Bodenfläche, einer Wand und einer Oberseite, wobei die Ausgleichskammer (26) in Relation zu dem Lufteinlaß derart angeordnet ist, daß, wenn die Verpackung in einer umgedrehten Gebrauchslage ist, die Ausgleichskammer (26) umgekehrt ist und ihr Inneres mit dem Lufteinlaß in Verbindung steht und zusätzlich das Innere des Gehäuses (10) mit dem Inneren der Ausgleichskammer (26) über die Oberseite der Ausgleichskammer (26) in Verbindung steht, so daß Luft aus der Ausgleichskammer (26) über deren Oberseite in einen Kopfraum in dem Gehäuse (10) austreten kann, wenn die Verpackung gebraucht wird, dadurch gekennzeichnet,

daß eine Öffnung (55) in der Oberseite der Ausgleichskammer (26), welche den Eintritt kompensierender Luft in diese Kammer und den Austritt von Luft aus der Ausgleichskammer (26) in den Kopfraum des Gehäuses (10) ermöglicht, einen kleineren Querschnittsbereich als der maximale Querschnittsbereich der Ausgleichskammer (26) aufweist, wobei der Lufteinlaß eine Röhre (22) aufweist, welche durch eine Kappe (11), die die Oberseite des Gehäuses (10) verschließt, läuft und in die Ausgleichskammer (26) ragt, wobei die Röhre (22) in abdichtender Anlage mit der Bodenfläche der Ausgleichskammer (26) in einer ersten Stellung ist und in einer zweiten Stellung außer Anlage hiervon bringbar ist, um den Eintritt von Luft in die Augleichskammer (26), zu ermöglichen.

2. Behälter nach Anspruch 1, dadurch gekennzeichnet, daß die Oberseite der Ausgleichskammer von einem kegelstumpfförmigen Bereich (53) gebildet ist, dessen Ende mit größerem Durchmesser mit der Wand (39) der Ausgleichskammer in Verbindung steht und dessen Ende mit kleinerem Durchmesser die Öffnung (55) in der Oberseite bildet.

3. Behälter nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Röhre (22) von der Kappe (11) gehalten ist und die Kappe Einrichtungen (29, 19) aufweist, welche die Oberseite des Gehäuses (10) abdichtend verschließen, wobei die Kappe (11) relativ zu dem Gehäuse (10) versetzbar ist, um einerseits die Abdichtung zwischen dem Ende der Lufteinlaßröhre (11) und der Bodenseite der Ausgleichsseite (26) zu öffnen und andererseits den Fluß einer Flüssigkeit aus dem Gehäuse (10) durch eine Öffnung (25) in der Kappe zu ermöglichen.

4. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Ausgleichskammer (26) einstückig ausgebildet ist und in das Gehäuse eingesetzt ist.

5. Behälter nach Anspruch 4, dadurch gekennzeichnet, daß die Ausgleichskammer (315a) als tassenförmiges Teil (315) ausgebildet ist, welches durch teilweisen Blasspritzguß oder dergleichen oberhalb eines Halsbereiches (319a), der die Öffnung in der Oberseite der Ausgleichskammer bildet, eine Volumenerhöhung erfährt.

6. Behälter nach einem der vorhergehenden Ansprüche, abgedichtet und gefüllt mit aromatisierendem Flüssigkeitskonzentrat.

Revendications

1. Récipient pour la distribution de liquides sous une pression constante, comprenant un corps de récipient (10) comportant un fond, une paroi et une extrémité supérieure, l'extrémité supérieure ayant une sortie pour l'évacuation du liquide à partir du corps (10), et une entrée pour l'air pour remplacer le liquide évacué du corps, une chambre de compensation (26) à l'intérieur du corps ayant un fond, une paroi et une extrémité supérieure, la chambre de compensation (26) étant reliée à ladite entrée d'air, de sorte que, quand le récipient est dans la position inversée

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d'utilisation, la chambre de compensation (26) est inversée et l'intérieur communique avec ladite entrée d'air, et, de plus, l'intérieur du corps (10) communique avec l'intérieur de la chambre de compensation (26) via l'extrémité supérieure de la chambre de compensation (26), par quoi l'air s'échappe sous forme de bulles de la chambre de compensation (26) à travers son extrémité supérieure dans un espace de pression dans le corps (10) quand le récipient est utilisé, caractérisé en ce que l'ouverture (55) dans l'extrémité supérieure de la chambre de compensation (26) pour permettre à l'air de compensation d'y entrer et pour permettre à l'air de s'échapper de la chambre de compensation (26) sous forme de bulles dans l'espace de pression du corps (10), présente une surface de section transversale plus petite que la surface de section transversale maximale de la chambre de compensation (26), et dans lequel l'entrée d'air comprend un tube (22) qui conduit à travers un capuchon (11) fermant l'extrémité supérieure du corps (10) dans la chambre de compensation (26), le tube (22) étant adapté pour engager de façon étanche le fond de la chambre de compensation (26) dans une première position et, dans une seconde position, étant déplaçable à partir de celui-ci pour permettre à l'air de s'écouler dans la chambre de compensation (26).

2. Récipient selon la revendication 1, caractérisé en ce que l'extrémité supérieure de la chambre de compensation est définie par une partie tronconique (53) dont l'extrémité de plus grand diamètre est reliée à la paroi (39) de la chambre de compensation, et l'extrémité de plus petit diamètre forme ladite ouverture (55) dans l'extrémité supérieure.

3. Récipient selon la revendication 1 ou 2, caractérisé en ce que le tube (22) est porté par le capuchon (11) et le capuchon présente de moyens (29, 19) servant à fermer de façon étanche l'extrémité supérieure du corps (10), mais le capuchon (11) est déplaçable par rapport au corps (10) pour provoquer, d'une part, l'ouverture du joint étanche entre l'extrémité du tube d'air (11) et le fond de la chambre de compensation (26) et, également, d'autre part, pour permettre un écoulement de liquide à partir du corps (10) à travers une ouverture (25) dans le capuchon.

4. Récipient selon l'une quelconque des revendications précédentes, caractérisé en ce que la chambre de compensation (26) est formée en tant qu'unité et est insérée dans le corps.

5. Récipient selon la revendication 4, caractérisé en ce que la chambre de compensation (315a) est formée à partir d'un organe (315) en forme de coupe qui est partiellement moulé par soufflage on dont le volume est augmenté d'une autre façon au-dessus d'une région de col (319a) qui définit ladite ouverture dans l'extrémité supérieure de la chambre de compensation.

6. Récipient selon l'une quelconque des revendications précédentes, fermé de façon étanche et rempli d'un concentré de goût.