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(54) **BOTTLE TRANSFER DEVICE**

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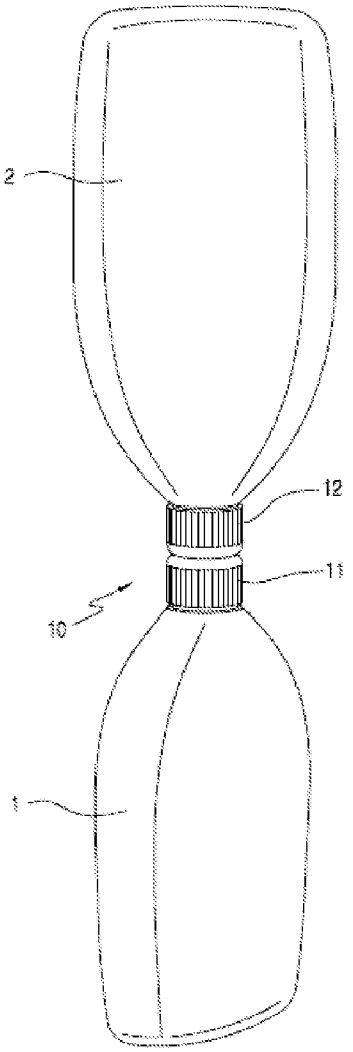
(57) **ABSTRACT**

A device and a system for transferring viscous fluid between a first bottle and a second bottle may be provided. The device and system may comprise a first cap having a first internal thread and a first channel extending through the first cap and a second cap having a second internal thread and a second channel extending through the second cap. The first cap and the second cap may be coupled to one another, and the first channel may be fluidly connected with the second channel.



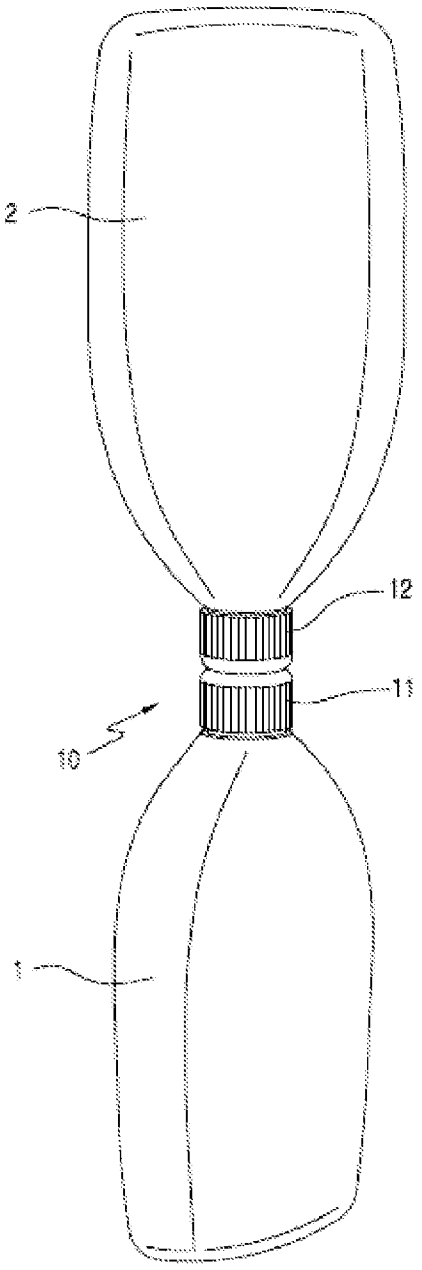


FIG. 1

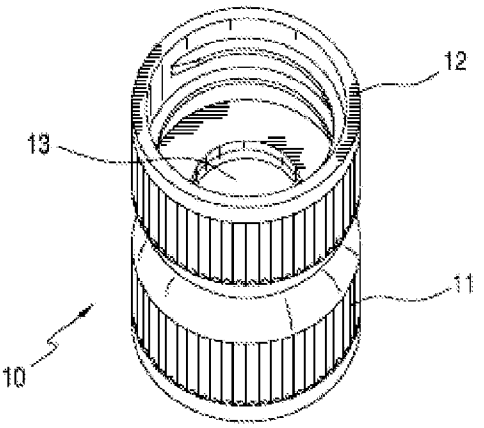


FIG. 2

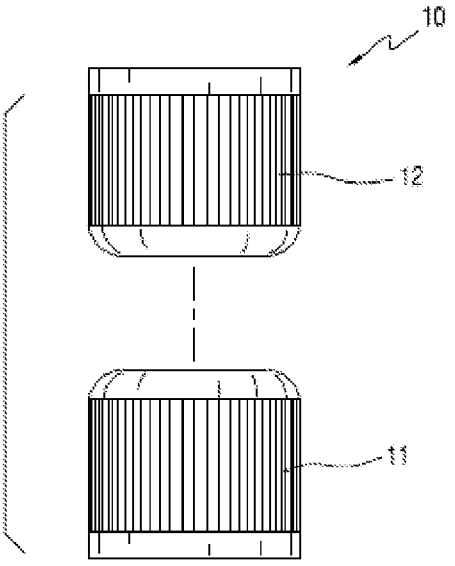


FIG. 3

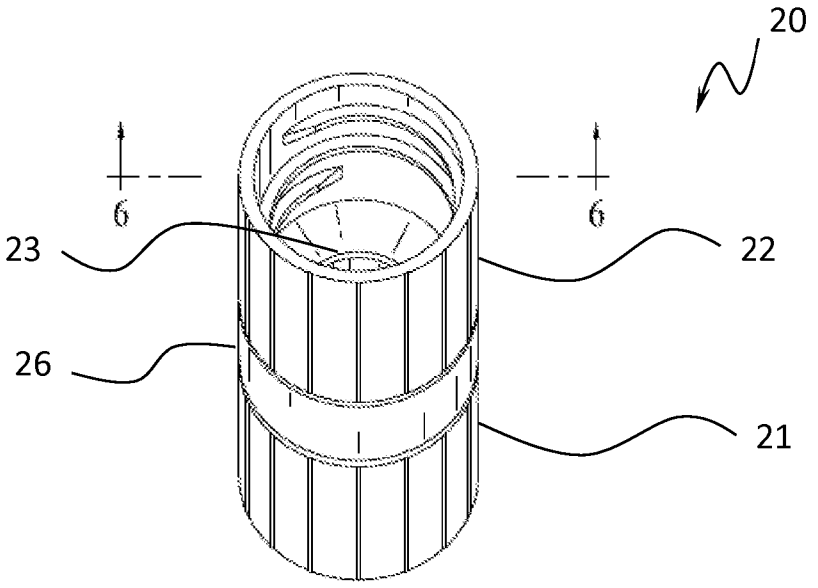


FIG. 4

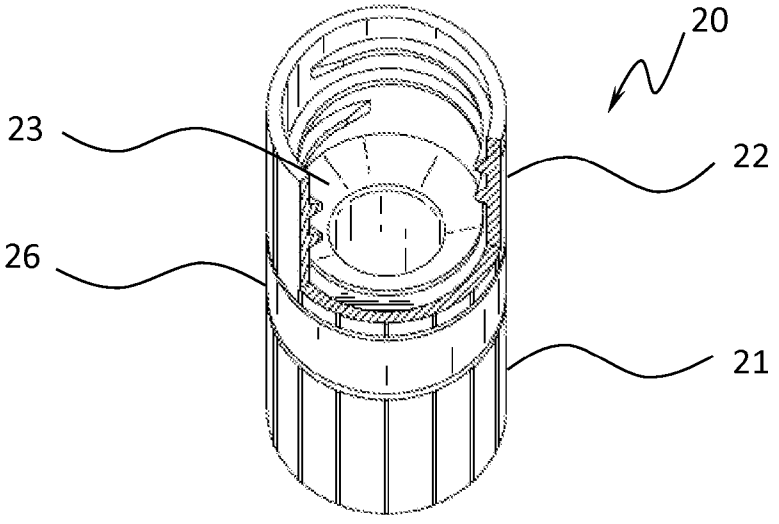


FIG. 5

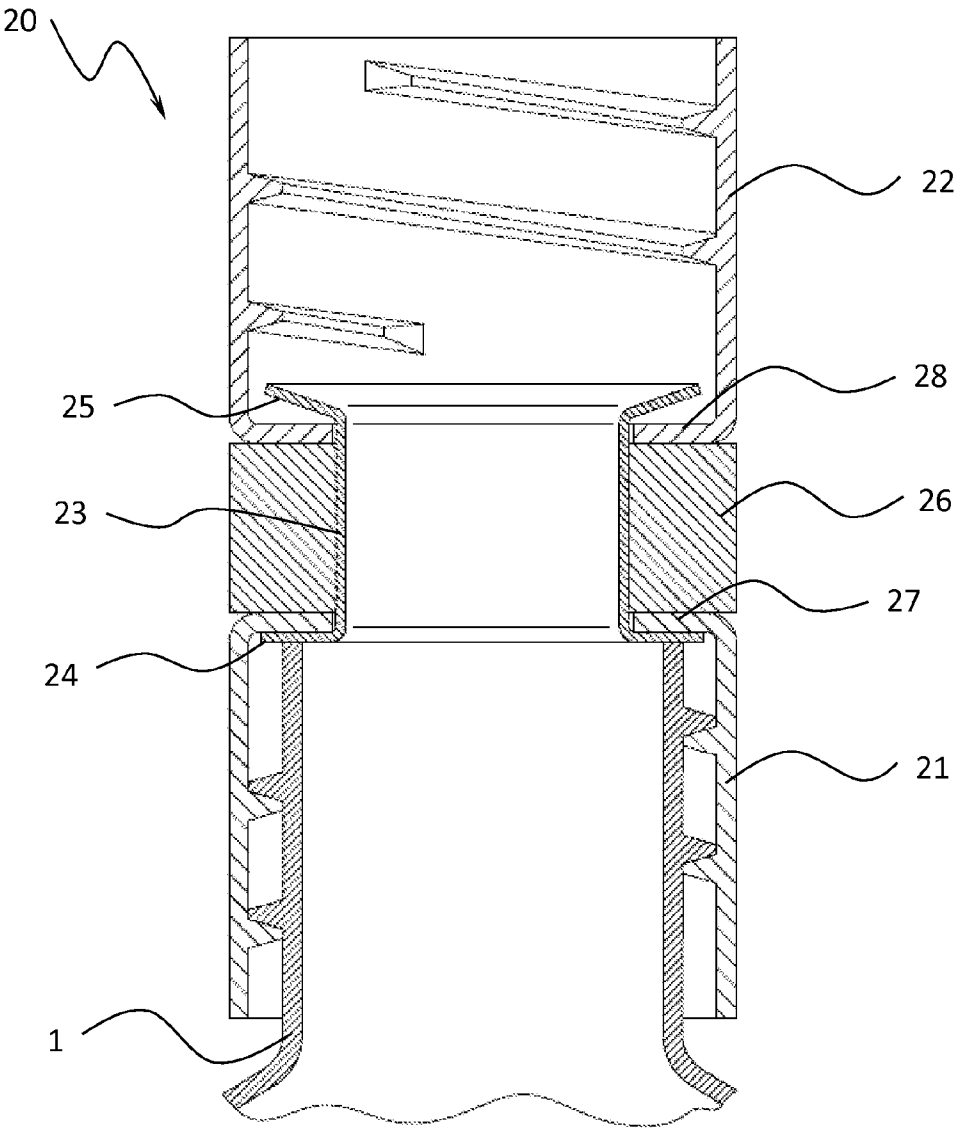


FIG. 6

BOTTLE TRANSFER DEVICE

PRIORITY

[0001] This non-provisional application claims priority to Provisional U.S. Patent Application Ser. No. 61/853,048 filed Mar. 27, 2013.

BACKGROUND

[0002] In many instances, a person, trying to remove the last vestiges of a viscous liquid from a fluid-containing bottle, experiences only frustration for his or her efforts. When this scenario is repeated again and again by a large number of consumers, a big waste of money and resources can result. There is a need for a low cost device which one can easily use to empty the entire contents of the bottle.

[0003] Thus, there is a need for a device with which one can transfer virtually 100 percent of the residual contents of a fluid-containing bottle from it to another bottle so that the residual fluid can be collected in the latter vessel and stored therein for subsequent consumption at the user's convenience. Moreover, there is a need for a device that may quickly and easily couple to one or more bottles to facilitate transfer of fluid between the bottles.

SUMMARY

[0004] In one exemplary embodiment, a device for transferring fluid may be provided. The transferring device may include a first cap member having a first internal thread and a first channel extending through the first cap member, and a second cap member having a second internal thread and a second channel extending through the second cap member. The first cap member and the second cap member may be coupled to one another, and the first channel may be fluidly connected with the second channel.

[0005] In another exemplary embodiment, a system for transferring fluid from a first bottle to a second bottle may be provided. The system may include a first cap member having a first internal thread and a first channel extending through the first cap member, and a second cap member having a second internal thread and a second channel extending through the second cap member. The system may further include a first bottle having a first interior chamber and a second bottle having a second interior chamber. The first cap member and the second cap member may be coupled to one another, and the first channel may be fluidly connected with the second channel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Advantages of embodiments of the present invention will be apparent from the following detailed description of the exemplary embodiments. The following detailed description should be considered in conjunction with the accompanying figures in which:

[0007] FIG. **1** shows an exemplary embodiment of the transfer device fluidly connected to two bottles, one of which is inverted above the other, as the device is being used to drain the contents of the inverted bottle into the upright bottle.

[0008] FIG. **2** shows an exemplary top perspective view of the embodiment of FIG. **1**.

[0009] FIG. **3** shows an exemplary view of the first and second screw-on caps which, in assembled relation, are coupled together in the transfer device embodiment of FIG. **1**.

[0010] FIG. **4** shows an exemplary top perspective view of another embodiment of the transfer device.

[0011] FIG. **5** shows an exemplary top perspective view of the FIG. **4** embodiment of the transfer device in which a portion thereof has been cut away.

[0012] FIG. **6** shows an exemplary cross-sectional view of the FIG. **4** embodiment of the transfer device being installed onto a bottle.

DETAILED DESCRIPTION

[0013] Aspects of the present invention are disclosed in the following description and related figures directed to specific embodiments of the invention. Those skilled in the art will recognize that alternate embodiments may be devised without departing from the spirit or the scope of the claims. Additionally, well-known elements of exemplary embodiments of the invention will not be described in detail or will be omitted so as not to obscure the relevant details of the invention.

[0014] As used herein, the word "exemplary" means "serving as an example, instance or illustration." The embodiments described herein are not limiting, but rather are exemplary only. It should be understood that the described embodiments are not necessarily to be construed as preferred or advantageous over other embodiments. Moreover, the terms "embodiments of the invention", "embodiments" or "invention" do not require that all embodiments of the invention include the discussed feature, advantage or mode of operation.

[0015] Exemplary FIGS. **1** and **2** depict an exemplary transfer device that is indicated generally by the reference numeral **10**.

[0016] The transfer device **10** may have a structure that defines a pair of oppositely directed, screw thread sets that are aligned axially and between which a through channel **13** may extend longitudinally along the respective axis of each such set. Further, each individual screw thread set may be sized and threaded to threadedly engage a bottle **1**, **2**.

[0017] These screw thread sets may be provided by two screw-on caps **11** and **12** which may be welded, glued, or otherwise coupled together. The transfer device **10** may alternatively be formed integrally as a single, unitary piece fabricated of plastic or the like. Each of the caps **11**, **12** may have a cylindrical body having an interior surface upon which the respective thread set is disposed. Each of the caps **11**, **12** may further comprise an opening configured to receive a portion of a bottle at one end of the cylindrical body, and a top portion disposed at the opposite end of the cylindrical body. The first and second caps **11**, **12** may be coupled or formed integrally together such that the top portion of the first cap **11** is directly affixed to the top portion of the second cap **12**. A bore through the interface between the caps **11**, **12** so affixed may complete the through channel **13**, so that gravity can be used to transfer fluid from an inverted bottle **2** into an upright bottle **1**.

[0018] Prior to use, the cap **11** of the transfer device **10** may be first screwed onto the bottle **1**, and then cap **12** may be screwed onto bottle **2**. The latter step may entail rotating bottle **2** relative to the transfer device **10**. A user may place bottle **1**, once it has been threadedly engaged with cap **11**, in a generally horizontal position in order to keep fluid from draining out of bottle **2** prematurely—that is, prior to its being completely installed by threaded engagement with cap **12**. Alternatively, the order in which the caps are screwed on may be reversed.

[0019] The device may be assembled such that each of the caps **11**, **12** are engaged to respective bottles **1**, **2** to form a system for transferring fluid between the bottles **1**, **2**. The system may be disposed in a vertical orientation. In the vertical orientation, the receiving bottle **1** may be disposed in an upright position, and the residue-containing bottle **2** may be inverted above the receiving bottle **1** with the transfer device **10** disposed between the bottles **1**, **2**.

[0020] FIGS. **4-6** may depict another exemplary embodiment **20** of a transfer device. The transfer device **20** may comprise a pair of screw-on caps **21**, **22**. Each of the caps **21**, **22** may have a cylindrical body defining an interior channel and an interior surface upon which a respective thread set is disposed. Each of the caps **21**, **22** may further have an opening configured to receive a portion of a bottle at one end of the cylindrical body and a top portion disposed at the opposite end of the cylindrical body. The top portion of each cap **21**, **22** may have a bore defined therethrough such that a hollow shaft **23** having an internal lumen may be slip-fitted through the bores in top portions of the first and second caps **21**, **22** prior to assembly. The internal surface of the top portion of each cap **21**, **22** may define a generally circular rim-like projection **27**, **28**. Each rim-like projection **27**, **28** may surround the bore of the respective cap **21**, **22**. The shaft **23** may be fabricated of a short piece of ½ inch polyethylene tubing or the like. As shown in exemplary FIG. **6**, the shaft **23** may have flared end portions **24**, **25** wherein the flared end portions **24**, **25** may have a diameter greater than a diameter of a middle portion of the shaft **23**.

[0021] FIG. **6** can depict a cross-section of the exemplary transfer device **20** of FIGS. **4** and **5**. During installation, the cap **21** may be screwed onto a bottle **1** having an interior chamber, a mouth in fluid communication with the interior chamber, and an external thread surrounding the mouth. As the cap **21** is screwed over the external thread of the bottle **1**, a first flared end portion **24** of the shaft **23** may be compressed between the rim-like projection **27** on the cap **21** and the leading edge of the mouth of the bottle **1**. When the flared end portion **24** of the hollow shaft **23** is so compressed, a substantially leak-tight joint may be formed between the interior of the bottle **1**, the interior channel of the first cap **21**, and the internal lumen of the hollow shaft **23**.

[0022] The cap **22** may then be screwed onto a bottle **2** (not shown) having an interior chamber, a mouth in fluid communication with the interior chamber, and an external thread surrounding the mouth. As the cap **22** is screwed over the external thread of the bottle **2**, a second flared end portion **25** of the shaft **23** may be compressed between the rim-like projection **28** on the cap **22** and the leading edge of the mouth of the bottle **2**. When the second flared end portion **25** of the hollow shaft **23** is so compressed, a substantially leak-tight joint may be formed between the interior of the bottle **2**, the interior channel of the first cap **22**, and the internal lumen of the hollow shaft **23**.

[0023] Once the ends of the shaft **23** have been so compressed, seals which are adequate for preventing the leakage of a highly viscous fluid at the junctures between the shaft and the caps **21**, **22** may be formed. In this configuration, a substantially leak-tight connection may be formed between the first bottle **1**, the channel of the first cap **21**, the lumen of the hollow shaft **23**, the channel of the second cap **22**, and the second bottle **2**. Because the shaft **23** may be present in the device **20**, the caps **21**, **22** may be free to rotate independently of each other and independently of the shaft **23**. As a consequence, after cap **21** has been screwed onto bottle **1**, cap **22** can then be screwed onto bottle **2** without a user having to rotate the latter bottle. This configuration may thereby expedite the installation process.

[0024] A spacer member **26** may be provided between the caps **21**, **22** to facilitate vertical alignment and independent rotation of the caps **21**, **22**. The spacer member may have a central bore disposed coaxially with the bores of the caps **21**, **22**. Accordingly, the hollow shaft **23** may extend from the channel in the first cap, through the bore in the top portion of the first cap, through the bore in the spacer member **26**, through the bore in the top portion of the second cap **22**, and finally into the channel in the second cap. The spacer member **26** may be rotationally fixed to the hollow shaft **23**. In this embodiment, the first bottle **1**, the second bottle **2**, the first cap **21**, the second cap **22**, and the hollow shaft **23** may all be independently rotatable relative to one another. In an alternate embodiment, the spacer **26** may be free to rotate independently from the hollow shaft **23**. So configured, the first bottle **1**, the second bottle **2**, the first cap **21**, the second cap **22**, the hollow shaft **23** and the spacer member **26** may all be independently rotatable relative to one another. Allowing the caps and other components to rotate freely may facilitate installation of the device onto the first and second bottles **1**, **2**.

[0025] A vent (not shown) may be provided in a side wall along the cylindrical body of one or both of the caps **21**, **22**. Prior to installation of the respective cap **21**, **22** onto a bottle, the vent may fluidly connect with the channel of the respective cap **21**, **22**. When the cap **21** is engaged with a bottle **1** such that the flared end of the hollow shaft **23** is engaged between the rim-like projection of the respective cap **21**, **22** and the edge of the mouth tip of the respective bottle **1**, **2**, the substantially leak-tight joint between the bottle **1**, **2**, the cap channel, and the lumen of hollow shaft **23** may prevent the vent from fluidly connecting with internal chamber of the bottle **1**, **2** and the lumen of the hollow shaft **23**. In other words, the connection between the bottle **1** and the lumen of the hollow shaft **23** may be substantially sealed and may not fluidly connect with the vent. Providing one or more vents may allow air disposed in the threads of the caps **21**, **22** and the bottles **1**, **2** to be released, thereby facilitating engagement of the respective threads.

[0026] The foregoing description and accompanying figures illustrate the principles, preferred embodiments and modes of operation of the invention. However, the invention should not be construed as being limited to the particular embodiments discussed above. Additional variations of the embodiments discussed above will be appreciated by those skilled in the art.

[0027] Therefore, the above-described embodiments should be regarded as illustrative rather than restrictive. Accordingly, it should be appreciated that variations to those embodiments can be made by those skilled in the art without departing from the scope of the invention as defined by the following claims.

What is claimed is:

1. A device for transferring a fluid comprising:

a first cap having a first internal thread and a first channel extending through the first cap;

a second cap having a second internal thread and a second channel extending through the second cap;

wherein the first cap and the second cap are coupled to one another, and the first channel is fluidly connected with the second channel.

2. The device of claim **1**, wherein the first cap has a first top portion and a first bore extending therethrough, the second cap has a second top portion and a second bore extending therethrough, and the first and second bores provide fluid communication between the first channel and the second channel.

3. The device of claim **2**, wherein the first and second caps are welded together.

4. The device of claim **2**, wherein the first and second caps are glued together.

5. The device of claim **2**, wherein the first and second caps are formed integrally as a single, unitary piece.

6. The device of claim **2**, wherein a hollow shaft having an axial lumen is disposed such that it extends from the first channel through the first and second bores into the second channel.

7. The device of claim **6**, wherein the hollow shaft has a first flared end portion, and the first flared end portion is disposed within the first channel such that the first flared end portion is configured to be compressed between an internal surface of the first top portion and a surface of a first bottle that engages the first internal thread, thereby providing a substantially leak-tight joint between the first channel and the lumen of the hollow shaft.

8. The device of claim **7**, wherein the internal surface of the first top portion comprises a generally circular first rim-like projection.

9. The device of claim **7**, wherein the hollow shaft has a second flared end portion, and the second flared end portion is disposed within the second channel such that the second flared end portion is configured to be compressed between an internal surface of the second top portion and a surface of a second bottle that engages the second internal thread, thereby providing a substantially leak-tight joint between the second channel and the lumen of the hollow shaft.

10. The device of claim **8**, wherein the internal surface of the second top portion comprises a generally circular second rim-like projection.

11. The device of claim **6**, wherein each of the first cap member, the second cap member and the hollow shaft are configured to rotate independently of one-another.

12. The device of claim **6**, further comprising a spacer, wherein the spacer comprises a spacer bore that is coaxial with the first bore and the second bore, and the hollow shaft extends through the spacer bore.

13. The device of claim **12**, wherein each of the first cap member, the second cap member, and the spacer are configured to rotate independently of one another.

14. The device of claim **13**, wherein the spacer is rotationally fixed to the hollow shaft.

16. The device of claim **7**, wherein the first cap member comprises an air vent disposed on a side-wall thereof, and the device is configured such that when the first cap member is engaged to a first bottle, the first bottle is not in fluid communication with the air vent.

17. A system for transferring fluid from a first bottle to a second bottle comprising:

a first cap having an first internal thread and a first channel extending through the first cap;

a second cap having an second internal thread and a second channel extending through the second cap;

a first bottle having a first interior chamber;

a second bottle having a second interior chamber;

wherein the first cap and the second cap are coupled to one another, and the first channel is fluidly connected with the second channel.

18. The system of claim **17**, wherein the first cap has a first top portion and a first bore extending therethrough, the second cap has a second top portion and a second bore extending therethrough, and the first and second bores provide fluid communication between the first channel and the second channel, and the system further comprises a hollow shaft having an axial lumen is disposed such that it extends from the first channel through the first and second bores into the second channel.

19. The system of claim **18**, wherein the first bottle has a first mouth tip surface, and the first cap is threaded onto the first bottle such that the first flared end portion of the hollow shaft is compressed between the first mouth tip surface and an interior surface of the first top portion such that a substantially leak-tight joint is formed between the first interior chamber, the first channel, and the lumen of the hollow shaft; and

wherein the second bottle has a second mouth tip surface, and the second cap is threaded onto the second bottle such that the second flared end portion of the hollow shaft is compressed between the second mouth tip surface and an interior surface of the second top portion such that a substantially leak-tight joint is formed between the second interior chamber, the second channel, and the lumen of the hollow shaft.

20. The system of claim **19**, further comprising a spacer, wherein the spacer comprises a spacer bore that is coaxial with the first bore and the second bore, and the hollow shaft extends through the spacer bore;

wherein the spacer is rotationally fixed to the hollow shaft; and

wherein each of the first cap, the second cap, the hollow shaft, the first bottle, and the second bottle are configured to rotate independently of one-another.

* * * * *