



US 20160355305A1

(19) **United States**

(12) **Patent Application Publication**
Hoskins

(10) **Pub. No.: US 2016/0355305 A1**

(43) **Pub. Date: Dec. 8, 2016**

(54) **MULTI-DRINK BOTTLES**

Publication Classification

(71) Applicant: **TSI Manufacturing, LLC**, Bend, OR (US)

(72) Inventor: **Matthew Hoskins**, Bend, OR (US)

(73) Assignee: **TSI Manufacturing, LLC**, Bend, OR (US)

(51) **Int. Cl.**
B65D 51/18 (2006.01)
B65D 47/08 (2006.01)
B65D 47/14 (2006.01)
B65D 1/02 (2006.01)

(52) **U.S. Cl.**
CPC **B65D 51/18** (2013.01); **B65D 1/0246** (2013.01); **B65D 47/0885** (2013.01); **B65D 47/147** (2013.01); **B65D 47/0838** (2013.01)

(21) Appl. No.: **15/171,211**

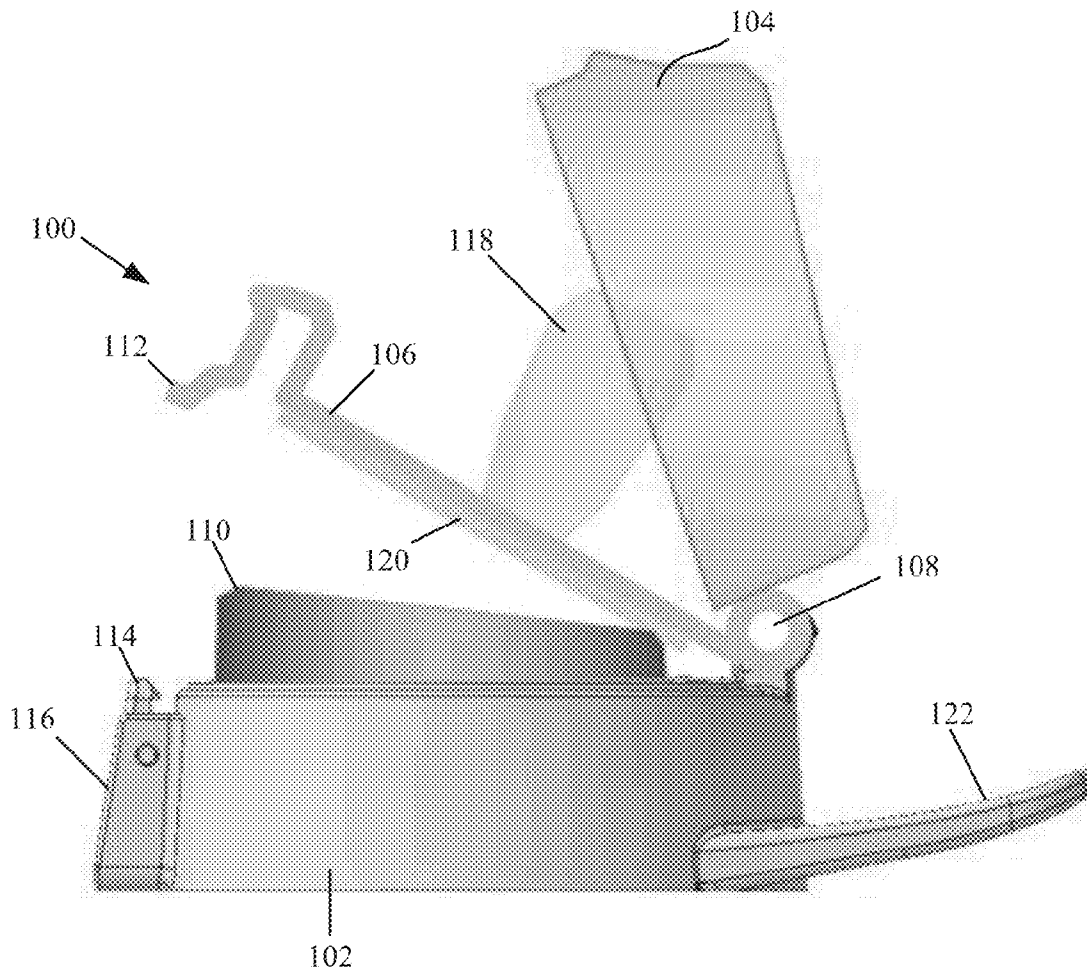
(22) Filed: **Jun. 2, 2016**

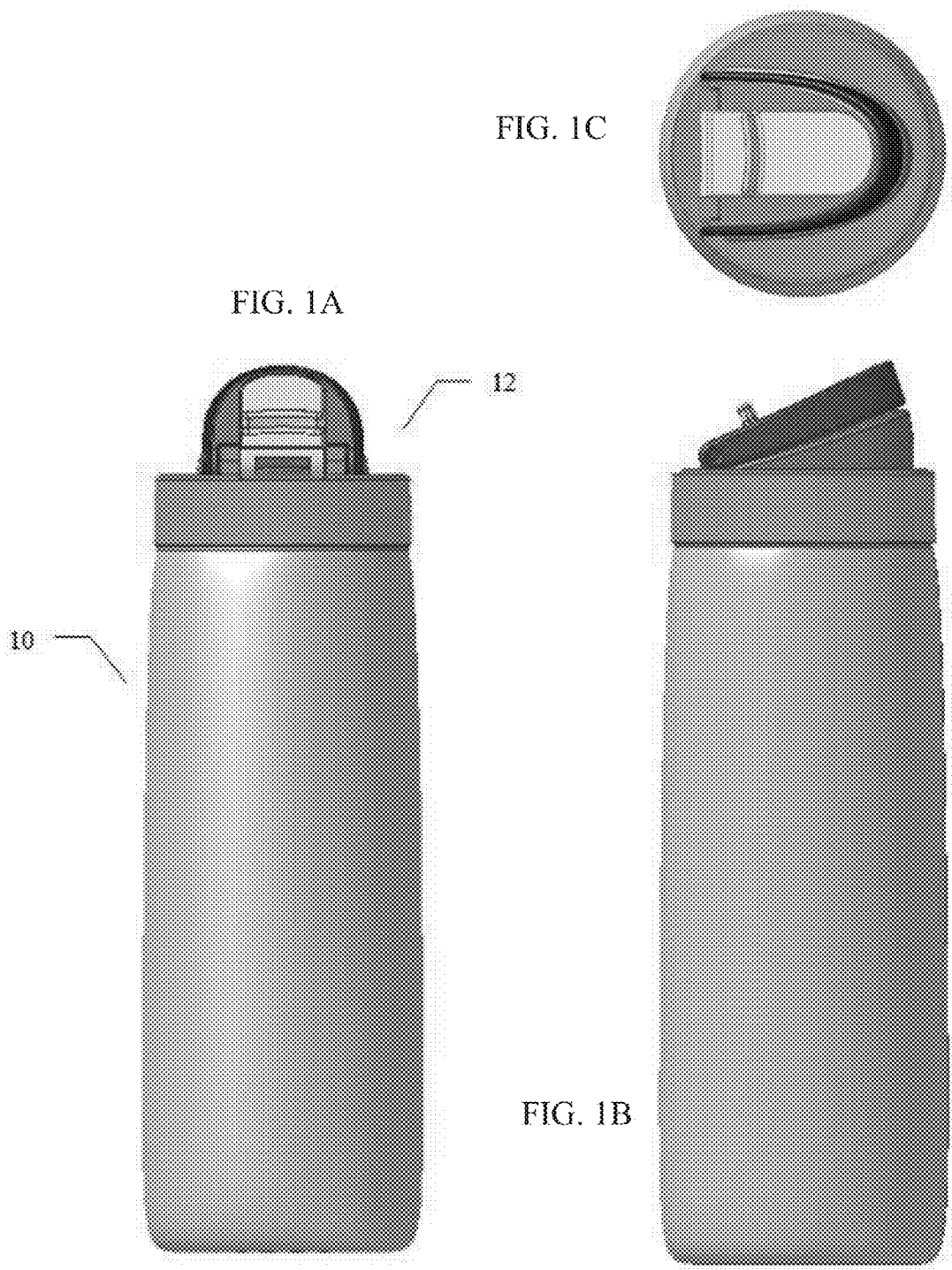
(57) **ABSTRACT**

A drink bottle for fluid replenishment is described featuring multiple ports to access the bottle's contents. The drink bottle features a screw-on closure that when removed offers access to the bottle's entire top port. The closure itself includes a mouthpiece port and a fill/pour port. The drink bottle closure is constructed in such a way as to protect its multiple ports from the environment when they are not in use.

Related U.S. Application Data

(60) Provisional application No. 62/170,395, filed on Jun. 3, 2015.





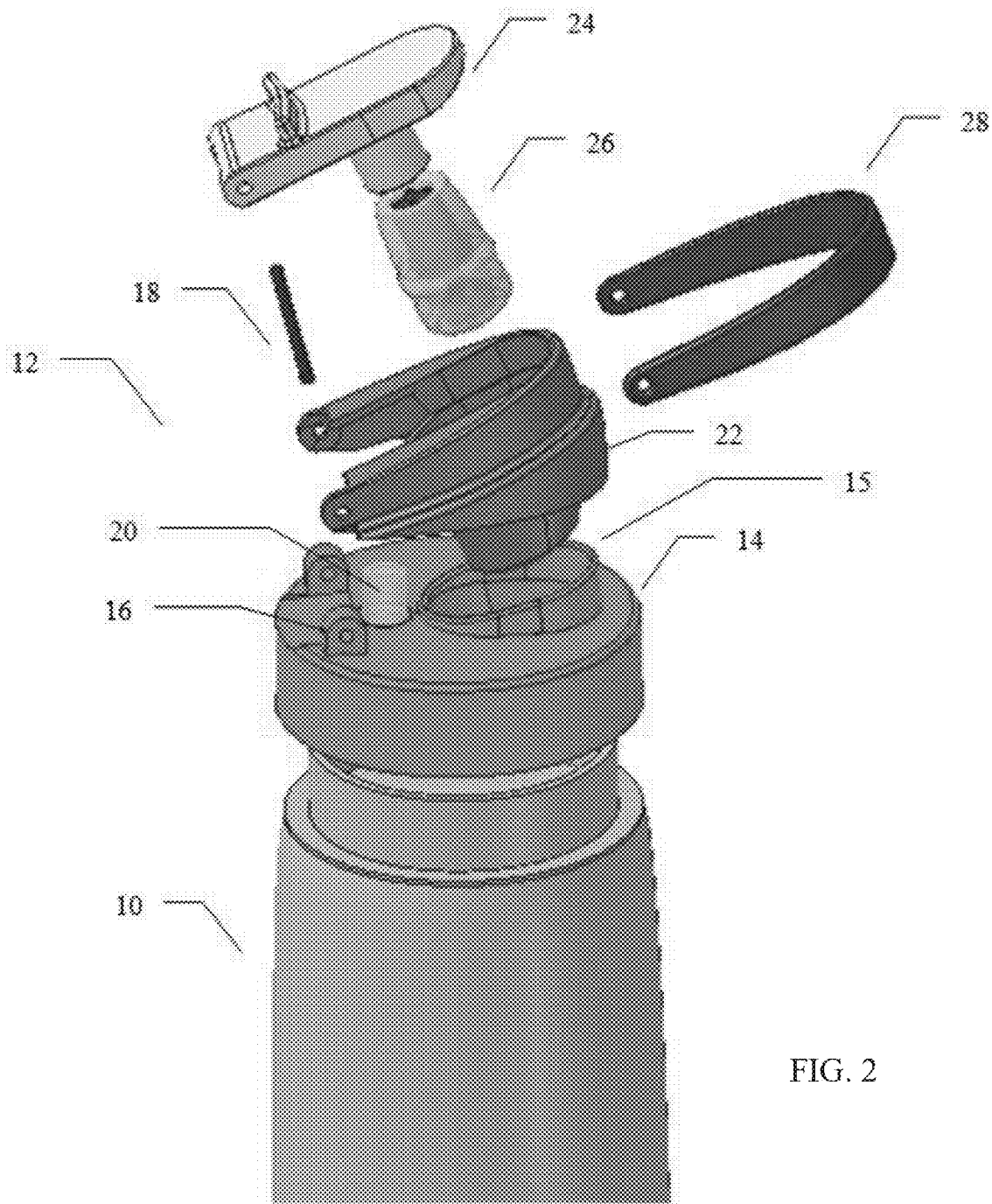


FIG. 2

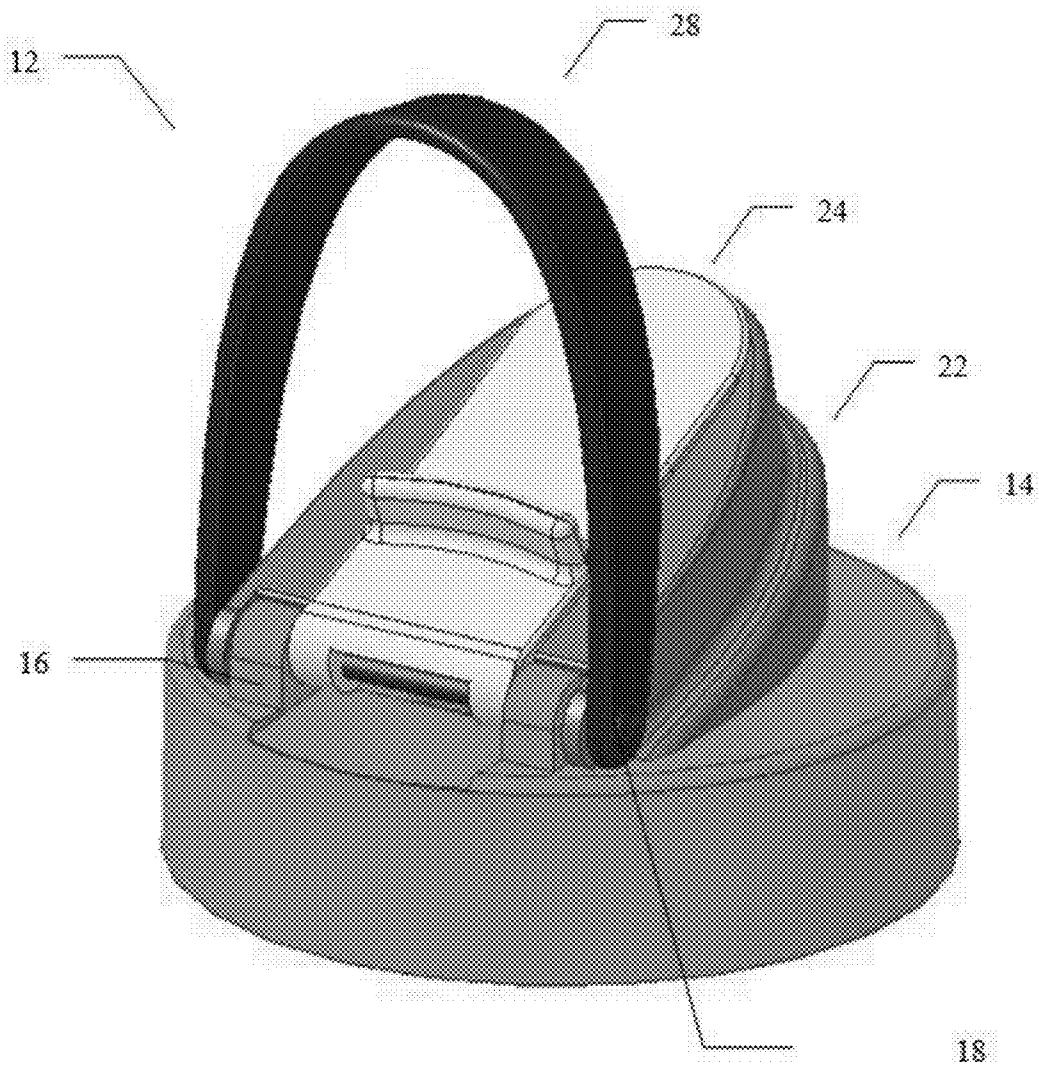


FIG. 3

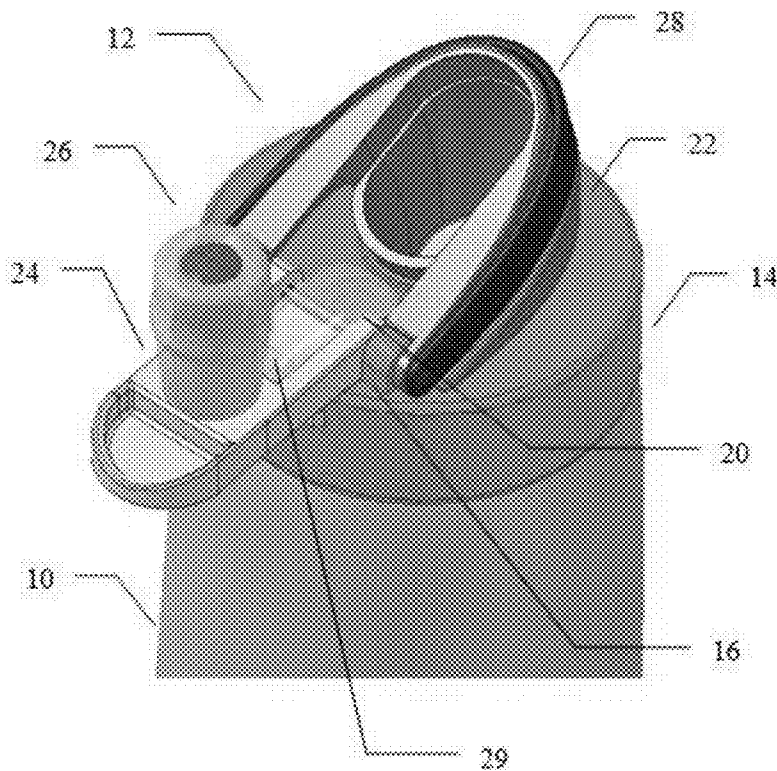


FIG. 4A

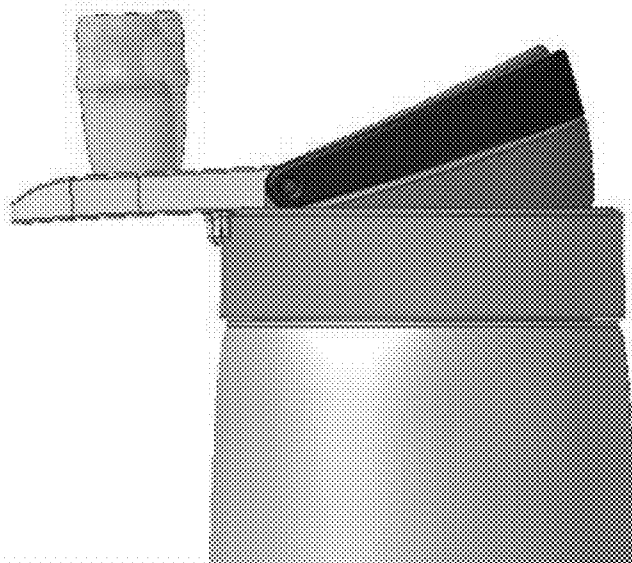


FIG. 4B

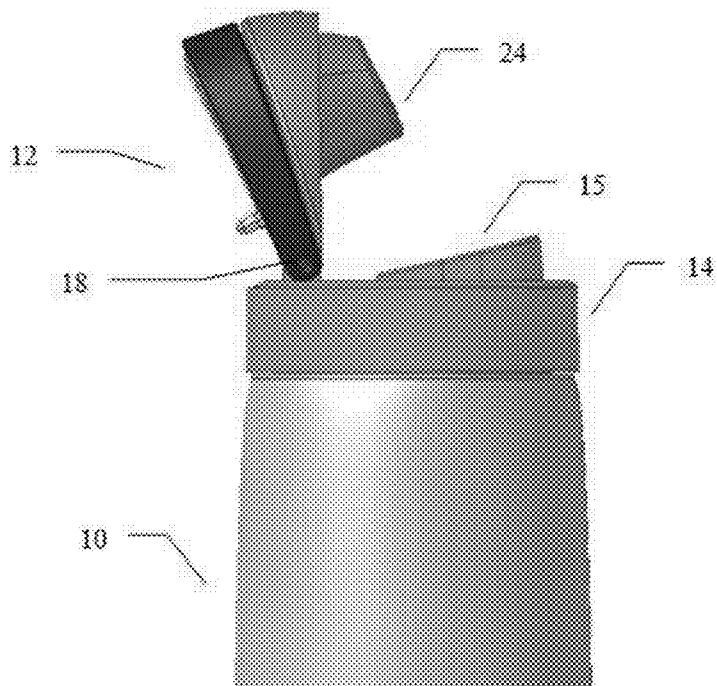


FIG. 5A

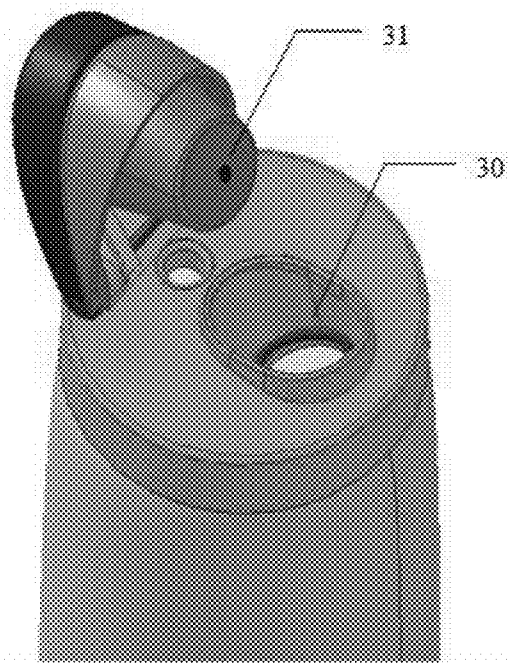


FIG. 5B

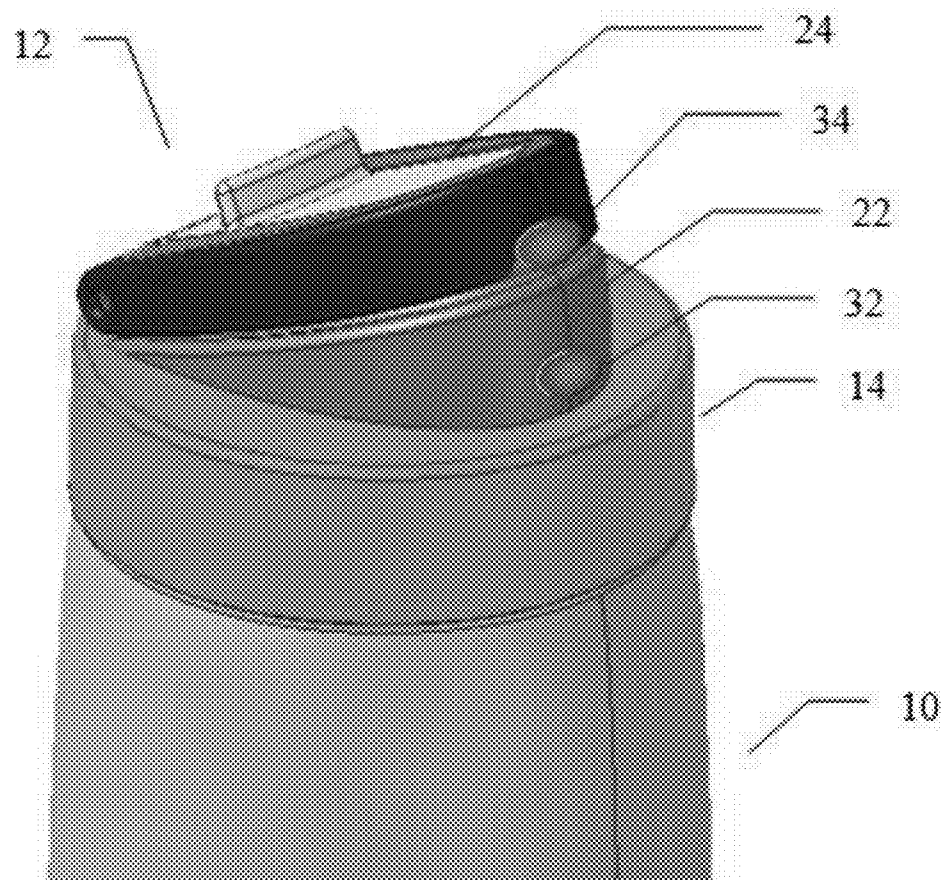


FIG. 6

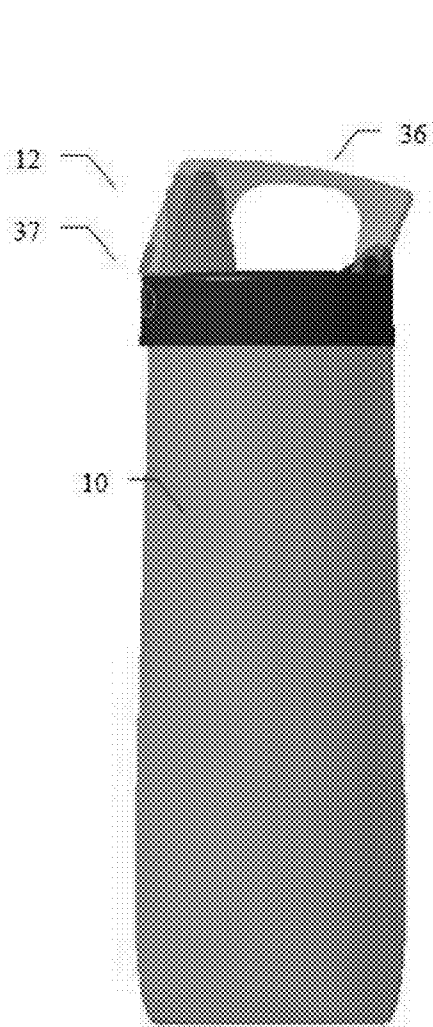


FIG. 7A

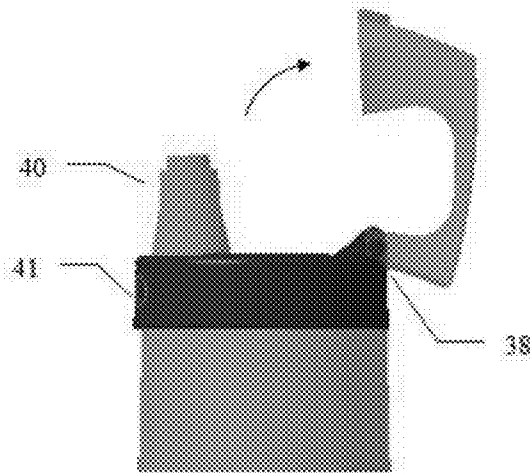


FIG. 7B

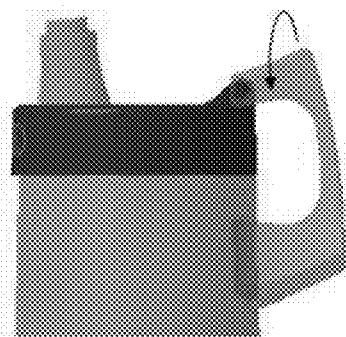


FIG. 7C

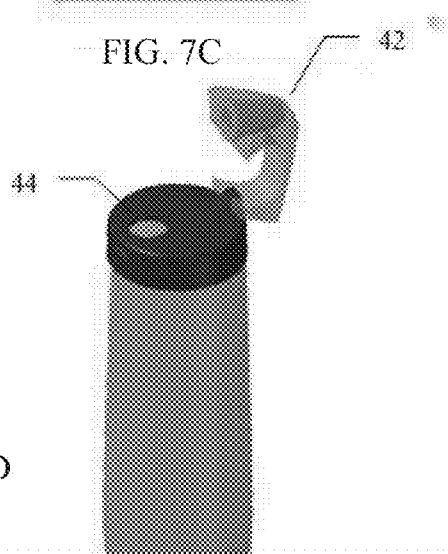


FIG. 7D

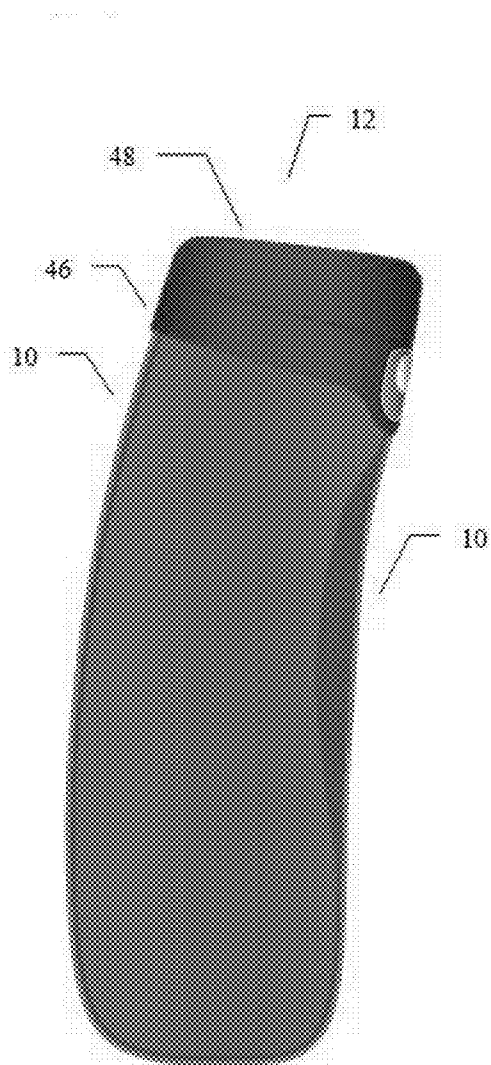


FIG. 8A

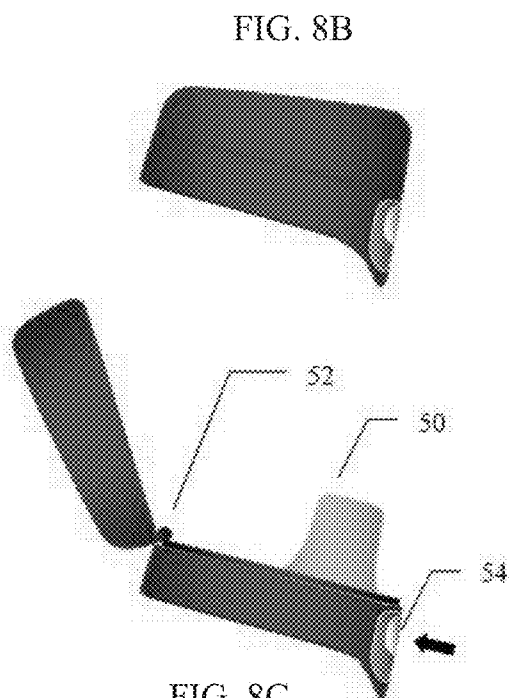


FIG. 8C

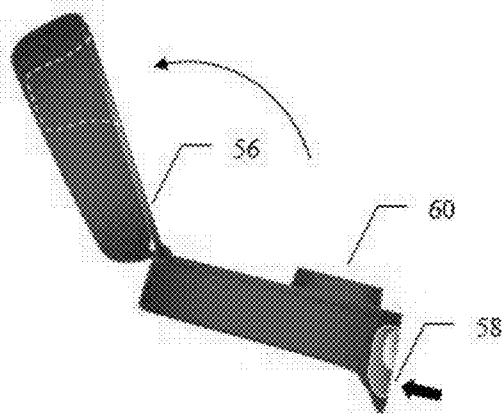


FIG. 8D

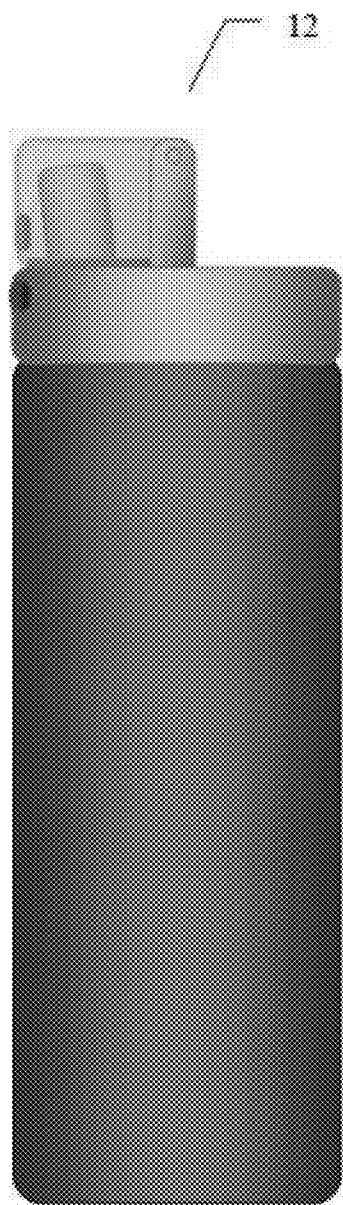


FIG. 9A

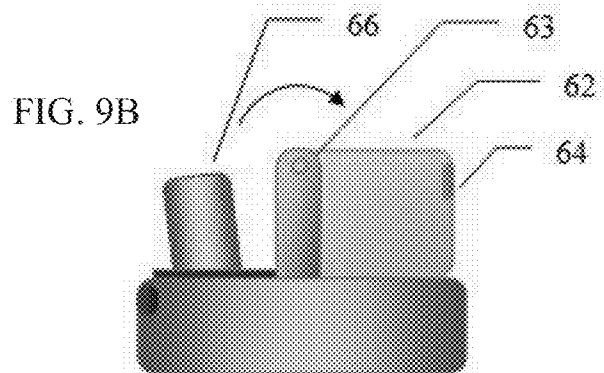


FIG. 9B

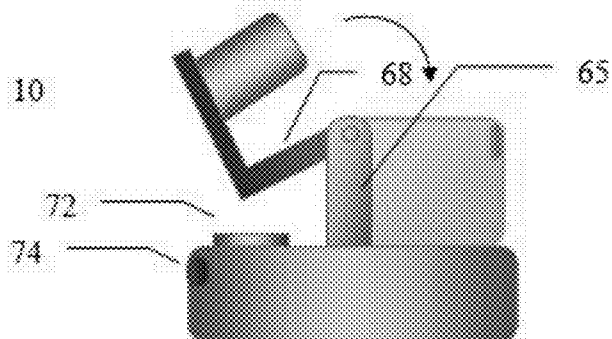


FIG. 9C

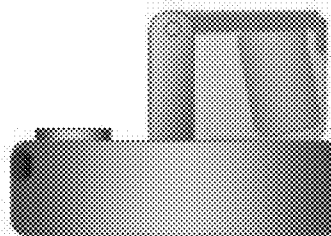


FIG. 9D



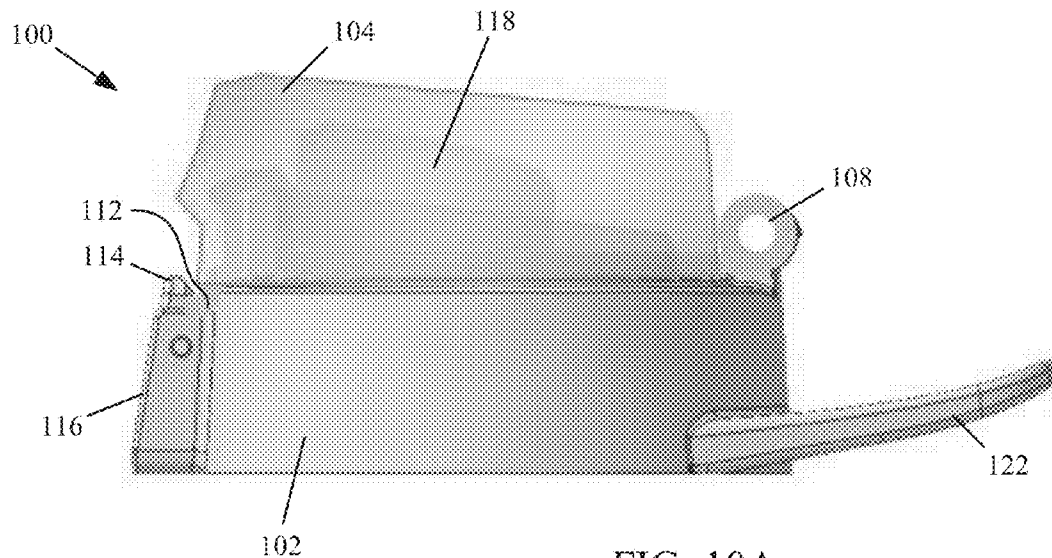


FIG. 10A

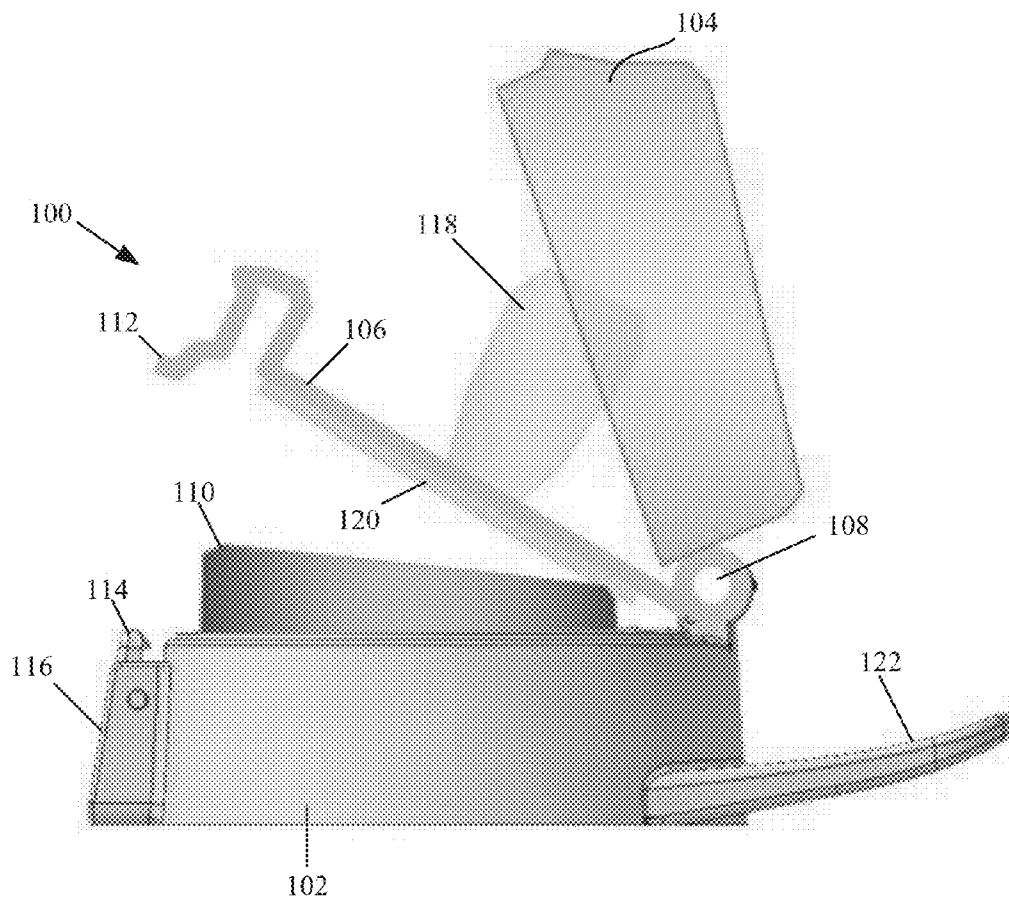


FIG. 10B

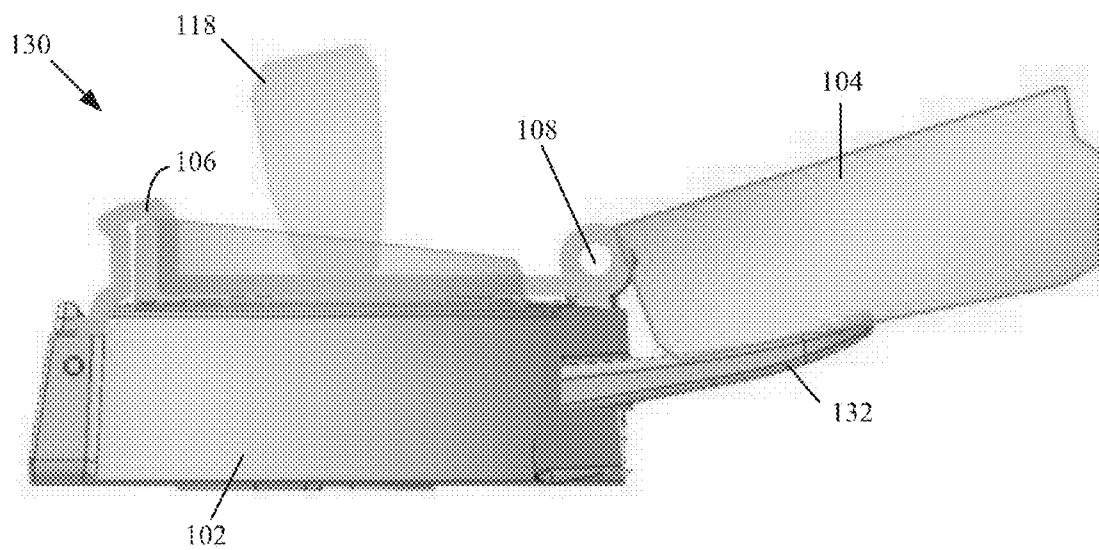


FIG. 11

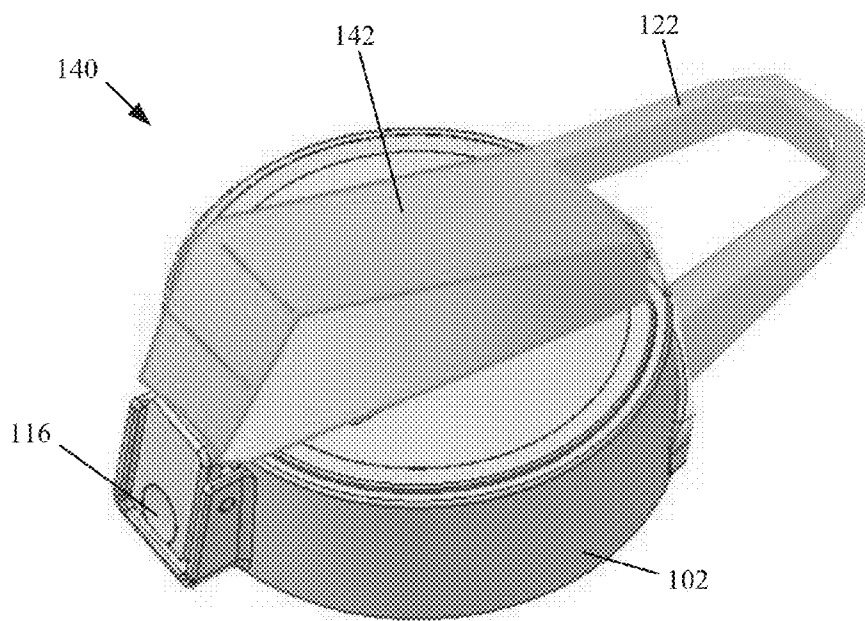


FIG. 12

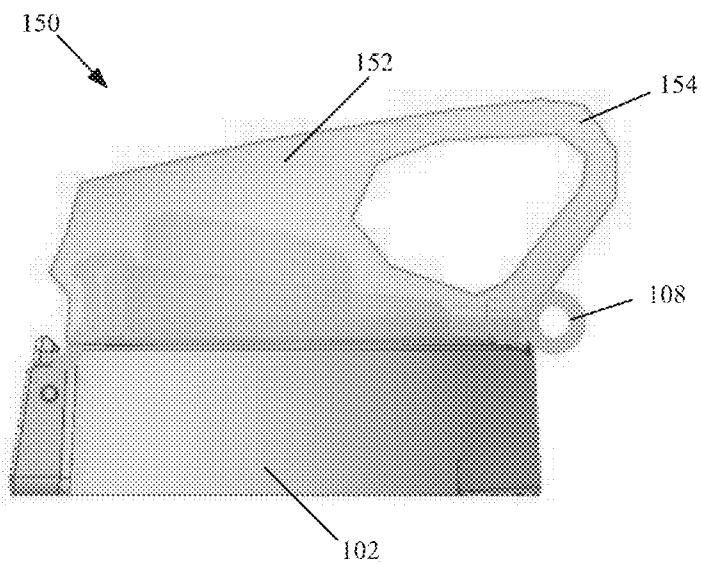


FIG. 13A

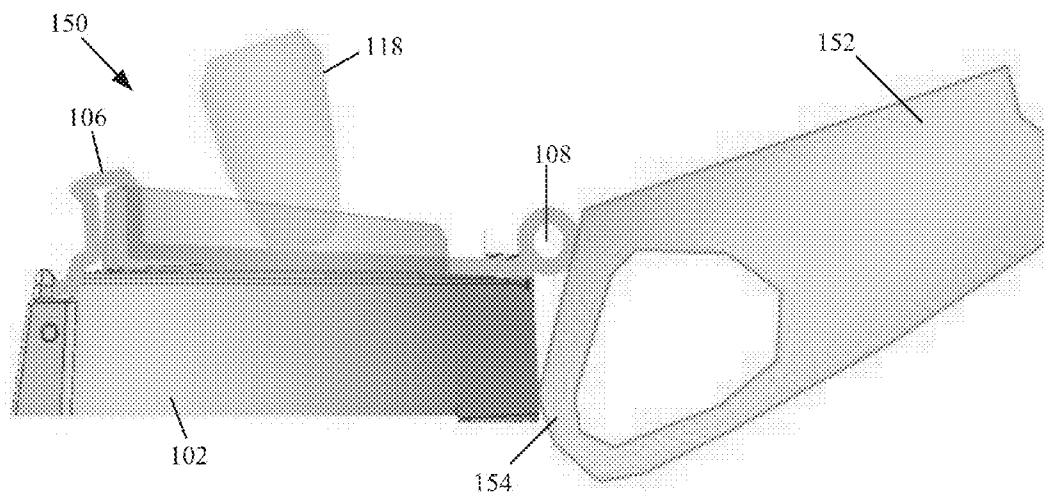


FIG. 13B

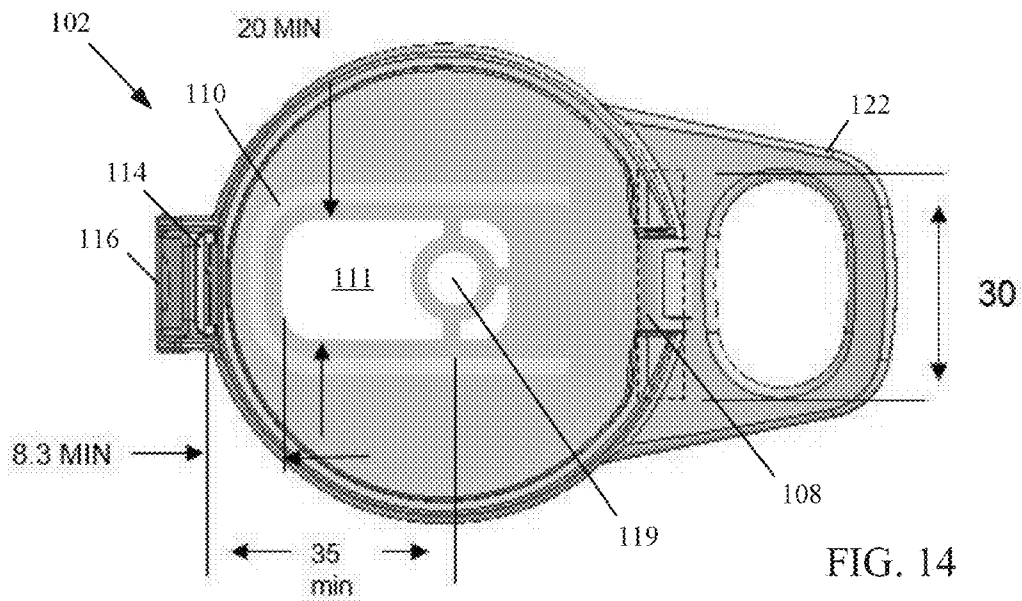


FIG. 14

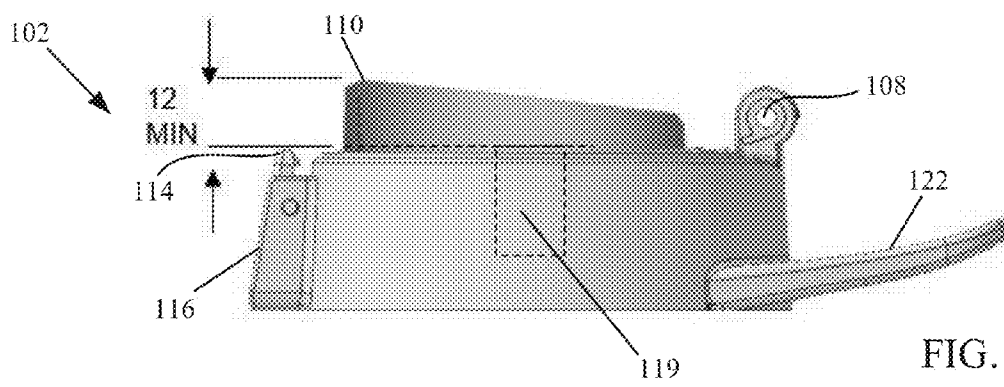


FIG. 15

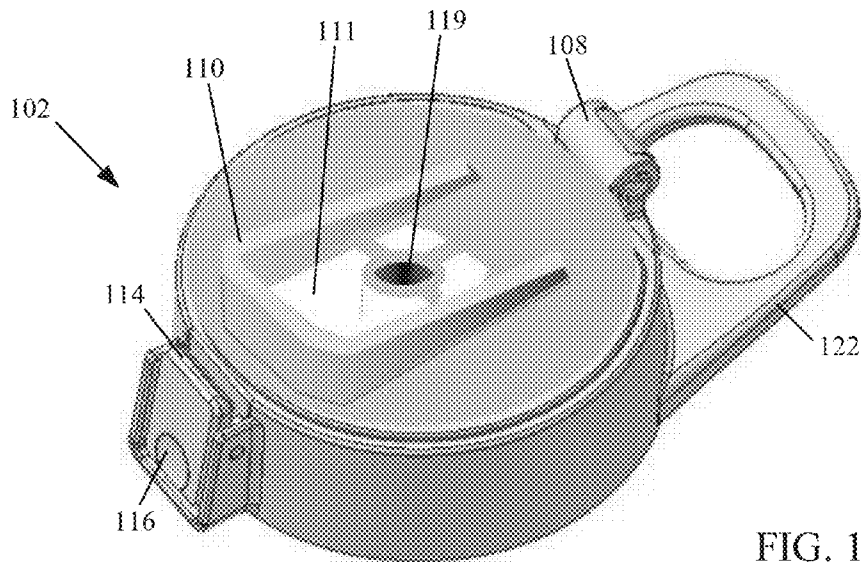


FIG. 16

MULTI-DRINK BOTTLES

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 62/170,395, entitled MULTI-DRINK BOTTLES, filed on Jun. 3, 2015, which is incorporated by reference herein.

FIELD

[0002] The present invention relates to drink bottles and bottle caps/closures, such as for everyday use and sports hydration.

BACKGROUND

[0003] Drink bottles are used in all sorts of situations as a convenient means of hydration. Hikers and travelers carry drink bottles for hydration on-the-go. Runners and cyclists utilize drink bottles to replenish fluid loss. Office workers and students use drink bottles at their desks and in class. Personal drink bottles typically comprise a container and a screw-top cap, which may feature a mouthpiece or smaller port for accessing the bottle's contents.

[0004] Types of bottle cap ports include sipper ports, bite valves, push/pull spouts, check valves, and simple pour spouts. Sipper ports typically connect to a straw and fluid is drawn up through mouthpiece via suction. Sipper ports are simple and offer reasonable flow, but are prone to spillage, unless they are manually closed off. Bite valves are similar to sipper ports in that they must go in the drinker's mouth, require suction and use a straw connection. Bite valves however, are designed not to leak unless activated and as a result minimize spillage. Push/pull spouts offer mouth or hand actuated shut-off capability. They are typically not as comfortable in the mouth as sippers and bite valves, but do work satisfactorily in squeezable squirt bottles. An alternative squirt bottle port is a check valve that releases fluid when the use generates a sufficient amount of pressure within the bottle.

[0005] To prevent leakage and contamination of bottle contents, many bottle cap ports feature valves that open or close off the fluid conduit from the bottle to the port. Types of valves include stopcocks, push/pull stoppers, pinched tubes, check valves, and mouth-actuated valves.

[0006] Additional protection from contamination and in some cases leakage may come in the form of a cover or cap that goes over the bottle cap port to shield it from the environment. For simple open ports, a push on cap or screw cap is used to both enclose the spout and seal off fluid access. Mouthpiece type ports may be covered with a removable cap or they may be designed to articulate into a covered recess within the bottle cap. Port covers are often tethered to the cap so that they are not mislaid. Another approach is to employ a pivoting cover over the bottle's drink port. The cover protects, and in some designs, seals the mouthpiece.

[0007] Drink bottle designs seek to meet the goals of leak protection and hygiene while at the same time offering a vessel that is easy to drink from, fill, and clean. Designers have addressed drinkability with easy-to-access mouthpieces. In some designs, the mouthpiece can be articulated out from the bottle cap to orient the mouthpiece at a convenient drinking angle. Other designs include mouth-

pieces that flip out from covered recesses. Many hinged covers are spring-loaded so that they flip open with the touch of a button.

[0008] There is a wide variety of drink bottle designs at every level of price and complexity directed at providing convenient drinking, preventing spills, minimizing contamination, and other considerations. While many bottles are successful at one or two of these functions, none meet all these use needs in an ergonomic and comprehensive fashion. Thus, improved bottles and bottle caps are needed that offers convenient fluid access, protective shielding of mouth-contacting surfaces, easy cleaning, one-handed filling, and leak and spill protection.

SUMMARY

[0009] The disclosed multi-drink bottles and bottle caps offer convenient fluid access, protective shielding of mouth-contacting surfaces, easy cleaning, one-handed filling, leak and spill protection, improved hygiene, and other advantages. Some disclosed drink bottles feature a screw-top cap for wide mouth access to the bottle, a smaller fill/pour (and sip) port, and a mouthpiece port with a thru channel to the bottle's contents. In some embodiments, the fill/pour and mouthpiece port can both be mounted on a screw-top cap. The caps can be non-threaded in some embodiments, and can couple to the bottle in other ways besides being threaded on by rotation.

[0010] Each of the access ports can provide convenient, ergonomic access and can be configured to minimize contamination of the fluid and mouth contacting surfaces. Both the mouthpiece port and fill/pour port can be enclosed when not in use. When needed, either port can be easily deployed by the user with the hand grasping the drink bottle.

[0011] Some embodiments include a wide mouth bottle with a cap. The diameter of the mouth of the bottle and the cap is roughly the same as the bottle, providing access to the entire inner girth of the bottle. The cap features a mouthpiece port and a fill/pour port. The mouthpiece can be attached to a flexible conduit which passes through the cap and into the bottle. The mouthpiece can be mounted on a tongue piece, which is hinged at its base to the top of the cap. Sharing this pivot point is a mouthpiece cover which sits on the top of the cap and is releasably anchored in place. The tongue and mouthpiece nest within the mouthpiece cover such that the mouthpiece is entirely protected from the environment when not in use. In its anchored position, the mouthpiece cover encloses and seals a fill/pour port. The fill/pour port is a spout mounted on the bottle cap which is sized and shaped for easy drinking, pouring, and filling. A handle may be attached to the same pivot point as the tongue and mouthpiece cover.

[0012] The bottle's contents may be accessed in three different ways with the disclosed multi-drink cap. The cap may be removed to provide a wide-mouth access to the bottle's interior. Alternatively, the mouthpiece may be rotated out of its stowed position cover to a convenient angle for sipping or squirting fluid. In a third mode, the mouthpiece cover, along with the nested mouthpiece, may be pivoted upward, to uncover and unseal the fill/pour port for drinking or re-filling.

[0013] In some embodiments, the flexible conduit is designed such that it acts as a spring force on the mouthpiece tongue and mouthpiece cover. This force acts in the direction of mouthpiece deployment and mouthpiece cover opening.

In some embodiments, one or more catch mechanisms can act against this spring force and hold the mouthpiece and mouthpiece cover in place when they are in their non-deployed positions. The catch mechanisms can include release buttons allowing the mouthpiece and/or mouthpiece cover to be deployed by the user. The release buttons can be positioned on the cap such that the user can easily activate them with their bottle-holding hand or the other hand. When the mouthpiece is in its stowed position, the flexible conduit bends back on itself and folds to block flow to the mouthpiece. Both mouthpiece and mouthpiece cover can be designed to be manually returned to their non-deployed position.

[0014] In some embodiments, the bottle cap may be a screw-top cap which can feature a thread arrangement where cap removal requires less than 360 degrees of rotation. The mouthpiece may comprise an open channel/tube, a bite valve, or a squirt valve, for examples. The flexible conduit can be an elastomeric tube mounted to the tongue and connected to the mouthpiece. Alternatively, the flexible conduit, tongue, and mouthpiece may be integrated into one piece. In any case, the cap can provide for easy user removal and replacement of the mouthpiece and/or flexible conduit when they are dirty or worn out.

[0015] When a bite valve or squirt valve is employed, the cap can include an inlet that allows re-pressurization of the bottle. The inlet may be a sealable conduit or a one way valve. The inlet can be located on cap or the mouthpiece cover. If located in the mouthpiece cover, the inlet may be designed to act as a drain, such that fluid within the mouthpiece cover drains back into the bottle. The interior of the mouthpiece cover may include features for opening the bite valve so that any fluid captured within, drains into the mouthpiece cover.

[0016] The disclosed multi-drink bottle caps can offer improved convenience by allowing the user to use the bottle and cap one-handed, for example to deploy the mouthpiece to and from a drink ready position using their bottle-grasping hand, such as when the other hand is not available. Similarly, the design allows the user to open the fill/pour port with the same ease. The bottle caps can also offer improved cleanliness, storing the mouthpiece in an enclosed space when not in use. The fill/pour spout can also be covered when not in use. The disclosed bottle caps can safeguard against leakage by automatically sealing off the flexible conduit when the mouthpiece is in its stowed position. The mouthpiece cover can lock in place to plug the fill/pour port when the port is not in use. The bottle caps described herein can also achieve these features and advantages using a minimum of parts and materials, and can do so within a size range common to most sports bottles.

[0017] Various other design approaches can be employed in alternative bottle caps to achieve the some or all of the herein described features. In one alternate embodiment, the mouthpiece and tongue can seat over the fill/pour port to seal it off until pivoted out of the way. The mouthpiece can be enclosed by a separate, removable cover.

[0018] The foregoing and other objects, features, and advantages of the disclosed technology will become more apparent from the following detailed description, which proceeds with reference to the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIGS. 1A-1C show front, side, and top views of an exemplary drink bottle.

[0020] FIG. 2 depicts an exploded view of the drink bottle assembly of FIG. 1A.

[0021] FIG. 3 shows the drink bottle cap of FIG. 1A with its handle deployed.

[0022] FIGS. 4A and 4B show the drink bottle of FIG. 1A with the mouthpiece in a drink-ready position.

[0023] FIGS. 5A and 5B show the drink bottle of FIG. 1A with the mouthpiece cover raised to provide access to the fill/pour port.

[0024] FIG. 6 shows the location of release buttons for the mouthpiece and mouthpiece cover of the drink bottle of FIG. 1A.

[0025] FIGS. 7A-7D illustrate an alternative drink bottle embodiment.

[0026] FIGS. 8A-8D illustrate another alternative drink bottle embodiment.

[0027] FIGS. 9A-9D illustrate another alternative drink bottle embodiment.

[0028] FIGS. 10A and 10B illustrate an alternative bottle cap embodiment.

[0029] FIG. 11 shows another alternative bottle cap embodiment.

[0030] FIG. 12 shows another alternative bottle cap embodiment.

[0031] FIGS. 13A and 13B illustrate yet another alternative bottle cap embodiment.

[0032] FIGS. 14-16 show various views of a cap base of the bottle cap shown in FIG. 10A.

DETAILED DESCRIPTION

[0033] FIGS. 1A-1C show side and top views an exemplary multi-drink bottle 8 that comprises a bottle 10 and bottle cap assembly 12.

[0034] FIG. 2 shows an exploded view of the drink bottle 8. The cap assembly 12 includes a cap 14 seals an upper opening of bottle 10. Cap 14 includes hinge feature 16, which accepts hinge pin 18. Flexible conduit 20 passes thru cap 14 and is in fluid communication with mouthpiece 26. Cap 14 includes fill/pour port 15 which is open to the bottle's interior. Mouthpiece cover 22 is pinned at hinge feature 16 via hinge pin 18 and can seal and surround fill/pour port 15. Tongue 24 is also hinged via hinge feature 16 and hinge pin 18. Mouthpiece 26 mounts on to tongue 24 and both can nest into a recess within mouthpiece cover 22. Handle 28 can connect to hinge feature 16 via hinge pin 18 as well.

[0035] FIG. 3 illustrates handle 28 in its extended position. In FIG. 3, mouthpiece cover 22 sits over fill/port 15 (not seen), while tongue 24 and mouthpiece 26 (not seen) nest within.

[0036] In FIGS. 4A and 4B, the mouthpiece assembly including tongue 24, mouthpiece 26, and flexible conduit 20 has been pivoted forward to place mouthpiece 26 at a convenient position for drinking. Flexible conduit 20 connects to passageway 29 on tongue 24. Passageway 29 is in fluid communication with mouthpiece 26. Flexible conduit 26 is shaped to include a right angled bend just before it passes through cap 14. The force exerted by this right angled bend on tongue 24 helps positions the mouthpiece assembly as shown for drinking.

[0037] FIGS. 5A and 5B show mouthpiece cover 24 pivoted up and away from cap 14 to unseal and uncover fill/pour port 15. Fill/pour port 15 features gasket 30 which enhances sealing when mouthpiece cover 15 is in its closed position. Flexible conduit 20 (not seen) pushes on mouthpiece cover 24 to raise it into its extended position unless otherwise secured. Air inlet valve 31 can be incorporated into mouthpiece cover 24 or cap 14.

[0038] FIG. 6 depicts possible locations for a mouthpiece cover release button 32 and a mouthpiece release button 34.

[0039] FIGS. 7A-7D shows another exemplary multi-drink bottle and cap. In this embodiment, hollow handle 36 pivots to cover and uncover mouthpiece 40. To access mouthpiece 40, handle 36 is rotated backwards (as shown in FIG. 7B) then side-to-side (as shown in FIG. 7C) at pivot point 38 to contact the side of the bottle 10 and form a handle. Handle 36 can be spring-loaded and secured with a catch mechanism such that it is locked in place over mouthpiece 40 until release button 37 is pressed. To access fill/pour port 44, handle 36 is brought to the closed position shown in FIG. 7A. Mouthpiece release button 41 is then actuated, which releases both handle 36 and mouthpiece 40, as shown in FIG. 7D. Holding features within hollow handle 36 secure the mouthpiece 40 so that the mouthpiece remains captured within the handle 36 as the handle pivots away from port 44.

[0040] FIGS. 8A-8D illustrate another exemplary multi-drink bottle and cap. In this embodiment, bottle cap assembly 12 includes cap base 46 and cap top 48. Cap base 46 and cap top 48 are hinged via hinge feature 52. Actuation of release button 54 releases spring-loaded cap top 48 to reveal mouthpiece 40. To access fill/pour port 60, cap top release button 58 is pressed so that spring-loaded mouthpiece base 56 swings upward. The release buttons 54 and 58 can be positioned next to each other and/or one can be nested within the other for ease of use.

[0041] FIGS. 9A-9D show another exemplary multi-drink bottle and cap. In this configuration bottle cap assembly 12 includes mouthpiece cover 62 which pivots around pivot point 63 such that mouthpiece 62 can be uncovered for drinking. Pivot point 63 is supported by support member 65. Cover release button 64 can be pressed to cause spring-loaded mouthpiece cover 62 to swing up and away from mouthpiece 66. To access fill/pour port 72, mouthpiece release button 74 is activated allowing spring-loaded mouthpiece support piece 68 to rotate around pivot point 63 and uncover fill/pour port 72.

[0042] FIGS. 10A-10C illustrate an exemplary multi-drink bottle cap assembly 100 that includes a cap base 102, a cover 104, and a mouthpiece platform 106. The cover 104 and platform 106 pivot at hinge 108 relative to the base 102. As shown in detail in FIGS. 14-16, the base 102 includes a raised rim 110 that extends partially around a fill/pour port 111 and a straw port 119. The platform 106 includes a front lip 112 that is releasably engagable with a mechanism 114 on the base, such that pressing release button 116 can free the platform to pivot up and back and expose the fill/pour port 111 and rim 110. The platform 106 includes a mouthpiece 118 and a sealing member 120 that covers the ports 111 and 119 when the platform is closed, sealing off the port 111 and coupling the port 119 to the mouthpiece. The sealing member 120 can comprise a silicone gasket, and it can be molded with the mouthpiece 118. When the platform 106 is pivoted open, the platform and the mouthpiece can nest within the cover 104. When the cover 104 is closed, the cover can bend

or kink the mouthpiece to seal off the conduit within and prevent leakage. The front of the cover can catch/engage with the front of the platform and/or the front of the base to hold the cover closed. The base can also include handle 122 for conveyance and handling. The platform 106 and the cover 104 can be opened and closed together for quick access to the port 111 from the closed position.

[0043] The mouthpiece 119 can comprise a bite valve, a squirt valve, or an open channel/tube. In the case of an open tube, the cover can cause the tube to fold and kink in order to seal the tube and prevent leaking. In other embodiment, the cover can press against the top of the tube to seal off the outlet of the tube without causing the tube to fold down.

[0044] FIG. 11 shows a cap assembly 130 that is similar to cap assembly 100, except that the handle 132 of the base 102 is positioned to support the cover 104 in a desired open position.

[0045] FIG. 12 shows a cap assembly 140 that is similar to cap assembly 100, except that the cover 142 is minimal in width and configured to cover the area around the rim 110, fill port 111, and mouthpiece 118, while leaving lateral surfaces of the base 102 exposed.

[0046] FIGS. 13A and 13B show a cap assembly 150 that is similar to cap assembly 100, except that the cover 152 is shaped to include a loop 154 at its rear. The loop 154 can be sized to fit a user's finger and/or to couple the cap assembly 150 to another device. The loop 154 can also be shaped to contact the back of the base 102 to limit the opening motion of the cover 152.

[0047] FIGS. 14-16 shows the cap base 102 in various views, and FIGS. 14 and 15 provide some example dimensions for the base 102. All dimensions shown are in millimeters. "MIN" means an exemplary minimum dimension. As shown in FIG. 14, the sealing member 120 (FIG. 10B) can contact a perimeter surface around the fill-pour port 111 and mouthpiece port 119, and inside of the rim 110 to couple the mouthpiece 118 to the port 119.

[0048] For purposes of this description, certain aspects, advantages, and novel features of the embodiments of this disclosure are described herein. The disclosed methods, apparatuses, and systems should not be construed as limiting in any way. Instead, the present disclosure is directed toward all novel and nonobvious features and aspects of the various disclosed embodiments, alone and in various combinations and sub-combinations with one another. The methods, apparatuses, and systems are not limited to any specific aspect or feature or combination thereof, nor do the disclosed embodiments require that any one or more specific advantages be present or problems be solved.

[0049] Integers, characteristics, materials, and other features described in conjunction with a particular aspect, embodiment, or example of the disclosed technology are to be understood to be applicable to any other aspect, embodiment or example described herein unless incompatible therewith. All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive. The invention is not restricted to the details of any foregoing embodiments. The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any

novel one, or any novel combination, of the steps of any method or process so disclosed.

[0050] Although the operations of some of the disclosed methods are described in a particular, sequential order for convenient presentation, it should be understood that this manner of description encompasses rearrangement, unless a particular ordering is required by specific language. For example, operations described sequentially may in some cases be rearranged or performed concurrently. Moreover, for the sake of simplicity, the attached figures may not show the various ways in which the disclosed methods can be used in conjunction with other methods.

[0051] As used herein, the terms “a”, “an”, and “at least one” encompass one or more of the specified element. That is, if two of a particular element are present, one of these elements is also present and thus “an” element is present. The terms “a plurality of” and “plural” mean two or more of the specified element. As used herein, the term “and/or” used between the last two of a list of elements means any one or more of the listed elements. For example, the phrase “A, B, and/or C” means “A”, “B”, “C”, “A and B”, “A and C”, “B and C”, or “A, B, and C.” As used herein, the term “coupled” generally means physically coupled or linked and does not

exclude the presence of intermediate elements between the coupled items absent specific contrary language.

[0052] In view of the many possible embodiments to which the principles of the disclosed technology may be applied, it should be recognized that the illustrated embodiments are only examples and should not be taken as limiting the scope of the disclosure. Rather, the scope of this disclosure is at least as broad as the full scope of the following claims, including all equivalents. Accordingly, I claim all that falls within the scope of the following claims.

1. A drink bottle for fluid replenishment comprising multiple ports to access the bottle's contents, the drink bottle including a screw-on closure that when removed offers access to the bottle's entire top port, the closure itself including a mouthpiece port and a fill/pour port, the drink bottle closure being constructed in such a way as to protect its multiple ports from the environment when they are not in use.

2. The closure of claim 1.

3. Any new and nonobvious device, system, or process described herein.

* * * * *