

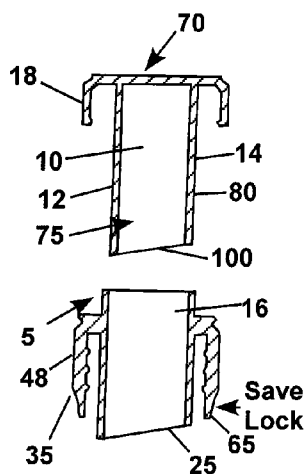


- (51) International Patent Classification:  
*B65D 51/28* (2006.01) *B65D 81/32* (2006.01)  
*B65D 41/34* (2006.01) *B65D 25/08* (2006.01)
- (21) International Application Number:  
PCT/US2012/052580
- (22) International Filing Date:  
27 August 2012 (27.08.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
61/530,908 2 September 2011 (02.09.2011) US
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:  
US 61/530,908 (CON)  
Filed on 2 September 2011 (02.09.2011)
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[Continued on next page]

(54) Title: CAP

(57) Abstract: A cap having a first part with a piercing element and a second part has a chamber with a bottom seal. The chamber is configured to receive the piercing element. The piercing element pierces the bottom seal upon a rotation of the first and second parts with respect to each other.



A

**FIG. 1**



**WO 2013/033047 A2**



**(81) Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

**(84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

**CAP****CROSS REFERENCE TO RELATED APPLICATIONS**

This application claims the benefit of U.S. provisional application number 61/530,908 filed on September 2, 2011, the entirety of which is hereby incorporated by reference.

**BACKGROUND**

[0001] Bottled beverages, including water, soda, and juices, comprise a multibillion dollar industry worldwide. The primary container used for the storage and sale of such beverages is the plastic bottle. Plastic bottles have gained such widespread use for a variety of factors, including low cost, light weight, ease of use, and durability. Plastic bottles are usually closed at the top with a plastic cap, usually with a type of safety seal. The cap can be removed by twisting or flipping to expose the beverage inside the bottle. Often such caps comprise a movable valve such as a sports bottle cap, which allows a person to seal the bottle and to use the valve as a drinking aid similar to a straw.

[0002] Water-soluble drink mixes are in widespread commercial use. Often in tablet or powder form, these mixes allow consumers to create beverages by simply adding water. The consumer measures the indicated or desired amount of mix to water in order to produce a beverage. Such mixing is impractical with common plastic water bottles, as it is difficult to introduce a powder through a narrow opening. It may be easier to do this in

the home (with the use of a small funnel), however, but it is quite difficult when traveling or during outdoor activities such as hiking. Furthermore, such "on the go" mixing requires that the consumer carry a separate bottle and drink mix. It is also easy to incorrectly measure the amount of water or drink mix and thus create a beverage that is either too concentrated or diluted.

[0003] It is well known in the art that beverage additives such as vitamins, nutrients, and other supplements are volatile when suspended in liquids such as water. The potency of such beverage additives decreases over time in water. As a result, beverage manufacturers must "over fortify" such beverages by adding additional vitamins, nutrients, and other supplements to ensure a minimum potency level at consumption or expiration. This causes additional raw material expenses for beverage producers, significantly shortens beverage shelf life, and leaves consumers uncertain of the potency or nutritional value of such beverages.

[0004] The general concept of a bottle or container top comprising a storage reservoir for a beverage additive is well known in the art. Various means have been described in the art. However some can suffer from one or more undesirable aspects.

#### **SUMMARY**

[0005] An aspect of the technology described herein relates to a cap that preferably includes a first part including a piercing element and a second part including a chamber with a bottom seal, the chamber configured to

receive the piercing element, wherein the piercing element pierces the bottom seal upon a rotation of the first and second parts with respect to each other.

[0006] Another aspect of the technology described herein relates to a cap including a first hollow part capped at one end thereof, a second hollow part having a punchable seal closing one end thereof and slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween, a save lock holding the two hollow parts in rotationally fixed with respect to each other, relationship, wherein upon unlocking of the save lock, allows the first hollow part to rotate with respect to the second hollow part allowing for engagement of a locking means and such that the uncapped end of the first hollow part at least partially to dislodges the punchable seal.

[0007] Another aspect of the technology described herein relates to a method for forming a cap including forming a first hollow part capped at one end thereof with a first protrusion and a first recess on its outer diameter; forming a second hollow part having a punchable seal closing one end thereof and capable of slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween; forming a second protrusion around the inner diameter of the second hollow part; forming a second recess to receive the first protrusion therein; forming a first annular space between the two hollow parts; sealing the first annular space by engagement of the second protrusion with the first recess; forming a breakable annular seal disposed to hold

the two hollow parts in a rotationally fixed relationship; allowing the first hollow part to be rotated with respect to the second hollow part for the first protrusion to be received in the second recess and the uncapped end of the first annular part to dislodge the punchable seal by rotating; forming an annular part disposed around and securely attached to the outside of the second hollow part to define a second annular space therebetween; forming threads extending around the inner diameter of the third annular part to engage a bottleneck in the second annular space and dispose the punchable within the bottle upon a rotation of the first hollow part with respect to the second hollow part.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

[0008] FIG. 1A is a cutaway exploded view of an aspect of the present technology depicting two pieces of the cap.

[0009] FIG. 1B is an exploded outside perspective of an aspect of the present technology depicting two pieces of the cap.

[0010] FIG. 1C is an outside perspective of an aspect of the present technology depicting two pieces of the cap coupled together.

[0011] FIG. 1D is a cutaway closed perspective of an aspect of the present technology depicting two pieces of the cap coupled together.

[0012] FIG. 2A is a cutaway view of an aspect of the present technology depicting two pieces of the cap coupled together placed atop a bottle prior to engaging the mechanism to release beverage additives into the bottle.

[0013] FIG. 2B is a is a cutaway view of an aspect of the present technology depicting engagement of the mechanism to release beverage additives into the bottle.

[0014] FIG. 2C is a cutaway view of an aspect of the present technology in which the mechanism to release beverage additives into the bottle has been engaged.

[0015] FIG. 3 is an outside perspective of an aspect of the present technology depicting a top of the cap including a save lock feature.

#### DETAILED DESCRIPTION

[0016] The present technology relates to an apparatus, system, and method for making the same related to a cap. Each apparatus, system and method may include one or more embodiments in any combination. The features of any embodiment may be used in combination with any other embodiment. Furthermore, use of the term "top" and "bottom" is not intended to limit the orientation of any element(s), but is only used for convenience of discussion.

[0017] An embodiment of the present technology relates to a reservoir compartment bottle cap, which may be referred to as a reservoir cap. As illustrated in FIGS. 1A-1D, the bottle cap is preferably comprised of a first part 70 and a second part 5 which are configured to interlockingly fit together. The first and second parts 70 and 5 may be hollow. As shown in FIG. 1A, the first part 70 may be a top piece 70 and the second part 5 may be a bottom piece 5. The bottom piece 5 may include a chamber 16 for receiving the top piece 70, a bottom seal 25 (also referred to as a punchable seal 25), a surface

for securing to a screw top container, a screw top seal, and/or a lock seal. The top piece 70 may include a first hollow part or reservoir 10 for receiving and storing beverage additives. The reservoir 10 in the top piece 70 may be of a shape which allows the reservoir 10 to function as a piercing element 75 for breaking seals. Both pieces may be comprised of an opaque material which can block all light from spoiling the beverage additives. When the two pieces are fitted together, multiple seals may form to prevent spoilage of the beverage additives due to heat, humidity, air, and other environmental factors. The seals can further prevent the fluid in the bottle from prematurely mixing with the beverage additives. Both pieces may be fabricated from a material such as plastic through an injection mold or similar process. Other materials, including but not limited to polymer resin, paper, glass, rubber, silica, carbon, metal, or a combination of these materials (including plastic), may be utilized to achieve the benefits of the writing.

**[0018]** In some embodiments, the piercing member 75 and the bottom seal 25 are configured such that rotating the top piece 70 and the bottom piece 5 with respect to each other causes the piercing member 75 to pierce at least some (or in some embodiments all) of the bottom seal 25. The bottom seal 25 may thus be pierced by the piercing element 75 by a simple rotational or twisting motion, without requiring the top piece 70 to be pushed down into the bottom piece 5. One advantage of such a cap is no additional spatial separator between the top and bottom piece 5 is required to prevent downward movement of the piercing element 75, which would cause premature breaking



of the bottom seal 25. This can reduce the amount of material used, and can also eliminate the additional step of removing the spatial separator before pushing the top piece 70 down such that the piercing element 75 breaks the bottom seal 25.

**[0019]** As illustrated in FIG. 2A, in some embodiments, the piercing member 75 may be shaped or arranged such that it does not extend below any of the bottom seal 25 prior to twisting the top and bottom pieces 70 and 5 with respect to each other, but does extend below at least a portion of the bottom seal 25 after twisting as shown in FIGs. 2B and 2C. For example, the piercing element 75 and bottom seal 25 may be configured so that their respective sidewalls have a similar shape such that the piercing element 75 and the bottom seal 25 have a corresponding or matching taper or angle before twisting. For example, the bottom seal 25 can have a taper/angle based on the shape of its sidewall, a taper/angle that is similar to or matches the taper/angle of the piercing element 75 based on the shape of its sidewall. Rotating or twisting the top piece 70 with respect to the bottom piece 5 causes one portion of the sidewall of the piercing element 75 (for example the piercing element 75's longer sidewall) to extend below at least a portion of the bottom seal 25, thereby piercing it. In other embodiments, the taper or angle of the piercing element 75 and bottom seal 25 may not be the same, but rotation of the piercing element 75 nevertheless causes at least one portion of the piercing element 75 to pierce the bottom seal 25.

**[0020]** Alternative piercing techniques using the rotational/twisting caps may be used as well.

Additionally, the tapering and angle of the piercing element 75 with respect to the bottom seal 25 may vary, and is not limited to the embodiments or examples depicted herein. Any structure, method and/or system wherein the piercing element 75 pierces the bottom seal 25 upon a rotation or twisting of the top piece 70/piercing element 75 is contemplated.

[0021] As illustrated in FIG. 3, at the interface between the top piece 70 and bottom piece 5 may be a locking mechanism such as a save lock 55, which prevents the interlocked top piece 70 and bottom piece 5 from inadvertently moving with respect to each other, absent the application of a force or before the twisting/rotation. For example, the save lock feature may prevent the top piece 70 and bottom piece 5 from rotating with respect to each other until a user applies a twisting motion to break or release the locking mechanism, whereupon the top and bottom piece 5 are no longer locked together by the locking mechanism. The rotational or twisting motion may be applied to either cap.

[0022] In some embodiments, the locking mechanism may include one or more releasable or breakable "teeth" that connect the top and bottom piece 5 with each other, thereby preventing their free rotation with respect to each other. Upon application of a sufficient twisting force, the one or more "teeth" are released or broken, so that the locking mechanism no longer prevents the top piece 70 and bottom piece 5 from rotating with respect to each other.

[0023] In some embodiments, the bottom seal 25 does not require a line of weakness. In other words, the

bottom seal 25 may have a relative uniform strength/material across its entirety, and yet still be pierced by the hollow piercing element 75.

**[0024]** As shown in FIG. 1A, in some embodiments, the top piece 70 includes a first sidewall 12 and second side wall 14 of different lengths, thereby creating a tapered or angular circular edge 100 at the bottom of the piercing element 75. For example, top piece 70 as represented in FIG. 1A represents a cutaway view of the top piece 70, and FIG. 1B depicts the exterior view of the top piece 70. Top piece 70 comprises a hollow piercing element 75, which is formed by exterior wall 80, and has an angled circular edge 100 at the bottom of piercing element 75. Angled circular edge 100 is at an angle of inclination such that, when the save lock 55 is released or broken by a twisting motion of the top piece 70, for example, and top piece 70 is rotated with respect to bottom piece 5, the angled circular edge 100 breaks through and at least partially (or entirely) pierces and opens bottom seal 25.

**[0025]** In some embodiments, completely rotating the top and bottom pieces with respect to each other does not cause the bottom seal 25 to completely separate from the bottom portion because of the taper/shape of both the piercing element 75 and the bottom seal 25. In such embodiments, as the piercing element 75 approaches its initial position, it no longer extends below the bottom seal 25 due to its matching taper with the bottom seal 25. Thus, as the piercing element 75 approaches its initial position, it does not pierce that portion of the bottom seal 25. This allows the bottom seal 25 to remain

at least partially attached to the bottom portion, thereby preventing it from falling into the container.

[0026] The amount of rotation or twisting necessary to break the bottom seal 25 can vary, and is not limited to a particular amount in any way. For example, the seal-breaking rotation may be 90 degrees, 180 degrees or 340 degrees. Alternatively, the seal-breaking rotation can be anywhere from 1 degree to 360 degrees.

[0027]

[0028] In some embodiments, the amount of rotation after releasing the locking mechanism may be limited by another structural feature on the top and/or bottom piece 5. Such a structure may inhibit rotation of the top piece 70 with respect to the bottom piece 5 after beyond a certain amount even after releasing the locking mechanism. In other embodiments, no such rotation-limiting structures are present or required so that the top and bottom piece 5 may rotate freely with respect to each other after releasing the locking mechanism.

[0029] In some embodiments, the bottom piece 5 also includes a separate locking mechanism such as a save lock 65 for preventing inadvertent rotation of the bottom piece 5 with respect to the container to which it may be connected. This save lock 55 mechanism may also include the one or more "teeth" described previously. Upon rotation of the bottom piece 5 with respect to the container, the save lock 55 mechanism is released, for example by breaking or releasing the "teeth", thereby permitting free rotation of the bottom piece 5 with respect to the container.

[0030] In some embodiments, bottom piece 5 further comprises exterior wall or protrusion 48, which with

rings or threads 35, enables bottle cap 1 to screw onto bottle 160. Top piece 70 can also comprise a protrusion 18.

[0031] Some embodiments include:

[0032] A cap comprising:

[0033] a first part comprising a piercing element;

[0034] a second part comprising a chamber with a bottom seal, said chamber configured to receive said piercing element, wherein said piercing element pierces said bottom seal upon a rotation of said first and second parts with respect to each other.

[0035] The piercing element may comprise a tapered or angled bottom.

[0036] The bottom seal may be tapered or angled.

[0037] The piercing element and said bottom seal may have the same taper or angle.

[0038] The cap further may comprise a save lock arranged to restrict rotation of said first and second part with respect to each other.

[0039] The save lock feature may comprise teeth.

[0040] The cap further may comprise a structural element configured to limit free rotation of the first part with respect to the second part after unlocking of said save lock feature.

[0041] The piercing element may be arranged to pierce only a portion of said bottom seal.

[0042] The bottom seal further may comprise an area of weakness for piercing.

[0043] The second part further may comprise a save lock feature arranged to restrict rotation of said second part with respect to an attached container.

[0044] Some embodiments include a cap comprising:

[0045] a first hollow part capped at one end thereof and formed with a first protrusion on its outer diameter and a first recess;

[0046] a second hollow part having a punchable seal closing one end thereof and slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

[0047] the second hollow part may further be formed with a second protrusion around its inner diameter and a second recess to receive the first protrusion therein, the two hollow parts defining a first annular space therebetween sealed by engagement of the second protrusion against the first recess on the outer diameter of the first hollow part, and an annular part disposed around and securely attached to the outside of the second hollow part to define a second annular space therebetween, the annular part formed with threads extending around its inner diameter to threadably engage a bottleneck in the second annular space and dispose the punchable seal within the bottle upon a rotation of the first hollow part with respect to the second hollow part.

[0048] Some embodiments include:

[0049] A cap comprising:

[0050] a first hollow part capped at one end thereof;

[0051] a second hollow part having a punchable seal closing one end thereof and slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

[0052] a save lock holding the two hollow parts in rotationally fixed, relationship, upon unlocking of the save lock, allowing the first hollow part to rotate with respect to the second hollow part allowing for engagement of a locking means and the uncapped end of the first hollow part to dislodge the punchable seal, and an annular part disposed around and securely attached to the outside of the second hollow part to define a first annular space therebetween, the annular part formed with threads extending around its inner diameter to threadably engage a bottleneck in the second annular space and dispose the punchable seal within the bottle upon a rotation of the first hollow part with respect to the second hollow part.

[0053] Some embodiments include a cap comprising:

[0054] a first hollow part capped at one end thereof and formed with a first recess around its outer diameter;

[0055] a second hollow part having a punchable seal closing one end thereof and slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

[0056] the second hollow part further formed with a second protrusion around its inner diameter, the two hollow parts defining a first annular space therebetween sealed by engagement of the second protrusion against the first recess on the outer diameter of the first hollow part;

[0057] a breakable annular seal holding the two hollow parts in rotationally fixed relationship and, upon breaking of the breakable annular seal, allowing the first hollow part to be rotated with respect to the

second hollow part for the uncapped end of the first hollow part to dislodge the punchable seal, and an annular part disposed around and securely attached to the outside of the second hollow part to define a second annular space therebetween, the annular part formed with threads extending around its inner diameter to threadably engage a bottleneck in the second annular space and dispose the punchable seal within the bottle upon a rotation of the first hollow part with respect to the second hollow part.

[0058] Some embodiments include:

[0059] A method for forming a cap comprising the steps of:

[0060] forming a first hollow part capped at one end thereof with a first protrusion and a first recess on its outer diameter; forming a second hollow part having a punchable seal closing one end thereof and capable of slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

[0061] forming a second protrusion around the inner diameter of the second hollow part; forming a second recess to receive the first protrusion therein;

[0062] forming a first annular space between the two hollow parts;

[0063] sealing said first annular space by engagement of the second protrusion with the first recess;

[0064] forming a breakable annular seal disposed to hold the two hollow parts in a rotationally fixed relationship;

[0065] allowing the first hollow part to be rotated with respect to the second hollow part for the first



protrusion to be received in the second recess and the uncapped end of the first annular part to dislodge the punchable seal by rotating;

[0066] forming an annular part disposed around and securely attached to the outside of the second hollow part to define a second annular space therebetween;

[0067] forming threads extending around the inner diameter of the third annular part to engage a bottleneck in the second annular space and dispose the punchable within the bottle upon a rotation of the first hollow part with respect to the second hollow part.

[0068] Some embodiments include:

[0069] A cap comprising:

[0070] a first hollow part capped at one end thereof;

[0071] a second hollow part having a punchable seal closing one end thereof and slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

[0072] a save lock holding the two hollow parts rotationally fixed with respect to each other, wherein unlocking the save lock allows the first hollow part to rotate with respect to the second hollow part such that the uncapped end of the first hollow part at least partially dislodges the punchable seal.

[0073] The cap uncapped end of the first hollow part and said punchable seal can have a similar taper or angle.

[0074] The save lock feature can comprise breakable teeth.

[0075] The cap can further comprise an annular part disposed around and securely attached to the outside of

the second hollow part, the annular part formed with threads extending around its inner diameter to threadably engage a container and dispose the punchable seal within the container upon a rotation of the first hollow part with respect to the second hollow part.

[0076] The cap can further comprise a second save lock holding the second hollow part and container rotationally fixed with respect to each other, wherein unlocking the save lock allows the second hollow part to rotate with respect to the container.

[0077] The punchable seal can further comprise a line of weakness for puncturing.

[0078] The cap can further comprise a structural element configured to limit free rotation of the first hollow part with respect to the second hollow part after unlocking of said save lock feature.

[0079] Some embodiments include one or more of the following concepts:

[0080] Concept 1. A cap comprising:

[0081] a first part comprising a piercing element;

[0082] a second part comprising a chamber with a bottom seal, said chamber configured to receive said piercing element, wherein said piercing element pierces said bottom seal upon a rotation of said first and second parts with respect to each other.

[0083] Concept 2. The cap of any of the preceding concepts, wherein said piercing element comprises a tapered or angled bottom.

[0084] Concept 3. The cap of any one or more of the preceding concepts, wherein said bottom seal is tapered or angled.

[0085] Concept 4. The cap of any one or more of the preceding concepts, wherein said piercing element and said bottom seal have a matching taper or angle.

[0086] Concept 5. The cap of any one or more of the preceding concepts, wherein said first part comprises a top piece and said second part comprises a bottom piece.

[0087] Concept 6. The cap of any one or more of the preceding concepts, further comprising a save lock arranged to restrict rotation of said first and second part with respect to each other.

[0088] Concept 7. The cap of concept 6, wherein said save lock feature comprises teeth.

[0089] Concept 8. The cap of any one or more of the preceding concepts, further comprising a structural element configured to limit free rotation of the first part with respect to the second part after unlocking of a save lock feature.

[0090] Concept 9. The cap of any one or more of the preceding concepts, wherein said piercing element is arranged to pierce only a portion of said bottom seal.

[0091] Concept 10. The cap of any one or more of the preceding concepts, wherein said bottom seal further comprises an area of weakness for piercing.

[0092] Concept 11. The cap of any one or more of the preceding concepts, wherein said second part further comprises a save lock feature arranged to restrict rotation of said second part with respect to an attached container.

[0093] Concept 12. A cap comprising:

[0094] a first hollow part capped at one end thereof;

[0095] a second hollow part having a punchable seal closing one end thereof and slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

[0096] a save lock holding the two hollow parts rotationally fixed with respect to each other, wherein unlocking the save lock allows the first hollow part to rotate with respect to the second hollow part such that the uncapped end of the first hollow part at least partially dislodges the punchable seal.

[0097] Concept 13. The cap of any one or more of the preceding concepts, wherein said uncapped end of the first hollow part and said punchable seal have a similar taper or angle.

[0098] Concept 14. The cap of any one or more of the preceding concepts, wherein said save lock feature comprises breakable teeth.

[0099] Concept 15. The cap of any one or more of the preceding concepts further comprising an annular part disposed around and securely attached to the outside of the second hollow part, the annular part formed with threads extending around its inner diameter to threadably engage a container and dispose the punchable seal within the container upon a rotation of the first hollow part with respect to the second hollow part.

[00100] Concept 16. The cap of concept 15, further comprising a second save lock holding the second hollow part and container rotationally fixed with respect to each other, wherein unlocking the save lock allows the second hollow part to rotate with respect to the container.

[00101] Concept 17. The cap of any one or more of the preceding concepts, wherein said punchable seal further comprises a line of weakness for puncturing.

[00102] Concept 18. The cap of any one or more of the preceding concepts, further comprising a structural element configured to limit free rotation of the first hollow part with respect to the second hollow part after unlocking of said save lock feature.

[00103] Concept 19. A method for forming a cap comprising:

[00104] forming a first hollow part capped at one end thereof with a first protrusion and a first recess on its outer diameter;

[00105] forming a second hollow part having a punchable seal closing one end thereof and capable of slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

[00106] forming a second protrusion around the inner diameter of the second hollow part; forming a second recess to receive the first protrusion therein;

[00107] forming a first annular space between the two hollow parts;

[00108] sealing said first annular space by engagement of the second protrusion with the first recess;

[00109] forming a breakable annular seal disposed to hold the two hollow parts in a rotationally fixed relationship;

[00110] allowing the first hollow part to be rotated with respect to the second hollow part for the first protrusion to be received in the second recess and

the uncapped end of the first annular part to dislodge the punchable seal by rotating;

[00111] forming an annular part disposed around and securely attached to the outside of the second hollow part to define a second annular space therebetween;

[00112] forming threads extending around the inner diameter of the third annular part to engage a bottleneck in the second annular space and dispose the punchable within the bottle upon a rotation of the first hollow part with respect to the second hollow part.

[00113] While certain features have been described herein, many other features are contemplated and fall within the scope of the disclosure.

[00114] All elements, parts and steps described herein are preferably included. It is to be understood that any of these elements, parts and steps may be replaced by other elements, parts and steps or deleted altogether as will be obvious to those skilled in the art.

**WHAT IS CLAIMED IS:**

1. A cap comprising:

a first part comprising a piercing element;

a second part comprising a chamber with a bottom seal, said chamber configured to receive said piercing element, wherein said piercing element pierces said bottom seal upon a rotation of said first and second parts with respect to each other.

2. The cap of claim 1, wherein said piercing element comprises a tapered or angled bottom.

3. The cap of claim 1, wherein said bottom seal is tapered or angled.

4. The cap of claim 1, wherein said piercing element and said bottom seal have a matching taper or angle.

5. The cap of claim 1, wherein said first part comprises a top piece and said second part comprises a bottom piece.

6. The cap of claim 1, further comprising a save lock arranged to restrict rotation of said first and second part with respect to each other.

7. The cap of claim 6, wherein said save lock feature comprises teeth.

8. The cap of claim 1, further comprising a structural element configured to limit free rotation of the first part with respect to the second part after unlocking of a save lock feature.

9. The cap of claim 1, wherein said piercing element is arranged to pierce only a portion of said bottom seal.

10. The cap of claim 1, wherein said bottom seal further comprises an area of weakness for piercing.

11. The cap of claim 1, wherein said second part further comprises a save lock feature arranged to restrict rotation of said second part with respect to an attached container.

12. A cap comprising:

a first hollow part capped at one end thereof;

a second hollow part having a punchable seal closing one end thereof and slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

a save lock holding the two hollow parts rotationally fixed with respect to each other, wherein unlocking the save lock allows the first hollow part to rotate with respect to the second hollow part such that the uncapped end of the first hollow part at least partially dislodges the punchable seal.

13. The cap of claim 12, wherein said uncapped end of the first hollow part and said punchable seal have a similar taper or angle.

14. The cap of claim 12, wherein said save lock feature comprises breakable teeth.

15. The cap of claim 12 further comprising an annular part disposed around and securely attached to the outside of the second hollow part, the annular part formed with threads extending around its inner diameter to threadably engage a container and dispose the punchable seal within the container upon a rotation of the first hollow part with respect to the second hollow part.

16. The cap of claim 15, further comprising a second save lock holding the second hollow part and container



rotationally fixed with respect to each other, wherein unlocking the save lock allows the second hollow part to rotate with respect to the container.

17. The cap of claim 12, wherein said punchable seal further comprises a line of weakness for puncturing.

18. The cap of claim 12, further comprising a structural element configured to limit free rotation of the first hollow part with respect to the second hollow part after unlocking of said save lock feature.

19. A method for forming a cap comprising:

forming a first hollow part capped at one end thereof with a first protrusion and a first recess on its outer diameter;

forming a second hollow part having a punchable seal closing one end thereof and capable of slidably receiving the first hollow part therein with the punchable seal axially opposite from the capped end to define an enclosed reservoir therebetween;

forming a second protrusion around the inner diameter of the second hollow part; forming a second recess to receive the first protrusion therein;

forming a first annular space between the two hollow parts;

sealing said first annular space by engagement of the second protrusion with the first recess;

forming a breakable annular seal disposed to hold the two hollow parts in a rotationally fixed relationship;

allowing the first hollow part to be rotated with respect to the second hollow part for the first protrusion to be received in the second recess and the

uncapped end of the first annular part to dislodge the punchable seal by rotating;

forming an annular part disposed around and securely attached to the outside of the second hollow part to define a second annular space therebetween;

forming threads extending around the inner diameter of the third annular part to engage a bottleneck in the second annular space and dispose the punchable within the bottle upon a rotation of the first hollow part with respect to the second hollow part.

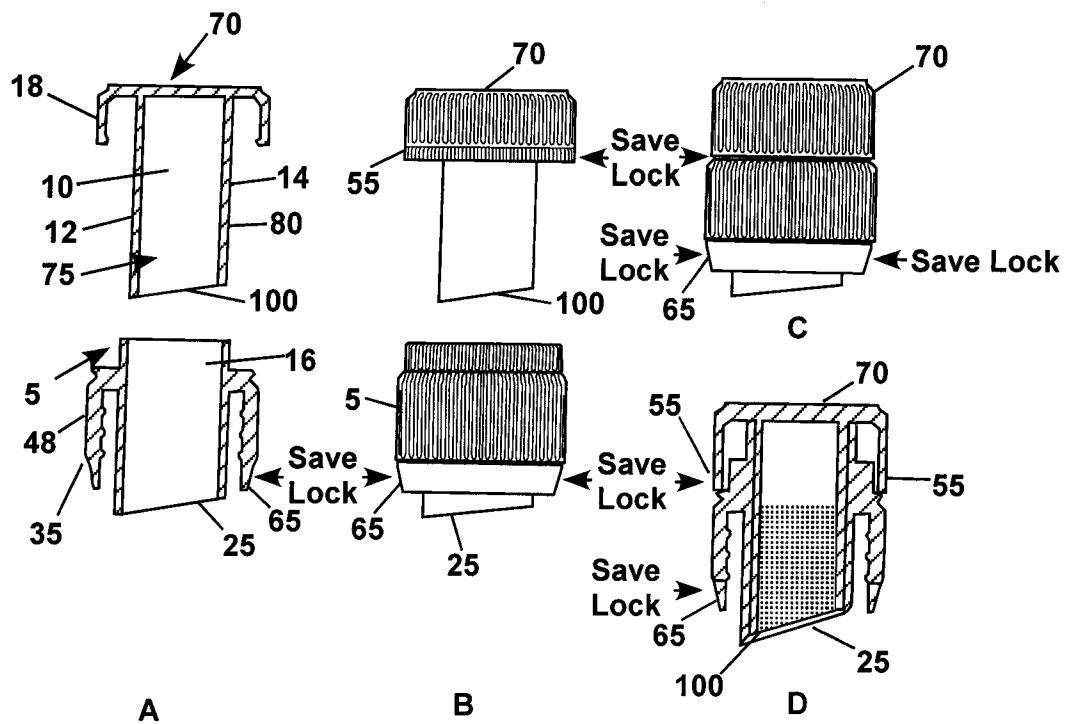
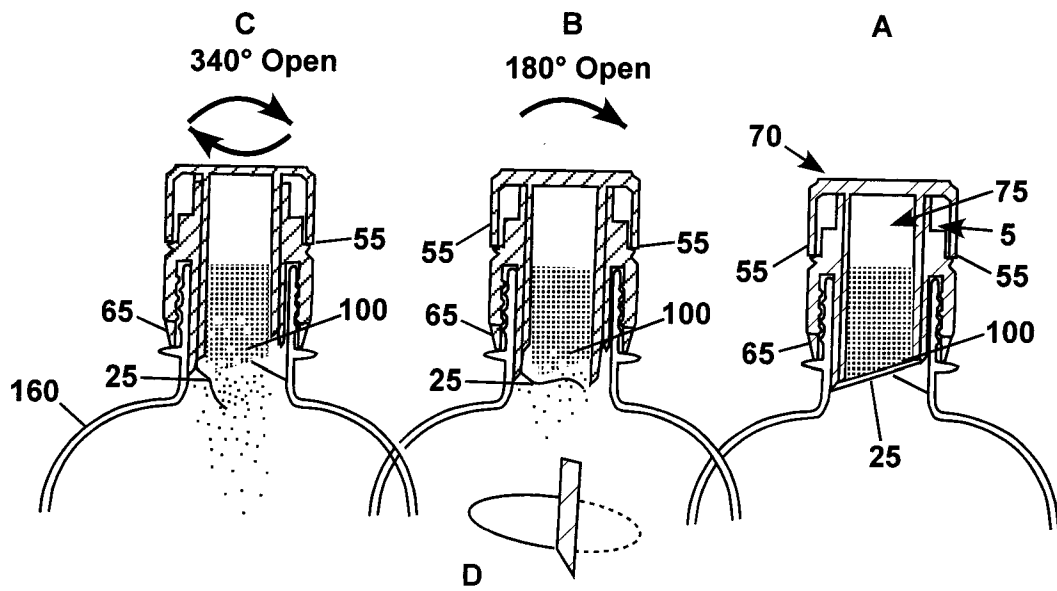
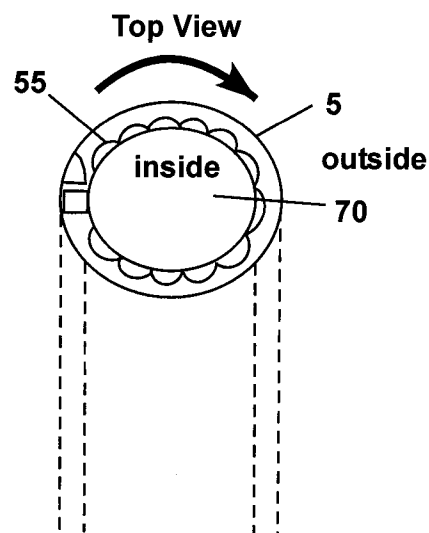


FIG. 1



**FIG. 2**



**FIG. 3**