

CONTAINER HAVING A RESEALABLE CAP

CROSS REFERENCE TO RELATED PATENT APPLICATIONS

[0001] This application claims the benefit of and priority to U.S. Provisional Patent Application No. 63/190,127, filed May 18, 2021. This application also claims the benefit of and priority to U.S. Provisional Application No. 63/282,609, filed November 23, 2021. Both of these applications are incorporated by reference herein in their entireties.

BACKGROUND

[0002] The present disclosure relates generally to a container having a resealable cap. The container (e.g., cans, bottles, vessels, etc.) may be used to store liquids (e.g., beverages, chemicals, paint, or any other sort of liquid), solids, or combinations thereof. The invention also relates to the resealable cap. The resealable cap utilizes a reverse lug design configured to be coupled to a container.

SUMMARY

[0003] An example embodiment relates to a resealable cap that includes a container top comprising a plurality of protrusions extending inward from the container top and a cap assembly threadably coupled to the container top. The cap assembly includes a beauty cap positioned on a top of the cap assembly that has an interface extending along a midpoint of the beauty cap and also includes a lug cap coupled to the beauty cap and including a lug cap interface positioned about a perimeter of the lug cap and configured to receive the plurality of protrusions. A tamper insert is coupled to the beauty cap at an underside of the beauty cap and positioned within the interface.

[0004] In some embodiments, the cap assembly is repositionable between a locked position and an unlocked position, and the tamper insert is configured to engage the protrusion when the cap assembly is in the locked position.

[0005] In some embodiments, the tamper insert is configured to disengage from the protrusion when the cap assembly is positioned into the unlocked position, and the protrusion prevents the cap assembly from repositioning back into the locked position.

[0006] In some embodiments, the container top includes a tamper identifier positioned about a top of the container top and configured to signify a position of the cap assembly. The tamper identifier may be a laser etched identifier comprising a plurality of identifiers, the plurality of identifiers may be positioned opposite another. The plurality of identifiers may include a locked identifier and an unlocked identifier, and the interface of the beauty cap may be aligned with the locked identifier and the unlocked identifier to signify a position of the cap assembly.

[0007] In some embodiments, a profile of the tamper insert is substantially similar to a profile of the interface, and the tamper insert is held within the interface.

[0008] In some embodiments, the lug cap includes one or more lug cap interfaces extending vertically along an inner surface of the lug cap, and the tamper insert is insertably coupled to the beauty cap along the one or more lug cap interfaces, and the plurality of protrusions are selectively received within the lug cap interfaces.

[0009] In some embodiments, the tamper insert may include a first end and a second end positioned opposite one another, a body centrally provided within the tamper insert, and a transition portion positioned between the body and the respective first end and second end. The transition portion is configured to flex upon rotation of the cap assembly from a locked position to an unlocked position.

[0010] In some embodiments, the tamper insert includes an insert interface positioned at a first end and a second end of the insert, the insert interface configured to engage the protrusion.

[0011] In some embodiments, the cap assembly is selectively repositionable between a closed position and an open position, where the open position is any position of the cap assembly that permits a flow of fluid therethrough.

[0012] In some embodiments, the tamper insert is repositionable from a compressed position and a normal position, and the tamper insert is in the compressed position when the cap assembly is in a locked position. An end of the tamper insert is configured to decompress outward past the protrusion when the tamper insert is in the normal position.

[0013] In some embodiments, the container top is fixedly coupled to a top of a container to couple the resealable cap to the container.

[0014] In some embodiments, the beauty cap includes one or more drink interfaces positioned opposite one another along an outer edge of the beauty cap and positioned offset the interface of the beauty cap, the one or more drink interfaces configured to transition a flow of fluid therebetween.

[0015] In some embodiments, the beauty cap includes one or more cavities positioned on either side of the interface and extending downward from a top of the beauty cap, the one or more cavities configured to receive a portion of a user (e.g., fingers of the user).

[0016] Another example embodiment relates to a container (e.g., a beverage container) that includes a resealable cap. The container also includes a container top or top portion that is configured to receive the resealable cap. The resealable cap includes a beauty cap (i.e., a user-facing portion with a desired aesthetic) and a lug cap (for coupling the resealable cap to the container top). The container top is fixedly coupled (e.g., crimped, welded, swaged, etc.) to the container, and includes a container top interface positioned on the inside of the container top. The beauty cap and the lug cap are fixedly coupled to each other to create a cap assembly. The lug cap includes at least one dimple positioned along a lug cap interface, a first opening and a second opening configured to be positioned adjacent to the first opening. The resealable cap is configured to be selectively positionable between an open position and a closed position. The resealable cap is sealed when the resealable cap is in the closed position by sealing edges. The dimples are configured to abut the container top when the repositionable cap is in the open position.

[0017] Another example embodiment relates to a container (e.g., a beverage container) that includes a container top and is configured to be coupled to a resealable cap that includes at least one of a beauty cap and a lug cap. The beauty cap and the lug cap may be formed as an integral component, may be formed from at least two separate components that are permanently affixed or coupled to each other, or may be formed from two separate components that are removably coupled to each other. The container top is configured to be fixedly coupled to the container (e.g., at an upper portion thereof), and includes a container top interface for receiving the resealable cap. The beauty cap is configured to be fixedly or removably coupled to the lug cap and includes a cap handle. The lug cap is configured to be removably or selectively coupled to the container top. The lug cap includes a lug cap interface, one or more dimples positioned along the lug cap interface, a first opening, and a second opening that is spaced apart from the first opening. The beauty cap and the lug cap together form a cap assembly. The cap assembly is intended to be selectively repositionable between an open position and a closed position. The dimples are configured to abut the container top when the cap assembly is in the open position. The resealable cap is configured to be sealed when the lug cap abuts the container top by a face seal and or flare seal.

[0018] Another example embodiment relates to a resealable cap for use with containers. The resealable cap includes a beauty portion and a lug cap and is configured to interface with a top portion of the container that includes a reverse lug configuration. The beauty portion is fixedly coupled to the lug cap such to create a cap assembly. The beauty portion includes a handle for, among other things, manipulating the cap relative to the container to which it is coupled. The lug cap includes a lug cap interface, one or more dimples positioned on the lug cap interface, a first opening, and a second opening positioned adjacent to the first opening. The cap assembly is selectively repositionable between an open position and a closed position by rotating the cap assembly within the top portion. The dimples are configured to abut the top portion when the cap assembly is in the open position. The cap is configured to be completely sealed when the cap assembly is in the closed position by sealing edges positioned between the top portion and the lug cap. The sealing edges further comprise a face seal and a flare seal.

[0019] This summary is illustrative only and should not be regarded as limiting. The various embodiments described herein may be combined in whole or in part with other described embodiments, and all such combinations are intended to be within the scope of the present disclosure.

BRIEF DESCRIPTION OF THE FIGURES

[0020] The disclosure will become more fully understood from the following detailed description, taken in conjunction with the accompanying figures, wherein like reference numerals refer to like elements, in which:

[0021] FIG. 1 is a perspective view of an example of a container including a resealable cap according to an example embodiment;

[0022] FIG. 2 is a top view of the container of FIG. 1, according to an exemplary embodiment;

[0023] FIG. 3 is a perspective view of a resealable cap for use with a container such as that illustrated in FIG. 1, according to an exemplary embodiment;

[0024] FIG. 4 is a perspective, front view of the resealable cap of FIG. 3, according to an exemplary embodiment;

[0025] FIG. 5 is a bottom view of the resealable cap of FIG. 3, according to an exemplary embodiment;

[0026] FIG. 6 is a perspective, bottom view of the resealable cap of FIG. 3, according to an exemplary embodiment;

[0027] FIG. 7 is a side view of the resealable cap of FIG. 6, according to an exemplary embodiment;

[0028] FIG. 8 is a perspective view of a container similar to that illustrated in FIG. 1, with the resealable cap removed, according to an example embodiment;

[0029] FIG. 9 is a perspective, front view of a cap assembly of FIG. 3, according to an exemplary embodiment;

[0030] FIG. 10 is a perspective, front view of the resealable cap of FIG. 3, shown in a closed position, according to an exemplary embodiment;

[0031] FIG. 11 is a perspective, front view of the resealable cap of FIG. 3, shown in an open position, according to an exemplary embodiment;

[0032] FIG. 12 is a perspective view of a container top such as that shown in the preceding FIGS., according to an exemplary embodiment;

[0033] FIG. 13 is a top view of the container top of FIG. 12, according to an exemplary embodiment;

[0034] FIG. 14 is a side view of the container top of FIG. 12, according to an exemplary embodiment;

[0035] FIG. 15 is a perspective, top view of a beauty cap shown in FIG. 3, according to an exemplary embodiment;

[0036] FIG. 16 is a top view of the beauty cap of FIG. 15, according to an exemplary embodiment;

[0037] FIG. 17 is a side view of the beauty cap of FIG. 15, according to an exemplary embodiment;

[0038] FIG. 18 is a front view of the beauty cap of FIG. 15, according to an exemplary embodiment;

[0039] FIG. 19 is a perspective, top view a lug cap shown in FIG. 3, according to an exemplary embodiment;

[0040] FIG. 20 is a perspective, bottom view of the lug cap of FIG. 19, according to an exemplary embodiment;

[0041] FIG. 21 is a top view of the lug cap of FIG. 19, according to an exemplary embodiment;

[0042] FIG. 22 is a front view of the lug cap of FIG. 19, according to an exemplary embodiment;

[0043] FIG. 23 is an exploded perspective view of the cap assembly shown in FIG. 7, according to an exemplary embodiment;

[0044] FIG. 24 is an exploded cutaway view of the cap assembly of FIG. 23, according to an exemplary embodiment;

[0045] FIG. 25 is a cutaway view of the cap assembly shown FIG. 7, in an assembled configuration, according to an exemplary embodiment;

[0046] FIG. 26 is an enlarged view a portion of the cap assembly of FIG. 7 showing a dimple, according to an example embodiment;

[0047] FIG. 27 is a cutaway view of the resealable cap of FIG. 3 illustrating certain sealing edges, according to an exemplary embodiment;

[0048] FIG. 28 is an enlarged view of a portion of the resealable cap shown in FIG. 27, according to an exemplary embodiment;

[0049] FIG. 29 is a perspective, top view of the resealable cap of FIG. 1, according to an example embodiment;

[0050] FIG. 30 is a perspective, bottom view of the resealable cap of FIG. 29, according to an exemplary embodiment;

[0051] FIG. 31 is a cutaway side view of the resealable cap of FIG. 29, according to an exemplary embodiment;

[0052] FIG. 32 is a photograph illustrating a prototype of the container including a resealable cap, according to an example embodiment;

[0053] FIG. 33 is a photograph illustrating a perspective view of the cap assembly of FIG. 32, according to an exemplary embodiment;

[0054] FIG. 34 is a photograph illustrating a top view of the beauty cap of FIG. 33, according to an exemplary embodiment;

[0055] FIG. 35 is a photograph illustrating a perspective view of the lug cap of FIG. 33, according to an exemplary embodiment;

[0056] FIG. 36 is a cutaway side view a resealable cap, according to an exemplary embodiment;

[0057] FIG. 37 is a perspective view of the container top of FIG. 36, according to an exemplary embodiment;

[0058] FIG. 38 is a perspective view of the lug cap of FIG. 36, according to an exemplary embodiment;

[0059] FIG. 39 is a perspective view of a resealable cap, according to an exemplary embodiment;

[0060] FIG. 40 is a top view of the resealable cap of FIG. 39, according to an exemplary embodiment;

[0061] FIG. 41 is a side view of the resealable cap of FIG. 39, according to an exemplary embodiment;

[0062] FIG. 42 is a perspective view of a can top of FIG. 39, according to an exemplary embodiment;

[0063] FIG. 43 is a top view of the can top of FIG. 42, according to an exemplary embodiment;

[0064] FIG. 44 is a side view of a can top of FIG. 42, according to an exemplary embodiment;

[0065] FIG. 45 is a perspective view of a lug cap of FIG. 39, according to an exemplary embodiment;

[0066] FIG. 46 is a top view of the lug cap of FIG. 45, according to an exemplary embodiment;

[0067] FIG. 47 is a side view of the lug cap of FIG. 45, according to an exemplary embodiment;

[0068] FIG. 48 is a perspective view of a beauty cap of FIG. 39, according to an exemplary embodiment;

[0069] FIG. 49 is a top view of the beauty cap of FIG. 39, according to an exemplary embodiment;

[0070] FIG. 50 is a side view of the beauty cap of FIG. 39, according to an exemplary embodiment;

[0071] FIG. 51 is a perspective view of a tamper evident cap for use with a container such as that illustrated in FIG. 1, according to an exemplary embodiment;

[0072] FIG. 52 is a side view of the tamper evident cap of FIG. 51, according to an exemplary embodiment;

[0073] FIG. 53 is a perspective view of a cap assembly of FIG. 51, according to an exemplary embodiment;

[0074] FIG. 54 is a rear, perspective view of the cap assembly of FIG. 53, according to an exemplary embodiment;

[0075] FIG. 55 is a side view of the cap assembly of FIG. 53, according to an exemplary embodiment;

[0076] FIG. 56 is a portion of the cap assembly of FIG. 53 including a locking member, according to an exemplary embodiment;

[0077] FIG. 57 is a perspective view of a container top of FIG. 51, according to an exemplary embodiment;

[0078] FIG. 58 is a top view of the container top of FIG. 57, according to an exemplary embodiment;

[0079] FIG. 59 is a top view of the tamper evident cap of FIG. 51, shown in a locked position, according to an exemplary embodiment;

[0080] FIG. 60 is a top view of the tamper evident cap of FIG. 51, shown in an unlocked position, according to an exemplary embodiment;

[0081] FIG. 61 is a perspective view of the locking member of FIG. 56, shown in a pre-loaded position, according to an exemplary embodiment;

[0082] FIG. 62 is a perspective view of the locking member of FIG. 56, shown in an engaged position, according to an exemplary embodiment;

[0083] FIG. 63 is a perspective view of a tamper evident cap for use with a container such as that illustrated in FIG. 1, according to an exemplary embodiment;

[0084] FIG. 64 is a side view of the tamper evident cap of FIG. 63, according to an exemplary embodiment;

[0085] FIG. 65 is a rear, perspective view of the tamper evident cap of FIG. 63, according to an exemplary embodiment;

[0086] FIG. 66 is a perspective view of a cap assembly of FIG. 63, according to an exemplary embodiment;

[0087] FIG. 67 is a perspective view of a container top of FIG. 63, according to an exemplary embodiment;

[0088] FIG. 68 is a detailed view of the tamper evident cap of FIG. 63, showing an insert, according to an exemplary embodiment;

[0089] FIG. 69 is a perspective view of the insert of FIG. 68, according to an exemplary embodiment;

[0090] FIG. 70 is a top view of the insert of FIG. 68, according to an exemplary embodiment;

[0091] FIG. 71 is a side view of the insert of FIG. 68, according to an exemplary embodiment;

[0092] FIG. 72 is a detailed view of the insert of FIG. 68, shown in a locked position, according to an exemplary embodiment;

[0093] FIG. 73 is a detailed view of the insert of FIG. 68, shown in an unlocked position, according to an exemplary embodiment;

[0094] FIG. 74 is a top view of the tamper evident cap of FIG. 63, shown in the locked position, according to an exemplary embodiment; and

[0095] FIG. 75 is a top view of the tamper evident cap of FIG. 63, shown in the unlocked position, according to an exemplary embodiment.

DETAILED DESCRIPTION

[0096] Before turning to the figures, which illustrate certain exemplary embodiments in detail, it should be understood that the present disclosure is not limited to the details or methodology set forth in the description or illustrated in the figures. It should also be understood that the terminology used herein is for the purpose of description only and should not be regarded as limiting.

[0097] Additionally, although the accompanying figures illustrate the use of a resealable cap in conjunction with a beverage container such as a container, it should be understood by those reviewing the present application that the resealable cap may be used with a wide variety of other types of containers which may be configured for containing any of a wide variety of different types of liquids, solids, or combinations thereof, and that all such configurations are intended to be included within the scope of the present disclosure.

[0098] Referring to the accompanying figures, a container (e.g., a beverage container such as a soda container, beer container, or other type of container configured to contain carbonated or non-carbonated beverages) includes a resealable cap, the features of which are shown and described with respect to various exemplary (and thus non-limiting) embodiments. The resealable cap may also be removable from the container.

[0099] The container is configured to hold a liquid, solid, or combinations thereof, and the resealable cap is configured to allow material to flow in and out of the container under various use conditions, and to seal the container when the flow of liquid is not desired. The container includes a container top that is coupled directly to the body of the container (e.g., to the upper end of the sidewall(s) of the container) and creates an interface for the resealable cap. The resealable cap includes a beauty cap, which provides a desired aesthetic for the top of the container, facilitates actuation or rotation of the resealable cap, and is visible to a consumer or user when the cap assembly is in place, and a lug cap, which facilitates coupling of the resealable cap to the container top.

[0100] The beauty cap may be fixedly coupled to the lug cap by a seaming process (or by any other suitable process, such as welding, adhesive, crimping, or the like), such that beauty cap and the lug cap may together define a cap assembly. According to other exemplary embodiments, the beauty cap and the lug cap may be removably coupled together.

[0101] The container top is crimped (or otherwise permanently affixed, such as by welding, adhesive, etc.) onto the container (e.g., to the upper edge or portion of the sidewall(s) of the container). In some embodiments, the container and the container top may be manufactured together such that the combination between the container and the container top is an individual part. The container top further includes a threaded interface that is positioned along the inner diameter of the container top.

[0102] The lug cap includes a threaded interface to allow the cap assembly to be threaded onto the container top. In some embodiments, the cap assembly may move or slide into and out of engagement with the container top. The resealable cap is configured to be selectively repositionable between an open position and a closed position by rotating the cap assembly, or to be completely removed from the container altogether to allow a larger opening at the top of the container (e.g., for purposes of filling or refilling the container, and/or to allow for quicker removal of material contained within the container).

[0103] The lug cap further includes one or more dimples positioned at or near the bottom of the lug cap. The dimples are configured to be extrusions that abut the container top when the resealable cap is in the open position. The dimples are configured to prevent the cap assembly from being completely removed from the resealable cap unless such is intended by the user (e.g., by creating “stops” beyond which the user would have to apply additional force to overcome, so as to prevent unintended complete removal of the cap from the container). Accordingly, in some embodiments, the cap assembly may be completely removed by a user applying enough rotational force to overcome the dimples. For instance, a dimple may be deformable when sufficient force is exerted by the beauty cap to allow the resealable cap to override a dimple to allow removal of the beauty cap. In such an embodiment, the resealable cap may be threaded

back onto the container top by rotating the cap in the opposite direction to re-seat the cap onto the container. As such, the resealable cap may be installed on and removed from the container one time or multiple times.

[0104] The resealable cap further includes one or more sealing surfaces. The sealing surfaces include a face seal and a flare seal. The sealing surfaces are formed from the engagement of the container top and the lug cap when the resealable cap is in the closed position. The sealing surfaces are configured to completely seal the resealable cap such that material may not flow out of the container. In some embodiments, the resealable cap may be sealed by a gasket positioned on the container top, a gasket positioned on the lug cap, or both. The resealable cap may be sealed by any combination of the face seal and the flare seal.

[0105] Referring to FIG. 1, a container, illustrated as container 100, is shown. The container 100 includes a first body end 110 and a second body end 120. The first body end 110 is configured to be positioned proximate a top of the container 100. The second body end 120 may be disposed opposite the first body end 110. For instance, the second body end 120 may be positioned proximate a bottom of the container 100. The container 100 further defines a body portion 130 disposed between the first body end 110 and the second body end 120. The body portion 130 may be integrally formed with or coupled to the first body end 110 and the second body end 120. In at least one configuration, the container 100 may have a generally cylindrical structure, such that a radius of the container 100 is substantially the same around the entire circumference of the container 100 for the majority of the height of the container 100. In some embodiments, the container 100 or a portion thereof may have a non-cylindrical configuration, such as a rectangular structure or the like. The container 100 further includes a resealable cap 150, positioned proximate the first body end 110. The resealable cap 150 is configured to be positioned on the top of the container 100. The resealable cap 150 may be positioned flush with the top of the container 100, such as when the resealable cap 150 is in a closed position (e.g., to allow stacking of containers without interference from components of the top of the container with adjacent containers). In some embodiments, the resealable cap 150 may be recessed into the container 100. For example, a side of the resealable cap 150 that faces away from the second

body end 120 may be recessed with respect to a top side of the container 100 or disposed closer to the second body end 120 than the top side of the container 100 is disposed to the second body end 120 when the resealable cap 150 is in a closed position. Positioning the resealable cap 150 flush with the top of the container 100 or recessed from the top of the container 100 may help protect the resealable cap 150 and may help prevent inadvertent actuation or rotation of the resealable cap 150.

[0106] Referring to FIG. 2, a top view of the container 100 is shown. The resealable cap 150 is configured to be positioned equidistant to the edge of the container 100. In some embodiments, the resealable cap 150 may not be positioned along the midpoint, such that the resealable cap 150 is not equidistant to the edge of the container 100. As shown, the resealable cap 150 is disposed on at least a portion of the top of the container 100. In some embodiments, the resealable cap 150 may be disposed along the entire top of the container 100, such that the resealable cap 150 may be the top of the container 100. The container top 160, which is best shown in FIG. 3 may encircle or extend continuously around the resealable cap 150 or a portion thereof.

[0107] Referring to FIG. 3, a perspective view of the resealable cap 150 and the container top 160 is shown. The resealable cap 150 includes a beauty cap 170 and a lug cap 180. The container top 160 is selectively coupled to the lug cap 180 when the resealable cap 150 is coupled to the container top 160 along an interface, such that the container top 160 may provide support between the container 100 and the lug cap 180. The lug cap 180 is fixedly coupled to the beauty cap 170, such that the lug cap 180 and the beauty cap 170 may further be an individual part. In some embodiments, the lug cap 180 is selectively coupled to the beauty cap 170, such that the lug cap 180 and the beauty cap 170 may not be an individual piece. The resealable cap 150 is configured to be positioned at the top of the container 100. In some embodiments, the resealable cap 150 may be positioned along the bottom of the container 100 (e.g., where the container 100 is designed to open at the bottom as opposed to the top). In at least one configuration, an outside perimeter of the beauty cap 170 (e.g., outside circumference or side of the beauty cap 170 that faces outward toward the container top 160) and an outside perimeter of

the lug cap 180 may be spaced apart from the container top 160. Moreover, the beauty cap 170 and the resealable cap 150 may not extend over, overhang, or encircle the container top 160 in one or more configurations.

[0108] Referring still to FIG. 3, the resealable cap 150 is further configured to be selectively repositionable between an open position and a closed position. For example, the resealable cap 150 may be configured to be in the closed position when a user is traveling with the container 100, or when the container 100 is in transit or storage. This prevents material (e.g., liquid, etc.) from exiting the container 100 from the resealable cap 150. The resealable cap 150 may be configured to be in the open position when the container 100 is in use (e.g., drinking, pouring, etc.).

[0109] According to an exemplary embodiment, both the container top 160 and the resealable cap 150 are formed of a metal material (e.g., aluminum, steel, etc.). An all metal design further allows the resealable cap 150 to be recyclable without disassembling any components. In some embodiments, the resealable cap 150 may be disassembled to recycle the material. According to still other embodiments, one or more of the beauty cap 170 and the lug cap 180 may be formed of a material that differs from the material used to form the container 100 and/or the container top 160 (e.g., the beauty cap may be formed of a polymeric material, a composite material, a glass material, or any other suitable material, including metals or metal alloys that differ from one or more of the container, container top, and/or lug cap; other configurations may also be possible according to other exemplary embodiments, and the concepts herein are not intended as being limited by the particular materials selected for each component described herein, all of which are intended to be included within the scope of the present disclosure).

[0110] The resealable cap 150 may be reconfigurable to include different combinations of the various modules, to create a custom resealable cap 150. As shown, the resealable cap 150 comprises the beauty cap 170 and the lug cap 180. In some embodiments, the resealable cap 150 may include the container top 160 and the beauty cap 170, but not the lug cap 180. In still some other embodiments, the resealable cap 150 may only include the container top 160 and the lug

cap 180, but not the beauty cap 170. In still some embodiments, the resealable cap 150 may only include the beauty cap 170 and the lug cap 180, but not the container top 160. The resealable cap 150 may include any combination of the container top 160, the beauty cap 170, and the lug cap 180.

[0111] Referring now to FIG. 4, a perspective, front view of the resealable cap 150 of FIG. 3 is shown. According to at least one embodiment, the resealable cap 150 has a generally cylindrical structure, where the radius of the resealable cap 150 may be uniform or substantially constant. In other embodiments, such as that shown in FIG. 4, the radius of the resealable cap 150 may not be uniform. In still other embodiments, the resealable cap 150 may have a rectangular structure or other various structures that may be non-circular.

[0112] The resealable cap 150 further includes a vertical axis 190 positioned at the midpoint (e.g., halfway to the edge) of the resealable cap 150. In some embodiments, the vertical axis 190 may not be positioned at the midpoint of the resealable cap 150. The vertical axis 190 is disposed within the container top 160, the beauty cap 170 and the lug cap 180, such that the vertical axis 190 is equidistant to the edges of the components (e.g., the container top 160, the beauty cap 170, and the lug cap 180 may be centered about or along the vertical axis 190). In some embodiments, the vertical axis 190 is not disposed within the container top 160, the beauty cap 170, and the lug cap 180. In still some embodiments, the vertical axis 190 is not equidistant to the edges of the container top 160, the beauty cap 170, and the lug cap 180.

[0113] Referring to FIGS. 5 and 6, a bottom view of the resealable cap 150 of FIG. 3 is shown. The resealable cap 150 includes an opening, shown as resealable cap opening 210. The resealable cap opening 210 is positioned at the center of the resealable cap 150 and is disposed along the vertical axis 190. In some embodiments, the resealable cap opening 210 is positioned proximal to the edge of the resealable cap 150 and not disposed along the vertical axis 190. The resealable cap opening 210 further includes an opening edge 220. The opening edge 220 is configured to have a cylindrical structure, where the resealable cap opening 210 is disposed within the opening edge 220. In some embodiments, the opening edge 220 or a portion thereof

may have a non-cylindrical or non-circular structure, such as rectangular structure. The resealable cap opening 210 is configured to allow material (e.g., liquid, etc.) to flow through it. In some embodiments, the material may flow around the resealable cap opening 210. The container top 160 further includes a face, shown as container bottom face 230. The bottom face 230 is configured to be between the opening edge 220 and the lug cap 180. The bottom face 230 is configured to include a face length 240 around the entirety of the bottom face 230. The face length 240 is configured to be the distance between the lug cap 180 and the opening edge 220. In at least one configuration, the face length 240 may be measured perpendicular from the opening edge 220. The face length 240 is uniform around the circumference of the bottom face 230. In some embodiments, the face length 240 may be longer or shorter around the bottom face 230 and/or may be non-uniform.

[0114] Referring to FIG. 7, a side view of the resealable cap 150 of FIG. 6 is shown. The beauty cap 170 and the lug cap 180 are configured to be disposed within the container top 160. In some embodiments, at least one of the beauty cap 170 and the lug cap 180 may be disposed within the container top 160. In still some embodiments, the beauty cap 170 and the lug cap 180 may not be disposed within the container top 160. The beauty cap 170 and the lug cap 180 are configured to be selectively repositionable within and with respect to the container top 160. As shown in FIGS. 3 and 10, the beauty cap 170 and the lug cap 180 are configured to be fully seated in the container top 160, such that the beauty cap 170 and the lug cap 180 would be in the closed position. The beauty cap 170 and the lug cap 180 may be rotated about the vertical axis 190 such that the beauty cap 170 and the lug cap 180 would be in the open position, an example of which is shown in FIGS. 7 and 11. In some embodiments, the beauty cap 170 and the lug cap 180 are selectively repositionable between the open position and the closed position by a push release or a pull release. In such an embodiment, the resealable cap 150 is selectively repositionable between the open position and the closed position by the user applying a force along the vertical axis 190. In still some embodiments, the beauty cap 170 and the lug cap 180 are selectively repositionable between the open position and the closed position by pulling and pushing on the beauty cap 170.

[0115] Referring to FIGS. 8 and 9, a perspective view of a container similar to the container 100 is shown, according to an example embodiment. The container 100 is shown with the container top 160 fixedly coupled to the container 100. That is, the cap assembly 250 (shown in FIG. 9, for example, and which is similar to the resealable cap 150 discussed above and elsewhere herein) has been removed from the container top 160. The user may remove the cap assembly 250 to increase the flow of the material out of the container 100, such as to increase the flow volume or flow rate as compared to when the cap assembly 250 is installed. The cap assembly 250 may further be removed if the user is adding material into the container 100 (e.g., liquid, ice, etc.). In some embodiments, the cap assembly 250 must be completely removed in order for material to flow out of the container 100.

[0116] The beauty cap 170 and the lug cap 180 are fixedly coupled together to create a cap assembly 250. Referring now to FIG. 9, a perspective, front view of the cap assembly 250 of FIG. 3 is shown. The beauty cap 170 and the lug cap 180 are configured to be fixedly coupled by seaming (e.g., crimping). In some embodiments, the beauty cap 170 may be fixedly coupled to the lug cap using alternative methods of manufacturing (e.g., welding, stamping, metal extruding, rolling, 3D printing, casting, etc.). In still some embodiments, the cap assembly 250 may be an individual part (e.g., instead of coupling the beauty cap 170 to the lug cap 180). The crimp is positioned where the beauty cap 170 abuts the lug cap 180 and is disposed along the entire circumference of the cap assembly 250. In some embodiments, the crimp may be positioned along at least a portion of the circumference of the cap assembly 250.

[0117] Referring still to FIG. 9, the cap assembly 250 further comprises a first opening 260. The first opening 260 may be a through hole. The first opening 260 is configured to be a positioned between the beauty cap 170 and the lug cap 180. In some embodiments, the first opening 260 may only be positioned within the beauty cap 170. In still some embodiments, the first opening 260 may only be positioned within the lug cap 180. The first opening 260 is configured to facilitate the flow of material between the container 100 and the surrounding environment. In some embodiments, the first opening 260 may be configured to facilitate the flow of material into another container.

[0118] Referring now to FIG. 10, a perspective, front view of the resealable cap 150 of FIG. 3 is shown, in a closed position. The resealable cap 150 is configured to be in the closed position when the cap assembly 250 is fully seated onto the container top 160 such that the material is prevented from flowing through the first opening 260. In some embodiments, material may flow through the first opening 260 when the resealable cap 150 is in the closed position. The cap assembly 250 is fully seated into the container top 160 such that the top of the beauty cap 170 may be flush with the top of the container top 160. In some embodiments, the beauty cap 170 may not sit flush with the container top 160 when the cap assembly 250 is fully seated into the container top 160. For instance, the cap assembly 250 may be recessed with respect to the top of the container top 160. The resealable cap 150 is positioned in the closed position by rotating the cap assembly 250 in a clockwise direction until the first opening 260 is closed off by the container top 160. In some embodiments, the resealable cap 150 is positioned into the closed position by rotating the cap assembly 250 in the counterclockwise direction.

[0119] Referring to FIG. 11, a perspective, front view of the resealable cap 150 of FIG. 3 is shown, in an open position. The resealable cap 150 is configured to be in the open position when the cap assembly 250 is not fully seated onto the container top 160 or sealed against the container top 160 such that material may flow through the first opening 260. In some embodiments, material may not flow through the first opening 260 when the resealable cap 150 is in the open position. The resealable cap 150 is positioned into the open position by rotating the cap assembly 250 in a counterclockwise direction until the first opening 260 is not closed off from the container top 160. In some embodiments, the resealable cap 150 is positioned into the open position by rotating the cap assembly 250 in the clockwise direction.

[0120] Referring now to FIG. 12, a perspective view of the container top 160 of FIG. 3 is shown. The container top 160 further includes an interface, shown as container top interface 270. The container top interface 270 includes one or more threads. In some embodiments, the container top interface 270 may comprise grooves, configured to provide structural support to the beauty cap 170. In still some embodiments, the container top interface 270 may be a smooth face. The threads of the container top interface 270 may interface or mate with corresponding

threads of the cap assembly 250. The container top interface 270 is disposed on the inner diameter of the container top 160. In some embodiments the container top interface 270 may be disposed on the outer diameter of the container top 160. The container top 160 further includes an interface, shown as stacking interface 280. The stacking interface 280 is disposed along the entire outer circumference of the container top 160. In some embodiments, the stacking interface 280 may be disposed on the inner circumference of the container top 160. In still some embodiments, the stacking interface may be disposed along at least a portion of the circumference of the container top 160. The stacking interface 280 is configured to allow containers 100 to stack on top of each other. The stacking interface 280 may be dimensionally similar to the bottom of the container 100, such that mating the bottom of one container 100 to the stacking interface 280 of another container 100 may help align and stack the containers 100.

[0121] Referring to FIG. 13, a top view of the container top 160 of FIG. 12 is shown. The containers 100 are configured to be stackable about the stacking interface 280. The containers 100 may be stacked such that the containers 100 are positioned vertically. Stacking allows the containers 100 to be packaged and stored without needing excessive space. In some embodiments, the containers 100 may be stacked horizontally. When the containers 100 are stacked, the containers may still be selectively coupled to one another, such that the containers 100 are not locked together. In some embodiments, the containers 100 may be configured to be fixedly coupled when stacked by a locking mechanism. In such an embodiment, the containers may be locked or unlocked by twisting the container 100 in and out of engagement with another container 100. In still such an embodiment, the containers 100 may be fixedly coupled by an alternate locking mechanism.

[0122] Referring to FIG. 14, a side view of the container top 160 of FIG. 12 is shown. The stacking interface 280 is formed by rolling a portion of the container top 160. In some embodiments, the stacking interface may be formed using alternate methods of manufacturing (e.g., stamping, casting, 3D printing, etc.). The stacking interface 280 is further configured to fixedly couple the container top 160 to the container 100. In some embodiments, the container top 160 may be selectively coupled to the container 100. The stacking interface 280 is fixedly

coupled to the container 100 by crimping. In some embodiments, the stacking interface 280 is fixedly coupled to the container 100 by seaming, such that the container 100 is further configured to be airtight. In still some embodiments, the stacking interface 280 is fixedly coupled to the container 100 by a weld, positioned along the circumference of the stacking interface 280.

[0123] Referring to FIG. 15, a perspective, top view of the beauty cap 170 of FIG. 3 is shown. The beauty cap 170 further comprises a handle, shown as cap handle 290. The cap handle 290 is disposed along the midpoint of the beauty cap 170 such that the beauty cap 170 may be configured into two equal portions. In some embodiments, the cap handle 290 may not be disposed along the midpoint of the beauty cap 170, or may have other configurations than that shown. For instance, the cap handle 290 may be non-linear. The cap handle 290 is configured to be grasped or engaged by a user or mechanism when selectively repositioning the cap assembly 250 between the open and the closed position. In some embodiments, the cap handle 290 may be configured to facilitate the stacking of containers 100. The cap handle 290 is further configured to sit flush with the beauty cap 170, such that the beauty cap 170 includes at least two cavities, shown as first cavity 300 and second cavity 310. In some embodiments, the cap handle 290 may be positioned on top of the beauty cap 170. The first cavity 300 is configured to be dimensionally similar to the second cavity 310. In some embodiments, the first cavity 300 may not be dimensionally similar to the second cavity 310. The first cavity 300 and the second cavity 310 are configured to be recessed into the beauty cap 170 such to allow a user or mechanism to interact with the cap handle 290. The cap handle 290 may also be a pop-up handle or one that initially lays flat and is moved or bent into position.

[0124] Referring now to FIG. 16, a top view of the beauty cap 170 of FIG. 15 is shown. The cap handle 290 is further configured to be positioned parallel to a pour interface 320. In some embodiments, the cap handle 290 may be positioned perpendicular to the pour interface 320. The pour interface 320 is configured to be positioned in the first cavity 300. In some embodiments, the pour interface 320 is positioned in the second cavity 310. The pour interface 320 is configured to further allow material to flow through the resealable cap 150. The pour

interface 320 is configured to be concave portion that is positioned on the edge of the beauty cap 170, where the open portion is positioned distal to the center of the beauty cap 170. The pour interface 320 may provide a visual reference as to a location where material stored inside the container 100 may exit the container 100.

[0125] Referring to FIGS. 17 and 18, side views of the beauty cap 170 of FIG. 15 is shown. As shown, the first cavity 300 and the second cavity 310 are recessed into the beauty cap 170. The first cavity 300 and the second cavity 310 extend below the top of the beauty cap 170. In some embodiments, the first cavity 300 and the second cavity 310 may extend above the top of the beauty cap 170. The beauty caps 170 of different containers 100 may further be configured to be stackable on one another. In some embodiments, the beauty cap 170 may include features that prevent the ability to stack different containers 100. The beauty cap 170 further includes a cap interface 330. The cap interface 330 is configured to interact with the lug cap 180, such that the seam may be positioned on at least the cap interface 330. In some embodiments, the cap interface 330 may interact with the container top 160.

[0126] Referring now to FIGS. 19 and 20, perspective top and bottom views of the lug cap 180 of FIG. 3 are shown. The lug cap 180 includes an interface, shown as lug cap interface 340. The lug cap interface 340 is positioned along at least a portion of the circumference of the lug cap 180. For instance, the lug cap interface 340 may be positioned closer to the vertical axis 190 than a lug cap surface 380 (best shown in FIG. 23) upon which the beauty cap 170 may be disposed. In some embodiments, the lug cap interface 340 may be positioned along the entirety of the circumference of the lug cap 180. The lug cap interface 340 may be internally and/or externally threaded. For example, the lug cap interface 340 may be threaded into the container top 160. In some embodiments, the lug cap interface 340 may contain grooves. In some embodiments, the lug cap interface 340 may be configured to be a smooth surface. Positioned along the lug cap interface 340 is an opening, shown as second opening 350. The second opening 350 is configured to be a through hole, positioned halfway up the lug cap interface 340. The second opening 350 is further configured to be positioned adjacent to the first opening 260. In some embodiments, the second opening 350 may be positioned proximal to the first opening

260. The second opening 350 is configured to allow a fluid, such as a gas or gas mixture like air to pass through the second opening 350 to facilitate the flow of material through the first opening 260. The second opening 350 may have the same shape as the first opening 260, the same volume as the first opening 260, a different shape than the first opening 260, and a different volume than the first opening 260. In FIG. 22, the first opening 260 is larger than the second opening 350 and is larger than the second opening 350. In some embodiments, the second opening 350 may be configured to be the first opening 260. In still some embodiments, the lug cap 180 may comprise multiple second openings 350. By way of example, the second opening 350 may be adjacent to the first opening 260. By way of another example, the second opening 350 may be disposed within the first opening 260. In such an embodiment, the combination of the first opening 260 and the second opening 350 may allow for both material and fluid to flow out of the container 100.

[0127] Referring to FIG. 21, a top view of the lug cap 180 of FIG. 19 is shown. The lug cap 180 further includes an interface, shown as pour interface 360. The pour interface 360 is configured to be a concave indent on the edge of the lug cap 180 where material (e.g., liquid, etc.) may pass through. The pour interface 360 extends only along a portion of the edge of the lug cap 180. In some embodiments, the pour interface 360 may extend along the entirety of the edge of the lug cap 180. The combination of the pour interface 320 of the beauty cap 170 and the pour interface 360 of the lug cap 180 are configured to direct the flow of material after the material passes through the first opening 260. In some embodiments, the pour interface 320 and the pour interface 360 are configured to be coupled to the first opening 260. The pour interface 320 is configured to be similar to the length of the pour interface 360, such that the two drink interfaces (e.g., pour interface 320 and pour interface 360) may be aligned when the beauty cap 170 is coupled to the lug cap 180. In some embodiments, the pour interface 320 may be offset to the pour interface 360.

[0128] Referring now to FIG. 22, a front view of the lug cap 180 of FIG. 19 is shown. The lug cap 180 includes one or more stops, shown as dimples 370. The dimples 370 are positioned along the lug cap interface 340. In at least one embodiment, the dimples 370 may be positioned

along or near the bottom of the lug cap interface 340. In some embodiments, the dimples 370 are positioned along or near the top of the lug cap interface. In still some embodiments, the dimples 370 are positioned along the middle of the lug cap interface 340. In some embodiments, the lug cap 180 may only include a single dimple 370 disposed along the lug cap interface 340. The dimples 370 are configured to abut the container top 160 when the resealable cap 150 is in the open position. The dimples 370 limit movement of the resealable cap 150, such to keep the cap assembly 250 selectively coupled to the container top 160. The user or a mechanism may apply enough twisting force to the cap assembly 250 such overcome the resistance imparted by the dimples 370 to permit further movement of the cap assembly 250 and to completely remove the cap assembly 250 from the container top 160. The cap assembly 250 may be threaded back onto the container top 160 after the cap assembly 250 is completely removed. In some embodiments, the cap assembly 250 may not be threaded back onto the container top 160 once the cap assembly 250 has been completely removed.

[0129] Referring to FIG. 23, a detailed, perspective view of the cap assembly 250 of FIG. 7 is shown. The beauty cap 170 abuts the lug cap 180 at a lug cap surface 380. The lug cap surface 380 is configured to be a substantially flat portion and may be positioned perpendicular to the vertical axis 190. In some embodiments, the lug cap surface 380 may contain grooves. The cap interface 330 is configured to be selectively coupled to the lug cap surface 380. In some embodiments, the cap interface 330 is configured to fixedly coupled to the lug cap surface 380. The beauty cap 170 is configured to be fixedly coupled to the lug cap 180 by a seaming process. Seaming the beauty cap 170 to the lug cap 180 forms a crimp along the cap interface 330 and the lug cap surface 380. In some embodiments, a weld may be positioned between the beauty cap 170 and the lug cap 180. The beauty cap 170 and the lug cap 180 are disposed along the vertical axis 190, such that the midpoint of the beauty cap 170 is positioned on top of the midpoint of the lug cap 180. In some embodiments, at least one of the beauty cap 170 and the lug cap 180 may not be positioned on the vertical axis 190.

[0130] Referring to FIGS. 24 and 25, an exploded and assembled front section views through the center of the cap assembly 250 is shown along line AA of FIG. 9. The cap assembly 250

comprises the beauty cap 170 and the lug cap 180. The beauty cap 170 is configured to be coupled to the lug cap 180 such that the cavities of the beauty cap 170 (e.g., as shown in FIG. 15 as first cavity 300 and second cavity 310) may be configured to be positioned within the lug cap 180. In some embodiments, the cavities of the beauty cap 170 may be positioned outside of the lug cap 180. The cap assembly 250 further a cavity wall 382, disposed within the beauty cap 170, and lug wall 384, disposed within the lug cap 180. The cavity wall 382 is configured to be disposed along the first cavity 300 and the second cavity 310. The cavity wall 382 may have of uniform cross section or uniform cross-sectional length around the entirety of the beauty cap 170. The lug wall 384 is configured to be disposed between the lug cap interface 340 and the lug cap surface 380. The lug wall 384 may have a uniform cross section or uniform cross-sectional length around the entirety of the lug cap 180. As shown, the cavity wall 382 is configured to be substantially parallel to the lug wall 384 when the beauty cap 170 is coupled to the lug cap 180. By way of example, the cavity wall 382 may not be in contact with the lug wall 384 when the beauty cap 170 is coupled to the lug cap 180. In some embodiments, the cavity wall 382 may abut the lug wall 384 such to form a sealing surface between the beauty cap 170 and the lug cap 180.

[0131] Referring now to FIG. 26, a detailed, rear view of the dimples 370 is shown, according to an example embodiment. The dimples 370 may be features disposed along the lug cap interface 340. For instance, the dimples 370 may be protrusions that may be disposed between adjacent threads of the lug cap 180 and that may extend away from the vertical axis 190. The dimples 370 may further be cylindrical extrusions. In some embodiments, the dimples 370 may be hollow features. The lug cap 180 includes a plurality of dimples 370, positioned along the same contact plane. In some embodiments, the lug cap 180 may include dimples 370 positioned on different contact planes along the lug cap interface 340. The lug cap 180 may include any number of dimples 370 positioned on the lug cap interface 340. As shown, the dimples 370 are configured to abut the container top 160 when the resealable cap 150 is in the open position. The dimples 370 do not abut the container top 160 when the resealable cap 150 is in the closed position. In some embodiments, the dimples 370 may abut the container top 160 when the

resealable cap 150 is in the closed position. By way of example, the cap assembly 250 may be rotated past a position where the dimples 370 abut the container top 160. In such an embodiment, the dimples 370 are deformed into an orientation that allows further rotation of the cap assembly 250 by the rotational force applied by the user. When the cap assembly 250 is completely removed from the container top 160, the dimples 370 are configured to orient back into the original configuration, such that the cap assembly 250 may be repeatedly positioned between a coupled position and a removed position. In some embodiments, the dimples 370 may not form back into the original configuration once the dimples 370 have been deformed. In other words, once the cap assembly 250 is completely removed from the container top 160, the dimples 370 may be deformed such to prevent the cap assembly 250 from rotating between the open and the closed position.

[0132] Referring to FIG. 27, an assembled front section view through the center of the cap assembly 250 along line AA of FIG. 9 is shown. The lug cap 180 abuts the container top 160 when the resealable cap 150 is in the closed position, such that the resealable cap 150 may be configured to be completely sealed. The engagement between the lug cap 180 and the container top 160 may include one or more sealing edges, such as a face seal 400, a flare seal 410, or both. Referring to FIG. 28, a detailed, front view of the sealing edges (e.g., face seal 400 and flare seal 410) of the resealable cap 150 along window M of FIG. 27 is shown. The face seal 400 is configured to be the engagement between the lug cap surface 380 and the container top 160 such that the coupling of the lug cap surface 380 and the container top 160 may completely seal the resealable cap 150. The flare seal 410 is configured to be the engagement between the container top interface 270 and the lug cap interface 340 such that the coupling of the container top interface 270 and the lug cap interface 340 may completely seal the resealable cap 150. In some embodiments, the combination of the face seal 400 and the flare seal 410 may completely seal the resealable cap 150. In still some embodiments, the resealable cap 150 may only be sealed by at least one of the face seal 400 and the flare seal 410.

[0133] According to an exemplary embodiment, the resealable cap 150 may include any combination of the features, where the features are configured to be the dimples 370, the face

seal 400, and the flare seal 410. By way of example, the resealable cap 150 may include the dimples 370 and the face seal 400, but not the flare seal. By way of another example, the resealable cap 150 may include the dimples 370 and the flare seal 410, but not the face seal 400. By way of another example, the resealable cap 150 may include the face seal 400 and the flare seal 410, but not the dimples 370. The resealable cap 150 may include any combination of the features thereof.

[0134] The sealing edges (e.g., face seal 400 and flare seal 410) are configured to completely seal the resealable cap 150, such that material may not flow in and out of the container 100 when the resealable cap 150 is in the closed position. In some embodiments, the resealable cap 150 may be sealed by a gasket positioned between the container top 160 and the lug cap 180. In such an embodiment, the gasket may be disposed on the container top 160, the lug cap 180, or both. In still some embodiments, the resealable cap 150 may be sealed using a latch to maintain a sealing force on the resealable cap 150.

[0135] Referring to FIG. 28, a detailed view of the sealing edges (e.g., face seal 400 and flare seal 410) of FIG. 27 is shown. As shown, the face seal 400 is configured to seal against the lug cap surface 380, where the face seal 400 may include a greater surface area than the flare seal 410. In at least one embodiment, the face seal 400 and the lug cap surface 380 may be configured to abut each other along the length of the sealing edges (e.g., face seal 400 and flare seal 410). In some embodiments, the face seal 400 may only be positioned along an edge, such that the sealing surface area will be less. The flare seal 410 may seal against the lug cap interface 340, where the flare seal 410 may include a greater surface area than the face seal 400. In at least one embodiment, the flare seal 410 and one or more mating surfaces of the lug cap interface 340 may be configured to abut each other along the length of the sealing edges (e.g., face seal 400 and flare seal 410). The flare seal 410 is further configured to be positioned along a portion of the lug cap interface 340. In some embodiments, the flare seal 410 may be positioned along the entirety of the lug cap interface 340.

[0136] The resealable cap 150 may be externally sealed before the user interacts with the container 100. The resealable cap 150 may comprise an external seal positioned around the cap assembly 250. The external seal may further be configured as being a tamper band, where the tamper band may be broken once the resealable cap 150 is repositioned into the open position. In some embodiments, the external seal may be a label positioned over the resealable cap 150. The external seal is configured to show the user if the container 100 has previously been open or used. In some embodiments, the external seal may be broken by mistake. In still some embodiments, the external seal may be configured to be a cover that is positioned over the resealable cap 150 and outside of the container top 160.

[0137] Referring now to FIGS. 29 and 30, a perspective, top view and bottom view of a resealable cap 500 of FIG. 1 is shown, according to an example embodiment. According to the example embodiment, the resealable cap 500 may have a smooth lug design. The resealable cap 500 is configured to be substantially similar to the resealable cap 150 such that similar components may be used to describe the resealable cap 500. The resealable cap 500 has a modular design including a container top 510, a beauty cap 520, and a lug cap 530. The beauty cap 520 is fixedly coupled to the lug cap 530 by a seam positioned between the beauty cap 520 and the lug cap 530. The resealable cap 500 is selectively repositionable between the open position and the closed position by pulling or pushing on the beauty cap 520. In some methods, a twisting force may be applied to the beauty cap 520 to selectively reposition the resealable cap 500 between the open position and the closed position.

[0138] Referring to FIG. 31, a detailed, side view of the resealable cap 500 along line BB of FIG. 29 is shown. As shown, the lug cap 530 is configured to have a lug cap interface 540. The lug cap interface 540 is configured to be substantially smooth, such that the friction between the lug cap 530 and the container top 510 may be decreased when selectively repositioning the resealable cap 500 between the open position and the closed position. The resealable cap 500 further comprises one or more sealing surfaces, such as a face seal 550 and a flare seal 560. The face seal 550 and the flare seal 560 are configured to completely seal the resealable cap 500 in the closed position. In some embodiments, the resealable cap 500 may be sealed by at least one

of the face seal 550 and the flare seal 560. In still some embodiment, the resealable cap 500 may be sealed by neither the face seal 550 nor the flare seal 560.

[0139] Referring now to FIGS. 32–35, various views of the container 100 including a resealable cap 150 is shown, according to another exemplary embodiment. The resealable cap 150 shown in FIGS. 32–35 is configured to be substantially similar to the resealable cap 150 at least shown in FIGS. 3–28, such that similar components and numbering may be utilized to describe the alternate embodiment. The resealable cap 150 is manufactured using a direct metal laser sintering process (e.g., DMLS 3D printing). DMLS 3D printing utilizes high power lasers to melt and fuse metal powder such to create the resealable cap 150. By way of example, the resealable cap 150 may be manufactured using various methods, such to create a custom resealable cap 150. In some embodiments, at least one component of the modular resealable cap 150 may be manufactured using DMLS 3D printing.

[0140] Referring now to FIG. 36, a cutaway side view of a resealable cap 600 along line AA is shown, according to an exemplary embodiments. The resealable cap 600 is configured to be similar to the resealable cap 150 and as such, like terms may be used to describe the resealable cap 600. The resealable cap 600 is configured to be a modular design including a container top 610, a beauty cap 620, and a lug cap 630. The beauty cap 620 is fixedly coupled to the lug cap 630 by a seam positioned between the beauty cap 620 and the lug cap 630. The resealable cap 600 is selectively repositionable between the open position and the closed position by a twisting force applied in the clockwise and counterclockwise direction about the beauty cap 620. In some methods, a pulling or pushing force may be applied to the beauty cap 620 to selectively reposition the resealable cap 600 between the open position and the closed position. As shown, the lug cap 630 is configured to have a lug cap interface 640. The lug cap interface 640 is configured to include guides 645 that are disposed angularly along the circumference of the lug cap 630. The lug cap interface 640 includes a plurality of guides 645 positioned along the lug cap interface 640. In some embodiments, the lug cap interface 640 may only include a single guide 645. The resealable cap 600 further comprises one or more sealing surfaces, such as a face seal 650 and a flare seal 660. The face seal 650 and the flare seal 660 are configured to

completely seal the resealable cap 600 in the closed position. In some embodiments, the resealable cap 600 may be sealed by at least one of the face seal 650 and the flare seal 660. In still some embodiment, the resealable cap 600 may be sealed by neither the face seal 650 nor the flare seal 660.

[0141] Referring now to FIGS. 37 and 38, a perspective view of the container top 610 and the lug cap 630 of FIG. 36 is shown. The container top 610 may further include buttons, shown as dimples 670. The dimples 670 are configured to be positioned along the inner diameter of the container top 610. The dimples 670 are configured to interface with the guides 645 such that the dimples 670 provide a stop when the lug cap 630 is in the open position. By way of example, the dimples 670 are continuously disposed within the guides 645 when the resealable cap 600 is selectively repositionable between the open position and the closed position. The guides 645 may further include stops, shown as dimple stops 647. The dimple stops 647 are configured to be disposed on each of the plurality of guides 645. In some embodiments, the dimple stops 647 may only be disposed on at least one of the plurality of dimple stops 647. The dimple stops 647 are configured to be positioned along three different positions on the guides 645: (a) at the bottom of the guides 645, distal to the beauty cap 620; (b) at the top of the guides 645, proximal to the beauty cap 620; and (c) at the midpoint of the guides 645, halfway between the top and the bottom of the guides 645. In some embodiments, the dimple stops 647 may be disposed along any number of guides 645 and in many different positions.

[0142] Referring generally to FIGS. 39–50, various views of a resealable cap 700 are shown, according to another exemplary embodiment. According to the example embodiment, the resealable cap 700 may have a threaded lug design. The resealable cap 700 is configured to be substantially similar to the resealable cap 150 such that similar reference numerals may be used to describe the resealable cap 700. The resealable cap 700 has a modular design and includes a container top 710, a beauty cap 720, and a lug cap 730. The beauty cap 720 is fixedly coupled to the lug cap 730 by a seam positioned between the beauty cap 720 and the lug cap 730. The resealable cap 700 is selectively repositionable between an open position and a closed position by rotating the beauty cap 720 in both the clockwise and counterclockwise directions. In some

methods, a pulling or pushing force may be applied to the beauty cap 720 to selectively reposition the resealable cap 700 between the open position and the closed position.

[0143] Referring to FIGS. 42–44, various views of the can top 710 of FIG. 39 are shown. The can top 710 may comprise an interface, shown as can top interface 740. The can top interface 740 may be configured to be disposed along the entire inner diameter of the can top 710. In some embodiments, the can top interface 740 may only be disposed along a portion of the inner diameter of the can top 710. By way of example, the can top interface 740 may include a plurality of extensions or protrusions, shown as can top lugs 750. The can top lugs 750 may be positioned equidistant to one another within the can top interface 740. The can top 710 may be configured to include six can top lugs 750. In some embodiments, the can top 710 may include any number of can top lugs 750. The can top lugs 750 are configured to be positioned diagonal to the top of the can top 710. In some embodiments, the can top lugs 750 may be positioned parallel to the top of the can top 710. In still some further embodiments, the can top lugs 750 may be positioned perpendicular to the top of the can top 710. It may be seen as advantageous to include can top lugs 750 instead of a traditional threaded interface for manufacturing material reduction.

[0144] As will be appreciated to those reviewing the present disclosure, the can top interface 740, including the can top lugs 750, may serve a similar purpose to the lug cap interface 340 described with respect, for example, to FIG. 19, although with less material. In other words, the shortened thread lugs may have a similar pitch as the threads included in the embodiment shown in FIG. 19, and may interface with complementary features for securing the lid to the can, while using less material.

[0145] Referring now to FIGS. 45–47, various views of the lug cap 730 of FIG. 39 are shown. The lug cap 730 may comprise an interface, shown as lug cap interface 760. The lug cap interface 760 may further be configured to be a threaded interface that is disposed along the inner diameter of the lug cap 730. By way of example, the lug cap interface 760 may be disposed on at least a portion of the outer diameter of the lug cap 730. In some embodiments, the lug cap

interface 760 may be a smooth interface where the lug cap 730 may be selectively repositioned between an opened and a closed position by pulling or pushing the lug cap 730. The lug cap interface 760 may be configured to interact with the can top lugs 750 such that at least one of the plurality of can top lugs 750 may be disposed within the threaded interface. In such an embodiment, the lug cap 730 may be selectively repositionable between the open position and the closed position by rotating the lug cap 730 in both the clockwise and counterclockwise directions.

[0146] Referring now to FIGS. 48–50, various views of the beauty cap 720 of FIG. 39 are shown. The beauty cap 720 may further comprise a handle, shown as cap handle 770. The cap handle 770 may be configured to be a handle disposed along the midpoint of the beauty cap 720. The cap handle 770 can be configured to facilitate the user in repositioning the lug cap 730 between the open position and the closed position. By way of example, the user may interact with the cap handle 770 to provide a rotating force onto the beauty cap 720. In some embodiments, the user may push or pull on the cap handle 770 to selectively reposition the lug cap 730 between the open position and the closed position. The cap handle 770 may further be configured to have a curved geometry. The cap handle 770 includes curved portions, shown as cap handle radii 780. The cap handle radii 780 are positioned at either end of the cap handle 770. In some embodiments, the cap handle radii 780 may only be positioned at one end of the cap handle 770. By way of example, the cap handle radii 780 are configured to allow a portion of the user's hand to be positioned within the curved portion when interacting with the beauty cap 720.

[0147] Referring now to FIGS. 51 and 52, a tamper evident cap 800 is shown according to an exemplary embodiment. The tamper evident cap 800 may be configured for use with a container (e.g., such as that shown in FIG. 1, for example.). The tamper evident cap 800 includes a container top 840 and a cap assembly 810 at least partially disposed within the container top 840. The container top 840 may be coupled to the container (e.g., crimped, seamed, etc.).

[0148] The cap assembly 810 includes a beauty cap 820 and a lug cap 830. The container top 840 may be selectively coupled to the lug cap 830 when the tamper evident cap 800 is coupled to the container top 840 along an interface, where the container top 840 may provide support between the container (e.g., container 100 in FIG. 1) and the lug cap 830. The beauty cap 820 and the lug cap 830 may cooperatively combine to form the cap assembly 810, and may be formed as a single component or as two separate components, in various materials including aluminum or plastic.

[0149] According to an exemplary embodiment, the tamper evident cap 800 is positioned at the top of the container (e.g., container 100 in FIG. 1). In other embodiments, the tamper evident cap 800 may be positioned at the bottom of the container (e.g., where the container is designed to open at the bottom as opposed to the top). In at least one configuration, an outside perimeter of the beauty cap 820 (e.g., outside circumference or side of the beauty cap 820 that faces outward toward the container top 840) and an outside perimeter of the lug cap 830 may be spaced apart from the container top 840. Moreover, in some configurations, the beauty cap 820 and the tamper evident cap 800 may not extend over, overhang, or encircle the container top 840.

[0150] Referring still to FIGS. 51 and 52, the tamper evident cap 800 may be configured to be selectively repositionable between a sealed position, an open position, and a closed position. For example, the tamper evident cap 800 may be configured to be in the sealed position prior to being opened by the user. The tamper evident cap 800 may be configured to be in the open position when the container is in use (e.g., drinking, pouring, etc.). Finally, the tamper evident cap 800 may be configured to be in the closed position (after having been opened previously) when a user is traveling with the container, or when the container is in transit or storage. This prevents material (e.g., liquid, etc.) from exiting the container from the tamper evident cap 800. As will be described in further detail herein, the tamper evident cap 800 may include indicia and/or structural components to identify to the user if the container has been tampered with (i.e., is not in the sealed position, etc.).

[0151] According to an exemplary embodiment, both the container top 840 and the tamper evident cap 800 may be formed of a metal material (e.g., aluminum, steel, etc.). An all metal design further allows the tamper evident cap 800 to be recyclable without disassembling any components. In some embodiments, the tamper evident cap 800 may be disassembled to recycle the material. According to still other embodiments, one or more of the beauty cap 820 and the lug cap 830 may be formed of a material that differs from the material used to form the container and/or the container top 840 (e.g., the beauty cap 820 may be formed of a polymeric material, various plastics, a composite material, a glass material, or any other suitable material, including metals or metal alloys that differ from one or more of the container, container top, and/or lug cap; other configurations may also be possible according to other exemplary embodiments, and the concepts herein are not intended as being limited by the particular materials selected for each component described herein, all of which are intended to be included within the scope of the present disclosure).

[0152] As shown in FIG. 52, the tamper evident cap 800 is shown in the open position. In the open position, material may exit the container by flowing through a gap between the cap assembly 810 and the container top 840. The tamper evident cap 800 may be selectively repositionable between the open position and the closed position by rotating the cap assembly 810 about the beauty cap 820. By way of example, the tamper evident cap 800 may be opened by rotating the cap assembly 810 in the counter clockwise direction and closed by rotating the cap assembly 810 in the clockwise direction. In some embodiments, the tamper evident cap 800 is selectively repositionable by providing a push and/or pull force onto the cap assembly 810.

[0153] Referring to FIGS. 53-55, the cap assembly 810 includes the beauty cap 820 and the lug cap 830. The beauty cap 820 may include one or more drink interfaces, shown as first drink interface 850a and second drink interface 850b. The one or more drink interfaces 850a, 850b may be positioned substantially opposite one another on the beauty cap 820. In some embodiments, the one or more drink interfaces 850a, 850b may be positioned substantially adjacent one another on the beauty cap 820. The lug cap 830 may include an interface, shown as lug cap interface 860. The lug cap interface 860 may be a threaded interface extended along an

outer perimeter of the lug cap 830. In some embodiments, the lug cap interface 860 may be a smooth interface. In other embodiments, the lug cap interface 860 may include slots, grooves or the like extending laterally along a length of the lug cap interface 860.

[0154] The lug cap interface 860 includes one or more openings, shown as first opening 870a and second opening 870b. The one or more openings 870a, 870b are shown as being positioned substantially opposite one another on the lug cap interface 860, although in some embodiments, the one or more openings 870a, 870b may be positioned substantially adjacent one another on the lug cap interface 860. The one or more openings 870a, 870b may be configured to facilitate the flow of material out of the container when the tamper evident cap 800 is in the open position.

[0155] Referring still to FIGS. 53-55, the beauty cap 820 includes a central interface 880 (e.g., rib, protrusion, structure, etc.). The central interface 880 is illustrated as a structure that extends through a midpoint of the beauty cap 820. While the central interface 880 is shown as extending along an entire diameter of the beauty cap 880, other configurations are possible (e.g., extending a portion of the way along the diameter). The beauty cap 820 also includes an outer edge 885 that is located proximate an outer circumference of the beauty cap 820. The central interface 880 and the outer edge 885 cooperatively surround one or more cavities, shown as first cavity 890a and second cavity 890b. The one or more cavities 890a, 890b may be configured to allow a user to grasp the central interface 880 to rotate the beauty cap 820. The first cavity 890a is shown as being located proximate the first drink interface 850a and the second cavity 890b is shown as being located proximate the second drink interface 850b, although other configurations are possible according to other embodiments.

[0156] As shown in FIGS. 54-56, the cap assembly 810 includes one or more locking mechanisms 900. Each locking mechanism 900 is shown as a hinge (e.g., a living hinge, etc.) that is selectively repositionable between a locked position (e.g., pre-loaded position, etc.) and an unlocked position (e.g., engaged position, etc.). According to an exemplary embodiment, the locking mechanisms 900 are designed so that once they are moved from the locked position to the unlocked position, they do not revert to the locked position. In this manner, the cap assembly

810 may be prevented from rotating back to the original position so as to convey that the container has been opened, as discussed in greater detail below. While in the unlocked position the cap assembly 810 may tighten enough to seal in the material (e.g., liquid, gas, etc.).

[0157] The locking mechanisms 900 are positioned at an upper end of the cap assembly 810, proximate the beauty cap 820, although other locations are possible according to other exemplary embodiments. For example, in some embodiments, the locking mechanisms 900 may be positioned at a lower end of the cap assembly 810, distal the beauty cap 820. By way of example, the locking mechanisms 900 may be at least partially disposed in an internal cavity of the lug cap 830. According to an exemplary embodiment, the lug cap interface 860 includes one or more locking mechanism openings 910. The locking mechanism openings 910 may be axially aligned with the locking mechanisms 900 so that the locking mechanisms 900 may be at least partially disposed within the locking mechanism openings 910. The locking mechanism 900 may be at least partially disposed within the locking mechanism openings 910 when selectively repositioning between the locking position and the unlocked position. The locking mechanism openings 910 may be positioned at an end of the lug cap interface 860, proximate the beauty cap 820. The locking mechanism 900 may be preloaded by moving the locks in from the inside center of the cap assembly 810. The locking mechanism 900 cannot be preloaded from the outside once the cap assembly 810 has been removed. The locking mechanism 900 and container top 840 may be preassembled in the locked position before the cap assembly 810 is attached to the container.

[0158] Referring now to FIGS. 57 and 58, the container top 840 includes an outer edge 930 and an inner edge 940. The outer edge 930 may be configured to interface with the container where the outer edge 930 is fixedly coupled to the container. The inner edge 940 may be configured to interface with the cap assembly 810. The inner edge 940 may include one or more protrusions 950 positioned on the inner edge 940. The protrusions 950 may further extend radially inward towards a center of the container top 840. In some embodiments, the protrusions 950 may extend radially outward away from a center of the container top 840. The protrusions 950 may be received within the lug cap interface 860, where the lug cap interface 860 maintains

contact with the protrusions 950 when selectively repositioning between the open position and the closed position. The protrusions 950 may further abut the locking mechanisms 900 when in the closed position. As can be appreciated, the protrusions 950 may maintain the cap assembly 810 into the closed position by interfacing with the locking mechanisms 900.

[0159] As shown in FIGS. 57-60, the tamper evident cap 800 includes a tamper identifier 970. The tamper identifier 970 is visible to a consumer or other individual viewing the tamper evident cap 800, and is configured to show whether or not the tamper evident cap 800 has been selectively repositioned away from the sealed position. As can be appreciated, the user may use the tamper identifier 970 to determine if the container has previously been opened.

[0160] According to an exemplary embodiment, the tamper identifier 970 may be a color identifier. In such an embodiment, the central interface 880 may align with one or more color identifiers to signify if the tamper evident cap 800 is in the sealed position. As shown in FIG. 59, the container top 840 includes one or more green identifiers and one or more red identifiers. The green identifiers may be positioned substantially opposite one another and the red identifiers may be positioned substantially opposite one another. When the central interface 880 aligns with the green identifiers, the tamper identifier 970 may signal to the user that the container has not previously been opened (e.g., as shown in FIG. 59). When the central interface 880 aligns with the red identifiers, the tamper identifier 970 may signal to the user that the container has been previously opened (e.g., as shown in FIG. 60).

[0161] According to another exemplary embodiment, the tamper identifier 970 may be a protrusion identifier. In such an embodiment, the central interface 880 may align with one or more protrusion identifiers to signify if the tamper evident cap 800 is in the sealed position. By way of example, the container top 840 may include one or more protrusions with a first depth and/or one or more protrusions with a second depth. The protrusions with a first depth may be positioned substantially opposite one another and the protrusions with the second depth may be positioned substantially opposite one another. The first depth may be substantially larger than the second depth. In some embodiments, the first depth may be substantially shallower than the

second depth. When the central interface 880 aligns with the protrusions with the first depth, the tamper identifier 970 may signal to the user that the container has not previously been opened. When the central interface 880 aligns with the protrusions with the second depth, the tamper identifier 970 may signal to the user that the container has been previously opened.

[0162] According to another exemplary embodiment, the tamper identifier 970 may be a recessed identifier. In such an embodiment, the central interface 880 may align with one or more recess identifiers to signify if the tamper evident cap 800 is in the sealed position. By way of example, the container top 840 may include one or more recesses with a first depth and/or one or more recesses with a second depth. The recesses with a first depth may be positioned substantially opposite one another and the recesses with the second depth may be positioned substantially opposite one another. The first depth may be substantially larger than the second depth. In some embodiments, the first depth may be substantially shallower than the second depth. When the central interface 880 aligns with the recesses with the first depth, the tamper identifier 970 may signal to the user that the container has not been previously opened. When the central interface 880 aligns with the recesses with the second depth, the tamper identifier 970 may signal to the user that the container has been previously opened.

[0163] According to another exemplary embodiment, the tamper identifier 970 may be a combination of protrusion identifier and a recessed identifier. In such an embodiment, the central interface 880 may align with one or more protrusion identifiers and one or more recess identifiers to signify if the tamper evident cap 800 is in the sealed position. By way of example, the container top 840 may include one or more protrusions and one or more recesses. When the central interface 880 aligns with the one or more protrusions, the tamper identifier 970 may signal to the user that the container has not previously been opened. When the central interface 880 aligns with the one or more recesses, the tamper identifier 970 may signal to the user that the container has been previously opened. In some embodiments, when the central interface 880 aligns with the one or more recesses, the tamper identifier 970 may signal to the user that the container has not been previously opened. In still some embodiments, when the central interface

880 aligns with the one or more protrusions, the tamper identifier 970 may signal to the user that the container has been previously opened.

[0164] According to another exemplary embodiment, the tamper identifier 970 may be a word identifier. In such an embodiment, the central interface 880 may align with one or more word identifiers to signify if the tamper evident cap 800 is in the sealed position. By way of example, the container top 840 may include one or more words associated with the sealed position, the open position and/or the closed position (e.g., “sealed”, “opened”, “closed”, “do not use”, etc.). When the central interface 880 aligns with the words corresponding to the sealed position, the tamper identifier 970 may signal to the user that the container has not previously been opened. When the central interface 880 aligns with the one or more words associated with the open position and/or the closed position, the tamper identifier 970 may signal to the user that the container has been previously opened. As can be appreciated, the words corresponding to the sealed position may signal to the user that the tamper evident cap 800 has not been opened or tampered with, and the words corresponding to the open position may signal to the user that the tamper evident cap 800 has been opened or tampered with.

[0165] Referring generally to FIGS. 61 and 62, the locking mechanism 900 may be moved from the pre-loaded position (e.g., shown in FIG. 61) to the engaged position (e.g., shown in FIG. 62). The lug cap 830 includes a connecting arm 975 that may be located between the lug cap interface 860 and the locking mechanism 900. When the locking mechanism 900 is moved from the pre-loaded position to the engaged position, the locking mechanism 900 moves about the connecting arm 975. The locking mechanism 900 includes a first side, shown as angular side 980, and a second side, shown as flat side 990. The angular side 980 may be sloped towards the connecting arm 975. The flat side 990 may extend substantially parallel to a radial direction of the lug cap 830. As can be appreciated, the angular side 980 may be configured to abut the protrusion 950, when in the pre-loaded position, where an end of the locking mechanism 900 moves away from the protrusion 950 while moving along the angular side 980. Once the protrusion 950 crests the angular side 980, the locking mechanism 900 may be automatically repositioned into the engaged position, where the flat side 990 abuts the protrusion 950. As

shown in FIG. 62, the flat side 990 interrupts the lug cap interface 860 to prevent the tamper evident cap 800 from rotating back into the sealed position.

[0166] Referring to FIG. 62, the locking mechanisms 900 may include a protrusion, lip, ridge, tab, shown as lock installation tab 995. The lock installation tab 995 may be a protrusion extending outward from the flat side 990. In some embodiments, the lock installation tab 995 may extend outward from the angular side 980. The lock installation tab 995 may be configured to interface (e.g., receive, etc.) with a tool. The tool may be used to install the locking mechanisms 900 into the lug cap 830. The tool may interact with the lock installation tab 995 to move the locking mechanisms 900 into an assembled position, where the locking mechanisms 900 are assembled within the lug cap 830.

[0167] Referring generally to FIGS. 51-62, the tamper evident cap 800 may be manufactured by first installing the beauty cap 820 onto the lug cap 830 to form the cap assembly 810. The beauty cap 820 may be crimped, sealed, pressed, seamed, etc. onto the lug cap 830. The cap assembly 810 may then be threaded onto the container top 840. As can be appreciated, the locking mechanisms 900 may be moved away from the engaged position so that the tamper evident cap 800 can be in the sealed position, where then the locking mechanisms 900 can be released back into the pre-loaded position. Then, the container top 840 may be crimped, sealed, seamed, pressed, etc. onto the container. Although an order of steps has been described, the tamper evident cap 800 may be manufactured using any method, combination or order of steps.

[0168] Referring now to FIGS. 63-67, a tamper evident cap 1000 is shown according to an exemplary embodiment. The tamper evident cap 1000 may be configured for use with a container (e.g., such as that shown in FIG. 1). The tamper evident cap 1000 includes a container top 1040 and a cap assembly 1010 at least partially disposed within the container top 1040. The container top 1040 may be coupled to the container (e.g., crimped, seamed, etc.).

[0169] The cap assembly 1010 includes a beauty cap 1020 and a lug cap 1030. The container top 1040 may be selectively coupled to the lug cap 1030 when the tamper evident cap 1000 is coupled to the container top 1040 along an interface, where the container top 1040 may provide

support between the container (e.g., container 100 in FIG. 1) and the lug cap 1030. The beauty cap 1020 and the lug cap 1030 may cooperatively combine to form the cap assembly 1010, and may be formed as a single component or as two separate components, in various materials including aluminum or plastic.

[0170] According to an exemplary embodiment, the tamper evident cap 1000 is positioned at the top of the container (e.g., container 100 in FIG. 1). In other embodiments, the tamper evident cap 1000 may be positioned at the bottom of the container (e.g., where the container is designed to open at the bottom as opposed to the top). In at least one configuration, an outside perimeter of the beauty cap 1020 (e.g., outside circumference or side of the beauty cap 1020 that faces outward toward the container top 1040) and an outside perimeter of the lug cap 1030 may be spaced apart from the container top 1040. Moreover, in some configurations, the beauty cap 1020 and the tamper evident cap 1000 may not extend over, overhang, or encircle the container top 1040.

[0171] Referring still to FIGS. 63-67, the tamper evident cap 1000 may be configured to be selectively repositionable between a sealed position, an open position, and a closed position. For example, the tamper evident cap 1000 may be configured to be in the sealed position prior to being opened by the user. The tamper evident cap 1000 may be configured to be in the open position when the container is in use (e.g., drinking, pouring, etc.). Finally, the tamper evident cap 1000 may be configured to be in the closed position (after having been opened previously) when a user is traveling with the container, or when the container is in transit or storage. This prevents material (e.g., liquid, etc.) from exiting the container from the tamper evident cap 1000. As will be described in further detail herein, the tamper evident cap 1000 may include indicia and/or structural components to identify to the user if the container has been tampered with (i.e., is not in the sealed position, etc.).

[0172] According to an exemplary embodiment, both the container top 1040 and the tamper evident cap 1000 may be formed of a metal material (e.g., aluminum, steel, etc.). An all metal design further allows the tamper evident cap 1000 to be recyclable without disassembling any

components. In some embodiments, the tamper evident cap 1000 may be disassembled to recycle the material. According to still other embodiments, one or more of the beauty cap 1020 and the lug cap 1030 may be formed of a material that differs from the material used to form the container and/or the container top 1040 (e.g., the beauty cap 1020 may be formed of a polymeric material, various plastics, a composite material, a glass material, or any other suitable material, including metals or metal alloys that differ from one or more of the container, container top, and/or lug cap; other configurations may also be possible according to other exemplary embodiments, and the concepts herein are not intended as being limited by the particular materials selected for each component described herein, all of which are intended to be included within the scope of the present disclosure).

[0173] When the tamper evident cap is in the open position, material may exit the container by flowing through a gap between the cap assembly 1010 and the container top 1040. The tamper evident cap 1000 may be selectively repositionable between the open position and the closed position by rotating the cap assembly 1010 about the beauty cap 1020. By way of example, the tamper evident cap 1000 may be opened by rotating the cap assembly 1010 in the counterclockwise direction and closed by rotating the cap assembly 1010 in the clockwise direction. In some embodiments, the tamper evident cap 1000 is selectively repositionable by providing a push and/or pull force onto the cap assembly 1010.

[0174] Referring to FIG. 66 and 74-75, the cap assembly 1010 includes the beauty cap 1020 and the lug cap 1030. The beauty cap 1020 may include one or more drink interfaces, shown as first drink interface 1050a and second drink interface 1050b. The one or more drink interfaces 1050a, 1050b may be positioned substantially opposite one another on the beauty cap 1020. In some embodiments, the one or more drink interfaces 1050a, 1050b may be positioned substantially adjacent one another on the beauty cap 1020. The lug cap 1030 may include an interface, shown as lug cap interface 1030. The lug cap interface 1030 may be a threaded interface extended along an outer perimeter of the lug cap 1030. In some embodiments, the lug cap interface 1030 may be a smooth interface. In other embodiments, the lug cap interface 1030

may include slots, grooves or the like extending laterally along a length of the lug cap interface 1030.

[0175] Referring still to FIGS. 66 and 74-75, the beauty cap 1020 includes a central interface 1090 (e.g., rib, protrusion, structure, etc.). The central interface 1090 is illustrated as a structure that extends through a midpoint of the beauty cap 1020. While the central interface 1090 is shown as extending along an entire diameter of the beauty cap 1090, other configurations are possible (e.g., extending a portion of the way along the diameter). The central interface 1090 and an outer edge of the container top 1040 cooperatively surround one or more cavities, shown as first cavity 1060a and second cavity 1060b. The one or more cavities 1060a, 1060b may be configured to allow a user to grasp the central interface 1090 to rotate the beauty cap 1020. The first cavity 1060a is shown as being located proximate the first drink interface 1050a and the second cavity 1060b is shown as being located proximate the second drink interface 1050b, although other configurations are possible according to other embodiments.

[0176] Referring now to FIG. 67, the container top 1040 includes an outer edge 1130 and an inner edge 1140. The outer edge 1130 may be configured to interface with the container where the outer edge 1130 is fixedly coupled to the container. The inner edge 1140 may be configured to interface with the cap assembly 1010. The inner edge 1140 may include one or more protrusions 1150 positioned on the inner edge 1140. The protrusions 1150 may further extend radially inward towards a center of the container top 1040. In some embodiments, the protrusions 1150 may extend radially outward away from a center of the container top 1040. The protrusions 1150 may be received within the lug cap interface 1030, where the lug cap interface 1030 maintains contact with the protrusions 1150 when selectively repositioning between the open position and the closed position.

[0177] Referring now to FIGS. 68-73, the tamper evident cap 1000 further includes a tamper evident insert, tamper insert, etc., shown as insert 1160. The insert 1160 may be coupled to a rearward side of the beauty cap 1020. That is, the insert 1160 may be positioned within the central interface 1090. That is, the insert 1160 may be positioned within a cap assembly

interface 1170. The cap assembly interface 1170 may be a portion of the cap assembly that is sized and positioned to receive the insert 1160. By way of example, the cap assembly interface 1170 includes an aperture where the protrusion 1150 may be received within the aperture. The insert 1160 may be configured to signify that the cap assembly 1010 is out of the sealed position. According to an exemplary embodiment, the insert 1160 is designed so that once the cap assembly 1010 is moved from the locked position to the unlocked position, the insert 1160 does not permit the cap assembly 1010 to revert back the locked position. In this manner, the cap assembly 1010 may be prevented from rotating back to the original position so as to convey that the container has been opened, as discussed in greater detail below. While in the unlocked position the cap assembly 1010 may tighten enough to seal in the material (e.g., liquid, gas, etc.).

[0178] The insert 1160 may include a first end 1160a and a second end 1160b. The ends 1160a, 1160b may be provided opposite one another along a length of the insert. The insert 1160 further includes one or more insert interfaces, shown as interfaces 1180, positioned proximate the ends 1160a, 1160b. That is, the ends 1160a, 1160b may include a respective interface 1180. The interfaces 1180 may be configured to receive the protrusion 1150 within. The interfaces 1180 may have a substantially curved profile, where the protrusion 1150 can be received within. The edges of the curved profile maintain the protrusion 1150 in contact with the interfaces 1180. In other embodiments, the interfaces 1180 may take on a different geometrical configuration than that of a curve (e.g., prismatic, frustoconical, combination thereof, etc.). Positioned between the ends 1160a, 1160b is a middle portion, shown as body 1175. The body 1175 may be centrally provided between the end 1160a, 1160b, where the ends 1160a, 1160b may be coupled to the body 1175 via one or more curved portions, shown as body transitions 1165. The body transitions 1165 may be curved, where openings are positioned about the curved portions. In one embodiment, the body transitions 1165 may be able to flex and/or compress out of placement when the cap assembly 1010 is repositioned out of the sealed position.

[0179] As shown in FIG. 71, a side of the insert 1160 has a substantially triangular profile. That is, a sidewall of the body 1175 may not be positioned perpendicular to either a top or a bottom of the insert 1160. The insert 1160 may include an angle 1185. The angle 1185 may be

an angle perpendicular to a normal of the top surface of the insert 1160 and the sidewall of the body 1175. As can be appreciated, the angle 1185 may be complementary to an angle of the central interface 1090 to facilitate insertion of the inset 1160 into the central interface 1090.

[0180] As shown in FIGS. 72 and 73, the interface 1180 may selectively engage the protrusion 1150. The interface 1180 may be engaged with the protrusion 1150 when the cap assembly 1010 is in the locked position (e.g., as shown in FIG. 72). Accordingly, the interface 1180 may be disengaged from the protrusion 1150 when the cap assembly 1010 is in the unlocked position (e.g., as shown in FIG. 73). By way of example, the unlocked position may be any position where the cap assembly 1010 is not in the locked position (e.g., closed position, open position, etc.). The cap assembly 1010 may be rotated in a first direction (e.g., counterclockwise) to disengage the interface 1180 from the protrusion 1150. In other embodiments, the cap assembly 1010 may be rotated in a second direction (e.g., clockwise) to disengage the interface 1180 from the protrusion 1150. When the insert 1160 is in the locked position, the insert 1160 may be compressed. That is, the insert 1160 may define a length that is substantially longer than a distance between opposing protrusions 1150, where insertion of the insert 1160 into the middle interface 1090 compresses the insert 1160 about the transition portions 1165. Upon rotation of the cap assembly 1010, the insert 1160 decompresses into a normal position. In the normal position, the interfaces 1180 may be radially extended past an end of the protrusion 1150 to prevent the cap assembly 1010 from rotating back into the locked position.

[0181] As shown in FIGS. 74 and 75, the tamper evident cap 1000 includes a tamper identifier 1190. The tamper identifier 1190 is visible to a consumer or other individual viewing the tamper evident cap 1000, and is configured to show whether or not the tamper evident cap 1000 has been selectively repositioned away from the sealed position. As can be appreciated, the user may use the tamper identifier 1190 to determine if the container has previously been opened.

[0182] According to an exemplary embodiment, the tamper identifier 1190 may be a color identifier. In such an embodiment, the central interface 1090 may align with one or more color identifiers to signify if the tamper evident cap 1000 is in the sealed position. As shown in FIGS.

74 and 75, the container top 1040 includes one or more green identifiers and one or more red identifiers. The green identifiers may be positioned substantially opposite one another and the red identifiers may be positioned substantially opposite one another. When the central interface 1090 aligns with the green identifiers, the tamper identifier 1190 may signal to the user that the container has not previously been opened (e.g., as shown in FIG. 74). When the central interface 1090 aligns with the red identifiers, the tamper identifier 1190 may signal to the user that the container has been previously opened (e.g., as shown in FIG. 75).

[0183] According to another exemplary embodiment, the tamper identifier 1190 may be a protrusion identifier. In such an embodiment, the central interface 1090 may align with one or more protrusion identifiers to signify if the tamper evident cap 1000 is in the sealed position. By way of example, the container top 1040 may include one or more protrusions with a first depth and/or one or more protrusions with a second depth. The protrusions with a first depth may be positioned substantially opposite one another and the protrusions with the second depth may be positioned substantially opposite one another. The first depth may be substantially larger than the second depth. In some embodiments, the first depth may be substantially shallower than the second depth. When the central interface 1090 aligns with the protrusions with the first depth, the tamper identifier 1190 may signal to the user that the container has not previously been opened. When the central interface 1090 aligns with the protrusions with the second depth, the tamper identifier 1190 may signal to the user that the container has been previously opened.

[0184] According to another exemplary embodiment, the tamper identifier 1190 may be a recessed identifier (e.g., laser etch, etc.). In such an embodiment, the central interface 1090 may align with one or more recess identifiers to signify if the tamper evident cap 1000 is in the sealed position. By way of example, the container top 1040 may include one or more recesses with a first depth and/or one or more recesses with a second depth. The recesses with a first depth may be positioned substantially opposite one another and the recesses with the second depth may be positioned substantially opposite one another. The first depth may be substantially larger than the second depth. In some embodiments, the first depth may be substantially shallower than the second depth. When the central interface 1090 aligns with the recesses with the first depth, the

tamper identifier 1190 may signal to the user that the container has not been previously opened. When the central interface 1090 aligns with the recesses with the second depth, the tamper identifier 1190 may signal to the user that the container has been previously opened.

[0185] According to another exemplary embodiment, the tamper identifier 1190 may be a combination of protrusion identifier and a recessed identifier. In such an embodiment, the central interface 1090 may align with one or more protrusion identifiers and one or more recess identifiers to signify if the tamper evident cap 1000 is in the sealed position. By way of example, the container top 1040 may include one or more protrusions and one or more recesses. When the central interface 1090 aligns with the one or more protrusions, the tamper identifier 1190 may signal to the user that the container has not previously been opened. When the central interface 1090 aligns with the one or more recesses, the tamper identifier 1190 may signal to the user that the container has been previously opened. In some embodiments, when the central interface 1090 aligns with the one or more recesses, the tamper identifier 1190 may signal to the user that the container has not been previously opened. In still some embodiments, when the central interface 1090 aligns with the one or more protrusions, the tamper identifier 1190 may signal to the user that the container has been previously opened.

[0186] According to another exemplary embodiment, the tamper identifier 1190 may be a word identifier. In such an embodiment, the central interface 1090 may align with one or more word identifiers to signify if the tamper evident cap 1000 is in the sealed position. By way of example, the container top 1040 may include one or more words associated with the sealed position, the open position and/or the closed position (e.g., “sealed”, “opened”, “closed”, “do not use”, etc.). When the central interface 1090 aligns with the words corresponding to the sealed position, the tamper identifier 1190 may signal to the user that the container has not previously been opened. When the central interface 1090 aligns with the one or more words associated with the open position and/or the closed position, the tamper identifier 1190 may signal to the user that the container has been previously opened. As can be appreciated, the words corresponding to the sealed position may signal to the user that the tamper evident cap 1000 has not been

opened or tampered with, and the words corresponding to the open position may signal to the user that the tamper evident cap 1000 has been opened or tampered with.

[0187] Referring generally to FIGS. 64-75, the tamper evident cap 1000 may be manufactured by first installing the beauty cap 1020 onto the lug cap 1030 to form the cap assembly 1010. The beauty cap 1020 may be crimped, sealed, pressed, seamed, etc. onto the lug cap 1030. The cap assembly 1010 may then be threaded onto the container top 1040. The insert 1160 may then be inserted into the beauty cap 1020, where the insert seats within a rearward side of the interface 1090. As can be appreciated, the insert 1160 is aligned with the protrusions 1150 to originally assemble the tamper evident cap 1000 in a sealed position. Then, the container top 1040 may be crimped, sealed, seamed, pressed, etc. onto the container. Although an order of steps has been described, the tamper evident cap 1000 may be manufactured using any method, combination or order of steps.

[0188] Although various implementations of a resealable cap is shown (e.g., resealable cap 100, resealable cap 500, resealable cap 600, resealable cap 700, tamper evident cap 800, and tamper evident cap 1000), any combination of features within the resealable caps 100, 500, 600, 700, 800, 1000 may be implemented into a resealable cap. For example, a resealable cap may include the flare seal 560, dimple stops 647, locking mechanisms 900, and insert 1160.

[0189] As utilized herein with respect to numerical ranges, the terms “approximately,” “about,” “substantially,” and similar terms generally mean $\pm 10\%$ of the disclosed values, unless specified otherwise. As utilized herein with respect to structural features (e.g., to describe shape, size, orientation, direction, relative position, etc.), the terms “approximately,” “about,” “substantially,” and similar terms are meant to cover minor variations in structure that may result from, for example, the manufacturing or assembly process and are intended to have a broad meaning in harmony with the common and accepted usage by those of ordinary skill in the art to which the subject matter of this disclosure pertains. Accordingly, these terms should be interpreted as indicating that insubstantial or inconsequential modifications or alterations of the

subject matter described and claimed are considered to be within the scope of the disclosure as recited in the appended claims.

[0190] It should be noted that the term “exemplary” and variations thereof, as used herein to describe various embodiments, are intended to indicate that such embodiments are possible examples, representations, or illustrations of possible embodiments (and such terms are not intended to connote that such embodiments are necessarily extraordinary or superlative examples).

[0191] The term “coupled” and variations thereof, as used herein, means the joining of two members directly or indirectly to one another. Such joining may be stationary (e.g., permanent or fixed) or moveable (e.g., removable or releasable). Such joining may be achieved with the two members coupled directly to each other, with the two members coupled to each other using a separate intervening member and any additional intermediate members coupled with one another, or with the two members coupled to each other using an intervening member that is integrally formed as a single unitary body with one of the two members. If “coupled” or variations thereof are modified by an additional term (e.g., directly coupled), the generic definition of “coupled” provided above is modified by the plain language meaning of the additional term (e.g., “directly coupled” means the joining of two members without any separate intervening member), resulting in a narrower definition than the generic definition of “coupled” provided above. Such coupling may be mechanical, electrical, or fluidic.

[0192] References herein to the positions of elements (e.g., “top,” “bottom,” “above,” “below”) are merely used to describe the orientation of various elements in the figures. It should be noted that the orientation of various elements may differ according to other exemplary embodiments, and that such variations are intended to be encompassed by the present disclosure.

[0193] Although the figures and description may illustrate a specific order of method steps, the order of such steps may differ from what is depicted and described, unless specified differently above. Also, two or more steps may be performed concurrently or with partial concurrence, unless specified differently above.

[0194] It is important to note that any element disclosed in one embodiment may be incorporated or utilized with any other embodiment disclosed herein. For example, the first opening of the exemplary embodiment described with respect to FIG. 9 may be incorporated with the resealable cap 150 and the resealable cap 500. As another example, the face seal 400 and the flare seal 410 may be incorporated with the resealable cap 150 and the resealable cap 500. Although only two examples of an element from one embodiment that can be incorporated or utilized in another embodiment has been described above, it should be appreciated that other elements of the various embodiments may be incorporated or utilized with any of the other embodiments disclosed herein.

WHAT IS CLAIMED IS:

1. A resealable cap, comprising:
 - a container top comprising a plurality of protrusions extending inward from the container top; and
 - a cap assembly threadably coupled to the container top, the cap assembly comprising:
 - a beauty cap positioned on a top of the cap assembly and comprising an interface extending along a midpoint of the beauty cap; and
 - a lug cap coupled to the beauty cap and comprising a lug cap interface positioned about a perimeter of the lug cap and configured to receive the plurality of protrusions; and
 - a tamper insert coupled to the beauty cap at an underside of the beauty cap and positioned within the interface.
2. The resealable cap of Claim 1, wherein the cap assembly is repositionable between a locked position and an unlocked position, and wherein the tamper insert is configured to engage the protrusion when the cap assembly is in the locked position.
3. The resealable cap of Claim 2, wherein the tamper insert is configured to disengage from the protrusion when the cap assembly is positioned into the unlocked position, and wherein the protrusion prevents the cap assembly from repositioning back into the locked position.
4. The resealable cap of any one of Claims 1-3, wherein the container top includes a tamper identifier positioned about a top of the container top and configured to signify a position of the cap assembly.
5. The resealable cap of Claim 4, wherein the tamper identifier is a laser etched identifier comprising a plurality of identifiers, the plurality of identifiers positioned opposite another.

6. The resealable cap of Claim 5, wherein the plurality of identifiers comprises a locked identifier and an unlocked identifier, and wherein the interface of the beauty cap is aligned with the locked identifier and the unlocked identifier to signify a position of the cap assembly.
7. The resealable cap of any one of Claims 1-6, wherein a profile of the tamper insert is substantially similar to a profile of the interface, and wherein the tamper insert is held within the interface.
8. The resealable cap of any one of Claims 1-7, wherein the lug cap includes one or more lug cap interfaces extending vertically along an inner surface of the lug cap, wherein the tamper insert is insertably coupled to the beauty cap along the one or more lug cap interfaces, and wherein the plurality of protrusions are selectively received within the lug cap interfaces.
9. The resealable cap of any one of Claims 1 or 4-8, wherein the tamper insert comprises:
 - a first end and a second end positioned opposite one another;
 - a body centrally provided within the tamper insert; and
 - a transition portion positioned between the body and the respective first end and second end;wherein the transition portion is configured to flex upon rotation of the cap assembly from a locked position to an unlocked position.
10. The resealable cap of any one of Claims 1 or 4-8, wherein the tamper insert comprises an insert interface positioned at a first end and a second end of the insert, the insert interface configured to engage the protrusion.
11. The resealable cap of any one of Claims 1-10, wherein the cap assembly is selectively repositionable between a closed position and an open position, and wherein the open position is any position of the cap assembly that permits a flow of fluid therethrough.

12. The resealable cap of any one of Claims 1, 4-8, or 11, wherein the tamper insert is repositionable from a compressed position and a normal position, wherein the tamper insert is in the compressed position when the cap assembly is in a locked position, and wherein an end of the tamper insert is configured to decompress outward past the protrusion when the tamper insert is in the normal position.
13. The resealable cap of any one of Claims 1-12, wherein the container top is fixedly coupled to a top of a container to couple the resealable cap to the container.
14. The resealable cap of any one of Claims 1-10, 12 or 13, wherein the beauty cap comprises one or more drink interfaces positioned opposite one another along an outer edge of the beauty cap and positioned offset the interface of the beauty cap, the one or more drink interfaces configured to transition a flow of fluid therebetween.
15. The resealable cap of any one of Claims 1-14, wherein the beauty cap comprises one or more cavities positioned on either side of the interface and extending downward from a top of the beauty cap, the one or more cavities configured to receive a portion of a user.