LID FOR A BEVERAGE CONTAINER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Application No. 18/622,542, filed March 29, 2024, which is incorporated herein by reference in its entirety.

FIELD

[0002] This disclosure generally relates to a lid for beverage containers. More specifically, some embodiments relate to locking and assembly mechanisms and features related to a closure on a lid for beverage containers.

BACKGROUND

[0003] A lid for a beverage container may have an opening for dispensing a beverage held in the containers, and the openings may be sealed by a closure. The lid may also include a mechanism to retain the closure in a closed position to seal the opening, and the closure may only be opened to allow access to the openings when needed. A push button may be used to open the closure cleanly and easily.

SUMMARY

[0004] Some embodiments disclosed herein are directed to a lid for a beverage container including a lid body having a spout, a flip top closure rotatably coupled to the lid body, and a lock disposed around the spout. The flip top closure can rotate between a closed position in which the closure covers the spout and an open position in which the closure does not cover the spout. The latch can move between a first position in which the latch engages with the closure in the closed position and a second position in which the latch does not engage with the closure in the closed position. The lock includes a ring and an actuator extending from the ring and accessible from a top surface of the lid body. The ring can rotate around the spout between an unlocked position in which the latch is allowed to move from the first position to the second position and a locked position in which the latch is inhibited from moving from the first position to the second position.

[0005] Some embodiments disclosed herein are directed to a lid for a beverage container including a lid body having a spout and a pair of grooves extending in a vertical direction, a flip top closure rotatably coupled to the lid body and rotatable between a closed position to cover the spout and an open position, and a button configured to be depressed in a horizontal direction. Each of the grooves includes a wider portion and a narrower portion, the wider portion being closer to the spout than the narrower portion. The button includes a latch to engage with the closure to retain the closure in the closed position and a pair of arms. Each of the arms includes a wider portion disposed within the wider portion of the groove and a narrower portion disposed within the narrower portion of the groove. The wider portion and the narrower portion of an arm form an L-shape, and the wider portion of each arm extends towards the other arm.

[0006] Some embodiments disclosed herein are directed to a lid for a beverage container including a lid body having a pair of mounts and a flip top closure rotatably coupled to the mounts to rotate between a closed position in which the closure covers a drinking opening of the lid body and an open position in which the closure does not cover the drinking opening. The closure can be retained in the closed position by a latch, and upon release of the latch, the closure is biased to automatically move to the open position by a spring. The closure is configured to be removable from the mount only when the closure is retained in an assembling position between the closed position and the open position.

BRIEF DESCRIPTION OF THE FIGURES

[0007] The accompanying drawings, which are incorporated herein and form a part of the specification, illustrate the present disclosure and, together with the description, further serve to explain the principles thereof and to enable a person skilled in the pertinent art to make and use the same.

[0008] FIG. 1 shows a perspective view of a beverage container with a lid in a closed position.

[0009] FIG. 2 shows an exploded perspective view of the beverage container of FIG. 1.

[0010] FIG. 3 shows a perspective view of the lid of FIG. 1 in an open position.

[0011] FIG. 4 shows a side cross-sectional view the lid of FIG. 1, taken at line IV of FIG. 1.

[0012] FIG. 5 shows a top view of the lid of FIG. 1.

[0013] FIG. 6a shows a lock for the lid of FIG. 1 according to some embodiments.

[0014] FIG. 6b shows a lock for the lid of FIG. 1 according to some embodiments.

[0015] FIG. 7 shows a bottom perspective view of the lock of FIG. 6a in a pre-assembly configuration.

[0016] FIG. 8 shows a top cross-sectional view of the lid of FIG. 1, taken at line VIII of FIG. 4, in a locked position.

[0017] FIG. 9 shows the top cross-sectional view of the lid of FIG. 7 in an unlocked position.

[0018] FIG. 10 shows a top cross-sectional view of the lid of FIG. 1, taken at line X of FIG. 4.

[0019] FIG. 11 shows a perspective view of a button for the lid of FIG. 1.

[0020] FIG. 12 shows a perspective view of the lid of FIG. 1 in an assembling position.

[0021] FIG. 13 shows the side cross-sectional view of the lid of FIG. 4 without a closure.

[0022] FIG. 14 shows a side view of a closure for the lid of FIG. 4.

[0023] FIG. 15 shows a side cross-sectional view the lid of FIG. 1, taken at line XV of FIG. 5, in the assembling position.

[0024] FIG. 16 shows the side cross-sectional view the lid of FIG. 14 in the closed position.

[0025] FIG. 17 shows the side cross-sectional view the lid of FIG. 14 in the open position.

DETAILED DESCRIPTION

[0026] In the following description, numerous specific details are set forth in order to provide a thorough understanding of the embodiments of the present disclosure. However, it will be apparent to those skilled in the art that the embodiments, including structures, systems, and methods, may be practiced without these specific details. The description and representation herein comport with standards used by those experienced or skilled in the art to most effectively convey the substance of their work to others skilled in the art. In some instances, well-known methods, procedures, and components have not been described in detail to avoid unnecessarily obscuring aspects of the disclosure.

[0027] References in the specification to "some embodiments" indicate that the embodiment described may include a particular feature, structure, or characteristic, but every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with an embodiment, it is submitted that it is within the knowledge of one skilled in the art to apply such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

[0028] The following examples are illustrative, but not limiting, of the present disclosure. Other suitable modifications and adaptations of the variety of conditions and parameters normally encountered in the field, and which would be apparent to those skilled in the art, are within the spirit and scope of the disclosure.

[0029] People use reusable containers to carry a variety of beverages. It is often desirable for a container to be airtight when a user is not drinking from it so that the beverage being carried will not leak. An airtight container may be achieved by covering and sealing the drinking opening of the container, for example with a closure having a seal. Sometimes, the closure is retained, for example by a latch, in a closed position to cover and seal the drinking opening, and the closure is un-latched and moved to an open position to allow access to the drinking open only when a user desires to drink from the container. A push button may be used to activate the latch to a position to release the closure to move to the open position. However, such a push button may be activated accidentally during a movement, causing unintentional opening and potentially undesirable spilling. It is therefore desirable to provide a locking mechanism to prevent accidental actuation of the push button, so that the closure stays in the closed position until a user intentionally opens the closure.

[0030] Further, because of the need to close and open the closure frequently, it is expected that a push button will be subjected to frequent pushes and releases, and the structure of the push button may gradually loosen in the direction of movement. If the direction of assembling the push button to a lid is in the same as the direction of movement of the push button, if the structure of the push button that maintains it in position within the lid loosens due to repeated actuations or other forces, the push button may become less securely attached to the lid. Accordingly, it is desirable to provide an assembly of a push button and a lid, where the direction of assembly is different from the

direction of the movement of the push button during use, while still being easy to assembly.

[0031] Further, a closure can be attached to a lid and when attached may be moveable between a closed position and an open position. In normal use the closure is not expected to be removed from the lid, and the attachment between the closure and the lid should be secure enough to prevent unintended detachment, while still permitting easy assembly. Therefore it is desirable to provide an attachment method that securely attaches the closure with the lid during daily uses, such as in the closed position and the open position, but also allows for easy assembly and minimizes the opportunity for unintentional detachment.

[0032] People also may prefer to drink beverages from a container in different ways. For example, some people prefer to drink beverages with a straw, and some people prefer to drink beverages directly from an opening by titling the container. Accordingly, a beverage container may include a spout having a first drinking opening and a second drinking opening, with the second opening attachable to a straw, so that a user may either drink directly from the spout by titling the container or drink by sucking through the straw.

[0033] Some embodiments of the present disclosure provide a lid having a locking mechanism for preventing a push button from being accidentally actuated, causing potential spilling from the container and creating a mess. The lock can include a ring rotatable around the spout of the lid and behind the push button. In a locked position, a portion of the ring abuts a rear of the push button to prevent the push button from being pressed. And in an unlocked position, the ring is rotated so that a recess is behind the push button, allowing the push button to be pressed to move rearwardly and thereby un-latch the closure. The lock can also include an actuator to assist rotating the ring, and the actuator can be exposed and accessible from a top surface of the lid.

[0034] Some embodiments of the present disclosure provide a push button that can vertically slide into a lid, such that the push button cannot be removed from the lid in the horizontal direction, which is the direction of movement when the push button is pressed. As such, the push button is less likely to detach from the lid in the horizontal direction after frequent use.

[0035] Some embodiments of the present disclosure provide an assembly of a closure and a lid, wherein the closure is securely attached to the lid during a closed position and an

open position, and the closure is allowed to be attached or detached from the lid within a predetermined range between the closed position and the open position, or an assembling position. An interface between the closure and the lid may be keyed so that the closure can only be attached at the interface when in the assembling position, between the open position and the closed position. Further, the closure can be biased towards the open position such that when not retained in the closed position (e.g., via a latch as described elsewhere) it will automatically rotate to the open position, automatically bypassing the assembling position. Thus, the closure will not be in the assembling position unless intentionally held there by an external force, and thus will not inadvertently detach from the lid. On the contrary, to detach the closure from the lid, a user has to purposefully move the closure to the assembling position. Without a user purposefully moving the closure, the closure would not stay at the assembling position by itself, thereby reducing the risk of the closure detaching from the lid unintentionally.

[0036] These and other embodiments are discussed below in more detail with reference to the figures.

[0037] FIG. 1 shows a beverage container having a lid 10 according to some embodiments attached to a vessel 50, lid 10 being in a closed position. FIG. 2 shows an exploded view of lid 10 and vessel 50 according to some embodiments. FIG. 3 shows lid 10 in an open position according to some embodiments. FIG. 4 is a side cross sectional view of lid 10 taken along plane IV shown in FIG. 1.

[0038] With reference to FIGS. 1–4, lid 10 can be coupled to vessel 50 to form a beverage container. Vessel 50 can be any form of vessel for holding liquid, and in some embodiments, vessel 50 can be a thermally insulated vessel. Vessel 50 is shown in FIGS. 1 and 2 and omitted in other figures, but it is understood that vessel 50 is compatible with lid 10 shown in all figures.

[0039] Lid 10 can include a lid body 100 defining a spout 102 and a closure 200 coupled to lid body 100. In some embodiments, closure 200 is a flip top closure that rotates open and closed on lid body 100 about an axis R. In some embodiments, axis R is not aligned with a direction of extension of spout 102. For example, axis R can be perpendicular to a vertical axis Z of lid body 100, (e.g., axis R can be perpendicular to the direction of extension of spout 102). In some embodiments, lid body 100 can be coupled to vessel 50 to form the beverage container through an attachment mechanism 120 on lid body 100 and a corresponding attachment mechanism 52 on vessel 50. In some embodiments,

attachment mechanism 120 may be threaded connectors (as shown in FIGS. 2 and 3), friction fit connectors, snap-fit connectors, or any other suitable releasable attachment mechanism. In some embodiments, attachment mechanism 120 is attached over an upper exterior portion of vessel 50. In some embodiments, attachment mechanism 120 is attached inside an interior portion of vessel 50 (as shown in FIG. 2). The attachment of lid body 100 to vessel 50 is not limited to the arrangement shown in the figures. In some embodiments, lid body 100 includes a vessel seal member 121 to form a seal between lid 10 and vessel 50. The term seal as used here and elsewhere in this document does not necessarily require a perfect hermetic seal; rather a seal capable of inhibiting passage of liquid fluid is sufficient.

[0040] In some embodiments, a handle 600 is coupled to lid body 100 and independently pivotable relative to lid body 100 and/or closure 200 for easier carrying. In some embodiments, as shown, handle 600 can pivot about a different axis from closure 200. For example, handle 600 can pivot about an axis parallel to but offset from axis R. Handle 600 can include openings 602 to couple with posts 135 on lid body 100. In some embodiments, handle 600 can be rigid, and in some embodiments, handle 600 can be flexible, like a strap. In some embodiments, instead of coupled to lid body 100, handle 600 can be coupled directly to vessel 50.

[0041] In some embodiments, a spout 102 is defined on lid body 100, through which a user may drink a beverage contained within the beverage container.

[0042] In some embodiments, spout 102 is offset (e.g., toward a front of lid body 100) from a central vertical axis z of lid body 100. In some embodiments, spout 102 is defined by an outer wall 110 extending from lid body 100. In some embodiments, outer wall 110 extends into a rim 114. In some embodiments, outer wall 110 has a lip rest 116 that is indented, positioned at a front of outer wall 110. Lip rest 116 may allow a user to more comfortably drink from spout 102. In some embodiments, outer wall 110 has a groove 111 under lip rest 116 for accommodating a lock 300, which is described in more detail below.

[0043] In some embodiments, spout 102 has an annular shape. However, the shape of spout 102 is not limited to the shape shown in the figures. Rather, spout 102 may have any shape sufficient to allow dispensing of a beverage from a beverage container. In some embodiments, rim 114 of spout 102 has a planar shape, such that top surface of rim 114 has a constant height. In some embodiments, rim 114 has a non-planar shape, such as a

curved or an angled shape. In some embodiments, rim 114 is curved up and higher towards the front of spout 102.

[0044] Sometimes a user has different drinking preferences for different beverages or in different circumstances. In some embodiments, spout 102 is separated into a first drinking opening 104 and a second drinking opening 106 to provide different methods of drinking. For example, second drinking opening 106 can extend to a straw connector 107 to which a straw 60 can be attached, such that a user may drink the beverage through straw 60 by sucking on second drinking opening 106. And first drinking opening 104 can be directly in fluid communication with vessel 50, such that a user may drink the beverage by tilting the beverage container and pouring the beverage through first drinking opening 104 and into the user's mouth. Spout 102 therefore can accommodate different drinking preferences.

[0045] In some embodiments, first drinking opening 104 is closer to a central vertical axis of spout 102 than second drinking opening 106. In some embodiments, second drinking opening 106 is offset from the central axis of spout 102. In some embodiments the central axis of spout 102 extends through first drinking opening 104. In some embodiments, second drinking opening 106 is offset from first drinking opening 104 towards a front of spout 102. In some embodiments, first drinking opening 104 is larger than second drinking opening 106. This may, for example, facilitate a user in drinking comfortably from first drinking opening 104 and/or second drinking opening 106.

[0046] In some embodiments, first drinking opening 104 and second drinking opening 106 together form spout 102. In some embodiments, spout 102 includes a separation wall 108 to separate first drinking opening 104 and second drinking opening 106, such that a first portion of outer wall 110 and separation wall 108 define first drinking opening 104, and a second portion of outer wall 110 and separation wall 108 define second drinking opening 106. In some embodiments, separation wall 108 has a top surface 109. In some embodiments, top surface 109 of separation wall 108 is lower than top surface 113 of rim 114. In some embodiments, when rim 114 is curved up, top surface 109 of separation wall 108 is lower than top surface 113 at the front of spout 102 but higher than top surface 113 at the rear of spout 102.

[0047] Spout 102 may be formed of food-grade plastic (e.g., polypropylene, copolyester, the copolymer sold as Eastman Tritan, high-density polyethylene (HDPE),

polyoxymethylene (POM), or acrylonitrile butadiene styrene (ABS)), glass, or metal (e.g., steel, stainless steel, aluminum, copper, or titanium).

[0048] In some embodiments, closure 200 is coupled to lid body 100 to cover and seal spout 102, which may include first drinking opening 104 and second drinking opening 106, to inhibit dirt or debris from contacting spout 102. In some embodiments, closure 200 is a flip top cap that is pivotable on lid body 100 and can rotate from an open position (e.g., FIG. 3) to a closed position (e.g., FIGS. 1 and 4) to cover and seal spout 102. In some embodiments, closure 200 is pivotally coupled to lid body 100 through an attachment mechanism 130. In some embodiments, attachment mechanism 130 is a pair of mounts 130 each having a recess 133 for receiving a corresponding protrusion 210 on closure 200. In some embodiments, attachment mechanism 130 further includes a torsional spring 136 to bias closure 200 towards the open position (e.g., FIG. 3). Attachment mechanism 130 will be described in more detail below.

[0049] In some embodiments, closure 200 is retained in the closed position (e.g., as shown in FIGS. 1 and 4) through a latch 404. In some embodiments, latch 404 is a part of a button 400. Button 400 can be depressible, so that latch 404 can move in a horizontal direction (e.g., a radial direction with respect to central axis Y of lid 10), from a first position (e.g., away from spout 102) to a second position (e.g., towards spout 102). In some embodiments, closure 200 has a groove 206 on the inner side of wall 204 to engage with latch 404 to retain closure 200 in the closed position, as shown in FIG. 4. Alternatively, in some embodiments, groove 206 can instead be a protrusion extending from the inner side of wall 204, also configured to engage with latch 404. In some embodiments, the engagement of groove 206 and latch 404 resists the biasing force from a torsional spring 133 and retains closure 200 in the closed position. In some embodiments, button 400 can be biased by a spring 402 towards the first position (e.g., as shown in FIG. 4), where latch 404 maintains engagement with groove 206, and button 400 only moves to the second position when it is pressed. When button 400 is pressed to move to the second position (shown in phantom in FIG. 4), latch 404, as part of button 400, moves in the horizontal direction towards spout 102 to disengage groove 206, so that closure 200 is released from the closed position and can move to the open position. In some embodiments, because closure 200 is biased by spring 136 towards the open position, once latch 404 disengages groove 206, closure 200 automatically rotates to the open position.

[0050] To prevent button 400 from being accidentally pressed, a lock 300 is provided. In some embodiments, lock 300 is disposed behind button 400 and movable from a locked position (e.g., as shown in FIG. 8) and an unlocked position (e.g., as shown in FIG. 9). In the locked position, button 400, and therefore latch 404, is inhibited to move from the first position to the second position. In the unlocked position, button 400, and therefore latch 404, is allowed to move to the second position (shown in phantom in FIG. 9). In some embodiments, lock 300 is disposed between button 400 and spout 102. In some embodiments, lock 300 is disposed around spout 102 to rotate between the locked position and the unlocked position.

[0051] As shown in FIGS. 6A, 6B, and 7, lock 300 can include a ring 310 and an actuator 330 extending from ring 310. In some embodiments, spout 102 has a radial groove 111 (see, e.g., FIG. 4) defined on outer wall 110, and ring 310 is disposed within groove 111, so that ring 310 can rotate around spout 102. Part of groove 111 can face button 400, such that part of ring 310 is disposed between button 400 and spout 102. In some embodiments, actuator 330 is exposed and therefore accessible to a user from a top surface 140 of lid body 100. In some embodiments, actuator 330 is disposed behind closure 200. A user may grip actuator 330 to rotate ring 310, thereby moving it between the locked and unlocked positions.

[0052] In the embodiment shown in FIG. 6A, ring 310 includes a recess 316 defined on outer side 312. When lock 300 is at the locked position as shown in FIG. 8, ring 310 extends between button 400 and spout 102, thereby preventing button 400 from moving to the second position towards spout 102. A portion of lock 300 forms a mechanical block impeding such motion, such that if button 400 were pressed while lock 300 is in the locked position, the blocking portion of lock 300 would prevent its inward movement at least enough to prevent closure 200 from un-latching.

[0053] In some embodiments, outer side 312 of ring 310 may abut a rear surface 410 of button 400 in the locked position, such that there is no space between ring 310 and rear surface 410. In some embodiments, outer side 312 may not abut rear surface 410 of button 400 in the locked position, but the space between outer side 312 and rear surface 410 is small enough that button 400 cannot move into the second position where latch 404 can disengage closure 200. In the locked position, recess 316 does not align with button 400. For example, as shown in FIG. 8, recess 316 is partially rotated to a side of button 400.

[0054] When lock 300 is at the unlocked position, as shown in FIG, 9, ring 310 is rotated to a position where recess 316 aligns with button 400, so that button 400 can move to the second position (shown in phantom). In some embodiments, button 400 moves into recess 316 to reach the second position. The recess 316 should be large enough and deep enough so that button 400 can move to second position where latch 404 can disengage closure 200. In some embodiments, the shape of recess 316 matches the shape of an accommodated rear portion of button 400, as shown in FIG. 9. In some embodiments, recess 316 is larger than the accommodated rear portion of button 400.

[0055] An alternative embodiment of lock 300 is shown in FIG. 6B as lock 300b. Lock 300b is similar to lock 300, except for that ring 310b includes a tab 324 on outer side 312. In the locked position, tab 324 is positioned between button 400 and spout 102 to inhibit button 400 to move to the second position. In some embodiments, tab 324 may abut a rear surface 410 of button 400 in the locked position, such that there is no space between tab 324 and rear surface 410. In some embodiments, tab 324 may not abut rear surface 410 in the locked position, but the space between tab 324 and rear surface 410 is small enough so that button 400 cannot move to second position where latch 404 can disengage closure 200.

[0056] In the unlocked position, tab 324 is rotated away to a position not behind button 400, and the rest of outer side 312 functions similar to recess 316 to allow button 400 to move to the second position.

[0057] In some embodiments, ring 310 can be opened in a pre-assembly configuration, as shown in FIG. 7. Ring 310 can have a first end 320 and a second end 321. To assemble ring 310 onto spout 102, ring 310 in the pre-assembly configuration shown in FIG. 7 is wrapped around spout 102 (e.g., around and within groove 111), and first end 320 is connected to second end 321 to thereby convert it into its assembled configuration around spout 102. The connection between first end 320 and second end 321 can be any suitable mechanism, such as a snapping mechanism or a latching mechanism. For example, as shown in FIG. 7, first end 320 can be clipped onto second end 321 through a pin 322 to close ring 310. To disassemble ring 310 from spout 102, first end 320 is disconnected from second end 321, such as by releasing first end 320 from pin 322, and first end 320 and second end 321 are pulled away from each other to open ring 310. In some embodiments, ring 310 is flexible, so that when first end 320 and second end 321 are pulled away from each other, the entire ring 310 deflects and expands to disassemble

from spout 102. It is understood that ring 310b can be opened in the same way and have the same structure as first end 320 and second end 321.

[0058] An inner side 314 of ring 310 can include detents to engage with protrusions extending from spout 102. The engagement between detents and protrusions can provide a slight resistant force to retain ring 310 in the locked position or the unlocked position, so that ring 310 cannot be accidentally moved out of the locked position or the unlocked position. Additionally, it can also provide feedback (e.g., a sound or a tactile feeling) to indicate to the user that ring 310 has reached the locked position or the unlocked position.

[0059] For example, as shown in FIGS. 8 and 9, ring 310 can have a first pair of detents 318 and a second pair of detents 319 on inner side 314, and outer wall 110 of spout 102 can have a pair of protrusions 112. In the locked position (e.g., FIG. 8), first pair of detents 318 engage with protrusions 112, and in the unlocked position (e.g., FIG. 9), second pair of detents 319 engage with protrusions 112. In some embodiments, ring 310 can be tightly fit around spout 102, such that there is no space between inner side 314 of ring 310 and outer wall 110 of spout 102. In some embodiments, ring 310 can be more loosely fit around spout 102, such that some space is kept between inner side 314 and outer wall 110; however, detents 318, 319 and protrusions 112 are deep enough to engage with each other despite of the space between side 314 and outer wall 110. It is understood that ring 310b can have the same detents 318, 319 for engaging with protrusions 112. In order to move lock 300 from the locked position and the unlocked position, for example, a force is applied enough to overcome the engagement between detents 318 and protrusions 112, causing ring 310 to flex over protrusions 112 (e.g., expand radially) to get out of the locked position. When lock 300 travels to the unlocked position, ring 310 snaps into place as detents 319 reaching protrusions 112, which can cause the sound or tactile feedback to indicate to a user that lock 300 has reached the unlocked position.

[0060] Actuator 330 can extend from ring 310 and configured to be gripped onto by a user or manipulated by a finger, like a switch. In some embodiments, actuator 330 extends from first end 320. In some embodiments, actuator 330 has an elongated shape, like a bar. However, it is understood that actuator 330 can have any alternative shapes suitable for a user to grip onto, such as a knob. Actuator 330 may be partially formed of thermoplastic elastomer to dampen the sound and impact of closure 200 as it opens under the force of spring 136 or under pressure from a pressurized beverage.. It is understood that actuator 330 described above is also applicable to ring 310b.

[0061] To improve accessibility of actuator 330, actuator 330 can be exposed on top surface 140 of lid body 100. In some embodiments, actuator 330 is located behind closure 200, as shown in FIG. 5. Additionally, in some embodiments, top surface 140 can include a recess 141 that is lower than the rest of top surface 140, and actuator 330 is accommodated within recess 141. This way, actuator 330 does not extend above top surface 140, which can help prevent unintended actuation of actuator 330. For example, as shown in FIG. 4, actuator 330 is located within recess 141, and it does not extend above, or it is lower than, a rim 142 of recess 141. While FIG. 4 shows an unlocked position, it is understood that in the locked position, actuator 330 is similarly located within recess 141.

[0062] In some embodiments, top surface 140 can also include a locked sign 143 and an unlocked sign 144 as shown in FIG. 5, which are located to align with actuator 330 in the locked position and the unlocked position, respectively. Locked sign 143 and unlocked sign 144 can provide visual indication to the user of the status of lock 300.

[0063] Lock 300 may be formed of food-grade plastic (e.g., polypropylene, copolyester, the copolymer sold as Eastman Tritan, high-density polyethylene (HDPE), polyoxymethylene (POM), or acrylonitrile butadiene styrene (ABS)), glass, or metal (e.g., steel, stainless steel, aluminum, copper, or titanium).

[0064] In some embodiments, a seal member 500 is coupled to closure 200 to seal spout 102, which can include first drinking opening 104 and second drinking opening 106. In some embodiments, seal member 500 is removably coupled to a seal mount 208 defined on top wall 202 of closure 200. In some embodiments, seal member 500 is larger than spout 102, so that it can at least partially enclose rim 114 of spout 102 when closure 200 is in the closed position. As shown in FIG. 4, in some embodiments, seal member 500 includes a sealing portion 502 extending radially inward. In some embodiments, sealing portion 502 is the only portion of seal member 500 that contacts spout 102 when closure 200 is in the closed position. In some embodiments, a gap 504 is defined between seal member 500 and separation wall 108 separating first drinking opening 104 and second drinking opening 106. Gap 504 allows fluid communication between first drinking opening 104 and second drinking opening 106, so that when spout 102 is unsealed, pressure within first drinking opening 104 and second drinking opening 106 is balanced to prevent beverage being forced out of spout 102 do due increased pressure.

[0065] Seal member 500 may be formed of a food-grade material suitable to seal spout 102. In some embodiments, seal member 500 may be formed of a resilient material (e.g., silicone). In some embodiments, seal member 500 may be formed of a material more resilient than the material of spout 102.

[0066] Another aspect of present disclosure is related to a structure and method of assembling button 400 onto lid body 100 in an easy-to-assemble manner that has improved security and resistance to inadvertent disassembly. As described above, button 400 can be pressed to move in the horizontal direction from the first position to the second position (see, e.g., FIGS. 4 and 9). If button 400 is also assembled to lid body 100 in the same horizontal direction, the repeated movements could cause the structure of button 400 to loosen over time or if subject to an unexpectedly large impact or other unintended forces, and button 400 may more easily inadvertently detach from lid body 100 in the horizontal direction. Instead, some embodiments include a button assembly structure and method whereby button 400 is assembled to lid body 100 in a vertical direction, which allows for more secure structural features preventing detachment in a horizontal direction, such that the likelihood of button 400 detaching from lid body 100 in the horizontal direction can be reduced.

[0067] In some embodiments, lid body 100 can include a pair of button grooves 145 vertically extending from top surface 140. Button grooves 145 can be located under spout 102 as shown in FIG. 2. Button 400 can vertically slide into button grooves 145. In some embodiments, once assembled, spout 102 above button grooves 145 can resist the movement of button 400 in the vertical direction out of button grooves 145, because button 400 can snap in below an upper wall of a button recess 113 formed on outer wall 110 of spout 102 (see, e.g., FIG. 4).

[0068] As shown in FIG. 10, each of button grooves 145 includes a wider portion 146 and a narrower portion 147, with wider portion 146 being closer to spout 102 than narrower portion 147. Button 400 can have two arms 406 on the rear side, each having a wider portion 407 disposed within wider portion 146 of button grooves 145 and a narrower portion 408 disposed within narrower portion 147 of button grooves 145. Arms 406 can be disposed under latch 404, as shown in FIG. 11, so that when arms 406 are disposed within button grooves 145, latch 404 remains above button grooves 145 and under spout 102.

[0069] In some embodiments, wider portion 407 extends from the end of arm 406 only laterally inwards and facing toward the other arm. For example, as shown in FIG. 10, wider portion 407 inwardly extending to forms an L-shape with narrower portion 408. Wider portion 407 also overlaps with the groove wall of narrower portion 147 in the radial direction along axis Y, the interference of which can resist button 400 from moving outwardly in the radial direction along axis Y. In some embodiments, for example, wider portion 407 of arms 406 is larger than narrower portion 147 of button grooves 145 by 20% to 100%, such as 25% to 40%, or 50% to 70%, so that the overlap between wider portion 407 and the groove wall of narrower portion 147 resists button 400 from moving outwardly in the radial direction along axis Y. Further, the width of grooves 145 can be the same or slightly larger than the width of arms 406, so that the inner walls of grooves 145 can resist arms 406 from flexing laterally within grooves 145.

[0070] When assembling button 400 onto lid body 100, wider portion 407 of arms 406 is aligned with wider portion 146 of button grooves 145, and narrower portion 408 of arms 406 is aligned with narrower portion 147 of button grooves 145, and then arms 406 vertically slide into button grooves 145. Wider portion 407 of arms 406 cannot pass through narrower portion 147 of button grooves 145, such that button 400 cannot be assembled in the horizontal direction by moving wider portion 407 of arms 406 through narrower portion 147 of button grooves 145. This therefore reduces the likelihood that button 400 detached from lid body 100 in the horizontal direction.

[0071] Button 400 may be formed of food-grade plastic (e.g., polypropylene, copolyester, the copolymer sold as Eastman Tritan, high-density polyethylene (HDPE), polyoxymethylene (POM), or acrylonitrile butadiene styrene (ABS)), glass, or metal (e.g., steel, stainless steel, aluminum, copper, or titanium).

[0072] Another aspect of present disclosure includes a mechanism for easy and secure assembly of closure 200 together with lid body 100. In some embodiments, when assembled closure 200 is pivotally coupled to a pair of mounts 130 extending from lid body 100. As shown in FIG. 13, each mount 130 on an inner side 131 can have a recess 133 connected with a slot 134. Closure 200 has a pair of protrusions 210 for engaging with recess 133. As shown in FIG. 14, each protrusion 210 includes a tab 212. The shape of tab 212 corresponds with the shape of slot 134. When protrusion 210 is inserted into recess 133, it can rotate within recess 133 to allow closure 200 to pivot from its open position to its closed position.

[0073] As shown in FIG. 15, when protrusion 210 is rotated to a position where tab 212 aligns with slot 134, protrusion 210 can pass into recess 133 by passing tab 212 through slot 134, so that closure 200 can be assembled together with lid body 100. The position of slot 134 therefore defines an assembling position of closure 200.

[0074] However, when tab 212 is in any other assembled position not aligning with slot 134, tab 212 is captured behind the groove of recess 133 to secure protrusion 210 within recess 133. For example, FIG. 16 shows closure 200 in the closed position, FIG. 17 shows closure 200 in the open position, and in both positions, tab 212 is captured behind the groove of recess 133 to prevent protrusion from disengaging recess 133.

[0075] FIG. 12 shows an assembling position of closure 200, which is defined by slot 134. The assembling position can between the opened position and the closed position, but is not aligned with the opened position or the closed position. In some embodiments, the assembling position can be a point within the middle one third of the range of motion of closure 200 from the open position to the closed position. For example, the assembling position can be the midpoint between the open position and the closed position. As described above, closure 200 can be retained by latch 404 in the closed position, and once released from the closed position, it is biased to the open position by torsional spring 136. As such, it is understood that closure 200 does not stop at any position between the opened position and the closed position (including the assembling position) without external force. This can help prevent accidental removal of closure 200, since it is unlikely to be held at the assembling position long enough to detach from lid body 100 unintentionally. A user needs to purposefully move closure 200 to the assembling position in order to remove closure 200 from lid body 100.

[0076] In some embodiments, lid body 100 can include a marking to indicate to the user where the assembling position is.

[0077] It is to be appreciated that the Detailed Description section, and not the Summary and Abstract sections, is intended to be used to interpret the claims. The Summary and Abstract sections may set forth one or more but not all exemplary embodiments of the present invention as contemplated by the inventor(s), and thus, are not intended to limit the present invention and the appended claims in any way.

[0078] The foregoing description of the specific embodiments will so fully reveal the general nature of the invention that others can, by applying knowledge within the skill of the art, readily modify and/or adapt for various applications such specific embodiments,

without undue experimentation, without departing from the general concept of the present invention. Therefore, such adaptations and modifications are intended to be within the meaning and range of equivalents of the disclosed embodiments, based on the teaching and guidance presented herein. It is to be understood that the phraseology or terminology herein is for the purpose of description and not of limitation, such that the terminology or phraseology of the present specification is to be interpreted by the skilled artisan in light of the teachings and guidance.

[0079] The breadth and scope of the present invention should not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the claims and their equivalents.

WHAT IS CLAIMED IS:

1. A lid for a beverage container, the lid comprising:

a lid body comprising a spout;

a flip top closure rotatably coupled to the lid body and configured to rotate between a closed position in which the closure covers the spout and an open position in which the closure does not cover the spout;

a latch configured to move between a first position in which the latch engages with the closure in the closed position and a second position in which the latch does not engage with the closure in the closed position; and

a lock disposed around the spout and comprising:

a ring configured to rotate around the spout between an unlocked position in which the latch is allowed to move from the first position to the second position and a locked position in which the latch is inhibited from moving from the first position to the second position; and

an actuator extending from the ring and accessible from a top surface of the lid body.

2. The lid of claim 1, the ring comprising a tab configured to be disposed between the spout and the lock in the locked position, thereby inhibiting the lock from moving from the first position to the second position.

3. The lid of claim 1, the ring comprising a recess configured to be disposed between the spout and the lock in the unlocked position, wherein the latch moves into the recess to move to the second position.

4. The lid of claim 3, wherein the recess has a shape corresponding to a shape of at least a part of the latch.

5. The lid of claim 1, the ring comprising two ends configured to be attached together, wherein the actuator extends from one of the two ends.

6. The lid of claim 1, wherein an outer wall of the spout comprises a groove, and the ring is disposed within the groove.

7. The lid of claim 1, wherein the actuator comprises a thermoplastic elastomer.

8. The lid of claim 1, the top surface of the lid body comprising a recess, wherein the actuator is disposed within the recess.

9. The lid of claim 8, wherein the actuator is lower than a rim of the recess.

10. The lid of claim 1, the ring comprising detents, and the spout comprising protrusions, wherein the engagement between the detents and the protrusions provides a feedback indicating that the lock is in the locked position or the unlocked position.

11. The lid of claim 1, wherein the closure is biased towards the open position by a spring.

12. The lid of claim 1, wherein the spout comprises a first drinking opening and a second drinking opening, the second drinking opening configured to attach to a straw.

13. A lid for a beverage container, the lid comprising:

a lid body comprising:

a spout; and

a pair of grooves extending in a vertical direction, each of the grooves comprising a wider portion and a narrower portion, the wider portion being closer to the spout than the narrower portion;

a flip top closure rotatably coupled to the lid body and configured to rotate between a closed position to cover the spout and an open position; and

a button configured to be depressed in a horizontal direction and comprising:

a latch configured to engage with the closure to retain the closure in the closed position; and

a pair of arms, each of the arms comprising a wider portion disposed within the wider portion of the groove and a narrower portion disposed within the narrower portion of the groove,

wherein the wider portion and the narrower portion of an arm form an L-shape, and the wider portion of each arm extends towards the other arm.

14. The lid of claim 13, wherein the wider portion of the arm is wider than the narrower portion of the groove by at least 20%.

15. The lid of claim 13, wherein the grooves are defined under a portion of the spout, and the portion of the spout restricts the arms from moving in the vertical direction out of the grooves.

16. A method of assembling the lid of claim 13, comprising:

aligning the wider portion of the arm with the wider portion of the groove and the narrower portion of the arm with the narrower portion of the groove;

sliding the arm into the groove along the vertical direction; and

snapping the latch into position underneath a portion of the lid that extends above the groove.

17. A lid for a beverage container, the lid comprising:

a lid body comprising a pair of mounts; and

a flip top closure rotatably coupled to the mounts and configured to rotate between a closed position in which the closure covers a drinking opening of the lid body and an open position in which the closure does not cover the drinking opening,

wherein the closure is configured to be retained in the closed position by a latch, and upon release of the latch, the closure is biased to automatically move to the open position by a spring, and

wherein the closure is configured to be removable from the mount only when the closure is retained in an assembling position between the closed position and the open position.

18. The lid of claim 17, the mount comprising a recess comprising a slot, and the closure comprising a protrusion comprising tab, wherein in the assembling position the slot is aligned with the tab, thereby allowing the protrusion to disengage from the recess.

19. The lid of claim 18, wherein when the closure is not at the assembling position, the tab is captured within the recess to prevent the protrusion from disengaging from the recess.

20. The lid of claim 17, wherein when the closure rotates between the closed position and the open position, the closure does not stop at the assembling position absent application of external force.