

A CLOSURE

Field of Invention

The present invention relates generally to a closure for use in resealing an opened beverage can.

Background

Conventional pry tab-activated beverage cans typically include a top or end wall formed with a score to define an opening. A pry tab is anchored to the top wall of the container by a rivet that defines a leverage point. When that portion of the tab opposite the scored area is raised by the user, the opposite end of the tab contacts and deflects the area circumscribed by the score, rupturing it from the top of the can. As the pry tab is leveraged about the rivet, the scored portion is separated from the top and bent downwardly into the can.

Known pry tab cans are not easily resealable once the opening has been exposed by the scored portion being separated from the top of the can. Although plastic tops may be affixed over the can end, they do not offer the same ease of use as other closure devices offer for competing beverage containers. For example, various types of plugging or capping closures are known for resealing bottles. One desiring to use only a portion of the contents of a pry tab container has no known way to avoid loss of carbonation, contamination or spilling of the contents of an opened can.

Several attempts have been made to devise pull or pry tabs for beverage cans which are resealable. Such structures require extensive modification to existing can configurations and hence, have proven largely impractical. Therefore, there is an apparent need to provide a closure addressing the foregoing problems.

Summary

In accordance with an aspect of the invention, there is disclosed a closure for selectively resealing cans equipped with a pry tab opener. The closure comprises a body for contacting and sealing an exposed opening formed in the can by the pry tab, an engagement structure and an offset. The body comprises a bracket for receiving a portion of the pry tab coupled to the can by a rivet with the closure being pivotable about the rivet in tandem with the pry tab when the pry tab is received by the bracket. The engagement structure is for yieldingly snap-fitting to the rim of the can when the closure is installed, and the offset is formed integral with the body for mating with the opening of the can exposed by activation of the pry tab for sealing the can.

Brief Description of the Drawings

FIG. 1 shows a partial front elevation a closure comprising a body and an engagement structure in accordance with an aspect of the invention;

FIG. 2 shows a partial side elevation of the closure of FIG. 1 with the body exposing a bracket;

FIG. 3 shows a partial top view of the closure of FIG. 1 with the body having a docking surface;

FIG. 4 shows a partial front perspective view of a typical can having a pry tab for application of the closure of FIG. 1;

FIG. 5 shows a partial front elevation of the closure of FIG. 1 applied to the can of FIG. 4 with the pry tab of the can being received by the bracket of the closure;

FIG. 6 shows a partial front elevation of the closure of FIG. 3 applied to the can of FIG. 4 with an article coupled to the docking surface;

FIG. 7 shows a partial side perspective view of the closure of FIG. 3 applied to the can of FIG. 4 with the docking surface being exposed;

FIG. 8 shows a partial side perspective view of the closure of FIG. 3 applied to the can of FIG. 4 with an article being coupled to the docking surface; and

FIG. 9 shows a partial front elevation of the closure of FIG. 1 applied to the can of FIG. 4 with the pry tab of the can being received by the bracket of the closure and a bottle cap opener structure being incorporated with a tail structure of the engagement structure.

Detailed Description

Reference will now be made in detail to an exemplary embodiment of the present invention, examples of which are illustrated in the accompanying drawings. While the invention will be described in conjunction with the embodiment, it will be understood that they are not intended to limit the invention to these embodiments. On the contrary, the invention is intended to cover alternatives, modifications and equivalents, which may be included within the spirit and scope of the invention as defined by the appended claims. Furthermore, in the following detailed description of embodiments of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be recognized by one of ordinary skill in the art that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, components, and circuits have not been described in detail as not to unnecessarily obscure aspects of the embodiments of the present invention

An exemplary embodiment of the invention, a closure 20, is described with reference to FIGS 1 to 9. The closure 20 is preferably used for selectively resealing cans equipped with a pry tab opener. More specifically, an opened but unemptied pry-tab can may be conveniently resealed for storage by employing the closure 20.

Typical cans 22 employ an end construction 24 comprising a pry tab 26 that is pivotally mounted to the can top 28 by a rivet 30. A deflectable region 32 is scored in the top 28 of the can 22. To open the can 22, handle end 34a of the pry tab 26 may be manually deflected upwardly, leveraging prong end 34b into forcible contact with deflectable scored area 32. The rivet 30 forms a fulcrum for the handle end 34a. The scored region 32 deflects after breaking and bends inwardly into the interior 36 of the can 22 to expose a discharge opening 38.

The closure 20 comprises a body 40 for contacting and sealing the exposed opening 38 defined in the can top 28. The body comprises a bracket 42 for receiving a portion of the pry tab 26 coupled to the can by the rivet 30. Preferably, the portion of the pry tab 26 received by the bracket 42 constitutes at least a portion of the handle end 34a of the pry tab 26. Once the portion of the pry tab 26 is received by the bracket 42, the closure is pivotable about the rivet 30.

The can top 28 defines a rim 44 that forms the periphery thereof. The rim 44 structurally couples the can top 28 to can body 46 of the can 22 and is shaped for forming a flange 48 that raises away from the can body 46. Generally, the closure 20 further comprises an engagement structure 50 for yieldingly snap-fitting to the rim 44 of the can 22 when the closure is installed thereto. The closure 20 further comprises an offset 51 formed integral with the body 40 for mating with the opening 38 of the can 22 exposed by activation of the pry tab 26 to thereby seal the can.

The rivet 30 defines a first axis 52 coinciding therewith and extending substantially perpendicular the can top 28. The rivet further defines a second axis 54 coincident therewith and perpendicular the first axis 52. Further, the second axis 54 is substantially perpendicular the interface between the handle end 34a and the prong end 34b of the pry tab 26. One function of the bracket 42 is to substantially reduce relative movement between the closure 20 and the pry tab 26 when the handle end 34a of the pry tab 26 is displaced away from and towards the can top 28 about the second axis 54 when the handle end 34a is received by the bracket 42. Therefore, it is preferred that the bracket 42 comprises an upper tab 56a and a lower tab 56b spatially displaced from the upper tab 56a for sandwiching the handle end 34a, or a portion thereof, of the pry tab 26 therebetween. This also further enables the rivet 30 to function as a pivot for the closure when the pry tab 26 is received by the bracket 42.

Preferably, the bracket 42 is formed as a sleeve structure 58 being shaped and dimensioned for receiving and defining a passageway for guiding travel of the pry tab 26, specifically the handle end 34a thereof, therethrough. The upper tab 56a and the lower tab 56b constitute portions of the sleeve structure 58. As the sleeve structure 58 is shaped to wrap around the handle end 34a of the pry tab 26 in addition to sandwiching the handle end 34a between the

upper tab 56a and the lower tab 56b, the bracket 42 also functions to limit relative movement between the pry tab 26 and the bracket 42 when the pry tab 26 is displaced about the first axis 52.

The sleeve structure 58 defines a notch 60 interiorly terminating in a saddle 62 for mating with the rivet 30 when the closure 20 is installed to limit travel of the pry tab 26 through the sleeve structure 58. Preferably, the notch 60 is defined in the lower tab 56b of the sleeve structure 58.

The engagement structure 50 comprises a tail structure 64 extending from the body 40 of the closure 20 and a tongue 66 extending preferably from adjacent an extremity 68 of the tail structure 64 and terminating at a free end 70. Functionally, an outer portion 72a of the rim 44 of the can 22 is claspable for tethering between the tail structure 64 and the free end 70 of the tongue 66. The tongue 66 is resiliently biased to enable snap-fitting of the tongue 66 over the outer portion 72a of the rim 44 to abut the flange 48 against the tail structure 64 and to enable the free end 70 of the tongue 66 to seat and be spatially located at a base 72b of the outer portion 72a of the rim 44.

The body 40 of the closure 20 preferably defines a reference plane 74 with the upper tab 56a of the sleeve structure 58 extending along the reference plane 74. The tail structure 64 is preferably substantially planar and also preferably extends along the reference plane 74 and being substantially parallel thereto. The tongue 66 comprises a first portion 76a and a second portion 76b. The first portion 76a of the tongue 66 extends away from and is substantially perpendicular the tail structure 64 to terminate at the second portion 76b. The second portion 76b extends from the first portion 76a of the tongue 66 oblique the reference plane 74 further away from the tail structure 64 in the direction of the body 40 to terminate proximal the body 40 at the free end 70. The free end may additionally comprises a kink towards the reference plane 74 whereat the second portion 76b terminates. Further, a gap 78 is formed between the free end 70 of the tongue 66 and the tail structure 64. It is preferred that the second portion 76b of the tongue 66 be longer than the first portion 76a thereof.

The body 40 further comprises a sole 80 having a curved surface formed substantially perpendicular the reference plane 74 and adjacent the interface between the body 40 and the tail structure 64. The sole 80 outwardly faces the sleeve structure 58 and is spatially displaced from the free end 70 of the tongue 66 for clasping the rim 44 therebetween. Functionally, the sole 80 is for mating with an inner portion 72c of the rim 44 and for cooperating with the tongue 66 and the tail structure 64 for removably coupling the closure to the rim 44 of the can 22 when the closure 20 is installed.

When the sole 80 slides across the inner portion 72c of the rim 44 from one end of the flange 48, whereat a ridge 82 is defined, to the other thereof, the free end 70 of the tongue 66 abuts the ridge 82 to deflect the tongue 66 and displace the free end 70 towards the tail structure 64 into the gap 78. The gap 78 provides space for accommodating deflection of the tongue 66. As the tail structure 64 approaches the ridge 82 of the rim 44 as the sole 80 continues sliding across the inner portion 72c of the rim 44, the free end 70 will be drawn across the outer portion 72a towards the base 72b of the rim 44. When the free end 70 reaches the base 72b of the rim 44, the tongue 66 snap biases the free end 70 thereof beneath the base 72b of the rim 44 into a slight indentation 84 defined at the interface between the base 72b of the rim 44 and the can body 46. The snap biasing of the free end 70 into the indentation 84 snap fits the tongue 66 to the rim 44 to impeded displacement of the body 40 away from the base 72 of the rim 44 and abuts the tail structure 64 to the ridge 82 to impede further spatial displacement of the body towards the can top 28. Preferably, the free end 70 is further shaped for shape-conforming to curvature of the indentation 84 about the first axis 52.

When the body 40 is positioned over the opening 38 of the can 22 with the offset 51 facing the opening 38, snap fitting the engagement structure 50 to the rim 44 will seat the offset 51 onto the can top 28 and over the opening 38 to seal the opening 38. The body 40 and the tail structure 64 are inter-configurable to enable displacement of the body 40 towards the can top 28 to be impeded by the offset 51 abutting the can top 28 with or without the tail structure 64 abutting the ridge 82 of the rim 44. In an implement where the tail structure 64 does not abut the ridge 82 of the rim 44, the offset 51 and the sole 80 cooperates to locate the free end 70 of the tongue 66 at the indentation 84 when the tongue 66 snap biases the free end 70 thereat.

It is preferred that the offset 51 is surrounded by a bevelled ridge for adapting the closure 20 to cans 22 having various sizes of the opening 38. The bevelled ridge can be further for mating with a channel surrounding the opening 38 of the can 22.

Alternatively or in addition, the body 40 further comprises a seal structure for being sandwiched between the offset 51 and portions of the can top 28 surrounding the opening 38 of the can to substantially fluid seal the can 22 at the opening 38. It is preferred that the seal structure be elastic to enable the seal structure to shape conform to various gaps that may be present between the offset 51 and the can top 28 when being compressed therebetween. The seal structure may be formed in various shapes that include but are not limited to a pad-like shape, a ring shape or a c-shape. The seal structure can be made from a variety of materials like, for example, cellulosic paper, plastics, polymers, elastomers, silicon and the like materials applicable for forming the seal structure for fluid sealing the opening 38.

The seal structure can also be formed integral the sole 80 and can be made from a variety of materials like, for example, cellulosic paper, plastics, polymers, elastomers, silicon and the like materials applicable for adaptively forming the seal structure required as a buffer for the opening 38 of the can 22 with the can top 28 having varying diameters.

With the tongue 66 fitted to the rim 44, any slight movement of the body 40 from the can top 28 will be met with resistance conveyed by the structural resiliency of the tongue 66. However, in instances where sufficient force has been applied to displace the body 40 away from the can top 28, the tongue 66 will deflect sufficiently away from the tail structure 64 to unsettle the free end 70 of the tongue 66 from the indentation 84. When this happens, the tongue 66 will remain deflected away from the tail structure 64 as the free end 70 thereof travels across the outer portion 72a of the rim 44 from the base 72b to the ridge 82 while the sole travels in tandem across the inner portion 72c of the rim 44 away from the can top 28.

For practicality of being easily carried around or retrievably, the engagement structure 50 further comprises a receptacle 90 whereat the tail structure 68 terminates. The receptacle 90 can be a loops, a hook or the like structure for enabling attachment of articles, for example key rings and trinkets, thereto. The receptacle 90 further enables direct or indirect attachment

of the closure 20 to an article, for example a key chain or a bag zipper loop, to enable the closure 20 to be stored away when not required for use and be easily accessible when use thereof is required. Alternatively, the engagement structure 50 further comprises a bottle cap opener structure 91 whereat the tail structure 68 terminates

Preferably, the body 40 further comprises a docking surface 92 whereon at least one article 94 is one of formable and couplable. The at least one article 94 being one of couplable to and formable on the docking surface 92 is at least one of a planar article, for example a print advertisement, and a three-dimensional article, for example at least one of a toy, a tool and an electronic device.

Should the at least one article 94 be a three dimensional article, the at least one article can function as a handle for installing the closure 20 onto a can 22 or for uninstalling or removal of the closure 20 from the can. The three dimensional article can be shaped as a toy, for example as a toy plane 100, as shown in FIG. 8. Further, the three dimensional article, specifically the toy plane 100, can be incorporated with other functions. FIG. 8 shows the toy plane 100 being incorporated with a bottle cap opener 102. The bottle cap opener 102 defines a concavity 104 formed into a positionally superior apex of the toy plane 100. The bottle cap opener 102 further comprises a first protrusion 106 and a second protrusion 108 extending from opposing edges of the concavity 104. The first protrusion 106 and the second protrusion 108 extends substantially towards each other but stop short of touching to define a receiving gap 110 therebetween. This results in a substantially twin-lobbed shaped formed from the concavity 104 together with the first protrusion 106 and the second protrusion 108. When in use, the side of a bottle cap is fitted through the receiving gap 110 with the second protrusion 108 being positioned beneath the edge of the bottle cap. The first protrusion 106 is then rested on the top of the bottle cap substantially towards its centre to form a fulcrum point while the second protrusion 108 engages the edge of the bottle cap to pry the cap about where the first protrusion 106 leverages on the bottle cap to disengage and lift the bottle cap away from the mouth of a bottle whereto the bottle cap was initially coupled.

To install the closure 20 onto the can 22 with the opening 38 being previously exposed for discharge of its content, the closure 20 is positioned to enable the handle end 34a of the pry

tab 26 to be received or wedged into the sleeve structure 58. Once the handle end 34a of the pry tab 26 has been received by the sleeve structure 58, the pry tab 26 being substantially structurally coupled to the closure 20 is swivelled in tandem with the closure 20 about the rivet 30 and specifically about the first axis 52. The closure 20 is swivelled with the pry tab 26 until the offset 51 is aligned over the opening 38. This can be effected by first swilling the pry tab 26 about the rivet 30 until the handle end 34a is positioned over the opening 38 before inserting the handle end 34a into the sleeve structure 58 of the closure 20 to thereby position the offset 51 of the closure 20 over the opening 38.

Next, the closure 20 is displaced, about the second axis 54, towards the can top 28 until the ridge 82 of the rim 44 straddles between the sole 80 and the free end 70 of the tongue 66. The closure 20 is then depressed towards the can top 28 until the engagement structure 50 engages and snap fits onto the rim 44 of the can 22 to enable the offset 52 to seal the opening 38 of the can 22. The installation of the closure 20 to the can is complete at this point.

When installed, the body 40 of the closure 20 is held down to the can top 28 by the pry tab 26 which in turn is anchored to the can top by the rivet 30. This substantially impedes pivoting of the closure 20 about the rim 44 which may dislodge the engagement structure 50 from the rim 44 when the body 40 lifts and tilts away from the can top 28 about the rim 44 to unseat the sole 80 from the inner portion 72c of the rim 44.

To uninstall or remove the closure 20 from the can 22, the tail structure 64 can be used as leverage to lift the engagement structure 50 away from the rim 44 to disengage the sole 80 and the tongue 66 from the rim 44. Next, the closure 20 is swivelled in tandem with the pry tab 26 about the first axis 52 to unimpeded access to the opening 38 before the pry tab 26 is removed from the sleeve structure 58 to complete the uninstallation or removal. Alternatively, the pry tab 26 may be removed from the sleeve structure 58 prior to swivelling the handle end 34a of the pry tab 26 about the first axis 52 away from the opening 38 to unimpeded access to the opening 38.

The closure 20 can be permanently or removably incorporated with the can 22. For example, the closure 20 may be formed integral with the pry tab 26 of the can 22 at the point of sales or supply. This is done for hygiene reasons, as contaminants are normally found on the can top 28, especially when left in various storage locations. The seating of the pry tab 26 of the can 22 within the closure 20 when formed integral therewith mitigates changes of facial hair being entangled with the pry tab 26 when in use. Further, the closure when used with the can 22, will also serve to impede access to sharp edges exposed at the opening 38 of the can 22 that may serve to prevent accidental cuts inflicted by the sharp edges, especially when the can is within reach of a child or a toddler.

In a forgoing manner, a closure is described according to an exemplary embodiment of the invention. Although only one embodiment of the invention is disclosed in this document, it will be apparent to one skilled in the art in view of this disclosure that numerous changes and/or modifications can be made to the disclosed embodiment without departing from the scope and spirit of the invention.

Claims

1. A closure for selectively resealing cans equipped with a pry tab opener, the closure comprising:
 - a body for contacting and sealing an exposed opening formed in the can by the pry tab, the body comprising:
 - a bracket for receiving a portion of the pry tab coupled to the can by a rivet, the closure being pivotable about the rivet in tandem with the pry tab when the pry tab is received by the bracket,
 - an engagement structure comprising a tail structure extending from the body and a tongue extending from the tail structure and terminating at a free end, the tail structure being substantially planar and abutting the rim of the can for positioning the tongue on the outer portion of the rim, the outer portion of the rim of the can being claspsible between the tail structure and the free end of the tongue, and the tongue being resiliently biased to enable snap-fitting of the tongue and the tail structure with the rim of the can when the closure is installed ; and
 - an offset formed integral with the body for mating with the opening of the can exposed by activation of the pry tab for sealing the can.
2. The closure as in claim 1, the bracket being a sleeve structure being shaped and dimension for receiving and defining a passageway for guiding travel of the pry tab therethrough.
3. The closure as in claim 2, the sleeve structure further defining a notch interiorly terminating in a saddle for mating with the rivet when the closure is installed to limit travel of the pry tab through the sleeve structure.
4. The closure as in claim 1, the body comprising a sole outwardly opposing the receptacle for mating with the inner portion of the rim of the can, the seat cooperating with the tongue and the tail structure for removably coupling the closure to the rim of the can when the closure is installed.

5. The closure as in claim 1, ~~the tail structure being substantially planar and~~ the tongue comprising a first portion extending away and substantially perpendicular the tail structure; and a second portion extending oblique the tail structure towards the body.
6. The closure as in claim 1, the engagement structure comprising a receptacle whereat the tail structure terminates, the receptacle for attachment of at least one article thereto.
7. The closure as in claim 1, the offset being surrounded by a bevelled ridge for adapting the closure to cans having varying sizes of openings.
8. The closure as in claim 1, the offset being surrounded by a bevelled ridge for mating with a channel surrounding the opening of the can.
9. The closure as in claim 1, the body comprising a seal structure for being sandwiched between the offset and portions of the can top surrounding the opening of the can to substantially fluid seal the can at the opening.
10. The closure as in claim 9, the seal structure being elastic to enable the seal structure to shape conform to various gaps that may be present between the offset and the can top when being compressed therebetween.
11. The closure as in claim 9, the seal structure being shaped as one of a pad, a ring shape and a c-shape.
12. The closure as in claim 1, the body further comprising a docking surface whereon at least one article is one of formable and couplable.
13. The closure as in claim 12, the at least one article being one of couplable to and formable on the docking surface is at least one of a planar article and a three-dimensional article.

14. The closure as in claim 13, the planar article being a print ad.
15. The closure as in claim 13, the three dimensional article being at least one of a toy, a tool and an electronic device.

A CLOSURE

Abstract

Described herein is a closure for selectively resealing cans equipped with a pry tab opener. The closure comprises a body for contacting and sealing an exposed opening formed in the can by the pry tab, an engagement structure and an offset. The body comprises a bracket for receiving a portion of the pry tab. The engagement structure is for coupling the rim of the can when the closure is installed, and the offset is formed integral with the body for mating with the opening of the can exposed by activation of the pry tab for sealing the can.

Figure 1