(54) Titre : COUVERCLE DE CANETTE DE BOISSON
(54) Title: BEVERAGE CAN LID SEAL

(57) Abrégé/Abstract:
The invention relates to a closure for a drinks can having a rotary lid (2) which is fastened at a rivet (5) of the can lid (D) such that it can be rotated over the pouring opening (7) from an opening rotary position into a closure rotary position, and back again, and is
(57) Abrégé(suite)/Abstract(continued):
designed, at least in certain regions, as a curved snap-action disc (S) which, by virtue of forces acting perpendicularly to the lid-surface plane, can be transferred by bending, and once a pressure point has been overcome, from a stable first state of curvature into a stable second state of curvature, in which the outer periphery (10) of the rotary lid (2) is positioned with a closure pressure against the lid periphery (9) binding the pouring opening (7), and out of which the snap-action disc (S) springs back into its first state of curvature under the renewed action of force.
(57) Abstract: The invention relates to a closure for a drinks can having a rotary lid (2) which is fastened at a rivet (5) of the can lid (D) such that it can be rotated over the pouring opening (7) from an opening rotary position into a closure rotary position, and back again, and is designed, at least in certain regions, as a curved snap-action disc (S) which, by virtue of forces acting perpendicularly to the lid-surface plane, can be transferred by bending, and once a pressure point has been overcome, from a stable first state of curvature into a stable second state of curvature, in which the outer periphery (10) of the rotary lid (2) is positioned with a closure pressure against the lid periphery (9) binding the pouring opening (7), and out of which the snap-action disc (S) springs back into its first state of curvature under the renewed action of force.

(57) Zusammenfassung: Die Erfindung bezieht sich auf einen Verschluss für eine Getränkedose mit einem an einer Niete (5) des Doseendeckels (D) von einer Öffnungsdrühte in eine Verschlussdrühte über der Ausgießöffnung (7) und wieder zurück drehbar befestigten Drehdeckel (2), welcher wenigstens bereichsweise als gebogene Schnapp scheibe (S) ausgebildet, welche durch Kraftleistung senkrecht zu der Deckelspiegellinie aus einem stabilen ersten Biegelast durch Verbiegen und nach Überwindung eines Druckpunktes in einen stabilen zweiten Biegelast überführbar ist, in welchem sich der Außenrand (10) des Drehdeckels (2) an dem die Ausgießöffnung (7) begrenzenden Deckelrand (9) mit einem Schließdruck anlegt und aus welchem die Schnapp scheibe (S) durch erneute Kraftleistung in ihren ersten Biegelast zurückspringt.
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Beverage Can Lid Seal

The invention relates to the seal for a beverage can based on a rotating lid that can be turned around a rivet in the can lid from an open rotating position to a closed rotating position above the pouring opening and back.

This invention has the purpose of improving such beverage can seals with regard to sealing function and ease of use.

According to the present invention, there is provided a seal for a beverage can with a rotating lid that is connected to a rivet in a can lid and turnable from an open rotating position into a closed rotating position above a pouring opening and back, which at least partially takes a form of a bent snap disk that movable by an application of force perpendicular to a lid plane, which bends the disk past a trigger point, from one stable first bending state to a stable second bending state in which an outside rim of the rotating lid is pressed with a predetermined closing force against a lid rim that delimits the pouring opening, and from which the snap disk returns to the first bending state by renewed application of said predetermined force, wherein the seal further comprises a press-in tab used for opening which is connected above the rotating lid to the same rivet of the can lid as the rotating lid, where the rotating lid is held against the lid rim that delimits the pouring opening by a press-in tip of the press-in tab, which is pulled up at an end opposite the press-in tip, supported against the can lid and locked.

For this purpose, the rotating lid at least partially takes the form of a bent snap disk, which can be moved by the use of force applied perpendicular to the lid plane, which bends the lid past a trigger point, from a stable first bending state to a stable second bending state, in which the outer rim of the rotating lid presses against the lid rim that delimits the pouring opening with increased closing pressure. The snap disk returns to the first bending state after renewed application of force (snap-action effect). Increased closing pressure may, for example, be achieved when the rotating
lid is less bent in the second bending state and therefore has a slightly larger outside diameter than in the first bending state.

It is therefore possible that, in the second bending state, the rotating lid extends slightly below or above the can lid or interlocks with it, for example when the lid rim area delimiting the pouring opening is groove-shaped.

It is advantageous for the operation of the snap disk when the rotating lid is attached to a rivet with a fastening tab that extends beyond the rivet as seen from the snap disk and forms an operating element on the opposite side.

Preferably, another version of the invention relates to a seal of the kind described above with a press-in tab used for opening, which is fastened above the rotating lid.
to the same rivet in the can lid to which the rotating lid is fastened. When the rotating lid is in the sealing position, it is held against the lid rim that delimits the pouring opening by the press-in tip of the press-in tab, which is pulled up at the end opposite to the press-in tip and is supported and latched against the can lid.

Preferably, the rotating lid can retain this sealing position in a particularly reliable manner when a support is hinged to the end of the press-in tab opposite the press-in tip, which can latch downwards into a notch in the can lid once the pouring opening has been pressed open and the rotating lid has been turned over the pouring opening with the end of the press-in tab opposite the press-in tip pulled up, so that the rotating lid, which has been moved to the closed rotating position, is pressed against the can lid rim that delimits the pouring opening by the press-in tip of the press-in tab. This already creates a generally reliable seal between the rotating lid and the can lid in a closed rotating position.

The support described above is preferably made of the same piece as the press-in tab and partially cut out of it to simplify production. The support may be connected to the press-in tab by a folded edge at the end opposite the rivet to make it easier to keep the support at an angle to the press-in tab. Effective latching of the press-in tab in a sealing position is achieved by making the length of the support smaller than approx. half the length of the press-in tab and larger than approx. one third of the length of the press-in tab. The notch in the can lid, which is in all versions preferably below the press-in tab in the can lid, for example in the form of a rib or groove, is in this case located at approx. half to one third of the length of the press-in tab as seen from the end of the press-in tab. The angle of the lifted press-in tab to the can lid plane in a closed and latched position is preferably between 30 and 45°.

Preferably, the press-in tab can be connected to the rivet by a fastening tab that is partially cut out of the press-in tab material.
Preferably, to simplify production, the rivet and/or the notch are shaped from the material of the can lid.

Preferably, a further development of the invention has a can lid with a guide groove for taking up a protrusion at the bottom of the rotating lid. The rotating lid can therefore be reliably moved from its opening rotating position – which is at the back as seen from the pouring opening – to its closed rotating position in front. This facilitates handling.

Preferably, the rotating lid may have reinforcement corrugations near the rivet, next to it or on the side opposite the press-in tip to absorb the material stress in these areas.

Preferably, the can lid may further have a limit stop for the rotating lid in a sealing position to make it easier to close the pouring opening.

Preferably, the sealing function can be further improved when the rotating lid is, at least partially, coated with sealing material, e.g. on the inside of its rim area.

Preferably, operation can also be simplified when the outer rim of the rotating lid has one or several fins or similar grip areas so that it is easier to hold the rotating lid for turning.

The material should be selected to ensure that the material thickness of the can lid is preferably between 0.1 and 0.3 mm, in particular approx. 0.224 mm, that the material thickness of the press-in tab is preferably between 0.15 and 0.35 mm, in particular approx. 0.265 mm and that the material thickness of the rotating lid is
Preferably, the invention further relates to a can lid with a seal as described above as well as to a beverage can with a can lid built in this way.

Additional goals, characteristics, advantages and application options of the invention result from the following description of embodiments based on drawings. All characteristics described and/or depicted are individually and in any combination part of the invention, independently of the way they are summarised or referenced in the individual claims.

The drawings show:

Figure 1a  A beverage can lid seal according to the invention in top view, section view and detailed section view, where the snap disk is shown in its closed rotating position and in the first bending state.

Figure 1b  Drawings according to Figure 1a in which the snap disk of the rotating lid is in the second bending state and the operation for transferring the snap disk from its first bending state shown in Figure 1a to its second bending state is illustrated.

Figure 1c  Drawings according to Figure 1b and

Figure 1d  Drawings according to Figure 1a, illustrating in conjunction with Figure 1c how the snap disk is moved from its second bending state to its first bending state.

Figure 2a  Schematic side view of another sealing system according to the invention, which is flanged to an approx. cylindrical can body and shows the rotating lid in a closed position and the support in a latched position, and

Figure 2b  Top view of a can lid with the rotating lid in an open rotating position.
The sealing system according to Figures 1a to 1d makes it possible to re-seal beverage cans with pouring openings that are built as press-in openings. The can lid D, which may, for example, be permanently flanged onto the top of an approx. cylindrical can body K, has a rivet 5 on which the rotating lid 2 is fastened in a rotatable manner so that it can be turned from an open rotating position into a closed rotating position above the pouring opening 7 and back. Figures 1a to 1d all show the rotating lid 2 in its closed rotating position above the pouring opening 7, which has previously been pressed open, for example by using pre-weakened lines in the material.

The rotating lid 2 is at least partially shaped as a bent snap disk S that can be moved by the application of force perpendicular to the lid mirror plane, which bends the disk past a trigger point, from a stable first bending stated to a stable second bending state in which the outer rim 10 of the rotating lid 2 rests with a certain closing pressure against the lid rim 9 that delimits the pouring opening 7. The disk can be moved back to the first bending state by re-applying force as illustrated in Figures 1a to 1d. Figures 1a to 1d show an implementation in which the snap disk S covers the main part of the pouring opening and has an outside contour that is adapted to the inner rim of the pouring opening 7, which is circular in this particular case.

The rotating lid 2 overlaps slightly with the lid rim 9 of the pouring opening 7. A comparison of figures 1a and 1b shows that the snap disk area of the rotating lid 2, which in Figure 1a fits into the pouring opening 7 with slight play, is pressed tightly against the lid rim 9 that delimits the pouring opening 7 along its entire circumference after being bent downwards, as is shown in Figure 1b.

The rotating lid 2 is fastened to the rivet 5 of the can lid D by a fastening tab 8. The fastening tab 8 extends beyond rivet 5 as seen from the snap disk S to form an
operating element 15 on the other side. A comparison of Figures 1c and 1d shows that pressure from the top onto operating element 15 can move the snap disk S from its second, tightly sealing bending state to its first bending state in which the rotating lid 2 can easily be turned away from the pouring opening 7.

The sealing system according to the invention as shown in Figures 2a and 2b can be used to re-seal beverage cans with pouring openings 7 formed as press-in openings in a more reliable way. The can lid D, which may, for example, be permanently flanged onto the top of an approximately cylindrical can body K, usually has a press-in tab 1 that is connected to a rivet 5 shaped from the can lid D by a fastening tab 8. The rotating lid 2 is also attached to the same rivet 5, so that it can be turned around rivet 5 and moved to its closed position after the pouring opening 7 has been opened by lifting the press-in tab 1 at its end opposite the pouring opening 7 and by pressing the press-in tip 6 in front onto the pre-weakened lid area.

After turning the rotating lid 2 from the open rotating position shown in Figure 2b to the closed rotating position shown in Figure 1 while moving the protrusion 12 at the bottom of the rotating lid 2 into a guide groove 11 in the can lid D up to the limit stop 14 of the can lid D, a support 3 hinged to the outer end of the press-in tab 1 can be bent in direction of the can lid D and moved to a latching position in notch 4 of the can lid D. In this latched position, the press-in tab 1 presses onto the rotating lid 2 in its closed position with its press-in tip 6 and secures it against the lid rim 9 that delimits the pouring opening 7, using the spring tension of the press-in tab 1 and the support 3 in such a way that a reasonable seal is created.

The dotted lines in Figure 1 show that the rotating lid 2 partially takes the form of a snap disk S, which can be moved by the application of force perpendicular to the lid plane, which bends the disk past a trigger point, from an upper stable bending state to a lower bending state in which the outer rim 10 of the rotating lid is pressed against the lid rim 9 delimiting the pouring opening 7 with more force than in the
other bending state to create a tight seal. The upward bend of the snap disk S in the initial position may be stronger than the downward bend of the snap disk S in the second stable bending state, so that the diameter of the rotating lid 2 in the latter, second bending state is slightly bigger than in the first bending state, in which the snap disk is bent upwards. When the snap disk area of the rotating lid is again pressed perpendicular to the lid plane, the snap disk S can snap back into its initial position, in which it is bent upwards.

After drinking from the beverage can, it can simply be resealed so that no insects or dirt can get into the can. The reliable seal ensures that none of the remaining drink can leak out, e.g. when the can is packed into a rucksack. The can is re-opened by turning the press-in tab slightly sideways until the support 3 detaches from the notch 4. Once the snap disk S has been transferred to its upward-bent initial position, the rotating lid 2 can be turned to its open rotating position.

The pouring opening 7 and the fitting rotating lid 2 in the example shown are circular. However, they can also be oval or trapezoidal, possibly with rounded corners, or have any other shape. The rotating lid 2 may, in particular, have one or several fins or similar gripping elements at its outer rim 10 (not shown), to make it easier to grip the rotating lid 2 for turning.

The material thickness of the press-in tab 1 can be slightly lower than that of the can lid D and the material thickness of the rotating lid 2 can be slightly higher than that of the can lid D.
Reference list

1  Press-in tab
2  Rotating lid
3  Support
4  Notch
5  Rivet
6  Press-in tip
7  Pouring opening
8  Fastening tab
9  Lid rim
10 Outer rim of the rotating lid
11 Guide groove
12 Protrusion
13 Reinforcement corrugation
14 Limit stop
15 Operating element

D  Can lid
F  Force applied
K  Can body
S  Snap disk
WHAT IS CLAIMED IS:

1. A seal for a beverage can with a rotating lid (2) that is connected to a rivet (5) in a can lid (D) and turnable from an open rotating position into a closed rotating position above a pouring opening (7) and back, which at least partially takes a form of a bent snap disk (S) that movable by an application of force perpendicular to a lid plane, which bends the disk past a trigger point, from one stable first bending state to a stable second bending state in which an outside rim (10) of the rotating lid (2) is pressed with a predetermined closing force against a lid rim (9) that delimits the pouring opening (7), and from which the snap disk (S) returns to the first bending state by renewed application of said predetermined force, wherein the seal further comprises a press-in tab (1) used for opening which is connected above the rotating lid (2) to the same rivet (5) of the can lid (D) as the rotating lid (2), where the rotating lid is held against the lid rim (9) that delimits the pouring opening (7) by a press-in tip (6) of the press-in tab (1), which is pulled up at an end opposite the press-in tip, supported against the can lid (D) and locked.

2. The seal according to claim 1, characterised by the fact that at least in the second bending state, the rotating lid (2) extends slightly above or below the lid rim (9) that delimits the pouring opening (7) or projects into it or extends around it.

3. The seal according to claim 1 or 2, characterised by the fact that the rotating lid (2) is attached to the rivet (5) with a fastening tab (8), which extends beyond the rivet (5) as seen from the snap disk (S) to an operating element (15) on an opposite side.

4. A seal according to one of claims 1 to 3, characterised by the fact that a support (3) is hinged to the end of the press-in tab (1) opposite the press-in tip (6), which is latchable downwards into a notch (4) in the can lid (D) once the pouring
opening (7) has been pressed open and the rotating lid (2) has been turned over the pouring opening (7), and wherein the end of the press-in tab (1) opposite the press-in tip is pulled up, so that the rotating lid (2), which has been moved to the closed rotating position, is pressed against the can lid rim (9) that delimits the pouring opening (7) by the press-in tip (6) of the press-in tab (1).

5. A seal according to claim 4, characterised by the fact that the support (3) and the press-in tab (1) are made of a single piece and that the support is partially cut out of the press-in tab.

6. A seal according to one of claims 4 or 5, characterised by the fact that the support (3) is connected to the press-in tab (1) by a folded edge at its end opposite the rivet (5).

7. A seal according to one of claims 4 to 6, characterised by the fact that a length of the support (3) is smaller than approximately half of a length of the press-in tab (1) and larger than approximately one third of the length of the press-in tab (1).

8. A seal according to one of claims 1 to 7, characterised by the fact that an angle of the press-in tab (1) to a mirror plane is in a latched, locked position between 30° and 45°.

9. A seal according to one of claims 1 to 8, characterised by the fact that the press-in tab (1) is attached by a fastening tab (8) to the rivet (5), where the fastening tab is partially cut out from material of the press-in tab.

10. A seal according to one of claims 1 to 9, characterised by the fact that the rivet (5) is made of a same piece of material as the can lid (D).
11. A seal according to one of claims 4 to 7, characterised by the fact that the notch (4) is made of a same piece of material as the can lid (D).

12. A seal according to one of claims 4 to 7, characterised by the fact that the rivet (5) and the notch (4) are made of a same piece of material as the can lid (D).

13. A seal according to one of claims 1 to 12, characterised by the fact that the outside rim (10) of the rotating lid (2) and the lid rim (9) that delimits the pouring opening (7) are shaped to form a pressure fitting.

14. A seal according to one of claims 1 to 13, characterised by the fact that the can rim (3) has a guide groove (11) for holding a protrusion (12) on a bottom of the rotating lid (2).

15. A seal according to one of claims 1 to 9, 11 or 12, characterised by the fact that the rotating lid (2) has reinforcement corrugations (13) near the rivet (5), next to it or on a side opposite the press-in tip (6).

16. A seal according to one of claims 1 to 15, characterised by the fact that the can lid (D) has a limit stop (14) for the rotating lid (2) in its locked position.

17. A seal according to one of claims 1 to 16, characterised by the fact that the rotating lid (2) is at least partially coated with sealing material.

18. A seal according to one of claims 1 to 17, characterised by the fact that the outside rim (10) of the rotating lid (2) has one or several fins or similar structures that allow easy gripping.
19. A seal according to one of claims 1 to 18, characterised by the fact that a material thickness of the can rim (D) is between 0.1 and 0.3 mm.

20. A seal according to claim 19, characterised by the fact that the material thickness of the can rim (D) is approximately 0.224 mm.

21. A seal according to one of claims 1 to 9, 11 or 12, characterised by the fact that a material thickness of the press-in tab (1) is between 0.15 and 0.35 mm.

22. A seal according to claim 21, characterised by the fact that the material thickness of the press-in tab (1) is approximately 0.265 mm.

23. A seal according to one of claims 1 to 22, characterised by the fact that a material thickness of the rotating lid (2) is between 0.05 and 0.15 mm.

24. A seal according to claim 23, characterised by the fact that the material thickness of the rotating lid (2) is approximately 0.1 mm.

25. A can lid with a seal according to one of claims 1 to 24.

26. A can with a can lid according to claim 25.