

Description

CAN END

Technical Field

- [0001] The present invention relates to the field of can ends.
- [0002] Can ends, in particular for cans that contain beverages, are provided with tabs (also known as ring pulls) to allow access to the contents of the can. The can end comprises an openable area that is intended to form an opening in the can end. The openable area is typically defined by a scored line in the can end. When a force is applied to the openable area, the scored line will break in preference to any other area of the can end, and produce an opening in the can end through which the contents can be accessed.
- [0003] A tab is affixed to the can end via a rivet or other fixing means. A nose end of the tab is adjacent to the openable area, and the opposite end of the tab is shaped so as to be easily manipulated by a user. When the user wishes to open the can, he lifts the tab. This causes the tab to pivot about the rivet so that the nose end of the tab presses against the openable area. This provides sufficient force to break the openable area and open the can end.
- [0004] Conventionally, once the can end has been opened, the tab has no more use and becomes redundant.

Background Art

- [0005] In **US 5492077 B** (HOWARD L. ROSE) 20.02.1996 the applicant describes how indicia can be provided on the end panel of a beverage container and the tab can be rotated to point to one of the indicia to avoid inadvertent use by another. This general idea is further described in **US 6053349 B** (EUGENE JR. ET EL.) 25.04.2000 and is developed in **US 6244456 B** (DENIS J. HANLON) 12.06.2001 which describes how such an identification system includes a series of discrete areas and each discrete area is configurable from an original condition to a visibly different condition.

Disclosure of Invention

- [0006] It is an object of the invention to provide an improved can end. Although it has been acknowledged in the prior art that a further use can be made of

the tab after the can end has been opened and the tab is rotatable about the rivet, the inventors have realised that after opening the drinks can, rotation of the tab is largely unrestricted. Therefore, the invention proposes that the can end may comprise two raised portions disposed on the can end either side of the tab. Each raised portion is arranged to limit a degree of rotation of the tab about the rivet. This prevents the tab from blocking the aperture that allows a user access to the contents of the drink can.

- [0007] The tab optionally further comprises a marker located at a handle end of the tab. The marker may be formed by a hole in the handle end, a depression in the handle end, or a raised area in the handle end. As a further option, the can end is further provided with two raised portions disposed on the can end either side of the tab. In this case, rotation of the tab causes an interaction between the marker and one of the raised portions at a predetermined angle of rotation of the tab about the rivet to provide an indication of a limit of rotation of the tab. Furthermore, the can end may be provided with further raised portions disposed on the can end, wherein a rotation of the tab causes an interaction between the marker and one of the raised portions at a predetermined angle of rotation of the tab about the rivet to provide an indication of an incremental degree of rotation of the tab.
- [0008] As an option, the tab further comprises a marker located at a handle end of the tab, the marker being formed by printing or laser etching. In order to reduce metal fatigue on the tab, the tab is optionally provided with a strengthened area at a location around the rivet.
- [0009] According to a second aspect, there is provided a method of making a can end for a drinks can. A can end is provided with a tab attached to the can end with a rivet, wherein the tab, once the drinks can has been opened, is arranged to be rotatable about the rivet to form a rotatable pointer.
- [0010] The method optionally comprises providing two raised portions on the can end either side of the tab, wherein each raised portion is arranged to limit a degree of rotation of the tab about the rivet.
- [0011] As an option, the tab is provided with a marker located at a handle end of the tab, the marker being formed by a hole in the handle end, a depression

in the handle end, or a raised area in the handle end. The method may further comprise providing a plurality of raised portions on the can end. The plurality of raised portions are arranged to interact with the marker during a rotation of the tab in order to provide a tactile indication of a limit of rotation and/or an incremental degree of rotation of the tab. The method may optionally comprise providing a marker located at a handle end of the tab by any of printing and laser etching.

- [0012] According to a third aspect, there is provided a container comprising a can end as described above in the first aspect. The can end is fastened to the container to close an access opening of a container body.

Brief Description of Drawings

- [0013] The invention will now be described, by way of example only, with reference to the following drawings, in which;
- [0014] Figure 1 shows a perspective view of a can prior to a can end being opened according to an embodiment of the invention;
- [0015] Figure 2 shows a perspective view of the can after opening of the can end according to an embodiment of the invention;
- [0016] Figure 3 shows a perspective view of the can end with the tab rotated according to an embodiment of the invention;
- [0017] Figure 4 shows an elevation view of a can end according to a further embodiment of the invention;

Mode(s) for Carrying Out the Invention

- [0018] As described above, once a known can end has been opened, there is no further use for the tab. It is provided solely to allow the user to form an opening in the can end to gain access to the contents of the can. Referring to Figure 1, a can 1 having a can end 2 is illustrated. The can end 2 is provided with a rim 3. An openable area 4 is also provided in the can end 2. The openable area 4 is typically defined by a score line in the can end 2 that extends partially around the openable area 4 and breaks preferentially when pressure is applied to the openable area 4.
- [0019] A tab 5 is affixed to the can end 2 using a rivet 6. A nose end 7 of the tab 5 is located adjacent to the openable area 4, and a handle end 8 of the tab 5 is located at the opposite end to the nose end 7. The tab 5 sits flush

against the can end 2, and is not easily rotatable owing to friction between the tab 5 and the can end 2 and the internal pressure of the unopened can 1. The original position of the tab 5 is such that a main length of the tab 5 and the openable area 4 of the can end 2 are disposed along a main axis 10 across the can end 2.

- [0020] In certain embodiments, the handle end 8 of the tab 5 is provided with a marker 9 such as an arrow, a chevron, a line, a triangle, a representation of a pointing finger etc. In the initial, unopened position of the tab, the marker 9 points along the main axis 10.
- [0021] Turning now to Figure 2, when a user wishes to open the can 1 he lifts the handle end 8 of the tab 5 away from the can end 2. This causes the tab 5 to pivot about the rivet 6, and pushes the nose end 7 of the tab 5 against the openable area 4. The score line that defines openable area 4 breaks under this pressure. The openable area 4 is pushed into the body of the can 1 to form an opening 11 in the can end 2 through which the contents of the can 1 can be accessed. The score line defining the openable area 4 does not extend completely around the openable area 4. The unscored edge of the openable area 4 forms a fold as the handle end 8 of the tab 5 is lifted and the nose end of the tab 5 pushes the openable area 4 into the body of the can 1. The openable area 4 remains attached to the can end 2 at the fold.
- [0022] At this point, the tab 5 becomes much more easily rotatable about the rivet 6, as the tab 5 is slightly raised and no longer sits flush against the can end 2. Turning to Figure 3, there is shown a can 1 having a can end 2 in which the tab has been pulled to form an opening 11. The tab 5 is rotated about the rivet 6 such that it is disposed at an angle away from the main axis 10. The tab 5, and any marker 9 located on the tab 5, now point to a different point 12 on the rim 3 from the original location of the tab 5. The tab 5 effectively becomes a rotatable pointer that can point to different areas of the can end 2 or around the rim 3 of the can end 2.
- [0023] The can end 2, the rim 3 of the can end 2, or an outer wall of the can 1 just below the can end 2 may be provided with graphics or decoration to which the tab 5 can be pointed. This may be, for example, printed or laser

etched. The decorations may relate to branding, customisation of the can, games, predictions, counters and so on.

- [0024] In the example shown in Figures 1 to 3, the marker 9 is shown as an opening in the handle end 8 of the tab 5. It will be appreciated that the marker 9 may be applied to the handle end 8 of the tab 5 in one of many different ways. For example, the handle end 8 of the tab 5 may have no hole at all, and the marker is applied to the handle end 8 of the tab 5 using techniques such as laser etching or printing. Alternatively, the marker 9 may be applied in the form of a depression or a raised area of the handle end 8 of the tab 5. Any suitable technique may be used, provided the marker 9 is easily visible to a user.
- [0025] In a further embodiment, the amount of allowable rotation of the tab 5 about the rivet 6 is restricted. It is undesirable for the tab 5 to point to a region of the rim 3 or can end in such a way that the tab 5 blocks the opening 11. This would impede access to the contents of the can 1. In order to avoid this, the rotation of the tab 5 about the rivet is limited to, for example, a rotation of 90° clockwise and 90° anticlockwise from the original position along the main axis 10, giving a total rotation of 180°. This not only prevents the tab 5 from blocking the opening 11, but also reduces metal fatigue of the tab 5 about the rivet 6 when the tab 5 is repeatedly rotated about the rivet 6.
- [0026] There are several ways that rotation of the tab 5 about the rivet 6 can be restricted to 180°. Referring to Figure 4, an exemplary way to restrict rotation is to provide two raised areas 13 on the can end 2. When the tab 5 is rotated 90° either clockwise or anticlockwise, it abuts one of the two raised areas 13, which restricts further rotation. This gives the user a tactile indication that the tab 5 should not be rotated any further.
- [0027] Another exemplary way, in the case where the marker 9 in the handle end 8 of the tab 5 is applied as a depression in the handle end 5, is to provide two raised areas 13 on the can end 2. When the tab 5 is rotated, the depressed marker 9 forms a raised area on a lower surface of the handle end 8. When the rotation limit is reached, the raised area on the underside of the handle end 8 of the tab 5 caused by the depressed marker 9 abuts

one of the raised areas 13 on the can end 2, indicating to the user the maximum limit of rotation.

- [0028] A further exemplary way to restrict rotation, in the case where the marker 9 comprises a hole through the handle end 8 of the tab 5 is to provide two raised areas 13 on the can end 2. When the tab 5 is rotated to its maximum allowable rotation in either direction, the marker 9 hole will align with one of the raised areas 13 and lock into place. Again, this provides an indication to the user that the maximum allowable rotation of the tab 5 has been reached. A similar technique can be used where the marker 9 is a raised area in the handle end 8 of the tab 5. In this case, the underside of the handle end will include a depression, caused by the raised marker 9. In this case, the depression on the underside of the handle end 8 of the tab will interlock with one of the raised areas 13 on the can end 2.
- [0029] In a further exemplary embodiment, further raised areas 14 may be provided. These correspond to incremental positions of the tab 5 within the allowable amount of rotation. The further raised areas 14 provide tactile and/or audible indications of an angle of rotation of the tab 5 at discrete positions. In the embodiment shown in Figure 4, the marker 9 comprises a hole in the handle end 8 of the tab 5. The hole interacts with a raised area 14 such that, as the tab 5 is rotated about the rivet 6, the user receives tactile and audible cues indicating the position of the tab 5 at certain discrete points.
- [0030] It will be appreciated that the further raised areas 14 may interact with markers 9 consists of a hole or a raised area. Furthermore, if the marker 9 is formed by making a depression in the upper surface of the handle end 8 of the tab 5, it effectively forms a raised area on an underside of the handle end 8 of the tab 5. As the tab 5 is rotated about the pivot 6, the raised area on the underside of the handle end 8 of the tab 5 will sit between two further raised areas 14, again providing an audible and tactile clue to the user as the tab 5 is rotated about the pivot 5.
- [0031] As mentioned above, repeated rotation of the tab 5 may cause metal fatigue. Metal fatigue is more likely to be an issue for the tab 5 where it is attached to the rivet 6 than for the rivet 6 itself. It may be desirable to

provide a strengthened area 15 on the tab 5 at the point where it is attached to the rivet 6, for example by providing a thicker cross-sectional area.

[0032] It will be appreciated by the person of skill in the art that various modifications may be made to the above-described embodiments without departing from the scope of the present invention. For example, different forms of tactile and/or audio indicator are described above that indicate to a user when the tab has been rotated to a particular increment or a preferred limit of rotation. However, a skilled person will be able to devise alternative indicators for the tab to interact with the can end in order to limit rotation or provide an indication of when the tab has been incrementally rotated to a predetermined angle.

Claims

1. A can end (2) for a drinks can (1), the can end (2) being provided with a tab (5) attached to the can end (2) with a rivet (6), wherein the tab (5) is initially flush against the can end (2), thereby having rotation restricted by friction between the tab (5) and the can end (2), but once the drinks can (1) has been opened, the tab (5) is arranged to be raised from the can end (2) and is thereby easily rotatable about the rivet (5) to form a rotatable pointer characterised in that the can end (2) includes two raised portions (13) disposed on the can end (2) either side of the tab (5), wherein each raised portion (13) is arranged to limit a degree of rotation of the tab (5) about the rivet (6).
2. The can end (2) according to claim 1, wherein the tab (5) further comprises a marker (9) located at a handle end (8) of the tab (5), the marker (9) being formed by any of a hole, a depression or a raised area in the handle end (8).
3. The can end according to claim 2, further comprising two raised portions (13) disposed on the can end (2) either side of the tab (5), wherein a rotation of the tab (5) causes an interaction between the marker (9) and one of the raised portions (13) at a predetermined angle of rotation of the tab (5) about the rivet (6) to provide an indication of a limit of rotation of the tab (5).
4. The can end according to claim 2 or 3, comprising further raised portions (14) disposed on the can end (2), wherein a rotation of the tab (5) causes an interaction between the marker (9) and one of the raised portions (13, 14) at a predetermined angle of rotation of the tab (5) about the rivet (6) to provide an indication of an incremental degree of rotation of the tab (5).
5. The can end (2) according to any of claims 1 to 4, wherein the tab (5) comprises a marker (9) located at a handle end (8) of the tab (5), the marker (9) being formed by any of printing and laser etching.
6. The can end (2) according to any of claims 1 to 5, wherein the tab comprises a strengthened area (15) at a location around the rivet (6).
7. A method of making a can end (2) for a drinks can (1), the method comprising: providing a can end (2) with a tab (5) attached to the can end (2) with a rivet (6), wherein once the drinks can (1) has been opened, the tab (5) is rotatable about the rivet (6) to form a rotatable pointer, and

providing two raised portions (13) on the can end (2) either side of the tab (5), wherein each raised portion (13) is arranged to limit a degree of rotation of the tab (5) about the rivet (6).

8. The method according to claim 7, further comprising providing the tab (5) with a marker (9) located at a handle end (8) of the tab (5), the marker (9) being formed by any of a hole, a depression, or a raised area in the handle end (8).
9. The method according to claim 8, further comprising providing a plurality of raised portions (13, 14) on the can end (2), the plurality of raised portions (13, 14) being arranged to interact with the marker (9) during a rotation of the tab (5) in order to provide any of a tactile indication of a limit of rotation and an incremental degree of rotation of the tab (5).
10. The method according to claim 8 or 9, further comprising providing a marker (9) located at a handle end (8) of the tab (5) by any of printing or laser etching.
11. A container comprising a can end (2) as claimed in any one of claims 1 to 6, the can end (2) fastened to close an access opening of a container body.