Description

BEVERAGE CAN WITH DISC

Technical Field

[0001] The present invention includes a conventional beverage can having a body, which incorporates an integrally domed base and a side-wall, and an end, which is fixed to the open end of the body using conventional techniques, a double seam for example.

Background Art

[0002] It is already known to internally reform the domed base of a beverage can to provide a re-entrant profile. This technique is primarily used to increase the strength of the base, which in turn allows light weighting. For example, EP 0482581 A (BALL CORP) 29.02.1992 describes an apparatus suitable for reforming the base of a beverage can in this way. In particular, Figure 11 of this application shows an enlarged cross-section view through a portion of the base of a beverage can after such reforming.

[0003] WO 96/24539 (KOHORN INTERNATIONAL PTY LIMIT) 15.08.1996 describes a container formed with an open void separate from the main containment volume. Examples of such containers are metal cans, which are formed with a generally concave or domed void in the base, as commonly used for soft drinks, beer etc. This document describes removal means that are provided to substantially close this void, thereby creating a second containment volume that may be used for promotional goods, a second active ingredient or such like.

[0004] Both these ideas are combined in EP 0958182 B (SCHMALBACH LUBECA) 24.11.1999 which describes a two piece beverage can made substantially of sheet metal having a base that is drawn-in to the inner side of the container, so that the diameter of the base is evidently smaller than the diameter of the container. This document also describes a separate disc-shaped component that is adapted to be fixed into the base. The separate disc-shaped component ("false bottom part") is separately produced and may therefore be easily decorated etc.

Summary of invention

[0005] According to a first aspect, there is~~The present invention~~ provides~~d~~ a beverage can~~(1)~~ having a base~~(10)~~

defining a re-entrant bead ~~(17)~~ in which a resilient disc ~~(50)~~ is held captive, ~~characterised in that~~wherein

the diametric dimension of the disc ~~(50)~~ is larger than the internal diameter of the re-entrant bead ~~(17)~~ and when the resilient disc ~~(50)~~ is fitted into the re-entrant bead ~~(17)~~, the disc ~~(50)~~ adopts a concave, domed shape, wherein the resilient disc defines at least three contact points spaced around the periphery thereof, the three contact points comprise two energizing prongs arranged on either side of the disc and a pivot diametrically opposite the energizing prongs, wherein the energizing prongs energise the disc as it is prised out of the re-entrant bead and the pivot causes the disc to spin orthogonal to the plane of the disc, as it is released from the re-entrant bead.

[0006] According to an embodiment~~the present invention~~, a resilient disc is snapped into the re-entrant bead at the base of a beverage can. The disc has a means of removal, by which it can be prised out of the re-entrant bead by a user. For example, the disc may have a cut–out that allows it to be prised out of the re-entrant, bead using a tab or a coin.

[0007] The disc and domed base of the beverage can together define a compartment, which can be used to store additives for the contents of the container or an item such as seeds, a compass, USB device etc. The disc is preferably stamped from a printed sheet of thermoplastic material e.g. PP, PET or other polymer, although other materials such as metal or card are also possible

[0008] The disc may be fitted into the base of the beverage can either before or after filling the can with product, by a canmaker or packer respectively. Preferably, cut-outs are provided in the disc to allow drainage of any liquid that has collected in the compartment. This allows the disc to be optionally fitted prior to pasteurising or rinsing on the filling line.

[0009] The inventors have found that the disc can be manufactured to a much tighter tolerance than may be achieved for the diameter of the re-entrant bead and thus, during trials the disc was found to fit tightly in the reformed base of some cans, whereas it only fitted very loosely in the reformed base of other cans. Upon further investigation the inventors found that if the diametric dimension of the disc (i.e. the maximum points of the disc plotted within a circle) was larger than the diameter of the re-entrant bead, the disc could be snapped into the reformed base, but the stresses exerted on the disc by the re-entrant bead, causes the disc to and flex into a concave, dome configuration. Depending upon the dimensions of the disc and the diameter defined by the re-entrant bead of the reformed base (as manufactured), the domed disc takes up a lesser or greater degree of

doming.

[0010] This variable shaped dome has a number of advantages. Firstly, the degree of doming can accommodate any variance between the dimensions of the disc and that of the reformed base of the can. For example, the disc can be manufactured having a tolerance of + - 0.1mm whereas the reformed base conventionally has a tolerance of + - 0.3mm.

[0011] The disc according to an embodiment~~proposed by the invention~~ includes one or more cut-outs arranged on its periphery. The concave, domed shape of the disc once fitted in the reformed base of the can, assists with the drainage of water from the internal surface of the disc and the stressed / fitted disc is more difficult to remove from the base of the can, reducing the risk of accidental separation from the can.

[0012] The disc is provided with a removal means, which is sized and shaped to allow a user to remove the disc from the base of the can. The removal means takes the form of a cut-out, which allows a user to insert a lever e.g. a coin or tab, to prise the disc out of the base of the can.

[0013] In an embodiment of the invention, the disc and base of the can together define three contact points and the removal means is provided by a cut-away, which allows a user to apply a lever under the disc. The two contact points located on either side of the cut away serve as energising prongs. These energising prongs may be located immediately adjacent to the cut-away or they may be displaced from the cut-away, but they must be located within the same half of the disc as the cut-way. The contact point located diametrically opposite the cut away acts as a pivot. In combination, the energising prongs and the pivot causes the disc to spin upon release from the base of the can, much like the flipping of a coin. This provides the opportunity for a simple decision based game.

[0013a] According to a second aspect, there is provided a method of filing a beverage can according to the first aspect, wherein the resilient disc is fitted into the re-entrant bead prior to filling the beverage can with a product and processing as required.

Brief description of drawings

[0014] The present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

[0015] Figure 1 is an isometric view of an upturned beverage can having a reformed base suitable for use in the invention.

[0016] Figure 1a is a section taken through the base of the beverage can shown