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(54) Container with filter

(57) A container (10) is disclosed comprising a portion with a pre-formed tear line (13) corresponding to a dispensing aperture (20) and which will tear with appropriate mechanical manipulation, thereby forming a dispensing aperture (20) such that the container portion (40)-corresponding to the dispensing aperture (20) is bent inside the container (10); and a filter (21) attached to the inside of the container (10) and located at least partly adjacent the dispensing aperture (20) such that the filter allows egress of fluid from the container (10) through the dispensing aperture (20) whilst preventing ingress of at least some contaminants. In one aspect of the invention, the filter (21) comprising a safety portion (34) of a size and / or shape which, should the filter become detached from the inside of the container (10), makes it impossible for the filter (21) to fall through the dispensing aperture (20) of the container. In another aspect of the invention, the filter (21) is resilient so as to first deform during forming of the dispensing aperture (20) from an initial configuration adjacent the dispensing aperture (20) to accommodate the initial bending inside the container (10) of the container portion (40) corresponding to the dispensing aperture (20), and subsequently to return to its initial configuration; and wherein the filter (21) comprises at least two limbs (30, 31) which may deform, at least to some extent, independently so to assist the filter (21) in returning to its initial configuration.

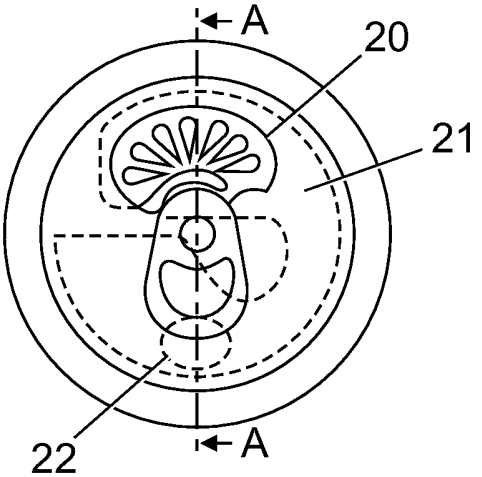

Fig. 2

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Description

Field of Invention.

[0001] This invention relates to a container and, in particular, to a container comprising a portion with a pre-formed tear line corresponding to a dispensing aperture and which will tear with appropriate mechanical manipulation, thereby forming a dispensing aperture such that the container portion corresponding to the dispensing aperture is bent inside the container; and a filter attached to the inside of the container and located at least partly adjacent the dispensing aperture such that the filter allows egress of fluid from the container through the dispensing aperture whilst preventing ingress of at least some contaminants.

Background to the Invention

[0002] European patent EP0865385B1 discloses such a "stay tab" container and, in particular, attention is drawn to the embodiment described in Figures 16 to 23 with reference to the corresponding portion of the description from paragraph [0060] to paragraph [0072]. This embodiment shows a resilient, planar filter attached to the container at a point opposite the dispensing aperture. During forming of the dispensing aperture, the filter is able to deform from an initial configuration adjacent the dispensing aperture to accommodate the initial bending inside the container of the container portion corresponding to the dispensing aperture, and subsequently to return to its initial configuration. It is noteworthy that the filter's curved, elongate shape renders the filter readily deformable in a plane orthogonal to the radius of curvature.

[0003] In respect of a container of this type with a larger dispensing aperture, there would be a correspondingly larger portion of the container that is required to be bent inside. Hence, a filter for a container with such a larger dispensing aperture would have to deform more in order to accommodate that portion of container which is bent inside. Also, the larger the portion of container which is bent inside, the more difficult it becomes for the filter to pass over that portion of container from a deformed state to its initial configuration adjacent the dispensing aperture.

Object of Invention

[0004] It is an object of the present invention to provide a container of the type described above with a filter of a configuration suitable for use with a "stay tab" container having a large dispensing aperture.

Summary of Invention

[0005] In accordance with a first aspect of the present invention, there is provided a container comprising a portion with a pre-formed tear fine corresponding to a dispensing aperture and which will tear with appropriate mechanical manipulation, thereby forming a dispensing aperture such that the container portion corresponding to the dispensing aperture is bent inside the container; and a filter attached to the inside of the container and located at least partly adjacent the dispensing aperture such that the filter allows egress of fluid from the container through the dispensing aperture whilst preventing ingress of at least some contaminants, wherein the filter comprising a safety portion of a size and /or shape which, should the filter become detached from the inside of the container, makes it impossible for the filter to fall through the dispensing aperture of the container.

[0006] The inventor has recognised what appears to be a previously unrecognised problem with containers of the type disclosed in EP0865385B1. Namely, that deformation of the resilient filter during formation of the dispensing aperture stresses the filter and the attachment of the filter to the container. This can result in detachment of the filter which might pose a choking risk to a consumer of beverage from such a container, especially when the container is turned upside down to effect egress of the last remaining beverage. Furthermore, this risk is increased if the filter has to very substantially deform to accommodate the bending inside the container of a large container portion corresponding to a large dispensing aperture.

[0007] With a container having a filter comprising a safety portion as described above, the choking risk is inherently reduced.

[0008] Note, by "fall through the dispensing aperture it is meant during the course of normal handling of the container and not, for example, vigorous shaking of the container for the purpose of deliberately causing the filter to deform to enable it to pass through the dispensing aperture or deliberately pulling the filter through the aperture.

[0009] Ideally, the safety portion will have at least two perpendicular dimensions which exceed any dimension of the dispensing aperture.

[0010] The safety portion may coincide with the portion of the filter attached to the container with the advantage that one would generally not expect much deformation in the area of attachment. Hence, the existence of a bulky safety portion in this area does not preclude the provision elsewhere of an area of weakness (typically an area with a narrow cross section) which renders the filter readily deformable.

[0011] In accordance with a second aspect of the present invention, there is provided a further container comprising a portion with a pre-formed tear line corresponding to a dispensing aperture and which will tear with appropriate mechanical manipulation, thereby forming a dispensing aperture such that the container portion corresponding to the dispensing aperture is bent inside the container; and a filter attached to the inside of the container and located at least partly adjacent the dispensing aperture such that the filter allows egress of fluid

from the container through the dispensing aperture whilst preventing Ingress of at least some contaminants, wherein the filter is resilient so as to first deform during forming of the dispensing aperture from an initial configuration adjacent the dispensing aperture to accommodate the initial bending inside the container of the container portion corresponding to the dispensing aperture, and subsequently to return to its initial configuration; and wherein the filter comprises at least two limbs which may deform, at least to some extent, independently so to assist the filter in returning to its initial configuration.

[0012] For example, a filter of such a container comprising two limbs may be able to deform whereby a first limb may deform and then be released to its initial configuration before a second limb does as both limbs pass over the container portion corresponding to the dispensing aperture bent inside the container.

Brief Description of Drawings

[0013]

Figure 1 shows a "stay tab" drinks can prior to formation of a dispensing aperture;

Figure 2 shows a "stay tab" drinks in accordance with the present invention, after formation of a dispensing aperture;

Figure 3 shows in isolation the filter of the can of Figure 2;

Figures 4a to 4e are sections along line A-A of Figure 2 and illustrate the formation of the dispensing aperture and corresponding deformation of the filter;

Figure 5 shows in isolation an alternative filter in accordance with the present invention.

Detailed Description

[0014] Figure 1 shows, schematically, the top of a "stay tab" drinks can 10 provided with a pre-formed tear line 13 which is a line of mechanical weakness defining a dispensing aperture. As is conventional, leveraging of a ring pull 11 about a pivot point, where the ring pull is attached to the can by a rivet 12, will cause the pre-formed tearline to tear, thereby forming the dispensing aperture. That portion of the can corresponding to the dispensing aperture is bent inside the can.

[0015] Figure 2 shows, schematically, the top of a "stay tab" drinks can 10 in accordance with the present invention and after formation of a dispensing aperture 20. The can is provided inside with a filter 21 composed of a contiguous layer of flexible, plastic material and which is attached to the underside of the top of the can by a patch of adhesive 22. Part of the filter, visible through the dispensing aperture, allows egress of fluid from the can whilst preventing ingress of contaminants such as insects.

[0016] For clarity, the filter 21 is shown in isolation in Figure 3.

[0017] The filter 21 comprises, in accordance with the first aspect of the present invention, a safety portion 34 of a size and shape which, should the filter become detached from the inside of the can 10, makes it impossible for the filter to fall through the can's dispensing aperture 20. The safety portion coincides with the portion of the filter attached to the can by the patch of adhesive 22 and has a circular profile on one side corresponding to the shape of the can.

[0018] The filter 21 is also provided with an area having a narrow cross section 35 which renders the filter readily deformable so as to accommodate the initial bending inside the can of the portion of the can corresponding to the dispensing aperture.

[0019] Furthermore and in accordance with the second aspect of the present invention, the filter 21 is provided with two limbs 30, 31 located adjacent the dispensing aperture 20. The largest limb comprises apertures 32 which allow egress of fluid through the dispensing aperture via the apertures. Although the smaller limb 31 has no such apertures, additional egress of fluid through the dispensing aperture occurs via the channel defined by the two limbs. Of course, the smaller limb could also have such apertures.

[0020] Multiple limbs make it easier for the filter 21 to deform from an initial configuration adjacent the dispensing aperture 20 away from the dispensing aperture to accommodate the initial bending inside the can 10 of the portion of the can corresponding to the dispensing aperture. Multiple limbs also make it easier for the filter 21 to pass over the portion of the can corresponding to the dispensing aperture during the return from its deformed state to Its Initial configuration. This process Is described in more detail below with reference to Figures 4a to 4e.

[0021] Figures 4a to 4e are each a section A-A (shown in Figure 2) of the drinks can 10 at various stages of formation of the dispensing aperture 20.

[0022] Referring to Figure 4a, a section of the top of the can 10 is shown with the pre-formed tearline 13 defining the dispensing aperture 20. Figure 4a shows the can prior to formation of the dispensing aperture when the pull ring 11 has not been retracted and instead lies parallel to the plane of the top of the can together with the planar filter 34, 31, 30 including its two limbs 31, 30.

[0023] Referring to Figure 4b, the can 10 is shown with after the pull ring 11 has been initially retracted, thereby cause the pre-formed tearline 13 to tear, and causing that part of the can 40 corresponding to the dispensing aperture 20 to be bent inside the can. This deformation of the can in turn deforms the two limbs 30, 31 of the filter.

[0024] Figure 4c shows the can 10 in a position where the pull ring 11 has been retracted approximately 90º. The part of the can 40 corresponding to the dispensing aperture 20 has corresponding bent approximately 90º.

however, it is evident that the resilience of the filter 21 and, in particular, that of the larger limb 30 is beginning to cause the filter to pass over that part of the can 40 bent Inside.

[0025] Referring to Figure 4d, the can is showed in a position where the pull ring 11 and the part of the can 40 corresponding to the dispensing aperture 20 has been retracted beyond 90º. The larger limb 30 has passed over the part of the can 40 corresponding to the dispensing aperture 20 but is being constrained from returning to its initial configuration adjacent the dispensing aperture by the smaller limb 31 which has yet to do so.

[0026] Further retraction of the pull ring 11 as shown in Figure 4e results in both limbs 30, 31 passing over the part of the can 40 corresponding to the dispensing aperture 20 and the filter 21, returning to its initial configuration where, with the dispensing aperture 20 formed, it allows egress of fluid from the can 10 whilst preventing ingress of contaminants such as insects.

[0027] In the above example, the filter has two limbs 30,31 which extend from the same side across the area corresponding to the dispensing aperture 20. However, this need not be the case. Figure 5 shows an example of an alternative filter 50 according to the present invention which has limbs 51, 52 which extent from opposing sides of the area corresponding to the dispensing aperture.

Claims

1. A container (10) comprising a portion with a preformed tear line (13) corresponding to a dispensing aperture (20) and which will tear with appropriate mechanical manipulation, thereby forming a dispensing aperture such that the container portion (40) corresponding to the dispensing aperture is bent inside the container (10); and a filter (21) attached to the inside of the container and located at least partly adjacent the dispensing aperture such that the filter allows egress of fluid from the container through the dispensing aperture whilst preventing ingress of at least some contaminants, wherein the filter comprising a safety portion (34) of a size and/or shape which, should the filter become detached from the inside of the container, makes it impossible for the filter to fall through the dispensing aperture of the container.

2. A container (10) as claimed in claim 1 wherein the safety portion (34) has at least two perpendicular dimensions which exceed any dimension of the dispensing aperture.

3. A container (10) as claimed in claim 1 or claim 2 wherein the safety portion (34) coincides with the portion of the filter attached to the container.

4. A container (10) as claimed in any of the preceding claims wherein the filter (21) is composed of a contiguous layer of resilient material including the safety portion (34).

5. A container (10) as claimed in any of the preceding claims wherein at least part of the profile of safety portion (34) corresponds to the shape of the container.

6. A container (10) as claimed in any of the preceding claims wherein the filter (21) is resilient so as to first deform during forming of the dispensing aperture (20) from an initial configuration adjacent the dispensing aperture to accommodate the initial bending inside the container of the container portion (40) corresponding to the dispensing aperture, and subsequently to return to its initial configuration.

7. A container (10) comprising a portion with a preformed tear line (13) corresponding to a dispensing aperture (20) and which Will tear with appropriate mechanical manipulation, thereby forming a dispensing aperture such that the container portion (40) corresponding to the dispensing aperture is bent inside the container; and a filter (21) attached to the inside of the container and located at least partly adjacent the dispensing aperture such that the filter allows egress of fluid from the container through the dispensing aperture whilst preventing ingress of at least some contaminants, wherein the filter is resilient so as to first deform during forming of the dispensing aperture from an initial configuration adjacent the dispensing aperture to accommodate the initial bending inside the container of the container portion corresponding to the dispensing aperture, and subsequently to return to its initial configuration; and wherein the filter comprises at least two limbs (30, 31) which may deform, at least to some extent, independently so to assist the filter in returning to its initial configuration.

8. A container (10) according to claim 7 wherein the initial configuration of the filter (21) is planar.

9. A container (10) according to claim 8 wherein, during forming of the dispensing aperture (20), one limb (30) deforms more than another limb (31) from the plane defined by the initial configuration of the filter (21).

10. A container (10) according to any of claims 7 to 9 wherein at least one limb (31) does not allow egress of fluid through that limb.

11. A container (10) according to any of claims 7 to 10 wherein at least two limbs (30,31) define a channel adjacent the dispensing aperture (20) and through which fluid may egress from the container.

12. A filter (21) of a container (10) according to any of the preceding claims.

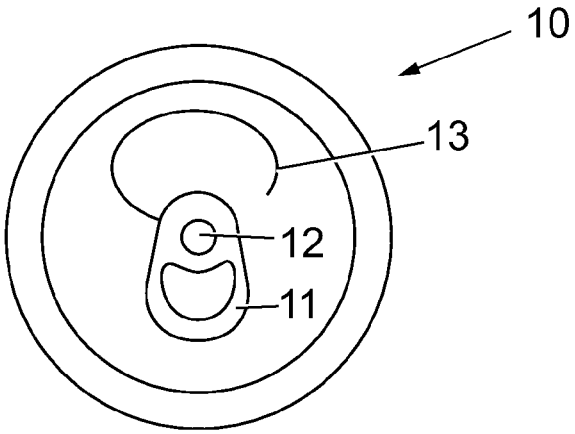

Fig. 1

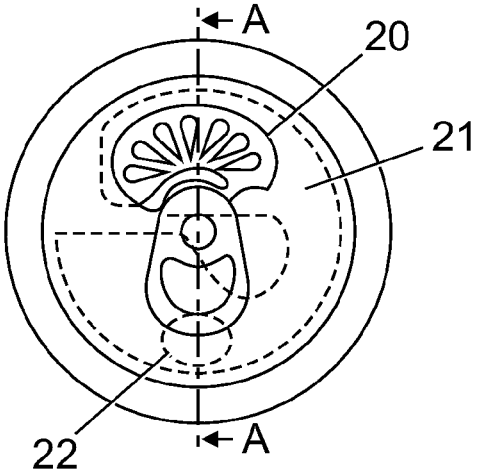

Fig. 2

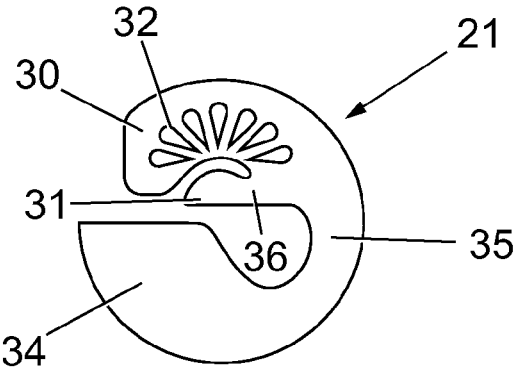

Fig. 3

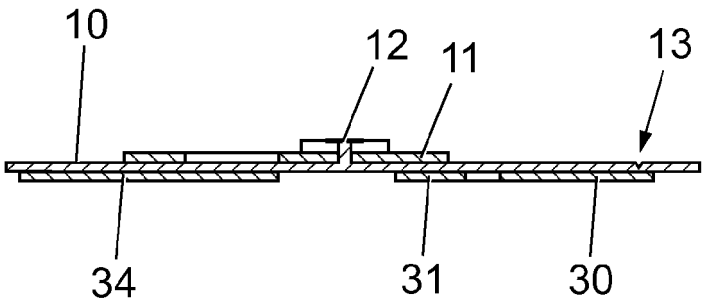

Fig. 4a

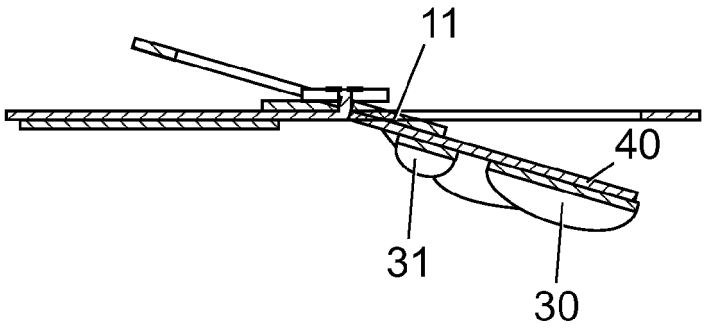

Fig. 4b

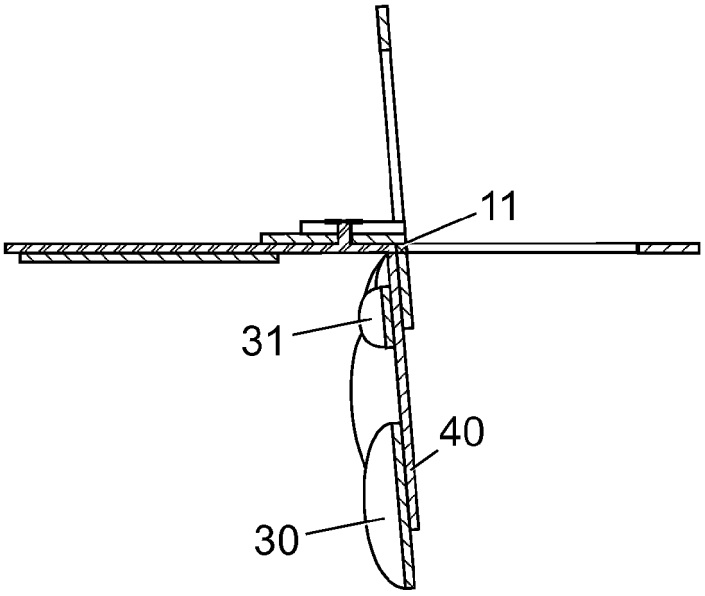

Fig. 4c

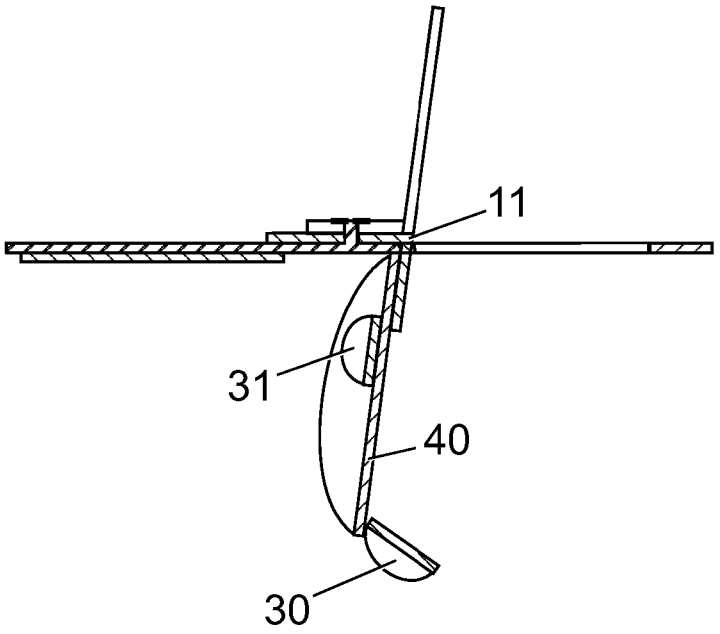

Fig. 4d

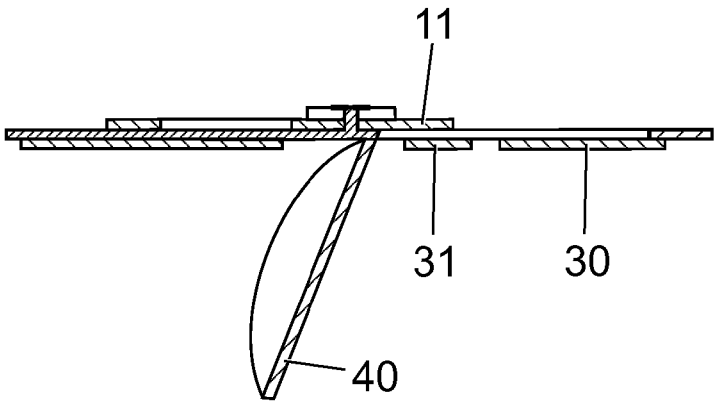

Fig. 4e

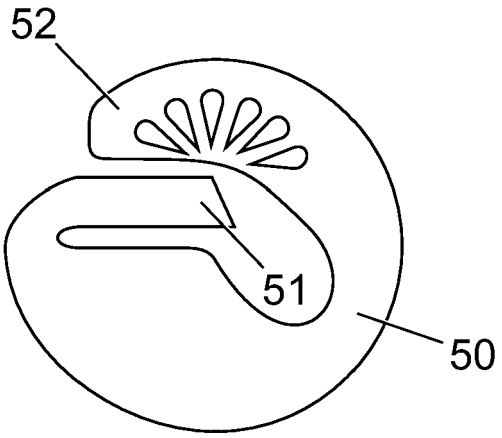

Fig. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 25 0721

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A	* figure 10 *	7-11	

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A	* figure 1 *	7-11	

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A	* figure 9 *	7-11	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 July 2008	Jervelund, Niels

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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