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(54) **Tin lid**

(57) The invention relates to a lid for a sheet metal container, which lid comprises:

- a sheet metal body;
- a score line (5) substantially arranged along the periphery of the sheet metal body and defining a tear-

out part;

- a tab (4) attached to the tear-out part of the sheet metal body; and
- a furrow (6) arranged in the tear-out part of the sheet metal body adjacent to the score line.

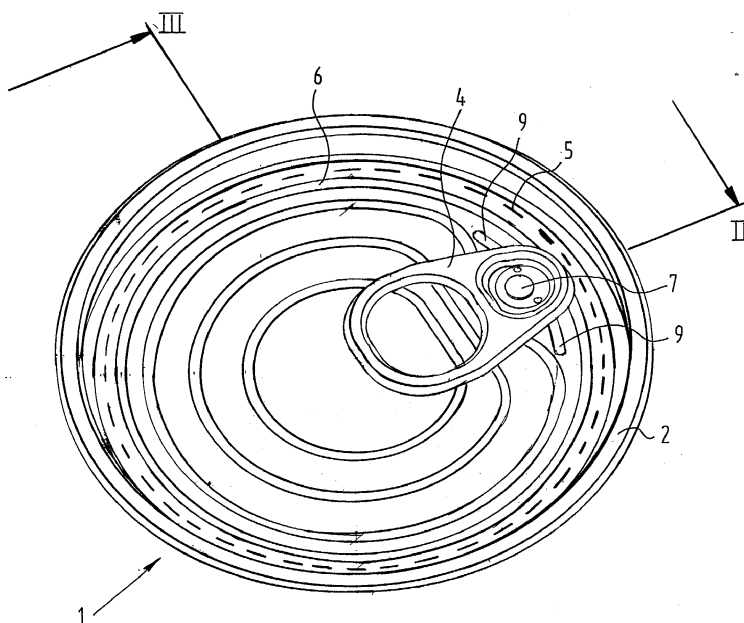


FIG. 1

EP 1 577 222 A1

Description

[0001] The invention relates to a lid for a sheet metal container, which lid comprises:

- a sheet metal body;
- a score line substantially arranged along the periphery of the sheet metal body and defining a tear-out part;
- a tab attached to the tear-out part of the sheet metal body.

[0002] Such lids are widely used for containers for foodstuff. Such containers are filled with the foodstuff and a lid according to the preamble is attached to the container, for example by seaming. Afterwards the containers are sterilized. With this sterilizing the containers are subjected to a heat treatment and afterwards cooled off. During the heat treatment the gasses inside of the container expand subjecting the container to an over pressure. When this pressure gets too high a so called peaking effect arises, which may breakes the score line resulting in a leaking container. The peaking effect is that a part of the lid is permanently deformed. Due to this deformation the container cannot be sold anymore, but also this peaking jeopardizes the airtightness of the score line.

[0003] In order to avoid peaking the lid should have a minimum thickness. This thickness depends on the material used.

[0004] As these containers are manufactured in large numbers a small reduction in material costs could save a substantial amount of money.

[0005] Therefore it is an object of the invention to provide a lid, which can better resist peaking.

[0006] This object is achieved with a lid according to the invention, which is characterized by a furrow arranged in the tear-out part of the sheet metal body at least partially adjacent to the score line.

[0007] This furrow provides an increased stiffness of the lid near the score line, such that the peaking effect is suppressed.

[0008] The extra stiffness of the furrow has a further advantage when opening the lid by pulling up the tab, such that part of the score line is broken. Due to the increased stiffness around the score line a consumer can generate with a tab a larger tear in the score line, which reduces the energy necessary to pull out the complete tear-out part of the lid.

[0009] In a preferred embodiment the lid comprises two additional furrows arranged adjacent to the tab. This furthermore increases the strength of the lid and provides better opening properties.

[0010] In another preferred embodiment of the lid according to the invention the furrow is parallel to the score line. This provides for a constant stiffness along the score line.

[0011] In yet another preferred embodiment of the lid

according to the invention the distance of the centerline of the furrow to the score line is in range of 0.75-2 times preferably 1 time, the width of the furrow.

[0012] If the furrow is too close to the score line, the score line can be damaged when providing a furrow into the lid after the score line has been manufactured. If the furrow is too distanced from the score line the contribution of the furrow to the stiffness is low.

[0013] In yet another embodiment of the lid according to the invention the sheet metal body comprises a curled edge for seaming to a container.

[0014] Preferably the tear-out part of the lid according to the invention comprises at least one recessed part. If more recessed parts are provided it is preferred to have the recessed parts terraced. These recessed parts provide additional stiffness to the lid, which is mostly of importance to the appearance of containers having such a lid. If the inside atmosphere of the container is under pressure, the lid would have the tendency to become convex. For a consumer this is not attractive.

[0015] The invention furthermore relates to a container comprising:

- a bottom part;
- an upstanding wall arranged along the periphery of the bottom part; and
- a lid according to any of the preceding claims arranged to the upper edge of the upstanding wall.

[0016] Preferably the lid is seamed to the upstanding wall.

[0017] These and other advantages of the invention will be elucidated in conjunction of the accompanying drawings.

[0018] Figure 1 shows a perspective view of an embodiment of a lid according to the invention.

[0019] Figure 2A shows a cross-sectional view along the line II of figure 1.

[0020] Figure 2B shows a detail of the cross-sectional view of figure 2A.

[0021] Figure 3 shows a cross-sectional view along the line III of figure 1.

[0022] Figure 1 shows a lid 1 according to the invention. This lid is made of sheet metal. The lid 1 has an edge part 2 and a center part 3. The center part 3 comprises a number of recesses, which are terraced. The center part 3 can be teared out by pulling the tab 4. The center part 3 is defined by the score line 5. Parallel to this score line 5 a furrow 6 is arranged, which provides additional stiffness in the tear part adjacent to the score line.

[0023] In this embodiment the furrow is arranged along the complete length of the score line, for example in the region of the tab.

[0024] The center part 3 has on either side of the tab an additional furrow 9. These two furrows 9 extend substantially perpendicular to the longitudinal direction of the tab 4. The furrows 9 are located between the rivet 7

and the score line 5 and provide additional stiffness to the part which is pushed open with the tab 4.

[0025] Figure 2A shows a cross-sectional view along the line II of figure 1. Figure 2B shows a detail of figure 2A. The tab 4 is attached to the lid 1 by a rivet 7 formed out of the sheet metal body of the lid 1. The tab 4 ends just before the score line 5. So when the tab 4 is lifted the end of the tab 4 will press just besides score line 5 in order to brake this score line. The furrow 6 provides for additional stiffness such that the tearing open of the score line is made easier. The edge 2 of the lid 1 is curved such that it could be seamed to a conventional container.

[0026] Figure 3 shows a cross-sectional view along the line III of figure 1. The furrow 6 is also present in this cross-sectional view and has the same depth in this embodiment as the part shown in figure 2A. This furrow 6 extends along the complete periphery of the lid 1. In figure 3 a first recessed part 8 is further shown.

[0027] The depth of the furrow 6 can also be varied along its length in order to adjust the tear-out-properties of the center part 3.

cessed part.

7. A lid according to claim 6, wherein recessed parts are terraced.
8. A lid according to claim 6 or 7, wherein at least one recessed part is non-circular.
9. Container comprising:
 - a bottom part;
 - an upstanding wall arranged along the periphery of the bottom part; and
 - a lid according to any of the preceding claims arranged to the upper edge of the upstanding wall.
10. Container according to claim 9, wherein the lid is seamed to the upstanding wall.

Claims

1. A lid for a sheet metal container, which lid comprises:

- a sheet metal body;
- a score line substantially arranged along the periphery of the sheet metal body and defining a tear-out part;
- a tab attached to the tear-out part of the sheet metal body;

characterized by

- a furrow arranged in the tear-out part of the sheet metal body adjacent to the score line.
2. A lid according to claim 1, comprising at least two additional furrows arranged on sides of the tab.
 3. A lid according to claim 1 or 2, wherein the furrow is parallel to the score line.
 4. A lid according to claim 3, wherein the distance of the centerline of the furrow to the score line is in the range of 0.75 - 2 times, preferably 1 time, the width of the furrow.
 5. A lid according to any of the preceding claims, wherein the sheet metal body comprises a curled edge for seaming to a container.
 6. A lid according to any of the preceding claims, wherein the tear-out part comprises at least one re-

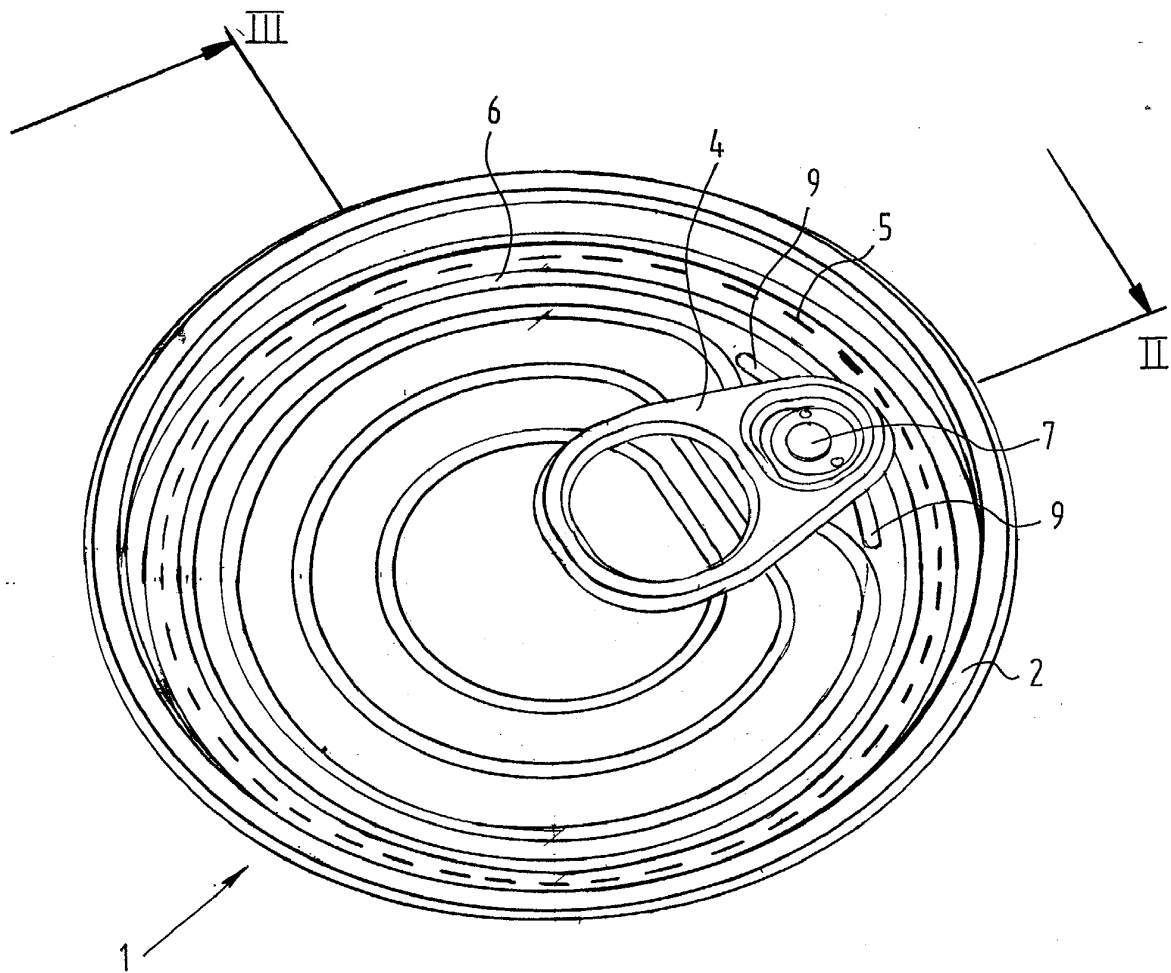


FIG. 1

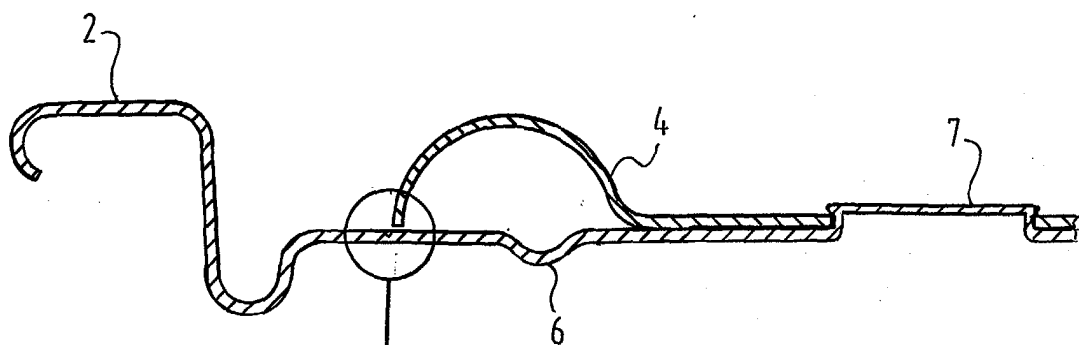


FIG. 2A

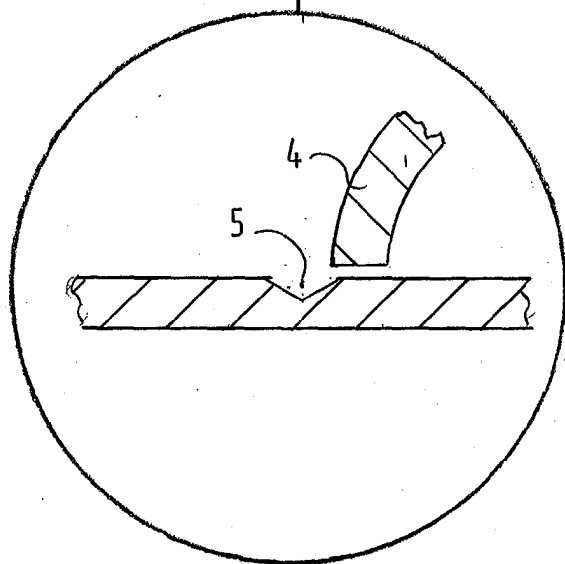


FIG. 2B

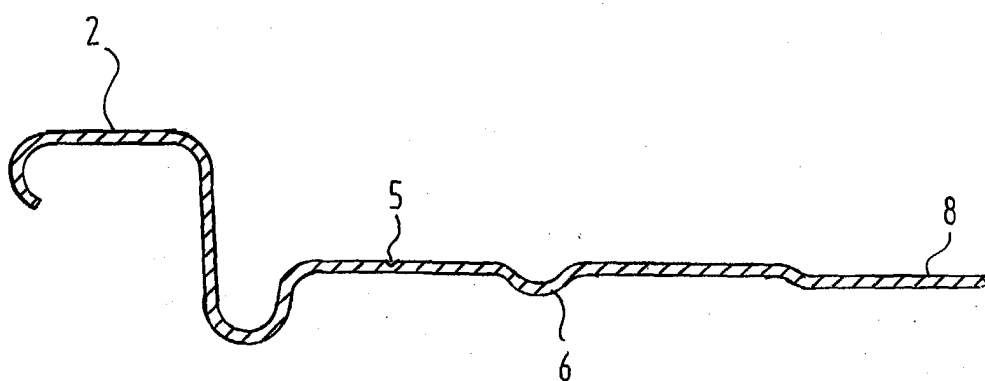


FIG. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 04 07 5710

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Y	* page 2, column 2, line 29 - page 3, column 1, line 7; figures 1-3 *	7,8	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 July 2004	Examiner Appelt, L
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P4/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 04 07 5710

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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