(19) DANMARK

(10) DK/EP 3257773 T3

Patent- og Varemærkestyrelsen

(12) Oversættelse af europæisk patentskrift

(51) Int.Cl.: *B 65 D 17/00 (2006.01)*

(45) Oversættelsen bekendtgjort den: **2019-05-27**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2019-02-20**

(86) Europæisk ansøgning nr.: **16174769.6**

(86) Europæisk indleveringsdag: **2016-06-16**

(87) Den europæiske ansøgnings publiceringsdag: **2017-12-20**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

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(54) Benævnelse: **Låg til en rund aflang dåse og en rund aflang dåse forsynet med et sådant låg**

(56) Fremdragne publikationer:
EP-A1- 3 028 952
US-A- 4 593 834
US-A- 4 767 020

DESCRIPTION

[0001] The present invention relates to a lid for a rounded oblong can, and to a rounded oblong can provided with such lid.

[0002] Such rounded oblong can are used for some time for a wide range of different products. The cans have normally little depth and the rounded corners or ends make the product contained in the can, easily removable after opening the can. Such marketed cans are of the types called Club, Dingley, Hansa, Large Hansa, and the like. The products include fish, such a herring and cod filets and other filling goods. The content of the can is easily taken from the can by removing a releasable lid portion than can be fully torn off, and practically substantially most of the entire area what normally constitutes the lid is removed and substantially the entire can body opening becomes exposed to the user.

[0003] The can is closed by its lid. The lid is provided with the releasable lid portion enclosed by a closed score line. The can is opened using a tab connected to the releasable lid portion. The tab is tilted by the user, whereby a tab nose presses on the score line which breaks open under the tab pressure. Further lifting the tab will result in forming an opening with the releasable lid portion being torn apart along the breaking score line. The score line breaks initially along the proximal rounded lid section near the tab. Subsequently the score line breaks along both longitudinal straight sides, and finally along the distal rounded lid section. Ultimately, the releasable lid portion is released at the most distal part of the score line generally functioning as a hinge. This means that lid portion is released after a to and fro movement of the releasable lid portion.

[0004] US 1,593,834 discloses a rounded oblong can provided with a lid according to the preamble of claim 1. GB1207769, and US 4,767,020 also disclose a rounded oblong can of the type described above having rounded ends. The can, such as of the Hansa format, comprises a lid which is seamed with its folded or curved edge to a curled rim of the container body. This curved lid edge forms the contour of the lid. The lid has a proximal rounded lid section, a distal rounded lid section, and an intermediate straight lid section between the two rounded lid sections, and comprising a releasable lid portion enclosed by a closed score line, which lid is to be torn-open along the score line and to be released by breaking off from a remaining lid portion after finger gripping, tilting and lifting of a tab connected via a tab connection to the releasable lid portion, and stiffening means to stiffen the releasable lid portion during the tearing open action and the release action. In the proximal rounded lid section the score line does not follow the contour of the lid. Here, starting from the initial breaking area, the score line diverges along a straight line towards the intermediate lid section, from where the score line continues following the contour of the intermediate straight lid section. This diverging straight line shape of the score line allows for an easy breaking and opening of the lid and release of the releasable lid portion. But removal of the releasable lid portion still the content of the can is still cover by the remaining lid portion, which content is more difficult to remove or even separate of the content of the can. The present invention has for its object to substantially

overcome this drawback and make substantial full exposure of the content of the can possible. This requires that in the proximal rounded lid section the score line should be torn alone a curved or rounded score line following the rounded contour of the lid. This tearing action of the curved score line should substantially concomitantly take place along both sides of the can.

[0005] As mentioned above the can may also be of the Club type, being rectangular with rounded corners, and in one of the corners the opening tab is arranged, or from the Dingley type, being rectangular with the tab arranged in the middle of one of the smaller sides, or an oval can with the tab arranged in one of the sharper corners of the oval.

[0006] Moreover, the tearing action of the straight score line in the intermediate lid portion should start at the same time at the transition from the curved score line into the straight score line. Otherwise, the releasable lid portion which is broken off, will take an askew shape while the tearing off force is not directed along the longitudinal axis of the oblong can. This make the opening action instable whereby the horizontal position of the can is unbalanced, with a high risk of sidewise tilting the container and loss of content. The invention also has for its object to substantially avoid the instable opening action at the transition of the rounded score line into the straight score line, so that the tearing action proceeds substantially at the same time along both sides of the intermediate straight lid portion.

[0007] Finally, with the score line tearing action approaching and continuing in the distal rounded lid portion, the tearing action should proceed at both sides substantially at the same time and should stop when the score line is torn up to a score line hinge section. As from this point the releasable portion is removed by the to and fro movement whereby the score line fails and breaks off over the length of the score line hinge section.

[0008] The tearing actions of the score line at both sides of the lid, which score line is first curved, then straight and subsequently again curved results in the formation of torn off releasable portion having an oblong form. This oblong form which is partly longitudinally curved will have a blade spring action, if broken off in an uncontrolled manner. This may result in contact between the spring loaded broken off released lid portion and the content of the can, leading to scoping and spoiling of content. Possibly, the uncontrolled spring action may also result in injuries of the user. Thus, the broken off releasable portion should be less curved whereby the blade spring action is reduced and is to be released in a controlled manner when the score line is torn at both sides up to the score line hinge section. This controlled tearing of the score line and release of the releasable lid portion is an object of the present invention.

[0009] Accordingly, the present invention has for its object to provide a lid for a rounded oblong can which avoids the above mentioned drawbacks and allows for a controlled and easy opening and release of the releasable lid portion, thereby making the entire content easily available to the user. This object is obtained with a lid according to claim 1.

[0010] The present invention is based on the insight that the tearing action of the score line can be controlled in the curved section in the proximal rounded lid section, the straight section

in the straight intermediate lid section, and in the curved section in the distal rounded lid section, by provided the score line in these lid sections with an adapted dimensions, namely at least an adapted residual thickness.

[0011] The residual thickness in the proximal lid section is the smallest and 110 ± 10µm, which smaller residual thickness benefits the easy popping and subsequent tearing of the score line in this area of the lid. In the intermediate lid section the residual thickness is 125 ± 10µm, which greater residual thickness guarantees an even progression of force and tearing, so that an uncontrolled tearing is inhibited. In the distal rounded lid portion the residual thickness is slightly smaller and 120 ± 10µm. The residual thickness is slightly smaller than in the previous intermediate lid section, because due to the polygonal shape the areas to be torn are smaller and thereby easier to tear. Moreover, tension in the distal rounded lid portion is inhibited. Finally, in the hinge section the residual thickness slightly greater and is 125 ± 10µm, whereby the residual thickness is again increased in the area to the broken off. This results in a noticeable increase of force inhibiting a undesired complete breaking off, and therewith an undesired backward spring movement. The hinge section is broken off, and the releasable lid portion broken off, by a to and for movement substantially perpendicular to the score line. This way the releasable lid portion is stepwise removed, and the can completely opened, resulting in a easy removal of the releasable lid portion at a low risk for back spring action and content spoiling.

[0012] Preferably, the score line has in cross section a substantially trapeze shape , with an angle between the trapeze side walls in the range of 30° - 70°, preferable 40° - 6o°, such as 50°. Thereby, the tearing action of the score line is further improved, and the wedge shape is very similar to the common triangular shape, and the specific angle changes the structure of the material.

[0013] Preferably, the score face width of the score line is in the range of 0,03-0,07mm, so that when scoring the lid material with the relatively flat tool form, damage to the metal in the form of cracks and damage of possible coating or lacquer, leading to delamination and corrosion is avoided.

[0014] Preferably, the intermediate straight lid section comprises elongated beads extending along the straight score line at both sides of the intermediate straight lid section, until in the distal rounded lid section. Accordingly, the releasable lid portion is stiffer so that when tearing the score line by pulling the tab, less force is used for deforming the releasable lid portion and more force is available for tearing the score line. Thus, less force is required for opening the can. Moreover, the stiffer intermediate portion of the releasable lid portion will avoid curving the releasable lid portion and desirably reduce the spring blade action.

[0015] In the distal rounded lid section the score line has the form of a polygon with at least two polygonal chords at each side of the longitudinal axis of the lid, and preferably with at least three polygonal chords. Such polygonal chords will assist in the tearing actions to take place substantially at the same time at both sides of the lid contour and retards and ultimately stops

the breaking action when arriving at the score line hinge section.

[0016] As mentioned hereinbefore it is desirable to have full access to the content of the can after breaking off the releasable lid portion. It is possible with the adapted score line of the invention, so that preferable in the proximal rounded lid section the score line extends along the contour of the lid.

[0017] According to the invention the score line will follow the contour of the lid in the proximal rounded lid section. Here the initial breaking and opening the score line is advantageously further improved by incorporating stiffening means in the proximal rounded lid section comprise a transverse bead extending over the width of the releasable lid portion and beneath a rear tab part, and is provided with a finger access, and/or the releasable lid portion comprises beads extending between the transverse bead and the tab connection at both sides of the longitudinal axis. In the alternative, the releasable lid portion comprises in the proximal round lid section elongated beads arranged lateral of the tab connection at an angle with the longitudinal axis, and a curved bead partially encircling a rear portion of the tab connection. In this respect it is preferred that the angle with the longitudinal axis is in the range of 30° to 70°, preferably 40° to 60°, such as 50°, so that stiffness in this area is improved facilitating the mounting of the rivet or tab, and initial popping of the score line.

[0018] In addition, and in the alternative the stiffness of the proximal rounded led section is improved and the related advantages obtained if preferably the releasable lid portion comprises at the rear side of the tab connection a horseshoe shaped stiffening element of which horseshoe legs extend until lateral of the tab connection, and preferably a stiffening beads extends across and beyond the horseshoe legs traverse of the longitudinal axis.

[0019] Finally, the present invention also related to a rounded oblong container with a rounded end or a rectangular can with rounded corners, such as a Hansa, Large Hansa, Dingley or Club type of container, provided with a lid as described above and claimed according to any of the claims 1-11.

[0020] Mentioned and other preferences and advantages of the present invention will be apparent from the following description of several embodiments of the lid and can of the invention, which embodiments are given for illustrative purposes without limiting the invention there to, and making reference to the following drawings, wherein:

Figure 1 is a top view of a rounded oblong lid according to the invention;

Figure 2 is a cross section along the line II-II and arrows of the lid illustrated in figure 1;

Figure 3 is a top view of a part of the rounded oblong lid shown in figure 1 with the tab removed;

Figure 4 at a greater magnification shows a cross section of the score line in the proximal rounded lid section; and

Figure 5 shows an alternative embodiment of the lid illustrated in figure 1 in top view.

[0021] Figure 1 shows a lid (1) according to the invention. The lid (1) comprises a curved edge (2) to be seamed to a rim of a container body of a can of the invention (not shown). The curved edge (2) is connected via a wall (3) to a panel (4). The panel (4) comprises a closed score line (5) enclosing a releasable lid portion (6), and further a remaining lid portion (7).

[0022] The lid (1) comprises a proximal rounded lid portion (8), a distal rounded lid portion (9) and an intermediate lid portion (10). The proximal lid portion (8) comprises a tab (11) comprising a rear tab part (12) having a finger opening (13) and a tab nose (14) extending near or above the score line (5). The tab (11) is connected to the releasable lid portion (6) via a rivet (15) as a separate structural element or formed from the releasable lid (6). In the proximal rounded lid section (8) the score line (5) extends along and close to the contour (16) of the lid (1) formed by the curved edge (2).

[0023] The proximal rounded lid section (8) is provided with a transverse bead (17) extending over the width of the releasable lid portion (6) and is provided with a widened part forming a finger access (18) near and beneath the rear tab part (12). In the area between the transverse bead (17) and the rivet (15) are present lateral beads (19) extending perpendicular to the longitudinal axis (20). This results in a relative stiff proximal rounded lid section (8). Furthermore, elongated lateral beads (21) are at an angle (α) arranged lateral of the rivet (15) of the tab (11). The rear part (22) of the tab connection for the rivet (or opening for the rivet) is partly encircled by a curved (or circular) bead (23). This bead (23) provides stiffness but also provides for additional material when the tab (11) is tilted during the opening action of the lid (1) and the tilting movement with related movement of material results in material tensile of which material failure by breakage is avoided by the presence of the encircling bead (23). The angle (α) of the lateral beads (21) is preferably 42°.

[0024] Figure 4 shows a cross section of the score line (5) in the proximal rounded lid section (8). The score line (5) has a trapeze shape in cross section. The residual thickness is 110±10µm and the angle (β) is 50°. The score face width (25) is between 0.03 - 0.07mm, such as 0.04mm or 0.05mm.

[0025] The intermediate straight lid section (10) comprises two beads (27) extending close and along the straight score line (35) and with a bead part (28) until and into the distal lid portion (9). In the central part of the intermediate straight lid section (10) is positioned a rectangular stiffening element (26). Accordingly, the element (26) and the beads (27) impart the intermediate section with stiffness against bending or curving of the released lid portion thereby reducing spring action of the released lid portion (6).

[0026] In the intermediate straight lid section (10) the score line (35) has a residual thickness of 125±10µm. The increased residual thickness results in a required even progress of force, so

that an uncontrolled progress of tearing is avoided. In the distal rounded lid section (9) the score line (29) has the form of a polygon comprising three polygonal chords (30, 31, 32) at both sides of the lid (1). The polygons terminate in the score line hinge section (33). In the distal lid section (9) are arranges along the longitudinal axis and between the parts (28) of the straight beads (27), three stiffening beads (34). Accordingly, the releasable lid portion (6) is imparted with continuous stiffness although the distal lid portion (8) has a converging rounded form.

[0027] In the distal rounded lid section (9) the score line (29) has a residual thickness of 120±10µm, and the score line hinge section (33) a residual thickness of 125±10µm. Thereby, in the distal rounded lid section, the residual thickness is slightly smaller than in the previous intermediate lid section, because due to the polygonal shape the areas to be torn are smaller and thereby easier to tear. Different from the conditions and requirement for the rounded distal lid section, the residual thickness is again increased in the area to be torn. This results in a noticeable increase of force inhibiting a undesired complete tearing, and therewith an undesired backward spring movement. The hinge section is broken off, and the releasable lid portion removed, by a to and for movement substantially perpendicular to the score line. This way the releasable lid portion is stepwise removed, and the can completely opened, resulting in an easy removal of the releasable lid portion at a low risk for back spring action and content spoiling.

[0028] The opening of the lid (1) of the invention is as follows. Gripping the tab (11) via the finger access (18) at the opening (13) and tilting the rear tab part (12) will result in levered pressure on the score line (5) beneath the tab nose (14) and ultimately in popping open and breaking of the score line (5). This is possible at low user force due to the adapted and selection residual thickness of the score line (5) and the adapted stiffness imparted by the beads (17, 18, 21) and at low breaking risk of the lid near the rivet (15) imparted by the circular bead (23).

[0029] The tearing of the score line along the rounded lid contour (16) proceeds at both sides and the tearing progresses into the straight lid section (10) at almost the same moment at both sides. This is the result of the adapted residual thickness of the score line (35), its adapted dimensions, and the beads (27) alongside the score line (35).

[0030] The score line (35) continues in the distal lid portion (9) in polygonal chords (30-32) of the score line (29) of adapted residual thickness so that breakage of the score line (29) is retarded and at relative low user force. The tearing stops at both ends of the score line hinge section (33).

[0031] The score line hinge section (33) is broken off by to and fro moment of the torn releasable lid portion (6) which has a substantially non-bended shape having reduced blade spring action when the releasable lid portion is ultimately broken off completely.

[0032] Finally, figure 5 shows an alternative embodiment of a lid (36) according to the

invention. The lid (36) comprises a stiffening structure (37) with substantially the form of a horse shoe and extending in the proximal rounded lid section (8) between the rivet (15) or rivet opening and the traverse bead (17) with which the structure (37) coincides with its curved section (38). The legs (39) of the horse shoe structure (37) extend at both sides along the rivet or rivet opening (15), and a transverse bead (40) extends between and beyond the legs (39). The function and properties of the horse shoe structure (37) is similar to that of the beads (19, 21, and 23) of the lid (1) illustrated in figures 1 and 3.

[0033] Although the examples are directed to oblong cans with rounded ends, such as of the Hansa or Large Hansa format and type, it will be apparent to the skilled person that other oblong rounded cans are encompassed, such as rectangular cans with rounded corners of the Club or Dingley type, and of oval shape.

[0034] Finally, the lid and can according to the invention is preferably made of metal, such as aluminium, steel, as well as their alloys and mixtures thereof. The metal may be coated at the inner, outer, or at both sides, dependent on the contents and the intended use.

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US1593834A **[0004]**
- GB1207769A **[0004]**
- US4767020A **[0004]**

Patentkrav

1. Låg (1, 36) til en rund aflang dåse, som har afrundede ender eller afrundede hjørner, såsom en dåse af Hansa-, Large Hansa-, Club- eller Dingley-format, hvilket låg har en proximal afrundet lågsektion (8), en distal afrundet lågsektion (9) og en mellemliggende lige lågsektion (10) imellem de to afrundede lågsektioner og omfatter en udløselig lågdel (6), som er omsluttet af en lukket ridselinje (5), hvilket låg er indrettet til at blive revet op langs ridselinjen og blive frigjort fra en resterende lågdel (7) efter fingerfastgribning, vipning og løftning af en flig (11), som er forbundet ved hjælp af en fligforbindelse (15) med den proximale afrundede lågsektion på den udløselige lågdel, og afstivningsmidler til at afstive den udløselige lågdel under oprivningsvirkningen og frigørelsesbevægelsen, hvorved ridselinjen i den distale afrundede lågsektion har form af en polygon med i det mindste to polygonale korder (30 - 32) ved hver side af lågets langsgående akse, **kendetegnet ved,** at ridselinjen har en resttykkelse på 110 ± 10 µm i den proximale afrundede lågsektion, en resttykkelse på 125 ± 10 µm i den mellemliggende lågsektion, en resttykkelse på 120 ± 10 µm i den distale afrundede lågsektion og en resttykkelse på 125 ± 10 µm i en ridselinjehængselsektion.

2. Låg ifølge krav 1, hvorved ridselinjen (5) har, set i tværsnit, en i alt væsentligt trapezformet form, hvorved en vinkel imellem trapezsidevæggene ligger i intervallet 30° - 70°, fortrinsvis 40° - 60°, såsom 50°.

3. Låg ifølge krav 1 eller 2, hvorved bredden af ridseoverfladen ligger i intervallet fra 0,03 - 0,07 mm.

4. Låg ifølge ethvert af kravene 1 - 3, hvorved den mellemliggende lige lågsektion (10) har aflange vulster (27), som strækker sig langs den lige ridselinje på begge sider af den mellemliggende lige lågsektion frem til den distale afrundede lågsektion.

5. Låg ifølge ethvert af kravene 1 - 4, hvorved ridselinjen i den distale afrundede lågsektion har form af en polygon med i det mindste tre polygonale korder.

6. Låg ifølge ethvert af kravene 1 - 5, hvorved ridselinjen (5) i den proximale afrundede lågsektion (8) strækker sig langs lågets kontur.

7. Låg ifølge krav 1 - 6, hvorved afstivningsmidlerne i den proximale afrundede lågsektion (8) har en tværgående vulst (17), som strækker sig over bredden af den udløselige lågdel (6) og under en bageste fligdel (12) og er forsynet med en fingerindgang (18).

8. Låg ifølge ethvert af kravene 1 - 7, hvorved den udløselige lågdel (6n) har vulster (19), som strækker sig imellem den tværgående vulst (17) og fligforbindelsen (15) på begge sider af og vinkelret på den langsgående akse.

9. Låg ifølge ethvert af kravene 1 - 8, hvorved den udløselige lågdel (6) i den proximale afrundede lågsektion har aflange vulster (21), som er anbragt lateralt i forhold til fligforbindelsen og danner en vinkel (α) med den langsgående akse og en bueformet vulst (23), som delvis omslutter en bageste del (22) af fligforbindelsen.

10. Låg ifølge krav 9, hvorved vinklen med den langsgående akse ligger i intervallet fra 30° til 70°, fortrinsvis 40° til 60°, såsom på 50°.

11. Låg ifølge ethvert af kravene 1 - 9, hvorved den udløselige lågdel (6) ved den bageste side (22) af fligforbindelsen har et hesteskoformet afstivningselement (37), hvis hesteskoben (39) strækker sig frem til siden af fligforbindelsen, og fortrinsvis en afstivningsvulst (40) strækker sig på tværs af og ud over hesteskobenene på tværs af den langsgående akse.

12. Rund aflang beholder, såsom en Hansa-, Large Hansa-, Club eller Dingley-beholder, forsynet med et låg ifølge ethvert af kravene 1 - 11.

DRAWINGS

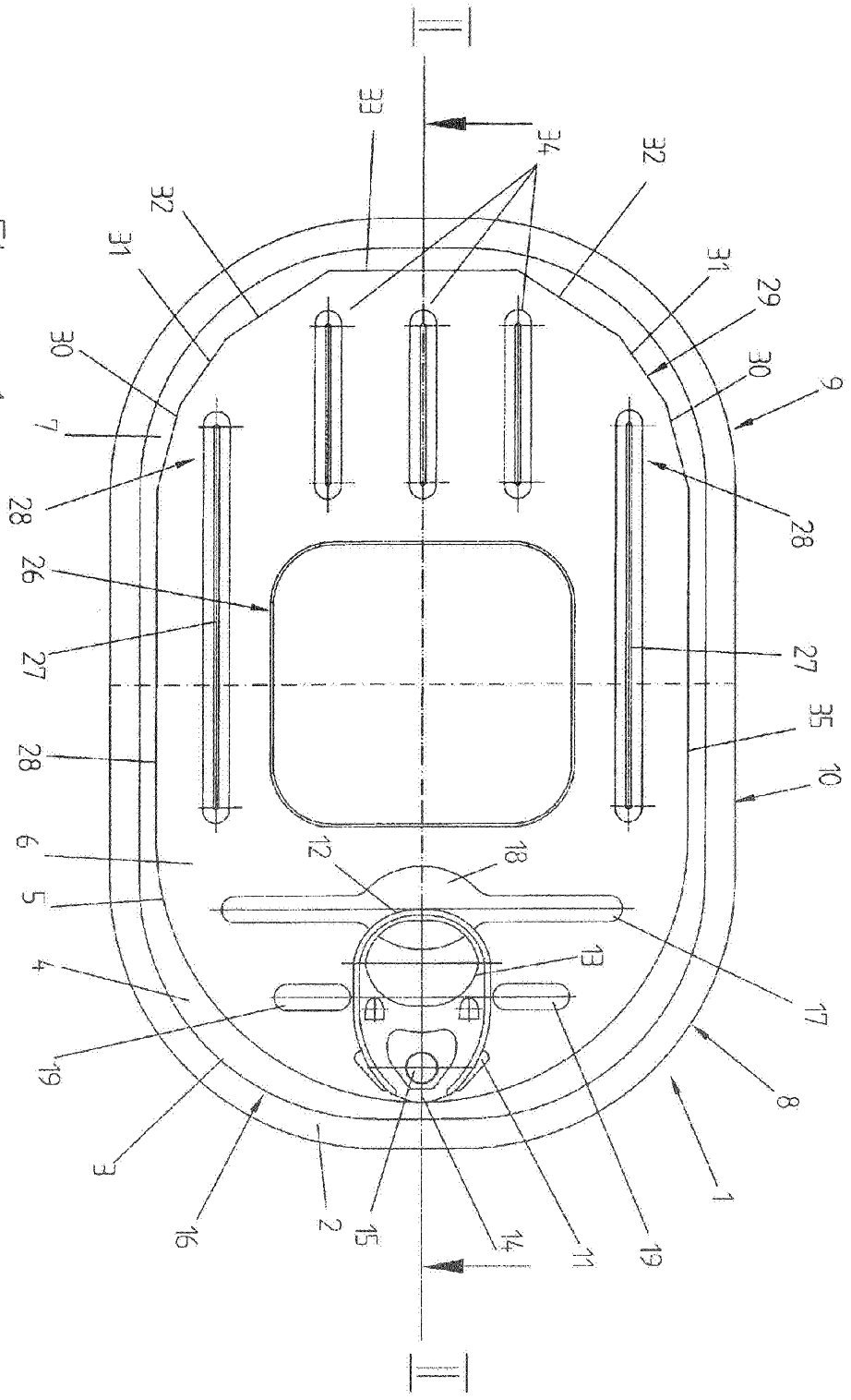


Figure 1

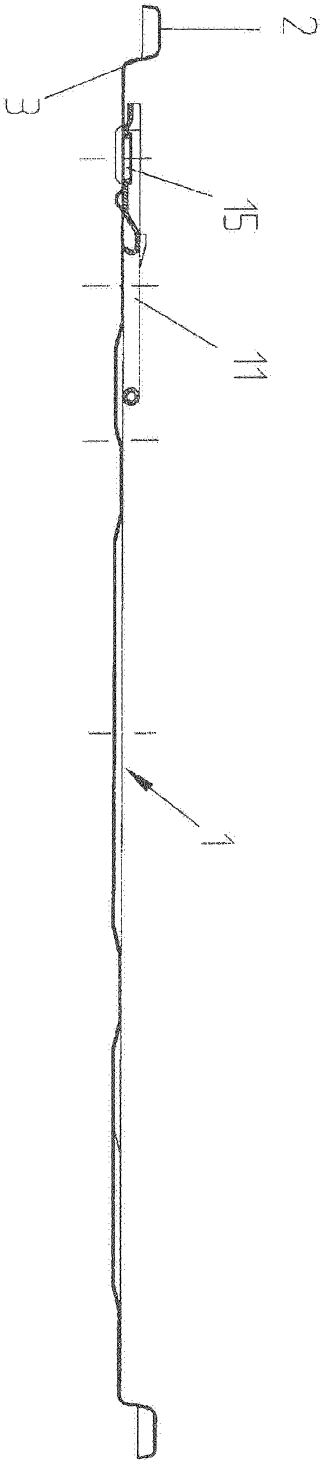


Figure 2

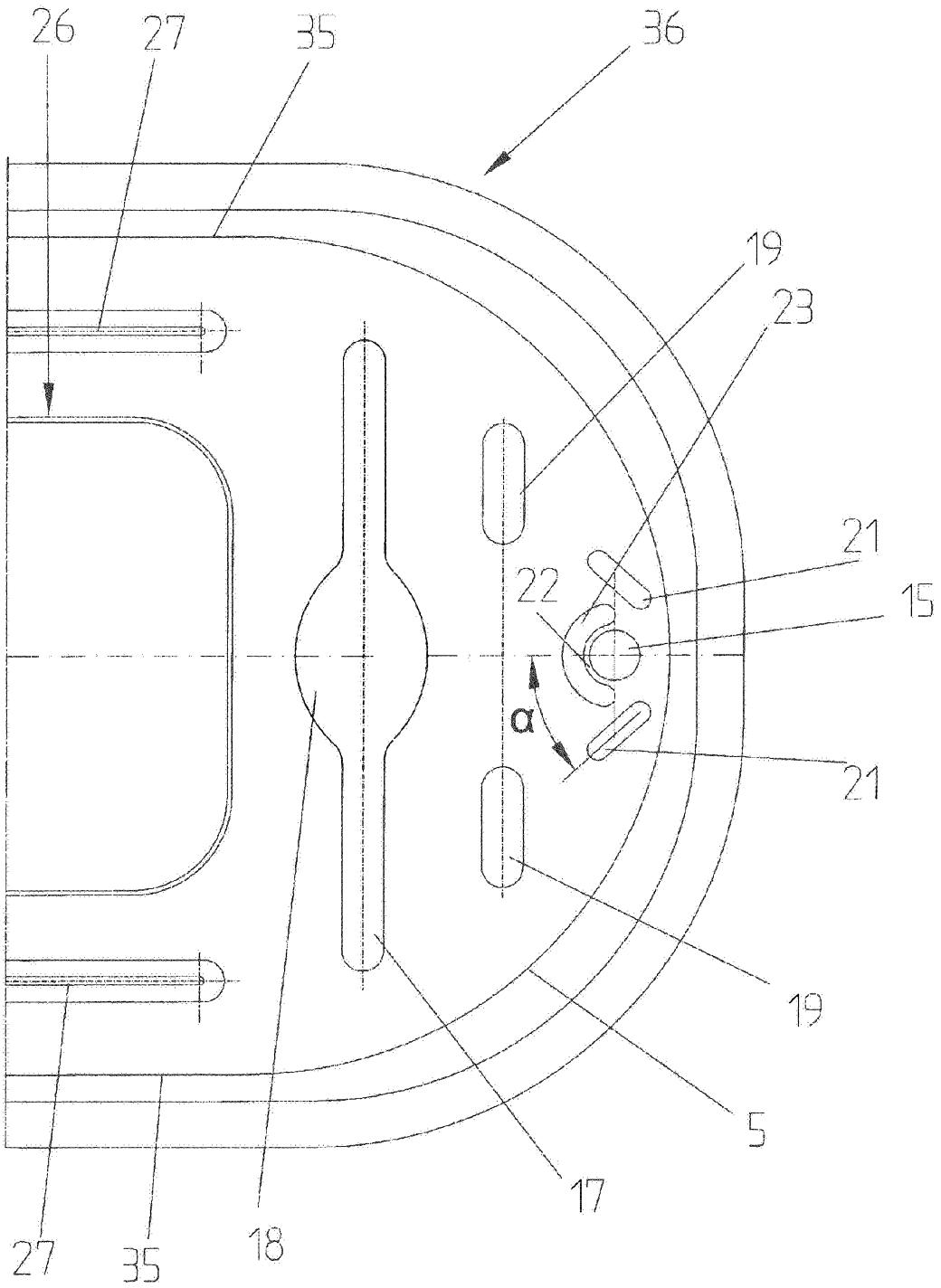
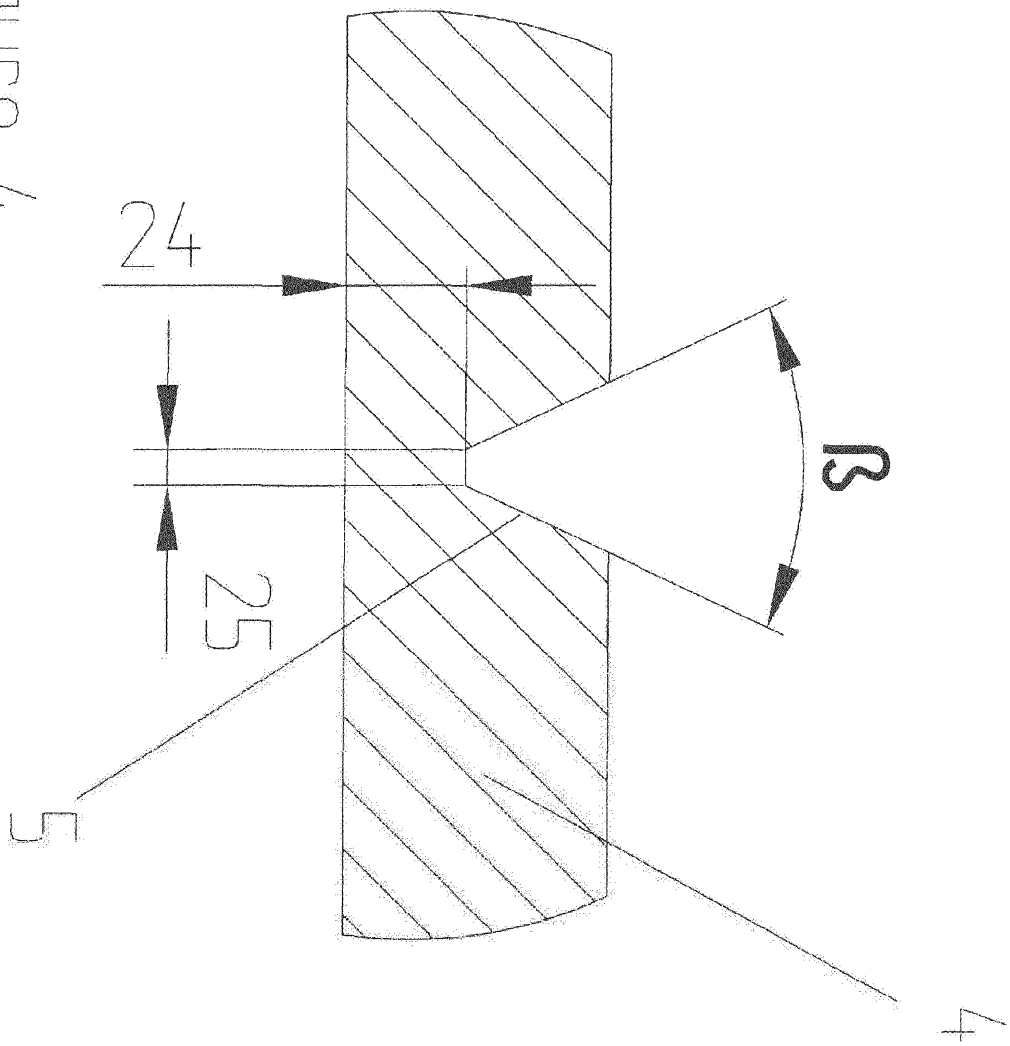


Figure 3

Figure 4



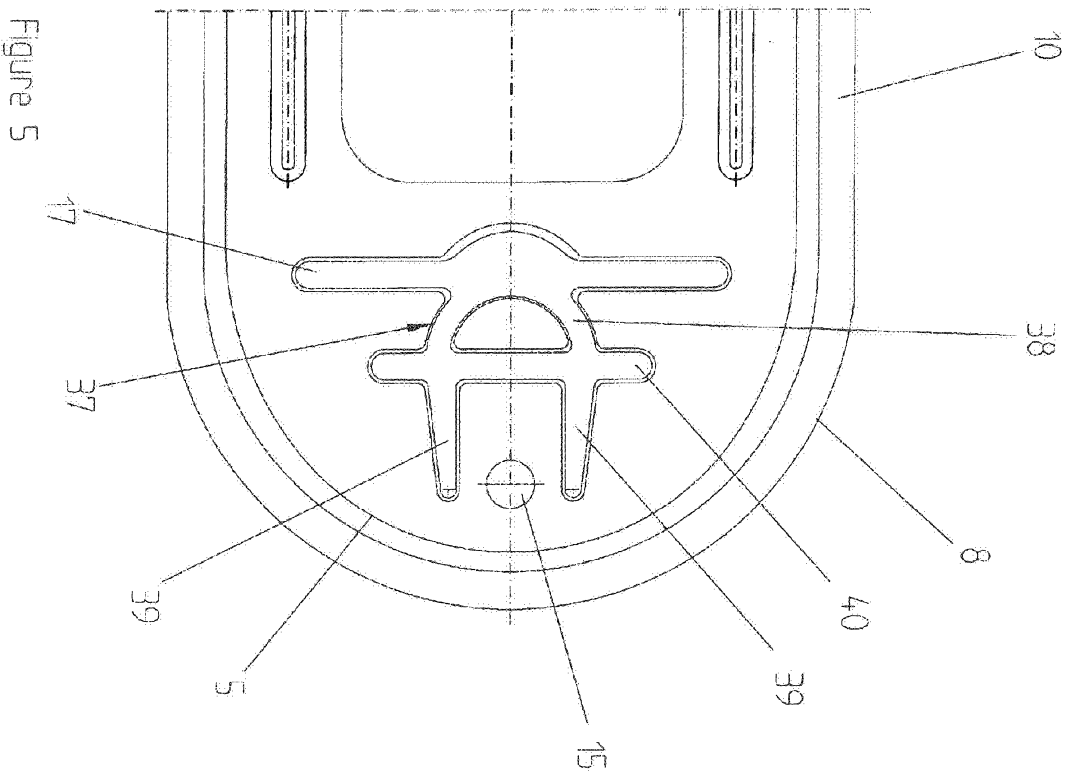


Figure 5