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(54) SEALING DISC FOR A PACKAGING CONTAINER, A PACKAGING CONTAINER COMPRISING THE SEALING DISC, AND A METHOD FOR PRODUCING THE SEALING DISC

DICHTSCHEIBE FÜR EINEN VERPACKUNGSBEHÄLTER, VERPACKUNGSBEHÄLTER MIT DICHTSCHEIBE UND VERFAHREN ZUR HERSTELLUNG DER DICHTSCHEIBE

DISQUE D'ÉTANCHÉITÉ POUR UN RÉCIPIENT D'EMBALLAGE, RÉCIPIENT D'EMBALLAGE COMPRENANT LE DISQUE D'ÉTANCHÉITÉ ET PROCÉDÉ PERMETTANT DE PRODUIRE LE DISQUE D'ÉTANCHÉITÉ

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Description

TECHNICAL FIELD

[0001] The disclosure pertains to a sealing disc for sealing an inner compartment in a packaging container. The sealing disc is a two-layer structure comprising a top member and a bottom member which are joined in a border seal along the peripheral edges of the top and bottom members. The sealing disc is provided with a tear-away area which is delimited by a contour line arranged in the top member. In order to be able to remove the tear-away area, a tear strip is arranged in the top member. The tear-strip is a part of the tear-away area and comprises a pull-tab which is arranged at a grip end of the tear strip. The tear strip and the contour line are defined by cut lines in the top member, the cut lines comprising first cut line and a second cut line. Disclosed herein is also a packaging container comprising the sealing disc.

BACKGROUND

[0002] Consumer goods, in particular bulk solids, are often packaged in relatively rigid paperboard packaging containers which protect the bulk solids during transport and storage at the manufacturer and retailer end and during storage and dispensing at the consumer end. One of the important factors in the area of bulk packaging containers is to ascertain that the quality of the packaged goods remains at a high level from the initial opening of the container until the packaged product has been completely consumed. The containers are usually provided with an openable and closable lid, and are additionally provided with inner transport seal which keeps the contents fresh and protected against contamination up until a first opening of the packaging container by a consumer. A common type of transport seal is a sealing disc comprising a top member and a bottom member. The top member is provided with cuts, forming a tear strip and a tear-away area which includes the tear strip. The tear-away area is delimited by a contour cut which forms an outer tear line extending in the top member along the full contour of the tear-away area. The tear-strip is formed by a different cut arranged inward of the contour cut in the top member. The top member and the bottom member are selectively interconnected in a peripheral border seal and at one or more locations within the tear strip and usually also within a further location in the tear-away area, outside of the tear strip. By pulling at the tear-strip formed in the top member, the connection or connections between the top member and the bottom member within the area constituted by the tear strip will cause the bottom member to break along the cuts in the top member. Thereby, both the top member and the bottom member within the tearable area can be removed from the container and to make the contents in the container available for use.

[0003] Although this type of seal is highly effective and can be made from few components and using well known production technology, it has been found that the opening mechanism with the tear strip may be subject to failure both due to manufacturing imperfections when applying the cuts in the top member and due to different users pulling at the tear strip in different ways.

[0004] Accordingly, there remains a need for a further improved opening arrangement for a sealing disc for packaging containers as disclosed herein.

[0005] Document JP S61 217350 A relates to a sealing lid of a container, which comprises a tear opening and discloses a sealing disc according to the preamble of claim 1 and a method according to the preamble of claim 14.

[0006] Document US 4 556 152 A relates to tear opening means for containers, especially powder proof, liquid proof or gas proof containers of the type which at least at one end is closed by means of an end closure providing an openable end panel, which for instance over a sealing edge sealingly engages the container sleeve, and, in which, the end closure is punched through along a line of the end panel extending some distance inside of the sealing edge. At the lower surface, the end panel carries a sealing foil of a weldable or solderable material which is welded or soldered to the end panel so as to seal the through punching of the end panel. The end panel is made of a material having higher shearing strength than that of the material of the lower sealing foil, so that the container can be opened along a sharp line corresponding to the through punching of the end panel. For facilitating the opening of the container the end panel may be formed with a tearing tongue or any other means, by which the container can be opened.

[0007] Document WO 2005/075314 A2 relates to a packaging and method for the production thereof. A packaging for pulverulent material is proposed consisting of a container part, made up of a laminate consisting of paper (board), metal foil and plastic material. The powder is filled into such a container and a seal consisting of a plastic film that is fixed to the container wall by heat sealing is applied on top of the powder. A small gap remains between the film and the lid to be placed on the container (in the closed state). A scoop is fitted in this gap. After first use, the scoop is snapped into a fixing in the lid. The lid is provided with an elevation for accommodating the scoop in the lid.

[0008] An object of the present disclosure is to provide a sealing disc having a more reliable opening arrangement. Further objects of the present disclosure are to offer a method for producing an improved sealing disc, as well as a packaging container being provided with an improved sealing disc.

SUMMARY

[0009] One or more of the above objects may be achieved with a sealing disc for a packaging container for bulk solids in accordance with claim 1 or a packaging

container for bulk solids in accordance with claim 13, and a method according to claim 14. Further embodiments are set out in the dependent claims, in the following description and in the drawings.

[0010] The sealing disc for sealing an inner compartment in a packaging container as disclosed herein comprises a top member and a bottom member. The top member has a top member peripheral edge and the bottom member has a bottom member peripheral edge. The top member is joined to the bottom member in a border seal arranged along the top member peripheral edge and the bottom member peripheral edge at the contour line. The sealing disc comprises a tear-away area, which is delimited by a contour line arranged in the top member, and a tear strip being arranged in the top member and being part of the tear-away area. The tear-strip comprises a pull-tab which is arranged at a grip end of the tear strip. The top member comprises a first cut line and a second cut line, wherein the first cut line has a first end and a second end arranged on the contour line and constitutes a first portion of the contour line extending between the first end and the second end of the first cut line. The second cut line has a first end and a second end, the first end being arranged on the contour line, and the second end of the second cut line being arranged within the tear-away area. The second cut line comprises a tear strip section and a contour section, the tear strip section delimiting the pull-tab and an inner edge of the tear strip and the contour section constituting a second portion of the contour line and, at the same time, an outer edge of the tear strip. The first end of the first cut line adjoins the second cut line at a transition portion between the tear strip section and the contour section of the second cut line and is arranged at a distance from the transition portion between the tear strip section and the contour section of the second cut line. The sealing disc has a modified rectangular shape with four side edges joined by four curved corner portions and the transition portion between the tear strip section and the contour section of the second cut line is arranged at one of the curved corner portions.

[0011] The arrangement of a second cut line, which is separated from the first cut line, which second cut line forms the tear-strip with the pull tab as well as a portion of the contour line of the tear-away area of the sealing disc has proven to considerably reduce tear-strip failure. When tearing open a sealing disc provided with a tear strip as disclosed herein, which tear-strip is defined by a cut line which also constitutes a part of the contour line of the tear-away area, pulling at the tear-strip may be made without the pulling force having to be transferred between different cuts or abruptly change direction at an area where there is an angle between the cuts, i.e. where the pull-tab joins the contour line of the tear-away area. The tear-strip as disclosed herein can be used to tear open the sealing disc in a smooth and controlled and continuous tearing movement starting at the pull-tab part of the tear-strip which is located in the tear-away area of the sealing disc, continuing over the transition between the tear strip section and the contour section of the second cut line into the contour section of the second cut line. The contour section of the second cut line also constitutes the outer edge of the tear strip, the tear strip being defined between the contour section of the second cut line and the tear strip section of the second cut line. The first and the second cut lines may be formed as continuous cuts, or may be formed as intermittent cuts with one or more un-cut tabs between cut sections which uncut tabs may have a length of at most 2 millimetres, preferably at most 1 millimetre.

[0012] In a sealing disc as disclosed herein, the distance between the first end of the first cut line and the transition portion between the tear strip section and the contour section of the second cut line may be in the range of from 0.5 millimetres to 5 millimetres, such as from 0.9 millimetres to 2 millimetres.

[0013] Accordingly, there is a small un-cut tab between the first cut line and the second cut line where the first end of the first cut line adjoins the second cut line. The un-cut tab ascertains that the cuts do not intersect and promotes correct initial tearing along the contour line.

[0014] The area where the pull-tab part of the tear strip joins the contour line which delimits the tear-away area has proven to be the most sensitive part of a tear-open arrangement for a sealing disc. In conventional tear-strip constructions most failures occur in this area. In a conventionally produced sealing disc, the contour line is formed by an outer cut extending in the top member along the full contour of the tear-away area. The tear-strip with the pull-tab is formed by an inner cut arranged in the top member. It has been found difficult to correctly synchronize the inner cut with the outer cut. If the inner cut does not reach all the way to the outer cut, poor tearing of the tear-strip or even tear strip failure has been known to occur. A construction of this kind has also proven to be very sensitive to different tear behaviour of different users. By way of example, some users tend to pull the tear strip in a direction towards the outer cut or contour line and may end up tearing across the outer cut, into the border seal which in the worst case results in complete tear-strip failure and in the best case results in poor tearing with rugged tear edges or only partial removal of the tear-away area.

[0015] It has been found that in a packaging container having side edges connected by corner portions and being provided with a correspondingly shaped sealing disc, consistent and accurate tearing of the tear strip and the tear-away portion may be promoted by arranging the transition portion between the tear strip section and the contour section of the second cut line in a corner portion.

[0016] The sealing disc as disclosed herein has a modified rectangular shape with four side edges joined by four curved corner portions. Modified rectangular shapes include modified square shapes, i.e. rectangular shapes having side edges of equal length.

[0017] The side edges of a sealing disc having rectan-

gular or modified rectangular shape may consist of first and second longitudinal side edges and first and second transverse side edges, the longitudinal side edges having a length greater than a length of the transverse side edges. The side edges may be straight side edges or may have a slight curvature, with a radius of curvature in the range of from 200-700 mm, preferably 300-600 mm, more preferably 400-500 mm.

[0018] The side edges are connected by curved corner portions, wherein the radius of curvature of the corner portions may be in the range of 5-60 mm, preferably 10-40 mm, more preferably 15-30 mm.

[0019] In a sealing disc as disclosed herein, the transition portion between the tear strip section and the contour section of the second cut line may be arranged at a curved corner portion, such as at one of the curved corner portions in a sealing disc having a modified rectangular shape.

[0020] Arranging the transition portion between the tear strip section and the contour section in a curved corner portion has been found beneficial for prompting users to grip and pull the tear-strip in a correct way, thereby further promoting controlled tearing and minimizing tear-strip failure. In a modified rectangular sealing disc having two longitudinal side edges and two transverse side edges, it has been found to be particularly beneficial to arrange the second cut line with the contour section of the second cut line extending along one of the first and second longitudinal side edges. Thereby the pull-tab end of the tear-strip will be arranged at one of the transverse side edges, i.e. along one of the short side edges. Such arrangement has been found to even further promote consistency in the tearing pattern between different users by inducing pulling of the tear strip in a correct tearing direction.

[0021] In a sealing disc as disclosed herein, it may be preferred that the first portion of the contour line and the second portion of the contour line together form the contour line delimiting the tear-away area. Accordingly, no further cuts are involved in forming the contour line.

[0022] As the second end of the first cut line and the first end of the second cut line are both located on the contour line means that the first and second ends of the cut line are aligned with each other or generally aligned with each other, such that tearing along the contour line may be performed continuously from the second cut line over to the first cut line. The adjoining ends of the first and second cut lines are preferably arranged at a small distance from each other along the contour line, leaving a non-cut tab between the adjoining ends of the first and second cut lines in the upper member. Such tab has no or practically no negative influence on the tearability of the sealing member, but aids in stabilizing the upper member during production and may provide for production tolerances when applying the first and second cut lines to the top member.

[0023] The distance between the adjoining ends of the first and second cut lines i.e. the width of the non-cut tab between the adjoining ends of the first and second cut lines is preferably small, such that the second end of the first cut line adjoins the first end of the second cut line at a distance between the second end of the first cut line and the first end of the second cut line being in the range of from 0.3 millimetres to 2 millimetres, such as from 0.7 millimetres to 1.2 millimetres and preferably 1 millimetre or less.

[0024] The second end of the first cut line may adjoin the first end of the second cut line at a curved corner portion of the sealing disc or at a transverse side edge.

[0025] In a sealing disc as disclosed herein, the transition portion between the tear strip section and the contour section of the second cut line may be curved and may have a radius of curvature in the range of from 15 millimetres to 22 millimetres, such as from 17 millimetres to 20 millimetres.

[0026] When the radius of curvature of the transition portion between the tear strip section and the contour section of the second cut line is placed at a curved corner portion, the radius of curvature of the transition portion between the tear strip section and the contour section of the second cut line may be smaller than the radius of curvature of the curved corner portions which, in such case, may be in the order of from 20 millimetres to 60 millimetres, such as from 20 millimetres to 40 millimetres.

[0027] In a sealing disc as disclosed herein, the tear strip may have a width in the range of from 15 millimetres to 30 millimetres, such as from 18 millimetres to 25 millimetres.

[0028] The width of the tear strip is the distance between the outer edge of the tear strip defined between the contour section of the second cut line, and the inner edge of the tear strip. The width of the tear strip is measured in a portion of the tear strip which is not the pull tab and may be constant along the length of the tear strip or may vary along the length of the tear strip. By way of example, the pull-tab part of the tear strip may have a width which is different from the width of other parts of the tear strip, such as a larger width to provide an enlarged grippable portion at the pull-tab end of the tear strip.

[0029] Bonding of the top member to the bottom member is preferably made by heat sealing, although adhesive attachments may be used as an alternative or as a complement. The top member and the bottom member are preferably laminates comprising a thermoplastic bondable layer and a structural layer, such as a layer of aluminium foil, paper, etc.

[0030] The attachments between the top member and the bottom member are permanent attachments, implying that the material in the layers will break before an attachment is broken when pulling at the tear strip.

[0031] The border seal is preferably a continuous seal such as a continuous weld seal which extends around the full periphery of the sealing disc. The border seal is preferably gas-tight. The width of the boarder seal may be from 2 millimetres to 5 millimetres, such as from 2.5

millimetres to 4 millimetres.

[0032] In addition to the border seal further attachments may be arranged between the top member and the bottom member, such as a tear strip attachment area arranged at an inner portion of the pull-tab, one or more attachments arranged on the tear-away area, discrete attachments along the tear strip e.g. in the form of arrows which at the same time may serve as indicators of a proper tear direction.

[0033] Disclosed herein is also a packaging container comprising the sealing disc as disclosed herein. The packaging container comprises a container body comprising a container wall extending from a container bottom to a container opening, and a closure arrangement comprising a lid, a peripheral edge portion of the sealing disc being attached to an inner surface of the container wall, the sealing disc forming a transport seal across the container opening.

[0034] The packaging container is preferably a paperboard packaging container, as defined herein.

[0035] When opening a packaging container as disclosed herein for a first time, a user first opens the lid to expose the sealing disc which is attached to the container wall. Thereafter the user removes the tear-away area of the sealing disc by lifting up the pull-tab from the bottom member and pulling it in a direction towards the contour line. As soon as the pulling force is propagated to the border seal or to a tear strip attachment area, continued pulling away of the tear strip initiates tearing along the second cut line of the bottom member. Removal of the tear-away area continues along the inner and outer edges of tear strip as defined by the second cut line and by continued tearing along the first cut line. Finally, the tear-away area is completely released from the packaging container by tearing off the un-cut tab between the first end of the first cut line and the transition portion between the tear strip section and the contour section of the second cut line.

[0036] Disclosed herein is also a method for producing a sealing disc, wherein said sealing disc has a modified rectangular shape with four side edges joined by four curved corner portions, the method comprising:

- providing a top member and a bottom member, the top member having a top member peripheral edge and the bottom member having a bottom member peripheral edge;
- joining the top member to the bottom member in a border seal along the top member peripheral edge and the bottom member peripheral edge;
- forming a tear-away area in the sealing disc the tear-away area being delimited by a contour line formed in the top member and forming a tear strip in the top member, the tear strip being part of the tear-away area and comprising a pull-tab formed at a grip end of the tear strip (12). The method further comprises:
- forming a first cut line in the top member, the first cut line having a first end and a second end arranged on the contour line and constituting a first portion of the contour line extending between the first end and the second end of the first cut line;
- forming a second cut line in the top member, the second cut line having a first end and a second end, the first end of the second cut line being arranged on the contour line, and the second end of the second cut line being arranged within the tear-away area, the second cut line comprising a tear strip section and a contour section, the tear strip section delimiting the pull-tab and an inner edge of the tear strip and the contour section constituting a second portion of the contour line and an outer edge of the tear strip, the first and second cut lines being formed in the top member with the first end of the first cut line adjoining the second cut line at a transition portion between the tear strip section and the contour section of the second cut line and being arranged at a distance from the transition portion between the tear strip section and the contour section of the second cut line, wherein said transition portion between said tear strip section and said contour section of said second cut line is arranged at one of said curved corner portions.

[0037] As disclosed herein, the first and second cut lines may be formed in separate method steps. The first and second cut lines may be made in any suitable order. However, it may be preferred to form the first cutline before forming the second cut line.

[0038] Joining of the top member to the bottom member in a border seal along the top member peripheral edge and the bottom member peripheral edge may be made by means of an adhesive. However, the joining of the top member to the bottom member is preferably made by welding, such as by thermo welding, ultrasonic welding, high frequency welding, etc. The top member and the bottom member may be connected by one or more further joins, such as one or more joins arranged within the tear-away area. When joining of the top member and bottom member is carried out by welding, one or both of the top member and the bottom member is provided with a thermoplastic layer or coating on a surface facing the other layer.

[0039] As used herein, a paperboard packaging container is a packaging container wherein the container body is formed from paperboard sheet material. The paperboard container may be formed in any manner known in the art, e.g. by forming a container body by bending a paperboard sheet material into a tubular shape and longitudinally closing the tube by joining overlapping or abutting side edges of the paperboard material. The join between the side edges may be covered by a sealing strip. In the paperboard packaging containers as disclosed herein, the container bottom is formed from a separate bottom disc which is attached at the bottom end of the container body tube. The bottom disc may be attached on the inside of the container body tube and may be inset

from the container body bottom edge to accommodate a bottom reinforcing rim attached to the inner surface of the container body.

[0040] As used herein, a paperboard material is a sheet material predominantly made from cellulose fibres or paper fibres. The sheet material may be provided in the form of a continuous web or may be provided as individual sheets of material. The paperboard material may be a single ply or multi ply material and may be a laminate comprising one or more layers of materials such as polymeric films and coatings, metal foil, etc. The polymeric films and coatings may include or consist of thermoplastic polymers. The paperboard material may be coated, printed, embossed, etc. and may comprise fillers, pigments, binders and other additives as known in the art. The paperboard materials as disclosed herein may also be referred to as cardboard or carton materials.

[0041] As used herein, the term "bulk solids" refers to a solid bulk material from which a desired amount of the product may be poured, scooped or taken by hand out of a packaging container. The bulk material may be dry or moist. The bulk solids which are suitable for packing in the paperboard packaging containers as disclosed herein include any material in the form of particles, granules, grinds, plant fragments, short fibres, flakes, seeds, pieces, etc.

[0042] The paperboard packaging container as disclosed herein may be a container for alimentary products such as infant formula, coffee, tea, rice, flour, sugar, cereals, soup powder, custard powder, pasta, snacks, or the like. Alternatively, the bulk solids may be non-alimentary, such as tobacco, detergent, fertilizer, chemicals or the like.

[0043] The tearable sealing disc as disclosed herein may be gastight or gas-permeable. A gastight sealing disc may comprise a structural layer made from any material or material combination suitable for providing a gastight sealing of a compartment delimited by the sealing disc, such as aluminium foil, silicon-coated paper, plastic film, etc. A gastight sealing disc is advantageous when the bulk solids stored in the packaging container are sensitive to air and/or moisture and it is desirable to avoid contact of the packaged bulk solids with ambient air.

[0044] The barrier properties of the packaging containers disclosed herein may be designed to meet different requirements of tightness depending on the goods which is packaged in the packaging container. By way of example, in a packaging container for dried peas a lower barrier level may be sufficient than in a packaging container for e.g. infant formula which is highly sensitive to oxygen and moisture exposure.

[0045] A gastight packaging container is particularly advantageous when the material stored in the packaging container is sensitive to air and/or moisture. It may also be desirable to keep fragrances and aromas in the packaging container and prevent the packaged contents from taking up scents and flavours from the ambient air. In case the packaging container has been filled in a protective gas atmosphere, the gas-tight sealing disc keeps the protective gas trapped together with the packaged contents in the sealed inner compartment.

[0046] When opening a packaging container which is sealed by a sealing disc as disclosed herein, the tear-away area of the sealing disc is removed by pulling at the grip-end of the tear-strip and tearing along the contour cut-line delimiting the tear-away area. The tear-away area defines the size of the access opening created in the packaging container when removing the tear-away area. The tear-away area may be arranged in the sealing disc such that all or only part of the sealing disc inside of the sealing border is removed when creating the access opening in the packaging container.

BRIEF DESCRIPTION OF THE DRAWINGS

[0047] The present invention will be further explained hereinafter by means of non-limiting examples and with reference to the appended drawings wherein:

Fig. 1 shows a sealing disc;

Fig. 2 shows a top member with a first cut line;

Fig. 3 shows a top member with a second cut line;

Fig 4 shows a top member with a first and a second cut line; and

Fig 5 shows a packaging container.

DETAILED DESCRIPTION

[0048] It is to be understood that the drawings are schematic and that individual components are not necessarily drawn to scale. The packaging container and the sealing disc shown in the figures are provided as examples only and should not be considered limiting to the invention as disclosed herein. In particular, it should be understood that the sealing disc as disclosed herein may be applied to any packaging container where a breakable transport seal is desired in addition to the provision of a reclosable lid. Furthermore, the size and shape of the packaging container and a corresponding sealing disc may be different from what is shown in the figures. The tear-strip may have a different size and shape, and may have a differently shaped pull-tab portion.

[0049] The sealing disc 1 which is shown in Fig. 1 comprises a top member 2 and a bottom member 3. The top member 2 has a top member peripheral edge 4 and the bottom member 3 has a bottom member peripheral edge 5. In Fig. 1, the top member 2 is shown to be larger than the bottom member 3 with the top member peripheral edge 4 arranged laterally outboard of the bottom member peripheral edge 5. Alternatively, the top member 2 and the bottom member 3 may have the same size and shape, or the bottom member 3 is shown may be larger than the

top member 3 with the bottom member peripheral edge 5 arranged laterally outboard of the top member peripheral edge 4. The edge portion of the top member 2 which extends outward of the peripheral edge 5 of the bottom member 3 provides the sealing disc 1 with a thinner more flexible sealing border 17 for sealing the sealing disc 1 to a container wall.

[0050] The top member 2 is joined to the bottom member 3 in a border seal 8 arranged along the peripheral edges 4, 5 of the top and bottom members 2, 3. The border seal 8 is preferably a continuous seal such as a continuous weld seal which extends around the full periphery of the sealing disc 1. The thinner sealing border 17 constituted by only the top member 2 forms a peripheral portion of the sealing disc 1 which is arranged outward of the border seal 8 and the peripheral edge 5 of the bottom member 4 and which surrounds the border seal 8.

[0051] The sealing disc 1 comprises a tear-away area 10 which is delimited by a contour line 11 arranged in the top member 2. A tear strip 12 is arranged in the top member 2 and forms part of the tear-away area 10. The tear-strip 12 comprises a pull-tab 13 which is arranged at a grip end of the tear strip 12. The outer portion of the pull-tab 13 is separable from the bottom member 12 of the sealing disc 1. The sealing disc 1 in Fig. 1 is shown with a cut-out portion 15 being removed from the top member 2 in order to expose the end edge 16 of the pull-tab 13 and facilitate lifting the pull-tab 13 away from the bottom member 3. The cut-out portion 15 is an optional feature of the sealing disc 1 as disclosed herein.

[0052] In addition to the border seal 8, the top member 2 and the bottom member 3 of the sealing disc 1 are further joined to each other in a tear strip attachment area 18 arranged at an inner portion of the pull-tab 13. The additional tear strip attachment area 18 is shown as a broadened portion of the border seal 8 and may aid in initiating proper tearing of the bottom member 3 when pulling away the tear-away area 10. The additional tear strip attachment area 18 is an optional feature of the sealing disc 1 as disclosed herein and may be omitted. Furthermore, the tear strip attachment area 18 may have useful size or shape. By way of example only, the tear strip attachment area may extend across a larger portion of the width of the tear strip such as over the full width of the tear strip and/or may extend further along the tear strip, etc.

[0053] The top member 2 comprises a first cut line 19 and a second cut line 20. Fig. 2 shows a top member 2 in which only a first cut line 19 has been arranged. Fig. 3 shows a top member 2 in which only a second cut line 20 has been arranged, and Fig. 4 shows a top member 2 in which both a first cut line 19 and a second cut line 20 have been arranged.

[0054] The first cut line 19 has a first end 21 and a second end 22 and constitutes a first portion of the contour line 11. The second cut line 20 has a first end 23 and a second end 24, the first end 23 is arranged on the contour line 11, and the second end 24 of the second cut line 20 is arranged within the tear-away area 10. The second cut line 20 is serpentine-shaped and comprises a tear strip section 20' and a contour section 20". The tear strip section delimits the pull-tab 13 and an inner edge 25 of the tear strip 12. The contour section 20" constitutes a second portion of the contour line 11 and, at the same time, forms an outer edge 26 of the tear strip 12.

[0055] The first end 21 of the first cut line 19 adjoins the second cut line 20 at a transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20 and is arranged at a distance d1 from the transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20. The distance d1 is the distance between the first end 21 of the first cut line 19 and the transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20 as measured along the contour line 11. The material in the top member 2 between the first end 21 of the first cut line 19 and the transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20 forms a tab separating the first cut line 19 from the second cut line 20 where the first end 21 of the first cut line 19 adjoins the second cut line 20. As set out herein, the distance d1 may be in the range of from0.5 millimetres to 5 millimetres, such as from 0.9 millimetres to 2 millimetres.

[0056] The sealing disc 1 illustrated in Fig. 1 has a modified rectangular shape with two longitudinal side edges 31, 32 and two transverse side edges 33, 34 which are joined by four curved corner portions, 35, 36, 37, 38. As set out herein, alternative modified rectangular shapes are contemplated within the scope of the appended claims.

[0057] The transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20 is arranged at a curved corner portion 35 with the contour section 20" of the second cut line 20 being arranged along the first longitudinal side edge 31 and with the pull-tab 13 arranged at the first transverse side edge 33. Although alternative locations of the tear-strip may be used, as set out herein, it has been found that in a packaging container having side edges connected by corner portions and being provided with a correspondingly shaped sealing disc 1, consistent and accurate tearing may be promoted by arranging the transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20 in a corner portion. In a packaging container having a rectangular or near rectangular shape, such as shown in Fig. 5 and having a correspondingly shaped sealing disc 1 as shown in Fig. 1, it has been found to even further promote consistency in the tearing pattern when the pull-tab 13 is arranged at one of the shorter transverse side edges 33, 34. When gripping the pull-tab 13 and tearing away the tear-strip 12, the tear will quickly be propagated out to the contour section 20" of the second cut line 20 where tearing can

continue without change of tearing direction along the full length of a longitudinal side edge 31, 32. Thereby, a large part of the contour line 11 can be torn open in a smooth pulling action, and with application of a uniform pulling force. It has been found that successful tearing of the remaining part of the contour line 11 surrounding the tear-away area is less dependent on the application of a uniform pulling force or a correct pulling direction. Accordingly, it has been found that differences in pulling behaviour between different users may be diminished and a user may be prompted to use the tear strip 12 in a correct manner, causing less incidences of tear strip failure by placing the transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20 in a corner portion 35, 36, 37, 38 and/or by arranging the pull-tab 13 at a short side edge 33, 34.

[0058] The transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20 is shown in the figures to be curved. The radius of curvature r may be in the range of from 15 millimetres to 22 millimetres, such as from 17 millimetres to 20 millimetres.

[0059] The radius of curvature of the transition portion 30 between the tear strip section 20' and the contour section 20" of the second cut line 20 is smaller than the radius of curvature of the curved corner portions.

[0060] As can be seen in Figs. 1 and 4, the second end 22 of the first cut line 19 adjoins the first end 23 of the second cut line 20 with a distance d2 between the second end 22 of the first cut line 19 and the first end 23 of the second cut line 20, whereby a non-cut tab 40 is formed in the contour line 11. The distance d2 may be in the range of from 0.3 millimetres to 2 millimetres, such as from 0.7 millimetres to 1.2 millimetres. The adjoining ends 22, 23 of the first and second cut line lines 19, 20 are both placed on the contour line 11 such that tearing along the contour cut line 11 can be readily propagated from the second end 22 of the first cut line 19 across the non-cut tab 40 to the first end 23 of the second cut line 20 and continue smoothly along the first cut line 19.

[0061] The non-cut tab 40 between the second end 22 of the first cut line 19 and the first end 23 of the second cut line 20 may preferably be arranged at a curved corner portion or at a transverse side edge as shown in Figs. 1 and 4.

[0062] As set out herein, the first cut line 19 and the second cut line 20 may be formed as continuous cuts, or may be formed as intermittent cuts with one or more uncut tabs 27 between cut sections, as illustrated in Figs. 1-4. Such uncut tabs 27 in the first and second cut lines 19, 20 may have a length of at most 2 millimetres, preferably at most 1 millimetre. The uncut tabs serve to stabilize the sealing disc 1 and make it easier to handle in a production process when applying sealing discs 1 to packaging containers. The number and locations of the un-cut tabs 27 as shown in the Figures are only intended as examples and it is to be understood that fewer or more un-cut tabs could be provided and that an un-cut tab may be arranged at any desirable location along the first and second cut lines 2, 3.

[0063] The top member 2 and the bottom member 3 may comprise attachments 28, 29 in addition to the border seal 8 and a tear strip attachment area 18. Such additional attachments are illustrated in Fig. 1 by a circular attachment area 28 arranged generally centrally on the tear-away area 10, and by discrete attachments 29 arranged between the inner and outer edges 25, 26 of the tear strip 12 and on the tear-away area 10 outside of the tear strip 12 and being in the form of arrows which at the same time serve as indicators of a proper tear direction. Any suitable number of additional attachments may be applied between the top member 2 and the bottom member 3 and the attachments may have any suitable size, shape and distribution.

[0064] The tear strip 12 may have a width w in the range of from 15 millimetres to 30 millimetres, such as from 18 millimetres to 25 millimetres. The width of the tear strip 12 is the distance between the outer edge 26 of the tear strip 12 defined between the contour section 20" of the second cut line 20, and the inner edge 25 of the tear strip 12. The width of the tear strip is measured in a portion of the tear strip which is not the pull tab 13 and may be constant along the length of the tear strip 12 or may vary along the length of the tear strip. The tear strip 12 shown in the Figs. has a section of uniform width between the widened pull tab 13 and a widened end portion at the first and second ends 23, 24 of the second cut line 20.

[0065] The packaging container 100 which is shown in Fig. 5 is a packaging container 1 for pourable or scoopable bulk solids as defined herein and comprises a container body 102 comprising a container wall 103 including a front wall portion 103a, a rear wall portion 103b and two side wall portions 103c, 103d. The container wall 103 extends from a container bottom 104 to a container opening 105. The container wall 103 has an inner surface 107 facing towards an inner compartment 111 in the packaging container 100 and an outer surface 108 facing away from the inner compartment 111 and being exposed to the exterior of the packaging container 100. A bottom disc 109 is positioned at the bottom 104 of the container body 102. The container body 102 is made from paperboard material as defined herein. The container body 102 may be formed by bringing together the side edges of a web of paperboard causing the material to assume a tubular shape, whereafter the side edges are sealed together. Sealing of the side edges may be made by any suitable method as known in the art, such as by welding or gluing, with welding being preferred. Sealing of the side edges of the container body web may involve using a sealing strip, as known in the art. The bottom disc 109 may be made from paperboard, metal, plastic, or from any suitable combination of such materials as known in the art. The body may be formed into any desired tubular shape including circular, oval, rectangular and modified rectangular shapes, such as the modified rectangular

shape with rounded corners which is shown in Fig. 5.

[0066] The container bottom 104 may alternatively be formed without a bottom disc 109 by folding of the container wall material, as known in the art.

[0067] The paperboard packaging container 1 is provided with a closure arrangement comprising a lid 114 and a reinforcing rim 115 extending along the upper edge of the container wall 103.

[0068] The reinforcing rim 15 may be a plastic rim, such as a thermoplastic rim. The reinforcing rim 115 is attached to the inner surface 107 of the container wall 3 at the container opening 105, preferably by welding.

[0069] A weld seal is formed by supplying energy to heat and locally soften or melt one or more thermoplastic components in a thermoplastic rim 115 and/or in a coating or film on the inner surface 107 of the container wall 103 and by pressing the reinforcing rim 115 and the container wall 103 together in a direction perpendicular to the container wall 103.

[0070] The lid 114 has an inner lid surface 124 which faces towards the bottom disc 109 when the lid 114 is closed on the container opening 105.

[0071] The lid 114 is connected by a hinge 129 to a frame structure 130, the lid 114 and the frame structure 130 together forming a lid component. The hinge 129 may be a live hinge, formed as a flexible connection between the lid 114 and the frame structure 130. The illustrated hinge is only intended as a non-limiting example and it should be understood that any other type of functional hinge may be used for the connection between the frame structure and the lid. Moreover, the lid may be of the removable kind, without any permanent connection to a frame structure, a reinforcing rim or to the container body. It is further to be understood that the closure arrangement as shown in Fig. 5 is non-limiting to the claimed invention and that the sealing disc as disclosed herein may be used as a transport seal in packaging containers having other types of closure arrangements such as closure arrangements wherein a lid cooperates with a single rim or with an upper edge of the container body to close and open the packaging container.

[0072] In the packaging container 100 shown in Fig. 5, the frame structure 130 is mechanically attached to the reinforcing rim 115 by a snap-on connection.

[0073] The interior compartment 111 is sealed with a sealing disc 101 as disclosed herein, e.g. a sealing disc 1 as shown in Fig. 1. The sealing disc 101 forms a transport seal over packaged goods 134 which are contained in the interior compartment 111. A sealing border 117 of the sealing disc 101 is attached to the container wall 103, e.g. by welding. The seal between the sealing border 117 and the container wall 103 is preferably a gas-tight seal or at least a sift-proof seal. The sealing disc 101 may be attached to the container wall either from the top end of the container body 102 or from the bottom end of the container body 102, in which case it is attached before attaching the bottom disc 109. In the example shown in Fig. 5, the sealing disc 101 has been applied from the top end of the container body 102, with the edge portion 117 of the sealing disc 101 which is attached to the container wall 103 being upwardly directed. The edge portion 117 preferably comprises only the top member of the sealing disc 101 but may comprise also the bottom member of the sealing disc 101 or only the bottom member of the sealing disc 101.

[0074] In order to gain a first access to the packaged goods, a user needs to open the lid 114 and then expose the packaged goods 134 by gripping the pull-tab 113, tearing open the sealing disc 101 along the tear-strip 112 and finally completely removing the tear-away area 110 of the sealing disc 101.

[0075] After the tear-away area 110 of the sealing disc 101 has been removed, a narrow edge part of the sealing disc 101 may be left at the inner surface 107 of the container wall 103. Any such remaining part of the sealing disc 101 is preferably as small as possible, in order not to encroach on the opening area. It may be preferred that a remaining sealing disc edge part has a width of at most 7 millimeters such as from 1 - 6 millimeters, from 2 - 5 millimeters or from 3 - 4 millimeters. It may be preferred that the inward extension of a remaining sealing disc part is 4 millimeters or less.

[0076] Once the sealing disc 101 has been removed, it is sufficient to open the lid 114 in order to gain access to the packaged goods 134 in the interior compartment 111 through the container opening 105.

Claims

1. A sealing disc (1) for sealing an inner compartment in a packaging container, said sealing disc (1) comprising a top member (2) and a bottom member (3), said top member (2) having a top member peripheral edge (4) and said bottom member (3) having a bottom member peripheral edge (5), said top member (2) being joined to said bottom member (3) in a border seal (8) arranged along said top member peripheral edge (4) and said bottom member peripheral edge (5), said sealing disc (1) comprising a tear-away area (10) being delimited by a contour line (11) arranged in said top member (2) and a tear strip (12) being arranged in said top member (2) and being part of said tear-away area (10), said tear-strip (12) comprising a pull-tab (13) arranged at a grip end of said tear strip (12) and said border seal (8) is arranged at said contour line (11), **characterized in that** said top member (2) comprises a first cut line (19) and a second cut line (20), said first cut line (19) having a first end (21) and a second end (22) arranged on said contour line (11) and constitutes a first portion of said contour line (11) extending between said first end (21) and said second end (22) of said first cut line (19), and said second cut line (20) has a first end (23) and a second end (24), said first end (23) of said second cut line (20) being ar-

ranged on said contour line (11), and said second end (24) of said second cut line (20) being arranged within said tear-away area (10), said second cut line (20) comprising a tear strip section (20') and a contour section (20"), said tear strip section (20') delimiting said pull-tab (13) and an inner edge (25) of said tear strip (12) and said contour section (20") constituting a second portion of said contour line (11) and an outer edge (26) of said tear strip (12), said first end (21) of said first cut line (19) adjoining said second cut line (20) at a transition portion (30) between said tear strip section (20') and said contour section (20") of said second cut line (20) and being arranged at a distance (d1) from said transition portion (30) between said tear strip section (20') and said contour section (20") of said second cut line (20), wherein said sealing disc (1) has a modified rectangular shape with four side edges (31, 32, 33, 34) joined by four curved corner portions (35, 36, 37, 38) and said transition portion (30) between said tear strip section (20') and said contour section (20") of said second cut line (20) is arranged at one of said curved corner portions (35, 36, 37, 38).

2. A sealing disc (1) according to claim 1, wherein said distance (d1) between said first end (21) of said first cut line (19) and said transition portion (30) between said tear strip section (20') and said contour section (20") of said second cut line (20) is in the range of from 0.5 millimetres to 5 millimetres, such as from 0.9 millimetres to 2 millimetres.

3. A sealing disc (1) according to claim 1 or 2, wherein said border seal (8) is arranged across said contour line (11).

4. A sealing disc (1) according to claim 1, 2 or 3, wherein said sealing disc (1) comprises one or more attachments (18, 28, 29) between said top member (2) and said bottom member (3) in addition to said border seal (8).

5. A sealing disc (1) according to any one of the preceding claims, wherein said side edges (31, 32, 33, 34) consist of first and second longitudinal side edges (31, 32) and first and second transverse side edges (33, 34), said longitudinal side edges (31, 32) having a length greater than a length of said transverse side edges (33, 34).

6. A sealing disc (1) according to claim 5, wherein said contour section (20") of said second cut line (20) is arranged along one of said first and second longitudinal side edges (31, 32).

7. A sealing disc (1) according to any one of the preceding claims, wherein said first portion of said contour line (11) and said second portion of said contour line (11) together form said contour line (11).

8. A sealing disc (1) according to claim 7, wherein said second end (22) of said first cut line (19) adjoins said first end (23) of said second cut line (20) at a distance (d2) between said second end (22) of said first cut line (19) and said first end (23) of said second cut line (20) said distance (d2) being in the range of from 0.3 millimetres to 2 millimetres, such as from 0.7 millimetres to 1.2 millimetres.

9. A sealing disc (1) according to any one of the preceding claims, wherein said second end (22) of said first cut line (19) adjoins said first end (23) of said second cut line (20) at one of said curved corner portions (35, 36, 37, 38).

10. A sealing disc (1) according to any one of claims 5 to 8, wherein said second end (22) of said first cut line (19) adjoins said first end (23) of said second cut line (20) at a transverse side edge (33, 34).

11. A sealing disc (1) according to any one of the preceding claims, wherein said transition portion (30) between said tear strip section (20') and said contour section (20") of said second cut line (20) is curved and having a radius of curvature (r) in the range of from 15 millimetres to 22 millimetres, such as from 17 millimetres to 20 millimetres.

12. A sealing disc (1) according to any one of the preceding claims, wherein said tear strip (12) has a width (w) in the range of from 15 millimetres to 30 millimetres, such as from 18 millimetres to 25 millimetres.

13. A packaging container (100) comprising the sealing disc (1; 101) according to any one of claims 1-12, wherein said packaging container (100) comprises a container body (102) comprising a container wall (103) extending from a container bottom (104) to a container opening (105), and a closure arrangement comprising a lid (114), a peripheral edge portion (117) of said sealing disc (1) being attached to an inner surface (107) of said container wall, said sealing disc (1) forming a transport seal across said container opening (105).

14. A method for producing a sealing disc (1), wherein said sealing disc (1) has a modified rectangular shape with four side edges (31, 32, 33, 34) joined by four curved corner portions (35, 36, 37, 38), said method comprising:

- providing a top member (2) and a bottom member (3), said top member (2) having a top member peripheral edge (4) and said bottom member (3) having a bottom member peripheral edge (5);
- joining said top member (2) to said bottom

member (3) with a border seal (8) along said top member peripheral edge (4) and said bottom member peripheral edge (5);
- forming a tear-away area (10) in said sealing disc (1), said tear-away area being delimited by a contour line (11) formed in said top member (2) and forming a tear strip (12) in said top member (2), said tear strip (12) being part of said tear-away area (10) and comprising a pull-tab (13) formed at a grip end of said tear strip (12),

characterized in

- forming a first cut line (19) in said top member (2), said first cut line (19) having a first end (21) and a second end (22) arranged on said contour line (11) and constituting a first portion of said contour line (11) extending between said first end (21) and said second end (22) of said first cut line (19);
- forming a second cut line (20) in said top member (2), said second cut line (20) having a first end (23) and a second end (24), said first end (23) of said second cut line (20) being arranged on said contour line (11), and said second end (24) of said second cut line (20) being arranged within said tear-away area (10), said second cut line (20) comprising a tear strip section (20') and a contour section (20"), said tear strip section (20') delimiting said pull-tab (13) and an inner edge (25) of said tear strip (12) and said contour section (20") constituting a second portion of said contour line (11) and an outer edge (26) of said tear strip (12), said first and second cut lines (19, 20) being formed in said top member (2) with said first end (21) of said first cut line (19) adjoining said second cut line (20) at a transition portion (30) between said tear strip section (20') and said contour section (20") of said second cut line (20) and being arranged at a distance (d1) from said transition portion (30) between said tear strip section (20') and said contour section (20") of said second cut line (20), wherein said transition portion (30) between said tear strip section (20') and said contour section (20") of said second cut line (20) is arranged at one of said curved corner portions (35, 36, 37, 38).

15. A method according to claim 14, wherein said first and second cut lines (19, 20) are formed in separate steps.

Patentansprüche

1. Dichtungsscheibe (1) zum Verschließen eines inneren Fachs in einem Verpackungsbehälter, wobei die Dichtungsscheibe (1) ein oberes Element (2) und ein unteres Element (3) umfasst, wobei das obere Element (2) eine Umfangskante (4) des oberen Elements aufweist und das untere Element (3) eine Umfangskante (5) des unteren Elements aufweist, wobei das obere Element (2) mit dem unteren Element (3) in einer Randdichtung (8) verbunden ist, die entlang der Umfangskante (4) des oberen Elements und der Umfangskante (5) des unteren Elements angeordnet ist, wobei die Dichtungsscheibe (1) einen Abreißbereich (10), der durch eine in dem oberen Element (2) angeordnete Konturlinie (11) begrenzt ist, und einen Aufreißstreifen (12) umfasst, der in dem oberen Element (2) angeordnet ist und Teil des Abreißbereichs (10) ist, wobei der Aufreißstreifen (12) eine Zuglasche (13) umfasst, die an einem Griffende des Aufreißstreifens (12) angeordnet ist, und wobei die Randdichtung (8) an der Konturlinie (11) angeordnet ist, **dadurch gekennzeichnet, dass** das obere Element (2) eine erste Schnittlinie (19) und eine zweite Schnittlinie (20) umfasst, wobei die erste Schnittlinie (19) ein erstes Ende (21) und ein zweites Ende (22) aufweist, die an der Konturlinie (11) angeordnet sind und einen ersten Abschnitt der Konturlinie (11) bilden, der sich zwischen dem ersten Ende (21) und dem zweiten Ende (22) der ersten Schnittlinie (19) erstreckt, und die zweite Schnittlinie (20) ein erstes Ende (23) und ein zweites Ende (24) aufweist, wobei das erste Ende (23) der zweiten Schnittlinie (20) an der Konturlinie (11) angeordnet ist und wobei das zweite Ende (24) der zweiten Schnittlinie (20) innerhalb des Abreißbereichs (10) angeordnet ist, wobei die zweite Schnittlinie (20) einen Aufreißstreifenabschnitt (20') und einen Konturabschnitt (20") umfasst, wobei der Aufreißstreifenabschnitt (20') die Zuglasche (13) und eine Innenkante (25) des Aufreißstreifens (12) begrenzt und wobei der Konturabschnitt (20") einen zweiten Abschnitt der Konturlinie (11) und eine Außenkante (26) des Aufreißstreifen (12) bildet, wobei das erste Ende (21) der ersten Schnittlinie (19) an die zweite Schnittlinie (20) an einem Übergangsabschnitt (30) zwischen dem Aufreißstreifenabschnitt (20') und dem Konturabschnitt (20") der zweiten Schnittlinie (20) angrenzt und in einem Abstand (d1) von dem Übergangsabschnitt (30) zwischen dem Aufreißstreifenabschnitt (20') und dem Konturabschnitt (20") der zweiten Schnittlinie (20) angeordnet ist, wobei die Dichtungsscheibe (1) eine modifizierte rechteckige Form mit vier Seitenkanten (31, 32, 33, 34) aufweist, die durch vier bogenförmige Eckabschnitte (35, 36, 37, 38) verbunden sind und der Übergangsabschnitt (30) zwischen dem Aufreißstreifenabschnitt (20') und dem Konturabschnitt (20") der zweiten Schnittlinie (20) an einem der bogenförmigen Eckabschnitte (35, 36, 37, 38) angeordnet ist.

2. Dichtungsscheibe (1) nach Anspruch 1, wobei der Abstand (d1) zwischen dem ersten Ende (21) der

ersten Schnittlinie (19) und dem Übergangsabschnitt (30) zwischen dem Aufreißstreifenabschnitt (20') und dem Konturabschnitt (20") der zweiten Schnittlinie (20) im Bereich von 0,5 Millimeter bis 5 Millimeter, beispielsweise von 0,9 Millimeter bis 2 Millimeter, liegt.

3. Dichtungsscheibe (1) nach Anspruch 1 oder 2, wobei die Randdichtung (8) über der Konturlinie (11) angeordnet ist.

4. Dichtungsscheibe (1) nach Anspruch 1, 2 oder 3, wobei die Dichtungsscheibe (1) zusätzlich zu der Randdichtung (8) eine oder mehrere Befestigungen (18, 28, 29) zwischen dem oberen Element (2) und dem unteren Element (3) umfasst.

5. Dichtungsscheibe (1) nach einem der vorstehenden Ansprüche, wobei die Seitenkanten (31, 32, 33, 34) aus einer ersten und einer zweiten längslaufenden Seitenkante (31, 32) und einer ersten und einer zweiten querlaufenden Seitenkante (33, 34) bestehen, wobei die längslaufenden Seitenkanten (31, 32) eine größere Länge aufweisen als eine Länge der querlaufenden Seitenkanten (33, 34).

6. Dichtungsscheibe (1) nach Anspruch 5, wobei der Konturabschnitt (20") der zweiten Schnittlinie (20) entlang einer der ersten und zweiten längslaufenden Seitenkante (31, 32) angeordnet ist.

7. Dichtungsscheibe (1) nach einem der vorstehenden Ansprüche, wobei der erste Abschnitt der Konturlinie (11) und der zweite Abschnitt der Konturlinie (11) zusammen die Konturlinie (11) bilden.

8. Dichtungsscheibe (1) nach Anspruch 7, wobei das zweite Ende (22) der ersten Schnittlinie (19) an das erste Ende (23) der zweiten Schnittlinie (20) in einem Abstand (d2) zwischen dem zweiten Ende (22) der ersten Schnittlinie (19) und dem ersten Ende (23) der zweiten Schnittlinie (20) angrenzt, wobei der Abstand (d2) im Bereich von 0,3 Millimeter bis 2 Millimeter, beispielsweise von 0,7 Millimeter bis 1,2 Millimeter, liegt.

9. Dichtungsscheibe (1) nach einem der vorstehenden Ansprüche, wobei das zweite Ende (22) der ersten Schnittlinie (19) an das erste Ende (23) der zweiten Schnittlinie (20) an einem der bogenförmigen Eckabschnitte (35, 36, 37, 38) angrenzt.

10. Dichtungsscheibe (1) nach einem der Ansprüche 5 bis 8, wobei das zweite Ende (22) der ersten Schnittlinie (19) an das erste Ende (23) der zweiten Schnittlinie (20) an einer querlaufenden Seitenkante (33, 34) angrenzt.

11. Dichtungsscheibe (1) nach einem der vorstehenden Ansprüche, wobei der Übergangsabschnitt (30) zwischen dem Aufreißstreifenabschnitt (20') und dem Konturabschnitt (20") der zweiten Schnittlinie (20) bogenförmig ist und einen Krümmungsradius (r) aufweist, der im Bereich von 15 Millimeter bis 22 Millimeter, beispielsweise von 17 Millimeter bis 20 Millimeter, liegt.

12. Dichtungsscheibe (1) nach einem der vorstehenden Ansprüche, wobei der Aufreißstreifen (12) eine Breite (w) aufweist, die im Bereich von 15 Millimeter bis 30 Millimeter, beispielsweise von 18 Millimeter bis 25 Millimeter, liegt.

13. Verpackungsbehälter (100), umfassend die Dichtungsscheibe (1; 101) nach einem der Ansprüche 1-12, wobei der Verpackungsbehälter (100) einen Behälterkörper (102) umfasst, umfassend eine Behälterwand (103), die sich von einem Behälterboden (104) zu einer Behälteröffnung (105) erstreckt, und eine Verschlussanordnung, die einen Deckel (114) umfasst, wobei ein Umfangskantenabschnitt (117) der Dichtungsscheibe (1) an einer inneren Oberfläche (107) der Behälterwand angebracht ist, wobei die Dichtungsscheibe (1) eine Transportdichtung über der Behälteröffnung (105) bildet.

14. Verfahren zur Herstellung einer Dichtungsscheibe (1), wobei die Dichtungsscheibe (1) eine modifizierte rechteckige Form mit vier Seitenkanten (31, 32, 33, 34) aufweist, die durch vier bogenförmige Eckabschnitte (35, 36, 37, 38) verbunden sind, wobei das Verfahren umfasst:

- Bereitstellen eines oberen Elements (2) und eines unteren Elements (3), wobei das obere Element (2) eine Umfangskante (4) des oberen Elements und das untere Element (3) eine Umfangskante (5) des unteren Elements aufweist;
- Verbinden des oberen Elements (2) mit dem unteren Element (3) mit einer Randdichtung (8) entlang der Umfangskante (4) des oberen Elements und der Umfangskante (5) des unteren Elements;
- Bilden eines Abreißbereichs (10) in der Dichtungsscheibe (1), wobei der Abreißbereich durch eine Konturlinie (11) begrenzt ist, die in dem oberen Element (2) ausgebildet ist und einen Aufreißstreifen (12) in dem oberen Element (2) bildet, wobei der Aufreißstreifen (12) Teil des Abreißbereichs (10) ist und eine Zuglasche (13) umfasst, die an einem Griffende des Aufreißstreifens (12) ausgebildet ist;

gekennzeichnet durch

- Bilden einer ersten Schnittlinie (19) in dem obe-

ren Element (2), wobei die erste Schnittlinie (19) ein erstes Ende (21) und ein zweites Ende (22) aufweist, die an der Konturlinie (11) angeordnet sind und einen ersten Abschnitt der Konturlinie (11) bilden, der sich zwischen dem ersten Ende (21) und dem zweiten Ende (22) der ersten Schnittlinie (19) erstreckt;

- Bilden einer zweiten Schnittlinie (20) in dem oberen Element (2), wobei die zweite Schnittlinie (20) ein erstes Ende (23) und ein zweites Ende (24) aufweist, wobei das erste Ende (23) der zweiten Schnittlinie (20) an der Konturlinie (11) angeordnet ist und wobei das zweite Ende (24) der zweiten Schnittlinie (20) innerhalb des Abreißbereichs (10) angeordnet ist, wobei die zweite Schnittlinie (20) einen Aufreißstreifenabschnitt (20') und einen Konturabschnitt (20") umfasst, wobei der Aufreißstreifenabschnitt (20') die Zuglasche (13) und eine Innenkante (25) des Aufreißstreifens (12) begrenzt und wobei der Konturabschnitt (20") einen zweiten Abschnitt der Konturlinie (11) und eine Außenkante (26) des Aufreißstreifens (12) bildet, wobei die erste und die zweite Schnittlinie (19, 20) in dem oberen Element (2) ausgebildet sind, wobei das erste Ende (21) der ersten Schnittlinie (19) an die zweite Schnittlinie (20) an einem Übergangsabschnitt (30) zwischen dem Aufreißstreifenabschnitt (20') und dem Konturabschnitt (20") der zweiten Schnittlinie (20) angrenzt und in einem Abstand (d1) von dem Übergangsabschnitt (30) zwischen dem Aufreißstreifenabschnitt (20') und dem Konturabschnitt (20") der zweiten Schnittlinie (20) angeordnet ist, wobei der Übergangsabschnitt (30) zwischen dem Aufreißstreifenabschnitt (20') und dem Konturabschnitt (20") der zweiten Schnittlinie (20) an einem der bogenförmigen Eckabschnitte (35, 36, 37, 38) angeordnet ist.

15. Verfahren nach Anspruch 14, wobei die erste und die zweite Schnittlinie (19, 20) in getrennten Schritten gebildet werden.

Revendications

1. Disque d'étanchéité (1) pour étanchéifier un compartiment intérieur dans un contenant d'emballage, ledit disque d'étanchéité (1) comprenant un élément supérieur (2) et un élément inférieur (3), ledit élément supérieur (2) présentant un bord périphérique d'élément supérieur (4) et ledit élément inférieur (3) présentant un bord périphérique d'élément inférieur (5), ledit élément supérieur (2) étant relié audit élément inférieur (3) dans un joint de bordure (8) agencé le long dudit bord périphérique d'élément supérieur (4) et dudit bord périphérique d'élément inférieur (5), ledit disque d'étanchéité (1) comprenant une zone de déchirement (10) étant délimitée par une ligne de contour (11) agencée dans ledit élément supérieur (2) et une bande de déchirure (12) agencée dans ledit élément supérieur (2) et faisant partie de ladite zone de déchirement (10), ladite bande de déchirure (12) comprenant une languette de traction (13) agencée au niveau de l'extrémité de prise de la bande de déchirure (12) et ledit joint de bordure (8) est agencé au niveau de ladite ligne de contour (11), **caractérisé en ce que** ledit élément supérieur (2) comprend une première ligne de coupe (19) et une seconde ligne de coupe (20), ladite première ligne de coupe (19) présentant une première extrémité (21) et une seconde extrémité (22) agencées sur ladite ligne de contour (11) et constitue une première partie de ladite ligne de contour (11) s'étendant entre ladite première extrémité (21) et ladite seconde extrémité (22) de ladite première ligne de coupe (19), et ladite seconde ligne de coupe (20) présente une première extrémité (23) et une seconde extrémité (24), ladite première extrémité (23) de ladite seconde ligne de coupe (20) étant agencée sur ladite ligne de contour (11), et ladite seconde extrémité (24) de ladite seconde ligne de coupe (20) étant agencée au sein de ladite zone de déchirement (10), ladite seconde ligne de coupe (20) comprenant une section de bande de déchirure (20') et une section de contour (20"), ladite section de bande de déchirure (20') délimitant ladite languette de traction (13) et un bord intérieur (25) de ladite bande de déchirure (12) et ladite section de contour (20") constituant une seconde partie de ladite ligne de contour (11) et un bord extérieur (26) de ladite bande de déchirure (12), ladite première extrémité (21) de ladite première ligne de coupe (19) jouxtant ladite seconde ligne de coupe (20) au niveau d'une partie de transition (30) entre ladite section de bande de déchirure (20') et ladite section de contour (20") de ladite seconde ligne de coupe (20) et étant agencée à une distance (d1) de ladite partie de transition (30) entre ladite section de bande de déchirure (20') et ladite section de contour (20") de ladite seconde ligne de coupe (20), dans lequel ledit disque d'étanchéité (1) présente une forme rectangulaire modifiée avec quatre bords latéraux (31, 32, 33, 34) reliés par quatre parties d'angle incurvées (35, 36, 37, 38) et la partie de transition (30) entre ladite section de bande de déchirure (20') et ladite section de contour (20") de ladite seconde ligne de coupe (20) est agencée au niveau d'une des parties de coin incurvées (35, 36, 37, 38).

2. Disque d'étanchéité (1) selon la revendication 1, dans lequel ladite distance (d1) entre ladite première extrémité (21) de ladite première ligne de coupe (19) et ladite partie de transition (30) entre ladite section de bande de déchirure (20') et ladite section de contour (20") de ladite seconde ligne de coupe (20) est

dans la plage allant de 0,5 millimètre à 5 millimètres, par exemple allant de 0,9 millimètre à 2 millimètres.

3. Disque d'étanchéité (1) selon la revendication 1 ou 2, dans lequel ledit joint de bordure (8) est agencé en travers de ladite ligne de contour (11).

4. Disque d'étanchéité (1) selon la revendication 1, 2 ou 3, dans lequel ledit disque d'étanchéité (1) comprend une ou plusieurs fixations (18, 28, 29) entre ledit élément supérieur (2) et ledit élément inférieur (3) en plus du joint de bordure (8).

5. Disque d'étanchéité (1) selon l'une quelconque des revendications précédentes, dans lequel lesdits bords latéraux (31, 32, 33, 34) consistent en des premier et second bords latéraux longitudinaux (31, 32) et des premier et second bords latéraux transversaux (33, 34), lesdits bords latéraux longitudinaux (31, 32) présentant une longueur supérieure à une longueur desdits bords latéraux transversaux (33, 34).

6. Disque d'étanchéité (1) selon la revendication 5, dans lequel ladite section de contour (20") de ladite seconde ligne de coupe (20) est agencée le long d'un desdits premier et seconds bords latéraux longitudinaux (31, 32).

7. Disque d'étanchéité (1) selon l'une quelconque des revendications précédentes, dans lequel ladite première partie de ladite ligne de contour (11) et ladite seconde partie de ladite ligne de contour (11) forment ensemble ladite ligne de contour (11).

8. Disque d'étanchéité (1) selon la revendication 7, dans lequel seconde extrémité (22) de ladite première ligne de coupe (19) jouxte ladite première extrémité (23) de ladite seconde ligne de coupe (20) au niveau d'une distance (d2) entre ladite seconde extrémité (22) de ladite première ligne de coupe (19) et ladite première extrémité (23) de ladite seconde ligne de coupe (20), ladite distance (d2) étant dans la plage allant de 0,3 millimètre à 2 millimètres, par exemple allant de 0,7 millimètre à 1,2 millimètre.

9. Disque d'étanchéité (1) selon l'une quelconque des revendications précédentes, dans lequel ladite seconde extrémité (22) de ladite première ligne de coupe (19) jouxte ladite première extrémité (23) de ladite seconde ligne de coupe (20) au niveau d'une desdites parties d'angle incurvées (35, 36, 37, 38).

10. Disque d'étanchéité (1) selon l'une quelconque des revendications 5 à 8, dans lequel ladite seconde extrémité (22) de ladite première ligne de coupe (19) jouxte ladite première extrémité (23) de ladite seconde ligne de coupe (20) au niveau d'un bord latéral transversal (33, 34).

11. Disque d'étanchéité (1) selon l'une quelconque des revendications précédentes, dans lequel ladite partie de transition (30) entre ladite section de bande de déchirure (20') et ladite section de contour (20") de ladite seconde ligne de coupe (20) est incurvée et présente un rayon de courbure (r) dans la plage allant de 15 millimètres à 22 millimètres, par exemple allant de 17 millimètres à 20 millimètres.

12. Disque d'étanchéité (1) selon l'une quelconque des revendications précédentes, dans lequel ladite bande de déchirure (12) présente une largeur (w) dans la plage allant de 15 millimètres à 30 millimètres, par exemple allant de 18 millimètres à 25 millimètres.

13. Contenant d'emballage (100) comprenant le disque d'étanchéité (1 ; 101) selon l'une quelconque des revendications 1-12, dans lequel ledit contenant d'emballage (100) comprend un corps de contenant (102) comprenant une paroi de contenant (103) s'étendant à partir d'un fond de contenant (104) vers une ouverture de contenant (105), et un agencement de fermeture comprenant un couvercle (114), une partie de bord périphérique (117) dudit disque d'étanchéité (1) étant fixée à une surface intérieure (107) de ladite paroi de contenant, ledit disque d'étanchéité (1) formant un joint de transport en travers de ladite ouverture de contenant (105).

14. Procédé de production d'un disque d'étanchéité (1), dans lequel ledit disque d'étanchéité (1) présente une forme rectangulaire modifiée avec quatre bords latéraux (31, 32, 33, 34) reliés par quatre parties d'angle incurvées (35, 36, 37, 38), ledit procédé comprenant les étapes consistant à :

- fournir un élément supérieur (2) et un élément inférieur (3), ledit élément supérieur (2) présentant un bord périphérique d'élément supérieur (4) et ledit élément inférieur (3) présentant un bord périphérique d'élément inférieur (5) ;
- relier ledit élément supérieur (2) audit élément inférieur (3) avec un joint de bordure (8) le long dudit bord périphérique d'élément supérieur (4) et dudit bord périphérique d'élément inférieur (5) ;
- former une zone de déchirement (10) dans ledit disque d'étanchéité (1), ladite zone de déchirement étant délimitée par une ligne de contour (11) formée dans ledit élément supérieur (2) et formant une bande de déchirure (12) dans ledit élément supérieur (2), ladite bande de déchirure (12) faisant partie de ladite zone de déchirement (10) et comprenant une languette de traction (13) formée au niveau d'une extrémité de prise de ladite bande de déchirure (12),

caractérisé par les étapes consistant à

- former une première ligne de coupe (19) dans ledit élément supérieur (2), ladite première ligne de coupe (19) présentant une première extrémité (21) et une seconde extrémité (22) agencées sur ladite ligne de contour (11) et constituant une première partie de ladite ligne de contour (11) s'étendant entre ladite première extrémité (21) et ladite seconde extrémité (22) de ladite première ligne de coupe (19) ;
- former une seconde ligne de coupe (20) dans ledit élément supérieur (2), ladite seconde ligne de coupe (20) présentant une première extrémité (23) et une seconde extrémité (24), ladite première extrémité (23) de ladite seconde ligne de coupe (20) étant agencée sur ladite ligne de contour (11), et ladite seconde extrémité (24) de ladite seconde ligne de coupe (20) étant agencée au sein de ladite zone de déchirement (10), ladite seconde ligne de coupe (20) comprenant une section de bande de déchirure (20') et une section de contour (20"), ladite section de bande de déchirure (20') délimitant ladite languette de traction (13) et un bord intérieur (25) de ladite bande de déchirure (12) et ladite section de contour (20") constituant une seconde partie de ladite ligne de contour (11) et un bord extérieur (26) de ladite bande de déchirure (12), lesdites première et seconde lignes de coupe (19, 20) étant formées dans ledit élément supérieur (2) avec ladite première extrémité (21) de ladite première ligne de coupe (19) jouxtant ladite seconde ligne de coupe (20) au niveau d'une partie de transition (30) entre ladite section de bande de déchirure (20') et ladite section de contour (20") de ladite seconde ligne de coupe (20) et étant agencée à une distance (d1) de ladite partie de transition (30) entre ladite section de bande de déchirure (20') et ladite section de contour (20") de ladite seconde ligne de coupe (20), dans lequel ladite partie de transition (30) entre ladite section de bande de déchirure (20') et ladite section de contour (20") de ladite seconde ligne de coupe (20) est agencée au niveau d'une des parties de coin incurvées (35, 36, 37, 38).

15. Procédé selon la revendication 14, dans lequel lesdites première et secondes lignes de coupe (19, 20) sont formées dans des étapes distinctes.

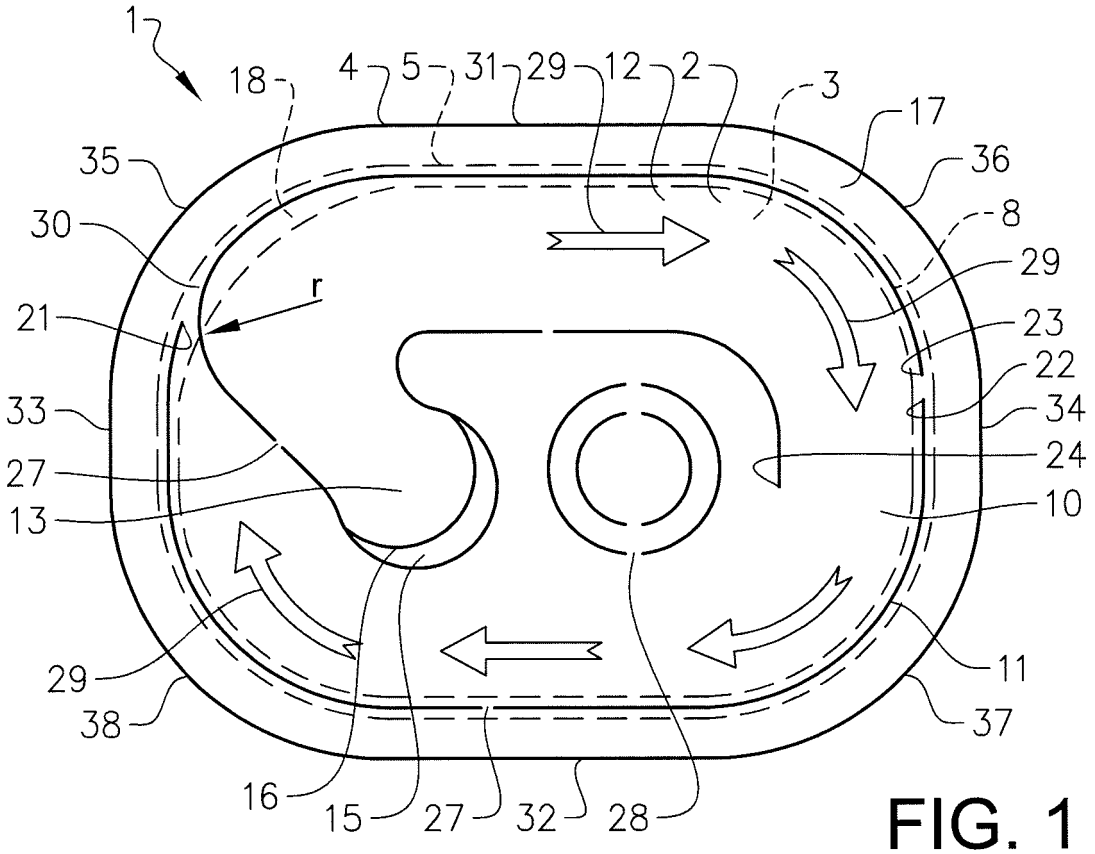
1
18
4
5
31
29
12
2
3
17
35
36
30
8
r
29
21
23
22
33
34
27
24
13
10
29
11
38
37
16
15
27
32
28

FIG. 1

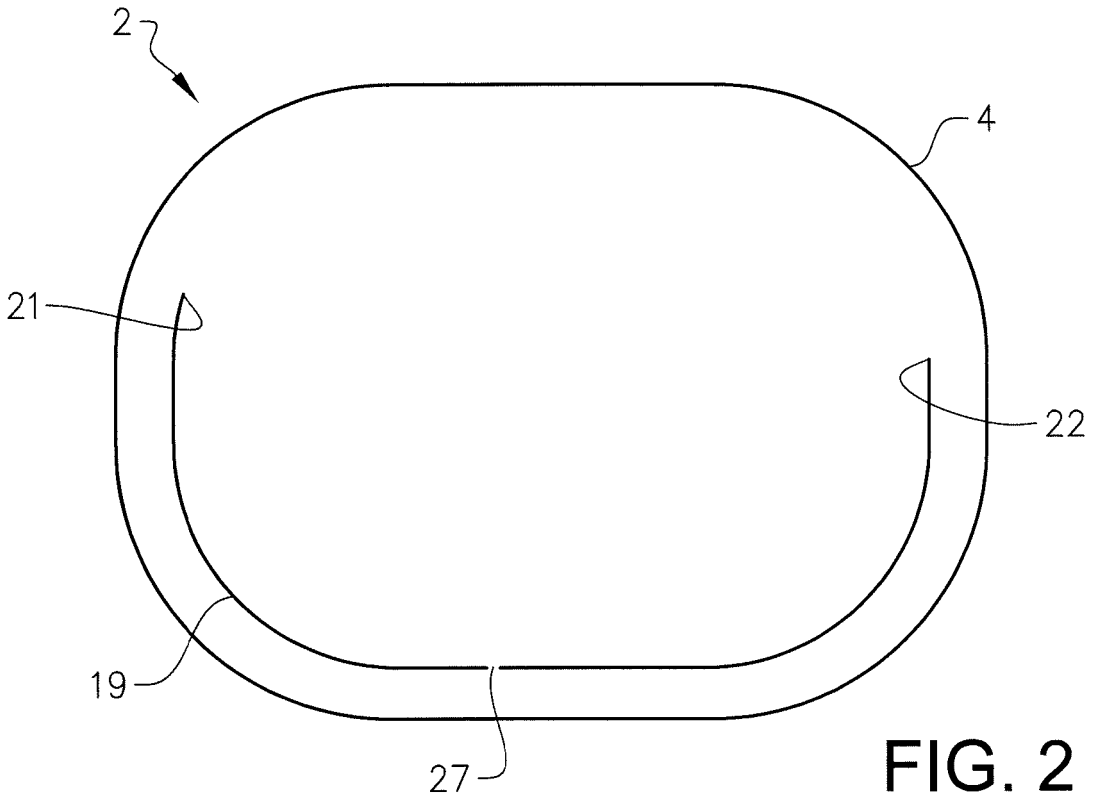
2
4
21
22
19
27

FIG. 2

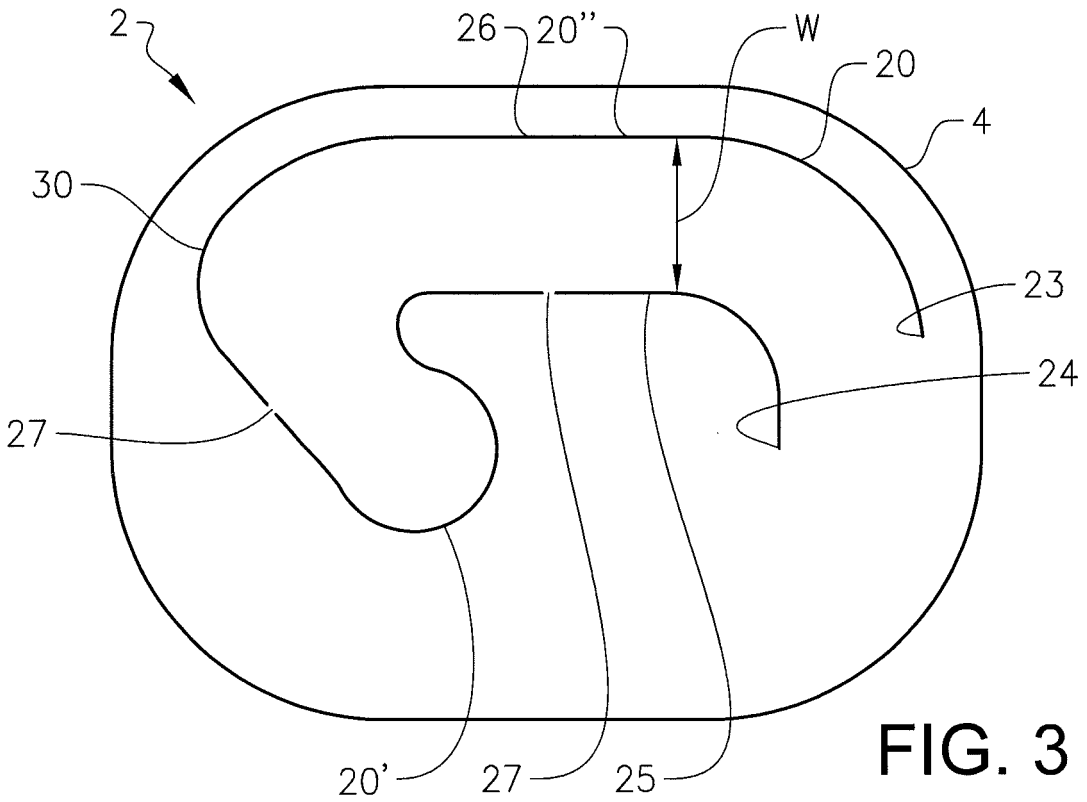
2
26
20''
W
20
4
30
23
24
27
20'
27
25

FIG. 3

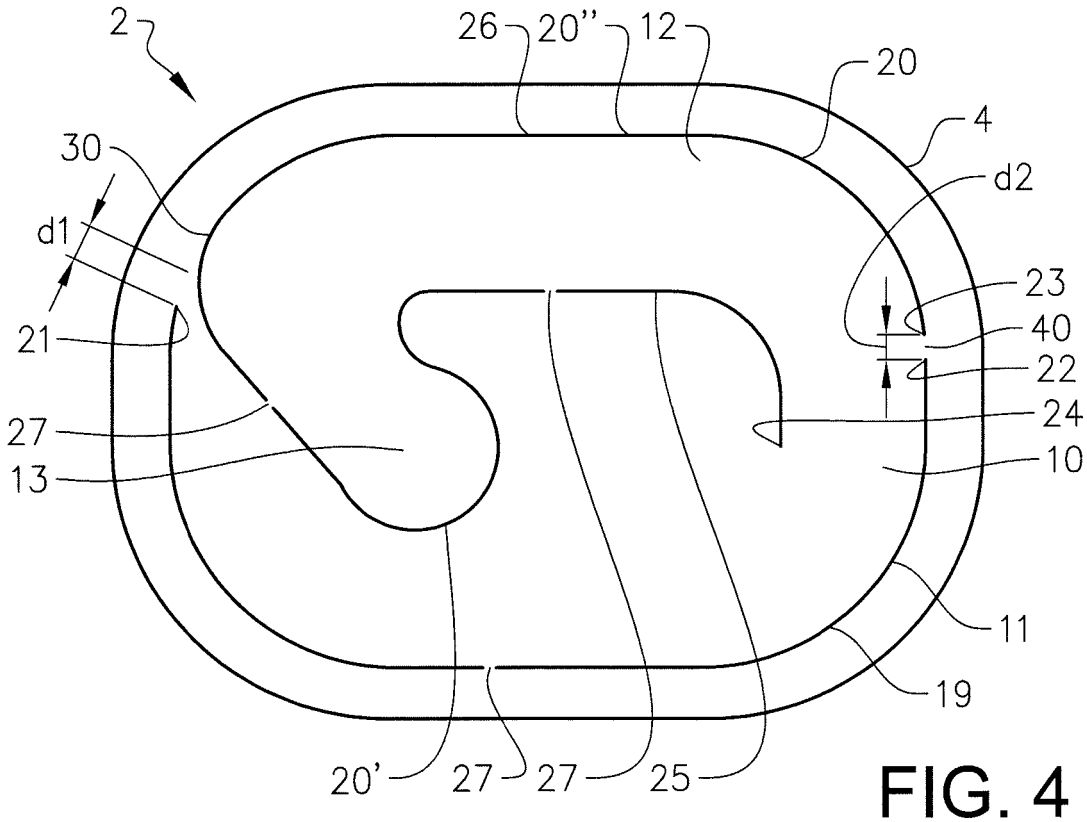
2
26
20''
12
20
4
30
d2
d1
23
40
21
22
24
27
13
10
11
19
20'
27
27
25

FIG. 4

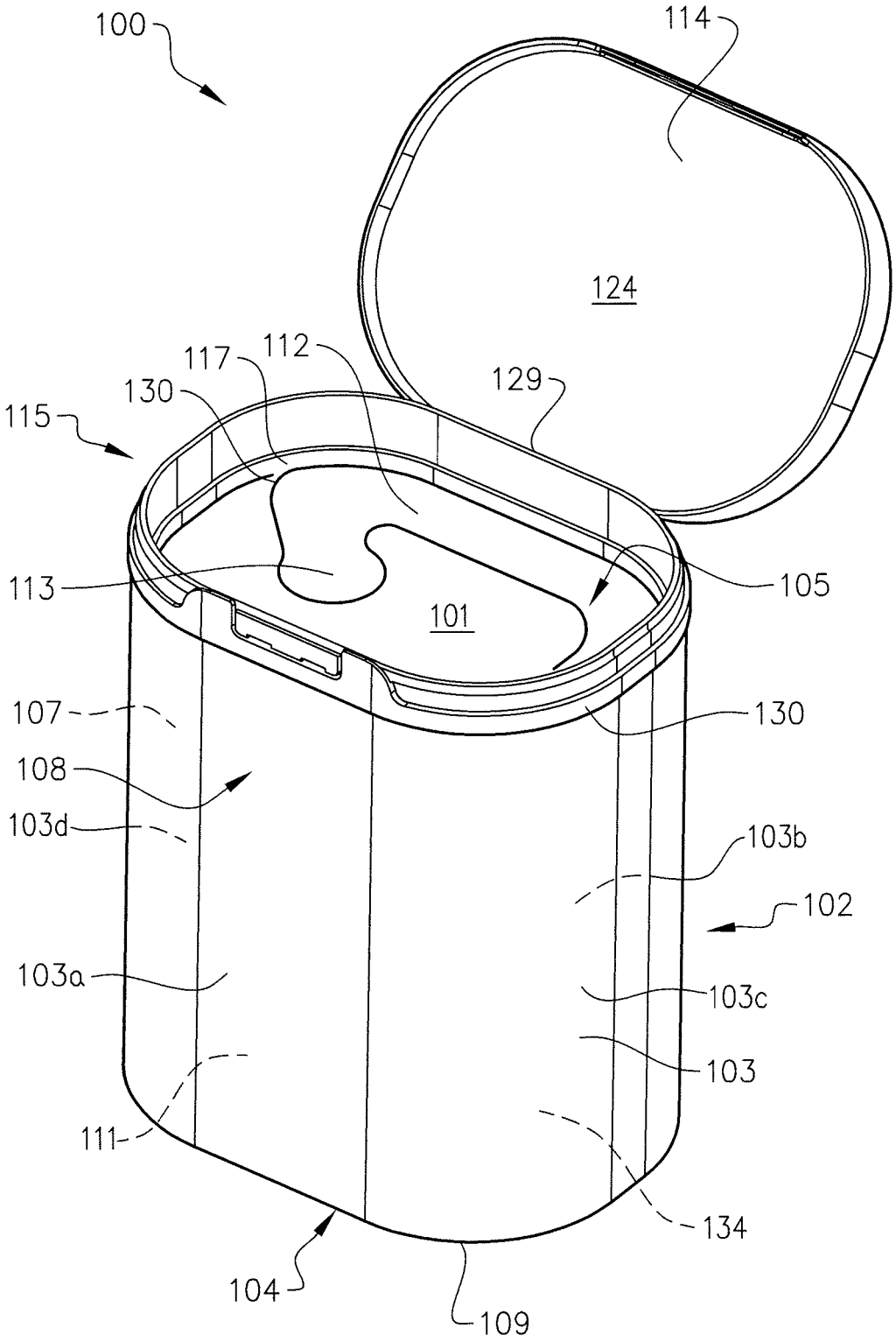
100
114
124
117
112
130
129
115
113
101
105
107
130
108
103d
103b
102
103a
103c
103
111
134
104
109

FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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