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(54) **TETHERED CLOSURE DEVICE AND CONTAINER COMPRISING A TETHERED CLOSURE
DEVICE**

ANGEBUNDENE VERSCHLUSSVORRICHTUNG UND BEHÄLTER MIT EINER SOLCHEN
ANGEBUNDENEN VERSCHLUSSVORRICHTUNG

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Description

[0001] The present invention relates to a closure device comprising a pour spout and a cap having a re-sealable lid portion. In particular, the present invention relates to a tethered closure device, e.g. a closure device in which the lid portion is tethered to the pour spout.

[0002] The invention also relates to an assembly comprising a container and a tethered closure device. In particular, the present invention relates to such an assembly wherein the container comprises a paper-based packaging. A paper-based packaging is sometimes referred to as a "carton" and is commonly used to distribute liquid consumable products, e.g. dairy products, such as milk, or fruit juices.

[0003] A carton is typically produced from a laminate packaging material, which typically comprises a multi-ply paper or paperboard sheet on which is laminated one or a plurality of barrier layers for holding the liquid and/or prevent migration of air and flavour degrading substances through the paperboard. A barrier layer may typically comprise a polyethylene or an aluminium layer.

[0004] In particular, the present invention relates to an assembly comprising a tethered closure device and a container in the form of a gable top carton comprising a top fin.

[0005] Using a tethered closure device on a container prevents users from misplacing and losing the lid portion when operating the container, e.g. when pouring liquid from the container. However, it is desirable that the tethered closure device does not negatively interfere with the operation. For example, the tethered lid portion, when in an open position, should not interfere with a pouring operation. It is also desirable that the tethered closure device can be produced in a simple and economical manner.

[0006] Within the art, different types of tethered closure devices are known.

[0007] US 9010555 B2 shows a closure device having a cap that comprises a circular skirt, said cap including an irremovable portion fixedly attached about the neck of a vessel and a removable portion removably attached to the neck, the irremovable and removable portions being separated by a first weakening line. In order to maintain the removable portion of the skirt attached to the irremovable portion of the skirt after the first opening, the skirt is provided with a second peripheral weakening line. It is also provided that the second weakening line takes a value strictly less than 180°.

[0008] However, the distance the tethered cap can be removed from the pour spout when the closure device is in an open position is rather limited. Therefore, there is a risk that the tethered cap may hinder or at least interfere with content distributed through the pour spout during dispensing action.

[0009] US 6474491 B1 shows a closure device for a container comprising a top, a ring axially maintained around a pour spout of the container, and two arc-shaped

arms, each of which is connected to the top via a hinge-film and foldable parts, and to the ring, thus tethering the top to the ring and, consequently also to the pour spout of the container.

[0010] However, the tethering mechanism, in particular the hinge-film and foldable parts of the closure device, is a relatively complex and therefore expensive to manufacture and, in addition, limits the distance the tethered cap can be removed from the pour spout when the closure device is in an open position.

[0011] Further closure devices having tethered caps are shown in US8443994 B1 and US 4557393A. While these closure devices allow the tethered cap to be removed from the pour spout sufficiently far to prevent the tethered cap from interfering with content distributed through the pour spout, the tethering provides limited control of the cap.

[0012] US 2012/305564 A1 discloses a cap for a container according to the preamble of claim 1. The cap comprises a cap body provided with a thread portion at the inner peripheral surface of its upper portion which is engaged with a thread of an opening portion of a container, and a fixed portion connected with the cap body at a cuttable connector portion. The fixed portion comprises an upper ring, and a lower ring provided with lock projections to prevent the lower portion from the opening portion of the container. The upper ring and the lower ring are connected at a connector portion. The lower ring is provided with at least one cutting line extending from its bottom end to its upper end.

Summary

[0013] With the abovementioned challenges and known solutions in mind, the present invention brings forward a tethered closure device that strives to solve or at least reduce at least one of the aforementioned problems or challenges.

[0014] According to an example aspect the present invention provides a closure device comprising:

- a pour spout and a cap;
- the cap comprising a lid portion, a linking portion and a retainment portion, the linking portion permanently linking the lid portion to the retainment portion and the retainment portion being permanently retained around the pour spout;
- the lid portion being resealably arranged on the pour spout allowing the closure device to be brought between an open position and a closed position;
- the pour spout and the cap, when the closure device is in the closed position, having a longitudinal, central axis;
- the cap comprising first and second separation lines along which the cap is configured to separate when the closure device is brought from the closed position to the open position;
- the first separation line, when the closure device is

in the closed position, extending circumferentially around the cap between a first endpoint and a second endpoint, the first and second endpoints of the first separation line defining between them a non-breakable first bridge section configured to permanently connect the retainment portion to the linking portion, said first bridge section having, when the closure device is in the closed position, a circumferential extent about the longitudinal, central axis that is less than 90°;

the second separation line, when the closure device is in the closed position, extending circumferentially around the cap between a first endpoint and a second endpoint, the first and second endpoints of the second separation line defining between them a non-breakable second bridge section configured to permanently connect the lid portion to the linking portion; the first bridge section and the second bridge section being located at opposite sides of the cap when the closure device is in the closed position; and the second bridge section having, when the closure device is in the closed position, a circumferential extent about the longitudinal, central axis that is less than 90°, the circumferential extent (α) of the first bridge section (348) being within the range of 10° to 90°.

[0015] Consequently, in the open position the lid portion will be tethered to the tubular pour spout via the linking portion and the retainment portion, wherein the first bridge section connects the retainment portion to the linking portion and the second bridge section connects the linking portion to the lid portion.

[0016] The first bridge section and the second bridge section may be arranged symmetrically about the central axis when the closure device is in the closed position.

[0017] The first bridge section may comprise a first sub-section, the second bridge section may comprise a second sub-section, and the first sub-section and the second sub-section, when the closure device is in the closed position, may be arranged symmetrically about the central axis.

[0018] The circumferential extent of the first bridge section may be equal to or larger than the circumferential extent of the second bridge section.

[0019] The circumferential extent of the first bridge section may be any one of: within the range of 20° to 60°; within the range of 30° to 50°; and 40°.

[0020] The circumferential extent of the second bridge section may be any one of: within the range of 10° to 90°; within the range of 20° to 60°; within the range of 30° to 50°; and 40°.

[0021] When the closure device is in the closed position the first separation line and the first bridge section may be arranged in a first plane which is transversal to the longitudinal, central axis of the pour spout, and the second separation line and the second bridge section may be arranged in a second plane which is parallel to

the first plane. The first and second planes may be arranged at a mutual distance of any one of: within the range of 1 to 10 mm; within the range of 1 to 8 mm; and within the range of 1 to 3 mm.

[0022] The pour spout may comprise an annular, radially extending ridge configured to deny the retainment portion axial movement along the pour spout towards a dispensing opening of the pour spout, i.e. an opening through which content is dispensed through the closure device during a dispensing operation. The first separation line, when the closure device is in the closed position, may advantageously be arranged at an axial distance from the dispensing opening that is larger than the axial distance between the ridge and the dispensing opening.

[0023] The second separation line, when the closure device is in the closed position, may be arranged at an axial distance from the dispensing opening that is approximately equal to the axial distance between the ridge and the dispensing opening. In other words, the second separation line may be positioned approximately level to the ridge.

[0024] The lid portion may comprise internal threads and the pour spout may comprise corresponding external threads allowing the lid portion to be rotated about the longitudinal, central axis of the pour spout to be screwed off the pour spout bringing the closure device from the closed position to the open position, and screwed on to the pour spout bringing the closure device from the open position to the closed position.

[0025] The first and second separation lines may form first and second break lines being adapted to be broken during a first opening of the closure device. The retainment portion and the linking portion may be adapted to be connected to each other, continuously or discontinuously, along the first break line prior to the first opening and being adapted to be disconnected from each other along the first break line after the first opening. Also, the lid portion and the linking portion may be adapted to be connected to each other, continuously or discontinuously, along the second break line prior to the first opening and being adapted to be disconnected from each other along the second break line after the first opening.

[0026] According to another example aspect the present invention provides an assembly comprising a container and a closure device as disclosed above.

[0027] The container may be a gable top container comprising a carton having a top fin and the closure device may be mounted on a front top panel of the carton, allowing the closure device to be operable between said closed position and an open position in which the top fin is positioned in a gap formed between the linking portion and the lid portion.

[0028] Above-discussed preferred and/or optional features of each aspect may be used, alone or in appropriate combination, in the other aspects of the invention.

[0029] Following drawings are appended to facilitate the understanding of the invention:

Fig. 1 is a first perspective view of an embodiment of a closure device according to an aspect of the invention.

Fig. 2 is a first side view of the closure device according to Fig. 1.

Fig. 3 is a partial cross-sectional view of the closure device according to Fig. 2.

Fig. 4 is a second perspective view of the closure device according to Fig. 1.

Fig. 5 is a second side view of the closure device according to Fig. 1.

Fig. 6 is a third perspective view of the closure device according to Fig. 1.

Fig. 7 is a third side view of the closure device according to Fig. 1.

Fig. 8 illustrates the circumferential extent of a first break line and a first bridge section of the closure device according to Fig. 1.

Fig. 9 illustrates the circumferential extent of a second break line and a second bridge section of the closure device according to Fig. 1.

Fig. 10 is a side view of the closure device according to Fig. 1 in an open position.

Fig. 11 illustrates the circumferential extent of alternative embodiments of first and second break lines.

Fig. 12 illustrates the circumferential extent of further alternative embodiments of first and second break lines.

Fig. 13 is a perspective view of an assembly according to an aspect of the invention, comprising a container and a closure device according to the invention.

Detailed description

[0030] In the following, embodiments of the invention will be described in more detail with reference to the drawings. However, it is specifically intended that the invention is not limited to the embodiments and illustrations contained herein but includes modified forms of the embodiments including portions of the embodiments and combinations of elements of different embodiments as come within the scope of the following claims.

[0031] It is appreciated that certain features of the invention, which, for clarity, have been described above in the context of separate embodiments, may also be pro-

vided in combination in a single embodiment. Conversely, various features of the invention, which, for brevity, have been described in the context of a single embodiment, may also be provided separately or in any suitable sub-combination. In particular, it will be appreciated that features described in relation to one particular embodiment may be interchangeable with features described in relation to other embodiments.

[0032] In the drawings, like reference numerals have been used to indicate common parts, elements or features unless otherwise explicitly stated or implicitly understood from the context.

[0033] In the following an embodiment of a closure device 100 according to the invention will be discussed in more detail with reference to Figs. 1 to 10.

[0034] The disclosed embodiment of the closure device 100 is configured to be used in a liquid packaging carton comprising a multi-ply paper or paperboard sheet on which is laminated one or a plurality of barrier layers for holding liquid and/or prevent migration of air and flavour degrading substances through the paperboard. Such liquid packaging containers are commonly used for distributing dairy products, e.g. milk, or juices. Typically, closure devices for such applications are made from polyethylene and it is preferable that the disclosed closure device is made from this material.

[0035] The closure device 100 comprises a generally tubular pour spout 200 and a cap 300. The pour spout 200 comprises a body 202 that is generally tubular-cylindrical and comprises a central axis A. The body 202 defines an axial, through-going channel 204 (see Fig. 3) and comprises a first, top end 206 (see Fig. 10), where the body 202 displays a first, top opening 208 of the channel 204, which opening 208 is defined by a rim 210 and forms a dispensing opening of the pour spout 200. The body 202 further comprises a second, bottom end 212, where the body 202 displays a second, bottom opening 214 of the channel 204 (see Fig. 3). At the bottom end 212, the body 202 also displays an annular, radially and outwardly extending flange 216 configured to be attached to a container in the form of a paper or paper board carton (see Fig. 13).

[0036] For reasons of convenience, the description below considers that the terms "upwards" correspond to a direction that is generally parallel to the central axis A and that goes from the second opening 212 towards the first opening 208, whereas the terms and "downwards" correspond to the opposite direction. The terms "top"- "bottom" and "upper"- "lower", correspond to relative positions with reference to this direction and the terms "inner"- "outer" correspond to correspond to relative positions with reference to a direction which is perpendicular to this direction.

[0037] The body 202 displays a first, inner surface 218 and a second, outer surface 220 (see Fig. 3). The inner surface is generally rotational-symmetric about the central axis A and defines an inner side wall of the channel 204. At the lower part of the body 202, the outer surface

220 is provided with an annular, radially extending ridge 222, sometimes referred to as a "bead ring". The ridge 222 displays an annular, downwardly facing surface which is generally planar and perpendicular to the axis A. Together with the flange 216, this surface defines an annular recess 226 configured for receiving and retaining a section of the cap 300 in a manner which will be disclosed in more detail in the following. The outer surface 220 is also provided with threads 228 starting adjacent the rim 210 and running helically along the outer surface 220 towards the ridge 222.

[0038] The cap 300 comprises a lid portion 302, a linking portion 304 and a retainment portion 306 (see Figs. 1 and 10). The linking portion 304 is configured to permanently link the lid portion 302 to the retainment portion 306 and the retainment portion 306 is permanently retained around the pour spout 200.

[0039] The lid portion 302 is open at its bottom end and is closed at its top end by an end-wall 308, at the outside periphery of which a tubular skirt 310 extends axially downwards, which skirt 310 is centred on a central axis B (see Figs. 3 and 10) and has a circular base. In the disclosed embodiment, the lid portion 302 is provided with a lip 312 that extends axially downwards from the end-wall 308 in such a manner as to be centred on the axis B inside the skirt 310.

[0040] The lid portion 302 is resealably arranged on the pour spout 200. In the present embodiment, this is realised by the skirt 310 comprising an inside wall 314 provided with internal threads 316 that extend radially from the inside wall 314 towards the axis B in a manner which is complementary to the external threads 228 of the pour spout 200. The internal threads 316 are configured to interact with the external threads 228, allowing the lid portion 302 to be rotated about the central axis A to be screwed off the pour spout 200 bringing the closure device 100 from a closed position to an open position, and screwed on to the pour spout 200 bringing the closure device 100 from the open position to the closed position. The skirt 310 comprises an outside wall 318 which, in order to make it easier for a user to rotate the lid portion 302 about the axis B, may be provided with elongate splines 320 that extend parallel to the axis B (e.g. see Fig. 1).

[0041] When the closure device 100 is in the closed position, the end-wall 308 extends above and across the top opening 208 of the pour spout 200 while the skirt 310 surrounds the body 202 externally and the lip 312 is pressed in a leak-tight manner against the inside wall 218. In this position, the axis A of the pour spout 200 and the axis B of the cap 300 are aligned (e.g. see Fig. 3). When the closure device 100 is in the open position, the lid portion 302 can be moved away from the pour spout 300, axially and transversely, allowing content, e.g. a liquid, to be dispensed through the top opening 208 of the pour spout 200 (e.g. see Fig. 10).

[0042] The retainment portion 306 comprises a first, outer section 322 and a second, inner section 324 which

is connected to the outer section 322 at a lower end thereof (see Fig. 3). The inner section 324 extends upwardly from the outer section 322 terminating at a free, upper end 326 displaying an annular, upwardly facing surface facing the ridge 222, which annular surface is generally planar and perpendicular to the axis A. Consequently, the inner section 324 extends upwardly from the outer section 322 into the recess 226, and the upwardly facing surface of the free end 326 of the inner section 324 is configured to interact with the downwardly facing surface of the ridge 222 to prevent the retainment portion 306 from moving axially towards the top opening 214 of the pour spout. The flange 216 prevents the retainment portion 306 from moving axially towards the bottom opening 214 of the pour spout 200.

[0043] However, the inner section 324 is configured not to interact tightly with the inner side wall of the recess 226, thus allowing the retainment portion 306 to rotate about the axis A. Consequently, the retainment portion 306 extends circumferentially around the pour spout 200, and the recess 226 defined by the ridge 222 and the flange 216 form retaining means preventing the retainment portion 306 from moving vis-à-vis the pour spout 200 in the axial direction but allowing the retainment portion 306 to be rotated about the central axis A. In other words, the retainment portion 306 is rotatably retained about the pour spout 200.

[0044] The cap 300 comprises a first, lower separation or break line 340 and a second, upper separation or break line 342 (see Figs. 1 to 3), along which break lines 340, 342 the cap 300 is configured to break during a first opening of the closure device 100 and then separate when the closure device 100 is brought towards the open position.

[0045] When the closure device 100 is in the closed position, the lower separation line 340 extends circumferentially around the cap 300 between a first endpoint 344 and a second endpoint 346 (see Fig. 5), which endpoints 344, 346 define between them a non-breakable first, lower bridge section 348 configured to permanently connect the retainment portion 306 to the linking portion 304. Likewise, the upper separation line 342 extends circumferentially around the cap 300 between a first endpoint 350 and a second endpoint 352 (see Fig. 7), which endpoints 350, 352 define between them a non-breakable second, upper bridge section 354 configured to permanently connect the lid portion 302 to the linking portion 304.

[0046] As previously stated, the lower and upper separation or break lines 340, 342 are adapted to be broken during a first opening of the closure device 100. Consequently, prior to the first opening the retainment portion 306 and the linking portion 304 are connected to each other along the lower break line 340, continuously or discontinuously, and during the first opening the retainment portion 306 and the linking portion 304 are configured to be separated from each other along this line 340. Likewise, prior to the first opening the lid portion 302 and the

linking portion 304 are connected to each other along the upper break line 342, continuously or discontinuously, and during the first opening the lid portion 302 and the linking portion 304 are configured to be separated from each other along this line 342.

[0047] The lower and upper bridge sections 348, 354 are arranged at opposites sides of the cap 300 such that the bridge sections 348, 354, or at least sub-sections 356, 358 thereof (see Figs. 11 and 12), are arranged symmetrically about the central axis A. When the closure device 100 is in the closed position, the lower bridge section 348 has a circumferential extent or distance α about the central axis A which is less than 90° . Likewise, the upper bridge section 354 has a circumferential extent or distance β about the central axis A which is less than 90° . This allows the lid portion 302, in the open position of the closure device 100, to be moved away from the central axis A sufficiently far to allow nearly unrestricted disposal of content through the top opening 208 of the pour spout 200 while keeping the lid portion 302 tethered to the pour spout 200 in a controlled manner. The smaller the circumferential distances α and β , the further away from the central axis A the lid portion 302 can be moved. However, if the circumferential distances α and β are made too small, the strength of the bridge sections 348 and/or 354 may be compromised. Preferably, the circumferential distances α and β are within the range of 10° to 90° , more preferably within the range of 20° to 60° , and even more preferably within the range of 30° to 50° , e.g. 40° . In the embodiment disclosed in Figs 1 to 10, α and β are both approximately 40° .

[0048] The circumferential extent or distance α of the lower bridge section 348 may preferably be equal to or larger than the circumferential extent or distance β of the upper bridge section 354. However, in other embodiments the circumferential distance α may be smaller than the circumferential distance β . Consequently, the circumferential distance α of the lower bridge section 348 does not have to be equal to the circumferential extent β of the upper bridge section 354. This is illustrated in Fig. 11, which shows a situation where the circumferential extent α of the lower bridge section 348 is larger than the circumferential extent β of the upper bridge section 354, and where the lower bridge section 348 comprises a sub-section 356 that is symmetrical to the upper bridge section 354 about the axis A.

[0049] Also, the lower and upper bridge sections 348, 354 do not have to be perfectly symmetrically arranged about the axis A. This is illustrated in Fig. 12, which shows a situation where the lower bridge section 348 comprises a first sub-section 356 and the upper bridge section 354 comprises a second sub-section 358, which first and second sub-sections 356, 358 are symmetrical about the axis A but which first and second bridge sections 348, 354 are not.

[0050] When the closure device 100 is in the closed position, the lower separation or break line 340 and the lower bridge section 348 may define a first plane P1 which

is transversal to the longitudinal, central axis A, and the upper separation or break line 342 and the upper bridge section 354 may define a second plane P2 which is parallel to the first plane P1 (see Fig. 2). The distance between the first and second planes P1, P2, thus defining the height of the linking portion 306, may preferably be at least 1 mm to ensure sufficient strength of the linking portion 306, but should preferably not be more than 10 mm in order not to compromise the flexibility of the same. Consequently, the distance between the planes P1 and P2 may preferably be within the range of 1-10 mm. However, more preferably the distance may be within the range of 1-8 mm or 1-3 mm.

[0051] In the disclosed embodiment, the lower separation line 340 is, in the closed position, arranged below the ridge 222, i.e. at an axial distance D1 from the dispensing opening 208 that is larger than the axial distance D2 between the ridge 222 and the dispensing opening 208 (see Fig. 3: the axial distance being the distance measured along the in the direction of the longitudinal, central axis A). This provides a design where the lid portion's 302 tethered connection with the pour spout 200, effectuated by the lower bridge section 348, is positioned remote from the top opening 208, thus mitigating the risk that the lid portion 302 and the linking portion 304, during a dispensing operation, will interfere with content dispensed through top opening 202.

[0052] In the disclosed embodiment, the upper separation line 342 is positioned, in the axial direction of the pour spout 200, approximately level with the ridge 222, i.e. at an axial distance from the dispensing opening 208 that is approximately equal to the axial distance between the ridge 222 and the dispensing opening 208.

[0053] In some embodiments (not disclosed) the first plane P1, defined by the lower separation or break line 340 and the lower bridge section 348, and the second plane P2, defined by the upper separation or break line 342 and the upper bridge section 354, need not be parallel.

[0054] In other embodiments (not disclosed), the lower separation or break line 340 and the lower bridge section 348, and the upper separation or break line 342 and the upper bridge section 354, respectively, may define curved, i.e. non-planar, surfaces.

[0055] The radial thickness of the linking portion 304 and/or that of the outer section 322 of the retainment portion 306 may typically be within the range of 0.5 to 1.0 mm.

[0056] Prior to the first opening, the separation or break lines 340, 342 may comprise slits, incisions or through-going cuts that are separated by bridge portions configured to break during the first opening. In the disclosed embodiment the lower separation or break line 340 comprises five bridge portions 360 arranged circumferentially along the separation or break line 340 with a mutual circumferential distance of approximately 60° , as is indicated in Fig. 8, and the upper separation or break line 342 comprises seven bridge portions 362 arranged circum-

ferentially along the separation or break line 342 with a mutual circumferential distance of approximately 45°. Each of the bridge portions 360, 362 may typically have a width that is within the range of 0.2 to 0.5 mm. Between two bridge portions 360, 362 the cap 300 may typically display through-going slits, thus allowing the first opening to be effectuated by a user unscrewing the cap 300 until the bridge portions 360, 362 are deformed beyond the point of breakage.

[0057] However, the separation or break lines 340, 342 may be arranged in other ways known in the art as long as they provide, during the first opening, a clean break between the retainment portion 306 and the linking portion 304, and between the linking portion 304 and the lid portion 302, respectively. Once broken, the separation or break lines 340, 342 provide evidence that the closure device 100 has been opened, thus providing so called "tamper evidence".

[0058] Fig. 13 discloses an assembly 400 comprising the closure device 100 discussed above and a container 500 in the form of a gable top container comprising a carton 600 made from a multi-ply paper or paperboard sheet on which is laminated one or a plurality of barrier layers, as is known in the art of liquid packaging containers. The carton 600 comprises four side wall panels 602, 604 (of which only two is visible in Fig. 13), a front top panel 610, a rear top panel (not visible in Fig. 13), two side top panels 614 (of which only one is visible in Fig. 13) and a top fin 618. The closure device 100 is mounted in an opening in the front top panel 610 with the flange section 216 attached to the inside wall of the front top panel 610.

[0059] Due to the retainment portion 306 being rotatably arranged around the pour spout 200, the closure device 100, when in the open position, can be rotated vis-à-vis the carton 600 such that the lower bridge section 348 faces the top fin 618. In this position, the lid portion 302 can be brought over the top fin 618 and locked behind the same with the top fin 618 inserted in a gap formed by the upper break line 342 between the linking portion 304 and the lid portion 302, as is shown in Fig. 13. By virtue of the linking portion 304 having two strands interconnecting the first and second bridge sections 348 and 354, the lid portion 302 and the linking portion 304 will be firmly held straddled over the top fin 618. Consequently, the closure device 100 provides a simple, efficient and convenient way of securing the lid portion 106 away from the pour spout 102 in the open position, thus allowing content to be dispensed from the container 500 without the tethered lid portion 302 interfering with the dispensing action.

[0060] Consequently, although the closure device according to the invention can be used with any type of container, it is especially advantageous to use the closure device together with a fin-equipped gable top container.

[0061] In the preceding specification, various aspects of the closure device according to the invention have

been described and discussed with reference to the illustrative embodiments. For purposes of explanation, specific numbers, systems and configurations were set forth in order to provide a thorough understanding of the closure device and its workings. However, this specification is not intended to be construed in a limiting sense. Various modifications and variations of the illustrative embodiment, as well as other embodiments of the closure device, which are apparent to person skilled in the art to which the disclosed subject-matter pertains, are deemed to lie within the scope of the present invention as defined by the following claims.

15 Claims

1. A closure device (100) comprising:

a pour spout (200) and a cap (300);
the cap (300) comprising a lid portion (302), a linking portion (304) and a retainment portion (306), the linking portion (304) linking the lid portion (302) to the retainment portion (306) and the retainment portion (306) being retained around the pour spout (200);
the lid portion (302) being resealably arranged on the pour spout (200) allowing the closure device (100) to be brought between an open position and a closed position;
the pour spout (200) and the cap (300), when the closure device (100) is in the closed position, having a longitudinal, central axis (A);
the cap (300) comprising first and second separation lines (340, 342) along which the cap (300) is configured to separate when the closure device (100) is brought from the closed position to the open position;
the first separation line (340), when the closure device (100) is in the closed position, extending circumferentially around the cap (300) between a first endpoint (344) and a second endpoint (346), the first and second endpoints (344, 346) of the first separation line (340) defining between them a first bridge section (348) configured to connect the retainment portion (306) to the linking portion (304), said first bridge section (348) having, when the closure device (100) is in the closed position, a circumferential extent (α) about the longitudinal, central axis (A) that is less than 90°;
the second separation line (342), when the closure device (100) is in the closed position, extending circumferentially around the cap (300) between a first endpoint (350) and a second endpoint (352), the first and second endpoints (350, 352) of the second separation line (342) defining between them a second bridge section (354) configured to connect the lid portion (302)

- to the linking portion (304), said second bridge section (354) having, when the closure device (100) is in the closed position, a circumferential extent (β) about the longitudinal, central axis (A) that is less than 90° ;
- the first bridge section (348) and the second bridge section (354) being located at opposite sides of the cap (300) when the closure device (100) is in the closed position;
- characterised by** the first bridge section (348) being a non-breakable bridge section configured to permanently connect the retainment portion (306) to the linking portion (304), the second bridge section (354) being a non-breakable bridge section configured to permanently connect the lid portion (320) to the linking portion (304); and the circumferential extent (α) of the first bridge section (348) being within the range of 10° to 90° .
2. The closure device (100) according to claim 1, **characterised by** the first bridge section (348) and the second bridge section (354), when the closure device (100) is in the closed position, being arranged symmetrically about the central axis (A).
 3. The closure device (100) according to claim 1, **characterised by** the first bridge section (348) comprising a first sub-section (356), the second bridge section (354) comprising a second sub-section (358), and the first sub-section (356) and the second sub-section (358), when the closure device (100) is in the closed position, being arranged symmetrically about the central axis (A).
 4. The closure device (100) according to any one of the preceding claims, **characterised by** the circumferential extent (α) of the first bridge section (348) being equal to or larger than the circumferential extent (β) of the second bridge section (354).
 5. The closure device (100) according to any one of the preceding claims, **characterised by** the circumferential extent (α) of the first bridge section (348) being any one of: within the range of 20° to 60° ; within the range of 30° to 50° ; and 40° .
 6. The closure device (100) according to any one of the preceding claims, **characterised by** the circumferential extent (β) of the second bridge section (354) being any one of: within the range of 10° to 90° ; within the range of 20° to 60° ; within the range of 30° to 50° ; and 40° .
 7. The closure device (100) according to any one of the preceding claims, **characterised by**, when the closure device (100) is in the closed position:
 - the first separation line (340) and the first bridge section (348) being arranged in a first plane (P1) which is transversal to the longitudinal, central axis (A); and
 - the second separation line (342) and the second bridge section (354) being arranged in a second plane (P2) which is parallel to the first plane (P1); and
 - the first and second planes (P1, P2) being arranged at a mutual distance of any one of: within the range of 1 to 10 mm; within the range of 1 to 8 mm; and within the range of 1 to 3 mm.
 8. The closure device (100) according to any one of the preceding claims, **characterised by**
 - the pour spout (200) comprising a dispensing opening (208) and an annular, radially extending ridge (222) configured to deny the retainment portion (306) axial movement along the pour spout towards the dispensing opening (208); and
 - the first separation line (340), when the closure device (100) is in the closed position, being arranged at an axial distance from the dispensing opening (208) that is larger than the axial distance between the ridge (222) and the dispensing opening.
 9. The closure device (100) according to claim 8, **characterised by** the second separation line (342), when the closure device (100) is in the closed position, being arranged at an axial distance from the dispensing opening (208) that is equal to the axial distance between the ridge (222) and the dispensing opening (208).
 10. The closure device (100) according to any one of the preceding claims, **characterised by** the lid portion (302) comprising internal threads (316) and the pour spout (200) comprising corresponding external threads (228) allowing the lid portion (302) to be rotated about the longitudinal, central axis (A) to be screwed off the pour spout (200) bringing the closure device (100) from the closed position to the open position, and screwed on to the pour spout (200) bringing the closure device (100) from the open position to the closed position.
 11. The closure device (100) according to any one of the preceding claims, **characterised by**
 - the first and second separation lines (340, 342) forming first and second break lines being adapted to be broken during a first opening of the closure device (100);
 - the retainment portion (306) and the linking portion (304) being adapted to be connected to

each other, continuously or discontinuously, along the first break line prior to the first opening and being adapted to be disconnected from each other along the first break line after the first opening; and
the lid portion (302) and the linking portion (304) being adapted to be connected to each other, continuously or discontinuously, along the second break line (342) prior to the first opening and being adapted to be disconnected from each other along the second break line (342) after the first opening.

12. An assembly (400) comprising a container (500) and a closure device (100) according to any one of the preceding claims.

13. The assembly according to claim 12, **characterised by:**

the container (500) being a gable top container comprising a carton (600) having a top fin (618); the closure device (100) being mounted on a front top panel (610) of the carton (600); and the closure device (100) being operable between said closed position and an open position in which the top fin (618) is positioned in a gap formed between the linking portion (304) and the lid portion (302).

Patentansprüche

1. Verschlussvorrichtung (100), umfassend:

eine Ausgusstülle (200) und eine Kappe (300); wobei die Kappe (300) einen Deckelabschnitt (302), einen Verbindungsabschnitt (304) und einen Rückhalteabschnitt (306) umfasst, wobei der Verbindungsabschnitt (304) den Deckelabschnitt (302) mit dem Rückhalteabschnitt (306) verbindet und der Rückhalteabschnitt (306) um die Ausgusstülle (200) herum gehalten wird; wobei der Deckelabschnitt (302) wiederverschließbar auf der Ausgusstülle (200) angeordnet ist, wodurch ermöglicht wird, dass die Verschlussvorrichtung (100) zwischen einer offenen Position und einer geschlossenen Position gebracht wird; wobei die Ausgusstülle (200) und die Kappe (300), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, eine Längsmittelachse (A) aufweisen; wobei die Kappe (300) eine erste und eine zweite Trennlinie (340, 342) umfasst, entlang derer die Kappe (300) dazu konfiguriert ist, sich zu trennen, wenn die Verschlussvorrichtung (100) von der geschlossenen Position in die offene

Position gebracht wird;

wobei sich die erste Trennlinie (340), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, in Umfangsrichtung um die Kappe (300) herum zwischen einem ersten Endpunkt (344) und einem zweiten Endpunkt (346) erstreckt, wobei der erste und der zweite Endpunkt (344, 346) der ersten Trennlinie (340) zwischen sich einen ersten Brückenabschnitt (348) definieren, der dazu konfiguriert ist, den Rückhalteabschnitt (306) mit dem Verbindungsabschnitt (304) zu verbinden, wobei der erste Brückenabschnitt (348), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, eine Umfangserstreckung (α) um die Längsmittelachse (A) aufweist, die kleiner als 90° ist;

wobei sich die zweite Trennlinie (342), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, in Umfangsrichtung um die Kappe (300) herum zwischen einem ersten Endpunkt (350) und einem zweiten Endpunkt (352) erstreckt, wobei der erste und der zweite Endpunkt (350, 352) der zweiten Trennlinie (342) zwischen sich einen zweiten Brückenabschnitt (354) definieren, der dazu konfiguriert ist, den Deckelabschnitt (302) mit dem Verbindungsabschnitt (304) zu verbinden, wobei der zweite Brückenabschnitt (354), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, eine Umfangserstreckung (β) um die Längsmittelachse (A) aufweist, die kleiner als 90° ist;

wobei der erste Brückenabschnitt (348) und der zweite Brückenabschnitt (354) an gegenüberliegenden Seiten der Kappe (300) angeordnet sind, wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet;

dadurch gekennzeichnet, dass der erste Brückenabschnitt (348) ein unzerbrechlicher Brückenabschnitt ist, der dazu konfiguriert ist, den Rückhalteabschnitt (306) dauerhaft mit dem Verbindungsabschnitt (304) zu verbinden; der zweite Brückenabschnitt (354) ein unzerbrechlicher Brückenabschnitt ist, der dazu konfiguriert ist, den Deckelabschnitt (302) dauerhaft mit dem Verbindungsabschnitt (304) zu verbinden; und die Umfangserstreckung (α) des ersten Brückenabschnitts (348) innerhalb des Bereichs von 10° bis 90° liegt.

2. Verschlussvorrichtung (100) nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Brückenabschnitt (348) und der zweite Brückenabschnitt (354), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, symmetrisch um die Mittelachse (A) angeordnet sind.

3. Verschlussvorrichtung (100) nach Anspruch 1, **dadurch gekennzeichnet, dass** der erste Brückenabschnitt (348) einen ersten Teilabschnitt (356) umfasst, der zweite Brückenabschnitt (354) einen zweiten Teilabschnitt (358) umfasst und der erste Teilabschnitt (356) und der zweite Teilabschnitt (358), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, symmetrisch um die Mittelachse (A) angeordnet sind.
4. Verschlussvorrichtung (100) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Umfangserstreckung (α) des ersten Brückenabschnitts (348) gleich der oder größer als die Umfangserstreckung (β) des zweiten Brückenabschnitts (354) ist.
5. Verschlussvorrichtung (100) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Umfangserstreckung (α) des ersten Brückenabschnitts (348) eine beliebige der Folgenden ist: innerhalb des Bereichs von 20° bis 60°; innerhalb des Bereichs von 30° bis 50°; und 40°.
6. Verschlussvorrichtung (100) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** die Umfangserstreckung (β) des zweiten Brückenabschnitts (354) eine beliebige der Folgenden ist: innerhalb des Bereichs von 10° bis 90°; innerhalb des Bereichs von 20° bis 60°; innerhalb des Bereichs von 30° bis 50°; und 40°.
7. Verschlussvorrichtung (100) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass**, wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet:
- die erste Trennlinie (340) und der erste Brückenabschnitt (348) in einer ersten Ebene (P1) angeordnet sind, die quer zu der Längsmittelachse (A) verläuft; und
- die zweite Trennlinie (342) und der zweite Brückenabschnitt (354) in einer zweiten Ebene (P2) angeordnet sind, die parallel zu der ersten Ebene (P1) verläuft; und
- die erste und die zweite Ebene (P1, P2) in einem gegenseitigen Abstand angeordnet sind, der in einem beliebigen der Folgenden liegt: innerhalb des Bereichs von 1 bis 10 mm; innerhalb des Bereichs von 1 bis 8 mm; und innerhalb des Bereichs von 1 bis 3 mm.
8. Verschlussvorrichtung (100) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass:**
- die Ausgusstülle (200) eine Ausgabeöffnung (208) und einen ringförmigen, sich radial erstreckenden Steg (222) umfasst, der dazu konfiguriert ist, eine axiale Bewegung des Rückhalteabschnitts (306) entlang der Ausgusstülle in Richtung der Ausgabeöffnung (208) zu verhindern; und
- die erste Trennlinie (340), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, in einem axialen Abstand von der Ausgabeöffnung (208) angeordnet ist, der größer ist als der axiale Abstand zwischen dem Steg (222) und der Ausgabeöffnung.
9. Verschlussvorrichtung (100) nach Anspruch 8, **dadurch gekennzeichnet, dass** die zweite Trennlinie (342), wenn sich die Verschlussvorrichtung (100) in der geschlossenen Position befindet, in einem axialen Abstand von der Ausgabeöffnung (208) angeordnet ist, der gleich dem axialen Abstand zwischen dem Steg (222) und der Ausgabeöffnung (208) ist.
10. Verschlussvorrichtung (100) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** der Deckelabschnitt (302) ein Innengewinde (316) umfasst und die Ausgusstülle (200) ein entsprechendes Außengewinde (228) umfasst, wodurch ermöglicht wird, den Deckelabschnitt (302) um die Längsmittelachse (A) zu drehen, um von der Ausgusstülle (200) abgeschraubt zu werden, wodurch die Verschlussvorrichtung (100) von der geschlossenen Position in die offene Position gebracht wird, und um auf die Ausgusstülle (200) geschraubt zu werden, wodurch die Verschlussvorrichtung (100) von der offenen Position in die geschlossene Position gebracht wird.
11. Verschlussvorrichtung (100) nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass:**
- die erste und die zweite Trennlinie (340, 342) eine erste und eine zweite Unterbrechungslinie bilden, die dazu angepasst sind, während eines ersten Öffnens der Verschlussvorrichtung (100) gebrochen zu werden;
- der Rückhalteabschnitt (306) und der Verbindungsabschnitt (304) dazu angepasst sind, entlang der ersten Unterbrechungslinie vor dem ersten Öffnen kontinuierlich oder diskontinuierlich miteinander verbunden zu sein, und dazu angepasst sind, entlang der ersten Unterbrechungslinie nach dem ersten Öffnen voneinander getrennt zu sein; und
- der Deckelabschnitt (302) und der Verbindungsabschnitt (304) dazu angepasst sind, entlang der zweiten Unterbrechungslinie (342) vor dem ersten Öffnen kontinuierlich oder diskontinuierlich miteinander verbunden zu sein, und dazu angepasst sind, entlang der zweiten Unterbre-

chungslinie (342) nach dem ersten Öffnen voneinander getrennt zu sein.

12. Anordnung (400), umfassend einen Behälter (500) und eine Verschlussvorrichtung (100) nach einem der vorstehenden Ansprüche. 5

13. Anordnung nach Anspruch 12, **dadurch gekennzeichnet, dass:**

der Behälter (500) ein Giebeldachbehälter ist, der einen Karton (600) mit einer oberen Rippe (618) umfasst; 10
die Verschlussvorrichtung (100) an einer vorderen oberen Platte (610) des Kartons (600) angebracht ist; und 15
die Verschlussvorrichtung (100) zwischen der geschlossenen Position und einer offenen Position, in der die obere Rippe (618) in einem zwischen dem Verbindungsabschnitt (304) und dem Deckelabschnitt (302) gebildeten Spalt positioniert ist, betreibbar ist. 20

Revendications 25

1. Dispositif de fermeture (100) comprenant :

un bec verseur (200) et un capuchon (300) ; 30
le capuchon (300) comprenant une partie de couvercle (302), une partie de liaison (304) et une partie de retenue (306), la partie de liaison (304) reliant la partie de couvercle (302) à la partie de retenue (306) et la partie de retenue (306) étant retenue autour du bec verseur (200) ; 35
la partie de couvercle (302) étant agencée, de manière refermable, sur le bec verseur (200), permettant au dispositif de fermeture (100) d'être amené entre une position ouverte et une position fermée ; 40
le bec verseur (200) et le capuchon (300), lorsque le dispositif de fermeture (100) est dans la position fermée, ayant un axe central (A) longitudinal ; 45
le capuchon (300) comprenant des première et seconde lignes de séparation (340, 342) le long desquelles le capuchon (300) est configuré pour se séparer lorsque le dispositif de fermeture (100) est amené de la position fermée à la position ouverte ; 50
la première ligne de séparation (340), lorsque le dispositif de fermeture (100) est dans la position fermée, s'étendant de manière circonférentielle autour du capuchon (300) entre un premier point d'extrémité (344) et un second point d'extrémité (346), les premier et second points d'extrémité (344, 346) de la première ligne de 55

séparation (340) définissant entre eux une première section de pont (348) configurée pour raccorder la partie de retenue (306) à la partie de liaison (304), ladite première section de pont (348) ayant, lorsque le dispositif de fermeture (100) est dans la position fermée, une étendue circonférentielle (α) autour de l'axe central (A) longitudinal, qui est inférieure à 90° ;
la seconde ligne de séparation (342), lorsque le dispositif de fermeture (100) est dans la position fermée, s'étendant de manière circonférentielle autour du capuchon (300) entre un premier point d'extrémité (350) et un second point d'extrémité (352), les premier et second points d'extrémité (350, 352) de la seconde ligne de séparation (342) définissant entre eux une seconde section de pont (354) configurée pour raccorder la partie de couvercle (302) à la partie de liaison (304), ladite seconde section de pont (354) ayant, lorsque le dispositif de fermeture (100) est dans la position fermée, une étendue circonférentielle (β) autour de l'axe central (A) longitudinal, qui est inférieure à 90° ;
la première section de pont (348) et la seconde section de pont (354) étant positionnées au niveau des côtés opposés du capuchon (300) lorsque le dispositif de fermeture (100) est dans la position fermée ;

caractérisé par la première section de pont (348) qui est une section de pont non cassable configurée pour raccorder, de manière permanente, la partie de retenue (306) à la partie de liaison (304) ; la seconde section de pont (354) étant une section de pont non cassable configurée pour raccorder, de manière permanente, la partie de couvercle (302) à la partie de liaison (304) ; et
l'étendue circonférentielle (α) de la première section de pont (348) étant dans la plage de 10° à 90° .

2. Dispositif de fermeture (100) selon la revendication 1, **caractérisé par** la première section de pont (348) et la seconde section de pont (354), lorsque le dispositif de fermeture (100) est dans la position fermée, qui sont agencées de manière symétrique autour de l'axe central (A).
3. Dispositif de fermeture (100) selon la revendication 1, **caractérisé par** la première section de pont (348) qui comprend une première sous-section (356), la seconde section de pont (354) qui comprend une seconde sous-section (358), et la première sous-section (356) et la seconde sous-section (358), lorsque le dispositif de fermeture (100) est dans la position fermée, sont agencées, de manière symétrique, autour de l'axe central (A) .

4. Dispositif de fermeture (100) selon l'une quelconque des revendications précédentes, **caractérisé par** l'étendue circonférentielle (α) de la première section de pont (348) qui est égale ou supérieure à l'étendue circonférentielle (β) de la seconde section de pont (354). 5
5. Dispositif de fermeture (100) selon l'une quelconque des revendications précédentes, **caractérisé par** l'étendue circonférentielle (α) de la première section de pont (348) qui est l'une quelconque parmi : dans la plage de 20° à 60° ; dans la plage de 30° à 50° ; et de 40°. 10
6. Dispositif de fermeture (100) selon l'une quelconque des revendications précédentes, **caractérisé par** l'étendue circonférentielle (β) de la seconde section de pont (354) qui est l'une quelconque parmi : dans la plage de 10° à 90° ; dans la plage de 20° à 60° ; dans la plage de 30° à 50° ; et de 40°. 15
7. Dispositif de fermeture (100) selon l'une quelconque des revendications précédentes, **caractérisé par**, lorsque le dispositif de fermeture (100) est dans la position fermée : 25
- la première ligne de séparation (340) et la première section de pont (348) qui sont agencées dans un premier plan (P1) qui est transversal à l'axe central (A) longitudinal ; et 30
- la seconde ligne de séparation (342) et la seconde section de pont (354) qui sont agencées dans un second plan (P2) qui est parallèle au premier plan (P1) ; et 35
- les premier et second plans (P1, P2) qui sont agencés à une distance mutuelle de l'une quelconque parmi : dans la plage de 1 à 10 mm ; dans la plage de 1 à 8 mm ; et dans la plage de 1 à 3 mm. 40
8. Dispositif de fermeture (100) selon l'une quelconque des revendications précédentes, **caractérisé par** : 45
- le bec verseur (200) qui comprend une ouverture de distribution (208) et une crête annulaire s'étendant de manière radiale (222) configurée pour refuser le mouvement axial de la partie de retenue (306) le long du bec verseur vers l'ouverture de distribution (208) ; et 50
- la première ligne de séparation (340), lorsque le dispositif de fermeture (100) est dans la position fermée, qui est agencée à une distance axiale de l'ouverture de distribution (208) qui est supérieure à la distance axiale entre la crête (222) et l'ouverture de distribution. 55
9. Dispositif de fermeture (100) selon la revendication 8, **caractérisé par** la seconde ligne de séparation (342), lorsque le dispositif de fermeture (100) est dans la position fermée, qui est agencée à une distance axiale de l'ouverture de distribution (208) qui est égale à la distance axiale entre la crête (222) et l'ouverture de distribution (208).
10. Dispositif de fermeture (100) selon l'une quelconque des revendications précédentes, **caractérisé par** la partie de couvercle (302) qui comprend des filetages internes (316) et le bec verseur (200) qui comprend des filetages externes (228) correspondants permettant à la partie de couvercle (302) d'être entraînée en rotation autour de l'axe central (A) longitudinal pour être dévissée du bec verseur (200), amenant le dispositif de fermeture (100) de la position fermée à la position ouverte, et vissée sur le bec verseur (200), amenant le dispositif de fermeture (100) de la position ouverte à la position fermée.
11. Dispositif de fermeture (100) selon l'une quelconque des revendications précédentes, **caractérisé par** : les première et seconde lignes de séparation (340, 342) qui forment les première et seconde lignes de rupture sont adaptées pour être cassées pendant une première ouverture du dispositif de fermeture (100) ; la partie de retenue (306) et la partie de liaison (304) qui sont adaptées pour être raccordées entre elles, de manière continue ou discontinue, le long de la première ligne de rupture avant la première ouverture et sont adaptées pour être déconnectées l'une de l'autre le long de la première ligne de rupture après la première ouverture ; et la partie de couvercle (302) et la partie de liaison (304) qui sont adaptées pour être raccordées entre elles, de manière continue ou discontinue, le long de la seconde ligne de rupture (342) avant la première ouverture et sont adaptées pour être déconnectées l'une de l'autre le long de la seconde ligne de rupture (342) après la première ouverture.
12. Ensemble (400) comprenant un récipient (500) et un dispositif de fermeture (100) selon l'une quelconque des revendications précédentes.
13. Ensemble selon la revendication 12, **caractérisé par** : le récipient (500) qui est un récipient à partie supérieure en forme de pignon comprenant une boîte (600) ayant une ailette supérieure (618) ; le dispositif de fermeture (100) qui est monté sur un panneau supérieur avant (610) de la boîte (600) ; et le dispositif de fermeture (100) qui peut être ac-

tionné entre ladite position fermée et une position ouverte, dans laquelle l'ailette supérieure (618) est positionnée dans un interstice formé entre la partie de liaison (304) et la partie de couvercle (302).

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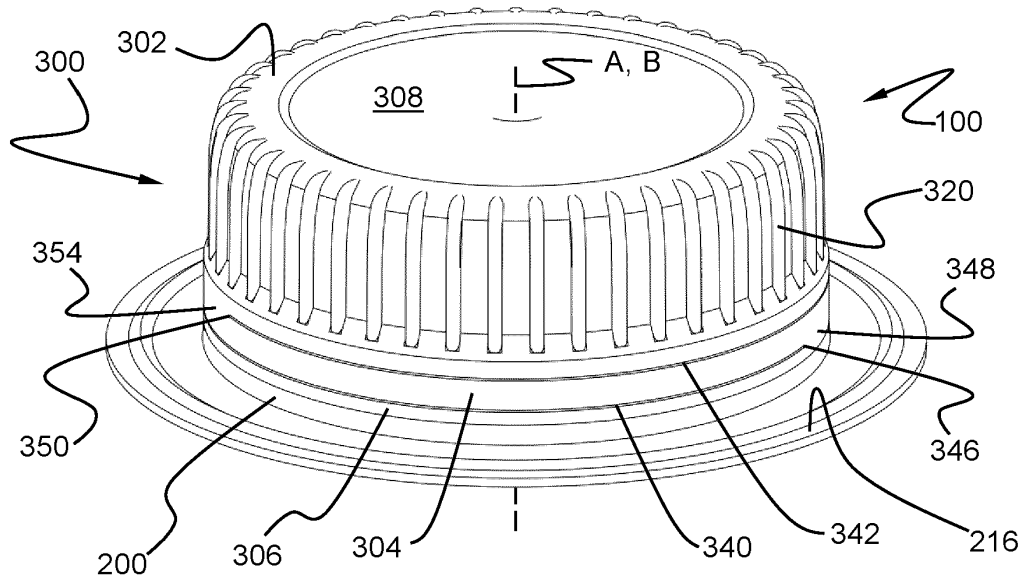


Fig. 1

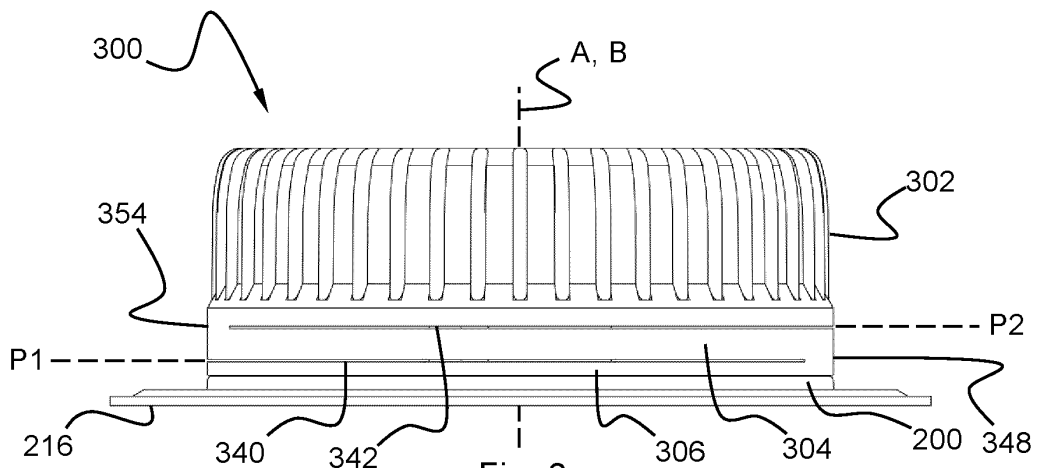


Fig. 2

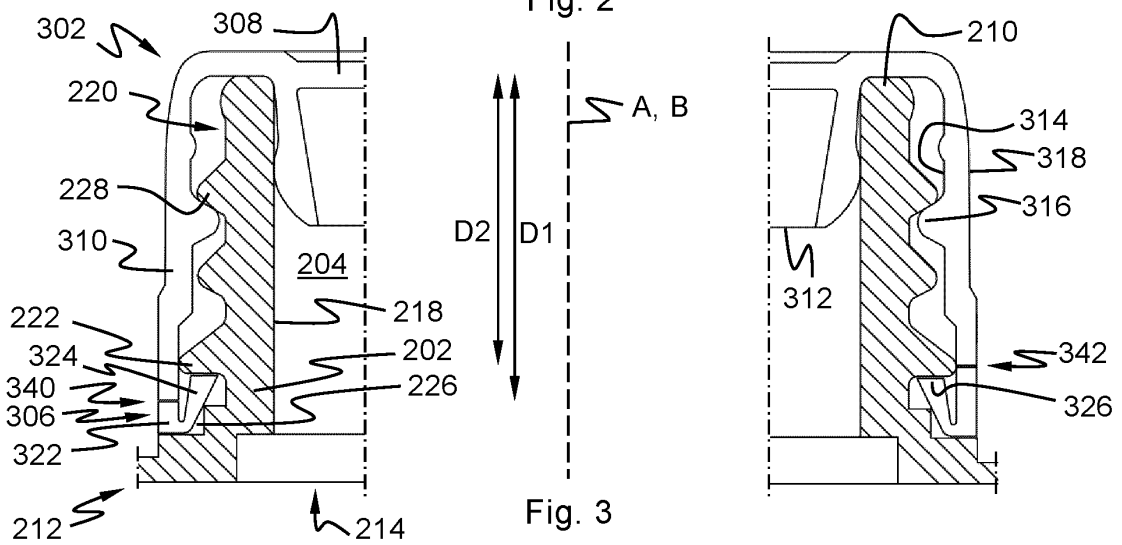
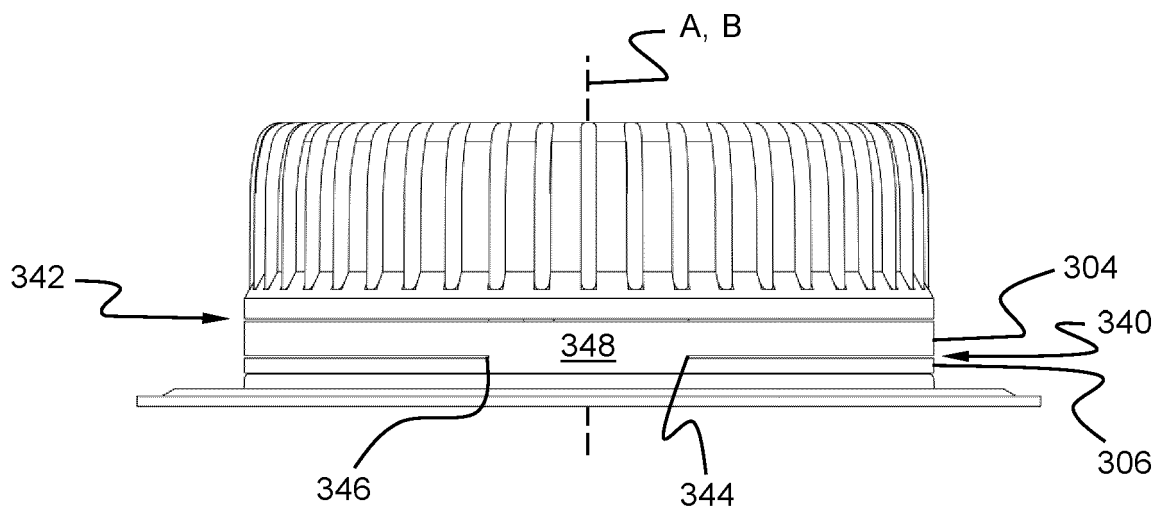
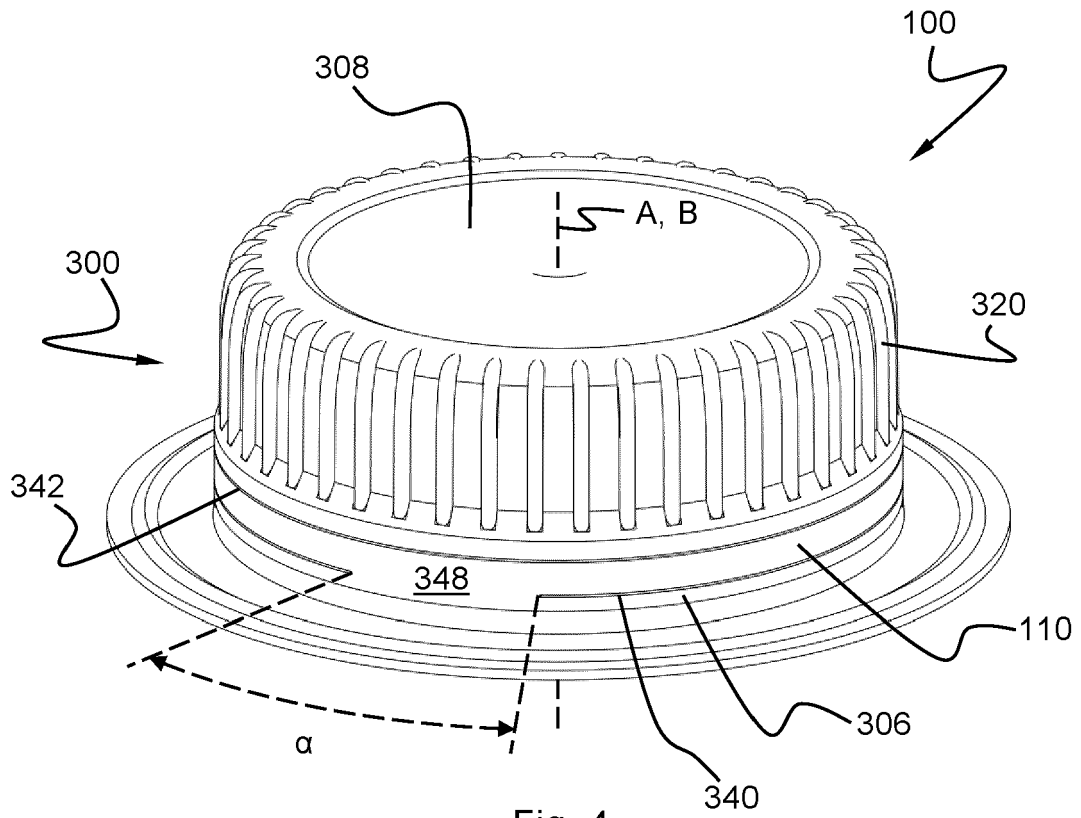


Fig. 3



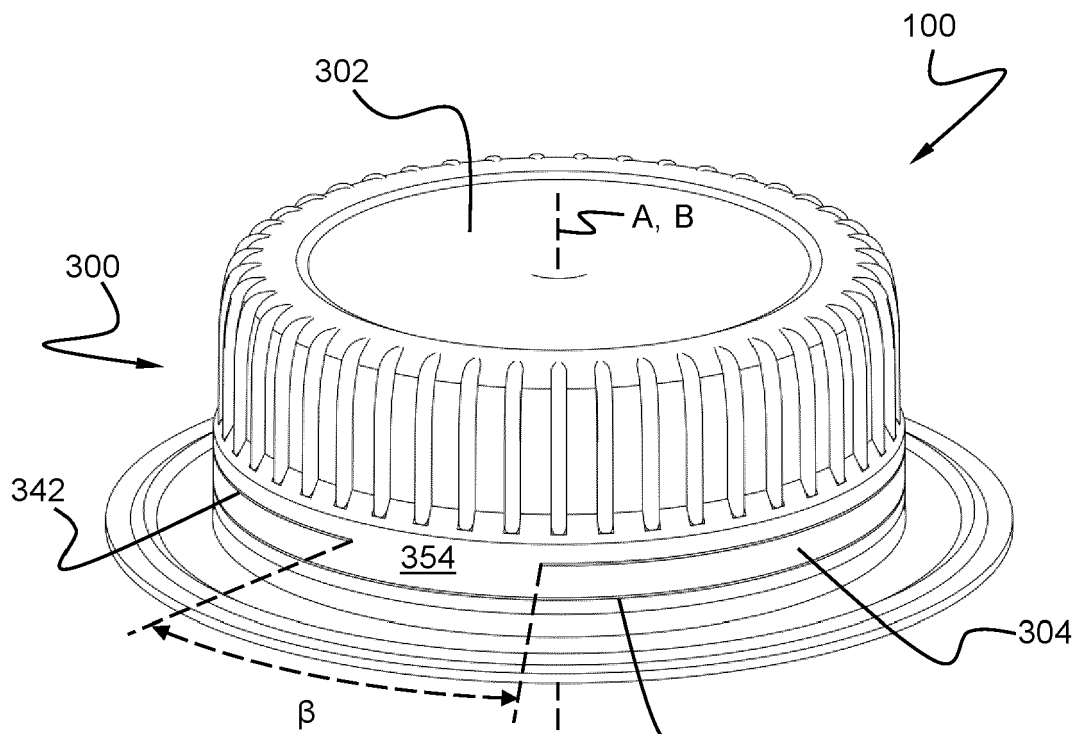


Fig. 6

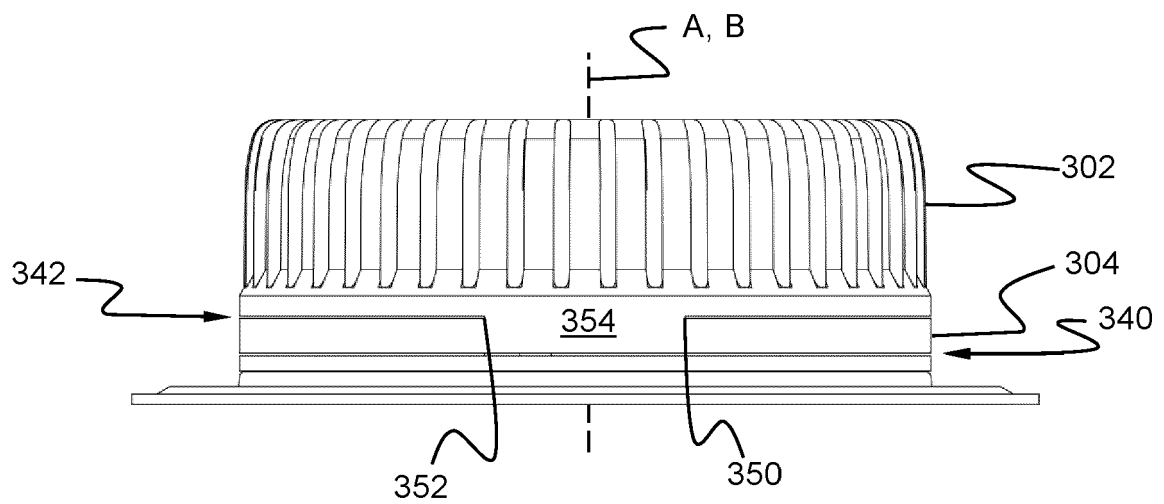


Fig. 7

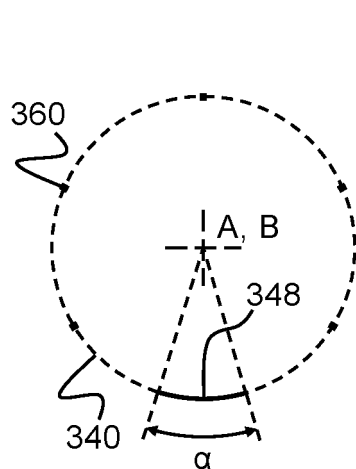


Fig. 8

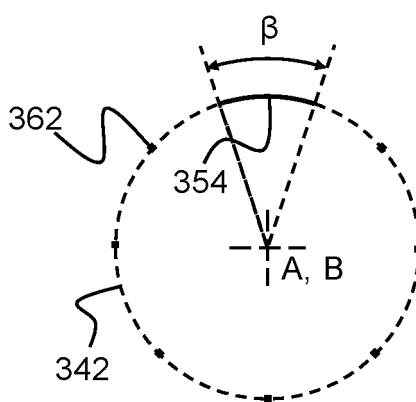


Fig. 9

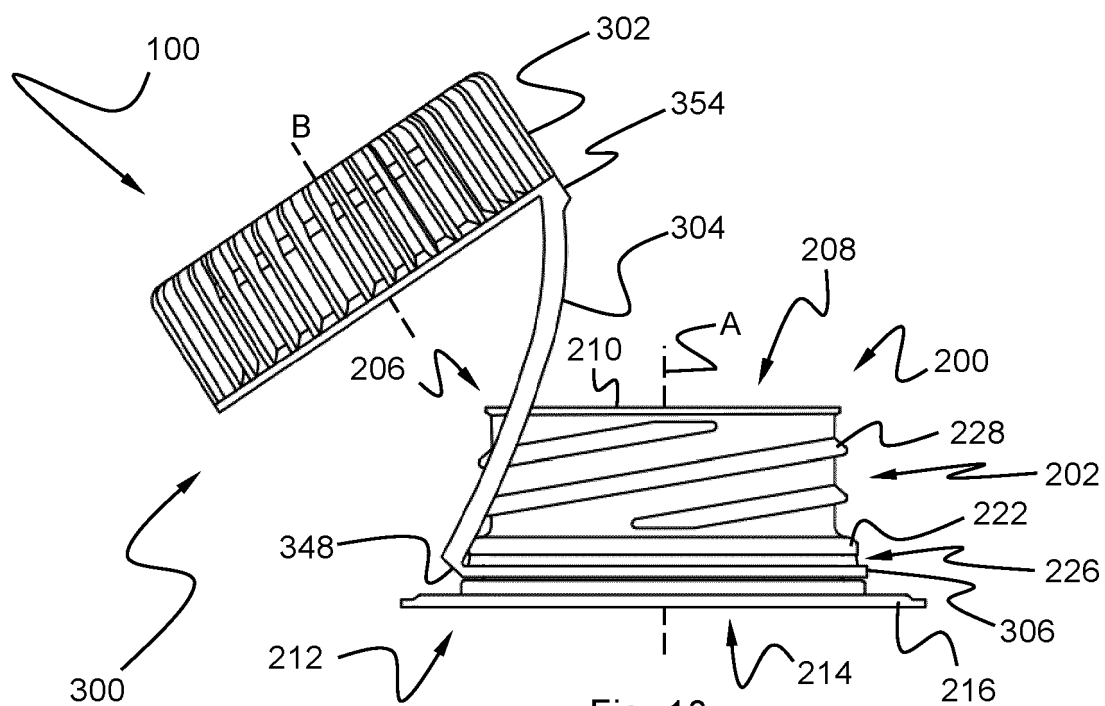


Fig. 10

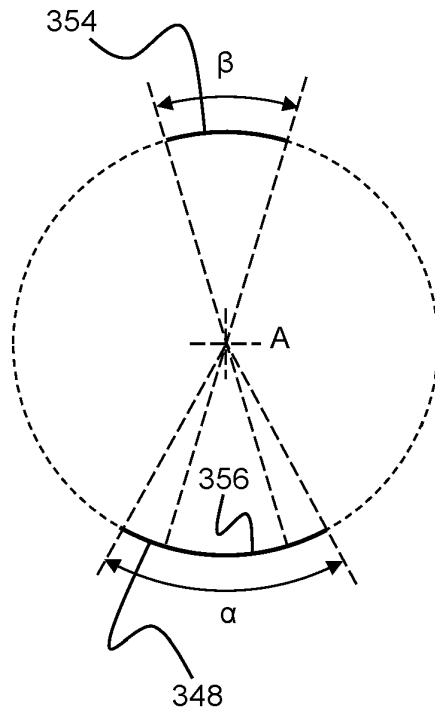


Fig. 11

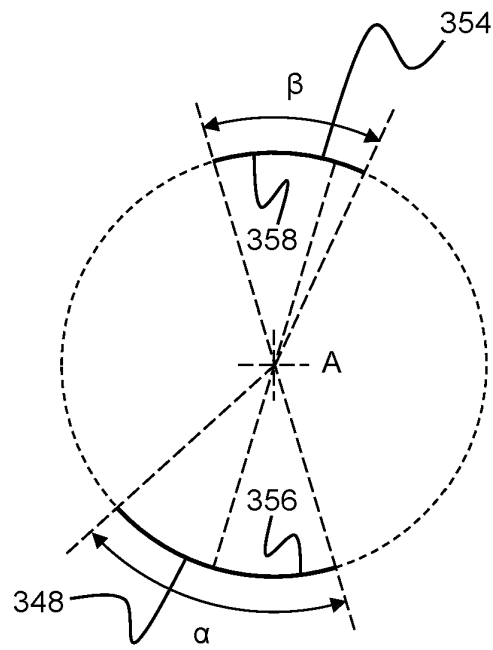


Fig. 12

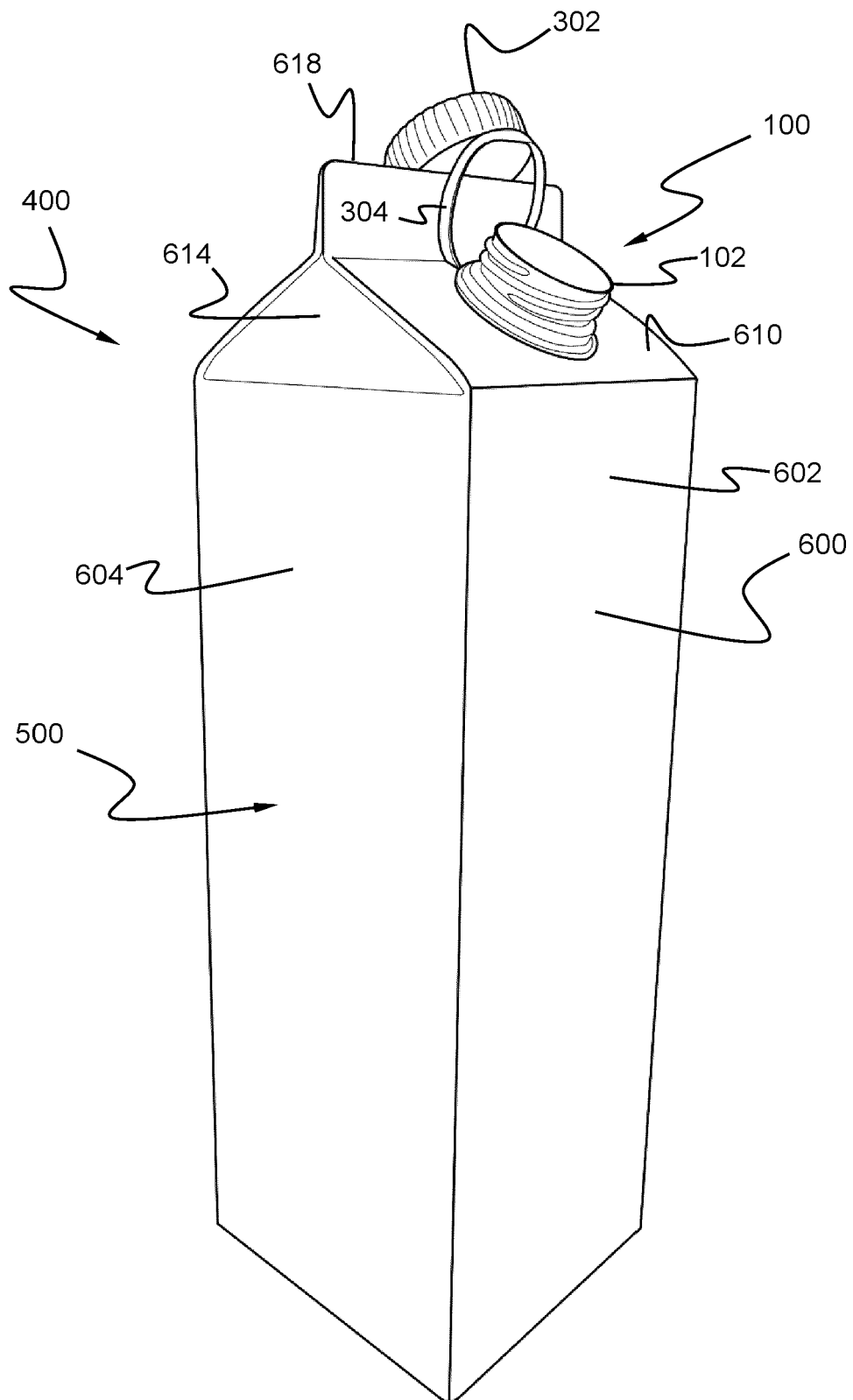


Fig. 13

REFERENCES CITED IN THE DESCRIPTION

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