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(54) A CAP FOR A FOOD PACKAGE

(57) A cap (30) for closing a spout (100) of a neck (20) of a package (10) is provided. The cap comprises a sidewall (32) being provided with inner threads (34) for engagement with corresponding outer threads (102) of the neck (20), and an inner top surface (36) forming a closing surface for the spout (100), wherein the sidewall (32) has an uppermost portion (38) connecting to the inner top surface (36), said uppermost portion (38) comprising a guiding structure (40).

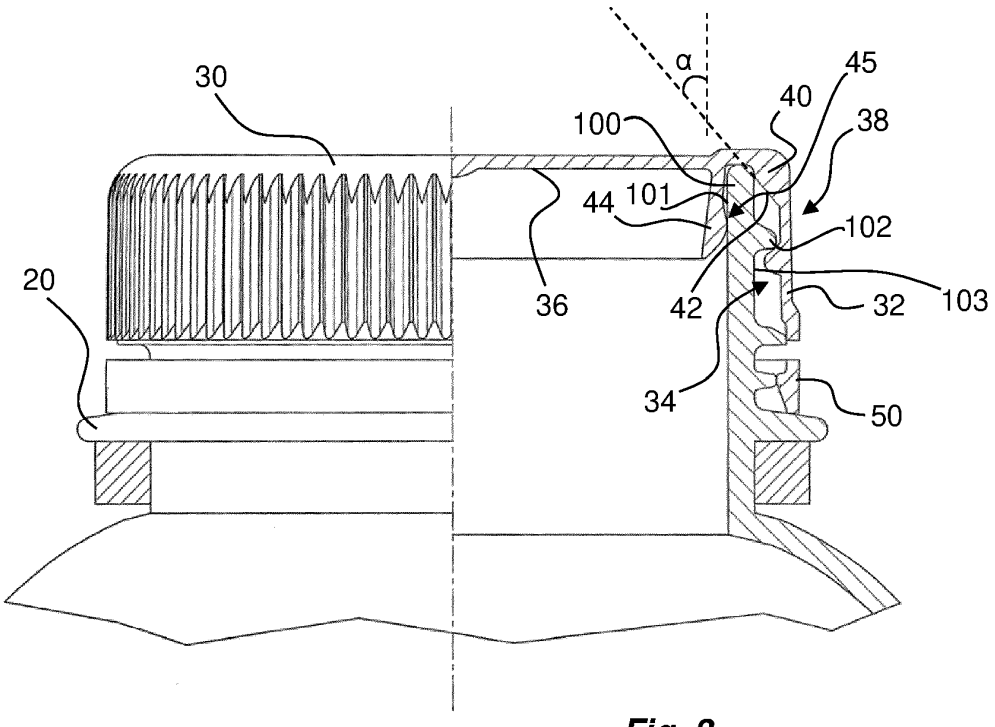

Fig. 3

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Description

Technical Field

[0001] The present solution relates to a cap for closing a pouring spout. More particularly, the present solution relates to a cap for closing a pouring spout of a food package.

Background

[0002] Food packages are generally provided with an opening arrangement in order to facilitate discharging of the enclosed food product. The opening arrangement may either be an irreversible opening, i.e. once the package is opened it may not be closed, or a recloseable opening device. In order to extend the shelf-life and quality of the food product the latter is often desired. A common way of providing a recloseable opening device is to arrange a threaded neck including a pouring spout on the upper part of the package. The threaded neck is designed such that it may receive a cap, including internal threads, such that the cap is capable of being unscrewed from the neck. Since the cap covers the open spout of the neck, the enclosed food product is protected from the outer environment and the quality of the product may thus be preserved during some time.

[0003] Although the above-mentioned solutions provide well-proven and reliable resealing of packages, guidance of the spout relative the cap is desired for ensuring that the cap is threaded properly onto the neck. Should the cap be threaded onto the neck at a slightly oblique angle the closing action will be inferior thus leading to an increased risk of leakage etc. By oblique angle it is meant that the angle under which the cap is screwed onto a threaded neck portion of the container deviates from an axis which is parallel to the symmetry axis of the pouring spout.

[0004] The interior of the cap may for this purpose be provided with a guiding rim arranged to guide the radial position of the spout when the cap is threaded onto the neck. However, due to the flexibility of the material of the spout, misalignment of the spout may still occur, whereby the sealing rim, by mistake, may be positioned on top of the spout rather than on the side of the spout. As the cap is threaded further downwards the sealing rim will press the spout downwards, leading to damaging and defects on the spout.

One attempt at solving the issue is shown in the Germain patent publication DE2109690. Here, a cap is shown having a sealing lip and a wedge-shaped structure between the inner wall of the cap and the sealing lip. The wedge-shaped structure urges a neck of a bottle on which the cap is screwed on into the wedge-shaped structure thus minimizing damages on the upper part of the neck during closing of the bottle.

Summary

[0005] It is, therefore, an object of the present invention to overcome or alleviate the above described problems.

[0006] According to a first aspect, the solution is provided by a cap for closing a spout of a neck of a package. The cap comprises a sidewall being provided with inner threads for engagement with corresponding outer threads of the neck, and an inner top surface forming a closing surface for the spout. The sidewall has an uppermost portion connecting to the inner top surface, wherein said uppermost portion comprises a guiding structure.

[0007] In an embodiment the guiding structure extends around the entire uppermost portion. Thereby the spout will be guided independently on the circumferential position of the wrongly positioned part of the spout.

[0008] The guiding structure may be formed by an inner surface of the sidewall being tilted radially inwards. The guiding structure will thus urge the spout radially inwards.

[0009] The tilting angle of at least a part of the guiding structure may be constant.

[0010] The guiding structure may in some embodiments extend from a vertical portion of the sidewall to the inner top surface. Along this extension, the guiding structure may be continuous.

[0011] In some embodiments the guiding structure comprises a depression forming a stop for the spout. The depression may also form a snap locking of the spout, as the upper end of the spout may fit in the depression.

[0012] The cap may further comprise a sealing lip arranged radially inwards of the guiding structure. The sealing lip may seal against an inner surface of the spout.

[0013] The depression may be arranged between the sealing lip and the guiding structure.

[0014] According to a second aspect a neck assembly is provided. The neck assembly comprises a spout and a cap according to the first aspect presented above. When the cap is screwed onto the neck, the open end of the spout is arranged radially inwards of the guiding structure of the cap.

Brief Description of the Drawings

[0015] The above, as well as additional objects, features, and advantages of the present invention, will be better understood through the following illustrative and nonlimiting detailed description of preferred embodiments of the present invention, with reference to the appended drawings, wherein:

Fig. 1 is a schematic view of a package having a spout according to an embodiment;

Fig. 2a is a partly cross-sectional view of a cap and neck assembly according to prior art,

Fig. 2b is a partly cross-sectional view of the cap and neck assembly shown in Fig. 2a, the neck being deformed,

Fig. 3 is a partly cross-sectional view of a cap and neck assembly, comprising a cap according to an embodiment, and

Fig. 4 is a detailed view of the cap shown in Fig. 3.

Detailed Description

[0016] With reference to Fig. 1 an example of a food package 10 is schematically shown. The food package 10 has a shape of a bottle formed by a body portion 11, which may preferably be made of a carton-based laminate and a top portion 12, which may preferably be made of a polymer material. The top portion 12 is provided with a neck 20 forming the upper part of the polymer top portion 12. The neck 20 may be integrally formed with the top portion 12, such that the entire top portion 12, including the neck 20, may be manufactured as a single piece.

[0017] A cap 30 is arranged onto the neck for sealing a spout 100 (see e.g. Fig. 3) forming the upper end of the neck 20. The cap 30 may optionally be provided with a tamper ring 50 as is well known in the art.

[0018] The package 10 may be manufactured by first forming a sleeve of the carton-based laminate, i.e. a tubular body extending between two open ends. In a second step, performed before, after, or in parallel with the sleeve forming, the polymer top portion 12 is manufactured by molding. The polymer top portion 12 may, as is shown in Fig. 1, comprise a shoulder section 13 arranged below the neck 20 which may be injection moulded on top of the tubular body. Alternatively, the plastic top portion 12 may be available as a single piece and then attached to the tubular body. Regardless of the way the parts of the container are arranged onto each other, the shoulder section 13 is arranged to connect the sleeve, which forms the structure for the body portion 11, to the neck 20. The neck 20 is preferably provided with threads 102 (see Fig. 3) for engaging with corresponding threads 32 (see Fig. 3) of the cap 30 including the tamper ring 40. As previously explained, the neck 20 and the shoulder section 13 may be provided as one piece, or as two separate pieces which are molded together.

[0019] After the cap 30 is screwed onto the top portion 12 the sleeve is filled with food content. Preferably, this is done by turning the sleeve and the top portion 12 assembly upside down, such that the remaining open end of the sleeve is facing upwards. After being filled the open end of the sleeve may be sealed and folded to a flat bottom as illustrated in Fig. 1.

[0020] Alternatively, filling of the package 10 may be performed by sealing the bottom end, and thereafter inserting a filling nozzle through the spout 100 before the cap 30 is screwed onto the spout 100.

[0021] In Figs. 2a-b an example of a prior art cap and neck assembly is shown. The neck 20 is provided with a spout 100. The spout 100 forms an open end of the package through which the content of the associated package may be discharged from. The spout 100 is provided with an inner wall 101 which is intended to seal against a downwardly projecting sealing lip 44' of the cap 30'. Hence the sealing lip 44' of the cap 30' is arranged radially inwards of the spout 100. Radially outwards of the sealing lip 44' a guiding rim 46' is provided. The purpose of the guiding rim 46' is to urge the upper end of the spout 100 to snap into a radial position between the lip 44' and the rim 46'. This is shown in Fig. 2a, where the spout 100 is positioned correctly inside the cap 30'.

[0022] Fig. 2b shows another situation in which the cap 30' has been threaded onto the spout 100 differently. Here, the spout 100 has been positioned slightly off-center when the cap 30' has been arranged onto it, whereby the guiding rim 46' hits the upper edge of the spout 100. As the cap 30' is threaded further onto the neck 20 the guiding rim 46' will cause a deformation of the spout 100. The spout 100 is thereby prevented from moving to its intended position which greatly reduces the closing functionality of the cap and neck assembly.

[0023] This problem is solved by modifying the cap in accordance with the embodiment shown in Figs. 3 and 4. While the cap and neck assembly is shown in Fig. 3, Fig. 4 is only showing details of the cap 30. As can be seen in Fig. 3 the neck 20 and the associated spout 100 is identical with the configuration shown in Figs. 2a-b. Hence the cap 30 will work perfectly fine with existing neck/spout designs.

[0024] The neck 20 is provided with threads 102 which projects radially outwards from an outer sidewall 103. The threads 102 are arranged somewhere between the shoulder section 13 and the upper end of the spout 100 in order to engage with internal threads 34 of the cap 30. The spout 100 may typically have a cylindrical shape, such that the cross-section of the spout 100 is circular. For a package 10 configured to enclose a volume of 0.2 to 2.0 liters of content, the material thickness of the spout 100 may be approximately 0.5-3 mm.

[0025] Now turning to details of the cap 30, a cylindrical sidewall 32 is provided with inner threads 34 for engagement with the corresponding outer threads 102 of the neck 20. The cap 30 further comprises an inner top surface 36 which forms a closing surface for the spout 100. The sidewall 32 of the cap 30 has an uppermost portion 38 connecting to the inner top surface 36. At this uppermost portion 38 a guiding structure 40 is provided. The guiding structure 40 is arranged on the inner side of the cap 30 such that it faces the spout 100.

[0026] The cap 30 further comprises a sealing lip 44 extending in a normal direction from the inner top surface 36. The sealing lip 44 is configured to seal against the inner wall 101 of the spout 100 when the cap 30 is threaded onto the neck 20 in a similar manner as described above with reference to Figs. 2a-b. The sealing lip 44 may have a bead 45 extending radially outwards and towards the spout 100 for further increasing the contact, and hence the sealing action, between the cap 30 and the neck 20. Additionally, the direction of the sealing lip 44 may be radially outwards, preferably only in a slight manner, such that when the cap 30 is screwed onto the

neck 20, the spout 100 will urge the sealing lip 44 to deflect radially inwards. Due to the flexibility of the sealing lip 44 it will be biased to return to its initial, or idle position, thus further improving the sealing action by means of the bead 45 pressing against the spout 100.

[0027] In order to avoid the spout 100 getting stuck at a wrong position the guiding structure 40 ensures that the cap 30 engages with the spout 100 in a desired manner, and in that the upper end of the spout 100 is guided correctly to its final position when the cap 30 is fully closed.

[0028] In the example shown, the guiding structure 40 is formed by an inner surface 42 of the sidewall 32 being tilted radially inwards, in a direction towards the inner top surface 36. This tilted inner surface 42 preferably extends around the entire uppermost portion 38 such that the guiding structure 40 is circular. As is shown in Fig. 3 the tilting angle α of the guiding structure 40 is constant, both in vertical and circumferential direction. The tilt angle α, here measured relative a normal direction of the cap or a direction being parallel with the longitudinal axis of the package, is e.g. in the range of 10-70°, even more preferably in the range of 30-60°. The tilt angle α should preferably be as small as possible in order to ensure smooth guidance of the spout 100. However, a small tilt angle α would normally require a rather long guiding distance making the cap 30 less compact. A trade-off between short distance and low tilt angle is therefore typically required.

[0029] The guiding structure 40, i.e. the inner surface 42, extends from a vertical portion of the sidewall 32 towards the inner top surface 36. In some embodiments, the inner surface 42 extends entirely to the inner top surface 36. However, as is best shown in Fig. 4, the inner surface 42 ends slightly before it reaches the inner top surface 36. Between the inner top surface 36 and the tilted inner surface 42 there is a small depression 46 dimensioned to receive the upper end of the spout 100 and to form a stop, preventing further movement of the cap 30 relative the spout 100. In a radial direction the depression extends from the sealing lip 44 to the end of the tilted inner surface 42. The depression 46 is preferably circular such that it extends around the entire circumference of the cap 30.

[0030] In an alternative embodiment, the tilt angle α of the inner surface 42 is not constant, but varies in the vertical direction. For example the tilt angle α may initially be very small but increases upwards, such that at the uppermost position, i.e. closest to the inner top surface 36, the tilt angle α is almost 90°.

[0031] The guiding structure 40 should thus be configured to ensure that the spout 100, when entering the interior of the cap 30 and moving relative the cap 30 towards a closed end position, is prevented from being stuck along its way. The guiding structure 40 should therefore preferably be free from any distinct edges or sharp contours, as such may prevent the spout 100 from moving correctly.

[0032] Instead, the side wall 32 of the cap 30 should connect with the inner top surface 36 by means of a smooth guiding structure 40 such that if the spout 100 contacts the guiding structure 40, it will be guided radially inwards towards the end position.

[0033] In the above description the guiding structure 40 has been described as a tilted surface 42. It should however be noted that other configurations of the guiding structure 40 are equally well applicable for achieving the same functionality. For example, instead of a circular surface 42 the guiding structure 40 may be provided as one or more tilted bars arranged between the side wall 32 and the inner top surface 36. Other suitable embodiments of guiding structures 40 may also fit within the concept described herein.

[0034] Although the above description has been made with reference to a food packages, it should be readily understood that the general principle of the neck and cap could be applied to all sorts of packages provided with opening devices.

[0035] Further, the invention has mainly been described with reference to a few embodiments. However, as is readily understood by a person skilled in the art, other embodiments than the ones disclosed above are equally possible within the scope of the invention, as defined by the appended claims.

[0036] All references to "upper", "lower", "upwards", "downwards" etc. are made with respect to a package standing upright.

Claims

1. A cap (30) for closing a spout (100) of a neck (20) of a package (10), comprising
   a sidewall (32) being provided with inner threads (34) for engagement with corresponding outer threads (102) of the neck (20), and an inner top surface (36) forming a closing surface for the spout (100), wherein the sidewall (32) has an uppermost portion (38) connecting to the inner top surface (36), said uppermost portion (38) comprising a guiding structure (40), wherein the guiding structure (40) is formed by an inner surface (42) of the sidewall (32) being tilted radially inwards, the guiding structure (40) extending from a vertical portion of the sidewall (32),
   characterized in that the guiding structure (40) further comprises a depression (46) forming a stop for the spout (100) .

2. The cap (30) according to claim 1, wherein the guiding structure (40) extends around the entire uppermost portion (38).

3. The cap (30) according to claim 2, wherein the tilting angle (α) of at least a part of the guiding structure (40) is constant.

4. The cap (30) according to any one of the preceding claims, further comprising a sealing lip (44) arranged radially inwards of the guiding structure (40).

5. The cap (30) according to claim 1 and 4, wherein the depression (46) is arranged between the sealing lip (44) and the guiding structure (40).

6. A neck assembly, comprising a spout (100) and a cap (30) according to any one of the preceding claims, wherein the open end of the spout (100) is arranged radially inwards of the guiding structure (40) of the cap.

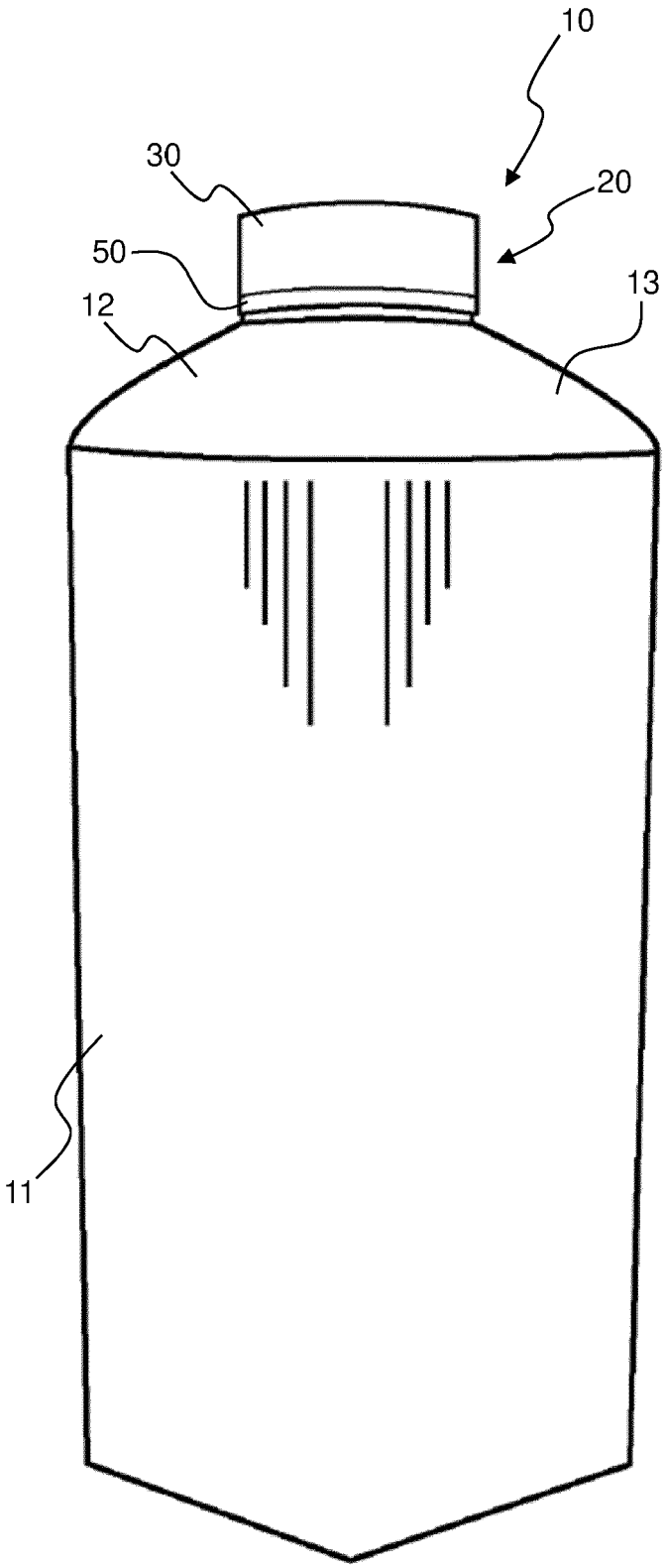

Fig. 1

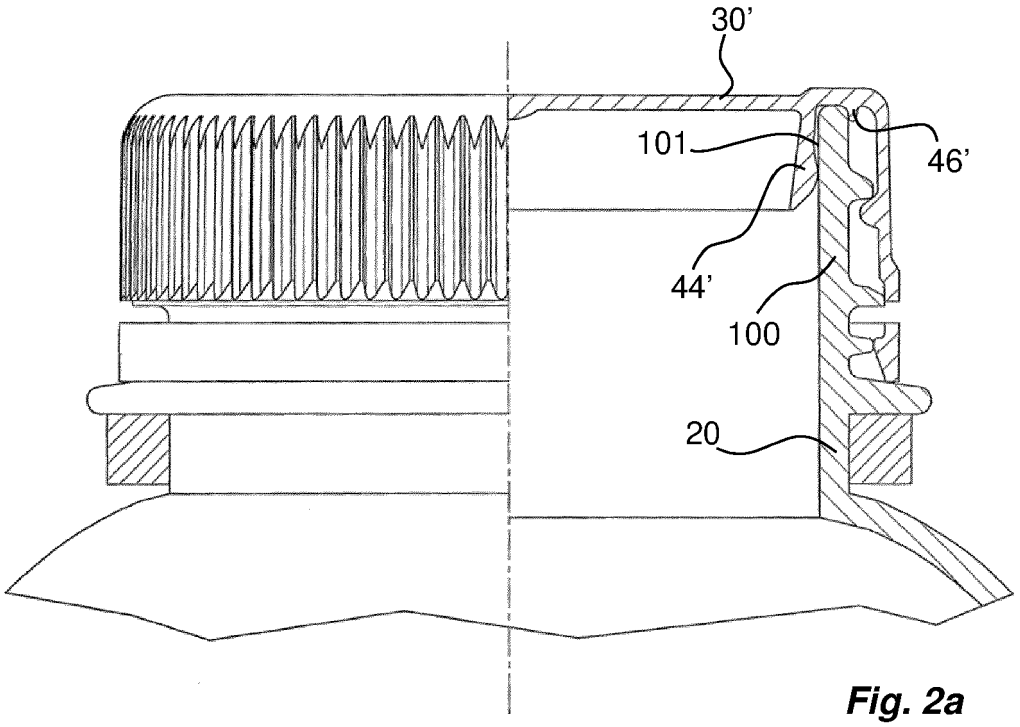

Fig. 2a
Prior art

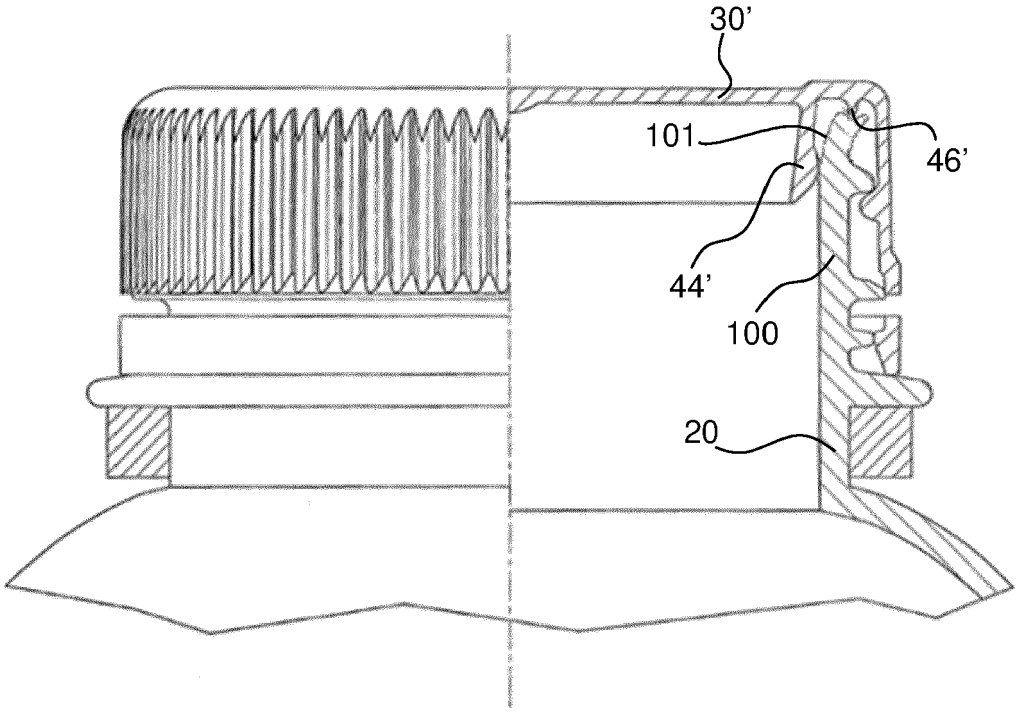

Fig. 2b
Prior art

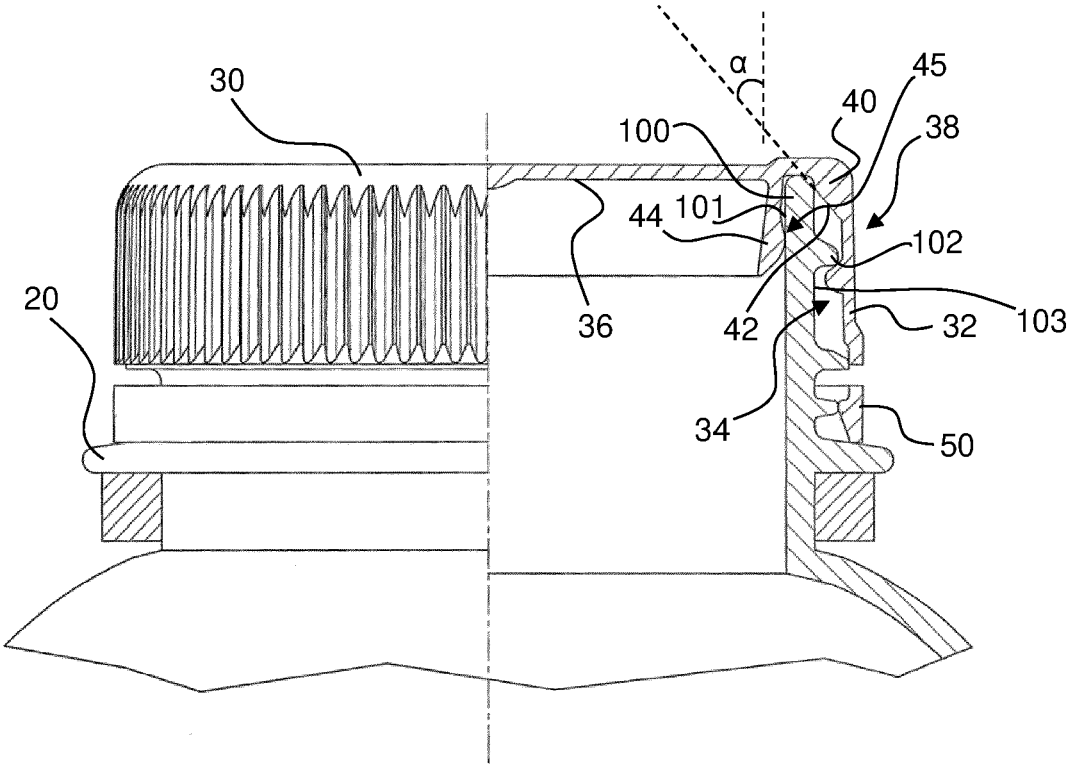
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Fig. 3

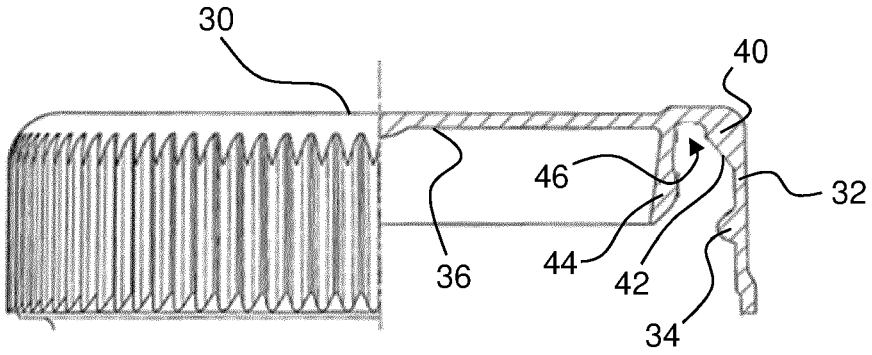
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Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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