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(71) Applicant: **Tetra Laval Holdings & Finance S.A.**
1009 Pully (CH)

(72) Inventors:

- **Fast, Ellinor**
221 86 Lund (SE)
- **Vighagen, Peter**
221 86 Lund (SE)

(74) Representative: **Tetra Pak Patent Attorneys**
AB Tetra Pak
Patent Department
Ruben Rausing's gata
221 86 Lund (SE)

(54) BLANK CONFIGURED TO BE FOLDED INTO A PACKAGE FOR HOLDING A FOOD PRODUCT

(57) A blank (10) configured to be folded into a package (200) for holding a food product, the blank (10) being made of a multilayer packaging material (12) comprising a layer of fibrous material (14), the blank (10) comprising a main section (22), a bottom section (24), and a top section (26); the top section (26) comprising a plurality of flaps (31-38) extending from the main section (22), each flap (35) having lateral edges (35a-b) arranged to be

joined with lateral edges (34b, 36a) of adjacent flaps (34, 36) to thereby form a top portion (204) of the package (200), wherein each lateral edge (35a-b) of every second flap (35) has a convex curvature (42), and each lateral edge (36a-b) of every other second flap (36) has a concave curvature (44) shaped to complement the convex curvature (42), to facilitate the joining of the lateral edges (35b, 36a).

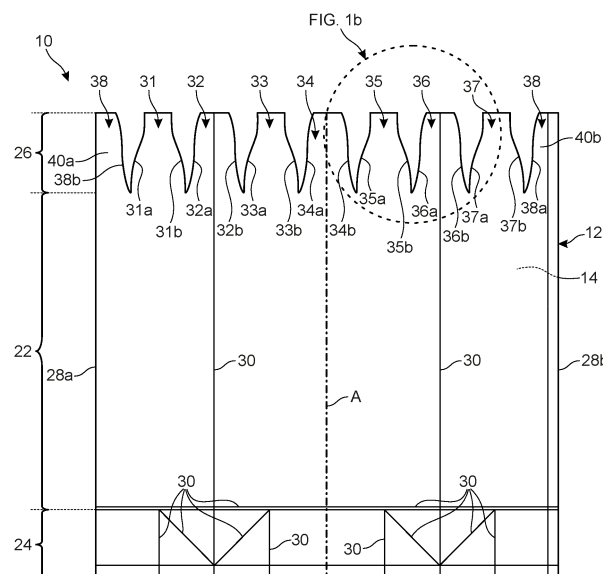


FIG. 1a

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Description

Technical Field

[0001] The invention relates to a blank configured to be folded into a package for holding a food product. The invention also relates to a web comprising multiple such blanks, to a package being formed from such a blank, and to a method for packaging a food product into such a package.

Background

[0002] WO2023285258A1 discloses a package for holding a food product. The package comprises a base, a sidewall, a shoulder, a neck, and a closure for forming a sealed, inner space for the food product. The base and the sidewall are formed from a multilayer packaging material that comprises a layer of fibrous material. The shoulder comprises a plurality of flap sections that are formed from a multilayer packaging material, extend from the sidewall and are folded towards each other in a direction towards the neck, with each flap section having lateral edges facing lateral edges of neighboring flap sections, and a plurality of molded seams join the lateral edges of neighboring flap sections. Each lateral edge comprise may comprise a first curved portion and a second curved portion, wherein the first curved portion is convexly shaped and the second curved portion is concavely shaped with respect to a central axis of the respective flap section. Each convexly shaped first curved portion faces the convexly shaped first curved portion of the neighbouring lateral edge, and each concavely shaped second curved portion faces the concavely shaped second curved portion of the neighbouring lateral edge, see for example FIGs. 3a-b in WO2023285258A1. WO2023285258A1 also discloses a corresponding blank of a multilayer packaging material having a main portion and a plurality of flap sections that extend from the main portion.

[0003] WO2023285258A1 successfully maintains an appealing bottle-shape of the package, while reducing the quantity of plastics used compared to more conventional packages. However, there is still room for improvements with respect to e.g. manufacturability, strength, and/or aesthetics of the package.

Summary

[0004] It is an object of the invention to at least partly overcome one or more of the above-identified limitations of the prior art.

[0005] To solve these objects, according to a first aspect, there is provided a blank configured to be folded into a package for holding a food product, the blank being made of a multilayer packaging material comprising a layer of fibrous material, the blank comprising a main section configured to form a main body of the package, a

bottom section configured to form a bottom portion of the package, and a top section configured to form a top portion of the package; the top section comprising a plurality of flaps extending from the main section, each flap having lateral edges arranged to be joined with lateral edges of adjacent flaps to thereby form the top portion of the package, wherein each lateral edge of every second flap has a convex curvature, and each lateral edge of every other second flap has a concave curvature shaped to complement the convex curvature, to facilitate the joining of the lateral edges.

[0006] The blank is advantageous in that the concave curvatures shaped to complement the convex curvatures may facilitate the joining of the lateral edges. Moreover, the top portion of the resulting package may, due to the concave curvatures shaped to complement the convex curvatures, have an increased torsional stiffness. Moreover, the resulting package, in particular where not all the flaps are the same, may have a more appealing aesthetic.

[0007] Each convex curvature of every second flap may be positioned opposite to and face a corresponding concave curvature of an adjacent flap, with both the convex curvatures and the concave curvatures having the same longitudinal extension. In this way, the lateral edges may accurately meet (no gaps or overlays) when folded to form the top portion of the package.

[0008] Each of the convex curvature and the concave curvature may comprise at least one radius of curvature including the minimum radius of curvature for the respective curvature. The minimum radius of curvature may have a value in the range of 10 mm to 80 mm, preferably 50 mm to 80 mm. The radius of curvature may be either constant or varying along the length of the curvature.

[0009] Each lateral edge of every second flap having the convex curvature may further comprise a concave curvature extending along the lateral edge following the convex curvature, and each lateral edge of every other second flap having the concave curvature may further comprise a convex curvature extending along the lateral edge following the concave curvature and shaped to complement the concave curvature of the adjacent flap. In one example, each lateral edge may have (or consist of) a single convex curvature and a single concave curvature.

[0010] In another example, each lateral edge of every second flap having the convex curvature and the following concave curvature may further comprise an additional convex curvature extending along the lateral edge following the concave curvature, and each lateral edge of every other second flap having the concave curvature and the following convex curvature may further comprise an additional concave curvature extending along the lateral edge following the convex curvature and shaped to complement the additional convex curvature of the adjacent flap. Each lateral edge of every second flap may for example exclusively have the convex curvature, the following concave curvature, and the additional convex

curvature, whereas each lateral edge of every other second flap may exclusively have the concave curvature, the following convex curvature, and the additional concave curvature. That is, each lateral edge may here have exactly three curved portions.

[0011] In yet another example, each lateral edge of every second flap may consist of a single convex curvature or comprise a single convex curvature along at least 90% of its length, and each lateral edge of every other second flap may consist of a single concave curvature or

comprise a single concave curvature along at least 90% of its length. That is, each lateral edge here has only one curved portion.

[0012] Each flap may have a transversal edge extending between endpoints of the lateral edges of the flap, wherein the transversal edges of all flaps either have the same width, or the transversal edges of every second flap differ in width by at least 10% relative to the transversal edges of every other second flap. In the former case, the transversal edges may be uniformly arranged around a

circular neck of the package. In the latter case, a particular shape of the top portion of the package may be defined.

[0013] The blank may have a longitudinal axis extending from the bottom section to the top section, wherein a plurality of interspaces are formed between the flaps, every second interspace having the same shape as each other, and every other second interspace having the same shape as each other, the shape of every other second interspace being mirrored across the longitudinal axis relative to the shape of every second interspace. In another example, all the interspaces may have (substantially) the same shape.

[0014] One flap may comprise a first part arranged at a first long side of the blank and a second part arranged at a second long side of the blank that is opposite the first long side, the first and second parts being configured to partially overlap when the blank is folded so that one long side overlaps the other, such that the overlapping parts form a full flap.

[0015] According to a second aspect, there is provided a web of a multilayer packaging material comprising multiple blanks according to the first aspect, wherein the blanks are successively arranged and continuously connected, each blank having a top section that is, via its flaps, connected to a bottom section of a preceding blank in the web.

[0016] According to a third aspect, where is provided a package for holding a food product, the package being formed from a blank according to the first aspect, the package comprising a bottom portion, a main body, a top portion, and a neck, wherein the bottom portion, the main body, and the top portion are formed from the blank, the top portion is formed by the flaps of the blank, which are folded towards each other in a direction towards the neck, and the package further comprises a plurality of molded seams that join the lateral edges of adjacent flaps. The main body may be a sidewall. The molded seams and the

top portion formed by the flaps may constitute a shoulder of the package.

[0017] According to a fourth aspect, where is provided a method for packaging a food product into a package according to the third aspect, the method comprising providing a blank according to the third aspect; folding and longitudinally sealing the blank to form the main body; folding the flaps towards each other so that the lateral edges of adjacent flaps move closer to each other; injection molding the neck and the molded seams to join the lateral edges of adjacent flaps; filling a food product into the package at a bottom end of the package; and sealing the bottom end to form the bottom portion of the package.

[0018] Still other objectives, features, aspects and advantages of the invention will appear from the following detailed description as well as from the drawings.

Drawings

[0019] Embodiments of the invention will now be described, by way of example, with reference to the accompanying schematic drawings, in which

Fig. 1a is a top view of a blank made of a multilayer packaging material according to a first embodiment;

Fig. 1b is an enlarged view of flaps of the blank in Fig. 1a;

Fig. 2 is a cross-sectional side view of the multilayer packaging material;

Figs. 3a-c illustrate a package formed from the blank in Fig. 1a;

Fig. 4a is a top view of a blank made of a multilayer packaging material according to a second embodiment;

Fig. 4b is an enlarged view of flaps of the blank in Fig. 4a;

Figs. 5a-c illustrate a package formed from the blank in Fig. 4a;

Fig. 6a is a top view of a blank made of a multilayer packaging material according to a third embodiment;

Fig. 6b is an enlarged view of flaps of the blank in Fig. 6a;

Figs. 7a-c illustrate a package formed from the blank in Fig. 6a;

Fig. 8a is a top view of a blank made of a multilayer packaging material according to a fourth embodiment;

Fig. 8b is an enlarged view of flaps of the blank in Fig. 8a;

Figs. 9a-c illustrate a package formed from the blank in Fig. 8a;

Fig. 10 is a top view of a web comprising multiple blanks; and

Fig. 11 is a flow chart of a method for packaging a food product into a package.

Detailed Description

[0020] With reference to Fig. 1a, a blank 10 configured to be folded into a package 200 for holding a food product is illustrated. The blank 10 is made of a multilayer packaging material 12 comprising a layer of fibrous material 14.

[0021] As illustrated in Fig. 2, the multilayer packaging material 12 may comprise: the layer of fibrous material 14, such as e.g. paper or cardboard, and at least two layers of heat-seal plastic material 16, e.g. polyethylene, interposing the layer of fibrous material 14 in between one another. Moreover, the multilayer packaging material 12 may also comprise a layer of gas- and light-barrier material 18, e.g. aluminum foil or ethylene vinyl alcohol (EVOH) film, in particular being arranged between one of the layers of heat-seal plastic material 16 and the layer of fibrous material 14. Preferentially, the multilayer packaging material 12 may also comprise a further layer of heat-seal plastic material 20 being interposed between the layer of gas- and light-barrier material 18 and the layer of fibrous material 14.

[0022] Returning to Fig. 1a, the blank 10 comprises a main section 22, a bottom section 24, and a top section 26. The blank 10 may further comprise a longitudinal axis A extending from the bottom section 24 to the top section 26. The blank may further comprise a first long side (or side edge) 28a and a second long side (or side edge) 28b that is opposite the first long side 28a. The first and second long sides 28a-b may be parallel to the longitudinal axis A.

[0023] The main section 22 is configured to form, after being folded and sealed, a main body (or sidewall) 202 of the package 200. Likewise, the bottom section 24 is configured to form, after being folded and sealed, a bottom portion 204 of the package 200. To this end, the blank 10, in particular the main section 22 and the bottom section 24, may comprise a plurality of crease lines 28. The plurality of crease lines 30 may facilitate folding the main section 22 and the bottom section 24 and/or help define the shape of the main body 202 and the bottom portion 204 of the package 200.

[0024] The top section 26 of the blank 10 comprises a plurality of flaps 31-38. The plurality of flaps 31-38 extends from the main section 22. Specifically, the plurality of flaps 31-38 may be arranged opposite the bottom section 24. The number of flaps 31-38 may for example

be eight (8). Notably, one flap 38 of the plurality of flaps may comprise a first part 40a arranged at the first long side 28 of the blank 10 and a second part 40b arranged the second long side 28b of the blank 10, wherein the first and second parts 40a-b are configured to partially overlap when the blank 10 is folded so that one long side 28a overlaps the other 28b, such that the overlapping parts 40a-b form a full flap 38.

[0025] Each flap of the plurality of flaps 31-38 has two lateral edges 31a-b, 32a-b, ... 38a-b arranged to be joined with lateral edges of adjacent flaps, to thereby form the top portion 206 of the package 200. For example, lateral edges 35a-b of flap 35 are arranged to be joined with lateral edge 34b of flap 34 and lateral edge 36a of flap 36, respectively, whereas lateral edges 36a-b of flap 36 are arranged to be joined with lateral edge 35b and lateral edge 37a, respectively, and so on.

[0026] With further reference to Fig. 1b, each flap of the plurality of flaps 31-38 may also have a transversal edge 35c, 36c extending between endpoints 35d-e, 36d-e of the lateral edges of the flap. The transversal edge 35c, 36c may also be referred to as a top edge of the flap. The transversal edge 35c, 36c may be distal to the main portion 22 of the blank 10. The transversal edge 35c, 36c may be orthogonal to the long sides 28a-b of the blank 10. The transversal edges of all the flaps 31-18 may have the same width w, as shown for example in Figs. 1a-b. Alternatively, the transversal edges 35c of every second flap 31, 33, 35, 37 could differ in width by at least 10% relative to the transversal edges 36c of every other second flap 32, 34, 36, 38. Each flap (of the plurality of flaps 31-38) may also have a base 35f, 36f proximal to the main portion 22. The base of each flap 31-38 may be wider than the transversal edge. The blank 10 may further comprise a plurality of interspaces 35g, 36g formed between the flaps 31-38.

[0027] In accordance with the invention, each lateral edge (such as lateral edges 35a-b) of every second flap 31, 33, 35, 37 has a convex curvature 42, and each lateral edge (such as lateral edges 36a-b) of every other second flap 32, 34, 36, 38 has a concave curvature 44 shaped to complement the convex curvature 42. This in order to facilitate the joining of the lateral edges, such as the joining of lateral edges 34b and 35a and the joining of lateral edges 35b and 36a.

[0028] Each convex curvature 42 of every second flap 31, 33, 35, 37 should be positioned opposite to and face a corresponding concave curvature 44 of an adjacent flap 32, 34, 36, 38. Moreover, the convex curvatures 42 and the concave curvatures 44 should have the same longitudinal extension (or length) L1. L1 may here be (approximately) 50% of the length of the respective lateral edge 35a. Moreover, each of the convex curvature 42 and the concave curvature 44 may comprise at least one radius of curvature R1. The at least one radius of curvature R1 may include a minimum radius of curvature for the respective curvature 42, 44. The minimum radius of curvature may correspond to the maximum curvature

of the respective curved portion 42, 44. The minimum radius of curvature may for example have a value in the range of 10 mm to 80 mm. The radius of curvature R1 may be either constant or varying along the length of the curvature 42, 44.

[0029] In Figs. 1a-b, each lateral edge such as lateral edges 35a-b of every second flap 31, 33, 35, 37 having the convex curvature 42 further comprises a concave curvature 46 extending along the lateral edge 35a-b following the convex curvature 42. On the other hand, each lateral edge such as lateral edges 36a-b of every other second flap 32, 34, 36, 38 having the concave curvature 44 further comprises a convex curvature 48 extending along the lateral edge 36a-b following the concave curvature 44 and shaped to complement the concave curvature 46 of the adjacent flap 35. Specifically in Figs. 1a-b, each lateral edge 35a-b, 36a-b may have (or consist of) a single convex curvature 42, 48 and a single concave curvature 44, 46. In other words, the flaps 31-38 are here double curved.

[0030] Similar to curvatures 42 and 44, each concave curvature 46 of every second flap 31, 33, 35, 37 should be positioned opposite to and face a corresponding concave curvature 48 of an adjacent flap 32, 34, 36, 38. Moreover, the concave curvatures 46 and the convex curvatures 48 should have the same longitudinal extension (or length) L2. L2 may be 50% of the length of the respective lateral edge 35a. Moreover, longitudinal extension L2 may be equal to the longitudinal extension L1. Moreover, each of the concave curvature 46 and the convex curvature 48 may comprise at least one radius of curvature. The at least one radius of curvature may include a minimum radius of curvature for the respective curvature 46, 48. The minimum radius of curvature may for example have a value in the range of 10 mm to 80 mm. The radius of curvature may be either constant or varying along the length of the curvature 46, 48.

[0031] The concave curvatures 46 and the convex curvatures 48 may be distal to the main portion 22 of the blank 10, whereas the convex curvatures 42 and the concave curvatures 44 may be proximal to the main portion 22 of the blank 10, as in Figs 1-b. Accordingly, every second flap 31, 33, 35, 37 may have a first symmetrical shape with respect to a central axis A' of the respective flap, whereas every other second flap 32, 34, 36, 38 may have a second symmetrical shape with respect to a central axis A' of the respective flap, wherein the second symmetrical shape is different from the first symmetrical shape. Moreover, every second interspace 35g has the same shape as each other, and every other second interspace 36g having the same shape as each other, the shape of every other second interspace 36g being mirrored across the longitudinal axis A relative to the shape of every second interspace 35g.

[0032] Figs. 3a-c illustrate package 200 for holding a food product in a side view, perspective view, and top view, respectively. The food product may for example be a pourable food product, such as milk, yoghurt, tomato

sauce, soup, salt, sugar, or similar.

[0033] The package 200 comprises a bottom portion 202, a main body (or sidewall) 204, a top portion 206, and a neck 208. The neck 208 may comprise a pouring outlet 210. The package 200 may further comprise a closure (not shown), such as a screw cap, removably attached to the neck 208, to selectively open and close the pouring outlet 210.

[0034] The bottom portion 202, the main body 204, and the top portion 206 of the package 200 are here formed from the blank 10 in Figs. 1a-b. Specifically, the bottom portion 202 is formed by the bottom section 24 of the blank 10, the main body (or sidewall) 204 is formed by the main section of the blank 10, and the top portion 206 of is formed by the flaps 31-38 of the top section 26 of the blank 10, which flaps 31-38 are folded towards each other in a direction towards the neck 208.

[0035] The package 200 further comprises a plurality of molded seams 211-218 that join the lateral edges 35b, 36a of adjacent flaps 35, 36. The seams 211-218 may be molded together with the neck 208. Moreover, the neck 208 may be moulded to the transversal edges 35c, 36c of the flaps 31-38. The molded seams 211-218 and the top portion 206 formed by the flaps 31-38 may constitute a shoulder of the package 200. The shoulder may, due to the concave curvatures 44, 46 shaped to complement the convex curvatures 42, 48 have an increased torsional stiffness.

[0036] Figs. 4a-b illustrate another blank 10. This blank 10 may be similar to that of Figs. 1a-b, except that each lateral edge here has exactly three curved portions (or curvatures). In other words, the flaps 31-38 are here triple curved. Namely, each lateral edge 36a-b of every second flap 32, 34, 36, 38 having a convex curvature 92 a following concave curvature 96 further comprises an additional convex curvature 90 extending along the lateral edge 36a-b following the concave curvature 96. Likewise, each lateral edge 35a-b of every other second flap 31, 33, 35, 37 having a concave curvature 94 and a following convex curvature 98 further comprises an additional concave curvature 93 extending along the lateral edge 36a-b following the convex curvature 98 and shaped to complement the additional convex curvature 90 of the adjacent flap 36. Each additional convex curvature 90 should be positioned opposite to and face a corresponding additional concave curvature 93. Moreover, the additional convex curvatures 90 and the additional concave curvatures 93 should have the same longitudinal extension (or length) L3, for example 1/3 of the length of the respective lateral edge 35b, 36a. Moreover, each of the additional convex curvature 90 and the additional concave curvature 93 may comprise at least one radius of curvature. The at least one radius of curvature may include a minimum radius of curvature for the respective curvature 90, 93. The minimum radius of curvature may for example have a value in the range of 10 mm to 80 mm. The radius of curvature may be either constant or varying along the length of the curvature 90,

93. The additional convex curvatures 90 and the additional concave curvatures 93 may be most distal to the main portion 22 of the blank 10.

[0037] Figs. 5a-c illustrate a package 200 similar to Figs. 3a-c, except the package 200 here is formed from the blank 10 in Figs. 4a-b. Notably, the shoulder of this package 200 gets a different appearance with three curved portions per lateral edge instead of just two.

[0038] Figs. 6a-b illustrate yet another blank 10. This blank 10 may be similar to that of Figs. 1a-b, except that each lateral edge here has only one curved portion (or curvature). In other words, the flaps 31-38 are here single curve flaps. Namely, each lateral edge 37a-b of every second flap 31, 33, 35, 37 consists of a single convex curvature 91, whereas each lateral edge 36a-b of every other second flap 32, 34, 36, 38 consists of a single concave curvature 95. Alternatively, each lateral edge of every second flap could comprise a single convex curvature along at least 90% of its length, whereas each lateral edge of every other second flap could comprise a single concave curvature along at least 90% of its length.

[0039] Figs. 7a-c illustrate a package 200 similar to Figs. 3a-c, except the package 200 here is formed from the blank 10 in Figs. 6a-b.

[0040] Figs. 8a-b illustrate still another blank 10. This blank 10 may be similar to that of Figs. 1a-b having "double curved" flaps 31-38, except that on one lateral edge 37a of every second flap 31, 33, 35, 37, a concave curvature 84 is proximal to the main portion 22 of the blank 10, whereas a convex curvature 83 is distal to the main portion 22 of the blank 10. Moreover, on one lateral edge 36b of every other second flap 32, 34, 36, 38, a convex curvature 82 is proximal to the main portion 22 of the blank 10, whereas a concave curvature 81 is distal to the main portion 22 of the blank 10. Accordingly, each flap 31-38 may (here) be asymmetrical with respect to central axis A' of the respective flap. Moreover, all the interspaces of the blank 10 such as interspaces 36g, 37g may have the same shape. The interspaces of the blank 10, such as interspaces 36g, 37g, may be symmetrical.

[0041] Figs. 9a-c illustrate a package 200 similar to Figs. 3a-c, except the package 200 here is formed from the blank 10 in Figs. 8a-b. Notably, the shoulder of this package 200 gets a spiralling or twisted appearance.

[0042] Regarding the curvatures, for the embodiment illustrated in Fig. 1b, convex curvature 42 may, at least along a portion of its length, have a radius in the range of approximately 61 mm to 75 mm. In one example, the radius of convex curvature 42 is 68 mm. Concave curvature 46 may, at least along a portion of its length, have a radius in the range of approximately 53 mm to 65 mm. In one example, the radius of concave curvature 46 is 59 mm. Concave curvature 44, which faces convex curvature 42, may have a radius within the same range as convex curvature 42, i.e., approximately 61 mm to 75 mm. In one example, the radius of concave curvature 44 is 68 mm. Convex curvature 48, which faces concave curvature 46, may have a radius within the same range as

concave curvature 46, i.e., approximately 53 mm to 65 mm. In one example, the radius of convex curvature 48 is 59 mm.

[0043] For the embodiment illustrated in Fig. 4b, convex curvature 92 may, at least along a portion of its length, have a radius in the range of approximately 29 mm to 35 mm. In one example, the radius of convex curvature 92 is 32 mm. Concave curvature 96 may, at least along a portion of its length, have a radius in the range of approximately 18 mm to 22 mm. In one example, the radius of concave curvature 96 is 20 mm. Convex curvature 90 may, at least along a portion of its length, have a radius in the range of approximately 14 mm to 18 mm. In one example, the radius of convex curvature 90 is 16 mm. Concave curvature 94, which faces convex curvature 92, may have a radius within the same range as convex curvature 92, i.e., approximately 29 mm to 35 mm. In one example, the radius of concave curvature 94 is 32 mm. Convex curvature 98, which faces concave curvature 96, may have a radius within the same range as concave curvature 96, i.e., approximately 18 mm to 22 mm. In one example, the radius of convex curvature 98 is 20 mm. Concave curvature 93, which faces convex curvature 90, may have a radius within the same range as convex curvature 90, i.e., approximately 14 mm to 18 mm. In one example, the radius of concave curvature 93 is 16 mm.

[0044] For the embodiment illustrated in Fig. 6b, convex curvature 91 may, at least along a portion of its length, have a radius in the range of approximately 63 mm to 78 mm. In one example, the radius of convex curvature 91 is 70 mm. Concave curvature 95, which faces convex curvature 91, may have a radius within the same range as convex curvature 91, i.e., approximately 63 mm to 78 mm. In one example, the radius of concave curvature 95 is 70 mm.

[0045] For the embodiment illustrated in Fig. 8b, convex curvature 82 may, at least along a portion of its length, have a radius in the range of approximately 30 mm to 36 mm. In one example, the radius of convex curvature 82 is 33 mm. Concave curvature 81 may, at least along a portion of its length, have a radius in the range of approximately 35 mm to 43 mm. In one example, the radius of concave curvature 81 is 39 mm. Concave curvature 84, which faces convex curvature 82, may have a radius within the same range as convex curvature 82, i.e., approximately 30 mm to 36 mm. In one example, the radius of concave curvature 84 is 33 mm. Convex curvature 83, which faces concave curvature 81, may have a radius within the same range as concave curvature 81, i.e., approximately 35 mm to 43 mm. In one example, the radius of convex curvature 83 is 39 mm.

[0046] Turning to Fig. 10, Fig. 10 illustrates a web 100 of multilayer packaging material 12. The web 100 comprises multiple blanks 10, such as blanks 10 according to the embodiment in Figs. 1a-b. The blanks 10 are successively arranged and continuously connected, each blank 10 having a top section 26 that is, via its flaps 31-38,

connected to the bottom section 24 of a preceding blank 10 in the web 100. Although the web 100 in Fig. 10 is in a flat state, the web 100 will typically be wound/stored on a roll (not shown). The web 100 may comprise a large number of blanks (or repeat units) 10, in the magnitude of several thousand.

[0047] Fig. 11 is a flow chart of a method for packaging a food product into package 200, in particular as it is operated within an automatic packaging machine.

[0048] The method comprises the steps of: a) providing blank 10 according to any embodiment or variant described in the present disclosure; b) folding and longitudinally sealing the blank 10 so as to form the main body 204; c) folding the flaps 31-38 towards each other so that the lateral edges 35b, 36a of neighboring flaps 35, 36 move closer to each other; d) injection molding the neck 208 and the molded seams 211-218 to join the lateral edges 35b, 36a of the neighboring flaps 35, 36, thereby forming the shoulder of the package 200; e) filling a food product into the partially formed package 200 at an open bottom end of the package 200; and f) sealing the bottom end to form the bottom portion 202.

[0049] The method may also comprise the step of g) providing and/or applying a closure on the neck 208. This step may be performed before filling the food product into the package 200. Alternatively, this step may be performed after filling the food product into the package 200, typically when the neck 208 includes a membrane that seals the neck 208.

[0050] The steps a) to f) may be executed in sequence of their appearance. The method may also comprise a plurality of further steps h) of repetition, during which the steps a) to f) or a) to g) are repeated. Moreover, step a) may include the sub-steps of: a1) providing the web 100 of the multilayer packaging material 12; and a2) cutting the web 100 of the multilayer packaging material 12, for forming the blank 10. The method for packaging a food product into a package is disclosed per se in WO2023285258A1 entitled PACKAGE FOR HOLDING A FOOD PRODUCT AND MOULD FOR A PACKAGING MACHINE with applicant TETRA LAVAL HOLDINGS & FINANCE S.A. and filed on 07 July 2022, which is incorporated herein by reference.

[0051] From the description above follows that, although various embodiments of the invention have been described and shown, the invention is not restricted thereto, but may also be embodied in other ways within the scope of the subject-matter defined in the following claims.

Claims

1. A blank (10) configured to be folded into a package (200) for holding a food product, the blank (10) being made of a multilayer packaging material (12) comprising a layer of fibrous material (14), the blank (10) comprising a main section (22) configured to form a

main body (202) of the package (200), a bottom section (24) configured to form a bottom portion (204) of the package (200), and a top section (26) configured to form a top portion (206) of the package (200);

the top section (26) comprising a plurality of flaps (31-38) extending from the main section (22), each flap (35) having lateral edges (35a-b) arranged to be joined with lateral edges (34b, 36a) of adjacent flaps (34, 36) to thereby form the top portion (204) of the package (200), **wherein**

each lateral edge (35a-b) of every second flap (35) has a convex curvature (42, 92, 91, 82), and each lateral edge (36a-b) of every other second flap (36) has a concave curvature (44, 94, 95, 84) shaped to complement the convex curvature (42), to facilitate the joining of the lateral edges (35b, 36a).

2. The blank (10) according to claim 1, wherein each convex curvature (42) of every second flap (35) is positioned opposite to and faces a corresponding concave curvature (44) of an adjacent flap (36), with both the convex curvatures (42) and the concave curvatures (44) having the same longitudinal extension.

3. The blank (10) according to any preceding claim, wherein each of the convex curvature (42) and the concave curvature (44) comprises at least one radius of curvature (R1) including the minimum radius of curvature for the respective curvature, the minimum radius of curvature having a value in the range of 10 mm to 80 mm, the radius of curvature (R1) being either constant or varying along the length (L) of the curvature.

4. The blank (10) according to any preceding claim, wherein

each lateral edge (35a-b) of every second flap (35) having the convex curvature (42) further comprises a concave curvature (46) extending along the lateral edge (35a-b) following the convex curvature (42), and

each lateral edge (36a-b) of every other second flap (36) having the concave curvature (44) further comprises a convex curvature (48) extending along the lateral edge (36a-b) following the concave curvature (44) and shaped to complement the concave curvature (46) of the adjacent flap (35).

5. The blank (10) according to claim 4, wherein

each lateral edge (36a-b) of every second flap

- (36) having the convex curvature (42) and the following concave curvature (46) further comprises an additional convex curvature (90) extending along the lateral edge (36a-b) following the concave curvature (46), and each lateral edge (35a-b) of every other second flap (35) having the concave curvature (44) and the following convex curvature (48) further comprises an additional concave curvature (52) extending along the lateral edge (35a-b) following the convex curvature (48) and shaped to complement the additional convex curvature (90) of the adjacent flap (36).
6. The blank (10) according to any of claims 1 to 3, wherein
- each lateral edge (35a-b) of every second flap (35) consists of a single convex curvature (91) or comprises a single convex curvature along at least 90% of its length, and each lateral edge (12b) of every other second flap (12) consists of a single concave curvature (95) or comprises a single concave curvature along at least 90% of its length.
7. The blank (10) according to any preceding claim, wherein
- each flap (35) has a transversal edge (35c) extending between endpoints (35d-e) of the lateral edges (35a-b) of the flap (35), and the transversal edges (35c) of all flaps either have the same width (w), or the transversal edges of every second flap differ in width by at least 10% relative to the transversal edges of every other second flap.
8. The blank (10) according to any preceding claim, wherein the blank (10) has a longitudinal axis (A) extending from the bottom section (24) to the top section (26), and a plurality of interspaces (35g, 36g) are formed between the flaps,
- every second interspace (35g) having the same shape as each other, and every other second interspace (36g) having the same shape as each other, the shape of every other second interspace (36g) being mirrored across the longitudinal axis (A) relative to the shape of every second interspace (35g).
9. The blank (1) according to any preceding claim, wherein one flap (38) comprises a first part (40a) arranged at a first long side (28a) of the blank (10) and a second part (40b) arranged a second long side (28b) of the blank (10) that is opposite the first long side (28a), the first and second parts (40a-b) being configured to partially overlap when the blank (10) is folded so that one long side overlaps the other, such that the overlapping parts (40a-b) form a full flap (38).
10. A web (100) of a multilayer packaging material (12) comprising multiple blanks (10) according to any preceding claim, wherein the blanks (10) are successively arranged and continuously connected, each blank (10) having a top section (26) that is, via its flaps (31-38), connected to a bottom section (24) of a preceding blank (10) in the web (100).
11. A package (200) for holding a food product, the package (200) being formed from a blank (10) according to any of claims 1 to 9,
- the package (200) comprising a bottom portion (202), a main body (204), a top portion (206), and a neck (208), wherein the bottom portion (202), the main body (204), and the top portion (206) are formed from the blank (10), the top portion (206) is formed by the flaps (31-38) of the blank (10), which are folded towards each other in a direction towards the neck (208), and the package (200) further comprises a plurality of molded seams (211-218) that join the lateral edges (35b, 36a) of adjacent flaps (35, 36).
12. A method for packaging a food product into a package (200) according to claim 11, the method comprising
- providing (a) a blank (10) according to any of claims 1 to 9;
- folding (b) and longitudinally sealing the blank (10) to form the main body (204);
- folding (c) the flaps (31-38) towards each other so that the lateral edges (35b, 36a) of adjacent flaps (35, 36) move closer to each other;
- injection molding (d) the neck (208) and the molded seams (214a-h) to join the lateral edges (35b, 36a) of adjacent flaps (35, 36) for forming the top portion (206);
- filling (e) a food product into the package (200) at a bottom end of the package (200); and
- sealing (f) the bottom end to form the bottom portion (202) of the package (200).

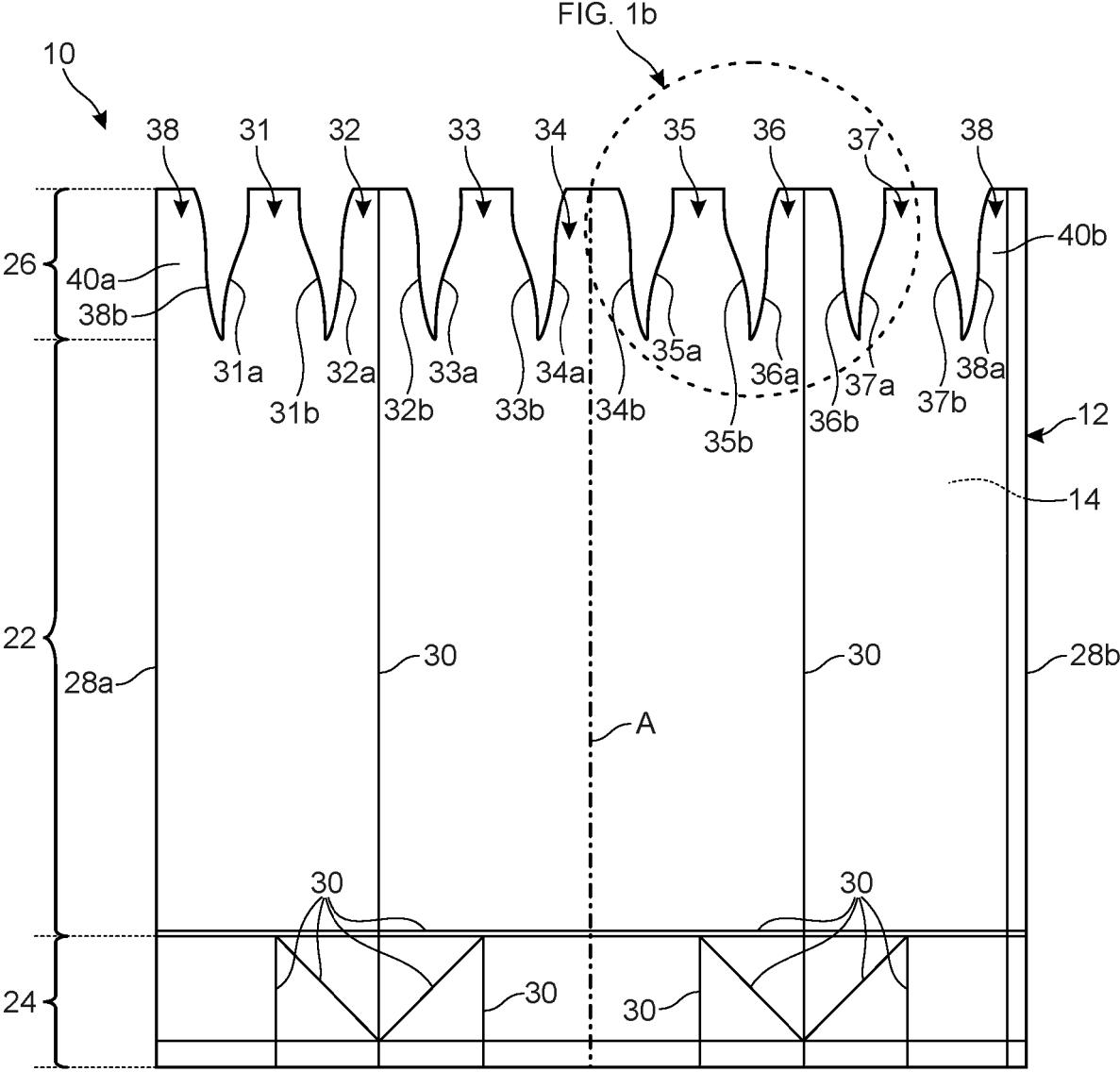


FIG. 1a

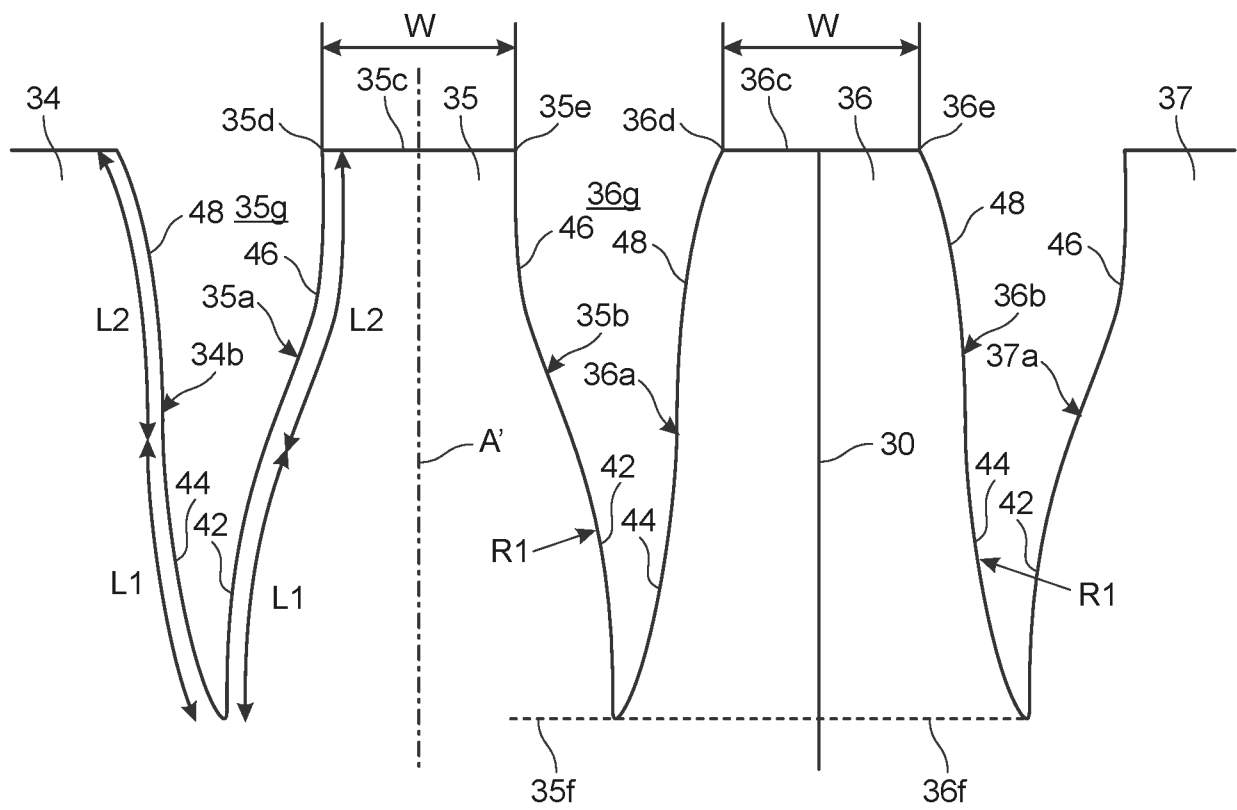


FIG. 1b

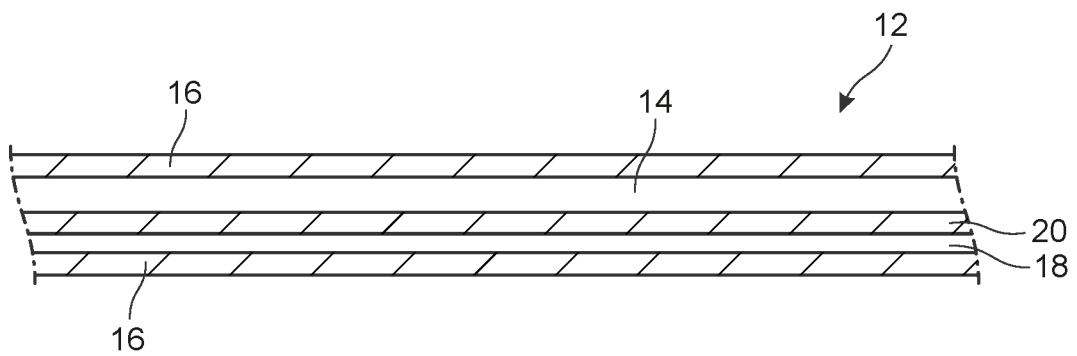
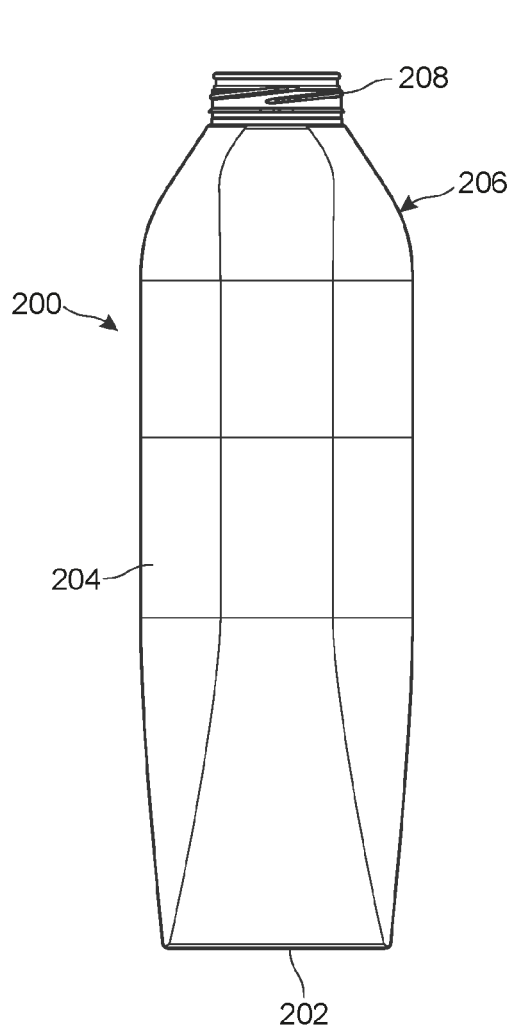


FIG. 2



202
FIG. 3a

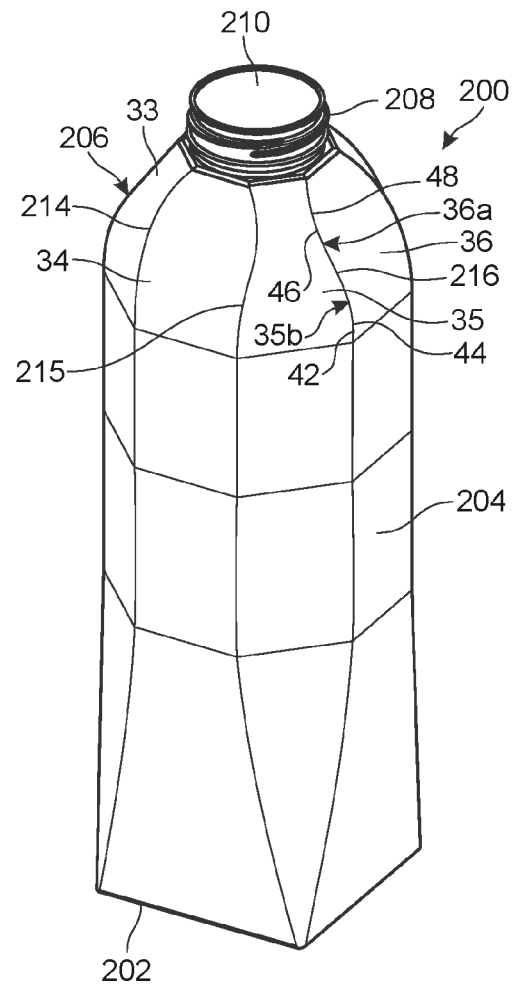


FIG. 3b

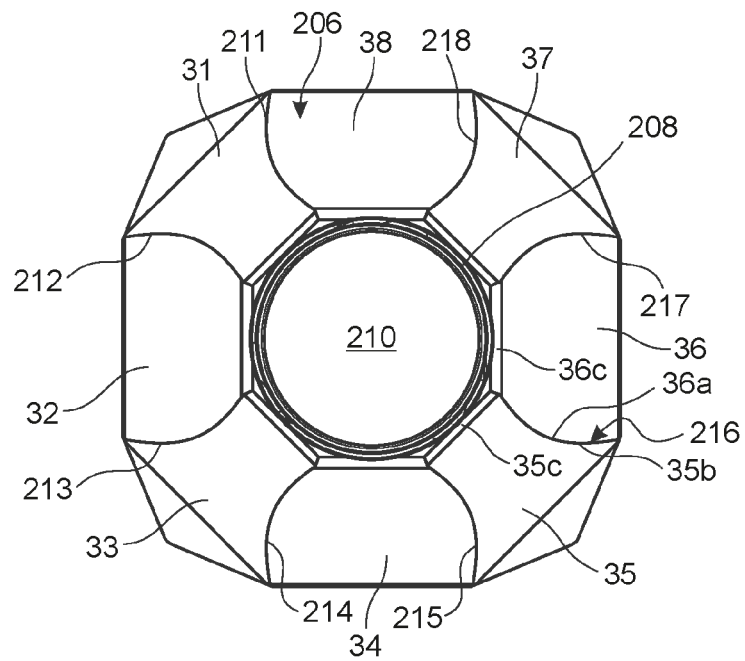


FIG. 3c

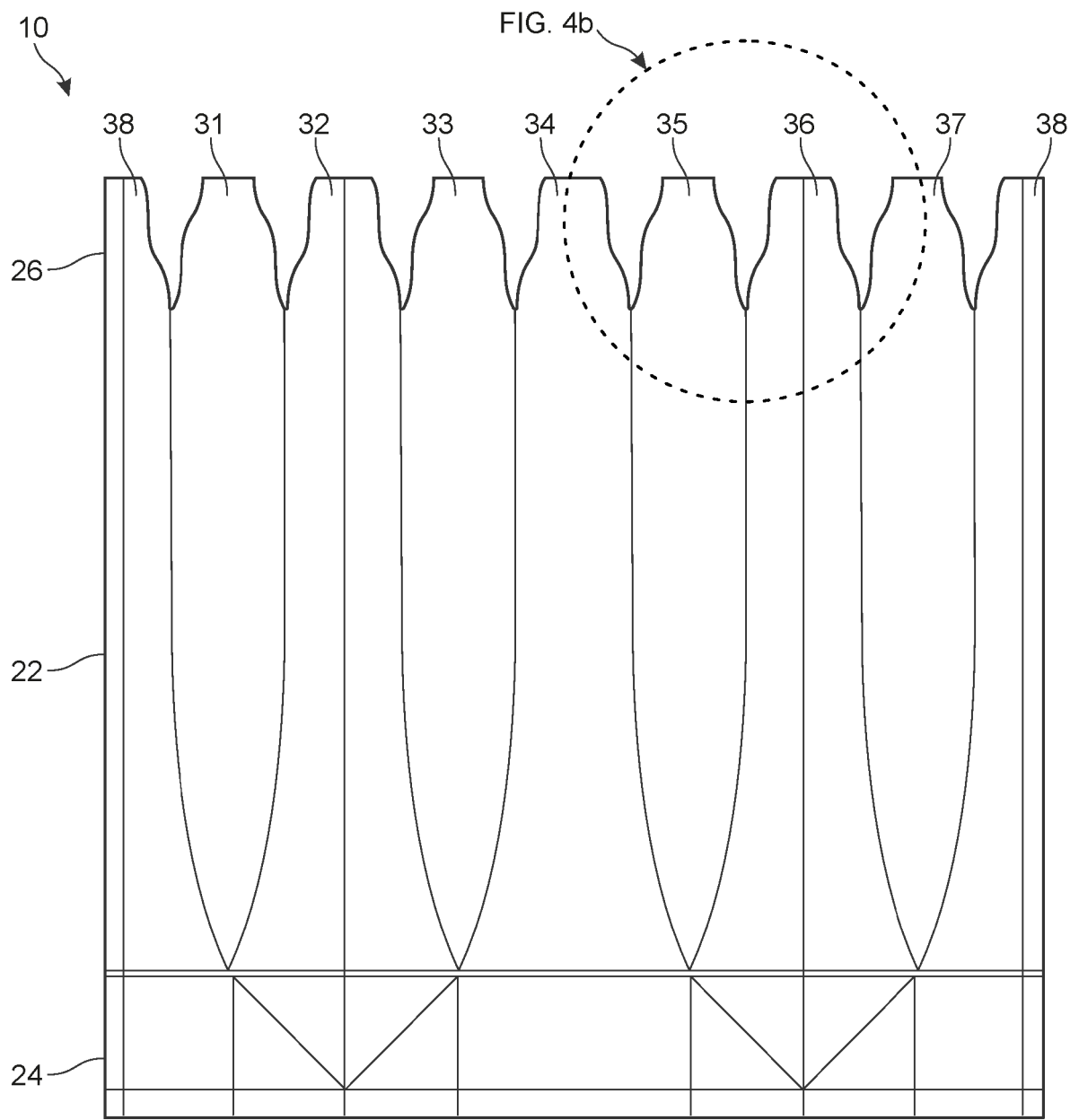


FIG. 4a

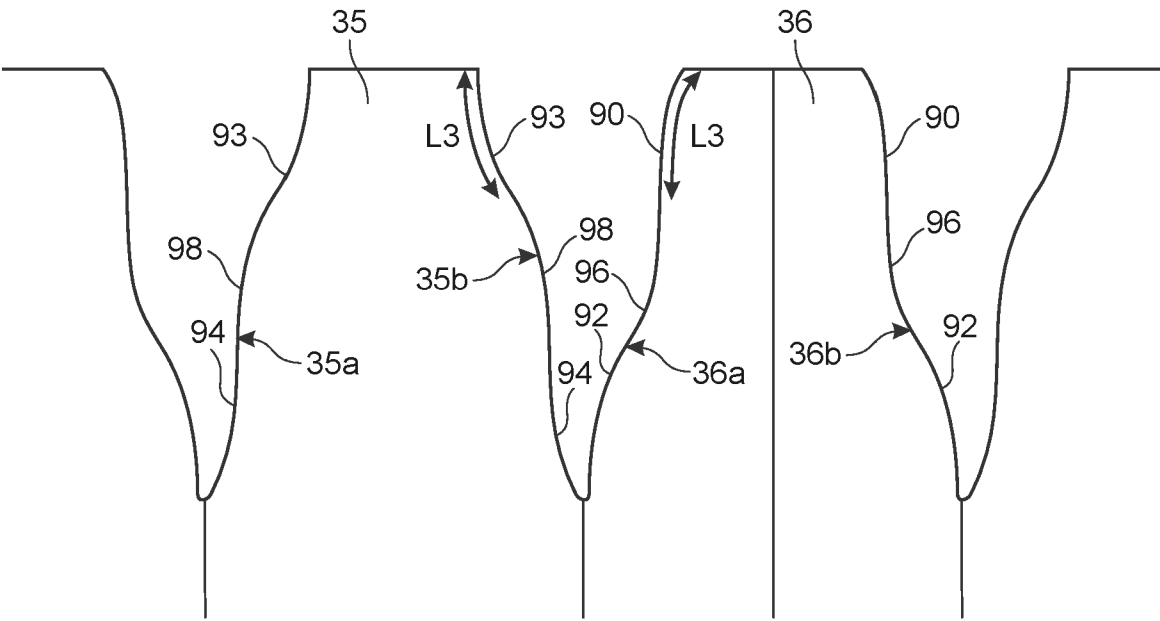


FIG. 4b

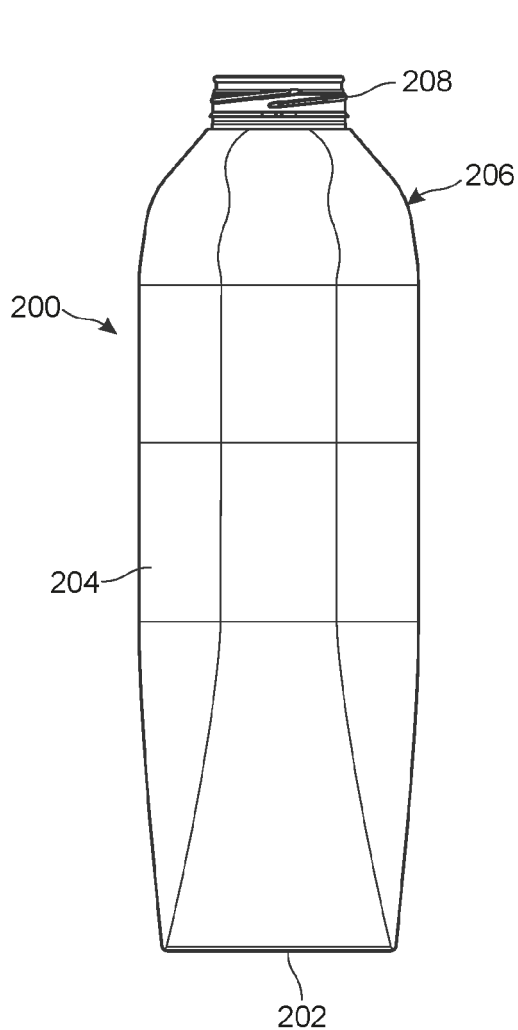


FIG. 5a

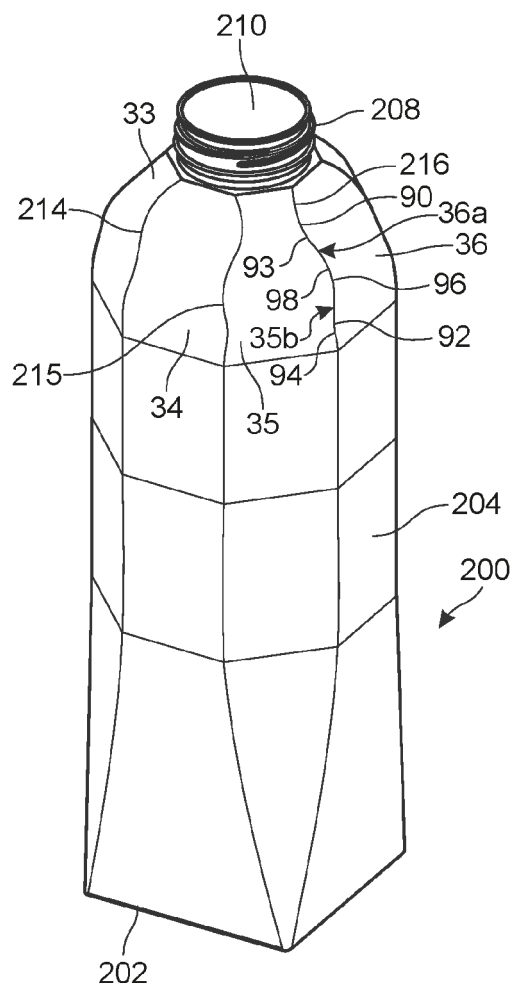


FIG. 5b

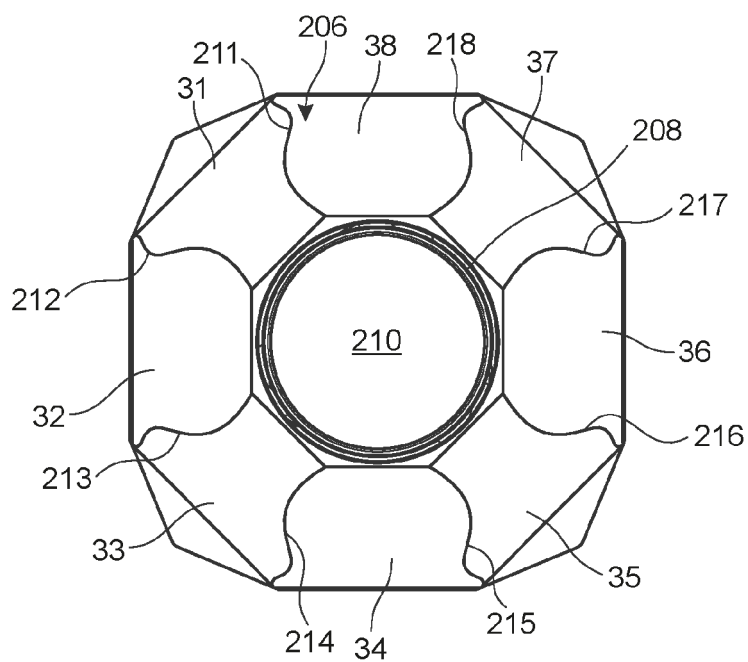


FIG. 5c

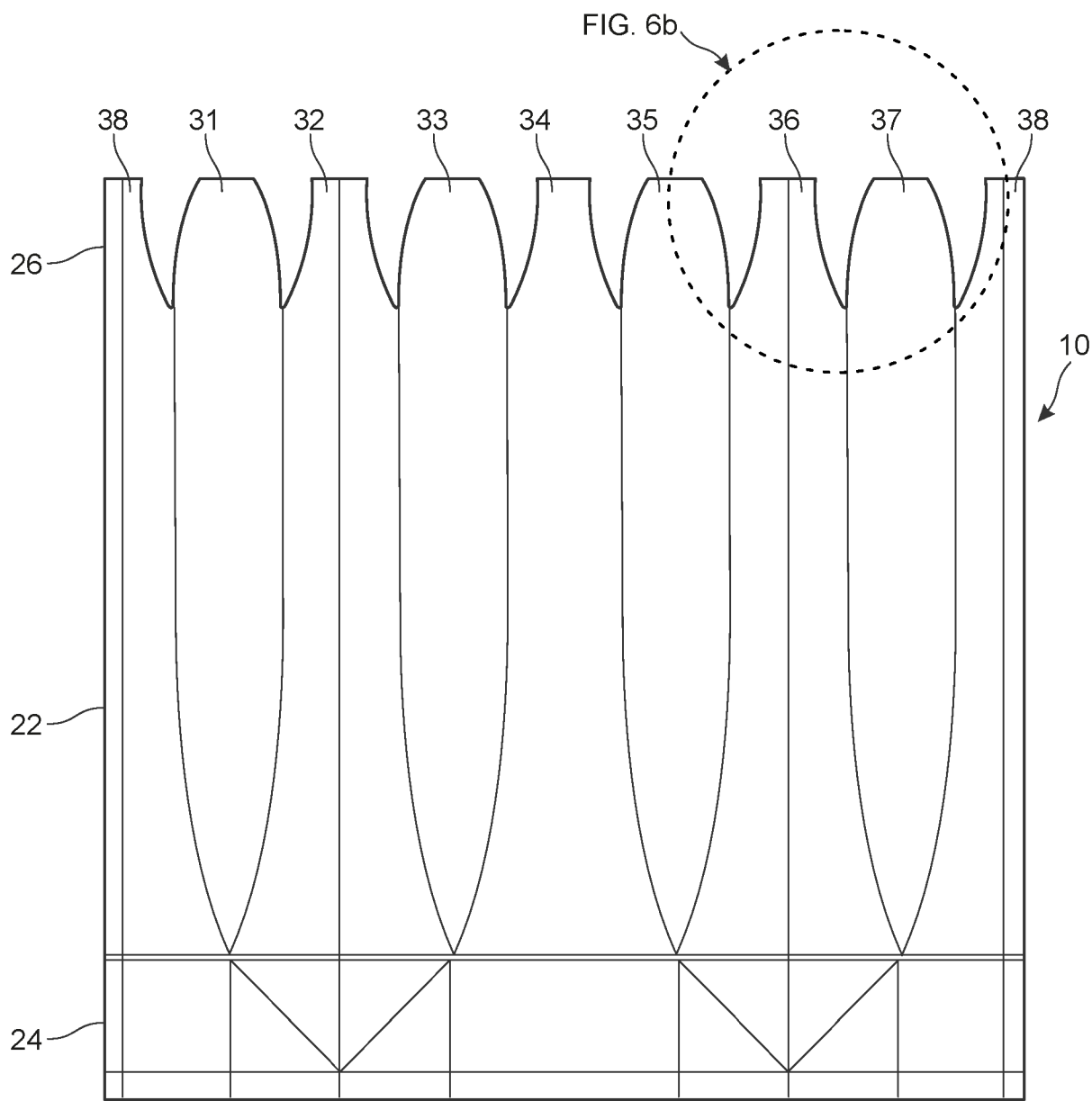


FIG. 6a

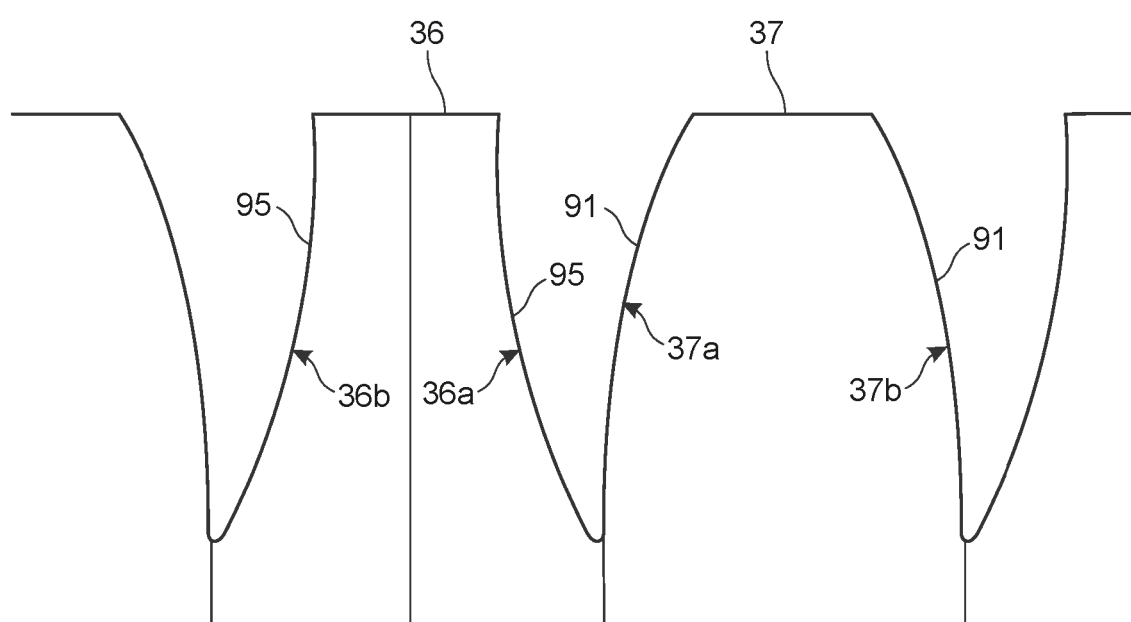


FIG. 6b

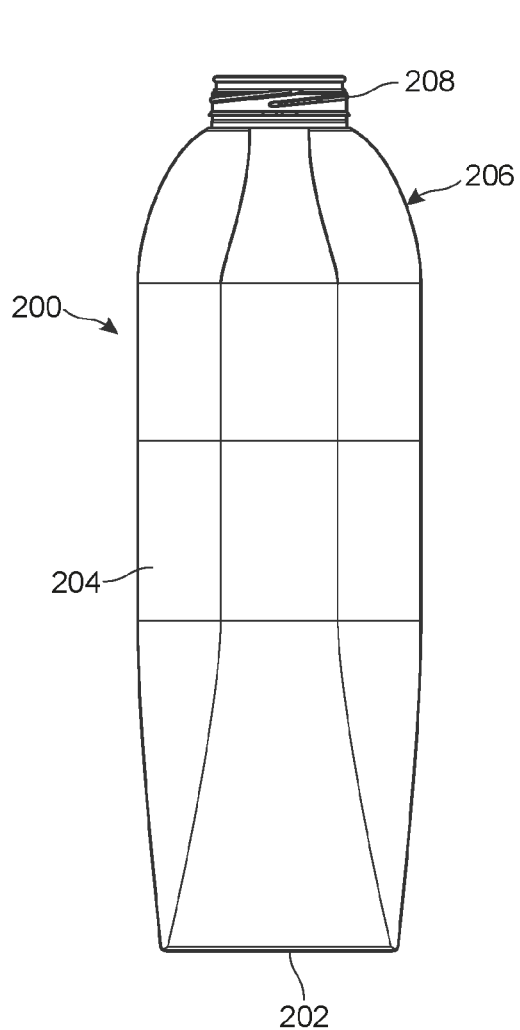


FIG. 7a

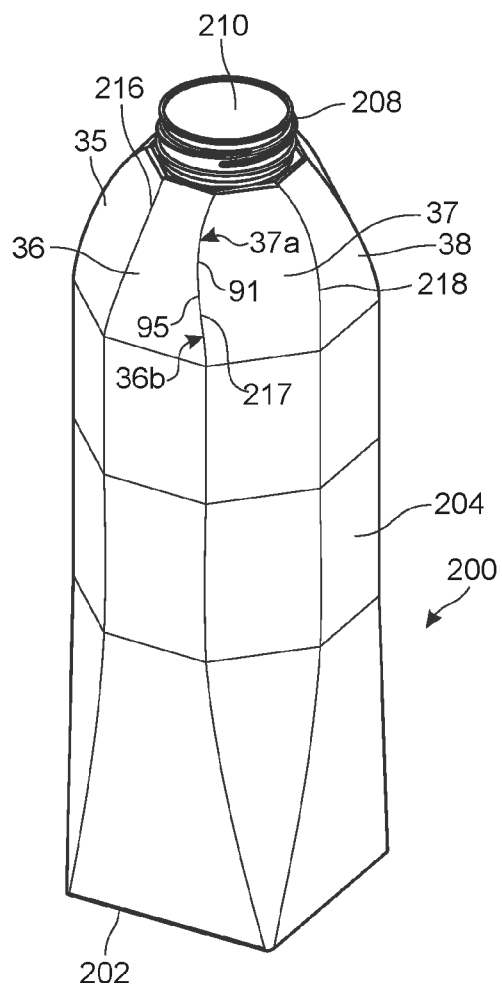


FIG. 7b

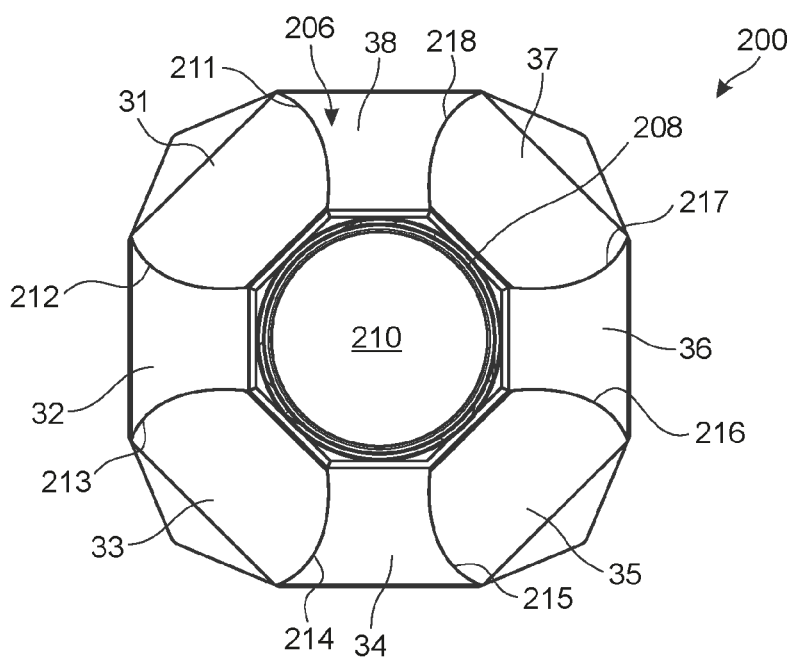


FIG. 7c

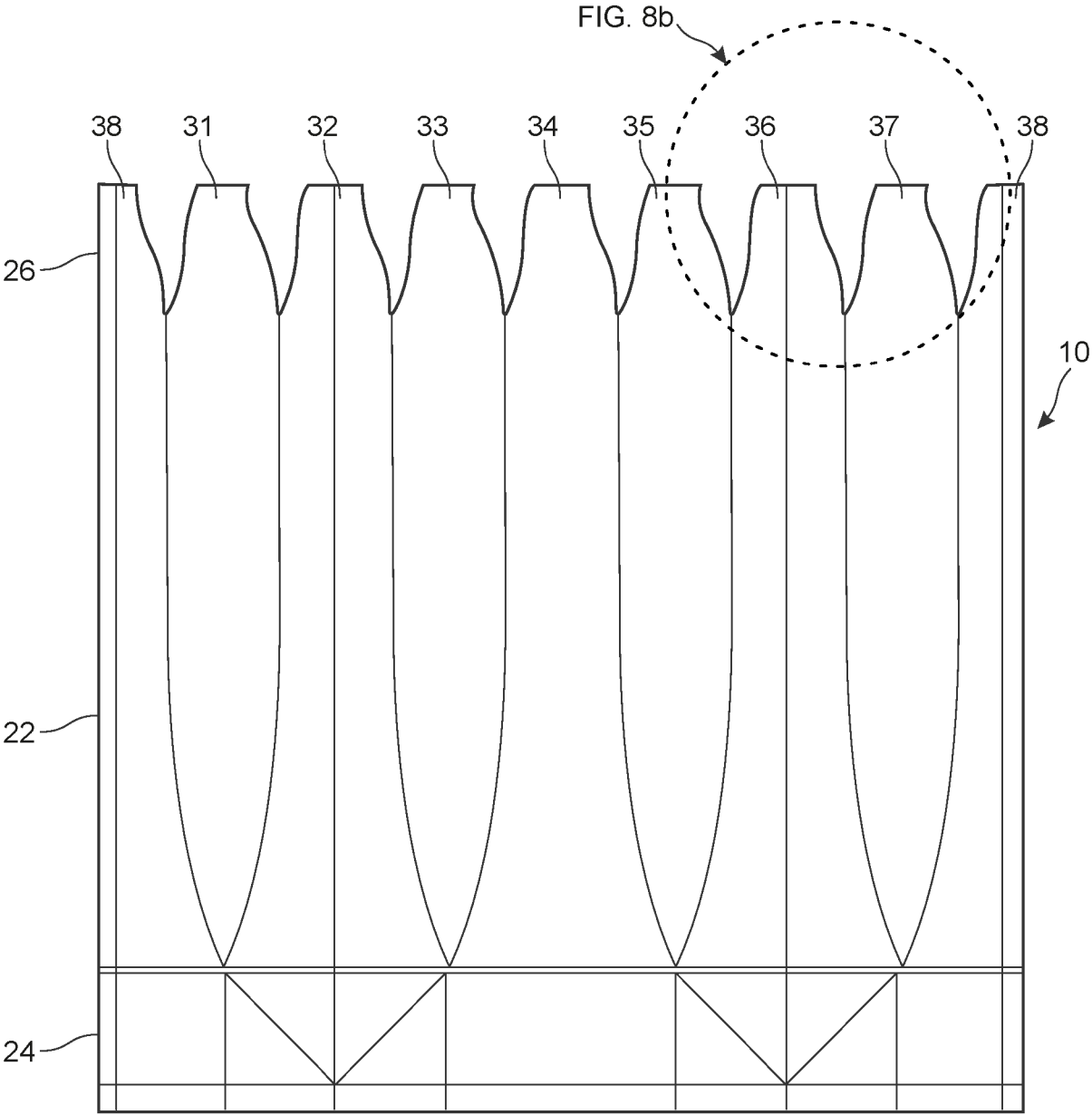


FIG. 8a

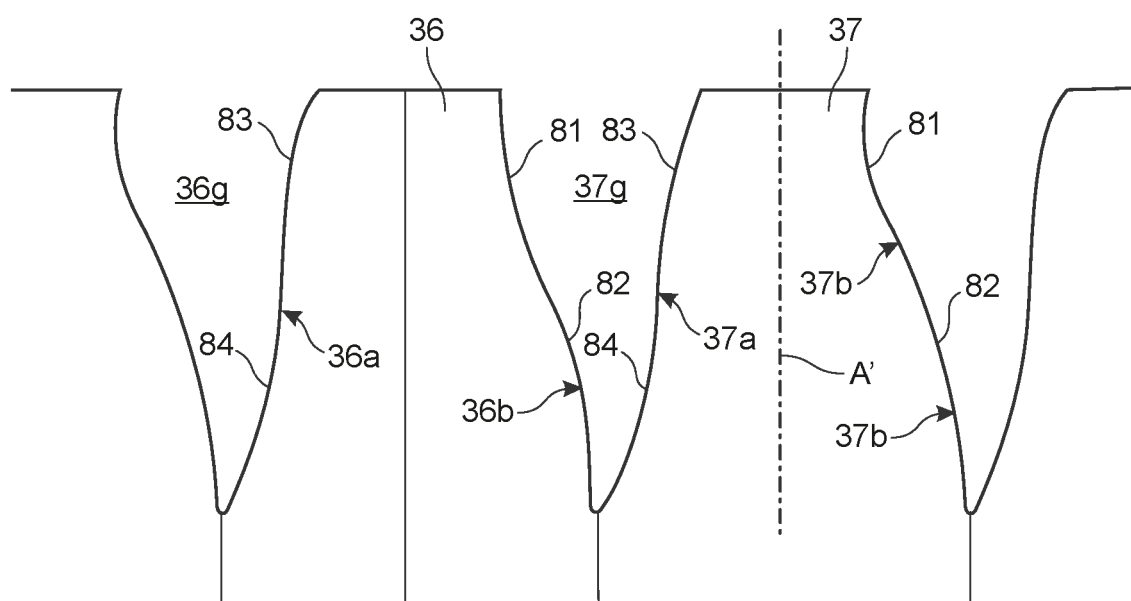


FIG. 8b

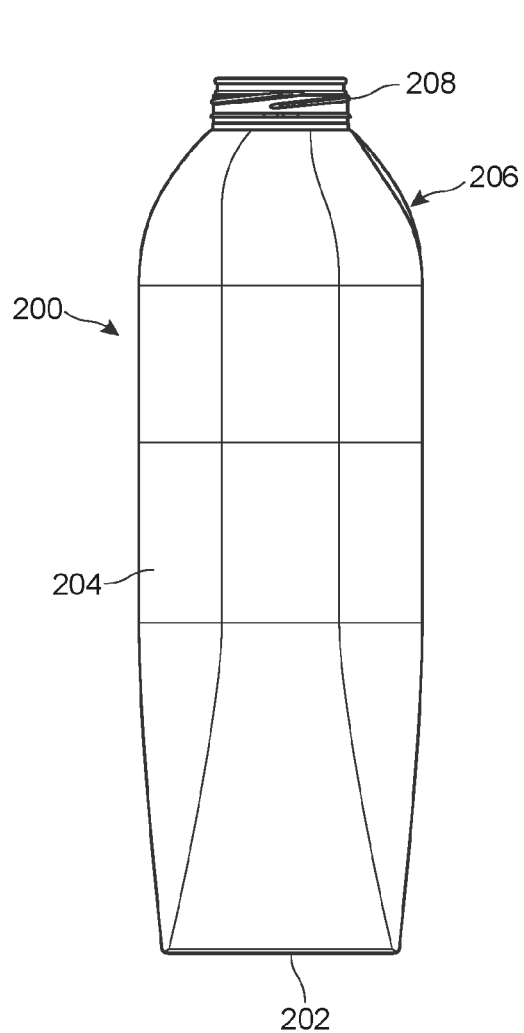


FIG. 9a

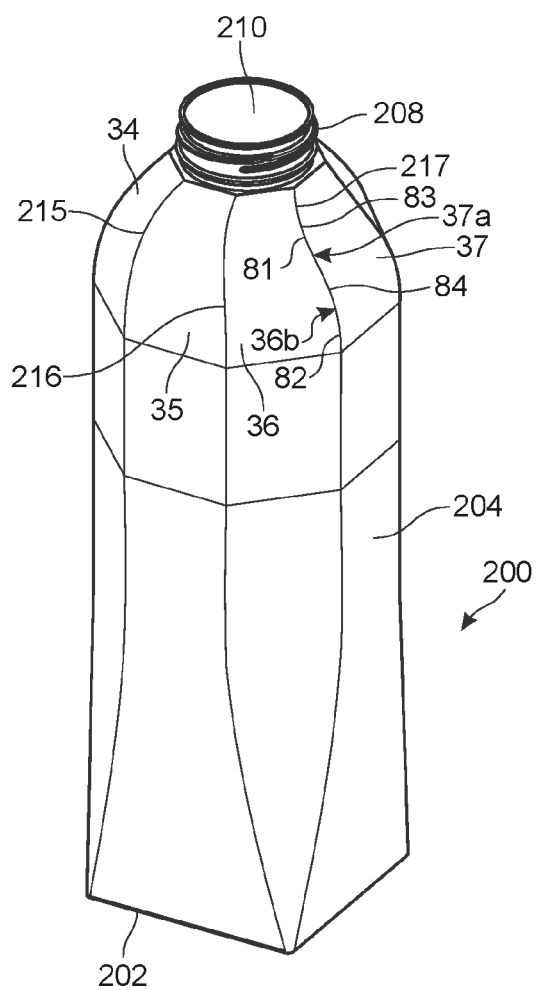


FIG. 9b

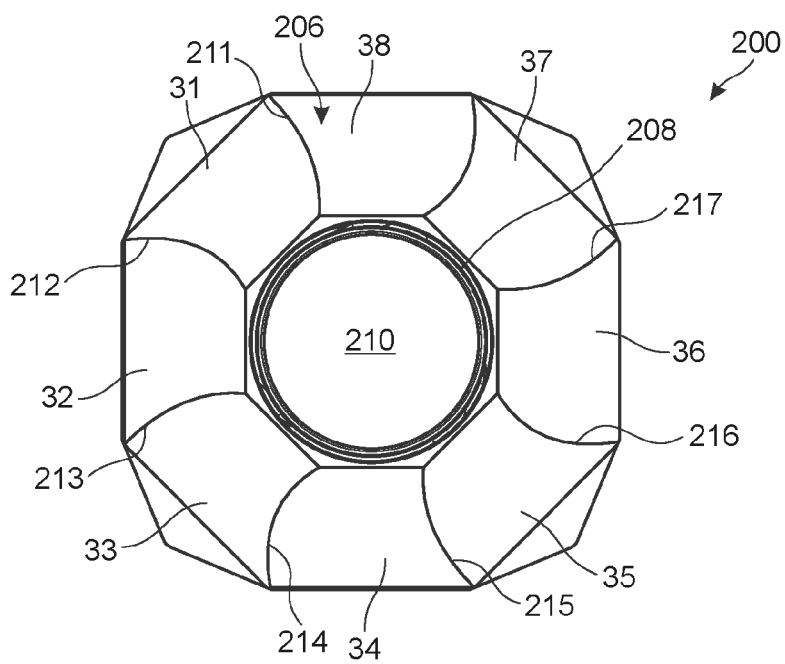


FIG. 9c

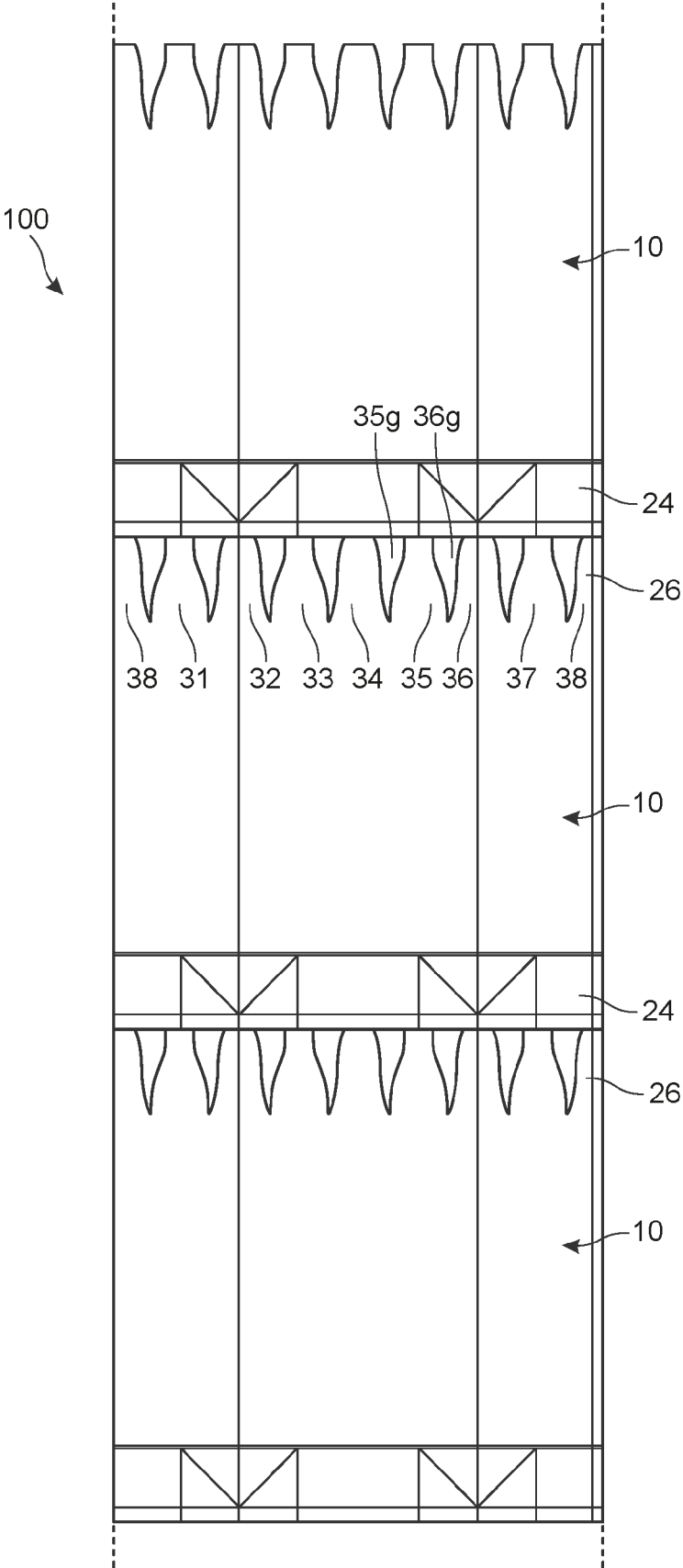


FIG. 10

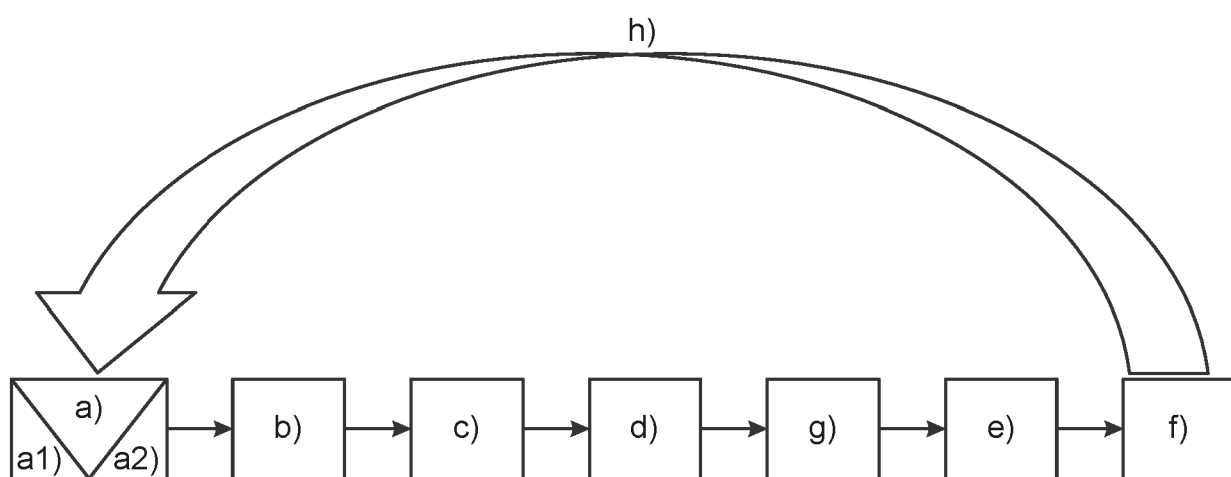


FIG. 11



EUROPEAN SEARCH REPORT

Application Number

EP 26 16 8879

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Y,D	WO 2023/285258 A1 (TETRA LAVAL HOLDINGS & FINANCE [CH]) 19 January 2023 (2023-01-19) * page 5, line 31 - page 15, line 34; figures 1-7 *	1-12	INV. B65D3/08 B31B50/59 B65D8/00
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A		1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65D B31F B31B
Place of search			Examiner
Munich			Leijten, René
Date of completion of the search			
23 June 2026			
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