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(54) **PACKAGING BLANK FOR FORMING A PACKAGE, PACKAGE FORMED FROM A PACKAGING BLANK AND PACKAGE FOR A POURABLE PRODUCT**

(57) There is described a packaging blank (2) for forming a package (1) filled with a pourable product, the packaging blank (2) comprising a top crease pattern (44), a bottom crease pattern (45) and an intermediate crease pattern (46) interposed between the top crease pattern (44) and the bottom crease pattern (45). The intermediate crease pattern (46) comprises a plurality of center panels (55) and a plurality of lateral panels (56). Each center panel (55) and each lateral panel (56) is delimited by a respective first crease line (57) and a respective second crease line (58). Each first crease line (57) and/or its imaginary extension intersects with the respective second crease line (58) and/or its imaginary extension at a respective first intersection point (59) and a respective second intersection point (60) spaced apart from the respective first intersection point (59). Each first intersection point (59) and the respective second intersection point (60) define a respective axis (G). Each center panel (55) and each lateral panel (56) is asymmetric with respect to the respective axis (G).

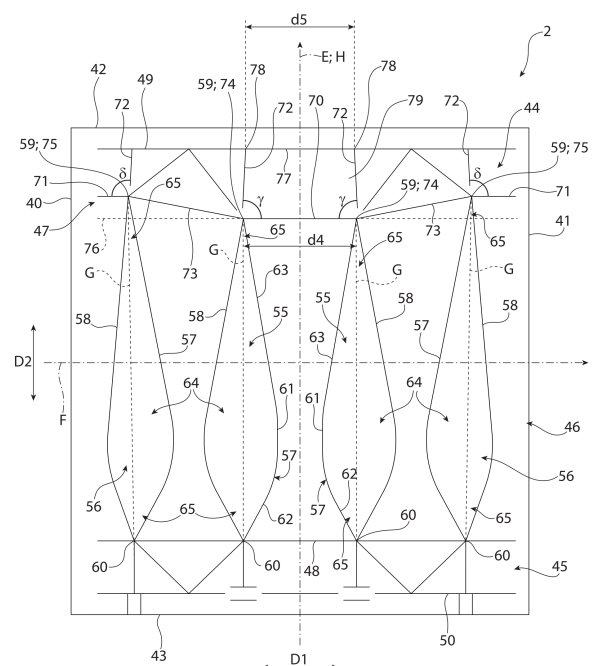


FIG. 1

EP 4 818 064 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a packaging blank for forming a package.

[0002] Moreover, the present invention also relates to a package formed from a packaging blank.

[0003] Additionally, the present invention also relates to a package for a pourable product, in particular for a pourable food product.

BACKGROUND ART

[0004] As is known, many liquid or pourable food products, such as fruit juice, UHT (ultra-high-temperature treated) milk, wine, tomato sauce, etc., are sold in packages made of sterilized packaging material.

[0005] A typical example is the parallelepiped-shaped package for liquid or pourable food products known as Tetra Brik Aseptic (registered trademark), which is made by sealing and folding a laminated packaging blank. The packaging blank has a multilayer structure comprising a fibrous base layer, e.g. of paper or cardboard, covered on both sides with layers of heat-seal plastic material, e.g. polyethylene. In the case of aseptic packages for long-storage products, such as UHT milk, the packaging blank also comprises a layer of gas and/or water vapor and/or light-barrier material, which is superimposed on a layer of heat-seal plastic material, and is in turn covered with another layer of heat-seal plastic material forming the inner face of the package eventually contacting the food product.

[0006] Packages of this sort are normally produced on fully automatic packaging apparatuses, which form the packages from respective packaging blanks. These packaging blanks can be provided in the form of single packaging blanks or in the form of a web, which is formed from a plurality of successively arranged packaging blanks.

[0007] In the case of the packaging apparatus being designed to form the packages from a web, the packaging apparatus advances and sterilizes the web, which is then formed into a tube and filled with the pourable product before the tube is formed into individual sealed packages.

[0008] It is known to produce packages having a bottom wall and a top wall being spaced apart from one another along a longitudinal axis of the packages and a side wall interposed between the top wall and the bottom wall. One variant comes along with the top wall being inclined with respect to the bottom wall; such packages are known as packages provided with a slanted top wall. In another variant, the top wall and the bottom wall are parallel to one another.

[0009] It is also known that some packages are provided with an opening device having at least a portion being connected to the top wall. The opening device

allows to control the outpouring of the pourable product from the package.

[0010] Even though the known packages provide for excellent results, a desire is felt in the sector to further improve the known packages.

DISCLOSURE OF INVENTION

[0011] It is an object of the present invention to provide an improved packaging blank for forming a package.

[0012] It is a further object of the present invention to provide an improved package.

[0013] According to the present invention, there are provided a packaging blank for forming a package and a package according to the respective independent claims.

[0014] Preferred non-limiting embodiments of the packaging blank and the package are claimed in the respective dependent claims.

[0015] Additionally, according to the present invention there is provided a package according to claim 13, which is formed from a packaging blank.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a plan view of a packaging blank according to the present invention;

Figure 2 is a perspective view of a package according to the present invention, in particular formed from the packaging blank of Figure 1;

Figure 3 is a front view of the package of Figure 2;

Figure 4 is a side view of the package of Figure 2;

Figure 5 is a back view of the package of Figure 2; and

Figure 6 is a top view of the package of Figure 2.

BEST MODES FOR CARRYING OUT THE INVENTION

[0017] Number 1 in Figure 2 indicates a package filled with a pourable product, preferentially a pourable food product, such as pasteurized milk, milk, milk-products, drinking yoghurt, yoghurt-drinks, beverages, fruit juice, wine, tomato sauce, salt, sugar, etc.

[0018] Preferably, package 1 is formed from a packaging blank 2 as e.g. shown in Figure 1.

[0019] More specifically, each package 1 may be formed from one respective packaging blank 2 by means of an automatic packaging machine.

[0020] The automatic packaging machine may be con-

figured to form packages 1 from the respective packaging blanks 2 and to fill packages 1 with the pourable product.

[0021] Packaging blank 2 may have a multilayer structure.

[0022] In more detail, each packaging blank 2 comprises at least a layer of fibrous material, such as e.g. a paper or cardboard layer, and at least two layers of heat-seal plastic material, e.g. polyethylene, interposing the layer of fibrous material in between one another.

[0023] One of these two layers of heat-seal plastic material may define an inner face of the respective package 1 formed from the respective packaging blank 2 and eventually contacting the pourable product.

[0024] According to some possible embodiments, each packaging blank 2 may also comprise a layer of gas and/or water vapor and/or light-barrier material, e.g. based on materials such as aluminum, ethylene vinyl alcohol (EVOH), paper materials and treated paper materials such as high-density or greaseproof papers, barrier-coated substrates such as cellulose based and polymeric substrates, metalized substrates such as cellulose-based or polymeric substrates with and without pre-applied barrier coating, barrier-coated polymer films such as olefinic polymer or polyamide films, combinations of these materials, and further materials having similar barrier properties.

[0025] In particular, the layer of gas and/or water vapor and/or light-barrier material is arranged between one of the layers of heat-seal plastic material and the layer of fibrous material.

[0026] According to some preferred non-limiting embodiments, packaging blanks 2 may be provided in the form of a web.

[0027] In more detail, the web may be formed from a plurality of successively arranged packaging blanks 2.

[0028] In other words, the successively arranged packaging blanks 2 define a plurality of repeat units of the web. In particular, each repeat unit (i.e. the respective packaging blank 2) forms the precursor of one respective package 1.

[0029] Preferentially, the packaging machine may be configured to produce packages 1 from the web such that each package 1 results from one respective packaging blank 2.

[0030] In particular, each packaging blank 2 may comprise a desired pattern/decoration.

[0031] With particular reference to Figure 2, package 1 extends along a longitudinal axis A, preferentially also along a first transversal axis B perpendicular to longitudinal axis A and a second transversal axis C perpendicular to longitudinal axis A and first transversal axis B.

[0032] Advantageously, an extension, i.e. a dimension, of package 1 along longitudinal axis A may be larger than respective extensions, i.e. respective dimensions, of package 1 along first transversal axis B and second transversal axis C.

[0033] In more detail and with reference to Figures 2 to 5, package 1 may comprise a bottom wall and a top wall 3

spaced apart from one another along longitudinal axis A. In particular, longitudinal axis A is perpendicular to the bottom wall.

[0034] Additionally, package 1 comprises a side wall 4 extending between (and connected to) bottom wall and top wall 3.

[0035] More specifically, the bottom wall may be defined as the wall of package 1 that has a substantially planar shape and that is substantially perpendicular to longitudinal axis A. According to some possible non-limiting embodiments, the bottom wall may be configured to be placed on a support surface, such as a support surface of a shelf, a fridge, a table, a working plane or the like.

[0036] With package 1 being placed on the support surface (and in its nominal position, i.e. when being used by a user in an intended manner), the bottom wall is in contact with the support surface and top wall 3 is distanced from the support surface.

[0037] Additionally, side wall 4 may be the portion of package 1 that is gripped by a user during an outpouring action of the pourable product from package 1.

[0038] According to some possible embodiments and as shown in Figure 2 and 4, top wall 3 may be inclined with respect to the bottom wall.

[0039] According to some preferred non-limiting embodiments, package 1 may comprise an opening device (not shown) configured to allow for the outpouring of the pourable product from package 1.

[0040] More specifically, at least a portion of the opening device may be connected to top wall 3.

[0041] In further detail, top wall 3 may comprise a pouring outlet 5 and the opening device may comprise an outlet opening aligned with pouring outlet 5.

[0042] Additionally, the opening device may comprise a collar having the outlet opening, the collar being arranged about pouring outlet 5.

[0043] Furthermore, the opening device may comprise a base frame being connected to top wall 3. The collar extends from the base frame.

[0044] According to some possible embodiments, the opening device may be connected to top wall 3 only.

[0045] According to some alternative embodiments, a first portion of the opening device may be connected to top wall 3 and a second portion of the opening device may be connected to side wall 4.

[0046] According to some possible embodiments, the opening device may be a so called post-applied opening device meaning that the opening device may be connected (e.g. glued, welded, bonded or the like) to top wall 3 after formation of package 1.

[0047] According to some alternative embodiments, at least a portion of the opening device may be molded to top wall 3 and/or packaging blank 2, in particular before packaging blank 2 is formed into package 1.

[0048] According to other alternative embodiments, the opening device may be reusable. According to such embodiments, package 1 is delivered to the consumer

without the opening device and the consumer couples the opening device to top wall 3 prior to the first outpouring action. Moreover, the opening device may be removed from top wall 3 after consumption of the pourable product.

[0049] In further detail (see Figure 5), package 1 comprises a longitudinal seam portion 6, e.g. resulting from forming packages 1 from a tube filled with the pourable product, the tube having a longitudinal seal and having been formed from a web of packaging material comprising a succession of packaging blanks 2.

[0050] Preferentially, longitudinal seam portion 6 may be substantially parallel to longitudinal axis A.

[0051] Additionally, each package 1 may comprise a first transversal seal and a second transversal seal 7, preferentially being transversal to longitudinal axis A. Preferentially, first transversal seal may be comprised by and/or associated to the bottom wall and second transversal seal 7 may be comprised by and/or associated to top wall 3.

[0052] In further detail, side wall 4 comprises a front panel 8, a back panel 9 opposite to front panel 8 and a plurality of, in the example shown two, lateral panels 10, each one interposed between back panel 9 and front panel 8.

[0053] During an outpouring action, a hand of a user (at least when considering the intended use of package 1) may contact at least partially lateral panels 10.

[0054] Preferentially, back panel 9 comprises longitudinal seam portion 6.

[0055] With reference to Figures 2 to 6, top wall 3 comprises at least two, more specifically exactly two, top front corners 15 and at least two, more specifically exactly two, top back corners 16.

[0056] More specifically, each top back corner 16 is spaced apart from a respective top front corner 15, more specifically along a direction having a component parallel to first transversal axis B.

[0057] In further detail, top wall 3 comprises a top front edge 17 extending between top front corners 15, a top back edge 18 extending between top back corners 16 and two top lateral edges 19, each top lateral edge 19 extending between one respective top front corner 15 and one respective top back corner 16.

[0058] More specifically, top wall 3 may be delimited by top front edge 17, top back edge 18 and top lateral edges 19.

[0059] Even more specifically, top front edge 17 may extend from one top front corner 15 to the other top front corner 15 and top back edge 18 may extend from one top back corner 16 to the other top back corner 16. Additionally, each top lateral edge 19 may extend from one respective top back corner 16 to one respective top front corner 15.

[0060] In further detail, each top lateral edge 19 contacts one respective top front edge 17 at the respective top front corner 15 and one respective top back edge 18 at the respective top back corner 16.

[0061] It should be noted that the terms front and back refer to the nominal use of package 1. For example, if package 1 is used during an outpouring action, top back edge 18 is interposed between top front edge 17 and the palm of the consumer executing the outpouring action. Additionally, in use, the consumer may arrange during a nominal outpouring action his or her palm in proximity of back panel 9.

[0062] In the case of drinking directly from package 1, the thumb of the consumer contacts front panel 8.

[0063] Additionally, front panel 8 may comprise a decoration aimed to be exposed to the consumer in a sales point.

[0064] According to the embodiment shown in Figures 2 to 6, top wall 3 is inclined with respect to the bottom wall. In particular, top wall 3 defines a slanted top of package 1.

[0065] Moreover, top back edge 18 is more distanced from the bottom wall than top front edge 17.

[0066] With particular reference to Figures 2, 3 and 6, top front edge 17 is rectilinear. Alternatively, top front edge 17 may be curved.

[0067] Additionally (see e.g. Figures 2, 3, 5 and 6), top back edge 18 is rectilinear. Alternatively, top back edges 18 may be curved.

[0068] Moreover, top lateral edges 19 are rectilinear. Alternatively, top lateral edges 19 may be curved.

[0069] With reference to Figures 2 to 5, the bottom wall may comprise a bottom front edge 20, a bottom back edge 21 and two bottom lateral edges 22.

[0070] Each bottom lateral edge 22 may contact bottom front edge 20, at a respective bottom front corner 23 and each bottom back edge 21 at a respective bottom back corner 24.

[0071] According to the embodiment shown, the bottom wall may have a (substantially) rectangular shape, i.e. each bottom lateral edge 22 is orthogonal to bottom front edge 20 and bottom back edge 21, and bottom front edge 20 and bottom back edge 21 may be parallel to one another.

[0072] Advantageously, front panel 8 may extend from top front edge 17 to bottom front edge 20 and back panel 9 may extend from top back edge 18 to bottom back edge 21.

[0073] With reference to Figures 2 to 5, package 2 in particular side wall 5, also comprises a plurality of, in particular two, auxiliary front panels 25, each one interposed between front panel 8 and one respective lateral panel 10.

[0074] With reference to Figures 2 to 5, package 2, in particular side wall 5, also comprises a plurality of, in particular two, auxiliary back panels 26, each one interposed between back panel 9 and one respective lateral panel 10.

[0075] In more detail, each auxiliary front panel 25 and each auxiliary back panel 26 is delimited by one respective first edge 27 and one respective second edge 28.

[0076] More specifically, the respective first edge 27 of each auxiliary front panel 25 contacts front panel 8 and

the respective second edge 28 contacts the respective lateral panel 10.

[0077] More specifically, the respective first edge 27 of each auxiliary back panel 26 contacts the respective lateral panel 10 and the respective second edge 28 contacts back panel 9.

[0078] In particular, each first edge 27 and each second edge 28 extend between one respective top corner of top wall 3 and one respective bottom corner of the bottom wall.

[0079] In particular, top front corners 15 and top back corners 16 define the top corners and bottom front corners 23 and bottom back corners 24 define the bottom corners.

[0080] In more detail, each first edge 27 and the respective second edge 28 of each auxiliary front panel 25 extend between one respective top front corner 15 and one respective bottom front corner 23.

[0081] In more detail, each first edge 27 and the respective second edge 28 of each auxiliary back panel 26 extend between one respective top back corner 16 and one respective bottom back corner 24.

[0082] With particular reference to Figure 6, top wall 3 is trapezoid-shaped.

[0083] With particular reference to Figures 2, 3, 5 and 6, a first distance is defined between top front corners 15 and a second distance is defined between top back corners 16.

[0084] The first distance may be larger than the second distance.

[0085] More specifically, the first distance and the second distance are determined along a direction parallel to second transversal axis C.

[0086] According to the embodiment shown in Figures 2 to 6, both top front edge 17 and top back edge 18 are rectilinear and top front edge 17 is longer than top back edge 18. This may be different in case that top front edge 17 and/or top back edge 18 differ from being rectilinear, however, also in such a case the first distance is larger than the second distance.

[0087] In this way, it is possible to optimize the space available for the opening device.

[0088] With particular reference to Figures 2 to 6, an imaginary front line 30 extends through top front corners 15, an imaginary back line 31 extends through top back corners 16, and one respective imaginary lateral line 32 extends through each top front corner 15 and the respective top back corner 16.

[0089] In particular, imaginary front line 30, imaginary back line 31 and each imaginary lateral line 32 have respective rectilinear shapes.

[0090] According to the example shown, a portion of imaginary front line 30 corresponds to top front edge 17, a portion of imaginary back line 31 corresponds to top back edge 18 and a respective portion of each imaginary lateral line 32 corresponds to the respective top lateral edge 19.

[0091] Additionally, a third distance is defined between

imaginary back line 31 and imaginary front line 30, in particular along transversal axis B.

[0092] Advantageously, the third distance is larger than the first distance.

[0093] Furthermore, a first angle α between imaginary back line 31 and at least one of imaginary lateral lines 32 is larger than 90° . In the specific case shown, both imaginary lateral lines 32 define together with imaginary back line 31 respective first angles α being larger than 90° .

[0094] Advantageously, a second angle β between imaginary front line 30 and at least one of imaginary lateral lines 32 is smaller than 90° . In the specific case shown, both imaginary lateral lines 32 define together with imaginary front lines 30 respective second angles β being smaller than 90° .

[0095] It should be noted that each first angle α and/or each second angle β is determined in a plane within which top wall 3 lies and which corresponds to the extension of top wall 3.

[0096] Each first angle α is measured by leaving imaginary back line 31 fixed with respect to the plane and top wall 3 and moving the respective imaginary lateral line 32 within the plane and top wall 3 until the respective imaginary lateral line 32 is superimposed on imaginary back line 31.

[0097] Similarly, each second angle β is measured by leaving imaginary front line 30 fixed with respect to the plane and top wall 3 and moving the respective imaginary lateral line 32 within the plane and top wall 3 until the respective imaginary lateral line 32 is superimposed on imaginary front line 30.

[0098] This also means that when considering an orientation of package 1 (seen from the consumer) such that top front edge 17 is interposed between the consumer and top back edge 18, the imaginary lateral line 32 being arranged on the left side moves anticlockwise for the determination of the respective first angle α and the imaginary lateral line 32 being arranged on the right side moves clockwise for the determination of the respective first angle α . Additionally, the imaginary lateral line 32 being arranged on the left side moves clockwise for the determination of the respective second angle β and the imaginary lateral line 32 being arranged on the right side moves anticlockwise for the determination of the respective second angle β .

[0099] According to the embodiment shown, imaginary lateral lines 32 are not parallel to one another. According to the embodiment shown, imaginary lateral lines 32 intersect with one another.

[0100] According to some preferred non-limiting embodiments, at least a portion of the opening device and/or of designated pouring outlet 5 may be interposed between second transversal seal 7 and top front edge 17. More specifically, no portion of the opening device and/or of the designated pouring outlet 5 may be interposed between second transversal seal 7 and top back edge 18.

[0101] With particular reference to Figure 2 and 4 to 6,

package 1 may comprise flaps 33 attached to and/or extending from top wall 3.

[0102] Packaging blank 2 of Figure 1 is designed for forming package 1.

[0103] In more detail, packaging blank 2 comprises:

- two longitudinal boundary edges, preferentially a first longitudinal boundary edge 40 and a second longitudinal boundary edge 41, spaced apart from one another along a first main direction D1 transversal, preferentially perpendicular, to a longitudinal axis E of packaging blank 2; and
- two transversal boundary edges, preferentially a first transversal boundary edge 42 and a second transversal boundary edge 43, spaced apart from one another along a second main direction D2 parallel to longitudinal axis E and/or transversal, preferentially perpendicular, to first main direction D1 and/or transversal, preferentially perpendicular, to a transversal axis F of the respective packaging blank 2.

[0104] Preferentially, transversal axis F is perpendicular to longitudinal axis E.

[0105] Preferentially, longitudinal axis E intersects with transversal axis F at a center point of packaging blank 2.

[0106] In further detail, each packaging blank 2 extends within a plane spanned by longitudinal axis E and transversal axis F.

[0107] Moreover, each packaging blank 2 has a (substantially) bi-dimensional shape, i.e. respective extensions (i.e. dimensions) of each packaging blank 2 along longitudinal axis E and transversal axis F are (significantly) larger than a thickness of packaging blank 2. In other words, the thickness of packaging blank 2 is negligible in comparison to the respective extensions (i.e. the respective dimensions) of packaging blank 2 along longitudinal axis E and transversal axis F.

[0108] Preferentially, each packaging blank 2 has a rectangular or square shape.

[0109] Additionally, first main direction D1 is parallel to transversal axis F.

[0110] Additionally, second main direction D2 is parallel to longitudinal axis E.

[0111] Moreover, each first longitudinal boundary edge 40 and each second longitudinal boundary edge 41 is connected to and interposed between the respective first transversal boundary edge 42 and the respective second transversal boundary edge 43.

[0112] Preferentially, each first longitudinal boundary edge 40 and each second longitudinal boundary edge 41 may be arranged at an angle of about 90° with respect to the respective first transversal boundary edge 42 and the respective second transversal boundary edge 43.

[0113] It should be noted that in the case of each packaging blank 2 being arranged singularly, i.e. separated from the other packaging blanks 2, the respective first longitudinal boundary edge 40, the respective second longitudinal boundary edge 41, the respective first

transversal boundary edge 42 and the respective second transversal boundary edge 43 are real edges.

[0114] In the case of packaging blanks 2 being arranged in the form of a web, the respective first longitudinal boundary edge 40 and the respective second longitudinal boundary edge 41 may be real edges and the respective first transversal boundary edge 42 and the respective second transversal boundary edge 43 may be imaginary edges. In particular, each first transversal boundary edge 42 of one packaging blank 2 may be adjacent to, or coincide with, the respective second transversal boundary edge 43 of another packaging blank 2.

[0115] Alternatively, the respective first transversal boundary edge 42 and the respective second transversal boundary edge 43 may be real edges and the respective first longitudinal boundary edge 40 and the respective second longitudinal boundary edge 41 may be imaginary edges. In particular, each first longitudinal boundary edge 40 of one packaging blank 2 may be adjacent to, or coincide with, the respective second longitudinal boundary edge 41 of another packaging blank 2.

[0116] With particular reference to Figure 1, each packaging blank 2 comprises a top section having a top crease pattern 44 configured to define the shape of at least a portion of top wall 3.

[0117] In further detail, top crease pattern 44 may be configured to define the shape of top wall 3 and flaps 33.

[0118] Preferentially, packaging blank 2 also comprises a bottom section having a bottom crease pattern 45 configured to define the shape, more specifically a rectangular shape, of at least the bottom wall.

[0119] In further detail, bottom crease pattern 45 is configured to define the bottom wall and flaps (not shown) attached to the bottom wall.

[0120] Moreover, the top section and the bottom section and therewith also top crease pattern 44 and bottom crease pattern 45 are spaced apart from one another along longitudinal axis E.

[0121] Additionally, packaging blank 2 also comprises an intermediate section having an intermediate crease pattern 46 interposed between top crease pattern 44 and bottom crease pattern 45 and being configured to define the shape of side wall 4. In particular, the intermediate section is interposed between the top section and the bottom section.

[0122] More specifically, intermediate crease pattern 46 defines front panel 8, back panel 9, lateral panels 10, auxiliary front panels 25 and auxiliary back panels 26.

[0123] It should be noted that top crease pattern 44, bottom crease pattern 45 and intermediate crease pattern 46 define respective sections of top wall 3, the bottom wall and side wall 4.

[0124] With particular reference to Figure 1, each top crease pattern 44 comprises at least a first transversal crease line 47 extending transversally to longitudinal axis E.

[0125] Additionally, bottom crease pattern 45 com-

prises at least a second transversal crease line 48 extending transversally to longitudinal axis E.

[0126] Moreover, first transversal crease line 47 and second transversal crease line 48 are spaced apart from one another along second main direction D2.

[0127] More specifically, first transversal crease line 47 and second transversal crease line 48 delimit together the intermediate section.

[0128] In further detail, top crease pattern 44 may comprise a third transversal crease line 49 spaced apart from first transversal crease line 47 along second main direction D2 and interposed between first transversal boundary edge 42 and first transversal crease line 47 along second main direction D2.

[0129] Additionally, bottom crease pattern 45 may comprise a fourth transversal crease line 50 spaced apart from second transversal crease line 48 along second main direction D2 and interposed between second transversal boundary edge 43 and second transversal crease line 48 along second main direction D2.

[0130] According to the example shown in Figure 1, second transversal crease line 48 and/or fourth transversal crease line 50 may have a rectilinear shape.

[0131] With particular reference to Figure 1, intermediate crease pattern 46 comprises a plurality of center panels 55, in particular two, and/or a plurality of lateral panels 56, in particular two.

[0132] In particular, center panels 55 are arranged between lateral panels 56.

[0133] In more detail, one lateral panel 56 is arranged adjacent to first transversal boundary edge 42 and another lateral panel 56 is arranged adjacent to second transversal boundary edge 43.

[0134] In particular, each center panel 55 is configured to define one respective auxiliary front panel 25.

[0135] In particular, each lateral panel 56 is configured to define one respective auxiliary back panel 26.

[0136] In more detail, each center panel 55 and each lateral panel 56 is delimited by a respective first crease line 57 and a respective second crease line 58.

[0137] In particular, each first crease line 57 and each second crease line 58 define, respectively, one respective first edge 27 and one respective second edge 28.

[0138] Each first crease line 57 and/or its imaginary extension intersects with the respective second crease line 58 and/or its imaginary extension at a respective first intersection point 59 and a respective second intersection point 60 spaced apart from the respective first intersection point 59, in particular along longitudinal axis E and/or second main direction D2.

[0139] Each first intersection point 59 and each second intersection point 60 define a respective axis G, in particular being parallel to longitudinal axis E.

[0140] Preferentially, each first crease line 57 and each second crease line 58 extends between the respective first intersection point 59 and the respective second intersection point 60 without any interruption.

[0141] Advantageously, each center panel 55 is asym-

metric with respect to the respective axis G.

[0142] Additionally or alternatively, each lateral panel 56 is asymmetric with respect to the respective axis G.

[0143] In more detail, each first crease line 57 and the respective second crease line 58 (i.e. first crease line 57 and second crease line 58 delimiting the same center panel 55, or the same lateral panel 56) are asymmetric with respect to the respective axis G.

[0144] The Applicant has observed that in this manner it is possible to obtain packages 1 with reinforced longitudinal seam portions 6. In particular, second crease lines 58 of back panel 9 are spaced apart from first longitudinal boundary edge 40 and second longitudinal boundary edge 41, which simplifies the process for sealing first longitudinal boundary edge 40 and second longitudinal boundary edge 41 to one another, so as to create longitudinal seam portion 6.

[0145] Furthermore, one or more or all first intersection points 59 intersect with (lie on) first transversal crease line 47 and/or one or more or all second intersection points 60 intersect with (lie on) second transversal crease line 48.

[0146] According to the embodiment shown, intermediate crease pattern 46 comprises two pairs of one respective lateral panel 56 and one respective center panel 55. In particular the respective lateral panel 56 and the respective center panel 55 of each pair are arranged in a respective half portion of packaging blank 2. Even more particular, each half portion of packaging blank 2 comprises one respective pair of one respective lateral panel 56 and one respective center panel 55.

[0147] Advantageously, the two pairs are symmetric with respect to a symmetry axis H parallel to longitudinal axis E. In particular, symmetry axis H corresponds to a center axis of packaging blank 2.

[0148] In particular, first crease lines 57 of center panels 55 face one another and/or first crease lines 57 of lateral panels 56 are interposed between the respective second crease lines 58 and one respective center panel 55.

[0149] Advantageously, first crease lines 57 of center panels 55 are specular to one another with respect to symmetry axis H and/or second crease lines 58 of center panels 55 are specular to one another with respect to symmetry axis H.

[0150] Alternatively or in addition, first crease lines 57 of lateral panels 56 are specular to one another with respect to symmetry axis H and/or second crease lines 58 of lateral panels 56 are specular to one another with respect to symmetry axis H.

[0151] With particular reference to Figure 1, the respective first crease line 57 of each center panel 55 comprises at least one straight portion 61, in particular parallel to longitudinal axis E.

[0152] Moreover, the respective first crease line 57 of each center panel 55 comprises at least one curved portion 62 being interposed between the respective straight portion 61 and the respective bottom crease

pattern 45.

[0153] By having straight portion 61 it is possible to obtain packages 1 having improved conveying properties, when e.g. being conveyed by means of belt conveyors engaging side walls 4 of packages 1.

[0154] With particular reference to Figure 1, the respective first crease line 57 of each center panel 55 also comprises a first portion 63 extending from the respective first intersection point 59 to the respective straight portion 61.

[0155] Additionally, each curved portion 62 is connected to the respective straight portion 61 and is interposed between the respective second intersection point 60 and the respective straight portion 61.

[0156] Advantageously, each first crease line 57 and each second crease line 58 comprises at least one curved portion.

[0157] With particular reference to Figure 1, each center panel 55 and each lateral panel 56 comprises a respective intermediate portion 64 and two respective end portions 65 opposite to one another, the respective intermediate portion 64 being interposed between the respective end portions 65. In particular, a width (with respect to transversal axis F) of each intermediate portion 64 is larger than a width (with respect to transversal axis F) of each of end portions 65.

[0158] Advantageously, each center panel 55 and each lateral panel 56 is shaped in such a way that, when considering a direction from the respective first intersection point 59 to the respective second intersection point 60, its width (with respect to transversal axis F) increases up to reaching a maximum width and so as to newly decrease until reaching the respective second intersection point 60.

[0159] In particular, each center panel 55 and each lateral panel 56 reaches its maximum width at a point that, when considering the direction from the respective first intersection point 59 to the respective second intersection point 60, is closer to the bottom crease pattern 45 than to the top crease pattern 44.

[0160] In further detail and with reference to Figure 1, top crease pattern 44 comprises a plurality of top crease lines defining and/or determining the shape of top wall 3.

[0161] In particular, at least some top crease lines may be designed to define and/or determine top front edge 17, top back edge 18 and top lateral edges 19 (after formation of package 1 from packaging blank 2). Additionally, at least some top crease lines may define and/or determine top front corners 15 and top back corners 16.

[0162] In even further detail, bottom crease pattern 45 may comprise a plurality of bottom crease lines defining and/or determining the shape of the bottom wall.

[0163] In particular, at least some bottom crease lines may be designed to define and/or determine bottom front edge 20, bottom back edge 21 and bottom lateral edges 22 (after formation of package 1 from packaging blank 2). Additionally, at least some bottom crease lines may define and/or determine bottom front corners 23 and

bottom back corners 24.

[0164] In particular, the top crease lines may be arranged such to obtain a top wall 3 as described above and accordingly, to obtain a top wall 3 such that the first distance is larger than the second distance.

[0165] Moreover, the top crease lines may be arranged such to obtain a top wall 3 such that the third distance is larger than the first distance.

[0166] According to some non-limiting embodiments, first transversal crease line 47 may comprise a front portion 70 designed to form and/or determine top front edge 17. Additionally, first transversal crease line 47 may comprise one or more back portions 71 designed to form and/or determine top back edge 18.

[0167] In further detail, front portion 70 may be interposed between two back portions 71.

[0168] In particular, front portion 70 and back portions 71 are linear.

[0169] Additionally, back portions 71 may be closer to third transversal crease line 49 than front portion 70.

[0170] Alternatively, front portion 70 may be closer to third transversal crease line 49 than back portions 71 or front portion 70 and back portions 71 may be equidistant from third transversal crease line 49.

[0171] Additionally, top crease pattern 44 may also comprise a plurality of lateral crease lines 72 designed to form and/or determine top lateral edges 19.

[0172] Accordingly, front portion 70, back portions 71 and lateral crease lines 72 may define at least some of the top crease lines.

[0173] More specifically, lateral crease lines 72 may extend between first transversal crease line 47 and third transversal crease line 49.

[0174] Moreover, lateral crease lines 72 may be spaced apart from one another along first main direction D1.

[0175] Additionally, top crease pattern 44, in particular first transversal crease line 47, may comprise a plurality of auxiliary crease lines 73, each auxiliary crease line 73 being interposed between one respective back portion 71 and front portion 70. In particular, each auxiliary crease line 73 may give rise to, i.e. form or determine, one respective top lateral edge 19 after formation of package 1 from packaging blank 2.

[0176] According to the embodiment of Figure 1, auxiliary crease lines 73 may be inclined with respect to back portions 71 and front portion 70.

[0177] According to some advantageous embodiments, each auxiliary crease line 73 and/or its respective imaginary extension may comprise one respective front intersection point 74, and more specifically one respective back intersection point 75. In particular, each auxiliary crease line 73 may intersect with front portion 70 and/or its respective imaginary extension at the respective front intersection point 74, and more specifically with one respective back portion 71 and/or its respective imaginary extension at the respective back intersection point 75.

[0178] According to some advantageous embodiments, after formation of the respective package 1 from packaging blank 2 each front intersection point 74 corresponds to one respective top front corner 15 and each back intersection point 75 corresponds to one respective top back corner 16.

[0179] In further detail, each one of two lateral crease lines 72 and/or their respective imaginary extensions may intersect with first transversal crease line 47 at a respective front intersection point 74.

[0180] Advantageously, the respective first intersection point 59 of each center panel 55 coincides with one respective front intersection point 74.

[0181] Additionally or alternatively, the respective first intersection point 59 of each lateral panel 56 coincides with one respective back intersection point 75.

[0182] According to some preferred non-limiting embodiments, a fourth distance d4 is defined between front intersection points 74.

[0183] In particular, fourth distance d4 may correspond to the first distance.

[0184] Additionally, respective separation distances are defined between each front intersection point 74 and a respective projected back intersection point corresponding to a projection (along longitudinal axis E) of the respective back intersection point 75 onto an imaginary line 76 extending through front intersection points 74. In other words, separation distance is defined between each front intersection point 74 and the projection onto imaginary line 76 along longitudinal axis E of the respective back intersection point 75 being comprised by the same auxiliary crease line 73 and/or its respective imaginary extension.

[0185] Advantageously, fourth distance d4 is smaller than the separation distance.

[0186] According to the embodiment shown, an extension, i.e. a dimension, of front portion 70 corresponds to fourth distance d4.

[0187] Alternatively, front portion 70 is interposed between front intersection points 74 but does not extend up to front intersection points 74. According to such an alternative embodiment, the extension, i.e. the dimension, of front portion 70 is shorter than fourth distance d4.

[0188] According to some possible embodiments, each one of two further lateral crease lines 72 and/or their respective imaginary extensions may intersect with first transversal crease line 47 and/or its respective imaginary extension at one respective back intersection point 75.

[0189] According to some possible non-limiting embodiments, each lateral crease line 72 is configured to cooperate with a respective other lateral crease line 72 so as to define and/or determine one respective top lateral edge 19.

[0190] According to some possible embodiments as shown in Figure 1, each lateral crease line 72 may be inclined with respect to third transversal crease line 49 and/or front portion 70 and/or back portion 71.

[0191] According to the embodiment shown in Figure 1, each lateral crease line 72 may be inclined with respect to first longitudinal boundary edge 40 and second longitudinal boundary edge 41.

[0192] According to some possible embodiments, packaging blank 2 may comprise a designated pour opening area (forming and/or defining the designated pouring opening 5 of package 1).

[0193] According to some examples, the designated pour opening area may be covered by a separation membrane.

[0194] Preferentially but not necessarily, top crease pattern 44 may comprise a main panel 79, preferentially having and/or carrying at least a portion of designated pour opening area.

[0195] More specifically, main panel 79 may be delimited by imaginary line 76, a delimiting portion 77 of third transversal crease line 49 and/or its respective imaginary extension facing and being parallel to imaginary line 76 and two respective lateral crease lines 72 and/or their respective imaginary extensions.

[0196] In more detail, delimiting portion 77 extends between two intermediate intersection points 78. Each intermediate intersection point 78 being defined by the intersection of one respective lateral crease line 72 and/or its respective imaginary extension with third transversal crease line 49 and/or its respective imaginary extension.

[0197] Preferentially but not necessarily, the designated pour opening area may be at least partially arranged on main panel 79.

[0198] According to some examples, packaging blank 2 may comprise at least a portion of the opening device connected, e.g. molded, or glued, to packaging blank 2 about the designated pour opening area.

[0199] Advantageously, main panel 79 may have a trapezoid shape.

[0200] A fifth distance d5 may be defined between the two intermediate intersection points 78.

[0201] Advantageously, fourth distance d4 may be larger than fifth distance d5.

[0202] According to some possible embodiments, a third angle γ is defined between imaginary line 76 and each one of lateral crease lines 72 and/or their respective imaginary extension. Preferentially, third angle γ may be smaller than 90°.

[0203] Angle γ is defined within main panel 79.

[0204] Additionally, a fourth angle δ is defined between each back portion 71 and/or its respective imaginary extensions and each one of lateral crease lines 72 and/or their respective imaginary extensions.

[0205] Angle δ is defined on the opposite side of auxiliary crease line 73 with respect to lateral crease line 72.

[0206] According to the embodiment shown in Figure 4, fourth angle δ may be larger than 90°.

[0207] It should be noted that each third angle γ is determined in a plane of packaging blank 2, i.e. third angle γ is measured by leaving the respective lateral

crease lines 72 fixed with respect to the plane and main panel 79 and by angularly moving front portion 70 within the plane and main panel 79 until front portion 70 is superimposed on the respective lateral crease lines 72.

[0208] Similarly, each fourth angle δ is determined in a plane of packaging blank 2, i.e. each fourth angle δ is measured by leaving the respective lateral crease lines 72 fixed with respect to the plane and main panel 79 and by angularly moving back portion 71 within the plane and main panel 79 until back portion 71 is superimposed on the respective lateral crease lines 72.

[0209] With particular reference to Figure 1, bottom crease pattern 45 may comprise a plurality of crease lines configured to determine and/or define bottom front edge 20, bottom back edge 21 and bottom lateral edges 22 and/or bottom front corners 23 and bottom back corners 24.

[0210] In particular, the above-mentioned crease lines are designed such that after formation of package 1, the bottom wall has a rectangular shape.

[0211] According to some possible non-limiting embodiments, some or all the imaginary extensions are linear imaginary extensions.

[0212] The specific packaging blank 2 shown and described allows to form package 1. The specific features of center panels 55, lateral panels 56, first crease lines 57 and second crease lines 58 are reflected on auxiliary front panels 25, auxiliary back panels 26, first edges 27 and first edges 28.

[0213] In particular, each top corner of top wall 3 and the respective bottom corner of the bottom wall define a respective rotation axis I.

[0214] In particular, each top front corner 15 and the respective bottom front corner 23 define a rotation axis I. Similarly, each top back corner 16 and the respective bottom back corner 24 define a rotation axis I.

[0215] In more detail, for each first edge 27 and the respective second edge 28 of each auxiliary front panel 25, the respective rotation axis I is defined between the respective top front corner 15 and the respective bottom front corner 23.

[0216] Further, for each first edge 27 and the respective second edge 28 of each auxiliary back panel 26, the respective rotation axis I is defined between the respective top back corner 16 and the respective bottom back corner 24.

[0217] Advantageously, for each first edge 27 and when considering an imaginary rotation of each first edge 27 about the respective rotation axis I, there is no angular position of first edge 27 at which first edge 27 is superimposed on (i.e. coincides with) the respective second edge 28. In other words, independently on how first edge 27 is rotated about the respective rotation axis I, it is not possible to superimpose first edge 27 on the respective second edge 28 (i.e. second edge 28 with which first edge 27 defines the respective auxiliary front panel 25 or the respective auxiliary back panel 26). This means that it is not possible to rotate first edge 27 about the respective

rotation axis I until it coincides with the respective second edge 28.

[0218] With particular reference to Figures 2 to 6, the respective first edge 27 of each auxiliary front panel 25 comprises at least one straight portion 80, in particular parallel to longitudinal axis A.

[0219] Moreover, the respective first edge 27 of each auxiliary front panel 25 comprises at least one curved portion 81 being interposed between the respective straight portion 80 and the respective bottom wall.

[0220] By having straight portion 80 it is possible to obtain packages 1 having improved conveying properties, when e.g. being conveyed by means of belt conveyors engaging side walls 4 of packages 1.

[0221] The respective first edge 27 of each auxiliary front panel 25 also comprises a first portion 82 extending from the respective top front corner 15 to the respective straight portion 80.

[0222] Additionally, each curved portion 81 is connected to the respective straight portion 80 and is interposed between the respective bottom front corner 23 and the respective straight portion 80.

[0223] Advantageously, each first edge 27 and each second edge 28 comprises at least one curved portion.

[0224] The advantages of packages 1 and/or packaging blanks 2 according to the present invention will be clear from the foregoing description.

[0225] In particular, the Applicant has observed that it is possible to obtain packages 1 with reinforced longitudinal seam portions 6.

[0226] Moreover, the conveying properties of packages 1 are improved thanks to straight portions 80.

[0227] Additionally, it is possible to couple opening devices to the respective top walls 4, which are sufficiently large as the space available on top wall 3 is maximized.

[0228] Additionally, due to the fact that each center panel 55 and each lateral panel 56 reaches its maximum width at a point that is closer to the bottom crease pattern 45 than to the top crease pattern 44 it is possible to obtain a package 1 having an improved stability.

[0229] Clearly, changes may be made to packages 1 and/or packaging blanks 2 as described herein without, however, departing from the scope of protection as defined in the accompanying claims.

Claims

1. Packaging blank (2) for forming a package (1) filled with a pourable product, the packaging blank (2) comprising:
 - a top section having a top crease pattern (44) configured to define and/or determine a shape of at least a top wall (3) of the package (1);
 - a bottom section having a bottom crease pattern (45) configured to define and/or determine a

shape of at least a bottom wall of the package (1); and
 - an intermediate section having an intermediate crease pattern (46) interposed between the top crease pattern (44) and the bottom crease pattern (45) and being configured to define and/or determine a shape of a side wall (4) of the package (1);

wherein the intermediate crease pattern (46) comprises a plurality of center panels (55) and a plurality of lateral panels (56); wherein each center panel (55) and each lateral panel (56) is delimited by a respective first crease line (57) and a respective second crease line (58); wherein each first crease line (57) and/or its imaginary extension intersects with the respective second crease line (58) and/or its imaginary extension at a respective first intersection point (59) and a respective second intersection point (60) spaced apart from the respective first intersection point (59); wherein each first intersection point (59) and the respective second intersection point (60) define a respective axis (G); wherein each center panel (55) and each lateral panel (56) is asymmetric with respect to the respective axis (G).

2. Packaging blank according to claim 1, wherein the top crease pattern (44) comprises a first transversal crease line (47) extending transversally to a longitudinal axis (E) of the packaging blank (2);

wherein the bottom crease pattern (45) comprises a second transversal crease line (48) extending transversally to the longitudinal axis (E); wherein one or more or all first intersection points (59) lie on the first transversal crease line (47); and/or wherein one or more or all second intersection points (60) lie on the second transversal crease line (48).

3. Packaging blank according to claim 1 or 2, wherein each axis (G) is parallel to a longitudinal axis (E) of the packaging blank (2).
4. Packaging blank according to any one of the preceding claims, wherein the intermediate crease pattern (46) comprises two pairs of one respective lateral panel (56) and one respective center panel (55), the two pairs being symmetric with respect to a symmetry axis (H) parallel to a longitudinal axis (E) of the packaging blank (2).

5. Packaging blank according to any one of the preceding claims, wherein the intermediate crease pattern (46) comprises two lateral panels (56) and two center panels (55);

wherein the first crease lines (57) of the center panels (55) face one another; wherein the first crease lines (57) of the center panels (55) are specular to one another with respect to a symmetry axis (H) parallel to a longitudinal axis (E) of the packaging blank (2) and/or wherein the second crease lines (58) of the center panels (55) are specular to one another with respect to a symmetry axis (H) parallel to a longitudinal axis (E) of the packaging blank (2); and/or wherein the first crease lines (57) of the lateral panels (56) are interposed between the respective second crease lines (58) and one respective center panel (55); wherein the first crease lines (57) of the lateral panels (56) are specular to one another with respect to a symmetry axis (H) parallel to a longitudinal axis (E) of the packaging blank (2) and/or wherein the second crease lines (58) of the lateral panels (56) are specular to one another with respect to a symmetry axis (H) parallel to a longitudinal axis (E) of the packaging blank (2).

6. Packaging blank according to any one of the preceding claims, wherein the intermediate crease pattern (46) comprises two center panels (55);

wherein the first crease lines (57) of the center panels (55) face one another; wherein the respective first crease line (57) of each center panel (55) comprises at least one straight portion (61) and one curved portion (62) being interposed between the straight portion (61) and the bottom crease pattern (45).

7. Packaging blank according to claim 6, wherein each straight portion (61) is parallel to a longitudinal axis (E) of the packaging blank (2).

8. Packaging blank according to claim 6 or 7, wherein the respective first crease line (57) of each center panel (55) comprises a first portion (63) extending from the respective first intersection point (59) to the respective straight portion (61); wherein each curved portion (62) is connected to the straight portion (61) and is interposed between the respective second interaction point (60) and the straight portion (61).

9. Packaging blank according to any one of the preceding claims, wherein the top crease pattern (44) comprises a first transversal crease line (47) extending transversally to a longitudinal axis (E) of the

packaging blank (2);

wherein the first transversal crease line (47) comprises:

- a front portion (70) designed to form and/or determine a top front edge (17) of the package (1);
- one or more back portions (71) designed to form and/or determine a top back edge (18) of the package (1);
- a plurality of auxiliary crease lines (73), each auxiliary crease line (73) being interposed between one respective back portion (71) and the front portion (70);

wherein each auxiliary crease line (73) and/or its respective imaginary extension comprises one respective front intersection point (74) and one respective back intersection point (75).

10. Packaging blank according to claim 9, wherein each front intersection point (74) coincides with one respective first intersection point (59) associated with one respective center panel (55) and each back intersection point (75) coincides with one respective first intersection point (59) associated with one respective lateral panel (56).

11. Packaging blank according to claim 9 or 10, wherein each auxiliary crease line (73) and/or its respective imaginary extension intersects with the front portion (70) and/or its respective imaginary extension at the respective front intersection point (74) and with one respective back portion (71) and/or its respective imaginary extension at the respective back intersection point (75);

wherein the top crease pattern (44) further comprises a plurality of lateral crease lines (72) designed to form and/or determine top lateral edges (19) of the package (1);

wherein the top crease pattern (44) also comprises a second transversal crease line (49) spaced apart from the first transversal crease line (47);

wherein the top crease pattern (44) comprises a main panel (79) delimited by an imaginary line (76) extending through the two front intersection points (74), a delimiting portion (77) of the second transversal crease line (49) and/or its respective imaginary extension facing and being parallel to the imaginary line (76) and two respective lateral crease lines (72) and/or their respective imaginary extensions;

wherein the delimiting portion (77) extends between two intermediate intersection points (78); wherein each of the two lateral crease lines (72)

and/or its respective imaginary extension intersects with the second transversal crease line (49) and/or its respective imaginary extension at one respective intermediate intersection point (78);

wherein the shape of the main panel (79) corresponds to a trapezoid.

12. Packaging blank according to claim 11, wherein a distance (d4) between the two front intersection points (74) is larger than a distance (d5) between the two intermediate intersection points (78).

13. Package (1) for a pourable product formed from a packaging blank (2) according to any one of the preceding claims.

14. Package (1) for a pourable product, the package (1) comprising a bottom wall (3) and a top wall (4) spaced apart from one another along a longitudinal axis (A) of the package (1) and a side wall (5) interposed between the top wall (3) and the bottom wall (4);

wherein the side wall (5) comprises a front panel (8), a back panel (9) opposite to the front panel (8) and two lateral panels (10), each one being interposed between the back panel (9) and the front panel (8); wherein the side wall (5) also comprises:

- a plurality of auxiliary front panels (25), each one interposed between the front panel (8) and one respective lateral panel (10); and
- a plurality of auxiliary back panels (26), each one interposed between the back panel (9) and one respective lateral panel (10);

wherein each auxiliary front panel (25) and each auxiliary back panel (26) is delimited by one respective first edge (27) and one respective second edge (28);

wherein the respective first edge (27) of each auxiliary front panel (25) contacts the front panel (8) and the respective second edge (28) contacts the respective lateral panel (10);

wherein the respective first edge (27) of each auxiliary back panel (26) contacts the respective lateral panel (10) and the respective second edge (28) contacts the back panel (9);

wherein each first edge (27) and each second edge (28) extends between a respective top corner (15; 16) of the top wall (3) and a respective bottom corner (23; 24) of the bottom wall; wherein each top corner (15; 16) and the respective bottom corner (23; 24) define a respective rotation axis (I);

wherein for each first edge (27) and when considering an imaginary rotation of each first edge (27) about the respective rotation axis (I), there is no angular position of the first edge (27) at which the first edge (27) is superimposed on the
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respective second edge (28).

15. Package according to claim 14, wherein the respective first edge (27) of each auxiliary front panel (25) comprises at least one straight portion (80) and at
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least one curved portion (81) being interposed between the respective straight portion (80) and the bottom wall.

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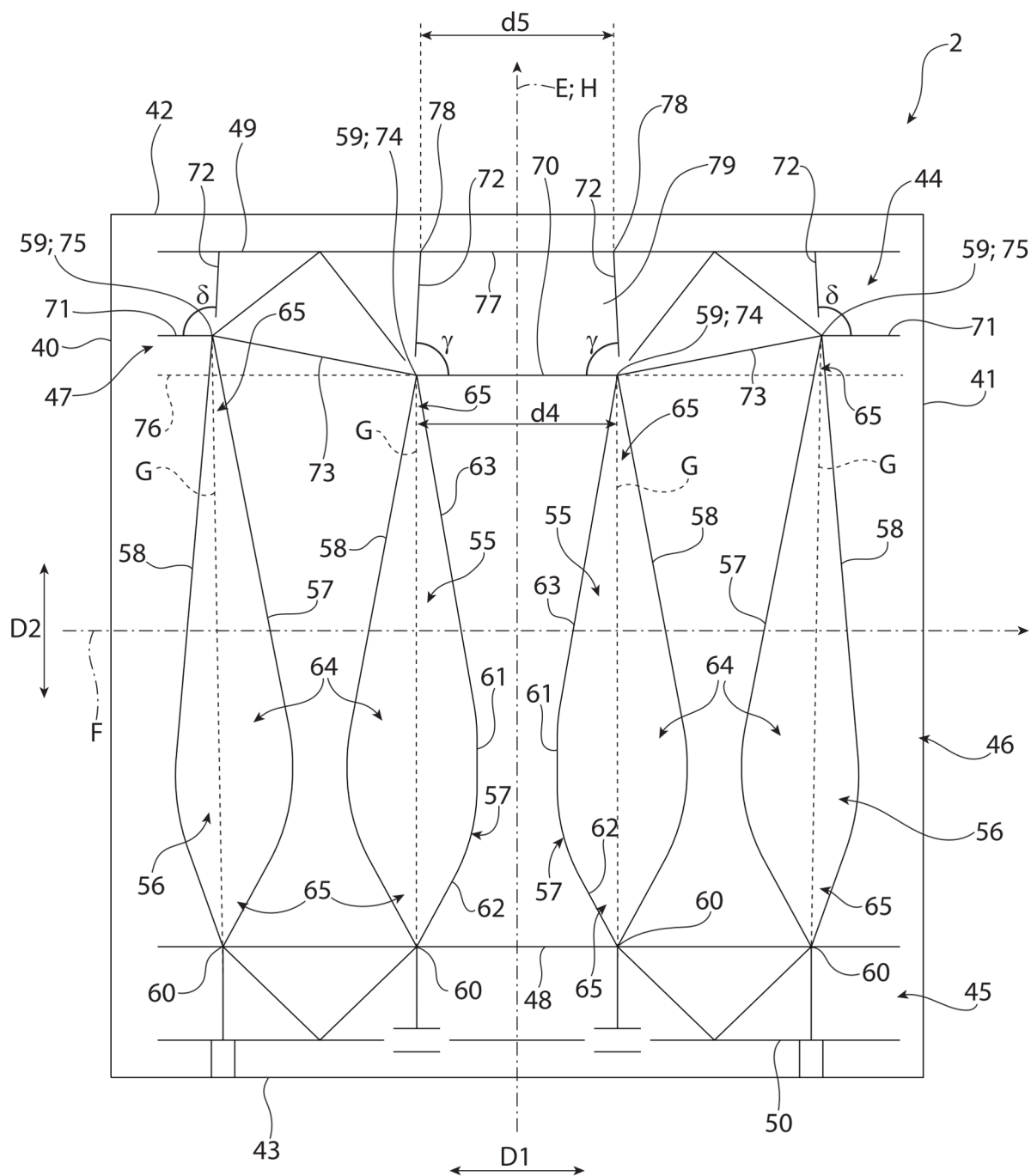


FIG. 1

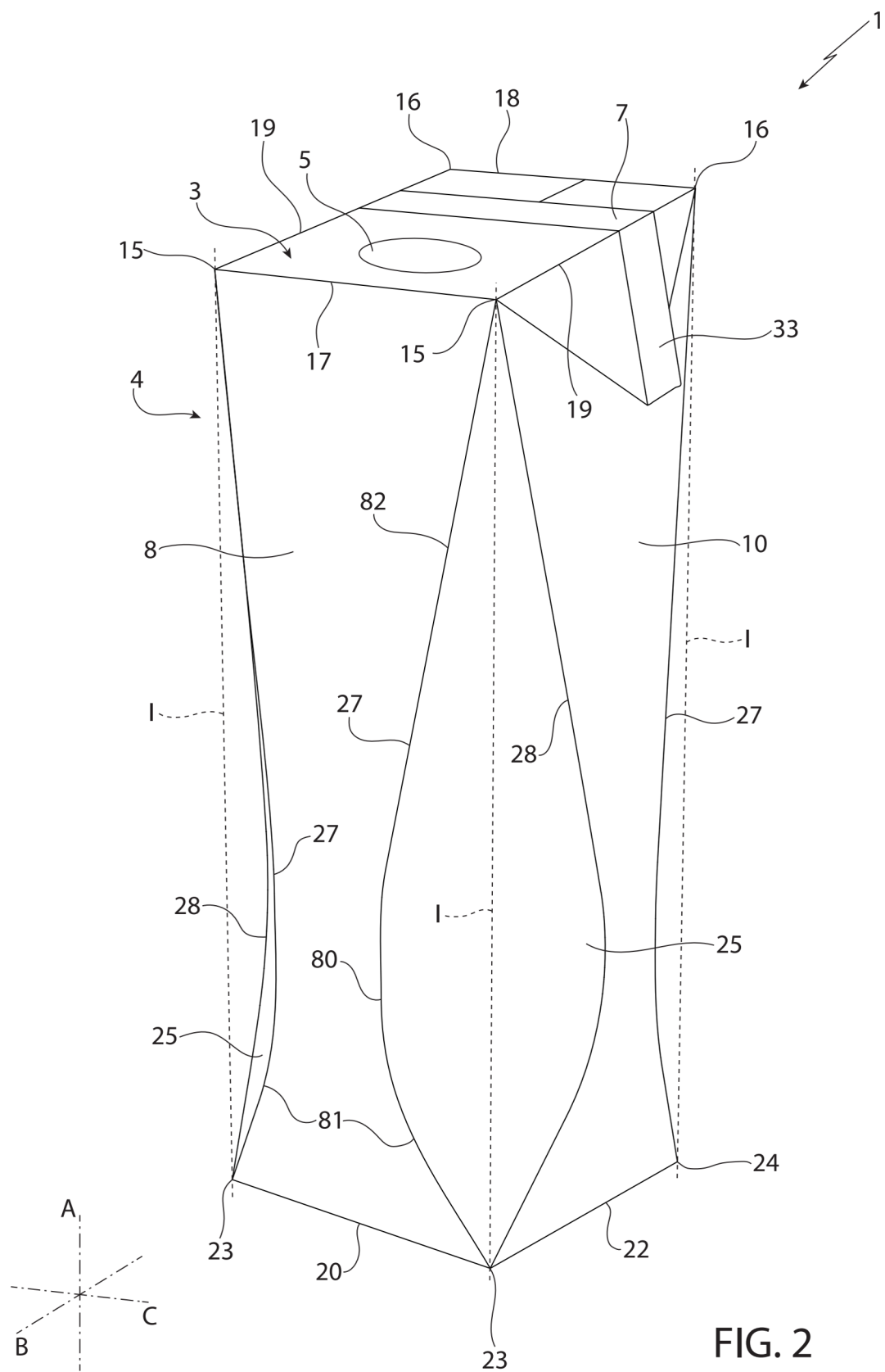
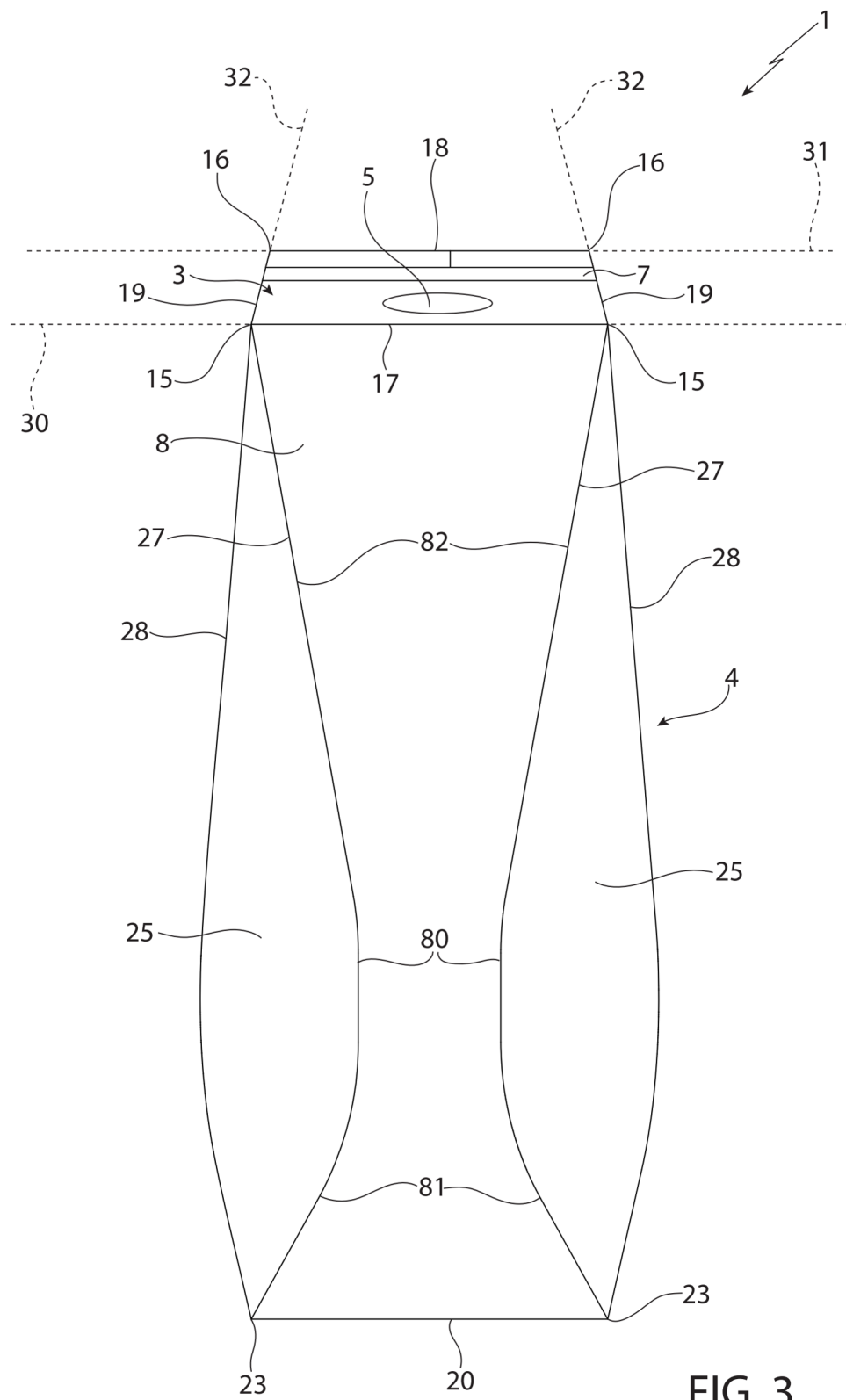


FIG. 2



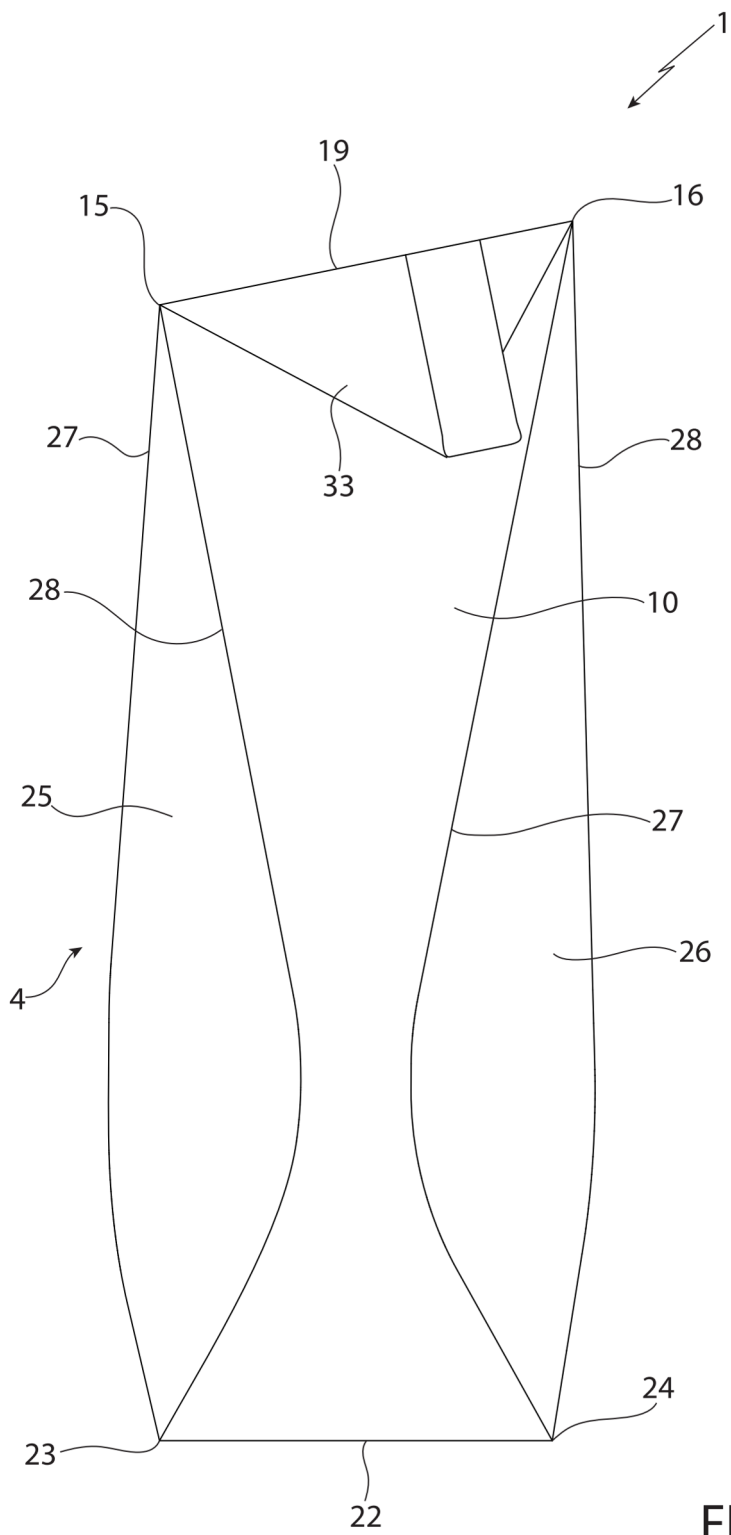
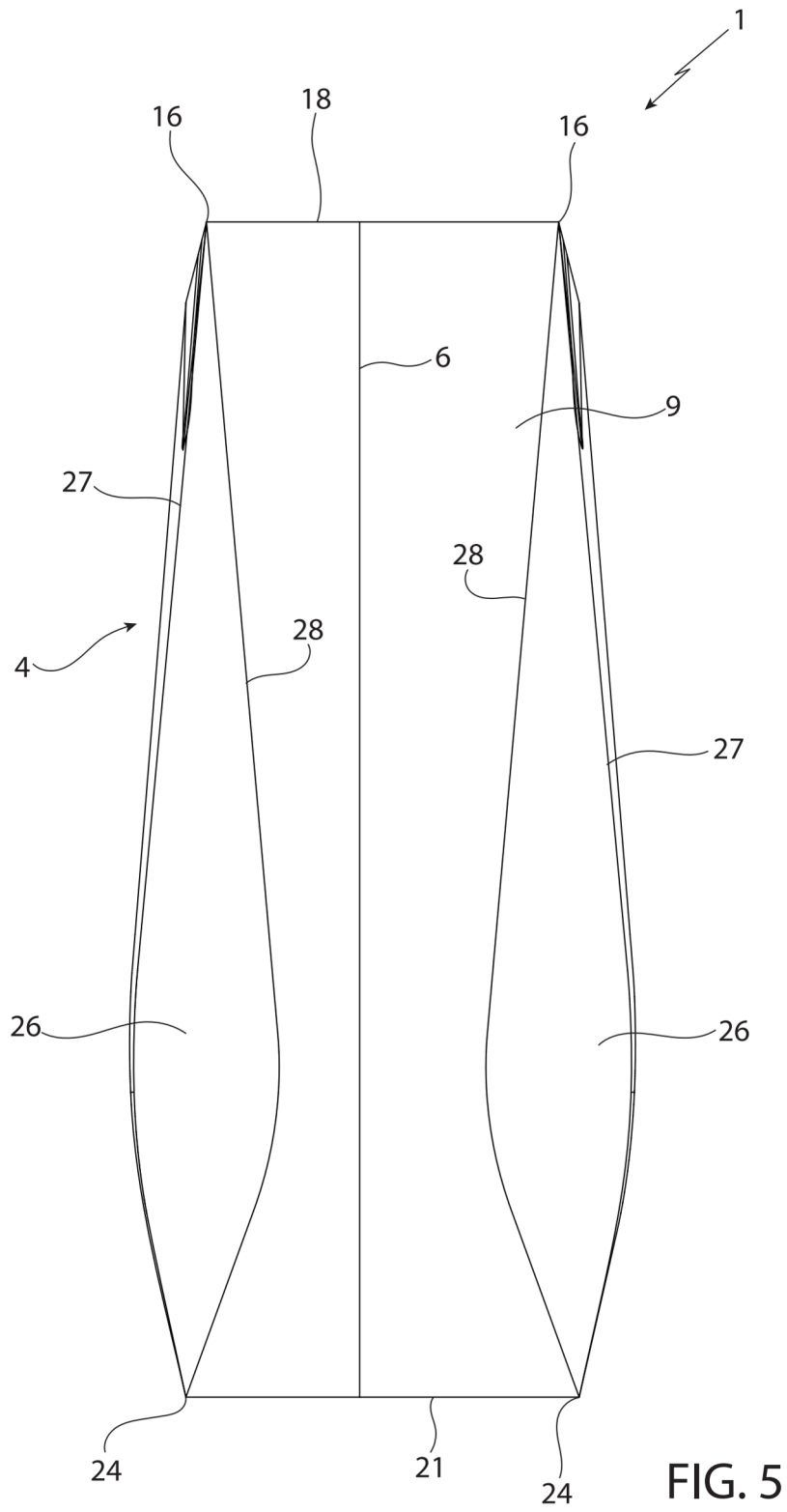


FIG. 4



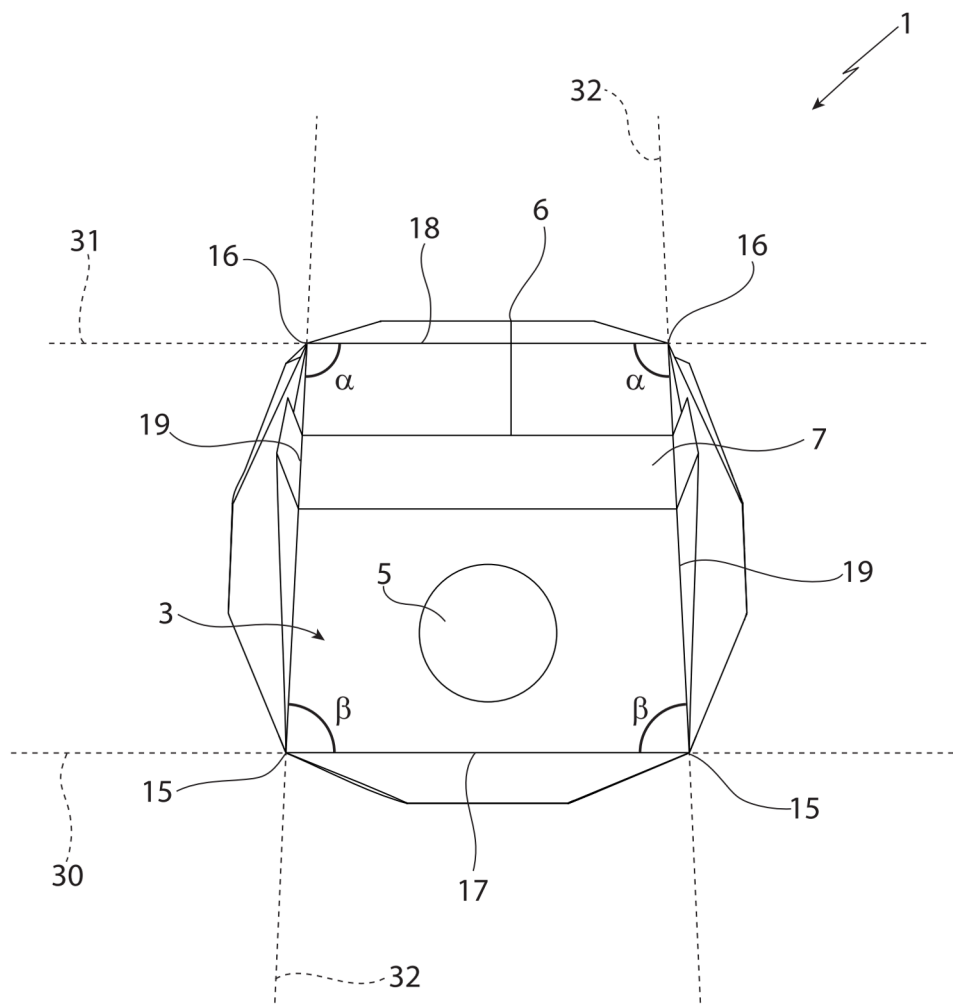


FIG. 6



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Place of search Munich		Date of completion of the search 21 August 2026	Examiner Rodriguez Gombau, F
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