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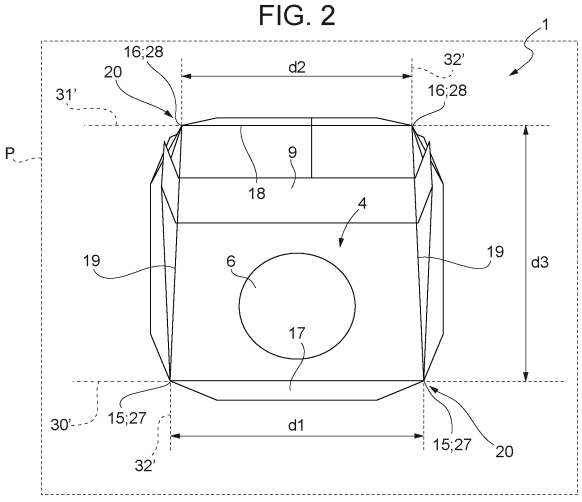
(54) PACKAGE FILLED WITH A POURABLE PRODUCT AND PACKAGING BLANK FOR FORMING A PACKAGE

(57) There is described a package (1, 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, 1') and a side wall (5) interposed between the top wall (3) and the bottom wall (4). The top wall (4) comprises a front edge (17) extending between two front corners (15), a back edge (18) extending between two back corners (16) and two lateral edges (19), each lateral edge (19) extending between one respective pair of one respective front corner (15) and one respective back corner (16). A first distance (d1) between the front corners (15) is larger than a second distance (d2) between the back corners (16).

FIG. 2



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Description

TECHNICAL FIELD

[0001] The present invention relates to a package filled with a pourable product, in particular a pourable food product.

[0002] Additionally, the present invention also relates to a packaging blank for forming a package.

BACKGROUND ART

[0003] 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.

[0004] 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 oxygen-barrier material (an oxygen-barrier layer), e.g. an aluminum foil, 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.

[0005] 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.

[0006] 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.

[0007] 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.

[0008] 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.

[0009] The space available for the opening device is determined by the size of the top wall.

[0010] Even though the known packages provide for excellent results, a desire is felt in the sector to further improve the known packages, in particular so as to have the possibility of maximizing the space available for the opening device.

DISCLOSURE OF INVENTION

[0011] It is an object of the present invention to provide an improved package.

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

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

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

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Two non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1A is a perspective view of a package filled with a pourable product according to a first embodiment of the present invention;

Figure 1B is a lateral view of the package of Figure 1A.

Figure 2 is a top view of the package of Figure 1A;

Figure 3 is a bottom view of the package of Figure 1A;

Figure 4 is a plan view of a packaging blank used to form the package of Figure 1A;

Figure 5 is a perspective view of a package filled with a pourable product according to a second embodiment of the present invention; and

Figure 6 is a plan view of a packaging blank used to form the package of Figure 5.

BEST MODES FOR CARRYING OUT THE INVENTION

[0016] Number 1 in Figure 1A 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.

[0017] In more detail, package 1 may be formed from a packaging blank 2 as e.g. shown in Figure 4.

[0018] More specifically, each package 1 may be formed from one respective packaging blank 2 by means of an automatic packaging machine.

[0019] The automatic packaging machine may be configured to form packages 1 from the respective packaging

blanks 2 and to fill packages 1 with the pourable product.

[0020] Preferentially but not necessarily, packaging blanks 2 may have a multilayer structure.

[0021] In more detail, each packaging blank 2 may comprise 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.

[0022] 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.

[0023] Preferably but not necessarily, each packaging blank 2 may also comprise a layer of gas- and light-barrier material, e.g. aluminum foil or ethylene vinyl alcohol (EVOH) film, in particular being arranged between one of the layers of the heat-seal plastic material and the layer of fibrous material. Preferentially but not necessarily, packaging blank 2 may also comprise a further layer of heat-seal plastic material being interposed between the layer of gas- and light-barrier material and the layer of fibrous material.

[0024] According to some preferred non-limiting embodiments, packaging blanks 2 may be provided in the form of a web.

[0025] In more detail, the web may be formed from a plurality of successively arranged packaging blanks 2.

[0026] 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.

[0027] 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.

[0028] In particular, each packaging blank 2 may comprise a desired pattern/decoration.

[0029] With particular reference to Figure 1A, package 1 may extend 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.

[0030] 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.

[0031] In more detail and with reference to Figures 1A, 1B, 2 and 3, package 1 may comprise a bottom wall 3 and a top wall 4 spaced apart from one another along longitudinal axis A. In particular, longitudinal axis A is perpendicular to bottom wall 3.

[0032] Additionally, package 1 may comprise a side wall 5 extending between (and connected to) bottom wall 3 and top wall 4.

[0033] More specifically, bottom wall 3 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, bottom wall 3 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.

[0034] 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), bottom wall 3 is in contact with the support surface and top wall 4 is distanced from the support surface.

[0035] Additionally, side wall 5 may be the portion of package 1 that is gripped by a user during an outpouring action of the pourable product from package 1.

[0036] According to some possible embodiments and as shown in Figure 1A, top wall 4 may be inclined with respect to bottom wall 3.

[0037] 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.

[0038] More specifically, at least a portion of the opening device may be connected to top wall 4.

[0039] In further detail, top wall 4 may comprise a pouring outlet 6 and the opening device may comprise an outlet opening aligned with respect to pouring outlet 6.

[0040] Additionally, the opening device may comprise a collar having the outlet opening, the collar being arranged about pouring outlet 6.

[0041] Furthermore, the opening device may comprise a base frame being connected to top wall 4. The collar extends from the base frame.

[0042] According to some possible embodiments, the opening device may be connected to top wall 4 only.

[0043] According to some alternative embodiments, a first portion of the opening device may be connected to top wall 4 and a second portion of the opening device may be connected to side wall 5.

[0044] 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 4 after formation of package 1.

[0045] According to some alternative embodiments, at least a portion of the opening device may be molded to top wall 4 and/or packaging blank 2, in particular before packaging blank 2 is formed into package 1.

[0046] 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 4 prior to the first outpouring action. Moreover, the opening device may be removed from top wall 4 after exhaustion of the pourable product.

[0047] In further detail, package 1 may comprise a longitudinal seam portion, e.g. resulting from forming packages 1 from a tube filled with the pourable product,

the tube presenting a longitudinal seal. Preferentially but not necessarily, the longitudinal seam portion may be substantially parallel to longitudinal axis A.

[0048] Additionally, each package 1 may comprise a first transversal seal and a second transversal seal 9, preferentially being transversal to longitudinal axis A. Preferentially, first transversal seal may be comprised by and/or associated to bottom wall 3 and second transversal seal 9 may be comprised by and/or associated to top wall 4.

[0049] In further detail, side wall 5 may comprise a front panel 10, a back panel opposite to front panel 10 and a plurality of, in the example shown two, lateral panels 12, each one interposed between the back panel and front panel 10.

[0050] During an outpouring action, a hand of a user (at least when considering the intended use of package 1) may contact at least partially the back panel and lateral panels 12.

[0051] Preferentially, the back panel may comprise the longitudinal seam portion.

[0052] With reference to Figures 1A, 1B and 2, top wall 4 comprises at least two, more specifically exactly two, front corners 15 and at least two, more specifically exactly two, back corners 16.

[0053] More specifically, back corners 16 may be spaced apart from front corners 15, more specifically along a direction having a component parallel to first transversal axis B.

[0054] In further detail, top wall 4 may comprise a front edge 17 extending between front corners 15, a back edge 18 extending between back corners 16 and two lateral edges 19, each lateral edge 19 extending between one respective pair 20 of one respective front corner 15 and one respective back corner 16.

[0055] More specifically, top wall 4 may be delimited by front edge 17, back edge 18 and lateral edges 19.

[0056] Even more specifically, front edge 17 may extend from one front corner 15 to the other front corner 15 and back edge 18 may extend from one back corner 16 to the other back corner 16. Additionally, each lateral edge 19 may extend from one respective back corner 16 to one respective front corner 15.

[0057] In further detail, each lateral edge 19 may contact front edge 17 at one respective front corner 15 of the respective pair 20 and back edge 18 at one respective back corner 16 of the respective pair 20.

[0058] It should be noted that the terms front and back refer to the nominal use of package 1. For example, if package 1 is correctly used during an outpouring action, back edge 18 is interposed between front edge 17 and the palm of the consumer executing the outpouring action.

[0059] Additionally, front panel 10 may comprise a decoration aimed to be exposed to the consumer in a sales point.

[0060] Additionally, in use, the consumer may arrange during a nominal outpouring action his or her palm in proximity of the back panel.

[0061] According to the embodiment shown in Figures 1A, 1B, 2 and 3, back edge 18 is more distanced from bottom wall 3 than front edge 17.

[0062] According to the embodiment shown in Figures 1A, 1B, 2 and 3, front edge 17 is rectilinear. Alternatively, front edge 17 may be curved.

[0063] Additionally, back edge 18 is rectilinear. Moreover, lateral edges 19 are rectilinear. Alternatively, one or more of back edge 18 and lateral edges 19 may be curved.

[0064] With reference to Figures 1A, 1B, and 3, bottom wall 3 may comprise a bottom front edge 21, a bottom back edge 22 and two bottom lateral edges 23.

[0065] Each bottom lateral edge 23 may contact bottom front edge 21 at a respective bottom front corner 24 and each bottom back edge 22 at a respective bottom back corner 25.

[0066] According to the embodiment shown, bottom wall 3 may have a (substantially) rectangular shape, i.e. each bottom lateral edge 23 is orthogonal to bottom front edge 21 and bottom back edge 22, and bottom front edge 21 and bottom back edge 22 may be parallel to one another.

[0067] Advantageously, front panel 10 may extend from front edge 17 to bottom front edge 21 and the back panel may extend from back edge 18 to bottom back edge 22.

[0068] As shown in Figure 1A, a respective interface between each lateral panel 12 and front panel 10 may define a respective auxiliary panel. The respective interfaces may have various shapes such as being curved, rectilinear and the like.

[0069] Moreover, the respective interfaces of the same package 1 may differ from one another.

[0070] With particular reference to Figures 1A and 2, a first distance d1 is defined between front corners 15 and a second distance d2 is defined between back corners 16.

[0071] First distance d1 may be larger than second distance d2.

[0072] More specifically, first distance d1 and second distance d2 are determined along a direction parallel to second transversal axis C.

[0073] According to the embodiment shown in Figures 1A, 1B, 2 and 3 in which both front edge 17 and back edge 18 are rectilinear, one understands that front edge 17 is longer than back edge 18. This may be different in case that front edge 17 and/or back edge 18 differ from being rectilinear, however, also in such a case first distance d1 is larger than second distance d2.

[0074] In this way, it is possible to optimize the space available for the opening device.

[0075] With particular reference to Figures 1A, an imaginary front line 30 extends through front corners 15, an imaginary back line 31 extends through back corners 16, and one respective imaginary lateral line 32 extends through each pair 20 of one respective front corner 15 and one respective back corner 16.

[0076] In particular, imaginary front line 30, imaginary back line 31 and each imaginary lateral line 32 have respective rectilinear shapes.

[0077] According to the example shown in Figures 1A, 1B, 2 and 3, a portion of imaginary front line 30 corresponds to front edge 17, a portion of imaginary back line 31 corresponds to back edge 18 and a respective portion of each imaginary lateral line 32 corresponds to the respective lateral edge 19.

[0078] Furthermore, according to the embodiment of Figures 1A, 1B, 2 and 3, 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°.

[0079] 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°.

[0080] It should be noted that each first angle α and/or each second angle β is determined in a plane within which top wall 4 lies and which corresponds to the extension of top wall 4.

[0081] Each first angle α is measured by leaving imaginary back line 31 fixed with respect to the plane and top wall 4 and moving the respective imaginary lateral line 32 within the plane and top wall 4 until the respective imaginary lateral line 32 is superimposed to imaginary back line 31.

[0082] Similarly, each second angle β is measured by leaving imaginary front line 30 fixed with respect to the plane and top wall 4 and moving the respective imaginary lateral line 32 within the plane and top wall 4 until the respective imaginary lateral line 32 is superimposed to imaginary front line 30.

[0083] This also means that when considering an orientation of package 1 (seen from the consumer) such that front edge 17 is interposed between the consumer and 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.

[0084] 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.

[0085] With reference to Figures 1A, 1B and 2, a projection of top wall 4 onto a projection plane P perpendicular to longitudinal axis A gives rise to respective projected front corners 27 and respective projected back corners 28, in particular corresponding to respective front corners 15 and respective back corners 16. In other words, projected front corners 27 are the projections on projection plane P of front corners 15 and projected back corners 28 are the projections on projection plane P of back corners 16.

[0086] In particular, in Figure 2 one notes a top view of package 1 and projected plane P in which each front corner 15 is superimposed on the respective projected front corner 27 and each back corner 16 is superimposed on the respective projected back corner 28.

[0087] According to the example shown, a distance between projected front portions 27 equals first distance d1.

[0088] With particular reference to Figures 1A and 2, a projection 30' of imaginary front line 30 extends through projected front corners 27 and a projection 31' of imaginary back line 31 extends through projected back corners 28.

[0089] Advantageously, one respective projection 32' of one imaginary lateral line 32 extends through each pair of one respective projected front corner 27 and one respective projected back corner 28.

[0090] According to some possible embodiments, a third distance d3 is defined between the respective projection 31' of imaginary back line 31 and the respective projection 30' of imaginary front line 30.

[0091] In general, in case of imaginary back line 31 and imaginary front line 30 not being parallel to one another, third distance d3 corresponds to the maximum distance between the respective portions of projection 31' and projection 30' being delimited between, respectively, projected back corners 28 and projected front corners 27.

[0092] Advantageously, third distance d3 is larger than first distance d1.

[0093] In this way, one further maximizes the space available for the opening device.

[0094] According to the embodiment shown in Figures 1A, 1B, 2 and 3 imaginary front line 30 and imaginary back line 31 are parallel to one another.

[0095] Additionally, imaginary lateral lines 32 have a common intersection point (not shown).

[0096] According to some preferred non-limiting embodiments, at least a portion of the opening device and/or of designated pour opening area 6 may be interposed between transversal seal 9 and front edge 17. More specifically, no portion of the opening device and/or no portion of the designated pour opening area may be interposed between transversal seal 9 and back edge 18.

[0097] With particular reference to Figure 1, package 1 may comprise flaps 33 attached to and/or extending from top wall 4.

[0098] Packaging blank 2 of Figure 4 is designed to allow formation of package 1.

[0099] In more detail, each packaging blank 2 may comprise:

- 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 M1 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 M2 parallel to longitudinal axis E and/or transversal, preferentially perpendicular, to first main direction M1 and/or transversal, preferentially perpendicular, to a transversal axis F of the respective packaging blank 2.

[0100] Preferentially, transversal axis F may be perpendicular to longitudinal axis E.

[0101] Preferentially, longitudinal axis E may intersect transversal axis F at a centre point of packaging blank 2.

[0102] In further detail, each packaging blank 2 may extend within a plane spanned by longitudinal axis E and transversal axis F.

[0103] Moreover, each packaging blank 2 may have 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 may be (significantly) larger than a thickness of packaging blank 2. In other words, the thickness of packaging blank 2 may be negligible in comparison to the respective extensions (i.e. the respective dimensions) of packaging blank 2 along longitudinal axis E and transversal axis F.

[0104] Preferentially, each packaging blank 2 may have a rectangular or square shape.

[0105] Additionally, first main direction M1 may be parallel to transversal axis F.

[0106] Additionally, second main direction M2 may be parallel to longitudinal axis E.

[0107] Moreover, each first longitudinal boundary edge 40 and each second longitudinal boundary edge 41 may be connected to and interposed between the respective first transversal boundary edge 42 and the respective second transversal boundary edge 43.

[0108] 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.

[0109] 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 may be real edges.

[0110] 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.

[0111] 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.

[0112] With particular reference to Figure 4, each packaging blank 2 may comprise a top section having a top crease pattern 44 configured to define the shape, more specifically a trapezoid shape, of at least top wall 4.

[0113] In further detail, top crease pattern 44 may be configured to define top wall 4 and flaps 33.

[0114] Preferentially, packaging blank 2 may also comprise a bottom section having a bottom crease pattern 45 configured to define the shape, more specifically a rectangular shape, of at least bottom wall 3.

[0115] In further detail, bottom crease pattern 45 may be configured to define bottom wall 3 and flaps (not shown) attached to bottom wall 3.

[0116] Moreover, the top section and the bottom section may be spaced apart from one another along longitudinal axis E.

[0117] 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 side wall 5. In particular, the intermediate section may be interposed between the top section and the bottom section.

[0118] More specifically, intermediate crease pattern 46 may define front panel 10, the back panel and lateral panels 12.

[0119] It should be noted that top crease pattern 44, bottom crease pattern 45 and intermediate crease pattern 46 may define respective sections of top wall 4, bottom wall 3 and side wall 5. Thus, in the following, where considered appropriate, we use the same terms and the same numerals for features of packaging blank 2 and package 1.

[0120] With particular reference to Figure 4, each top crease pattern 44 may comprise at least a first transversal crease line 47 extending transversally to longitudinal axis E.

[0121] Additionally, bottom crease pattern 45 may comprise at least a second transversal crease line 48 extending transversally to longitudinal axis E.

[0122] Moreover, first transversal crease line 47 and second transversal crease line 48 may be displaced from

one another along second main direction M2.

[0123] More specifically, first transversal crease line 47 and second transversal crease line 48 may delimit together the intermediate section.

[0124] In further detail, top crease pattern 44 may comprise a third transversal crease line 49 displaced from first transversal crease line 47 along second main direction M2 and interposed between first transversal boundary edge 42 and first transversal crease line 47 along second main direction M2.

[0125] Additionally, bottom crease pattern 45 may comprise a fourth transversal crease line 50 displaced from second transversal crease line 48 along second main direction M2 and interposed between second transversal boundary edge 43 and second transversal crease line 48 along second main direction M2.

[0126] According to the example shown in Figure 4, second transversal crease line 48 and/or fourth transversal crease line 50 may have a rectilinear shape.

[0127] In further detail and with reference to Figure 4, top crease pattern 44 may comprise a plurality of top crease lines defining and/or determining the shape of top wall 4.

[0128] In particular, at least some top crease lines may be designed to define and/or determine front edge 17, back edge 18 and lateral edges 19 (after formation of package 1 from packaging blank 2). Additionally, at least some top crease lines may define and/or determine front corners 15 and back corners 16.

[0129] In even further detail, bottom crease pattern 45 may comprise a plurality of bottom crease lines defining and/or determining the shape of bottom wall 3.

[0130] In particular, at least some bottom crease lines may be designed to define and/or determine bottom front edge 21, bottom back edge 22 and bottom lateral edges 23 (after formation of package 1 from packaging blank 2) . Additionally, at least some bottom crease lines may define and/or determine bottom front corners 24 and bottom back corners 25.

[0131] In particular, the top crease lines may be arranged such to obtain a top wall 4 as described above and accordingly, to obtain a top wall 4 such that first distance d1 is larger than second distance d2.

[0132] Moreover, the top crease lines may be arranged such to obtain a top wall 4 such that first distance d3 is larger than first distance d1.

[0133] According to some non-limiting embodiments, first transversal crease line 47 may comprise a front portion 54 designed to form and/or determine front edge 17. Additionally, first transversal crease line 47 may comprise one or more back portions 55 designed to form and/or determine back edge 18.

[0134] In further detail, front portion 54 may be interposed between two back portions 55.

[0135] Additionally, top crease pattern 44 may also comprise a plurality of lateral crease lines 56 designed to form and/or determine lateral edges 19.

[0136] Accordingly, front portion 54, bottom portions 55 and lateral crease lines 56 may define at least some of the top crease lines.

[0137] More specifically, lateral crease lines 56 may extend between first transversal crease line 47 and third transversal crease line 49.

[0138] Moreover, lateral crease lines 56 may be displaced from one another along first main direction M1.

[0139] Additionally, top crease pattern 44, in particular first transversal crease line 47, may comprise a plurality of auxiliary crease lines 57, each auxiliary crease line 57 being interposed between one respective back portion 55 and front portion 54. In particular, each auxiliary crease line 57 may give rise to, i.e. form or determine, one respective lateral edge 19 after formation of package 1 from packaging blank 2.

[0140] According to the embodiment of Figure 4, auxiliary crease lines 57 may be inclined with respect to back portions 55 and front portions 54.

[0141] According to some advantageous embodiments, each auxiliary crease line 57 and/or its respective imaginary extension may comprise one respective front intersection point 58, and more specifically one respective back intersection point 59. In particular, each auxiliary crease line 57 may intersect with front portion 54 and/or its respective imaginary extension at the respective front intersection point 58, and more specifically with one respective back portion 55 and/or its respective imaginary extension at the respective back intersection point 59.

[0142] According to some advantageous embodiments, after formation of the respective package 1 from packaging blank 2 each front intersection point 58 corresponds to one respective front corner 15 and each back intersection point 59 corresponds to one respective back corner 16.

[0143] In further detail, each one of two lateral crease lines 56 and/or their respective imaginary extensions may intersect with first transversal crease line 47 at a respective front intersection point 58.

[0144] According to some preferred non-limiting embodiments, a fourth distance d4 is defined between front intersection points 58.

[0145] In particular, fourth distance d4 may correspond to first distance d1.

[0146] Additionally, respective separation distances d are defined between each front intersection point 58 and a respective projected back interaction point 70 corresponding to a projection (along longitudinal axis E) of the respective back intersection point 59 onto an imaginary line 61 extending through front intersection points 58. In other words, separation distance d is defined between each front intersection point 58 and the projection onto imaginary line 61 along longitudinal axis E of the respective back intersection point 59 being comprised by the same auxiliary crease line 57 and/or its respective imaginary extension.

[0147] Advantageously, fourth distance d4 is smaller than distances d.

[0148] According to the embodiment shown, an extension, i.e. a dimension, of front portion 54 corresponds to fourth distance d4.

[0149] Alternatively, front portion 54 is interposed between front intersection points 58 but does not extend up to front intersection points 58. According to such an alternative embodiment, the extension, i.e. the dimension, of front portion 54 is shorter than fourth distance d4.

[0150] According to the non-limiting example shown, each one of two lateral crease lines 56 and/or their respective imaginary extensions may intersect with first transversal crease line 47 and/or its respective imaginary extension at a respective front intersection point 58.

[0151] According to some possible embodiments, each one of two further lateral crease lines 56 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 59.

[0152] According to some possible non-limiting embodiments, each lateral crease line 56 is configured to cooperate together with a respective other lateral crease line 56 so as to define and/or determine one respective lateral edge 19.

[0153] According to some possible embodiments as shown in Figure 4, each lateral crease line 56 may be inclined with respect to third transversal crease line 49 and/or front portion 54 and/or back portion 55.

[0154] According to the embodiment shown in Figure 4, each lateral crease line 56 may be inclined with respect to first longitudinal boundary edge 40 and second longitudinal boundary edge 41.

[0155] According to some possible embodiments, packaging blank 2 may comprise a designated pour opening area 6 (forming and/or defining the designated pour opening area 6 of package 1) .

[0156] According to some examples, the designated pour opening area 6 may be covered by a separation membrane.

[0157] Preferentially but not necessarily, top crease pattern 44 may comprise a main panel 60, preferentially having and/or carrying at least a portion of designated pour opening area 6.

[0158] More specifically, main panel 60 may be delimited by imaginary line 61, a delimiting portion 62 of third transversal crease line 49 and/or its respective imaginary extension facing and being parallel to imaginary line 61 and two respective lateral crease lines 56 and/or their respective imaginary extensions.

[0159] In more detail, delimiting portion 62 extends between two intermediate intersection points 63. Each intermediate intersection point 63 being defined by the intersection of one respective lateral crease line 56 and/or its respective imaginary extension with third transversal crease line 49 and/or its respective imaginary extension.

[0160] Preferentially but not necessarily, the designated pour opening area 6 may be at least partially arranged on main panel 60.

[0161] 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 6.

[0162] Advantageously, main panel 60 may have a trapezoid shape.

[0163] A fifth distance d5 may be defined between the two intermediate points 63.

[0164] Advantageously, fourth distance d4 may be larger than fifth distance d5.

[0165] According to some possible embodiments, a third angle γ is defined between imaginary line 61 and each one of lateral crease lines 56 and/or its respective imaginary extension. Preferentially, third angle γ may be smaller than 90°.

[0166] Angle γ is defined within main panel 60.

[0167] Additionally, a fourth angle δ is defined between each back portion 55 and/or its respective imaginary extensions and each one of lateral crease lines 56 and/or their respective imaginary extensions.

[0168] Angle δ is defined on the opposite side of auxiliary crease line 57 with respect to lateral crease line 56.

[0169] According to the embodiment shown in Figure 4, fourth angle δ may be larger than 90°.

[0170] 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 56 fixed with respect to the plane and main panel 60 and by angularly moving front portion 54 within the plane and main panel 60 until front portion 54 is superimposed to the respective lateral crease lines 56.

[0171] 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 56 fixed with respect to the plane and main panel 60 and by angularly moving back portion 55 within the plane and main panel 60 until back portion 55 is superimposed to the respective lateral crease lines 56.

[0172] With particular reference to Figure 4, bottom crease pattern 45 may comprise a plurality of crease lines configured to determine and/or define bottom front edge 21, bottom back edge 22 and bottom lateral edges 23 and/or bottom front corner 24, bottom back corner 25 and bottom lateral edges 26.

[0173] In particular, the above-mentioned crease lines are designed such that after formation of package 1, bottom wall 3 has a rectangular shape.

[0174] According to some possible non limiting embodiments, some or all the imaginary extensions are linear imaginary extensions.

[0175] In particular, the linear extension of front portion 54 is a linear imaginary extension, and/or the linear extensions of back portions 55 are linear imaginary extensions, and/or the linear extensions of lateral crease lines 56 are linear imaginary extensions, and/or the linear extensions of auxiliary crease lines 57 are linear imaginary extensions.

[0176] With reference to Figure 5, number 1' indicates an alternative embodiment of a package according to the present invention; as package 1' is similar to package 1, the following description is limited to the differences between them, and using the same references, where possible, for identical or corresponding parts.

[0177] Package 1' differs from package 1 in that top wall 4 is (substantially) parallel to bottom wall 3.

[0178] Hence, third distance d3 corresponds to the distance between front edge 17 and back edge 18.

[0179] In particular, each projected front corner 27 is coincident with the respective front corner 15 and each projected back corner 28 is coincident with the respective back corner 16.

[0180] With reference to Figure 6, number 2' indicates an alternative embodiment of a packaging blank according to the present invention; as packaging blank 2' is similar to packaging blank 2, the following description is limited to the differences between them, and using the same references, where possible, for identical or corresponding parts.

[0181] Packaging blank 2' differs from packaging blank 2 in that top crease pattern 44 is formed such that after formation of package 1', the respective top wall 4 is (substantially) parallel to bottom wall 3.

[0182] More specifically, packaging blank 2' is designed to allow for the formation of package 1'.

[0183] In particular, auxiliary crease lines 57 are parallel to back portions 55.

[0184] According to the example shown, imaginary line 61 is superimposed to, i.e. coincides with, first transversal crease line 47.

[0185] In particular, each projected back interaction point 70 is coincident with the respective back intersection point 59.

[0186] Preferentially, first transversal crease line 47 may be rectilinear.

[0187] The advantages of packages 1 and 1' and/or packaging blanks 2 and 2' according to the present invention will be clear from the foregoing description.

[0188] In particular, it is possible to couple opening devices to the respective top walls 4 that are sufficiently large as the space available on top wall 4 is maximized.

[0189] Clearly, changes may be made to packages 1 and 1' and/or packaging blanks 2 and 2' as described herein without, however, departing from the scope of protection as defined in the accompanying claims.

Claims

1. Package (1, 1') for a pourable product;

the package (1, 1') comprises a bottom wall (3) and a top wall (4) spaced apart from one another along a longitudinal axis (A) of the package (1, 1') and a side wall (5) interposed between the top wall (3) and the bottom wall (4) ;

wherein the top wall (4) comprises a front edge (17) extending between two front corners (15), a back edge (18) extending between two back corners (16) and two lateral edges (19), each lateral edge (19) extending between one respective pair of one respective front corner (15) and one respective back corner (16);

wherein a first distance (d1) between the front corners (15) is larger than a second distance (d2) between the back corners (16).

2. Package according to claim 1, wherein the top wall (4) has a trapezoid shape.

3. Package according to claim 1 or 2, and further comprising:

- an opening device at least partially arranged on the top wall (4) and being closer to the front edge (17) than to the back edge (18); and/or
- a designated pour opening area (6) at least partially arranged on the top wall (4) and being closer to the front edge (17) than to the back edge (18).

4. Package according to claim 3, wherein the top wall (4) comprises a transversal seal (9);

wherein at least a portion of the opening device is interposed between the transversal seal (9) and the front edge (17) and/or a portion of the designated pour opening area (6) is interposed between the transversal seal (9) and the front edge (17).

5. Package according to any one of the preceding claims,

wherein a projection of the top wall (4) onto a projection plane (P) perpendicular to the longitudinal axis (A) gives rise to two respective projected front corners (27) and two projected back corners (28) originating from the respective front corners (15) and the respective back corners (16);

wherein an imaginary front line (30) extends through the two projected front corners (27) and an imaginary back line (31) extends through the two projected back corners (28) ;

wherein a third distance (d3) between the imaginary back line (31) and the imaginary front line (30) is larger than the first distance (d1).

6. Package according to claim 5, wherein a first angle (α) between the imaginary back line (31) and at least one imaginary lateral line (32) is larger than 90°; and/or

wherein a second angle (β) defined between the imaginary front line (30) and at least one ima-

ginary lateral line (32) is smaller than 90°;
wherein each imaginary lateral line (32) extends through a respective projected front corner (27) and a respective projected back corner (28) corresponding to the projections on plane (P) of a front corner (15) and a back corner (16) of one respective lateral edge (19).

7. Package according to claim 6, wherein the imaginary lateral lines (32) intersect with one another; and/or the front imaginary line (30) and the back imaginary line (31) are parallel to one another.

8. Package according to any one of the preceding claims, wherein:

- the front edge (17) is curved or rectilinear; and/or
- the back edge (18) is curved or rectilinear; and/or
- the lateral edges (19) are curved or rectilinear.

9. Package according to any one of the preceding claims, wherein the bottom wall (3) has a rectangular shape.

10. Package according to any one of the preceding claims, and further comprising a side wall (5) extending between the top wall (4) and the bottom wall (3); wherein the side wall (5) comprises a front panel (10) extending from the front edge (15) to the bottom wall (3) and a back panel spaced apart from the front panel (10) and extending from the back edge (18) to the bottom wall (3).

11. Packaging blank (2, 2') designed to allow for the formation of a package (1, 1') according to any one of the preceding claims.

12. Packaging blank (2, 2') for the formation of a package (1, 1') filled with a pourable product, the packaging blank (2, 2') comprises:

- a top section having a top crease pattern (44) configured to define and/or determine the shape of at least a top wall (4) of the package (1, 1', 1'', 1‴);
- a bottom section having a bottom crease pattern (45) configured to define the shape of at least a bottom wall (3) of the package (1, 1', 1'', 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, 2');
wherein the first transversal crease line (47) comprises:

- a front portion (54) designed to form and/or determine a front edge (17) of the package (1, 1', 1'', 1‴);
- one or more back portions (55) designed to form and/or determine a back edge (18) of the package (1, 1', 1", 1‴); and
- a plurality of auxiliary crease lines (57), each auxiliary crease line (57) being interposed between one respective back portion (55) and the front portion (54);

wherein each auxiliary crease line (57) and/or its respective imaginary extension comprises one respective front intersection point (58) and one respective back intersection point (59);
wherein each auxiliary crease line (57) and/or its respective imaginary extension intersects with the front portion (54) and/or its respective imaginary extension at the respective front intersection point (58) and with one respective back portion (55) and/or its respective imaginary extension at the respective back intersection point (59);
wherein the top crease pattern (44) further comprises a plurality of lateral crease lines (56) designed to form and/or determine lateral edges (19) of the package (1, 1', 1" 1‴);
wherein the top crease pattern (44) also comprises a second transversal crease line (49) spaced apart from the first transversal crease line (46);
wherein the top crease pattern (44) comprises a main panel (60) delimited by an imaginary line (61) extending through the two front intersection points (58), a delimiting portion (62) of the second transversal crease line (49) and/or its respective imaginary extension facing and being parallel to the imaginary line (61) and two respective lateral crease lines (56) and/or their respective imaginary extensions;
wherein the delimiting portion (62) extends between two intermediate intersection points (63);
wherein each lateral crease line (56) 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 (63) ;
wherein the shape of the main panel (60) corresponds to a trapezoid;
wherein a fourth distance (d4) between the two front intersection points (59) is larger than a fifth distance (d5) between the two

intermediate points (63).

13. Packaging blank according to claim 12, wherein between each lateral crease line (56) and/or its respective imaginary extension and the imaginary line (61) is defined a respective third angle (γ), the third angle (γ) being smaller than 90°; and/or
wherein between each lateral crease line (56) and/or its respective imaginary extension and the delimiting portion (62) is defined a respective fourth angle (δ), the fourth angle (δ) being larger than 90°.

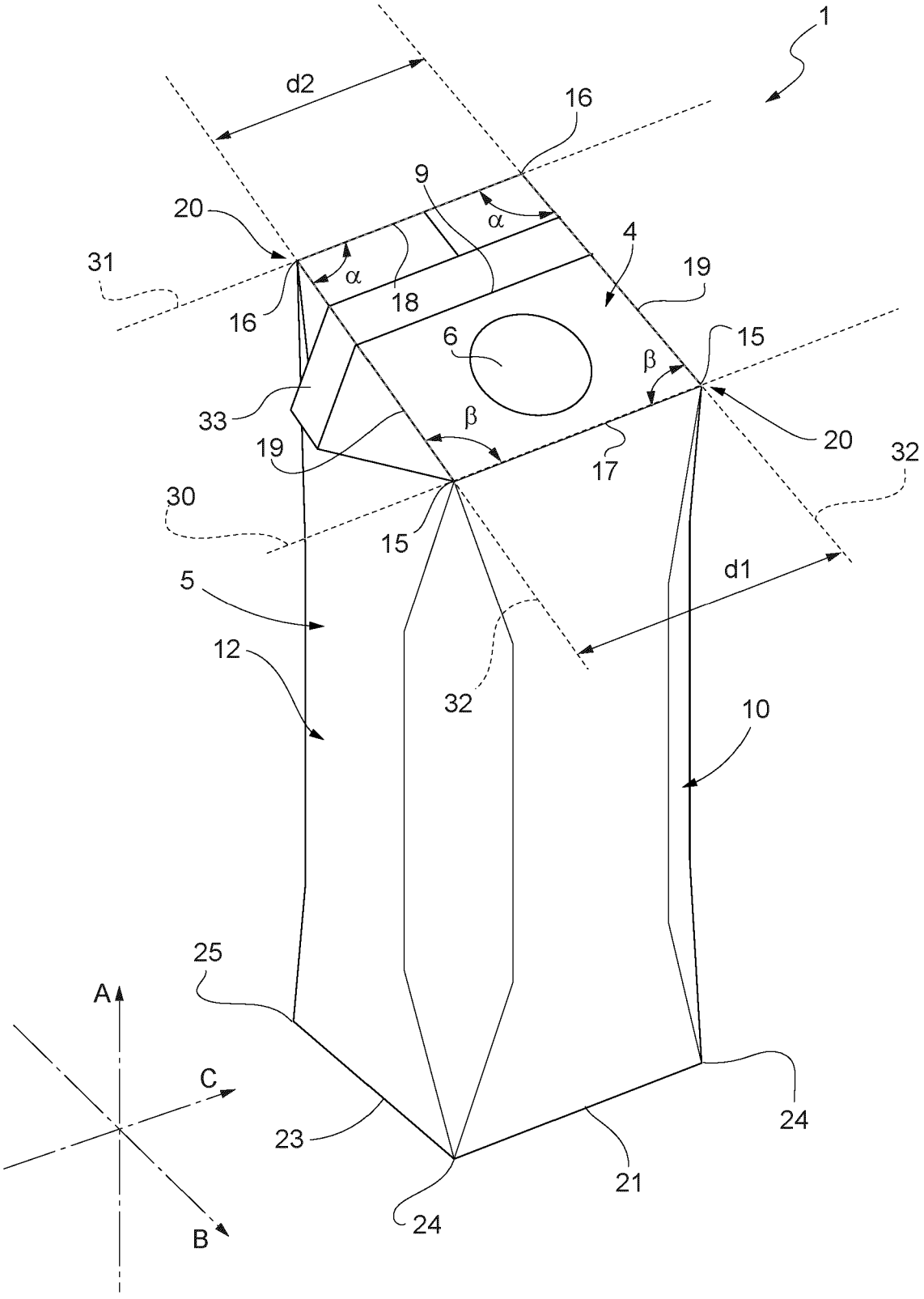
14. Packaging blank according to any one of claims 12 to 13, wherein respective separation distances (d) are defined between each front intersection point (58) and a respective projected back interaction point (70) corresponding to a projection of the respective back intersection point (59) onto imaginary line (61); wherein the fourth distance (d4) is smaller than each one of the separation distances (d).

15. Packaging blank according to any one of claims 12 to 14, and further comprising

- a portion of an opening device arranged on the main panel (60); and/or
- a designated pour opening area (6) at least partially arranged on the main panel (60).

16. Packaging blank according to any one of claims 12 to 15, wherein the packaging blank is a multilayer packaging material.

FIG. 1A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d2
16
9
20
α
4
31
α
19
18
16
6
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β
33
β
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19
17
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15
d1
5
12
32
10
25
A
C
23
24
21
24
B

FIG. 1B

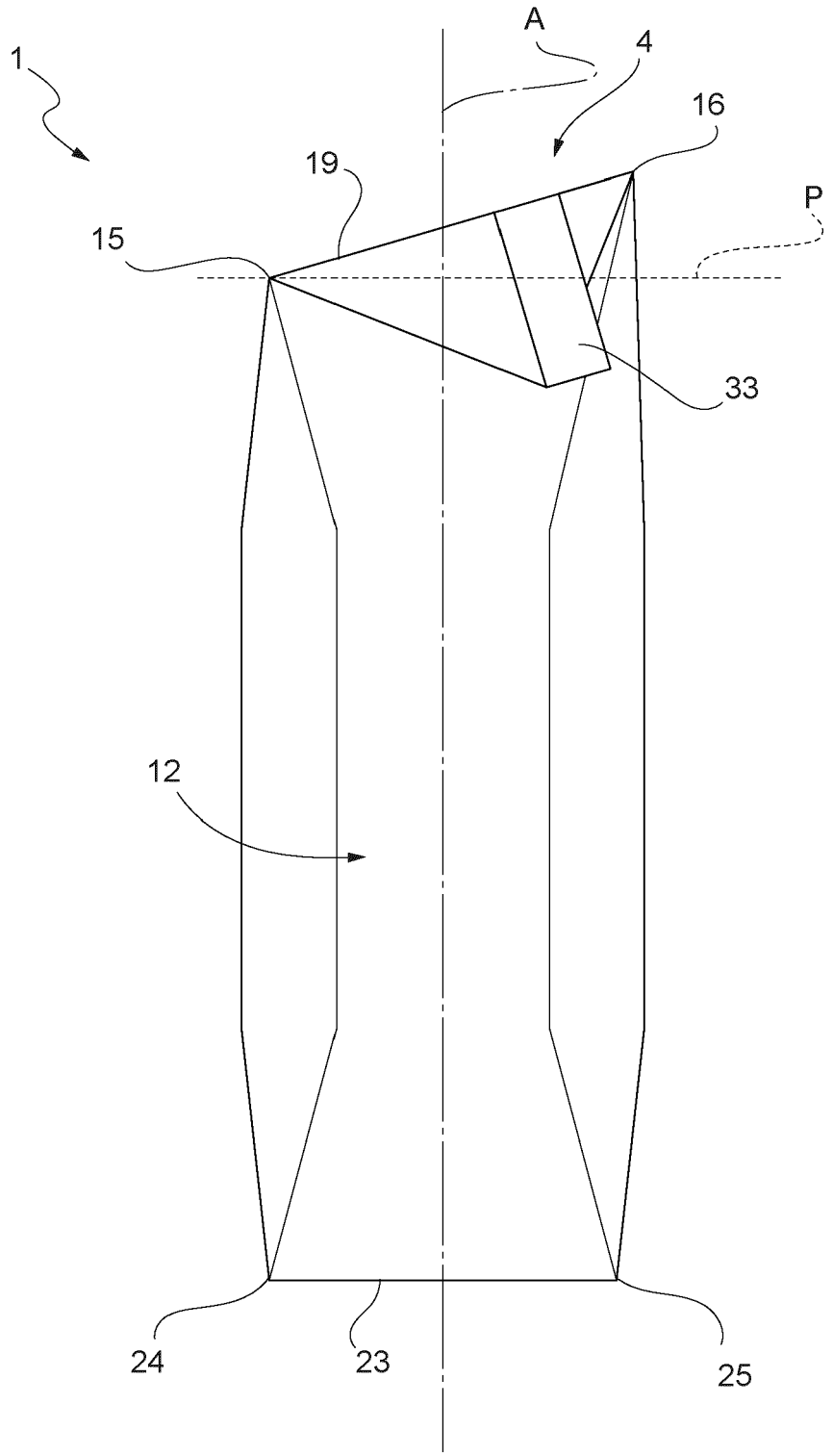
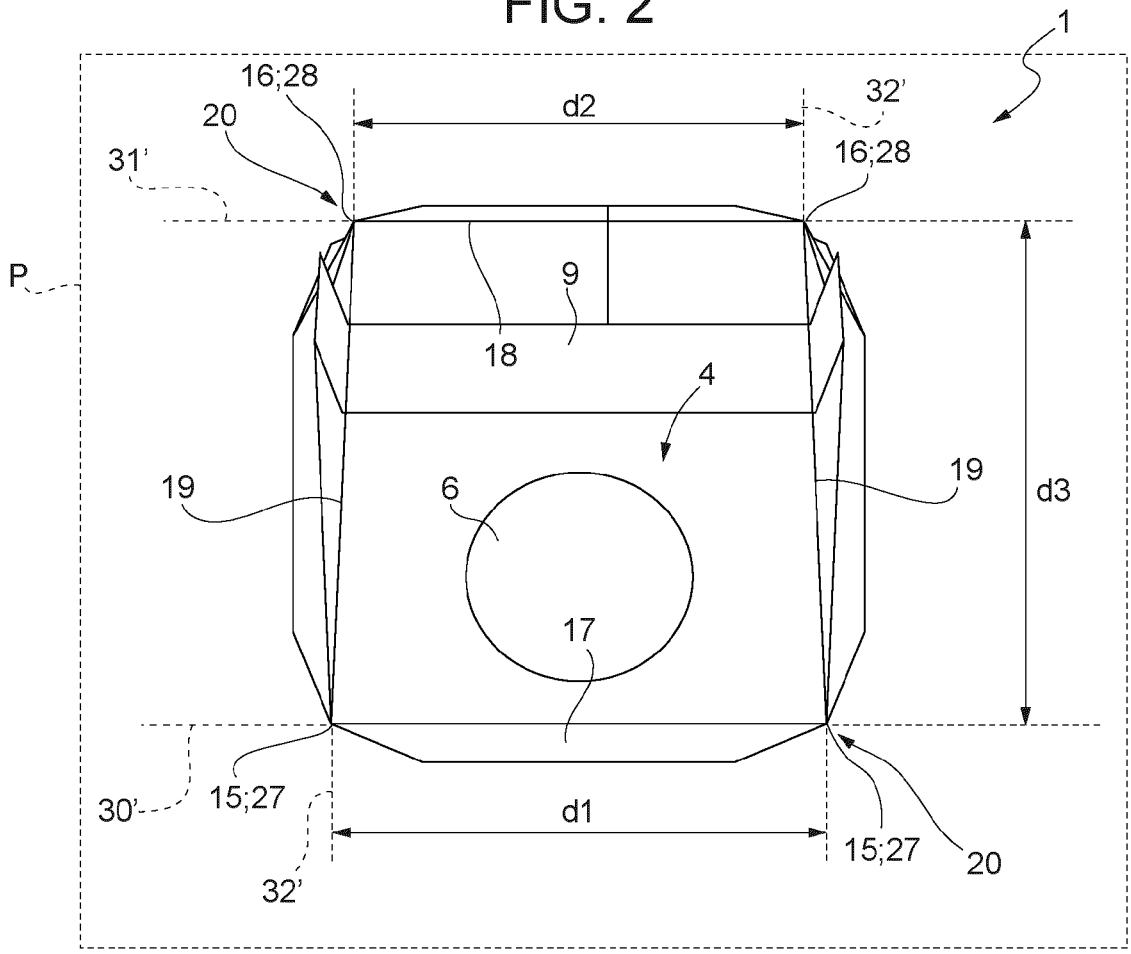


FIG. 2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16;28
20
31'
d2
32'
16;28
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9
18
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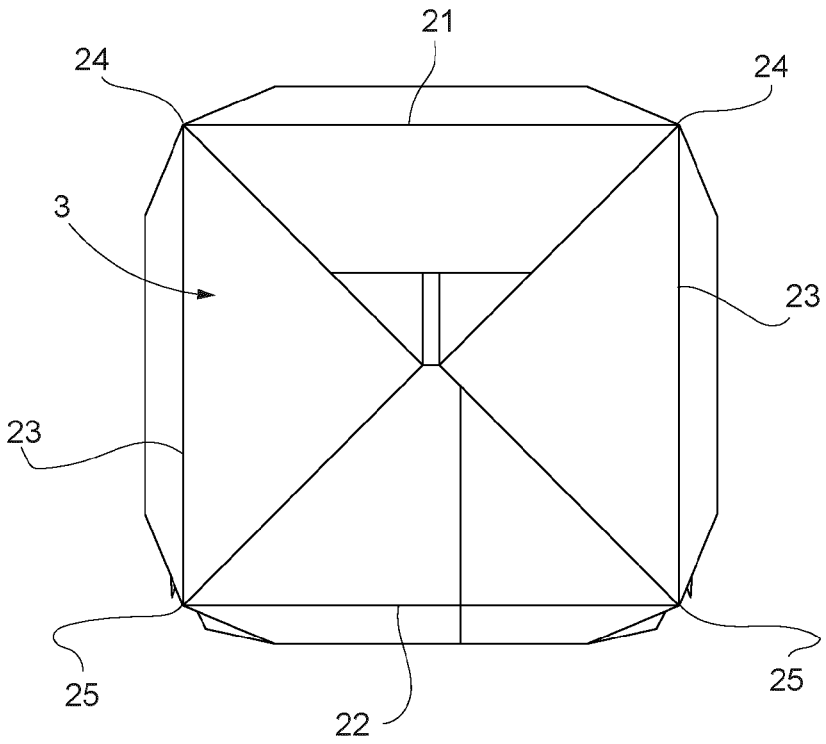
6
19
d3
17
30'
15;27
d1
15;27
20
32'

FIG. 3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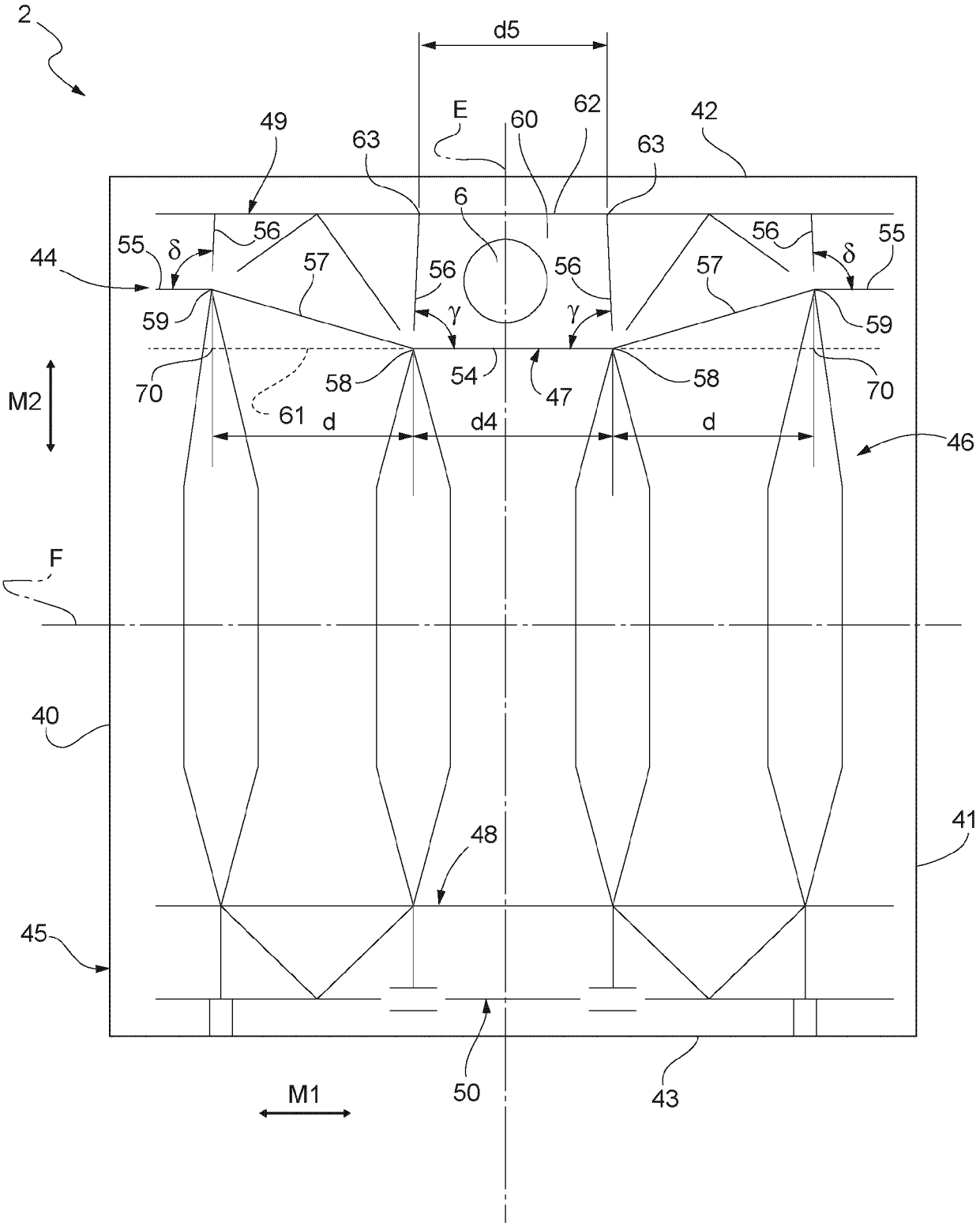
25

FIG. 4


2
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E
60
62
42
49
63
63
6
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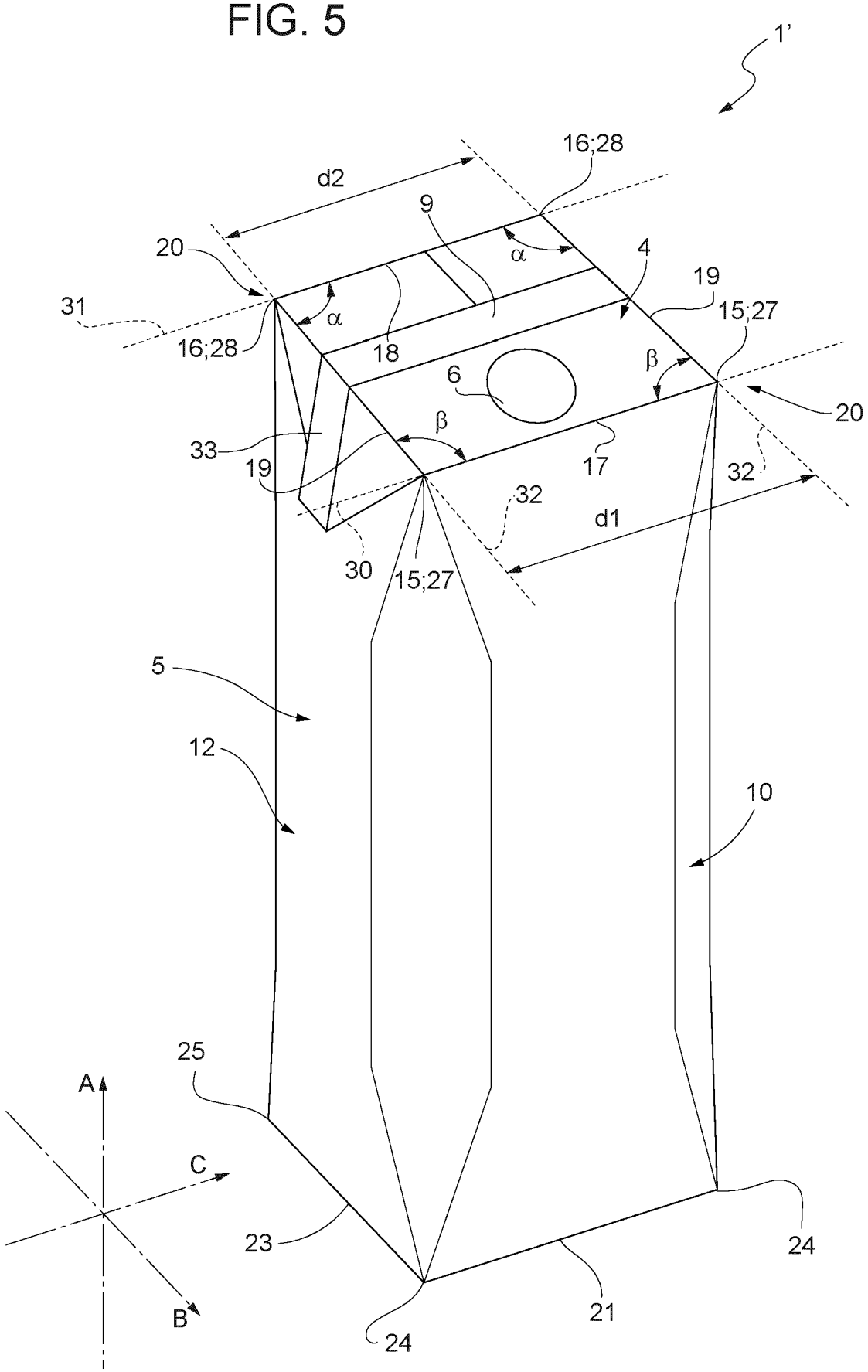
δ
56
56
57
56
56
57
δ
55
44
59
γ
γ
59
70
58
54
47
58
70
M2
61
d
d4
d
46
F
40
41
48
45
M1
50
43

FIG. 5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33
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17
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25
A
C
23
24
B
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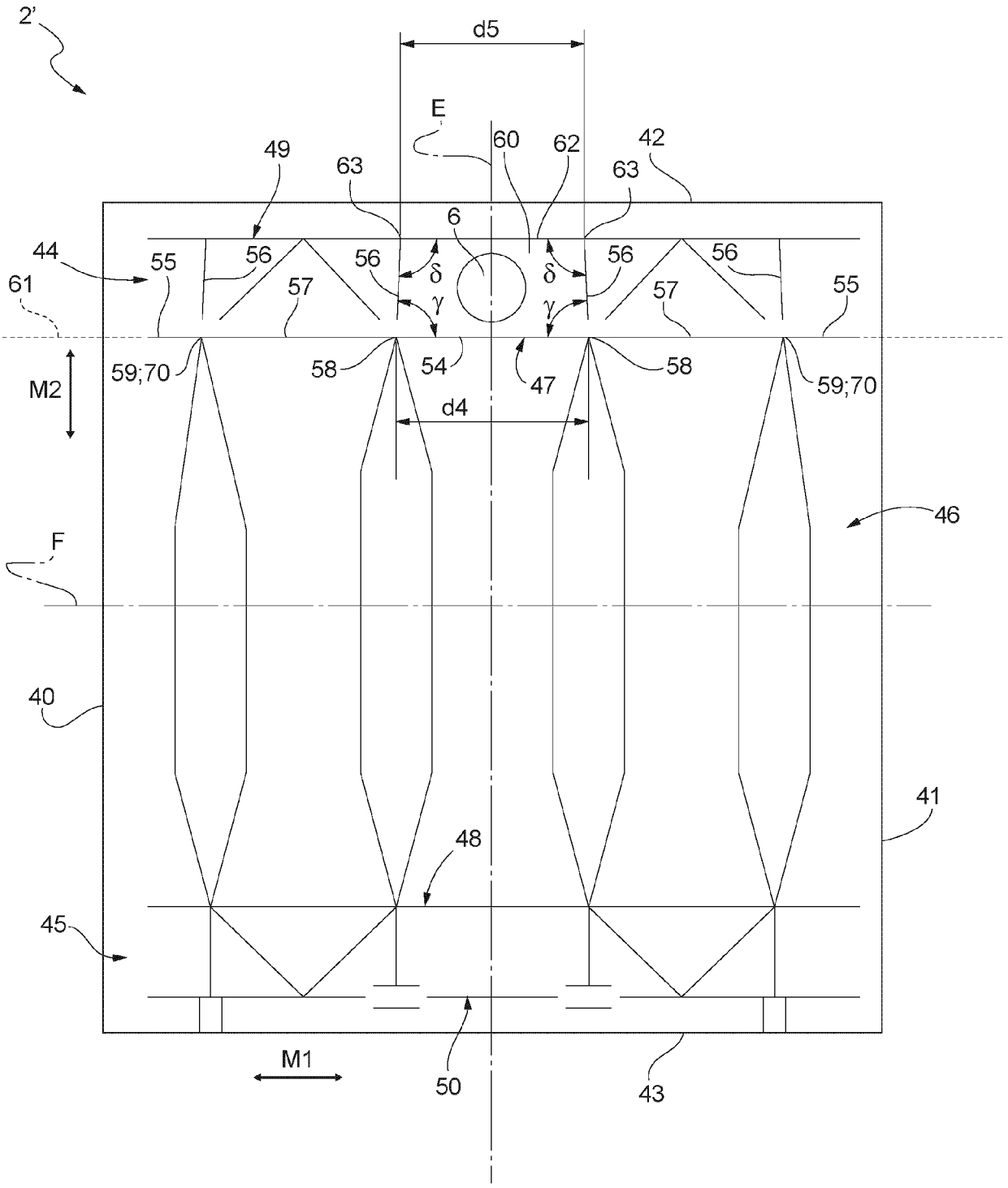
21

FIG. 6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63
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δ
γ
δ
γ
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57
55
61
59;70
58
54
47
58
59;70
M2
d4
46
F
40
41
48
45
M1
50
43

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EUROPEAN SEARCH REPORT

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Munich	24 March 2025	Leijten, René

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EUROPEAN SEARCH REPORT

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D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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