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

(57) There is described a packaging blank (2, 2', 2", 2‴) comprising an intermediate section having an intermediate crease pattern (47) interposed between a top crease pattern (44) and a bottom crease pattern (46) and being configured to define at least a side wall (5) of a package (1, 1', 1", 1‴). The intermediate crease pattern (47) comprises two pairs of front crease lines (52), each pair delimiting a respective front edge panel (53) and two pairs of back crease lines (54), each pair delimiting a respective back edge panel (55). Each pair of front crease lines (52) and/or their imaginary extensions intersect at a first front intersection point (58) and a second front intersection point (59) and each pair of back crease lines (54) and/or their imaginary extensions intersect at a first back intersection point (60) and a second back intersection point (61). The first front intersection points (58) define a first imaginary linear line (L1) and the first back intersection points (60) define a second imaginary linear line (L2). The first imaginary linear line (L1) is interposed between the second imaginary linear line (L2) and the top crease pattern (44).

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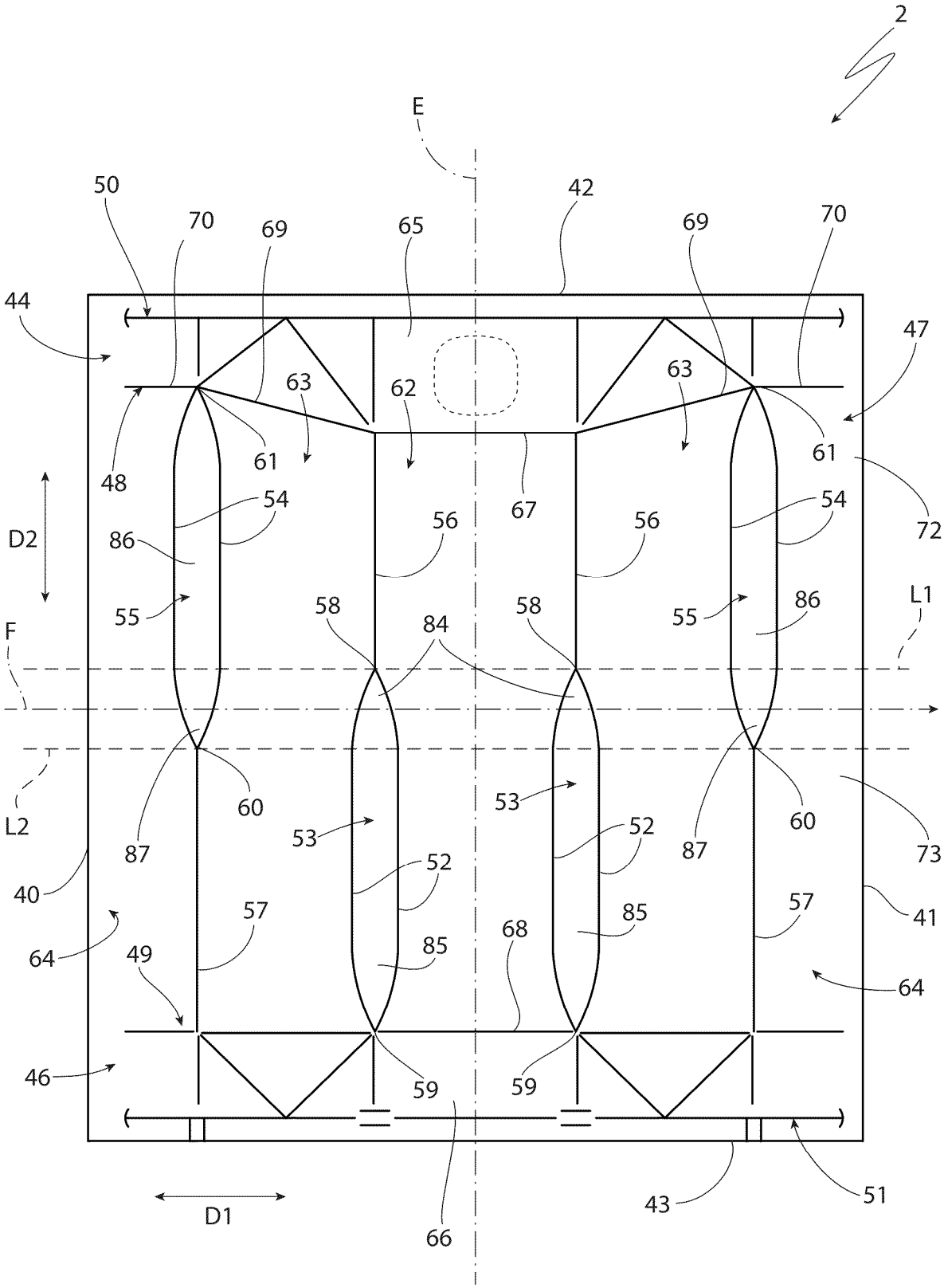
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FIG. 6

Description

TECHNICAL FIELD

[0001] The present invention relates to a packaging blank, in particular having a multilayer structure, for forming a package filled with a pourable product, in particular a pourable food product.

[0002] Advantageously, the present invention also relates to a package filled with a pourable product, in particular a pourable food product, and being formed from a packaging blank.

[0003] Moreover, the present invention also relates to a package filled with a pourable product, in particular 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 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.

[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 by 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] In order to facilitate the formation and for defining the shape of the packages, the packaging blanks are provided with a plurality of crease lines.

[0009] After formation of the packages, the packages travel on conveyors and need to undergo further manipulations, e.g. by means of robots, so as to e.g. pack the packages into carton boxes.

[0010] Even though the known packages provide for excellent results, a desire is felt in the sector, to further improve the known packages so as to improve the packing into boxes and/or the handling of the packages after their formation.

DISCLOSURE OF INVENTION

[0011] It is therefore an object of the present invention to provide an improved packaging blank.

[0012] It is another object of the present invention to provide an improved package formed from a packaging blank.

[0013] It is a further object of the present invention to provide an improved package.

[0014] According to the present invention, there is provided a packaging blank and a package according to the respective independent claims.

[0015] Preferred non-limiting embodiments of the packaging blank and the package are claimed in the respective dependent claims.

[0016] According to the present invention, there is also provided a package formed from a packaging blank according to claim 12.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Four non-limiting embodiments of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a package according to a first embodiment of the present invention;
Figure 2 is a side view of the package of Figure 1;
Figure 3 is a side view of two packages according to the present invention being placed adjacent to one another;
Figure 4 is a front view of the package of Figure 1;
Figure 5 is a back view of the package of Figure 1;
Figure 6 is a plan view of a packaging blank according to a first embodiment of the present invention;
Figure 7 is a plan view of a packaging blank according to a second embodiment of the present invention;
Figure 8 is a perspective view of a package according to a second embodiment of the present invention;
Figure 9 is a plan view of a packaging blank according to a third embodiment of the present invention;
Figure 10 is a perspective view of a package according to a third embodiment of the present invention
Figure 11 is a plan view of a packaging blank according to a fourth embodiment of the present invention; and
Figure 12 is a perspective view of a package according to a fourth embodiment of the present invention.

BEST MODES FOR CARRYING OUT THE INVENTION

[0018] The elements and features illustrated in the preferred embodiment, including drawings, may be com-

bined with each other without going beyond the scope of protection of this application as described below.

[0019] Number 1 in Figure 1 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.

[0020] Preferentially, package 1 is formed from a packaging blank 2 (see Figure 6).

[0021] Preferentially, each package 1 is formed from one respective packaging blank 2 by means of an automatic packaging machine.

[0022] 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.

[0023] Preferentially, packaging blanks 2 may have a multilayer structure.

[0024] 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, or another cellulose based substrate, and at least two layers of heat-seal plastic material, e.g. polyethylene, interposing the layer of fibrous material in between one another.

[0025] The at least two layers of heat-seal plastic material may comprise the same material or different materials, or different grades of the same material. The term "heat-seal" as used herein refers to the property of the layers of heat-seal plastic material that they are capable of forming a seal after the temporary application of heat to at least one of the layers of heat-seal plastic material.

[0026] 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.

[0027] Preferably but not necessarily, each packaging blank 2 may also comprise a layer of gas and/or water vapor and/or light barrier material, in particular being arranged between one of the layers of heat-seal plastic material and the layer of fibrous material.

[0028] Suitable materials for serving as the layer of gas and/or water vapour and/or light-barrier material include aluminium foil, paper materials and treated paper materials such as high-density or grease-proof 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.

[0029] 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/or water vapor and/or light barrier material and the layer of fibrous material.

[0030] According to some preferred non-limiting embodiments, packaging blanks 2 may be provided in the form of a web.

[0031] In more detail, the web may be formed from a plurality of successively arranged packaging blanks 2.

[0032] 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.

[0033] 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.

[0034] In particular, each packaging blank 2 may comprise a desired pattern/decoration.

[0035] With particular reference to Figure 1, 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.

[0036] Preferentially, 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.

[0037] In more detail, package 1 comprises a bottom wall 3 and a top wall 4 spaced apart from one another along longitudinal axis A. Additionally, package 1 comprises a side wall 5 interposed between (and connected to) bottom wall 3 and top wall 4.

[0038] In particular, bottom wall 3 is defined as the wall of package 1 that has a substantially planar shape and that is substantially perpendicular to longitudinal axis A. In particular, bottom wall 3 is 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.

[0039] 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.

[0040] Additionally, side wall 5 is the portion of package 1 that is gripped by a user during an outpouring action of the pourable product from package 1.

[0041] Moreover, top wall 4 may be provided with an opening device or may be configured so as to allow outpouring of the pourable product through a portion of top wall 4. In other words, top wall 4 may be defined as the portion of package 1 that can be manipulated such to allow outpouring of the pourable product. For example, top wall 4 may be manipulated so as to obtain a pouring opening or top wall 4 may comprise an opening device (e.g. a cap) that can be manipulated.

[0042] According to some preferred embodiments and as shown in Figure 2, top wall 4 may be inclined with respect to the respective longitudinal axis A and/or the respective bottom wall 3. More preferentially, top wall 4 may define a slanted top.

[0043] Alternatively, top wall 4 may be parallel to bottom wall 3.

[0044] In further detail, package 1 may comprise a longitudinal seam portion 6, e.g. resulting from forming packages 1 from a tube filled with the pourable product, the tube presenting a longitudinal seal. Preferentially, longitudinal seam portion 6 may be substantially parallel to longitudinal axis A.

[0045] Additionally, each package 1 may comprise a first transversal seal portion and a second transversal seal portion 7, preferentially being transversal to longitudinal axis A. Preferentially, first transversal seal portion may be comprised by and/or associated to bottom wall 3 and second transversal seal portion 7 may be comprised by and/or associated to top wall 4.

[0046] In further detail, side wall 5 comprises a front panel 8 and a back panel 9 opposite to front panel 8.

[0047] During an outpouring action, a hand of a user may contact back panel 9 (at least when considering the intended use of package 1).

[0048] Preferentially, back panel 9 may comprise longitudinal seam portion 6.

[0049] According to the example shown, back panel 9 may be longer than front panel 8 along longitudinal axis A. In other words, the extension of back panel 9 from bottom wall 3 to top wall 4 is larger than the extension of front panel 8 from bottom wall 3 to top wall 4. Alternatively, back panel 9 may be shorter than front panel 8 along longitudinal axis A or back panel 9 and front panel 8 may be equal in size along longitudinal axis A.

[0050] In more detail, top wall 4 may comprise a top front edge 10, a top back edge 11 opposed to top front edge 10 and two top lateral edges 12, each top lateral edge 12 being connected to top front edge 10 and top back edge 11 and being opposite to the other top lateral edge 12.

[0051] Additionally, bottom wall 3 may comprise a bottom front edge 13, a bottom back edge 14 opposite to bottom front edge 13 and two bottom lateral edges 15, each bottom lateral edge 15 being connected to bottom front edge 13 and bottom back edge 14 and being opposite to the other bottom lateral edge 15.

[0052] In further detail, front panel 8 may extend from top front edge 10 to bottom front edge 13 and back panel 9 may extend from top back edge 11 to bottom back edge 14.

[0053] With particular reference to Figures 1 to 5, top wall 4 comprises two top front corners 16 spaced apart from one another and two top back corners 17 spaced apart from one another and from top front corners 16. Additionally, top front edge 10 extends between top front corners 16, top back edge 11 extends between top back corners 17 and each top lateral edge 12 extends between one respective top front corner 16 and one respective top back corner 17.

[0054] Additionally, bottom wall 3 comprises two bottom front corners 18 spaced apart from one another and two bottom back corners 19 spaced apart from one another and from bottom front corners 18. Additionally, bottom front edge 13 extends between bottom front corners 18, bottom back edge 14 extends between bottom back corners 19 and each bottom lateral edge 15 extends between one respective bottom front corner 18 and one respective bottom back corner 19.

[0055] With particular reference to Figures 1 to 5, side wall 5 may also comprise two lateral panels 20 opposite to one another, each lateral panel 20 being connected to front panel 8 and back panel 9.

[0056] In more detail, each lateral panel 20 may extend from one respective top lateral edge 12 to one respective bottom lateral edge 15.

[0057] With particular reference to Figures 1 to 5, package 1 also comprises two front edge panels 21, each front edge panel 21 being delimited by a respective pair of front edge lines 22.

[0058] Package 1 also comprises two back edge panels 23, each back edge panel 23 being delimited by a respective pair of back edge lines 24.

[0059] In particular, each front edge panels 21 and each back edge panel 23 covers a respective surface area of side wall 5.

[0060] Moreover, each front edge panel 21 is interposed between front panel 8 and one respective lateral panel 20. More specifically, one respective front edge line 22 of each front edge panel 21 contacts front panel 8 and the other respective front edge line 22 contacts the respective lateral panel 20.

[0061] Additionally, each back edge panel 23 is interposed between back panel 9 and one respective lateral panel 20. More specifically, one respective back edge line 24 of each back edge panel 23 contacts back panel 9 and the other respective back edge line 24 contacts the respective lateral panel 20.

[0062] In further detail, package 1 also comprises two front edges 25, each front edge 25 extending between top wall 4, in particular top front edge 10, even more particular one respective top front corner 16, and one respective front edge panel 21.

[0063] Additionally, package 1 also comprises two back edges 26, each back edge 26 extending between bottom wall 3, in particular bottom back edge 14, even more particular one respective bottom back corner 19, and one respective back edge panel 23.

[0064] Furthermore, each pair of front edge lines 22 and/or their imaginary extensions intersect at a first front intersection point 27 and a second front intersection point 28, in particular spaced apart from one another along longitudinal axis A.

[0065] Each first front intersection point 27 is interposed between the respective second front intersection point 28 and top wall 4, in particular top front edge 10.

[0066] More specifically, each second front intersection point 28 coincides with one respective bottom front corner 18.

[0067] Additionally, each pair of back edge lines 24 and/or their imaginary extensions intersect at a first back intersection point 29 and a second back intersection point 30, in particular spaced apart from one another along

longitudinal axis A.

[0068] Each first back intersection point 29 is interposed between the respective second back intersection point 30 and bottom wall 3, in particular bottom back edge 14.

[0069] More specifically, each second back intersection point 30 coincides with one respective top back corner 17.

[0070] First front intersection points 27 define a first imaginary plane H1 perpendicular to longitudinal axis A and first back intersection points 29 define a second imaginary plane H2 perpendicular to longitudinal axis A.

[0071] First imaginary plane H1 is interposed between second imaginary plane H2 and top wall 4. Thus, first imaginary plane H1 is closer to top wall 4 than second imaginary plane H2. Moreover, first back intersection points 29 are closer to bottom wall 3 than first front intersection points 27.

[0072] The Applicant has observed that in this way, it is possible to improve both handling and packing of packages 1.

[0073] Additionally, stability of packages 1 is improved during handing and when placing packages 1 onto a support surface.

[0074] With particular reference to Figure 2, top front corners 16 and bottom front corners 18 define a first auxiliary imaginary plane H3 and top back corners 17 and bottom back corners 19 define a second auxiliary imaginary plane H4.

[0075] Additionally, front panel 8 comprises a front lower portion 31 laterally contacting front edge panels 21, and in particular also a front upper portion 32 being void of any lateral contact with front edge panels 21.

[0076] Advantageously, front lower portion 31 bulges away from and out of first auxiliary imaginary plane H3.

[0077] Additionally, a maximum distance of front lower portion 31 from first auxiliary imaginary plane H3 is larger than a maximum distance of front upper portion 32 from first auxiliary imaginary plane H3.

[0078] Advantageously, back panel 9 comprises a back upper portion 33 being in lateral contact with back edge panels 23, and in particular also a back lower portion 34 being void of any lateral contact with back edge panels 23.

[0079] Advantageously, back upper portion 33 bulges away from and out of second auxiliary imaginary plane H4.

[0080] Additionally, a maximum distance of back upper portion 33 from second auxiliary imaginary plane H4 is larger than a maximum distance of back lower portion 34 from second auxiliary imaginary plane H4.

[0081] With reference to Figure 3, each front lower portion 31 and each back upper portion 33 define respective projecting portions 74 defining at the same time recesses 75. In particular, package 1 comprises two projecting portions 74 and two recesses 75. More in particular, projecting portions 74 are diagonally opposite and recesses 75 are diagonally opposite.

[0082] In this way, it is possible to "interlock" packages 2. This is, when arranging packages on e.g. a pallet, or in a carton box, projecting portions 74 mate with respective recesses 75.

[0083] This allows e.g. to obtain an increased pallet efficiency, i.e. a higher number of packages 1 can be packaged on a pallet compared to the known solutions and when compared to different types of known packages having the same volume.

[0084] With particular reference to Figure 2, package 1 comprises a first half portion 76 and a second half portion 77.

[0085] In particular, first half portion 76 comprises top wall 4 and second half portion 77 comprises bottom wall 3.

[0086] Additionally, first half portion 76 and second half portion 77 are defined with respect to an intersection plane parallel to bottom wall 3 and/or perpendicular to longitudinal axis A.

[0087] In particular, the intersection plane is interposed between first imaginary plane H1 and second imaginary plane H2. More in particular, the distance between the intersection plane and first imaginary plane H1 equals the distance between the intersection plane and second imaginary plane H2.

[0088] Additionally, each front edge panel 21 and each back edge panel 23 have portions arranged within first half portion 76 and portions arranged within second half portion 77.

[0089] More specifically, each front edge panel 21 consists of a first portion 80 and a second portion 81 and each back edge panel 23 consists of a third portion 82 and a fourth portion 83.

[0090] Each first portion 80 and each third portion 82 extend within first half portion 76 and each second portion 81 and each fourth portion 83 extend within second half portion 77.

[0091] Advantageously, the respective extension (i.e. dimension) of each first portion 80 along longitudinal axis A is smaller than the respective extension (i.e. dimension) of the respective second portion 81 along longitudinal axis A.

[0092] Additionally, the respective extension (i.e. dimension) of each third portion 82 along longitudinal axis A is larger than the respective extension (i.e. dimension) of the respective fourth portion 83 along longitudinal axis A.

[0093] In further detail and with reference to Figures 1 to 4, each front edge panel 21 is symmetric with respect to a respective symmetry plane perpendicular to front edge panel 21 and intersecting the respective first front intersection point 27 and the respective second front intersection point 28 and/or each back edge panel 23 is symmetric with respect to a respective symmetry plane perpendicular to back edge panel 23 and intersecting the respective first back intersection point 29 and the respective second back intersection point 30.

[0094] Advantageously, a respective shape of each

back edge panel 23 equals and/or is specular to a respective shape of the other back edge panel 23 and/or a respective shape of each front edge panel 21 equals and/or is specular to a respective shape of the other front edge panel 21.

[0095] Additionally, the respective shapes of back edge panels 23 equal and/or are specular to the respective shapes of front edge panels 21.

[0096] Advantageously, each front edge line 22 and/or each back edge line 24 is curved.

[0097] Advantageously, each front edge 25 and/or each back edge 26 is rectilinear.

[0098] Packaging blank 2 of Figure 6 is designed for forming package 1.

[0099] In more detail, each 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 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 direction D2 parallel to longitudinal axis E and/or transversal, preferentially perpendicular, to first direction D1 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. dimensions) along longitudinal axis E and transversal axis F.

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

[0105] Additionally, first direction D1 may be parallel to transversal axis F.

[0106] Additionally, second direction D2 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 6, each packaging blank 2 may comprise a top section having a top crease pattern 44 configured to define the shape of at least part of top wall 4.

[0113] In further detail, top crease pattern 44 may be configured to define top wall 4 and flaps 45 attached to top wall 4.

[0114] Preferentially, packaging blank 2 may also comprise a bottom section having a bottom crease pattern 46 configured to define the shape of at least part of bottom wall 3.

[0115] In further detail, bottom crease pattern 46 may be configured to define bottom wall 3 and flaps (not shown) attached to bottom wall 3.

[0116] Additionally, packaging blank 2 also comprises an intermediate section having an intermediate crease pattern 47 interposed between top crease pattern 44 and bottom crease pattern 46 and being configured to define at least part of side wall 5, in particular to define the specific design of side wall 5.

[0117] It should be noted that top crease pattern 44, bottom crease pattern 46 and intermediate crease pattern 47 may define respective sections of top wall 4, bottom wall 3 and side wall 5.

[0118] With particular reference to Figure 6, top crease

pattern 44 comprises at least a first transversal crease line 48 extending transversally to longitudinal axis E.

[0119] Additionally, bottom crease pattern 46 comprises at least a second transversal crease line 49 extending transversally to longitudinal axis E.

[0120] Moreover, first transversal crease line 48 and second transversal crease line 49 are spaced apart from one another along second direction D2.

[0121] More specifically, first transversal crease line 48 and second transversal crease line 49 delimit together the intermediate section.

[0122] In further detail, top crease pattern 44 may comprise a third transversal crease line 50 spaced apart from first transversal crease line 48 and interposed between first transversal boundary edge 42 and first transversal crease line 48.

[0123] Additionally, bottom crease pattern 46 may comprise a fourth transversal crease line 51 spaced apart from second transversal crease line 49 and interposed between second transversal boundary edge 43 and second transversal crease line 49.

[0124] With particular reference to Figure 6, intermediate crease pattern 47 comprises:

- two pairs of front crease lines 52, each pair of front crease lines 52 delimiting a respective front edge panel 53; and
- two pairs of back crease lines 54, each pair of back crease lines 54 delimiting a respective back edge panel 55;
- two front edge crease lines 56, each front edge crease line 56 extending between first transversal crease line 48 and one respective front edge panel 53; and
- two back edge crease lines 57, each back edge crease line 57 extending between the second transversal crease line 49 and one respective back edge panel 55.

[0125] In particular, front crease lines 52, front edge panels 53, back crease lines 54, back edge panels 55, front edge crease lines 56 and back edge crease lines 57 define, respectively, respective front edge lines 22, front edge panels 21, back edge lines 24, back edge panels 23, front edges 25 and back edges 26 of package 1.

[0126] In more detail, front edge panels 53 are interposed between back edge panels 55.

[0127] Advantageously, each pair of front crease lines 52 and/or their imaginary extensions intersect at a first front intersection point 58 and a second front intersection point 59. Each first front intersection point 58 is interposed between the respective second front intersection point 59 and first transversal crease line 48.

[0128] Additionally, each pair of back crease lines 54 and/or their imaginary extensions intersect at a first back intersection point 60 and a second back intersection point 61. Each first back intersection point 60 is interposed between the respective second back intersection point 61 and second transversal crease line 49.

[0129] Moreover, first front intersection points 58 define a first imaginary linear line L1 and first back intersection points 60 define a second imaginary linear line L2. In particular first imaginary linear line L1 is parallel to second imaginary linear line L2.

[0130] First imaginary linear line L1 is interposed between second imaginary linear line L2 and first transversal crease line 48. Thus, first imaginary linear line L1 is closer to first transversal crease line 48 than second imaginary linear line L2. Moreover, first back intersection points 60 are closer to second transversal crease line 49 than first front intersection points 58.

[0131] First front intersection points 58, second front intersection points 59, first back intersection points 60 and second back intersection points 61 define, respectively, respective first front intersection points 27, second front intersection points 28, first back intersection points 29 and second back intersection points 30 of package 1.

[0132] More specifically, each second front intersection point 59 corresponds to and/or coincides with a point of second transversal crease line 49 and/or each second back intersection point 61 corresponds to and/or coincides with a point of first transversal cease line 48.

[0133] In further detail, each back edge panel 55 is symmetric with respect to a respective symmetry axis intersecting the respective first back intersection point 60 and the respective second back intersection point 61 and/or each front edge panel 53 is symmetric with respect to a respective symmetry axis intersecting the respective first front intersection point 58 and the respective second front intersection point 59.

[0134] Advantageously, a respective shape of each back edge panel 55 equals and/or is specular to a respective shape of the other back edge panel 55 and/or a respective shape of each front edge panel 53 equals and/or is specular to a respective shape of the other front edge panel 53.

[0135] Additionally, the respective shapes of back edge panels 55 equal and/or are specular to the respective shapes of front edge panels 53.

[0136] Advantageously, each front crease line 52 and/or each front crease line 54 is curved.

[0137] Each front edge crease line 56 may be curved and/or each back edge crease line 57 may be curved and/or each front edge crease line 56 may be rectilinear and/or each back edge crease line 57 may be rectilinear.

[0138] It should be noted that each front edge crease line 56 and/or each back edge crease line 57 may have also different and more complex shapes.

[0139] In further detail, the intermediate section comprises:

- an intermediate main panel 62 designed to form front panel 8 of package 1 (eventually formed from packaging blank 1);
- two lateral panels 63 designed to form respective lateral panels 20 of (eventually formed) package 1

and interposing intermediate main panel 62 between one another; and

- two auxiliary back panels 64 designed to form in combination with one another back panel 9 of (eventually formed) package 1 and interposing lateral panels between one another.

[0140] Advantageously, one front crease line 52 of each pair of front crease lines 52 defines, or delimits, intermediate main panel 62 and the other front crease line 52 of the corresponding pair of front crease lines 52 defines, or delimits, one respective lateral panel 63 and/or one back crease line 54 of each pair of back crease lines 54 defines, or delimits, one respective lateral panel 63 and the other back crease line 54 of the corresponding pair of back crease lines 54 defines, or delimits, one respective auxiliary back panel 64.

[0141] With particular reference to Figure 6, packaging blank 2 comprises a first half portion 72 and a second half portion 73.

[0142] In particular, first half portion 72 comprises the top section and second half portion 73 comprises the bottom section.

[0143] Additionally, first half portion 72 and second half portion 73 are defined with respect to an intersection line parallel to first transversal boundary edge 42 and/or second transversal boundary edge 43 and/or perpendicular to longitudinal axis E.

[0144] In particular, the intersection line is interposed between first imaginary linear line L1 and second imaginary linear line L2. More in particular, the distance between the intersection line and first imaginary linear line L1 equals the distance between the intersection line and second imaginary linear line L2.

[0145] In further detail, an extension (i.e. dimension or size) of first half portion 72 along longitudinal axis E equals an extension (i.e. dimension or size) of second half portion 73 along longitudinal axis E.

[0146] Additionally, each front edge panel 53 and each back edge panel 54 have portions arranged within first half portion 72 and portions arranged within second half portion 73.

[0147] More specifically, each front edge panel 53 consists of a first portion 84 and a second portion 85 and each back edge panel 55 consists of a third portion 86 and a fourth portion 87.

[0148] Each first portion 84 and each third portion 86 extend within first half portion 72 and each second portion 85 and each fourth portion 87 extend within second half portion 73.

[0149] Advantageously, the respective extension (i.e. dimension) of each first portion 84 along longitudinal axis E is smaller than the respective extension (i.e. dimension) of the respective second portion 85 along longitudinal axis E.

[0150] Additionally, the respective extension (i.e. dimension) of each third portion 86 along longitudinal axis E is larger than the respective extension (i.e. dimension) of the respective fourth portion 87 along longitudinal axis E.

[0151] With particular reference to Figure 6, the top section comprises a top main panel 65 configured to define at least a portion of top wall 4.

[0152] Preferentially, the bottom section comprises a bottom main panel 66 configured to define at least a portion of bottom wall 3.

[0153] Preferentially, top main panel 65 and bottom main panel 66 may be centered with respect to first longitudinal boundary edge 40 and second longitudinal boundary edge 41.

[0154] More specifically, first transversal crease line 48 comprises a first section 67, preferentially having a linear shape, delimiting top main panel 65. In particular, first section 67 may define top front edge 10 after formation of package 1; in other words, top front edge 10 is formed by first section 67.

[0155] Preferentially, first section 67 may be parallel to first transversal boundary edge 42 and second transversal boundary edge 43 and/or first section 67 may be perpendicular to first longitudinal boundary edge 40 and second longitudinal boundary edge 41.

[0156] Additionally, second transversal crease line 49 comprises a second section 68 delimiting bottom main panel 66. In particular, second section 68 may define bottom front edge 13 after formation of package 1; in other words, bottom front edge 13 is formed by second section 68.

[0157] In further detail, first transversal crease line 48 also comprises two intermediate sections 69 interposing first section 67 between one another and configured to define top lateral edges 12. In the example shown, intermediate sections 69 are inclined with respect to first section 67 and/or first transversal boundary edge 42 and second transversal boundary edge 43. Alternatively, intermediate sections 69 could be parallel to first section 67 and/or first transversal boundary edge 42 and second transversal boundary edge 43.

[0158] Finally, first transversal crease line 48 also comprises two end sections 70 interposing intermediate sections 69 between one another.

[0159] With reference to Figure 7, 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.

[0160] Packaging blank 2' is designed to allow for the formation of package 1' as shown in Figure 8.

[0161] Packaging blank 2' differs from packaging blank 2 in further comprising a plurality of, in particular two, side crease lines 71.

[0162] Additionally, packaging blank 2' also differs from packaging blank 2 in further comprising a plurality of, in particular two, first additional crease lines 92 and a plurality of, in particular two, second additional crease

lines 93.

[0163] In more detail, each first additional crease line 92 is interposed between one respective pair of front crease lines 52.

[0164] Additionally, each first additional crease line 92 extends between one respective first front intersection point 58 and one respective second front intersection point 59.

[0165] More specifically, each first additional crease line 92 and/or its imaginary extension intersects with the respective first front intersection point 58 and the respective second front intersection point 59.

[0166] Even more specifically, each first additional crease line 92 extends from the respective first front intersection point 58 to the respective second front intersection point 59.

[0167] Advantageously, each first additional crease line 92 has a linear shape.

[0168] In further detail, each second additional crease line 93 is interposed between one respective pair of back crease lines 54.

[0169] Additionally, each second additional crease line 93 extends between one respective first back intersection point 60 and one respective second back intersection point 61.

[0170] More specifically, each second additional crease line 93 and/or its imaginary extension intersects with the respective first back intersection point 60 and the respective second back intersection point 61.

[0171] Even more specifically, each second additional crease line 93 extends from the respective first back intersection point 60 to the respective second back intersection point 61.

[0172] Advantageously, each second additional crease line 93 has a linear shape.

[0173] By also having first additional crease lines 92 and second additional crease lines 93 it is possible to obtain different kinds of packages. For example, it is possible to fold packaging blank 2' along front crease lines 52 or first additional crease lines 92. Additionally, it is possible to fold packaging blank 2' along back crease lines 54 or second additional crease lines 93.

[0174] With particular reference to Figure 7, each side crease line 71 and/or its imaginary extension intersects with one respective first front intersection point 58 and with one respective first back intersection point 60.

[0175] Advantageously, each side crease line 71 extends from the respective first front intersection point 58 to the respective first back intersection point 60.

[0176] Advantageously, each side crease line 71 has a linear shape.

[0177] The Applicant has found that side crease lines 71 allow to increase stability of package 1' formed from packaging blank 2'.

[0178] With reference to Figure 8, 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.

[0179] Package 1' differs from package 1 in further comprising a plurality of, in particular two, side lines 35.

[0180] Package 1' also differs from package 1 in further comprising a plurality of, in particular two, first additional edge lines 36 and a plurality of, in particular two, second additional edge lines (not shown).

[0181] In more detail, each first additional edge line 36 is interposed between one respective pair of front edge lines 22.

[0182] More specifically, each first additional edge line 36 extends between one respective first front intersection point 27 and one respective second front intersection point 28.

[0183] Even more specifically, each first additional edge line 36 and/or its imaginary extension intersects the respective first front intersection point 27 and the respective second front intersection point 28.

[0184] Advantageously, each first additional edge line 36 extends from the respective first front intersection point 27 to the respective second front intersection point 28.

[0185] Advantageously, each first additional edge line 36 has a linear shape.

[0186] In more detail, each second additional edge line is interposed between one respective pair of back edge lines 24.

[0187] More specifically, each second additional edge line extends between one respective first back intersection point 29 and one respective second back intersection point 30.

[0188] Even more specifically, each second additional edge line and/or its imaginary extension intersects with the respective first back intersection point 29 and with the respective second back intersection point 30.

[0189] Advantageously, each second additional edge line extends from the respective first back intersection point 29 to the respective second back intersection point 30.

[0190] Advantageously, each second additional edge line has a linear shape.

[0191] With particular reference to Figure 8, each side line 35 and/or its imaginary extension intersects with one respective first front intersection point 27 and with one respective first back intersection point 29.

[0192] Preferentially, each side line 35 extends from the respective first front intersection point 27 to the respective first back intersection point 29.

[0193] Advantageously, each side line 35 has a linear shape.

[0194] With reference to Figure 9, 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.

[0195] Packaging blank 2" differs from packaging blank 2' in not comprising side crease lines 71.

[0196] With reference to Figure 10, 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.

[0197] Package 1" differs from package 1' in not comprising side lines 35.

[0198] With reference to Figure 11, 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.

[0199] Packaging blank 2‴ differs from packaging blank 2' in not comprising first additional crease lines 92 and second additional crease lines 93.

[0200] With reference to Figure 12, 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.

[0201] Package 1‴ differs from package 1' in not comprising first additional edge lines 36 and the second additional edge lines.

[0202] The advantages of packaging blank 2, 2', 2" and 2'" and package 1, 1', 1" and 1‴ according to the present invention will be clear from the foregoing description.

[0203] In particular, the Applicant has observed that it is possible to obtain packages 1, 1', 1'' and 1‴, which show an improved stability during packaging handling (e.g. during transport) and an improved pallet efficiency, in particular due to the "interlocking" capability.

[0204] Clearly, changes may be made to packaging blanks 2, 2', 2", 2‴ and packages 1, 1', 1". 1‴ as described herein without, however, departing from the scope of protection as defined in the accompanying claims.

Claims

1. Packaging blank (2, 2', 2", 2‴) for forming a package (1, 1', 1", 1‴) filled with a pourable product comprising:

    - a top section having a top crease pattern (44) and being configured to form at least part of a top wall (4) of the package (1, 1', 1", 1‴);
    - a bottom section having a bottom crease pattern (46), the bottom section being spaced apart from the top section along a direction (D2) parallel to a longitudinal axis (E) of the packaging blank (2, 2', 2'', 2‴) and being configured to form at least part of a bottom wall (3) of the package (1, 1', 1", 1‴); and
    - an intermediate section having an intermediate crease pattern (47) interposed between the top crease pattern (44) and the bottom crease pattern (46) and being configured to define at least part of a side wall (5) of the package (1, 1', 1", 1‴);

    wherein the top crease pattern (44) comprises at least a first transversal crease line (48) extending transversally to the longitudinal axis (E) and the bottom crease pattern (46) comprises at least a second transversal crease line (49) extending transversally to the longitudinal axis (E);
    wherein the intermediate crease pattern (47) comprises:

        - two pairs of front crease lines (52), each pair of front crease lines (52) delimiting a respective front edge panel (53); and
        - two pairs of back crease lines (54), each pair of back crease lines (54) delimiting a respective back edge panel (55);
        - two front edge crease lines (56), each front edge crease line (56) extending between the first transversal crease line (48) and one respective front edge panel (53); and
        - two back edge crease lines (57), each back edge crease line (57) extending between the second transversal crease line (49) and one respective back edge panel (55);

    wherein the front edge panels (53) are interposed between the back edge panels (55);
    wherein each pair of front crease lines (52) and/or their imaginary extensions intersect at a first front intersection point (58) and a second front intersection point (59); wherein each first front intersection point (58) is interposed between the respective second front intersection (59) point and the first transversal crease line (48);
    wherein each pair of back crease lines (54) and/or their imaginary extensions intersect at a first back intersection point (60) and a second back intersection point (61); wherein each first back intersection point (60) is interposed between the respective second back intersection point (61) and the second transversal crease line (49);
    wherein the first front intersection points

(58) define a first imaginary linear line (L1) and the first back intersection points (60) define a second imaginary linear line (L2); wherein the first imaginary linear line (L1) is interposed between the second imaginary linear line (L2) and the first transversal crease line (48).

2. Packaging blank according to claim 1, wherein a respective shape of each back edge panel (55) equals and/or is specular to a respective shape of the other back edge panel (55); and/or a respective shape of each front edge panel (53) equals and/or is specular to a respective shape of the other front edge panel (53).

3. Packaging blank according to claim 1 or 2, wherein respective shapes of the back edge panels (55) equal and/or are specular to respective shapes of the front edge panels (53).

4. Packaging blank according to any one of the preceding claims, wherein each front crease line (52) is curved and/or each back crease line (54) is curved; and/or wherein each front edge crease line (56) has a rectilinear shape and/or each back edge crease line (57) has a rectilinear shape.

5. Packaging blank according to any one of the preceding claims, wherein the intermediate section comprises:

- an intermediate main panel (62) designed to form a front panel (8) of the package (1, 1', 1", 1‴);
- two lateral panels (63) designed to form respective lateral panels (20) of the package (1, 1', 1", 1‴) and interposing the intermediate main panel (62) between one another; and
- two auxiliary back panels (64) designed to form in combination with one another a respective back panel (9) of the package (1, 1', 1", 1‴) and interposing the lateral panels (63) between one another;

wherein one front crease line (52) of each pair of front crease lines (52) defines, or delimits, the intermediate main panel (62) and the other front crease line (52) of the pair of front crease lines (52) defines, or delimits, one respective lateral panel (63); wherein one back crease line (54) of each pair of back crease lines (54) defines, or delimits, one respective lateral panel (63) and the other back crease line (54) of the pair of back crease lines (54) defines, or delimits, one respective auxiliary back panel (64).

6. Packaging blank according to any one of the preceding claims, wherein each second front intersection point (59) corresponds to and/or coincides with a point of the second transversal crease line (49) and/or wherein each second back intersection point (61) corresponds to and/or coincides with a point of the first transversal crease line (48).

7. Packaging blank according to any one of the preceding claims, and further comprising a first half portion (72) and a second half portion (73), wherein the first half portion (72) and the second half portion (73) are defined with respect to an intersection line perpendicular to the longitudinal axis (E), the intersection line being interposed between the first imaginary linear line (L1) and the second imaginary linear line (L2);
wherein each front edge panel (53) and each back edge panel (54) have portions arranged within the first half portion (72) and portions arranged within the second half portion (73).

8. Packaging blank according to any one of the preceding claims, and further comprising a plurality of side crease lines (71);
wherein each side crease line and/or its imaginary extension intersects with one respective first front intersection point (58) and with one respective first back intersection point (60).

9. Packaging blank according to claim 8, wherein each side crease line (71) has a linear shape and extends from the respective first front intersection point (58) to the respective first back intersection point (60).

10. Packaging blank according to any one of the preceding claims, and further comprising a plurality of first additional crease lines (92), each first additional crease line (92) being interposed between one respective pair of front crease lines (52) and a plurality of second additional crease lines (93), each second additional crease line (93) being interposed between one respective pair of back crease lines (54).

11. Packaging blank according to claim 10, wherein each first additional crease line (92) extends between one respective first front intersection point (58) and one respective second front intersection point (59); and wherein each second additional crease line (93) extends between one respective first back intersection point (60) and one respective second back intersection point (61).

12. Package (1, 1', 1". 1‴) filled with a pourable product formed from a packaging blank (2, 2', 2", 2‴) according to any one of the preceding claims.

13. Package (1, 1', 1", 1‴) filled with a pourable product

and formed from a multilayer packaging material;

the package (1, 1', 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', 1", 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 the front panel (8) and two lateral panels (20), each lateral panel (20) being interposed between the front panel (8) and the back panel (9);
wherein the package (1, 1', 1", 1‴) also comprises two front edge panels (21), each front edge panel (21) being delimited by a respective pair of front edge lines (22); and two back edge panels (23), each back edge panel (23) being delimited by a respective pair of back edge lines (24);
wherein the package (1, 1', 1", 1‴) also comprises two front edges (25), each front edge (25) extending between the top wall (4) and one respective front edge panel (21); and two back edges (26), each back edge (26) extending between the bottom wall (3) and one respective back edge panel (23);
wherein each pair of front edge lines (22) and/or their imaginary extensions intersect at a first front intersection point (27) and a second front intersection point (28); wherein each first front intersection point (27) is interposed between the respective second front intersection point (28) and the top wall (4);
wherein each pair of back edge lines (24) and/or their imaginary extensions intersect at a first back intersection point (29) and a second back intersection point (30); wherein each first back intersection point (29) is interposed between the respective second back intersection point (30) and the bottom wall (3);
wherein the first front intersection points (27) define a first imaginary plane (H1) perpendicular to the longitudinal axis (A) and the first back intersection points (29) define a second imaginary plane (H2) perpendicular to the longitudinal axis (A);
wherein the first imaginary plane (H1) is interposed between the second imaginary plane (H2) and the top wall (4).

14. Package according to claim 13, wherein the top panel (4) comprises a pair of top front corners (16) and the bottom panel (3) comprises a pair of bottom front corners (18);

wherein the top front corners (16) and the bottom front corners (18) define a first auxiliary imaginary plane (H3) and the top back corners (17) and the bottom back corners (19) define a second auxiliary imaginary plane (H4);
wherein the front panel (8) comprises a front lower portion (31) laterally contacting the front edge panels (21) and bulging away from and out of the first auxiliary imaginary plane (H3) and/or wherein the back panel (9) comprises a back upper portion (33) laterally contacting the back edge panels (23) and bulging away from and out of the second auxiliary imaginary plane (H4).

15. Package according to claim 14, wherein the front panel (8) further comprises a front upper portion (32) being void of any lateral contact with the front edge panels (21) and the back panel (9) comprises a back lower portion (34) being void of any lateral contact with the back edge panels (23);
wherein a maximum distance of the front lower portion (31) from the first auxiliary imaginary plane (H3) is larger than a maximum distance of the front upper portion (32) from the first auxiliary imaginary plane (H3) and/or a maximum distance of the back upper portion (33) from the second auxiliary imaginary plane (H4) is larger than a maximum distance of the back lower portion (34) from the second auxiliary imaginary plane (H4).

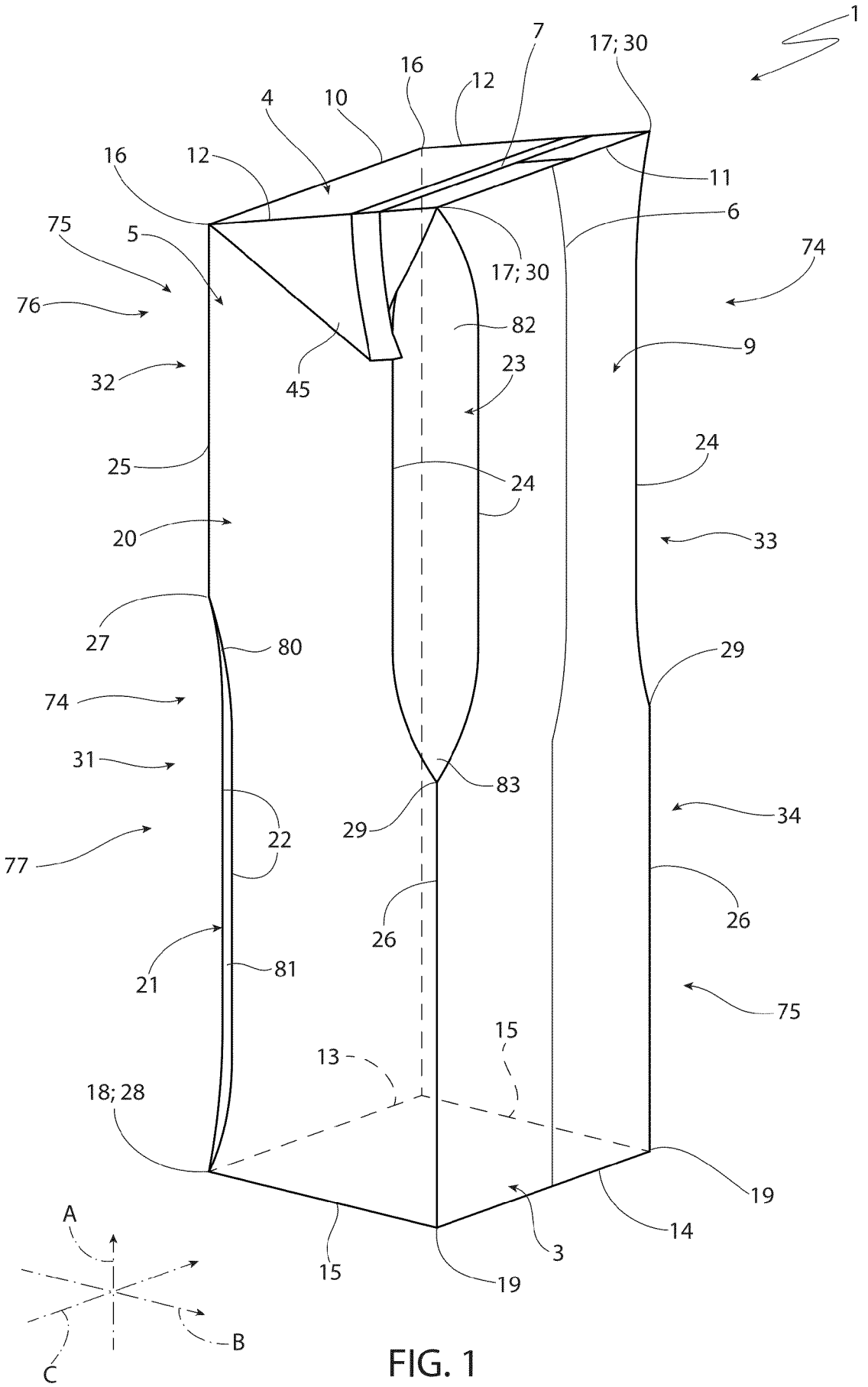
16. Package according to any one of claims 13 to 15, wherein a respective shape of each back edge panel (23) equals and/or is specular to a respective shape of the other back edge panel (23); and/or a respective shape of each front edge panel (21) equals and/or is specular to a respective shape of the other front edge panel (21); and/or respective shapes of the back edge panels (23) equal and/or are specular to respective shapes of the front edge panels (21).

17. Package according to any one of claims 13 to 16, and further comprising a plurality of side lines (35);
wherein each side line (35) and/or its imaginary extension intersects with one respective first front intersection point (27) and with one respective first back intersection point (28).

18. Package according to claim 17, wherein each side line (35) has a linear shape and extends from the respective first front intersection point (27) to the respective first back intersection point (28).

19. Package according to any one of claims 13 to 18, and further comprising a plurality of first additional edge lines (36), each first additional edge line (36) being interposed between one respective pair of front edge lines (22) and a plurality of second additional crease lines, each second additional crease line being interposed between one respective pair of back edge lines (24).

20. Package according to claim 19, wherein each first additional crease line (36) extends between one respective first front intersection point (27) and one respective second front intersection point (28); and wherein each second additional crease line extends between one respective first back intersection point (29) and one respective second back intersection point (30).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23
24
25
24
20
33
27
80
29
74
31
83
34
29
22
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18; 28
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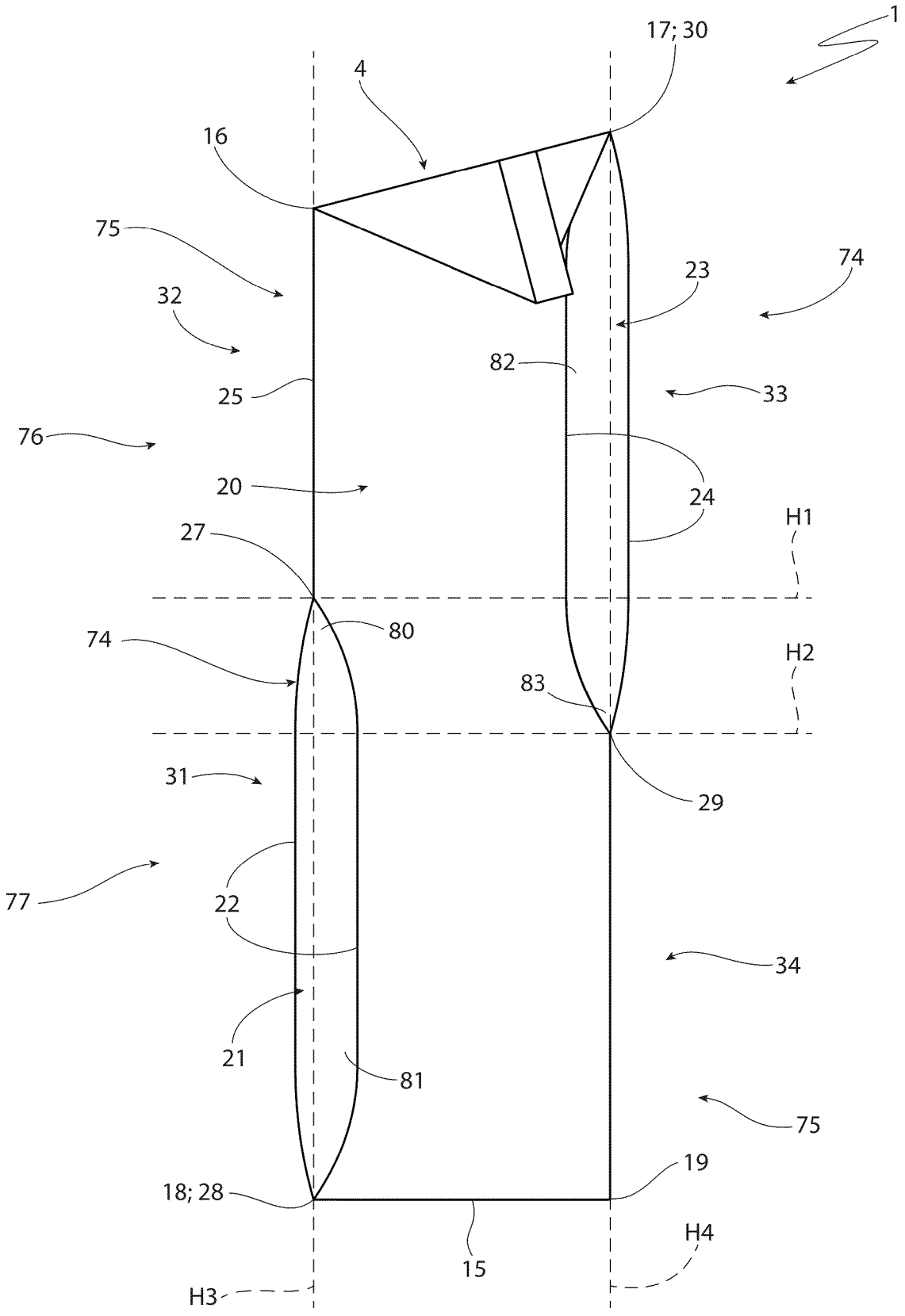
19
A
B
C

FIG. 1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76
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H1
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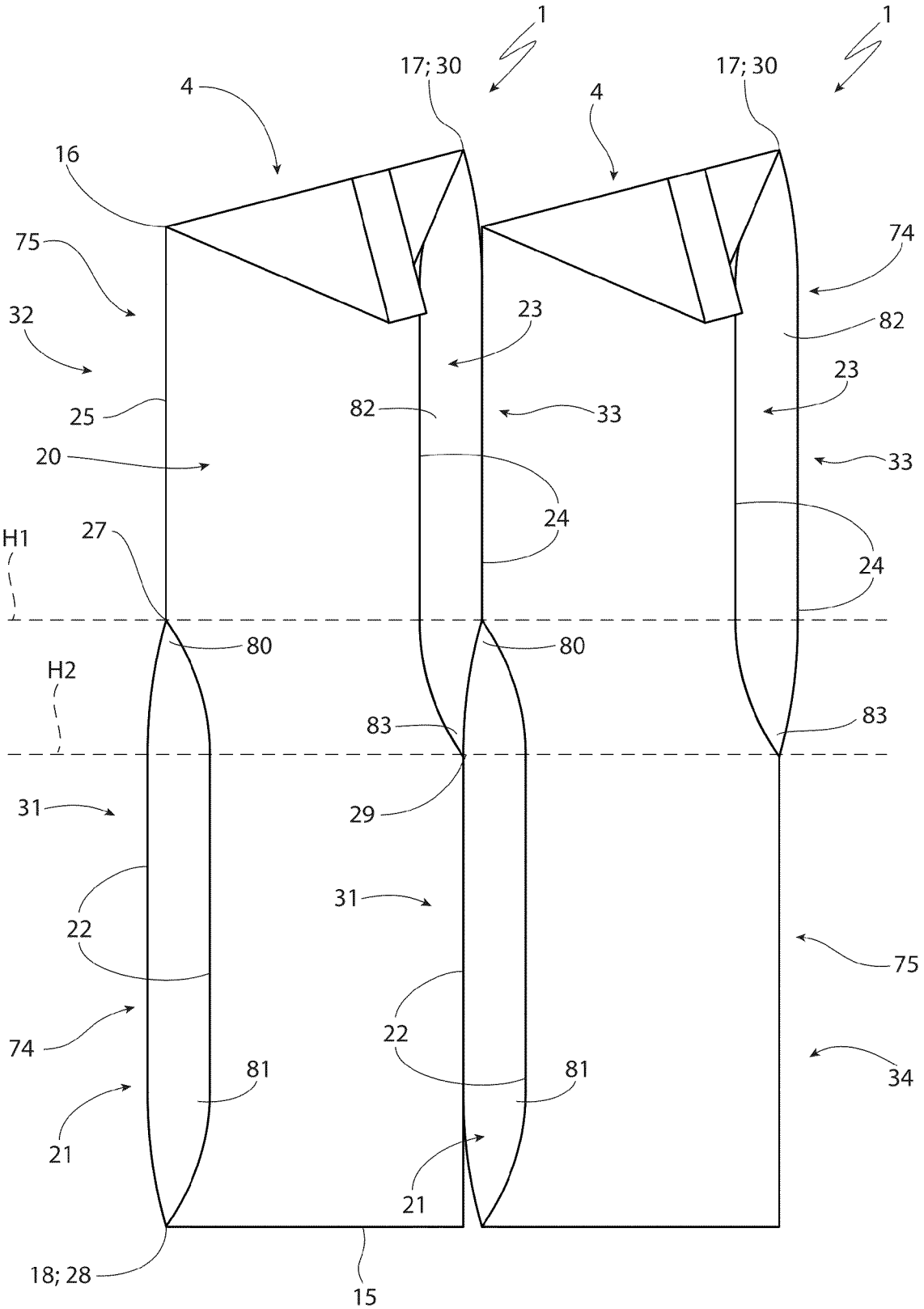
81
75
19
18; 28
H4
15
H3

FIG. 2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17; 30
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16
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32
25
20
H1
27
80
H2
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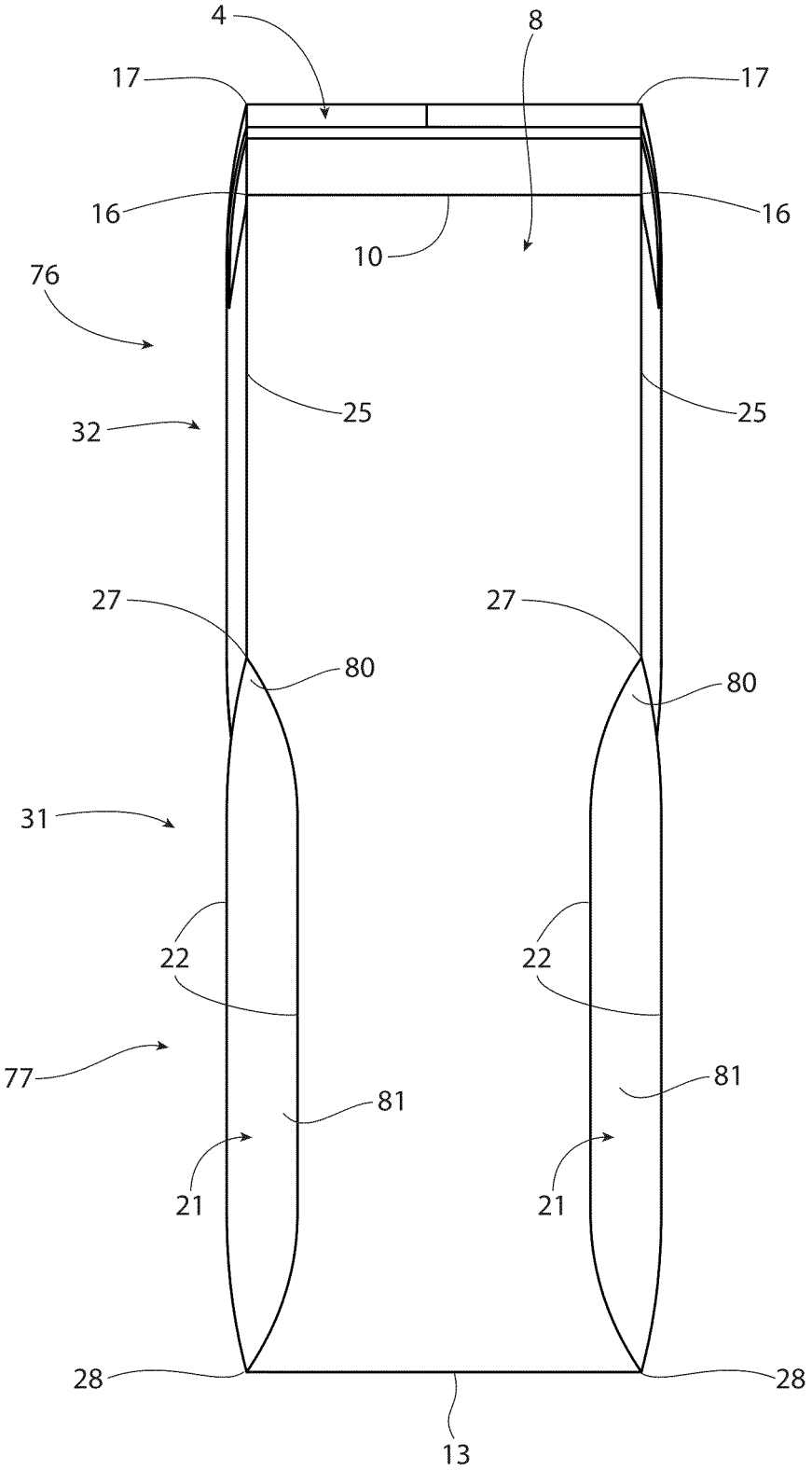
81
21
18; 28
15
29
83
24
33
23
82
34

FIG. 3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10
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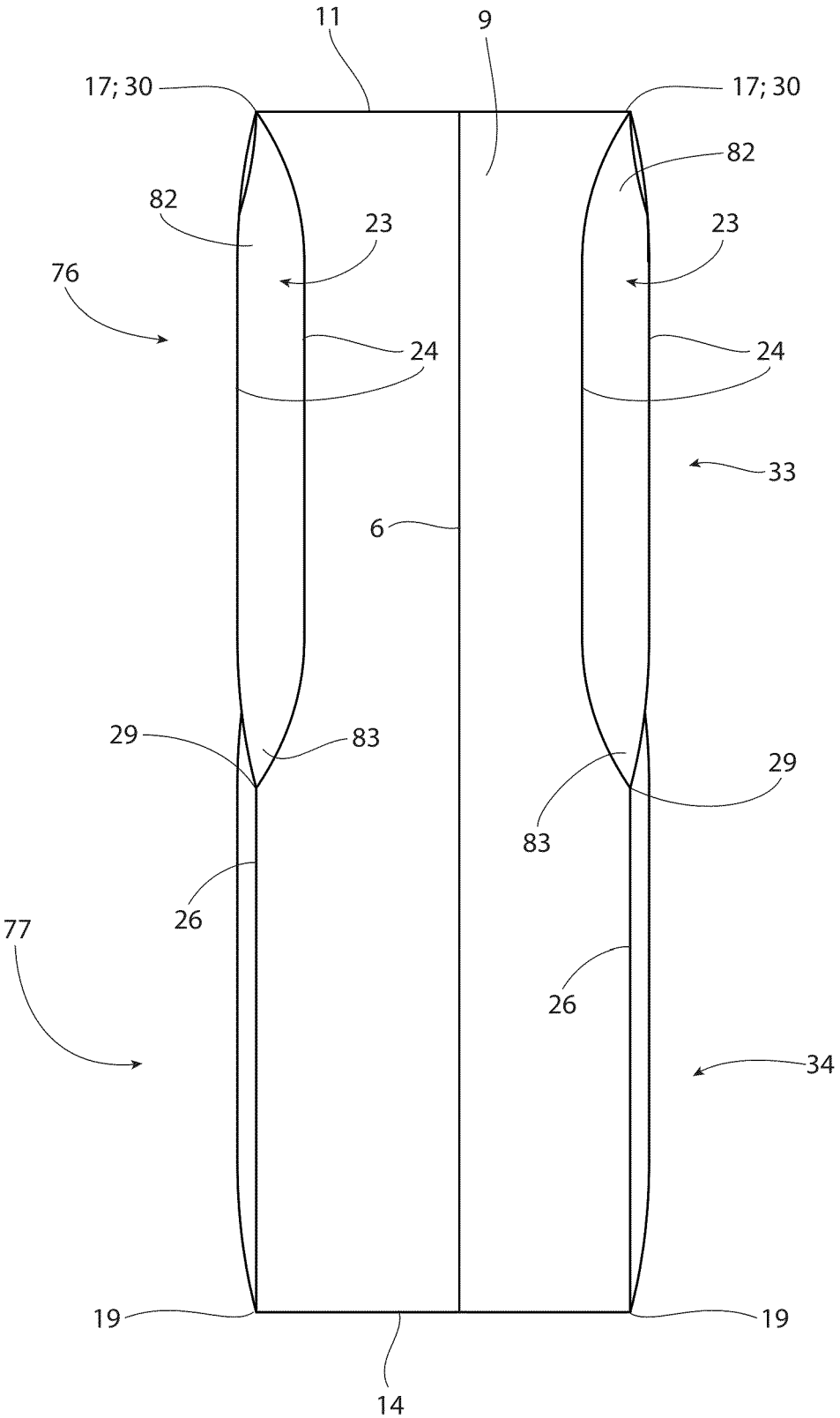
21
21
28
28
13

FIG. 4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9
17; 30
17; 30
82
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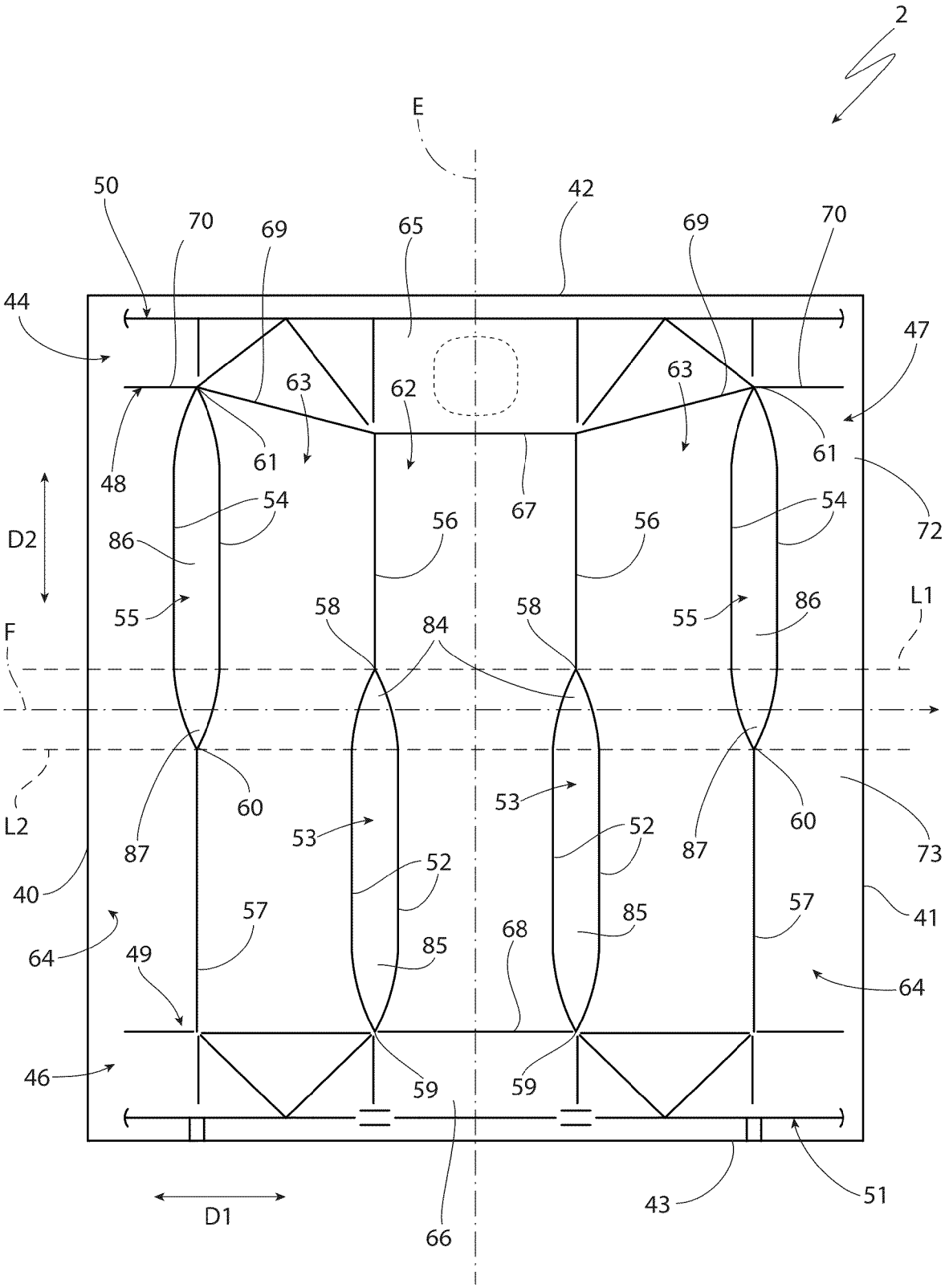
34
19
19
14

FIG. 5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E
50
70
69
65
42
69
70
44
47
63
62
63
61
61
48
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54
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D2
86
56
56
86
55
58
84
58
55
L1
F
L2
60
60
87
87
53
53
52
52
73
40
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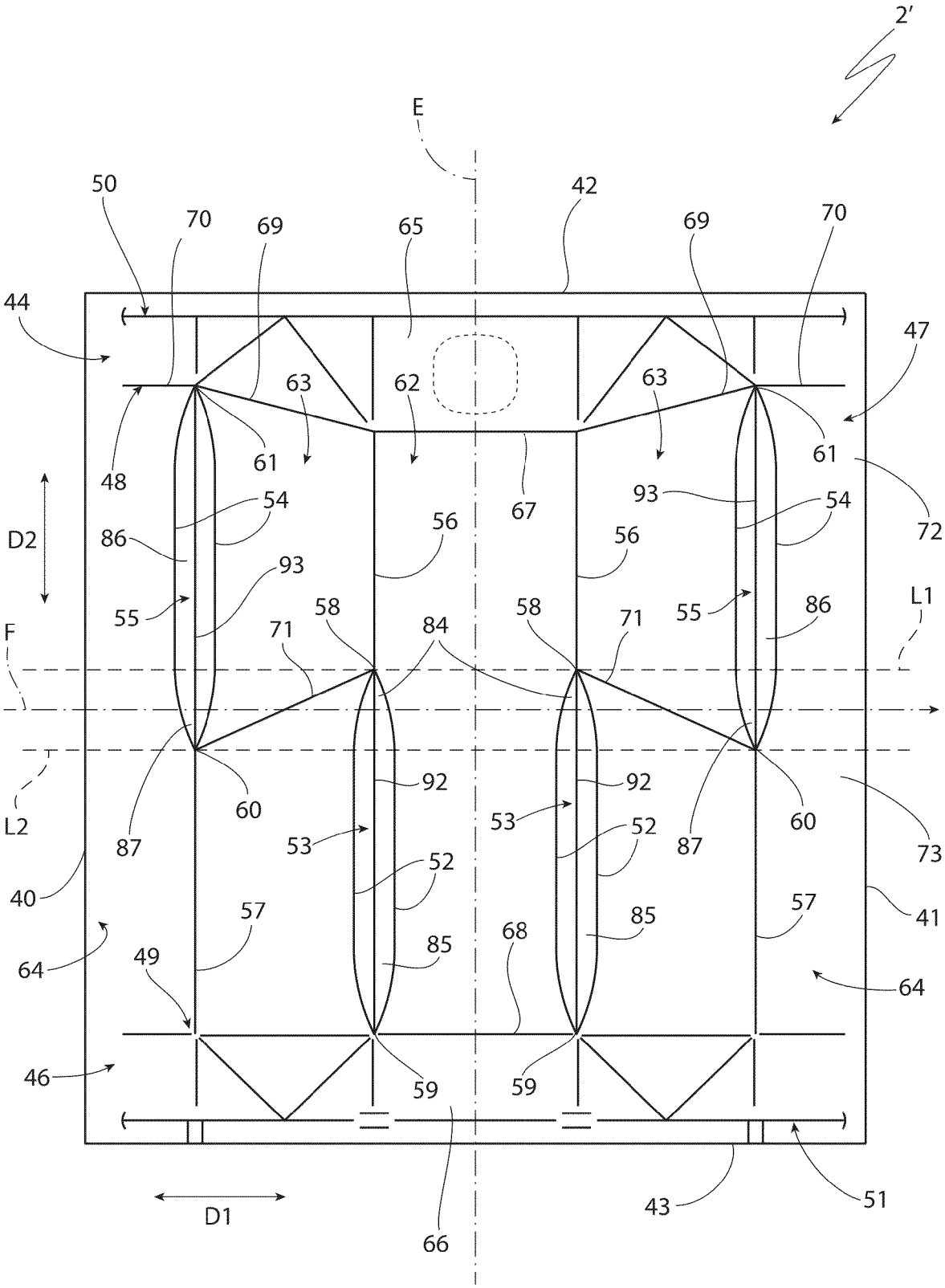
68
85
57
41
64
49
64
46
59
59
43
51
D1
66

FIG. 6


2'
E
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70
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65
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69
70
44
47
63
62
63
48
61
61
72
67
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54
86
56
56
D2
93
55
58
58
55
86
L1
F
71
84
71
L2
92
92
60
60
87
53
53
87
52
52
73
40
57
57
41
85
68
85
64
49
64
46
59
59
43
51
D1
66

FIG. 7

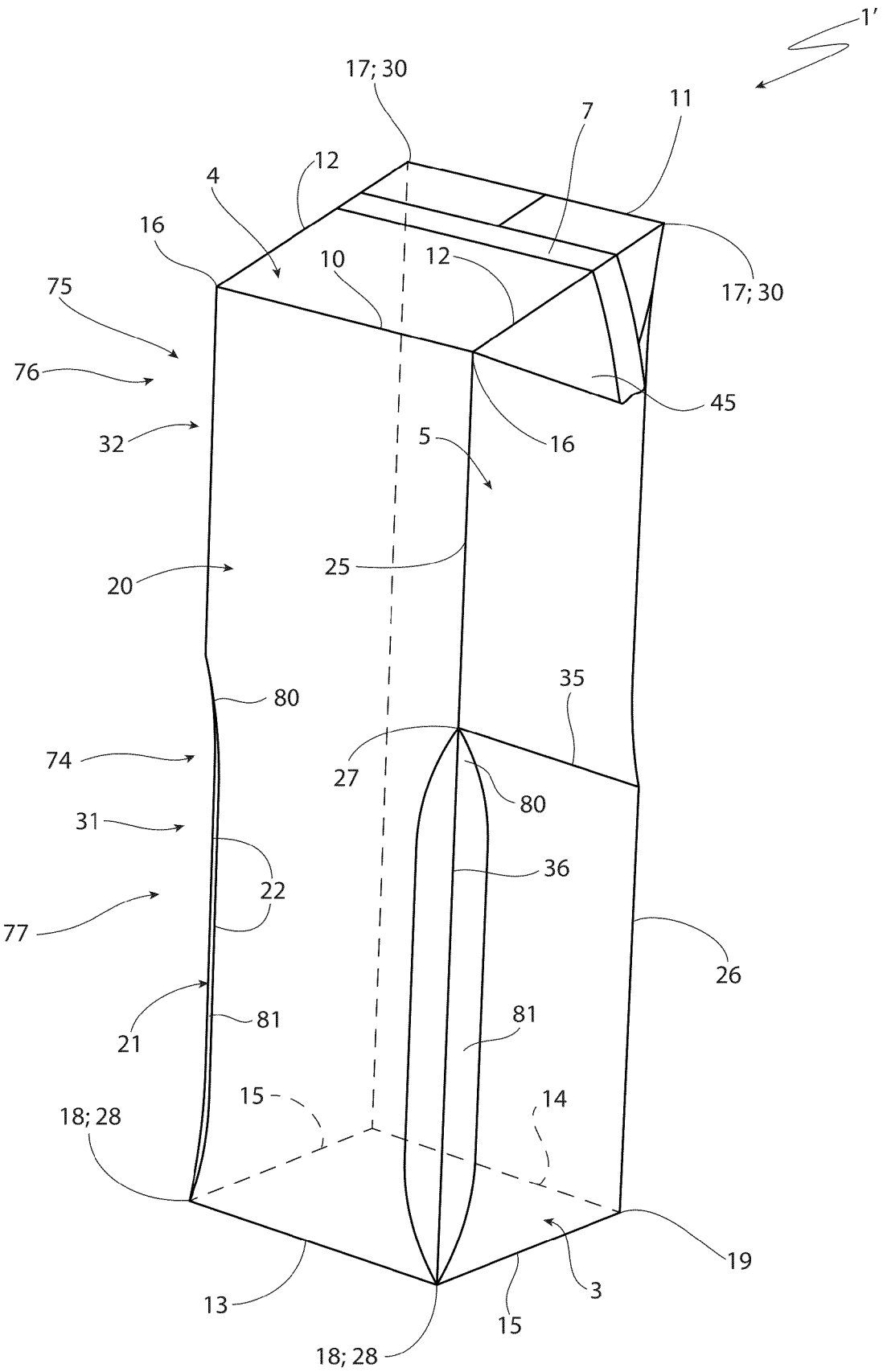
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FIG. 8

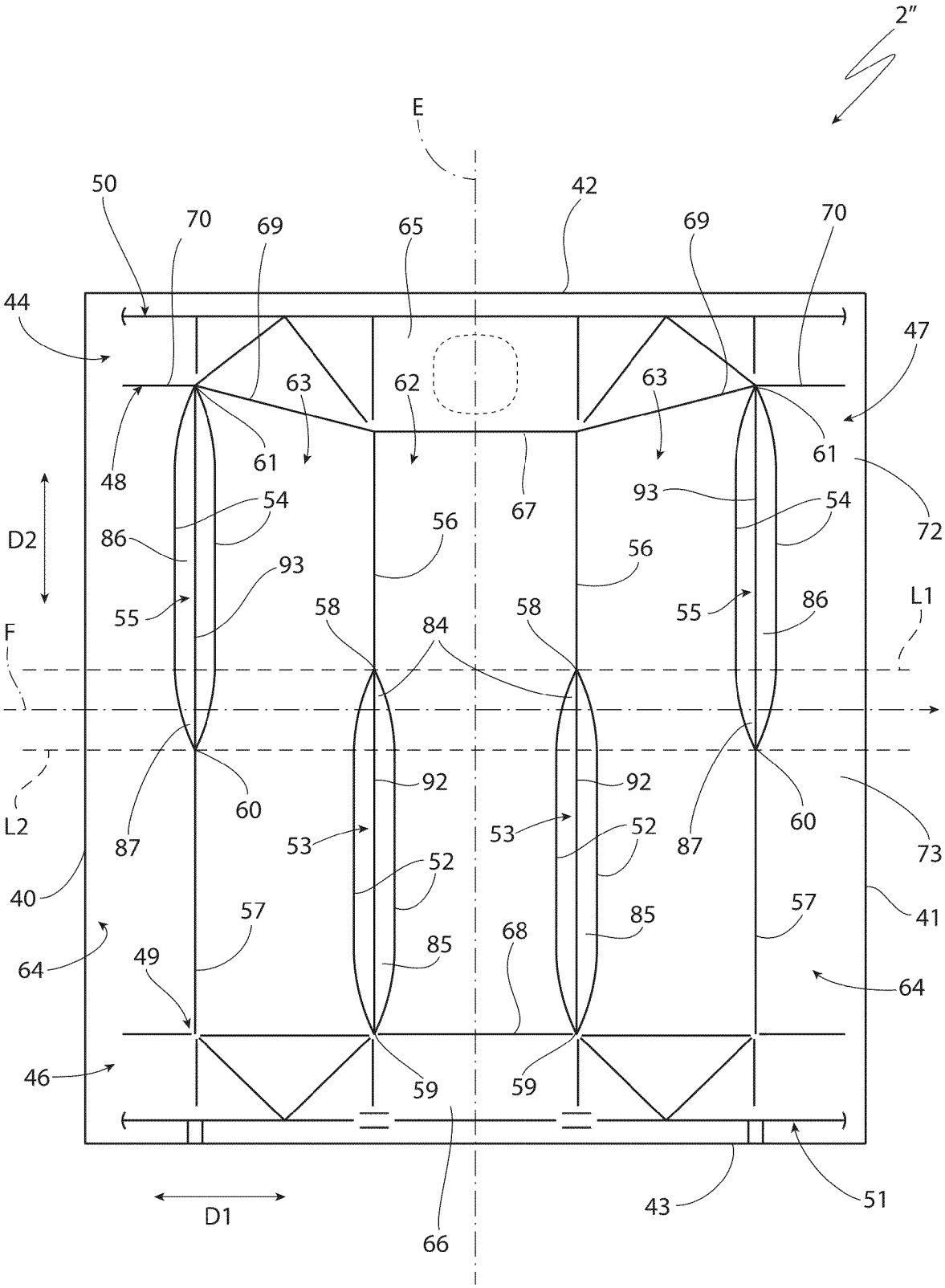
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FIG. 9

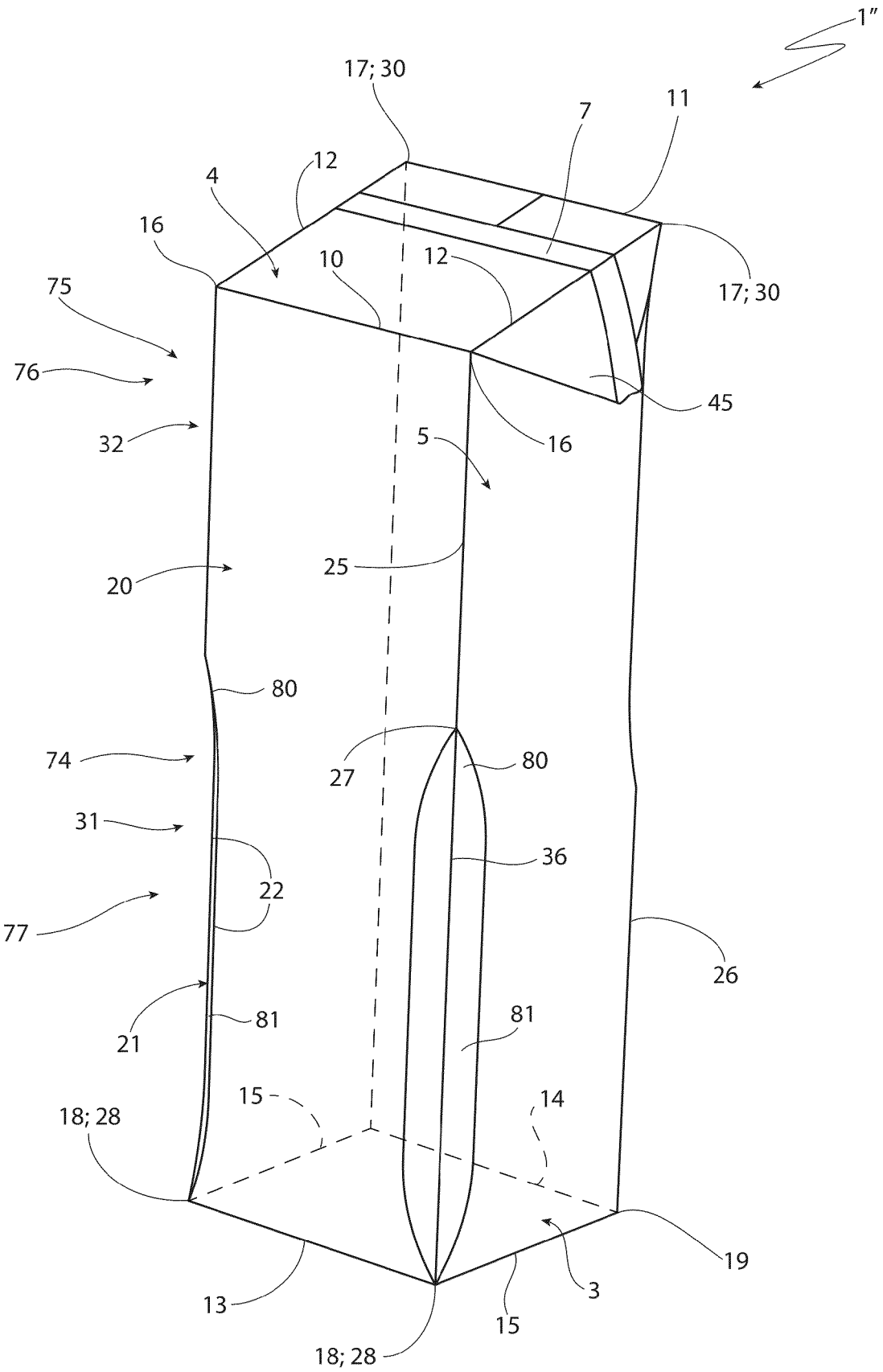
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FIG. 10

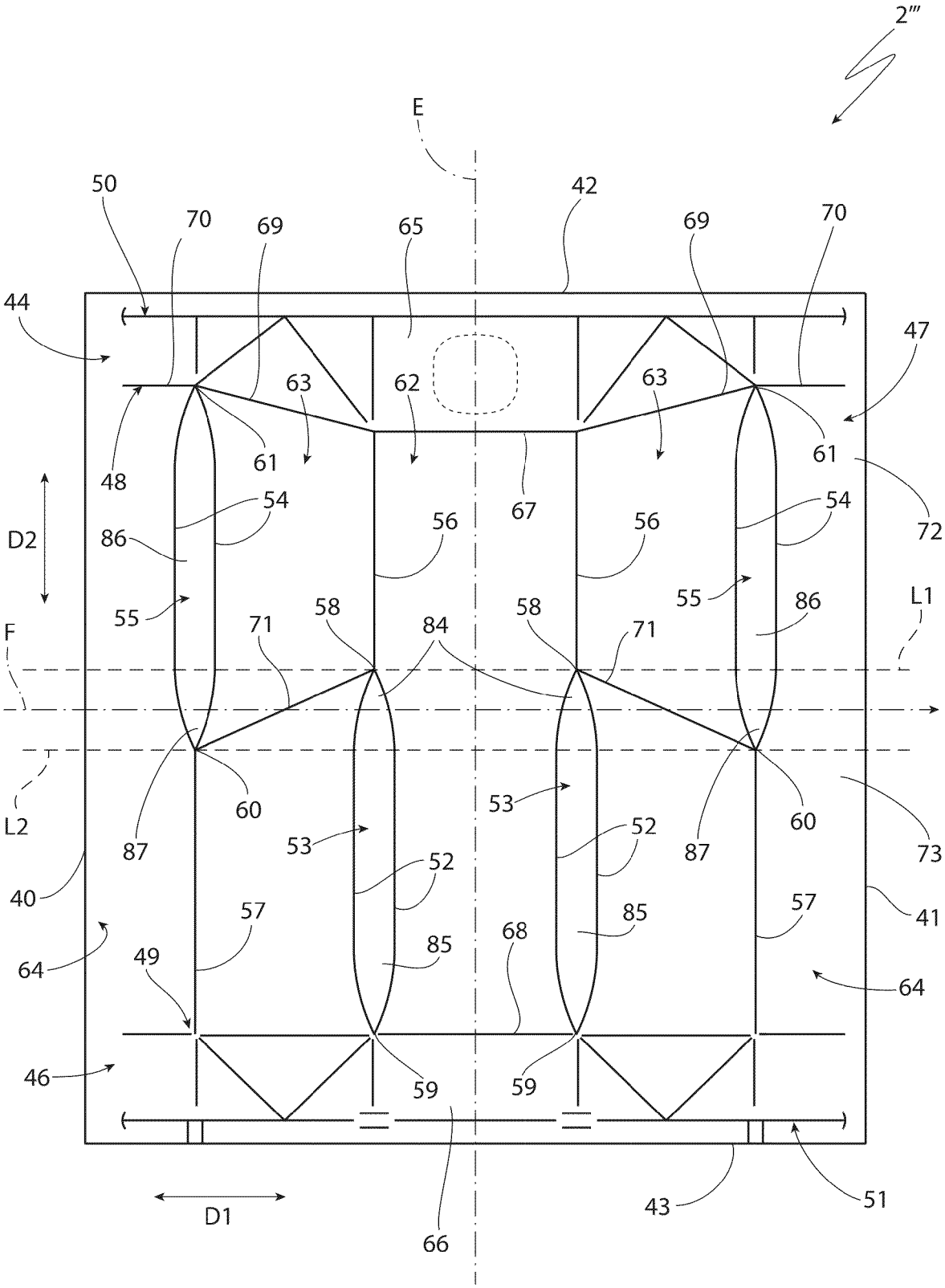
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FIG. 11

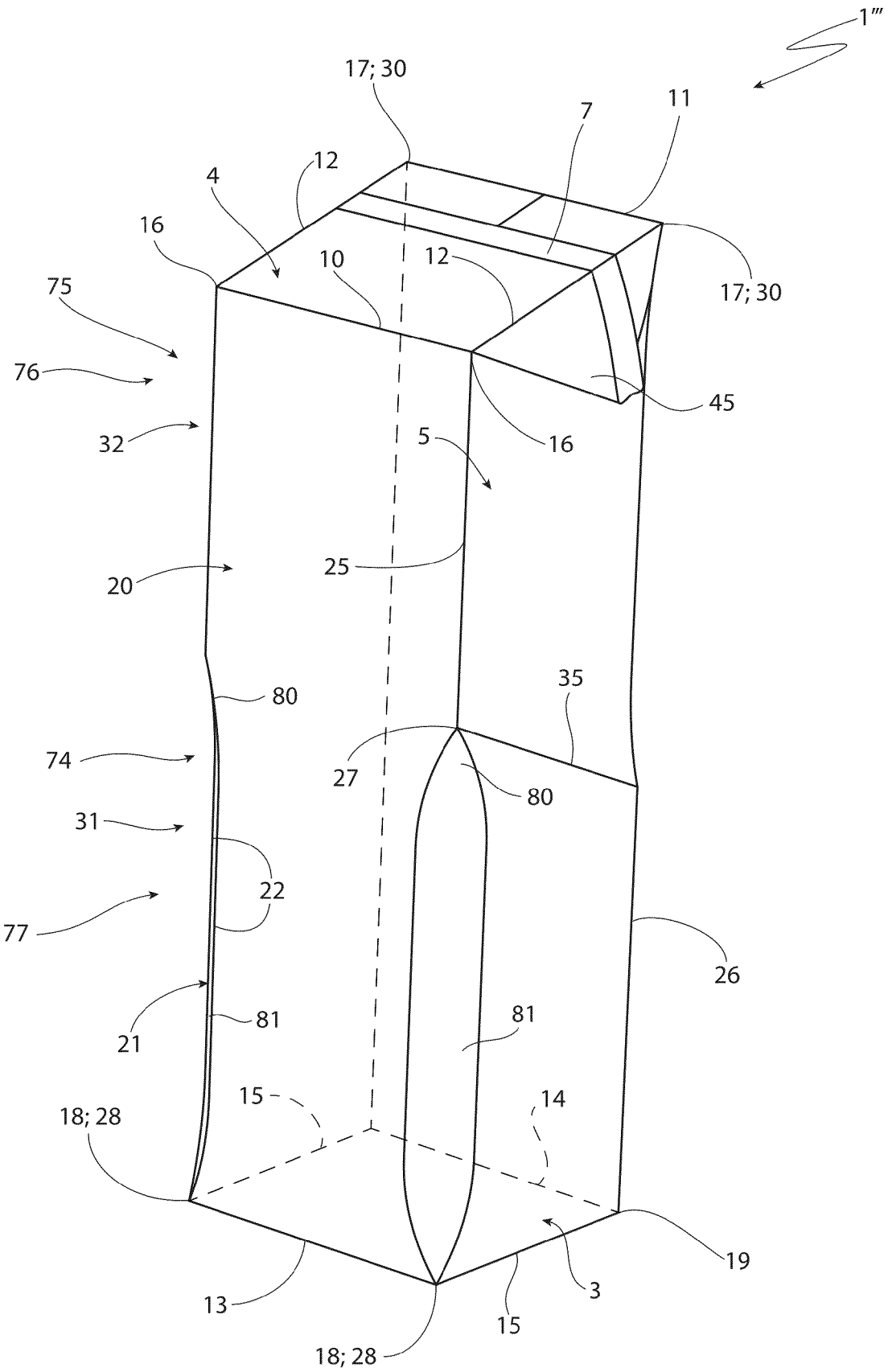
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FIG. 12

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EUROPEAN SEARCH REPORT

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 January 2026	Wimmer, Martin

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