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

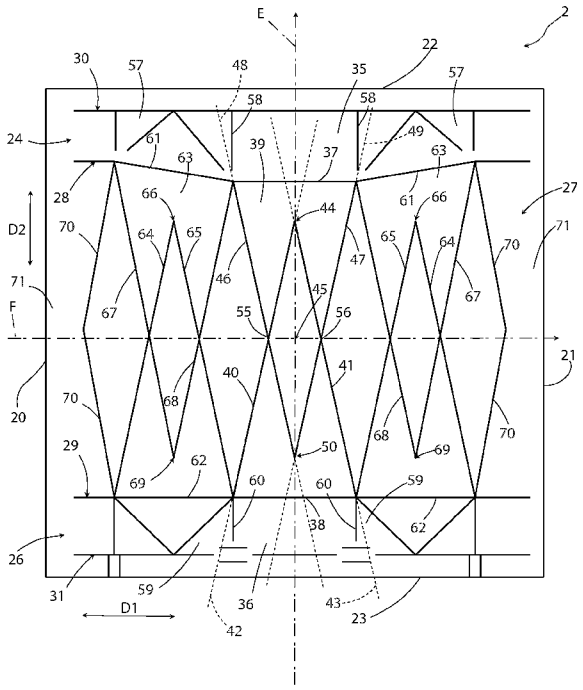

FIG.1

(57) **Abstract:** There are described a packaging blank (2; 2'; 2"; 2"') and a package (1; 1") comprising at least a first crease line (40) and a second crease line (41) converging towards one another A first imaginary line (42) comprises the first crease line (40) and a second imaginary line (43) comprises the second crease line (41), the first imaginary line (42) and the second imaginary line (43) intersecting at a respective top intersection point (44). The top intersection point (44) is distanced from a first section (37) of a transversal crease line (28) when considering the packaging blank (2, 2') or a top front edge (8) when considering the package (1; 1").

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PACKAGING BLANK FOR FORMING A PACKAGE, PACKAGE FORMED FROM A PACKAGING BLANK AND PACKAGE

TECHNICAL FIELD

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.

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.

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

BACKGROUND ART

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.

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.

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 form of a web, which is formed from a plurality of successively arranged packaging blanks.

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.

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.

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. 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. Other packages have a top wall being parallel to the bottom wall.

The crease lines may define the desired specific shapes of the packages. For example, there are known packages that are provided with a front panel having a top edge and a bottom edge, and four crease lines on the front panel, the four crease lines defining a rhombus. The top vertex and the bottom vertex of the rhombus lie on the top edge and the bottom edge of the front panel, respectively.

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

DISCLOSURE OF INVENTION

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

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

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

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

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

According to the present invention, there is also provided a package formed from a packaging blank according to claim 8.

BRIEF DESCRIPTION OF THE DRAWINGS

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 plan view of a packaging blank according to a first embodiment of the present invention;

Figure 2 is a perspective view of a package filled with a pourable product and being formed from the packaging blank of Figure 1;

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

Figure 4 is a plan view of a packaging blank according to a second embodiment of the present invention;

Figure 5 is a plan view of a packaging blank according to a third embodiment of the present invention;

Figure 6 is a perspective view of a package filled with a pourable product and formed from the packaging blank of Figure 5; and

Figure 7 is a plan view of a packaging blank according to a fourth embodiment of the present invention.

BEST MODES FOR CARRYING OUT THE INVENTION

Number 1 in Figure 2 indicates a package filled with a pourable product, preferentially a pourable food product, such as pasteurized milk, milk, milk-products, drinking

yoghurt, yoghurt-drinks, beverages, fruit juice, wine, tomato sauce, salt, sugar, etc.

Preferentially, package 1 may be formed from a packaging blank 2 (see Figure 1).

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

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.

Preferentially, packaging blanks 2 may have a multilayer structure.

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.

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.

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.

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

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

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.

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.

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

With particular reference to Figure 2, 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.

Preferentially, an extension of package 1 along longitudinal axis A may be larger than the respective extensions of package 1 along first transversal axis B and second transversal axis C.

In more detail, package 1 may comprise 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.

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.

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.

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.

Moreover, top wall 4 may be provided with an opening device or may be configured so as to allow for the 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 for the 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.

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.

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, longitudinal seam portion may be substantially parallel to longitudinal axis A.

Additionally, each package 1 may comprise a first transversal seal portion and a second transversal seal portion 6, 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 6 may be comprised by and/or associated to top wall 4.

In further detail, side wall 5 comprises a front panel 7 and a back panel (not shown) opposite to front panel 7.

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

Preferentially, the back panel may be longer than front

panel 7 along longitudinal axis A. In other words, the extension of the back panel from bottom wall 3 to top wall 4 is larger than the extension of front panel 7 from bottom wall 3 to top wall 4.

Preferentially, the back panel may comprise the longitudinal seam portion.

Moreover, top wall 4 may comprise a top front edge 8, a top back edge 9 opposed to top front edge 8 and two top lateral edges 10, each one being connected to top front edge 8 and top back edge 9 and being opposite to one another.

Additionally, bottom wall 3 may comprise a bottom front edge 11, a bottom back edge opposite to bottom front edge 11 and two bottom lateral edges 12 (only one shown), each one being connected to bottom front edge 11 and the bottom back edge and being opposite to one another.

In further detail, front panel 7 may extend from top front edge 8 to bottom front edge 11 and the back panel may extend from top back edge 9 to the bottom back edge.

With particular reference to Figure 2, side wall 5 may also comprise two lateral panels 13 (only one shown) opposite to one another and each one connected to front panel 7 and the back panel.

In more detail, each lateral panel 13 may extend from one respective top lateral edge 10 to one respective bottom lateral edge 12.

Packaging blank 2 of Figure 1 is designed to allow

formation of package 1.

In more detail, each packaging blank 2 may comprise:

- two longitudinal boundary edges, preferentially a first longitudinal boundary edge 20 and a second longitudinal boundary edge 21, 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 22 and a second transversal boundary edge 23, 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.

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

Preferentially, each longitudinal axis E may intersect the respective transversal axis F at a centre point of packaging blank 2.

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

Moreover, each packaging blank 2 may have a (substantially) bi-dimensional shape, i.e. respective extensions 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 along longitudinal axis E and transversal axis F.

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

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

Additionally, second direction D2 may be parallel to longitudinal axis E.

Moreover, each first longitudinal boundary edge 20 and each second longitudinal boundary edge 21 may be connected to and interposed between the respective first transversal boundary edge 22 and the respective second transversal boundary edge 23.

Preferentially, each first longitudinal boundary edge 20 and each second longitudinal boundary edge 21 may be arranged at an angle of about 90° with respect to the respective first transversal boundary edge 22 and the respective second transversal boundary edge 23.

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 20, the respective second longitudinal boundary edge 21, the respective first transversal boundary

edge 22 and the respective second transversal boundary edge 23 may be real edges.

In the case of packaging blanks 2 being arranged in the form of a web, the respective first longitudinal boundary edge 20 and the respective second longitudinal boundary edge 21 may be real edges and the respective first transversal boundary edge 22 and the respective second transversal boundary edge 23 may be imaginary edges. In particular, each first transversal boundary edge 22 of one packaging blank 2 may be adjacent to, or coincide with, the respective second transversal boundary edge 23 of another packaging blank 2.

Alternatively, the respective first transversal boundary edge 22 and the respective second transversal boundary edge 23 may be real edges and the respective first longitudinal boundary edge 20 and the respective second longitudinal boundary edge 21 may be imaginary edges. In particular, each first longitudinal boundary edge 20 of one packaging blank 2 may be adjacent to, or coincide with, the respective second longitudinal boundary edge 21 of another packaging blank 2.

With particular reference to Figure 1, each packaging blank 2 may comprise a top section having a top crease pattern 24 configured to define the shape of at least top wall 4.

In further detail, top crease pattern 24 may be configured to define top wall 4 and flaps 25 attached to top

wall 4.

Preferentially, packaging blank 2 may also comprise a bottom section having a bottom crease pattern 26 configured to define the shape of at least bottom wall 3.

In further detail, bottom crease pattern 26 may be configured to define bottom wall 3 and flaps (not shown) attached to bottom wall 3.

Additionally, packaging blank 2 also comprises an intermediate section having an intermediate crease pattern 27 interposed between top crease pattern 24 and bottom crease pattern 26 and being configured to define side wall 5, in particular to define the specific design of side wall 5.

It should be noted that top crease pattern 24, bottom crease pattern 26 and intermediate crease pattern 27 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.

As described in more detail further below, intermediate crease pattern 27 may comprise a plurality of successively arranged rhombi or rhomboids. Preferentially, the plurality of successively arranged rhombi or rhomboids may comprise rhombi or rhomboids of a first size and rhombi or rhomboids of a second size, which alternate with the rhombi or rhomboids of the first size.

With particular reference to Figures 2 and 3, each top

crease pattern 24 comprises at least a first transversal crease line 28 extending transversally to longitudinal axis E.

Additionally, bottom crease pattern 26 may comprises at least a second transversal crease line 29 extending transversally to longitudinal axis E.

Moreover, first transversal crease line 28 and second transversal crease line 29 are displaced from one another along second direction D2.

More specifically, first transversal crease line 28 and second transversal crease line 29 delimit together the intermediate section.

In further detail, top crease pattern 24 may comprise a third transversal crease line 30 displaced from first transversal crease line 28 and interposed between first transversal boundary edge 22 and first transversal crease line 28.

Additionally, bottom crease pattern 26 may comprise a fourth transversal crease line 31 displaced from second transversal crease line 29 and interposed between second transversal boundary edge 23 and second transversal crease line 29.

With particular reference to Figure 1, the top section comprises a top main panel 35 configured to define at least a portion of top wall 4.

Preferentially, the bottom section comprises a bottom

main panel 36 configured to define at least a portion of bottom wall 3.

Preferentially, top main panel 35 and bottom main panel 36 may be centered with respect to first longitudinal boundary edge 20 and second longitudinal boundary edge 21.

More specifically, first transversal crease line 28 comprises a first section 37, preferentially having a linear shape, delimiting top main panel 35. In particular, first section 37 may define top front edge 8 after formation of package 1; in other words, top front edge 8 is formed by first section 37.

Preferentially, first section 37 may be parallel to first transversal boundary edge 22 and second transversal boundary edge 23 and/or first section 37 may be perpendicular to first longitudinal boundary edge 20 and second longitudinal boundary edge 21.

Additionally, second transversal crease line 29 comprises a second section 38 delimiting bottom main panel 36. In particular, second section 38 may define bottom front edge 11 after formation of package 1; in other words, bottom front edge 9 is formed by second section 38.

Preferentially, second section 38 may be parallel to first transversal boundary edge 22 and second transversal boundary edge 23 and/or perpendicular to first longitudinal boundary edge 20 and second longitudinal boundary edge 21.

In further detail, the intermediate section comprises

an intermediate main panel 39 interposed between, in particular extending from, first section 37 and second section 38.

In particular, after formation of package 1, intermediate main panel 39 defines front panel 7.

With particular reference to Figure 1, intermediate crease pattern 27 comprises at least a first crease line 40 and a second crease line 41 arranged on intermediate main panel 39. Preferentially, first crease line 40 and second crease line 41 have rectilinear shapes.

Additionally, first crease line 40 and second crease line 41 converge towards one another and towards first section 37.

Additionally, first crease line 40 and second crease line 41 are also reproduced on front panel 7 and converge towards top front edge 8.

It should be noted that first crease line 40 and second crease line 41 may be considered to have a substantially rectilinear shape. In this context, one should consider that the presence of the pourable product within package 1 may lead to a modification of the actual shape of first crease line 40 and second crease line 41. However, first crease line 40 and second crease line 41 having a rectilinear shape is to be considered in the sense that if one takes in an imaginary manner front panel 7 alone and separates from it the other portions of package 1 and one arranges front panel

7 in a (substantially) two-dimensional way, first crease line 40 and second crease line 41 will have a rectilinear shape.

Please also note that in the following, additional crease lines will be introduced and the shapes of these crease lines on package 1 are always to be considered in an analogous manner as done with regard to first crease line 40 and second crease line 41 on front panel 7.

Advantageously, a(n) (endless) first imaginary line 42 comprises first crease line 40 and a(n) (endless) second imaginary line 43 comprises second crease line 41. In particular, first imaginary line 42 and second imaginary line 43 may have a rectilinear shape.

Advantageously, first imaginary line 42 and second imaginary line 43 intersect at a respective top intersection point 44. Top intersection point 44 is arranged on intermediate main panel 39 and is distanced from first section 37 along second direction D2.

In package 1, top intersection point 44 is arranged on front panel 7 and is distanced from top front edge 8 along a longitudinal direction parallel to longitudinal axis A.

In particular, top intersection point 44 may be closer to first section 37 than to a center position 45 of packaging blank 2. Preferentially, a distance of top intersection point 44 from first section 37 may be at least two times, preferentially three times, smaller than a distance of top

intersection point 44 from center position 45.

According to the example shown, first crease line 40 and second crease line 41 may extend to and intersect at top intersection point 44.

Alternatively, first crease line 40 and second crease line 41 may extend towards, but not intersect at top intersection point 44.

According to some possible preferred non-limiting embodiments, intermediate crease pattern 27 may comprise at least a third crease line 46, preferentially having a rectilinear shape, and a fourth crease line 47, preferentially having a rectilinear shape, arranged on intermediate main panel 39 and converging towards one another and towards second section 38.

Additionally, a third imaginary line 48 may comprise third crease line 46 and a fourth imaginary line 49 may comprise fourth crease line 47.

Moreover, third imaginary line 48, preferentially having a rectilinear shape, and fourth imaginary line 49, preferentially having a rectilinear shape, may intersect at a respective bottom intersection point 50.

Preferentially, bottom intersection point 50 may be arranged on intermediate main panel 39 and may be distanced from second section 38 along second direction D2.

In package 1, bottom intersection point 50 may be arranged on front panel 7 and may be distanced from bottom

front edge 9 along a longitudinal direction parallel to longitudinal axis A.

In particular, bottom intersection point 50 may be closer to second section 38 than to center position 45. Preferentially, a distance of bottom intersection point 50 from second section 38 may be at least two times, preferentially three times, smaller than a distance of bottom intersection point 50 from center position 45.

According to the example shown, third crease line 46 and fourth crease line 47 may extend to and intersect at bottom intersection point 50.

Alternatively, third crease line 46 and fourth crease line 47 may extend towards, but not intersect at bottom intersection point 50.

As shown in Figures 1, 2 and 3, first crease line 40, second crease line 41, third crease line 46 and fourth crease line 47 may define together a rhombus. Thereby, top intersection point 44 and bottom intersection point 50 may define respective vertices of the rhombus.

In addition or alternatively, first crease line 40 and third crease line 46 may intersect at a first intersection 55 and second crease line 41 and fourth crease line 47 may intersect at a second intersection 56.

Preferentially, first intersection 55 and second intersection 56 may lie on intermediate main panel 39 or when considering package 1 (see Figures 2 and 3) on front

panel 7.

A virtual line connecting first intersection 55 and second intersection 56 may be parallel to and/or interposed between and/or being centered with respect to first transversal boundary edge 22 and second transversal boundary edge 23.

In further detail, the top section may comprise two top side panels 57 connected to opposite top lateral edges 58 of top main panel 35. In particular, each top side panel 57 may be connected to one respective top lateral edge 58.

Additionally, the bottom section may comprise two bottom side panels 59 connected to opposite bottom lateral edges 60 of bottom main panel 36. In particular, each bottom side panel 59 may be connected to one respective bottom lateral edge 60.

With particular reference to Figure 1, first transversal crease line 28 may comprise two first auxiliary sections 61, preferentially of a rectilinear shape, each one delimiting one respective top side panel 57. In particular, first section 37 may be interposed between first auxiliary sections 61.

Preferentially, first auxiliary sections 61 may be inclined with respect to first section 37.

Preferentially, each first auxiliary section 61 may define one respective top lateral edge 10 of package 1.

According to some preferred non-limiting embodiments,

second transversal crease line 29 may comprise two second auxiliary sections 62, each one delimiting one respective bottom lateral panel 59. In particular, second section 38 may be interposed between second auxiliary sections 62.

Preferentially, second auxiliary sections 62 may be aligned with second section 38.

With reference to Figure 1, the intermediate section may comprise two intermediate side panels 63, connected to opposite sides of intermediate main panel 39 and each one being interposed between one respective first auxiliary section 61 and one respective second auxiliary section 62.

In particular, each intermediate main panel 39 may define one respective lateral panel 13.

Furthermore, intermediate crease pattern 27 may comprise at least two first auxiliary crease lines 64 and at least two second auxiliary crease lines 65. Each first auxiliary crease line 64 and the respective second auxiliary crease line 64 may be arranged on one respective intermediate side panel 63 and may converge towards one another and towards the respective first auxiliary section 61.

Moreover, two first auxiliary imaginary lines (not specifically shown) may be provided. Each first auxiliary imaginary line may comprise one respective first auxiliary crease line 64.

In addition, two second auxiliary imaginary lines (not specifically shown) may be provided. Each second auxiliary

imaginary line may comprise one respective second auxiliary crease line 65.

Additionally, each first auxiliary imaginary line and the respective second auxiliary imaginary line may intersect at a respective top auxiliary intersection point 66.

More specifically, each top auxiliary intersection point 66 may be arranged on the respective intermediate side panel 63 and may be distanced from the respective first auxiliary section 61 along second direction D2.

When considering package 1, each first auxiliary crease line 64 and the respective second auxiliary crease line 65 may be arranged on the respective lateral panel 13 and top auxiliary intersection point 66 may be arranged on the respective lateral panel 13 and may be distanced from the respective top lateral edge 10 along a longitudinal direction parallel to longitudinal axis A.

According to the example shown, first auxiliary crease line 64 and second auxiliary crease line 65 may extend to and intersect at top auxiliary intersection point 66.

Alternatively, first auxiliary crease line 64 and second auxiliary crease line 65 may extend towards top auxiliary intersection point 66 without intersecting at top auxiliary intersection point 66.

Furthermore, intermediate crease pattern 27 may comprise at least two third auxiliary crease lines 67 and at least two fourth auxiliary crease lines 68. Each third

auxiliary crease line 67 and the respective fourth auxiliary crease line 68 may be arranged on one respective intermediate side panel 63 and may converge towards one another and towards the respective second auxiliary section 62.

Moreover, two third auxiliary imaginary lines (not specifically shown) may be provided. Each third auxiliary imaginary line may comprise one respective third auxiliary crease line 67.

In addition, two fourth auxiliary imaginary lines (not specifically shown) may be provided. Each fourth auxiliary imaginary line may comprise one respective fourth auxiliary crease line 68.

Additionally, each third auxiliary imaginary line and the respective fourth auxiliary imaginary line may intersect at a respective bottom auxiliary intersection point 69.

More specifically, each bottom auxiliary intersection point 69 may be arranged on the respective intermediate side panel 63 and may be distanced from the respective second auxiliary section 62 along second direction D2.

When considering package 1, each third auxiliary crease line 67 and the respective fourth auxiliary crease line 68 may be arranged on the respective lateral panel 13 and bottom auxiliary intersection point 69 may be arranged on the respective lateral panel 13 and may be distanced from the respective bottom lateral edge 12 along a longitudinal direction parallel to longitudinal axis A.

According to the example shown, third auxiliary crease line 67 and fourth auxiliary crease line 68 may extend to and intersect at bottom auxiliary intersection point 69.

Alternatively, third auxiliary crease line 67 and fourth auxiliary crease line 68 may extend towards bottom auxiliary intersection point 69 without intersecting at bottom auxiliary intersection point 69.

Preferentially, first auxiliary crease line 64, second auxiliary crease line 65, third auxiliary crease line 67 and fourth auxiliary crease line 68 may define a rhombus.

With reference to Figure 1, intermediate crease pattern 27 may also comprise further intermediate crease lines 70 arranged on respective lateral end panels 71 of the intermediate sections (or on the back panel when considering package 1). In particular, further intermediate crease lines 70 are arranged so as to define with respective first auxiliary crease lines 64 and third auxiliary crease lines 67 respective rhomboids.

In particular, during formation of packages 1, the lateral end panels 71 of packaging blank 2 are sealed to one another, thereby also forming the respective longitudinal seam portion.

According to some preferred non-limiting embodiments, first crease line 40 may intersect one respective second auxiliary crease line 65, and preferentially also second transversal crease line 29; and/or

second crease line 41 may intersect one respective second auxiliary crease line 65, and preferentially also second transversal crease line 29; and/or

third crease line 46 may intersect one respective fourth auxiliary crease line 68, and preferentially also first transversal crease line 28; and/or

fourth crease line 47 may intersect one respective fourth auxiliary crease line 68, and preferentially also first transversal crease line 28.

With reference to Figure 4, 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.

In particular, packaging blank 2′ may be used for forming packages 1 provided with opening devices (not shown). Such packages 1 may comprise a main body formed from packaging blank 2′ and the opening device may be applied onto the main body after its formation and its filling with the pourable product.

Packaging blank 2′ may comprise a designated pour opening 72, preferentially covered with a separation membrane. More specifically, the separation membrane may be defined by a portion of the multilayer packaging material.

Moreover, the opening device may be applied onto the

main body in correspondence with designated pour opening 72.

In particular, the opening device may cover the designated pour opening 72.

Preferentially, designated pour opening may be partially arranged on top main panel 35 and partially on intermediate main panel 39.

Preferentially, a portion of rim 73 may extend on top main panel 35 and another portion on intermediate main panel 39.

After formation of the main body and/or package 1, rim 73 may partially extend on top wall 4 and partially on front panel 7.

Advantageously, top intersection point 44 may be distanced not only from first section 37 (or top front edge 8) but also from rim 73, i.e. also from the portion of rim 73 extending on intermediate main panel 39 (or front panel 7).

With reference to Figure 5, 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.

In particular, packaging blank 2'' differs from packaging blank 2 in that first transversal crease line 28 may have a rectilinear shape. For example, first transversal

crease line 28 may be (as a whole) parallel to first transversal boundary edge 22 and second transversal boundary edge 23.

Moreover, the respective two first auxiliary sections 61 may be parallel to first section 37. More specifically, first auxiliary sections 61 may linearly extend from first section 37.

Furthermore, the respective two first auxiliary sections 61 and first section 37 may define a rectilinear line.

According to the embodiment shown, packaging blank 2'' may be used for forming packages 1'' as shown in Figure 6. The respective top wall 4 and the respective bottom wall 3 of each package 1'' are (substantially) parallel to one another. This results from the respective two first auxiliary sections 61 being parallel to first section 37.

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.

Packaging blank 2''' differs from packaging blank 2'' in comprising an opening 74, preferentially covered with a separation membrane. More specifically, the separation membrane may be defined by a portion of the multilayer

packaging material.

In further detail, opening 74 may be configured to receive a straw and/or to allow for the introduction of a straw into the respective package. Additionally, the separation membrane may be rupturable upon the application of a force onto the separation membrane by means of a straw.

More specifically, each opening 74 may be arranged on top main panel 35.

Moreover, each opening 74 may be delimited by a rim 75. Rim 75 may have a circular shape.

In particular, packaging blank 2''' may be used for forming packages having a top wall 4 provided with an opening 74. This allows a user to insert a straw into the packages 2 and to drink from the package through the straw.

The advantages of packaging blanks 2, 2', 2'' and 2''' and packages 1 and 1'' according to the present invention will be clear from the foregoing description.

In particular, the Applicant has observed an increased stability of packages 1 and 1'' by having top intersection point 44 being displaced from first section 37 when considering packaging blank 2, 2', 2'' and 2''' or from top front edge 8 when considering packages 1 and 1''. Such a solution is of particular advantage during transport of packages 1 and 1''.

In the presence of an opening device, it is furthermore advantageous to distance top intersection point 44 also from

the rim delimiting a pour opening.

A further advantage in terms of stability results from distancing bottom intersection point 50 from second section 38 (or bottom front edge 11) and/or top auxiliary intersection point 66 from first section 37 (or top front edge 8) and/or bottom auxiliary intersection point 69 from second section 38 (or bottom front edge 11).

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

According to some further non-limiting embodiments not shown, package 1'' (having a flat top) and accordingly packaging blank 2'' may comprise an opening 72 as disclosed with respect to the embodiment of Figure 4. In other words, while in the embodiment of Figure 4, the respective top wall 4 is inclined with respect to the respective bottom wall 3, such an alternative embodiment not shown results in the respective top wall 4 being parallel to the respective bottom wall 3 and having an opening 72 for an opening device.

In particular, the respective package 1'' may comprise an opening device arranged on top wall 4 about the respective opening 72.

CLAIMS

1.- Packaging blank (2; 2'; 2''; 2''') for forming a package (1; 1'') filled with a pourable product comprising:

- two longitudinal boundary edges (20; 21) spaced apart from one another along a first direction (D1) transversal to a longitudinal axis (E) of the packaging blank (2; 2'; 2''; 2'''); and

- two transversal boundary edges (22; 23) spaced apart from one another along a second direction (D2) parallel to the longitudinal axis (E); and

- a top section having a top crease pattern (24) and being configured to form at least a top wall (4) of the package (1; 1'');

- a bottom section having a bottom crease pattern (26), the bottom section being displaced from the top section along the second direction (D2) and being configured to form at least a bottom wall (3) of the package (1; 1'');

- an intermediate section having an intermediate crease pattern (27) interposed between the top crease pattern (24) and the bottom crease pattern (26) and being configured to define at least a side wall (5) of the package (1; 1'');

wherein the top crease pattern (24) comprises at least a first transversal crease line (28) extending transversally to the longitudinal axis (E) and the bottom crease pattern (26) comprises at least a second transversal crease line (29) extending transversally to the longitudinal axis (E);

wherein the first transversal crease line (28) and the second transversal crease line (29) delimit together the intermediate section;

wherein the top section comprises a top main panel (35) configured to at least partially define a top wall (4) of the package (1; 1'') and the bottom section comprises a bottom main panel (36) configured to at least partially define a bottom wall (3) of the package (1; 1'');

wherein the first transversal crease line (28) comprises a first section (37) delimiting the top main panel (35) and the second transversal crease line (29) comprises a second section (38) delimiting the bottom main panel (36);

wherein the intermediate section comprises an intermediate main panel (39) interposed between the first section (37) and the second section (38);

wherein the intermediate crease pattern (27) comprises at least a first crease line (40) and a second crease line (41) arranged on the intermediate main panel (39) converging towards one another and towards the first section (37);

wherein a first imaginary line (42) comprises the first crease line (40) and a second imaginary line (43) comprises the second crease line (41);

wherein the first imaginary line (42) and the second imaginary line (43) intersect at a respective top intersection point (44);

wherein the top intersection point (44) is arranged on

the intermediate main panel (39) and is distanced from the first section (37) along the second direction (D2).

2.- Packaging blank according to claim 1, wherein the first crease line (40) and the second crease line (41) extend to and/or extend towards and/or intersect at the top intersection point (44).

3.- Packaging blank according to claim 1 or 2, wherein the intermediate crease pattern (27) comprises at least a third crease line (46) and a fourth crease line (47) arranged on the intermediate main panel (39) and converging towards one another and towards the second section 38;

wherein a third imaginary line (48) comprises the third crease line (46) and a fourth imaginary line (49) comprises the fourth crease line (47);

wherein the third imaginary line (48) and the fourth imaginary line (49) intersect at a respective bottom intersection point (50);

wherein the bottom intersection point (50) is arranged on the intermediate main panel (39) and is distanced from the second section (38) along the second direction (D2).

4.- Packaging blank according to claim 3, wherein the third crease line (46) and the fourth crease line (47) extend to and/or extend towards and/or intersect at the bottom intersection point (50).

5.- Packaging blank according to claim 3 or 4, wherein the first crease line (40), the second crease line (41), the

third crease line (46) and the fourth crease line (47) define together a rhombus; and/or

wherein the first crease line (40) and the third crease line (46) intersect at a first intersection (55) and the second crease line (41) and the fourth crease line (47) intersect at a second intersection (56); wherein the first intersection (55) and the second intersection (56) lie on the intermediate main panel (39).

6.- Packaging blank according to any one of the preceding claims, wherein the top section comprises two top side panels (57) connected to opposite edges of the top main panel (35) and the bottom section comprises two bottom side panels (59) connected to opposite edges of the bottom main panel (36);

wherein the first transversal crease line (28) comprises two first auxiliary sections (61), each one delimiting one respective top side panel (57) and the second transversal crease line (29) comprises two second auxiliary sections (62), each one delimiting one respective bottom side panel (59);

wherein the intermediate section comprises two intermediate side panels (63), connected to opposite sides of the intermediate main panel (39) and each one being interposed between one respective first auxiliary section (61) and one respective second auxiliary section (62);

wherein on each intermediate side panel (63) there is

arranged at least a first auxiliary crease line (64) and a second auxiliary crease line (65) converging towards one another and towards the respective first auxiliary section (61);

wherein for each intermediate side panel (63) a first auxiliary imaginary line comprises the respective first auxiliary crease line (64) and a second auxiliary imaginary line comprises the respective second auxiliary crease line (65);

wherein each first auxiliary imaginary line and the respective second auxiliary imaginary line intersect at a respective top auxiliary intersection point (66);

wherein each top auxiliary intersection point (66) is arranged on the respective intermediate side panel (63) and is distanced from the respective first auxiliary section (61) along the second direction (D2).

7.- Packaging blank according to any one of the preceding claims, wherein the top section comprises two top side panels (57) connected to opposite edges of the top main panel (35) and the bottom section comprises two bottom side panels (59) connected to opposite edges of the bottom main panel (36);

wherein the first transversal crease line (28) comprises two first auxiliary sections (61), each one delimiting one respective top side panel (57) and the second transversal crease line (29) comprises two second auxiliary

sections (62), each one delimiting one respective bottom side panel (59);

wherein the intermediate section comprises two intermediate side panels (63), connected to opposite sides of the intermediate main panel (39) and each one being interposed between one respective first auxiliary section (61) and one respective second auxiliary section (62);

wherein on each intermediate side panel (63) there is arranged at least a third auxiliary crease line (67) and a fourth auxiliary crease line (68) converging towards one another and towards the respective second auxiliary section (62);

wherein for each intermediate side panel (63) a third auxiliary imaginary line comprises the respective third auxiliary crease line (67) and a fourth auxiliary imaginary line comprises the respective fourth auxiliary crease line (68);

wherein each third auxiliary imaginary line and the respective fourth auxiliary imaginary line intersect at a respective bottom auxiliary intersection point (69);

wherein each bottom auxiliary intersection point (69) is arranged on the respective intermediate side panel (63) and is distanced from the respective second auxiliary section (62) along the second direction (D2).

8.- Package (1; 1'') filled with a pourable product formed from a packaging blank (2; 2'; 2''; 2''') according

to any one of the preceding claims.

9.- Package (1; 1'') filled with a pourable product and formed from a multilayer packaging material;

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 side wall (5) comprises a front panel (7) and a back panel (8) opposite to the front panel (7);

wherein the back panel (8) is longer than the front panel (7) along the longitudinal axis (A);

wherein the top wall (4) comprises a top front edge (8) and the bottom wall (3) comprises a bottom front edge (11);

wherein the front panel (7) extends from the top front edge (8) to the bottom front edge (11);

wherein the front panel (7) comprises at least a first crease line (40) and a second crease line (41) converging towards one another and towards the top front edge (8);

wherein a first imaginary line (42) comprises the first crease line (40) and a second imaginary line (43) comprises the second crease line (41);

wherein the first imaginary line (42) and the second imaginary line (43) intersect at a top intersection point (44);

wherein the top intersection point (44) is arranged on

the front panel (7) and is distanced from the top front edge (8) along a longitudinal direction parallel to the longitudinal axis (A).

10.- Package according to claim 9, wherein the first crease line (40) and the second crease line (41) extend to and/or extend towards and/or intersect at the top intersection point (44).

11.- Package according to claim 9 or 10, wherein the front panel (7) comprises at least a third crease line (46) and a fourth crease line (47) converging towards one another and towards the bottom front edge (11);

wherein a third imaginary line (48) comprises the third crease line (46) and a fourth imaginary line (49) comprises the fourth crease line (47);

wherein the third imaginary line (48) and the fourth imaginary line (49) intersect at a respective bottom intersection point (50);

wherein the bottom intersection point (50) is arranged on the front panel (7) and is distanced from the bottom front edge (11) along the longitudinal direction.

12.- Package according to claim 11, wherein the third crease line (46) and the fourth crease line (47) extend to and/or extend towards and/or intersect at the bottom intersection point (50).

13.- Package according to claim 11 or 12, wherein the first crease line (40), the second crease line (41), the

third crease line (46) and the fourth crease line (47) define together a rhombus; and/or

wherein the first crease line (40) and the third crease line (46) intersect at a first intersection (55) and the second crease line (41) and the fourth crease line (47) intersect at a second intersection (56); wherein the first intersection (55) and the second intersection (56) lie on the front panel (7).

14.- Package according to any one of the claims 9 to 13, wherein the top wall (4) comprises two top lateral edges (10) opposed to one another and connected to and transversal to the top front edge (8);

wherein the bottom wall (3) comprises two bottom lateral edges (12) opposed to one another and connected to and transversal to the bottom front edge (11);

wherein the side wall (5) comprises two lateral panels (13) opposite to one another, each one extending from one respective top lateral edge (10) to one respective bottom lateral edge (12);

wherein each lateral panel (13) comprises at least a respective first auxiliary crease line (64) and a respective second auxiliary crease line (65) converging towards one another and towards the respective top lateral edge (8);

wherein for each lateral panel (13) a first auxiliary imaginary line comprises the respective first auxiliary crease line (64) and a second auxiliary imaginary line

comprises the respective second auxiliary crease line (65);

wherein each first auxiliary imaginary line and the respective second auxiliary imaginary line intersect at a respective top auxiliary intersection point (66);

wherein the top auxiliary intersection point (66) is arranged on the respective lateral panel (13) and is distanced from the respective top lateral edge (10) along the longitudinal direction.

15.- Package according to any one of the claims 9 to 14, wherein the top wall (4) comprises two top lateral edges (10) opposed to one another and connected to and transversal to the top front edge (8);

wherein the bottom wall (3) comprises two bottom lateral edges (12) opposed to one another and connected to and transversal to the bottom front edge (11);

wherein the side wall (5) comprises two lateral panels (13) opposite to one another, each one extending from one respective top lateral edge (10) to one respective bottom lateral edge (12);

wherein each lateral panel (13) comprises at least a respective third auxiliary crease line (67) and a respective fourth auxiliary crease line (68) converging towards one another and towards the respective bottom lateral edge (12);

wherein for each lateral panel (13) a third auxiliary imaginary line comprises the respective third auxiliary crease line (67) and a fourth auxiliary imaginary line

comprises the respective fourth auxiliary crease line (68);

wherein each first auxiliary imaginary line and the respective second auxiliary imaginary line intersect at a respective bottom auxiliary intersection point (69);

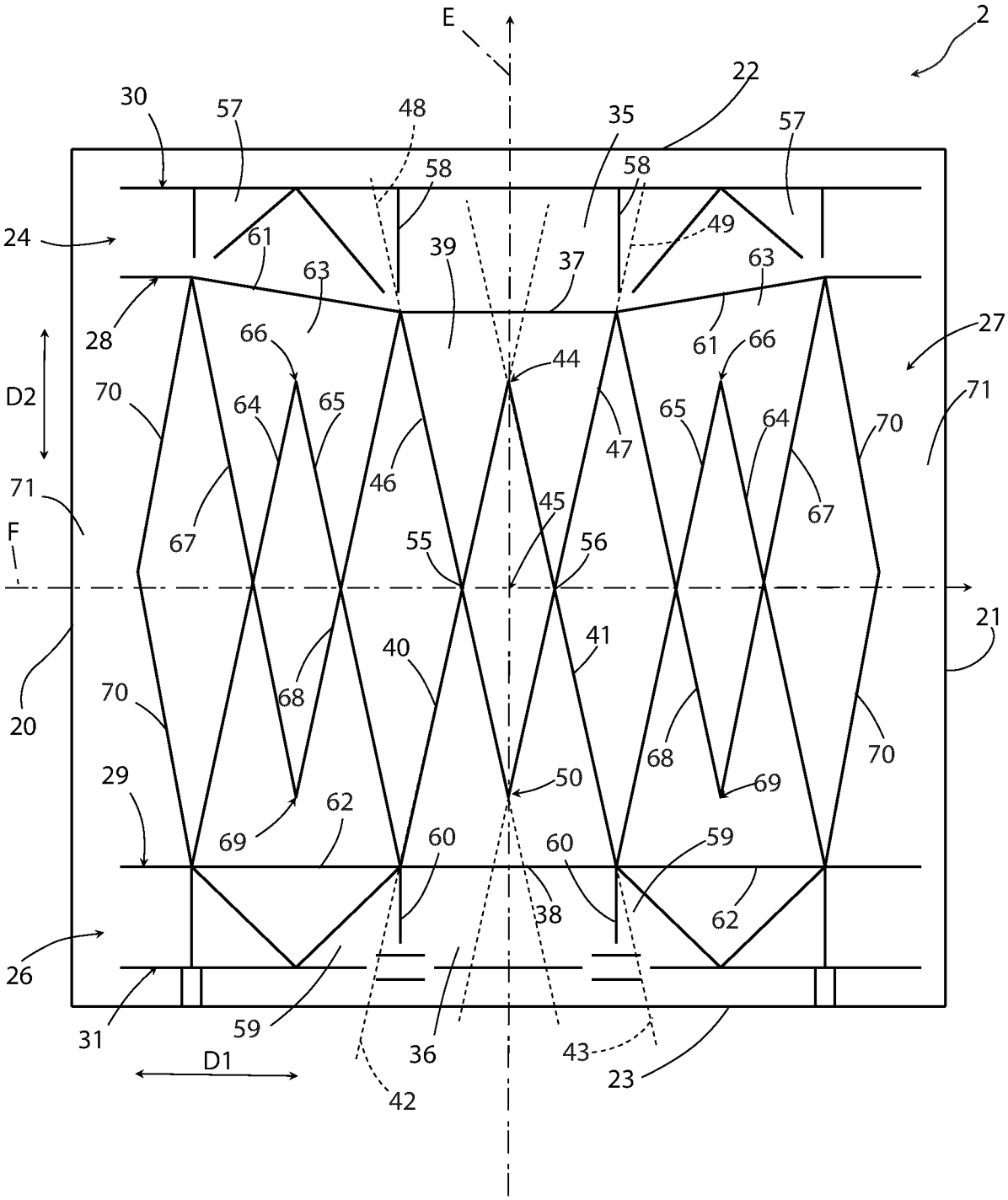
wherein the bottom auxiliary intersection point (69) is arranged on the respective lateral panel (13) and is distanced from the respective bottom lateral edge (12) along the longitudinal direction.

16.- Package according to any one of claims 9 to 15, and further comprising a rim (73) delimiting a designated pour opening (72) covered by an opening device;

wherein the top intersection point (44) is also displaced from the rim along the longitudinal direction.

17.- Package according to any one of claims 9 to 16, wherein the top wall (4) is inclined with respect to the bottom wall (3) and/or the longitudinal axis (A); or

wherein the top wall (4) is parallel to the bottom wall (3).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70
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FIG.1

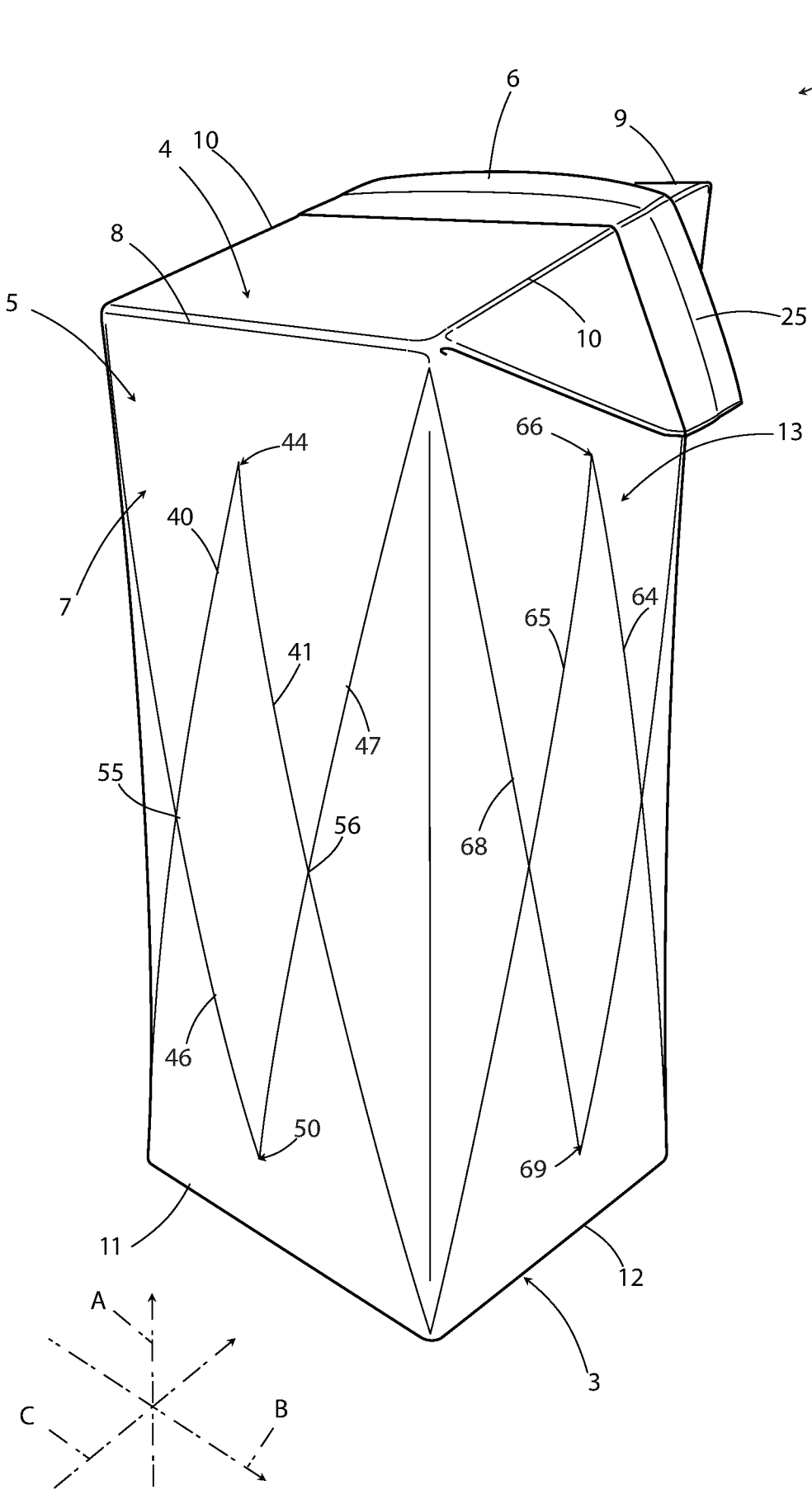

FIG.2

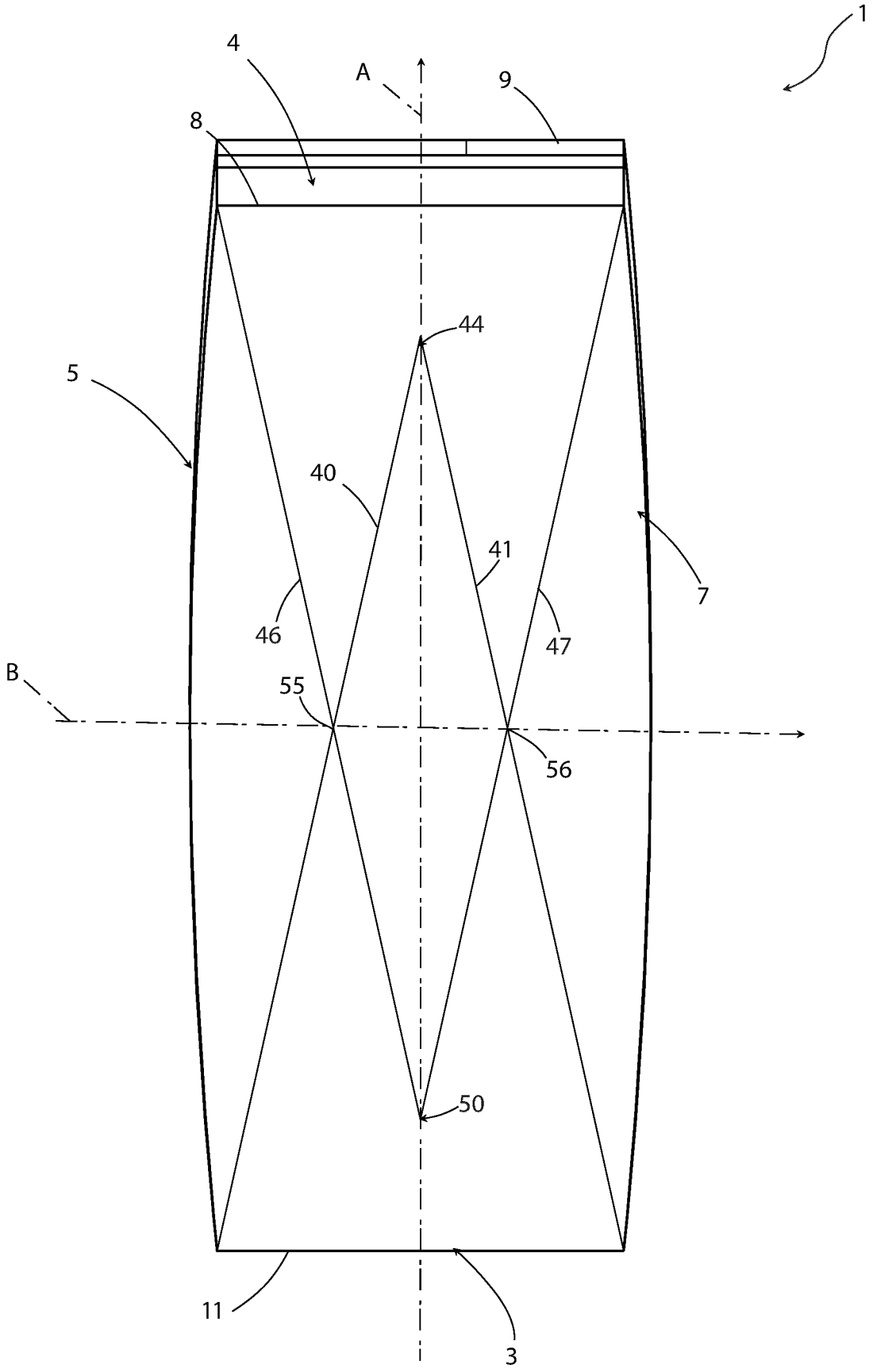

FIG.3

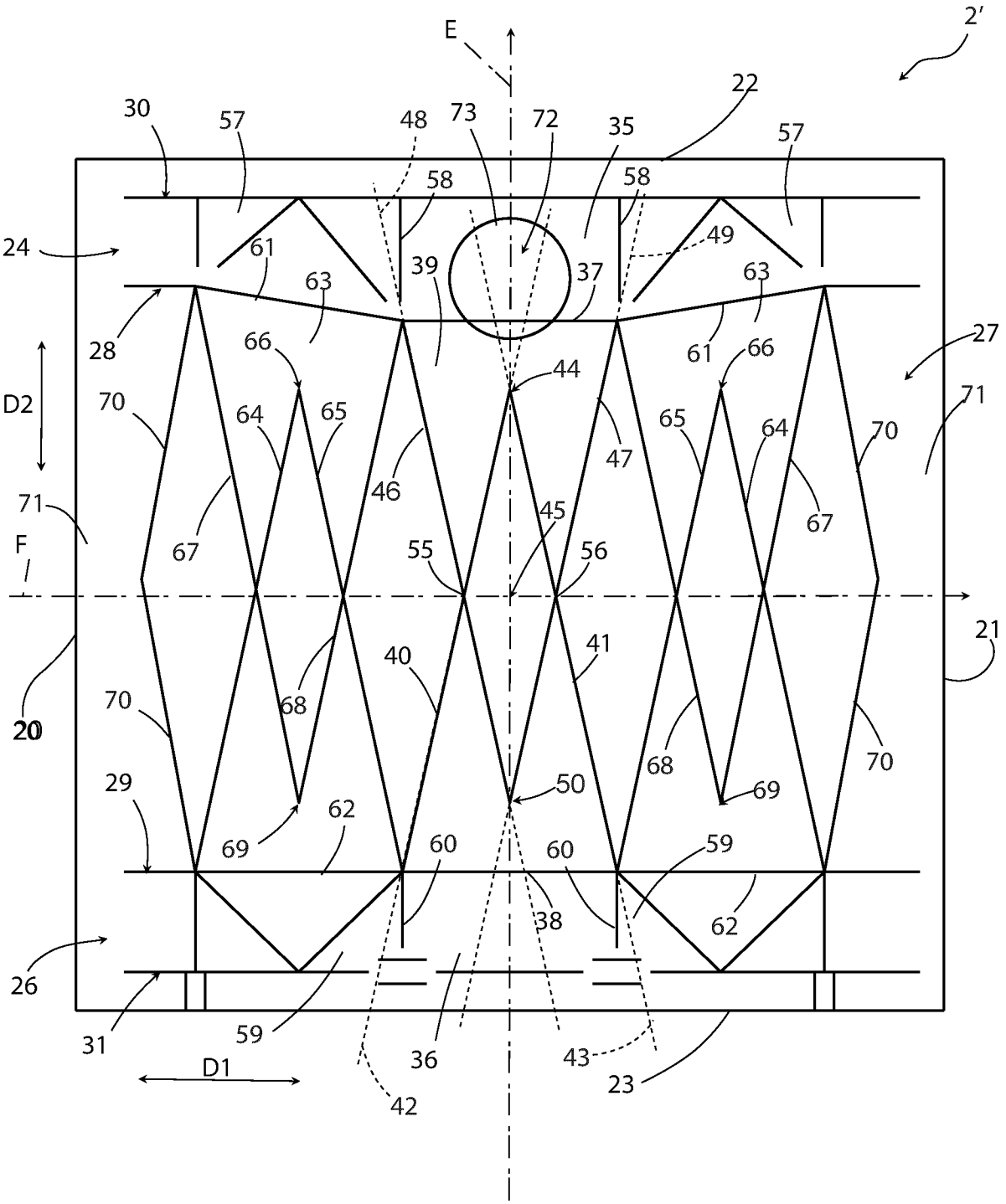
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FIG.4

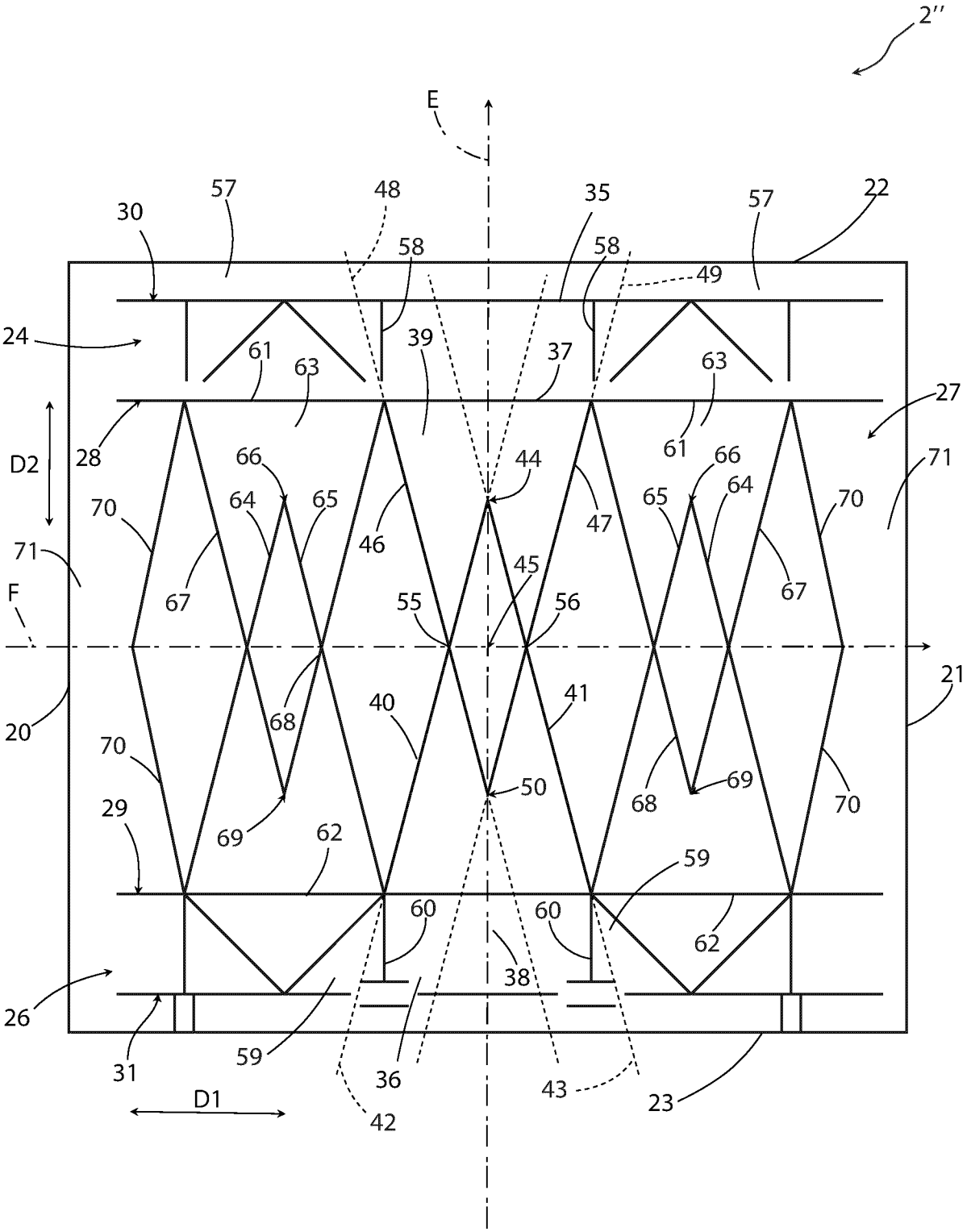
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FIG.5

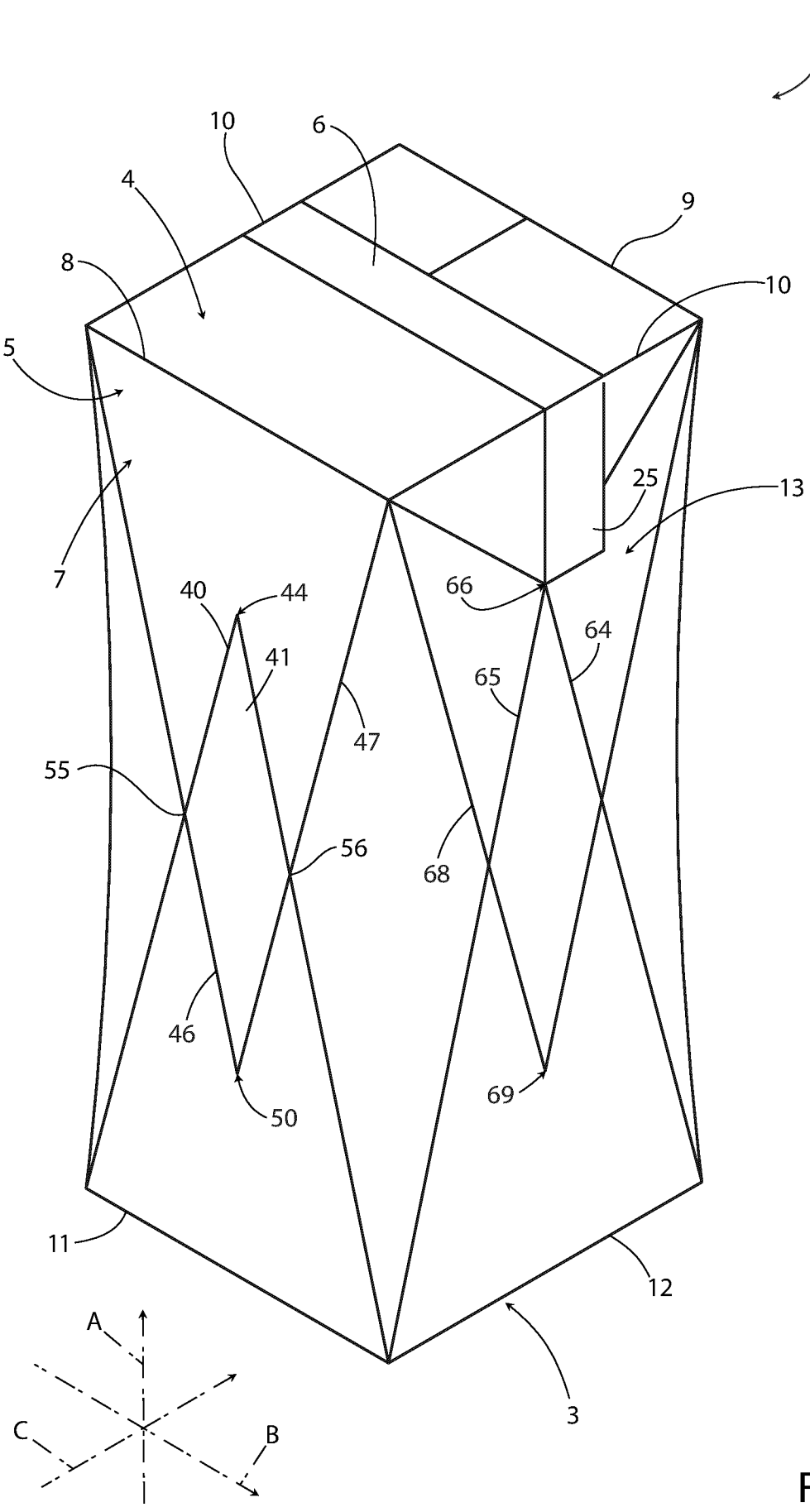

FIG.6

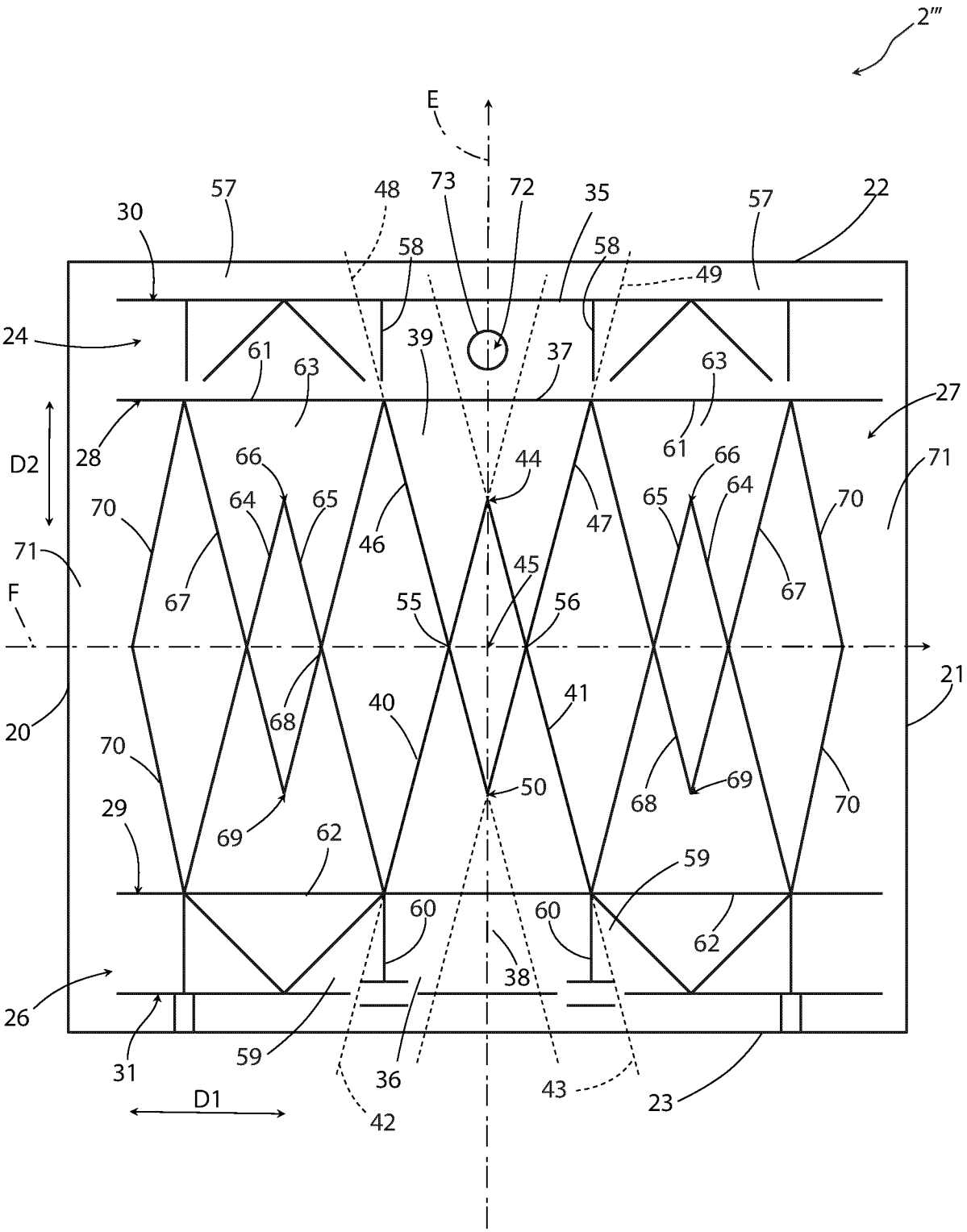
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FIG.7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/066236

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D5/06 B65D5/42 B65D5/74
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2018/053926 A1 (SHANGHAI PRECISE PACKAGING CO LTD [CN]) 29 March 2018 (2018-03-29) paragraphs [0042] - [0051]; figures 1-10	1-17
X	WO 2009/141389 A2 (ELOPAK SYSTEMS [CH]; FRANIC IVICA [AT]) 26 November 2009 (2009-11-26) page 13, lines 21-31; figures 18-19	1-17
X	CN 205 470 247 U (SHANDONG BIHAI PACKAGING CO LTD) 17 August 2016 (2016-08-17) abstract; figures 1-2	1-17
X	WO 2017/143188 A1 (EVERGREEN PACKAGING INC [US]) 24 August 2017 (2017-08-24) page 8, lines 13-32; figures 1-6	1-5, 8-13,16, 17

-/--

[x] Further documents are listed in the continuation of Box C.

[x] See patent family annex.

* Special categories of cited documents :

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"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 September 2024	17/09/2024

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Grondin, David

2

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/066236

C(Continuation). **DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2021/140192 A1 (ELOPAK AS [NO]) 15 July 2021 (2021-07-15) page 29, lines 6-17; figures 35-36 -----	1-17

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2024/066236

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