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(54) Die-cut blank for packaging bottle-shaped containers with a tapered neck and production method for the package obtained therewith

(57) A die-cut blank (1) for packaging containers (30) with a tapered neck (33) is disclosed, which comprises a central panel (2) provided with the same number of apertures (5) as the number of containers (30), so that the top part (31, 32) of the containers can engage in the apertures (5), and a first and a second side panel (21, 22) connected to the central panel (2) by means of respective folding lines (3, 4) of the side panels. The apertures (5) are rectangular in shape with the major sides at right angles to the fold lines (3, 4) of the side panels. In the central panel (2) fan-foldable walls (6, 7) are formed that are erected from the major sides of the apertures (5), so that the outer edges of the walls (6) abut against the upper collar (32) of the containers and each fan fold (6, 7) tightly follows the tapered neck (33) of the containers.

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Description

[0001] The present invention refers to a die-cut blank for packaging containers. It refers in particular to the field of packaging/boxing in a single package containers with caps, such as bottles, flasks or jars, having a particularly tapered neck, used mainly in the food sector for liquid or semi-liquid products such as drinks, yoghurt, creams, etc.

[0002] According to the prior art, there are currently present on the market various types of packages for food product containers with a substantially cylindrical shape, provided with caps in their top part or in any case with collars or protruding rims. Said containers are held inside the package thanks to blocking teeth formed by means of triangular cuts made in the die-cut blank near the holes for coupling with the top part of said containers.

[0003] The retaining teeth of the die-cut blank are erected by pressing against the top part of the container. The die-cut blank remains on a substantially horizontal plane, the top end of the teeth abuts against the protruding upper rim of the container and the base of the teeth abuts against the abutment surface that is formed between the cylindrical body and the tapered neck of the container.

[0004] The above packages are not suitable for bottle-shaped containers with a particularly tapered neck, in which the transition area between the cylindrical body and the tapered neck is gradual, thus such an abutment surface is not formed between the body and the neck of the bottle. In this case, in fact, the bases of the teeth would not grip on the surface of the bottle, thus a loose coupling would be obtained between the bottles and the die-cut blank and consequently the bottles would not be well retained by the die-cut blank.

[0005] Object of the invention is to reduce this drawback of the prior art as much as possible, by providing a die-cut blank for packaging bottle-shaped containers with a tapered neck that is practical and able to retain said containers and to ensure a certain stability of the containers.

[0006] Another object of the present invention is to provide such a die-cut blank for packaging bottle-shaped containers with a tapered neck that is economical and simple to produce and that can be mechanized on an automatic machine.

[0007] These objects are achieved in accordance with the invention through a die-cut blank with the characteristics listed in appended independent claim 1.

[0008] Advantageous embodiments of the invention are apparent from the dependent claims.

[0009] The die-cut blank according to the invention is used for packaging bottle-shaped containers with a tapered neck arranged in single file. The die-cut blank comprises a central panel provided with the same number of apertures as the number of containers to be packaged, so that the upper part of the containers can engage with said apertures. A first and a second side panel are connected to the central panel, by means of respective folding lines.

[0010] The apertures in the central panel are substantially rectangular in shape with the major sides at right angles to the folding lines of the side panels.

[0011] Walls that can be fan-folded are formed in the central panel. Each fan fold involves a side wall and a transverse part of the neck of a container.

[0012] The walls are erected from the major sides of the apertures, so that the outer edges of some walls abut transversally against the caps or the upper collar of the containers and the other walls are disposed laterally to the containers. Each fan fold tightly follows the tapered neck of the containers.

[0013] The advantages of the die-cut blank according to the invention, which provides fan-folded walls that follow the tapered neck of the containers, allowing a firm and tight coupling of the die-cut blank even with containers that have a tapered neck and do not have an abutment surface between the body and the neck of the container, are obvious to a skilled person.

[0014] Further characteristics of the invention will be made clearer by the detailed description that follows, referring to a purely exemplifying and therefore non-limiting embodiment thereof, illustrated in the appended figures, wherein:

Figure 1 is a top plan view of the die-cut blank according to the invention, spread out;

Figure 2 is a perspective view of the die-cut blank of Figure 1, spread out and disposed above a group of three bottle-shaped containers with a tapered neck;

Figures 3-5 are perspective views, like Figure 2, showing three subsequent steps in preparation of the package obtained with the die-cut blank according to the invention;

Figure 6 is a side view of the finished package of Figure 5;

Figures 7A and 7B are two perspective views showing diagrammatically the various steps in the automation of the production cycle of a package according to the invention.

[0015] The die-cut blank for packaging bottle-shaped containers with a tapered neck, according to the invention, designated as a whole with reference number 1, is described with the aid of the figures.

[0016] As can be seen from Figure 1, the die-cut blank 1, generally made of cardboard, is supplied by the paper industry in a flat, substantially rectangular form. The die-cut blank 1 comprises a central panel 2, delimited by two lateral folding or creasing lines 3 and 4, parallel to each other and preferably bearing cuts or incisions to make the folding easier. The creasing lines 3 and 4 connect the central panel 2 to two respective side panels 21, 22. The first side panel 21 is wider than the second side panel 22, whereas the width of the central panel 2 is about three times the width of the second side panel 22.

[0017] In the central panel 2 there are three rectangular apertures 5 with straight major sides and rounded minor sides. The apertures 5 are disposed parallel to and equidistant from each other in the central part of the base panel 2. The major sides of the apertures 5 are at right angles to the lateral folding lines 3 and 4.

[0018] In the central panel 2 fan-foldable walls 6 and 7 are formed, which are erected from the major sides of the apertures 5. To be precise, a rectangular wall 6 and two triangular walls 7 connected to the two minor sides of the rectangular wall 6 are erected on each major side of each aperture 5, so as to generate a fan fold consisting of three walls that can be folded along two folding lines.

[0019] For this purpose, the fan-foldable walls 6 and 7 are formed by means of suitable folding lines or creasing 10, 11 and 12. There are provided:

- transverse folding lines 10 disposed parallel to the major sides of the apertures 5;
- oblique folding lines 11 that connect the ends of the transverse folding lines 10 to the ends of the major sides of the apertures 5, forming an isosceles trapezium the major base of which is represented by the major side of the aperture 5 and the minor base is represented by the transverse folding line 10; and
- longitudinal folding lines 12 disposed substantially along the height of the isosceles trapeziums defined by the folding lines 10 and 11 and by the major side of the apertures 5.

[0020] Between the adjacent rectangular walls 6 an intermediate or bottom base wall 8 is left, which is rectangular in shape and is delimited by the two transverse folding lines 10 and by two small folding lines 13 which connect the vertices of the two triangular walls 7 and are a continuation of the longitudinal folding lines 12.

[0021] The rectangular walls 6 of the two end apertures 5, which extend towards the edges of the central panel 2, do not have the transverse folding lines 10. In fact said rectangular end walls are delimited by the edges of the base panel 2.

[0022] Along the vertices of the triangular walls 7, facing towards the edges of the central panel 2, curved cuts 14 are provided, formed as a continuation of the oblique folding lines 11, which serve to prevent incipient tears in the central panel 2 between the vertices of the triangular walls 7 and the edges of the central panel 2.

[0023] The steps that lead to the final production of the package are described hereunder with reference to Figures 2-6.

[0024] With reference to Figure 2, the die-cut blank 1 is deposited exactly above a predefined group of three aligned containers with which it has to couple. Each container 30 is bottle-shaped with a tapered neck 33 and has an upper part (cap) 31 disposed above a collar 32 that protrudes radially from the tapered neck 33 of the bottle.

[0025] The apertures 5 in the central panel 2 are disposed to coincide with the upper parts (caps) 31 of the containers 30. Thanks to the pressure against the caps or against other possible protruding edges of the containers 30, the erection of the walls 6 and 7 of the die-cut blank which fold to form a fan-fold will take place.

[0026] As shown in Figure 3, thanks to the normal elastic return of the cardboard, the outer edges of the rectangular walls 6 will be positioned against the protruding necks 32 of the containers and in any case beneath the protruding upper parts 31 of the containers, actually retaining said containers. The side walls 7, on the other hand, will be disposed laterally with respect to the rectangular walls 6, partially enclosing the respective necks of the containers.

[0027] The central panel 2 will form two side portions 2a, 2b that are disposed laterally with respect to the upper parts 31 of the containers. whilst the fan-folded rectangular walls 6 are disposed transversally between the lateral portions 2a and 2b of the central panel.

[0028] It should be noted that the intermediate base walls 8 are disposed along a horizontal plane, between the necks 33 of the containers. Thus the side walls 2a and 2b of the die-cut blank have V-shaped apertures 25 between the intermediate base walls 8.

[0029] Both the rectangular walls 6 and the triangular walls 7, when they are fan-folded, are disposed along inclined planes, which follow the inclination of the tapered necks 33 of the containers. In this manner, a tight coupling is obtained between the pre-cut blank 1 and the tapered necks 33 of the containers, avoiding the formation of a play between the walls 6, 7 and the tapered necks 33 of the containers.

[0030] As shown in Figure 4, in the subsequent step the first side panel 21 is folded along its folding line 3, to bring it into abutment on the caps 31. A layer of glue is then applied to the first side panel 21. Naturally the glue can be disposed in advance on the die-cut blank.

[0031] Subsequently, as shown in Figures 5 and 6, the second side panel 22 is folded and kept pressed onto the first side panel 21 so as to make it adhere thereto, forming the final package.

[0032] Obviously, given the high production speeds that the industry requires in this sector, the possibility of mechanising the proposed packaging solution with automatic machines such as multi packaging machines is decisive.

[0033] The production method for the package obtained with the die-cut blank 1 according to the invention is described hereunder with reference to Figures 7A and 7B.

[0034] The die-cut blank 1 is obtained, in a per se known manner, from a single piece of cardboard or of other suitable material, by cutting and by forming folding lines.

[0035] With reference to Figure 7A, the spread-out die-cut blanks 1 are gathered in a pile, arranged on edge, in a suitable magazine 50 of an automatic machine which, given its prerogative of packaging products in a multiple

configuration, is generally known as a multi-packer. The multi-packer comprises a conveyor or conveyor belt, which feeds an accumulating station 51 with the containers in an upright position disposed in single file.

[0036] Downstream of the accumulating station 51 a phasing area 52 is provided, where with special phasing means the containers 30 are divided regularly into groups according to the desired configuration (for example, groups of three containers in a file).

[0037] With reference to Figure 7B, in a drawing station 53, suction drawing means or drawing means of another type sequentially withdraw the die-cut blanks 1 from the magazine 50 and place them over the groups of containers 30, so that the apertures 5 match the top part 31 of the containers 30.

[0038] Subsequently, the assembly consisting of the die-cut blank and the respective containers is transported towards a coupling area 54, where a pressure system, for example a perforated back-up plate constrained to a cam or to an overhead catenary, pushes the blank 1 downwards, causing the coupling thereof with the bottom group of containers 30, which will be gripped and retained by the fan-folded walls 6 and 7.

[0039] The folding of the first side panel 21 will follow; then glue will be applied thereto. Subsequently the package will pass through a pressing station in which the second side panel 22 is folded and pressed onto the first side panel 21 to make sure the glue sticks.

[0040] After the pressing station, the end package will be expelled to be sent to any other machines, such as tray packers, bundlers, etc. for final storage.

[0041] Numerous changes and modifications of detail within the reach of a person skilled in the art can be made to the present exemplifying embodiments of the invention without thereby departing from the scope of the invention as set forth in the appended claims.

Claims

1. A die-cut blank (1) for packaging containers (30) with a tapered neck (33), disposed in a file and provided with a radially protruding cap (31) or upper collar (32), comprising:

   - a central panel (2) provided with the same number of apertures (5) as the number of containers (30), so that the upper part of the containers can engage with said apertures (5), and
   - a first and a second side panel (21, 22) connected to the central panel (2) by means of respective folding lines (3, 4).

   characterised in that
   said apertures (5) are substantially rectangular in shape with the major sides at right angles to the folding lines (3, 4) of the side panels, and
   that walls (6, 7) that can be fan-folded are formed in the central panel (2),
   each fan fold (6, 7) involving a side wall and a transverse part of the neck (33) of a container (30),
   said walls (6, 7) being erected from the major sides of said apertures (5), so that the outer edges of the walls (6) abut transversally against the caps (31) or the upper collar (32) of the containers and the walls (7) are disposed laterally to the containers,
   each fan fold (6, 7) tightly following the tapered neck (33) of the containers.

2. A die-cut blank (1) according to claim 1, **characterised in that** said fan-foldable walls (6, 7) are formed by means of folding lines or creasing (10, 11, 12) made in said central panel (2).

3. A die-cut blank (1) according to claim 1 or 2, **characterised in that** on each major side of said apertures (5) a substantially rectangular wall (6) and two triangular walls (7) connected to the two minor sides of said rectangular wall (6) are provided, so as to determine two fan folds (6, 7).

4. A die-cut blank (1) according to claim 2 or 3, **characterised in that** said folding lines comprise:

   - transverse folding lines (10) disposed parallel to the major sides of the apertures (5),
   - oblique folding lines (11) that connect the ends of the transverse folding lines (10) to the ends of the major sides of the apertures (5), forming an isosceles trapezium the major base of which is represented by the major side of the aperture (5) and the minor base is represented by the transverse folding line (10), and
   - longitudinal folding lines (12) disposed substantially along the height of the isosceles trapeziums defined by the transverse and by the oblique folding lines (10, 11) and by the major side of the apertures (5).

5. A die-cut blank (1) according to claim 4, **characterised in that** curved cuts (14), made as a continuation of the oblique folding lines (11), are formed along the vertices of the triangular walls (7) of each fan fold (6, 7) facing towards the edges of the central panel (2).

6. A die-cut blank (1) according to any one of claims 3 to 5, **characterised in that** between the adjacent rectangular walls (6) intermediate base walls (8) destined to be disposed along a horizontal plane between the necks (33) of containers are provided.

7. A die-cut blank (1) according to any one of the preceding claims, **characterised in that** said rectangular apertures (5) are disposed in a central portion of said central panel (2) so as to leave two lateral

portions (2a, 2b) of the central panel adapted to be disposed laterally with respect to the necks (33) of said containers, leaving V-shaped apertures (25) coinciding with the triangular walls (7) of the fan-folds.

8. A package of containers aligned in a file, made from a die-cut blank according to any one of the preceding claims.

9. A procedure for packaging containers in a die-cut blank (1) as claimed in any one of claims 1 to 7, **characterised in that** it comprises the following steps:

- feeding the die-cut blanks (1) into a multi-packing machine;
- feeding the containers (30) into said multi-packing machine and phasing of the containers in groups in single file;
- drawing a die-cut blank (1) and positioning of the central panel (2) of the die-cut blank on the upper part (31) of a group of containers (30),
- lowering the central panel (2) of the die-cut blank so that the upper parts (31) of the containers engage in the apertures (5) of the central panel of the die-cut blank,
- folding the first side panel (21) to abut on the upper part (31) and applying a layer of glue thereon, and
- folding and pressing the second side panel (22) onto the layer of glue of the first side panel (21).

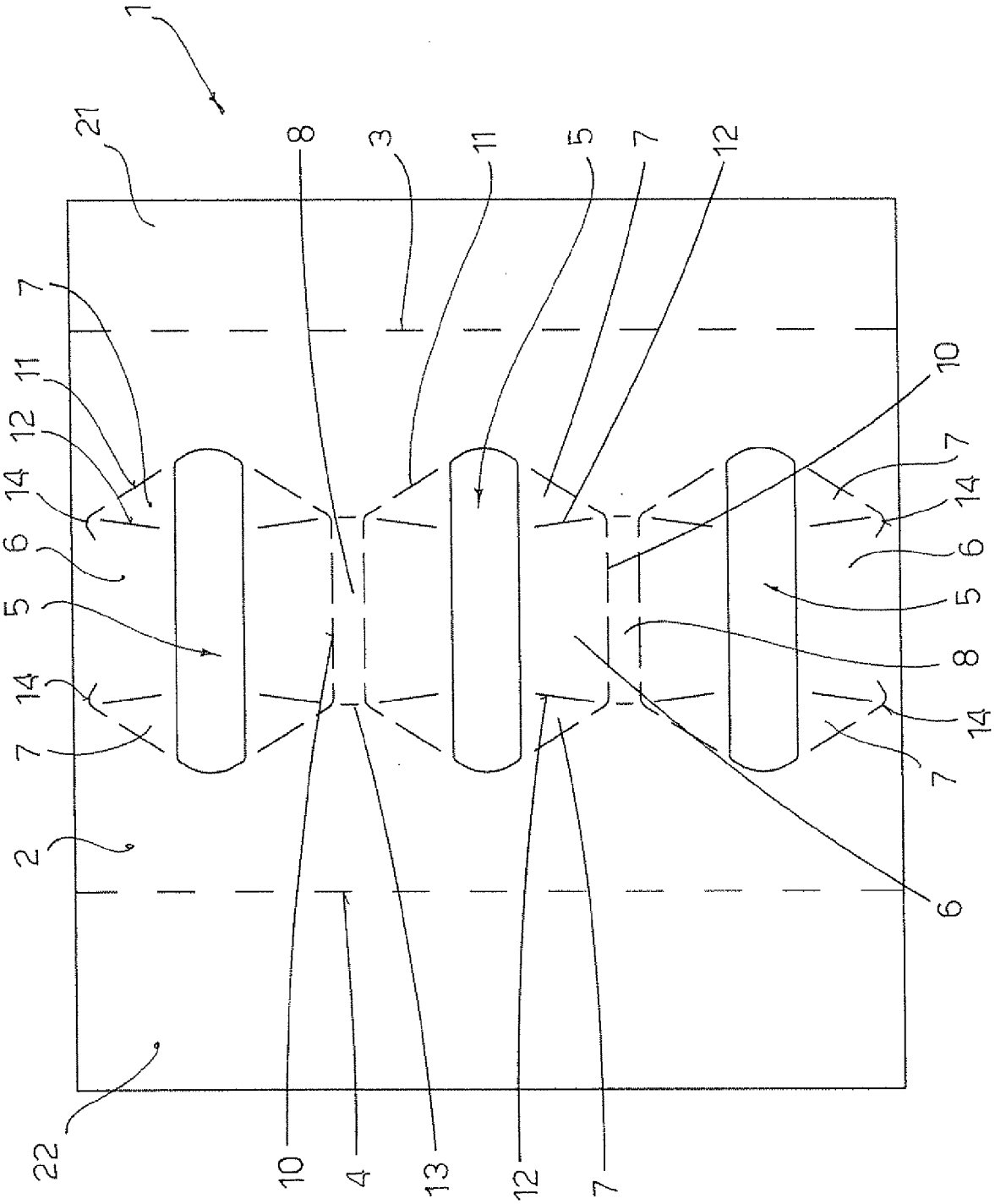


FIG. 1

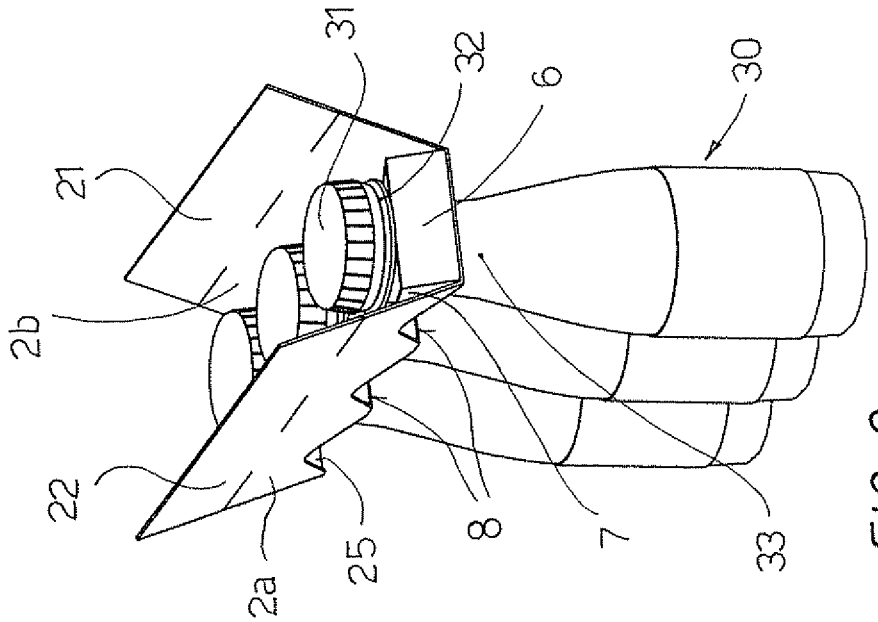


FIG. 3

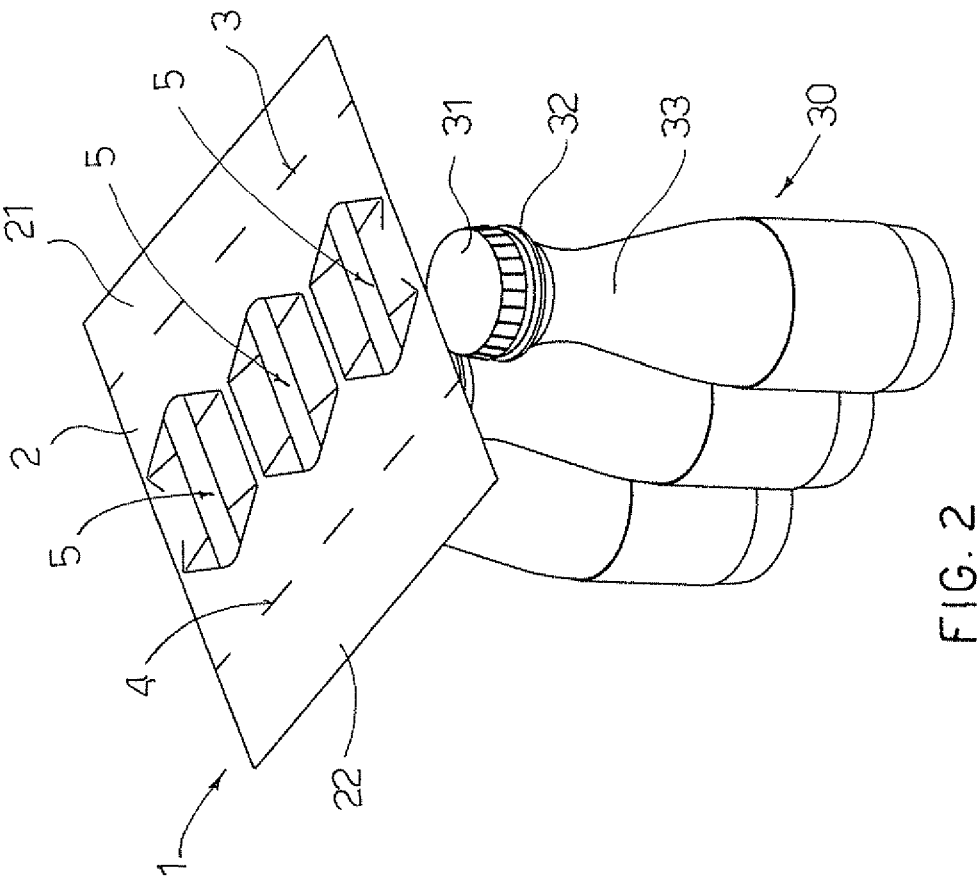


FIG. 2

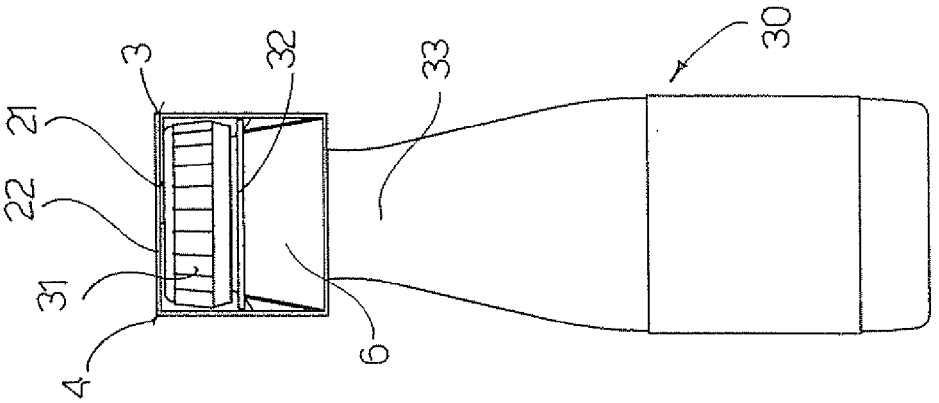


FIG. 6

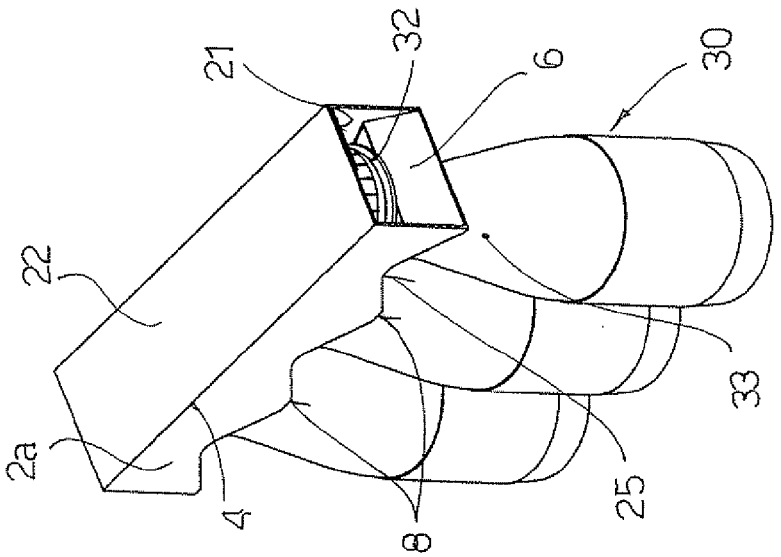


FIG. 5

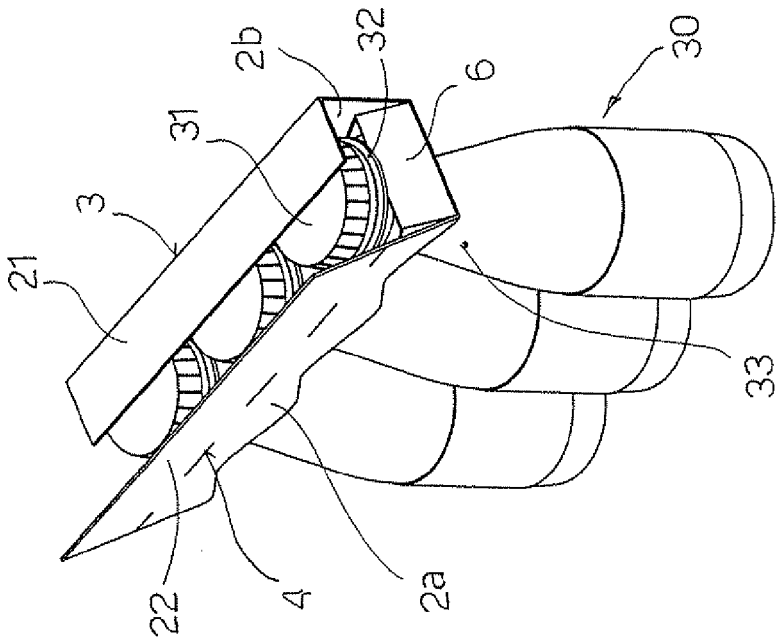


FIG. 4

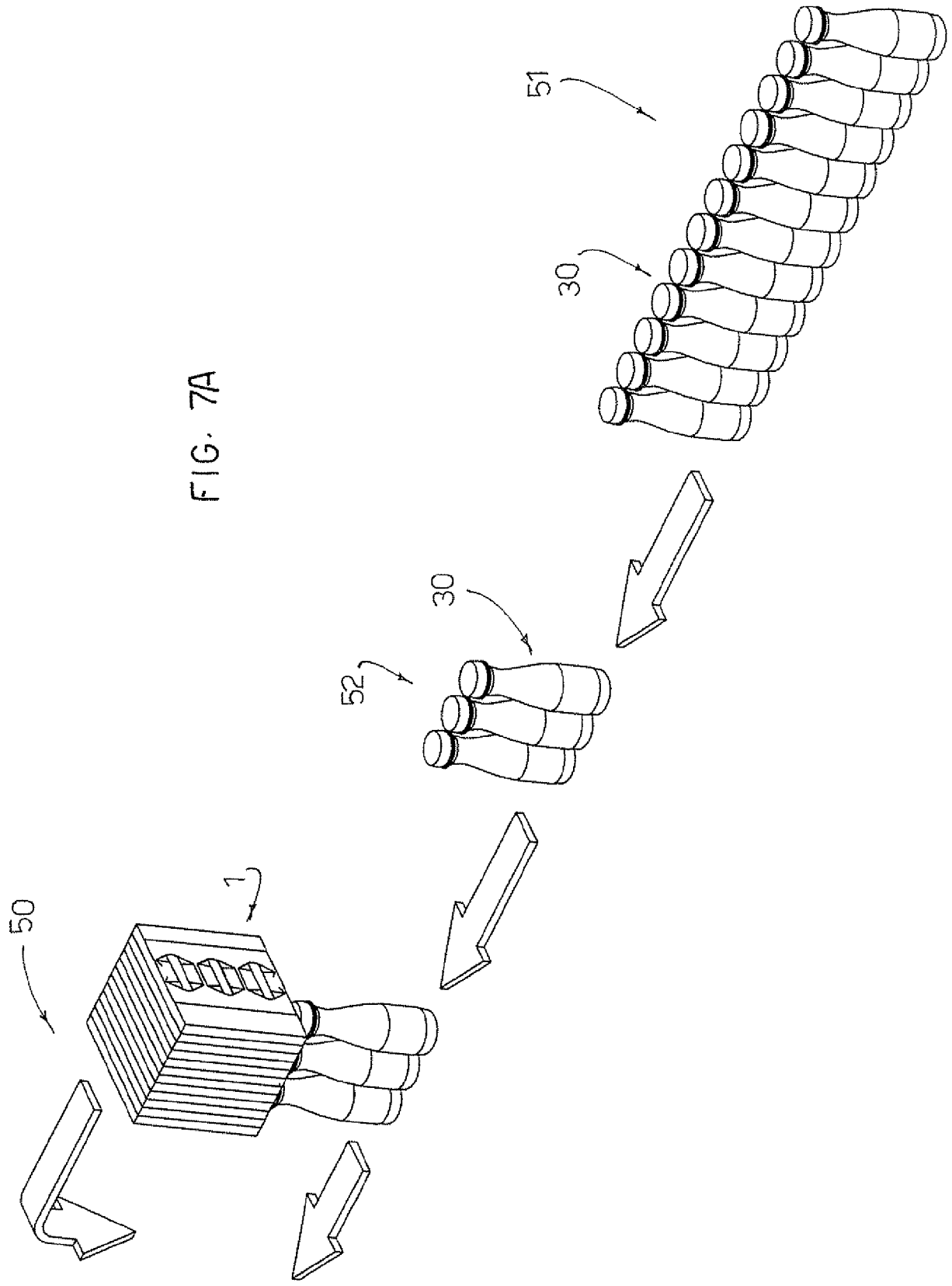
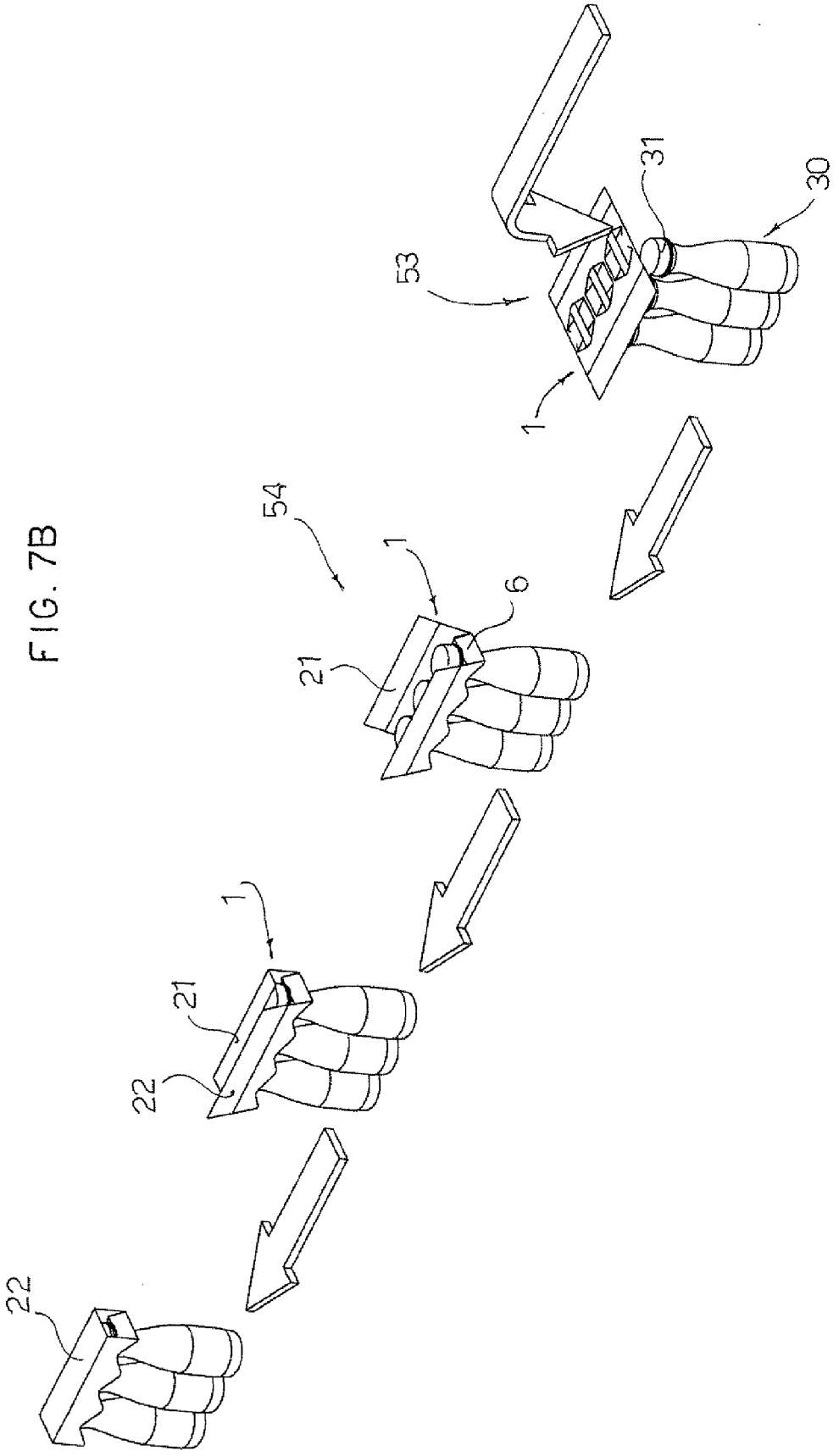


FIG. 7A

FIG. 7B



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EUROPEAN SEARCH REPORT

Application Number
EP 08 16 8733

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	WO 97/33807 A2 (MEAD CORP [US]; SAULAS ALAIN [FR]; AUCLAIR JEAN MICHEL [FR] MEAD CORP) 18 September 1997 (1997-09-18) * figures 1-3 * -----	1-2,8-9 3-7	INV. B65D71/46
Y	GB 1 260 411 A (DAMSTRA) 19 January 1972 (1972-01-19) * figure 3 * -----	3-7	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 May 2009	Bridault, Alain

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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