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• **KOYAMA Yasuhiro**
Kanonji-shi
Kagawa 769-1602 (JP)

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(71) Applicant: **Uni-charm Corporation**
Ehime 799-0111 (JP)

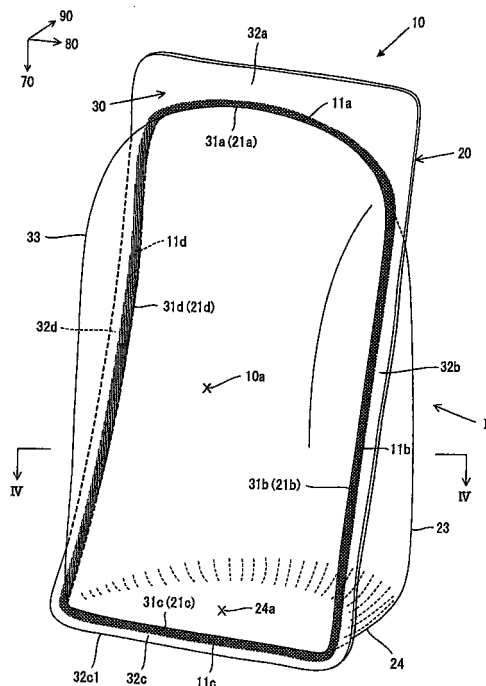
(74) Representative: **Murgatroyd, Susan Elizabeth et al**
Baron Warren Redfern
Cambridge House
100 Cambridge Grove
Hammersmith
London
W6 0LE (GB)

(72) Inventors:
• **UEDA Takahiro**
Kanonji-shi
Kagawa 769-1602 (JP)

(54) **CONTAINER**

(57) Provided is a technology to manufacture a large capacity self-standing container at a low cost. A container (10) comprises a lower container member (20) and an upper container member (30) joined at joint portions (11a to 11d). The container (10) has a content space (10a) formed by a lower container face (23) and an upper container face (33), and lower flanges (22c and 32c). The lower container face (23) has a concave bottom container face (24) at the bottom, which forms a concave bottom face (24a) wherein an object to be contained (400) is fixed. The container is structured so that when at least one of the lower flanges (22c and 32c) and the bottom container face (24) are arranged on a horizontal plane, a line perpendicularly projected to the horizontal surface from the gravity center of the container (10) passes an area framed by a contact portion between the at least one of the lower flanges (22c and 32c) and the horizontal surface and a contact portion between the bottom container face (24) and the horizontal surface.

FIG. 1



Description

FIELD OF THE INVENTION

[0001] This invention relates to a container for storing a storage article within a storage space.

BACKGROUND OF THE INVENTION

[0002] Japanese non-examined laid-open Patent Publication No. 2008-74478 discloses a container having two flexible barrel sheets and one bottom sheet. A bottom seal is formed by bonding a lower edge of the barrel sheet and a circumferential edge of the bottom sheet. Further, a side seal and a top seal are formed by bonding side edges and an upper edge of the barrel sheet. A storage article is stored in a storage space surrounded by the seals.

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0003] The known container can freely stand on a horizontal plane by contact of the bottom-sealed edge with the horizontal plane when the edge is placed on the horizontal plane, but it is difficult to ensure large capacity of the storage space.

It is, accordingly, an object of this invention to provide a rational technique for constructing a freestanding container.

MEANS FOR SOLVING THE PROBLEMS

[0004] The above-described problem is solved by features as defined in claims of this invention. A representative embodiment of this invention is provided as a container formed by bonding a first storage member and a second storage member. The first and second storage members are preferably flexible.

[0005] As the first and second storage members, for example, a sheet (film) formed of nylon and polyethylene and having a thickness of 50 to 200 μm is used. The materials and the thickness of the sheet are not limited to these. The first storage member has a first storage surface and a first flange extending from an edge of the first storage surface.

[0006] The first storage surface has a bottom storage surface forming a bottom surface in a predetermined first direction on which the storage article is disposed.

[0007] The first flange has a first lower flange extending along a second direction transverse to the first direction.

[0008] The second storage member has a second storage surface and a second flange extending from an edge of the second storage surface.

[0009] The second flange has a second lower flange extending along the second direction. The first and second storage members are bonded to-

gether at the edges of the first and second storage surfaces such that the first and second storage surfaces define the storage space.

[0010] When at least one of the first and second lower flanges and the bottom storage surface are placed on a horizontal plane, a line for projecting the center of gravity of the container perpendicularly to the horizontal plane passes through a region which is surrounded by a contact part between at least one of the first and second lower flanges and the horizontal plane and a contact part between the bottom storage surface and the horizontal plane, and the container freely stands on the horizontal plane.

[0011] Further, it is preferably constructed such that the storage article stored in the storage space is externally visible. For example, at least one of the first and second storage members is formed by such a transparent material that the storage article stored in the storage space is externally visible. This transparency here refers to such transparency that at least the appearance of the storage article stored in the storage space can be checked.

EFFECT OF THE INVENTION

[0012] According to this invention, a rational technique for constructing a freestanding container is provided.

Other objects, features and advantages of this invention will be readily understood after reading the following detailed description together with the accompanying drawings and the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

FIG. 1 is a perspective view showing one embodiment of a container according to this invention.

FIG. 2 is a view as viewed from a direction of arrow II in FIG. 1.

FIG. 3 is a perspective view showing an upper storage member and a lower storage member which form the container of the one embodiment.

FIG. 4 is a sectional view taken along line IV-IV in FIG. 1.

FIG. 5 schematically illustrates a method for obtaining the center of gravity.

FIG. 6 schematically illustrates a method for obtaining the center of gravity.

FIG. 7 schematically illustrates a method for obtaining the center of gravity.

FIG. 8 is a perspective view showing another embodiment of the container according to this invention.

FIG. 9 is a sectional view taken along line IX-IX in FIG. 8.

FIG. 10 is a view showing a modification of the second embodiment of the container according to this invention.

FIG. 11 schematically shows one embodiment of a container manufacturing method according to this invention.

FIG. 12 schematically shows one embodiment of a container manufacturing device according to this invention.

FIG. 13 schematically shows a primary sealing section (primary sealing step) in the embodiment of the container manufacturing device.

FIG. 14 schematically shows an air passage blocking section (air passage blocking step) in the embodiment of the container manufacturing device.

FIG. 15 schematically shows a secondary sealing section (secondary sealing step) in the embodiment of the container manufacturing device.

FIG. 16 schematically shows a cutting section (cutting step) in the embodiment of the container manufacturing device.

FIG. 17 schematically shows a primary sealing section (primary sealing step) in another embodiment of the container manufacturing device.

FIG. 18 schematically shows an air injecting section (air injecting step) in the second embodiment of the container manufacturing device.

FIG. 19 schematically shows an air passage blocking section (air passage blocking step) in the second embodiment of the container manufacturing device.

FIG. 20 schematically shows a secondary sealing section (secondary sealing step) in the second embodiment of the container manufacturing device.

FIG. 21 schematically shows a cutting section (cutting step) in the second embodiment of the container manufacturing device.

BEST MODES FOR PERFORMING THE INVENTION

[0014] Each of the additional features and method steps disclosed above and below may be utilized separately or in conjunction with other features and method steps to provide and manufacture improved containers and methods for using such containers and devices utilized therein. Representative examples of the present invention, which examples utilized many of these additional features and method steps in conjunction, will now be described in detail with reference to the drawings. This detailed description is merely intended to teach a person skilled in the art further details for practicing preferred aspects of the present teachings and is not intended to limit the scope of the invention. Only the claims define the scope of the claimed invention. Therefore, combinations of features and steps disclosed within the following detailed description may not be necessary to practice the invention in the broadest sense, and are instead taught merely to particularly describe some representative examples of the invention, which detailed description will now be given with reference to the accompanying drawings.

One embodiment 10 of a container of this invention is

now explained with reference to FIGS. 1 to 7. The container 10 of this embodiment is configured as a container which can freely stand on a horizontal plane with an article having a predetermined shape such as a cleaning article stored in a storage space. Naturally, an article having an appropriate shape can be stored in the storage space. The contour of the container 10, or the contours of a first storage member 20 and a second storage member 30 which form the container 10 can be appropriately changed according to an article to be stored. Further, in the following explanation, a first direction 70, a second direction 80 and a third direction 90 represent directions of the container 10 standing freely on the horizontal plane (standing on the horizontal plane without a support) when viewed from an upper storage surface 33 side (the left as viewed in FIG. 2). The "first direction 70" represents a height direction (vertical direction as viewed in FIG. 2). The "one side in the first direction 70" and "the other side in the first direction 70" represent a lower side (lower side as viewed in FIG. 2) and an upper side (upper side as viewed in FIG. 2), respectively. Further, the "second direction 80" represents a horizontal (transverse) direction (front-back direction as viewed in FIG. 2). The "one side in the second direction" and "the other side in the second direction" represent the right (front as viewed in FIG. 2) and the left (back as viewed in FIG. 2), respectively. Further, the "third direction 90" represents a front-back direction (horizontal direction as viewed in FIG. 2). The "one side in the third direction" and "the other side in the third direction" represent the front (left as viewed in FIG. 2) and the back (right as viewed in FIG. 2), respectively. Further, in this embodiment, the "concave shape" and the "convex shape" are shapes as viewed from the storage space side and essentially refer to an outwardly bulged shape and an inwardly bulged shape, respectively.

[0015] The construction of the container 10 according to this embodiment is described in brief with reference to FIGS. 1 to 3. FIG. 1 is a perspective view of the container 10 and FIG. 2 is a view as viewed from a direction of arrow II in FIG. 1. Further, FIG. 3 is a perspective view showing lower and upper storage members 20, 30 which form the container 10.

The container 10 of this embodiment is formed by bonding the lower and upper storage members 20, 30 which are shown in FIG. 3. Further, in this specification, a storage member which is placed on the lower side of the container 10 standing freely on the horizontal plane is referred to as the "lower storage member". The lower and upper storage members 20, 30 are formed by a sheet (film) which is flexible and has high airtightness (gas barrier property) and a moisture-proofing effect. As this sheet (film), for example, a sheet formed of nylon and polyethylene and having a basis weight of 180 g/m² and a thickness of 50 to 200 μ m is used. Naturally, the material, basis weight and thickness of the sheet are not limited to these. The lower and upper storage members 20, 30 may be formed by different sheets. Further, at

least one of the lower and upper storage members 20, 30 is preferably so transparent that a storage article 400 stored in the storage space 10a is visible through the storage member, and it is formed, for example, of a transparent sheet. It is essential for such a sheet to be so transparent that at least the appearance of the storage article 400 stored in the storage space 10a can be checked.

[0016] The lower storage member 20 has a concave lower storage surface 23 which defines a concave lower storage space 20a. The concave lower storage surface 23 has a bottom (on one side in the first direction 70) having a concave bottom storage surface 24 forming a concave bottom surface 24a. Specifically, the lower storage surface 23 and the bottom storage surface 24 are shaped in a concave form having an opening on the other side (upper side) in the first direction 70. The storage article 400 is fixedly disposed on the concave bottom surface 24a. The construction in which the storage article 400 "is fixedly disposed" represents a construction in which the storage article 400 is fixed to the concave bottom surface 24a such that it can be prevented from moving within the storage space 10a during carriage of the container 10 and can be removed from the bottom surface 24a. The storage article 400 can be fixedly disposed on the bottom surface 24a by using appropriate methods. For example, the storage article 400 is removably mounted on a mat board and then the mat board is fixed on the bottom surface 24a by an adhesion tape or an adhesive. The bottom storage surface 24 is shaped such that the storage article 400 can be fixedly disposed on the concave bottom surface 24a, and the lower storage surface 23 is shaped such that the storage article can be stored in the storage space 10a.

Further, the lower storage member 20 has a flange 22 extending from an edge 21 of the lower storage surface 23. In this embodiment, the edge 21 includes a lower edge 21c on one side (lower side) in the first direction 70, an upper edge 21a on the other side (upper side) in the first direction 70, a right edge 21b on one side (right side) in the second direction 80 and a left edge 21d on the other side (left side) in the second direction 80. Further, the flange 22 includes a lower flange 22c extending from the lower edge 21c to the one side (lower side) in the first direction 70 (downward) and along the second direction 80, an upper flange 22a extending from the upper edge 21a to the other side (upper side) in the first direction 70 (upward) and along the second direction 80, a right flange 22b extending from the right edge 21b to the one side (right side) in the second direction 80 (rightward) and along the first direction 70, and a left flange 22d extending from the left edge 21d to the other side (left side) in the second direction 80 (leftward) and along the first direction 70. Each of the flanges 22a, 22b, 22c, 22d has an edge. For example, the lower flange 22c has a lower edge 22c1 on the one side (lower side) in the first direction 70.

The lower storage member 20, the lower storage surface

23, the bottom surface 24a, the bottom storage surface 24 are features that correspond to the "first storage member", the "first storage surface", the "concave bottom surface", the "bottom storage surface", respectively, according to this invention. The edge 21 is a feature that corresponds to the "edge of the first storage surface (first edge)" according to this invention, and the edges 21a, 21b, 21c, 21d are features that correspond to the "first upper edge", the "first right edge", the "first lower edge" and the "first left edge", respectively, according to this invention. Further, the flange 22 is a feature that corresponds to the "first flange" according to this invention, and the flanges 22a, 22b, 22c, 22d are features that correspond to the "first upper flange", the "first right flange", the "first lower flange" and the "first left flange", respectively, according to this invention. Further, the lower edge 22c1 of the lower flange 22c is a feature that corresponds to the "lower edge of the first lower flange" according to this invention.

[0017] An upper storage member 30 has an upper storage surface 33. The upper storage surface 33 is shaped such the storage article can be stored in the storage space 10a. In this embodiment, the upper storage surface 33 has a concave shape and defines a concave storage space 30a. Specifically, the upper storage surface 33 is shaped in a concave form having an opening on the one side (lower side) in the first direction 70. Further, the upper storage surface 33 may be shaped in a planar form.

Further, the upper storage member 30 has a flange 32 extending from an edge 31 of the upper storage surface 33. In this embodiment, the edge 31 includes a lower edge 31c on the one side (lower side) in the first direction 70, an upper edge 31a on the other side (upper side) in the first direction 70, a right edge 31b on the one side (right side) in the second direction 80 and a left edge 31d on the other side (left side) in the second direction 80. Further, the flange 32 includes a lower flange 32c extending from the lower edge 31c to the one side (lower side) in the first direction 70 (downward) and along the second direction 80, an upper flange 32a extending from the upper edge 31a to the other side (upper side) in the first direction 70 (upward) and along the second direction 80, a right flange 32b extending from the right edge 31b to the one side (right side) in the second direction 80 (rightward) and along the first direction 70 and a left flange 32d extending from the left edge 31d to the other side (left side) in the second direction 80 (leftward) and along the first direction 70. Each of the flanges 32a, 32b, 32c, 32d has an edge. For example, the lower flange 32c has a lower edge 32c1 on the one side (lower side) in the first direction 70.

The lower storage member 30 and the lower storage surface 33 are features that correspond to the "second storage member" and the "second storage surface", respectively, according to this invention. The edge 31 is a feature that corresponds to the "edge of the second storage surface (second edge)" according to this invention, and the

edges 31a, 31b, 31c, 31d are features that correspond to the "second upper edge", the "second right edge", the "second lower edge" and the "second left edge", respectively, according to this invention. Further, the flange 32 is a feature that corresponds to the "second flange" according to this invention, and the flanges 32a, 32b, 32c, 32d are features that correspond to the "second upper flange", the "second right flange", the "second lower flange" and the "second left flange", respectively, according to this invention. The lower edge 32c1 of the lower flange 32c is a feature that corresponds to the "lower edge of the second lower flange" according to this invention.

[0018] Further, when the lower storage member 20 and the upper storage member 30 are bonded together, the edges of the flanges 22a to 22d of the lower storage member 20 and the edges of the flanges 32a to 32d of the upper storage member 30 are preferably opposed (aligned) with each other, but they may be displaced with respect to each other. The length (width) of the flanges 22a to 22d of the lower storage member 20 from the edges 21 b to 21 d and the length (width) of the flanges 32a to 32d of the upper storage member 30 from the edges 31b to 31 d are set, for example, to 5 to 10 mm. Further, the container 10 of this embodiment is constructed to freely stand on a horizontal plane by contact of the lower flange 22c (32c) and the bottom storage surface 24 with the horizontal plane. Specifically, the lower edge 22c (32c1) of the lower flange 22c (32c) and the bottom storage surface 24 get into contact with the horizontal plane. For this purpose, the lower flange 22c (32c) is configured to have sufficient strength for the container to freely stand. For example, the lower flange 22c (32c) is formed of a sheet having desired strength. Alternatively, the lower flanges 22c, 32c are bonded together so as to provide the lower flange with desired strength.

[0019] As shown in FIGS. 1 and 2, the lower and upper storage members 20, 30 are laid one on the other such that the lower storage surface 23 and the upper storage surface 33 (the edge 21 of the lower storage surface 23 and the edge 31 of the upper storage surface 33) are opposed to each other, and in this state, they are bonded together at a bonded part 11. In this embodiment, the lower and upper storage members 20, 30 are bonded together at an upper bonded part 11a provided in a region of the upper edge 21 a (31 a), a right bonded part 11b provided in a region of the right edge 21 b (31b), a lower bonded part 11c provided in a region of the lower edge 21 c (31c) and a left bonded part 11d provided in a region of the left edge 21 d (31 d). Each of the bonded parts 11a to 11d has a width, for example, of about 3 mm. Further, the container 10 has, for example, a length (height) of about 250 mm along the first direction 70, a length (width) of about 140 mm along the second direction 80 and a length (depth) of about 90 mm along the third direction 90.

[0020] Suitably, air is injected into the storage space 10a. If pressure in the storage space 10a is lower, the container 10 can be easier to freely stand. In order to

protect the storage article 400 from damage by external force applied to the lower storage surface 23 and the upper storage surface 33, however, it is better to increase pressure in the storage space 10a so as to increase resilience of the lower storage surface 23 and the upper storage surface 33.

In this embodiment, the pressure in the storage space 10a is set in the range of 0.01 to 5 times atmospheric pressure, or suitably in the range of 1 to 5 times atmospheric pressure, or more suitably in the range of 1 to 3 times atmospheric pressure.

[0021] The container 10 of this embodiment is configured to freely stand by contact of the lower flanges 22c, 32c and the lower storage surface 23 with a horizontal plane. For this purpose, the container 10 has the following construction.

If a region surrounded by a contact part of the lower flanges 22c, 32c with a horizontal plane and a contact part of the lower storage surface 23 with the horizontal plane has a larger area, the container 10 can freely stand with greater stability and the storage article 400 can be easily disposed fixedly. Therefore, in this embodiment, the bottom storage surface 24 is formed such that the concave bottom surface 24a has a generally planar shape extending generally in parallel to the horizontal plane when the container 10 freely stands on the horizontal plane. Further, in this embodiment, the lower storage surface 23 having the bottom storage surface 24 is formed by deep drawing of the sheet.

Further, the bottom storage surface 24 is formed to have a generally arcuate peripheral contour as viewed from the one side (or the other side) in the first direction 70. In this case, as shown in FIG. 4, when the container 10 freely stands on the horizontal plane, the container 10 comes in contact with the horizontal plane at contact parts T1, T2. The contact part T1 is a contact part between the lower flanges 22c, 32c and the horizontal plane and provided along the lower edge 22c1 of the lower flange 22c and the lower edge 32c1 of the lower flange 32c. The contact part T2 is a contact part between the bottom storage surface 24 and the horizontal plane and provided along the peripheral contour of the bottom storage surface 24. In FIG. 4, the contact part T1 is provided along a straight line and the contact part T2 is provided along a circular arc. Further, the positions of the contact parts T1, T2 are not limited to the positions shown in FIG. 4. For example, the lower flanges 22c, 32c may not become flat under heat or pressure caused when the lower and upper storage members 20, 30 are bonded together. In such a case, the lower edge 22c1 of the lower flange 22c and the lower edge 32c1 of the lower flange 32c do not extend in a straight line, so that the contact part T1 is provided along not a straight line but a curved line.

Further, the peripheral contour of the bottom storage surface 24 is not limited to the arcuate contour. The contact part T2 between the bottom storage surface 24 and the horizontal plane is arranged along the peripheral contour of the bottom storage surface 24.

[0022] Further, in the container 10 of this embodiment, the center of gravity G is positioned such that the container 10 is easy to freely stand.

The position of the center of gravity G of the container 10 can be found, for example, by a method shown in FIGS. 5 and 6. Holes 41, 42, 43 are formed at three points along the second direction 80 on the other (upper) end of the upper flange 22a (32a) of the container 10 in the first direction 70. First, as shown in FIG. 5, the container 10 is supported at the hole 41 and dangled in a free state. Then a normal 41 G passing through the hole 41 is determined by viewing the container from the one side (the front) in the third direction 90. Secondly, as shown in FIG. 6, the container 10 is supported at the hole 42 and dangled in a free state. Then a normal 42G passing through the hole 42 is determined by viewing the container from the one side (the front) in the third direction 90. Thirdly, as shown in FIG. 7, the container 10 is supported at the hole 43 and dangled in a free state. Then a normal 43G passing through the hole 43 is determined by viewing the container from the one side (the right) in the second direction 80. A point of intersection of the normals 41 G, 42G, 43G determined as described above is defined as the position of the center of gravity G of the container 10. Next, as shown in FIG. 2, the container 10 is placed on the horizontal plane F such that the lower flange 22c (32c) and the bottom storage surface 24 are held in contact with the horizontal plane F. Then a line g for projecting the center of gravity G of the container 10 perpendicularly to the horizontal plane F is drawn. At this time, as shown in FIG. 4, the line g passes through a region S which is surrounded by the contact part T1 between the lower flanges 22c, 32c and the horizontal plane F and the contact part T2 between the bottom storage surface 24 and the horizontal plane F. The region S refers to a region having the largest area in a region surrounded by a line connecting the contact part T1 between the lower flanges 22c, 32c and the horizontal plane F with the contact part T2 between the bottom storage surface 24 and the horizontal plane F. Further, preferably, the line g passes through the center of the region S. By provision of such a construction, the container 10 becomes easier to freely stand with the lower flange 22c (32c) and the bottom storage surface 24 in contact with the horizontal plane. In the container 10 of this embodiment which is constructed to freely stand on the horizontal plane F by contact of the lower flanges 22c, 32c and the bottom storage surface 24 with the horizontal plane F, it is essential for the flanges 22, 32 to have at least the lower flanges 22c, 32c.

[0023] Further, the container 10 of this embodiment is constructed such that the right and left bonded parts 11b, 11d or the right and left flanges 22b (32b), 22d (32d) are inclined when viewed from the one side (or the other side) in the second direction 80.

As shown in FIG. 2, the right flange 22b (32b) and the left flange 22d (32d) are inclined such that their upper ends on the other side (upper side) in the first direction 70 are located to the other side in the third direction 90

(rearward) or to the lower storage surface 23 side with respect to their lower ends on the one side (lower side) in the first direction 70. In other words, when the lower flanges 22c, 32c and the bottom storage surface 24 of the container 10 come in contact with the horizontal plane F, the right and left bonded parts 11b, 11d or the right and left flanges 22b (32b), 22d (32d) form an angle θ ($< 90^\circ$) with respect to the third direction (front-back direction) parallel to the horizontal plane when viewed from the one side (the right) in the second direction 80. In this embodiment, the angle θ is set in the range of 75 to 80° . By provision of the construction in which the right and left bonded parts 11b, 11d or the right and left flanges 22b (32b), 22d (32d) are inclined, the container 10 is easier to freely stand.

Further, the construction in which the right flange 22b (32b) and the left flange 22d (32d) are inclined may be omitted.

[0024] In the above description, the container 10 is allowed to freely stand on the horizontal plane F by placing the lower edge 22c1 of the lower flange 22c, the lower edge 32c1 of the lower flange 32c and the bottom storage surface 24 in contact with the horizontal plane F, but other methods may also be used to allow the container 10 to freely stand on the horizontal plane F. For example, it may be constructed to freely stand by placing at least one of the lower edge 22c1 of the lower flange 22c and the lower edge 32c1 of the lower flange 32c and the bottom storage surface 24 in contact with the horizontal plane F. Alternatively, it may be constructed to freely stand by placing at least one of a region of the lower flange 22c other than the lower edge 22c1 and a region of the lower flange 32c other than the lower edge 32c1 and the bottom storage surface 24 in contact with the horizontal plane F.

Further, the lower edge 22c1 of the lower flange 22c and the lower edge 32c1 of the lower flange 32c may come in contact with the horizontal plane F at the same positions (regions opposed to each other) or at different positions.

[0025] The container 10 of the above-described embodiment freely stands on the horizontal plane by the lower flange 22c (32c) and the lower storage surface 23 (the bottom storage surface 24), but the container 10 may be constructed to freely stand on the horizontal plane solely by the lower storage surface. A container 110 of another embodiment is shown in FIGS. 8 and 9. FIG. 8 is a perspective view of the container 110 of another embodiment and FIG. 9 is a sectional view taken along line IX-IX in FIG. 8.

Like the container 10, the container 110 of this embodiment includes a lower storage member 120 and an upper storage member 130. In the container 110 of this embodiment, the lower storage member 120 has a different structure from the lower storage member 20 of the container 10. Therefore, in the following description, the structure of the lower storage member 120 is mainly explained.

The lower storage member 120 has a lower storage surface 123 defining a lower storage space 120a. The lower storage surface 123 has concave bottom storage surfaces 124, 125 and a convex bottom storage surface 126 which form a convex bottom surface on one side (lower side) in the first direction 70. The concave bottom storage surface 124, the concave bottom storage surface 125 and the convex bottom storage surface 126 form a concave bottom surface 124a, a concave bottom surface 125a and a convex bottom surface 126a, respectively. In this embodiment, the concave bottom storage surfaces 124, 125 are formed along a peripheral contour of the convex bottom storage surface 126. The storage article 400 is fixedly mounted on the convex bottom surface 126a. The "concave shape" and the "convex shape" refer to a shape having a concave on the storage space 110a side and a shape having a convex on the storage space 110a side, respectively.

The convex bottom storage surface 126 is shaped such that the storage article 400 can be fixedly disposed on the convex bottom surface 126a. For example, the convex bottom storage surface 126 is configured such that the convex bottom surface 126a has a generally planar shape extending generally in parallel to the horizontal plane when the container 110 freely stands on the horizontal plane.

[0026] The container 110 of this embodiment is constructed to freely stand by contact of the concave bottom storage surfaces 124, 125 of the lower storage member 120 with a horizontal plane. Specifically, it is constructed such that, when the concave bottom storage surfaces 124, 125 are in contact with the horizontal plane, a line g for projecting the center of gravity G of the container 110 perpendicularly to the horizontal plane passes through a region S which is surrounded by a contact part T1 between the concave bottom storage surface 124 and the horizontal plane and a contact part T2 between the concave bottom storage surface 125 and the horizontal plane. The region S refers to a region having the largest area in a region surrounded by a line connecting the contact part T1 between the concave bottom storage surface 124 and the horizontal plane and the contact part T2 between the concave bottom storage surface 125 and the horizontal plane.

Further, like the container 10, the container 110 of this embodiment is constructed such that right and left bonded parts or right and left flanges 122b (132b), 122d (132d) are inclined when viewed from the one side in the second direction 80. Further, the construction in which the right flange 122b (132b) and the left flange 122d (132d) are inclined may be omitted.

[0027] The concave bottom storage surfaces 124, 125 are appropriately shaped and positioned such that the storage article 400 can be fixedly disposed on the convex bottom surface 126a and the container 110 can freely stand on the horizontal plane.

In this embodiment, as shown in FIG. 9, the concave bottom storage surface 124 is formed generally in parallel

to the second direction 80 (to the lower flange) and the concave bottom storage surface 125 is formed along a generally circular arc extending from both ends of the concave bottom storage surface 124. Specifically, the concave bottom storage surfaces 124, 125 are contiguously formed with each other. In this case, the contact part T1 between the concave bottom storage surface 124 and the horizontal plane is provided along a straight line (including a generally straight line) and the contact part T2 between the concave bottom storage surface 125 and the horizontal plane is provided along a circular arc (including a generally circular arc).

The concave bottom storage surfaces 124, 125 only have to be designed to come in contact with the horizontal plane at least partially along the straight line and the circular arc. For example, as shown in FIG. 10, it may be constructed such that the concave bottom storage surface 124 comes in contact with the horizontal plane at a contact part T11 formed along part of the straight line and the concave bottom storage surface 125 comes in contact with the horizontal plane at contact parts T21, T22 formed along part of the circular arc.

[0028] Further, when the concave bottom storage surface 124 of the container 10 and the concave bottom storage surfaces 124, 125 and the convex bottom storage surface 126 of the container 110 are formed by deep drawing, the sheet thickness of the deep-drawn parts is reduced, so that the strength may be reduced. Therefore, in order to increase the strength, a rubber or other similar materials may be provided in the deep-drawn parts.

Further, the deep-drawn parts having a curved shape are easier to slide. Therefore, in order to prevent such sliding, a rubber or other similar materials may be provided in the deep-drawn parts.

In order to facilitate removal of the storage article 400 from the storage space, an opening aid may be provided. For example, a notch or a part (non-bonded part) which can be easily peeled off may be formed in the container. Further, preferably, the container can freely stand on the horizontal plane not only when the storage article 400 is fixedly disposed on the concave bottom surface 124a of the container 10 (or on the convex bottom surface 126a of the container 110), but also when the storage article 400 is not stored in the storage space. Specifically, it is preferably constructed such that a line for projecting the center of gravity of the container 10 (110) perpendicularly to the horizontal plane passes through a region surrounded by the contact parts when the storage article 400 is not stored in the storage space and at least one of the lower flanges 22c and 32c and the bottom storage surface 24 of the container 10 (or the concave bottom storage surfaces 124, 125 of the container 110) are placed on the horizontal plane.

Further, even if a line for projecting the center of gravity of the container 10 (or the container 110) perpendicularly to the horizontal plane does not pass through a region surrounded by the contact parts when the container 10 (or the container 110) is placed on the horizontal plane

without the storage article 400 in the storage space, it is only necessary for such a line to pass through the region surrounded by the contact parts when the storage article 400 is fixedly disposed on the concave bottom surface 24a of the container 10 (or on the convex bottom surface 126a of the container 110).

[0029] As described above, the container of this invention is formed of a flexible sheet in its entirety, so that it is soft and easy to handle. Further, the container can be reduced in size at the time of disposal, so that it can be easily disposed of and its disposal cost can be reduced. The container has the bottom storage surface on which the storage article is fixedly disposed, so that its storage capacity can be increased.

Further, by pressurizing the storage space, the storage article can be protected from damage by external force applied to the upper and lower storage surfaces. Further, even if the upper and lower storage surfaces are dented by external force, they can be restored to their original state.

[0030] A method for manufacturing the container of this invention is now explained. One embodiment of a container manufacturing method according to this invention is schematically shown in FIG. 11. The container manufacturing method shown in FIG. 11 is suitable for manufacturing the container in which the pressure in the storage space 10a is set to be equal to or higher than the atmospheric pressure.

Step P1 is a lower storage surface forming step. In step P1, a lower storage surface of a lower storage member is formed in a first sheet. The lower storage surface of the container of this embodiment has a concave bottom storage surface which forms a concave bottom surface (or a concave bottom storage surface and a convex bottom storage surface which form a convex bottom surface). Therefore, in step P1, the lower storage surface having the concave bottom storage surface (or having the concave bottom storage surface and the convex bottom storage surface) is formed by deep drawing. Naturally, various other methods can also be used to form the lower storage surface. Step P1 is a feature that corresponds to the "first storage surface forming step" according to this invention.

Step P2 is an air injection hole forming step. In step P2, an air injection hole is formed in the first sheet as an opening for air injection to inject air into the storage space. Step P2 is a feature that corresponds to the "gas injection hole forming step" according to this invention.

Step P3 is a storage article supplying step. In step P3, a storage article is supplied into a lower storage space defined by the lower storage surface of the first sheet. At this time, the storage article is fixedly disposed on a bottom surface formed by the bottom storage surface such that it can be prevented from moving within the storage space during carriage. Step P3 is a feature that corresponds to the "storage article supplying step" according to this invention.

Step P4 is an upper storage surface forming step. In step

P4, an upper storage surface of an upper storage member is formed in a second sheet. Various other methods can also be used to form the upper storage surface according to the shape of the upper storage surface. Step P4 is a feature that corresponds to the "second storage surface forming step" according to this invention.

Step P5 is a sheet overlaying step. In step P5, the first sheet having the lower storage surface and the second sheet having the upper storage surface are overlaid one on the other. At this time, suitably, the first and second sheets are overlaid such that the lower and upper storage surfaces are opposed to each other or such that edges of the lower and upper storage surfaces are opposed to each other. Step P5 is a feature that corresponds to the "sheet overlaying step" according to this invention.

Further, in this embodiment, the air injection hole for injecting air is formed in the first sheet, but it may be formed in the second sheet. In this case, step P2 is bypassed and an air injection hole forming step of forming the air injection hole in the second sheet is provided between step P4 and step P5.

[0031] Step P6 is a primary sealing step. In step P6, the first and second sheets are bonded (primarily sealed) together at a region other than an air passage. Specifically, the first and second sheets are bonded such that a storage space is formed by the lower and upper storage spaces and the air passage for injecting air into the storage space is formed between the air injection hole formed in the first sheet (or the second sheet) and the storage space. The first and second sheets are suitably bonded together at the edges of the lower and upper storage spaces. Naturally, they may be bonded together at regions other than the edges of the lower and upper storage spaces. In the primary sealing step, in order to form the bonded part, typically, parts of the first and second sheets are heated to the softening point of the sheet material or higher and melted, and the melted parts are pressed and fusion bonded, and then the fusion-bonded part is cooled. Specifically, the primary sealing step consists of a heating step, a pressing step and a cooling step. Naturally, the method of bonding the first and second sheets is not limited to this. Step P6 is a feature that corresponds to the "primary sealing step" according to this invention.

Step P7 is an air injecting step. In step P7, air is injected into the storage space through the air injection hole via the air passage. For example, an air injection nozzle is inserted into the air injection hole and air is injected into the storage space through the air injection nozzle via the air passage and an air inlet. At this time, the pressure in the storage space is set to be equal to or higher than the atmospheric pressure or, for example, in the range of 1 to 5 times atmospheric pressure, or suitably in the range of 1 to 3 times atmospheric pressure. In this embodiment, the air, the air injection hole and step P7 are features that correspond to the "gas", the "gas injection hole" and the "gas injecting step", respectively, according to this invention.

Step P8 is an air passage blocking step. In step P8, the

air passage is temporarily blocked in order to prevent a subsequent secondary sealing from being performed in pressurized atmosphere. The air passage is suitably blocked at a position toward the storage space or, for example, in the vicinity of the air inlet of the storage space. The air passage can be temporarily blocked suitably by pressing at least one of the first and second sheets toward each other. For example, a pair of pressing members can be used which are opposed to each other and can be controlled to be placed in a standby position or a working position. When the pressing members are controlled to be placed in the working position, the first and second sheets are pressed toward each other, so that the air passage is blocked. Various other methods can also be used to block the air passage. Step P8 is a feature that corresponds to the "gas passage blocking step" according to this invention. Further, in this specification, "blocking the gas passage" means "temporarily closing the gas passage at an arbitrary point so as to prevent gas from passing through this point".

[0032] Step P9 is a secondary sealing step. In step P9, the first and second sheets are bonded together at a region of the air passage. Step P9 is suitably performed when the region of the air passage toward the storage space is blocked and air injection from the air injection hole is stopped (for example, the air injection nozzle is removed from the air injection hole). The secondary sealing is performed in its entirety or in part of a region between the blocked point of the air passage and the air injection hole. Like the primary sealing step, the secondary sealing step typically includes a heating step, a pressing step and a cooling step. Step P9 is a feature that corresponds to the "secondary sealing step" according to this invention. The secondary sealing step is not performed in pressurized atmosphere, so that the bonding strength can be ensured.

Step P10 is an air passage unblocking step. In step P10, the air passage is unblocked. For example, when the pressing member is used, the pressing member is controlled to be held in the standby position. Thus, pressure upon the at least one of the first and second sheets is released and the air passage is unblocked. Step P10 is a feature that corresponds to the "gas passage unblocking step" according to this invention.

Step P11 is a cutting step. In step P11, the first and second sheets which are subjected to the primary and secondary sealing steps are cut off at cutting positions corresponding to the shape and the size of the container. For example, the first and second sheets are cut lengthwise along the longitudinal direction of the first and second sheets and cut widthwise along a direction transverse to the longitudinal direction. Step P11 is a feature that corresponds to the "cutting step" according to this invention.

Further, the container manufacturing method of this invention is not limited to that shown in FIG. 11. For example, a method of performing each of the steps shown in FIG. 11 and the sequence of performing each of the steps

can be appropriately changed.

[0033] A manufacturing device for manufacturing the container of this invention is now explained. One embodiment of the container manufacturing device of this invention is schematically shown in FIG. 12. The container manufacturing device shown in FIG. 12 is suitable for manufacturing the container in which the pressure in the storage space 10a is set to be equal to or higher than the atmospheric pressure.

The container manufacturing device shown in FIG. 12 includes a lower storage surface forming section 500, an air injection hole forming section 510, a storage article supplying section 520, an upper storage surface forming section 530, a sheet overlaying section 540, a primary sealing section 550, an air injecting section 560, an air passage blocking section (air passage unblocking section) 570, a secondary sealing section 580 and a cutting section 590.

[0034] An operation of each section shown in FIG. 12 is explained with reference to FIGS. 13 to 16.

In the lower storage surface forming section 500, a lower storage surface 223 having a bottom storage surface is formed in a first sheet 220. In this embodiment, the lower storage surface 223 is formed by deep drawing. The lower storage surface forming section 500 can be configured as a device for forming the lower storage surface 223 by using a known method. The lower storage surface 223 defines a lower storage space 220a. The lower storage surface forming section 500 is a feature that corresponds to the "first storage surface forming section (first storage surface forming step)" according to this invention.

In the air injection hole forming section 510, an air injection opening in the form of an air injection hole 228 for injecting air into a storage space is formed in the first sheet 220. In this embodiment, the air injection hole 228 is formed between adjacent lower storage surfaces 223. In this embodiment, in the air injection hole forming section 510, the air injection hole 228 is formed in the first sheet 220 by using a hole punch 240. Various other devices can also be used to form the air injection hole 228 in the first sheet 220. The shape of the air injection hole 228 is appropriately selected. In this embodiment, the air injection hole 228 is shaped to allow the air injecting nozzle to be inserted. The air, the air injection hole 228 and the air injection hole forming section 510 are features that correspond to the "gas", the "gas injection opening" and the "gas injection hole forming section (gas injection hole forming step)", respectively, according to this invention.

In the storage article supplying section 520, the storage article 400 is supplied into the lower storage space 220a defined by the lower storage surface 223 of the first sheet 220. Further, the storage article 400 is fixedly disposed on the concave bottom formed by the bottom storage surface of the lower storage surface 223 such that it can be prevented from moving within the storage space during carriage. The storage article supplying section 520 is a feature that corresponds to the "storage article sup-

plying section" according to this invention.

[0035] In the upper storage surface forming section 530, the upper storage surface 233 is formed in the second sheet 230. The upper storage surface forming section 530 can be configured as a device for forming the upper storage surface 233 by using a known method. The upper storage surface forming section 530 is a feature that corresponds to the "second storage surface forming section (second storage surface forming step)" according to this invention.

In the sheet overlaying section 540, the first and second sheets 220, 230 are overlaid one on the other. They are suitably overlaid such that the lower storage surface 223 of the first sheet 220 and the upper storage surface 233 of the second sheet 230 (edges of the lower and upper storage surfaces 223, 233) are opposed to each other. The sheet overlaying section 540 is a feature that corresponds to the "sheet overlaying section (sheet overlaying step)" according to this invention.

Further, the air injection hole 228 can also be formed in the second sheet 230. When the air injection hole 228 is formed in the second sheet 230, the air injection hole forming section 510 is provided between the upper storage surface forming section 520 and the sheet overlaying section 540.

[0036] In the primary sealing section 550, the first and second sheets 220, 230 overlaid one on the other are bonded together (primarily sealed) such that the storage space is defined by the lower and upper storage surfaces 223, 233 and the air passage 213 is formed between the air injection hole 228 and the storage space (an air inlet 212 of the storage space). For example, a bonded part 250 (first bonded part) at which the first and second sheets 220, 230 are bonded together is formed in a region of the edges of the lower and upper storage surfaces 223, 233 other than the air passage 213 between the air injection hole 228 and the air inlet 212 of the storage space (see FIG. 13). Further, it is essential for the bonded part to be formed such that the storage space and the air passage 213 can be formed, and location of the bonded part is not limited to that shown in FIG. 13. The primary sealing section 550 is a feature that corresponds to the "primary sealing section (primary sealing step)" according to this invention.

The primary sealing section 550 includes, for example, a heating section that heats the first and second sheets 220, 230 to melt sheet materials, a pressing section that applies pressure on (presses) the melted part to fusion bond them, and a cooling section that cools the fusion-bonded part to form the bonded part. As the heating section, various types of heating sections can be used, including a heating section of a type that heats with heat generated from a heating wire to which low voltage and large current are supplied in a short time (impulse welding method), a heating section of a type that heats with radiant heat from a highly-heated hot plate (noncontact-type hot plate welding method), a heating section of a type that heats by contact of a highly-heated hot plate

(contact-type hot plate welding method), a heating section of a type that heats with friction heat generated by pressing and rotating a circular molding at high speed (spin welder welding method), a heating section of a type that heats with heat generated by molecular motion of plastic which is caused by high-frequency polarity change (high-frequency induction welding method), a heating section of a type that fusion-bonds portions to be bonded by radiation of high frequencies, where the portions of the sheets to be bonded are shaped to be mated with each other and a metal material (such as a wire) is inserted into the portions to be bonded (electromagnetic induction welding method), a heating section of a type that heats and welds by laser beam irradiation (laser welding method), and a heating section of a type that heats by transmitting oscillation of a metal member which oscillates at high speed (for example, with amplitude of 50 μ or lower at 15 to 40kHz) (ultrasonic heating method). Further, the heating section and the pressing section can also be provided in one device.

Various other known bonding methods can be used to bond the first and second sheets 220, 230 together.

[0037] In the air injecting section 560, air is injected into the storage space. In this embodiment, a nozzle (air injection nozzle) 260 is inserted into the air injection hole 228, and then air is injected from the nozzle 260 into the storage space via the air passage 213 and the air inlet 212. The pressure in the storage space is set, for example, in the range of 1 to 5 times atmospheric pressure, or suitably in the range of 1 to 3 times atmospheric pressure. The air injecting section 560 is a feature that corresponds to the "gas injecting section (gas injecting step)" according to this invention.

In the air passage blocking section 570, after air is injected into the storage space, the air passage is temporarily blocked. Suitably, the air passage 213 is blocked at a position toward the storage space (the air inlet 212). In this embodiment, the air passage blocking section 570 has a pair of pressing members 270 opposed to each other. The pair pressing members 270 can be controlled to be placed in the working position in which the first and second sheets 220, 230 are pressed toward each other, or in the standby position in which the first and second sheets 220, 230 are not pressed. In the air passage blocking section 570, the opposed pair pressing members 270 are moved to the working position and bring the first and second sheets 220, 230 into contact with each other in the region of the air passage 213 toward the storage space (in the vicinity of the air inlet 212 of the storage space) (see FIG. 14). Thus, even if air injection through the air injection hole 228 is stopped, the pressure in the storage space never decreases. The pressing members 270 and the air passage blocking section 570 are features that correspond to the "pressing member" and the "gas passage blocking section (gas passage blocking step)", respectively, according to this invention. Further, in order to bring the first and second sheets 220, 230 into contact with each other, at least one of the first and second sheets

220, 230 only has to be pressed toward the other. Therefore, it is essential for the air passage blocking section 570 to have a pressing member which presses at least one of the first and second sheets 220, 230 toward the other.

[0038] In the secondary sealing section 580, the first and second sheets 220, 230 are bonded together (secondarily sealed) such that the air passage 213 blocked by the pressing members 270 is closed. For example, a bonded part 280 (second bonded part) is formed between a part of the air passage 213 which is blocked by the pressing members 270 and the air injection hole 228, and bonds the first and second sheets 220, 230 (see FIG. 15). It is essential for the bonded part 280 to be formed such that the air injection hole 228 and the storage space (the air inlet 213) do not communicate with each other when pressing of the pressing members 270 is released, and the bonded part 280 may be formed in part of the region between the blocked part and the air injection hole 228. Like the primary sealing section 550, the secondary sealing section 580 can be formed by a heating section that heats the first and second sheets 220, 230 to melt sheet materials, a pressing section that applies pressure on (presses) the melted parts to fusion bond them, and a cooling section that cools the fusion-bonded part to form the bonded part. When the bonded part 280 is formed by the secondary sealing section 580, air injection is stopped. For example, the air injection nozzle 260 is pulled out of the air injection hole 228. Therefore, the region forming the bonded part 280 is not subjected to pressure, so that the bonding strength of the bonded part 280 can be ensured. Further, the region between the air injection hole 228 and the storage space (the air inlet 212) is blocked by the pressing members 270, so that the secondary sealing can be performed while the pressure in the storage space is held within a set range. The secondary sealing section 580 is a feature that corresponds to the "secondary sealing section (secondary sealing step)" according to this invention.

In the air passage blocking section 570, after secondary sealing by the secondary sealing section 580, the air passage is unblocked. For example, the pair pressing members 270 are controlled to be placed in the standby position in which the first and second sheets 220, 230 are not pressed. The air passage blocking section 570 is a feature that corresponds to the "air passage unblocking section (air passage unblocking step)" according to this invention.

In the cutting section 590, the first and second sheets 220, 230 subjected to the primary sealing and the secondary sealing are cut (for example, cut lengthwise along the longitudinal direction and cut widthwise along a direction transverse to the longitudinal direction) by a cutting member (cutter) 290, so that the container 10 is obtained (see FIG. 16). The cutting section 590 is a feature that corresponds to the "cutting section (cutting step)" according to this invention.

[0039] In the above description, the air injection hole

228 is formed in the first sheet 220 or the second sheet 230 as the air injection opening, but the method for forming the air injection opening (gas injection opening) is not limited to this. Another embodiment of a container manufacturing device (container manufacturing method) is briefly explained with reference to FIGS. 17 to 21. In this embodiment, an opening defined by edges of the first and second sheets is used as the air injection opening. Further, in the following description, only an essential part of this embodiment is briefly explained.

In this embodiment, the air injection hole forming step P2 shown in FIG. 11 and the air injection hole forming section 510 shown in FIG. 12 can be omitted.

As shown in FIG. 17, a storage space and a bonded part (primary sealing) 350 are formed with first and second sheets 320, 330 overlaid one on the other. At this time, the first and second sheets 320, 330 are bonded together at the bonded part 350 such that the storage space (an air inlet 312 of the storage space) communicates with an opening 313a via an air passage 313. In this embodiment, the opening 313a is formed between an edge of the first sheet 320 and an edge of the second sheet 330. FIG. 17 shows a section (step) corresponding to the "primary sealing section (primary sealing step) 550" shown in FIG. 12.

Next, as shown in FIG. 18, an air injection nozzle 360 is inserted into the opening 313a and air is injected into the storage space via the air passage 313 and the air inlet 312. FIG. 18 shows a section (step) corresponding to the "air injection section (air injection step) 560" shown in FIG. 12.

Next, as shown in FIG. 19, the air passage 313 is blocked by a pressing member 370. FIG. 19 shows a section (step) corresponding to the "air passage blocking section (air passage blocking step) 570" shown in FIG. 12.

Then, as shown in FIG. 20, a bonded part (secondary sealing) 380 is formed to bond the first and second sheets 320, 330 together such that the air passage 313 is closed. FIG. 20 shows a section (step) corresponding to the "secondary sealing section (secondary sealing step) 580" shown in FIG. 12.

Next, as shown in FIG. 21, the first and second sheets 320, 330 subjected to the primary sealing 350 and secondary sealing 380 are cut by a cutting member (cutter). FIG. 21 shows a section (step) corresponding to the "cutting section (cutting step) 590" shown in FIG. 12.

[0040] Further, if air is not injected into the storage space, the air injection hole forming step (air injection hole forming section), the air injecting step (air injecting section), the air passage blocking step (air passage blocking section) and the secondary sealing step (secondary sealing section) can be bypassed.

[0041] The container, the container manufacturing method and the container manufacturing device of this invention are not limited to those described in the above embodiments, but rather, may be added to, changed, replaced with alternatives or otherwise modified.

The storage article to be stored in the container can be

appropriately selected.

The shape of the container (for example, the shapes of the bottom storage surface, the lower storage surface and the upper storage surface) is designed such that the container is easy to freely stand (can stand on the horizontal plane without a support). Further, the shape of the container can be appropriately changed according to the shape of the storage article.

The pressure in the storage space is set within a range in which the container can freely stand, and preferably in the range in which the storage article can be protected against damage by external force applied to the upper and lower storage surfaces. The pressure in the storage space is set, for example, in the range of 0.01 to 5 times atmospheric pressure, or suitably in the range of 1 to 3 times atmospheric pressure.

Each of the features or constructions of the container explained in the embodiments can be used separately or in combination of appropriately selected ones.

In the container manufacturing method and the container manufacturing device of the above-described embodiments, air is injected into the storage space of one container through one air injection opening (gas injection opening), but air can be injected into storage spaces of a plurality of containers through one air injection opening (gas injection opening). For example, it can be constructed such that adjacent containers are arranged with the storage spaces in opposite orientations along the feeding direction of the sheets (first and second sheets) and air is injected into the storage spaces of two containers adjacent along the feeding direction of the sheets through one air injection opening (gas injection opening) at the same time. Alternatively, it can be constructed such that air is injected into the storage spaces of two containers adjacent in a direction transverse to the feeding direction of the sheets through one air injection opening (gas injection opening) at the same time.

Gas to be injected into the storage space is not limited to air.

The container manufacturing method and the container manufacturing device explained in the embodiments can be appropriately changed. For example, as for the steps of the container manufacturing method, change of sequence, addition, deletion, combination and division can be appropriately made. Further, as for the sections which form the container manufacturing device, change of sequence of arrangement, addition, deletion, combination and division can be appropriately made.

A known container manufacturing method and a known container manufacturing device may be used in place of the container manufacturing method and the container manufacturing device described in the above embodiments. For example, they can be used to manufacture the container in which the pressure in the storage space is set to be equal to or lower than the atmospheric pressure.

Description of Numerals

[0042]

- | | |
|----|--|
| 5 | 10,110 container |
| | 10a storage space |
| | 11a -11d,111a -111d bonded part |
| | 20,120 lower storage member |
| | 20a, 120a, 220a, 320a lower storage space |
| 10 | 21, 31 edge |
| | 21 a, 31 a upper edge |
| | 21b,31b right edge |
| | 21c,31c lower edge |
| | 21d, 31d left edge |
| 15 | 22,32,122,132 flange |
| | 22a, 32a, 122a, 132a upper flange |
| | 22b, 32b,122b,132b right flange |
| | 22c, 32c, 122c, 132c lower flange |
| | 22d, 32d,122d,132d left flange |
| 20 | 22c, 33c lower edge of the lower flange |
| | 22a - 22d, 32a - 32d, 122a - 122d, 132a - 132d flange |
| | 23,123, 223, 323 lower storage surface |
| | 24 concave bottom storage surface |
| | 24a concave bottom surface |
| 25 | 30,130 upper storage member |
| | 30a, 130a, 230a, 330a upper storage space |
| | 31a - 31d edge |
| | 33,133, 233, 333 upper storage surface |
| | 124,125 concave bottom storage surface |
| 30 | 124a,125a concave bottom surface |
| | 126 convex bottom storage surface |
| | 126a convex bottom surface |
| | 228 air injection hole (gas injection opening) |
| | 212, 312 air inlet |
| 35 | 213, 313 air passage (gas passage) |
| | 220, 320 first sheet |
| | 230, 330 second sheet |
| | 240 hole punch |
| | 250, 280, 350, 380 bonded part |
| 40 | 260, 360 nozzle |
| | 270,370 pressing member |
| | 290 cutting member |
| | 313a opening (gas injection opening) |
| | 500 lower storage surface forming section (lower storage surface forming step) |
| 45 | 510 air injection hole forming section (air injection hole forming step) |
| | 520 storage article supplying section (storage article supplying step) |
| 50 | 530 upper storage surface forming section (upper storage surface forming step) |
| | 540 sheet overlaying section (sheet overlaying step) |
| | 550 primary sealing section (primary sealing step) |
| | 560 air injecting section (air injecting step) |
| 55 | 570 air passage blocking section (air passage blocking step) |
| | 580 secondary sealing section (secondary sealing step) |

590 cutting section (cutting step)
 400 storage article
 T1, T2, T11, T21, T22 contact part

Claims

1. A container, having a storage space, comprising:

a first storage member and a second storage member, wherein:

the first storage member has a first storage surface and a first flange extending from an edge of the first storage surface, the first storage surface has a bottom storage surface forming a bottom surface in a predetermined first direction on which a storage article is disposed, the first flange has a first lower flange extending along a second direction transverse to the first direction,

the second storage member has a second storage surface and a second flange extending from an edge of the second storage surface, and

the second flange has a second lower flange extending along the second direction,

the first and second storage members are bonded together at the edges of the first and second storage surfaces such that the first and second storage surfaces define the storage space,

characterized in that

when at least one of the first lower flange and the second lower flange and the bottom storage surface are placed on a horizontal plane, a line for projecting the center of gravity of the container perpendicularly to the horizontal plane passes through a region which is surrounded by a contact part between at least one of the first and second lower flanges and the horizontal plane and a contact part between the bottom storage surface and the horizontal plane, and the container freely stands on the horizontal plane.

2. The container as defined in claim 1, wherein, when the storage article is disposed on the bottom surface and at least one of the first and second lower flanges and the bottom storage surface are placed on the horizontal plane, a line for projecting the center of gravity of the container perpendicularly to the horizontal plane passes through the region which is surrounded by the contact part between at least one of the first and second lower flanges and the horizontal

plane and the contact part between the bottom storage surface and the horizontal plane, and the container freely stands on the horizontal plane.

3. The container as defined in claim 1 or 2, wherein the bottom surface and the bottom storage surface have a concave shape.

4. The container as defined in claim 1 or 2, wherein the bottom surface has a convex shape and the bottom storage surface has a concave bottom storage surface and a convex bottom storage surface.

5. The container as defined in claim 4, wherein the concave bottom storage surface is formed along a peripheral contour of the convex bottom storage surface as viewed from the first direction.

6. The container as defined in any one of claims 1 to 5, wherein each of the first and second storage members is flexible.

7. The container as defined in any one of claims 1 to 6, wherein at least one of the first and second lower flanges at least partially comes in contact with the horizontal plane.

8. The container as defined in any one of claims 1 to 7, wherein the bottom storage surface has an arcuate peripheral contour as viewed from the first direction.

9. The container as defined in any one of claims 1 to 8, wherein:

the first flange has a first right flange extending from an edge of the first storage surface to one side in the second direction and along the first direction, and a first left flange extending from the edge of the first storage surface to the other side in the second direction and along the first direction,

the second flange has a second right flange extending from an edge of the second storage surface to one side in the second direction and along the first direction, and a second left flange extending from the edge of the second storage surface to the other side in the second direction and along the first direction, and

the first right flange, the first left flange, the second right flange and the second left flange are inclined such that their upper ends on the other side in the first direction are located to the first storage surface side with respect to their lower ends on one side in the first direction as viewed from one side in the second direction.

10. The container as defined in any one of claims 1 to

9, wherein the storage space is filled with gas.

5

10

15

20

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30

35

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45

50

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FIG. 1

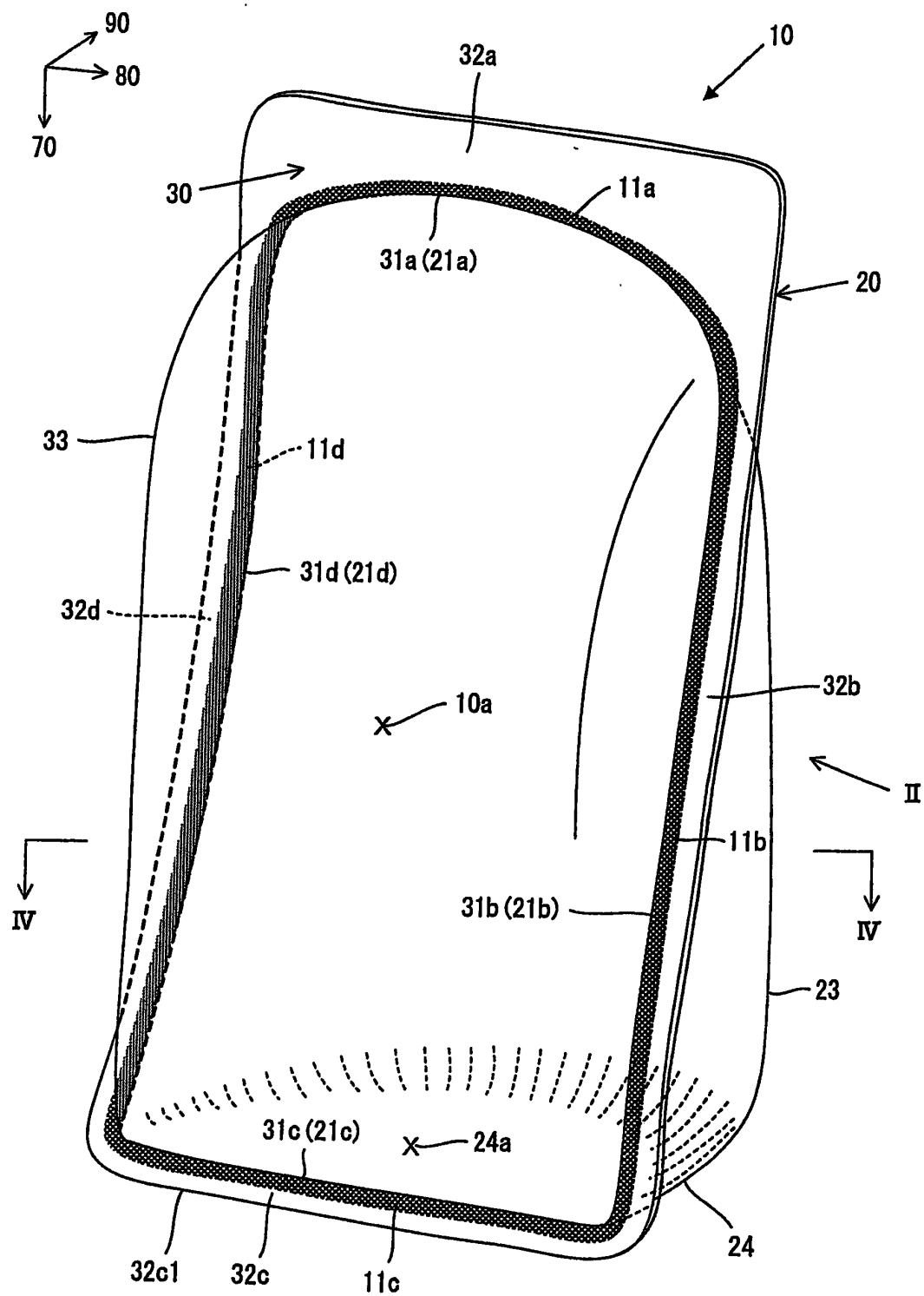


FIG. 2

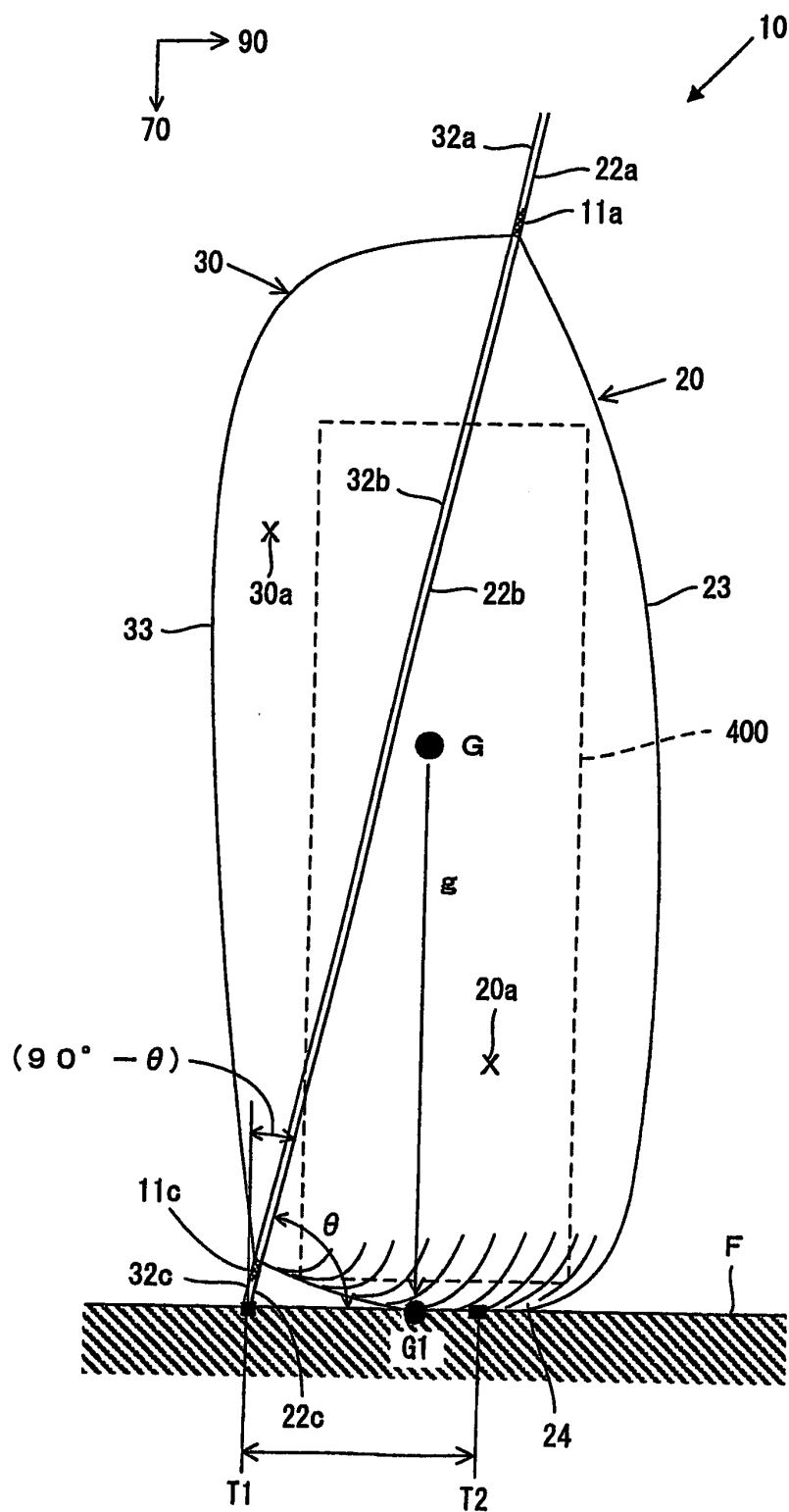


FIG. 3

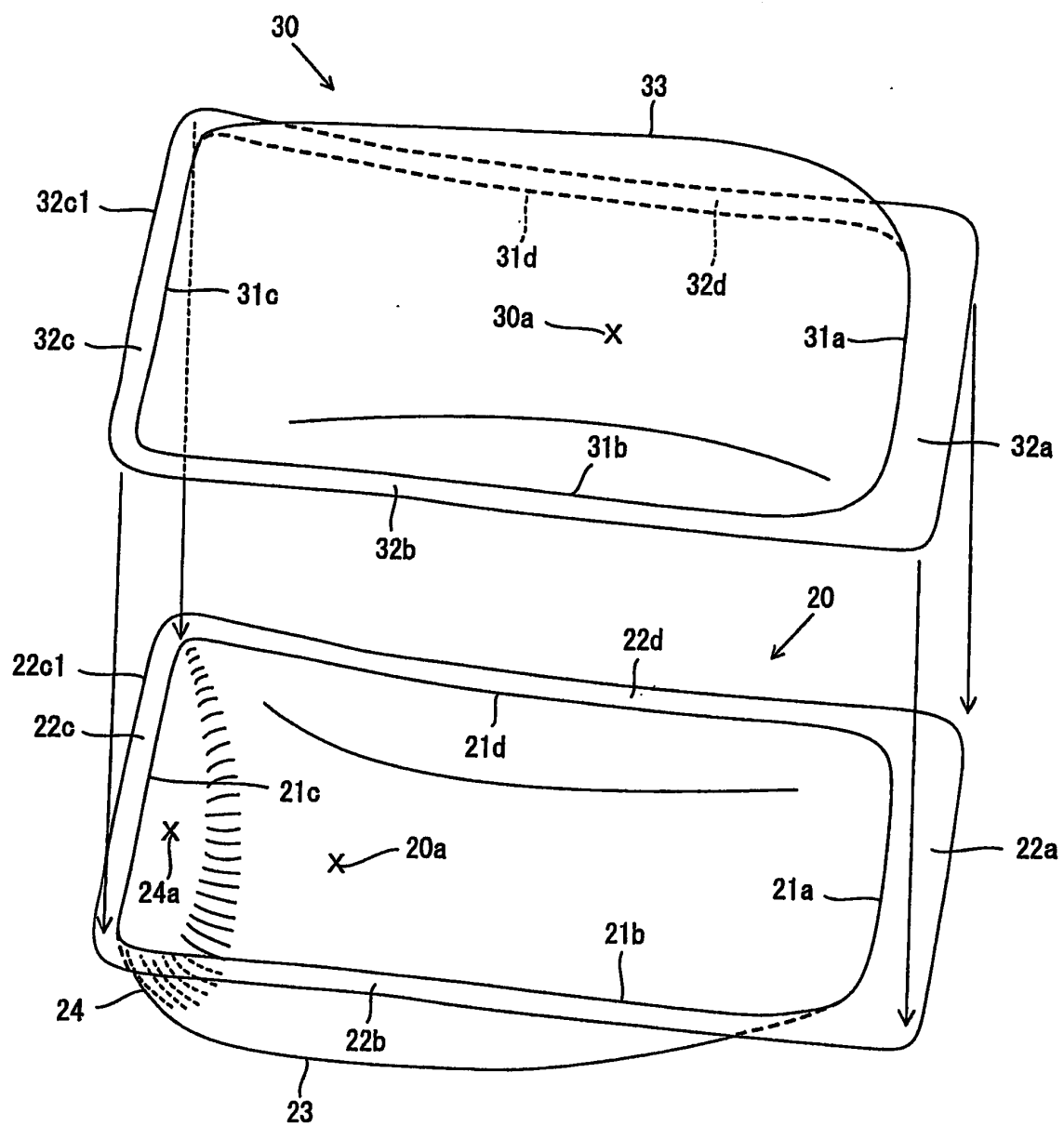


FIG. 4

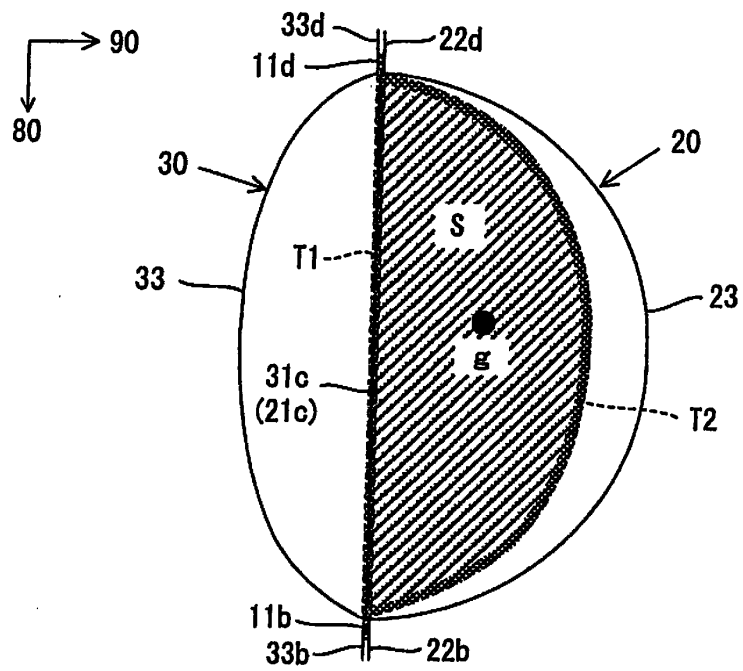


FIG. 5

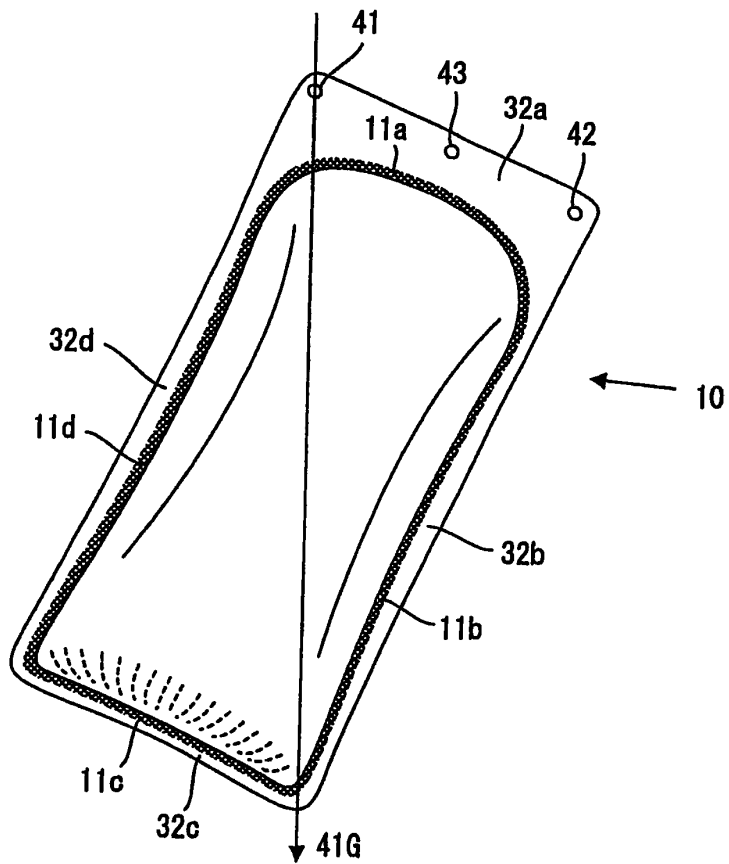


FIG. 6

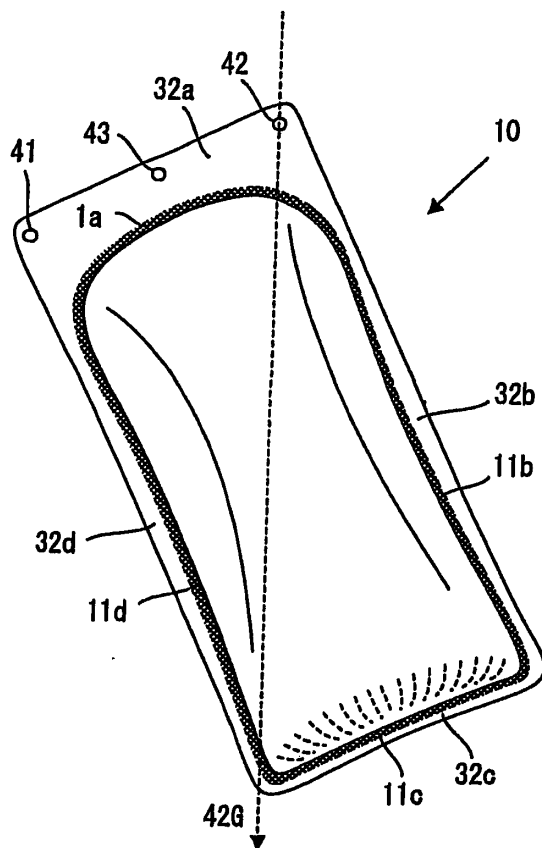


FIG. 7

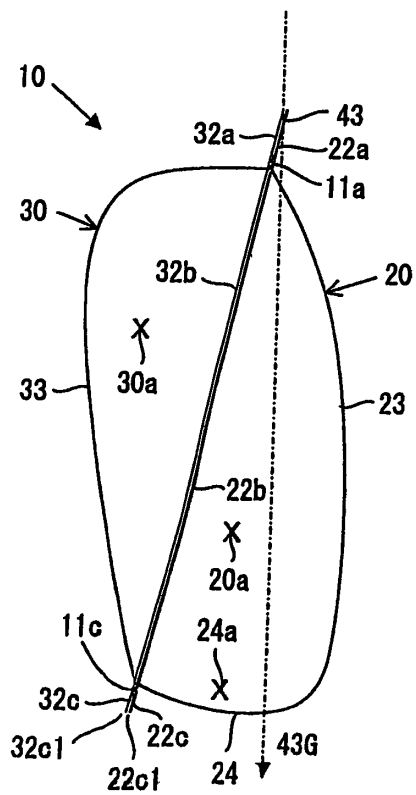


FIG. 8

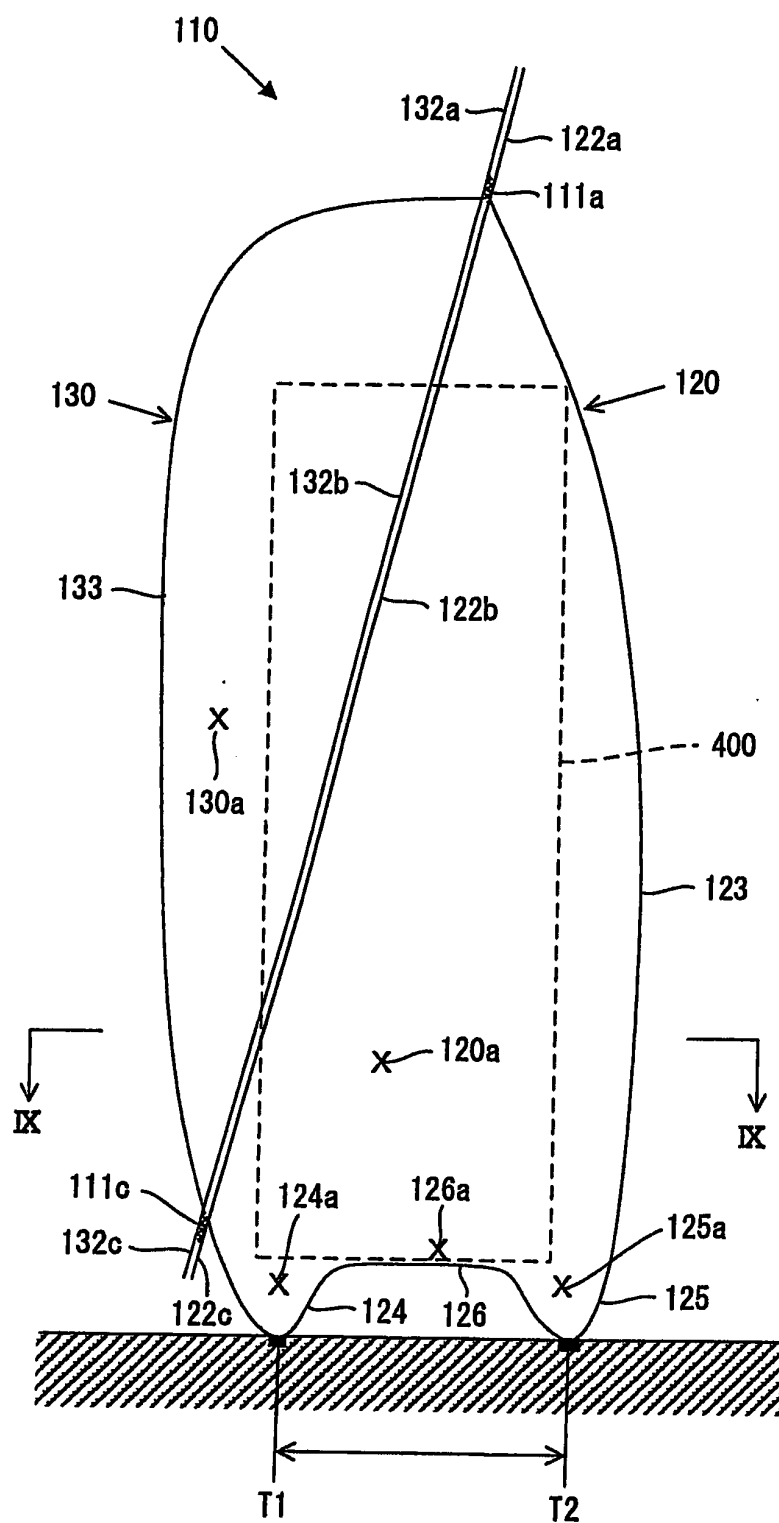


FIG. 9

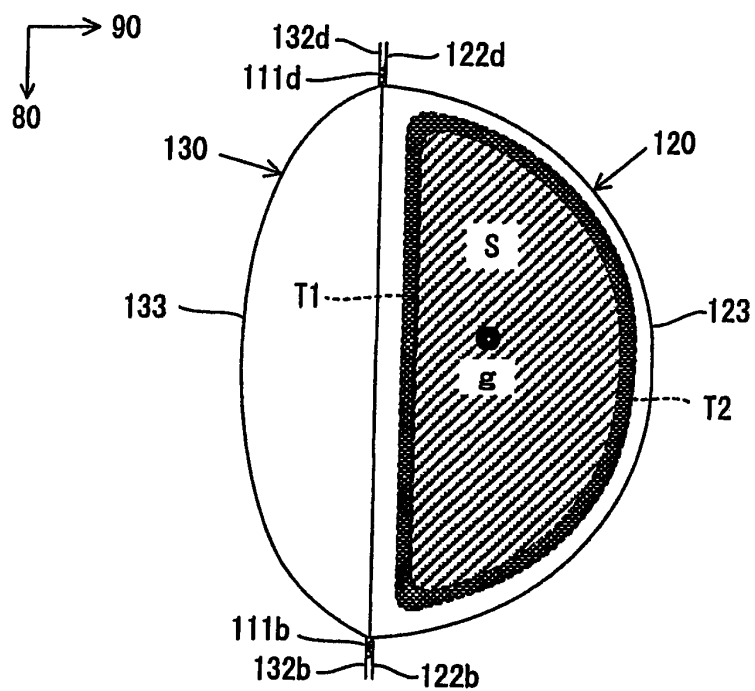


FIG. 10

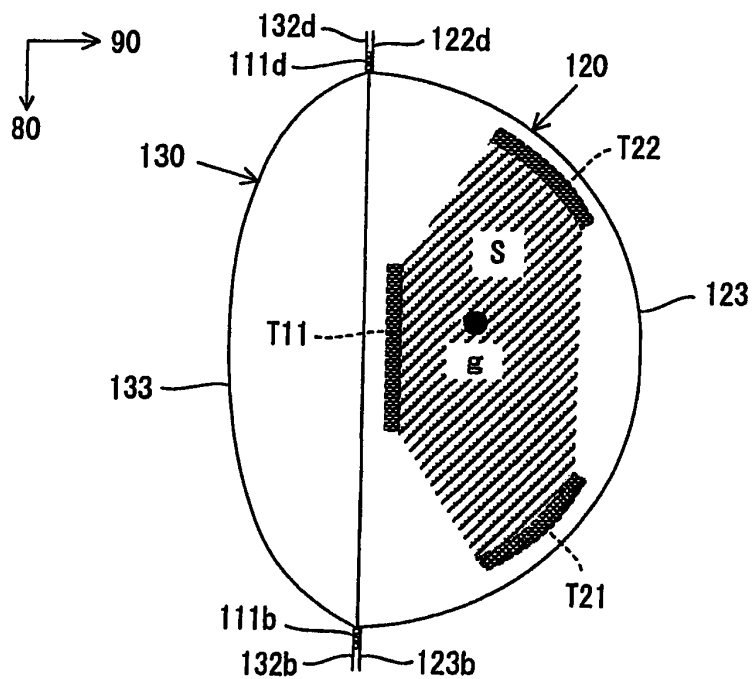


FIG. 11

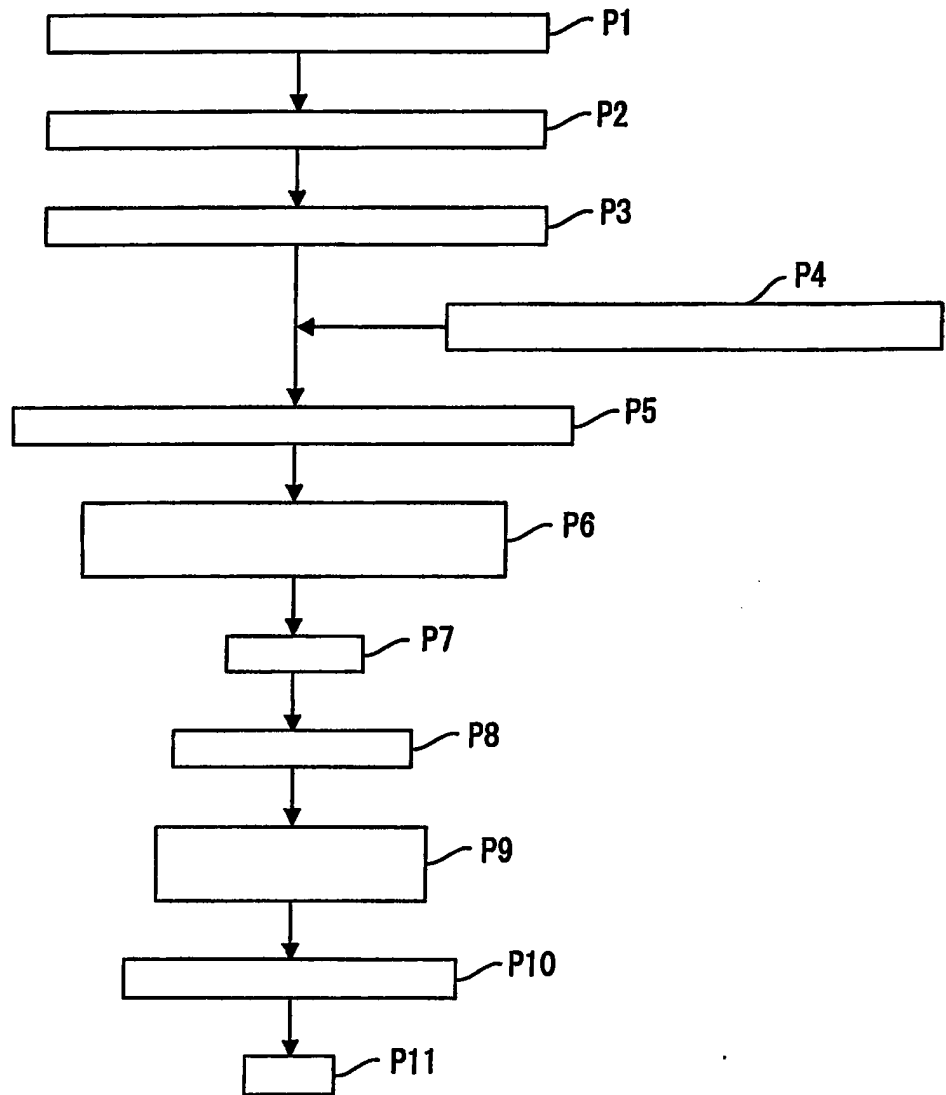


FIG. 12

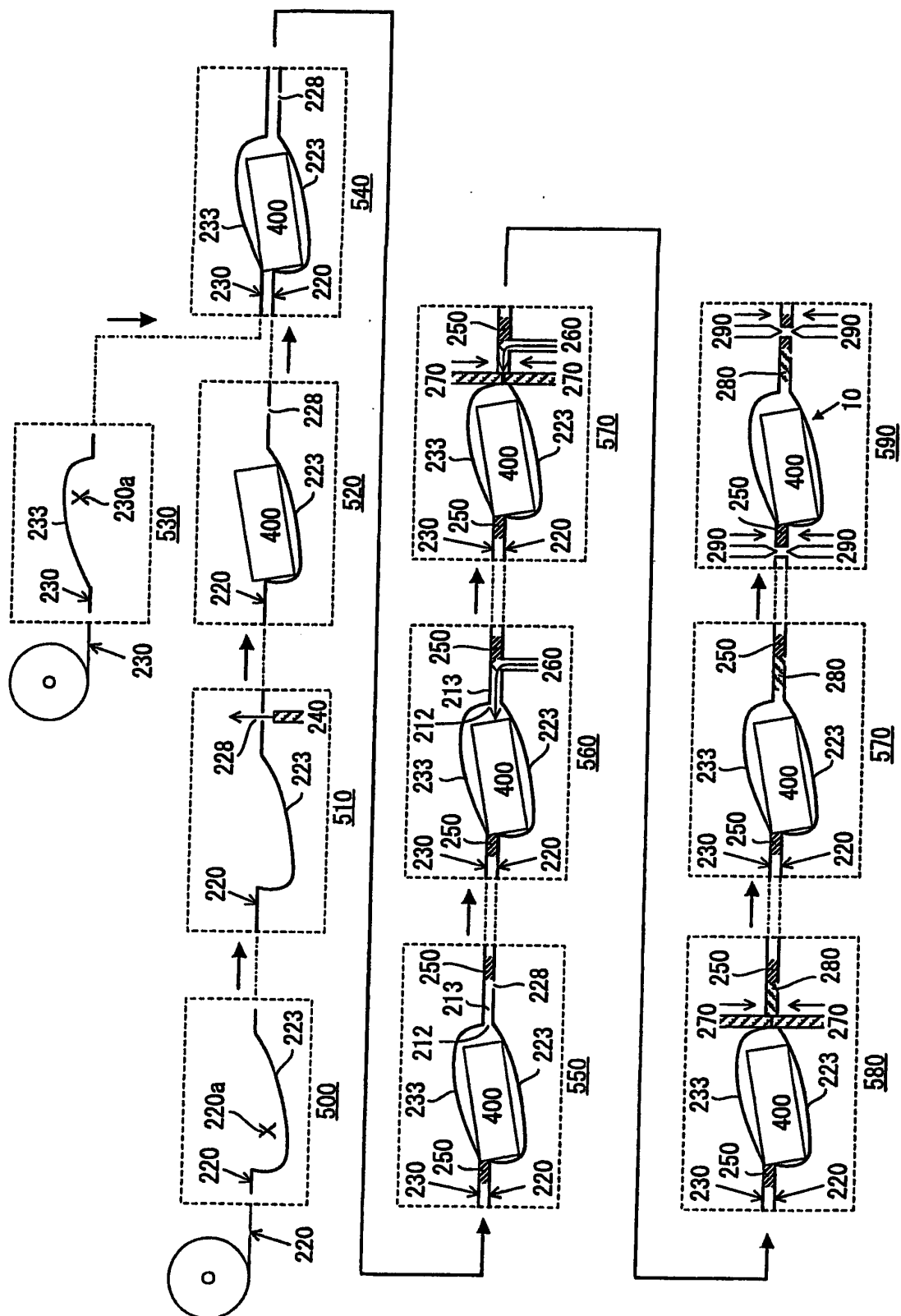


FIG. 13

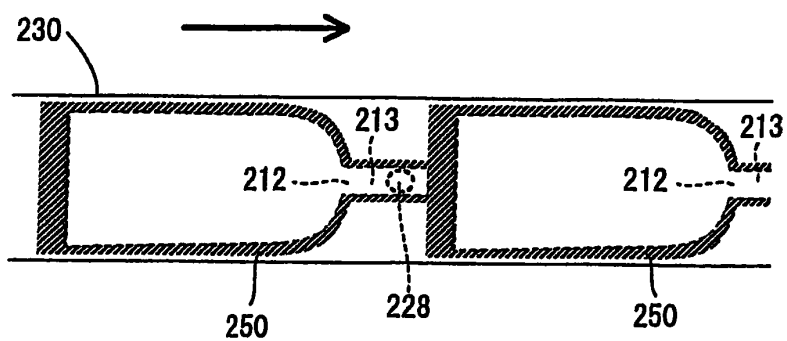


FIG. 14

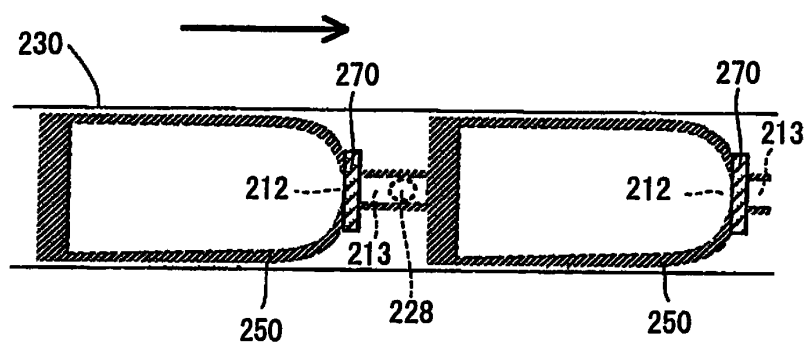


FIG. 15

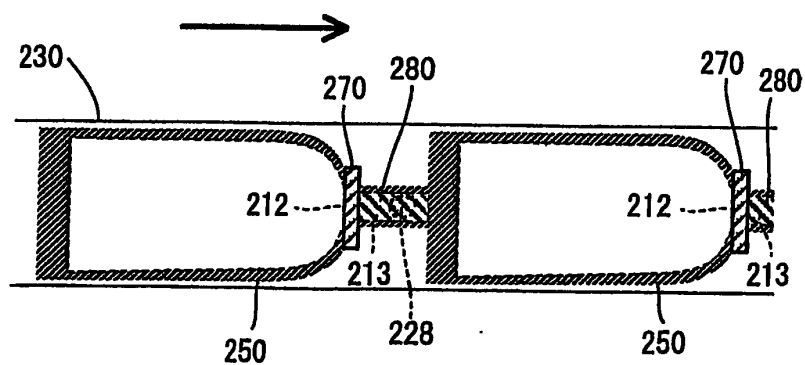


FIG. 16

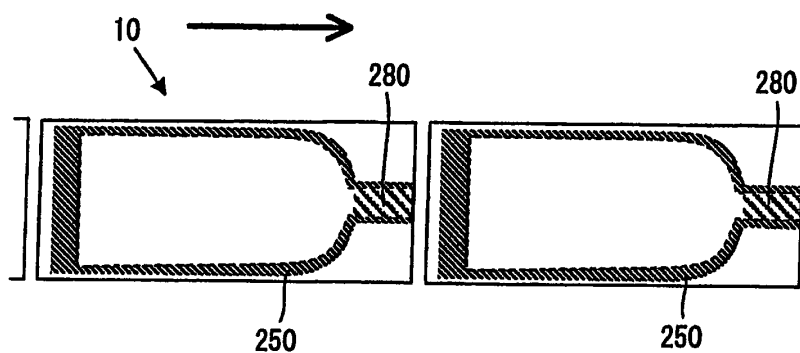


FIG. 17

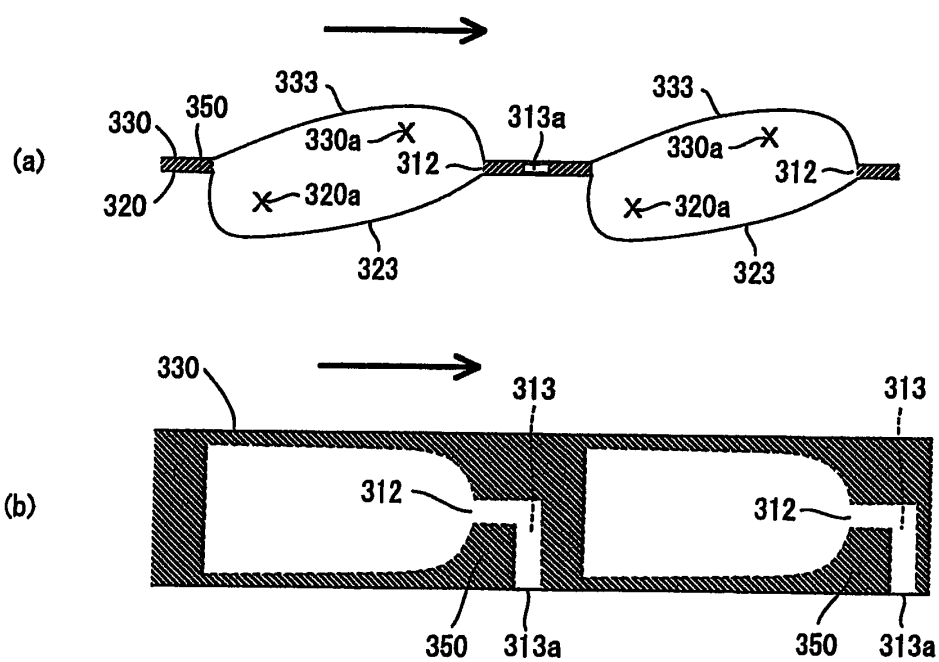


FIG. 18

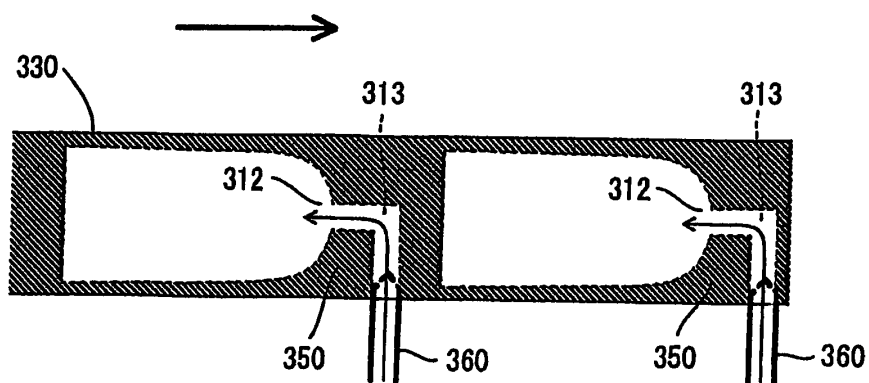


FIG. 19

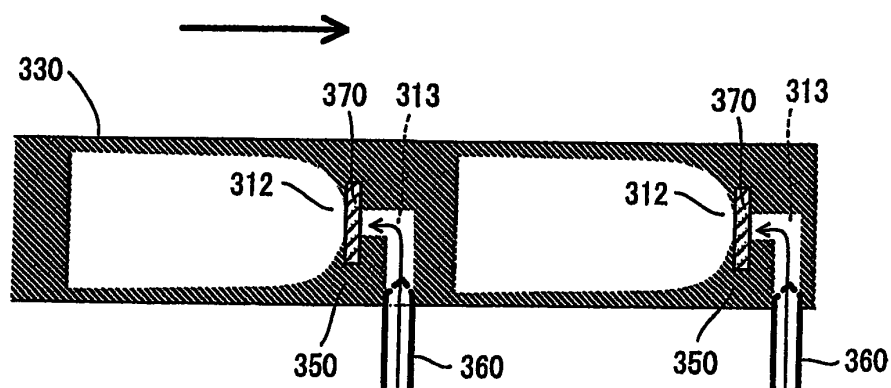


FIG. 20

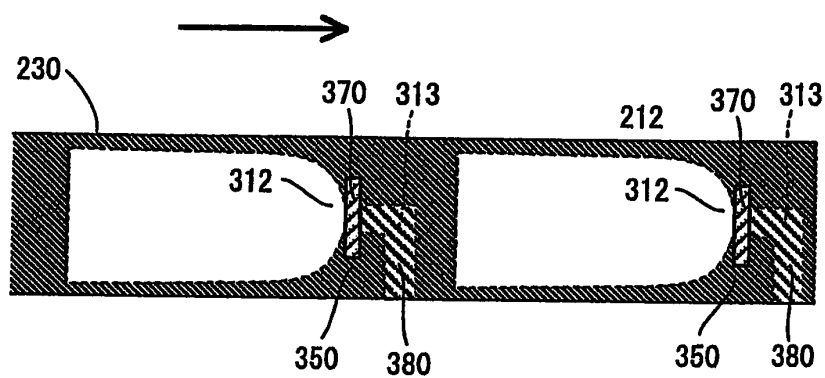
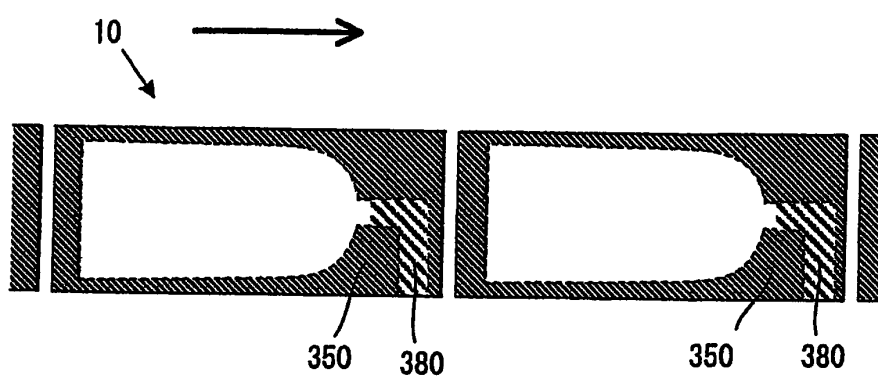


FIG. 21



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2011/061198

A. CLASSIFICATION OF SUBJECT MATTER

B65D30/20(2006.01)i, B65D75/32(2006.01)i, B65D81/20(2006.01)i

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)

B65D30/20, B65D75/32, B65D81/20

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2011
Kokai Jitsuyo Shinan Koho	1971-2011	Toroku Jitsuyo Shinan Koho	1994-2011

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5018622 A (William L. HARTLEY), 28 May 1991 (28.05.1991), fig. 1 (Family: none)	1-10
Y	JP 56-14176 Y2 (Kabushiki Kaisha Daie), 02 April 1981 (02.04.1981), fig. 1, 2 (Family: none)	1-10
A	JP 4291740 B2 (Howa Sangyo Co., Ltd.), 08 July 2009 (08.07.2009), fig. 8, 9 (Family: none)	1-10

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search
27 May, 2011 (27.05.11)Date of mailing of the international search report
07 June, 2011 (07.06.11)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2011/061198

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2009-538650 A (Fresenius Medical Care Deutschland GmbH), 12 November 2009 (12.11.2009), fig. 2 & WO 2007/0140942 A1 & EP 1862189 A1 & US 2010/0016825 A1	1-10

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2008074478 A [0002]