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(71) Applicant: **Sony Interactive Entertainment Inc.**
Tokyo 108-0075 (JP)

(72) Inventors:
 • **Kanno, Hirofumi**
Minato-ku, Tokyo 108-0075 (JP)
 • **Noda, Takanori**
Minato-ku, Tokyo 108-0075 (JP)

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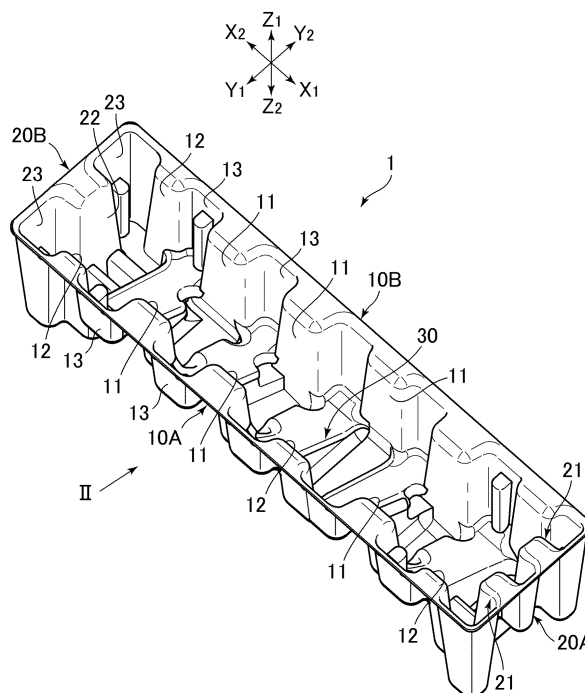
(74) Representative: **D Young & Co LLP**
120 Holborn
London EC1N 2DY (GB)

(54) **PULP MOLD CUSHIONING MATERIAL**

(57) A pulp mold cushioning material (1) has a plurality of main walls (10A, 10B, 20A, 20B) which define an accommodating space for accommodating inside thereof a body to be accommodated and which each have an opening that opens in a first direction. The plurality of main walls include a first main wall, the first main wall includes a first outer wall portion (13) and a first inner wall portion (11, 12) that projects more to inside of the

accommodating space than the first outer wall portion, the first outer wall portion and the first inner wall portion being aligned in a second direction orthogonal to the first direction, the first main wall has an edge portion extending in the second direction, at an end portion of the first main wall in the first direction, and the first main wall does not have a flange at the edge portion.

FIG. 1



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Description

BACKGROUND

[0001] The present disclosure relates to a pulp mold cushioning material.

[0002] In transport of goods such as electronic apparatus, a cushioning material for protecting the goods is utilized. The goods are each placed in an accommodating box for transport, in the state in which the cushioning material is mounted to the outside thereof. As the cushioning material, a molded product obtained using paper as a raw material (pulp mold cushioning material) may be utilized. As disclosed in JP 2001-146700A, the pulp mold cushioning material in the past has a part spreading toward outside of the cushioning material, at an edge thereof. In other words, the pulp mold cushioning material in the past has a flange at an edge thereof. Such a flange contributes to securing of rigidity of the cushioning material.

SUMMARY

[0003] Where the cushioning material is formed with a flange at an edge thereof, however, the cushioning material is enlarged in size by the width of the flange, and, therefore, a need for utilizing a large-sized accommodating box would be generated. This leads to a lowering in transport efficiency of goods.

[0004] In addition, depending on the external shape of goods, a large force may act between the goods and the cushioning material.

[0005] Thus, it is desirable to provide a pulp mold cushioning material capable of enhancing transport efficiency while restraining a lowering in rigidity.

[0006] It is also desirable to prevent a large force from acting between a pulp mold cushioning material and goods.

[0007] A pulp mold cushioning material proposed in the present disclosure has a plurality of main walls which define an accommodating space for disposing inside thereof a body to be accommodated and which have an opening that opens in a first direction. The plurality of main walls include a first main wall. The first main wall includes a first outer wall portion, and a first inner wall portion projecting more to the inside of the accommodating space than the first outer wall portion, and the first outer wall portion and the first inner wall portion are aligned in a second direction orthogonal to the first direction. The first main wall has an edge portion extending in the second direction, at an end portion of the first main wall in the first direction, and the first main wall does not have a flange at the edge portion. According to this pulp mold cushioning material, it is possible to restrain a lowering in the rigidity of the pulp mold cushioning material, and to enhance transport efficiency of goods.

[0008] Another example of the pulp mold cushioning material proposed in the present disclosure is a pulp mold

cushioning material having a plurality of main walls which define an accommodating space for disposed inside thereof a body to be accommodated and which have an opening that opens in a first direction. The plurality of main walls include a first main wall. The first main wall includes a first outer wall portion and at least two first projecting portions having first inner wall portions that project more to the inside of the accommodating space than a position of the first outer wall portion. The first outer wall portion is located between the at least two first projecting portions and is aligned with the at least two first projecting portions in a second direction orthogonal to the first direction. The first outer wall portion has a first edge portion that is located at an end portion of the outer wall portion in the first direction and that is part of an edge of the opening. Each of the at least two first projecting portions has an end wall portion located at an end portion of the first inner wall portion in the first direction, and the end wall portions of the at least two first projecting portions are connected to each other through the first edge portion of the first outer wall portion. According to this pulp mold cushioning material, it is possible to restrain a lowering in the rigidity of the pulp mold cushioning material, and to enhance transport efficiency of goods.

[0009] A further pulp mold cushioning material proposed in the present disclosure includes an accommodating space for disposing inside thereof a body to be accommodated, and a plurality of main walls defining the accommodating space. The plurality of main walls include a first main wall, and a second main wall which is located in a direction opposite to the first direction with respect to the first main wall and which is connected to the first main wall. The first main wall includes a first outer wall portion, and a first inner wall portion projecting more to the inside of the accommodating space than the first outer wall portion, and the first outer wall portion and the first inner wall portion are aligned in a second direction orthogonal to the first direction. The second main wall includes a second outer wall portion, and a second inner wall portion projecting more to the inside of the accommodating space than the second outer wall portion, and the second outer wall portion and the second inner wall portion are aligned in the second direction. A recess or a hole is formed in a connection portion between the first inner wall portion and the second inner wall portion. According to this pulp mold cushioning material, it is possible to prevent a large force from acting between the pulp mold cushioning material and goods.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

FIG. 1 is a perspective view illustrating an example of a pulp mold cushioning material proposed in the present disclosure;

FIG. 2 is a front view depicting the pulp mold cushioning material, as viewed in the direction indicated

by arrow II in FIG. 1;
 FIG. 3 is a sectional view taken along line III-III of FIG. 2;
 FIG. 4A is a sectional view taken along line IVa-IVa of FIG. 2;
 FIG. 4B is a sectional view taken along line IVb-IVb of FIG. 2;
 FIG. 4C is a sectional view taken along line IVc-IVc of FIG. 2;
 FIG. 5 is an enlarged view of a region V in FIG. 4B;
 FIG. 6A is an enlarged view of FIG. 1;
 FIG. 6B is a perspective view of the part illustrated in FIG. 6A, as viewed from another angle; and
 FIG. 7 is a sectional view taken along line VII-VII of FIG. 2.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] An example of an embodiment of the pulp mold cushioning material proposed in the present disclosure will be described below. Herein, referring to FIGS. 1 to 7, a pulp mold cushioning material 1 as an example of the embodiment will be described. In the following, the pulp mold cushioning material 1 will be referred to simply as the cushioning material 1.

[0012] In the following description, Y1 and Y2 directions illustrated in FIG. 1 and the like will be referred to respectively as the forward and rearward directions, X1 and X2 directions will be referred to respectively as the rightward and leftward directions, and Z1 and Z2 directions will be referred to respectively as the upward and downward directions. These directions are used for indicating the relative positional relations of components of the cushioning material 1, and do not define the posture of the cushioning material 1 during use.

[0013] As illustrated in FIG. 1, the cushioning material 1 has a box-like shape opening to the upper side. When the cushioning material 1 is in use, a body to be accommodated, P (see FIG. 3), such as an electronic apparatus is disposed inside the cushioning material 1. In other words, the cushioning material 1 has inside thereof an accommodating space inside of which the body to be accommodated, P, is disposed. When the cushioning material 1 is in use, in a body to be accommodated, two cushioning materials 1, which face each other, are used. The body to be accommodated, P, is put in the accommodating box in the state in which the cushioning material 1 is fitted outside thereof.

[0014] The cushioning material 1 has a plurality of main walls defining the accommodating space. The cushioning material 1 has a front wall 10A, a rear wall 10B, a right wall 20A, a left wall 20B, and a bottom wall 30 as the main walls. The right wall 20A is located on the right side of the walls 10A and 10B, and is connected to end portions of the walls 10A and 10B. Similarly, the left wall 20B is located on the left side of the walls 10A and 10B, and is connected to end portions of the walls 10A and

10B. The bottom wall 30 is located at lower portions of the walls 10A, 10B, 20A and 20B.

[0015] The cushioning material 1 is a molded product obtained using paper (for example, used paper) as a raw material, and the walls 10A, 10B, 20A, 20B and 30 are integrally molded. In other words, the cushioning material 1 is not a material formed by bending the walls 10A, 10B, 20A, 20B and 30, and is not a material formed by mutually connecting the walls 10A, 10B, 20A, 20B and 30 through application of an adhesive thereto.

[0016] The shape of the cushioning material is not limited to that in the example of the cushioning material 1. The cushioning material 1 may have only part of the walls 10A, 10B, 20A, 20B and 30. For instance, the cushioning material 1 may have only the front wall 10A, the bottom wall 30 and the rear wall 10B, and may lack the walls 20A and 20B. As another example, the cushioning material 1 may have only the front wall 10A, the right wall 20A and the bottom wall 30. Such a cushioning material 1 is opening in the three directions (the upward, forward and leftward directions), and can be mounted to a corner of the body to be accommodated, P. In the cushioning material 1, the length of the front wall 10A and the rear wall 10B in the left-right direction is greater than the length of the right wall 20A and the left wall 20B in the front-rear direction. The length of the front wall 10A and the rear wall 10B in the left-right direction may be equal to, or may be smaller than, the length of the right wall 20A and the left wall 20B in the front-rear direction, unlike in the cushioning material 1.

[0017] As depicted in FIG. 1, the front wall 10A is formed with a plurality of projecting portions 11 and 12 that project toward the inside of the accommodating space (projecting toward the rear side). The first projecting portion 11 has an inner wall portion 11a (see FIG. 4A) of the first projecting portion 11 that is oriented toward the inside of the accommodating space and that extends upward from the bottom wall 30. The second projecting portion 12 has an inner wall portion 12a (see FIG. 4C) of the second projecting portion 12 that is oriented toward the inside of the accommodating space and that extends upward from the bottom wall 30. The projecting portions 11 and 12 are aligned at intervals in the left-right direction, and the front wall 10A has outer wall portions 13 (see FIG. 4B) extending upward from the bottom wall 30, between two adjacent projecting portions 11 and 12. Specifically, one outer wall portion 13 is formed between two adjacent inner wall portions 11a and 12a (or between the two adjacent inner walls 11a and between the inner wall portion 11a and the inner wall portion 12a adjacent to each other). The inner wall portions 11a and 12a project more to the inside of the accommodating space than the outer wall portions 13. In other words, the inner wall portions 11a and 12a formed in the front wall 10A are located more to the rear side than the outer wall portions 13.

[0018] As illustrated in FIGS. 4A and 4C, the inner wall portion 11a of the first projecting portion 11 projects more largely to the inside of the accommodating space than

the inner wall portion 12a of the second projecting portion 12. In the front wall 10A, the inner wall portion 11a of the first projecting portion 11 is located more to the rear side than the inner wall portion 12a of the second projecting portion 12. Therefore, the position of the inner wall portion 12a in the front-rear direction is between the position of the inner wall portion 11a and the position of the outer wall portion 13 in the front-rear direction. When the cushioning material 1 is in use, the front wall 10A supports the body to be accommodated, P, by the inner wall portion 11a of the first projecting portion 11. In a state in which the first projecting portions 11 are not deformed, the inner wall portions 12a of the second projecting portions 12 do not make contact with the body to be accommodated, P. With the front wall 10A thus formed with the two kinds of projecting portions 11 and 12 which differ in projection width, it is possible to restrain large forces from acting on the body to be accommodated, P, as compared to the structure wherein, for example, all the projecting portions are the same in size. In the example of the cushioning material 1, the front wall 10A is formed with three first projecting portions 11 and three second projecting portions 12. The numbers of the projecting portions 11 and 12 are not limited to those in the example of the cushioning material 1.

[0019] In the example of the cushioning material 1, the width of the first projecting portion 11 in the left-right direction is substantially the same as the width of the second projecting portion 12 in the left-right direction; however, the relation between the widths is not limited to that in the example of the cushioning material 1. In addition, the outer wall portion 13 is substantially the same as the projecting portions 11 and 12 in the width in the left-right direction, but its size is not limited to that in the example of the cushioning material 1.

[0020] The projecting portions 11 and 12 are columnar in shape, and have side wall portions 11b and 12b (see FIG. 6A) that extend forward from left and right ends of the inner wall portions 11a and 12a and that are connected to the outer wall portion 13, respectively. In addition, the projecting portions 11 and 12 have upper end wall portions 11c and 12c extending forward from an upper edge of the inner wall portions 11a and 12a, respectively. This structure of the front wall 10A can enhance more the rigidity of the front wall 10A. Note that the height of the upper end wall portions 11c and 12c coincides with the height of an upper edge 10a (see FIGS. 4A and 4C) of the front wall 10A.

[0021] The rear wall 10B of the cushioning material 1 has the same structure as that of the front wall 10A. Thus, the rear wall 10B has the projecting portions 11 and 12 and the outer wall portion 13 described above. In the example of the cushioning material 1, the positions of the projecting portions 11 and 12 of the rear wall 10B in the left-right direction coincide with the positions of the projecting portions 11 and 12 of the front wall 10A in the left-right direction. The projecting portions 11 and 12 of the rear wall 10B may be deviated from the projecting por-

tions 11 and 12 of the front wall 10A in the left-right direction, unlike in the cushioning material 1.

[0022] The structure of the front wall 10A and the rear wall 10B is not limited to that in the example of the cushioning material 1. For instance, the positions of the inner wall portions 12a of the second projecting portions 12 in the front-rear direction may be the same as those of the inner wall portions 11a of the first projecting portions 11. In other words, the front wall 10A and the rear wall 10B may each have only one kind of projecting portions. Unlike this, the front wall 10A and the rear wall 10B may have three kinds of projecting portions that differ in the size of inward projection. In a further example, the projecting portions 11 and 12 may not reach the upper edge 10a of the front wall 10A. In other words, the upper end wall portions 11c and 12c may be formed at positions lower than the upper edge 10a of the front wall 10A. In a further example, the front wall 10A and the rear wall 10B may not be the same in structure.

[0023] As depicted in FIG. 1, the right wall 20A also is formed with projecting portions 21 projecting toward the inside of the accommodating space (projecting toward the left side). The right wall 20A is formed with two projecting portions 21, which are aligned in the front-rear direction. The number of the projecting portions 21 formed in the right wall 20A is not limited to that in the example of the cushioning material 1. The number of the projecting portions 21 may be, for example, one or may be three or more. The projecting portion 21 has an inner wall portion 21a (see FIG. 3) that is oriented to the inside of the accommodating space and that extends upward from the bottom wall 30. In addition, the right wall 20A has a plurality of outer wall portions 23 (see FIG. 3) extending upward from the bottom wall 30. The inner wall portions 21a and the outer wall portions 23 of the projecting portions 21 are alternately aligned in the front-rear direction. In other words, one outer wall portion 23 is formed between the two inner wall portions 21a. The inner wall portions 21a project more to the inside of the accommodating space than the outer wall portions 23. In other words, the inner wall portions 21a formed in the right wall 20A are located more to the left side than the outer wall portions 23. Such a structure of the right wall 20A can enhance the rigidity of the right wall 20A. The projection width of the projecting portions 21 is, for example, greater than four times a thickness T1 (see FIG. 5) of the cushioning material 1, like the projecting portions 11 and 12 of the front wall 10A described above. When the cushioning material 1 is in use, the right wall 20A supports the body to be accommodated, P, by the inner wall portions 21a.

[0024] The projecting portions 21 of the right wall 20 are columnar in shape, and each have side wall portions 21b (see FIG. 6A) that extend rightward from front end rear edges of the inner wall portion 21a and that are connected to the outer wall portion 23. The projecting portion 21 has an upper end wall portion 21c (see FIG. 6A) extending rightward from an upper edge of the inner wall

portion 21a. The upper end wall portions 21c can enhance the rigidity of the right wall 20A. The height of the upper end wall portions 21c coincides with the height of an upper edge of the right wall 20A.

[0025] As illustrated in FIG. 1, the left wall 20B has a projecting portion 22 and outer wall portions 23. The projecting portion 22 projects to the inside of the accommodating space, like the projecting portions 21 of the right wall 20A. The number of the projecting portion 22 in the left wall 20B is one, unlike in the right wall 20A. Therefore, one projecting portion 22 is formed between two outer wall portions 23. The number of the projecting portions 22 may be more than one, unlike in the example of the cushioning material 1. The projecting portion 22 also has an inner wall portion 22a (see FIG. 3) extending upward from the bottom wall 30, and an upper end wall portion 22c (see FIG. 3) extending leftward from an upper edge of the inner wall portion 22a. The height of the upper end wall portion 22c coincides with the height of an upper edge of the left wall 20B. The structure of the left wall 20B may be the same as that of the right wall 20A, unlike in the example of the cushioning material 1.

[0026] In a cushioning material in the past, a flange (for example, a flange N indicated by alternate long and two short dashes line in FIG. 4B) is provided at an edge of an opening of the cushioning material. The flange is a part that spreads from the edge of the opening of the cushioning material to the outside of the cushioning material and that extends along the edge of the opening. The flange is formed along the whole circumference of the opening. On the other hand, the cushioning material 1 proposed in the present disclosure does not have a flange at the edge of the opening.

[0027] Specifically, as depicted in FIG. 4B, the front wall 10A and the rear wall 10B do not have, at their upper edge 10a, a portion extending to the outside of the cushioning material 1 beyond the position of the outer wall portion 13. In other words, the front wall 10A does not have a part extending forward beyond the position of the outer wall portion 13. In addition, the rear wall 10B does not have a part extending rearward beyond the position of the outer wall portion 13.

[0028] Therefore, in the front wall 10A, the outer wall portions 13 are located at the frontmost positions, and, in the rear wall 10B, the outer wall portions 13 are located at the rearmost positions. In the example of the cushioning material 1, the outer wall portions 13 are slightly inclined toward the outside in relation to the vertical direction. For this reason, in the front wall 10A, the upper edges of the outer wall portions 13 (the upper edge 10a of the front wall 10A) are located at the frontmost positions, and, in the rear wall 10B, the upper edges of the outer wall portions 13 (the upper edge 10a of the rear wall 10B) are located at the rearmost positions. Therefore, when the cushioning material 1 is in use, the outer wall portions 13 themselves (inclusive of the upper edges of the outer wall portions 13) make contact with the inner surface of the accommodating box.

[0029] According to such a cushioning material 1, the size of the accommodating box for accommodating the body to be accommodated, P, can be reduced, resulting in that transport efficiency of the body to be accommodated, P, can be enhanced. Note that the front wall 10A and the rear wall 10B are formed with the aforementioned projecting portions 11 and 12. As a result of this, sufficient rigidity can be secured for the cushioning material 1 notwithstanding the absence of a flange.

[0030] Since the front wall 10A and the rear wall 10B thus do not have a flange, the upper end wall portions 11c of the two projecting portions 11 aligned in the left-right direction with the outer wall portion 13 therebetween are connected to each other through an upper edge of the outer wall portion 13 (part of the upper edge 10a). In other words, in the case where the front wall 10A and the rear wall 10B have flanges at the upper edges 10a, the upper end wall portions 11c of the two projecting portions 11 aligned in the left-right direction are connected to each other through the upper edge of the outer wall portion 13 and the flanges. However, in the cushioning material 1, since the front wall 10A and the rear wall 10B are not formed with a flange at the upper edges 10a, the upper end wall portions 11c of the two projecting portions 11 are connected with each other through only the upper edge of the outer wall portion 13. The front wall 10A has the outer wall portion 13 located between the first projecting portion 11 and the second projecting portion 12. The upper end wall portions 11c and 12c of the projecting portions 11 and 12 are connected to each other through only the upper edge of the outer wall portion 13. The front wall 10A may have an outer wall portion 13 located between two second projecting portions 12. Besides, the upper end wall portions 12c of the two projecting portions 12 may be connected to each other through only the upper edge of the outer wall portion 13.

[0031] Note that the upper edge of the outer wall portion 13 is that part of the upper edge 10a (or an end portion of material of the cushioning material 1) which includes the outer wall portion 13. As will be described later, as the outer wall portion 13 is viewed in a direction (arrow D, see FIG. 5) along the outer wall portion 13, a thickness (T2, see FIG. 5) of the upper edge of the outer wall portion 13 is substantially the same with the thickness (T1) of the outer wall portion 13. Therefore, the cushioning material 1 does not have a part connected to the upper edge of the outer wall portion 13, in section of the outer wall portion 13. In the case where the front wall 10A and the rear wall 10B have flanges, the edge of the opening (the opening that opens to the upper side) is present at a position spaced by the width of the flange from the edge (the edge of the flange) of the outer wall portion 13. In the cushioning material 1, however, since the front wall 10A and the rear wall 10B do not have a flange, the upper edge of the outer wall portion 13 constitutes part of the edge of the opening (the opening that opens to the upper side) of the cushioning material 1.

[0032] Note that the edges of the upper end wall por-

tions 11c and 12c of the projecting portions 11 and 12 (the edges located on the side opposite to the inner wall portions 11a and 12a) do not come beyond the positions of the upper edges of the outer wall portions 13 toward the outside of the cushioning material 1. In the example of the cushioning material 1, the positions of the edges of the upper end wall portions 11c and 12c are the same as the positions of the upper edges of the outer wall portions 13. In other words, the upper edge 10a of the front wall 10A is formed rectilinearly along the left-right direction. The edges of the upper end wall portions 11c and 12c and the upper edges of the outer wall portions 13 are aligned in the left-right direction, and constitute the upper edge 10a.

[0033] Although the front wall 10A is not formed with a flange at the upper edge 10a thereof, the upper edge 10a is slightly curved to the front side, as depicted in FIG. 5. The thickness T2 of the upper edge 10a obtained as the outer wall portion 13 is viewed in the direction along the outer wall portion 13 (the direction indicated by arrow D in FIG. 5) is greater than the thickness (the thickness of the outer wall portion 13) T1 of the front wall 10A, but is smaller than two times the thickness T1. Preferably, the thickness T2 is not more than 1.5 times the thickness T1. In other words, the thickness T2 and the thickness T1 are substantially the same.

[0034] As aforementioned, the front wall 10A is formed with the projecting portions 11 and 12. Projection widths W1 and W2 (see FIGS. 4A and 4C) of the projecting portions 11 and 12 are greater than, for example, three times the thickness T2 (see FIG. 5) of the upper edge 10a of the front wall 10A. Preferably, the projection widths W1 and W2 are greater than four times the thickness T2 of the upper edge 10a of the front wall 10A. More preferably, the projection widths W1 and W2 are greater than five times the thickness T2 of the edge 10a of the cushioning material 1. In the example of the cushioning material 1, the projection width W1 of the projecting portion 11 is greater than, for example, six times the thickness T2 of the edge 10a of the cushioning material 1. Since the projection widths are thus comparatively large, high cushioning performance can be secured, and the rigidity of the front wall 10A can be secured notwithstanding a flange is not formed at the edge 10a. The projection widths W1 and W2 of the projecting portions 11 and 12 may be smaller than three times the thicknesses T1 and T2.

[0035] As depicted in FIG. 3, the right wall 20A also does not have a flange. Thus, the right wall 20A does not have, at the upper edge 20a thereof, a part extending to the outside of the cushioning material 1 beyond the positions of the outer wall portions 23 (in other words, a part extending rightward beyond the positions of the outer wall portions 23). Therefore, in the right wall 20A, the outer wall portions 23 are located at the rightmost positions.

[0036] The outer wall portions 23 are inclined toward the outside of the cushioning material 1 (toward the right

side). Therefore, in the right wall 20A, upper edges of the outer wall portions 23 (the upper edge 20a of the right wall 20A) are located at the rightmost positions. As a result, when the cushioning material 1 is in use, the outer wall portions 23 (inclusive of the upper edges of the outer wall portions 23) make contact with the inner surface of the accommodating box. Note that as illustrated in FIG. 6A, a right edge of an upper end wall portion 21c of the projecting portion 21 does not come beyond the position of the outer wall portion 23, and the upper edge 20a of the right wall 20A is formed rectilinearly along the front-rear direction.

[0037] Since the right wall 20A thus does not have a flange, the upper end wall portions 21c of the two projecting portions 21 aligned in the front-rear direction with the outer wall portion 23 therebetween are connected to each other through the upper edge of the outer wall portion 23 (part of the upper edge 20a). In other words, in the case where the right wall 20A has a flange at the upper edge 20a, the upper end wall portions 21c of the two projecting portions 21 aligned in the front-rear direction are connected to each other through the upper edge of the outer wall portion 23 and the flange. However, in the cushioning material 1, since the right wall 20A is not formed with a flange at the upper edge 20a, the upper end wall portions 21c of the two projecting portions 21 are connected to each other through only the upper edge of the outer wall portion 23.

[0038] The upper edge of the outer wall portion 23 is part of the upper edge 20a (or an end portion of material of the cushioning material 1) of the right wall 20A. Therefore, the cushioning material 1 does not have a part connected to the upper edge of the outer wall portion 23, in section of the outer wall portion 23. In the case where the right wall 20A has a flange, the edge of the opening (the opening that opens to the upper side) of the cushioning material 1 is present at a position spaced by the width of the flange from the edge of the outer wall portion 23 (the edge of the flange). However, in the cushioning material 1, since the right wall 20A does not have a flange, the upper edge of the outer wall portion 23 constitutes part of the edge of the opening (the opening that opens to the upper side) of the cushioning material 1.

[0039] In addition, similarly to the thicknesses T1 and T2 of the front wall 10A described referring to FIG. 5, the thickness of the upper edge 20a of the right wall 20A obtained as the outer wall portion 23 is viewed in a direction along the outer wall portion 23 is smaller than two times the thickness of the right wall 20A (the thickness of the outer wall portion 23). Preferably, the thickness of the upper edge 20a is not more than 1.5 times the thickness of the right wall 20A (the thickness of the outer wall portion 23). In addition, the projection width of the projecting portion 21 is greater than, for example, three times the thickness of the upper edge 20a of the right wall 20A. Preferably, the projection width is greater than four times the thickness of the upper edge 20a of the right wall 20A.

[0040] The left wall 20B also does not have a flange,

like the right wall 20A. In other words, the left wall 20B does not have a part extending to the outside of the cushioning material 1 (a part extending leftward) beyond the positions of the outer wall portions 23.

[0041] Thus, in the cushioning material 1, the four walls 10A, 10B, 20A and 20B are not formed with a flange at the upper edges 10a and 20a. In other words, the cushioning material 1 lacks a flange along the whole circumference of the edge of the opening. A configuration may be adopted in which the front wall 10A and the rear wall 10B are not formed with a flange but the right wall 20A and the left wall 20B are formed with flanges, unlike the example of the cushioning material 1.

[0042] As illustrated in FIG. 3, the bottom wall 30 also is formed with projecting portions 31 projecting toward the inside of the accommodating space (projecting upward). As depicted in FIG. 3, the projecting portions 31 are aligned at intervals in the left-right directions. The bottom wall 30 has lower wall portions (outer wall portions) 32 and 33 which are each located between the two adjacent projecting portions 31. The projecting portions 31 have higher wall portions (inner wall portions) 31a located at positions higher than the lower wall portions 32 and 33. In other words, the higher wall portions 31a are located more to the inside of the accommodating space than the lower wall portions 32 and 33. The higher wall portions 31a and the lower wall portions 32 and 33 are aligned in the left-right direction. In other words, the lower wall portion 32 or the lower wall portion 33 is formed between the two adjacent higher wall portions 31a. This structure enhances the rigidity of the bottom wall 30, resulting in that high rigidity of the cushioning material 1 is secured, notwithstanding the cushioning material 1 is not formed with a flange at the edge of the opening.

[0043] As illustrated in FIG. 3, the lower wall portions 32 are located at positions higher than the lower wall portions 33. In other words, the lower wall portions 32 are located more to the inside of the accommodating space than the lower wall portions 33. The positions of the lower wall portions 32 in the vertical direction are lower than those of the higher wall portions 31a. When the cushioning material 1 is in use, the body to be accommodated, P, is supported by the higher wall portions 31a. In addition, the lower wall portions 33 make contact with the inner surface of the accommodating box, whereas the lower wall portions 32 do not make contact with the inner surface of the accommodating box in a state in which the lower wall portions 33 are not deformed. This makes it possible to restrain excessively large forces from acting on the body to be accommodated, P, as compared to the structure in which, for example, all the lower wall portions 32 and 33 make contact with the inner surface of the accommodating box.

[0044] As depicted in FIG. 4B, the higher wall portion 31a of the projecting portion 31 continues from the front wall 10A to the rear wall 10B. More specifically, the higher wall portion 31a of the projecting portion 31 continues from the outer wall portion 13 of the front wall 10A to the

outer wall portion 13 of the rear wall 10B. In the example of the cushioning material 1, the higher wall portion 31a of the projecting portion 31 has an inclined surface 31e conforming to the external shape of the body to be accommodated, P. The inclined surface 31e is inclined such as to become higher in going from the rear side toward the front side. The higher wall portion 31a has horizontal portions 31f on the front side and the rear side of the inclined surface 31e. The higher wall portion 31a may not have such an inclined surface 31e, unlike in the example of the cushioning material 1. In other words, the higher wall portion 31a may be formed horizontally. In a further example, the bottom wall 30 may not have the two kinds of lower wall portions 32 and 33 differing in height.

[0045] Note that as illustrated in FIG. 4A, a lower wall portion 33 is formed between an inner wall portion 11a of the first projecting portion 11 of the front wall 10A and an inner wall portion 11a of the first projecting portion 11 of the rear wall 10B. In addition, as depicted in FIG. 4A, a lower wall portion 33 is formed between an inner wall portion 11a of the first projecting portion 11 of the front wall 10A and an inner wall portion 11a of the first projecting portion 11 of the rear wall 10B.

[0046] As aforementioned, when the cushioning material 1 is in use, the body to be accommodated, P, is supported by the higher wall portions 31a of the bottom wall 30 and the inner wall portions 11a of the first projecting portions 11 of the front wall 10A and the rear wall 10B. As depicted in FIGS. 6A and 6B, the higher wall portions 31a are connected to the inner wall portions 11a. Besides, a recess E is formed in a connection portion between the higher wall portion 31a and the inner wall portion 11a. Therefore, when the cushioning material 1 is in use, the body to be accommodated, P, does not make contact with the connection portions between the higher wall portions 31a and the inner wall portions 11a. This makes it possible to restrain excessively large forces from acting on the edges of the body to be accommodated, P.

[0047] In the example of the cushioning material 1, the higher wall portion 31a is formed between the outer wall portion 13 of the front wall 10A and the outer wall portion 13 of the rear wall 10B, and the positions of the higher wall portions 31a and the positions of the inner wall portions 11a of the walls 10A and 10B are deviated from each other in the left-right direction. Therefore, an edge 31g (an edge located at an end portion in the left-right direction) of the higher wall portion 31a and an edge 31g (an edge located at an end portion in the left-right direction) of the inner wall portion 11a are connected with each other. The recess E is formed in the connection portion (boundary) between them.

[0048] Note that a hole penetrating the cushioning material 1 may be formed in place of the recess E, in the connection portion between the higher wall portion 31a and the inner wall portion 11a. In addition, the positions of the higher wall portions 31a and the positions of the

inner wall portions 11a may not be deviated from each other in the left-right direction. In this case, also, a groove may be formed as an example of the recess E, in the connection portion between the higher wall portion 31a and the inner wall portion 11a.

[0049] As has been described above, the cushioning material 1 opens to the upper side, and the front wall 10A has the outer wall portions 13 and the inner wall portions 11a and 12a that project more to the inside of the accommodating space than the outer wall portions 13. The front wall 10A does not have a flange at the upper edge 10a thereof. According to this structure, transport efficiency of goods can be enhanced, while restraining a lowering in the rigidity of the pulp mold cushioning material.

[0050] In addition, the front wall 10A has the outer wall portions 13 and the inner wall portions 11a and 12a projecting more to the inside of the accommodating space than the outer wall portions 13, and the outer wall portions 13 and the inner wall portions 11a and 12a are aligned in the left-right direction. The bottom wall 30 has the lower wall portions 33 and 32 and the higher wall portions 31a projecting more to the inside of the accommodating space than the lower wall portions 33 and 32, and the lower wall portions 33 and 32 and the higher wall portions 31a are aligned in the left-right direction. The recess E is formed in the connection portion between the outer wall portion 13 of the front wall 10A and the higher wall portion 31a of the bottom wall 30. According to this structure, it is possible to restrain large forces from acting on the corners of the body to be accommodated, P.

[0051] The pulp mold cushioning material proposed in the present disclosure is not limited to the aforementioned cushioning material 1, and various modifications are possible. For instance, as aforementioned, the size and shape of the cushioning material 1 may be changed as required. For example, the cushioning material 1 may have only the front wall 10A, the bottom wall 30 and the rear wall 10B, and may lack the walls 20A and 20B. As another example, the cushioning material 1 may have only the front wall 10A, the right wall 20A and the bottom wall 30.

[0052] The present disclosure contains subject matter related to that disclosed in Japanese Priority Patent Application JP 2018-076808 filed in the Japan Patent Office on April 12, 2018(H30), the entire content of which is hereby incorporated by reference.

[0053] It should be understood by those skilled in the art that various modifications, combinations, sub-combinations and alterations may occur depending on design requirements and other factors insofar as they are within the scope of the appended claims or the equivalents thereof.

Claims

1. A pulp mold cushioning material having a plurality of main walls which define an accommodating space

for accommodating inside thereof a body to be accommodated and which each have an opening that opens in a first direction,

wherein the plurality of main walls include a first main wall,

the first main wall includes a first outer wall portion and a first inner wall portion that projects more to inside of the accommodating space than the first outer wall portion, the first outer wall portion and the first inner wall portion being aligned in a second direction orthogonal to the first direction,

the first main wall has an edge portion extending in the second direction, at an end portion of the first main wall in the first direction, and

the first main wall does not have a flange at the edge portion.

2. A pulp mold cushioning material having a plurality of main walls which define an accommodating space for accommodating inside thereof a body to be accommodated and which have an opening that opens in a first direction,

wherein the plurality of main walls include a first main wall,

the first main wall includes a first outer wall portion and at least two first projecting portions having first inner wall portions projecting more to inside of the accommodating space than a position of the first outer wall portion,

the first outer wall portion is located between the at least two first projecting portions and is aligned with the at least two first projecting portions in a second direction orthogonal to the first direction,

the first outer wall portion has a first edge portion which is located at an end portion of the outer wall portion in the first direction and which is part of an edge of the opening,

each of the at least two first projecting portions has an end wall portion located at an end portion of the first inner wall portion in the first direction, and the end wall portions of the at least two first projecting portions are connected to each other through the first edge portion of the first outer wall portion.

3. The pulp mold cushioning material according to claim 1,

wherein a thickness of the edge portion as the first main wall is viewed in a direction along the first main wall is smaller than 2.0 times a thickness of the first outer wall portion.

4. The pulp mold cushioning material according to claim 1,

wherein the first main wall has a first projecting portion that has the first inner wall portion and that projects more to inside of the accommodating space than the first outer wall portion, and a projection width of the first projecting portion is

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greater than three times a thickness of the edge portion as the first main wall is viewed in a direction along the first main wall.

5. The pulp mold cushioning material according to claim 1 or claim 2,
wherein the plurality of main walls include a second main wall that is located on a side opposite to the first direction with respect to the first main wall and that is connected to the first main wall,
the second main wall includes a second outer wall portion and a second inner wall portion that projects more to inside of the accommodating space than the second outer wall portion, and
the second outer wall portion and the second inner wall portion are aligned in the second direction.
6. The pulp mold cushioning material according to claim 1 or claim 2,
wherein the plurality of main walls include a third main wall that is located in the second direction with respect to the first main wall and that is connected to the first main wall,
the third main wall has an edge portion extending in a third direction orthogonal to both the first direction and the second direction, at an end portion of the third main wall in the first direction, and
the third main wall does not have a flange at the edge portion.
7. The pulp mold cushioning material according to claim 1 or claim 2,
wherein the plurality of main walls have an opening edge that includes the edge portion of the first main wall and that opens in the first direction, and
the opening edge does not have a flange along a whole circumference of the opening edge.
8. The pulp mold cushioning material according to claim 1,
wherein the first main wall has a first projecting portion that projects to inside of the accommodating space and that has the first inner wall portion, and
the first projecting portion has an end wall portion extending from the first inner wall portion to outside of the accommodating space.
9. The pulp mold cushioning material according to claim 5,
wherein a connection portion between the first inner wall portion and the second inner wall portion is formed with at least one of a recess and a hole.
10. The pulp mold cushioning material according to claim 1 or claim 2,
wherein the first main wall has a (1-1)th inner wall portion and a (1-2)th inner wall portion located more to inside of the accommodating space than the

(1-1)th inner wall portion, as the first inner wall portion.

11. The pulp mold cushioning material according to claim 2,
wherein the end wall portions of the at least two first projecting portions extend from the first inner wall portion in a third direction orthogonal to both the first direction and the second direction,
the end wall portions have an edge portion located at an end portion in the third direction, and
the edge portions of the end wall portions are aligned with the edge portion of the outer wall portion in the second direction.
12. A pulp mold cushioning material comprising:
an accommodating space which opens in a first direction and inside of which a body to be accommodated is disposed; and
a plurality of main walls that define the accommodating space,
wherein the plurality of main walls include a first main wall and a second main wall that is located in a direction opposite to the first direction with respect to the first main wall and that is connected to the first main wall,
the first main wall has a first outer wall portion and a first inner wall portion that projects more to inside of the accommodating space than the first outer wall portion, the first outer wall portion and the first inner wall portion being aligned in a second direction orthogonal to the first direction,
the second main wall has a second outer wall portion and a second inner wall portion that projects more to inside of the accommodating space than the second outer wall portion, the second outer wall portion and the second inner wall portion being aligned in the second direction, and
a connection portion between the first inner wall portion and the second inner wall portion is formed with a recess or a hole.
13. The pulp mold cushioning material according to claim 10,
wherein a position of the first inner wall portion and a position of the second inner wall portion are deviated from each other in the second direction, and
the recess or the hole is formed between an edge of the first inner wall portion and an edge of the second inner wall portion.

FIG. 2

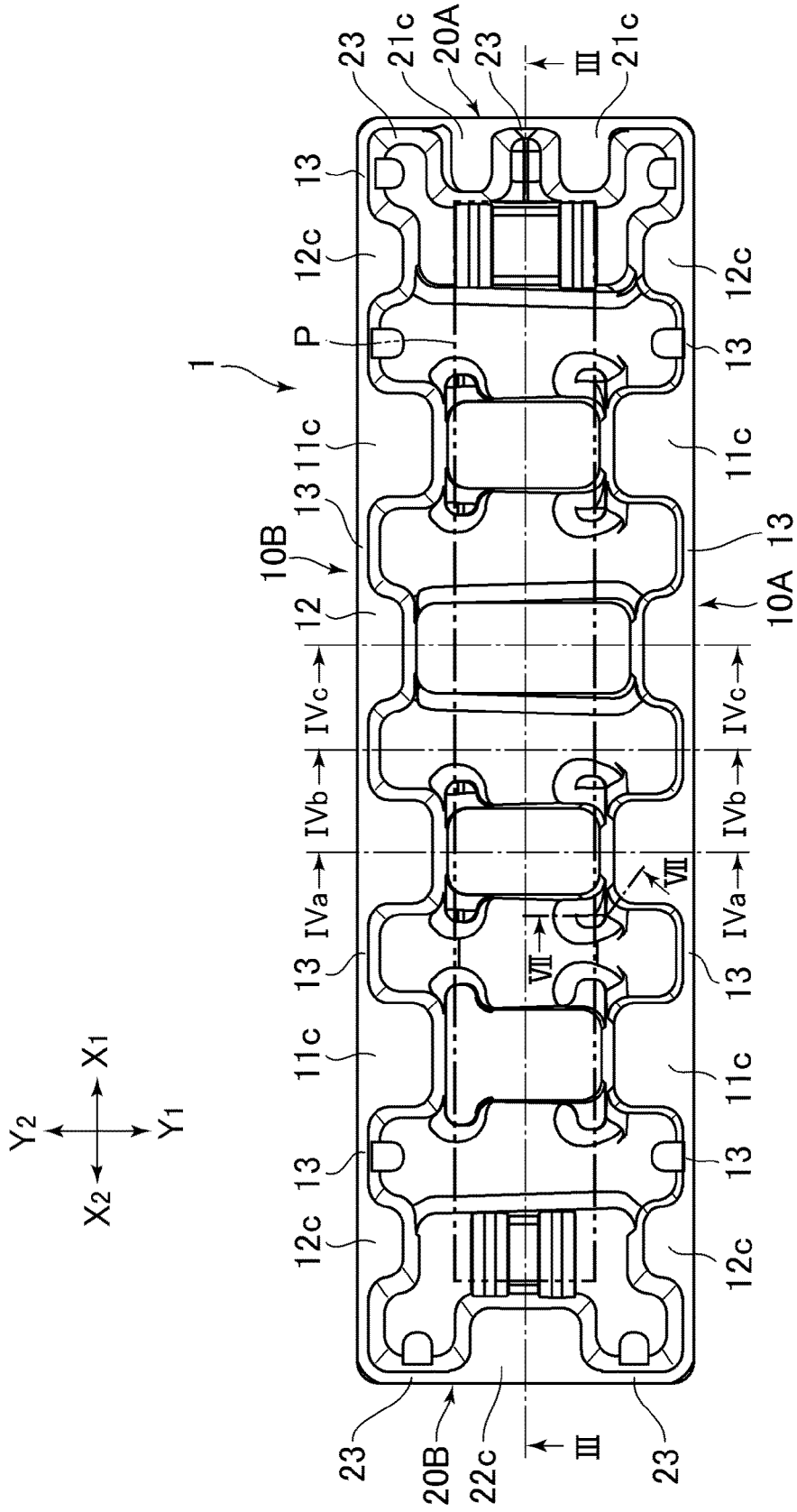


FIG. 3

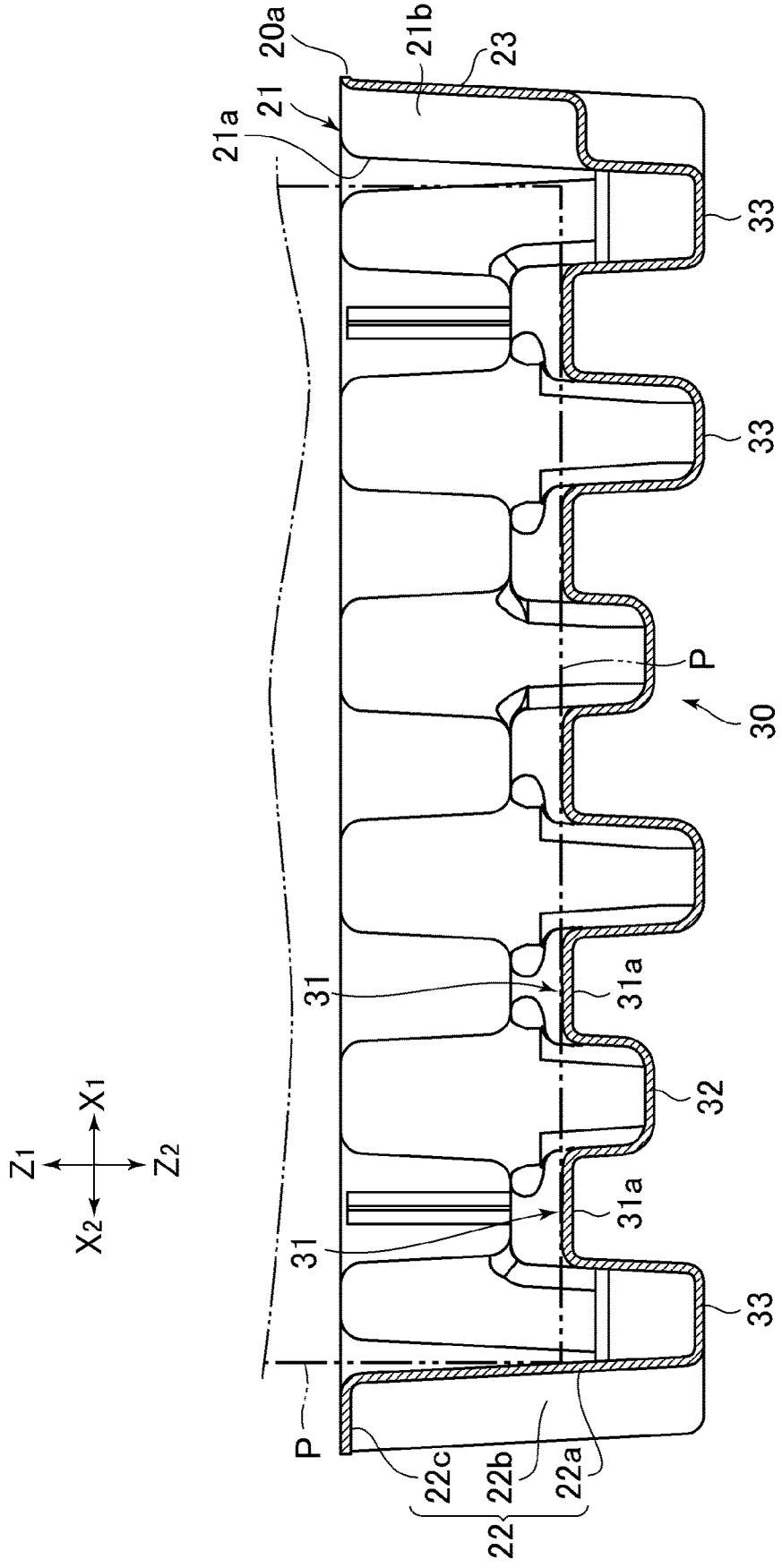


FIG. 4A

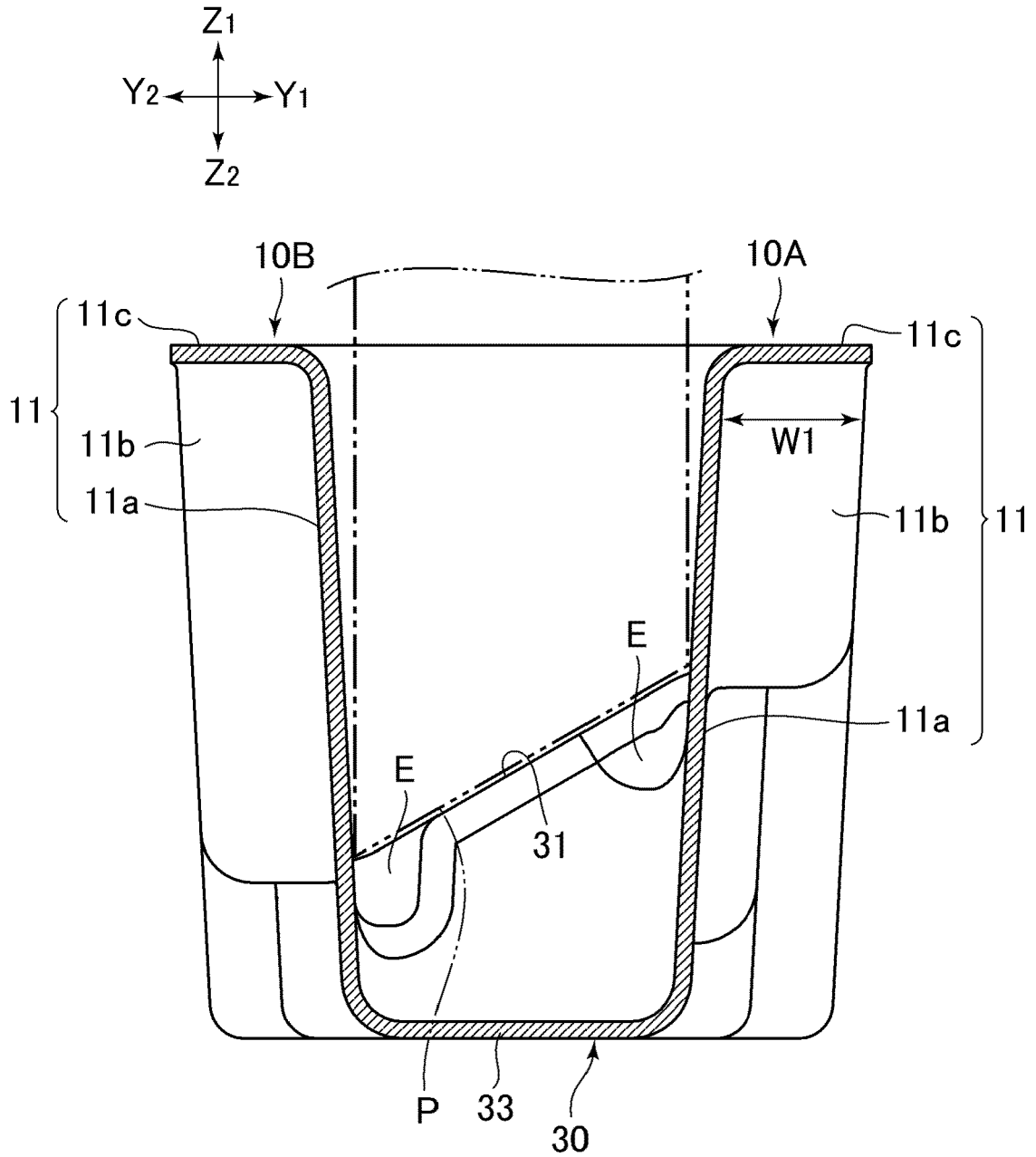


FIG. 4 B

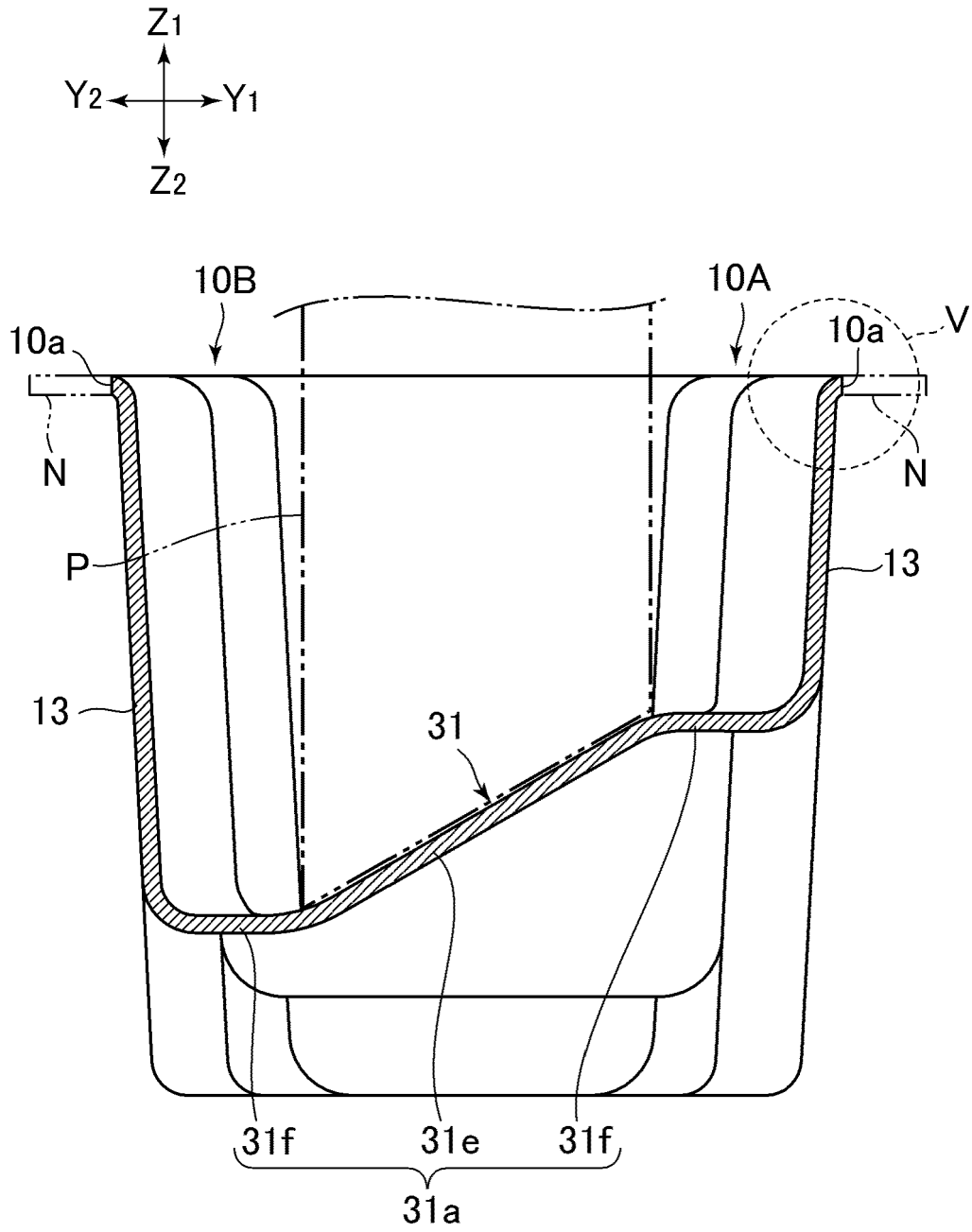


FIG. 4C

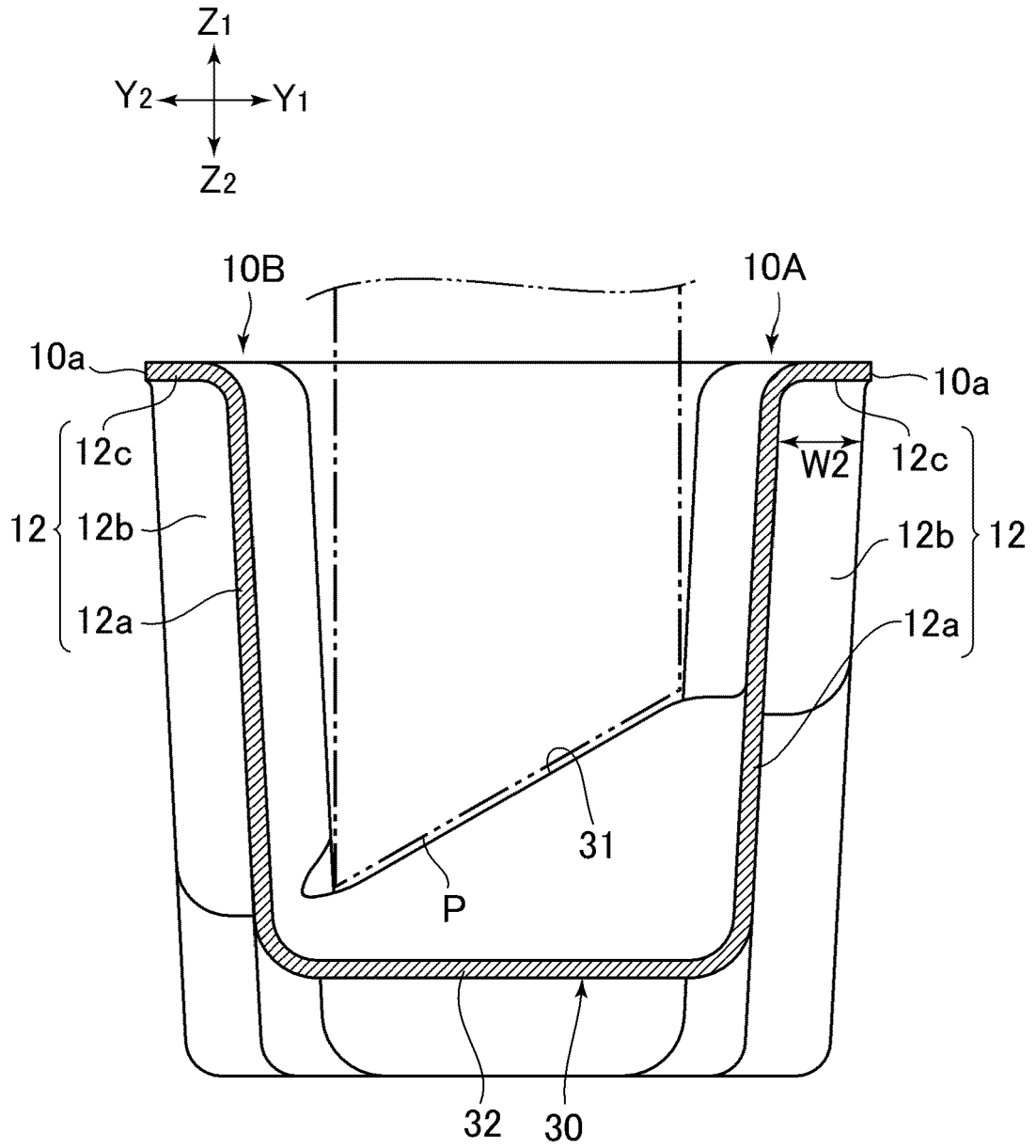


FIG. 5

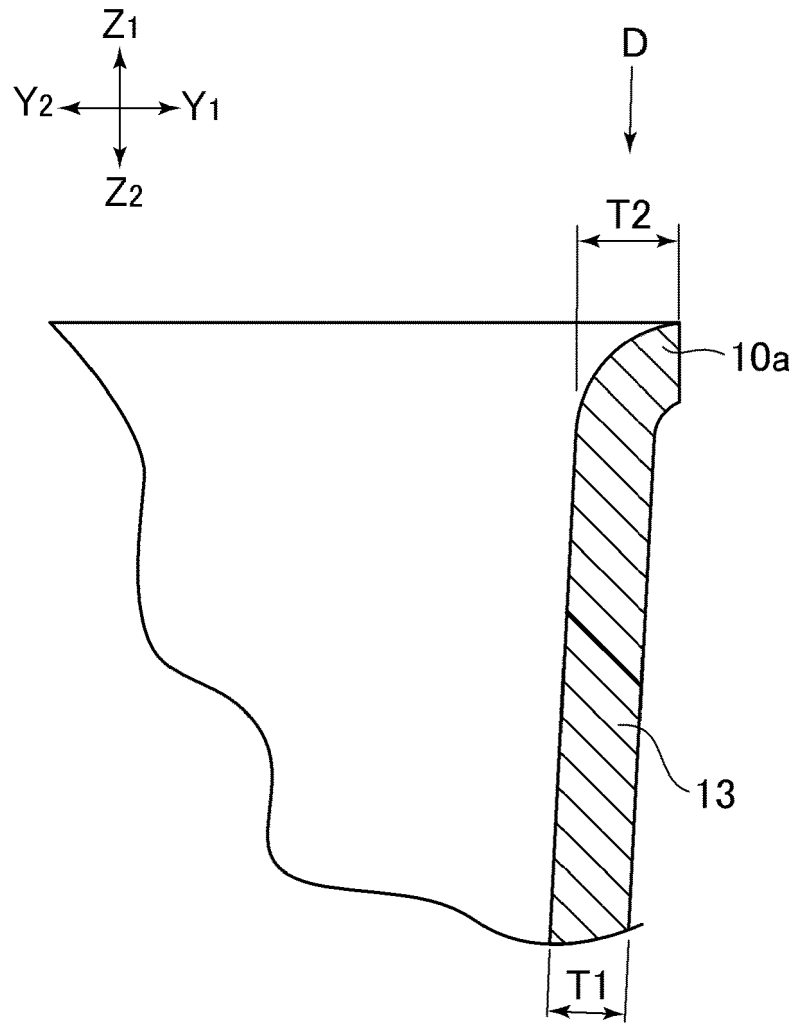


FIG. 6A

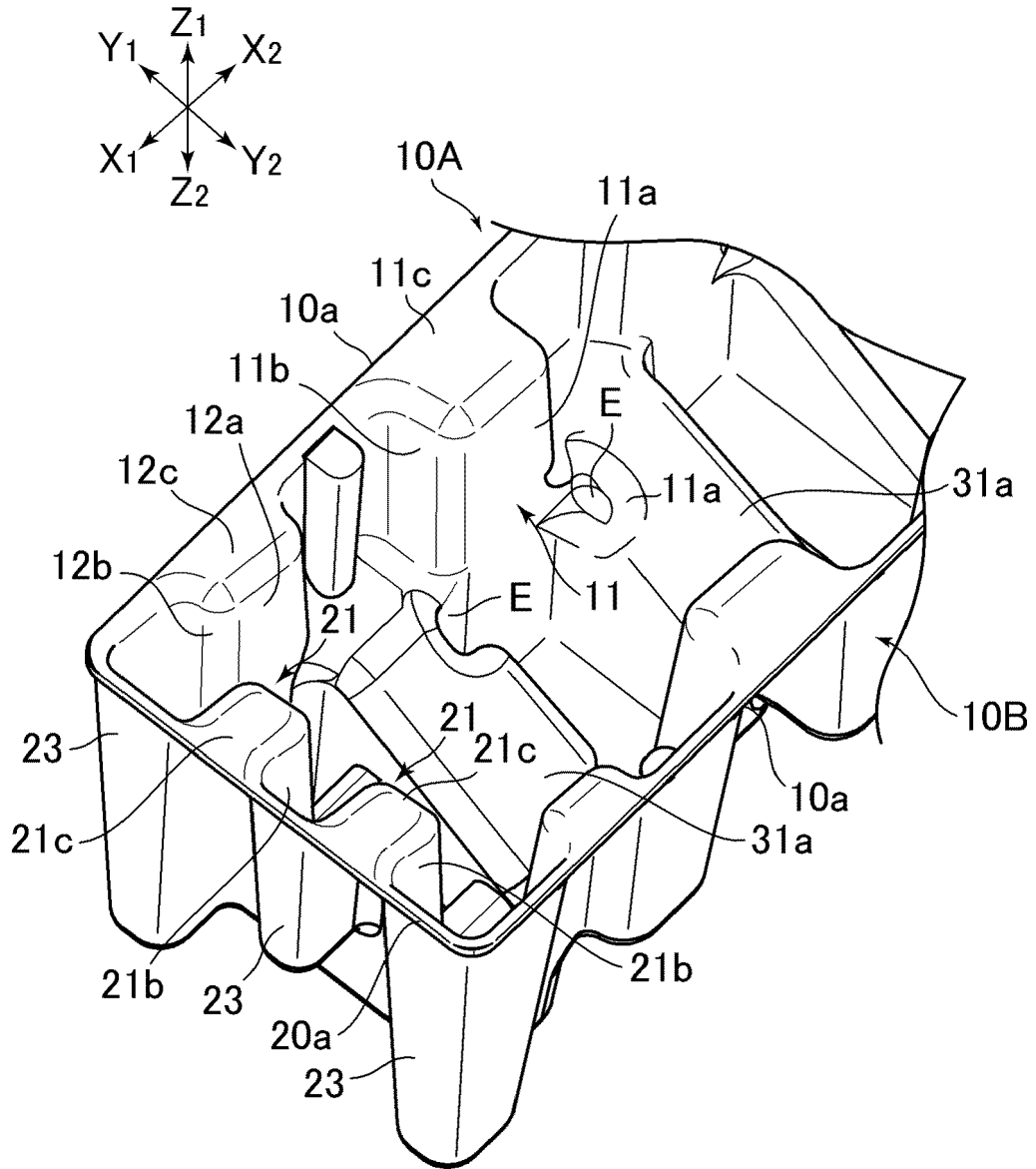


FIG. 6 B

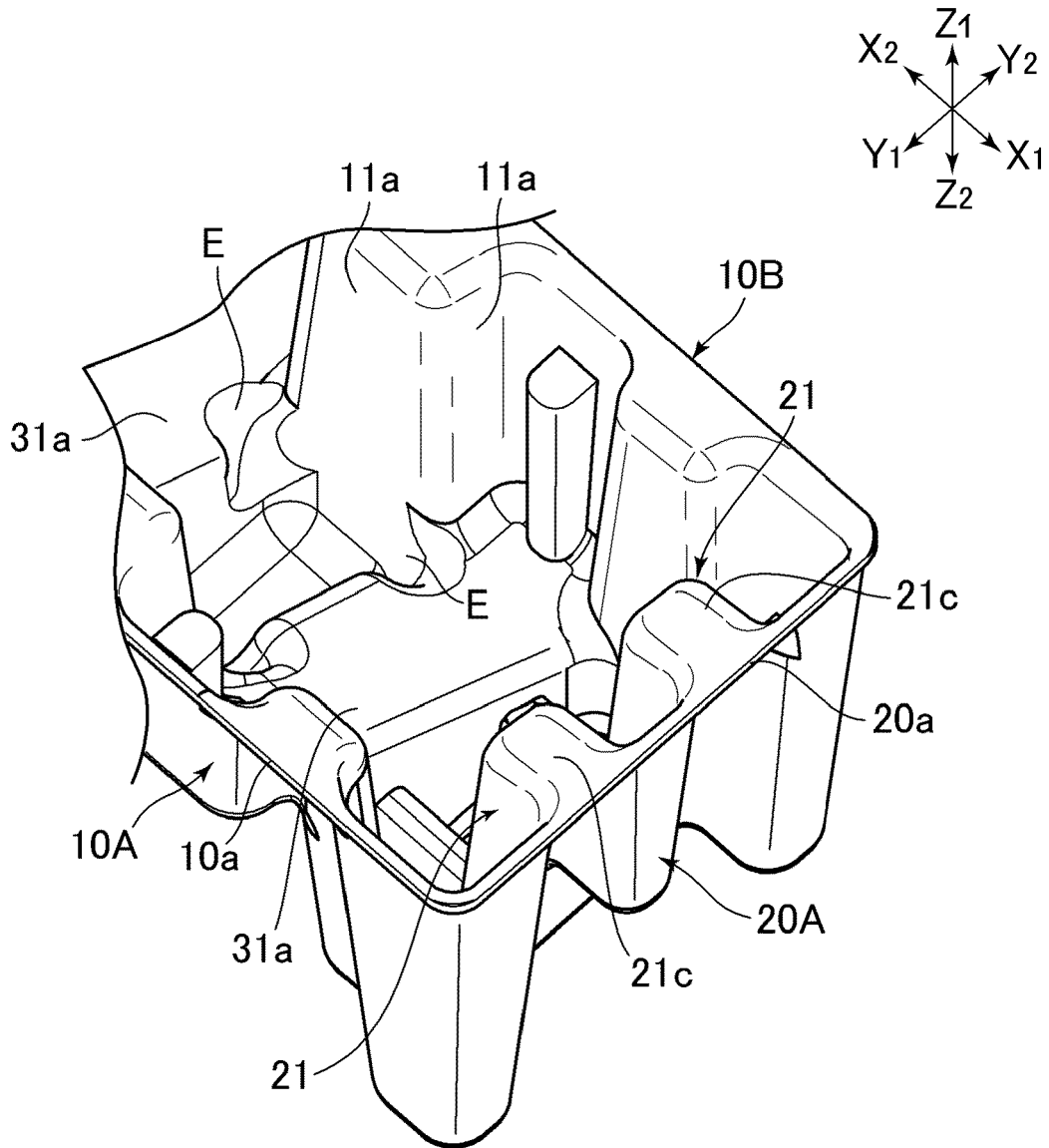
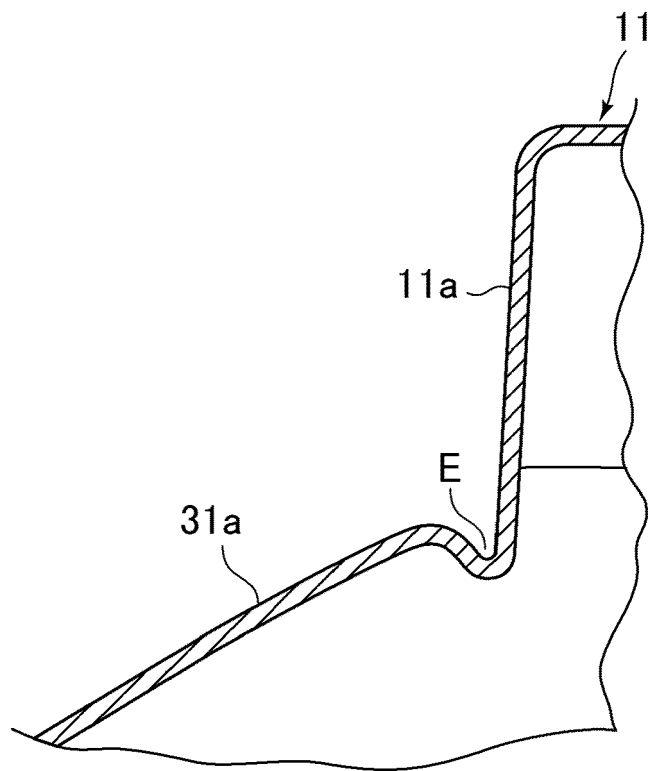


FIG. 7



REFERENCES CITED IN THE DESCRIPTION

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