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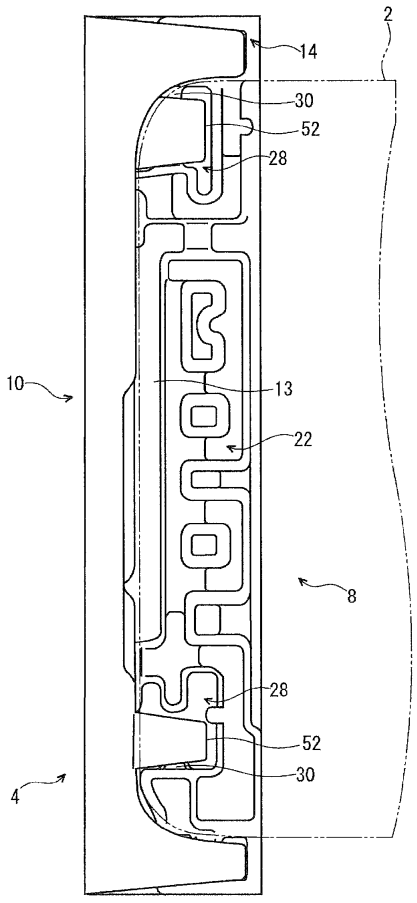
(54) Cushioning material

(57) Cushioning material 4 is interposed between an article to be packaged 2 and a packaging box 3 that houses the article to be packaged 2. The cushioning material 4 is equipped with a first support piece 8 and a second support piece 10. The first support piece 8 supports one face of the article to be packaged 2. The second support piece is equipped on an inner face with a projection 52, folded to the first support piece 8, and supports another face that is adjacent to one face of the article to be packaged 2. The projection 52 of the second support piece 10 is fixed with one face of the article to be packaged 2 so the folded posture of the second support piece 10 is maintained with the first support piece 8.

FIG. 5



EP 2 599 736 A1

Description

[0001] This application is based on and claims the benefit of priority from Japanese Patent Application No. 2011-260793, filed on 29 November 2011, the content of which is incorporated herein by reference.

BACKGROUND

[0002] The present disclosure relates to a cushioning material for protecting an article to be packaged when transporting or storing and the like.

[0003] Conventionally, a packaging implement is used for transporting or storing an article such as an image-forming device such as a printer, a copier, a facsimile, or a multifunction peripheral and the like for example, or components and the like that compose the image-forming device. This kind of packaging implement is, for example, equipped with a packaging box that houses the article to be packaged, and a cushioning material interposed between the packaging box and the article to be packaged.

[0004] Conventionally, as a cushioning material used in this kind of packaging implement, a cushioning material is known that is equipped with a first face holder that supports one face of the article to be packaged, and a second face holder folded to the first face holder, that folds from the first face holder and supports another face that is adjacent to the one face of the article to be packaged.

[0005] In this prior art technology, oblique faces are disposed on each of the first face holder and the second face holder. A fitting convex part is disposed on the oblique face of the first face holder. A fitting concave part is disposed on the oblique face of the second face holder. By touching together oblique faces thereby mating the fitting concave part and the fitting convex part, it is possible to maintain a folded posture of the second face holder to the first face holder.

[0006] However, with the cushioning material constituted as described above, when the packaging implement is dropped with front-rear sides or left-right sides facing downward in packaging implement drop tests, the first face holder and the second face holder protect a product by absorbing an impact, so the cushioning material becomes deformed. There is possibility that a positional relationship of the first face holder and the second face holder changes greatly and the mating of the fitting concave part and the fitting convex part can inadvertently become disengaged due to the deformation of the cushioning material. Particularly, if the cushioning material is formed from a pulp material, there is a limit to a strength of the fitting concave part and the fitting convex part, so said possibility increases.

[0007] If the mating of the fitting concave part and the fitting convex part inadvertently becomes disengaged, this causes the folded posture of the second face holder to become disengaged from the first face holder. Because of this, the cushioning material that normally should be arranged straddling between one face and another face of the article to be packaged will slide between one face of the article to be packaged and the packaging box, or between another face of the article to be packaged and the packaging box. For that reason, the position of the article to be packaged supported by the cushioning material shifts from a predetermined position. Therefore, in packaging implement drop tests, after being dropped with the front-rear sides or the left-right sides facing downward as described above, if the packaging implement is dropped with a bottom face facing downward, there is concern that the article to be packaged can be damaged.

SUMMARY

[0008] The packaging implement of the present disclosure is a cushioning material interposed between the article to be packaged and the packaging box that houses the article to be packaged, equipped with a first support piece and a second support piece. The first support piece supports one face of the article to be packaged. The second support piece is equipped with a projection on an inner face, folded to the first support piece, and supports another face adjacent to the one face of the article to be packaged. The projection of the second support piece is fixed with one face of the article to be packaged so the folded posture of the second support piece is maintained with the first support piece.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

Fig. 1 is a side view of a packaging implement according to one embodiment of the present disclosure;

Fig. 2 is a plan view depicting a state before the second support piece is folded to the first support piece, in a cushioning material of the packaging implement according to one embodiment of the present disclosure;

Fig. 3 is a perspective view of the first support piece in the cushioning material of the packaging implement according to one embodiment of the present disclosure;

Fig. 4 is a perspective view of the second support piece in the cushioning material of the packaging implement according to one embodiment of the present disclosure;

Fig. 5 is a plan view depicting a state after the second support piece is folded to the first support piece, in the cushioning material of the packaging implement

according to one embodiment of the present disclosure;

Fig. 6 is a side view depicting the state after the second support piece is folded to the first support piece, in the cushioning material of the packaging implement according to one embodiment of the present disclosure; and

Fig. 7 is a schematic view of a manufacturing machine for manufacturing the cushioning material of the packaging implement according to one embodiment of the present disclosure.

DETAILED DESCRIPTION

[0010] A configuration of the packaging implement 1 of one embodiment of the present disclosure will now be described with reference to Figs. 1 to 6. Fig. 1 is a side view of the packaging implement according to one embodiment of the present disclosure. Fig. 2 is a plan view depicting the state before the second support piece is folded to the first support piece, in the cushioning material of the packaging implement according to one embodiment of the present disclosure. Fig. 3 is a perspective view of the first support piece in the cushioning material of the packaging implement according to one embodiment of the present disclosure. Fig. 4 is a perspective view of the second support piece in the cushioning material of the packaging implement according to one embodiment of the present disclosure. Fig. 5 is a plan view depicting the state after the second support piece is folded to the first support piece, in the cushioning material of the packaging implement according to one embodiment of the present disclosure. Fig. 6 is a side view depicting the state after the second support piece is folded to the first support piece, in the cushioning material of the packaging implement according to one embodiment of the present disclosure.

[0011] As shown in Fig. 1, an article to be packaged 2, such as an image-forming device such as a printer, a copier, a facsimile, or a multifunction peripheral and the like for example, or components and the like that compose the image-forming device is packaged in the packaging implement 1. The article to be packaged 2 of the embodiment is substantially a rectangular parallelepiped shape.

[0012] The packaging implement 1 is equipped with a packaging box 3 that houses the article to be packaged 2, and four pieces of cushioning material 4 interposed between the packaging box 3 and the article to be packaged 2.

[0013] The packaging box 3 is formed by a sheet material, such as cardboard and the like, being folded, for example. The packaging box 3 is equipped with a main body 5 that composes side faces of the packaging box 3 formed into square tube-shape; a pair of bottom flaps 6 openably disposed at a bottom end of the main body 5; and lid flaps 7 openably disposed at a top end of the main body 5.

[0014] Cushioning material 4 is each disposed along the folded sides of the packaging box 3 in the four corners of the top left, bottom left, top right, and bottom right of the packaging box 3. The cushioning material 4 in the lower left corner will now be described referring to a bottom side of Fig. 2 as a front face side (the front side) of the cushioning material 4, based on the state before folding (see Fig. 2).

[0015] As shown in Fig. 2, the cushioning material 4 is equipped with a first support piece 8, and a second support piece 10 disposed at a left hand of the first support piece 8. The second support piece 10 is linked to the first support piece 8 via a hinge 11. The second support piece 10 is folded to the first support piece 8 along the hinge 11. The first support piece 8 can also be folded to the second support piece 10.

[0016] At a center in front-rear directions between the first support piece 8 and the second support piece 10, a central notch 12 is disposed. The hinge 11 is divided into a front side and a rear side by the central notch 12. The central notch 12 has substantially rectangular shape that is long in the front-rear directions. The four corners of the central notch 12 are rounded.

[0017] As shown in Fig. 3, the first support piece 8 is long in the front-rear directions. A first engaging end 14 is disposed at the front end and the rear end of the first support piece 8. The first engaging end 14 projects upward from an inner face 13 of the first support piece 8. Each of the first engaging ends 14 is equipped with a lower level projection 16 and an upper level projection 17. A first touching portion 15 is disposed at a left-side face of the lower level projection 16. The upper level projection 17 is disposed at a right side of the lower level projection 16. A projection 18 (see Fig. 2) is disposed at the rear of the lower level projection 16 at the front-end first engaging end 14. A projection 20 is disposed at the left of the lower level projection 16 at the rear-end first engaging end 14. The projection 20 is linked to the rear-end first engaging end 14 by a linking piece 21 (see Fig. 2).

[0018] As shown in Fig. 3, a first support face 22 is disposed on the first support piece 8 between the front and the rear first engaging ends 14. The first support face 22 projects upward from the inner face 13 of the first support piece 8. A projecting height of the first support face 22 from the inner face 13 of the first support piece 8 is lower than a projecting height of each first engaging end 14 from the inner face 13 of the first support piece 8. The first support face 22 is equipped with a lower level portion 23 and an upper level portion 24. The upper level portion 24 is arranged at the right side of the lower level portion 23. An area between the lower level portion 23 and the upper level portion 24 has a gentle step shape. A height (thickness) of the upper level portion 24 is 30 mm, for example.

[0019] A plurality of cavities 25 is disposed at a central

area in front-rear directions from the front of the first support face 22, at predetermined spacing in the front-rear directions. A groove 26 is disposed in right-left directions at the rear of the first support face 22. A linking piece 27 (see Fig. 2) is disposed in the groove 26. The linking piece 27 projects upward from the inner face 13 of the first support piece 8. The first support face 22 at the front side of the groove 26 and the first support face 22 at the rear side of the groove 26 are linked by the linking piece 27.

[0020] A first cavity 28 is each disposed at the front end and at the rear end of the first support face 22. As shown in Fig. 2, the left side and the upper side on each of the first cavities 28 are open. A support projection 30 is disposed in front-rear directions at a bottom portion of the first cavity 28. The support projection 30 projects slightly upward from the inner face 13 of the first support piece 8. A projection 31 is each disposed at the right and at the rear of the front-end first cavity 28. The projection 31 projects sideward from the first support face 22.

[0021] A first projection 32 is disposed at each of the left area at the front and the left area at the rear of the first support face 22, on the inner face 13 of the first support piece 8. Each of the first projections 32 projects upward from the inner face 13 of the first support piece 8. As shown in Fig. 2, a width a1 in front-rear directions of the front-side first projection 32 is wider than a width a2 in front-rear directions of the rear-side first projection 32. A projecting height from the inner faces 13 on the first support pieces 8 is substantially the same for each of the first projections 32; each projection 32 is higher than a projecting height of the first support face 22 from the inner face 13 of the first support piece 8. The front-side first projection 32 is disposed adjacent to the front-end first cavity 28 at the rear and at the left of the front-end first cavity 28. The rear-side first projection 32 is disposed adjacent to the rear-end first cavity 28 at the front and at the left of the rear-end first cavity 28.

[0022] As shown in Fig. 4, the second support piece 10 is long in the front-rear directions, in the same way as the first support piece 8. The length of the second support piece 10 in the front-rear directions is substantially the same as the length of the first support piece 8 in the front-rear directions. More accurately, the length of the second support piece 10 in the front-rear directions is slightly shorter than the length of the first support piece 8 in the front-rear directions. A width of the second support piece 10 in the left-right directions is larger than a width of the left-right directions of the first support piece 8.

[0023] A second engaging end 34 is disposed at the front end and at the rear end of the second support piece 10. The second engaging end 34 projects upward from the inner face 33 of the second support piece 10. An engaging level portion 35 is disposed at an upper right portion of each second engaging end 34. A second touching portion 36 is disposed at a right side face of each second engaging end 34. A touching base 38 is disposed at the right of each second engaging end 34 via a groove 37. A base 41 is disposed at the right of the front-end touching base 38 via a groove 40.

[0024] A second support face 42 is disposed on the second support piece 10 between the front and the rear second engaging ends 34. The second support face 42 projects upward from the inner face 33 of the second support piece 10. A projecting height of the second support face 42 from the inner face 33 of the second support piece 10 is lower than a projecting height of each second engaging end 34 from the inner face 33 of the second support piece 10. The second support face 42 is equipped with a lower level portion 43 and an upper level portion 44. The upper level portion 44 is disposed at the front side and the rear side of the lower level portion 43. An area between the lower level portion 43 and the upper level portion 44 has a gentle step shape. A groove 45 is disposed in the second support face 42, extending in the front-rear directions. A plurality of linking pieces 46 is disposed at the front and at the rear of the groove 45. The second support face 42 on the left side of the groove 45 and the second support face 42 on the right side of the groove 45 are linked by the linking piece 46.

[0025] A second cavity 47 is each disposed at the front and at the rear of the second support face 42. The right side and the upper side of each second cavity 47 are open. A protrusion 48 is each disposed at the rear of the front-side second cavity 47, and at the front of the rear-side second cavity 47. Each protrusion 48 projects toward the right from the second support face 42. A triangular notch portion 51 is disposed at the right of the rear-side protrusion 48.

[0026] A second projection 52 is each disposed at the right of the front end and at the right of the rear end of the second support face 42, on the inner face 33 of the second support piece 10. Each of the second projections 52 projects upward from the inner face 33 of the second support piece 10. The front-end second projection 52 is formed to be integrated with the base 41 at the rear of the base 41. The front-end second projection 52 is disposed adjacent to the front-side second cavity 47, at the front and at the right of the front-side second cavity 47.

[0027] A groove 53 is disposed between the rear-end second projection 52 and the second support face 42. A linking piece 54 (see Fig. 2) is disposed in the groove 53. The rear-end second projection 52 and the second support face 42 are linked by the linking piece 54. The rear-end second projection 52 is disposed adjacent to the rear-side second cavity 47, at the rear and at the right of the rear-side second cavity 47.

[0028] A projecting height of each of the second projections 52 from the inner faces 33 on the second support pieces 10 is each substantially the same; it is higher than a projecting height of the second support face 42 from the inner face 33 of the second support piece 10. A projecting height of each of the second projections 52 from the inner face 33 of the second support piece 10 is slightly lower than a projecting height of each first projection 32 from the inner face 13 of the first support piece 8. As

shown in Fig. 2, a width b1 in front-rear directions of the front-side second projection 52 is wider than a width b2 in front-rear directions of the rear-side second projection 52.

[0029] Note that three pieces of cushioning material 4 other than the cushioning material 4 at the lower left corner, described above, have the same configuration as the cushioning material 4 at the lower left corner. For that reason, in Fig. 1, the same numbers as those used in relation to the description of the cushioning material 4 in the lower left corner are applied to each portion; descriptions thereof will therefore be omitted.

[0030] The following will now describe a method for packaging the article to be packaged 2 using the packaging implement 1 configured as described above.

[0031] First, the second support piece 10 is folded substantially 90 degrees to the inside toward the first support piece 8 to prepare for the cushioning material 4. Next, the cushioning material 4 is placed in the lower left and the lower right corners of the packaging box 3. Pursuant to this, as shown in Fig. 5, each of the second projections 52 on the cushioning material 4 in the lower left corner is inserted into each of the first cavities 28. Also, each of the second projections 52 touches each of the support projections 30 disposed in the inner face 13 of the first support piece 8. Also, as shown in Fig. 6, each of the first projections 32 on the cushioning material 4 in the lower left corner is inserted into each of the second cavities 47. Also, each of the first projections 32 touches the inner face 33 of the second support piece 10. In this state, each upper face of the second projections 52 and the upper level portion 24 of the first support face 22 is nearly same at the height from the inner face 13 of the first support piece 8. Also, each right side face of the first projections 32 and the upper level portion 44 of the second support face 42 is nearly same at the height from the inner face 33 of the second support piece 10. With this, the angle (substantially 90 degrees in the embodiment) of the second support piece 10 to the first support piece 8 is determined. In the same way, for the cushioning material 4 in the lower right corner, the angle (substantially 90 degrees in the embodiment) of the second support piece 10 to the first support piece 8 is determined.

[0032] Also, as shown in Fig. 1, the upper level projection 17 on each of the first engaging ends 14 and the engaging level portion 35 on each of the second engaging ends 34 engage on the cushioning material 4 in the lower left corner and the lower right corner. Also, the lower level projection 16 on each of the first engaging ends 14 touches the second touching portion 36 on each of the second engaging ends 34. Also, the touching base 38 on each of the second engaging ends 34 touches the first touching portion 15 on each of the first engaging ends 14.

[0033] In this state, a bottom face of the article to be packaged 2 is placed on the first support face 22 of the first support piece 8 in the cushioning material 4 in the lower left corner, and on the first support face 22 of the first support piece 8 in the cushioning material 4 in the lower right corner. With this, as shown in Fig. 1, the bottom face of the left of the article to be packaged 2 is supported by the first support piece 8 on the cushioning material 4 in the lower left corner, and the side face of the lower left part of the article to be packaged 2 is supported by the second support piece 10 on the cushioning material 4 in the lower left corner. In the same way, the bottom face of the right of the article to be packaged 2 is supported by the first support piece 8 on the cushioning material 4 in the lower right corner, and the side face of the lower right part of the article to be packaged 2 is supported by the second support piece 10 on the cushioning material 4 in the lower right corner.

[0034] Also, as shown in Fig. 5, each of the second projections 52 on the cushioning material 4 in the lower left corner is fixed with the bottom face on the left of the article to be packaged 2. As shown in Fig. 6, each of the first projections 32 on the cushioning material 4 in the lower left corner is fixed with the side face on the lower left part of the article to be packaged 2. With this, the releaseing of the second support piece 10 from the first support piece 8 is restricted, thereby maintaining the folded posture of the second support piece 10 to the first support piece 8. In the cushioning material 4 in lower right corner as well, the releasing of the second support piece 10 from the first support piece 8 is restricted, thereby maintaining the folded posture of the second support piece 10 to the first support piece 8, not shown.

[0035] Next, as shown in Fig. 1, the cushioning material 4 is placed in the upper left and the upper right corners of the article to be packaged 2. In the cushioning material 4 in the upper left corner and the upper right corner, the releasing of the second support piece 10 from the first support piece 8 is restricted, in the same way. Finally, the lid flaps 7 on the packaging box 3 are closed, and joined together by adhesive tape and the like. This completes the work involved in packaging the article to be packaged 2 in the packaging implement 1.

[0036] Pursuant to the embodiment described above, in the cushioning material 4 in the lower left corner, the second projection 52 on the second support piece 10 is fixed with the bottom face on the left of the article to be packaged 2, thereby maintaining the folded posture of the second support piece 10 to the first support piece 8. For that reason, since it is avoided that the folded posture of the second support piece 10 becomes inadvertently disengaged from the first support piece 8, it is possible to prevent the cushioning material 4 from slipping between the bottom face of the left part or the side face of the lower left part of the article to be packaged 2, and the packaging box 3. Therefore, the cushioning material 4 can support the article to be packaged 2 at predetermined positions, preventing the article to be packaged 2 from being damaged by slipping from its supported position.

[0037] Furthermore, the first projection 32 on the first support piece 8 is fixed with the side face of the lower left part of the article to be packaged 2, in the cushioning material 4 in the lower left corner. For that reason, the

first projection 32 of the first support piece 8 and the second projection 52 of the second support piece 10 are is fixed with the article to be packaged 2 by being mutually crossed. With this configuration, it is possible more securely to maintain the folded posture of the second support piece 10 to the first support piece 8, more effectively to prevent the slipping of the cushioning material 4.

[0038] Also, as a result of securely restricting the slipping of the cushioning material 4 in this way, it is acceptable to make a thickness (30 mm) of the first support face 22 on the cushioning material 4 in this embodiment of the present disclosure thinner than a thickness (for example 60 mm) of a support face that corresponds to conventional cushioning materials. In this way, the cushioning material 4 can be thinner, so it is possible to make the cushioning material 4 more compact and to reduce its cost.

[0039] Also, each of the second projections 52 disposed on the second support face 42 of the second support piece 10 is inserted into each of the first cavities 28 formed in the first support face 22 of the first support piece 8, and each of the first projections 32 disposed on the first support face 22 of the first support piece 8 is inserted into each of the second cavities 47 formed in the second support face 42 of the second support piece 10. With this configuration, it is possible to support the bottom face on the left of the article to be packaged 2 with both the first support face 22 and the second projection 52, and to support the side face of the lower left part of the article to be packaged 2 with both the second support face 42 and the first projection 32. This makes it possible to increase the support portions of the cushioning material 4 that supports the article to be packaged 2 and to increase stability and strength of the cushioning material 4, which increases cushioning performance of the cushioning material 4.

[0040] Also, the projecting height of each of the second projections 52 from the inner face 33 of the second support piece 10 is set to be slightly lower than the projecting height of each of the first projections 32 from the inner face 13 of the first support piece 8. This allows the projecting height of each projection 32 and 52 to change as required, and makes it possible easily to change the strength of each of the support pieces 8 and 10 as required.

[0041] "Pulp mold manufacturing method", which is a manufacturing method of the cushioning material 4 according to the embodiment of the present disclosure, will now be described with reference to Fig. 7.

[0042] As shown in Fig. 7, manufacturing apparatus for the cushioning material 4 is equipped with a die 61, a mesh 62 disposed along a top face of the die 61; and a container 63 that covers a top face of the die 61 and the mesh 62. A plurality of suction holes 64 are disposed in the die 61, penetrating from the top face to the back face. Pulp solution dissolved with used paper and the like in water and a chemical is stored in the container 63.

[0043] As indicated by the arrow in Fig. 7, the pulp solution in the container 63 is drawn by a sucking configuration (not shown) through the suction holes 64. Pulp material in the pulp solution adheres to the top face of the mesh 62 along a shape of the cushioning material 4. The cushioning material 4 is completed by removing and drying the adhered pulp material.

[0044] Pursuant to the embodiment of the present disclosure, the cushioning material 4 is manufactured using the pulp-mold manufacturing method. For that reason, it is easier to form each of the projections 32 and 52 compared to the case in which the cushioning material 4 is manufactured by a sheet material such as cardboard and the like. Also, it is possible to lighten the impact on the environment compared to the case in which the cushioning material 4 is manufactured by Styrofoam and the like.

[0045] A description was provided according to the embodiment of the present disclosure, forming the cushioning material 4 using the pulp-mold manufacturing method. However, in different embodiment, it is possible to form cushioning material 4 by folding a sheet material, such as cardboard and the like. It is also acceptable to form the cushioning material 4 using Styrofoam and the like.

[0046] With the embodiment, the description adopted the configuration of the present disclosure to a horizontal type cushioning materials 4 placed in the four corners of the top left, bottom left, top right and bottom right of the packaging box 3. However, in a different embodiment, it is acceptable to adopt the configuration of the present disclosure to a vertical type cushioning materials 4 placed in the four corners of the front left, rear left, front right and rear right of the packaging box 3.

Claims

1. A cushioning material interposed between an article to be packaged and a packaging box that houses the article to be packaged, comprising:

   a first support piece supports one face of the article to be packaged; and
   a second support piece equipped with a first projection on an inner face, folded to the first support piece, that supports another face adjacent to the one face of the article to be packaged, wherein the folded posture of the second support piece is maintained with the first support piece by the first projection on the second support piece fixing with the one face of the article to be packaged.

2. The cushioning material according to claim 1, wherein the first support piece is equipped on an inner face with a second projection, and the second projection is fixed with the another face of the article to be packaged.

3. The cushioning material according to claim 1 or claim 2, wherein the first support piece is equipped a support face that supports the one face of the article to be packaged, and the support face is equipped with a first cavity that can be inserted with the first projection on the second support piece.

4. The cushioning material according to any one of claims 1 to 3, wherein the second support piece is equipped a support face that supports the other face of the article to be packaged, and the support face is equipped with a second cavity that can be inserted with the second projection on the first support piece.

5. The cushioning material according to any one of claims 1 to 4, being manufactured by a pulp-mold manufacturing method.

FIG. 1

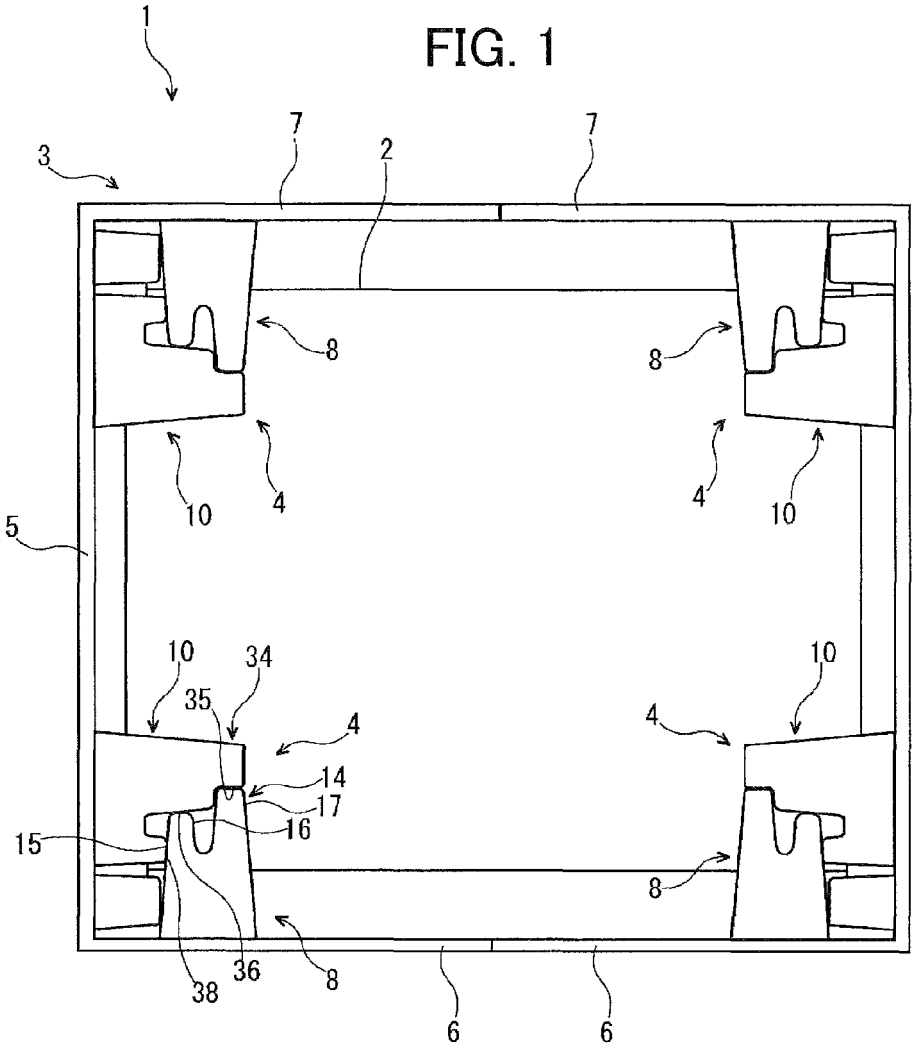


FIG. 2

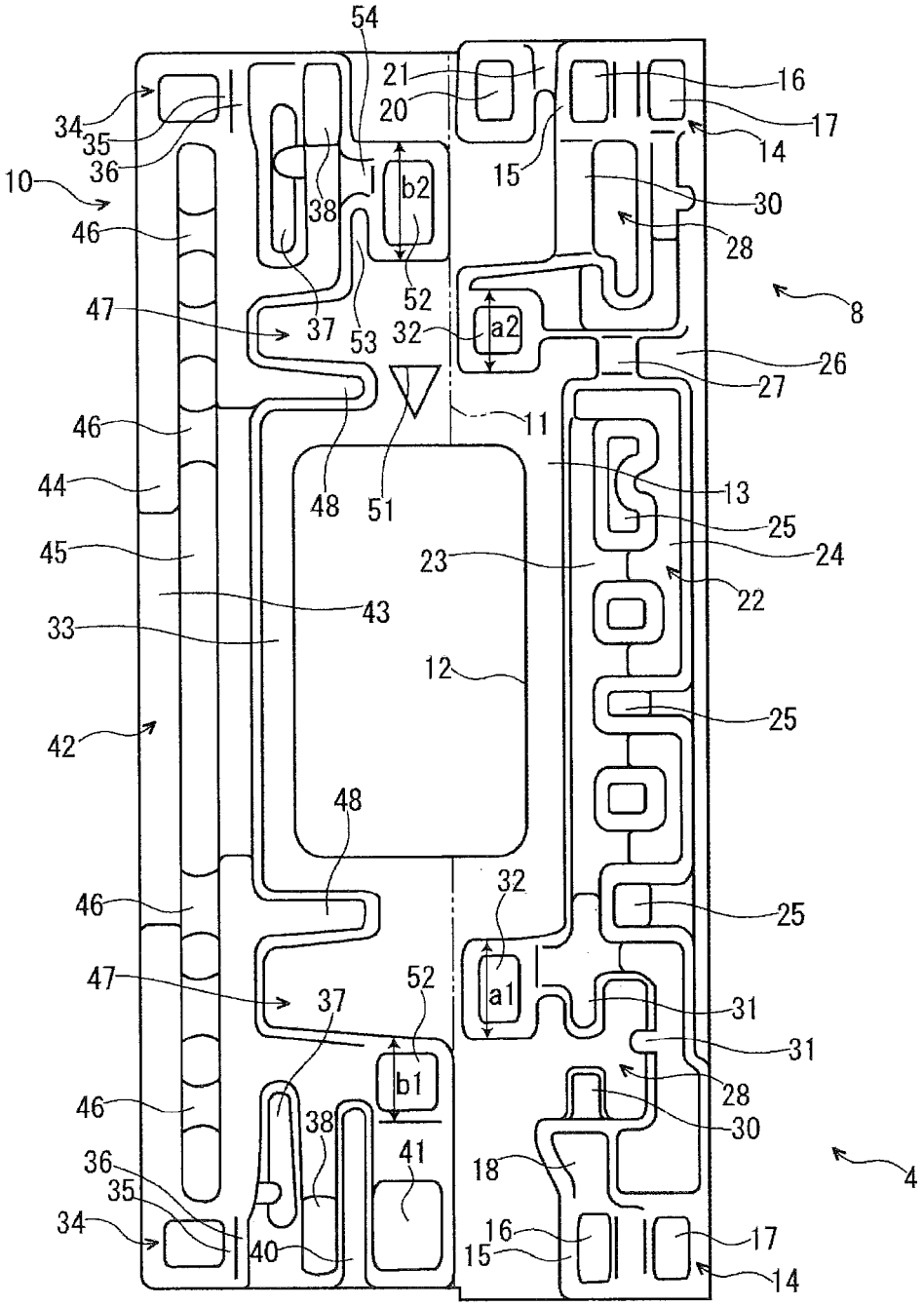

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FIG. 3

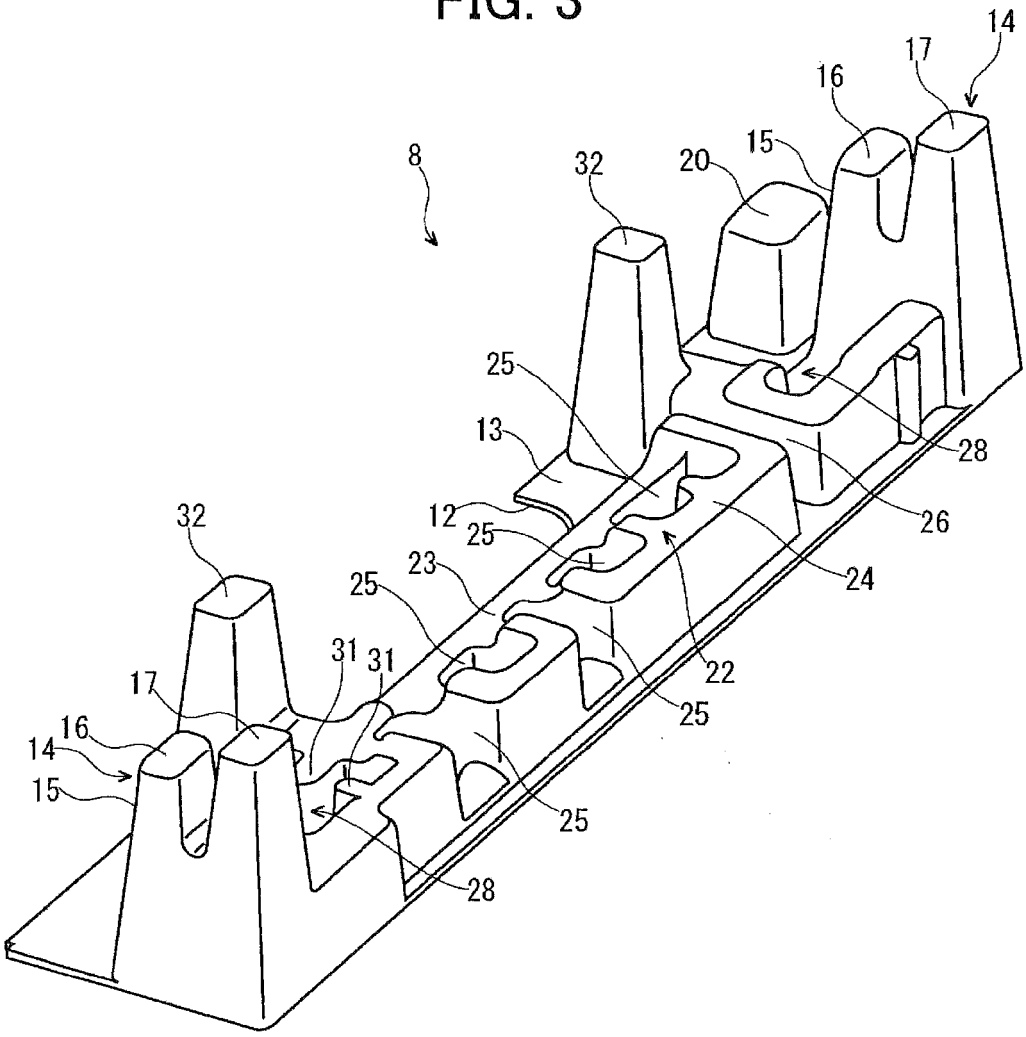

FIG. 4

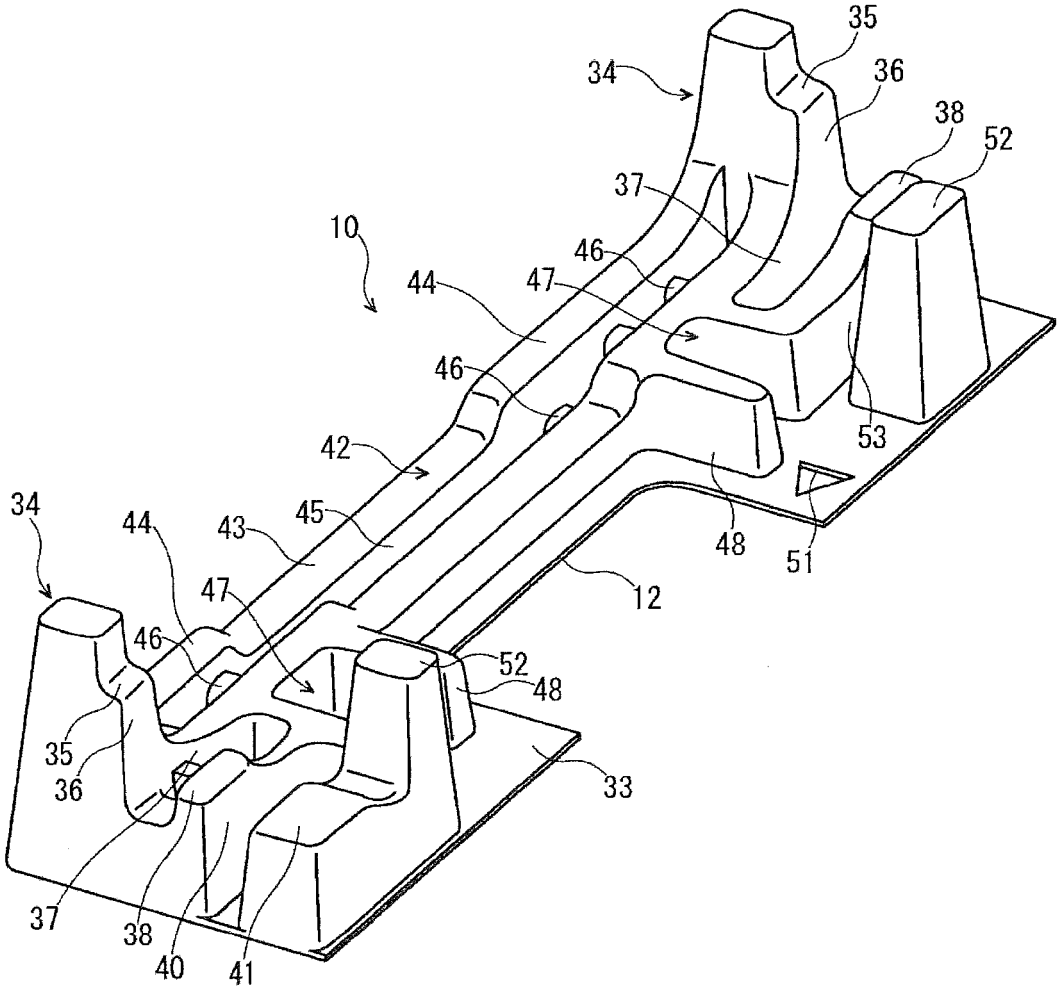
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FIG. 5

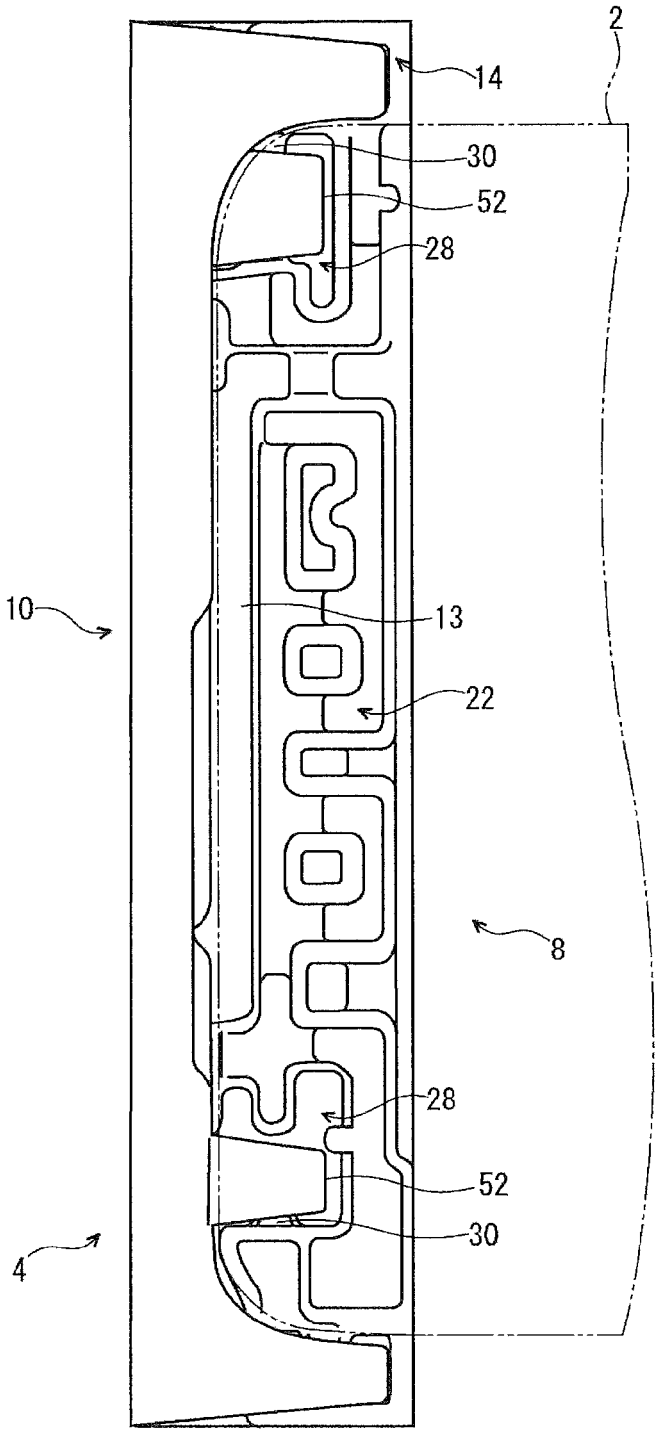


FIG. 6

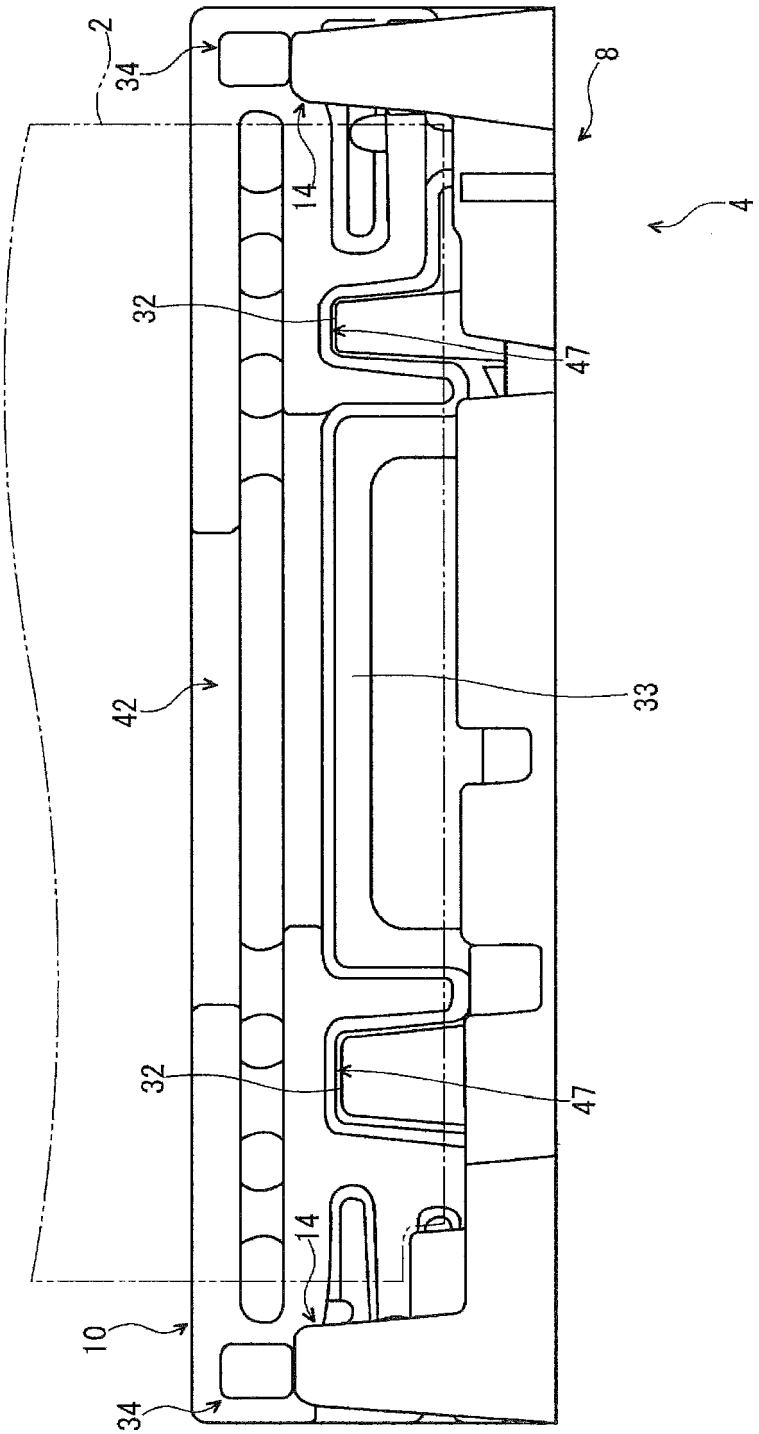
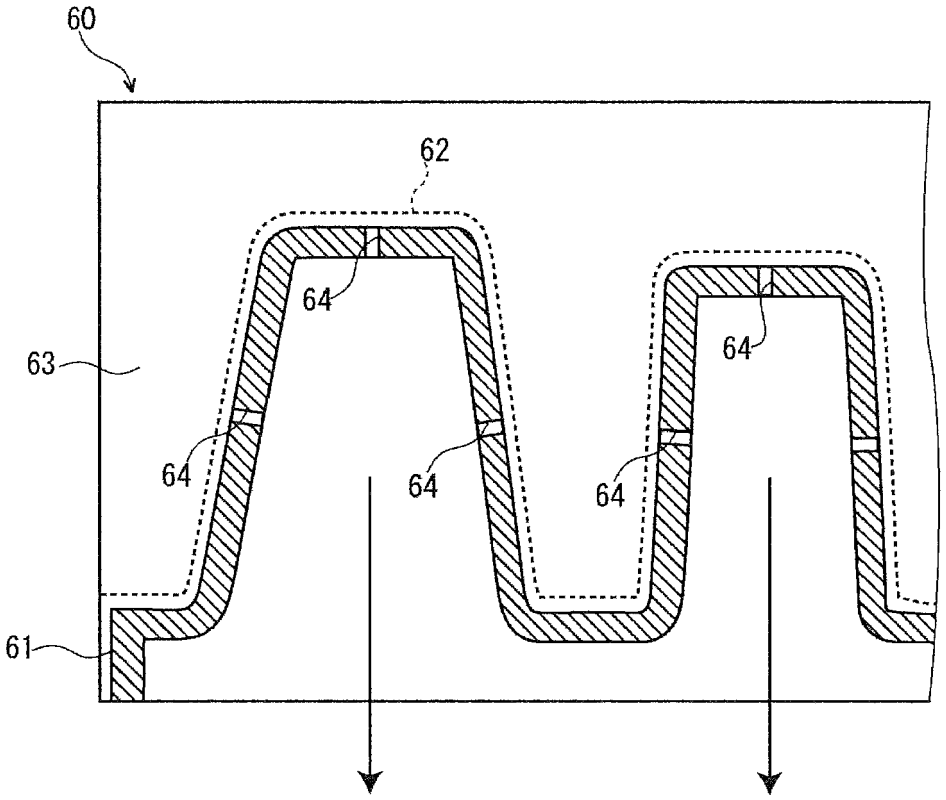


FIG. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 12 19 4120

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 February 2013	Jervelund, Niels

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1

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