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(54) **Box and blank for a box**

(57) Box provided with a bottom panel (1) and with a first (4,5) and a second (8,9) pair of vertical parallel side walls. Each side wall comprises a side wall panel, each side wall panel of a pair forming a corner of the box with a side wall panel of the other pair. Each side wall panel of each pair is connected to the bottom panel by one bottom folding line (2,3,6,7), a reinforcing sleeve being arranged at least near each corner of the box, which reinforcing sleeve is substantially perpendicular to the plane of the bottom and encloses a cavity. Blank for the manufacture of a box. The blank is provided with a bottom panel with a number of corners (A,B,C,D), with a first pair and a second pair of parallel side wall panels. Each side wall panel is connected to the bottom panel by one bottom folding line and has end edges transverse to the bottom folding line, and a number, equal to the number of corners, of extension flap groups. Each extension flap group is connected near an associated corner to a side wall panel concerned by one folding line, neighbouring extension flaps in each group being mutually connected by folding lines. The extension flaps with folding lines of each group are arranged and designed in such a way that after folding on the folding lines, each extension flap group forms a reinforcing sleeve which encloses a cavity, at least near the associated corner.

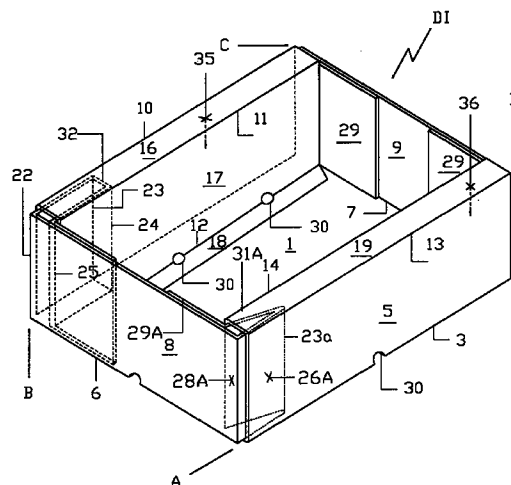


FIG. 2

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Description

The present invention relates to a box, made in particular of cardboard, provided with a bottom panel and with a first and a second pair of vertical parallel side walls.

The invention also relates to a blank for the manufacture of a box.

Such a box is generally known and is used on a wide scale for the storage, possibly cold-storage, and the transport of vegetables, fruit and the like. This box is also often used on the market to display goods. A drawback to such a box is that it has little or no insulating capacity. Moreover, the box is almost impossible to stack, since its side walls have almost no bearing capacity. A further problem with such boxes is to realize as large a usefully applicable content as possible in boxes that are stackable when filled, wherein the material consumption for the boxes is reduced as much as possible.

It is the object of the invention to provide a box which allows for at least a number of these problems to be solved.

This is effected according to the invention by a box provided with a bottom panel and with a first and a second pair of vertical parallel side walls, each side wall comprising a side wall panel, each side wall panel of a pair forming a corner of the box with a side wall panel of the other pair and each side wall panel of each pair being connected to the bottom panel by one bottom folding line, a reinforcing sleeve being arranged at least near each corner of the box, which reinforcing sleeve is substantially perpendicular to the plane of the bottom and encloses a cavity. Because a reinforcing sleeve is arranged near each corner of the box, which reinforcing sleeve is substantially perpendicular to the plane of the bottom, the box has sufficient strength in vertical direction to be stacked when filled, for instance into a stack having a height which is used for transporting such filled boxes in for instance lorries or other means of transport. Because the reinforcing sleeve encloses a cavity, in other words is a figure which is closed in cross-section, an extremely high stacking strength is obtained.

In a preferred embodiment of a box according to the invention each reinforcing sleeve is located on the outer side of a side wall panel concerned, and contacts only that side wall panel. Because the reinforcing sleeves are located outside the side wall panels and therefore do not project in the inner space of the box, they do not constitute an obstacle which could damage for instance fruit or another sensitive product. Moreover, a useful space is hereby obtained, which can be filled entirely or almost entirely with products having a square or rectangular horizontal cross-section, such as cartons for milk products.

In a further preferred embodiment according to the invention, at least one pair of side walls is designed to have double walls, in that each side wall of the at least one pair comprises, apart from a side wall panel, a con-

necting strip connected to the side wall panel via a folding line running parallel to the bottom folding line concerned and a wall strip connected to the connecting strip via a folding line running parallel to the bottom folding line concerned. The application of double-walled side walls allows, on the one hand, for the creation of air-filled spaces, which have an insulating effect and, on the other hand, the side walls become thicker, that is to say designed with two spaced wall panels, so that the so-called stacking strength is increased. When each reinforcing sleeve is located between the side wall panel concerned and the associated wall strip, this stacking strength is further increased.

In an especially practical embodiment of a box according to the invention, one or more wall stiffening members have been arranged in the space limited by a side wall panel, the associated connecting and wall strip and two reinforcing sleeves. By arranging these wall stiffening members, for instance in two opposed side walls of the box, which members can be placed at substantially equal distance from the transverse walls and possibly from each other, smaller boxes of the same width and with half or a third or another portion of the length of that box can be put on top of that box, the vertical pressure load on the corners of those smaller boxes being absorbed by the wall stiffening members of the larger box. Furthermore, these wall stiffening members allow for the boxes to be stacked "bonded" in such a way, that they overlap each other in layers placed on top of each other and are still protected against the pressure load exerted thereon.

Further features and advantages of a box according to the invention will be elucidated on the basis of the embodiments described below.

The invention also relates to a blank for the manufacture of a box, the blank being provided with a bottom panel with a number of corners, with a first pair and a second pair of parallel side wall panels, each side wall panel being connected to the bottom panel by one bottom folding line and having end edges transverse to the bottom folding line, with a number, equal to the number of corners, of extension flap groups, each extension flap group being connected near an associated corner to a side wall panel concerned by one folding line, neighbouring extension flaps in each group being mutually connected by folding lines, the extension flaps with folding lines of each group being arranged and designed in such a way that after folding on the folding lines, each extension flap group forms a reinforcing sleeve which encloses a cavity, at least near the associated corner. By using such a blank, it is possible to manufacture a box with reinforcing sleeves which has sufficient stacking strength.

In a preferred embodiment of a blank according to the invention, to each side wall panel of at least one pair of side wall panels a connecting strip is connected via a folding line running parallel to the bottom folding line concerned, and to each connecting strip a wall strip is connected via a folding line running parallel to the bot-

tom folding line concerned, each wall strip having end edges transverse to the folding line. This blank allows for the realization of a double-walled box with reinforcing sleeves.

A blank according to the invention uses a minimum amount of material, when at least one extension flap group is connected to an end edge concerned of a side wall panel or wall strip.

A box in which the reinforcing sleeves come to lie on the outer sides of the side wall panels can be realized in a simple manner by using as a basis a blank in which the side wall panel or the wall strip, on an end edge of which an extension flap group is connected, is extended beyond the bottom folding lines of the adjacent side wall panels.

A number of embodiments of a box and a blank according to the invention will be further elucidated by way of example on the basis of the drawing.

The following is shown in:

figure 1: a top view of an example of a blank for the box according to the invention,

figure 2: a perspective view of an example of a box according to the invention,

figure 3: a perspective view of the corner D of the box of figure 2, in which a side wall portion has been cut out,

figure 4: a top view of another embodiment of a blank according to the invention,

figure 5: a perspective view of the cardboard box, folded from the blank according to figure 4,

figure 6: a top view of a corner portion of a blank for the manufacture of a box according to a further embodiment,

figure 7: a perspective view of a corner portion of a box, manufactured from the blank according to figure 6,

figure 8: a top view of a corner portion of a blank for the manufacture of a box according to yet a further embodiment,

figure 9: a perspective view of a corner portion of a box, manufactured from the blank according to figure 8,

figure 10: a horizontal cross-section of the box along the line X-X in figure 9,

figure 11: a top view of a blank, in which some possible positions of extension flap groups are shown,

figure 12: a part of a corner of a box according to the invention, with a reinforcing sleeve folded from extension flap group E of figure 11, and

figure 13: a corner of a blank according to the invention, for a box with four double side walls.

In order to facilitate the description of a, for instance cardboard, box according to the invention, first a blank for the manufacture of a box will be described on the basis of figure 1.

The blank PI according to figure 1 comprises a bottom panel 1, to which a pair of relatively long, first side wall panels 4 and 5 are foldably connected by bottom folding lines 2 and 3, and a pair of relatively short, second side wall panels 8 and 9 are foldably connected by bottom folding lines 6 and 7.

The relatively long first side wall panels 4 and 5 are provided with connecting strips 16 and 19, respectively, foldably connected thereto by folding lines 10 and 13, respectively, running parallel to the bottom folding lines 2 and 3. To these connecting strips 16, 19, wall strips 17 and 20 are connected with folding lines 11 and 14 running parallel to the bottom folding lines 2 and 3. The hollow side walls of the box will be folded from the side wall panels, the wall strips and the connecting strips. Furthermore, attaching strips 18 and 21 are connected to the wall strips 17 and 20 by folding lines 12 and 15 running parallel to the bottom folding lines 2 and 3, for fastening to the bottom panel 1.

The relatively short second side wall panels 8 and 9, together with the side wall panels 4 and 5, constitute the "corners" A, B, C and D of the blank. The end edges, transverse to the bottom folding lines 6 and 7, of the side wall panels 8 and 9 are provided with extension flaps 26, 27, 28 and 29, respectively, foldably connected thereto and to each other by folding lines 22, 23, 24 and 25, of which extension flaps the reinforcing sleeves (to be described later) will be folded.

At the location of the bottom folding lines 2, 3, 6 and 7 and the folding lines 12 and 15, for instance round holes 30 can be provided in the blank, which round holes serve to drain off liquid, for instance melt water, when the box contains fresh fish and similar goods with ice.

The box DI according to figure 2 is folded and constructed from the blank PI according to figure 1 in the following manner. First, the relatively short, second side wall panels 8 and 9 are folded at right angles to the bottom panel 1 and on the four corners A, B, C and D each time one reinforcing sleeve 31, 32, 33 and 34 (only sleeve 32 has been drawn) are folded from the extension flaps 26, 27, 28 and 29 in the manner drawn in figures 3 and 1. The extension flaps 29 are therein glued to the associated side wall panel 8 or 9. The reinforcing sleeves are substantially perpendicular to the bottom 1 and to the associated side wall panel 8 or 9. Subsequently, the relatively long, first side wall panels 4 and 5 are folded approximately at right angles to the bottom

panel 1, the connecting strips 16 and 19 are folded at right angles inwards onto the reinforcing sleeves 31-34, subsequently the wall strips 17 and 20 are folded at right angles inwards and downwards and the fastening strips 18 and 21 are glued onto the bottom 1. Possibly, the side wall panels 4 and 5 and/or the wall strips 17 and 20 can also be glued to the reinforcing sleeves 31-34. In this way, the hollow side walls 35 and 36 of the box DI are formed.

It goes without saying that the location of the reinforcing sleeves 31-34 and that of the hollow side walls 35 and 36 can be exchanged, that is to say the reinforcing sleeves 31-34 on the first, long side wall panels 4 and 5 and the hollow walls 35 and 36 on the second side wall panels 8 and 9.

Instead of the rectangular reinforcing sleeves 31 and 32 drawn in figures 2 and 3, triangular reinforcing sleeves can also be used, as indicated in figure 2 with the reinforcing sleeve 31A. This reinforcing sleeve 31A can simply be obtained by omitting the extension flap 27 in the blank PI, wherein the extension flaps 26A and 28A are then connected to each other along a single folding line 23A. In this example the extension flap 26A is glued to side wall panel 5 and 28A is inclined at an angle of a little less than 90° to the side wall panel 8 and the extension flap 29A is glued to the side wall panel 8.

In figures 4 and 5, another embodiment of a blank PII and of a box DII according to the invention has been drawn, in which the blank PII is identical to the blank PI, except in the ways described below. The blank PII therefore has the same parts 1a up to and including 30a and corners Aa-Dd, for a description of which reference is made to those parts 1 up to and including 30 and the corners A-D of the blank PI in figure 1.

In the blank PII, connecting strips 43 and 46, respectively, wall strips 44 and 47, respectively and fastening strips 45 and 48, respectively are foldably connected to the side wall panels 8a and 9a by means of folding lines 37, 38 and 39 or 40, 41 and 42, respectively. At the location of the folding lines 39 and 42, one or more liquid draining holes 30a can be provided.

The box DII according to figure 5 again has the same parts and corners as the box DI according to figure 2, wherein the reference numerals are provided with the addition a. The box DII is further provided with a second pair of hollow side walls 49 and 50, folded from the strips 43, 44 and 45 or 46, 47 and 48, respectively. In this, the box DII is folded and constructed in the same way as the box DI, upon which the connecting strips 43 and 46 are then folded inwards at right angles to the side wall panels 8a and 9a, subsequently the wall strips 44 and 47 are folded inwards and downwards at right angles and finally the fastening strips 45 and 48 are glued onto the bottom 1a.

Through the use of the reinforcing sleeves and additionally of the hollow walls, the boxes DI and DII obtain a very high stacking strength (compression strength) and form stiffness, so that there is no objection to creating high stacks of filled boxes, which are very

stable, wherein the lower boxes are not in danger of being compressed, while the hollow side walls have a relatively high insulating value.

The boxes according to the invention are intended, among other things, for use as fish box, that is to say for packaging and shipping fish, as well as for displaying fish, shellfish and the like on the market, in shops and the like. They can serve to replace the box-shaped plastic foam containers which have up to now been used on a wide scale, which containers are difficult to recycle. The cardboard boxes according to the invention, on the other hand, can be easily recycled.

These boxes can, however, also be used excellently for the above-mentioned purpose in the case of vegetables, fruit and suchlike foodstuffs and other perishable goods.

The boxes can also be provided with a lid (not drawn) of the same material as the box or another material, wherein the skirt of the lid extends across the entire height or a part of the height of the box.

The blank PIII according to figure 6, which shows only one corner portion, comprises a bottom panel 51, two pairs of parallel side wall panels 52 and 53, connected to the bottom panel 51 by bottom folding lines 54 and 55, respectively, an extension flap group with extension flaps 56, 57, 58 and 59, connected to an end edge, transverse to the bottom folding line 54 of the side wall panel 52 by folding line 60, wherein neighbouring extension flaps are connected to each other by folding lines 61, 62 and 63, respectively, connecting strips 64 and 65 which are connected to the side wall panel 53 by a folding line 66 running parallel to the bottom folding line 55, and a wall strip 65 which is connected to the connecting strip 64 by a folding line 67 running parallel to the bottom folding line 55 and a side wall part 68, separated from the side wall panel 52 by recesses 69 and being connected thereto by a folding line 70 running parallel to the bottom folding line 54.

Figure 6 shows that the side wall panels 52 are longer on both ends than the bottom panel 51, wherein the folding line 60 between each side wall panel 52 and each first extension flap 56 is moved outwards relative to the bottom folding line 55 between the bottom panel 51 and the side wall panels 53 of the second pair over a distance which, depending on the type of material used, allows for the simple folding of the extension flaps up to outside the side wall panel 53 of the reinforcing sleeves to be described on the basis of figure 7.

The extension flaps 58 and 59 are each provided on both sides of the folding line 63 with a projecting lip 71, and the blank PIII is further provided near each corner of the bottom panel 51 with a recess 72, on the other end of each folding line with a recess 73 and on both ends of each connecting strip 64 with a recess 74, wherein the function of the lips 71 and the recesses 72-74 will be further elucidated.

The box DIII, of which only one corner portion has been drawn in figure 7, is built up from the blank PIII in the following manner. Both side wall panels 53 are

folded on the folding lines 55 at right angles to the bottom panel 51, of the total of four groups of extension flaps 56, 57 and 58 (of which one has been shown) reinforcing sleeves 75 are folded, which are glued on the extension flaps 59 on the side wall panels 2, the side wall parts 68 are folded and fastened on the first side wall panels 52, the side wall panels 53 are folded on the bottom folding lines 55 at right angles to the bottom 51, the formed reinforcing sleeves 75 being attached with the extension flaps 58 on the outer side of the second side wall panels 53 and the connecting strips 64 being folded at right angles over the top of the reinforcing sleeves 75 and the wall strips 65 being folded over downwards at right angles on the folding lines 67 and fastened onto the extension flaps 56 of the reinforcing sleeves 75.

The reinforcing sleeves 75 can herein be folded in a simple manner until they abut the outer side of the side wall panels 53, because in the blank PIII the first side wall panels 52 have, over a small distance, been made longer on both ends than the bottom panel 51.

As already mentioned above, the function of the reinforcing sleeves 75 is to give the filled boxes sufficient strength and stiffness in a stack to be able to carry the load, without the boxes being deformed to an unacceptable degree and to make the stability of the stack of filled boxes as great as possible. The reinforcing sleeves 75 therein preferably extend across the entire height of the box DIII.

When stacking several boxes DIII, the lips 71 on the upper side of each box engage the recesses 72 and 73 at the bottom side of the box lying on top, so that, in a stack, the boxes can not shift relative to each other in transverse direction and a greater stability of the stack can be obtained.

However, the reinforcing sleeves 75 can also be so long or can be provided in such a way, that the bottom side of the reinforcing sleeves 75 is located at a small distance, for instance ± 5 mm, above the bottom face of the bottom 51 of the box DIII. When stacking filled boxes DIII, the box lying on top can then sink into the box located below it over a small distance. The boxes are hereby excellently centred relative to each other in a stack and a great stability is realized in the stack. In this embodiment of the reinforcing sleeves 75, the lips and possibly also the recesses 72 and 73 can be omitted.

At the location of the folded side wall part 68 a gripping opening is created between the boxes in a stack, which serves to allow for easy lifting of the boxes from a stack. Such openings further constitute ventilation holes for the products in the boxes.

The blank PIV according to figure 8, of which also only one corner portion has been drawn, comprises a bottom panel 76, two pairs of parallel side walls panels 77 and 78 which are connected to the bottom panel 76 by bottom folding lines 79 and 80, respectively, a total of four extension flap groups (of which one is shown) with extension flaps 81, 82, 83 and 83 which are connected on both ends to the first pair of side wall panels 77 and

to each other by folding lines 85, 86, 87 and 88, respectively, and connecting strips 89, wall strips 90 and fastening strips 91 which are connected to the second pair of side wall panels 98 and to each other by folding lines 92, 93 and 94, respectively.

In the blank PIV, too, the side wall panels 77 of the first pair have been made longer on both ends than the bottom panel 76, namely over a distance which facilitates the folding of reinforcing sleeves outside the side wall panels.

At the location of the folding line 85 a projecting lip 95 has been provided on the outer end thereof, into which the folding line 85 extends and which is attached to both the side wall panel 77 and to the first extension flap. A recess 96 is provided on the inner end of the folding line 85, the shape of which recess is substantially complementary to that of the lip 95. Furthermore, a recess 97 is provided on both ends of the connecting strips 89 and a recess 98 is provided on both ends of the folding line 94. In the folding lines 94 one or more holes 99 may have been formed at some distance from the recesses 98 and from each other.

The box DIV according to figure 9, of which also only one corner portion has been drawn, is constructed from the blank PIV in the following manner. Both side wall panels 77 of the first pair are folded on the bottom folding lines 79 at right angles to the bottom panel 76, reinforcing sleeves 100 are folded from the extension flaps 81-83, while the extension flap 84 is fastened onto the side wall panel 77, as a result of which the reinforcing sleeves 100 are fixed, the side wall panels 78 of the second pair are folded on the bottom folding lines 80 at right angles to the bottom 76, the reinforcing sleeves 100 with the extension flaps 83 being fastened on the outer side of the side walls 78 of the second pair, the reinforcing sleeves 100 coming to lie on the outer sides of the side wall panels 78 of the second pair, because the first side wall panels 77 have been made longer by a distance on both ends than the bottom panel 76, the connecting strips 89 are folded at right angles over the upper side of the reinforcing sleeves 100, the wall strips 90 are folded downwards at right angles on the folding lines 93 and the fastening strips 91 are folded over inwards at right angles on the folding lines 94 and fastened onto the bottom 76. The holes 99 which hereby occur in the fold 94 serve to drain away fluid, for instance melt water of products packaged with ice, such as fish.

When stacking several boxes DIV, the lips 95 of a box located below engage the bottom recesses 96 and 98 of a box lying on top. As a consequence, the boxes can not shift relative to each other in transverse direction and a great stability of the stack is obtained.

The function of the reinforcing sleeves 100 is the same as that of the reinforcing sleeves 75 of the box DIII and the reinforcing sleeves 100 preferably extend across the entire height of the box DIV.

If necessary, the reinforcing sleeves are filled, for instance with corrugated board, for instance several lay-

ers of corrugated or solid board glued together in order to obtain an increased strength of the stack, or polystyrene foam and the like.

Furthermore, it is possible to execute the reinforcing sleeves, which are folded from the blank material, in the shape of a triangle, another polygonal prism or another figure which surrounds a cavity.

Figure 10 shows that the side wall panels 78 of the second pair are fastened to the inner flaps 83 of the reinforcing sleeves 100 with a layer of adhesive 101, preferably glue. The wall strips 90 of the side wall panels 78 are attached with glue or another adhesive on the outer flaps 81 of the reinforcing sleeves 100. The extension flaps 84 are preferably also attached with glue onto side wall panels 77.

According to the invention, one or more wall stiffening members 103 have been placed in each space 102, limited by a side wall panel 78 of the second pair, by two reinforcing sleeves 100 on both ends and by connecting strip and wall strip 90. This member 103 preferably consists of a cardboard strip folded into a U-shape, said cardboard strip being provided on the free edges of the legs of the U with outwardly projecting fastening flaps 104, the base 105 of the U being fastened on the wall strip 90 and the fastening flaps 104 being fastened on the side wall panel 78 of the second pair, preferably with glue 101. The wall stiffening member 103 can of course also be fastened with the base 105 on the side wall panel 78 and with the fastening flaps 105 on the wall strip 90. The wall stiffening members can for instance also consist of layers of corrugated board laid on top of each other and preferably extend across the entire height of the box. In the embodiment of the box DIV drawn in figure 10, the reinforcing sleeves 100 and the wall stiffening members 103 have been filled up, for instance with layers of corrugated board or other filling material 106 glued on top of each other.

One or more of such wall stiffening members (not shown) can of course also be arranged in both side walls of the second pair of the box DIII according to figure 7, namely in the spaces 65a, which are limited by the side wall panels 53, the connecting strip 64 and the wall strip 65 and the reinforcing sleeve 75.

The purpose of the wall stiffening members 103 is to achieve that, on a box which is provided with one wall stiffening member 103 in the longitudinal centre of each panel 78, 89 and 90, two smaller boxes can be put next to each other, each having the same length as the width of the box located below it but having a width which is only half the length of the box located below it. When two wall stiffening members have been arranged in each panel 78, 89, 90, as a consequence of which the length of that second side wall is divided into three equal parts, three smaller boxes can be laid on top of the box located below it, the width of the three smaller boxes amounting to one third of the length of that box located below it, etc.

The wall stiffening members 103 further allow for the boxes to be stacked "bonded", so that they overlap each other in the various layers. This especially gives

stiffness to a stack on for instance a pallet, which is to be transported by means of for instance a fork-lift.

The placing or positioning of the four extension flap groups constituting the reinforcing sleeves can be effected in many ways. In figure 11 a number of the possible placings have been shown. Figure 11 does not show a blank according to the invention, but merely serves to show these placing possibilities. The "dummy" blank of figure 11 has a bottom panel 200, bottom folding lines 201, 202, 203 and 204, side wall panels 205, 206, 207 and 208, folding line 209, connecting strip 210, folding line 211, wall strip 212, folding line 213, fastening strip 214 and extension flap groups E, F, G, H, I and J. Although the positionings of the extension flap groups are self-explanatory on the basis of figure 11, the various possibilities will be briefly discussed below.

The extension flap group E is fastened to the short side wall panel 206, on a side thereof which runs parallel to the bottom folding line 203. The group E comprises six flaps, one of which, E₂, is fastened to the side wall panel 206 via a folding line. Furthermore, the flaps E₆ and E₁; E₁ and E₂; E₂ and E₃; E₃ and E₄; and E₄ and E₅ are connected to each other by a folding line concerned. When folding these flaps E₁ up to and including E₆ on the folding lines concerned, a reinforcing sleeve of the type as shown schematically in figure 12 can be obtained, wherein for instance the flap E₂ is glued to the side wall panel 206 and the flap E₅ is glued to E₆. The flaps E₃ and E₄ are wider than the other flaps, so that inside the reinforcing sleeve the folding line which connects them abuts flap E₁ (as an equivalent flap E₁ can be narrower).

Analogously, an extension flap group G can be fastened to the long side wall panel 207, on a side thereof which runs parallel to the bottom folding line 202.

In the case of a short side wall panel 208 extending beyond the bottom folding lines 201 and 202, in order to be able to fold a reinforcing sleeve outside the side wall panel 205 in a simple manner, the extension flap group H can also be fastened to the side of the panel 208 running parallel to the bottom folding line 204.

The extension flap groups G and H can supply rectangular reinforcing sleeves, wherein the group H has flaps H₅ and H₆ which seal the sleeve at the top. This seal is useful when the sleeve is filled with for instance polystyrene foam, upon which flaps H₅ and H₆ are immediately bent over and flap H₆ is glued together with flap H₄.

When the wall of a box should be double-walled, a wall strip 212 is used apart from the side wall panel 205. The extension flap group for the reinforcing sleeve could now be fastened to the end edge, transverse to the bottom folding line 201, of the side wall panel 205 (flap group J) or to the end edge of the wall strip 212 (flap group I).

When all extension flap groups have been fastened to the end edges of their side wall panel or wall strip concerned, a minimum amount of material, especially

cardboard, is used for a blank according to the invention.

Finally, figure 13 shows one corner of a blank according to the invention (the other corners are analogous), which can be used to manufacture a box with four double-walled side walls. In this example, the extension flap groups are fastened to the end edge of a side wall panel.

Claims

1. Box provided with a bottom panel and with a first and a second pair of vertical parallel side walls, each side wall comprising a side wall panel, each side wall panel of a pair forming a corner of the box with a side wall panel of the other pair and each side wall panel of each pair being connected to the bottom panel by one bottom folding line, a reinforcing sleeve being arranged at least near each corner of the box, which reinforcing sleeve is substantially perpendicular to the plane of the bottom and encloses a cavity. 15
2. Box according to claim 1, wherein each reinforcing sleeve is located on the outer side of a side wall panel concerned, and contacts only that side wall panel. 25
3. Box according to claim 1 or 2, wherein at least one pair of side walls is designed to have double walls, in that each side wall of the at least one pair comprises, apart from a side wall panel, a connecting strip connected to the side wall panel via a folding line running parallel to the bottom folding line concerned and a wall strip connected to the connecting strip via a folding line running parallel to the bottom folding line concerned. 30
4. Box according to claim 3, wherein each reinforcing sleeve is located between the side wall panel concerned and the associated wall strip. 35
5. Box according to claim 4, wherein in the space limited by a side wall panel, the associated connecting and wall strip and two reinforcing sleeves, one or more wall stiffening members have been arranged. 40
6. Box according to claim 5, **characterized in that** a wall stiffening member consists of a cardboard strip folded into a U-shape, said cardboard strip being provided on the free edges of the legs of the U with outwardly projecting fastening flaps, the base of the U and the fastening flaps being fastened on a wall strip and on the side wall of the second pair, respectively, or vice versa. 45
7. Box according to claim 5, **characterized in that** a wall stiffening member consists of layers of corrugated board laid on top of each other. 50
8. Box according to claim 5, 6 or 7, **characterized in that** the wall stiffening members extend across substantially the entire height of the box. 55
9. Box according to any one of the preceding claims, each reinforcing sleeve being filled.
10. Box according to any one of the preceding claims, each reinforcing sleeve extending across substantially the entire height of the box.
11. Box according to any one of the preceding claims, each reinforcing sleeve comprising several layers of corrugated board secured on top of each other.
12. Blank for the manufacture of a box, the blank being provided with a bottom panel with a number of corners, with a first pair and a second pair of parallel side wall panels, each side wall panel being connected to the bottom panel by one bottom folding line and having end edges transverse to the bottom folding line, with a number, equal to the number of corners, of extension flap groups, each extension flap group being connected near an associated corner to a side wall panel concerned by one folding line, neighbouring extension flaps in each group being mutually connected by folding lines, the extension flaps with folding lines of each group being arranged and designed in such a way that after folding on the folding lines, each extension flap group forms a reinforcing sleeve which encloses a cavity, at least near the associated corner.
13. Blank according to claim 12, wherein to each side wall panel of at least one pair of side wall panels a connecting strip is connected via a folding line running parallel to the bottom folding line concerned, and to each connecting strip a wall strip is connected via a folding line running parallel to the bottom folding line concerned, each wall strip having end edges transverse to the folding line.
14. Blank according to claim 12 or 13, at least one extension flap group being connected to an end edge concerned of a side wall panel or wall strip.
15. Blank according to claim 14, the side wall panel or the wall strip, to an end edge of which an extension flap group is connected, being extended beyond the bottom folding lines of the adjacent side wall panels.

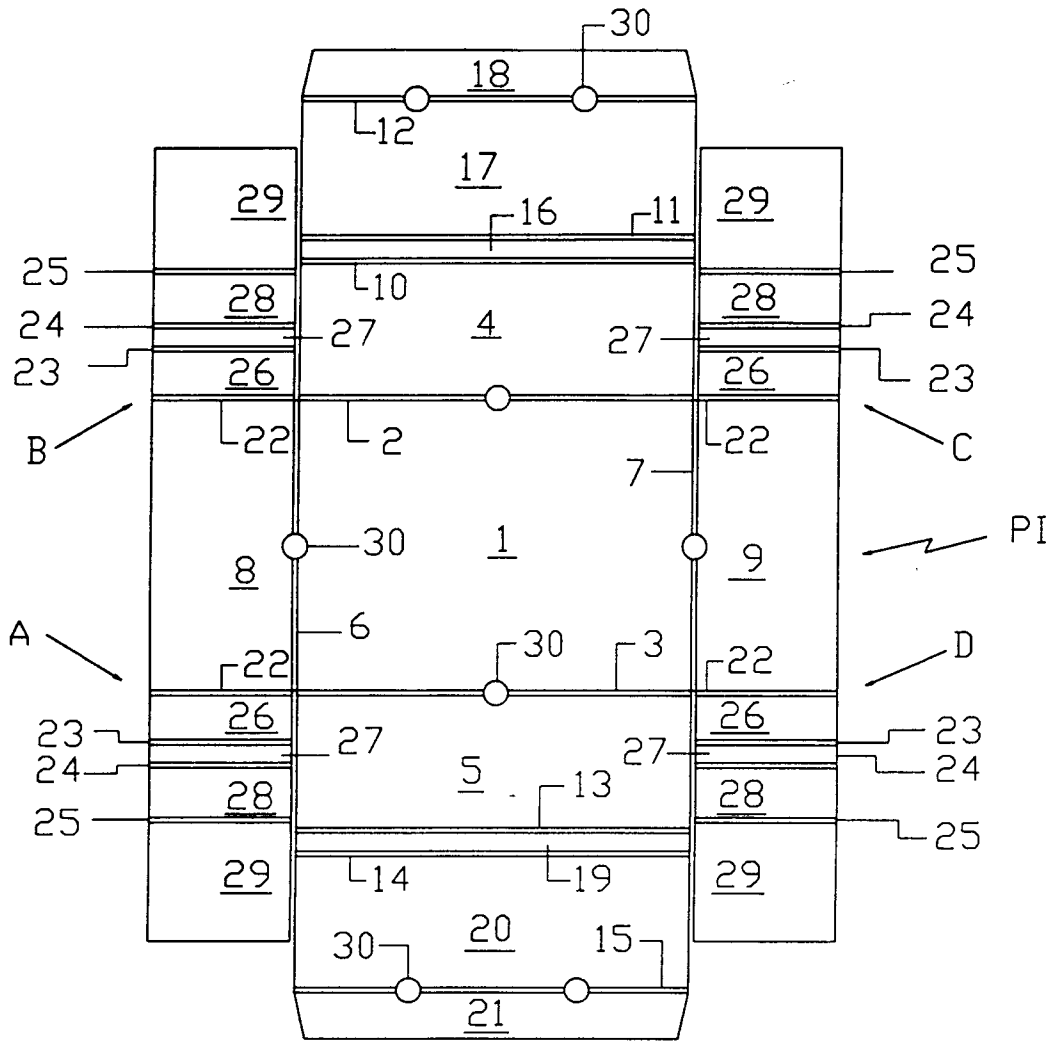


FIG. 1

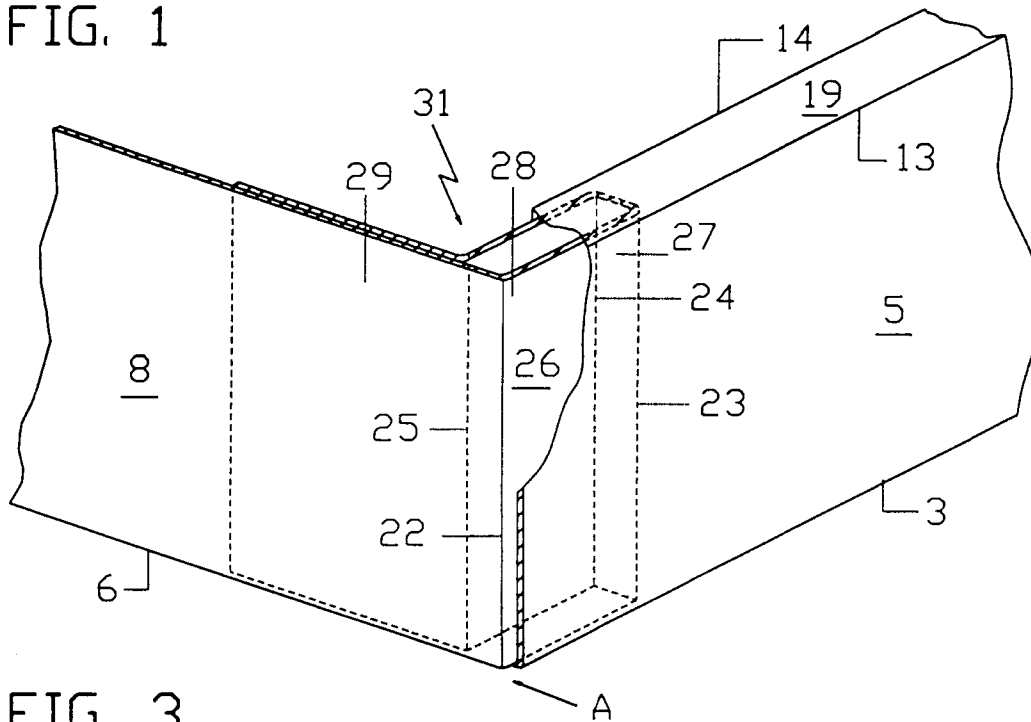


FIG. 3

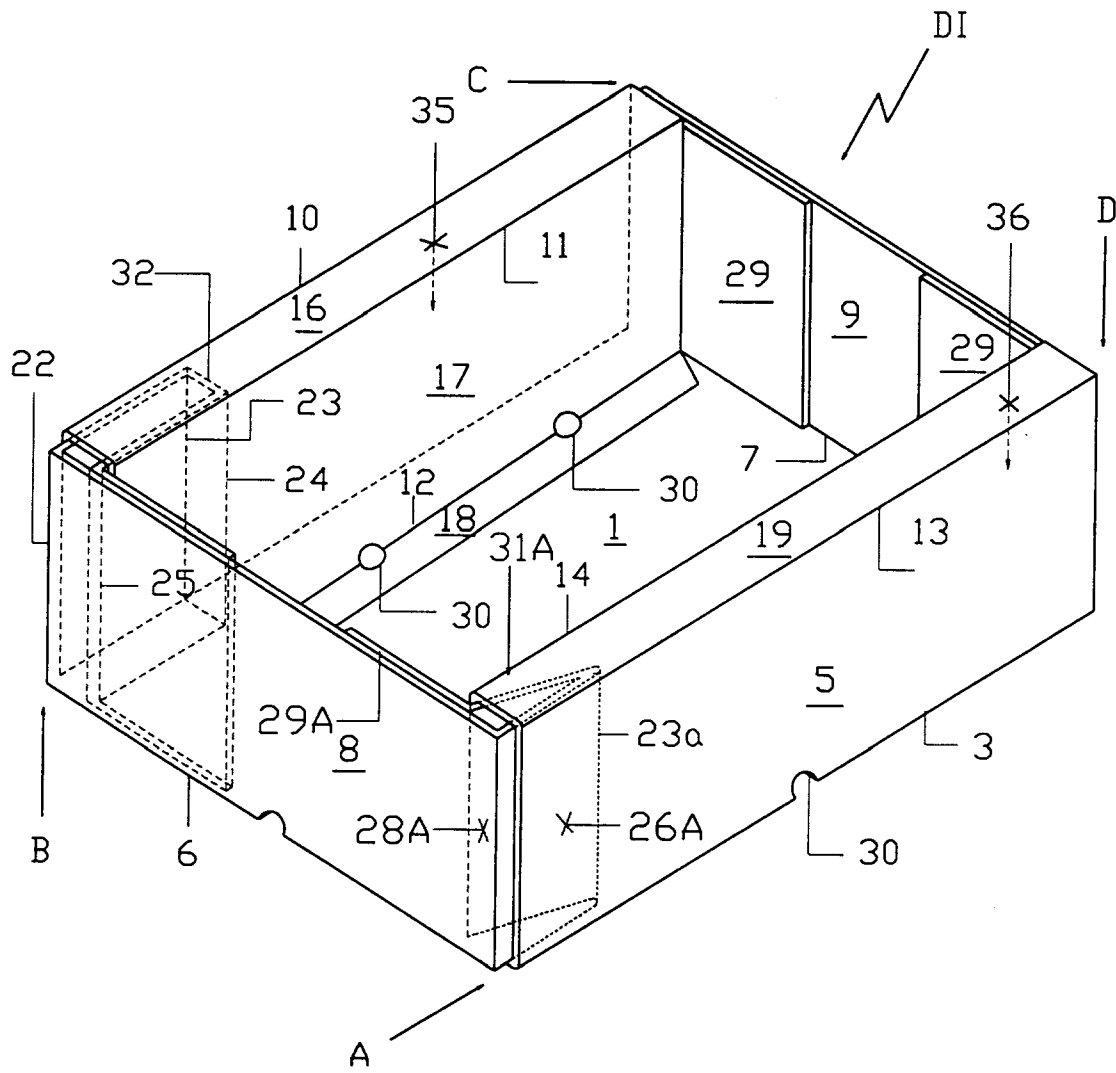


FIG. 2

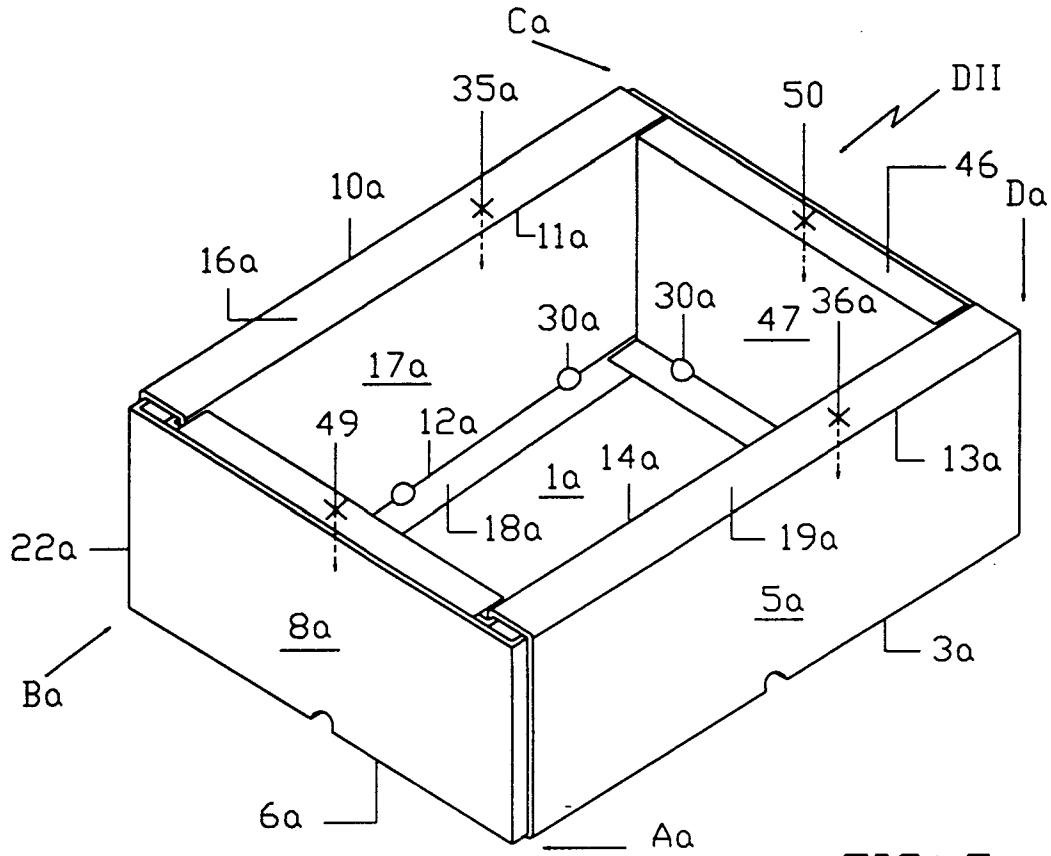


FIG. 5

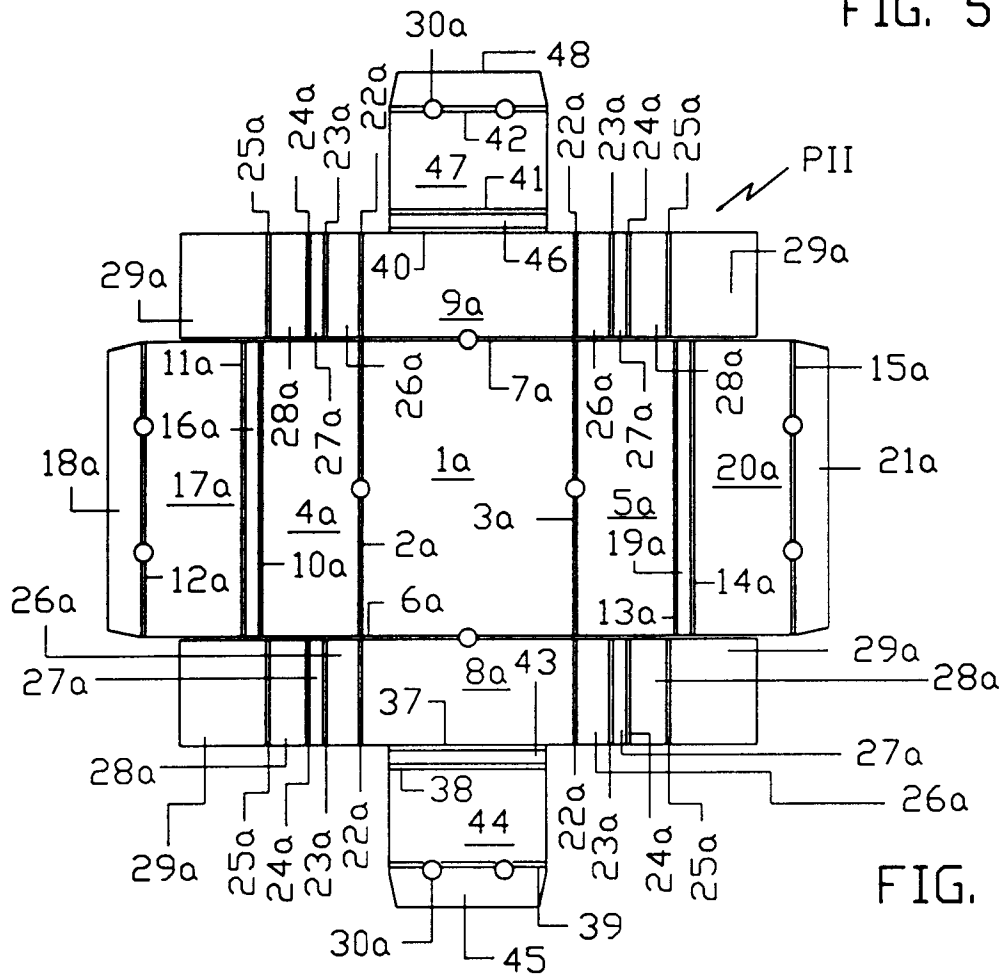


FIG. 4

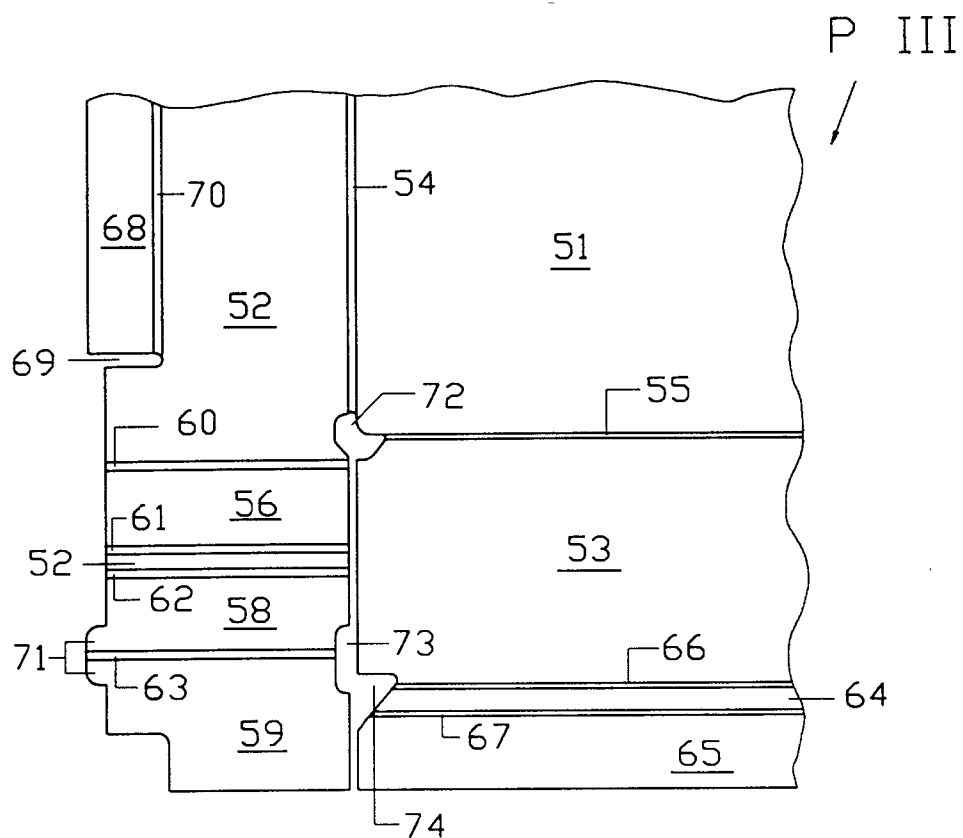


FIG. 6

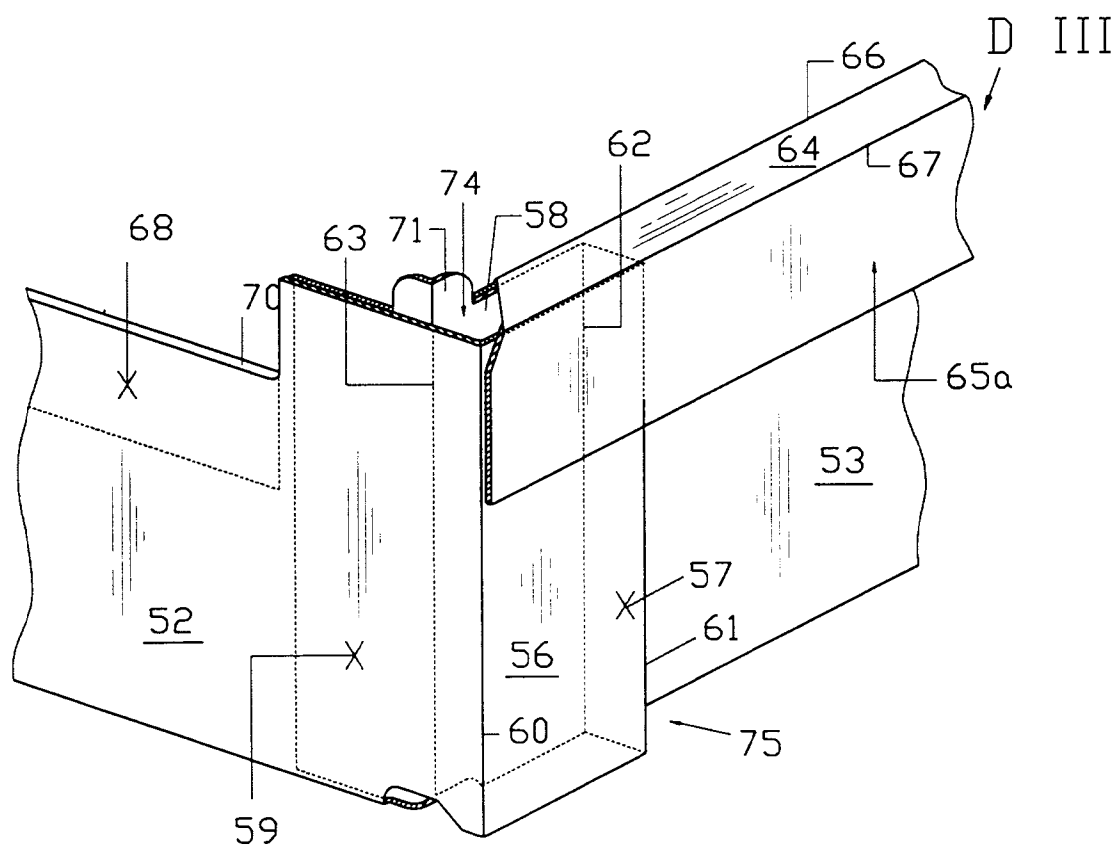


FIG. 7

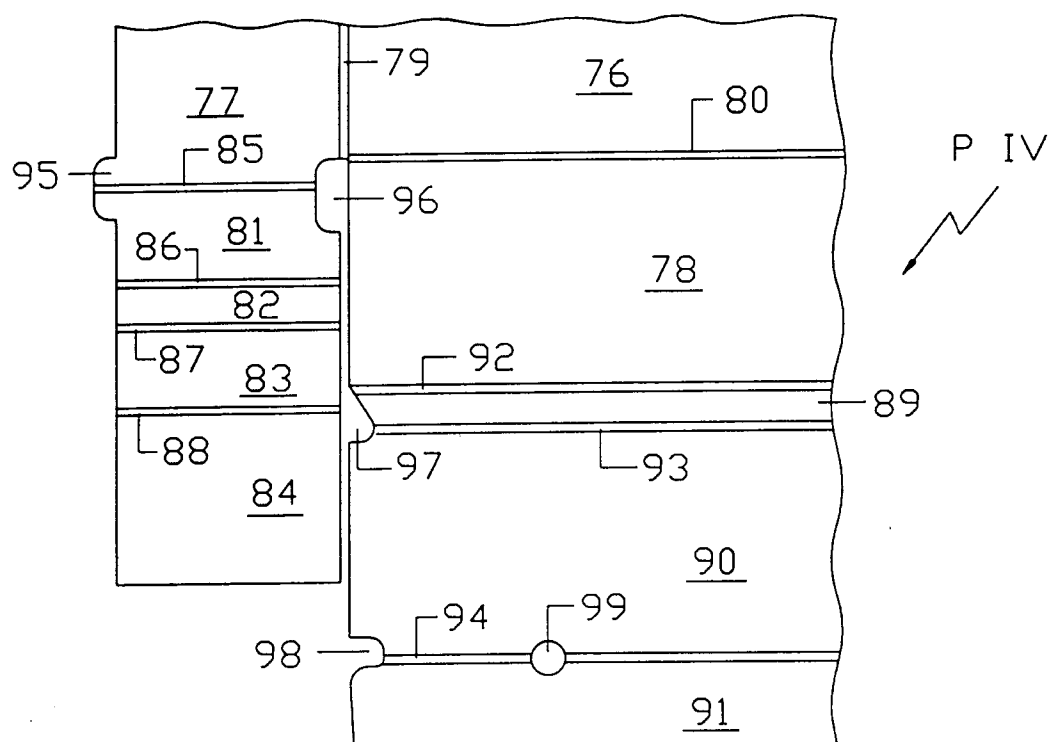


FIG. 8

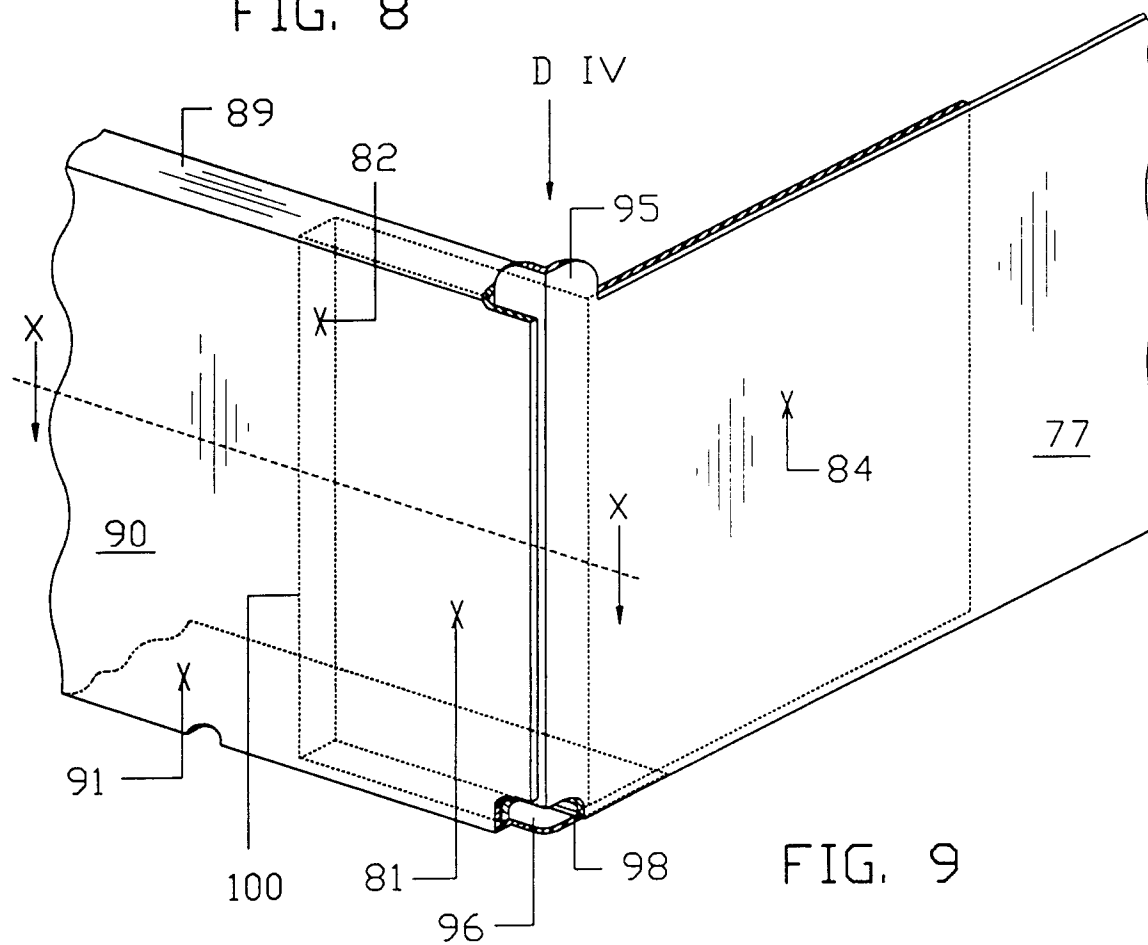


FIG. 9

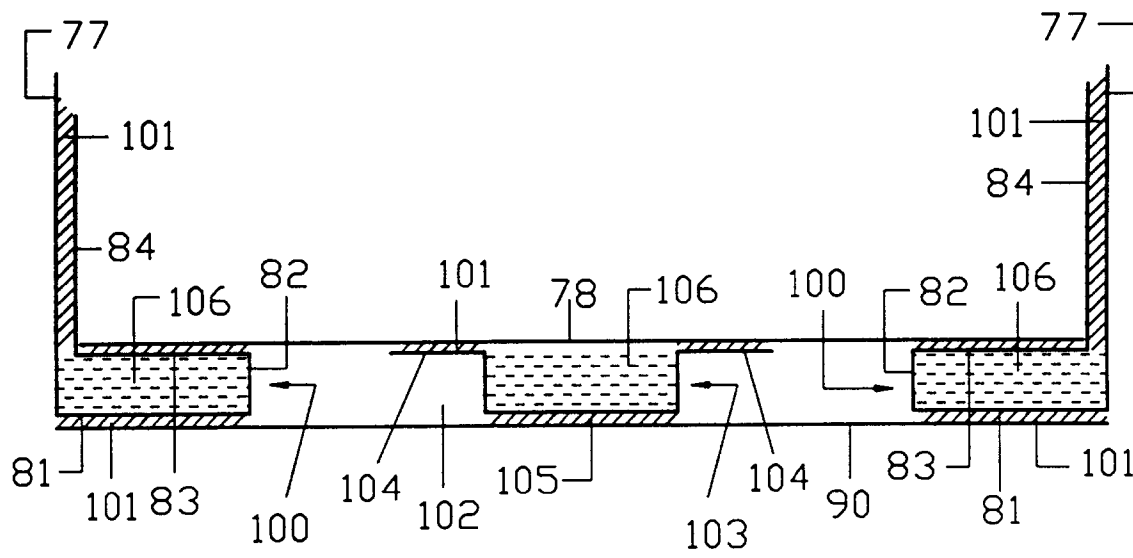


FIG. 10

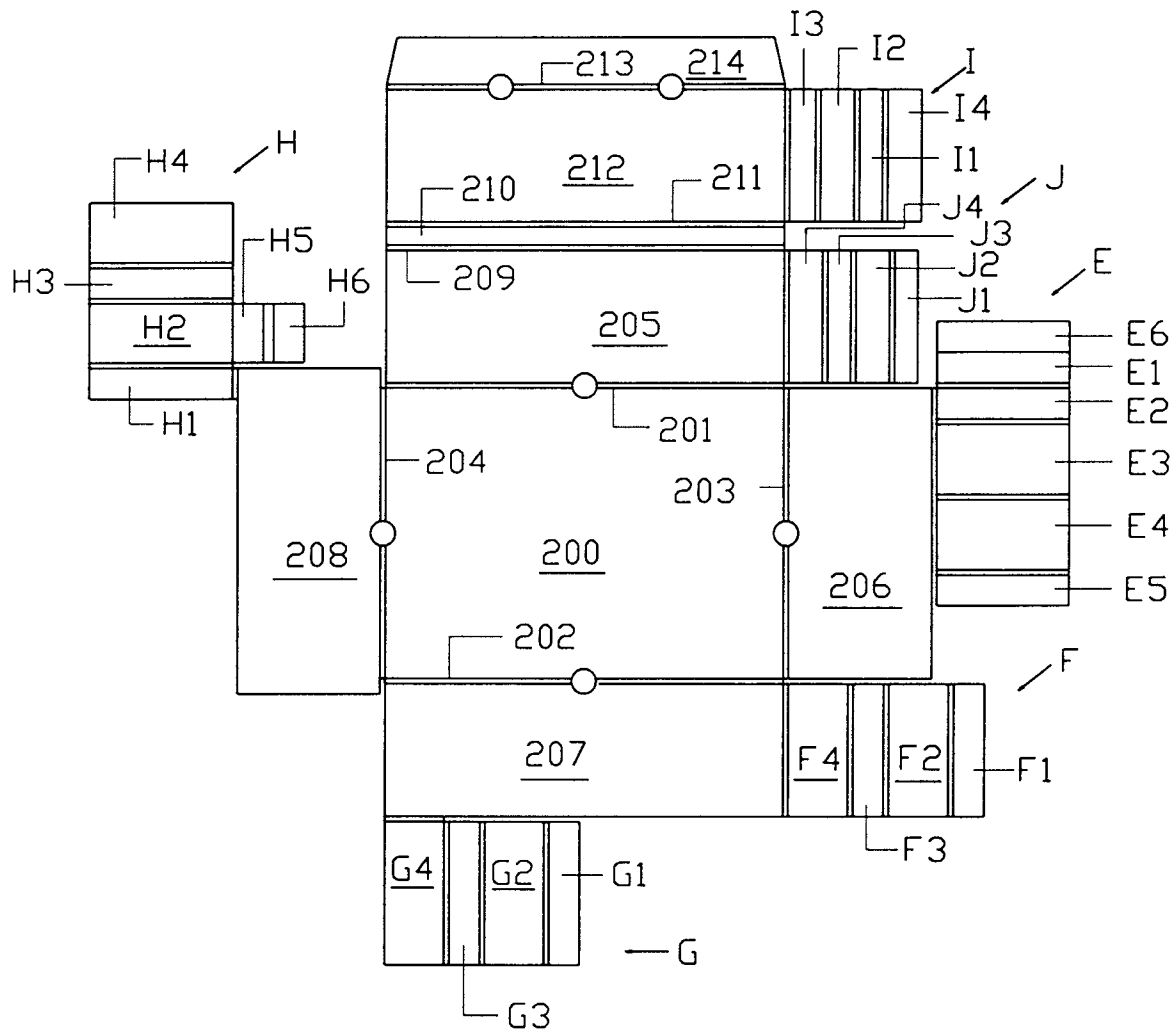


FIG. 11

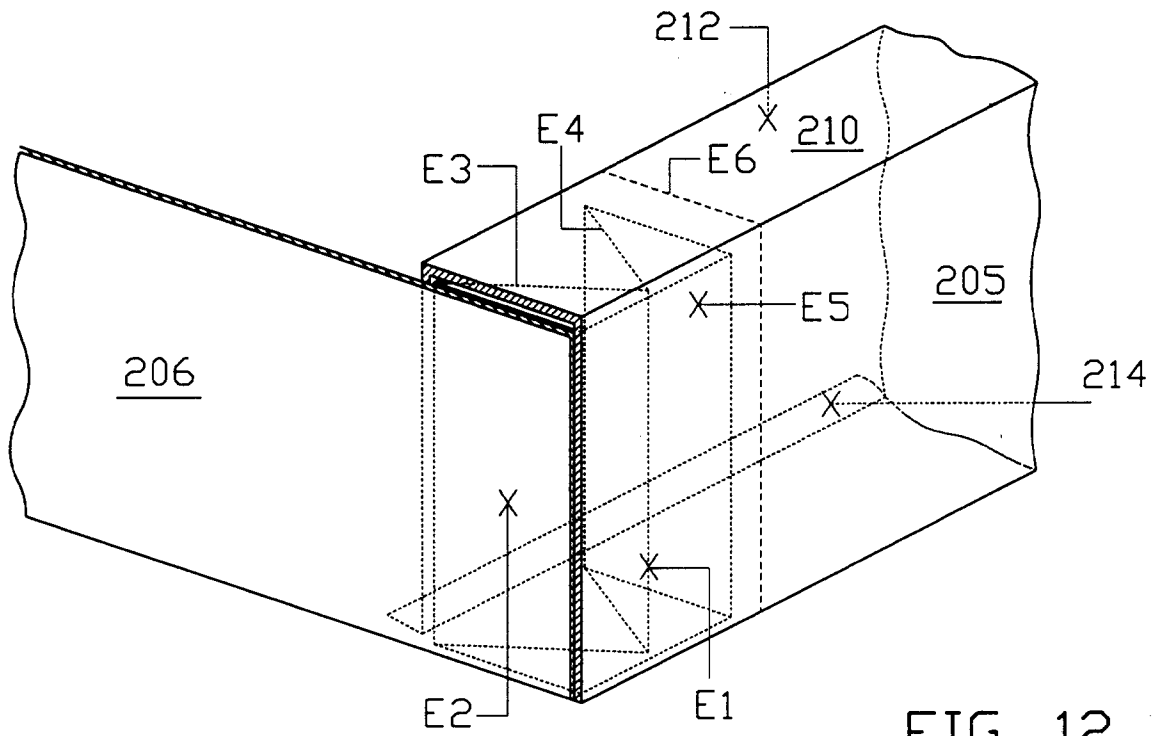


FIG. 12

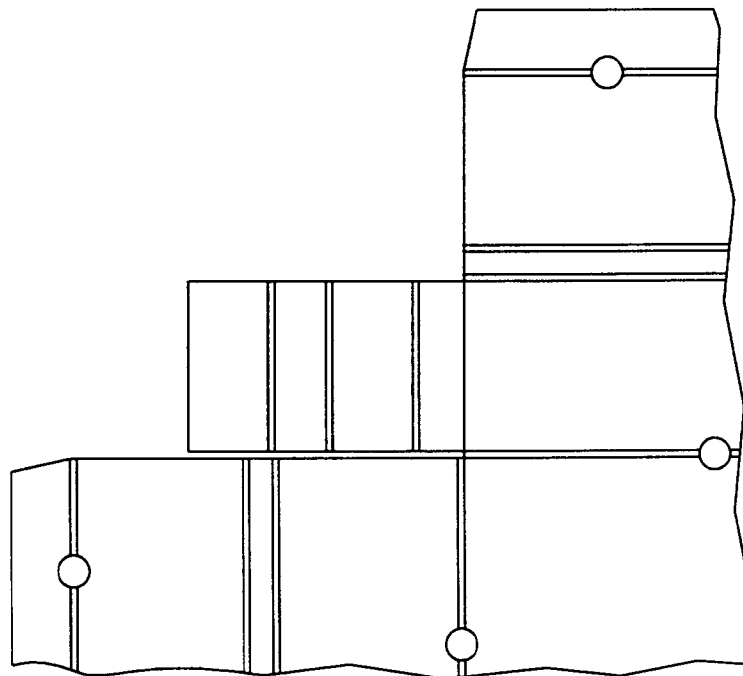


FIG. 13



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 20 0519

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	FR-A-1 423 121 (LOMBARD) * page 1, right-hand column, line 18 - line 29; figures 1,2 * ---	1-4,10, 12-14	B65D5/20 B65D5/00 B65D5/44
X	EP-A-0 579 479 (KELSO) * the whole document * ---	1-3,10, 12-15	
X	EP-A-0 076 883 (H. KILIAN LTD)	1,2,9, 10,12	
Y	* figures 1-5,10,12 * ---	5	
Y	FR-A-1 574 602 (JORBA GABARRO JOSÉ)	5	
A	* page 1, line 37 - page 2, line 13 * -----	6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		6 June 1996	Martin, A
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