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(12) # EUROPEAN PATENT APPLICATION

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(54) **Blank for constructing a box and box constructed therefrom.**

(57) The invention relates to a plate (1) which can be converted by the user easily and quickly into a solid box. The plate (1) comprises a bottom surface (2) and two pairs of lateral surfaces (3, 4). A connecting flap (6) is connected to each end of the first pair of lateral surfaces (3) through a second fold line (7), to which connecting flap (6) an attachment flap (9) is connected through a third fold line (8). In a plane position wherein the first pair of lateral surfaces (3) are folded against the bottom surface (2), the attachment flaps (9) are attached against the second pair of lateral surfaces (4). Said second (7) and third fold lines (8) are provided in such a manner that when the user brings the lateral surfaces towards the upright position, the connecting flaps (6) are folded against the attachment flaps (9). In the plate (1) side flaps are moreover provided to the second pair of lateral surfaces (4), which side flaps are folded in the upright position over the attachment flaps (6) and prevent in this way the box from folding open.

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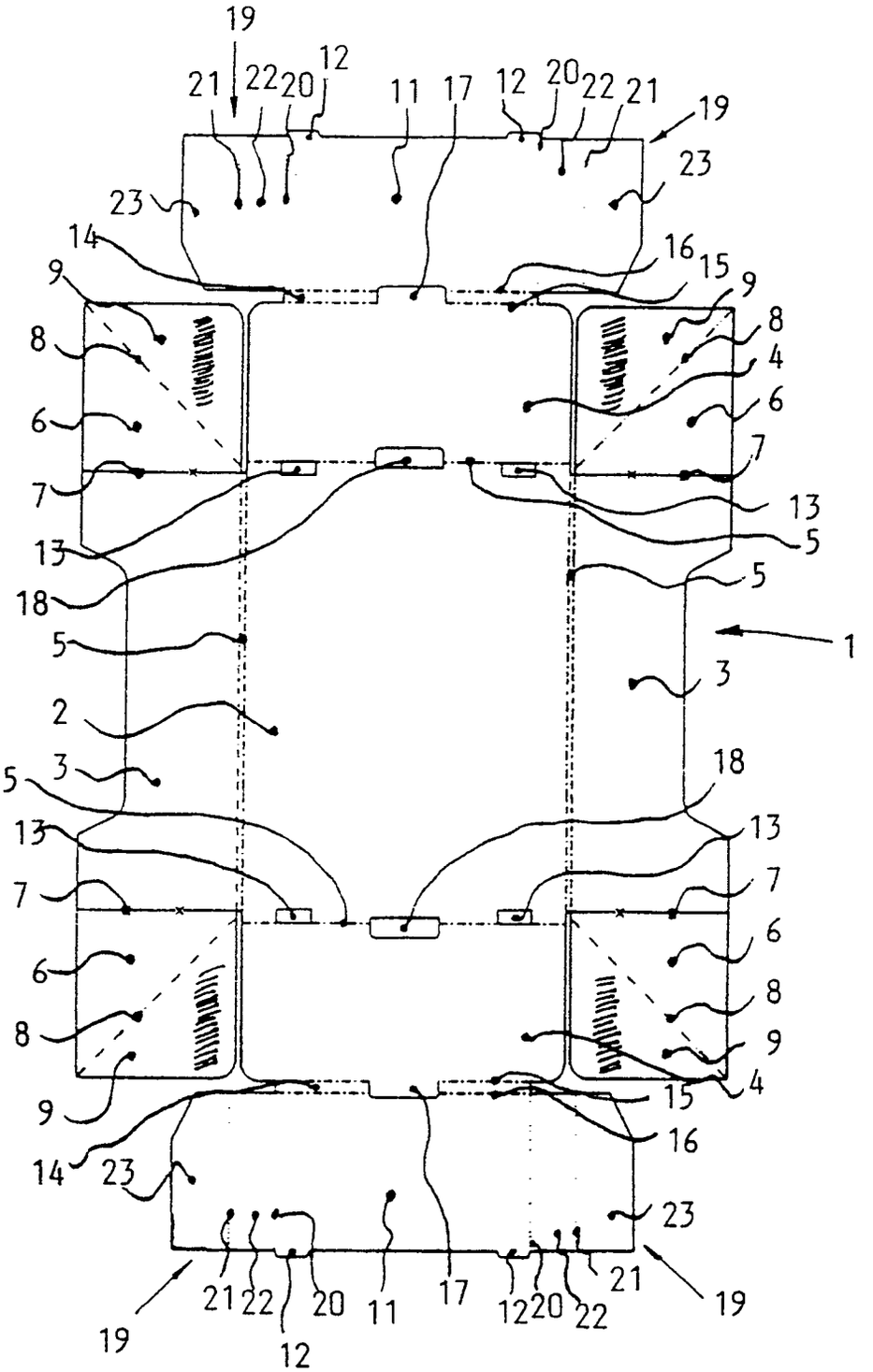
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Fig. 1.

A PLATE FOR CONSTRUCTING A BOX AND BOX CONSTRUCTED THEREFROM

This invention relates to a plate for constructing a box, which plate comprises a bottom surface, and a first and a second pair of opposite lateral surfaces which are each connected through a first fold line to said bottom surface and which are each provided for being folded along these first fold lines into an upright position, in addition to which a connecting flap is connected to both ends of each lateral surface of the first pair through a second fold line, which connecting flap is provided for being attached in the upright position against an adjacent lateral surface of the second pair.

Such plates for constructing boxes are generally known.

An object of the invention is to provide a plate from which a relatively solid box can be constructed easily and quickly without requiring therefore special apparatus. Preferably, the box can be realised manually, even without any tools.

Indeed, a drawback of boxes which require special apparatus for their construction is that they have to be assembled into their final shape already during the manufacture en require therefore during the transport to the user as much space as filled boxes.

In order to allow the user himself to convert the plate quickly into a box, an attachment flap is connected in the plate according to the invention through a third fold line to each of said connecting flaps, which attachment flap is provided for being attached to the adjacent lateral surface of the second pair in a plane position wherein said first pair of lateral surfaces are folded against the bottom surface, said second and third fold lines being applied in such a manner that when bringing said lateral surfaces into the upright position, each of the connecting flaps is folded along the respective third fold line against the corresponding attachment flap, and in that both lateral surfaces of the second pair are provided with at least one side flap which is provided for being folded over the adjacent connecting flap towards the bottom surface so as to attach this connecting flap against the adjacent lateral surface.

From such a plate according to the invention, a box can be constructed in a simple and quick way without requiring any special apparatus. In the first place, the attachment flaps are attached against the adjacent lateral surfaces, for example by gluing or by stapling in said plane position wherein the first pair of lateral surfaces are folded against the bottom surface. This attachment is preferably already realised during the manufacture of the plates which are thus delivered to the user. In order to make a box, the user has only to fold the lateral surfaces into their upright position and to fold the side flaps over the connecting flaps towards the bottom surface. Therefore, it is not necessary any more to fix any component by gluing or stapling. A solid box is directly obtained. A further advantage of the plate according to the invention is that beside this plate no further elements are required to construct the box.

In a special embodiment of the plate according to the invention, said side flaps and said bottom surface comprise a first and respectively a second attachment member which are both provided for cooperating with each other.

In a preferred embodiment of the plate according to the invention, said side flaps are provided, near the ends of the second pair of lateral surfaces, with a corner piece which is connected through a sixth fold line to the respective side flap and which is provided for defining in said upright position an oblique corner between the adjacent lateral surface of the first pair and the adjacent lateral surface of the second pair.

By folding the side flaps back towards the bottom surface oblique reinforcement corners are moreover formed in this way in the corners of the box which provide an additional solidity and which allow to stack up the boxes higher.

In a further preferred embodiment of the plate according to the invention, said first pair of lateral surfaces are folded against the bottom surface and the attachment flaps are attached against the adjacent lateral surface of the second pair of lateral surfaces. In this case, the box can be realised easily and quickly simply by folding. When the first pair of lateral surfaces are set up, the second pair of lateral surfaces is automatically brought also to the upright position.

The invention relates also to a box constructed from a plate according to the invention, which box is characterised in that said lateral surfaces are folded into the upright position and said connecting flaps are folded against said attachment flaps and are kept against these attachment flaps by means of the side flaps folded towards the bottom surface.

Further particularities and advantages of the plate and the box according to the invention will become apparent from the following description of a plate provided for constructing a box and of a box constructed therefrom according to the invention. This description is only given by way of non limiting example. The reference numerals relate to the annexed drawings.

Figure 1 is a top plan view of a special embodiment of a precut plate provided with fold lines for constructing a box according to the invention ;

Figure 2 is a perspective view of the plate according to figure 1 wherein a first pair of lateral surfaces are folded against the bottom surface and are glued with their attachment flaps against the adjacent lateral surfaces ;

Figures 3 and 4 show two phases during the set-

ting-up of a box from a plate according to figure 2 ;

Figure 5 is a perspective view of the box constructed from the plate according to figure 1 or 2 ; and

Figure 6 is a top plan view of the box constructed from the plate according to figure 1 or 2.

In the different figures, the same reference numerals relate to the same or analogous elements.

Figure 1 shows a top plan view of a plate 1 for constructing a box according to a special embodiment of the invention. This plate 1 consists of cardboard, preferably corrugated cardboard, or of another appropriate material which provides a sufficient rigidity. The plate has such a shape and is provided in such a manner with fold lines or creases that it can be folded easily and quickly without special apparatus into a box as represented in figure 5.

The plate 1 according to the invention comprises a bottom surface 2 to which a first 3 and a second pair of lateral surfaces 4 are connected each through a first fold line 5 in such a manner that these lateral surfaces can be folded into an upright position as in the final box. In order to prevent the lateral surfaces of the box from folding back open, each lateral surface 3 of the first pair is provided with a connecting flap 6 which has to be attached against the adjacent lateral surface 4. Each connecting flap 6 is connected to the corresponding lateral surface 3 through a fold line 7.

In a box according to the invention, it is not necessary to fix the connecting flaps 6 in the upright position by gluing or stapling against the adjacent lateral surface 4. Indeed, in the plate 1 according to the invention, an attachment flap 9 is connected to each of said connecting flaps 6 through a third fold line 8. As represented in figure 2, these attachment flaps 9 are attached against the adjacent lateral surface 4 in a plane position of the plate 1 wherein said first pair of lateral surfaces 3 are folded against the bottom surface 2. This is realised preferably during the manufacture of the plate 1, by stapling, gluing or in another appropriate way, even before the plates 1 are delivered to the user.

Said second 7 and third fold line 8 are applied in such a manner that when bringing the lateral surfaces 3 and 4 into the upright position (see figure 3) each of the connecting flaps 6 are folded along the respective third fold line 8 against the corresponding attachment flap 9. In the sepecial embodiment according to figure 1, having a rectangular bottom surface 2, said second fold lines 7 are directed according to the first fold lines 5 of the adjacent lateral surfaces 4 whereas said third fold lines 8 form an angle of about 45° with these first fold lines 5. The connecting flaps 6 have the shape of a right-angled triangle, the oblique side of which is formed by the third fold line 8. In this case, a box with perpendicular lateral walls is obtained. However, it will be clear that a possibly oblique arrangement of the walls require an adaptation of the direction of said second and third fold lines.

In the embodiment according to figure 1, the attachment flaps 9 are, with respect to the third fold lines 8 the mirror image of the connecting flaps 6. This is obtained by applying a cut 10 between the attachment flaps 9 and the adjacent lateral surface 4 which is especially advantagous when use is made of a relatively thick plate 1. Further, a part of the attachment flap 9 can possibly be cut away. For thin plates 1, the cut 10 could further be replaced by a fold line.

In order to attach the connecting flaps 6, in the position as represented in figure 3, against the adjacent lateral surfaces 4 without additional means such as glue, staples and the like, the lateral surfaces 4 of the second pair are provided with at least one side flap 11 which can be folded over the adjacent connecting flap 6 towards the bottom surface 2. Preferably, the side flaps 11 and the bottom surface 2 are provided with attachment members 4 maintaining the side flaps 11 in the folded position. To this end, the side flaps 11 are provided in the embodiment according to figure 1 with two projecting lips 12 which snap in a corresponding slot 13 in the bottom surface 2 when folding these side flaps 11 back.

In order to allow the side flaps 11 to be folded over the connecting flaps 6 and the attachment flaps 9, an edge surface 14 is provided between a side flap 11 and the lateral surface 4. The edge surface 14 is delimited by means of a fourth fold line 15 from the lateral surface 4 and by means of a fifth fold line 16 from the side flap 11. Both fold lines 14 and 15 are substantially parallel and the mutual distance is substantially equal to twice the thickness of the plate 1.

In the edge surface 14 an anchor lip 17 is preferably cut out, which anchor lip projects above the edge surface 14 after folding the side flap 11 back. In the bottom surface 2 and partly in the lateral surface 4 a corresponding cut out 18 is than provided which prevents a lateral displacement of one box with respect to one other when stacking them up.

In a preferred embodiment of the invention, the side flaps 11 are provided near the ends of the second pair of lateral surfaces 4, in other words in the corners of the box, with a corner piece 19 which is connected to the respective side flap 11 through a sixth fold line 20. This corner piece 19 is provided to form in said upright position an oblique reinforcement corner between the adjacent lateral surface 3 of the first pair and the adjacent lateral surface 4 of the second pair.

The corner pieces 19 are preferably divided up into two parts by means of a seventh fold line 21 which is parallel to said sixth fold line 20. In the box, the first part 22 situated between both fold lines 20 and 21 forms, as represented in figure 6, the oblique reinforcement corner whereas the second part 23 rests against the adjacent lateral surface 3.

The hereabove described plate 1 can easily and quickly be folded into a box by the user which is clearly

illustrated in figures 2 to 4. Starting from the plane position as represented in figure 2 and wherein the attachment flaps 9 are already glued or stapled to the lateral surfaces 4, no further apparatus is required herefor. Moreover, no additional reinforcement elements are required but the necessary rigidity is provided with a minimum of material by the plate itself and this due to the special structure according to the invention.

Since the user himself can fold the plates 1 into boxes, these boxes can be transported as plates which require clearly considerably less transport place than the stacked boxes themselves.

It will be clear that the invention is in no way limited to the hereabove described embodiment but that many modifications can be brought thereon without leaving the scope of this invention.

In this way, additional openings or cut outs which are for example provided as handle can be applied in the different surfaces.

The edge of the box can also be cut out in different ways.

Claims

1. A plate for constructing a box, which plate (1) comprises a bottom surface (2), and a first and a second pair of opposite lateral surfaces (3, 4) which are each connected through a first fold line (5) to said bottom surface (2) and which are each provided for being folded along these first fold lines (5) into an upright position, in addition to which a connecting flap (6) is connected to both ends of each lateral surface (3) of the first pair through a second fold line (7), which connecting flap (6) is provided for being attached in the upright position against an adjacent lateral surface (4) of the second pair, characterized in that an attachment flap (9) is connected through a third fold line (8) to each of said connecting flaps (6), which attachment flap (9) is provided for being attached to the adjacent lateral surface (4) of the second pair in a plane position wherein said first pair of lateral surfaces (3) are folded against the bottom surface (2), said second and third fold lines (7, 8) being applied in such a manner that when bringing said lateral surfaces (3, 4) into the upright position, each of the connecting flaps (6) is folded along the respective third fold line (8) against the corresponding attachment flap (9), and in that both lateral surfaces (4) of the second pair are provided with at least one side flap (11) which is provided for being folded over the adjacent connecting flap (6) towards the bottom surface (2) so as to attach this connecting flap (6) against the adjacent lateral surface (4).

2. A plate according to claim 1, characterised in that said side flaps (11) and said bottom surface (2) comprise a first and respectively a second attachment member (12, 13) which are both provided for cooperating with each other.

3. A plate according to claim 2, characterised in that said first attachment member comprises at least one projecting lip (12) and said second attachment member a slot (13) which is provided in such a manner that in the upright position the lip (12) of the side flap (11) folded over the adjacent connecting flap (6) projects into the corresponding slot (13) and locks this side flap (11) against the connecting flap (6).

4. A plate according to anyone of the claims 1 to 3, characterised in that said side flap (11) is connected through an edge surface (14) to the corresponding lateral surface (4) of the second pair, which edge surface (14) is delimited from this latter lateral surface (4) by a fourth fold line (15) and from said side flap (11) by a fifth fold line (16) which is substantially parallel to said fourth fold line (15), with the distance between said fourth and fifth fold line being substantially twice the plate thickness.

5. A plate according to anyone of the claims 1 to 4, characterised in that said side flaps (11) are provided, near the ends of the second pair of lateral surfaces (4), with a corner piece (19) which is connected through a sixth fold line (20) to the respective side flap (11) and which is provided for defining in said upright position an oblique corner between the adjacent lateral surface (3) of the first pair and the adjacent lateral surface (4) of the second pair.

6. A plate according to claim 5, characterised in that said corner piece (19) is divided into two parts (22, 23) by means of a seventh fold line (21) which is substantially parallel to said sixth fold line (20), a first part (22) of which, situated between said sixth and seventh fold line, is provided for defining said oblique corner and the second part (23) of which is provided for resting against the adjacent lateral surface (3) of the first pair.

7. A plate according to anyone of the claims 1 to 6, characterised in that said connecting flaps (6) define substantially a right-angled triangle, the oblique side of which being formed by said third fold line (8).

8. A plate according to claim 7, characterised in that said attachment flap (9) is substantially the mirror image of said connecting flap (6) with respect to

said third fold line (8).

9. A plate according to claim 8, characterised in that said attachment flap (9) is separated from the adjacent lateral surface (4) of the second pair by means of a cut (10).

10. A plate according to anyone of the claims 1 to 9, characterised in that said bottom surface (2) is substantially rectangular, said second pair of lateral surfaces (4) are provided along the short sides of this rectangular bottom surface (2) and said third fold lines (8) form an angle of about 45° with said first fold lines (5).

11. A plate according to anyone of the claims 1 to 10, characterised in that said first pair of lateral surfaces (3) are folded against the bottom surface (2) and in that the attachment flaps (1) are attached against the adjacent lateral surface (3) of the second pair of lateral surfaces.

12. A box constructed from a plate according to anyone of the claims 1 to 11, characterised in that said lateral surfaces (3, 4) are folded into the upright position, and said connecting flaps (6) are folded against said attachment flaps (9) and are kept against these attachment flaps (9) by means of the side flaps (11) folded towards the bottom surface (2).

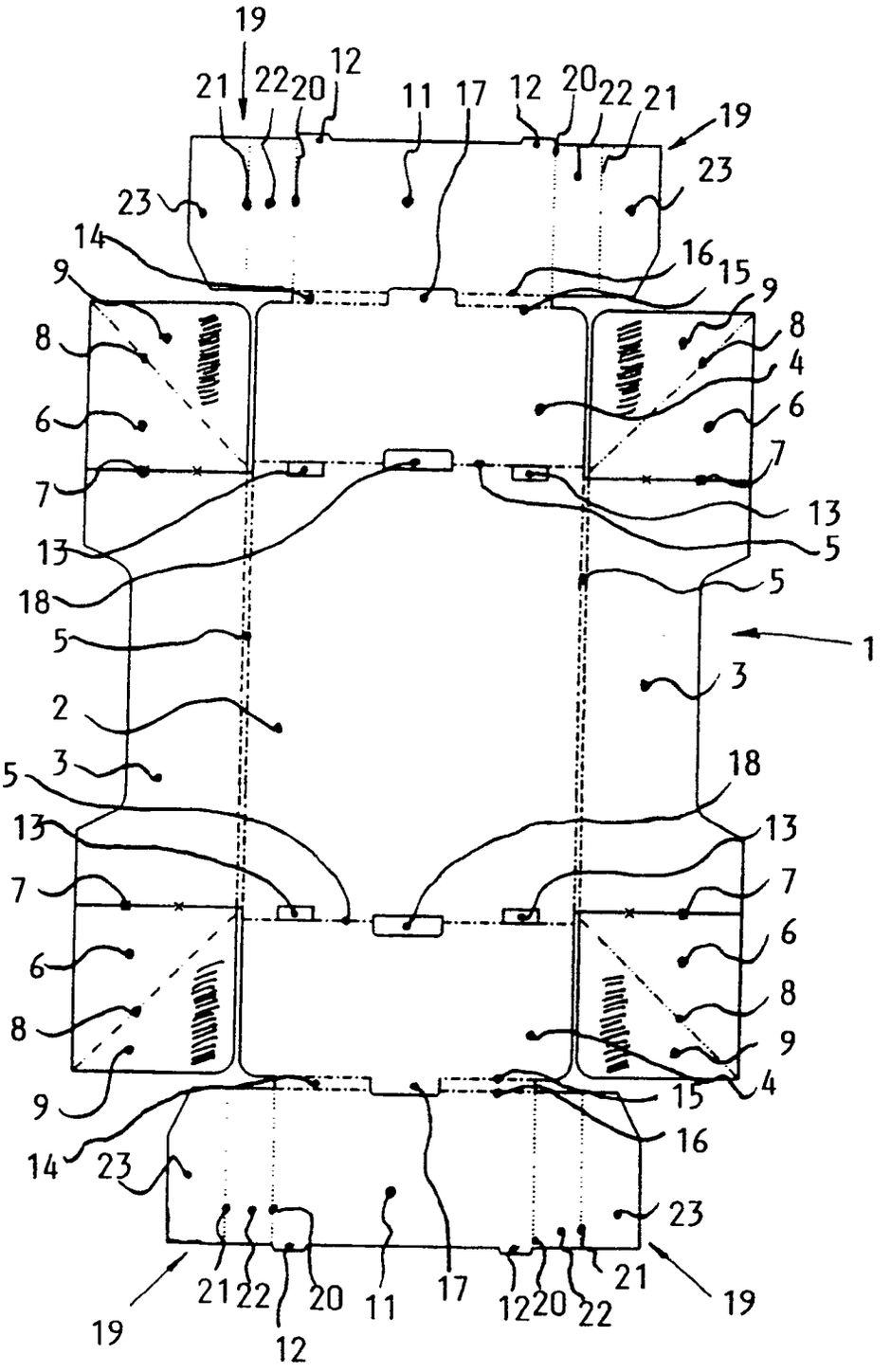
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Fig. 1.

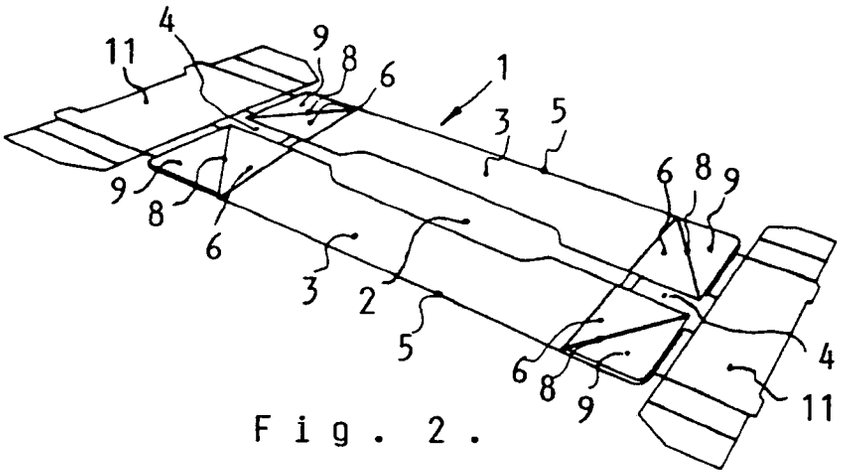

Fig. 2.

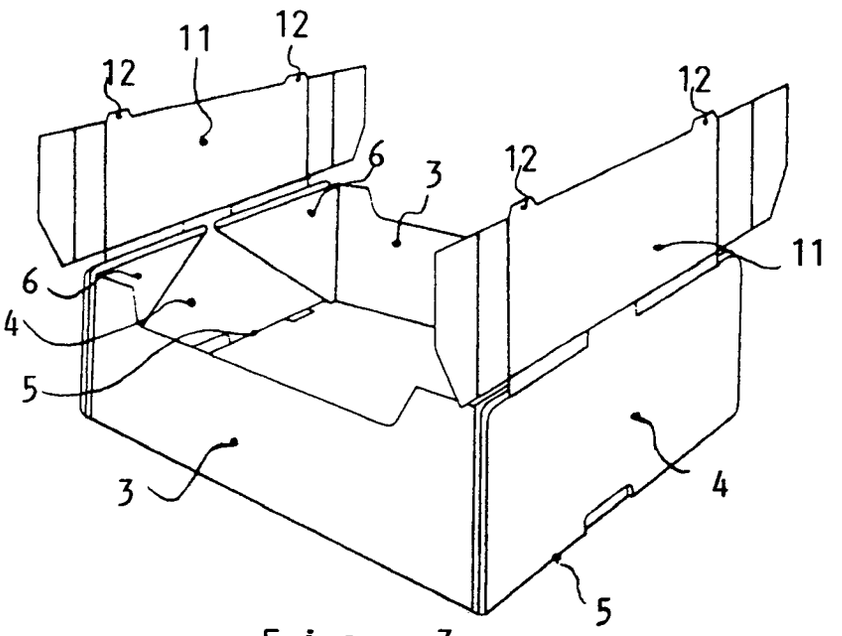

Fig. 3.

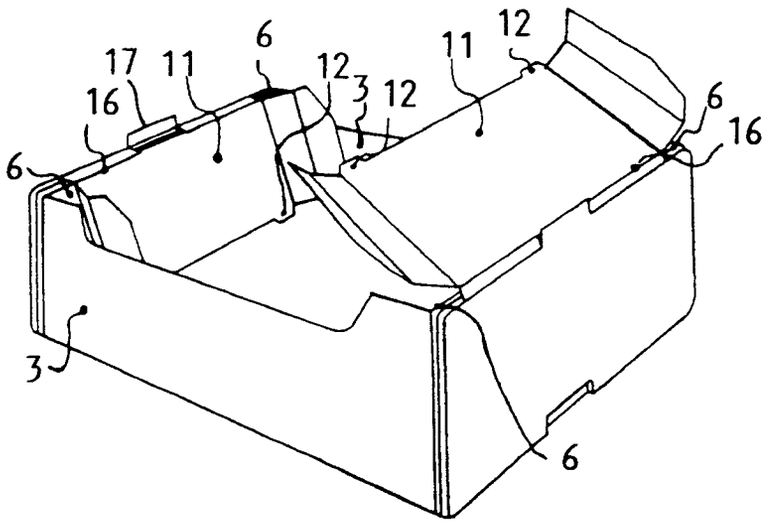

Fig. 4.

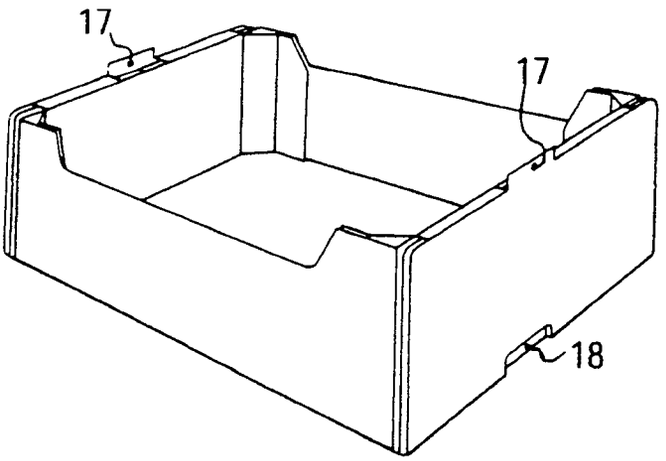

Fig. 5.

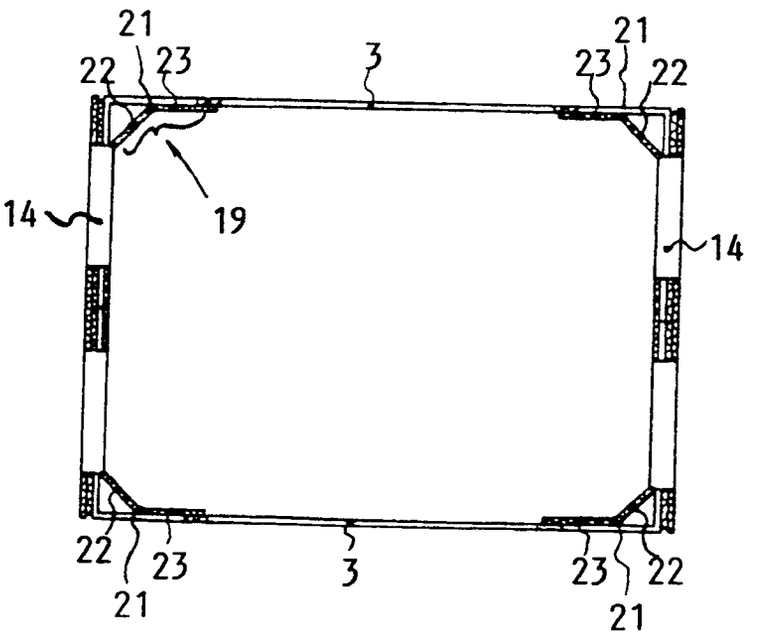

Fig. 6.

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EUROPEAN SEARCH REPORT

Application Number

EP 91 87 0028

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.5)
X Y	DE-U-8 610 403 (HERZBERGER PAPIERFABRIK) * Claims 1-6; figures 1-2 * ---	1-3,5,7,8,9,11,12 6,10	B 65 D 5/22 B 65 D 5/36
X	DE-A-2 834 418 (HUBERT) * Claims 1-5; figures 1-2 * ---	1-4,7,8,9,11,12	
Y	FR-A-2 242 872 (SOC. NORMANDE DE CARTON ONDULE) * Page 2, line 19 - page 3, line 15; figures 1-8 * -----	6,10	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28-05-1991	VANTOMME M.A.

CATEGORY OF CITED DOCUMENTS

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