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(54) **Self-assembling tray**

(57) A tray formed from a sheet divided into panels, adopting a three-by-three matrix configuration, provided with a central, an upper and a lower row, each with three panels, wherein the sheet has a central panel (1) and two end panels (2) at its intermediate row, one at each side of central panel (1), these three panels intended to form the bottom, while in the upper and lower rows, there is a central panel (3) and (6) respectively and two panels

with handle at each side (4) (5), (7) and (8), wherein additionally the end panels from each row, that is, the two panels (2) and panels (4), (5), (7) and (8) are refolded over central panels (1), (3) and (6), wherein optionally the overlapping surface of panels (2) is glued through one or several gluing points, such that a tray with a minimum production processing, made on a single machine, and erectable "in situ", is obtained.

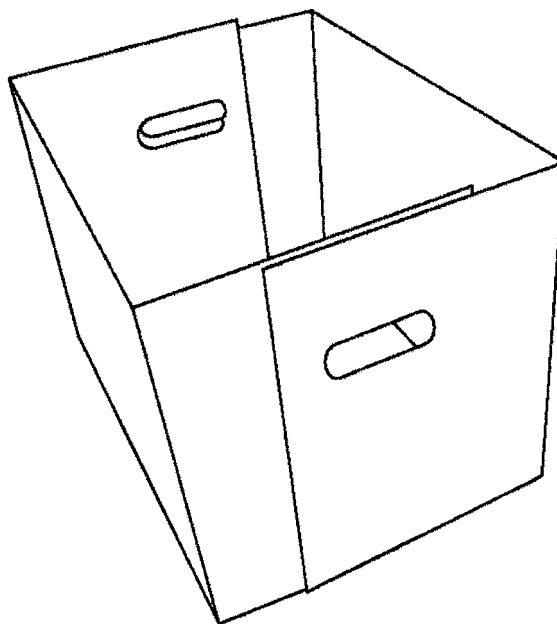


FIG.6

Description

DESCRIPTION

OBJECT OF THE INVENTION

[0001] The object of this invention is a self-assembling tray, understanding by "tray" a prismatic configuration open at the top, that is, a box without a top closure. This self-assembling tray can be erected directly from a single folded sheet, without having to perform any additional operation.

[0002] The present invention is characterized by the special configuration and design of the die-cut, cut and scored sheet which forms the tray object of the invention, such that the sheet is provided folded and optionally with a gluing at the central part of the base and it is possible to erect the tray just by pulling conveniently from the ends of the box in order to match the handles.

[0003] Therefore, the present invention belongs to the field of boxes and trays made of cardboard, starting from a die-cut and cut sheet, and preferably among self-assembling boxes.

BACKGROUND OF THE INVENTION

[0004] The state of the art shows many cardboard boxes formed from die-cut and cut cardboard sheets, all of them having the feature that once the sheet is cut, folding and a subsequent gluing are required to ensure structural strength and stability.

[0005] The fact that after folding the panels, the side walls, the front walls and the flaps it is necessary to apply a number of gluing points on the overlapping surfaces, complicates the formation of the boxes, since on the one hand, if they are factory-mounted, transporting empty boxes is bulky and expensive, whereas if transport is saved, there should be machines for assembling the boxes *in situ*, which is a disadvantage.

[0006] There are other boxes that can be erected *in situ*, but they can be improved in some aspects. Generally these boxes have a complex geometry; they do not guarantee enough structural stability and strength.

[0007] Usually cartons are provided flat in order to optimize transport, and they are erected to form its container structure at the time of filling. This assembly can be done manually, which takes some handling time, or by any specialized machine, adapted to the design of the box. The object of the invention is to ease the formation of the boxes, so they can be manually erected with a minimum handling time and as ergonomically as possible.

[0008] Therefore, it is an object of the present invention to overcome the above disadvantage relating to the the formation of the box, to the complex geometries of the boxes, and to the lack of enough structural stability and strength, and this is done by a tray like the one described below and defined in its essence in the first claim.

DESCRIPTION OF THE INVENTION

[0009] The object of the invention is a self-assembling tray formed from a die-cut and cut cardboard sheet and on which score lines have been made in order to assist subsequent folding of its panels during assembly. Optionally the starting sheet for the formation of the box could have a central gluing at the base, which could be done through one or several gluing points, preferably one.

[0010] The sheet used to form the tray has an essentially rectangular configuration divided into panels separated by score lines forming a three-by-three matrix. That is, the sheet has three rows of panels, each having one panel, where each panel has a different function.

[0011] Panels forming the bottom of the box are in the central row in the horizontal direction, looking at the sheet as seen in Figure 1, while upper and lower rows are identical, and each of them having a central panel forming one of the front walls of the box, while the two end panels of each row are intended to form the side walls of the box, i.e. the sides on which handles are arranged.

[0012] The side walls are formed with two panels, one from the upper row and the opposing panel from the lower row, which overlap. Each of these panels has a cutting and a score line in an oblong form. By cutting partially along the score lines, an oblong aperture is formed, which will serve as a handle. Also as a result of the partial cutting a flap is formed. When the opposing panels in the upper and lower rows match each other, the oblong apertures also match. When the flaps are passed through the apertures, the result is that one of the panels is held by the other, thus ensuring structural stability of the tray.

[0013] The panels playing an important role are the end panels in the intermediate row, which have a triangular configuration at their upper and lower part, where one of the sides of the triangular configuration is a score line separating the panels with handles from these panels forming the bottom, another side is free of connections to another part of the panel and the third is a score line which allows turning and pivoting of the panels with handle.

[0014] Furthermore, these panels forming the bottom, can have a folding line at the line separating the end panels from the central panel, in case they are manually erected, or optionally they are provided with a gluing surface, which is provided on the overlapping part of the central area of the opposite panels from the central row, when the opposite panels are provided on the central panel, being glued through one or several gluing points along the overlapping surface, such that the bottom of the packaging is double.

[0015] Thanks to the described configuration, a packaging open at the top is obtained, which has a minimum processing during production, obtained from a single sheet which can be printed, die-cut and glued, which may optionally have a central gluing area at the base, all this being done in a single specific machine. Thus, ergonom-

ics in assembly and its production cost come together since the machine performs every operation in a single process. In addition, the packaging has a double bottom, resulting in a greater load capacity of the packaging without the bottom of the box collapsing.

EXPLANATION OF FIGURES

[0016] As a complement to the present description and in order to help a better understanding of the features of the invention, according to a preferred embodiment thereof, a set of drawings is accompanied, in which:

Figure 1 shows the die-cut, cut and scored sheet which forms the tray object of the invention.

Figure 2 shows the formed tray as it would be once folded and formed.

Figure 3 shows the tray folded, ready for transport and its subsequent formation into a tray.

Figures 4, 5 and 6 show the process of forming the tray starting from the sheet shown in Figure 3.

PREFERRED EMBODIMENT OF THE INVENTION

[0017] A preferred embodiment of the proposed invention is now described in view of the figures.

[0018] In Figure 1, the initial die-cut, cut and scored sheet can be seen. This sheet is the starting point towards the arrangement shown in Figure 3, from which a tray as the one shown in Figure 2 can be self-assembled.

[0019] The sheet has an essentially rectangular configuration, divided into panels, adopting a three-by-three matrix configuration, having an upper row of three panels, aligned, followed by an intermediate row, of three panels as well, and finally a lower row of three panels, their connecting sides having the same dimensions.

[0020] On its intermediate row, the sheet has a central panel (1) and two end panels (2) at each side of the central panel (1), these three panels forming the bottom of the box.

[0021] The central panel (1) is connected to front panels (3) and (6) and to end panels (2) by a folding line (1.1).

[0022] In the upper row there is a central panel (3) and two panels at each side (4) and (5), each of them with a handle. In the lower row there is a central panel (6) and two panels at each side (7) and (8), each with a handle.

[0023] Panels (3) and (6) form the front panels of the tray, or front walls, while the panels with handle (4), (5), (7) and (8) are intended to form the side walls containing the handles.

[0024] Each of the panels with handle (4), (5), (7) and (8) has:

- A folding line (4.2), (5.2), (7.2), (8.2) respectively at its junction with the panel (3) or (6).

- A folding line (4.1), (5.1), (7.1) and (8.1) respectively at its junction with panel (2).
- A cutting defining an oblong aperture (4.3), (5.3), (7.3) and (8.3) respectively, which serves as a handle; and a flap (4.4), (5.4), (7.4) and (8.4).

[0025] The panels (2) at the ends of the central row and which form the bottom together with central panel (1), have a triangular configuration at their upper and lower part at their junction with the panels with handle, and a central area (2.3) polygonal in shape.

[0026] The upper triangular configuration of panels (2) has a side which is the folding line (4.1) or (5.1), another side which is a folding line (2.1) and which starts from the bottom panel's apex (1), at which apex there is a convergence of folding lines (5.1) with (1.2) or (4.1) with (1.2), and then converges with the other side (2.4), this other side (2.4) starting from the free end of folding line (4.1) or (5.1).

[0027] On the other hand, the lower triangular configuration of panels (2) has a side which is the folding line (7.1) or (8.1), another side which is a folding line (2.2) and which starts from the bottom panel's apex (1), at which apex there is a convergence of folding lines (7.1) with (1.2) or (8.1) with (1.2), and then converges with the other side (2.4), this other side (2.4) starting from the free end of folding line (7.1) or (8.1) respectively.

[0028] Figure 3 illustrates the sheet ready for its subsequent formation, for which purpose the end panels from each row, that is the two panels (2) and panels (4), (5), (7) and (8) are refolded over central panels (1), (3) and (6), and the overlapping surface of the central area (2.3) from panels (2) can be glued, with one or several gluing points to be applied preferably on the overlapping area of the central area (2.3).

[0029] Proceeding from the folded sheet as shown in Figure 3, the self-assembly of the tray can be started by pulling panels (4), (5), (7) and (8), by matching their handles, for which purpose handles from said panels must be separated at a distance "D" from the respective folding line with side panel (3) or (6) so that such a distance "D" is half the height "H" of panels (2).

[0030] Once the panels with handles are matched so they form the side walls, the other panel flap is passed through the oblong opening of one of the overlapping panels, and this serves as an additional means of union and reinforcement of said panels, as shown in Figure 6.

[0031] Finally, the formed tray is shown in Figure 2.

Claims

1. Self-assembling tray, formed from a single die-cut and cut sheet, provided with score lines for folding, **characterized in that** the sheet has an essentially rectangular configuration, it is divided into panels adopting a three-by-three matrix configuration, having an upper row of three aligned panels followed

by an intermediate row, also of three panels, and finally a lower row of three panels, all of them with the same dimensions at their junctions, wherein the sheet has a central panel at its intermediate row (1) and two end panels (2), one at each side of the central panel (1), these three panels intended to form the bottom, while in the upper and lower rows, there is a central panel (3) and (6) respectively and two panels with handle at each side (4), (5), (7) and (8), wherein additionally the end panels from each row, that is, the two panels (2) and panels (4), (5), (7) and (8) are refolded over central panels (1), (3) and (6).

2. Self-assembly tray, according to claim 1, **characterized in that** the central panel (1) is connected to the upper rows' side panels (3) and (6) through a folding line (1.1), and it is connected to the end panels (2) through a folding line (1.2).
3. Self-assembly tray, according to claim 1, **characterized in that** each of the panels with handle (4), (5), (7) and (8) has:
 - a folding line (4.2) (5.2), (7.2), (8.2) respectively at its junction with panel (3) or (6).
 - a folding line (4.1), (5.1), (7.1) and (8.1) respectively at its junction with panel (2).
 - a cutting defining firstly an oblong aperture (4.3), (5.3), (7.3) and (8.3) respectively which serves as a handle, and secondly a flap (4.4), (5.4), (7.4) and (8.4).
4. Self-assembly tray, according to claim 1, **characterized in that** panels (2), have a triangular configuration at their upper and lower part at their connection to the panels with handle, and a central area (2.3) polygonal in shape.
5. Self-assembly tray, according to claim 4, **characterized in that** the upper triangular configuration of panels (2) has one side which is the folding line (4.1) or (5.1), another side which is a folding line (2.1) and which starts from the bottom panel apex (1) at which apex there is a convergence of folding lines (5.1) with (1.2) or (4.1) with (1.2), and then converges with the other side (2.4), this other side (2.4) starting from the free end of folding line (4.1) or (5.1), while the lower triangular configuration of panels (2) has one side which is the folding line (7.1) or (8.1), another side which is a folding line (2.2) and which starts from the bottom panel apex (1) at which apex there is a convergence of folding lines (7.1) with (1.2) or (8.1) with (1.2), and then converges with the other side (2.4), this other side (2.4) starting from the free end of folding line (7.1) or (8.1) respectively.
6. Self-assembly tray, according to claim 3, **characterized in that** handles of the panels with handle (4),

(5), (7) and (8) must be separated at a distance "D" from the respective folding line with side panel (3) or (6) so that such a distance "D" is one half of height "H" of panels (2).

7. Self-assembly tray, according to claim 1, **characterized in that** end panels (2) from the intermediate row have a central area (2.3) polygonal in shape and when panels (2) are refolded over central panel (1), the overlapping area has a gluing area, on which one or more gluing points are provided.

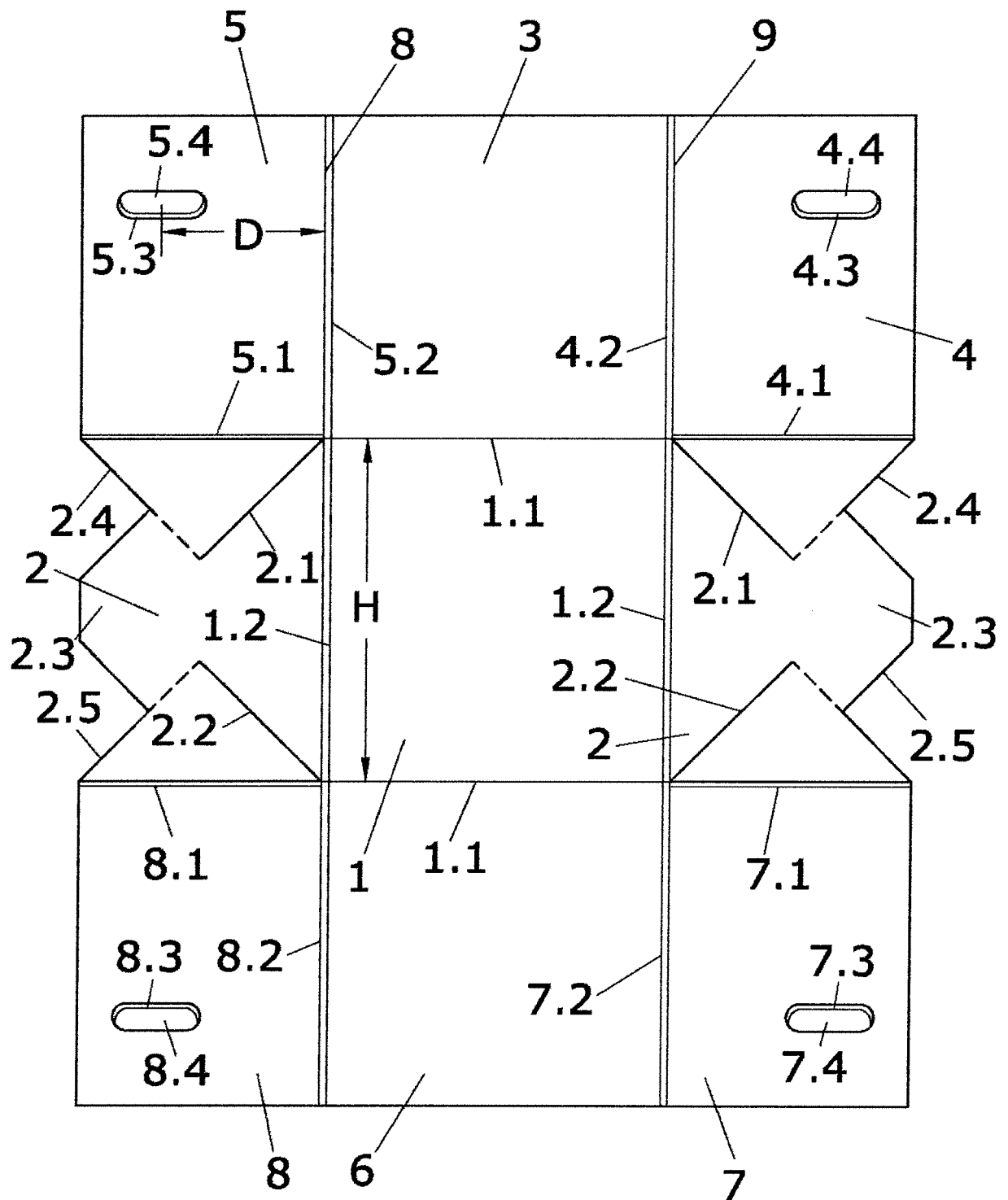


FIG.1

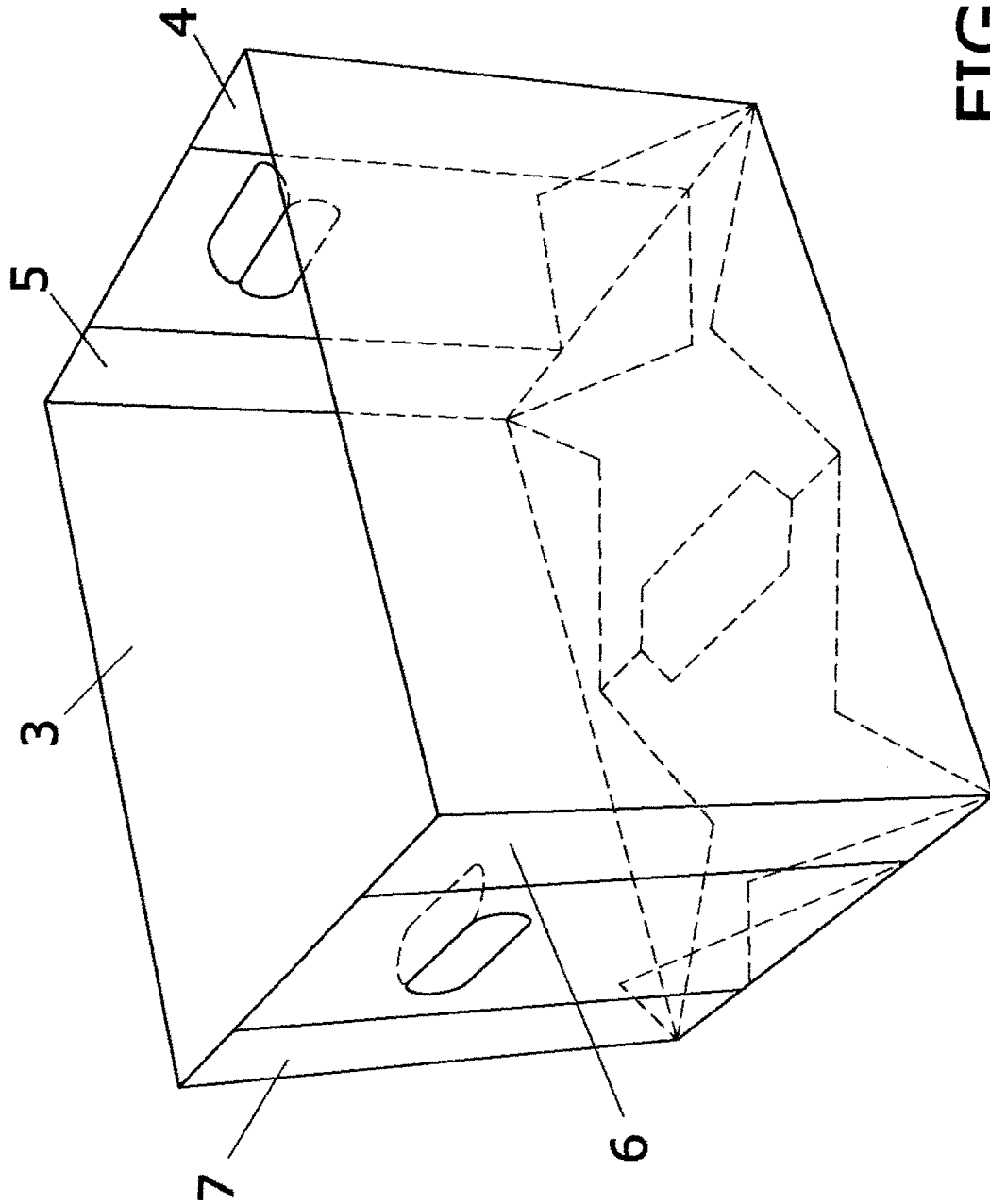


FIG. 2

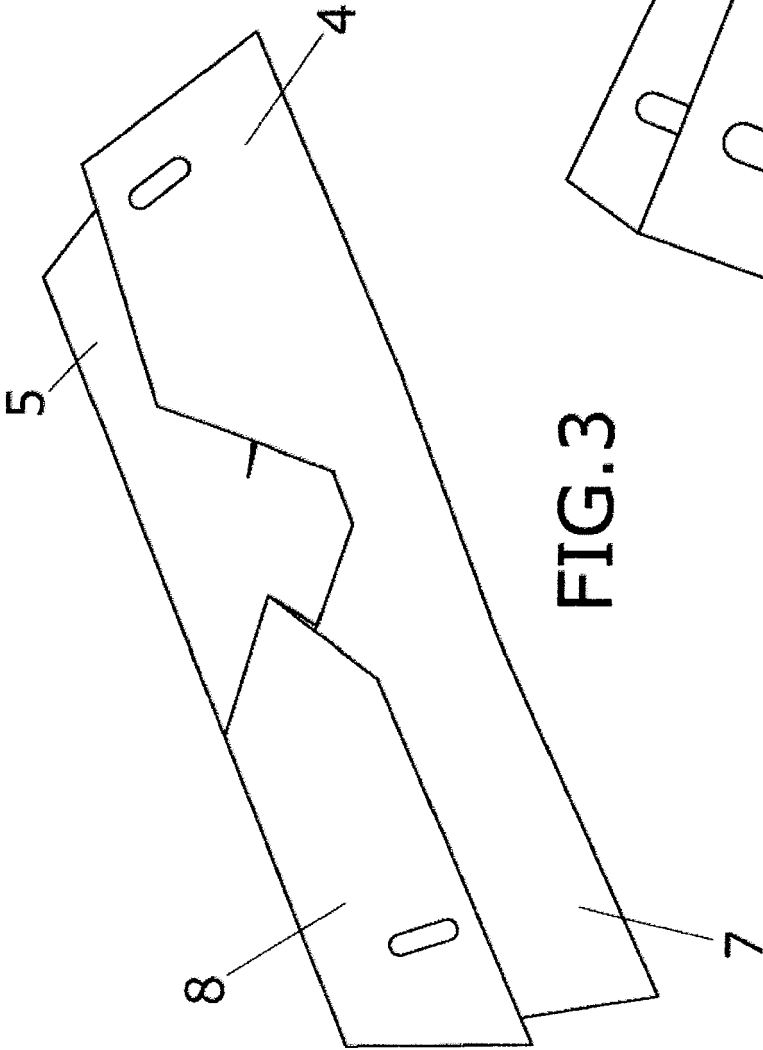


FIG. 3

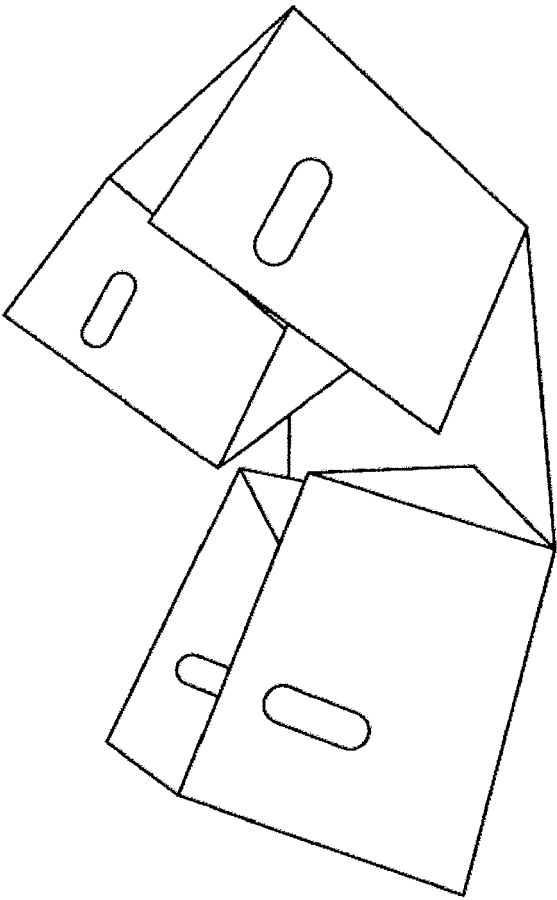


FIG. 4

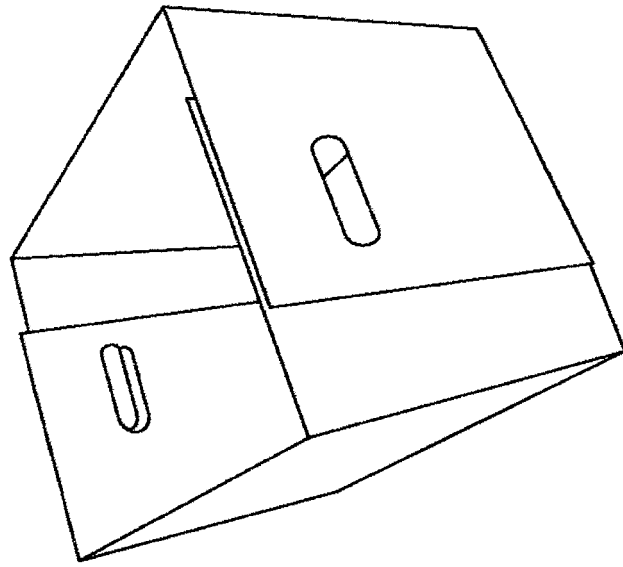


FIG. 6

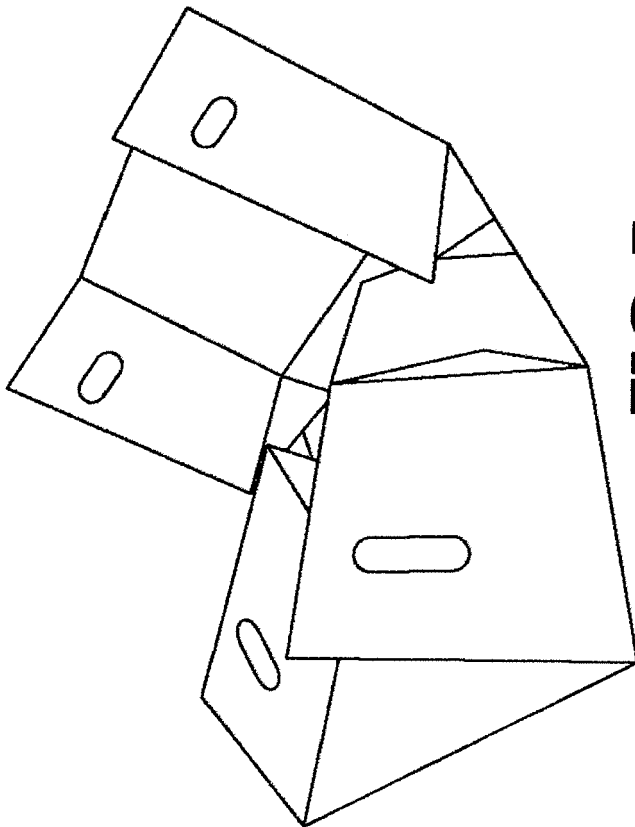


FIG. 5



EUROPEAN SEARCH REPORT

Application Number
EP 12 38 2005

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 5 060 850 A (WEAVER SHERRY M [US]) 29 October 1991 (1991-10-29) * column 5, line 48 - column 6, line 35; figures 1-8 *	1	INV. B65D5/36
A	JP 54 002541 U (*) 9 January 1979 (1979-01-09) * figures 1-5 *	1	
A	GB 800 423 A (REED CORRUGATED GASES LTD) 27 August 1958 (1958-08-27) * claim 1; figures 1-8 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 21 May 2012	Examiner Grondin, David
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 38 2005

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21-05-2012

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US 5060850	A	29-10-1991	NONE	
JP 54002541	U	09-01-1979	NONE	
GB 800423	A	27-08-1958	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82