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(54) **Unfoldable container with self-locking bottom**

(57) The invention relates to a packaging, in particular a box, comprising a side wall and a bottom, which box can be moved from a folded-down, flat position to an unfolded, erect position, wherein the box comprises a blank part for the side wall, this part comprising a number of side wall panels, and two blank parts for the bottom which each comprise a substantially polygonal bottom panel and a number of bottom flaps which are arranged

hingedly thereon and at least one of which is fixed to the side wall, wherein each bottom panel comprises a fold line extending from the side wall of the box to the opposite free edge of the bottom panel, further comprising fixation means integrated with the bottom flaps and/or bottom panels for fixing the bottom, wherein the fixation means are adapted to retain the box in its unfolded, erect position.

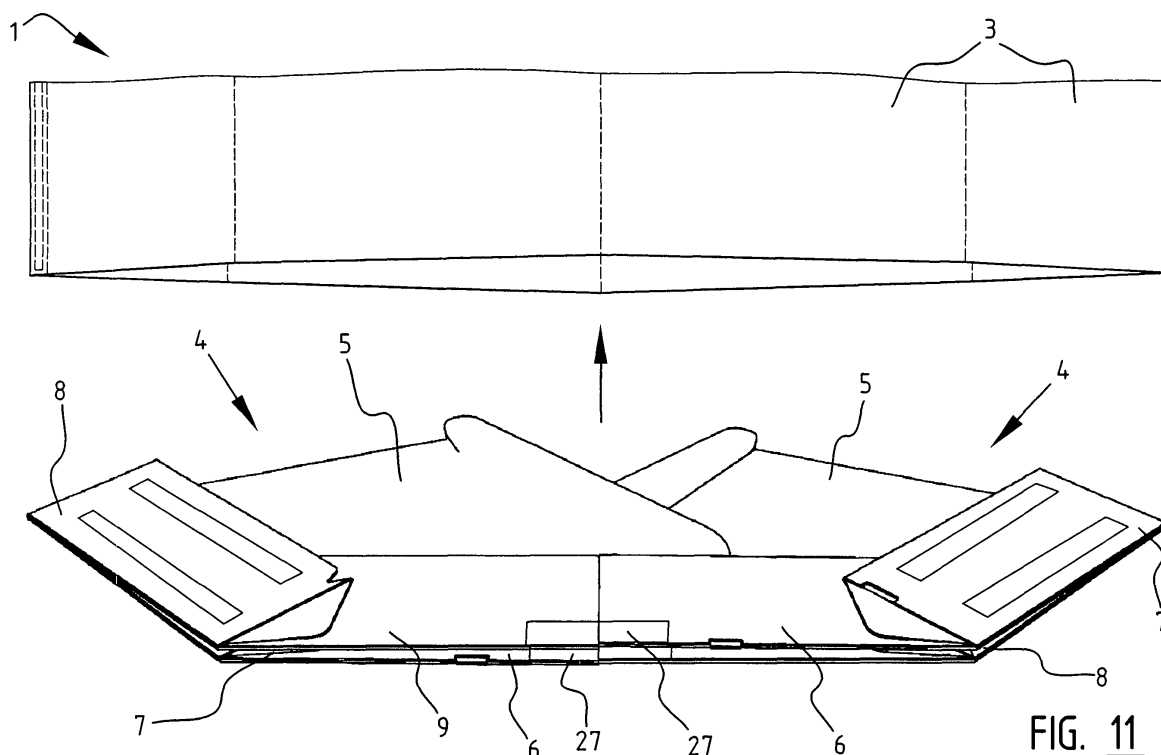


FIG. 11

Description

[0001] The present invention relates to a packaging, in particular a box, comprising a side wall and a bottom, which packaging can be moved from a folded-down, flat position to an unfolded, erect position, wherein the packaging comprises a blank part for the side wall which comprises a number of side wall panels, and two blank parts for the bottom which each comprise a substantially polygonal bottom panel and a number of bottom flaps which are arranged hingedly thereon and at least one of which is attached to the side wall, wherein each bottom panel comprises a fold line extending from the side line of the packaging to the opposite free edge of the bottom panel.

[0002] Such a packaging, generally known from the prior art, is often provided with eight side wall panels. This octagonal packaging or box, also referred to as an octabin, is used to transport and/or store bulk products, such as powders or granules, mainly for the chemical industry. The boxes are supplied in folded flat position and can therefore be stored without taking up much space. Before the box is taken into use and filled with product, it is moved into an unfolded, erect position with a simple operation. The octagonal shape provides not only for optimization of the available space when the octagonal box is transported on a pallet, but also for a relatively rigid construction.

[0003] A user of the box must be able to unfold this box quickly and easily into the erect position before use, preferably using a single, simple hand movement, without extra assist means being necessary here.

[0004] In addition, the box must preferably be sufficiently strong so that it can be transported internally at the premises of the user from the location where the box is erected to the location where it is filled.

[0005] Known from the document EP 1 216 925 A is another, already per se known unfoldable box. The known box comprises a blank part for the side wall and two blank parts for a bottom. The bottom parts each take the form of a polygon, more particularly a triangle. Hinged bottom flaps are provided which are glued to the side wall. Each bottom part comprises a fold line extending from the side wall of the box to the opposite free edge of the bottom part. In unfolded position the bottom parts are mutually interlocked by sliding cuts provided in each of the bottom parts into each other.

[0006] It has been found however that in some cases the cuts in the bottom parts do not hold the known box adequately in the unfolded, erect position. Additional measures for holding the box in unfolded position may be necessary in such cases.

[0007] The object of the present invention is to provide a box which can be held better in the unfolded, erect position. It is a more particular object of the present invention to provide a box which can be placed easily in an erect position and wherein the three-dimensional form of the box is secured in the erect position.

[0008] According to a first aspect of the present inven-

tion, there is provided for this purpose a packaging comprising a side wall and a bottom, which packaging can be moved from a folded-down, flat position to an unfolded, erect position, wherein the packaging comprises:

- a blank part for the side wall, this part comprising a number of side wall panels, and
- two blank parts for the bottom which each comprise a substantially polygonal bottom panel and a number of bottom flaps arranged hingedly thereon, wherein each bottom panel comprises a fold line extending from the side wall of the packaging to the opposite free edge of the bottom panel,

wherein at least one of the bottom flaps is provided with fixed, non-releasable fixation means with which the relevant at least one bottom flap is attached to the side wall; and

- lockable, non-releasable fixation means for fixing the packaging when the packaging is moved from the folded-down, flat position to its unfolded, erect position;

wherein the lockable, non-releasable fixation means are integrated with the bottom flaps and are adapted to mutually interlock the bottom flaps automatically when the packaging is moved from the folded-down, flat position to the unfolded, erect position in order to retain the packaging in its unfolded, erect position.

[0009] During unfolding of the packaging it is automatically locked in the erect position, i.e. in a position with erect wall and bottom flaps and with a lying bottom, by the lockable fixation means. Such fixation means of the bottom flaps moreover result in a much more stable and better-functioning packaging construction. An additional advantage is that the bottom and the wall do not easily fold back again, whereby the user can move the packaging before it is filled without here running the risk of the packaging folding together again.

[0010] According to a preferred embodiment, the packaging comprises lockable, non-releasable fixation means which are integrated with a bottom panel and a bottom flap and which are adapted to allow the upright bottom flap to interlock automatically with the lying bottom panel when the packaging is moved from the folded-down, flat position to the unfolded, erect position. In this embodiment there is therefore not only a mutual locking between two or more bottom flaps, but also between one or more bottom flaps and one or more bottom panels, which results in an improved locking of the packaging in its erect position.

[0011] According to a further preferred embodiment, at least one of the bottom flaps is provided on a first side with fixed, non-releasable fixation means for attaching to an adjacent bottom flap and is provided on a second, opposite side with lockable, non-releasable fixation means for locking the bottom flap to the other adjacent

bottom flap during erection. The fixed attachment, for instance in the form of fastening the first bottom flaps to each other using glue or tape, provides for an improved automatic locking of the other bottom flaps, which can be mutually coupled with lockable fixation means. When the lockable fixation means for instance comprise parts or elements which slide into each other, the fixed fixation means ensure that such parts or elements slide together more readily. The chance of sliding the parts or elements together wrongly, and the chance of the locking thereby failing during erection of the packaging, is hereby reduced. This embodiment moreover enables a structurally more rigid embodiment of the lockable fixation means, and thereby a stronger fixation of the packaging.

[0012] The fixation means can act between two adjacent bottom flaps of the same blank part for the bottom and/or between the two blank parts for the bottom.

[0013] The fixation means can have various embodiments. The fixation means for instance comprise a hook-like protrusion formed on the edge of a bottom flap, and a recess in an edge of an adjacent bottom flap co-acting therewith. According to another embodiment, the fixation means comprise a tongue-shaped part formed on the edge of a bottom flap and a slotted hole in an adjacent bottom flap co-acting therewith. In order to have sufficient material around the slotted hole to provide the desired fixation, the adjacent bottom flap is preferably provided with an adjacent flap arranged hinged thereon, wherein the slotted hole is arranged close to this flap. A fixation is further obtained in that one of the bottom flaps of each blank part for the bottom can comprise a glue flap which is arranged hinged thereon and which is then glued to an adjacent bottom flap. In this case the bottom flaps in question preferably lie on either side of the fold line of the relevant blank part for the bottom. This is particularly advantageous for manufacture of the packaging. In a further embodiment the fixation means comprise a tongue-shaped part on the edge of a bottom panel of the one blank part of the bottom and, co-acting therewith, a slotted hole in a bottom flap of the other blank part for the bottom.

[0014] The various fixation means can each be applied alone or in random combinations with each other. A packaging preferably comprises all types of fixation means together.

[0015] As already described above, the fixation means can be split into two main groups, i.e. the fixed, non-releasable fixation means and the lockable, non-releasable fixation means. Bottom flaps can be glued together for fixing of the bottom, this falling within the group of fixed, non-releasable fixation means. The fixation means belonging to the other group of lockable, non-releasable fixation means will only enter into co-action with each other when the box is erected and interlock the bottom flaps or blank parts and fix the whole bottom. Fixing of the bottom is understood to mean that the box can no longer return from its unfolded, erect position to its folded-down, flat position. In other words, the fixation means will

hold the box in its unfolded, erect position.

[0016] In addition, the bottom flaps on either side of the fold line of the relevant blank part are preferably not attached to the side wall of the box, while the outermost bottom flaps of each blank part for the bottom are however attached to the side wall of the box. Such a combination of glued and non-glued bottom flaps provides on the one hand an attachment of the bottom to the side wall and on the other the option of still being able to move the box from a folded-down, flat position to an unfolded, erect position. In addition, mutually locking, non-releasable fixation means can hereby be provided between the glued and non-glued bottom flaps.

[0017] The box preferably comprises eight side wall panels for the purpose of forming an octagonal box. More preferably, this is a regular octagonal box with eight sides of the same size.

[0018] A pouring opening can further be provided in the bottom of the box so that the content of the box can be discharged in simple manner. The pouring opening is obtained by breaking the perforation lines arranged in the bottom.

[0019] The material of the box preferably comprises cardboard, corrugated board or a material with equivalent properties. The box can hereby be destroyed and recycled easily when it can no longer be used or is damaged.

[0020] According to another aspect of the present invention, there is provided a blank part for forming the bottom of a box, wherein the blank part comprises a substantially polygonal bottom panel and a number of bottom flaps which are arranged hinged thereon and at least one of which is attached to the side wall of the box, wherein the bottom panel comprises a fold line extending from the edge of the bottom panel on which bottom flaps are arranged to the opposite free edge of the bottom panel, wherein lockable, non-releasable fixation means are provided which are integrated with the bottom flaps and are adapted to mutually interlock the bottom flaps automatically when the box is moved from the folded-down, flat position to the unfolded, erect position in order to hold the box in its unfolded, erect position.

[0021] In addition, the invention relates to a blank part for forming the bottom of a box.

[0022] The invention will be further elucidated with reference to the accompanying drawings. In the drawings:

Figure 1 shows a perspective view of an octagonal box according to the invention in unfolded, erect position;

Figure 2 shows a top view of the box in figure 1;

Figure 3 shows a bottom view of the box in figure 1;

Figure 4 shows a detail view according to arrow IV in figures 1 and 2;

Figure 5 shows a detail view according to arrow V in figures 1 and 2;

Figure 6 shows a detail view according to arrow VI in figures 1 and 2;

Figure 7 shows a detail view according to arrow VII

in figures 1 and 2;

Figure 8 shows a blank part according to the invention;

Figure 9 shows a bottom for the octagonal box of figure 1 in the flat state, as seen on the side which, in the final box, is located on the inner side thereof; Figure 10 is a view according to figure 9, as seen on the side which, in the final box, is located on the underside thereof; and

Figure 11 shows two blank parts for the bottom of the octagonal box in figure 1 before this bottom is attached to the blank part for the side wall of the box.

[0023] The octagonal box shown in figure 1 is at least provided with a side wall 1 and a bottom 2, but can in addition also comprise a cover (not shown). This box can be moved from a folded-down, flat position to an unfolded, erect position (see figure 1). The box can optionally be provided with a cover, this being further not relevant to the invention.

[0024] The box comprises a blank part for the side wall which comprises a number of side wall panels 3, and two blank parts 4 for the bottom 2 (see also figures 8-11). Referring to figure 8, it can be seen that a blank part 4 for bottom 2 comprises a substantially polygonal bottom panel 5 and a number of bottom flaps 6-9 arranged hinged thereon. Bottom flaps 6-9 are each connected hinged to bottom panel 5 by means of a fold line. Bottom panel 5 is further provided with a fold line 10 extending from the edge of bottom panel 5 on which bottom flaps 6-9 are arranged to the opposite free edge of bottom panel 5.

[0025] The blank part for the bottom is further provided with perforation lines 11 which can be broken during use for the purpose of discharging the content of the box.

[0026] Handgrips 12 arranged in bottom panels 5 can facilitate the outward movement of bottom panels 5, and therefore erection of the box.

[0027] Two outermost bottom flaps 6-9 of each blank part for the bottom are attached to side wall 1 of the box (see figures 8-10 in combination with figure 1). Bottom flaps 7, 8 on either side of fold line 10 of each blank part 4 are not attached to side wall 1 of the box.

[0028] The box is further provided with fixation means for fixing the bottom 2 which are integrated with bottom flaps 6-9 and bottom panels 5, wherein the fixation means are adapted to maintain the box in its unfolded, erect position. The fixation means are indicated with arrows in figures 1 and 2 and are shown in detail in figures 4-7. Figures 4-6 show fixation means acting between two adjacent bottom flaps 6-9 of the same blank part 4, while figure 7 shows fixation means acting between the two blank parts 4 for the bottom. The fixation means shown in figure 4 comprise a hook-like protrusion 13 formed on side edge 14 of bottom flap 9, and a recess 15 in a longitudinal edge 16 of the adjacent bottom flap 8 co-acting therewith. In figure 4 recess 15 is substantially V-shaped, but can for instance also be U-shaped. In addition, a flap

18 is arranged hinged on bottom flap 8, wherein recess 15 is provided close to this flap 18. Flap 18 is connected to bottom flap 8 by means of a fold line 17. In the embodiment shown in figure 4 the flap has a substantially triangular shape, but other shapes can also be envisaged. Flap 18 co-acts with bottom part 9 and provides sufficient support for recess 15, which must support the hook-like protrusion 13 of adjacent bottom flap 9 in erected position of the box. If flap 18 were not present, there would be a danger of the material between the recess and the fold line in the corner of bottom flap 8 bending under pressure exerted by hook-like protrusion 13, and the bottom possibly returning to its folded-down, flat position as a result.

[0029] The fixation means shown in figure 5 comprise a glue flap 19 which is arranged hinged on bottom flap 8 and which is glued to the adjacent bottom flap 7. A fixed non-releasable locking between bottom flaps 7,8 is hereby provided. Glue flap 19 is connected to bottom flap 8 by means of a fold line 20 lying substantially in line with fold line 10 of the relevant blank part 4. In the embodiment shown in figure 5 glue flap 19 has a substantially triangular shape, although it will be apparent that glue flap 19 can have another random shape.

[0030] The fixation means shown in figure 6 comprise a tongue-shaped part 21 formed on side edge 22 of bottom flap 6 and, co-acting therewith, a slotted hole 23 in adjacent bottom flap 7. A flap 24 is here also arranged hinged on bottom flap 7, wherein slotted hole 23 is located close to this flap 24. As in the embodiment in figure 4, flap 24 serves as an extra strengthening for fixation means 21, 23.

[0031] Figure 7 finally shows a final embodiment of the fixation means according to the invention. A tongue-shaped part 25 is here formed on the free edge of bottom panel 5 of the one blank part 4 for the bottom (see also figure 8), and a slotted hole 26 co-acting therewith is formed in bottom flap 6 of the other blank part 4 for the bottom. These fixation means 25, 26 therefore act between the two blank parts 4 for the bottom.

[0032] Figure 7 further shows that a piece of tape 27 is arranged over adjacent bottom parts 6, 9 of blank parts 4 for the bottom. This is done in the first instance to enable easier attachment of two separate blank parts to the blank part for side wall 1. For manufacture of a box according to the invention reference is made to figure 11. The two blank parts 4 for the bottom are folded in two over their fold lines 10 and slide together such that bottom flaps 6, 9 of the two blank parts 4 come to lie opposite each other. A piece of tape 27 is then arranged over these two bottom flaps 6, 9. The situation shown in figure 11 is then obtained. The assembly shown in figure 11 is placed into the folded-double sleeve formed from the blank part for side wall 1, and glue is applied between bottom flaps 6,9 and the sleeve in order to attach these bottom flaps to the relevant side wall panels 3. The box is now ready to be transported to the user. If the user wishes to fill the box with product, he has only to grasp the box on one

side, for instance on a side wall panel, and pull it upward and then place it on its bottom 2, wherein the bottom unfolds itself and fixation means 13, 15; 21, 23 and 25, 26 automatically interlock and thereby fix the bottom. The box is now in its unfolded, erect position and will be maintained in this position by fixation means 13, 15; 19; 21, 23 and 25, 26. Handgrips 12 can be used when the box is erected from a lying position (see figure 3). In this case the bottom 2 will have to be pulled outward into an unfolded position by manual effort, not by the force of gravity.

Claims

1. Packaging, in particular a box, comprising a side wall (1) and a bottom (2), which packaging can be moved from a folded-down, flat position to an unfolded, erect position, wherein the packaging comprises:

- a blank part for the side wall, this part comprising a number of side wall panels (3), and
- two blank parts (4) for the bottom which each comprise a substantially polygonal bottom panel (5) and a number of bottom flaps (6-9) arranged hingedly thereon, wherein each bottom panel (5) comprises a fold line (10) extending from the side wall (1) of the packaging to the opposite free edge of the bottom panel (5), wherein at least one (6,9) of the bottom flaps is provided with fixed, non-releasable fixation means with which the relevant at least one bottom flap is attached to the side wall (1); and
- lockable, non-releasable fixation means (13, 15; 19, 21, 23; 25, 26) for fixing the packaging when the packaging is moved from the folded-down, flat position to its unfolded, erect position;

characterized in that the lockable, non-releasable fixation means (13, 15; 19, 21, 23; 25, 26) are integrated with the bottom flaps (6-9) and are adapted to mutually interlock the bottom flaps automatically when the packaging is moved from the folded-down, flat position to the unfolded, erect position in order to retain the packaging in its unfolded, erect position.

2. Packaging as claimed in claim 1, comprising lockable, non-releasable fixation means which are integrated with a bottom panel and a bottom flap and which are adapted to allow the upright bottom flap to interlock automatically with the lying bottom panel when the packaging is moved from the folded-down, flat position to the unfolded, erect position.
3. Packaging as claimed in any of the foregoing claims, wherein at least one of the bottom flaps (7,8) is provided on a first side with fixed, non-releasable fixation means for attaching to an adjacent bottom flap,

and is provided on a second, opposite side with lockable, non-releasable fixation means for locking the bottom flap (7,8) to the other adjacent bottom flap during erection.

4. Packaging as claimed in any of the foregoing claims, wherein the bottom flaps are arranged on the inner side of the side wall (1).

5. Packaging as claimed in any of the foregoing claims, wherein the lockable fixation means are adapted to hold bottom flaps unlocked in the folded-down, flat position and to lock the bottom flaps in unfolded, erect position.

6. Packaging as claimed in claim 5, wherein the fixation means comprise parts which are adapted to interlock in the unfolded, erect position.

7. Packaging as claimed in any of the foregoing claims, wherein the fixation means comprise a hook-like protrusion (13) formed on the edge (14) of a bottom flap (9), and a recess (15) in an edge (16) of an adjacent bottom flap (8) co-acting therewith.

8. Packaging as claimed in any of the foregoing claims, wherein the fixation means comprise a tongue-shaped part (21; 25) formed on the edge of a bottom flap (6) or bottom panel (5) and, co-acting therewith, a slotted hole (23; 26) in an adjacent bottom flap.

9. Packaging as claimed in claim 7 or 8, wherein the adjacent bottom flap (8; 7) comprises a flap (18; 24) arranged hingedly thereon, wherein the recess (15) or the slotted hole (23) is provided close to this flap (18; 24).

10. Packaging as claimed in any of the foregoing claims, wherein the fixed, non-releasable fixation means of one or more of the bottom flaps (8) of the blank part (4) for the bottom (2) comprise a glue flap (19) which is arranged hingedly thereon and which is glued to an adjacent bottom flap (7).

11. Packaging as claimed in claim 10, wherein said bottom flaps (7; 8) lie on either side of the fold line (10) of the relevant blank part (4) for the bottom (2).

12. Packaging as claimed in any of the foregoing claims, wherein the fixation means (13, 15; 19, 21, 23) act between two adjacent bottom flaps (8, 9; 7, 8; 6, 7) of the same blank part (4) for the bottom.

13. Packaging as claimed in any of the foregoing claims, wherein the fixation means (25, 26) act between the two blank parts (4) for the bottom.

14. Packaging as claimed in any of the foregoing claims,

wherein the bottom flaps (7; 8) on either side of the fold line (10) of the relevant blank part (4) are not attached to the side wall (1) of the packaging.

15. Packaging as claimed in any of the foregoing claims, 5
wherein the outermost bottom flaps (6; 9) of each blank part (4) for the bottom (2) are attached to the side wall (1) of the packaging.
16. Packaging as claimed in any of the foregoing claims, 10
wherein a hinged bottom flap is provided on each of the peripheral edges of the polygonal bottom.
17. Packaging as claimed in any of the foregoing claims, 15
wherein the packaging has eight side wall panels (3).
18. Blank part for forming the bottom (2) of a packaging 20
as claimed in any of the claims 1-17, wherein the blank part (4) comprises a substantially polygonal bottom panel (5) and a number of bottom flaps (6-9) 25
which are arranged hingedly thereon and at least one (6; 9) of which is attached to the side wall (1) of the packaging, wherein the bottom panel (5) comprises a fold line (10) extending from the edge of the bottom panel (10) on which bottom flaps (6-9) are 30
arranged to the opposite free edge of the bottom panel (5), **characterized by** lockable, non-releasable fixation means (13, 15; 19, 21, 23; 25, 26) which are integrated with the bottom flaps (6-9) and are adapted to mutually interlock the bottom flaps auto- 35
matically when the packaging is moved from the folded-down, flat position to the unfolded, erect position in order to retain the box in its unfolded, erect position.

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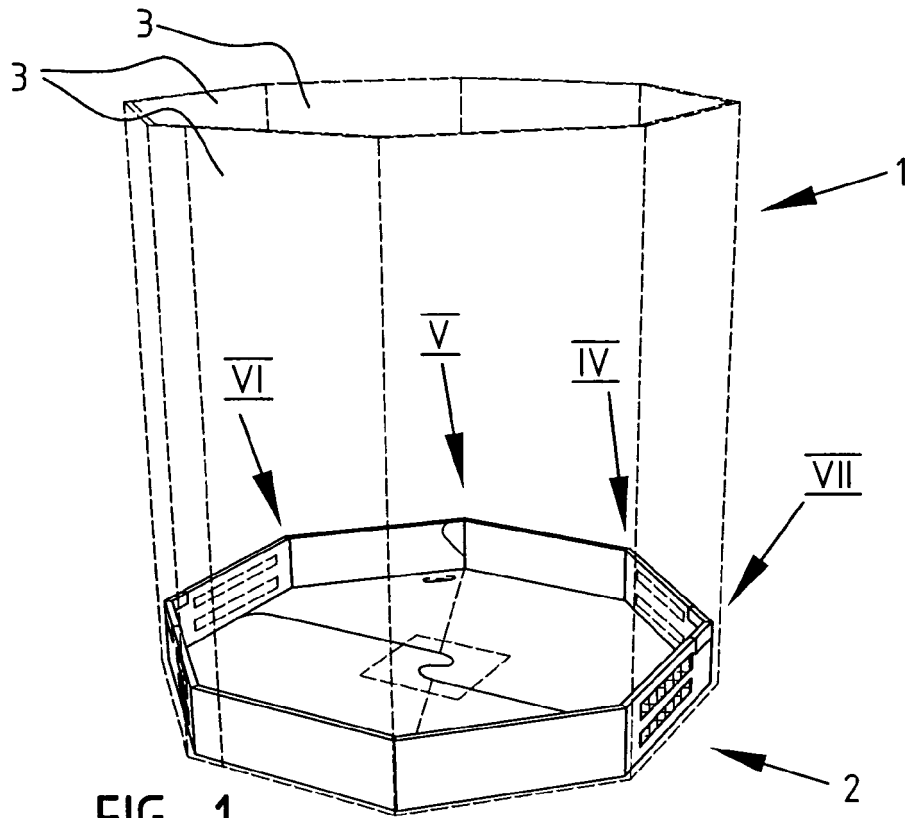


FIG. 1

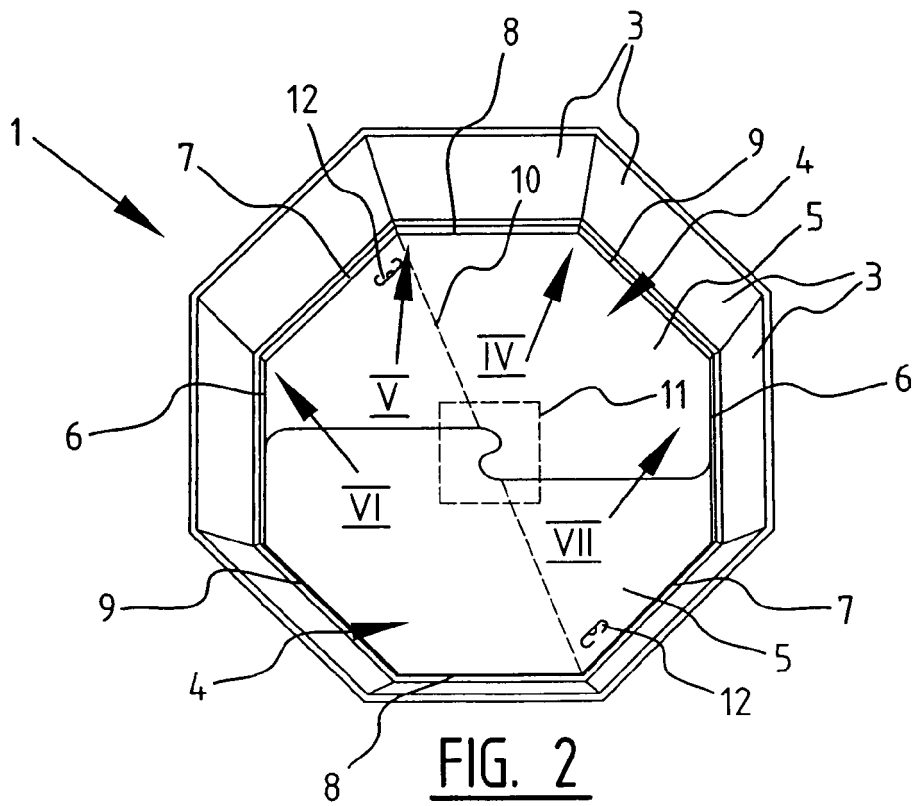
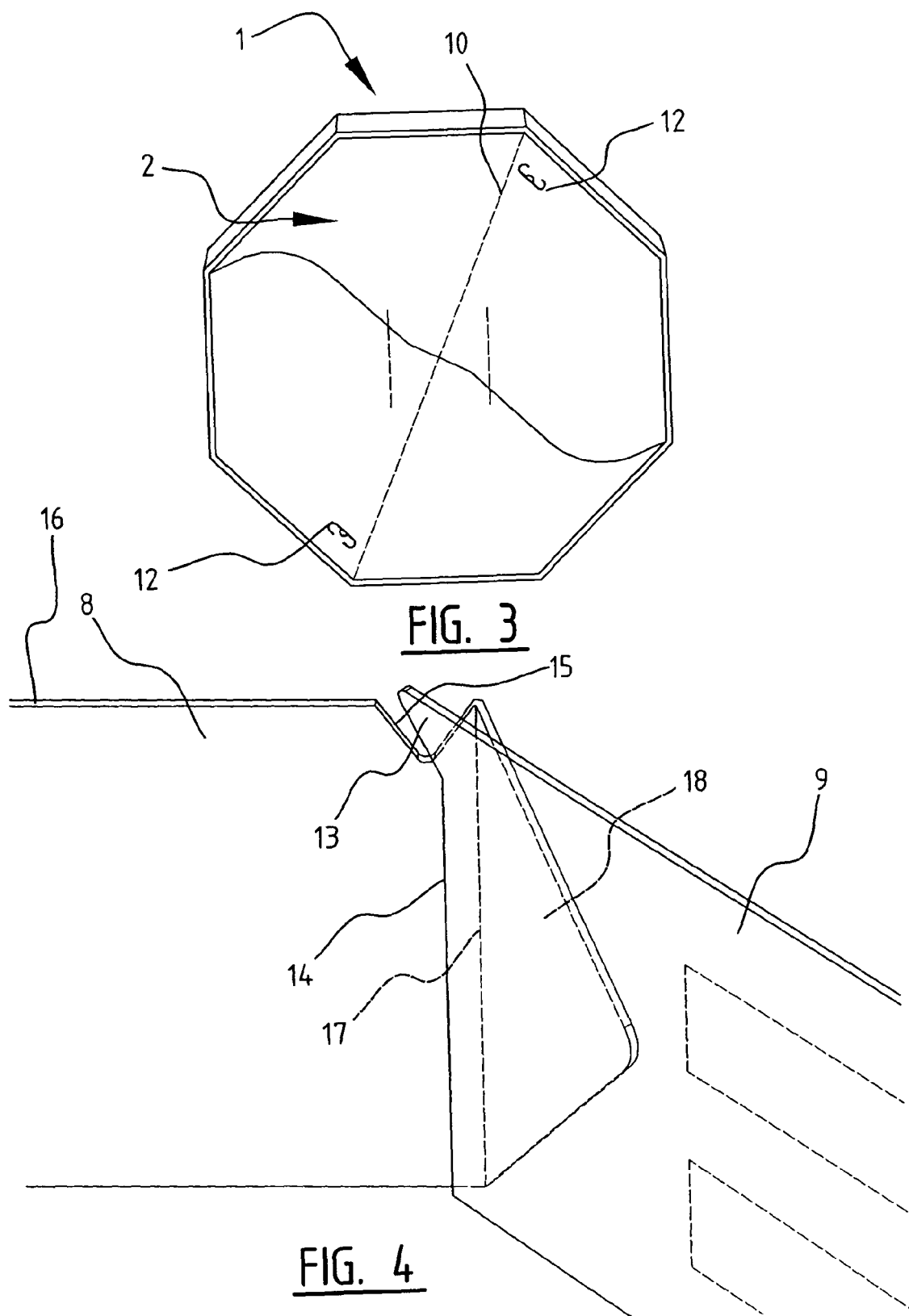
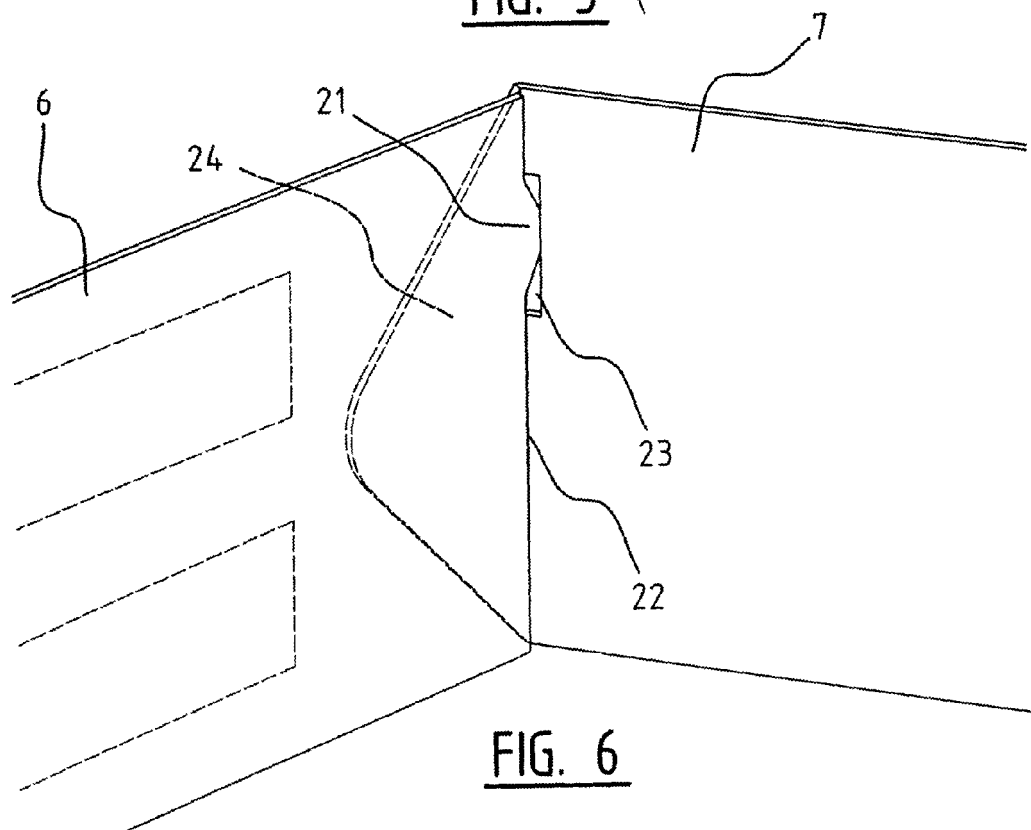
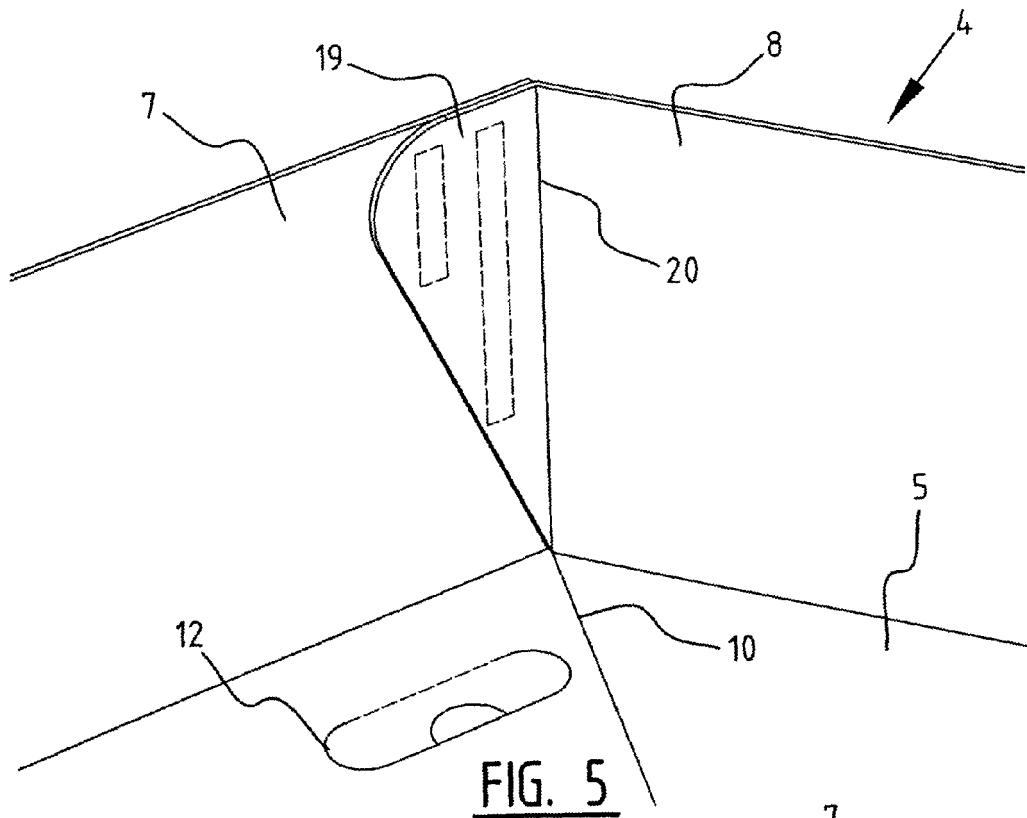


FIG. 2





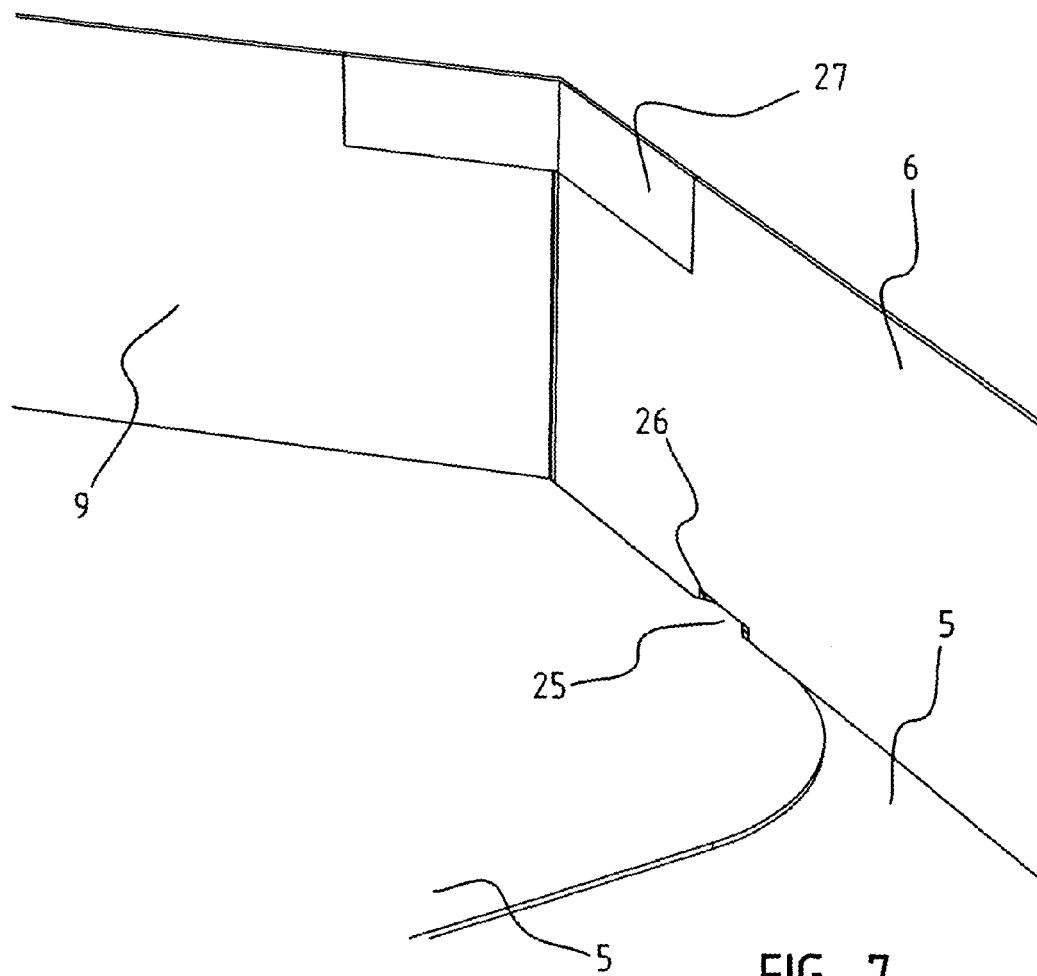
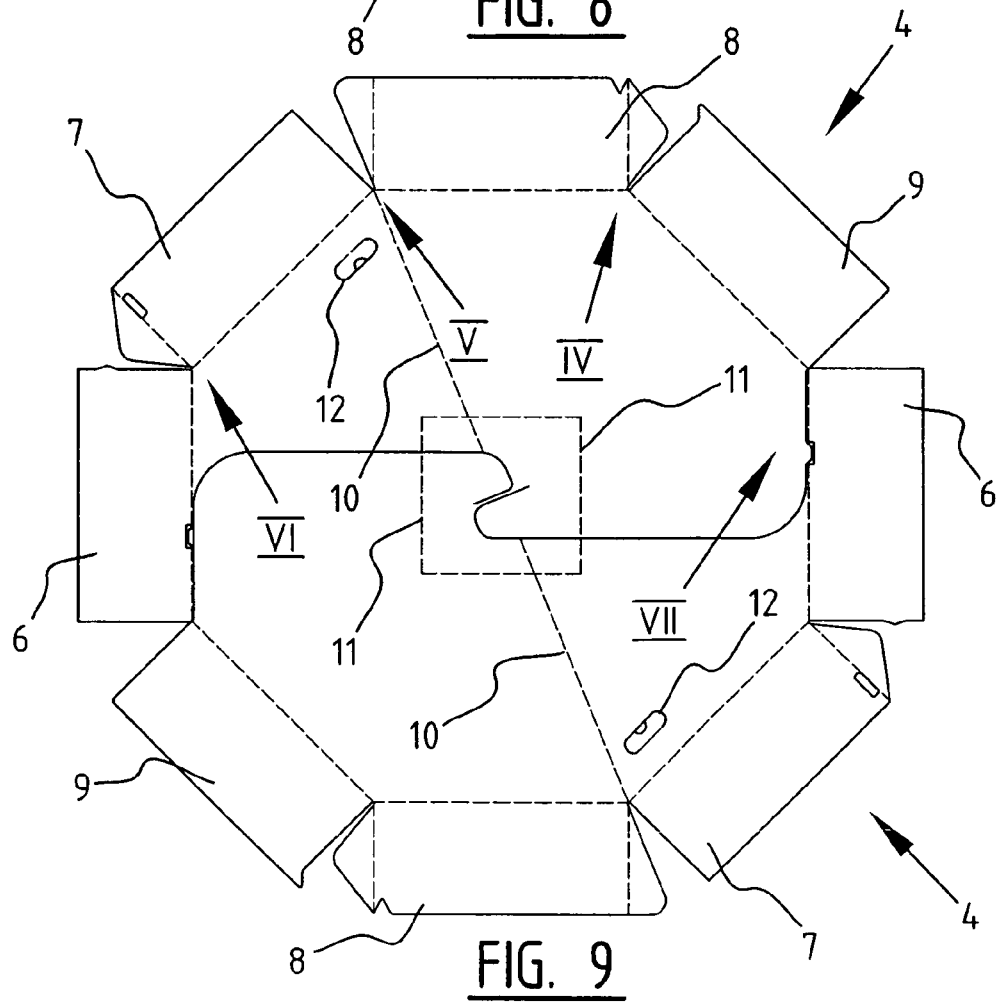
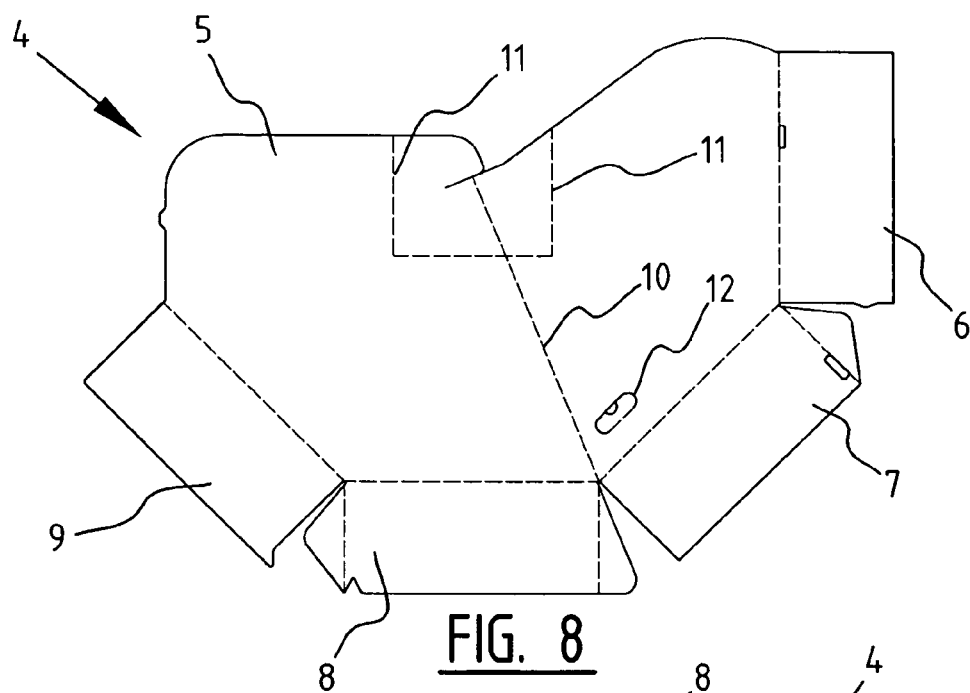
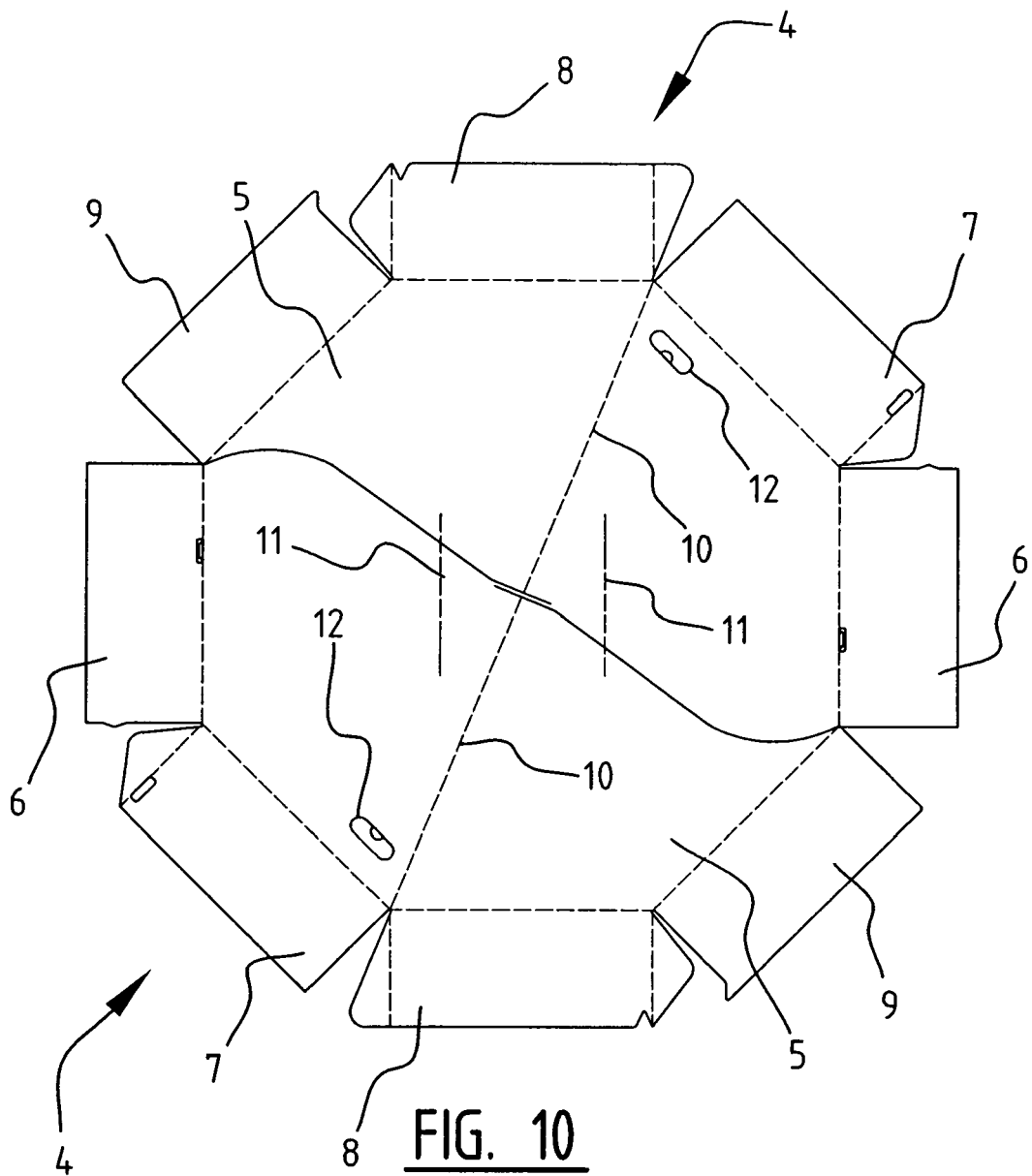
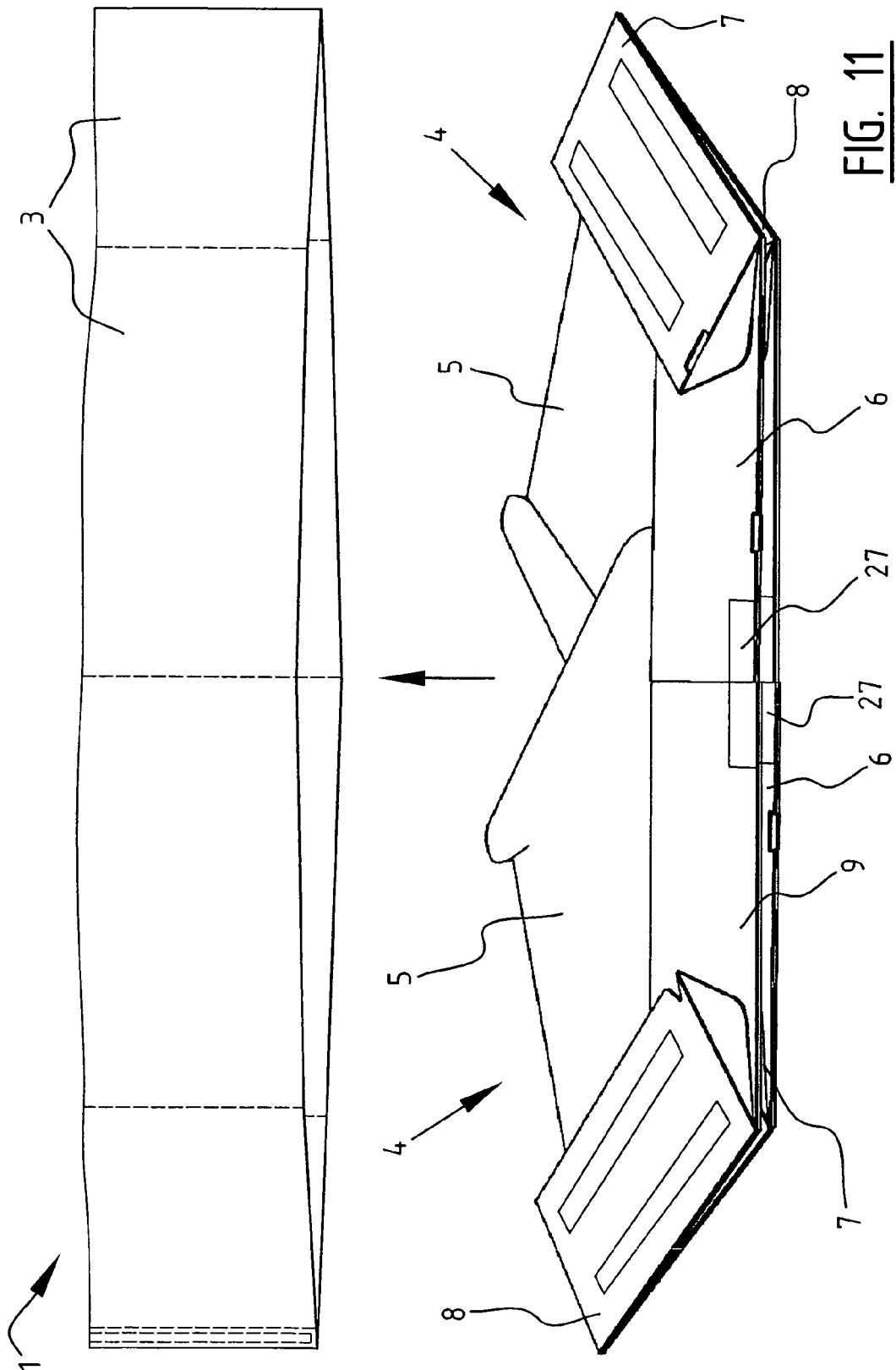


FIG. 7







REFERENCES CITED IN THE DESCRIPTION

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