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(54) **Box with breakable and reclosable lid**

(57) Box formed from a single piece of punched, crease-lined and knurled cardboard and provided with a

lid breakable by tearing and shaped to enable the lid to be easily and securely closed again after it has been opened for the first time.

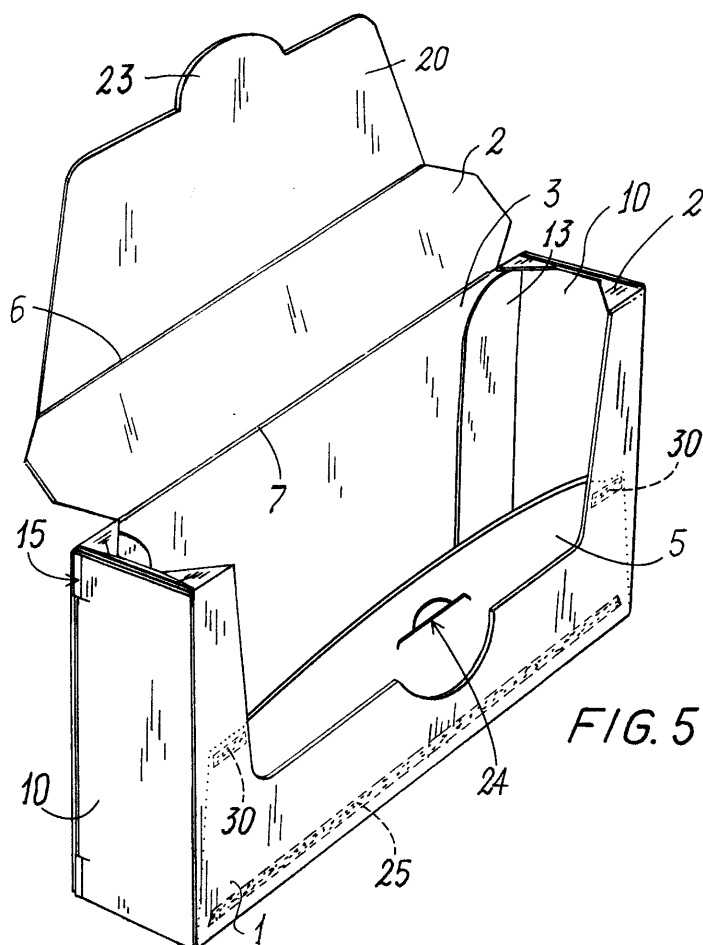


FIG. 5

Description

[0001] The present invention relates to a box formed in one piece from a sheet of punched, crease-lined and knurled cardboard or similar flexible material, of the type having side closure panels of high resistance to opening, with flaps positioned below and in contact with the closure panels when these are closed, with, projecting from them, a tab which is inserted into the box, this tab being folded relative to the panel about a folding line, the ends of which present cuts into which said flaps extend to retain the tab in a closed position.

[0002] US-A-5207374, EP-B-0709293 and EP-A-1340684 (all incorporated herein as reference) describe boxes apparently similar to that of the present invention, these boxes having side closure panels with high resistance to opening, from said panels there projecting tabs which are inserted into and retained in the respective box when made up and closed.

[0003] The present invention provides a box of the aforesaid type, comprising a main panel of relatively large dimensions, in which knurlings are provided bounding a lid openable by tearing, the lid remaining connected to the rest of the box along a folding line about which the lid can be rotated from a closed to an open position, there projecting from the lid an appendix or projection insertable into a cut provided in an underlying secondary panel of the box, to be retained therein with the lid closed, after the lid has been opened for the first time following breakage of the knurlings which bound it in the panel in which it was provided.

[0004] A box of this type is illustrated in the patent application US 2005/0116016A1 published on 2 June 2005, but presents the drawback that the knurling which bounds the lid in the closed box while still whole can be easily and accidentally broken if the surface of the panel in which the lid is provided is pressed; in addition, closing the box after it has been opened (after breaking the knurling which bounds it in the box panel) represents a very difficult and unstable operation, because that panel below the box lid and in which the cut is provided for inserting and retaining the lid appendix is freely rotatable towards the box interior.

[0005] The main object of the present invention is therefore to provide a box with a lid openable by tearing, in which the lid can be easily closed after having been opened and in which the panel containing the lid is securely fixed to the underlying secondary panel in which the cut for insertion of the lid appendix is provided.

[0006] These and further objects are attained by a box having the features specified in claim 1.

[0007] Preferably the first panel has also the features according to claim 2.

[0008] The invention also relates to the single sheet in the form of a single piece of punched, crease-lined and knurled cardboard or similar flexible material for forming a box having the aforesaid characteristics.

[0009] The structure and characteristics of the box of

the invention will be more apparent from the ensuing description of a preferred embodiment thereof given by way of non-limiting example with reference to the accompanying drawings, in which:

Figures from 1 to 3 represent a punched, crease-lined and knurled cardboard sheet shown in plan view and in its successive respective stages of folding to form a box open and lying flat on itself;

Figure 4 is an enlarged perspective view of a completed closed box with its lid integral;

Figure 5 is similar to Figure 4, but with its lid open and shown in the raised position; and

Figure 6 shows the box after its lid has been returned from the open position of Figure 5 to a newly closed position, even though the knurling which originally (Figure 4) fixed the lid to the rest of the panel of which it formed part has been broken.

[0010] Reference will firstly be made to Figure 1, which shows, spread out in plan view, a piece of punched, crease-lined and knurled cardboard comprising four consecutive main panels 1-4 and a secondary panel 5 separated from each other by longitudinal parallel folding (crease) lines 6-9. A side closure panel 10 projects from each of the two ends of the panel 1, a tab 11 projecting from each end of the panels 2 and 4, the closure panels 10 and the tabs 11 being separated from the respective main panels by transverse folding lines, all indicated by the reference numeral 12.

[0011] From each panel 10 there projects a lip 13 which is separated from the panel by a folding line 14 the two ends of which are both incised by a short cut 15, the width of each panel 10 between the folding lines 12 and 14 relative thereto being substantially equal to the width of the two main panels 2 and 4.

[0012] When the lips 13 are folded about the respective folding lines 14 (which occurs when the two ends of the made-up box are closed as in Figures 4-6), the ends of the tabs 11 close to their folding lines 12 become inserted into the respective cuts 15 provided at the ends of the folding lines 14, so effectively opposing the opening of the box side panels.

[0013] All the aforescribed structural and functional characteristics are known from US-A-5207374, EP-B-0709293 and EP-A-1340684, incorporated herein for reference: in particular, Figure 1 of US-A-5207374, Figure 4 of EP-B-0709293 and Figure 6 of EP-A-1340684 show how the tabs 11 of the box can interfere with the lip 13 to oppose opening of the side panels 10 of the box of which they form part.

[0014] In the cardboard sheet shown in the accompanying figures it can be seen that the panel 1 is provided with a breakable knurling 21 and a semicircular aperture 22 defining an appendix or projection 23 which can be gripped with two fingers of a hand and pulled outwards to break the panel 1 by tearing along said knurling 21: in this manner a lid 20 is obtained, rotatable about the fold-

ing line 6.

[0015] It can also be seen that in the secondary panel 5 there is provided a cut defining an aperture or slot 24 into which the appendix or projection 23 of the rotatable lid can be inserted and retained after it has already been opened to extract contained articles from the completed box.

[0016] Again with reference to Figure 1, to make up the box, the panel 4 (and with it the secondary panel 5) is rotated about the folding line 8 to superpose it on the panel 3, then a thin layer of glue 25 is applied to the panel 5 in proximity to and along the entire length of the folding line 9 (Figure 2), after which the panel 1 is rotated about its folding line 6 to lie superposed on the panel 5, to which it is fixed by the glue strip 25 (Figure 3) substantially along the entire length of the longitudinal free edge of the panel 1.

[0017] The box manufacturer has thus terminated box production, piles of flat mutually superposed boxes (Figure 3) then being despatched to the user firms which, by means of automatic machines of known type operating at high speed, shapes each box by firstly pressing the two opposing folding lines 6 and 9 towards each other (so that the box cross-section becomes rectangular), then automatically closes the two side panels 10 with the relative box lips 13, after inserting into it the products to be contained.

[0018] The box hence assumes the shape shown in perspective view in Figure 4, in which the lips 13 of the box side panels are inserted into the box in contact with the panel 3, and are securely retained thereat by the tabs 11 (as already fully described in the aforesaid prior patents).

[0019] A last important characteristic of the aforedescribed box is the fact that (simultaneously with the aforedescribed glue strip 25) two separate glue spots 30 are also applied to the secondary panel 5 (folded into the position shown in Figure 2), in proximity to the free edge of this panel: the position of the glue spots 30 is such that, under the conditions in which the finished flattened box lies (Figure 3 and Figures 4-6), these glue spots 30 do not come into contact with the lid 20, so enabling it to be lifted away from the secondary panel 5 when the box lid is opened (Figure 5).

[0020] It is also important to note that the panel 5 is securely joined (glued) to the panel 1 along its free edge, superposed on the glue strip 25, and also along the free edge of the panel 5 by the glue spots 30. It follows that, in the finished box, the panel 5 is unable to substantially sway about the panel 1, so giving considerable rigidity to the closed box (Figure 4), this rigidity being enhanced by the fact that the side closure panels 10 project from the panel 1 (which, as stated, is substantially rigid, being glued to the panel 5) and that the lips 13 rest on the inner surface of the panel 3 where they are retained by the tabs 11 inserted into the cuts 15 of the side panels 10, 13.

[0021] As already stated, to open the box for the first time, the appendix 23 is gripped with two fingers and the

lid 20 lifted to break the knurling 21 which joins it to the remainder of the panel 1.

[0022] When the lid is to be reclosed from the lid-open position (Figure 5), it is rotated into the position of Figure 6 and the appendix 23 inserted into the aperture or slot 24 of the panel 5 (Figure 6): this operation can be carried out very easily because that portion of the panel 5 visible (Figure 5) in the space left free by the lid 20 (in the panel 1) is substantially rigid, it being prevented from flexing substantially towards the box interior by the glue spots 30, in collaboration with the glue strip 25.

[0023] When in its position of Figure 6, with the lid 20 reclosed in the described manner, the lid appendix 23 is securely retained in this position because the panel 5 is substantially rigid with the panel 1 and because the appendix 23 is positioned (in Figure 6) below the panel 5 (extending through the aperture 24), while the remaining portion of the lid is disposed above the panel 5, so that the reclosed box (Figure 6) has considerable stability and rigidity.

Claims

1. A box formed in one piece from a sheet of punched, crease-lined and knurled cardboard or the like, comprising:

- four consecutive main panels (1-4) and a secondary panel (5) projecting from the fourth main panel (4), these panels being separated from each other by longitudinal parallel folding lines (6-9), and

- two side closure panels (10) and flaps projecting from the ends of respective main panels (1) and separated from them by transverse folding lines (12) perpendicular to said longitudinal folding lines (6-9),

- the fourth main panel (4) and the secondary panel (5) being folded about the longitudinal folding line (8) which separates the third (3) from the fourth main panel (4) to be superposed on the third panel (3), the first main panel (1) being folded about the longitudinal folding line (6) which separates it from the adjacent second main panel (2) so that the first main panel (1) is superposed on the secondary panel (5), onto which a portion of said first panel (1) is fixed by glue,

- in the first main panel (1) there being provided a breakable knurling (21) bounding a lid (20) openable by tearing and rotatable about the longitudinal folding line (6) which separates the first (1) from the second main panel (2), from said lid (20) and from the opposite side of the folding line (6) which joins it to the adjacent second main panel (2) of the box there extending a projection (23) defined by a cut provided in the first main

panel (1), in the secondary panel (5) there being provided a cut defining a slot (24) into which said projection (23) is insertable and is retained to maintain the box closed after the lid (20) has been opened following breakage of the knurling bounding the lid (20), **characterised in that** said glue which fixes the first panel (1) to the secondary panel (5) is applied as a continuous thin strip (25) on said secondary panel (5) along and in proximity to the folding line (9) which separates it from the fourth main panel (4).

2. A box as claimed in claim 1, **characterised in that** the first panel (1) is also joined to the secondary panel (5) by further glue spots (30) applied in proximity to the free edge of the secondary panel (5) outside that region thereof on which said lid (20) is superposable in the closed box.

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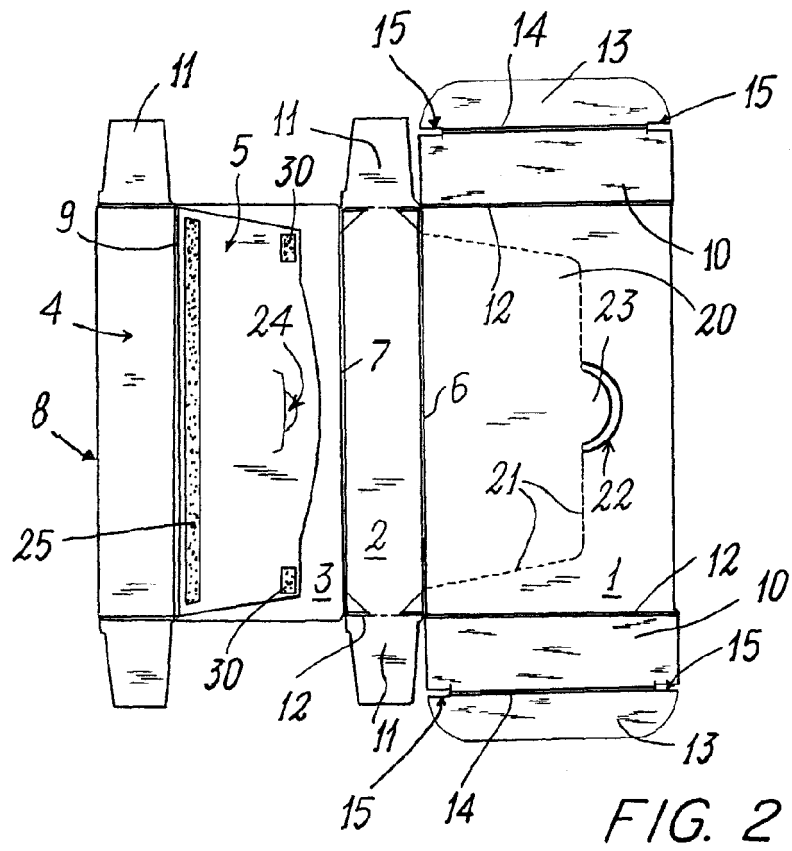
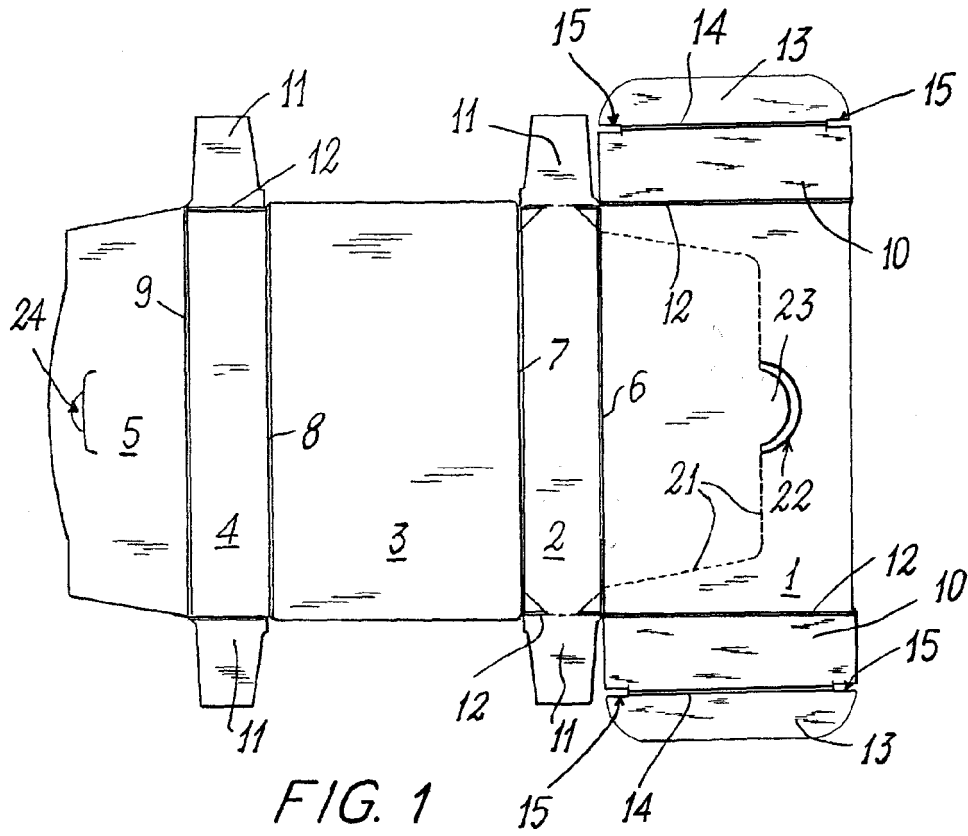
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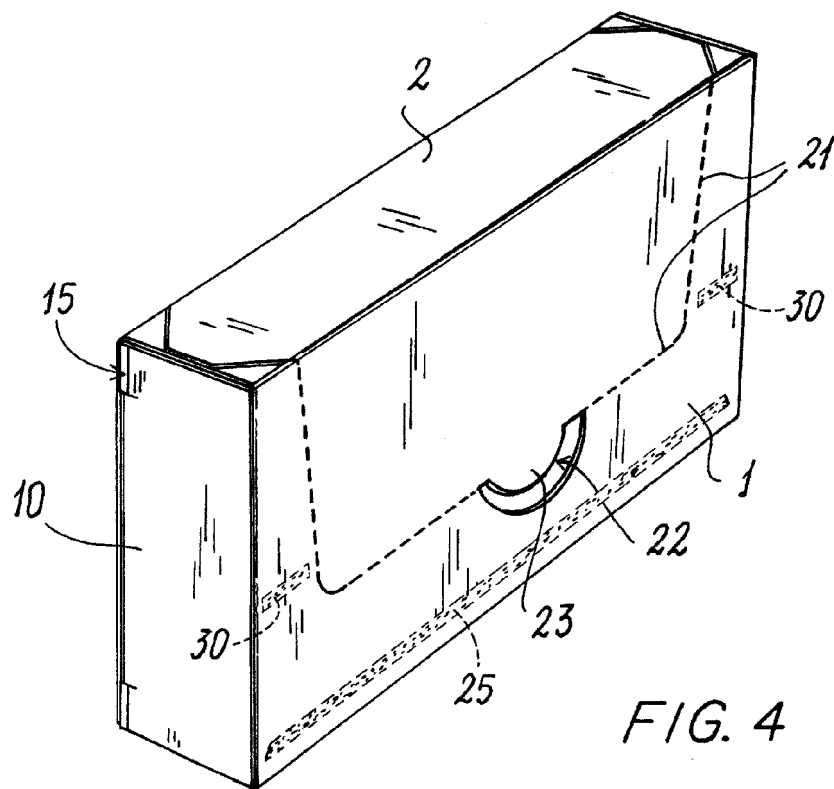
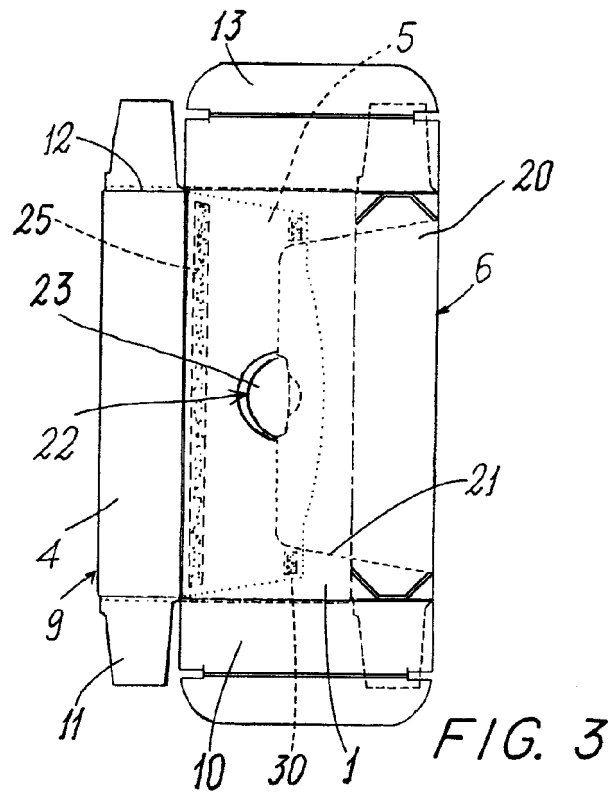
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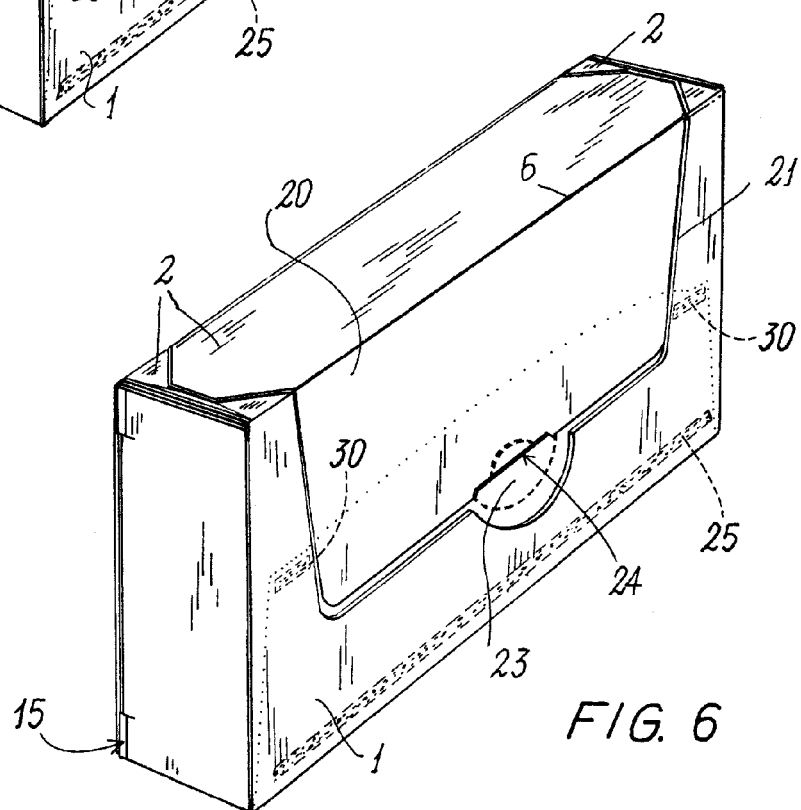
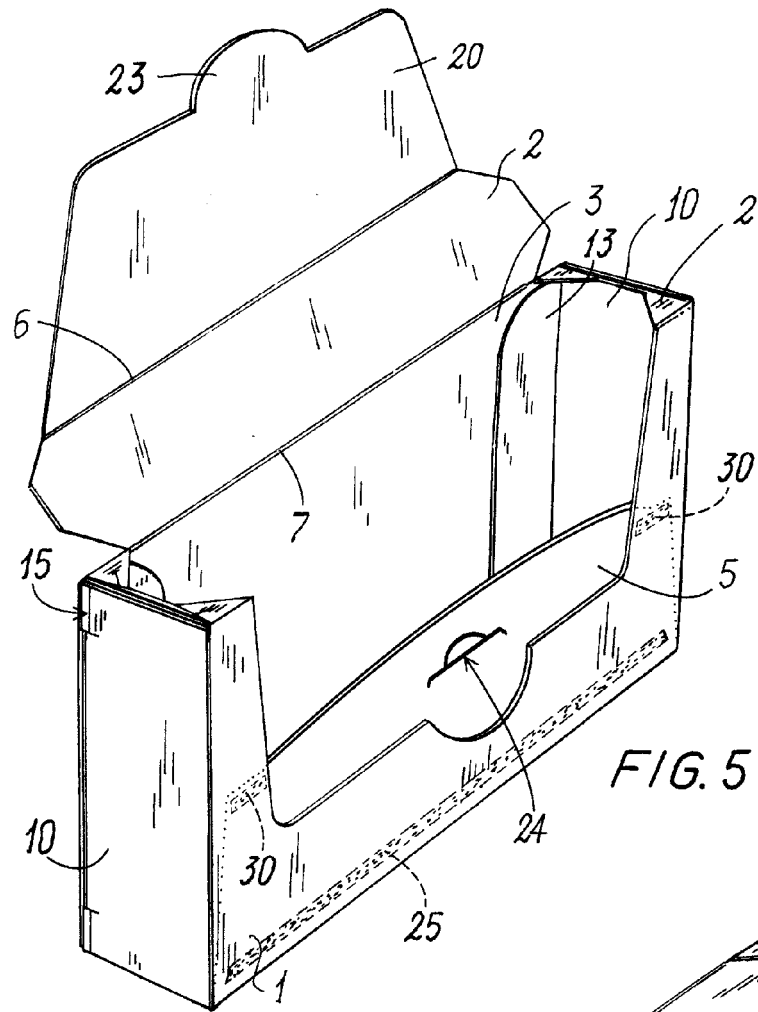
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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	EP 1 538 090 A (GI BI EFFE SRL [IT]) 8 June 2005 (2005-06-08) * paragraph [0022]; figure 2 *	1	INV. B65D5/02 B65D5/54
Y	-----	2	
Y	US 5 078 273 A1 (KUCHENBECKER MORRIS W [US]) 7 January 1992 (1992-01-07) * column 6, lines 39-46; figures 2,3 *	2	
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			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 22 February 2007	Examiner Visentin, Mauro
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 06 12 2991

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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22-02-2007

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