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(54) Box with tamper-proof lid

(57) A box having at least one tamper-proof lid (10) in which a cut (16) is provided to induce breakage of the lid (10) and highlight its tampering when the lid (10), initially closed, is opened for the first time.

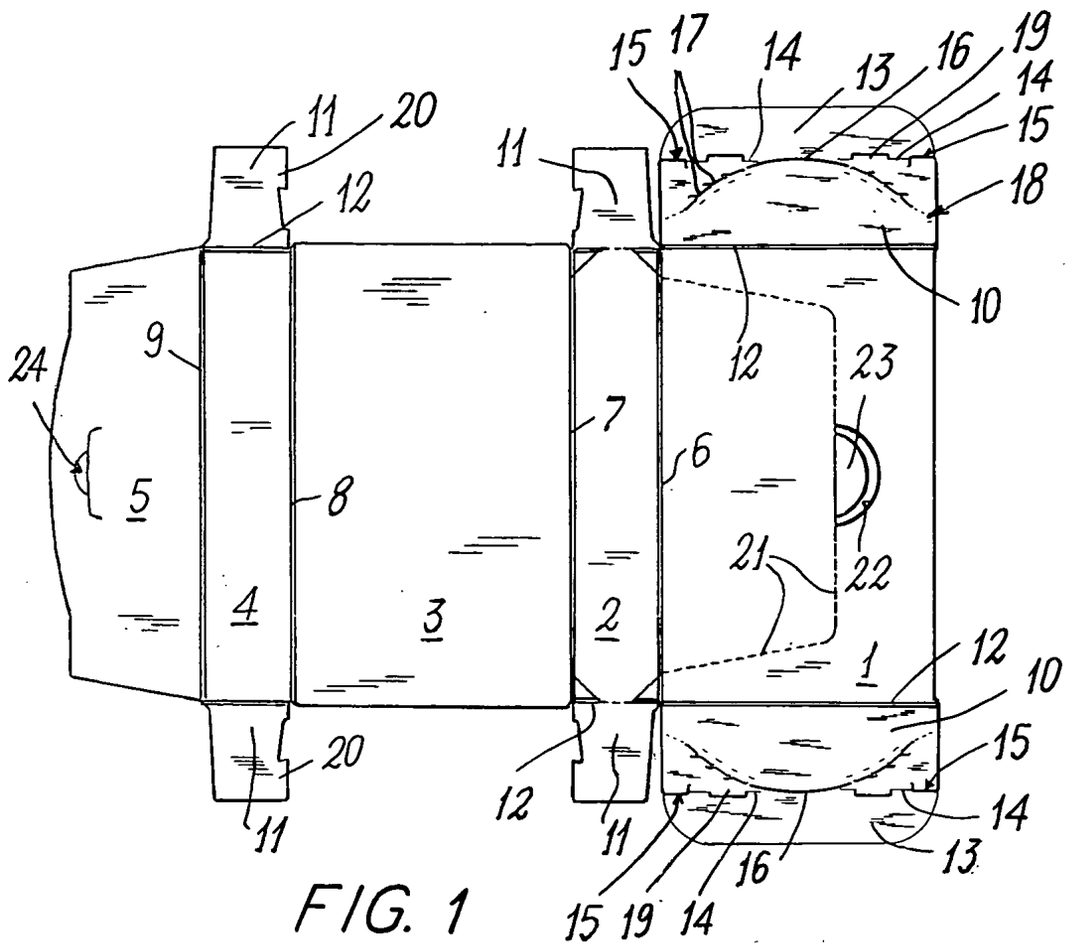

FIG. 1

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Description

[0001] The present invention relates to a box with tamper-proof lid formed from a single piece of punched and crease-lined cardboard or similar flexible material, of the type having at least one closure panel of high resistance to opening with at least one flap positioned below and in contact with said closure panel when this is closed with a tab projecting therefrom inserted into the box, said tab being folded from the panel about a folding line, the two ends of which present cuts into which said flaps extend to retain the tab in its 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 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, knurled lines being provided, which are broken when the closure panels are opened for the first time, to highlight the fact that the box has already been opened.

[0003] The boxes described in the aforesaid prior patents are very efficient, but they all present the drawback of being able to be opened, using considerable care and patience, without breaking the said knurling, by inserting a thin rigid blade below the closed panel, releasing the box flaps which engage and retain the tabs projecting from said closure panel, then rotating the closure panel (again by means of the thin rigid blade) to open the box lid; this fraudulent box opening operation is very laborious and delicate, but it can be done.

[0004] The main object of the present invention is to provide a box similar to those described in the aforesaid prior patents, but which is effectively tamper-proof, in the sense that it cannot be opened without tearing a large part of the box lid.

[0005] A further object is to provide a box which is of low production cost and can be made up and closed in the manner of a common box of similar type.

[0006] These and further objects are attained by a box with tamper-proof lid, comprising

- four consecutive main panels (1-4) and a flap (5) projecting from the fourth main panel on which the first main panel (1) is superposed and glued, the main panels and said flap being separated from each other by longitudinal parallel folding lines (6-9),
- two closure panels (10) for the two ends of the box and projecting from the ends of at least one of the main panels (1, 3),
- a tab (11) projecting from the ends of at least one of the main panels (2, 4) consecutive to that (1, 3) from which the closure panel (10) projects, the closure panels (10) and said tabs (11) being separated from the main panels (1-4) by transverse folding lines (12) perpendicular to said longitudinal folding lines (6-9),
- a lip (13) projecting from each closure panel (10) and separated from it by a folding line (14) the two ends of which are both incised by a short cut (15), the width of each closure panel (10) between the folding lines (12, 14) which separate it from the adjacent main panels and from the respective lip (13) being substantially equal to the width of that main panel adjacent to that from which the closure panel (10) projects, characterised in that in the closure panel (10) there is provided a continuous cut (16) which intersects the folding line (14) and extends with a succession of separate short cuts (17) and a knurling (18) towards the side edges of the said closure panel.

[0007] Preferably, said continuous cut (16), the succession of short cuts (17) and the knurling (18) provided in the closure panel (10) extend along a substantially arc-shaped line.

[0008] Again preferably, in said lips (13), external to that portion of the closure panel (10) bounded by the continuous cut (16), C-shaped cuts are provided defining appendices (19) projecting from the adjacent closure panel (10) to leave free a corresponding window in the lip when this is folded about the respective folding line (14) which separates it from the closure panel (10), from the tabs (11) there laterally projecting a hook-shaped tooth (20) which when the box is closed projects through the window left free in the lip (13) by the adjacent appendix (19) to retain this lip inside the box.

[0009] The invention also relates to the sheet in the form of a single piece of punched and crease-lined cardboard or similar flexible material for forming a box having the aforesaid characteristics.

[0010] 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 and crease-lined 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 represents on a considerably enlarged scale one of the two box closure panels, shown flat and integral as it appears in Figures from 1 to 3;
Figure 5 is a perspective view of a finished and closed box, with its closure panel integral; and
Figure 6 shows, on an enlarged scale and seen from a different angle, an end portion of the box of Figure 5, but with its closure panel tampered with, torn and partially lifted upwards.

[0011] Reference will firstly be made to Figure 1, which shows, spread out in plan view, a piece of punched, crease-lined and knurled cardboard compris-

ing four main panels 1-4 and a flap 5 separated from each other by longitudinal parallel folding (crease) lines 6-9. A 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.

[0012] 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.

[0013] As can be seen in particular from Figure 4, in each of the two lips 13 there are provided two C-shaped cuts which define appendices 19 projecting outwards from the panel 10 when in its flattened position (Figures 1-4). When the lips 13 are folded about the respective folding lines 14 (which occurs when the two ends or lids of the made-up box are closed as in Figure 5), the appendices 19 remain coplanar with the relative panel 10 to leave free within the lips 3 windows into which hook-shaped teeth 20 (Figures 1-3) projecting laterally one from each tab 11 are inserted and hooked. When the box is closed, those 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, to hence considerably obstruct the opening of the box lid.

[0014] All the aforedescribed 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 lid of the box of which they form part.

[0015] 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 23 which can be gripped with two fingers of a hand and pulled outwards to break the panel 1 along said knurling: in this manner a lateral lid is obtained, rotatable about the folding line 6.

[0016] It can also be seen that in the flap 5 there is provided a cut defining an aperture 24 into which the appendix 23 of the rotatable lateral lid can be inserted and retained after it has been opened to extract contained articles from the completed box.

[0017] The presence of the said lateral lid is not however necessary for implementing the present invention.

[0018] The new and characteristic part of the box according to the invention regards the structure of its end lids formed by the closure panel 10 and the lip 13 connected to and projecting from it.

[0019] As can be seen in particular from the enlarged scale reproduction of Figure 4, a continuous arc-shaped elongate cut 16 is provided in the closure panel 10 to intersect the folding line 14 and extend beyond the line 14 into a portion of the lip 13: the cut 16 is continued beyond its ends by a succession of separate short cuts 17 terminating with a knurling 18 which reaches the side edges of the panel 10 (Figure 4).

[0020] After the box has been made up and closed (Figure 5), if an attempt is made to lift the end lid with a finger, an inevitable traction is exerted upwards on the panel 10 at the cut 16, so causing the panel to break along the short cuts 17 and the knurlings 18: the closure panel then assumes the attitude shown in Figure 6, immediately highlighting the fact that the box has been tampered with.

[0021] Even if, with the closure panel unbroken and with the end lid (of which it forms part) closed (Figure 5), a rigid blade is inserted between the panel 10 and the tabs 11 to attempt to fraudulently open the lid, the closure panel 10 will again be broken along the short cuts 17 and knurlings 18 given the small size and the consequent weakness of those points of the panel 10 where the panel is complete (i.e. without short cuts and knurlings) on its surface (along the arc-shaped line where the cut 16, the short cuts 17 and the knurlings 18 are provided), while the lip 13 will sufficiently securely retain (even if there were no tab teeth 20 inserted and hooked into the lip apertures left free by the appendices 19) that portion of the panel 10 to which said lip 13 is connected along the folding lines 14.

[0022] Again considering Figure 1, the box is made up by firstly rotating the panel 4 (and with it the flap 5) about the folding line 8 to superpose them on the panel 3, then a thin strip of glue 25 is applied to the flap 5 in proximity to the folding line 9 (Figure 2), after which the panel 1 is rotated about its folding line 6 to superpose it on the flap 5, to which it is then fixed by the strip of glue 25 (Figure 3).

[0023] The box manufacturer has thus terminated box production, piles of flat mutually superposed boxes (Figure 3) then being despatched to the user firm 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 bottom cover of the box, inserts into it the products to be contained, and finally closes the top cover.

[0024] The box hence assumes the shape shown in perspective view in Figure 5, in which the lip 13 (forming part of the box end lid visible in Figures 5 and 6) is inserted below the panel 3 and securely retained thereat by the tabs 11 (as already fully described in the aforesaid prior patents).

[0025] If an attempt is made (possibly using a rigid blade inserted between the closure panel 10 and the underlying tabs 11) to fraudulently open or tamper with the box end lid, of which the panel 10 forms part, the panel will certainly be broken.

Claims

1. A box with tamper-proof lid, formed from a single piece of punched and crease-lined cardboard or the like, comprising

   - four consecutive main panels (1-4) and a flap (5) projecting from the fourth main panel on which the first main panel (1) is superposed and glued, the main panels and said flap being separated from each other by longitudinal parallel folding lines (6-9),
   - two closure panels (10) for the two ends of the box and projecting from the ends of at least one of the main panels (1, 3),
   - a tab (11) projecting from the ends of at least one of the main panels (2, 4) consecutive to that (1, 3) from which the closure panel (10) projects, the closure panels (10) and said tabs (11) being separated from the main panels (1-4) by transverse folding lines (12) perpendicular to said longitudinal folding lines (6-9),
   - a lip (13) projecting from each closure panel (10) and separated from it by a folding line (14) the two ends of which are both incised by a short cut (15), the width of each closure panel (10) between the folding lines (12, 14) which separate it from the adjacent main panels and from the respective lip (13) being substantially equal to the width of that main panel adjacent to that from which the closure panel (10) projects, **characterised in that** in the closure panel (10) there is provided a continuous cut (16) which intersects the folding line (14) and extends with a succession of separate short cuts (17) and a knurling (18) towards the side edges of the said closure panel.

2. A box as claimed in claim 1, **characterised in that** said continuous cut (16), the succession of separate short cuts (17) and the knurling (18) provided in the closure panel (10) extend along a substantially arc-shaped line.

3. A box as claimed in claims 1 or 2, **characterised in that** in said lips (13), external to that portion of the closure panel (10) bounded by the continuous cut (16), C-shaped cuts are provided defining appendices (19) projecting from the adjacent closure panel (10) to leave free a corresponding window in the lip when this is folded about the respective folding line (14) which separates it from the closure panel (10), from the tabs (11) there laterally projecting a hook-shaped tooth (20) which when the box is closed projects through the window left free in the lip (13) by the adjacent appendix (19) to retain this lip inside the box.

4. A sheet in the form of a single piece of punched and crease-lined cardboard or similar flexible material for forming a box having the characteristics resulting from claims from 1 to 3.

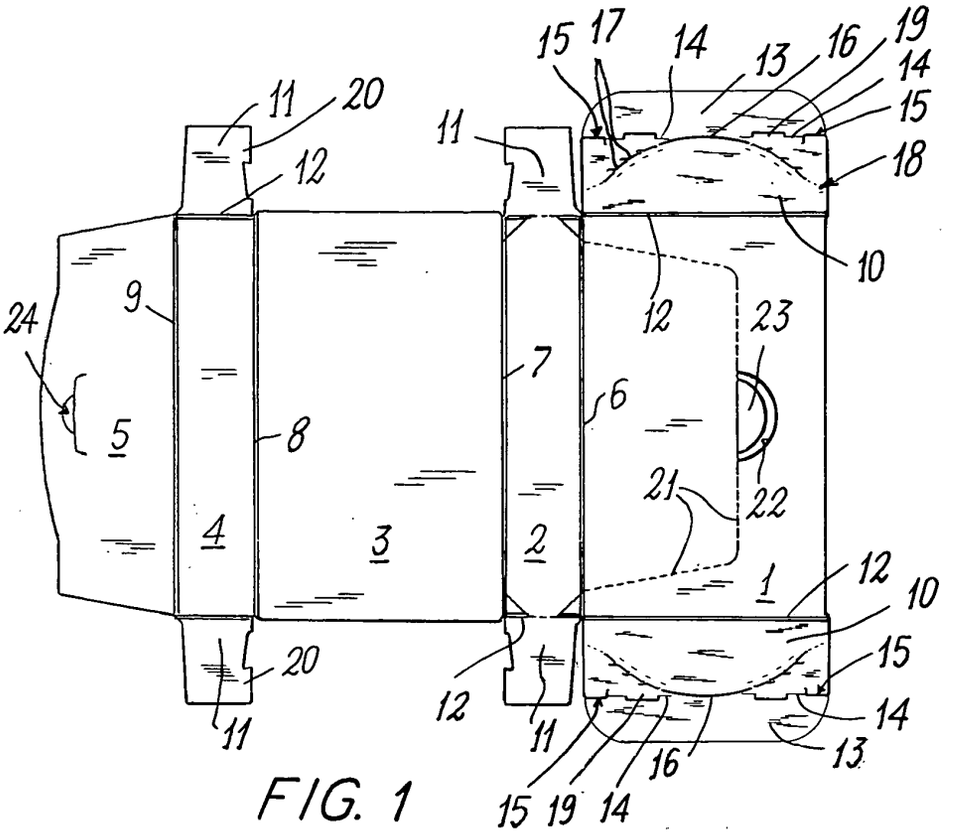
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FIG. 1

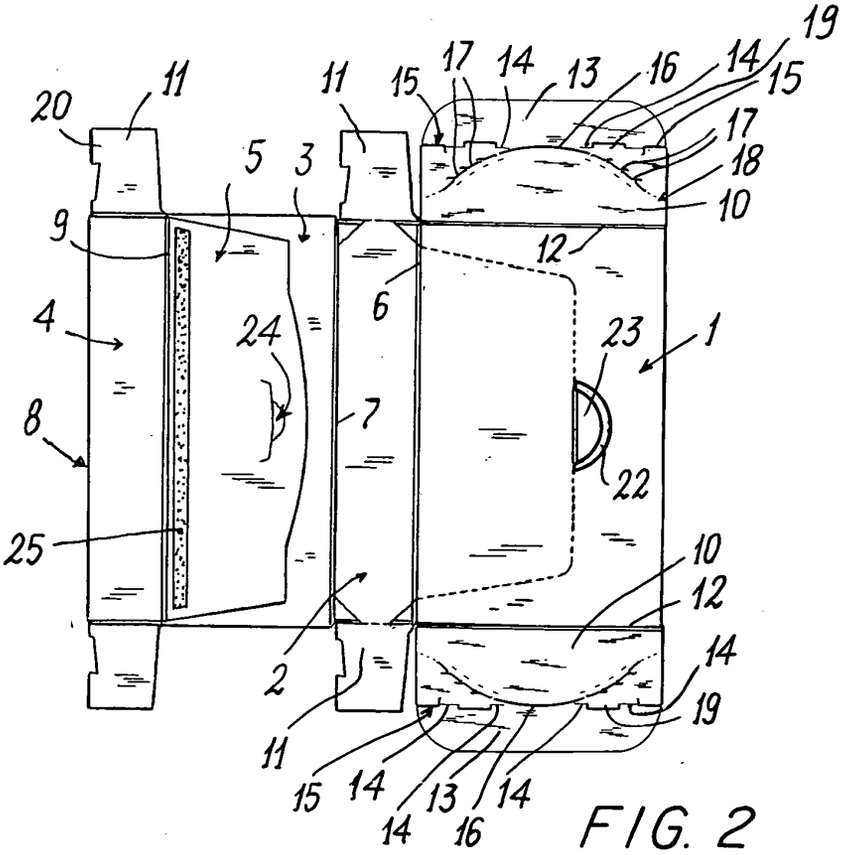
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FIG. 2

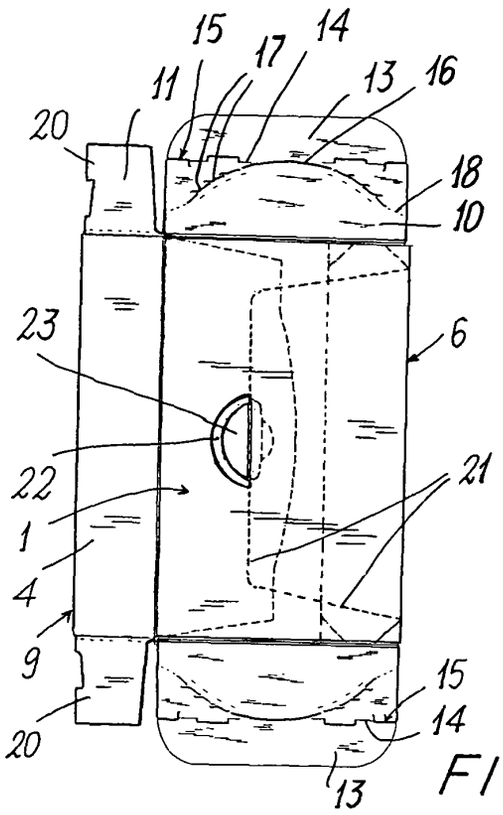
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FIG. 3

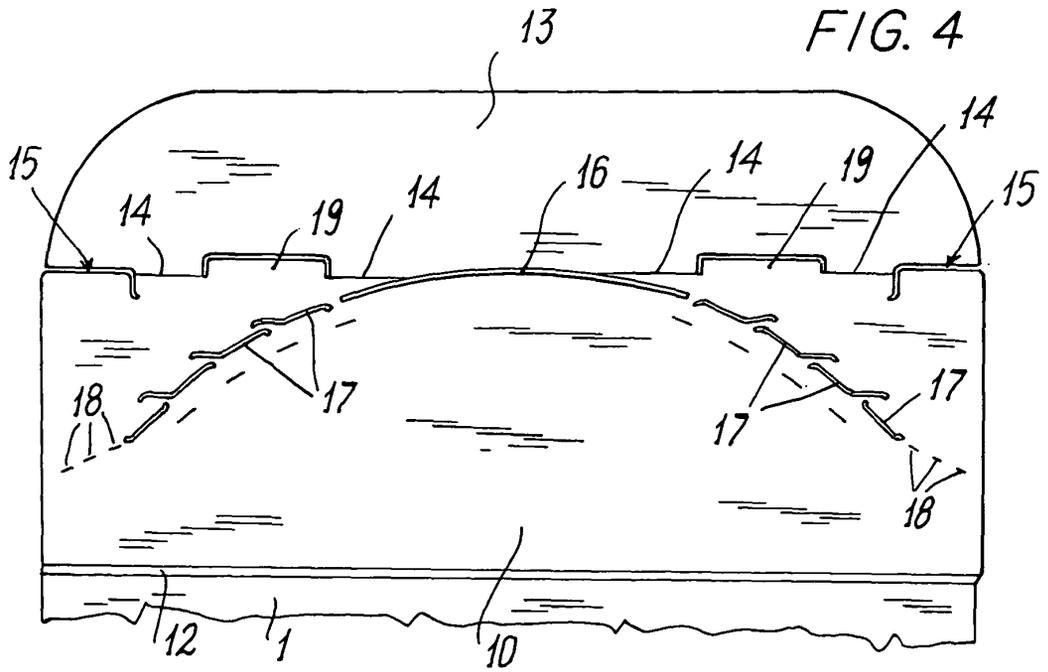
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FIG. 4

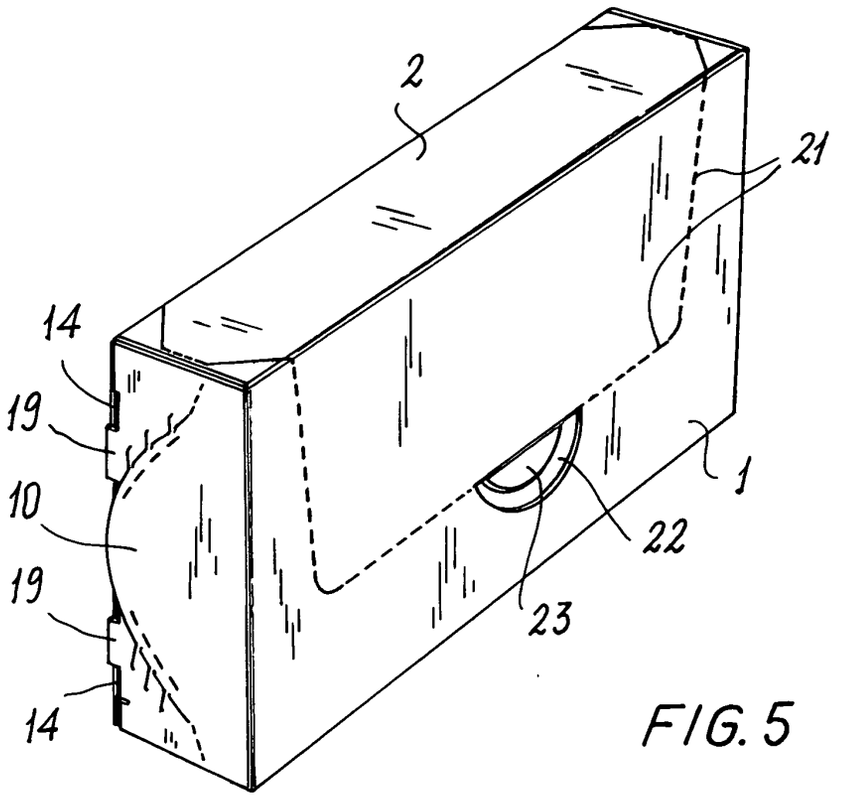

FIG. 5

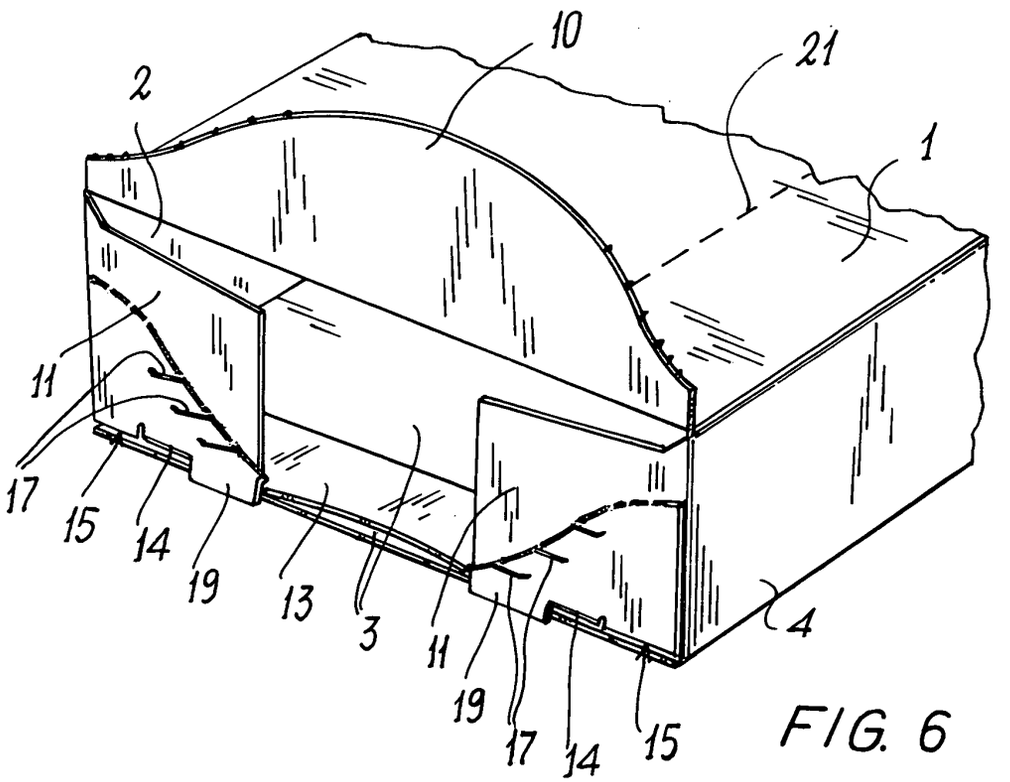

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 04 02 7373

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.7)
D,X	EP 0 709 293 A (GI.BI.EFFE S.R.L) 1 May 1996 (1996-05-01) * column 4, line 41 - line 52; figure 2 * -----	1-4	B65D5/02 B65D5/10 B65D5/54 B65D101/00
P,X	FR 2 847 555 A (FINEGA) 28 May 2004 (2004-05-28) * page 7, line 9 * * page 9, line 26 - last line * * page 11, line 18 - line 20; figure 6 * -----	1,2,4	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 March 2005	Sundell, O

CATEGORY OF CITED DOCUMENTS

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0709293 A	01-05-1996	IT MI942206 A1	29-04-1996
		AT 165782 T	15-05-1998
		DE 69502370 D1	10-06-1998
		DE 69502370 T2	27-08-1998
		EP 0709293 A1	01-05-1996
		ES 2115304 T3	16-06-1998
		IT MI970444 U4	29-04-1996
FR 2847555 A	28-05-2004	FR 2847555 A1	28-05-2004

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