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(72) Inventor: **Robinson, Duncan B.**
Market Harborough,
Leicestersh. LE16 7NY (GB)

(74) Representative: **Leckey, David Herbert**
Frank B. Dehn & Co.
St Bride's House
10 Salisbury Square
London EC4Y 8JD (GB)

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(71) Applicant: **FIELD GROUP PLC**
Old Amersham,
Buckinghamshire HP7 0DD (GB)

(54) **Child-resistant packaging**

(57) A child resistant container 2 comprises a closable wall 10, a closure flap 20 connected to the closable wall 10 and a wall portion 4 having an inner layer 6 and an outer layer 8, said closure flap 20 being inserted between said inner and outer layers 6, 8. The closure flap

20 comprises one or more locking apertures 26 and said inner layer 6 of said wall portion 4 comprises one or more locking tabs 34 which engage in respective locking apertures 26 to prevent the closure flap 20 from being withdrawn from between the inner and outer layers 6,8.

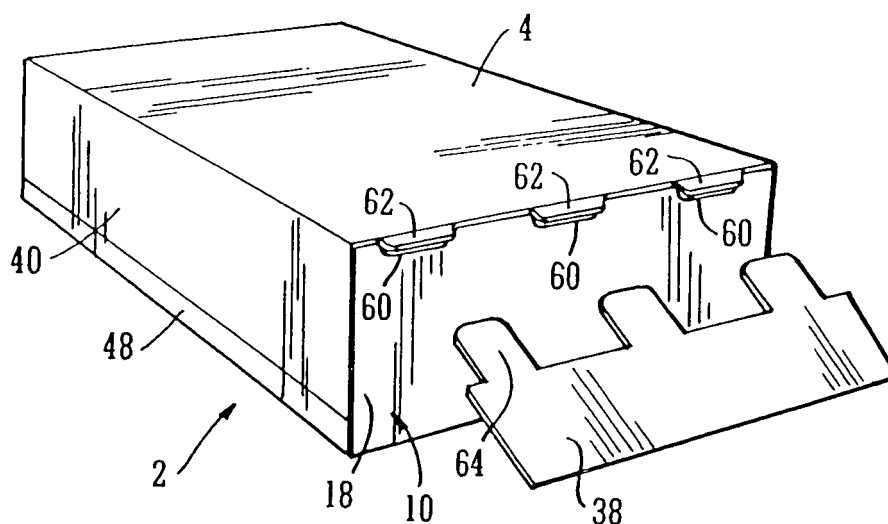


FIG. 1

Description

[0001] The present invention relates to child-resistant packaging.

[0002] With the proliferation of pharmaceutical packaging in particular, there has been an increasing need in recent times for packaging which is easy for a user to open, but which prevents children gaining access to the contents of the package.

[0003] The present invention seeks to provide such a container, and from a first aspect comprises a container comprising: a closable wall; a closure flap connected to said closable wall; a wall portion having an inner layer and an outer layer, said closure flap being inserted between said inner and outer layers of said wall portion; wherein: said closure flap comprises one or more locking apertures and said inner layer of said wall portion comprises one or more locking tabs which engage in respective locking apertures to prevent the closure flap from being withdrawn from between the inner and outer layers of the wall.

[0004] In accordance with the invention, therefore, a closure flap which is attached to a closable wall of the container, is provided with one or more locking apertures with which engage one or more locking tabs provided in an inner wall thickness of the wall portion. This prevents the locking flap being withdrawn from between the wall layers without some action being taken to release the tabs from the apertures. Accordingly, this will prevent inadvertent access to the contents of the container by children.

[0005] A single locking tab and locking aperture may be provided, but preferably a plurality of locking tabs and locking apertures are provided.

[0006] The respective locking tab and locking aperture are preferably configured and arranged such that the tab engages with the aperture substantially in the closed position of the closure flap such that a distal edge of the locking tab engages with an inner edge of the locking aperture.

[0007] Preferably the locking tab is a hinged member, whereby the tab may be hingedly moved out of engagement with the locking aperture to allow opening of the end wall.

[0008] The locking tab may also, or additionally, be flexible such that it may be resiliently deflected out of engagement with the locking aperture to allow opening of the closable wall. In practice, the movement of the tab may be a combination of hinging and flexure.

[0009] In the preferred embodiment, the locking tab is connected to an inner flap of the closable wall. Preferably, the hinged connection is sufficiently stiff that as the inner flap is rotated to a closed position the locking tab will rotate with it, so raising the locking tab. This facilitates engagement of the locking tab with locking aperture provided in the closure flap during closure of the closure flap. At the same time, the connection is preferably such that it allows the locking tab to hinge relative to the end wall

so as to be deflected out of the locking aperture during opening..

[0010] As stated above, the container can only be opened once the locking tab is disengaged from its associated locking aperture. To this end, the container preferably comprises access means which allows a user to access the locking tab for this purpose.

[0011] Preferably, the access means comprises an access aperture provided in the closable wall of the container, the access aperture preferably being aligned with the respective locking tab whereby a release member may be inserted through the access aperture to deflect the locking tab out of engagement with the locking aperture.

[0012] In the preferred embodiment, this access aperture may be provided substantially on a hinge line between the closable wall and the closure flap, adjacent the base of the locking tab.

[0013] Preferably the access aperture is created by a cut line extending between respective portions of the hinge line. Most preferably, the cut is shaped to provide a tab which projects over the access aperture to assist in positioning release means as they are being inserted into the access aperture.

[0014] Preferably, the access aperture is wider than the locking tab whereby a release member which is wider than that tab may be used. This is preferred since, depending on the nature of the material used for the container, a narrower release member may not cause complete disengagement of the locking tab from its locking aperture.

[0015] In order to open the container, as stated above, a suitable release member should be provided. Although this may be provided as a completely separate member, for supply purposes it is preferred that the release member is provided as a detachable part of the container itself.

[0016] The release member should obviously be long enough to extend sufficiently far into the container to release the locking tab.

[0017] Preferably the container is formed from a foldable sheet material, such as cardboard, paperboard, or plastic sheet material. Most preferably it is formed from a one piece blank of such a material, and from a further aspect, the invention also extends to a one piece blank for erecting into a container in accordance with the invention.

[0018] Particularly preferred materials are plastics sheet, e.g. polypropylene sheet, or plastics coated paperboard, which gives some tear resistance to the locking apertures.

[0019] A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a container in accordance with the invention, with its associated release member; Figure 2 shows a longitudinal cross-section taken along centre line of the container of Figure 1;

Figure 3 shows the container of Figure 1 during closing;

Figure 4 shows a longitudinal cross-section taken along the centre line of the container of Figure 3;

Figure 5 shows the container of Figure 1 in a first stage of opening;

Figure 6 shows a longitudinal cross-section taken along the centre-line of the container of Figure 5;

Figure 7 shows the container of Figure 2 fully opened;

Figure 8 shows a longitudinal cross-section taken along the centre line of the container of Figure 7; and
Figure 9 shows a blank for making the container of Figures 1 to 8.

[0020] With reference to Figure 1, a container 2 embodying the present invention comprises a top wall 4 which itself comprises an inner layer 6 and an outer layer 8. It further comprises a closable end wall 10, with a locking mechanism being provided between the end wall 10 and the top wall 4.

[0021] The container 2 is made from a one piece blank 12 of paperboard, cardboard, plastics sheet or other foldable sheet material, as shown in Figure 9. The blank 12 comprises a series of panels connected about parallel fold lines which, when erected, form a tubular body having a double layer top wall 4. The inner layer 6 of the top wall is provided by a inner top wall panel 14 and the outer layer 8 by an outer top wall panel 16 which, when the carton is erected overlies one another.

[0022] As can be seen most clearly in Figure 9, the end wall 10 of the container 2 comprises an end wall panel 18 to which is attached a closure flap 20 along an intermittent hinge line 22. The end wall panel 18 is connected to a base wall panel 24 of the container 2.

[0023] The closure flap 20 comprises a series of three spaced apart locking apertures 26. Aligned with each of these locking apertures 26 is a shallow U-shaped cut-line 28 which extends between the ends of adjacent sections of the intermittent hinge line 22.

[0024] The end wall 10 further comprises an inner end wall flap 30 hingedly connected to the inner top wall panel 14. The inner top wall panel 14 has a series of three circular cuts 32 each of which liberates the distal end of a locking tab 34. Each locking tab 34 is connected to the inner end wall flap 30 by a web 36 of material. The web 36 includes a short cut 37 formed at the proximal end of the tab 34, so as to give the connection some degree of hinging movement. The length of the cut can be chosen to give the desired flexibility of the connection.

[0025] The outer top wall panel 16 of the blank 12 further includes a detachable release member or key 38. This key 38 extends into a glue strip panel 40 of the blank 12 which will lie on the outside of a side wall of the container after erection, the glue strip being provided with a tab 42 which facilitates removal of the key 38 from the container 2.

[0026] In order to make the container 2, the blank 12

is folded up into a tubular form, with a first glue strip 44 glued to a side wall panel 46, the outer top wall panel 16 then being folded over the top of the inner side wall panel 14 and the glue tab 40 being affixed to the second side wall panel 48. Rear end panels 50 of the blank can then be closed to close one end of the container and the container filled with contents as desired.

[0027] The end wall 10 can then be closed. Firstly, as shown in Figure 4 the inner end wall flap 30, to which the locking tabs 34 are attached, is folded down, as shown by arrow A. This partially closes the end of the container 2 and at the same time due to the stiffness of the web 36 causes the tabs 34 to pivot upwardly into contact with the outer layer 8 of the top wall 4 of the container 2.

[0028] The closure flap 18 is then folded upwardly in the direction shown by arrow B, and the closure flap 20 inserted between the inner and outer layers 6, 8 of the top wall 4. As the closure flap 20 is inserted, it will resiliently deflect the tabs 34 downwardly until such time as the distal edge 52 of each tab 34 clicks into position behind the distal edge 54 of the corresponding locking aperture 26 formed in the closure flap 20.

[0029] In this position, the end wall 10 cannot be opened, since pulling the end wall 10 outwardly will merely bring the edges 52, 54 of the locking tabs 34 and locking apertures into firmer engagement, preventing opening of the end wall 10. Even if the distal edge 54 of the locking aperture 26 were to slip under the respective locking tab 34, the end wall 10 will not be able to be fully opened since the distal edge 54 of the locking aperture would eventually engage with the proximal end 56 of the locking tab 34.

[0030] In order to open the end wall 10 of the container 2, the key 38 must be used. As will be seen from Figures 1 and 2, the folding in of the closure flap 20 about the hinge line 22 creates access apertures 60 in the end wall panel 18 adjacent the hinge line 22. This is due to the cut lines 28 formed between the end wall panel 18 and the closure flap 20. Each access aperture has, at its upper side, a projecting tab 62 formed by the material to one side of each cut line 28.

[0031] Each access aperture 60 is wider than the corresponding opening 26 and the corresponding tab 34. The key 38 is formed with three-spaced apart teeth 64 which are also preferably wider than the locking tabs 34.

[0032] To open the container, the teeth 64 of the key 38 are inserted into the respective access apertures 60 in the end wall panel 18, as shown in Figure 5. This is facilitated by the tabs 62 which guide the teeth 64 into the openings 60, at least in the vertical direction.

[0033] As can be seen in Figure 6, the teeth 64 extend between the closure flap 20 and the inner top wall layer 6 so as to engage the upper surface of each locking tab 34. The teeth deflect the locking tabs 34 downwardly, thereby disengaging them from the locking apertures 26 in the closure flap 20, back into the plane of the inner top wall layer 6. The end wall 10 can be opened simply by grasping the sides of the end wall panel 18 and pulling

outwardly as shown by arrow C in Figure 8. It will be seen that the key 38 remains engaged in the access apertures 60 in the end wall panel 18. Opening of the end wall 10 allows the locking tabs 34 to return to their original positions so that they may once more act to engage the locking apertures 26 in the closure flap 20 when that closure flap 20 is next inserted between the inner and outer top wall layers 6, 8.

[0034] It will be appreciated that various modifications may be made to the embodiment above within the scope of the invention. For example, although it is preferred that a plurality of locking apertures 26 and locking tabs 34 are provided, a single such aperture 26 and tab 34 may be provided if desired. Also, the tabs 34 and apertures 26 need not have the particular shapes shown, but may have any shape which allows engagement of the two elements.

[0035] In addition, the locking tabs 34 need not be joined to the inner end wall flap 30, as shown. They could equally merely be formed to project from the inner top wall panel 14.

[0036] It should be understood that the closable wall 10 may extend fully or only partly across a face of the container. Similarly, the inner and outer wall layers 6, 8 need not be coterminous. For example one layer may extend over a full face of the container, but the other only extend over a limited extent of the face.

Claims

1. A container comprising:

- a closable wall (10);
- a closure flap (20) connected to said closable wall (10, 18); and
- a wall portion (4) having an inner layer (6) and an outer layer (8), said closure flap (20) being inserted between said inner (6) and outer (8) layers of said wall portion (4);

wherein said closure flap (20) comprises one or more locking apertures (26) and said inner layer (6) of said wall portion (4) comprises one or more locking tabs (34) which engage in respective locking apertures (26) to prevent the closure flap (20) from being withdrawn from between the inner (6) and outer (8) layers.

2. A container as claimed in claim 1 wherein a plurality of locking tabs (34) and locking apertures (26) are provided.
3. A container as claimed in claim 1 or 2 wherein the respective locking tab (34) and locking aperture (26) are configured and arranged such that the tab (34) engages with the aperture (26) substantially in the closed position of the closure flap (20) such that a

distal edge (52) of the locking tab (34) engages with an inner edge (54) of the locking aperture (26).

4. A container as claimed in any preceding claim wherein the locking tab (34) is a hinged member.
5. A container as claimed in any preceding claim wherein the locking tab (34) is a flexible member.
6. A container as claimed in any preceding claim wherein the locking tab (34) is connected to an inner flap (30) of the closable wall (10).
7. A container as claimed in claim 6 wherein the connection (36) is sufficiently stiff that as the inner flap (30) is rotated to a closed position the locking tab (34) will rotate with it.
8. A container as claimed in any preceding claim comprising access means (60) which allows a user to access the locking tab (34) for release purposes.
9. A container as claimed in claim 8 wherein the access means comprises an access aperture (60) provided in the closable wall (10) of the container.
10. A container as claimed in claim 9 wherein the access aperture (60) is aligned with a respective locking tab (34).
11. A container as claimed in claim 9 or 10 wherein the access aperture (60) is provided substantially on a hinge line (22) between the closable wall (10, 18) and the closure flap (20), adjacent the base of the locking tab (34).
12. A container as claimed in claim 11 wherein the access aperture (60) is created by a cut line (28) extending between respective portions of the hinge line (22) between the closable wall (10, 18) and the closure flap (20).
13. A container as claimed in claim 12 wherein the cut is shaped to provide a tab (62) which projects over the access aperture (60).
14. A container as claimed in any of claims 9 to 13 wherein the access aperture (60) is wider than the associated locking tab (34).
15. A container as claimed in any preceding claim in combination with a release member (38) for disengaging said locking tab (34) and said locking aperture (26).
16. A container as claimed in any of claims 1 to 14 comprising a detachable release member (38) for disengaging said locking tab (34) and said locking aper-

ture (26).

17. A container as claimed in any preceding claim formed from a foldable sheet material, such as cardboard, paperboard, or plastic sheet material. 5
18. A container as claimed in claim 17 formed from a one piece blank (12) of foldable sheet material.
19. A container as claimed in claims 17 or 18 wherein said material is plastics sheet, e.g. polypropylene sheet, or plastics coated paperboard. 10
20. A one piece blank of foldable sheet material for forming a container as claimed in any preceding claim. 15

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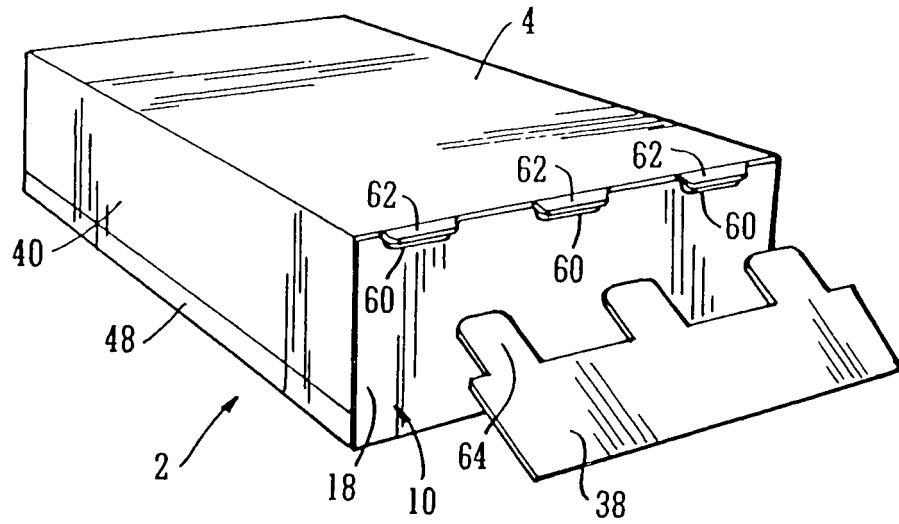


FIG. 1

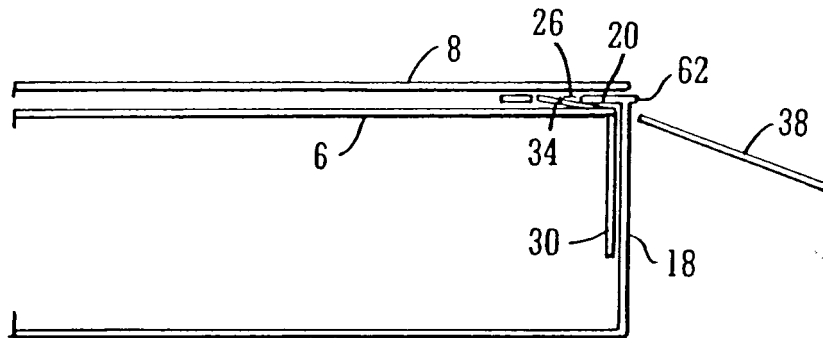


FIG. 2

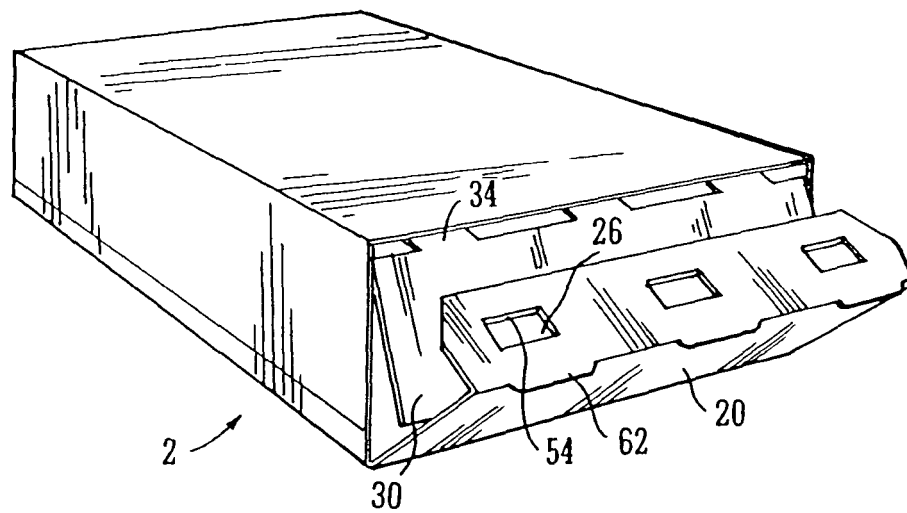


FIG. 3

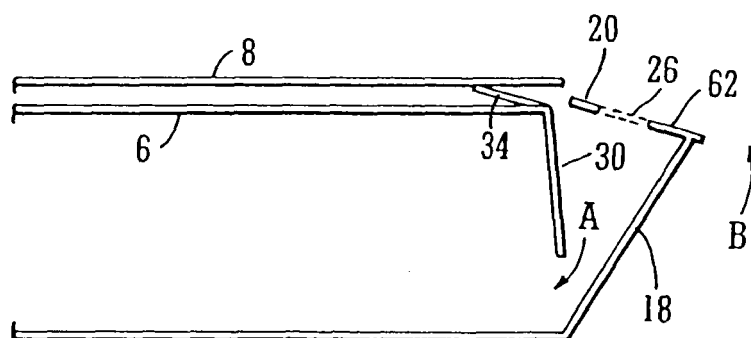


FIG. 4

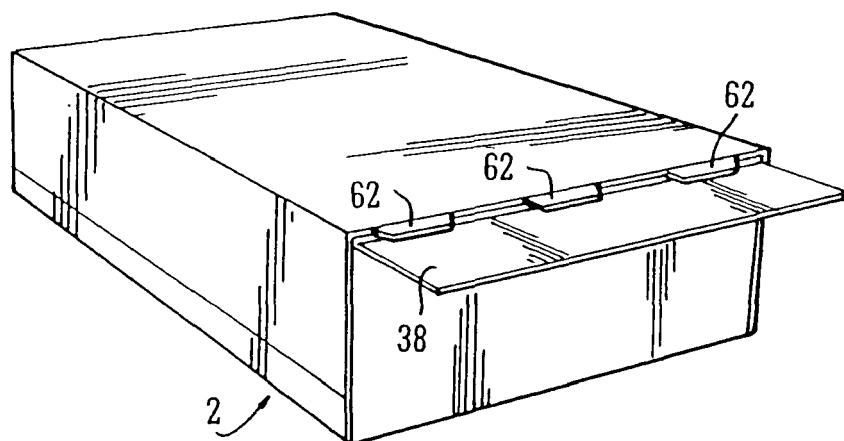


FIG. 5

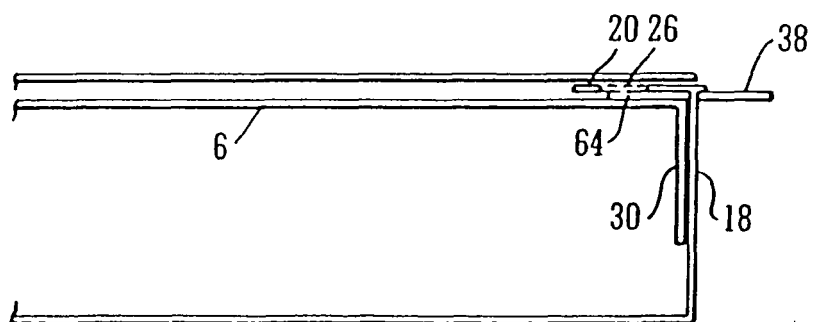


FIG. 6

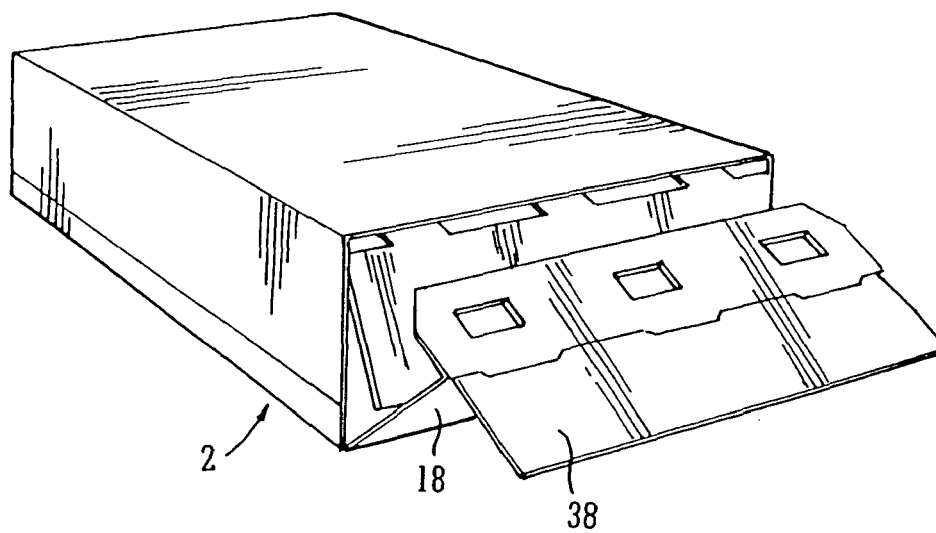


FIG. 7

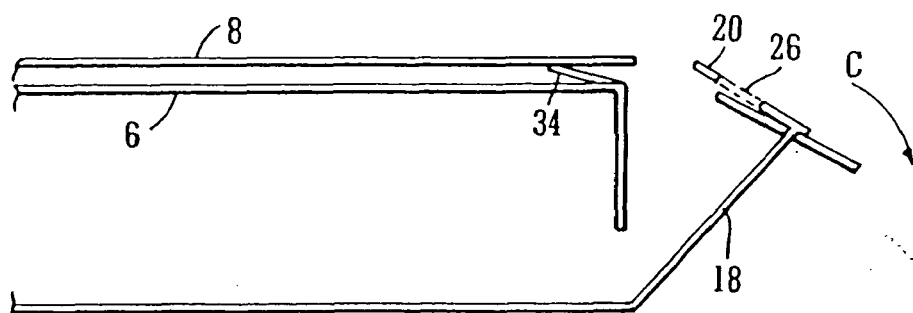


FIG. 8

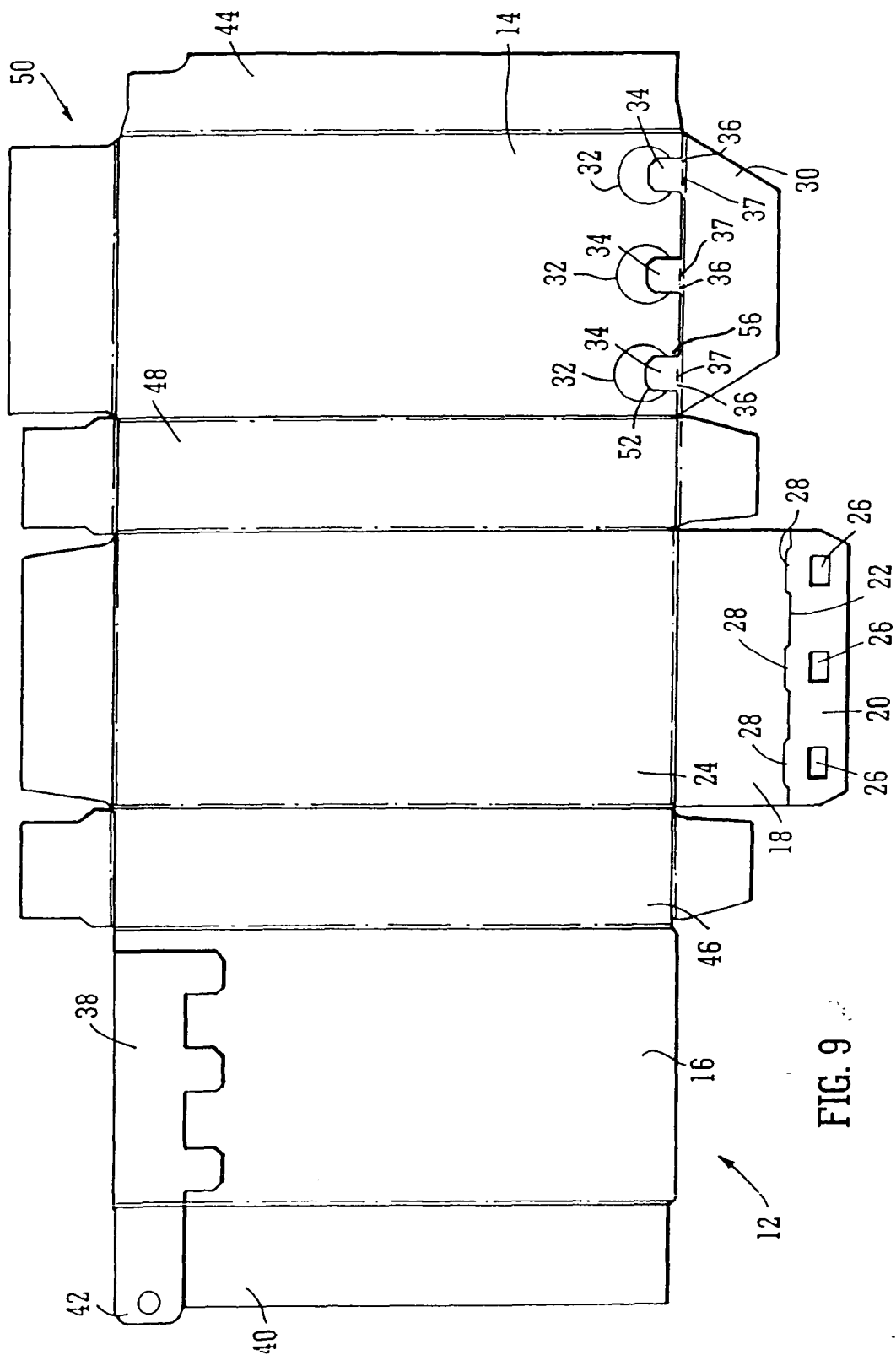


FIG. 9



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 1 433 439 A (WEIS ANDREW L) 24 October 1922 (1922-10-24) * figures 1-9 *	1-6,17, 18,20	INV. B65D5/02
A	----- GB 2 305 164 A (SMURFIT LTD [GB]) 2 April 1997 (1997-04-02) * the whole document *	1-6	
A	----- DE 81 10 597 U1 (SCHUMM ERICH GMBH [DE]) 10 December 1981 (1981-12-10) * the whole document * -----	15	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) B65D
Place of search Munich		Date of completion of the search 23 October 2006	Examiner Balz, Oliver
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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 EPO FORM 1503 03.82 (P04C01)

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

EP 06 25 3668

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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23-10-2006

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 1433439	A	24-10-1922	NONE	

GB 2305164	A	02-04-1997	NONE	

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