(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 484 311 A1**

# (12) EUROPEAN PATENT APPLICATION

(21) Application number : **91870165.7**

(51) Int. Cl.[5] : **B65D 5/54,** B65D 5/46

(22) Date of filing : **21.10.91**

(30) Priority : **29.10.90 EP 90870203**

(43) Date of publication of application :
**06.05.92 Bulletin 92/19**

(84) Designated Contracting States :
**AT BE CH DE DK ES FR GB GR IT LI LU NL SE**

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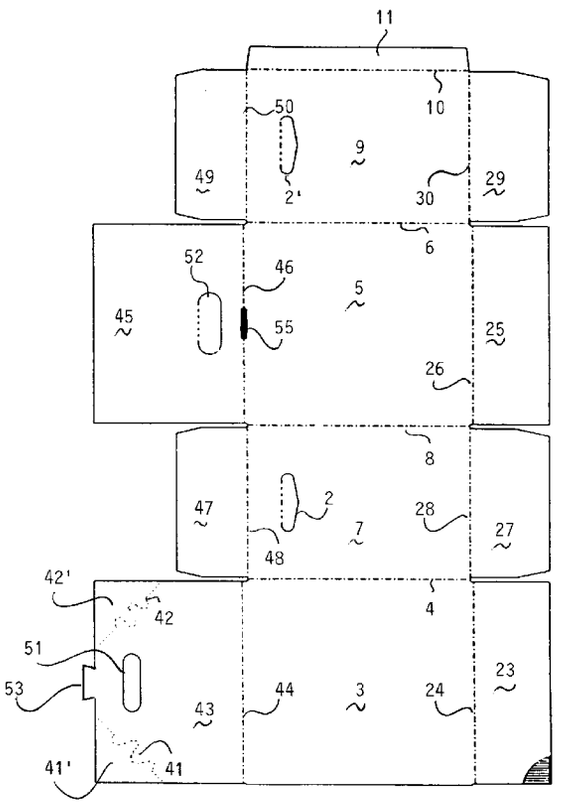
## (54) Reclosable easy-opening box.

(57) Reclosable easy-opening box (1) comprising two opposite longitudinal lateral faces (3,5) and two opposite transverse lateral faces (7,9) binding both said longitudinal faces (3,5) the transverse faces (7,9) bearing each via a folding line (28,30,48, 50) a transverse bottom flap (27, 29) and a transverse cover flap (47,49) the width of which substantially corresponds to the width of the corresponding transverse face (7,9), the longitudinal faces (3,5) bearing each via a folding line (24,26,44,46) a longitudinal bottom flap (23,25) and longitudinal cover flap (43,45) the width of which substantially corresponds to the width of the corresponding longitudinal face (3,5), at least one cover flap, called overlapping flap, being designed to overlap at least another flap(s) when the box (1) is closed, wherein at least the overlapping flap (43) or flaps (43,45) is/are equipped with at least one partially precut line (41,42 ;61,62,71,72), that is interrupted by a sinusoidal section of partially precute line, at least the area of the overlapping flap (43) or flaps (43,45) defined by the said partially precut line (41,42 ;61,62,71,72) and the side edges being assembled with underlying flap(s) (45 ;47,49) under prestress.

Fig. 1

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The present invention relates to a box which is easy to open, and reclosable, particularly to a box made of a sheet material, useful as a container.

Liquid products are generally contained in plastic bottles or containers when delivered to customers. Such bottles or containers may present suitable design but are generally difficult to store and stack. Moreover, there is a need to store such bottles or containers in an outer box and/or to combine more than one bottle or container in a single box which protects the content against undesirable external influences, e.g. direct sunlight, dust; and damages especially caused by shocks, falls, etc. .. and which further allows easier handhling of several bottles or containers together and facilitates storage and stacking.

The "American style box" for instance, is quite often used for the above purposes. This type of box, generally made of cardboard, comprises four lateral faces, each bearing an upper flap and a lower flap having a width substantially of the same dimension as the width of the corresponding face. At least two opposite flaps, generally the flaps bound to the longitudinal faces, present a height of substantially half the width of the adjacent face in order to form a closed bottom face or cover face of the box when folded adequately along a folding line between the lateral face and the corresponding flap. The box may be kept closed by an adhesive tape binding together two opposite longitudinal flaps, by gluing together two superimposed flaps or by stapling together two superimposed and/or opposite longitudinal flaps.

The above known boxes are generally not customer-friendly or environmentally friendly. In fact, customers have to open the box respectively, by tearing off the adhesive tape, by using a cutting tool, for instance a knife, in order to cut the adhesive tape or means, e.g. a screwdriver, to remove the staples. Moreover, opening a box with glued flaps generally results in tearing up the box which can thus no more be reclosed which is often wanted for further storage of the contents remaining after first partial use, since the glued assembly has to be strong and resistant, particularly in the case of heavy contents.

Also known in the package art are boxes, more particularly cardboard boxes, intended for the packaging of apparatus or devices of different kinds, comprising two opposite lateral longitudinal faces and two opposite lateral transverse faces binding both longitudinal faces, the transverse faces bearing each a transverse bottom flap and a transverse cover flap the width of which substantially corresponds to the width of the corresponding transverse face, the longitudinal faces bearing each a longitudinal bottom flap and a longitudinal cover flap the width of which substantially corresponds to the width of the corresponding longitudinal face, at least two opposite cover flaps having a height arranged to overlap when the box is closed. The overlapping flaps are generally glued together and/or held together by staples and/or an adhesive tape and/or by a tongue extending from the outer edge of the upper cover flap and arranged for entering into a slit made in a folding line between the opposite underlying cover flap and the corresponding longitudinal face.

The above type of box, however, has all the disadvantages recited in the case of the "American style box".

US-A-3 368 739 discloses a device for opening and reclosing a carton. It has a tab in an upper reclosure section of an overlying panel that is inserted through an aperture in an underlying panel.

GB-B-1 346 110 discloses cartons and blanks for forming cartons. The upper of a pair of end flaps is formed with a pair of spaced lines of weakness whereby, to open the carton, a user may effect a separation operation along said lines of weakness. According to that reference, the separation operation provides a tab for engagement in a slot in the lower of said pair of end flaps for effecting reclosing. The lines of weakness are said to be inclined throughout their lengths to the line of juncture between the end flaps and the corresponding side wall, and to include portions which extend parallel to the line of juncture. The reclosing still requires introducing a tab in a slot.

The aim of the present invention is to provide a box which is easy to open and reclosable after use, which may be used according to the above, but which does not present the disadvantages of the current boxes.

Another aim of the invention is to provide a box which is easy to open and reclosable after use, but which does not require a tab for reclosure.

A further aim of the invention is to provide a box which is easy to open without requiring a special tool and without causing problems to the user.

Another aim of the invention is to provide a box which is reusable after first opening, since it is not damaged in any way which would inhibit or exclude further use.

A further aim of the invention is to provide a box which ensures a maximum of protection against dust or other undesirable external influences, even after a first opening.

The present invention provides such a box, responding to the needs and aims mentioned hereinbefore, which is easy to open and reclosable. This box is referred to as "reclosable easy-opening box".

According to the present invention, the reclosable easy-opening box comprises two opposite longitudinal lateral faces and two opposite transverse lateral faces binding both said longitudinal faces, the transverse faces each bearing via a folding line a transverse bottom flap and a transverse cover flap, the width of which substantially corresponds to the width of the corresponding transverse face, the longitudinal faces bearing each via a folding line a longitudinal bot-

tom flap and a longitudinal cover flap the width of which substantially corresponds to the width of the corresponding longitudinal face, at least one cover flap, called overlapping flap, being designed to overlap at least another flap when the box is closed; the box according to the invention is characterized in that at least the overlapping flap or flaps is/are equipped with at least one partially precut line, that is interrupted by a section of partially precut lines directed according to a direction crossing it, at least the area of the overlapping flap or flaps defined by the said partially precut line and the side edges being assembled with underlying flap(s) under prestress.

The box according to the present invention is particularly convenient since the user may easily open and disclose the contents by opening the upper overlapping flap by tearing up the partially precut line. Another advantage of the box according to the invention is that it is reclosable after having torn along the precut lines. Since the flap or flaps are assembled under prestress, the torn up part is maintained in closed position by a force acting on it by pressing it edgewise against the corresponding remaining part.

According to a first embodiment, at least two opposite cover flaps have a height such that they overlap when the box is closed and at least the overlapping flap, more particularly a longitudinal flap, has a height substantially corresponding to the width of the adjacent lateral face.

Pursuant to another embodiment, the cover flaps may be arranged according to the "American style" thus forming two overlapping flaps. Preferably, each overlapping flap is provided with two partially precut lines parallel to two opposite diagonal directions, defining two triangular areas, preferably arranged at the opposite side to the folding line.

Each overlapping flap may be assembled under prestress to the underlying flap or flaps through areas as defined by the partially precut line(s) and the side edges of the corresponding flap or through essentially the whole surface of the said overlapping flap.

In the case, the overlapping is assembled under prestress to the underlying flap(s) through essentially the total surface of said overlapping flaps, the underlying flap(s) may also be provided with partially precut lines essentially in register with the corresponding precut lines of the flap(s).

The "reclosable easy opening box" according to the invention is preferably made of a relatively thick sheet material, like a corrugated fibreboard. The thickness of the sheet material along with the stiffness of that material understandably further improves the reclosability of the box, since it allows the application of a reasonable stress acting on the different parts of the closing flaps and thus assures that the opposite parts remain in contact and allow reclosing of the box.

Advantageously, the area of the outer overlapping flap defined by the said outer overlapping flap and the corresponding lateral face is provided with a handgrip known per se. Said handgrip facilitates the tearing of the partially precut lines.

Preferably,the handgrip is then arranged between both triangular areas, preferably close to the outer zone, opposite the folding line.

This arrangement keeps to a minimum the power to be provided by the user in order to open the box by tearing up the precut line and ensures the best assembly strength of the closed box before the partially precut line is torn up.

In a preferred simple embodiment, the handgrip consists in an aperture or adequate area defined by a partially precut line, to be pushed in by the user. This last embodiment ensures a suitable protection against dust or other undesirable external influences since all box walls remain closed.

The box of the invention preferably comprises the above disclosed easy-opening system on the upper side face of the box. Further, the different flaps are preferably arranged such that the said overlapping flaps are two opposite flaps, most particularly two longitudinal flaps.

In order to facilitate handling by a user, the underlying flap may also be provided with a handgrip allowing the introduction of the user's hand. Said handgrip may also correspond to a known per se embodiment as described above. The user may thus develop a greater force when pulling the overlapping flap in order to tear along the precut line(s). This feature also permits easy handling when carrying the box.

Further details will become apparent from the following description of preferred embodiments and from the attached drawings wherein

- Figure 1: represents an unfolded sheet material intended to constitute a box according to the invention;
- Figure 2: is a schematic perspective view of a box of the invention;
- Figure 3: is a schematic view of the upper face of said box;
- Figure 4: is a view similar to figure 1 of another embodiment of a box according to the invention.

In the drawings the same reference numerals are used for designation of the same or similar means.

Figure 1 shows an unfolded sheet material, for instance double corrugated fibreboard, arranged in order to form a box 1 when suitably folded and assembled.

There are foreseen two longitudinal lateral faces 3 and 5 and two transverse lateral faces 7 and 9. Furthermore the transverse lateral face 9 bears a lip 11 to be assembled, preferably stapled, taped or glued, with the adjacent longitudinal lateral face 3. Instead of a lip 11 fitted to the lateral face 9, an analogous lip could also be provided on lateral face 3 for assembly with face 9. Similarly, a lip 11 extending only on a portion of the height of the lateral face may also be used.

Faces 3, 7, 5, 9 and lip 11 are separated by folding lines 4, 8, 6, 10.

Each transverse lateral face 7, 9 bears a bottom flap 27 and 29 respectively, and a cover flap 47, 49 respectively. The flaps 27, 29, 47, 49 are separated from the lateral transverse faces by folding lines 28, 30, 48 and 50 respectively. As shown in the figures and particularly in figure 1, the width of the transverse flaps 27, 47, 29, 49 corresponds substantially to the width of the transverse lateral faces.

The longitudinal lateral faces 3, 5 bear longitudinal bottom flaps 23 and 25 respectively, separated from the lateral face by a folding line referred to as 24 and 26, respectively.

The bottom flaps are arranged to form an "American style" bottom, known per se, when the box is formed. In fact, the height of the transverse bottom flaps corresponds to a portion of the width of the adjacent longitudinal face as well as to the height of the longitudinal bottom flaps, which corresponds substantially to half the width of the transverse face. Thus, in order to form a box, when the lateral faces are already assembled by means of the lip 11, the transverse bottom flaps are first folded along the folding line and the longitudinal bottom flaps are folded afterwards. The thus formed box bottom is maintained by assembly means like an adhesive tape applied along the outer edges of both longitudinal flaps or glue applied to the transverse flaps or by means of staples in such a manner that a resistant bottom is obtained.

It is to be noted that another type of bottom system may be used which offers at least the same strength, defined in view of the contents of the formed box.

Both longitudinal lateral faces also bear longitudinal cover flaps 43 and 45, respectively, separated from the lateral faces by a folding line 44 and 46, respectively.

Advantageously the transverse cover flaps have about the same size as the transverse bottom flaps. The longitudinal cover flaps 43 and 45, however, present a width corresponding to the width of the longitudinal lateral face and a height corresponding substantially to the width of the adjacent transverse lateral face.

The upper longitudinal cover flap 43 intended to be on the top when the box is closed is provided with two partially precut lines 41 and 42 substantially parallel to two opposite or symmetric diagonal directions, defining two triangular areas 41′ and 42′, with the outer edges of the flap, opposite to the folding line 44.

Said triangular areas are suitably assembled to the underlying flap, preferably the other longitudinal cover flap 45, by means known per se, preferably a glue, more particularly a hot melt glue. As shown, the partially precut line is interrupted by a substantially sinusoidal section. The overlapping flap has to be assembled to the underlying flaps under stress. Stress may be obtained by a force acting within the plane of the flaps in the direction leading away from or to the folding line 44 or 46, during assembling operation. The prestress thus acts in opposite direction pushing the interconnected parts edgewise, one against the other, thus keeping the box closed when the flaps are again brought in contact with each other at reclosing after opening the box. This, of course requires corresponding thickness and stiffness of the cardboard material.

It is a further feature of the present invention that a handgrip 51 is foreseen in the upper cover flap. In case said handgrip is in the form of an aperture made in the said flap 43 or of a delimited area to be pushed out by the user, a second aperture 52 is advantageously also provided, in register with the first one, in the underlying overlapping flap 45. Aperture 52 may also be pushed out. As already mentioned earlier, the handgrip is provided between the triangular areas in order to facilitate the opening of the box.

When the box is to be closed, after assembly, both transverse flaps 47 and 49 are folded first; then flap 45 is folded and afterwards upper cover flap 43, glue being applied in order to have the upper longitudinal flap glued to the underlying flap only via the triangular area 41′ and 42′ defined by the precut line 41, 42 and the outer edge of the flap.

When a user has to first open a closed box according to the invention, he pushes the precut handgrip in and introduces his hand through the aperture thus formed. By pulling the upper cover flap, the latter tears up along the partially precut lines 41, 42 and the contents of the box becomes so easily accessible.

Reclosing is obtained by pushing the top cover back into place; the shape of the precut lines and the force resulting from the prestress will then keep said cover in place.

Obviously, the box may also be equipped with lateral handgrips, 2, 2′ performed in the lateral transverse faces, to facilitate the carrying of heavy boxes.

In the embodiment of figure 4, the upper flap system is of the "American type". Both longitudinal cover flaps 43 and 45, designed to be the overlapping flaps at the top of the box, each are provided with partially precut lines 61, 62 and 71, 72 as already previously defined. Said lines define triangular areas 61′ and 62′ on flap 43 and 71′ and 72′ on flap 45.

Handgrips 65 and 75 may of course be provided on the longitudinal flaps, like precut handgrips.

When the box is to be closed, after assembly, both longitudinal corner flaps (overlapping flaps) 43 and 45 may be assembled under stress to the underlying transverse flaps by gluing or stapling or other methods known per se, through the areas 61′, 62′ and 71′, 72′ only or through essentially the total flap surface. In the latter case, however, transverse underlying flaps may also be equiped with precut lines 64, 74,

66, 76 essentially in register with precut lines 61, 62, 71, 72.

The precut lines are advantageously designed as previously discussed, thus allowing an easy reclosing and reopening after first use.

From the above it is understandable that the box is easy to open without requiring a special tool. Moreover cumbersome synthetic adhesive tapes or staples which can harm the user are no longer necessary.

The arrangement of the different flaps also provides for strength of the base and cover faces allowing easy storage and stacking and protection against impacts and other outer influences.

In addition the box may be reclosed, once opened.

The easy-opening box according to the invention may be made of a sheet material like cardboard and corrugated fibreboard single wall or double wall corrugated possibly reinforced by mineral or synthetic fibres, plastic materials or similar materials suitable for making boxes and known per se in the art.

The box according to the invention may be used to contain several plastic bottles or containers filled with liquid or dry materials. It may also be used for one or more bags containing for instance powdered materials or for dry materials in any form or it may contain other boxes or cartons.

## Claims

1. Reclosable easy-opening box (1) comprising two opposite longitudinal lateral faces (3,5) and two opposite transverse lateral faces (7,9) binding both said longitudinal faces (3,5) the transverse faces (7,9) bearing each via a folding line (28, 30, 48, 50) a transverse bottom flap (27, 29) and a transverse cover flap (47,49) the width of which substantially corresponds to the width of the corresponding transverse face (7,9), the longitudinal faces (3,5) bearing each via a folding line (24,26,44,46) a longitudinal bottom flap (23,25) and longitudinal cover flap (43,45) the width of which substantially corresponds to the width of the corresponding longitudinal face (3,5), at least one cover flap called overlapping flap (43;43, 45) being designed to overlap at least another flap(s) (45;47, 49) when the box (1) is closed, characterized in that at least the overlapping flap (43) or flaps (43, 45) is/are equipped with at least one partially precut line (41, 42; 61, 62, 71, 72) that is interrupted by a section of partially precut line directed according to a direction crossing it, preferably a substantially sinusoidal or zigzag section, at least the area of the overlapping flap (43) or flaps (43, 45) defined by the said partially precut line (41,42; 61, 62, 71, 72) and the side edges being assembled with underlying flap(s) (45; 47, 49) under prestress.

2. Reclosable easy-opening box according to Claim 1 characterized in that at least two opposite cover flaps have a height such that they overlap when the box (1) is closed and that at least the overlapping flap (43) has a height substantially corresponding to the width of the adjacent lateral face.

3. Reclosable easy-opening box according to Claim 1 or 2 characterized in that the overlapping flap is a longitudinal upper cover flap (43) and the underlying flap(s) is the opposite longitudinal cover flap (45).

4. Reclosable easy-opening box according to Claim 1 characterized in that the cover flaps (43, 45) are arranged according to the "American style" thus forming two overlapping flaps (43, 45).

5. Reclosable easy-opening box according to any of Claims 1 to 5 characterized in that each overlapping flap (43; 43, 45) is provided with two partially precut lines (41,42; 61, 62 and 71, 72) parallel to two opposite diagonal directions, defining two triangular areas (41′,42′;61′,62′, 71′, 72′), preferably arranged at the opposite side of the folding line (44; 50).

6. Reclosable easy-opening box according to any of the preceding claims characterized in that each overlapping flap (43;43, 45) is assembled to the underlying flap (45) or flaps (47,49) through the areas (41′,42′,61′,62′,71′,72′) defined by the said partially precut line(s) and the side edges of the overlapping flap(s) or through essentially the whole surface of the said overlapping flap (43;43,45).

7. Reclosable easy-opening box according to claim 6 characterized in that each overlapping flap (43;43,45) is assembled to the underlying flap (45) or flaps (47,49) through essentially the total surface of the overlapping flap and that the underlying flap or flaps is/are provided with partially precut lines (64,74,66,76) essentially in register with the partially precut lines (61,62,71,72), of the overlapping flap.

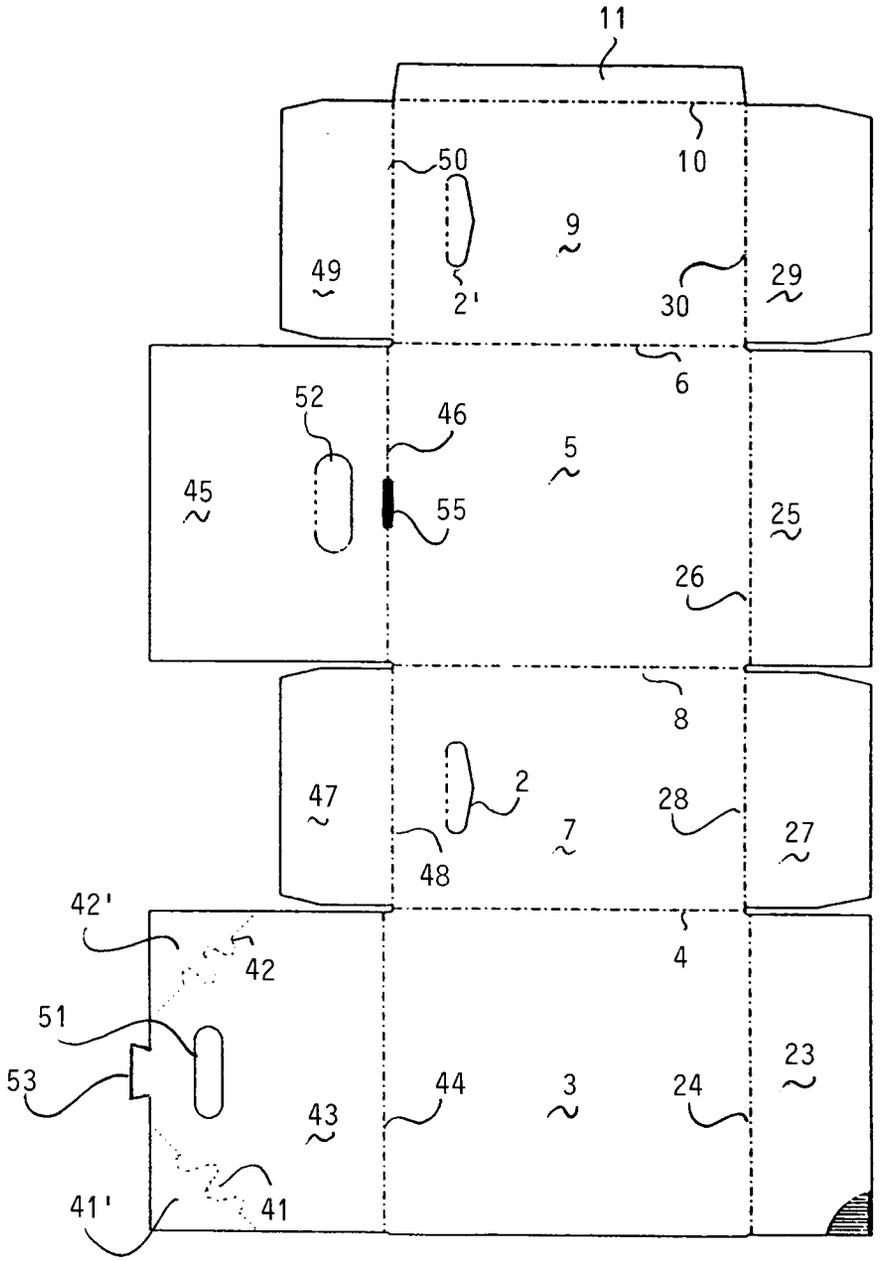
8. Reclosable easy-opening box according to any of the preceding claims characterized in that at least one of the areas of the overlapping flap (43;43, 45) defined by the said partially precut line(s) (41,42; 61, 62, 71, 72) and a folding line (44;44, 46) between the said overlapping flap (43;43, 45) and the corresponding lateral face (3; 3,5) is provided with a handgrip (51; 65,75) known per se.

**9.** Reclosable easy-opening box according to Claims 8 and 5, characterized in that the handgrip (51,65,75) is arranged between both triangular areas (41,42; 61′,62′,71′,72′) preferably at the outer zone, opposite to the folding line (44;46).

**10.** Reclosable easy-opening box according to any of the preceding claims characterized in that the handgrip (51; 65,75) consists in an aperture or adequate area defined by a partially precut line, to be pushed in by the user.

**11.** Reclosable easy-opening box according to any of claims 8-10 characterized in that the underlying flap or flaps is/are also provided with a handgrip (52), preferably an aperture or adequate area defined by a partially precut line, in register with the handgrip (51) of the overlapping flap (43).

Fig. 1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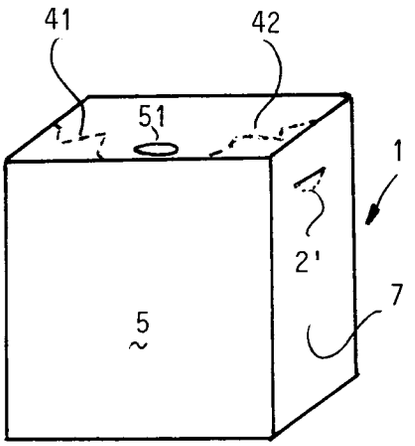


Fig. 2

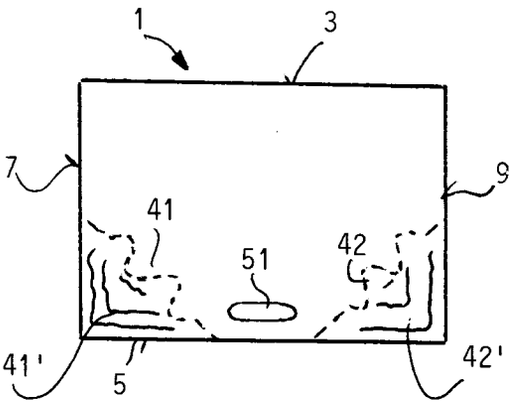


Fig. 3

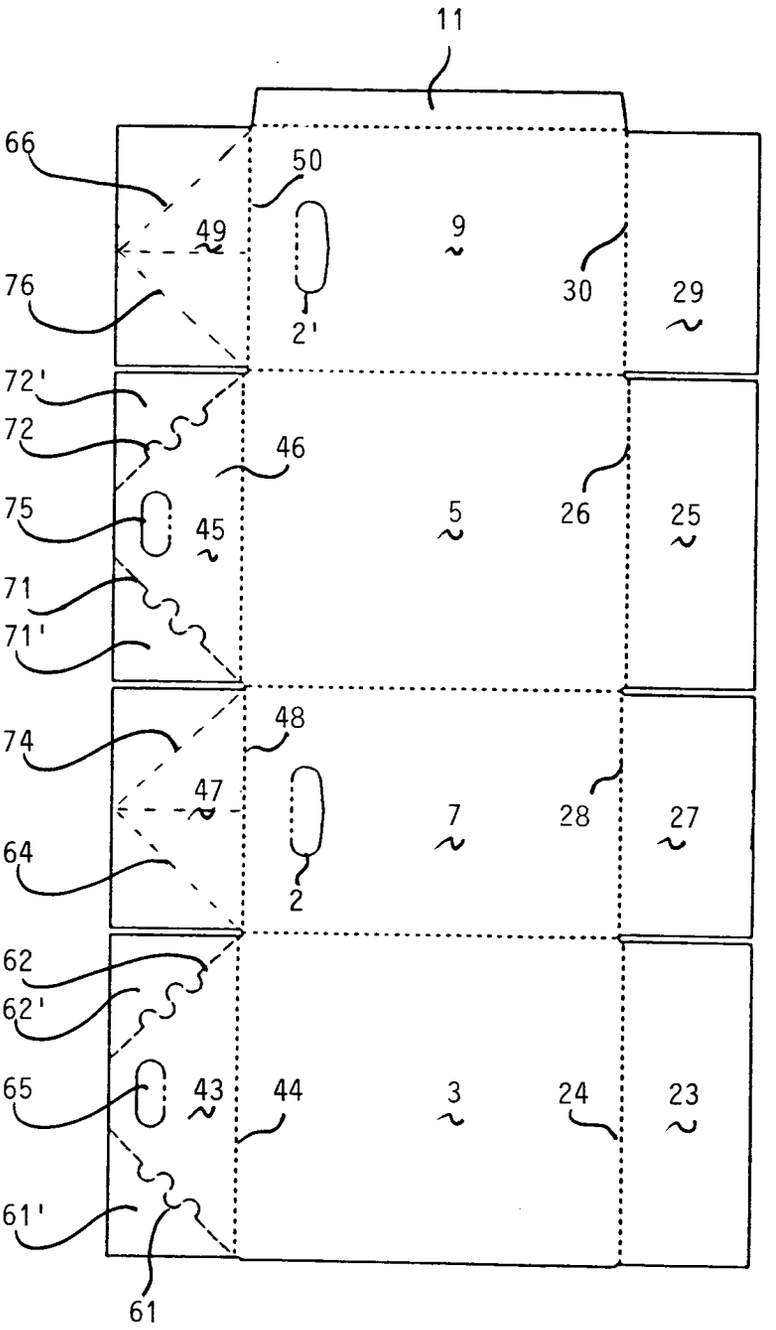
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Figure 4

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number

EP 91 87 0165

## 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.5) |
|---|---|---|---|
| D,A | GB-A-1 346 110 (VIBIXA)<br>* page 2, line 35 - line 80; figures 1,2 *<br>--- | 1-7 | B65D5/54<br>B65D5/46 |
| D,A | US-A-3 368 739 (ROCCAFORTE)<br>* column 2, line 45 - line 72; figures 1-5 *<br>--- | 1,8-11 | |
| A | FR-A-2 267 943 (BERICOL NATIONAL)<br>* page 3, line 32 - page 4, line 13; figures 1-3 *<br>----- | 1,8-11 | |

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B65D

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 14 FEBRUARY 1992 | VANTOMME M.A. |

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