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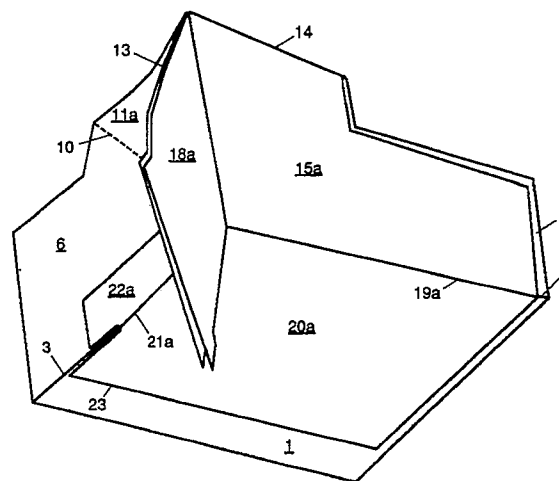
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107
NL-2587 BP 's-Gravenhage(NL)(54) **Ready-to-use box with doubled bottom.**

(57) This invention relates to a tray or box to be made from a blank by folding and adhesion, comprising a bottom wall (1) and upright walls (6-9) connected thereto by folding lines (2-5), wherein at the corners where upright walls (6-9) meet, one of said walls (8,9) is extended by means of a rectangular connecting flap (13) hingedly connected thereto and in the other upright wall (6,7) a triangular connecting zone (11) is bounded by a folding line (10) inclined at 45°, which connecting zone after being folded back against the rear side of the upright wall (6,7) is attached by adhesion to said rectangular connecting flap (13) and wherein at least a number of the upright box walls (8,9) are provided with so-called overlap panels (15) which are folded over against the corresponding wall panels (8,9) along a folding line (14) and are adhesively affixed thereto, characterized in that at least one of the overlap panels (15) is connected via a folding line (19) to a bottom-doubling panel (20). At opposite side edges of bottom-doubling panels (20), suspension flaps (22) connected thereto along folding lines (21), may be provided, which are adhered to the upright sidewalls (6,7) with the triangular connecting zones (11).

**FIG. 7****EP 0 442 552 A1**

READY-TO-USE BOX WITH DOUBLED BOTTOM

This invention relates to a tray or box to be made from a blank by folding and adhesion, comprising a bottom wall and upright walls connected thereto by folding lines, wherein at the corners where upright walls meet, one of said walls is extended by means of a rectangular connecting flap hingedly connected thereto and in the other upright wall a triangular connecting zone is bounded by a folding line inclined at 45° , which connecting zone after being folded back against the rear side of the upright wall is attached by adhesion to said rectangular connecting flap and wherein at least a number of the upright box walls are provided with so-called overlap panels which are folded over against the corresponding wall panels along a folding line and are adhesively affixed thereto.

Such boxes and/or covers which are fixedly joined to the box along a hinging line at the upper edge of a rear wall of a box, and which are of the so-called ready-to-use type are well known, for instance from NL patent application no. 85 02214. They are frequently used for packing vegetables and fruit directly after harvesting. A ready-to-use box is a box which, by virtue of the above-described typical angle joint between the upright walls, permits these walls, while already being joined to each other, to be folded down over the bottom of the box, so that finished boxes or covers can be supplied to the user in a position taking up little space. For the boxes to be used, only the collapsed walls need to be erected and a box is ready to be filled. Besides ready-to-use boxes, set-up boxes are known, which can also be formed from a blank, but which require a plurality of operations to be performed to make them ready for use, for example, setting up the side walls separately and forming angle joints by stapling, by sliding locking tabs into receiving apertures, or other manipulations taking up time that cannot usually be spared directly after the vegetables or fruit to be packed have been harvested. It is possible to have a box set-up machine perform these operations, but this requires additional investments.

Further, it is known to provide boxes, including those of the ready-to-use type, with angle supports, for example in the form of prismatic tubes which in the collapsed position of the box are folded flat between the collapsed side walls of the box and the bottom of the box and which, when the walls of the box are being set up, are automatically brought into the operative, prismatic form so as to contribute at the corners of the box to the capacity of the box to transmit vertical forces from the upper edge of the box to the bottom thereof.

The stiffening that can be accomplished with such measures is limited by the bottom of the box consisting of only one layer of material and by the risk of the bottom sagging under a high vertical load. Where set-up boxes are concerned, one might consider bracing the bottom of the box by positioning an insert bottom in the box during the setting up of the box, which can be connected to the box by adhesion or stapling.

When any bracing panels, tubes, and the like, are to be provided in ready-to-use boxes, the practical option must always be taken into consideration of mechanized production of the box and its delivery in collapsed position, starting from a blank which already includes all elements of a box to be formed. In such a concept there is no room for loose inserts.

It is an object of the present invention to provide a box of the type described in the preamble, which enables a doubling of the bottom of the box in a simple manner, with due regard for considerations of mechanized production.

To that effect, according to the invention, at least one of the overlap panels is connected via a folding line to a bottom-doubling panel.

The box may have only one of the overlap panels connected to a bottom-doubling panel that has substantially the same size as the bottom wall, or two opposite overlap panels may each be connected to a bottom-doubling panel, with the doubling panels, overlapping or abutting, together covering the bottom of the box.

In the mechanized production of such a box from a blank - for example, a rectangular box with longer side walls and shorter end walls - first the overlap panels of the two side walls are folded inwardly over the side walls in the direction of the bottom, the or each bottom-doubling panel coming to rest on the bottom. Then the rectangular connecting flaps are folded onto the side walls and the end walls provided with the triangular connecting zones are folded down onto the bottom, already doubled, with the triangular connecting zones folded back over the rear side of these end walls. When the sidewalls are subsequently folded over the bottom, the rearwardly folded triangular connecting zones are connected by adhesion to the rectangular connecting flaps of the end walls. This renders the ready-to-use box with doubled bottom ready for delivery in collapsed position.

It will be clear that for the production of this ready-to-use box with doubled bottom in principle no complicated additional operations in the machine are required. Further, the box according to the invention has the following economically very

important advantage.

It is desirable for the surfaces of a box that come into contact with the products to be packed to satisfy certain requirements as to moisture resistance and the like. In the blank-folded boxes to date, the surfaces turned towards the inside of the finished box "originate" from both sides of the blank. This means that both sides of the blank must be subjected to the treatment in question, for example the provision of a plastics layer on the solid cardboard.

In the box according to the invention all surfaces turned towards the inside of the box originate from one side of the blank, so that only this side of the blank needs to be treated. This yields a considerable reduction of costs.

In further elaboration of the invention, at opposite edges of the bottom-doubling panels, suspension flaps may be provided, connected thereto via folding lines and adhesively attached to the upright side walls with the triangular connecting zones. Thus the or each bottom-doubling panel is suspended from a plurality of upright walls, namely from the upright walls with the triangular connecting zones via the suspension panels just mentioned, and from the other upright walls via the overlap panels.

Some embodiments of the ready-to-use box with doubled bottom will now be further explained and illustrated with reference to the accompanying drawings, in which:

Fig. 1 shows a blank for making a box with doubled bottom;

Figs. 2-6 show consecutive folding operations in the making of the box, with reference to a portion of the blank according to Fig. 1;

Fig. 7 is a perspective view of the relative position of the box elements, partly bent apart, at a corner of the box; and

Fig. 8 is a variant embodiment of the blank according to the invention.

In the embodiment shown in Figs. 1-7 the box comprises a bottom wall 1 connected to end walls 6 and 7 and side walls 8 and 9 via folding lines 2, 3, 4 and 5. It is observed that in the present specification the terms side walls and end walls are used merely to simplify the differentiation between pairs of opposite upright walls.

In the end walls 6 and 7 folding lines 10 inclined at 45° are provided for bounding triangular connecting zones 11. The side walls 8 and 9 are each extended by rectangular connecting flaps 13 via folding lines 12.

The side walls 8, 9 are each connected to an overlap panel 15 via folding lines 14. Although not essential to the invention, cut-outs 16 are shown which in the finished box form a recess in the upper edge. Also not essential to the invention are

end flaps 18, which are connected to the overlap panels 15 via folding lines 17, though they contribute to an increase of strength.

Essential to the invention are bottom-doubling panels 20 connected to the overlap panels 15 via a folding line 19.

Further, suspension panels 22 are connected to the bottom-doubling panels 20 via folding lines 21. The free end edge of the bottom-doubling panels 20 is indicated at 23.

To facilitate an explanation of the various folding stages, the rear sides of the various panels will be designated by the same reference numerals but with an a added thereto.

The first folding operation is shown in Fig. 2. In that step, on opposite sides (only one side, namely the right-hand side is shown) the overlap panel 15 having connected to it the bottom-doubling panel 20 as well as the suspension panel 22, is folded over towards the middle along folding line 14. As a result, the bottom-doubling panels 20 come to lie on the bottom wall 1. In this embodiment the two bottom-doubling panels 20 are each half the size of the bottom wall 1 and thus cover the bottom wall 1, their end edges 23 abutting each other.

The next operations are shown in Figs. 3 and 4 and comprise, respectively, folding back the triangular connecting zones 11 against the end wall panels 6 and 7 and, further, folding inwards the assembly of the connecting flaps 13 and end flaps 18 along the folding line 17. Fig. 5 shows the intermediate position thus achieved. Finally, the assembly of sidewalls 8,9, overlap panels 15, connecting flaps 13 and end flaps 18 are folded towards the middle along the folding lines 2 and 4, with the connecting flaps being adhesively attached to the triangular connecting zones 11. In this position, shown in Fig. 6, the box is ready for delivery in collapsed position.

Fig. 7 shows a corner of the box when the walls are being set up into the operative position. Solely for the purpose of illustrating the underlying position of the various panels, flaps, etc., in the finished box, they are shown while slightly bent apart.

Figure 7 shows that the bottom-doubling panels 20 at the side edges are suspended from the overlap panels 15 via the folding lines 19a. At the end edges they are also suspended, by adhesively attaching the suspension flaps 22 to the end walls 6,7. It will be clear that in this manner an extremely firm and stable box is obtained.

Further, Fig. 7 shows that all surfaces turned towards the inside of the box have a reference numeral with an a added thereto, which is to say that all these surfaces in the blank of Fig. 1 are disposed on one side thereof. Accordingly, it will be sufficient to treat one surface of the blank, if the

inner side of the box is to be provided with a special coating.

The embodiment according to Fig. 8 differs from that according to Figs. 1-7 solely in that only one bottom-doubling panel 20 is present.

It is observed that in Figs. 1-7 the bottom-doubling panels 20 each cover one half of the bottom wall 1. It is possible that in this embodiment the panels 20 are larger so that they overlap in part or in whole.

Claims

1. A tray or box to be made from a blank by folding and adhesion, comprising a bottom wall (1) and upright walls (6-9) connected thereto by folding lines (2-5), wherein at the corners where upright walls (6-9) meet, one of said walls (8,9) is extended by means of a rectangular connecting flap (13) hingedly connected thereto and in the other upright wall (6,7) a triangular connecting zone (11) is bounded by a folding line (10) inclined at 45° , which connecting zone after being folded back against the rear side of the upright wall (6,7) is attached by adhesion to said rectangular connecting flap (13) and wherein at least a number of the upright box walls (8,9) are provided with so-called overlap panels (15) which are folded over against the corresponding wall panels (8,9) along a folding line (14) and are adhesively affixed thereto, characterized in that at least one of the overlap panels (15) is connected via a folding line (19) to a bottom-doubling panel (20).
2. A box according to claim 1, characterized in that only one of the overlap panels (15) is connected to a bottom-doubling panel (20), which has substantially the same size as the bottom wall (1).
3. A box according to claim 1, characterized in that two opposite overlap panels (15) are each connected to a bottom-doubling panel (20), said bottom-doubling panels (20) together covering the bottom of the box (1), either overlapping or abutting each other.
4. A box according to any one of the preceding claims, characterized in that at opposite side edges of bottom-doubling panels (20), suspension flaps (22) connected thereto along folding lines (21), are provided, which are adhered to the upright sidewalls (6,7) with the triangular connecting zones (11).

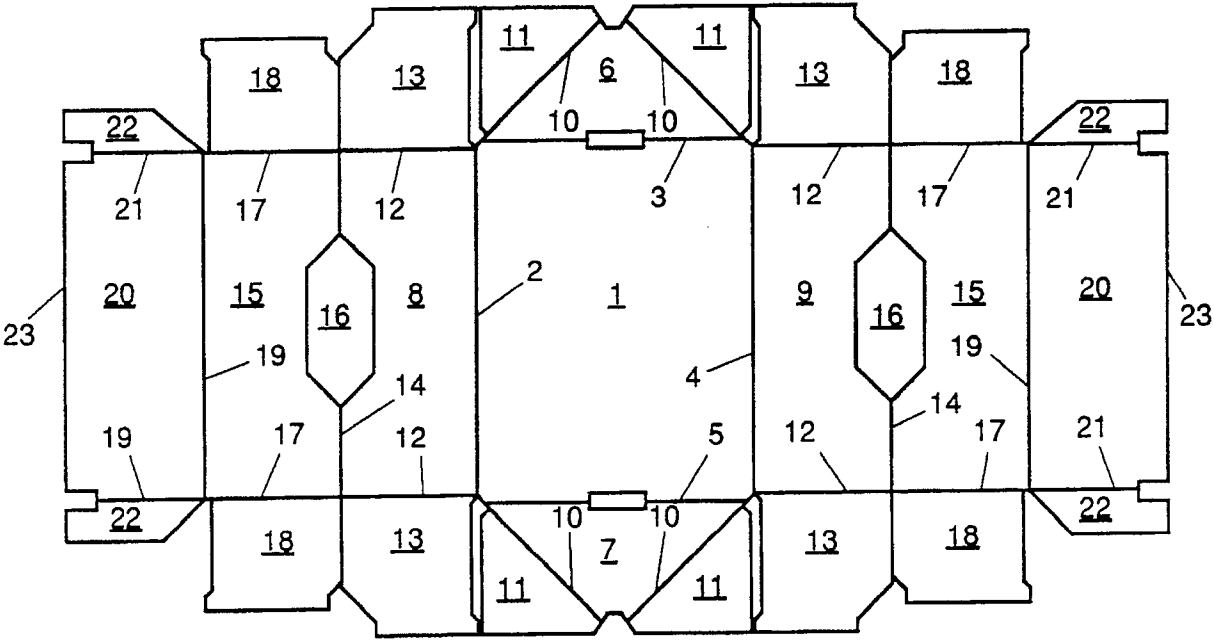


FIG.1

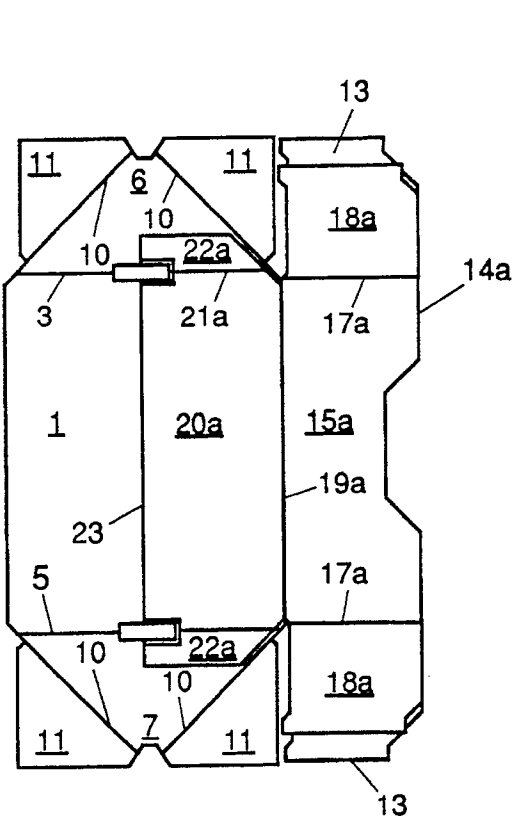


FIG.2

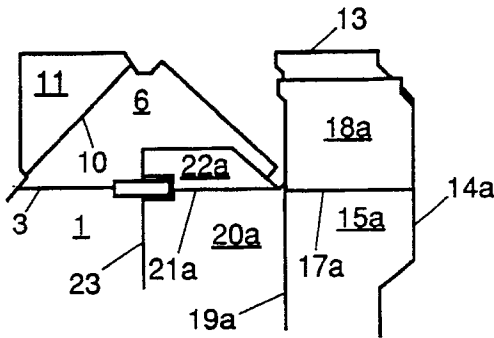


FIG.3

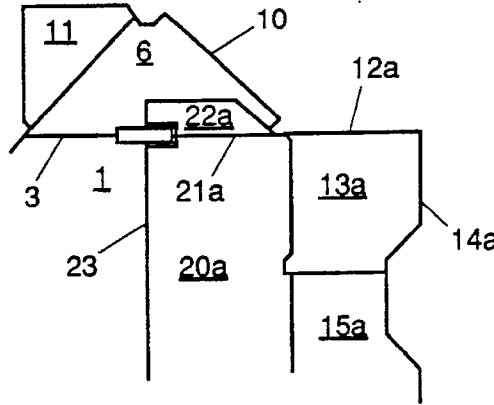


FIG.4

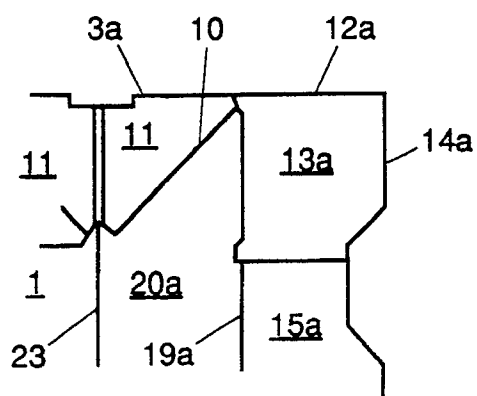


FIG. 5

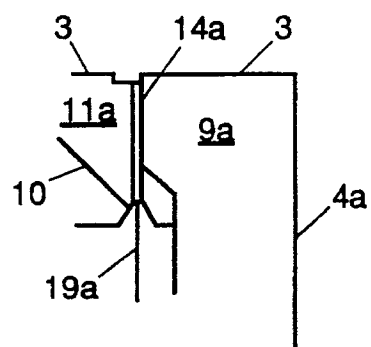


FIG. 6

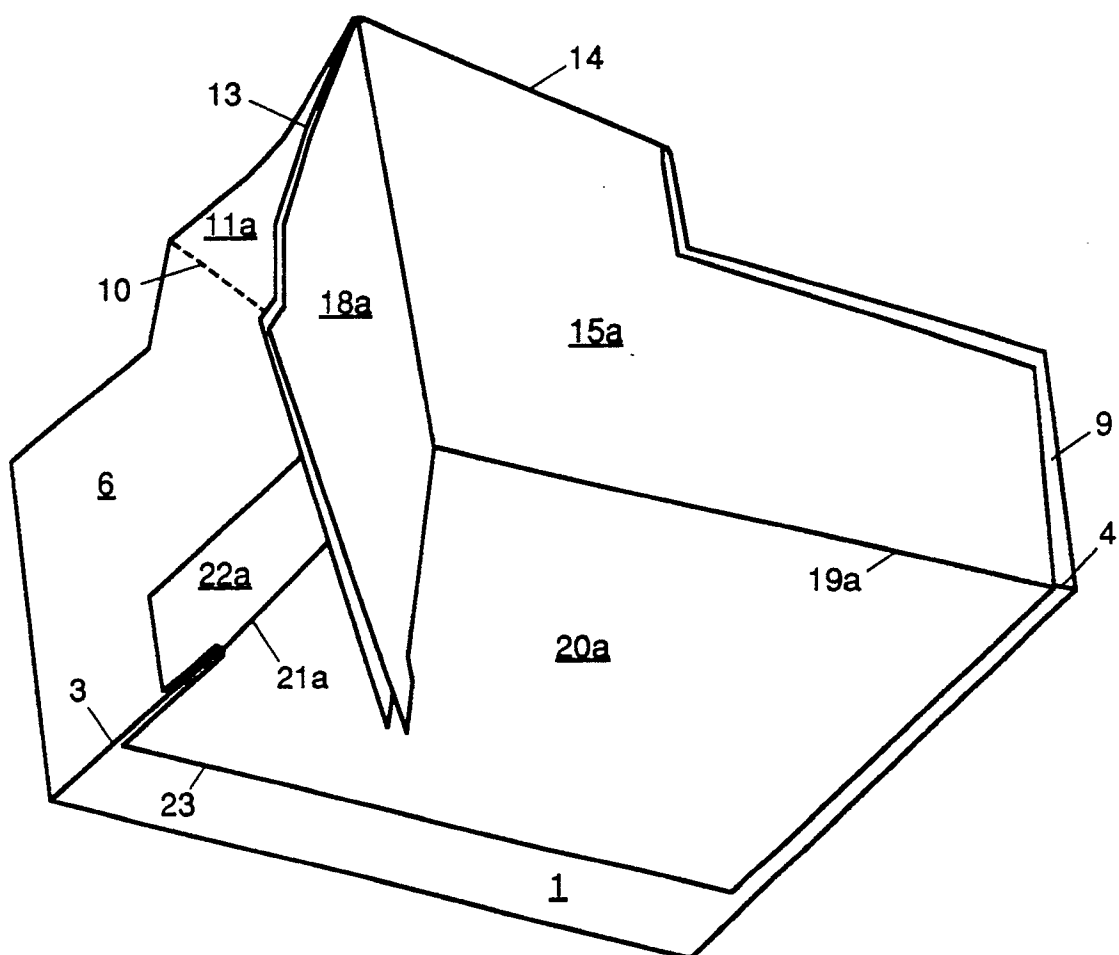


FIG. 7

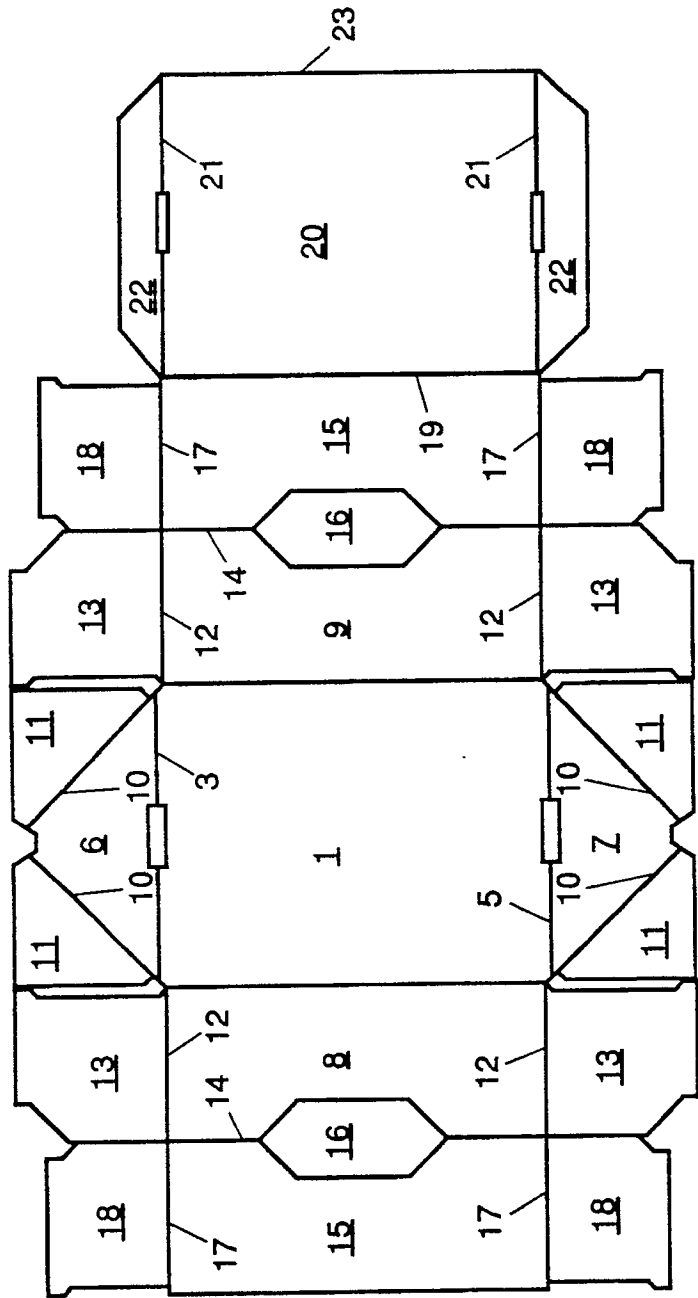


FIG.8



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EUROPEAN SEARCH REPORT

Application Number

EP 91 20 0125

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)
Y	EP-A-0 083 133 (KARTONNAGEFABRIEK GELRIA) * Page 3, line 31 - page 4, line 12; page 5, lines 5-15; page 5, line 29 - page 6, line 29; figures 1,2,4 * - - -	1,3	B 65 D 5/36
Y	US-A-3 002 672 (KOTOWICK) * Column 2, lines 6-12; column 3, lines 19-27; figures 1,2,4 * - - - - -	1,3	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 D
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		17 April 91	SMOLDERS R.C.H.
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			