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(54) Plastic case

(57) The present patent application relates to a plastic case with monolithic structure and collapsible walls, which can pass from the horizontal position, coplanar with the bottom, to the vertical position in operating condition; it being provided that the laterals walls are equipped with suitable fixing means in order to guarantee their stable permanent fixing in vertical position.

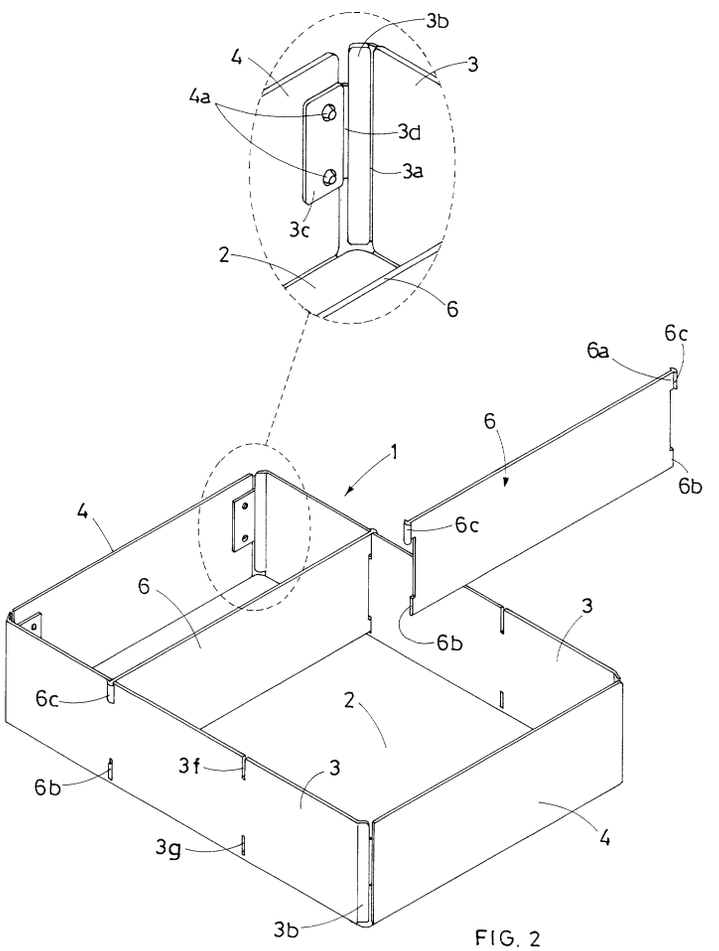

FIG. 2

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Description

[0001] The present patent application for industrial invention relates to a plastic case for installation inside bags or similar items.

[0002] In particular, sports-bags are usually provided with an upper compartment used to contain clothes and other objects and a lower rectangular compartment used to contain shoes as well as dirty or wet clothes.

[0003] Obviously, the separation between the upper and lower compartment is designed to prevent shoes as well as dirty or wet clothes from coming into direct contact with the other objects contained in the bag.

[0004] Being located under the upper compartment for clean clothes, the lower compartment for shoes and dirty clothes must carry the weight of the upper compartment.

[0005] For this reason, a light, resistant plastic case is usually positioned inside the lower compartment, with two functions.

[0006] Firstly, the vertical walls of the plastic case make the lower compartment of the bag rigid, thus preventing the crushing risk caused by the weight of the objects contained in the upper compartment. Secondly, the plastic case prevents the fabric or leather walls of the compartment from touching the deposits of soil, dust or water.

[0007] So far the plastic case has been obtained with plastic moulding technique, using large moulding dies to produce monolithic parallelepipeds with a rectangular bottom and four lateral walls.

[0008] The traditional technique, however, is impaired by substantial limitations: first of all, it requires the realisation and use of large, expensive moulding dies. Secondly, it presents difficulties related to the handling, storing and transportation of the plastic cases in view of their physical volume.

[0009] The purpose of the present invention is to realise a plastic case for installation inside the lower compartment of bags capable of overcoming the aforementioned inconveniences of the existing technique.

[0010] This has been obtained by designing a special monolithic case with collapsible lateral walls, capable of 90° rotation from the horizontal to vertical position and vice versa with respect to suitable folding lines that act as hinges.

[0011] The lateral walls of the case can be maintained in horizontal position, perfectly coplanar with the bottom of the bag, and brought in vertical position, thus assuming the structure of a parallelepiped.

[0012] The advantages of the plastic case according to the present invention appear evident, since the lateral walls can be maintained in coplanar position with the bottom, thus giving the case according to the present invention the shape of a simple plastic sheet.

[0013] The capacity of the plastic case according to the present invention to become flat also proves particularly advantageous during the moulding stage.

[0014] It appears obvious that the moulding of a simple plastic sheet instead of a parallelepiped allows for using simplified moulds, thus considerably reducing the cost of the entire production process.

[0015] The possibility of maintaining the plastic case according to the present invention in a "flat" condition is also very advantageous since it facilitates its handling, storing and transportation.

[0016] For major clarity the description of the present invention continues with reference to the enclosed drawings, which are intended for purposes of illustration and not in a limiting sense, whereby:

- Fig. 1 is the plan of the plastic case according to the present invention, shown with the lateral walls in coplanar position with respect to the bottom;
- Fig. 2 is an axonometric view of the same plastic case in operating position, with an enlarged detail for easier reference.

[0017] With particular reference to Fig. 1, the case (1) has a monolithic structure and comprises a rectangular bottom (2) with two pairs of opposite lateral walls (3, 4).

[0018] Each lateral wall is joined to the border of the bottom (2) through a longitudinal intermediate bead (5) with lower thickness of the plastic material; for this reason, each longitudinal bead (5) acts as folding line - that is a real hinge - for the lateral walls (3, 4).

[0019] In this way, each lateral wall (3, 4) can rotate by 90° with respect to the border of the bottom (2), passing from the horizontal to vertical position and vice versa.

[0020] On both borders each longitudinal wall (3) of the case (1) has two transversal folding lines (3a) obtained by reducing the thickness of the plastic material.

[0021] A section of plastic material with normal thickness is located under each folding line (3a), i.e. a strip (3b) having the same height as the wall (3), capable of rotating with respect to the adjacent border of the wall (3), using the folding line (3a) in intermediate position as a hinge.

[0022] A small tab (3c) with normal thickness is located under each strip (3b), with the interposition of another section of material with reduced thickness (3d); obviously, the section of material with reduced thickness (3d) represents a folding line that allows the tab (3c) to rotate with respect to the adjacent strip (3b).

[0023] Each tab (3c) has two aligned holes (3e) on the longitudinal symmetrical axis of the tab (3c).

[0024] The walls (4) on the transversal borders of the case (1) have a simpler structure.

[0025] Each transversal wall (4) has two pairs of buttons (4a) on its internal side, in internal position with respect to the opposite ending borders of the wall (4). The shape of the buttons (4a) allows them to snap into the pairs of holes (3e) located on the tabs (3c) of the longitudinal walls (3).

[0026] From the flat position - that is the position of

the case (1) at the end of the moulding process - the case (1) can assume the traditional structure of a parallelepiped by rotating the lateral walls (3, 4) thanks to the presence of the folding lines (5, 3a, 3d).

[0027] With particular reference to Fig. 2, the following operations are performed in a sequence:

- 90° inward rotation (from horizontal to vertical position) of the two opposite longitudinal walls (4);
- once the longitudinal walls (4) have reached the vertical position, approximately 45° inward rotation of the four strips (3b) located in external position with respect to the ending borders of the two walls (3);
- approximately 45° inward rotation of the four tabs (3c) with holes located in external position with respect to the strips (3b);
- 90° inward rotation (from horizontal to vertical position) of the two opposite transversal walls (3);
- snapping of the buttons (4a) located on the proximity of the opposite borders of each transversal wall (4) inside the pair of holes (3e) located on the tabs (3c) of the longitudinal walls (3).

[0028] In particular, the enlargement in Fig. 2 illustrates the fixing method between one of the transversal walls (4) and the tab (3c) of the adjacent longitudinal wall (3); the same enlargement shows that, in operating condition, each strip (3b) at the end of the longitudinal walls (3) acts as a joint for each longitudinal wall (3) with respect to the adjacent transversal wall (4) on the four corners of the case (1).

[0029] Finally, it must be said that the case (1) can also be provided with transversal partitions (6), as shown in Fig. 2.

[0030] To that end, each longitudinal wall (3) of the case (1) is provided with two notches (3f) on the free longitudinal border that match two slots (3g) located on the opposite longitudinal border. Each notch (3f) is exactly aligned with one of the slots (3g) along an axis perpendicular to the longitudinal axis of the wall (3).

[0031] The notches (3f) and the slots (3g) have been designed to allow for the assembling of the transversal partitions (6).

[0032] Each transversal partition (6) (see the example shown in Fig. 2) consists in a rectangular panel made of the same material used to mould the case (1).

[0033] Two protruding pairs of wings (6a, 6b) in edgeways position are provided on the lateral borders of the partition (6), one (6a) on the top and one (6b) on the base; it being also provided that the two wings (6a) on the top of each partition (6) have an enlarged external border.

[0034] In order to assemble the partitions (6) inside the case (1), the two top wings (6a) are exactly engaged from up downwards inside two opposite notches (3f) of the longitudinal walls (3) of the case; in this stage, the two enlarged borders (6c) act as a guide when the wings (6a) are inserted into the notches (3f) of the case (1).

[0035] Thanks to the structural flexibility of the case (1), the two lower wings (6b) of the partition (6) are inserted inside the slots (3g) located on the longitudinal walls (3) of the case (1).

[0036] Once completely inserted, the partition (6) remains stable also thanks to the presence of the enlarged borders (6c) which are located in external position on the longitudinal walls of the case (1) to prevent the accidental uncoupling of the partition (6) from the longitudinal walls (3).

Claims

1. A plastic case with monolithic structure, **characterised by** the fact that it comprises a bottom (2) and two opposite pairs of collapsible walls (3, 4) joined to a border of the bottom (2) with the interposition of a folding line (5); it being provided that each end of the longitudinal walls (3) of the case (1), from inside outwards, has a first folding line (3a) that extends on the entire height of the wall (3), a strip (3b) having the same height as the first folding line (3a), a second folding line (3d) parallel to the first folding line (3a), but with lower height, and a tab (3c) with two holes having the same height as the second folding line (3d); it being also provided that each transversal wall (4) of the case (1) internally features two pairs of buttons (4a), whose shape and position ensure the exact snapping inside the pairs of holes (3e) located on the tabs (3c) of the longitudinal walls (3).

2. A plastic case according to claim 1, **characterised by** the fact that it comprises transversal partitions (6), each of them consisting in a rectangular panel made of the same material used to mould the case (1) and provided on the lateral borders with two protruding pairs of wings in edgeways position, with one wing (6a) on the top provided with enlarged external borders (6c) and another wing (6b) on the base; it being also provided that, on its free longitudinal border, each longitudinal wall (3) of the case (1) has two notches (3f) that exactly match two slots (3g) on the opposite longitudinal border; it being provided that the two top wings (6a) of each partition (6) can be inserted, from up downwards, into an opposite pair of notches (3f) of the longitudinal walls (3), just like the two base wings (6b) of the partition (6) can be inserted into the corresponding opposite pair of slots (3g) located on the longitudinal walls (3).

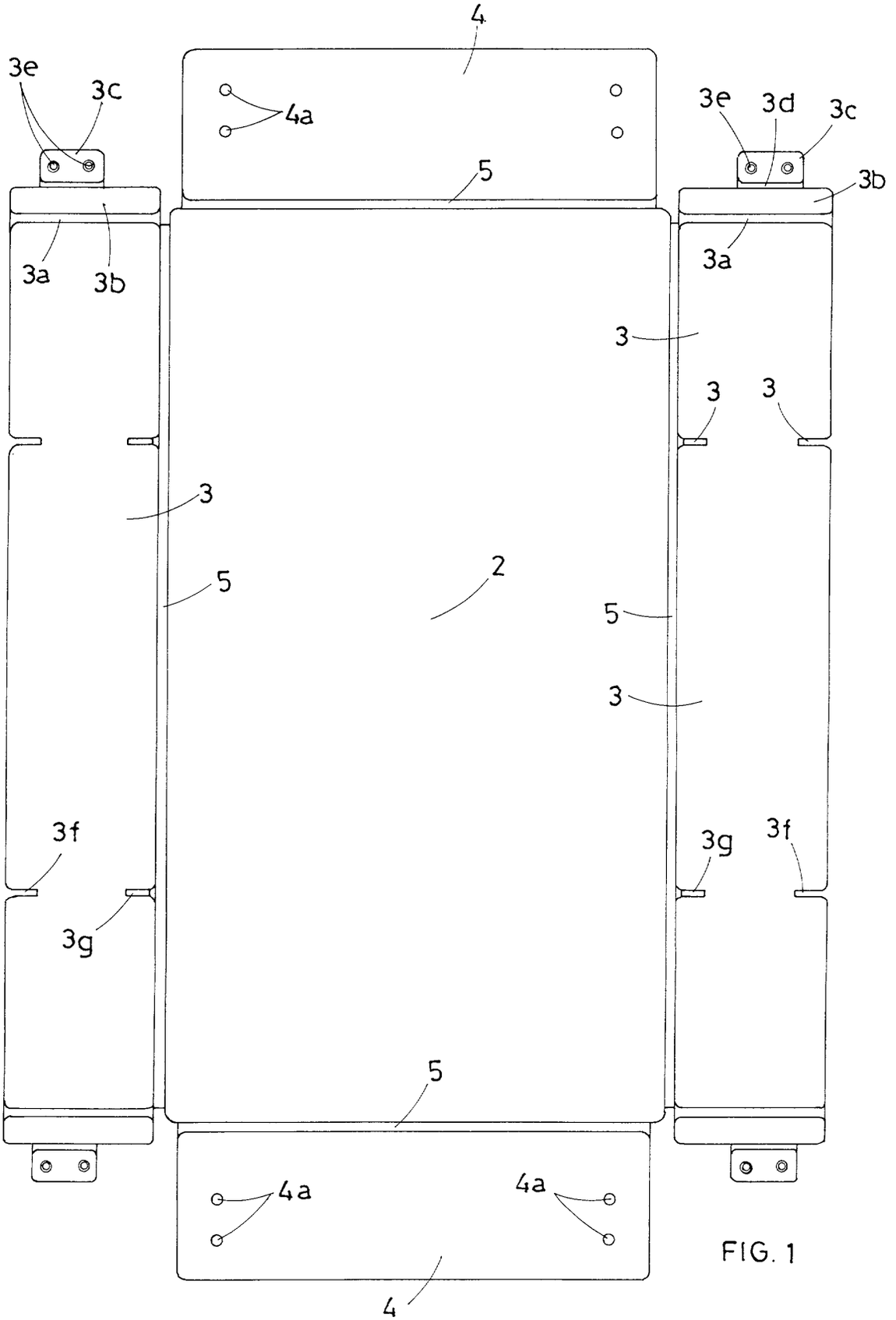

FIG. 1

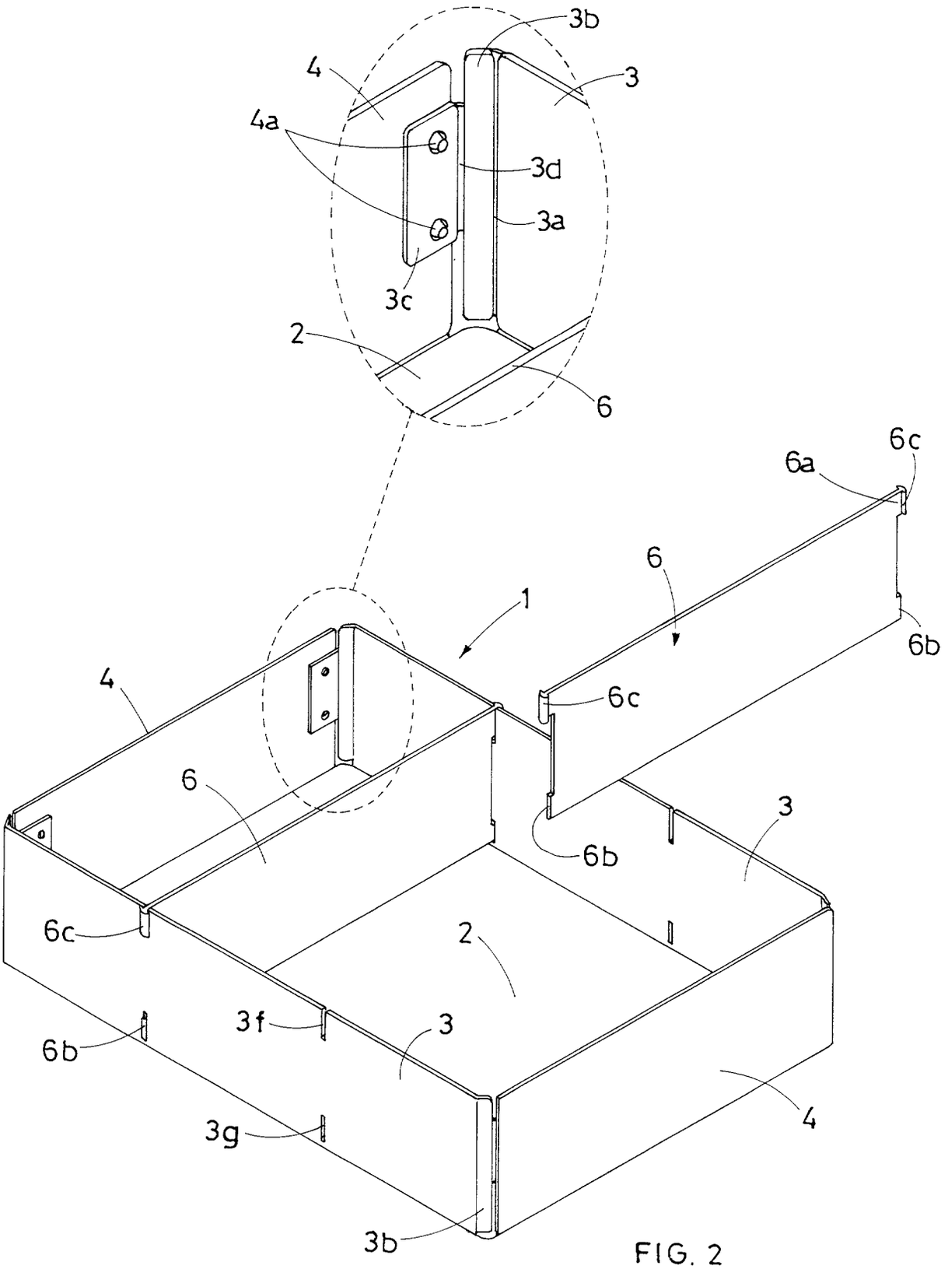

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0430

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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Y		2	
Y	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 11, 30 September 1999 (1999-09-30) & JP 11 164721 A (KOKUYO CO LTD), 22 June 1999 (1999-06-22) * abstract *	2	
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A	US 6 174 116 B1 (BRAND ROBERT STEWART) 16 January 2001 (2001-01-16) * the whole document *	2	
A	US 4 499 997 A (SWINGLEY JR HAROLD E) 19 February 1985 (1985-02-19) * the whole document *	2	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A45C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10 October 2001	Garcia, J

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