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(54) **A plastic box with collapsible walls provided with folding support legs**

(57) The present invention relates to a plastic box (1) with collapsible walls (3), provided with support legs (6) that can be folded under the bottom of the box and

activated by means of two shutter plates (10) located on the outside of the transversal sides of the boxes and provided with handles (10d) that the user can hold with his fingertips by grabbing the upper edge of the box.

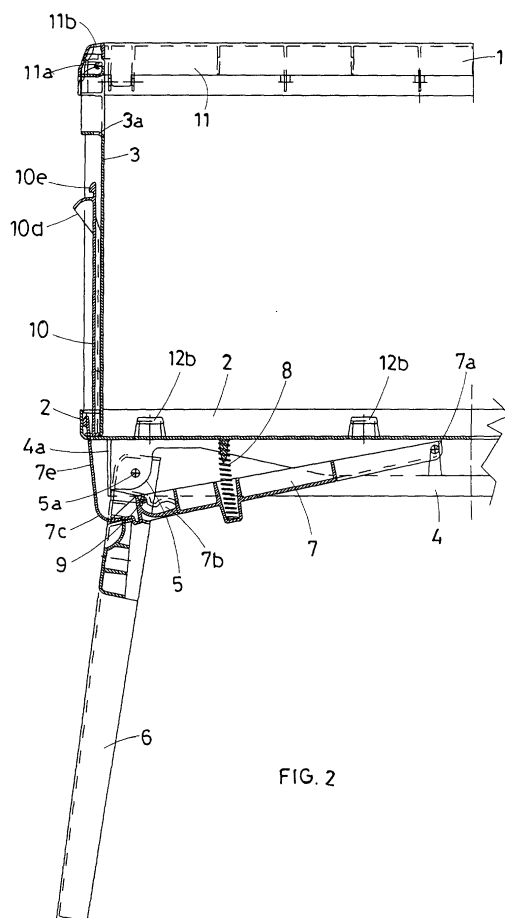


FIG. 2

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Description

[0001] The present patent application for utility model relates to a plastic box with collapsible walls, provided with support legs that can be folded under the bottom of the box.

[0002] Plastic-moulded boxes with four legs hinged on horizontal pins are already available on the market. In this type of boxes, the legs can be closed in a raised position under the bottom of the box or opened in a lowered, slightly divergent position in order to lift the box off the ground.

[0003] The applicant is the owner of the Italian patent for utility model No. 01264112, which relates to a similar box whose legs are closed by means of a lever pivoted at one end located in central position under the bottom of the box.

[0004] More precisely, each lateral pair of legs is attached to an actuation lever by means of a pin inserted into a suitably shaped slot of the lever, whose free end is connected to a plate that slides on the outside of one transversal wall of the box and ends with a handle located immediately under the border of the wall.

[0005] When holding the box from the sides the user can easily grab the handle of the two plates, in order to completely pull them up and hold them in place by means of a stop tooth located on the handles that engages in a suitable housing located on the edge of the box, immediately under the border.

[0006] The vertical movement of the plates lifts the actuation levers until they touch the bottom of the box. The vertical movement of the levers corresponds to the inward vertical overturn of the legs, because of the special shape of the slot in which the pin connecting each pair of legs to its actuation lever is inserted and slides.

[0007] The legs are closed by overcoming the opposite action of two springs that oppose the lifting of the two actuation levers. The springs also ensure the forced lowering of the levers as soon as the stop tooth is ejected from its housing, thus automatically opening the legs.

[0008] The purpose of the present invention is to use folding legs with actuation levers on boxes provided with collapsible walls, that is walls that can be collapsed towards the inside of the box until they are placed flat on the bottom.

[0009] These boxes are becoming more and more popular both for industrial and domestic use thanks to their reduced volume when closed, with consequent saving on space both during transportation and storage of empty boxes.

[0010] However, the folding legs as described above cannot be used on these boxes since they cannot be universally applied on different types of boxes.

[0011] As a matter of fact, the presence of collapsible - not fixed - walls does not allow to use sliding plates that can be attached to the edges in order to actuate the levers of the legs located under the box.

[0012] To this end, an innovative solution has been

devised to ensure the easy actuation of the levers as well as their disengagement from the means used to hold them in place against the bottom of the box.

[0013] In fact, the presence of collapsible - not fixed - walls does not allow to use return levers applied on the outside of the edges and permanently attached to the actuation levers of the legs located under the box.

[0014] To this end, an innovative solution has been devised to actuate the levers located under the box by means of handles located immediately under the external border of the collapsible walls of the box.

[0015] This purpose has been achieved through a new, original design of the free end of the actuation lever that features a vertical appendix consisting in a rectangular wing that protrudes upwards, on the outside of the transversal wall of the box, provided with a shutter with handle on top in which the user can insert his fingertips by grabbing the upper border of the box in its open position.

[0016] When the box is open, the upper border of the appendix is attached to the base of the shutter. The appendix and the shutter automatically disengage when the transversal sides of the box collapse and automatically engage when the transversal sides are placed back in vertical position.

[0017] For major clarity the description of the box according to 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 a side view of the box, with sides in vertical position and legs diverted downwards;
- Fig. 2 is a section of the box shown in Fig. 1 with the plane II-II;
- Fig. 3 is the same section as Fig. 2, in which the legs are raised and folded under the bottom of the box;
- Fig. 4 is the same section as Fig. 3, showing the box with collapsed sides;
- Fig. 5 is an axonometric view of one of the actuation levers of the legs, with the appendix attached to the shutter;
- Fig. 6 is an axonometric view of one of the transversal sides of the box, as well of one of the actuation levers of the legs, with the appendix disengaged from the shutter, which is in turn disengaged from the transversal side of the box;
- Fig. 7 is an axonometric view of one of the transversal sides of the box, as well of one of the actuation levers of the legs, with the appendix disengaged from the shutter, which is engaged to the transversal side of the box;
- Fig. 8 is a section, with the longitudinal symmetrical plane of the box, of one of the two actuation levers matched with its corresponding pair of legs, sectioned with the same plane.

[0018] With reference the aforementioned figures, the box (1) according to the present invention has a rectangular bottom (2). Four lateral walls (3) are hinged on horizontal pins on the four sides of the bottom (2), with the possibility of collapsing them inside of the box (1) until they are placed flat on the bottom (2), provided with a support base (4).

[0019] More precisely, the transversal sides are of collapsible type, being hinged only on their upper side, while the longitudinal sides are of folding type, being hinged both on the upper and the lower side and provided with central hinge.

[0020] A notch (4a) is located in central position on the two transversal sides of the base (4), internally delimited by an opposite pair of tabs (5) with central holes (5a), in which the pivoting pins (6a) of each pair of folding legs (6) are inserted.

[0021] It must be noted that each pair of legs (6) is an integral part of a single plastic piece shaped as a portal and formed by a top crosspiece (6b) and two lateral legs (6).

[0022] A deep cradle (6c) is located in the centre of the top crosspiece (6b) with the pivoting pins (6a) protruding from the opposite walls, as shown in Fig. 8.

[0023] Each pair of legs (6) is moved by means of an actuation lever (7) consisting in a longitudinal plate that laterally features an opposite coaxial pair of pins (7a) with horizontal axis at one end, which are inserted into housing holes (2a) located on a parallel pair of longitudinal separators (2b) on the lower side of the bottom (2).

[0024] The holes (2a) are located in the proximity of the transversal symmetrical axis of the box (1).

[0025] A cup housing (7b) is centrally located on the actuation lever (7), which houses a pre-compressed spring (8) located between the bottom (2) and the lever (7).

[0026] The free end of the actuation lever (7) features a head (7c), which goes through the notch (4a) and slightly protrudes outside the base (4).

[0027] Each actuation lever (7) is connected to its pair of legs (6) by means of a pin (9) fixed through the cradle (6c) and inserted into a slot (7e) located on the lever (7) near the head (7c).

[0028] The head (7c) of each lever (7) features an appendix consisting in a rectangular wing (7e) that protrudes upwards, on the outside of the transversal wall (3) of the box (1) and ends with an beak-like upper border (7g).

[0029] Each transversal wall of the box externally features a sliding shutter (10), whose lower side (10a) features a pair of external shelves (10b) capable of exactly engaging with a corresponding pair of notches (7h) located on the two sides of the wing (7e), as shown in Fig. 5.

[0030] The upper side (10c) of the shutter (10) features an external handle (10d) located, immediately under the border of the transversal wall (3) of the box (1).

[0031] The upper side (10c) of the shutter (10) also

features a stop tooth (10e) capable of engaging in a suitable housing (3a) located on the transversal wall (3) of the box (1), as shown in Fig. 7.

[0032] According to the traditional construction, the box (1) has an upper border (11) made up of a monolithic perimeter frame on which the transversal walls are hinged with pins (11a), while the two longitudinal walls of folding type are hinged to the border (11) by means of pins (12a) and to the bottom (2) of the box by means of pins (12b).

[0033] On the transversal walls, the bottom (2) of the box (1) according to the present invention features a pair of slots (2c) intersected by the wing (7e) of the actuation levers (7), while on the transversal walls the upper border (11) of the box (1) features a pair of slots (11b) perfectly aligned with the slots (2c) of the bottom (2).

[0034] As shown in Fig. 4, when the box (1) is closed and the legs (6) are raised and folded against the bottom (2) of the box, the hooked border (7g) of each wing (7e) is engaged within the slots (11b) of the border (11), so that the actuation levers (7) cannot rotate downwards, in spite of the expulsive thrust of the springs (8).

[0035] Fig. 4 also shows how each shutter (10) is disengaged from the wing (7e) when the shutter (10) lies horizontally, together with the transversal wall, above the bottom (2) of the box.

[0036] To automatically divert the legs (6) starting from the position shown in Fig. 4, the user needs to push with one finger on the hooked border (7g) to disengage it from its slot (11b) so that the actuation levers (7) can move downwards under the action of the springs (8), thus automatically diverting the legs (6) due to the matching between the pin (9) and the cam slot (7d).

[0037] Once the legs have been diverted (6), the walls (3) of the box (1) can be placed in vertical position, as usual, to open the box, as shown in Figs. 1 and 2.

[0038] Once the vertical movement of the transversal sides has been completed, the pair of external shelves (10b) of each shutter (10) automatically engages within the corresponding pair of notches (7h) located on the two sides of the wing (7e), thus connecting the wing (7e) with the shutter (10).

[0039] As explained below, this connection is necessary to close the legs (6) when grabbing the upper border (11) of the box.

[0040] In fact, by grabbing the upper border of the transversal walls of the box, the user can reach and grab the handle (10d) of the shutters (10) with his fingertips, in order to pull the shutter upwards until the tooth (10e) engages with the housing (3a).

[0041] It is obvious that the lifting of the shutters (10) determines the simultaneous lifting of the actuation levers (7), since the shutters (10) are engaged to the wing (7e) of the levers (7).

Claims

1. A plastic box with collapsible walls, provided with folding support legs, of the type comprising:

- a rectangular bottom (2) with four lateral walls (3) hinged on horizontal pins (11a, 12a° and 12b) on the four sides of the bottom (2), with the possibility of collapsing them inside the box (1) until they are placed flat on the bottom (2) featuring a support base (4) on the perimeter provided with an opposite pair of tabs (5) with central holes (5a) in which the pivoting pins (6a) of each pair of folding legs (6) are inserted; 5 10
- two opposite pairs of legs (6), each being an integral part of a single plastic piece shaped as a portal and formed by two lateral legs (6) and a top crosspiece (6b), centrally provided with a deep cradle (6c) with pivoting pins (6a) protruding from the opposite walls; 15 20
- an actuation lever (7) for each pair of legs (6) consisting in a longitudinal plate that laterally features an opposite coaxial pair of pins (7a) with horizontal axis at one end, which are inserted into housings (2a) located on a parallel pair of longitudinal separators (2b) on the lower side of the bottom (2); it being provided that a cup housing (7b) is centrally located on the actuation lever (7), which houses a pre-compressed spring (8) located between the bottom (2) and the lever (7); it also being provided that each actuation lever (7) is connected to its pair of legs (6) by means of a pin (9) fixed through the cradle (6c) and inserted into a slot (7e) located on the lever (7) near its free end; 25 30 35

being characterised by the fact that:

- the free end of each lever (7) features a head (7c) with appendix, consisting in a rectangular wing (7e) that protrudes upwards, on the outside of the transversal wall (3) of the box (1) and ends with a beak-like upper border (7g); 40
- on the transversal walls the bottom (2) of the box (1) features a pair of slots (2c) intersected by the wing (7e) of the levers (7); 45
- the transversal walls of the box (1) externally feature a shutter (10) in central position, with an external handle (10d) on the upper side (10c), and a pair of external shelves (10b) on the lower side (10a), capable of exactly engaging with a corresponding pair of notches (7h) located on the two sides of the wing (7e); 50
- the upper side (10c) of the shutter (10) features a stop tooth (10e) capable of engaging with a suitable housing (3a) located on the transversal walls (3) of the box (1); 55
- on the transversal walls the upper border (11)

of the box (1) features a pair of slots (11 b) perfectly aligned with the slots (2c) of the bottom (2).

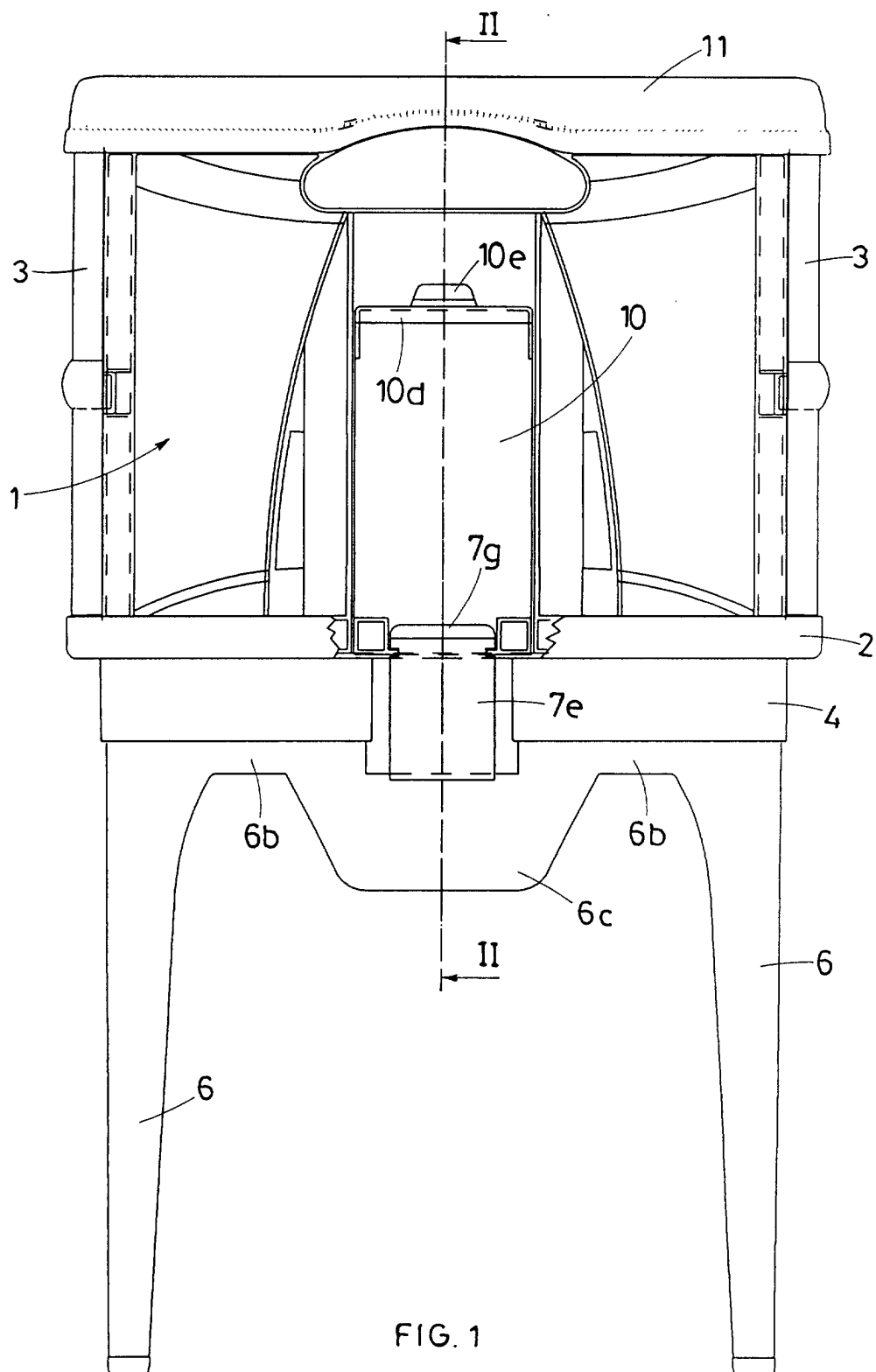


FIG. 1

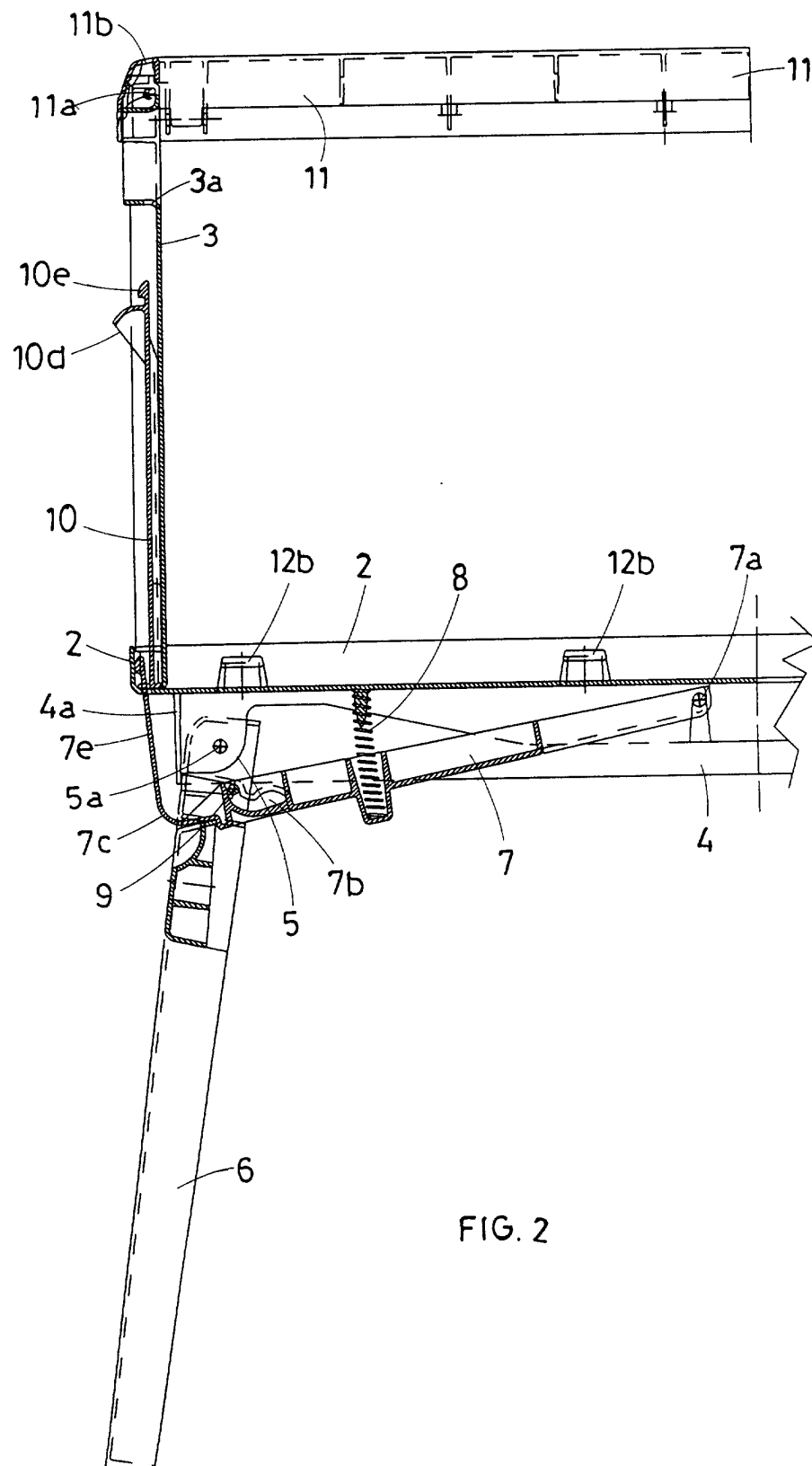
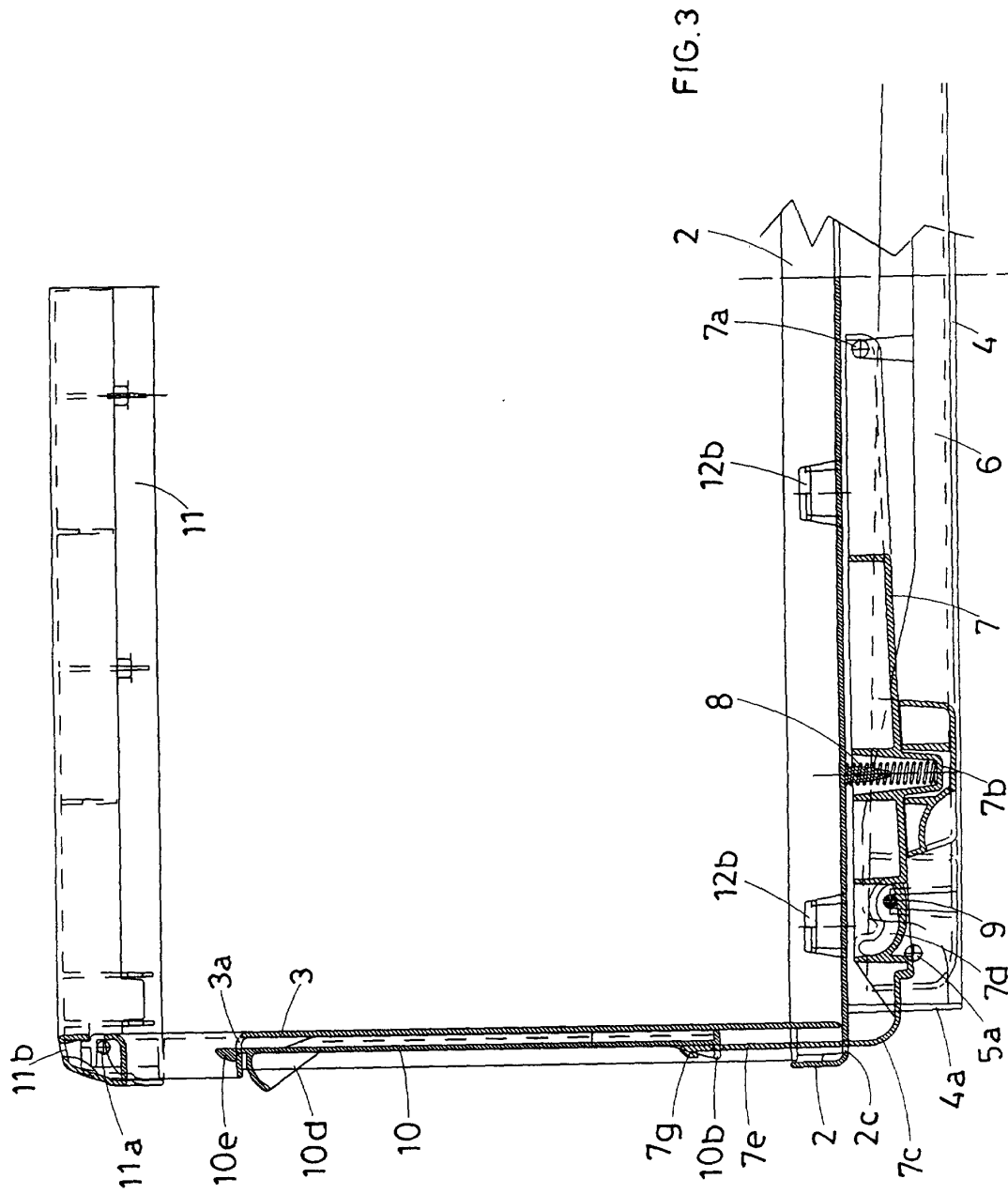


FIG. 2



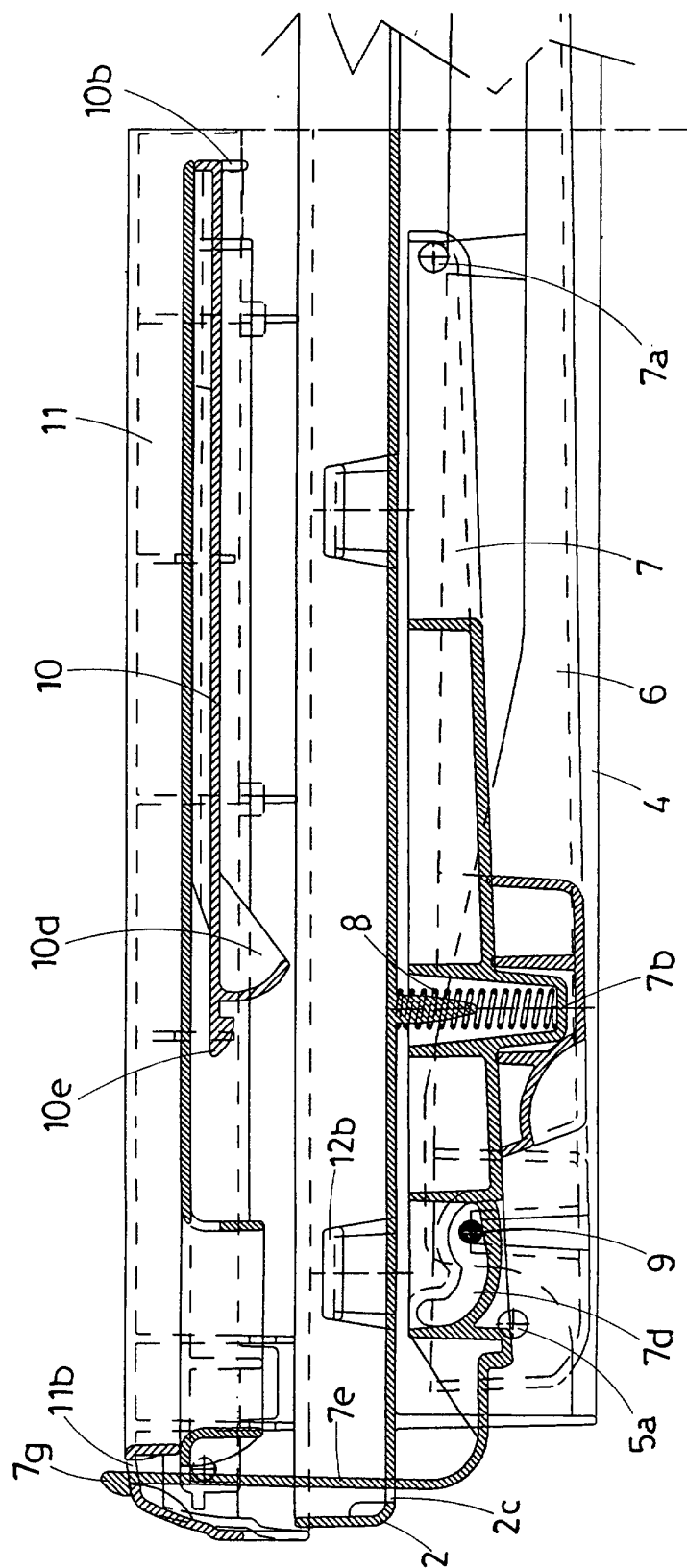
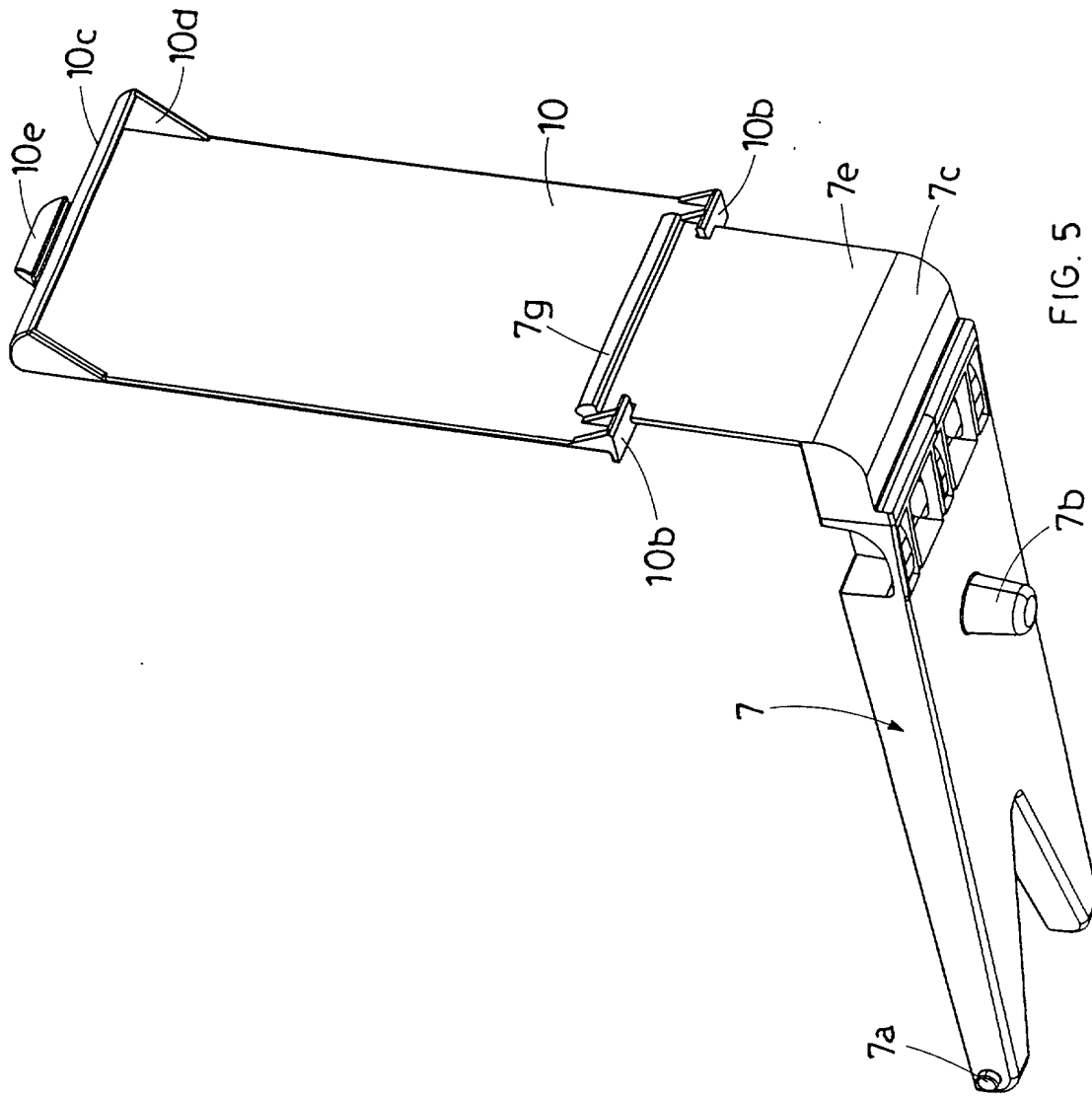
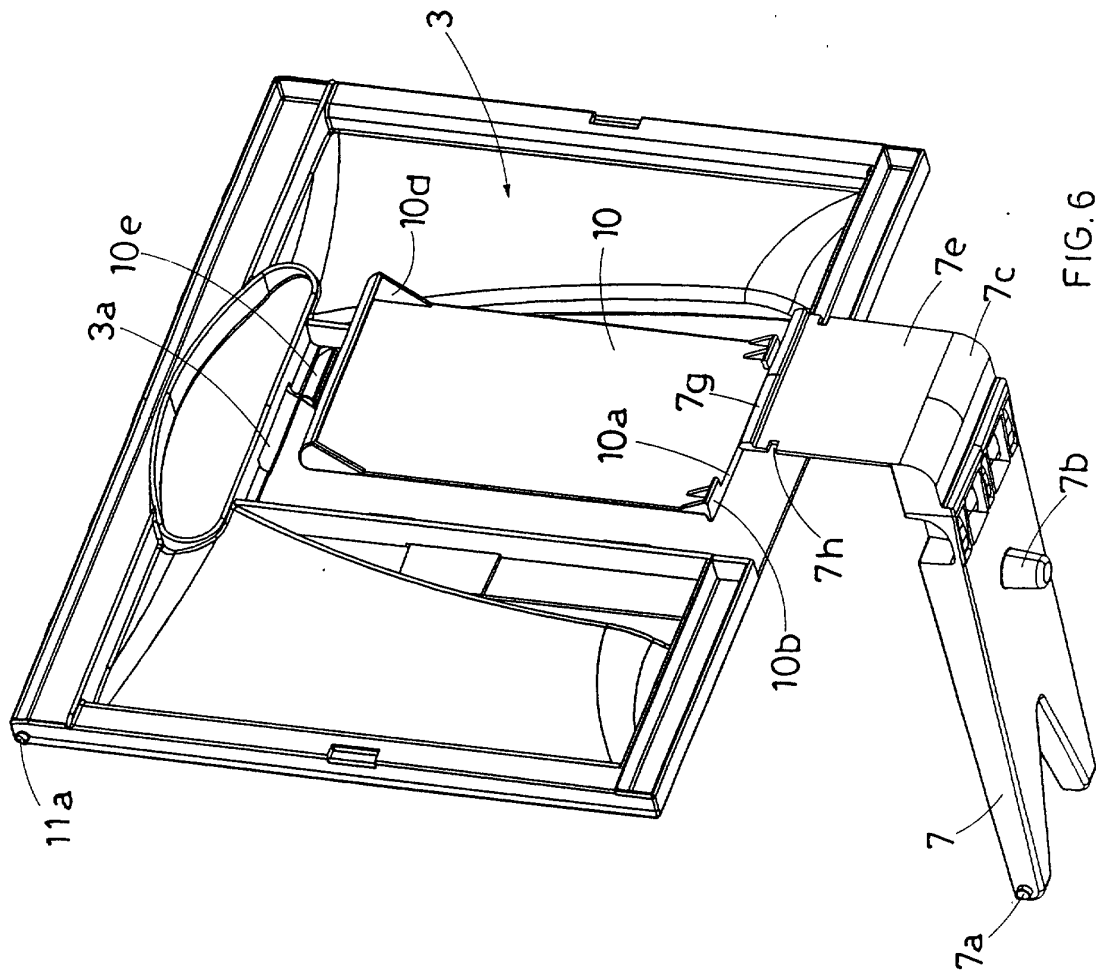
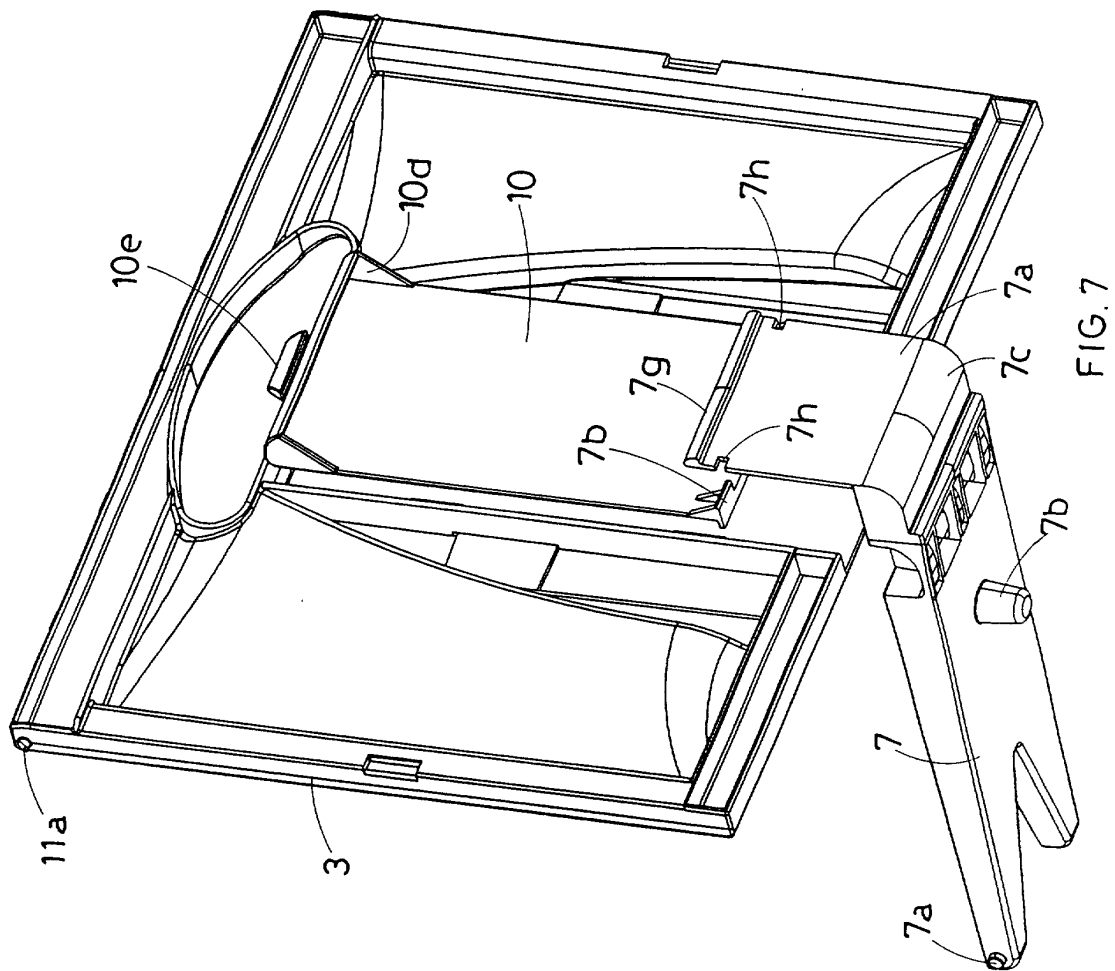


FIG. 4







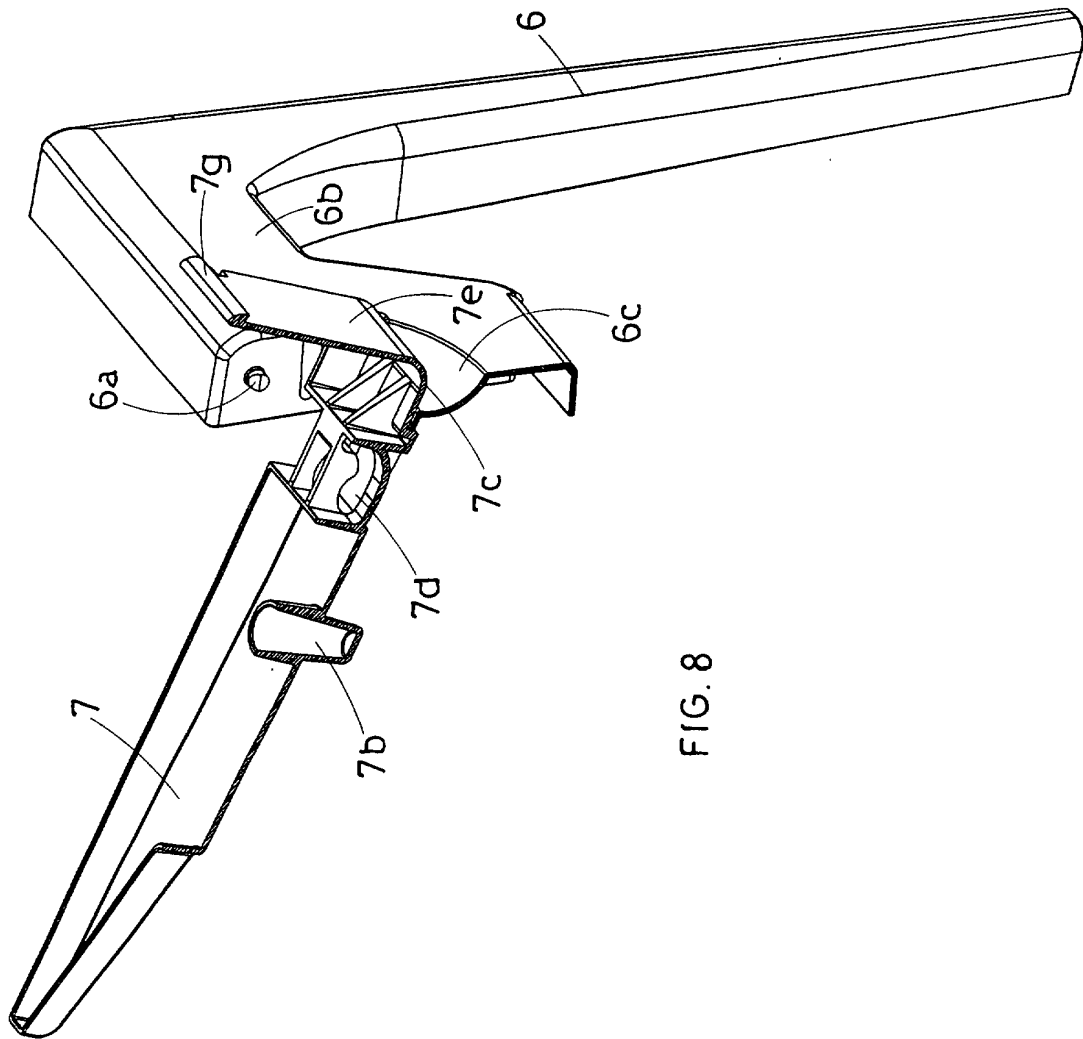


FIG. 8



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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0019

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)
A	EP 1 055 769 A (MEGA) 29 November 2000 (2000-11-29) * the whole document *	1	B65D25/24
A	WO 79 00048 A (BIERI) 8 February 1979 (1979-02-08) * page 4, line 22 - page 8, line 8; figures 1-4 *	1	
A	DE 297 22 887 U (FAFFLOK) 2 April 1998 (1998-04-02) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D D06F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 21 June 2001	Examiner Martens, L
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EPO FORM 1503 03/82 (P04C01)

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

EP 01 83 0019

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21-06-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1055769 A	29-11-2000	NONE	
WO 7900048 A	08-02-1979	CH 618132 A	15-07-1980
		AU 525987 B	09-12-1982
		AU 3818478 A	24-01-1980
		BR 7808668 A	14-08-1979
		CA 1119977 A	16-03-1982
		DE 2856978 C	29-04-1982
		EP 0007335 A	06-02-1980
		GB 2021071 A,B	28-11-1979
		JP 1332675 C	28-08-1986
		JP 54022279 A	20-02-1979
		JP 60058100 B	18-12-1985
		US 4424912 A	10-01-1984
DE 29722887 U	02-04-1998	NONE	