



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.08.2011 Bulletin 2011/33

(51) Int Cl.:
E05D 15/06 (2006.01)

(21) Application number: **10014961.6**

(22) Date of filing: **24.11.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(71) Applicant: **ECLISSE SRL**
31053 Pieve di Soligo (TV) (IT)

(72) Inventor: **De Faveri, Luigi**
31020 Refrontolo (TV) (IT)

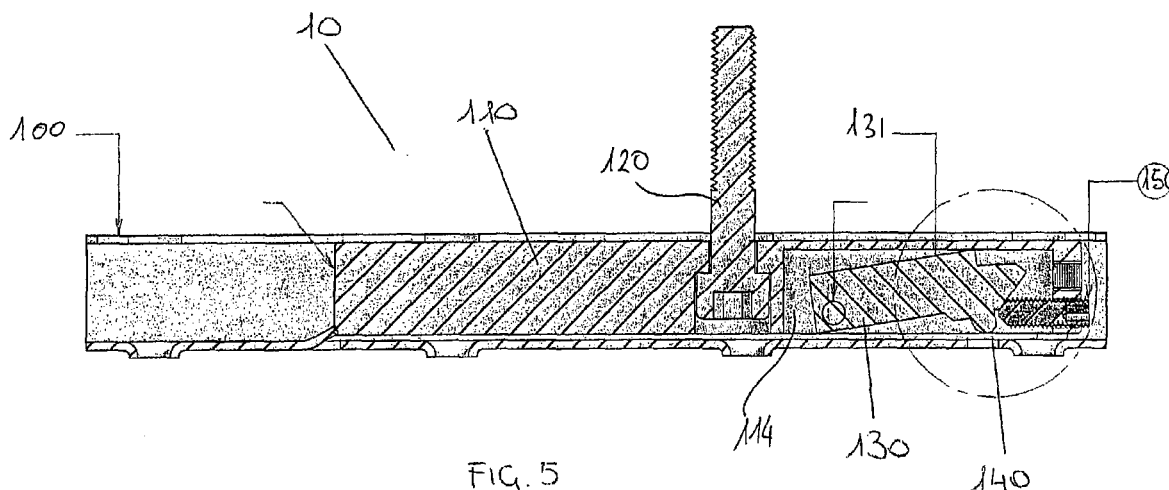
(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

(30) Priority: **15.02.2010 IT TV20100012**

(54) **Device for supporting and anchoring in a having condition the door panel in a counter-frame for retractable sliding doors**

(57) Device for the support and anchorage (10) in a hanging condition of the door panel (20) in a counter-frame for sliding doors, which consists of a mechanical hooking obtained by means of a protruding fixing movable tooth (130, 140) which is hinged on a body (110)

which slides within a metallic section bar (100) and is left to fall unscrewing a dowel screw (150) which supports it, entering a slit (101) obtained in the fixed section bar (100) to be then locked by the same dowel screw (150) which prevents the exit from said slit (101).



Description

[0001] This invention relates to a device for supporting and anchoring in a hanging condition the door panel in a counter-frame for retractable sliding doors.

Field of the invention

[0002] The proposal finds particular but not exclusive application in the sector of the industry for the production of accessories for window and door frames, particularly window and door frames of sliding type.

[0003] With reference to the door frames, the sliding doors of retractable type are structured in such a way as to include a series of fixed elements, intended to be integrated in the load-bearing structure, and a series of movable elements, which are intended to be used during the installation phase of the door and then removed subsequently. Substantially, a counter-frame is integrated in the load-bearing structure, which can be of plaster or plasterboard type. The mentioned fixed elements are provided to be associated to the load-bearing structure and include at least one case or large case intended to be the structure within which the door panel will be contained once the same has been slid up to the opening position, together with a rabbet stanchion intended to be anchored to the wall at the vertical profile of the doorcase opposite to the one for positioning the mentioned case, in such a way as to allow the door itself to go into abutment against it when in the closing position. Moreover, above the same case a longitudinal guide is engaged, being screwed to said load-bearing structure. In order to allow the actual opening and closing movement of the door, the presence of a sliding track is conventionally provided to which the door panel is suspended by means of convenient means. In order to allow the opening and closing movement of the door, the sliding track, placed at the upper part of the case structure, is usually equipped with sliding means usually of the trolley type to which, by means of conventional threaded means, the upper edge of the door is joined by means of appropriate devices for the support and anchorage of the door panel.

Prior art

[0004] The technical panorama shows several solutions of devices for the support and anchorage of door panels in a counter-frame for sliding doors. A brief and not in-depth research within the patent literature has allowed to find at least the following documents:

D1: JP6146726 (Yamamoto)
D2: ITFO2001A000009 (Scrigno)
D3: ITTV2007A000007 (DE Faveri)

[0005] D1 proposes to facilitate the adjustment in height of the door panel relatively to the guide track and to prevent the possibility of loosening caused by a pro-

longed use. The solution provides a lever body consisting of a vertical screw jointed to a threaded seat with an assembly seat assembled on the surface of the upper edge of the door panel. A suspension and support means, of the sliding type, is placed on the sliding track and is connected to the upper part of the rod of the screw of the lever body, which can rotate around an axis. A locking seat is obtained in the end part of a through-hole through which said rod of the suspension and support means is inserted. Moreover, a protruding locking means of the type engageable and disengageable from a locking seat is obtained at the upper part of the end of said rod. The length of the threaded lever body, placed between the suspension and support element and the door panel is provided to be capable of being adjusted through the rotation of the screw of the lever body so that the mentioned protruding locking means during the assembly of the door panel is released from said locking seat, and then successively constrained to said locking seat.

[0006] In D2 the upper edge of the door panel is provided with appropriate seats, placed at each of the two side ends of the same mentioned upper edge. Within each seat a supporting device is positioned comprising a guide, consisting of a metallic section bar with a "C"-shaped section and provided with holes for the engagement of threaded fixing means by means of which the anchorage is obtained of each guide to the corresponding seat of the door panel. Inside the mentioned guide two metallic wedges with 45 degree oblique cut are placed which are reciprocally engaged by means of a threaded fixing means, where the reciprocal clamping by means of the same mentioned threaded fixing means causes them to ward off towards two opposite sides of said guide and thus to lock the ensemble. One of the two wedges is provided to be equipped with an orthogonally through hole for the engagement of a threaded pin of the type equipped with head intended to be screwed on the corresponding threaded seat of which the sliding trolley is provided with, which sliding trolley supports the door panel to the guide track.

[0007] Also in D3 an improved support and anchorage device for sliding doors is described. More particularly it consists of a guide profile of the type with "C"-shaped section, provided with at least one through-hole for the engagement of the same to the upper edge of the panel of a sliding door and further provided, at one side wall at least, with at least one seat for a tooth which is present in at least one movable lever, equipped with a spring, forming part of a door-pin small block comprising a shaped body equipped with at least one retaining pin for the movable lever and at least one through-hole for a threaded pin of the type equipped with head.

Drawbacks

[0008] Even though the technique has evolved, in the opinion of the applicant, the current known solutions of support and anchorage devices for door panel in a coun-

ter-frame for sliding doors still have some limitations.

[0009] A first limitation which has no solution so far in the technical panorama of the support and anchorage devices for sliding doors, consists in the difficulty of positioning and following locking of the door-pin device inside the guide profile.

In particular the applicant believes that the positioning of the device, for example of the one described in D2 because it substantially consists of two wedges which are in a loose condition in the insertion phase, is complex and particularly difficult requiring a preventive manual alignment. In the same way, there seems to be the same disadvantage as in the solution shown in D3 and maybe even in a more increased way because the spring lever present in the lower part would represent an additional obstacle to the linear insertion of the so configured device.

[0010] A second limitation of the current solutions of support and anchorage devices for sliding doors, also relates to the difficulty they have for a following removal of the door-pin device from the guide profile. In other words, in the solution described in both D2 and D3, it is necessary to operate in the presence of a screw, for determining the locking, in a position difficult to access, rotating several times in an uncomfortable way, and so much as to allow the sufficient loosening of the wedge-shaped or lever retaining devices which determine the locking of the device.

[0011] A third limitation consists in the difficulty to obtain an optimal support of the sliding door avoiding the disadvantage that the loosening of the door-pin device may cause an undesired sliding of the same inside the guide profile with inevitable negative repercussions for the stability of the corresponding panel of the sliding door, which circumstances contribute to make the movement of said door panel particularly noisy.

[0012] In relation to the above the need emerges to identify alternative and more functional solutions with respect to the current ones.

[0013] This invention aims at providing a device for the support and anchorage in a hanging condition of the door panel in a counter-frame for sliding doors which allows to improve the positioning and the removal of the door-pin device within the guide profile, at the same time optimizing the anchorage and support conditions.

Brief description of the invention

[0014] This and other aims are achieved by the present invention according to the characteristics as per the appended claims, solving the above problems through a device for the support and anchorage (10) in a hanging condition, of the door panel (20) in a counter-frame for sliding doors, which consists of a mechanical hooking obtained by means of a protruding fixing movable tooth (130, 140) which is hinged on a body (110) which slides within a metallic section bar (100) and is left to fall unscrewing a dowel screw (150) which supports it, and is

inserted in a slit (101) obtained in the fixed section bar (100) and is successively locked by the same dowel screw (150) which prevents its exit from said slit (101).

Aims

[0015] In this way, through the appreciable creative contribution whose effect constitutes an immediate technical progress, some advantageous aims are achieved.

[0016] A first advantageous aim consists in realizing a support and anchorage device for door panel which assures a locking having considerable resistance against accidental sliding, due to strong impacts of the door panel at the end of stroke, and which does not need clamping controls due to a possible loosening of the locking provoked by vibrations, transmitted by the normal sliding of the door panel, at the same time ensuring an optimal anchorage and support of the door panel, facilitating the necessary operations for the positioning and the possible removal of the door-pin small block from inside the guide profile.

[0017] A second advantageous aim consists in the realization of an improved support and anchorage device for sliding doors in which the position can be predetermined of the door-pin small block within the guide profile.

[0018] Another advantageous aim consists in the realization of an improved support and anchorage device for sliding doors which allows to reduce the installation time of the same, consequently, contributing to contain the costs related to such an operation. In particular, the insertion phase of the movable bracket inside the fixed bracket is rendered more comfortable, and at the same time the removal phase is rendered easier, without the need to pay particular attention in the alignment, as the movable bracket forms a single stable body together with the lever which integrates the hooking tooth.

[0019] These and other advantages will appear from the following detailed description of at least one preferred solution with the aid of the enclosed schematic drawings.

Brief description of the drawings

[0020]

Figure 1 represents a whole top view of the device for the support and anchorage in a hanging condition of the door panel according to the invention, in an installed condition along the upper side of the door panel;

Figure 2 represents an exploded view of the device for the support and anchorage of Figure 1 and of the door panel;

Figure 3 is an axonometric view of the movable bracket body;

Figure 4 represents a top view of the device for the support and anchorage of Figure 1;

Figure 5 represents a longitudinal sectional view of the device for the support and anchorage according

to the object of the present invention, according to the section A-A of Figure 4, in a release condition of the lever with hooking tooth;

Figure 6 is a local view of the hooking lever of the device for the support and anchorage according to the object of the present invention;

Figure 7 represents a top view of the object of the present invention;

Figure 8 represents a longitudinal sectional view of the device for the support and anchorage according to the object of the present invention, according to the section B-B of Figure 7, in an engagement condition of the lever with hooking tooth;

Finally, Figure 9 is a local view of the lever with hooking tooth, in a locking condition of the device for the support and anchorage in a hanging condition.

Practical example of embodiment

[0021] The device for the support and anchorage in a hanging condition (10) of the door panel (20) (Fig. 1), in a counter-frame for sliding doors, substantially consists of a fixed guide bracket (100), a movable bracket body (110) having substantially square section, an adjusting screw (120) for the connection to the sliding trolley along the track, which adjusting screw (120) is substantially perpendicular and passing through with respect to said movable bracket (110), a lever (130) with hooking tooth (140) where said lever is hinged with respect to the movable bracket (110), a dowel (150) screwing at the front head (111) in at least one of the two threaded seats (112, 113) each passing through said front head (111) of the movable bracket (110) in such a way as to communicate with the housing recess (114) for said lever (130) with hooking tooth (140).

[0022] The device for the support and anchorage in a hanging condition (10) is conceived to allow the anchorage of a door panel (20) of a sliding door and for the connection and fixing of the sliding trolleys along the track joined to the crosspiece, in a counter-frame for sliding door to the door panel (20), as close as possible to the track of the same counter-frame, thus leaving a space as short as possible between the track and the door panel (20) and thus without using the normal support brackets, screwed along the upper side of the door panel (20) which namely protrude from the perimeter of encumbrance of the same panel.

[0023] The device for the support and anchorage in a hanging condition (10) consists of a mechanical hooking obtained by means of a hooking tooth (140) which protrudes with respect to the movable bracket (110) and which, hinged on the body of said movable bracket (110) by means of the lever (130), is capable to oscillate from a locking position, Figure 9, to an unlocking position, Figure 6, with respect to the fixed guide bracket (100). In more detail, the movable bracket (110) in an installation phase slides inside the fixed guide bracket (100), which

consists of a metallic section bar with "C"-shaped section, so that the lever (130) which is left to fall unscrewing the dowel screw (150) from the seat (113), makes the relative tooth (140) enter at least one slit (101) (Fig. 9) which is obtained at the bottom (102) of the fixed guide bracket (100). In this condition the lever (130) with the hooking tooth (140) is then locked by the same dowel screw (150) which prevents the exit from this slit (101), moving said dowel screw (150) in the upper threaded seat (112). The insertion of the movable bracket body (110) along the fixed guide bracket body (100) can be also carried out with the dowel (150) already unscrewed and removed with respect to the seat (113), simply pushing the movable bracket body (110) inside the longitudinal housing in the fixed guide bracket (100).

[0024] As for the lever (130) (Fig. 5), it consists of a monolithic body, housed inside the recess (114) which is obtained along the base side of the movable bracket (110) facing the bottom (102) of the underlying fixed guide bracket (100). Said lever (130) is hinged with one end inside the recess (114) and with respect to the movable bracket (110) in such a way that its oscillation allows the front end (131) of the lever (130), opposed with respect to the pivoting lever which is provided with a hooking tooth (140), to protrude with respect to said recess (114) to enter the slit (101) at the underlying fixed guide bracket (100). More in particular the front end (131) of the lever (130) includes the hooking tooth (140) which faces the underlying fixed guide bracket (100) while the head side (134) of the lever (130) against which the dowel screw abuts (150) includes two inclined planes (132, 133) oriented in opposite directions (Fig. 6), against each of which depending on the required operativeness, said dowel screw abuts (150) in such a way that at the lower inclined plane (132) the lever (130) and the relative hooking tooth (140) raise, while varying the position of said dowel screw (150) moving it from the lower threaded seat (113) inside the upper seat (112), it progressively abuts at the upper inclined plane (133) in such a way as to push the lever (130) with the hooking tooth (140) over the edge of said recess (114) in order to make said hooking tooth (140) enter the slit (101) of the underlying fixed guide bracket (100). In this position, the front end of the lever (131) with the locking seat (135) of the dowel (150) is placed in a nearly aligned position to the upper threaded seat (112) in such a way as to let the dowel (150) in a screwed condition determine the stop of the oscillation movement of said lever (130), through the overlap of the dowel (150) in said locking seat (135).

[0025] Operatively, in the insertion phase of the movable bracket body (110) into the fixed guide bracket (100), the dowel screw (150) maintains the lever (130) with hooking tooth (140) in a raised position, which lever is hinged by means of the metal peg to the movable bracket body (110). Once arrived at the locking position, which can be predetermined, for example by a clamp for movable bracket body (110), the dowel screw is unscrewed (150) from said lower holed and threaded seat (113)

which is at the head of the movable bracket body (110). In this way the lever (130) with hooking tooth (140) rotates downwardly and the hooking tooth (140) goes inside the fissure or slit (101) present on the bottom (102) of the fixed guide bracket (100). The dowel screw (150) is then screwed in order to lock the lever (130) and the hooking tooth (140) in the closing position.

References:

[0026]

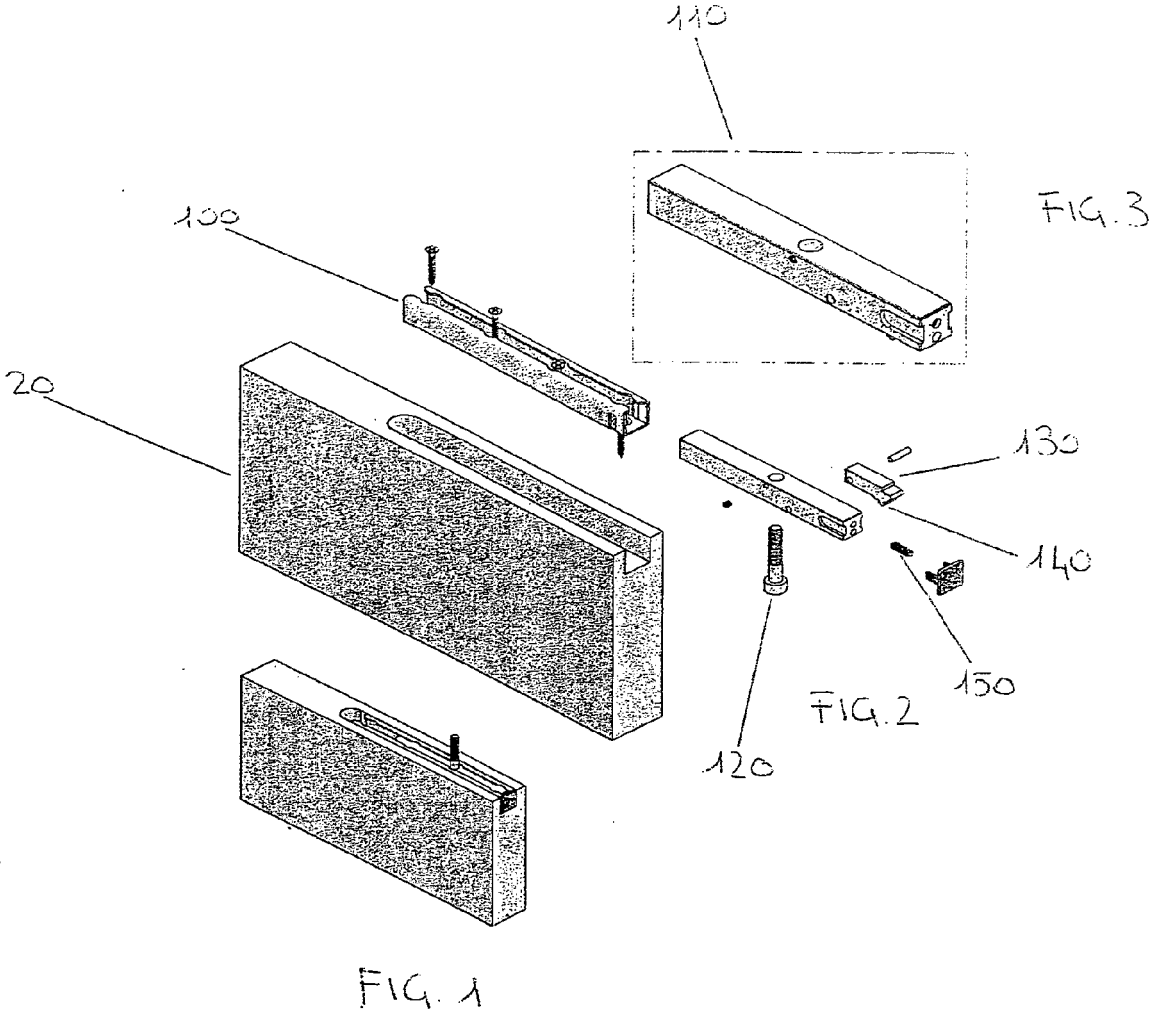
(10) device for the support and anchorage in a hanging condition
 (20) door panel
 (100) fixed guide bracket
 (101) slit
 (102) bottom of the fixed guide bracket
 (110) movable bracket
 (111) front head
 (112, 113) threaded seats
 (114) recess
 (120) adjusting screw for the connection to the trolley
 (130) lever
 (131) front end of the lever
 (132, 133) inclined planes
 (134) head side of the lever
 (135) lever locking seat
 (140) hooking tooth
 (150) dowel

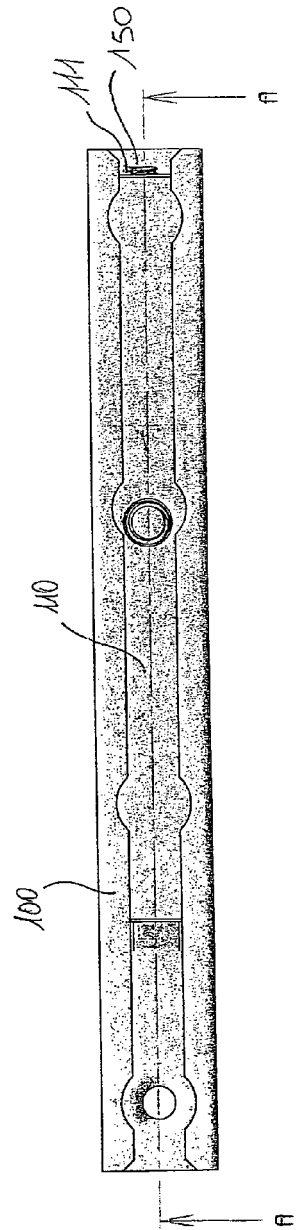
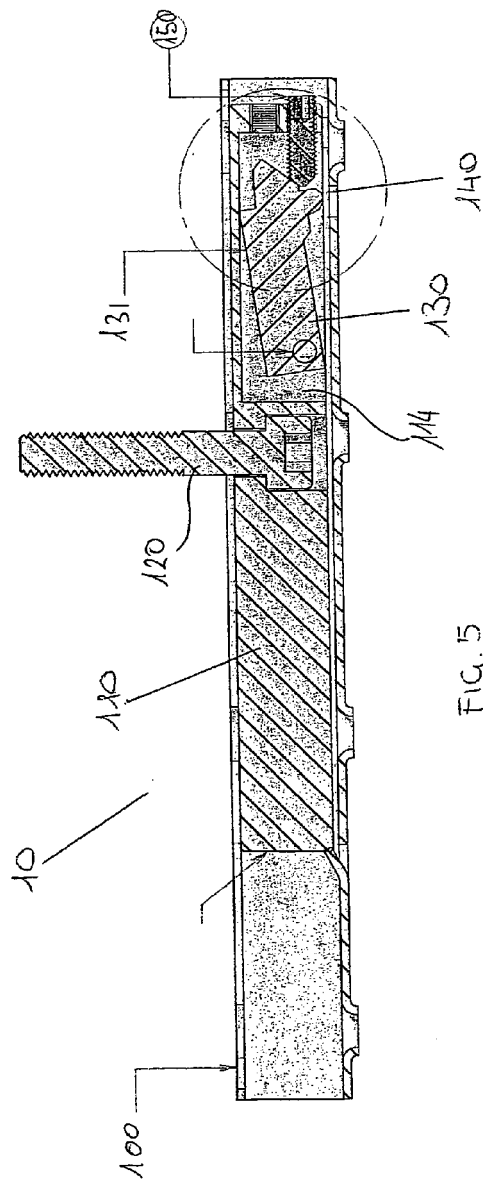
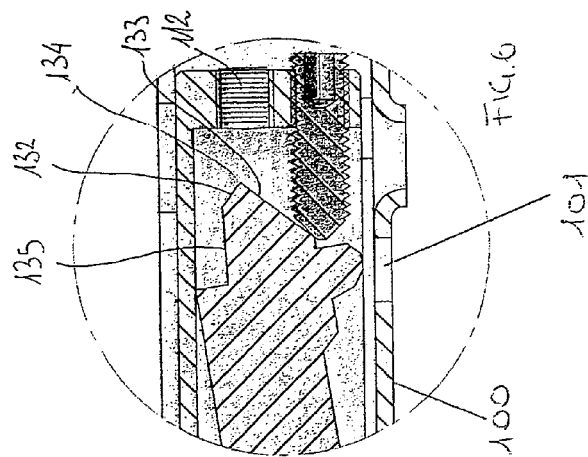
Claims

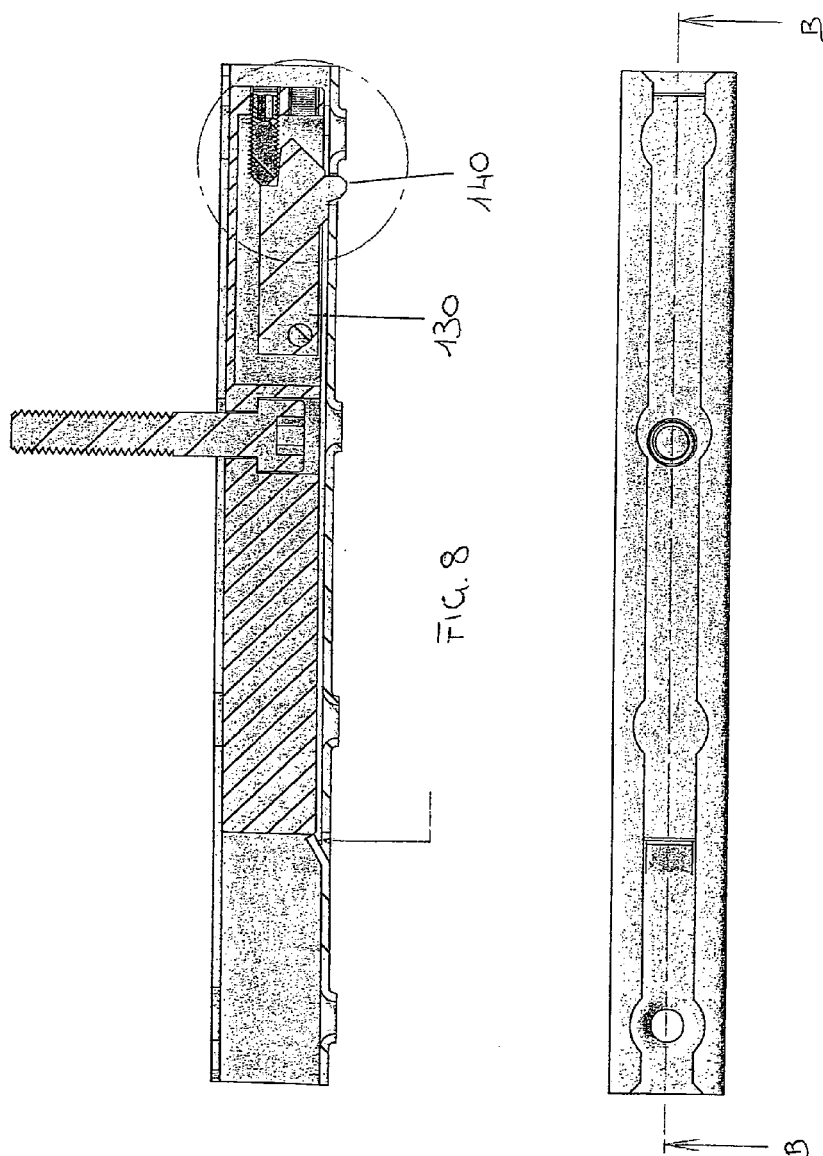
1. Device for the support and anchorage (10) in a hanging condition of the door panel (20) of the type comprising a fixed guide bracket (100) with "C"-shaped section, which fixed guide bracket (100) has a bottom (102) which is provided with through-holes for the engagement by means of fixing means along the upper side of said door panel (20), **characterised in that** it has a mechanical hooking obtained by means of the protruding hooking tooth (140), which is hinged with respect to the movable bracket body (110) inside said fixed guide bracket (100), and is left to fall unscrewing a dowel screw (150) with respect to the movable bracket body (110) which supports it, entering at least one slit (101) obtained in the fixed bracket (100) to be then locked by the same dowel screw (150) which prevents the exit from said slit (101).
2. Device for the support and anchorage (10) according to claim 1, **characterised in that it consists of** a movable bracket body (110) with at least one adjusting screw (120) for the connection to the sliding trolley along the track, which adjusting screw (120) is substantially perpendicular and passing-through

with respect to said movable bracket (110); one lever (130) with hooking tooth (140) where said lever is hinged with respect to the movable bracket (110), a dowel (150) which is screwed at the front head (111) of the movable bracket (110), in at least one of the threaded seats (112, 113), each passing through said front head (111) of the movable bracket (110) in such a way as to communicate with the recess (114) for the housing of said lever (130) with hooking tooth (140), said movable bracket body (110) lever (130) and hooking tooth (140) being inserted inside the fixed guide bracket (100).

3. Device for the support and anchorage (10) according to claims 1 and 2, **characterised in that** the lever (130) is a monolithic body, housed inside the recess (114) which is obtained along the base side of the movable bracket (110) facing the bottom (102) of the underlying fixed guide bracket (100), said lever (130) hinged with one end inside the recess (114) and with respect to the movable bracket (110) in such a way that its oscillation allows the end front (131) of the lever (130), opposed with respect to the pivoting one which is provided with a hooking tooth (140), to protrude with respect to said recess (114) to enter the slit (101) at the underlying fixed guide bracket (100).
4. Device for the support and anchorage (10) according to the preceding claims, **characterised in that** the front end (131) of the lever (130) at the head side (134) against which the dowel screw (150) abuts, includes two inclined planes (132, 133) oriented in opposite directions, against at least one of which said dowel screw (150) abuts in such a way that the lever (130) and the relative hooking tooth (140) rise at the lower inclined plane (132), while varying the position of said dowel screw (150) moving it from the lower threaded seat (113) inside the upper seat (112), it progressively abuts against the upper inclined plane (133) in such a way as to push the lever (130) with the hooking tooth (140) over the border of said recess (114) for making said hooking tooth (140) enter the slit (101) of the underlying fixed guide bracket (100).
5. Device for the support and anchorage (10) according to the preceding claims, **characterised in that** the head side (134) has a locking seat (135) of the dowel (150).









EUROPEAN SEARCH REPORT

Application Number
EP 10 01 4961

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 592 357 A1 (EKU AG [CH]) 13 April 1994 (1994-04-13) * page 3, line 6 - page 4, line 39; claim 1; figures 1,2,8 *	1-5	INV. E05D15/06
A	EP 1 460 225 A1 (EKU AG [CH]) 22 September 2004 (2004-09-22) * paragraph [0008] - paragraph [0009]; claim 1; figures 1-3 *	1-5	
A,D	JP 6 146726 A (DAIKEN TRADE & INDUSTRY; IMAMURA SHINJI) 27 May 1994 (1994-05-27) * the whole document *	1-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 21 April 2011	Examiner Balice, Marco
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 10 01 4961

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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21-04-2011

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