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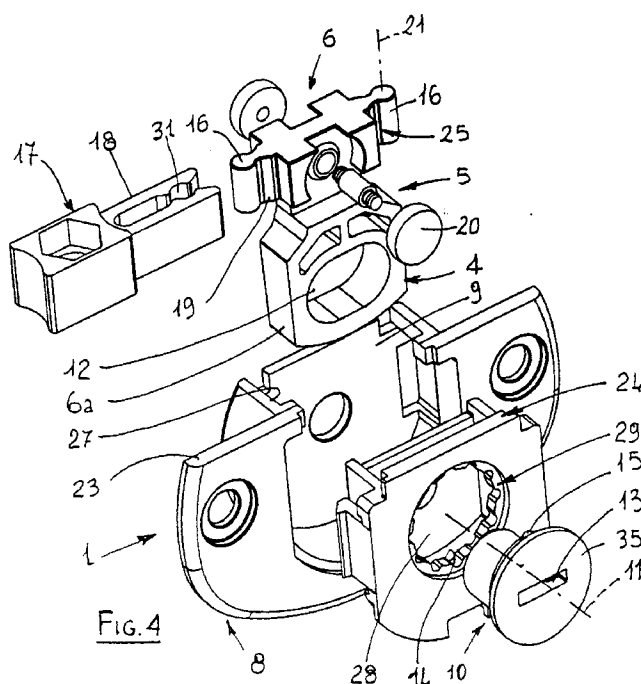
AT BE CH DE ES FR GB GR IT LI• **Caldari, Gianfranco****47036 Riccione RN (IT)**(30) Priority: **18.06.1996 IT BO960332**(74) Representative: **Lanzoni, Luciano****c/o BUGNION S.p.A.****Via Cairoli, 107****47037 Rimini (Forlì) (IT)**(71) Applicant: **Koblenz S.r.l.****47040 Coriano (RN) (IT)**

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• **Migliorini, Massimo****47037 Rimini RN (IT)****(54) Device for the adjustable connection of a sliding door wing to a furniture piece**

(57) A device (1) for the adjustable connection of a sliding door wing (3) to a furniture piece (2) comprises a carriage (4) suspending the wing (3) from the furniture piece (2) provided with at least one sliding block (5) supported by a supporting body (6) and coupled to a guide (7) fastened to the furniture piece (2) in such a way as to be free to translate within said guide (7); a body (8) fastening the carriage (4) to the wing (3) having an internal cavity (9) able to retain the body (6) supporting

the carriage (4) allowing its relative mobility with respect to the internal cavity (9); and means (16, 17, 18, 19, 25) for slowing and retaining the wing (3) in the extreme points of its translation along the guide (7). The supporting body (6) is mounted so as to slide within the cavity (9) in such a way as to allow vertical transation shifts of the sliding block (5) with respect to the wing (3), when the related adjustable actuating means (10, 12) are acted upon allowing the wing (3) to be adjusted with respect to the furniture piece (2).

**FIG. 4****EP 0 814 226 A1**

Description

The present invention relates to a device for the adjustable connection of a sliding door wing to a furniture piece.

In particular, the present invention relates to a device which can be used advantageously for the connection of light door wings such as those fitted to office or kitchen cabinets; however, this does not diminish its general nature, as it can also be used for the adjustable connection of heavy door wings, such as those related to sliding doors.

In the furniture manufacturing industry, the production of door wings which can be opened by sliding along the plane on which they lie, and which are connected to the furniture piece in such a way as to be suspended from a guide located in correspondence with the top of the furniture piece, is well known.

In these embodiments, the sliding guides are generally rather limited in size either because they must be housed within the thickness of the top plane of the furniture piece, or because, mounted so as to protrude from it, they must not reduce the useful cross-section for accessing the space inside the furniture piece.

A connection device described in the document EP 0 592 357 and embodied according to the preamble to claim 1 comprises, for the purposes mentioned, a carriage which is attached to the door wing by means of a suitable fastening body, which carriage, on one side, engages its sliding block in the guide of the furniture piece thus being able to translate therein and, on the opposite side, projects externally from the guide connecting to the fastening body.

The device also comprises slowing and retaining means which, activated in correspondence with the limits of the translation of the carriage, allow the wing which has reached its fully opened or fully closed position to remain stably in the condition reached, in the absence of a contrary action imparted externally.

The sliding block of the carriage is actuated in particular by two pairs of wheels arranged in succession along the guide, and the supporting body of the carriage is coupled with a rotating joint to the fastening body so as to oscillate, rotating around a horizontal axis, allowing all the carriage wheels constantly to remain in direct contact with the guide.

The fastening body is in turn fastened to the wing, fitted inside a housing cavity, of complementary shape, currently known as "well cavity", obtained on the wing for the purpose of limiting the size of the device within the thickness of the wing itself.

Such device, though it operates properly, is not free of drawbacks: if the cavities housing the fastening bodies were produced with a parallelism error with respect to the guide of the furniture piece, upon mounting the wing would fit crookedly with respect to the guide.

The purpose of the present invention therefore is to eliminate the drawbacks mentioned above by means of

a device for the connection to a furniture piece of a wing opened by sliding, which allows to adjust the wing along a vertical direction.

According to the invention, these problems are solved by means of a device wherein the supporting body of the carriage is mounted so as to slide within the cavity of the fastening body in such a way as to enable it to translate crosswise with respect to the guide, allowing the sliding block to move in that direction with respect to the door wing. Adjustable means to activate such a motion are provided to adjust the way the wing is mounted with respect to the furniture piece.

The technical characteristics of the invention, according to the aforesaid purposes, can clearly be seen in the content of the claims reported below and the advantages of the invention shall be made clearer in the detailed description with follows, made with reference to the enclosed drawings, which show an embodiment provided purely by way of non limiting example, in which:

- Figure 1 is a partially sectioned view of a furniture piece provided with a sliding door wing fitted with devices according to the invention;
- Figure 2 is a cross section of the furniture piece in Figure 1 made along a vertical plane II-II;
- Figures 3 and 4 are prospective views, in an enlarged scale, of the device according to the invention, shown respectively fully assembled and in an exploded view;
- Figure 5 is an overall prospective view of a second embodiment of the device.

With reference to the enclosed Figures 1 and 2 one can observe a device, labelled 1 in its entirety, for connecting to a furniture piece 2 (partially shown) a wing 3, suspended at its top from two connection points, and whose bottom is engaged by means of its own guide 32 to pins 33 inserted in the base 34 of the furniture piece 2 and capable of being opened by sliding along the plane on which it lies.

The device 1 essentially comprises a carriage 4 for suspending the wing 3, which carriage (Figure 4) includes a supporting body 6 and a sliding block 5 supported at the top by the supporting body 6.

The sliding block 5, comprising a pair of rollers 20 mounted coaxially to each other and fitted to both sides of the supporting body 6, is engaged to translate with a sliding guide 7 fastened to the top of the furniture piece 2 and opened at its bottom towards door 3.

The supporting body 6, constrained by the guide 7, in part 6a protrudes downward from the guide 7 and projects towards the underlying wing 3. A body 8 for fastening the device 1 to the wing 3 is housed inside a well cavity 26 obtained on the wing 3 in a position near the top corner of the wing 3.

The fastening body 8 (Figures 3 and 4) comprises two shells 23, 24 which, assembled together in a known

manner, bound an inner cavity 9, open towards the guide 7, in which is inserted the lower part 6a of the body 6 supporting the carriage 4 which is kept in the cavity 9 in a condition of relative mobility with respect to the cavity itself.

More particularly, observing Figure 4, one notes how the shell 23 has inner walls 27 which are shaped to complement the contour of the lower part 6a of the body 6 supporting the carriage 4 so as to enable the supporting body 6 itself to move by sliding vertically within the cavity 9, thus allowing to move the sliding block 5 away from the wing 3, or vice versa to move it closer according to the practical needs arising from mounting operations.

The lower part 6a of the supporting body 6 is also traversed by a through cavity 12, within which is axially inserted a cylindrical body 10, supported by the shell 24 and traversing eccentrically a through hole 28, of larger size, obtained on the shell 24 itself.

The cylindrical body 10 is borne eccentrically by a head 35 coupled so as to swivel with a seat 29 of the shell 24, coaxial with hole 28.

The body 10 therefore performs the dual function of retaining the supporting body 6 within the cavity 9 and to impart, by means of its eccentric rotation with respect to the head 35, the translation to the carriage 4, as a consequence thereof the sliding block 5 moves vertically. The head 35 of the cylindrical body 10, in particular, is provided with a seat 13 for the engagement of a tool effecting its rotation from outside the wing 3.

The body 10, which can swivel eccentrically, and the cavity 12 of the supporting body 6 constitute a non limiting example of embodiment of adjustable means for effecting the aforementioned movement of the sliding block 5.

These actuating means are also provided with additional arresting means able to prevent backward motion, responsible for the spontaneous movement of the body 6 with respect to the cavity 9.

An embodiment provided purely by way of non limiting example of such arresting means, integrated in the actuating means, can be observed in Figure 4, which shows that the eccentrically swivelling body 10 bears an outer toothing 15 which is engaged in a corresponding complementary toothing 14 obtained inside the through hole 28 of the shell 24.

Inside the guide 7 (Figure 1), in correspondence with the extreme points of the translation of the carriage 4 which correspond with the fully opened or fully closed position of the wing 3, the device 1 comprises means for slowing and stably retaining the wing 3 in the open or closed position it has reached.

In particular, (Figures 3 and 4), such means comprise two heads 16 jutting from the body 6 supporting the carriage 4, to the front and to the rear of the sliding block 5, along the sliding direction 30 of the block 5 in the guide 7; and a fork element 17 mounted on the guide 7 opposite to the heads 16.

The heads 16 have an essentially cylindrical shape with axis of symmetry 21 essentially transverse to guide 7 and parallel to the plane on which the wing 3 lies, and are joined to the body 6 supporting the carriage 4 by a tang 25 having two vertical inclined planes 19, converging to each other as they project away from the supporting body 6.

The fork element 17 is provided with arms 18 which can be elastically deformed in a horizontal plane transverse to the plane on which the wing 3 lies, between which arms, in the opened or closed position of the wing 3 one or the other of the heads 16 come to fit, remaining engaged there in corresponding housing receptacles 31 obtained on the arms 18.

The operation of the slowing and retention means can be described considering as initial the configuration of the device 1 in Figure 4 wherein the head 16 is located in the vicinity of the arms 18. When the wing 3 is made to advance towards the fork element 17, the head 16 progressively fits between the tines 18; the latter coming against the inclined planes 19 of the tang 25 widen elastically, and imparting a reaction force against the advance of the carriage 4, slow the motion of the wing 3 as it nears the fully open or fully closed conditions.

An alternative embodiment of the device 1 is reported in Figure 5, wherein the device 1 shown differs from the example of embodiment described above solely in that the sliding block 5 is actuated by a pair of bodies 22, of essentially elliptical cross section, which engage the guide 7 sliding within it, with a grazing rather than rolling coupling.

From the above exposition it is evident that the device 1 described fully attains its set purposes, allowing to integrate within it in a simple and functional manner adjustment elements which, given the limited space available, are rather difficult to place. The device 1 is also characterised by its remarkable manufacturing simplicity which makes it quite economical.

The invention thus conceived can be subject to numerous modifications and variations, without thereby departing from the scope of the inventive concept. Moreover, all components may be replaced with technically equivalent elements.

Claims

1. Device (1) for the adjustable connection of a sliding door wing (3) to a furniture piece (2) comprising a carriage (4) to suspend the wing (3) from the furniture piece (2) provided with at least one sliding block (5) supported by a supporting body (6) and coupled to a guide (7) fastened to the furniture piece (2) in such a way as to be free to translate within said guide (7); a body (8) for fastening the carriage (4) to the wing (3) having an internal cavity (9) able to retain the body (6) supporting the carriage (4) allowing its relative mobility with respect to the inter-

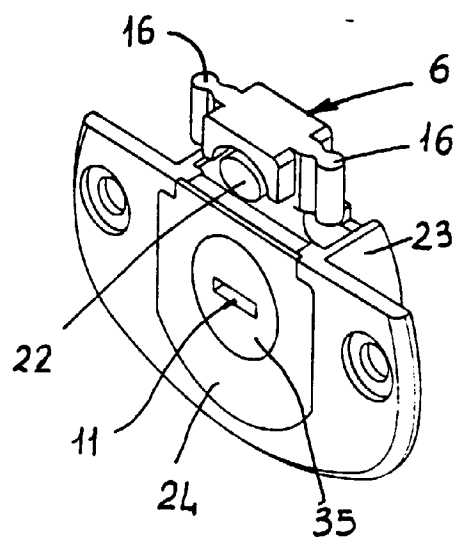
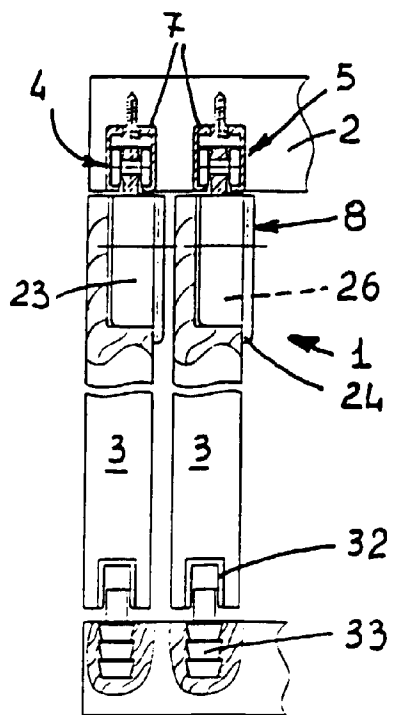
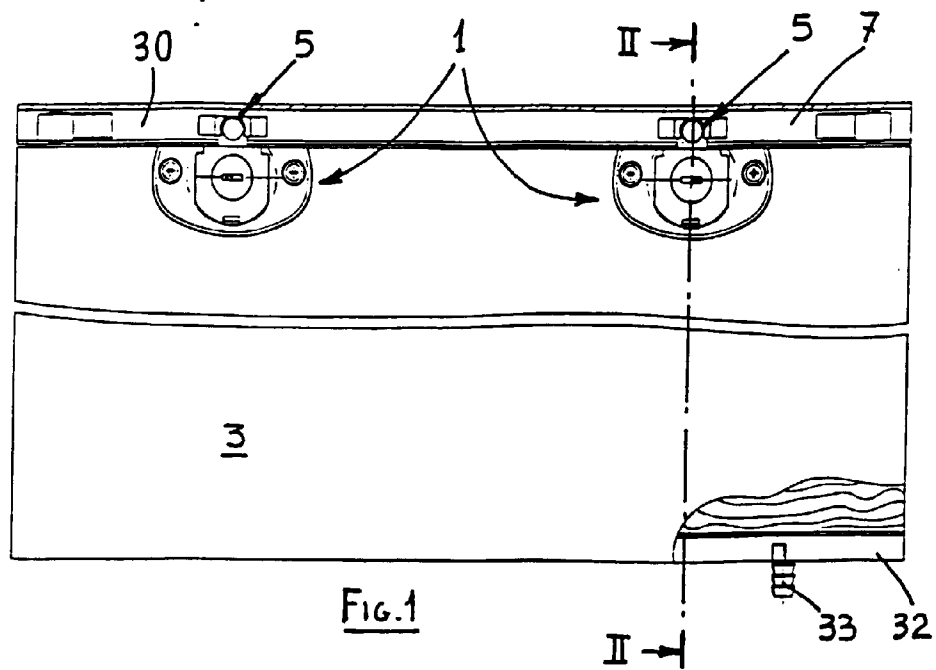
nal cavity (9); and means (16, 17, 18, 19, 25) for slowing and retaining the wing (3) in the extreme points of its translation along the guide (7), characterised in that the supporting body (6) is mounted to slide within said cavity (9) in such a way as to allow translation movements of the sliding block (5) with respect to the wing (3), across the guide (7), the device (1) further comprising adjustable means for effecting (10, 12) said shift, to adjust the position of the wing (3) with respect to the furniture piece (2).

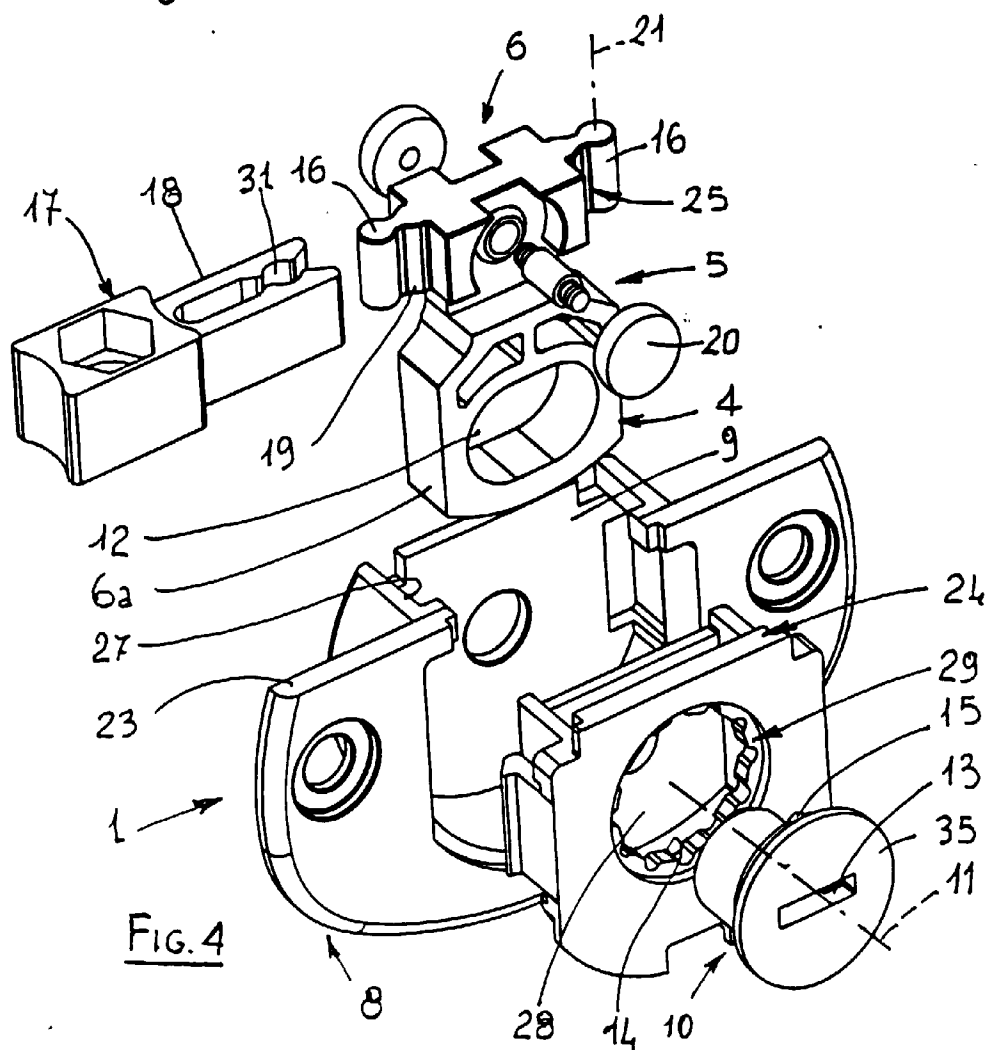
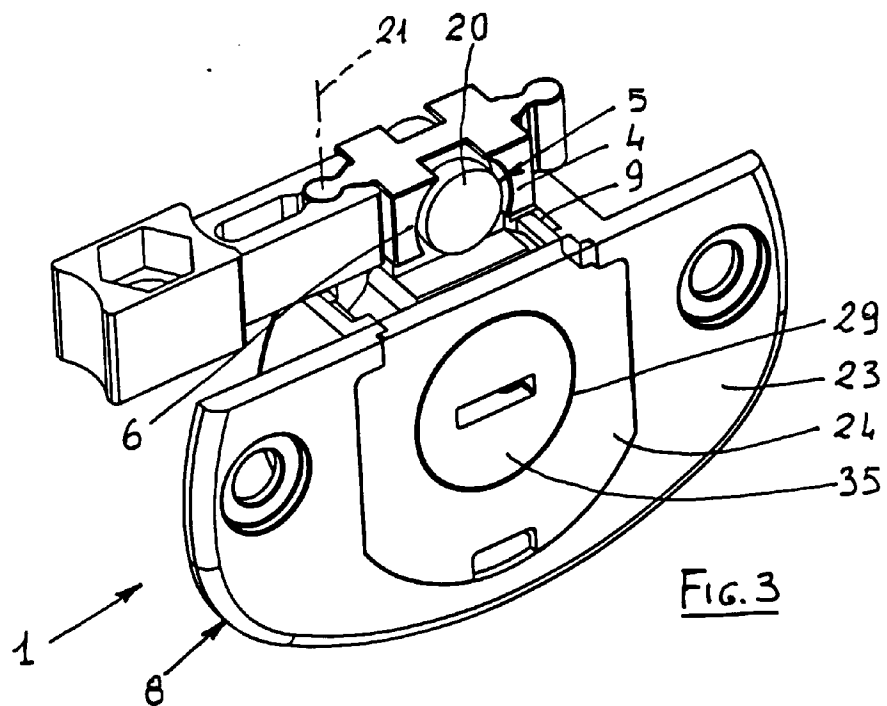
2. Device, according to claim 1, characterised in that said actuating means comprise a body (10) supported by the fastening body (8) so it can rotate around an eccentric axis of rotation (11), and inserted in a cavity (12) obtained on the body (6) supporting the carriage (4), as well as arresting means (14, 15) able to prevent the body (10) from moving spontaneously within the cavity (9) of the fastening body (6). 20
3. Device, according to claim 2, characterised in that the rotating body (10) is provided with a seat (13) for the engagement of a tool effecting the rotation. 25
4. Device, according to claim 2, characterised in that the arresting means are actuated by complementary toothings (14, 15) obtained on the fastening body (8) and on the rotating body (10). 30
5. Device, according to claim 1, characterised in that the slowing and retaining means comprise at least one head (16) borne by the supporting body (6) and jutting with respect to the direction of sliding (30) of the sliding block (5) in the guide (7) and a fork element (17) set opposite to the head (16) and mounted on the guide (7), said fork element (17) being provided with elastically yielding arms (18) between which the head (16) comes to fit, remaining engaged therein, in correspondence with the open or closed positions of the wing (3). 35 40
6. Device, according to claim 5, characterised in that the slowing means comprise a tang (15) fitted between the head (16) and the body (6) supporting the carriage (4), having at least one inclined plane (19), against which at least one of the arms (18) comes in contact progressively slowing the translation of the movable carriage (4) as it approaches, against the elastic reaction imparted by said arm (18), and vice versa. 45 50
7. Device, according to claim 5, characterised in that the head (16) has essentially cylindrical shape with axis (21) of symmetry transverse to the guide (7) and essentially parallel to the plane on which the wing (3) lies. 55

8. Device, according to claim 1, characterised in that the sliding block (5) is actuated by a pair of rollers (20) revolving inside the guide (7).

5 9. Device, as per claim 1, characterised in that the sliding block (5) is actuated by a pair of bodies (22) fitted inside the guide (7) in a grazing coupling.

10 10. Device, according to claim 1, characterised in that the fastening body (8) comprises two shells (23, 24) coupled so as to bound in combination said internal cavity (9).







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EUROPEAN SEARCH REPORT

Application Number
EP 97 83 0204

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.6)
Y	DE 564 572 C (HAUTAU) * page 1, line 47 - line 90; figures 1-8 *	1-8,10	E05D15/06
Y	DE 90 11 081 U (GEZE) * page 4, paragraph 7 - page 7, paragraph 4; figure 2 *	1-10	
Y	GB 1 258 907 A (SWISH PRODUCTS) * page 1, line 70 - page 2, line 79; figures 1,2 *	1,9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E05D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15 September 1997	Examiner Guillaume, G
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