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(11) **EP 2 270 305 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.01.2011 Bulletin 2011/01

(51) Int Cl.:
E06B 3/54 *(2006.01)*

(21) Application number: **10163835.1**

(22) Date of filing: **25.05.2010**

(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 SE SI SK SM TR
Designated Extension States:
BA ME RS

(30) Priority: **04.06.2009 IT MC20090134**

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(54) **Adjusting device for the inclination of window frames and window frame**

(57) The present invention relates to an adjusting device of the frame of aluminum or PVC window frames, which comprises a horizontal plate (1) with ending section (1a) with upward curved profile, whereas the other end is provided with a threaded hole (2), in which a screw (4) with vertical axis is screwed and a buffer (5) of non-metal material situated under the plate (1).

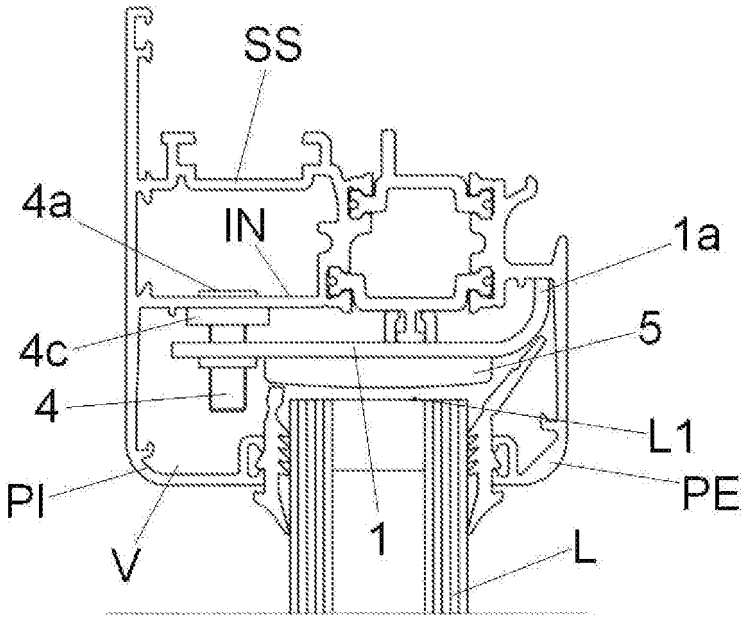

FIG. 3

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Description

[0001] The present patent application for industrial invention relates to an adjusting device of the inclination of the frame of aluminum or PVC window frames, and to the window frame provided with said device.

[0002] The device of the invention has been devised to remedy a typical drawback of aluminum or PVC window frames, which tend to lose their initial adjusting over time due to the heavy weight of the glass plate incorporated in them.

[0003] In order to understand the aforementioned drawback better, the structural configuration of an ordinary aluminum or PVC window frame must be described, with special reference to the window.

[0004] Said window comprises a glass plate supported by a perimeter frame, consisting in a quadrangular frame formed by perpendicularly coupling four identical box-shaped sections with ends cut at 45°.

[0005] In order to stiffen the frame, four squares are mounted at the four corners of the frame, the sides of which are respectively inserted and fixed into the ending sections of the two sections that converge into the corner.

[0006] Hinges are mounted in one of the two uprights of said frame to act as pivots for the window with respect to the frame.

[0007] In view of the above, it is evident that the weight of the glass plate stresses the support frame just like a projecting load stresses a shelf.

[0008] In spite of the presence of said stiffening squares, the frame tends to deform under the heavy weight of the glass plate, in such a way that the two horizontal sides of said frame lose their initial leveling over time, assuming downward inclination starting from the pivoting upright of the frame, which instead maintains its perfectly vertical position, it being rigidly fixed to the frame.

[0009] It must be noted that also the glass plate maintains perfect leveling inside the frame, which instead loses its square centering with respect to the glass plate incorporated into it.

[0010] The lowering of the window sometimes reaches such a high value that is impairs regular closing, because of the interference between the lower side of the frame (which is inclined downwards) and the lower side of the window frame.

[0011] In these circumstances it is necessary to call the window technician, who must partially dismount the window to insert thickening wedges between the upper horizontal side of the glass plate and the inclined side of the frame, in such a way to eliminate inclination, bringing the four corners of the frame back to square position.

[0012] DE 32 17 244 discloses an arrangement for fastening and sealing a filling in a frame, in particular a glazing unit in a window frame. Said arrangement comprises an adjusting device for the inclination of the window frame. Said device has a limited adjusting ability.

[0013] The purpose of the present invention is to devise an adjusting device for aluminum or PVC window frames, which allows for registering the window rapidly and easily, without dismounting the window frame.

[0014] Said purpose has been achieved by the device of the invention, which comprises a horizontal plate provided at one end with a threaded hole with vertical axis, wherein a special registering screw is engaged, by means of which the inclination of said plate can be changed, practically acting as a lifting lever, positioned between the upper side of the glass plate and the upper side of the frame.

[0015] For major clarity, the description of the device of the invention continues with reference to the enclosed drawings, which are only for illustrative, not limitative purposes, wherein:

- fig. 1 is an axonometric exploded view of the adjusting device of the invention;
- fig. 2 is a cross-sectional view with a vertical plate of the upper side of the frame of an aluminum window frame, prepared to receive the adjusting device of the invention;
- fig. 3 is basically identical to fig. 2 except for it is a plan, not a cross-sectional view, of the upper side of the frame, also showing the adjusting device of the invention in idle position;
- fig. 4 is basically identical to fig. 3 except for it shows the adjusting device of the invention in operating position;
- fig. 5 is a diagrammatic view of a window.

[0016] Referring to fig. 1, the adjusting device (A) of the invention comprises a horizontal plate (1) provided with ending section (1a) with upward curved profile, whereas the other end is provided with a threaded hole (2), in which a screw (4) with vertical axis is screwed.

[0017] Said screw (4) is provided with a circular head (4a) with central polygonal cavity (4b) for Allen screw, and a pin (4c) situated under said head (4a) and having a higher diameter than the head (4a).

[0018] Said device (A) also comprises a buffer (5) of non-metal material, preferably molded from plastics or nylon, designed to be attached under the plate (1) by means of a clamp (5a) provided on the upper side of said buffer (5).

[0019] The plate (1) is centrally provided with a side-by-side pair of transversal slots (1 b) with suitable shape, dimensions and centre-to-centre distance to receive the two elastically flexible claws (5a) of the clamp (5).

[0020] Said adjusting device (A) is designed to be mounted on the frame of the windows of aluminum window frames, of the type shown in fig. 2.

[0021] For better thermal insulation, the frames of aluminum windows are currently made with an integrated aluminum section, meaning that it is formed of an internal metal profile (PI) and an external metal profile (PE) mutually connected by a polyamide extruded bar (B) that avoids the formation of heat bridge.

[0022] The glass plate (L), normally provided with internal air chamber, is perimetrally tightened inside a compartment (V), with borders consisting in said internal (PI) and external (PE) profile, wherein the bottom of the compartment (V) is closed by means of said polyamide bar (B), the integrity of which must be guaranteed to guarantee inefficiency and avoid the formation of heat bridge.

[0023] In view of the above, it must be noted that the frame (TE) of the window (AN) must be prepared to be equipped with the adjusting device (A) of the invention.

[0024] More precisely, the upper side (LS) of said frame is provided with a hole with vertical axis drilled from outside inwards until it reaches the compartment (V). Said hole with vertical axis crosses a first upper partition (SS) of the internal profile (PI), in which a first whole (F1) is generated, and a second lower partition (SI) of the profile (PI), in which a second hole (F2) is generated aligned with the upper hole (F1).

[0025] Moreover, a longitudinal rib (N) with T-shaped section is obtained on the internal side of sand bar (B).

[0026] As shown in fig. 3, the plate (1) must be mounted in said compartment (V) between the glass plate (L) and the upper bar (B), with the ending section (a1) with upward curved profile facing the external profile (PE) inserted in an internal angle (AI) of said compartment (V).

[0027] The head (4a) of the screw (4) is inserted from below inside the hole (F2) obtained in the internal partition (SI), under which the pin (4c) is fitted, as shown in fig. 3.

[0028] The buffer (5) is hung under the plate (1) by means of the clamp (5a), the claws (5b) of which are inserted into the slots (1 b) and are coupled with the rib (N) in such a way that the buffer (5) also acts as air support of the plate (1), until the plate (1) is in idle position.

[0029] As shown in fig. 3, when the device (A) is mounted, the screw (4) is completely screwed into the threaded hole (2) and the buffer (5) does not adhere against the upper border (L1) of the glass plate (L).

[0030] The undesired inclination of said upper side (LS) of the frame of the window can be corrected easily and rapidly by inserting an Allen key into the hole (F1) until it reaches the head (4a) of the screw (4) that must be unscrewed from the screwing hole (2).

[0031] Since the upward travel of the screw (4) is obstructed by the pin (4c) that interferes with said internal partition (SI), following to said unscrewing operation, the plate (1) is lowered until the buffer (5) touches against the upper side (L1) of the glass plate (L).

[0032] More precisely, the plate (1) is inclined downwards, pivoting on the ending section (1 a) with curved profile, inserted in said internal angle (AI) of the compartment (V).

[0033] Now, while keeping on unscrewing the screw (4), the upper side (LS) of the frame is gradually raised with respect to the glass plate (L), thus restoring the square position of all four corners of the frame.

[0034] Finally, it must be noted that the maximum efficacy of the adjusting device of the invention can be measured by positioning it near the end of the upper side (LS) facing the side opposite to the one that intersects the pivoting upright of the window.

Claims

1. Adjusting device of inclination of window frames, comprising:

   - a horizontal plate (1) with a first ending section (1 a) with upward curved profile,
   - a screw (4) with vertical axis screwed in the plate (1), and
   - a buffer (5) of non-metal material, situated under the plate (1),

   characterized in that
   said plate (1) comprises a second ending section provided with a threaded hole (2) in which said screw (4) is screwed,
   said screw (4) is provided with a circular head (4a) with central polygonal cavity (4b) for Allen screw, and a pin (4c) situated under the said head (4a) and having a higher diameter than the head (4a).

2. Device as claimed in the above claim, **characterized in that** the buffer (5) is provided on the upper side with a clamp (5a) with jaws (5b) inserted from below upwards inside two slots (4b) obtained on the plate (1).

3. Window frame comprising at least one door with frame comprising:

   - an internal box-shaped profile (PI) and an external box-shaped profile (PE) connected by an extruded polyamide bar (B) that creates a heat bridge,
   - a glass plate (L) perimetrally tightened in a compartment (V) with borders consisting in said internal (PI) and external (PE) profile, wherein said polyamide bar (B) closes the bottom of the compartment (V),

   characterized in that
   the plate (1) claimed in the above claims is located in the said compartment (V), and
   the upper side (LS) of the frame has a hole with vertical axis drilled from outward inwards, until it reaches the compartment (V), wherein the hole with vertical axis crosses a first upper partition (SS) of the internal profile (PI), in which a first hole (F1) is generated, and a second lower partition (SI) of the said profile (PI) in which a second hole (F2) is generated, aligned with the first hole (F1),

   - the head (4a) of the screw (4) is inserted from below inside the hole (F2) obtained in the lower

partition (SI), and
- the pin (4c) is abutted under said lower partition (SI).

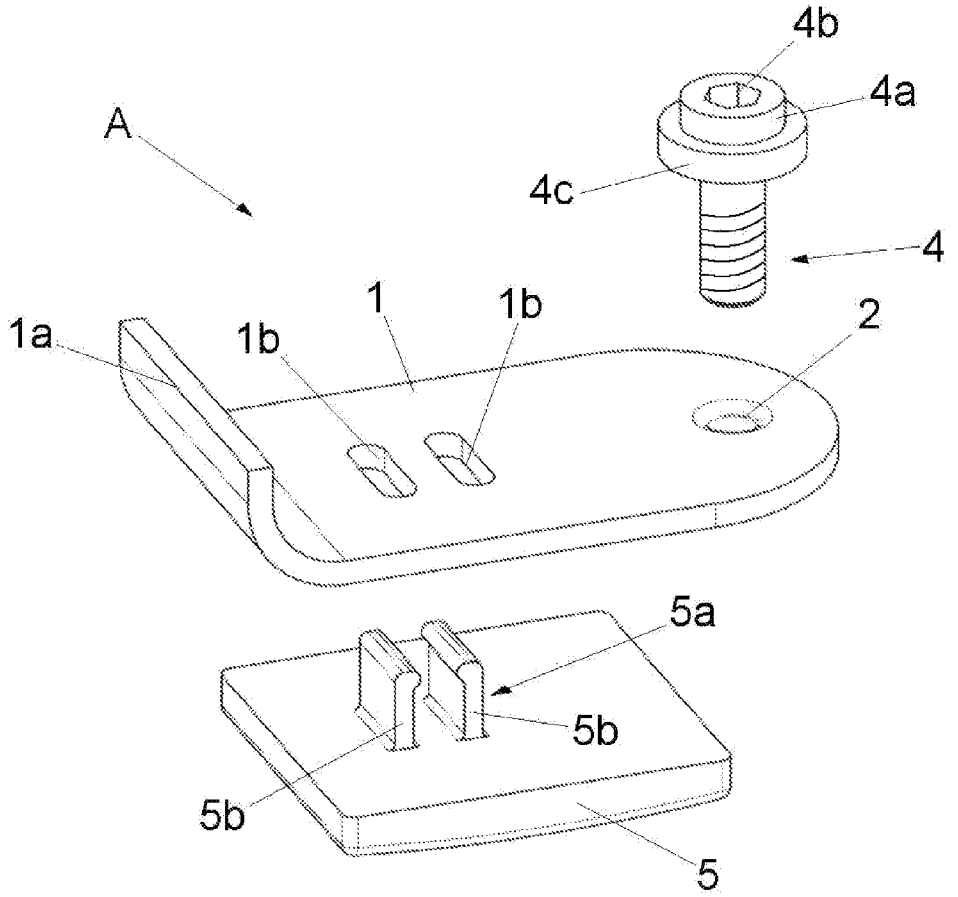

FIG. 1

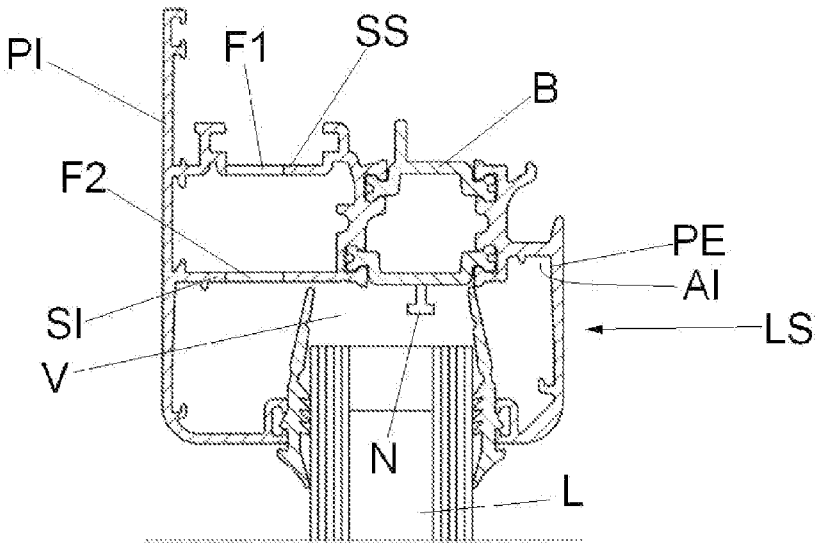

FIG. 2

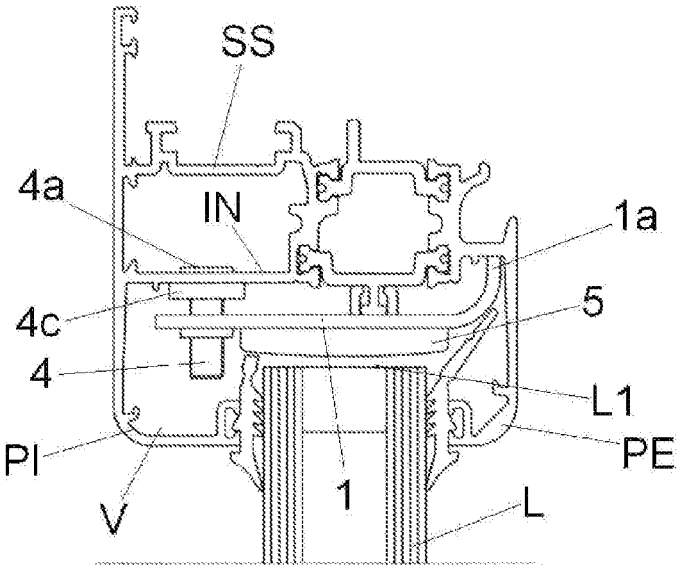

FIG. 3

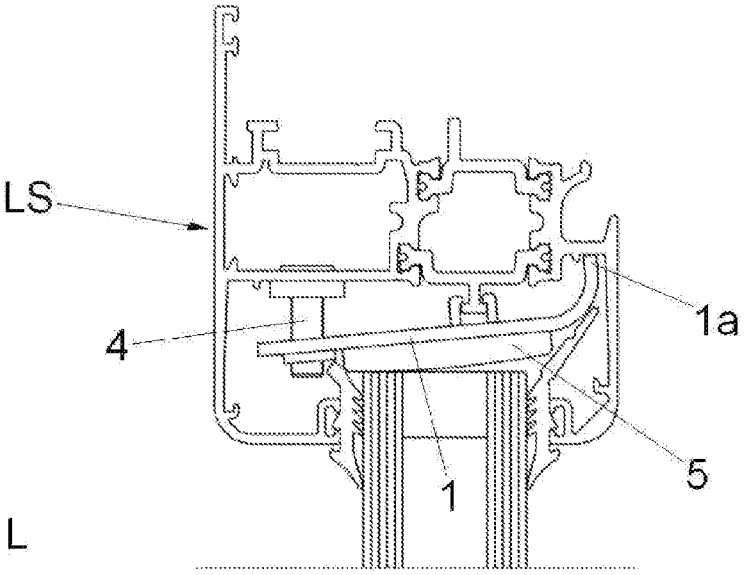

FIG. 4

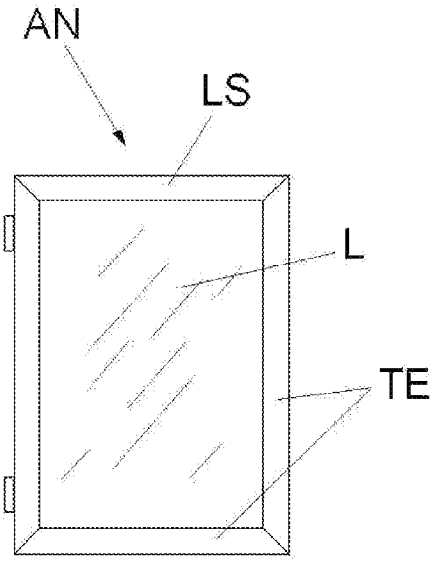

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 10 16 3835

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	DE 32 17 244 A1 (JACOB GERNOT DIPL ING) 10 November 1983 (1983-11-10) * page 11, line 19 - page 12, line 29; figures 3,4 * * page 13, line 31 - page 14, paragraph 1 *	1,2	INV. E06B3/54
A	DE 34 19 412 A1 (SAELZER HEINRICH) 28 November 1985 (1985-11-28) * page 11 - page 13; figure 3 *	1,2	
A	WO 98/36145 A1 (R A L INFISSI S R L [IT]; RUZZON MASSIMO [IT]; RUZZON FABRIZIO [IT]) 20 August 1998 (1998-08-20) * page 8, paragraph 4; figure 1 *	1,2	
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 July 2010	Knerr, Gerhard

CATEGORY OF CITED DOCUMENTS

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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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22-07-2010

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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