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(54) **A support and adjustment device for a sliding door trolley**

Träger und Einstellungsrichtung für einen Schiebetürwagen

Dispositif de support et de réglage pour un chariot de porte coulissante

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Description

[0001] The present invention relates to a support and adjustment device for a sliding trolley, in particular for sliding doors of furniture items.

[0002] As it is known, a sliding door comprises at least a spaced pair of trolleys, applied on the upper edge and adapted to be coupled when assembling a door, with a horizontal track that guides the alternate travels of the sliding door.

[0003] The connection between trolley and sliding door is normally obtained by means of a device comprising a plate that incorporates a box body that is vertically crossed by a vertical stem joined on top with the frame of the trolley.

[0004] The internal wall of the sliding door is provided with a blind housing, in proximity to its upper edge, where the box body of said plate is exactly housed, whereas the plate is disposed against the internal wall of the door, where the plate is firmly stopped with ordinary screws.

[0005] Said vertical stem is normally threaded and helically coupled with the frame of the trolley or with said box body, so that the stem can also be used to adjust the height of the sliding door.

[0006] Evidently, if the guide track is not perfectly horizontal, the sliding door must be leveled by the operator by means of the threaded stem of each trolley. Said box body is open on one side and its opening is closed with a lid, which is suitably shaped to cooperate with said threaded stem provided with an adjustment knob housed inside said box body and used by the operator to adjust the height of the door.

[0007] In order to access said adjustment knob without removing the lid, the latter is provided with a window from which a perimeter section of said adjustment knob protrudes partially.

[0008] Patent EP 1 108 845 discloses a support and adjustment device of a trolley for sliding doors like the one described herein.

[0009] In view of the above, the operator in charge of assembling the sliding door is given the following parts when installing the sliding door:- said trolley; - said plate, which incorporates the box body in open configuration, i.e. without lid; - said threaded stem with the adjustment washer; - said lid to close the box body; - fixing screws to stop the plate on the internal wall of the sliding door.

[0010] Documents DE202004001068U1 and WO2010/127466A1 disclose another support and adjustment device of a trolley for sliding doors.

[0011] The purpose of the present invention is to provide a new support and adjustment device of a trolley for sliding doors, which does not require any assembly operation of its parts by the operator in charge of installing the sliding door.

[0012] An additional purpose of the present invention is to provide a support and adjustment device of a trolley for sliding doors, which can be rapidly fixed on the internal wall of the sliding door without using traditional tools, such

as screwdrivers or wrenches.

[0013] Finally, an additional purpose of the invention is to provide a support and adjustment device of a trolley for sliding doors, which is formed of a lower number of parts than the one provided in equivalent devices of known type, in such manner to reduce the production and assembly costs of the device. These purposes have been obtained by the device of the invention, the primary and secondary characteristics of which are disclosed in the attached claims.

[0014] The device of the invention comprises a trolley that is pre-assembled to the support plate, which incorporates said stem and fast-fixing means of the plate on the internal wall of the sliding door, in such manner that the operator in charge of installing the sliding door does not need to make any assembly operations, it being simply necessary to fix the plate on the internal wall of the sliding door.

[0015] According to the preferred embodiment of the invention, the plate incorporates fast-fixing means of the plate on the internal wall of the sliding door, so that fixing can be obtained rapidly without using any screws or tools, such as screwdrivers or wrenches.

[0016] For explanatory reasons, the description of the device according to the present invention continues with reference to attached drawings, which only have illustrative, not limiting value, wherein:- Fig. 1 shows the device of the invention coupled with the guide track of the trolley and situated in front of the sliding door; - Fig. 2 is a three-dimensional exploded drawing of the device of the invention according to a first embodiment; - Fig. 3 is a three-dimensional exploded drawing of the device of the invention according to a first embodiment, seen from the opposite side of the one shown in Fig. 2; - Fig. 4 is a three-dimensional exploded drawing of the device of the invention according to a second embodiment; - Fig. 5 shows the device of the invention according to the embodiment of Fig. 4, wherein said plate is sectioned with a vertical plane; - Fig. 6 is a sectional view of the plate shown in Fig. 1 with plane VI of Fig. 1. Referring to Figs. 1 to 3, which illustrate a first preferred embodiment of the invention, the device (D) of the invention comprises a trolley (C) of known type, associated to a support plate (1), which incorporates in one piece a box body (2) that protrudes from one (A) of the two sides (A) and (B) of the plate (1).

[0017] Side (A) is the front side of the plate (1), which is adapted to be disposed against the internal wall (P1) of the sliding door (P), whereas side (B) is the back side of the plate (1), which is adapted to be faced towards the internal compartment of the furniture item, which is closed by the sliding door (P). Said box body (2) has a cylindrical shape with horizontal axis and is truncated on top, thus having an upper flat side (2a) that is coplanar to the upper horizontal edge (1 a) of the plate (1).

[0018] Said box body (2) is crossed by a through hole (3) with vertical axis, which exactly ends on top in the center of said flat side (2a).

[0019] Said box body (2) is also provided with a central

window (4) ending on both sides (A and B) of the plate (1) and crossed by the longitudinal axis (Y) of said hole (3).

[0020] It must be noted that said hole (3) has two sections with different diameter:- a first lower section (3a) with higher diameter, extending under said window (4); - a second upper section (3b) with lower diameter, extending above said window (4).

[0021] The device of the invention also comprises a stem (5) that is inserted into said hole (3) from down upwards.

[0022] Said stem (5) has a lower section (5a) with higher diameter than the upper section (5b), which has the same diameter as the second upper section (3b) of the hole (3).

[0023] The upper section (5b) of said stem (5) is longer than the second upper section (3b) of the hole (3) so that the upper section (5b) of said stem (5) partially comes out of the box body (2) and is coupled with the frame (T) of a trolley (C), whereas the lower section (5a) is coupled with the first lower section (3a) of the hole (3) and completely housed inside said box body (2).

[0024] In view of the above, said box body (2), and more generally the plate (1), act as support base of the trolley (C), to which said support base is connected by means of said stem (5).

[0025] From the front side (A) of the plate, in a preferred manner, a pair of tubular screw anchors (6), which are obtained in one molded piece with the plate (1), projects horizontally in symmetric position with respect to axis (Y).

[0026] Each of said preferred screw anchors (6) is externally provided with a series of annular ribs (6a) with sawtooth profile, whereas it internally houses a spreading means (7) that can be put into rotation, inside said screw anchors (6), by means of a flat crank (7a) situated on the back side (B) of the plate (1). Referring to Fig. 1, said box body (2) is exactly housed into a housing (S1) obtained on the internal wall (P1) of the sliding door (P). Likewise, the pair of screw anchors (6) is adapted to be exactly house into blind holes (FC) obtained on the internal wall (P1) of the sliding door (P).

[0027] As mentioned above, said stem (5) for connection between trolley (C) and plate (1) is also used as means to adjust the height of the plate (1) - and indirectly of the door (P) joined to the plate (1) - with respect to the trolley (C), the height of which is affected by the assembling and fixing height of the track (B1) where the trolley (C) is slidably housed, as shown in Fig. 1.

[0028] Said stem (5) is associated with an adjustment washer (8), which is housed inside said window (4) and centrally crossed by said axis (Y).

[0029] The present invention can be realized according to two alternative embodiments. In the first embodiment, the stem (5) can also make upward or downward translations along the direction defined by said vertical axis (Y). In the second embodiment, the stem (5) can rotate around said vertical axis (Y).

[0030] The first embodiment is shown in Figs. 2 and 3.

[0031] According to said first embodiment, the stem (5) and the washer (8) are helically coupled by means of mutual threads (5d) and (8d), which are respectively provided on the section (5a) of the stem (5) and on the hole (8a) of the washer (8).

[0032] Said thread (5d) is interrupted by one or more facets (5e) that are interfaced with corresponding facets (3e) provided on the second upper section (3b) of the hole (3).

[0033] Evidently, the rotation of the washer (8) determines the upward or downward translation of the stem (5), the facets (5e) of which rub against the facets (3e), thus adjusting the height of the plate (1) with respect to the trolley (C). The second embodiment is shown in Figs. 4 and 5.

[0034] According to said second embodiment, the stem (5) and the washer (8) are coupled by means of mutual grooved profiles (5c) and (8c), respectively provided on the lower section (5a) of the stem (5) and the hole (8a) of the washer (8).

[0035] The top section (5b) of the stem (5) is provided with thread (5g) and screwed unto a threaded hole (T1) of the frame (T) of the trolley (C).

[0036] Evidently, the rotation of the adjustment washer (8) determines the higher or lower insertion of the stem (5) in the hole (T1), thus adjusting the height of the plate (1) with respect to the trolley (C).

[0037] Referring to Fig. 6, it must be noted that the adjustment washer (8) protrudes from the opening of the window (4) on the back side (B) of the plate (1), so that the user can easily reach it and make it turn with one finger.

[0038] The figure shows a flexible claw (9) preferably obtained inside the window (4), which elastically adheres to the external edge of the adjustment washer (8); the function of said flexible claw (9) is to prevent the free uncontrolled rotation of the adjustment washer (8).

[0039] As shown in Fig. 5, a flexible tooth (10) is preferably obtained in the lower opening of the hole (3), which prevents the stem (5) from coming out of the hole (3) and falling during the assembly of the various parts of the device (D).

[0040] Vice versa the stem (5) cannot come out of the hole (3) in the direction of the trolley (C) because the second upper section (3b) of the hole (3) has a smaller diameter than the lower section (5a) of the stem (5).

[0041] The plate (1) is preferably provided with two holes (F2) for fixing screws that can be used to fix the plate (1), in addition to the screw anchors (6), for higher safety.

Claims

1. A support and adjustment device for a sliding door trolley (C), comprising:

- a support plate (1) for said trolley (C) incorpo-

- rating in one piece a box body (2) crossed by a through hole (3) with vertical axis (Y) and a central window (4) ending on both sides (A and B) of the plate (1) and crossed by the longitudinal axis (Y) of said hole (3), which is provided with two sections with different diameter, a first lower section (3a) with higher diameter extending under said window (4) and a second upper section (3b) with lower diameter extending above said window (4);
- a stem (5) inserted from down upwards inside said hole (3) and provided with a lower section (5a) with higher diameter than an upper section (5b) of said stem (5), said upper section (5b) having a diameter equal to the second upper section (3b) of the hole (3); the upper section (5b) of said stem (5) is longer than the second upper section (3b) of the hole (3) so that the upper section (5b) of said stem (5) partially comes out of the box body (2) and is suitable to be coupled with the frame (T) of the trolley (C), whereas the lower section (5a) of said stem (5) is coupled with the first lower section (3a) of the hole (3) and is completely contained inside said box body (2);
 - an adjustment washer (8) associated with said stem (5) and housed inside said central window (4) and centrally crossed by said axis (Y), for adjusting the height of the plate (1) with respect to the trolley (C).
2. The device of the previous claim, wherein said box body (2) protrudes from the front side (A) of the two sides (A and B) of the plate (1); from the same side (A) also a horizontal pair of tubular screw anchors (6) in symmetric position with respect to the axis (Y).
 3. The device of the previous claim, wherein each of said screw anchors (6) is externally provided with a series of annular ribs (6a) with sawtooth profile, whereas it internally houses a spreading means (7) that can be put into rotation, inside said screw anchors (6), by means of a flat crank (7a) situated on the back side (B) of the plate (1).
 4. The device of one of the previous claims, wherein the stem (5) and washer (8) are helically coupled by means of mutual threads (5d) and (8d), respectively provided on the section (5a) of the stem (5) and the hole (8a) of the washer (8); said thread (5d) is interrupted by one or more facets (5e) interfaced with corresponding facets (3e) provided on the second upper section (3b) of the hole (3).
 5. The device of one of claims 1 to 3, wherein:
 - said stem (5) and said washer (8) are coupled by means of mutual grooved profiles (5c) and (8c), respectively provided on the lower section (5a) of the stem (5) and the hole (8a) of the washer (8);
 - said upper section (5b) of the stem (5) is provided with thread (5g) and is suitable to be screwed into a threaded hole (T1) of the frame (T) of the trolley (C).
 6. The device of one of the previous claims, wherein the window (4) is internally provided with a flexible claw (9) that elastically adheres to the external border of the adjustment washer (8).
- ### 15 Patentansprüche
1. Vorrichtung zum Halten und Einstellen eines Schlittens (C) für Schiebetüren, umfassend:
 - eine Platte (1) zum Halten des Schlittens (C), der in einem einstückigen Teil ein kastenförmiges Gehäuse (2) enthält, das von einem Durchgangsloch (3) mit vertikaler Achse (Y) und einem zentralen Fenster (4) durchquert wird, das auf beiden Seiten (A und B) der Platte (1) ausmündet und von der Längsachse (Y) des Loches (3) durchquert wird, welches zwei Anteile mit unterschiedlichem Durchmesser aufweist, und zwar einen ersten, unteren Anteil (3a) mit größerem Durchmesser, der sich unterhalb des Fensters (4) erstreckt, und einen zweiten, oberen Anteil (3b) mit kleinerem Durchmesser, der sich oberhalb des Fensters (4) erstreckt;
 - einen Schaft (5), der von unten nach oben in das Loch (3) eingesteckt ist und einen unteren Abschnitt (5a) mit größerem Durchmesser als ein oberer Abschnitt (5b) des Schafts (5) aufweist, wobei der obere Abschnitt (5b) einen gleich großen Durchmesser wie der zweite obere Abschnitt (3b) des Loches (3) aufweist; der obere Abschnitt (5b) des Schafts (5) ist länger als der zweite obere Abschnitt (3b) des Loches (3), so dass der obere Abschnitt (5b) des Schafts (5) teilweise aus dem kastenförmigen Gehäuse (2) hervorsteht und dazu geeignet ist, mit dem Rahmen (T) des Schlittens (C) gekoppelt zu werden, während der untere Abschnitt (5a) des Schafts (5) mit dem ersten unteren Abschnitt (3a) des Loches (3) verbunden und vollständig im Inneren des kastenförmigen Gehäuses (2) enthalten ist;
 - eine Einstellscheibe (8), die mit dem Schaft (5) verbunden und in dem zentralen Fenster (4) untergebracht ist und mittig von der Achse (Y) durchquert wird, um die Höhe der Platte (1) bezogen auf den Schlitten (C) einzustellen.
 2. Vorrichtung nach dem vorstehenden Anspruch, wo-

bei das kastenförmige Gehäuse (2) aus der Frontseite (A) der beiden Seiten (A und B) der Platte (1) auskragt; aus derselben Seite (A) kragt auch ein Paar von horizontalen, rohrförmigen Schraubendübeln (6) aus, die symmetrisch bezogen auf die Achse (Y) angeordnet sind.

3. Vorrichtung nach dem vorstehenden Anspruch, wobei jeder Schraubendübel (6) außenseitig eine Reihe von ringförmigen Rippen (6a) mit Sägezahnprofil aufweist, während er inwendig ein Spreizmittel (7) aufweist, das im Inneren der Schraubendübel (6) mittels einer entsprechenden, auf der Außenseite (B) der Platte (1) angeordneten, flachen, Kurbel (7a) in Drehung versetzt werden kann.
4. Vorrichtung nach einem der vorstehenden Ansprüche, wobei der Schaft (5) und die Einstellscheibe (8) mittels gegenbezüglicher Gewindegänge (5d) und (8d) schraubenförmig miteinander verbunden sind, die jeweils auf dem Abschnitt (5a) des Schafts (5) und in dem Loch (8a) der Einstellscheibe (8) vorgesehen sind; das Gewinde (5d) wird von einer oder mehreren Flachstellen (5e) unterbrochen, die entsprechenden Flachstellen (3e) gegenüberliegen, die auf dem zweiten oberen Abschnitt (3b) des Loches (3) vorgesehen sind.
5. Vorrichtung nach einem beliebigen Anspruch von 1 bis 3, wobei:
 - der Schaft (5) und die Einstellscheibe (8) mittels gegenbezüglicher Nutprofile (5c) und (8c) verbunden sind, die jeweils auf dem unteren Abschnitt (5a) des Schafts (5) und in dem Loch (8a) der Einstellscheibe (8) vorgesehen sind;
 - der obere Abschnitt (5b) des Schafts (5) ein Gewinde (5g) aufweist und dazu geeignet ist, in ein Gewindeloch (T1) des Rahmens (T) des Schlittens (C) eingeschraubt zu werden.
6. Vorrichtung nach einem der vorstehenden Ansprüche, wobei das Fenster (4) inwendig mit einer flexiblen Krallen (9) versehen ist, die elastisch an der äußeren Kante der Einstellscheibe (8) anliegt.

Revendications

1. Dispositif pour le support et le réglage d'un chariot (C) pour portes coulissantes comprenant :
 - une plaque (1) de support du dit chariot (C), qui incorpore, en une seule pièce monolithique, un corps en forme de boîtier (2) qui est traversé par un orifice passant (3), ayant axe vertical (Y) et par une fenêtre centrale (4) qui débouche sur les deux côtés (A et B) de la plaque (1) et qui

résulte traversée par l'axe longitudinal (Y) du dit orifice (3), qui présente deux sections de diamètre différent, un premier segment inférieur (3a), de plus grand diamètre, qui se déploie en-dessous de ladite fenêtre (4) et un second segment supérieur (3b), de diamètre mineur, qui se déploie au-dessus de ladite fenêtre (4) ;

- une tige (5) qui résulte enfilée du bas vers le haut dans ledit orifice (3) et qui présente un segment inférieur (5a), de plus grand diamètre par rapport à un segment de sommet (5b) de ladite tige (5), ledit segment de sommet (5b) ayant un diamètre égal à celui du premier segment supérieur (3b) de l'orifice (3) ; le segment de sommet (5b) de ladite tige (5) est plus long du second segment supérieur (3b) de l'orifice (3), de sorte que le segment de sommet (5b) de la tige (5) déborde partiellement du corps en forme de boîtier (2) et il est apte à être couplé au châssis (T) du chariot (C), tandis que le segment inférieur (5a) de la tige (5) est couplé au premier segment inférieur (3a) de l'orifice (3) et il est entièrement contenu dans ledit corps en forme de boîtier (2) ;
- une rondelle de réglage (8) associée à ladite tige (5) et logée dans ladite fenêtre centrale (4) et qui résulte traversée centralement par ledit axe (Y), pour régler la hauteur de la plaque (1) par rapport au chariot (C).

2. Dispositif selon la revendication précédente, où ledit corps en forme de boîtier (2) déborde du côté avant (A) des deux côtés (A et B) de la plaque (1) ; de ce même côté (A) une paire horizontale de chevilles tubulaires à expansion (6) débordent elles aussi et elles sont positionnées de manière symétrique par rapport à l'axe (Y).

3. Dispositif selon la revendication précédente, où chacune des dites chevilles à expansion (6) présente à l'extérieur une série de nervures annulaires (6a), profilées en dent de scie, tandis qu'à l'intérieur il y a un moyen écarteur (7), qui peut être mis en rotation à l'intérieur des dites chevilles (6) moyennant une respectue manivelle de manoeuvre plate (7a) disposée sur le côté arrière (B) de la plaque (1).

4. Dispositif selon l'une des revendications précédentes, où ladite tige (5) et ladite rondelle (8) résultent couplées hélicoïdalement moyennant des filetages réciproques (5d) et (8d), respectivement prévus sur le segment (5a) de la tige (5) et sur l'orifice (8a) de la rondelle (8) ; ledit filetage (5d) est interrompu par une ou plusieurs facettes (5e) qui s'interfacent avec des facettes correspondantes (3e) prévues sur le second segment supérieur (3b) de l'orifice (3).

5. Dispositif selon l'une des revendications de 1 à 3, où :

- ladite tige (5) et ladite rondelle (8) résultent couplées moyennant des profils rainurés réciproques (5c) et (8c), respectivement prévus sur le segment inférieur (5a) de la tige (5) et sur l'orifice (8a) de la rondelle (8) ;

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- ledit segment de sommet (5b) de la tige (5) présente un filetage (5g) et il est apte à être vissé dans un orifice fileté (T1) du châssis (T) du chariot (C).

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6. Dispositif selon l'une des revendications précédentes, où la fenêtre (4) présente à l'intérieur une griffe flexible (9), qui adhère de manière élastique au bord externe de la rondelle de réglage (8).

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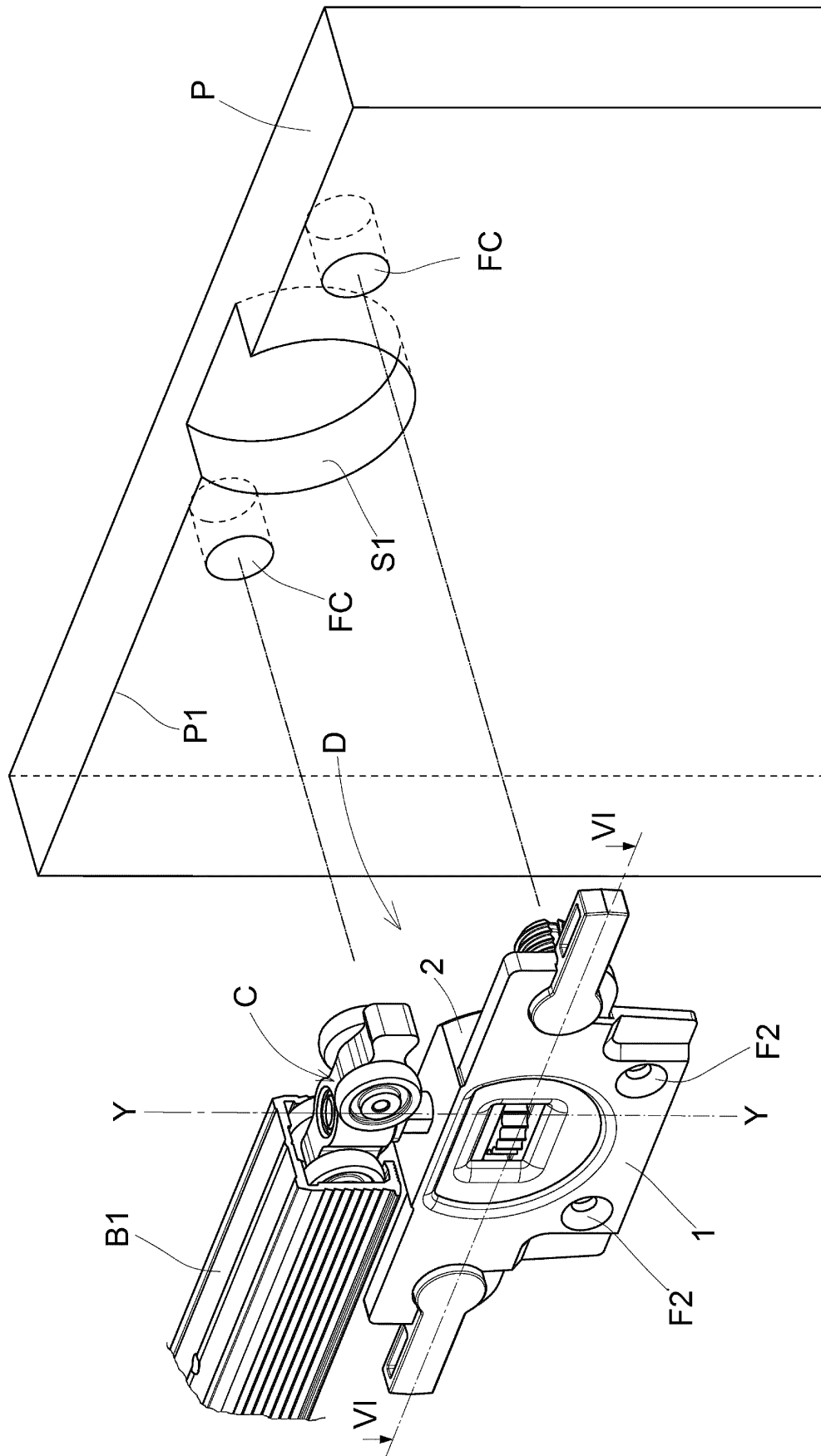


FIG. 1

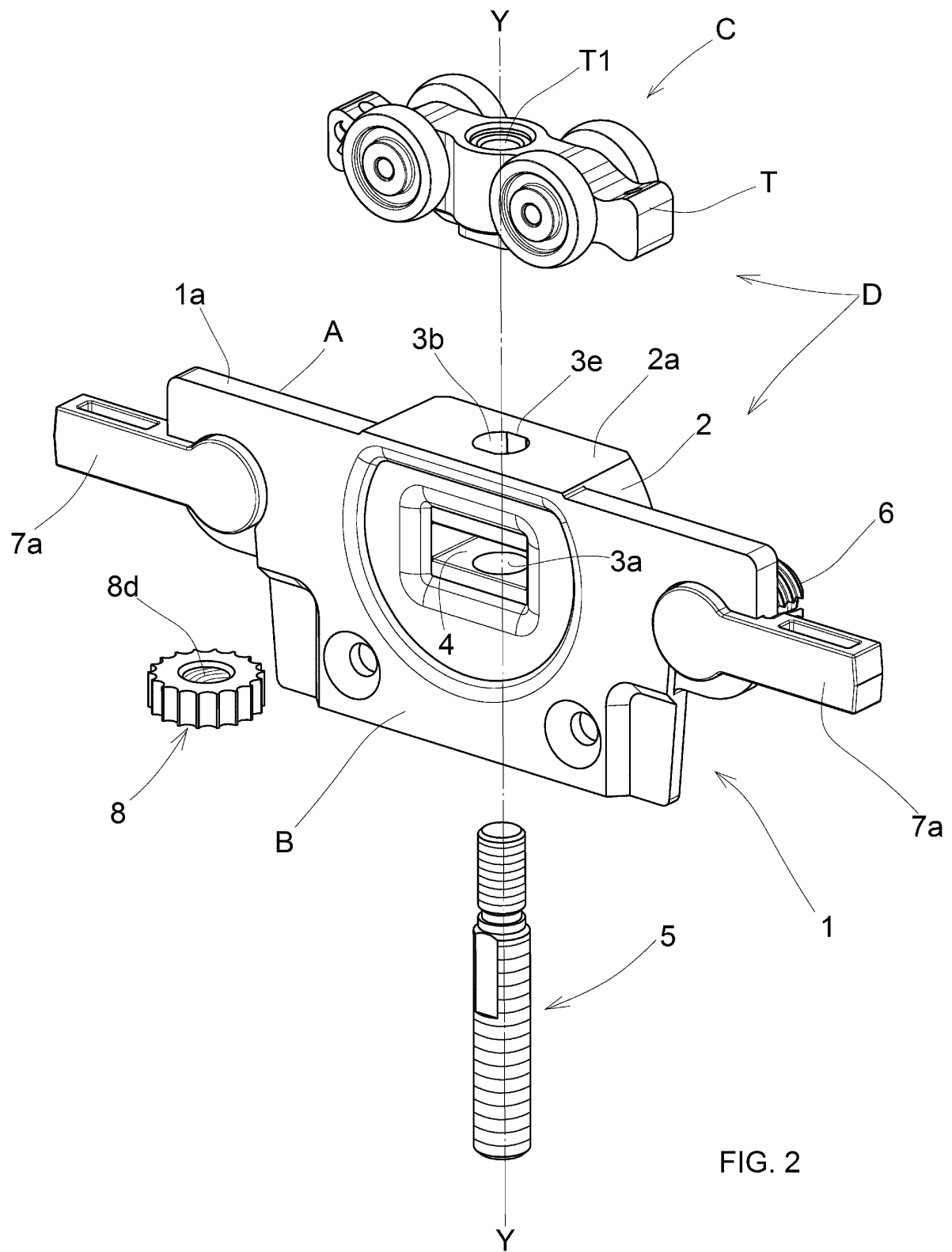
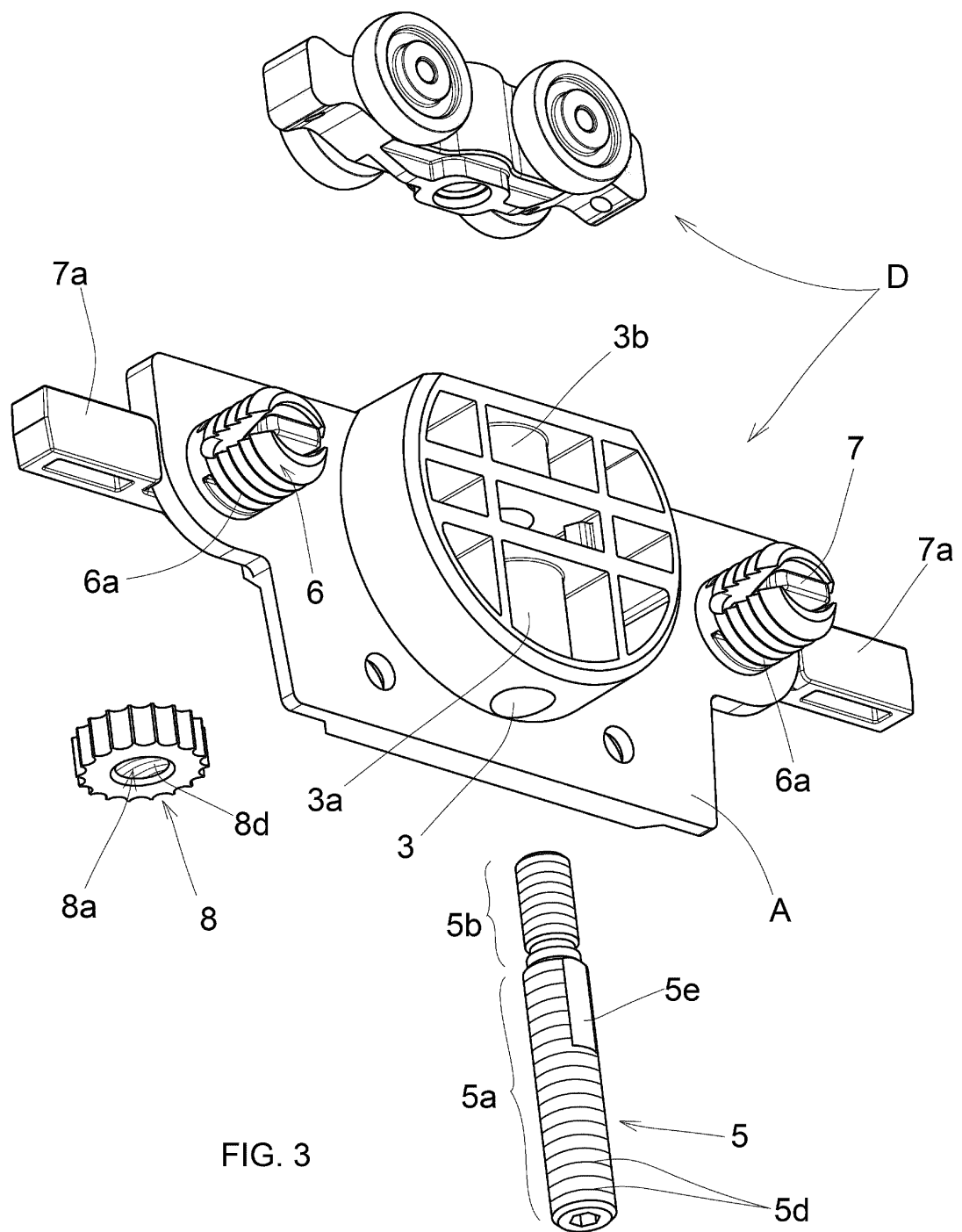
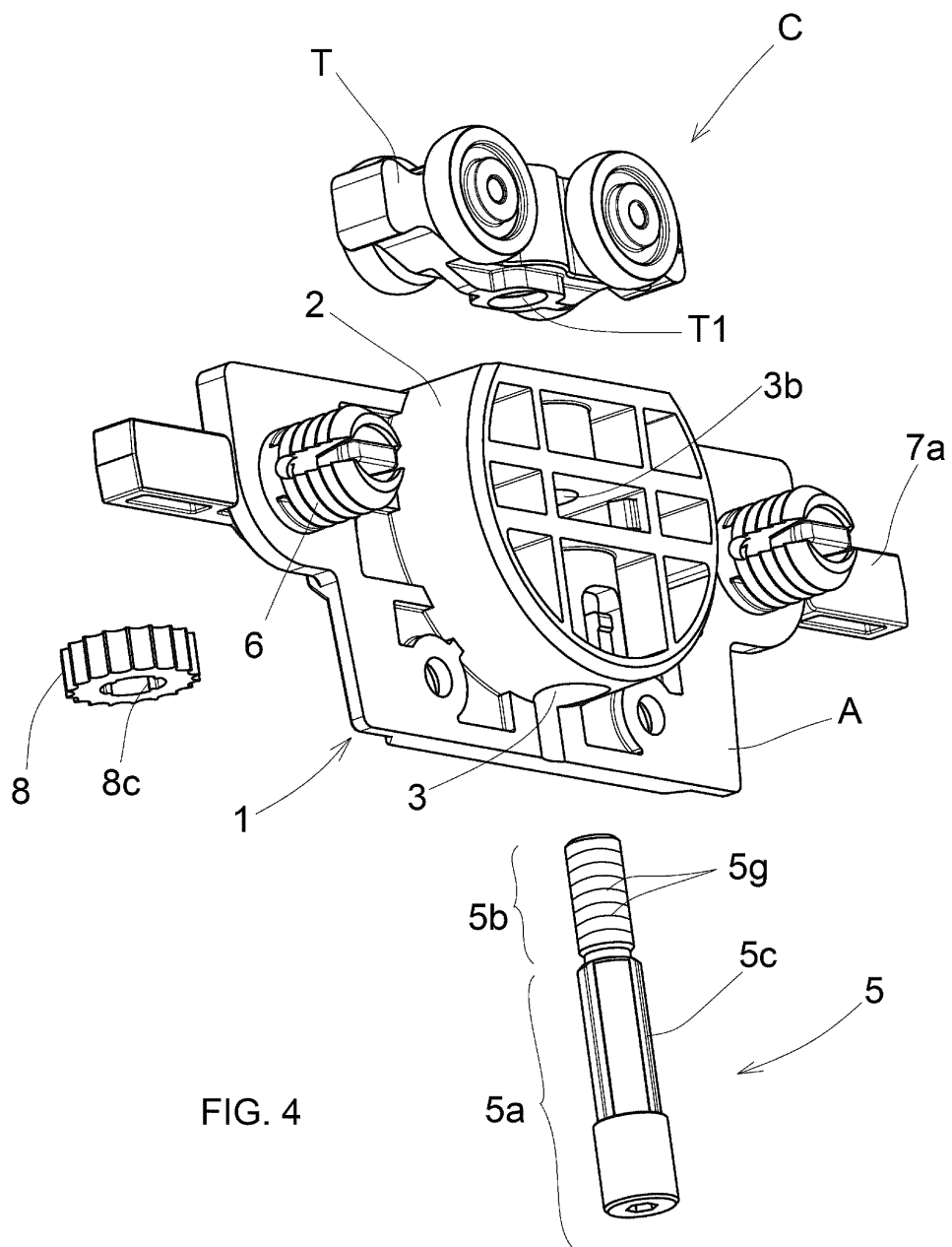


FIG. 2





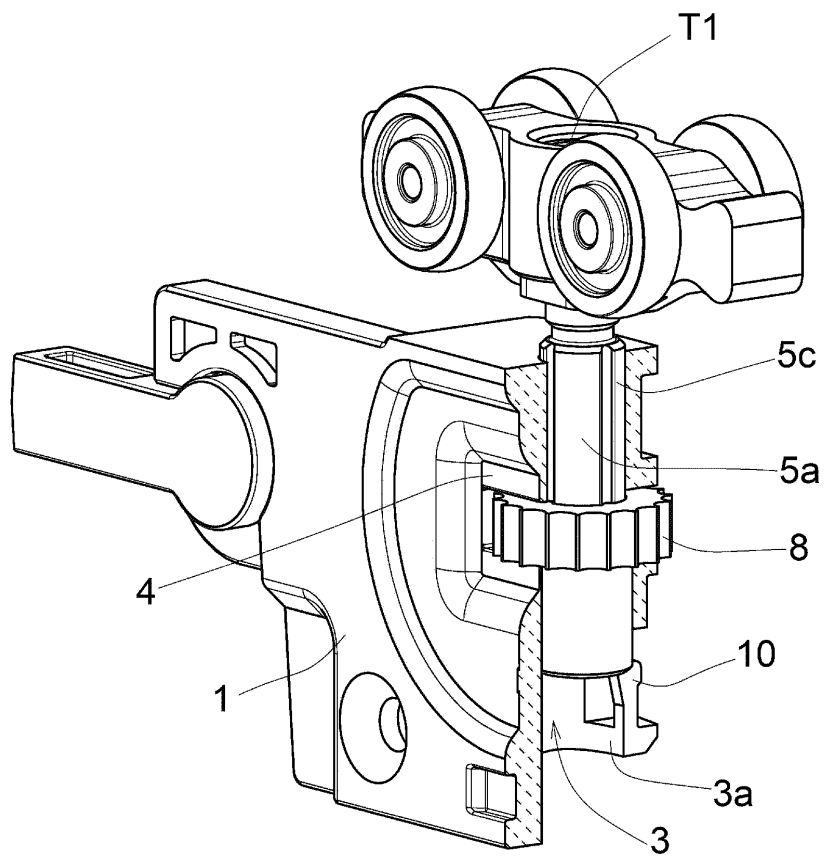


FIG. 5

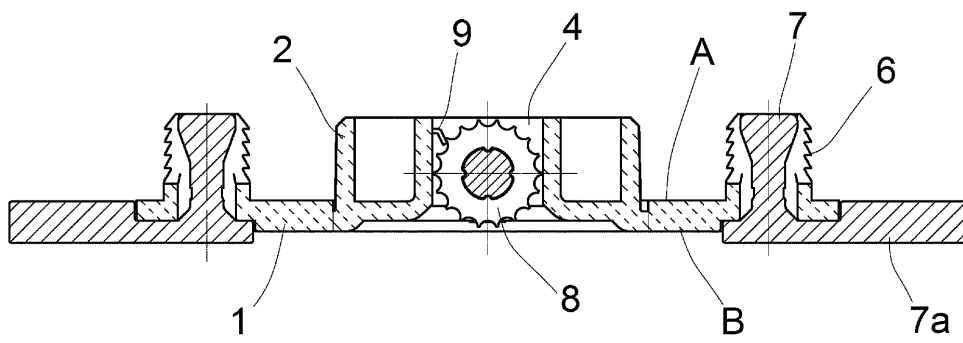


FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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