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(54) **IMPROVED HANDLE FOR SLIDING WINDOW FRAMES**

(57) A handle (100) comprising a first bracket (1) and a second bracket (2), a holding bar (3) that is revolvingly supported by said two brackets (1, 2) in such a way to rotate relative to its longitudinal axis (Y), and a pin (5) with square section that revolves around its longitudinal axis (X) orthogonal to said longitudinal axis (Y) and provided with a first ending section (51) and a second ending section (50); the handle (100) comprising transmission means (6) configured in such a way to transmit the rotation of the holding bar (3) around the longitudinal axis (Y) to the pin (5), in such a way the pin (5) is rotated around its longitudinal axis (X).

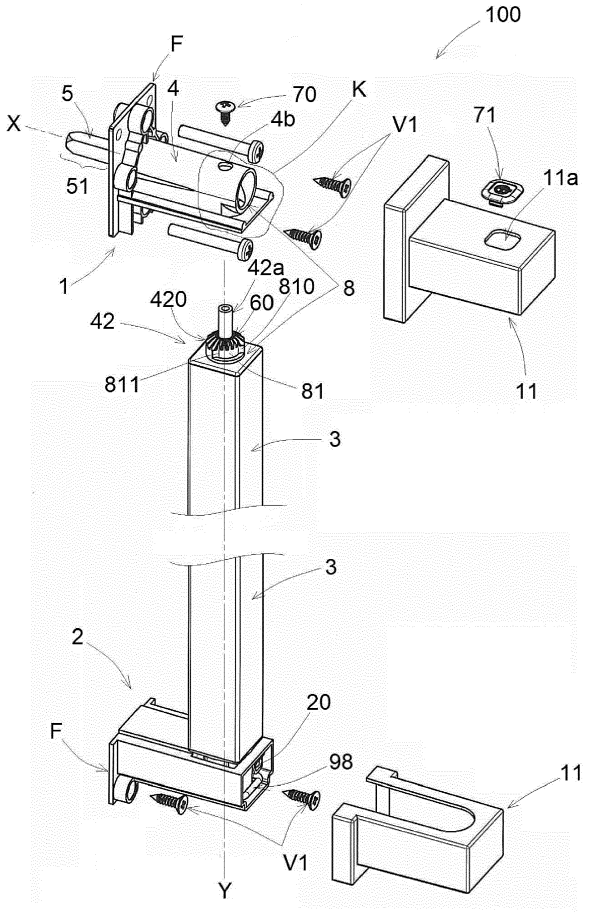

FIG. 5

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Description

[0001] The present patent application for industrial invention relates to a handle for sliding window frames.

[0002] The field of primary reference for the present invention is the field of sliding systems, which will be the only reference in the following description for the sake of brevity and simplicity.

[0003] The advantages of the present invention will become manifest after a brief description of the prior art and its drawbacks.

[0004] A sliding window system according to the prior art is hereinafter described with reference to Fig. 1, which is an three-dimensional exploded view of a portion of a sliding window frame that comprises locking/unlocking means that are technically defined as "multi-point closure".

[0005] As it is known, with reference to Fig. 1, a sliding panel (A) comprises a sheet of glass (V) and a frame (C) that supports said sheet of glass (V).

[0006] The panel (A) is suitable for being slidingly supported in a fixed secondary frame (B) that defines an opening suitable for being covered by the panel (A) and comprising two lateral uprights (B1) and two crosspieces, namely an upper transom and a lower transom (not visible in the figures).

[0007] The panel (A) comprises a set of slides that are provided in upper position and in lower position in the frame (C) of the panel (A); said slides are suitable for being inserted in rails obtained in the upper transom and in the lower transom of the fixed secondary frame (B).

[0008] In particular, the slides allow the panel (A) to slide with respect to the fixed secondary frame (B) between a closing position and an opening position.

[0009] More precisely, in the closing position, a lateral upright (C1) of the frame (C) is stopped against a lateral upright (B1) of the fixed secondary frame (B).

[0010] On the contrary, in the opening position, the lateral upright (C1) of the frame (C) is not stopped against the lateral upright (B1) of the fixed secondary frame (B) and the opening defined by the fixed secondary frame (B) is completely or partially open.

[0011] The locking/unlocking of the panel (A) in closing position is obtained by means of the locking/unlocking means (M).

[0012] The locking/unlocking means (M) (see Fig. 1) comprise a mobile bar (M1) that is slidingly mounted in the upright (C1) of the frame (C) of the panel (A).

[0013] Locking elements (M2) are obtained in said mobile bar (M1) in upper position and in lower position relative to the mobile bar (M1).

[0014] The locking/unlocking means (M) also comprise seats (M3) obtained in plates that are fixed to the lateral upright (B1) of the fixed secondary frame (B), wherein the locking elements (M2) are suitable for being inserted in such a way to lock the sliding panel (A) with respect to the fixed secondary frame (B).

[0015] More precisely, the mobile bar (M1) can slide between a locking position, wherein the locking elements (M2) are engaged in the seats (M3) disposed on the lateral upright (B1) of the fixed secondary frame (B), and an unlocking position, wherein the locking elements (M2) are released from the seats (M3).

[0016] In the unlocking position, the panel (A) can move freely with respect to the fixed secondary frame (B).

[0017] On the contrary, in the locking position, the panel (A) is constrained to the fixed secondary frame (B) by means of the locking elements (M2) of the frame (C) that are engaged in the seats (M3) disposed on the lateral upright (B1) of the fixed secondary frame (B).

[0018] The locking/unlocking means (M) are actuated by a pin (5) with square section that rotates by an angle of 90° to allow the up-down sliding movement of the mobile bar (M1) and consequently the insertion (locking position) and the release (unlocking position) of the locking elements (M2) into/from the seats (M3).

[0019] The frame (C) also comprises a handle (200) that determines the rotation of said pin (5) around its longitudinal axis in such a way to actuate the locking/unlocking means (M).

[0020] The handle (200) has an L-shaped configuration and comprises a first holding portion (201) and a second fixing portion (202) for fixing to the frame (C) around which said second fixing portion (202) rotates.

[0021] Said second fixing portion (202) is orthogonal to the first holding portion (201) and is aligned and coupled with the pin (5).

[0022] In particular, the handle (200) is rotated around an axis (X) orthogonal to the frame (C) and coinciding with the longitudinal axis of the pin (5) with square section.

[0023] The 90° rotation of the handle (200) integral with the pin (5) determines the actuation of the locking/unlocking means (M).

[0024] Normally, in order to actuate the locking/unlocking means (M), the holding portion (201) of the handle (200) is moved from a vertical position to a horizontal position and vice versa.

[0025] Generally speaking, in order to release the locking elements (M2) from the seats (M3), the user must rotate the handle (200) in such a way that the first holding portion (201) is in horizontal position.

[0026] In order to make the panel (A) slide, when opening or closing the window, the user grabs said first holding portion (201) that lies in horizontal position, exerting a force in horizontal direction in order to make the panel (A) slide.

[0027] Such a maneuver is difficult and awkward because the user must hold said first holding portion (201) tightly in order to prevent it from slipping off his/her hand.

[0028] JP2016191231 discloses a handle for sliding windows according to the preamble of claim 1.

[0029] The purpose of the present invention is to overcome the drawbacks of the prior art by disclosing a handle for sliding window frames that is configured in such a way that the user can easily make the panel slide when closing

or opening the window.

[0030] Another purpose is to disclose a strong, easy-to-use, and inexpensive-to-make handle that can be comfortably and securely held by the user when closing or opening the window.

[0031] These purposes are achieved according to the invention with the characteristics of the appended independent claim 1.

[0032] Advantageous embodiments appear from the dependent claims.

[0033] The handle of the invention is defined by claim 1.

[0034] For clarity purposes, the description of the handle according to the invention continues with reference to the appended drawings, which only have an illustrative, not limiting value, wherein:

- Fig. 2 is an axonometric view of a portion of a panel (A) in closing position, where the handle of the invention is installed;
- Fig. 3 is substantially the same axonometric view as Fig. 2, except for the fact that the handle is in disassembled condition and its upper portion is shown with an exploded view;
- Fig. 3A is an enlarged view of the adapter of Fig. 3;
- Fig. 4 is an exploded axonometric view of the lower portion of the handle according to the invention;
- Fig. 5 is an exploded axonometric view of the handle according to the invention;
- Fig. 5A is an enlargement of the detail enclosed in the circle K of Fig. 5, wherein a portion of the cylindrical body of the first bracket is omitted in such a way to show the circular hole and the striker.

[0035] In the following description, the parts that are identical to or correspond with the ones already described with reference to Fig. 1 are identified with the same reference numerals, omitting their detailed description.

[0036] With reference to Figs. 2-5, a handle according to the invention is disclosed, which is generally indicated with reference numeral (100).

[0037] With reference to Fig. 2, the handle (100) is suitable for being positioned on a panel (A) comprising a sheet (V) particularly, but not exclusively made of glass and a frame (C) for supporting said sheet (V).

[0038] As shown in Fig. 5, the handle (100) comprises a first bracket (1) and a second bracket (2) configured in such a way to be connected to the panel (A).

[0039] Still with reference to Fig. 5, each bracket (1, 2) comprises a flange (F) for fixing each bracket (1, 2) to one of the uprights (C1) of the frame (C) of the panel (A) by means of fixing screws (V1).

[0040] As shown in Figs. 2 and 5, a cover (11) is disposed on each bracket (1, 2) to cover the mechanisms and the parts that are mounted or disposed on said brackets (1, 2).

[0041] As shown in Figs. 2, 3 and 5, the handle (100) comprises a holding bar (3) that is revolvingly supported by the two brackets (1, 2) in such a way that the holding bar (3) rotates relative to an axis that coincides with the longitudinal axis (Y) of the holding bar (3), being disposed in two end-of-travel positions that are staggered by an angle of 90°, which can be defined as the locking position and the unlocking position of the panel (A) because said two positions correspond to the locking or to the unlocking of the locking elements (M2) relative to the corresponding seats (M3).

[0042] As shown in the appended figures, the longitudinal axis (Y) around which the holding bar (3) of the handle (100) rotates is a vertical axis.

[0043] As shown in Figs. 4, 5 and 5a, the first bracket (1) comprises a circular hole (40), whereas the second bracket (2) comprises a cylindrical seat (41).

[0044] The holding bar (3) comprises a first ending pin (42) that is integral with said holding bar (3) and is revolvingly inserted in the circular hole (40) of the first bracket (1).

[0045] The holding bar (3) also comprises a second ending pin (43) that is integral with the holding bar (3) and is revolvingly inserted in the circular seat (41) of the second bracket (2).

[0046] Preferably, the holding bar (3) is made of a metallic material, has a tubular structure and a square cross-section.

[0047] Although the holding bar (3) of the appended figures has a square section, in order to achieve the purposes of the invention, the holding bar (3) can have a circular or polyhedral section.

[0048] The square section of the holding bar (3) allows a firm grip when said handle (100) is grabbed and rotated around its longitudinal axis (Y).

[0049] With reference to Figs. 3 and 5, the handle (100) comprises a pin (5) with square section that extends astride said flange (F), in such a way to define a first ending section (51) directed towards the frame (C) and a second ending section (50) directed towards the holding bar (3).

[0050] More precisely, the first ending section (51) is inserted in a seat (5a) provided in the locking/unlocking means (M), as shown in Fig. 1.

[0051] The pin (5) rotates around an axis (X) that coincides with the longitudinal axis of said pin (5) and is orthogonally incident with the longitudinal axis (Y).

[0052] Said pin (5) allows for actuating the locking/unlocking means (M).

[0053] The locking/unlocking means (M) are actuated by rotating the holding bar (3) around the longitudinal axis (Y). Transmission means (6) are provided to rotate the pin (5) around its longitudinal axis (X).

[0054] More precisely, as shown in Fig. 3, said transmission means (6) comprise a pair of mutually engaging conical wheels (60, 61), wherein the first conical wheel (60) is integral with the holding bar (3) and rotates around the longitudinal axis (Y), whereas the second conical wheel (61) is associated with said pin (5) and rotates around the longitudinal axis (X).

[0055] As shown in Figs. 3 and 3a, preferably, said second conical wheel (61) is not directly associated with said pin (5), it being associated by means of an adapter (7) with a tubular body (7b) that ends with a clamp (7a) at one end, wherein the second ending section (50) of the pin (5) is inserted, and with said second conical wheel (61) at the other end.

[0056] Because of the provision of said adapter (7), the handle (100) of the invention can replace the traditional L-shaped handles shown in Fig. 1 because the pin (5) with square section of the handle (100) is identical to the one of the handles (200).

[0057] With reference to Fig. 5, the first ending pin (42) comprises a first ending portion (420) that is exactly inserted in the circular hole (40) and ends in upper position with said first conical wheel (60) obtained in one piece with said first ending portion (420).

[0058] As shown in Fig. 5, the handle (100) comprises stop means (8) in order to stop the holding bar (3) automatically and exactly in its locking and unlocking positions, as defined above, when the holding bar (3) is rotated around the longitudinal axis (Y).

[0059] More precisely, as shown in Figs. 5 and 5a, the stop means (8) comprise a striker (80) that protrudes radially from the edge of the circular hole (40) of the first bracket (1), and a partial notch (81) of the external wall of the first ending pin (42) that extends for an angle of 90° in such a way that said partial notch (81) is defined by a pair of stop teeth (810, 811) staggered by an angle of 90°.

[0060] Said striker (80) is housed in said partial notch (81).

[0061] When the holding bar (3) is rotated around the longitudinal axis (Y), the striker (80) slides inside said partial notch (81) and is selectively stopped against either one of the two stop teeth (810, 811).

[0062] Otherwise said, said stop means (8) also prevent the holding bar (3) from rotating by an angle of 360° around the longitudinal axis (Y), exclusively allowing two rotations by an angle of 90° in opposite direction.

[0063] With reference to Fig. 4, the handle (100) comprises stabilization means (9) to stabilize the angular position of the holding bar (3) in its end-of-travel positions.

[0064] Said stabilization means (9) comprise an opposite pair of elastic plates (90), each one of them being disposed in a housing (90a) that is obtained tangentially in said cylindrical seat (41) of the second bracket (2).

[0065] The stabilization means (9) also comprise two diametrically opposite pairs of facets (92, 93; 94, 95) staggered by an angle of 90° and obtained on the second ending pin (43).

[0066] More precisely, when the holding bar (3) is rotated until the end-of-travel position, the pair of elastic plates (90) is engaged against the first pair (92, 93) or the second pair (94, 95) of said facets, preventing the holding bar (3) from rotating freely.

[0067] During the rotation of the holding bar (3), said pair of elastic plates (90) interferes with the second ending pin (43), being elastically divaricated.

[0068] Although it is not shown in the appended figures, the two diametrically opposite pairs of facets (92, 93 e 94, 95) may be provided in the first ending pin (42), and one elastic plate (90) may be used instead of the two elastic plates illustrated in Fig. 4.

[0069] With reference to Fig. 4, the second bracket (2) also comprises two holes (20) that end in the cylindrical seat (41) of said second bracket (2).

[0070] With reference to Fig. 4, the handle (100) comprises fixing means (10) for fixing said second ending pin (43) of the holding bar (3) to the bracket (2).

[0071] More precisely, said second ending pin (43) of the holding bar (3) comprises an annular groove (310).

[0072] The fixing means (10) comprise a fork-shaped pin (98) with arms (12) inserted in said two holes (20), which end in the cylindrical seat (41), until they are fixed in said annular groove (310).

[0073] With reference to Fig. 5A, the first bracket (1) comprises a cylindrical body (4) with a cylindrical seat (4a) that acts as housing and guide for the rotations of said adapter (7) associated with the second conical wheel (61).

[0074] A hole (4b) in central position with respect to the longitudinal axis (Y) is obtained in said cylindrical body.

[0075] As shown in Fig. 5, an internally threaded tubular appendage (42a) is obtained in the first ending pin (42) and provided with an upper section that exactly ends inside said hole (4b).

[0076] A register screw (70) is screwed on said tubular appendage (42a), and the head of said register screw (70) is suitable for being engaged against a cap (71) applied on the cover (11) to cover a hole (11a) obtained in the cover (11) that provides access to the head of said register screw (70).

[0077] More precisely, the coupling clearance between said pair of conical wheels (60, 61) can be recovered by adjusting said register screw (70) in such a way that the pair of conical wheels (60, 61) is always engaged in a regular, correct way.

[0078] The present invention also relates to an assembly that comprises a panel (A) and a handle (100) fixed to the panel (A), and also to an assembly that comprises a panel (A), a frame (C) that frames the panel (A) and a handle (100) fixed to the frame (C).

[0079] The advantages of the present invention are manifest after the preceding description.

[0080] The handle (100) is designed in such a way to fit to the various types of panels (A) that are available on the market.

[0081] In particular, the handle (100) can be fitted to any type of panel (A) that is made of any type of material, with any shape or size, as long as the panel (A) uses a so-called "multi-point" closure.

[0082] Moreover, the handle (100) allows the user to move the panel (A) comfortably thanks to the firm grip and the typical sturdiness of the traditional pulling han-

dles that are available on the market.

[0083] More precisely, the provision of the two brackets (1, 2) provides a solid anchoring of the handle (100).

[0084] Moreover, the vertical holding bar (3) of the handle (100) allows the user to slide the panel (A) when opening or closing the window, without the risk for the handle (100) to slip off his/her hand as it can accidentally occur with the handles (200) of the prior art.

[0085] Furthermore, the handle (100) allows for locking and unlocking the panel (A) in an easy, quick and safe way.

[0086] In particular, the handle (100) of the present invention combines the functionalities of two products that are currently marketed separately, namely a typical L-shaped handle that is used to actuate the locking/unlocking means of the panel (A) with respect to the fixed secondary frame (B), and a typical pulling handle that is only used to slide the panel, without the possibility to actuate the locking/unlocking means (M).

[0087] Therefore, after grabbing the handle (100), by simply rotating the holding bar (3), the user can release the panel (A) from the fixed secondary frame (B) and slide the panel (A) in order to open the window.

[0088] Although this description refers to a panel (A) of a window frame, the handle (100) of the invention can be advantageously used in other fields of application, such as sliding doors for furniture or prefabricated partition walls.

Claims

1. Handle (100) suitable for being positioned on a panel (A) composed of a sheet (V) supported by a frame (C) coupled with a fixed secondary frame (B); said handle (100) comprising:

- a first bracket (1) and a second bracket (2) configured in such a way to be fixed to the frame (C) of the panel (A);
- a holding bar (3) that is revolvingly supported by said two brackets (1, 2) in such a way to rotate relative to a longitudinal axis (Y) between two end-of-travel positions; said holding bar (3) comprising a first ending pin (42) and a second ending pin (43);
- a pin (5) with square section that revolves around a longitudinal axis (X) orthogonal to said longitudinal axis (Y) of the holding bar and provided with a first ending section (51) and a second ending section (50); wherein said first ending section (51) is suitable for being coupled with locking/unlocking means (M) that are suitable for constraining the panel (A) with respect to the fixed secondary frame (B);
- transmission means (6) configured in such a way to transmit a rotation of the holding bar (3) around the longitudinal axis (Y) to the pin (5), in such a way the pin (5) is rotated around its longitudinal axis (X),

characterized in that

said two end-of-travel positions of the holding bar (3) are staggered by an angle of 90°.

2. The handle (100) of claim 1, wherein said transmission means (6) comprise a pair of mutually engaging conical wheels (60, 61), wherein:

- a first conical wheel (60) is integral with the holding bar (3) and rotates around said longitudinal axis (Y) of the holding bar;
- a second conical wheel (61) is associated with said pin (5) and rotates around said longitudinal axis (X) of the pin.

3. The handle (100) of any one of the preceding claims, wherein said first bracket (1) comprises a circular hole (40) and said second bracket (2) comprises a cylindrical seat (41); said first ending pin (42) and said second ending pin (43) being revolvingly coupled with said circular hole (40) and said cylindrical seat (41).

4. The handle (100) of claim 2 or claim 3 when depending on claim 2, wherein the first ending pin (42) comprises a portion (420) provided with said first conical wheel (60) in upper position.

5. The handle (100) of any one of claims 2 to 4, wherein said pin (5) is coupled with said second conical wheel (61) by means of an adapter (7) with a tubular body (7b) that ends with a clamp (7a) at one end, wherein the second ending portion (50) of the pin (5) is inserted, and with said second conical wheel (61) at the other end.

6. The handle (100) of anyone of the claims 3 to 5, comprising stop means (8) to stop the holding bar (3) in the two end-of-travel positions staggered by an angle of 90°; said stop means (8) comprising:

- a striker (80) that protrudes radially from the edge of the circular hole (40) of the first bracket (1);
- a partial notch (81) that is slidingly coupled with said striker (80) and obtained on the first ending pin (42); said notch (81) comprising two stop teeth (810, 811) for said striker (80).

7. The handle (100) of any one of the preceding claims, comprising stabilization means (9) of the holding bar (3) that comprise:

- an opposite pair of elastic plates (90), each one of them being disposed in a housing (90a) ob-

tained tangentially to said cylindrical seat (41) of the second bracket (2);
- two diametrically opposite pairs of facets (92, 93; 94, 95) staggered by an angle of 90° and obtained on the second ending pin (43); said opposite pair of elastic plates (90) being stopped against the first pair of facets (92, 93) or the second pair of facets (94, 95) when said holding bar (3) is rotated to the end-of-travel position.

8. The handle (100) of any one of the preceding claims, comprising fixing means (10) for fixing said second ending pin (43) of the holding bar (3) to said bracket (2).

9. The handle (100) of claim 8, wherein the second ending pin (43) of the holding bar (3) comprises an annular groove (310); said second bracket (2) comprising at least one hole (20) that ends into the cylindrical seat (41) of the second bracket (2); said fixing means (10) comprising a fork-shaped pin (98) with arms (12) inserted inside said at least one hole (20) and inside the annular groove (310).

10. Assembly comprising:

- a panel (A);
- a handle (100) according to any one of the preceding claims, which is fixed to said panel (A).

11. Assembly comprising:

- a panel (A) provided with a sheet (V) and a frame (C) that frames said sheet (V);
- a handle (100) according to any one of the claims 1 to 9, which is fixed to said frame (C).

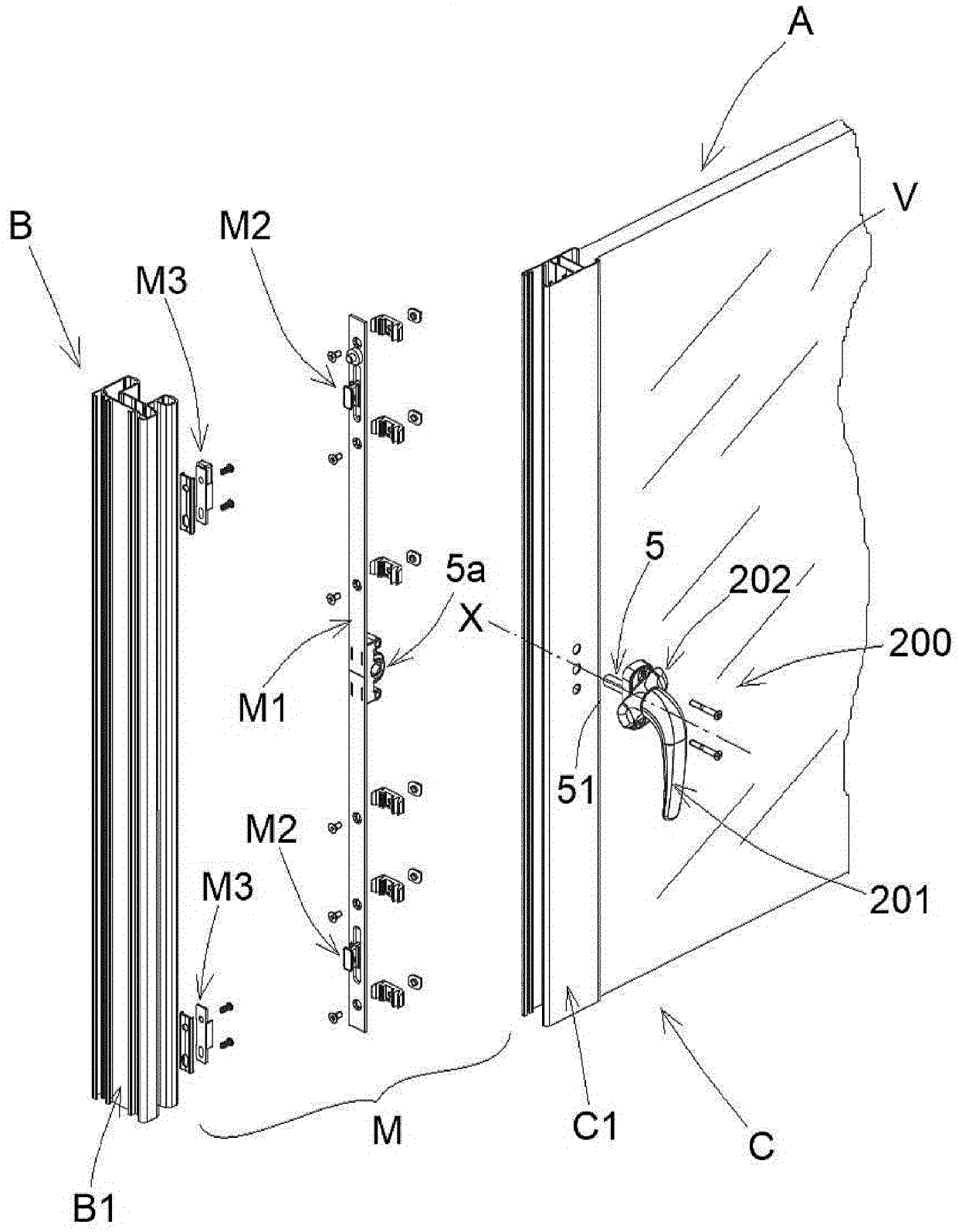

FIG. 1

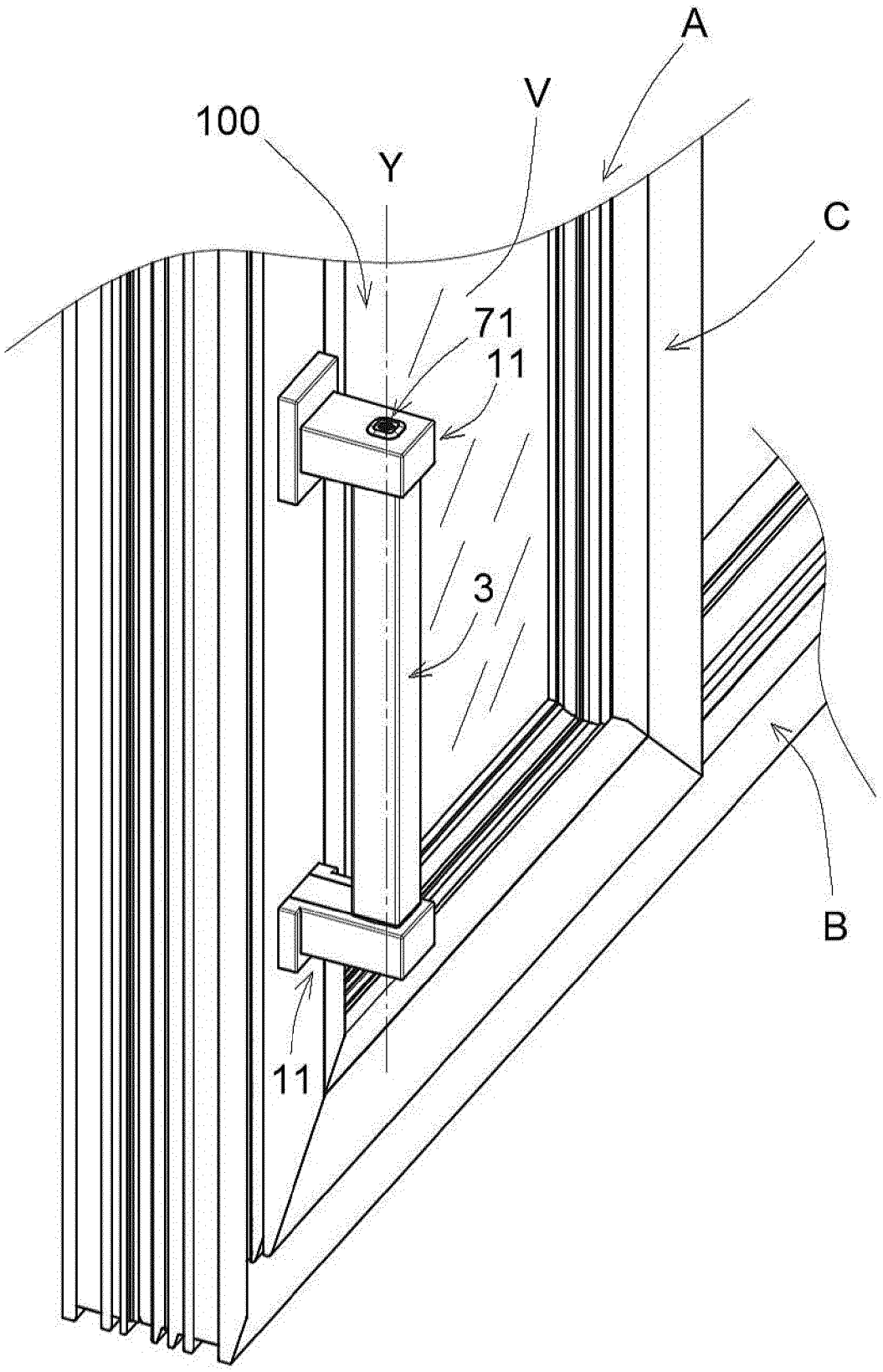

FIG. 2

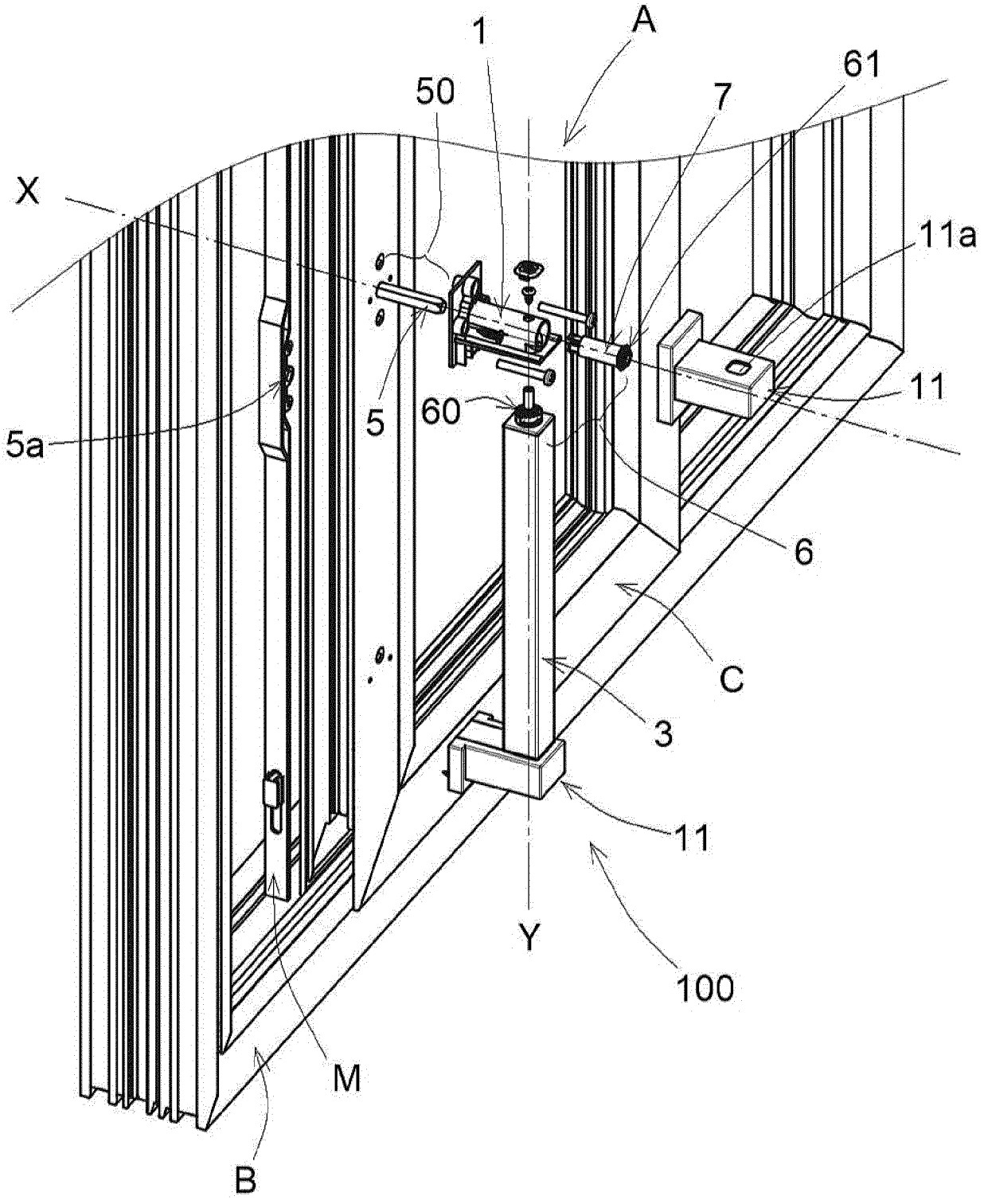

FIG. 3

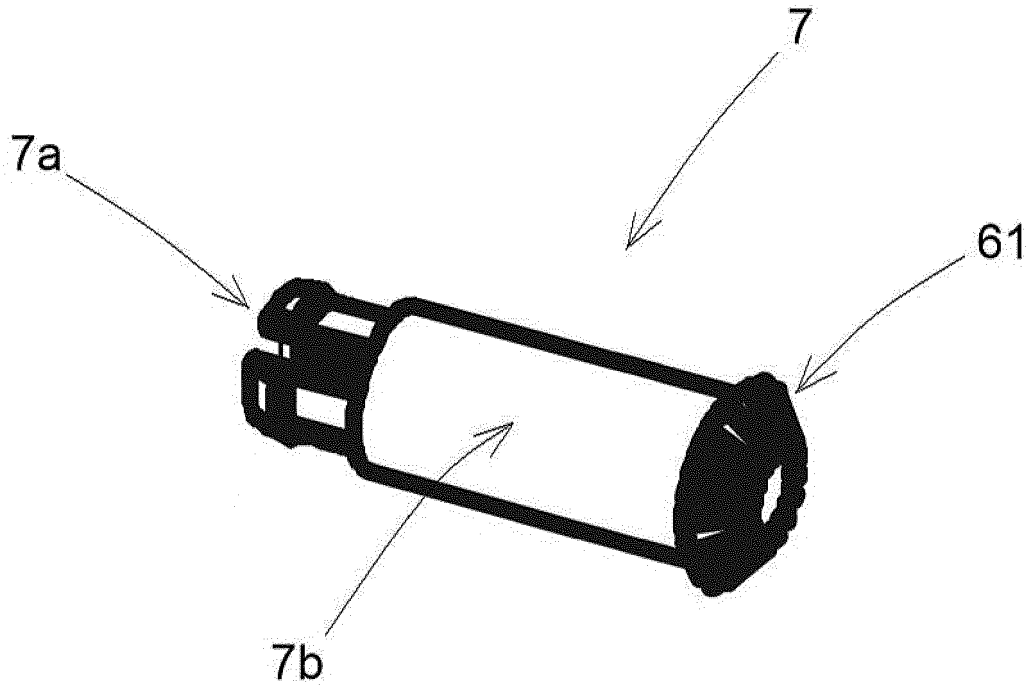

FIG. 3A

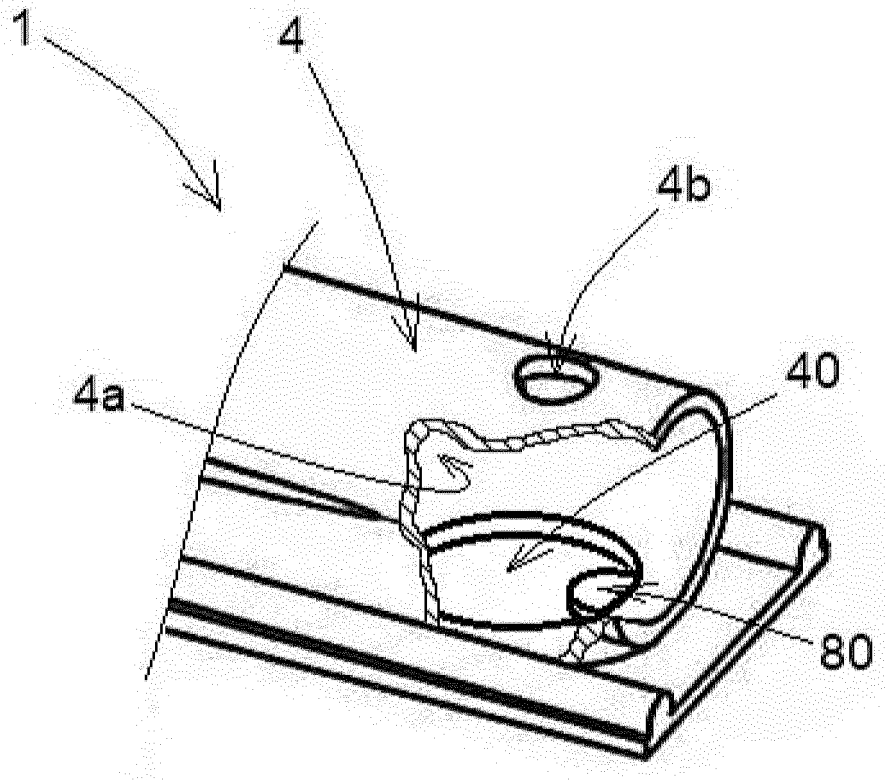

FIG. 5A

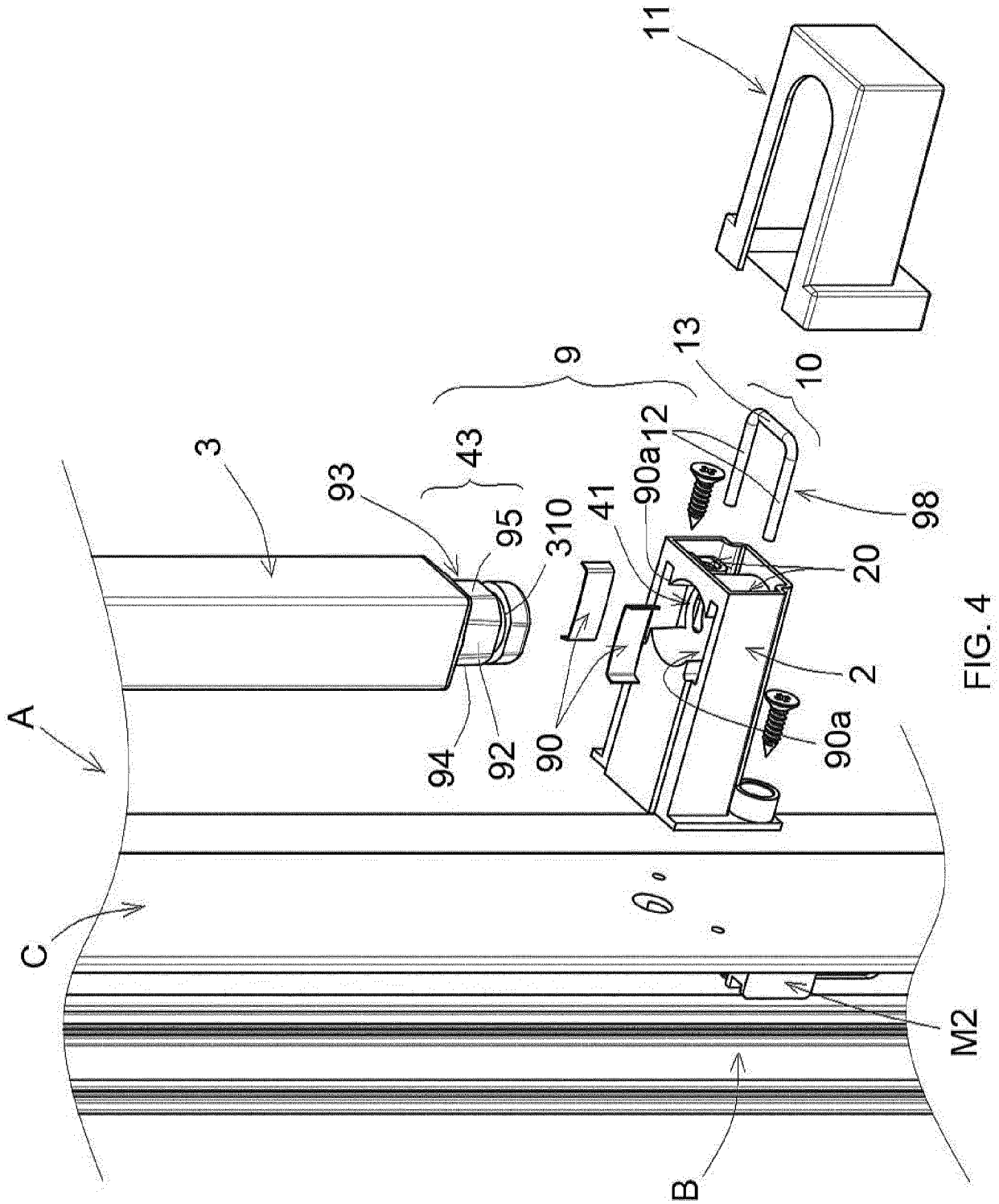

FIG. 4

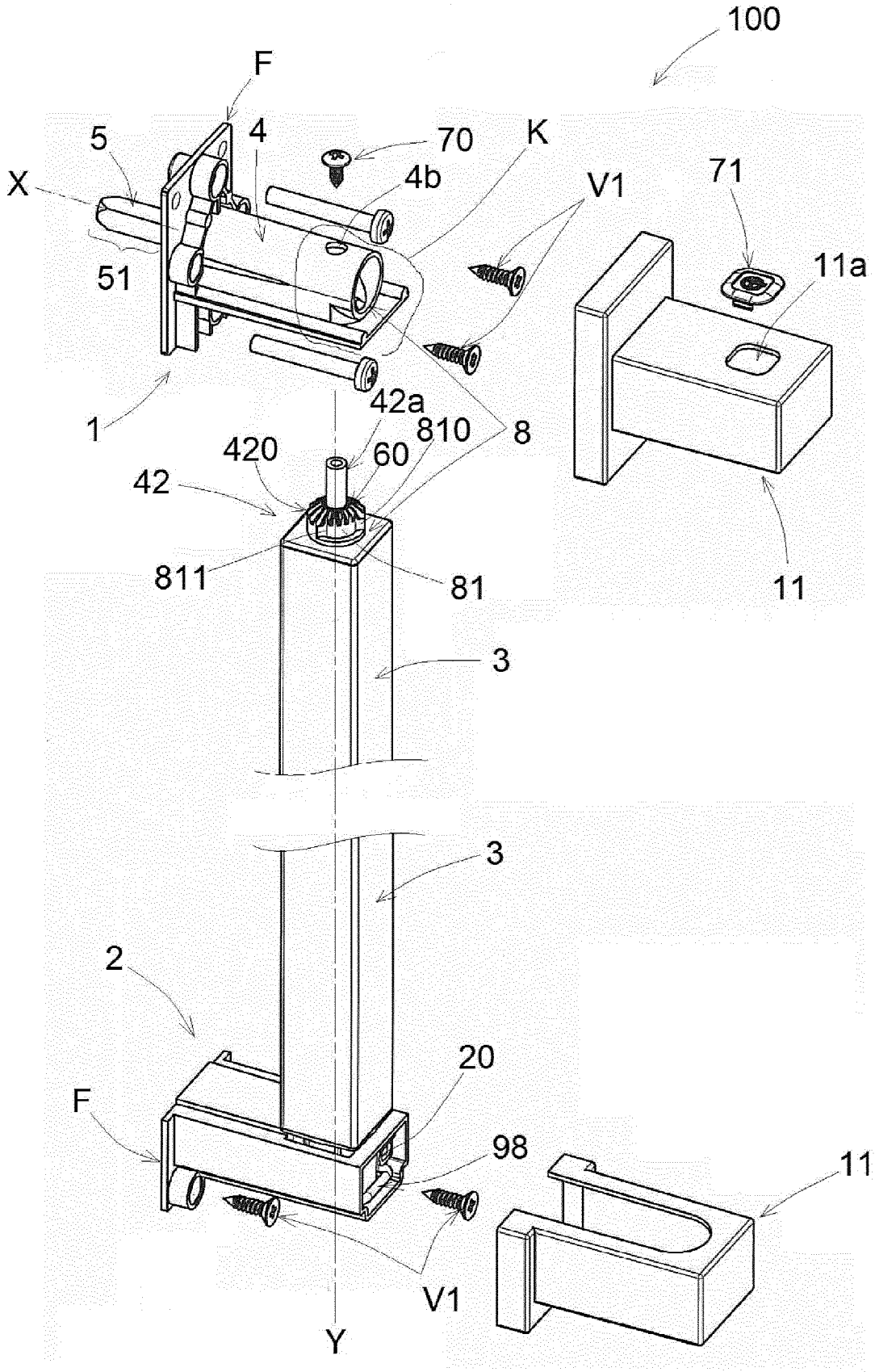
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FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 20 18 2713

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	JP 2016 191231 A (MIWA LOCK KK) 10 November 2016 (2016-11-10) * the whole document *	1-11	INV. E05B7/00 E05B1/00
A	JP 2009 191580 A (MIWA LOCK KK) 27 August 2009 (2009-08-27) * the whole document *	1-11	
A	EP 2 267 253 A2 (MILGARD MFG INC [US]) 29 December 2010 (2010-12-29) * the whole document *	1-11	
A	EP 0 551 872 A2 (WILKE HEINRICH HEWI GMBH [DE]) 21 July 1993 (1993-07-21) * the whole document *	1-11	
A	AU 467 039 B2 (MASTERBILT IND PTY LTD) 10 January 1974 (1974-01-10) * the whole document *	1-11	
A	DE 44 20 037 A1 (WILKE HEINRICH HEWI GMBH [DE]) 14 December 1995 (1995-12-14) * the whole document *	1-11	TECHNICAL FIELDS SEARCHED (IPC) E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 September 2020	Geerts, Arnold

CATEGORY OF CITED DOCUMENTS

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