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(72) Inventor: **Labertini, Marco**
40068, San Lazzaro di Savena (Bologna) (IT)

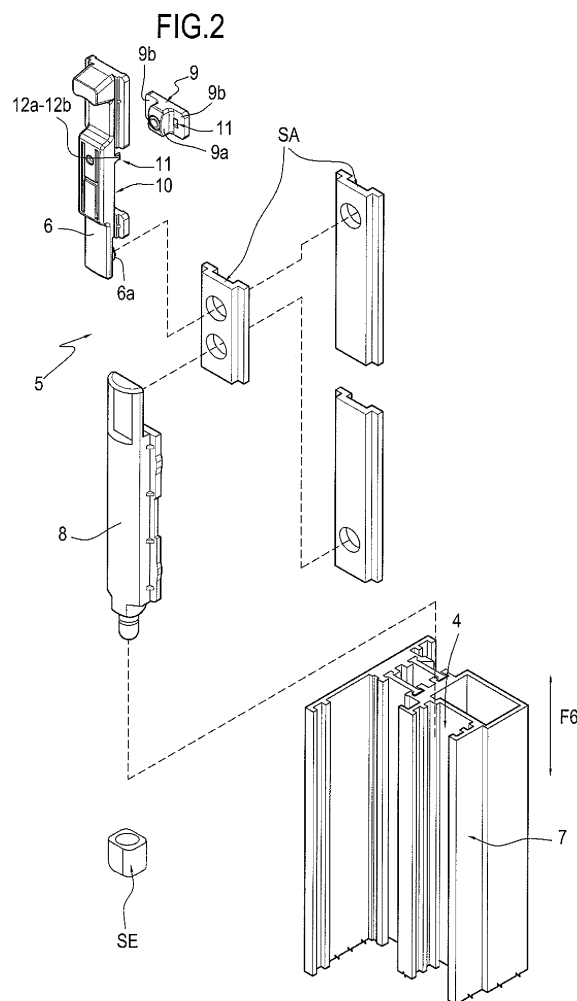
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(74) Representative: **Lanzoni, Luciano**
Bugnion SpA
Via Goito 18
40126 Bologna (IT)

(71) Applicant: **GSG INTERNATIONAL S.p.A.**
40054 Budrio (Bologna) (IT)

(54) **Door and window bolt**

(57) Described is a bolt for doors and windows (1) which comprise at least a fixed frame (2) and a mobile frame (3) equipped with at least one semi-fixed sash (3a) provided with a perimetric groove (4) in which operating and/or closing means are slidably accommodated. The bolt (5) comprises: an operating slider (6) which can be housed in the groove (4) of an upright (7) of the semi-fixed sash (3a) and which can be connected to an end locking bar (8) designed to set the sash (3a) to a stable open position and a stable closed position by the slidable control of the slider (6); a positioning /limit stop block (9) for the slider (6) housed stably, in use, in the groove (4) and having a head (9a) that fits into a hollow socket (10) obtained from a raised portion in the central part of the slider (6) and designed to form a slideway between the head (9a) and the slider (6), in such a way as to abut the slider (6) and thereby determine two end limit positions for the slider (6) itself; pre-assembly means (11) positioned and operating between the slider (6) and the block (9) in such a way as to releasably connect the two parts (6, 9) and so that both these parts are constrained in the required position at least upon being housed and positioned in the groove (4). [Figure 2]



Description

[0001] This invention relates to a bolt for doors and windows, in particular for doors and windows with frames made of metal, PVC or similar materials, wood - PVC, etc. and having perimetric grooves for housing operating and locking accessories.

[0002] In the door and window trade, it is known that in doors and windows composed of two or more opening sashes, the semi-fixed sashes, that is to say, the sashes that are not opened with the handle may include at least one hand-operated slide bar or bolt used to fasten the sash securely to the fixed frame of the door or window unit when the main sash operated using the handle is open. In its open configuration, the slide bar can also be used to move the semi-fixed sash.

[0003] In one prior art constructional form, these bolts essentially comprise:

- an operating element mounted in the perimetric groove of the semi-fixed sash and connected, through a respective rod - where fitted - to
- a locking bar which, in the locked position, fits into a striker plate mounted on the fixed frame and facing the locking bar itself.

[0004] The operating member usually consists of a slider that runs in the groove and a retaining/positioning block fixed to the groove and mounted behind the slider which has a respective socket defined by a raised hollow portion in the central part of it which accommodates the end of the block.

[0005] Also, the walls of the raised portion of the slider have a bow-like spring system, in practice wide portions and narrow portions in the socket, forming a kind of snap mechanism which allows the sash to snap into the two, open/closed positions as the slider moves along the groove, acting in combination with the fixed block which alternately abuts the spring.

[0006] For operating the slider, one end of the slider itself is provided with a cup-shaped recess which facilitates gripping, allowing the user to lift or lower the slider easily.

[0007] At present, the slider and the fixed block are available to door and window installers as separate parts.

[0008] Their installation in the frame groove is a slow and difficult task since the two parts, which must be fitted simultaneously, are relatively complex in shape and must be precisely positioned relative to one another. In addition to that, it is quite easy for the two parts to become misaligned and off-centred, thus reducing the efficiency and performance of the bolt as a whole.

[0009] This invention therefore has for an aim to overcome the above mentioned disadvantages by providing a bolt for doors and windows with an optimized structure that is easy to install without reducing the effectiveness of the seal or the performance of the door or window.

[0010] According to this invention, the above aim is

achieved by a bolt, in particular a bolt for doors and windows comprising the technical characteristics set out in one or more of the appended claims.

[0011] The technical characteristics of the invention, with reference to the above aims, are clearly described in the appended claims and its advantages are apparent from the detailed description which follows, with reference to the accompanying drawings which illustrate a preferred embodiment of the invention provided merely by way of example without restricting the scope of the inventive concept, and in which:

- Figure 1 is a schematic front view of a window equipped with the bolt according to this invention;
- Figure 2 is a perspective exploded view showing a first embodiment of the bolt according to the invention, with an upright for housing a semi-fixed sash;
- Figure 3 illustrates a scaled-up detail from Figure 2;
- Figure 4 is a perspective exploded view showing a second embodiment of the bolt according to the invention, with an upright for housing a semi-fixed sash;
- Figure 5 illustrates a scaled-up detail from the embodiment of Figure 4, in a pre-assembled configuration, shown in a side view with some parts in cross section to better illustrate other details;
- Figure 6 is a perspective view showing the bolt of Figure 2 in a pre-assembled configuration.

[0012] With reference to the accompanying drawings, in particular Figures 1 and 2, the bolt according to the invention, denoted by the numeral 5 in its entirety, may be mounted on doors or windows 1 comprising at least a fixed frame 2 and a mobile frame 3 which may in turn comprise a sash 3b equipped with a handle M and at least one semi-fixed sash 3a provided with a perimetric groove 4 in which operating and/or closing means are slidably accommodated.

[0013] The bolt 5 can be applied to the semi-fixed sash 3b that is not controlled by the handle M.

[0014] As shown also in Figures 2 and 3, the bolt 5 basically comprises a slider 6, a locking bar 8 and a positioning / limit stop block 9 for the slider 6.

[0015] More specifically, the operating slider 6 can be housed in the groove 4 of an upright 7 of the semi-fixed sash 3a and connected directly to the locking bar 8 through a pin 6a located at one end of the slider 6 that fits into a socket in the locking bar 8, or through an interposed rod segment SA between the two parts if the distance from the closing point is quite long.

[0016] The end locking bar 8 is designed to set the sash 3a to a stable open position and a stable closed position by the slidable control of the slider 6 (see arrows F6) to move the locking bar 8 towards or away from the fixed frame 2, which can be provided with suitable sockets SE for accommodating the end of the locking bar 8.

[0017] The aforementioned positioning / limit stop block 9 for the slider 6 can be housed stably, in use, in

the groove 4 and has a head 9a that fits into a hollow socket 10 obtained from a raised portion in the central part of the slider 6 designed to form a slideway between the head 9a and the slider 6, in such a way as to abut the slider 6 and thereby determine two end limit positions for the slider 6 itself.

[0018] For determining the two stable end positions, bow-like spring systems can be used which, in practice, comprise wide portions G in the socket 10 (see Figures 2 and 5) or narrow portions R in the socket 10 (see Figure 4), forming a kind of snap mechanism which allows the sash 3a to snap into the two, open/closed positions as the slider 6 moves along the groove 4, acting in combination with the fixed block 9 which alternately abuts the wide portions G and the narrow portions R.

[0019] The bolt according to the invention also comprises pre-assembly means 11 positioned and operating between the slider 6 and the block 9, in such a way as to releasably connect the two parts 6 and 9 and so that both the slider 6 and the block 9 are constrained in the required position at least upon being housed and positioned in the groove 4 (see Figures 5 and 6).

[0020] In other terms, pre-assembly means 11 are provided to allow the slider 6 and the block 9 to be fitted in the groove 4 together as a single unit and then separated once they have been positioned.

[0021] Looking more closely at the constructional details, the pre-assembly means 11, in one example embodiment of them (see Figures 2 and 6), comprise at least one pair of tabs 12a and 12b protruding from the rear edges of the central portion of the slider 6.

[0022] The two tabs 12a, 12b, having limited thickness, are, in the pre-assembled configuration, housed in respective through slots 13a and 13b made in flanges 9b on both sides of the head 9a of the block 9. The flanges 9b allow the block 9 to be housed in the groove 4.

[0023] Once the slider 6 has been fitted in the groove 4 for the first time and the block 9 has been secured in place in the groove 4 using respective locking means 14, the tabs 12a and 12b can be cut.

[0024] For this reason, the tabs 12a and 12b are made preferably of plastic so that they can be cut off more easily after final positioning.

[0025] As mentioned above, the block 9 is equipped with means 14 for locking the block 9 in the groove 4.

[0026] In a second constructional solution, shown in Figures 4 and 6, the pre-assembly means 11 may be embodied by the locking means, comprising a grub screw 14 which, in the pre-assembled configuration, is engaged in both a through hole 15 made in the central part of the slider 6 and in a corresponding threaded through hole 16 made in the head 9a of the block 9: the grub screw 14 thus holds the slider 6 and the block 9 together.

[0027] The grub screw 14 can then be screwed into the bottom of the groove 4 when the slider 6 and the block 9 are positioned, thus releasing the grub screw 14 itself from the hole 15 in the slider 6.

[0028] Advantageously, the diameter D15 of the hole

15 in the slider 6 is smaller than the diameter D14 of the grub screw 14: thus, when the grub screw 14 is screwed in, it cuts into the hole 15, creating a firm hold, and is then screwed into the hole 16 in the block 9 to fasten the two parts together securely at the pre-assembly stage.

[0029] Next, as mentioned, the installer fastens the block 9 to the groove 4, by screwing the grub screw 14 further so it goes out right through the other end of the hole 15 in the slider 6.

[0030] The tabs 12a or 12b and the through hole 15 can be positioned in such a way as to fasten the slider 6 and the block 9 to each other at one end of the socket 10 in the central part of the slider 6 corresponding, in use, to a stable open or closed position of the bolt 5, depending on installation requirements.

[0031] In both embodiments, however, the slider 6 (which is usually, but not necessarily, made of plastic) is provided with the above mentioned through hole 15 made in the central part of it, at one end of the socket 10 in which the block 9 is positioned: this enables the latter to be fastened to the groove 4 using a suitable tool that can pass through the hole 15.

[0032] Obviously, in the first embodiment described above, with the pre-assembly tabs 12a, 12b, the grub screw 14 is pre-fitted in the hole 16 of the block 9.

[0033] A bolt made as described above fully achieves the aforementioned aims thanks to the parts which allow the slider and the block to be temporarily fastened to each other so that the installer can easily mount them in the groove of the door/window frame.

[0034] The temporary fastening of the two parts also avoids the risk of misplacing and losing the block - which is usually a very small part - with obvious advantages in terms of storage convenience.

[0035] Another advantage of this temporary fastening is that it makes installation extremely quick and easy because the slider and the block are already in the right position relative to one another.

[0036] The invention described above is susceptible of industrial application and may be modified and adapted in several ways without thereby departing from the scope of the inventive concept. Moreover, all the details of the invention may be substituted by technically equivalent elements.

Claims

1. A bolt for doors and windows (1) which comprise at least a fixed frame (2) and a mobile frame (3) which may in turn comprise at least one semi-fixed sash (3a) provided with a perimetric groove (4) in which operating and/or closing means are slidably accommodated; the bolt (5) comprising at least:

- an operating slider (6) which can be housed in the groove (4) of an upright (7) of the semi-fixed sash (3a) and which can be connected to

- an end locking bar (8) designed to set the sash (3a) to a stable open position and a stable closed position by the slidable control of the slider (6) to move the locking bar (8) towards or away from the fixed frame (2);
- a positioning / limit stop block (9) for the slider (6) housed stably, in use, in the groove (4) and having a head (9a) that fits into a hollow socket (10) obtained from a raised portion in the central part of the slider (6) and designed to form a slide-way between the head (9a) and the slider (6), in such a way as to abut the slider (6) and thereby determine two end limit positions for the slider (6) itself; the bolt (5) being **characterized in that** it further comprises pre-assembly means (11) positioned and operating between the slider (6) and the block (9) in such a way as to releasably connect the two parts (6, 9) and so that both the slider (6) and the block (9) are together constrained in the required position at least upon being housed and positioned in the groove (4).
2. The bolt according to claim 1, **characterized in that** the pre-assembly means (11) comprise at least one pair of tabs (12a, 12b) protruding from the rear edges of the central part of the slider (6); said protruding tabs (12a, 12b) being, in the pre-assembled configuration, housed in respective through slots (13a, 13b) made in flanges (9b) on both sides of the head (9a) of the block (9) and said tabs (12a, 12b) being designed to be cut once the slider (6) has been fitted in the groove for the first time and the block (9) has been secured in place in the groove (4) using respective locking means (14).
3. The bolt according to claim 1, where the block (9) is equipped with means (14) for locking the block (9) itself in the groove (4), **characterized in that** the pre-assembly means (11) are embodied by the locking means, comprising a grub screw (14) which, in the pre-assembled configuration, is engaged in both a through hole (15) made in the central part of the slider (6) and in a corresponding threaded through hole (16) made in the head (9a) of the block (9), so as to keep the slider (6) and the block (9) fastened to each other; it being then possible to screw the grub screw (14) into the bottom of the groove (4) when the slider (6) and the block (9) have been positioned, thereby releasing the grub screw (14) itself from the hole (15) in the slider (6).
4. The bolt according to claim 3, **characterized in that** the diameter (D15) of the hole (15) in the slider (6) is smaller than the diameter (D14) of the grub screw (14).
5. The bolt according to claim 1, **characterized in that** the pre-assembly means (11) fasten the slider (6) and the block (9) to each other at one end of the socket (10) in the central part of the slider (6) corresponding, in use, to a stable open position of the bolt (5).
6. The bolt according to claim 1, **characterized in that** the pre-assembly means (11) fasten the slider (6) and the block (9) to each other at one end of the socket (10) in the central part of the slider (6) corresponding, in use, to a stable closed position of the bolt (5).
7. The bolt according to claim 5 or 6, **characterized in that** the slider (6) is provided with a through hole (15) made in the central part of it, at one end of the socket (10) in which the block (9) is positioned.

FIG.1

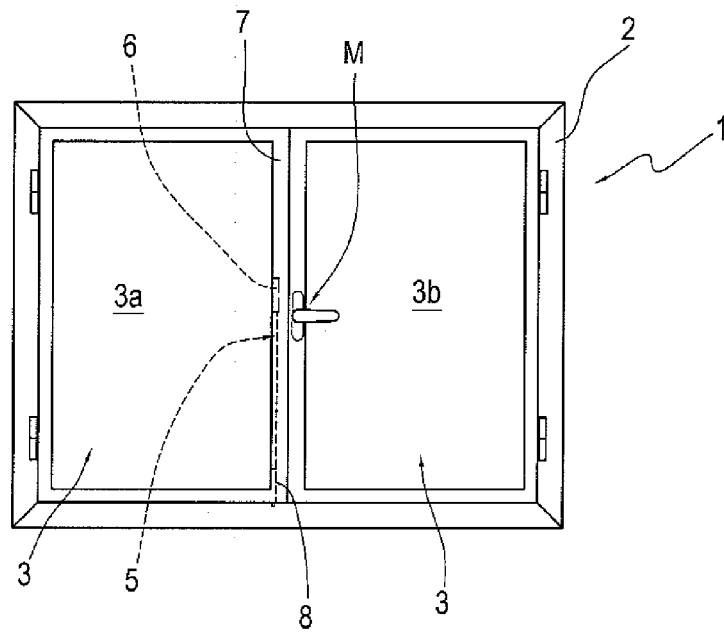


FIG.4

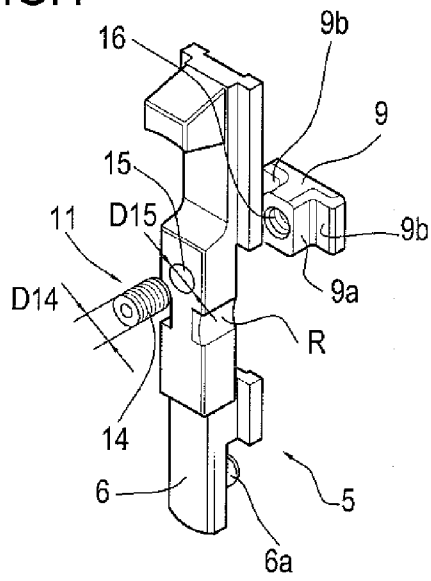


FIG.5

