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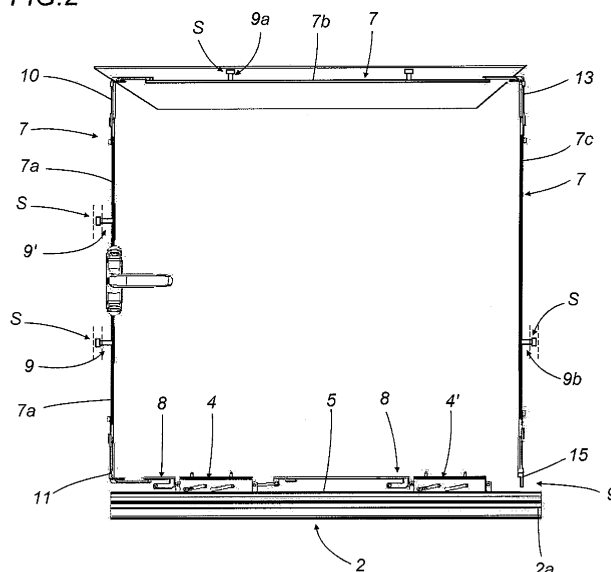
(84) Designated Contracting States: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR Designated Extension States: AL BA MK RS (30) Priority: 14.03.2007 IT BO20070177 (71) Applicant: GSG INTERNATIONAL S.p.A. 40054 Budrio (Bologna) (IT)	(72) Inventor: LAMBERTINI, Marco 40068, SAN LAZZARO DI SAVENA (BOLOGNA) (IT) (74) Representative: Lanzoni, Luciano Bugnion SpA Via Goito 18 40126 Bologna (IT)
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(54) **A sliding door or window**

(57) A sliding door or window (1) comprises: a fixed frame (2); a sash (3) that opens and closes by sliding horizontally relative to the fixed frame (2); a sliding unit or carriage (4) associated with the bottom horizontal member (3a) of the sash (3) and resting on a horizontal base track (5); a controlling member (6) located on the sash (3) and connected to operating means (7) which, when actuated by the controlling member element (6), lift the sash (3) from the carriage (4) and lower the sash (3) through drive means (8) located between the sash (3) and the carriage (4) and connected to the operating means (7); closing means (9) acting between the vertical

member (3b) of the sash (3) and the vertical member (2b) of the fixed frame (2) which, in the closed configuration, abut against each other edge to edge; the operating means (7) comprise a first rod segment (7a) and a second rod segment (7b) slidable in both directions in respective grooves (3c) formed on the profile of the vertical member (3b) and the upper horizontal member (3d) of the sash (3), respectively, and connected to each other by first right-angle drive means (10); the two rod segments (7a, 7b) operate on respective closing means (9, 9a) in such a way as to enable multiple and simultaneous closure of the sash (3) by a single direct movement of the segments (7a, 7b) using the controlling member (6).

FIG.2



Description

[0001] This invention relates to a sliding door or window, in particular a door or window of the type known in the jargon of the trade as "lift and slide".

[0002] Lift and slide doors/windows are well known in prior art (see, for example, patent GB 1370420). Doors/windows of this kind basically comprise:

- a fixed frame;
- at least one mobile frame or sash that opens and closes by sliding horizontally relative to the fixed frame;
- at least one sliding unit or carriage associated with the bottom horizontal member of the sash and resting on a horizontal base track and designed to enable the sash to slide in both directions;
- a controlling member located on the sash and designed to control operating means for lifting the sash from the carriage (thereby moving the sash seals away from the track) so that it can be slid open, and lowering the sash when it is back in the closed position, thereby returning the door/window to a sealed condition;
- closing means acting between the vertical member of the sash and the vertical member of the fixed frame (which, in the closed configuration, abut against each other edge to edge).

[0003] This specification describes in particular the solutions regarding the controlling member, the operating means and the closing means.

[0004] The sash profile (and, more specifically, the profile of the vertical member of the sash frame) is usually machined to form grooves, open to the outside, which, in some solutions, can be used for fitting a profile having a main chamber delimited by parallel wings at the sides and, at the top, two transversal ledges made on the parallel wings and forming a sort of upper supporting surface.

[0005] When the door or window is assembled, this profile is fitted with a preassembled kit comprising an operating unit consisting of a rack and pinion device (to which a handle is then connected) and some rods built into or connected to the operating unit. The rods are in turn slidably mounted in a longitudinal cover-like supporting element usually of predetermined length (greater than the length of the vertical member of the sash and adapted on assembly).

[0006] This cover is positioned on the above mentioned upper supporting surface and screwed directly to the profile chamber.

[0007] The above mentioned means for closing and/or operating the door/window (usually nibs for locking to the vertical member of the fixed frame) are connected to or made as one with the rods and protrude from the cover, the latter having suitable openings and slots made in it to permit the movement of the operating and closing elements under the action of the rods.

[0008] When actuated by the handle to open and close the sash, the rod also moves a kinematic system located on a right-angle drive associated with the bottom corner of the vertical member of the frame and designed to transmit motion to a system for lifting/lowering the sash relative to the carriage or carriages, said system being located between the carriage or carriages and the bottom horizontal member of the frame.

[0009] Up to now, this structure for controlling and operating the lift/lower and closing systems has been used for two specific reasons: the fact that the frame is generally made of wood or a synthetic material (such as PVC), with a machined profile having slots open to the outside and the fact that most of the doors and windows of this kind are very heavy precisely because of the basic materials they are made from.

[0010] These structures lack not only assembling flexibility, on account of the specific needs deriving from the final structure of the door/window, but also the possibility of using the entire frame for example to provide more closing points to operate between the sash and the fixed frame at different points around the door or window.

[0011] This is contrary to current market requirements which call for adaptable and rapid installation procedures based, for example, on the bar system, with specially-designed tools which can also be used to automatically fasten the operating and closing elements at predetermined positions (as is already being done, for example, with swinging doors and windows with metal frames).

[0012] For this reason, the Applicant has invented and designed a sliding door or window of the type stated above whose structural characteristics are such that operating units can be fitted to it quickly and easily, combined with a high degree of adaptability to different sizes and final configuration of the elements making up the door/window operating and closing elements at different points around the door/window frame, and with greater constructional simplicity.

[0013] According to the invention, the above aim is achieved by a sliding door/window, in particular a lift and slide door/window comprising the technical characteristics set out in one or more of the appended claims.

[0014] The technical characteristics of the invention, with reference to the above aims, are clearly described in the claims below 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 sliding door/window according to the invention;
- Figure 2 is schematic front view of a system for operating and driving the sliding door/window of Figure 1;
- Figure 3 is a partial perspective view illustrating a detail A from Figure 1;

- Figure 4 is a top sectional view of a detail B from Figure 1;

[0015] With reference to the accompanying drawings, in particular Figures 1 and 2, the sliding door/window according to the invention, labelled 1, is of the type generally known as "lift and slide" and basically comprises:

- a fixed frame 2;
- at least one mobile frame or sash 3 that opens and closes by sliding horizontally relative to the fixed frame 2 (also illustrated purely by way of example is a fixed sash 20);
- at least one sliding unit or carriage 4 associated with the bottom horizontal member 3a of the sash 3 and resting on a horizontal base track 5 to enable the sash 3 to slide in the opening and closing directions, labelled F1 and F2 (there being, as is known, preferably two carriages 4, 4', as shown in Figure 2);
- a controlling member 6 located on the sash 3 and connected to operating means 7 which, when actuated by the controlling member 6, lift the sash 3 from the carriage 4 so that it can be slid open, and lower the sash 3 when the sash 3 is returned to the closed position; said movements being made possible by drive means 8 located between the sash 3 and the carriage 4 and connected to the operating means 7;
- closing means 9 acting at least between the vertical member 3b of the sash 3 and the vertical member 2b of the fixed frame 2 which, in the closed configuration, abut against each other edge to edge.

[0016] As shown in Figure 2, the operating means 7 comprise a first and a second rod segment 7a and 7b slidable in both directions in respective grooves 3c formed on the profile of the vertical member 3b and the upper horizontal member 3d of the sash 3, respectively, and connected to each other by first right-angle drive means 10.

[0017] The first and second rod segments 7a and 7b operate on respective closing means 9 and 9a in such a way as to enable multiple and simultaneous closure of the sash 3 by a single direct movement of the segments 7a and 7b using the controlling member 6.

[0018] More specifically, the groove 3c of the sash 3 is open at the front (see Figure 4), is formed directly in the profile of the sash 3 at the primary manufacturing stage and runs all the way round the perimeter of the sash 3 itself.

[0019] Alternatively, the groove 3c of the sash 3 might be press fitted into the profile of the sash 3 at the manufacturing stage and, again, runs all the way round the perimeter of the sash 3.

[0020] Figure 2 also shows that, at the bottom, the first rod segment 7a is connected by a second right-angle drive 11 (of known type) to the drive means 8 between the sash 3 and the carriages 4 and 4': this also allows the lifting and lowering of the sash 3 to be controlled

directly.

[0021] Looking in more detail at the closing means on the first rod segment 7a, there are at least two of these 9 and 9' located on each side of the point where the first rod segment 7a is connected to the controlling member 6.

[0022] The closing means 9a located on the second rod segment 7b, on the other hand, operate between the second rod segment 7b itself and the upper horizontal member 2c of the fixed frame 2.

[0023] As illustrated, again in Figure 2, there may be a third rod segment 7c slidable in a respective groove 3c formed on the second vertical member 3e of the sash 3, opposite the vertical member 3b fitted with the controlling member 6.

[0024] The third rod segment 7c is fitted with further closing means 9b acting at least between the second vertical member 3e and a second, fixed vertical member 12 (forming part of the frame 2 or of the fixed sash 20) close to the second vertical member 3e of the sash 3 in the closed position.

[0025] Further, the third rod segment 7c is connected by third right-angle drive means 13 to the second rod segment 7b in such a way as to provide a third closure of the sash 3, simultaneous with the other closures, by a single movement of the segments 7a, 7b and 7c using the controlling member 6.

[0026] Also, the third rod segment 7c may be fitted, at its bottom end, with a bolt 15 constituting a further closing element acting between the rod segment 7c itself and the lower horizontal member 2a of the fixed frame 2.

[0027] Figure 2 also shows that each closing element 9, 9a, 9b is associated directly with the respective rod segment 7a, 7b, 7c and extends outwards from the respective open groove 3c.

[0028] Each of the closing elements 9, 9a, 9b, 15, embodied by pins, for example, interacts with respective slots in the vertical or horizontal members 2a, 2b, 2c or 20 of the fixed frame 2.

[0029] As illustrated in Figure 4, the controlling member may be embodied by a cremone handle 6 equipped with a through bar 6a for connection to the first rod segment 7a equipped with bosses 14 for bilaterally constraining the bar 6a so that the latter causes the first rod segment 7a itself to slide in both directions.

[0030] In short, therefore, the controlling and driving movement of the door/window 1 is provided by operating on the handle 6 to enable the first rod segment 7a to slide (in opening or closing direction). The movement of the first rod segment 7a causes the simultaneous movement of the other rod segments 7b and 7c and of the means 8 for lifting and lowering the sash 3.

[0031] These simultaneous movements enable the sash to be opened and closed at two or more points around its perimeter through a direct action from the handle 6. The system as described above offers the following advantages:

- improved door/window security thanks to the large

number of closing points;

- lighter weight thanks to direct control through sliding rods in the standard groove made in the sash profile;
- constructional flexibility of the components thanks to the possibility of adapting the length of the rod segments and the number of closing points to be fitted easily, using specific machinery, according to door/window size;
- ease of assembly and installation of the rods which simply slide in the groove in the sash frame. 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 details of the invention may be substituted by technically equivalent elements.

Claims

1. A sliding door or window (1) comprising at least:

- a fixed frame (2);
- at least one mobile frame or sash (3) that opens and closes by sliding horizontally relative to the fixed frame (2);
- at least one sliding unit or carriage (4) associated with the bottom horizontal member (3a) of the sash (3) and resting on a horizontal base track (5) to enable the sash (3) to slide in both the opening and closing directions (F1, F2);
- a controlling member (6) located on the sash (3) and connected to operating means (7) which, when actuated by the controlling member (6) and through drive means (8) located between the sash (3) and the carriage (4) and connected to the operating means (7), lift the sash (3) from the carriage (4) so that it can be slid open, and lower the sash (3) when the sash (3) is returned to the closed position;
- closing means (9) acting at least between the vertical member (3b) of the sash (3) and the vertical member (2b) of the fixed frame (2) which, in the closed configuration, abut against each other edge to edge; the door/window (1) being **characterized in that** the operating means (7) comprise at least a first rod segment (7a) and a second rod segment (7b) both slidable in both directions in respective grooves (3c) formed on the profile of the vertical member (3b) and the upper horizontal member (3d) of the sash (3), respectively, and connected to each other by first right-angle drive means (10); the first and second rod segments (7a, 7b) operating on respective closing means (9, 9a) in such a way as to enable multiple and simultaneous closure of the sash (3) by a single direct movement of the rod segments (7a, 7b) using the controlling

member (6).

2. The door or window according to claim 1, **characterized in that** the groove (3c) in the profile of the sash (3) is open at the front, formed in the profile itself or press-fitted into the profile of the sash (3) and runs all the way round the perimeter of the sash (3).
3. The door or window according to claim 1, **characterized in that** the first rod segment (7a) is connected at the bottom to the drive means (8) between the sash (3) and the carriage (4) by a second right-angle drive (11).
4. The door or window according to claim 1, **characterized in that** it comprises a third rod segment (7c) slidable in a respective groove (3c) formed on the second vertical member (3e) of the sash (3), opposite the vertical member (3b) fitted with the controlling member (6); the third rod segment (7c) being fitted with further closing means (9b) acting at least between the second vertical member (3e) and a second, fixed vertical member (12) close to the second vertical member (3e) of the sash (3) in the closed position; the third rod segment (7c) being connected by third right-angle drive means (13) to the second rod segment (7b) in such a way as to provide a third closure of the sash (3), simultaneous with the other closures, by a single movement of the segments (7a, 7b, 7c) using the controlling member (6).
5. The door or window according to claims 1 and 4, **characterized in that** each of the closing elements (9, 9a, 9b) is associated directly with the respective rod segment (7a, 7b, 7c) and extends outwards from the respective open groove (3c).
6. The door or window according to claim 1, **characterized in that** the controlling member is embodied by a cremone handle (6) equipped with a bar (6a) for connection to the first rod segment (7a) which has two bosses (14) for bilaterally constraining the bar (6a) so that the latter causes the first rod segment (7a) itself to slide in both directions.
7. The door or window according to claim 1, **characterized in that** the closing means (9) on the first rod segment (7a) are at least two (9, 9') located on each side of the point where the first rod segment (7a) is connected to the controlling member (6).
8. The door or window according to claim 4, **characterized in that** the third rod segment (7c) is fitted, at its bottom end, with a bolt (15) constituting a further closing element acting between the rod segment (7c) itself and the lower horizontal member (2a) of the fixed frame (2).

9. The door or window according to claim 1, **characterized in that** the closing means (9a) located on the second rod segment (7b) operate between the second rod segment (7b) and the upper horizontal member (2c) of the fixed frame (2).

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FIG. 1

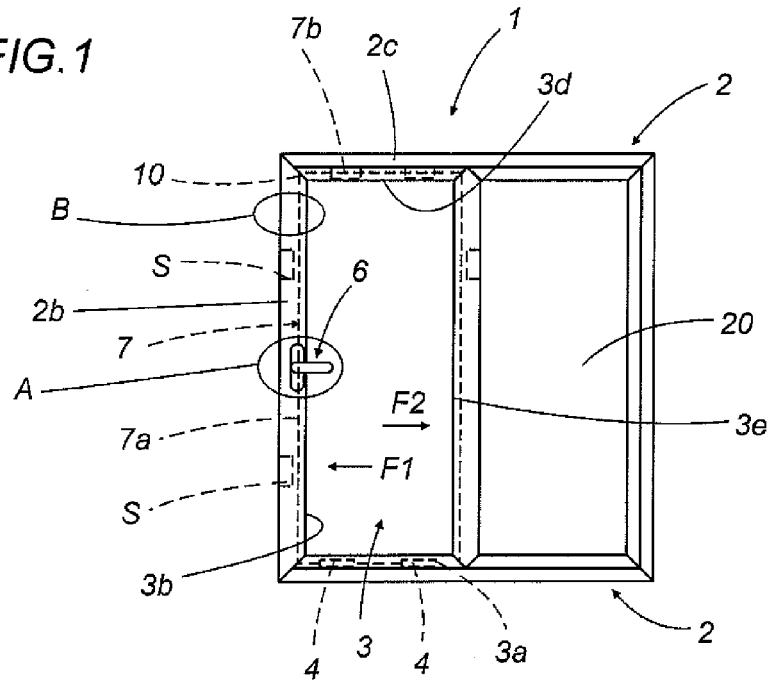


FIG. 2

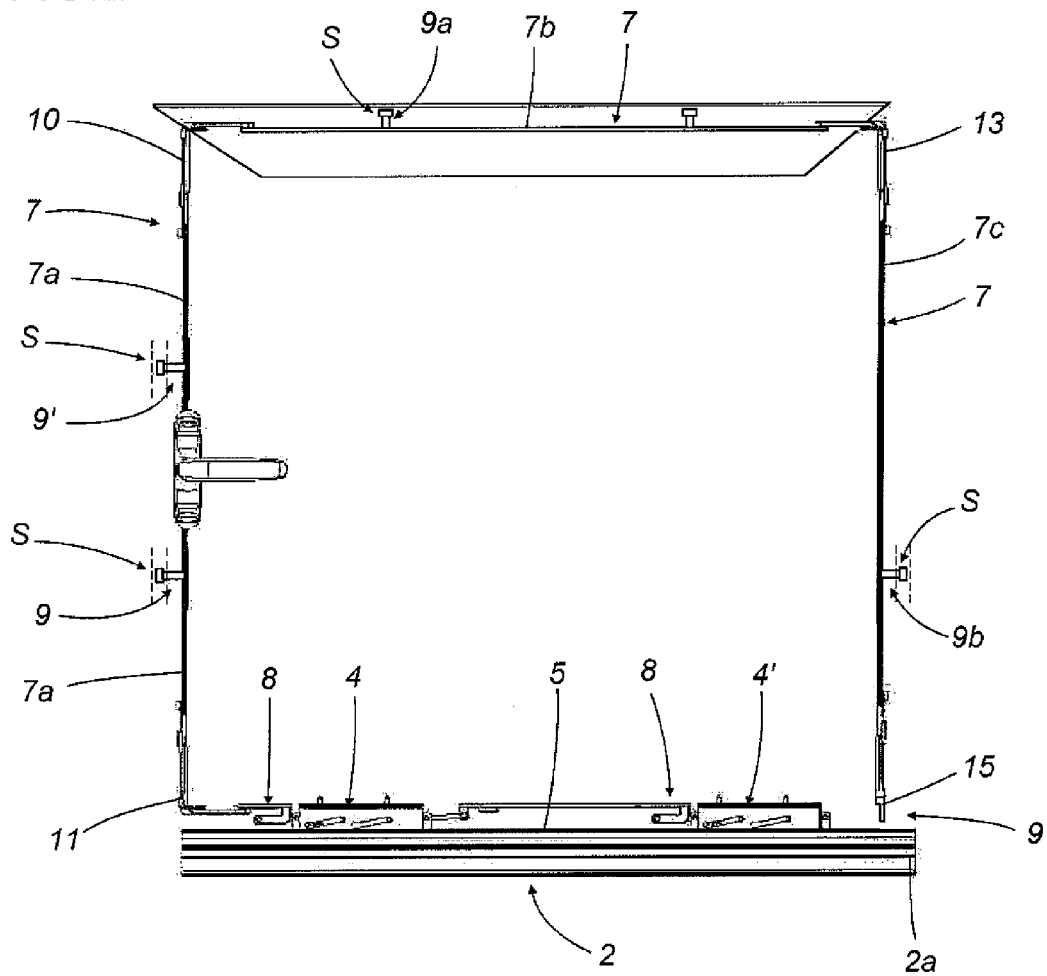


FIG.3

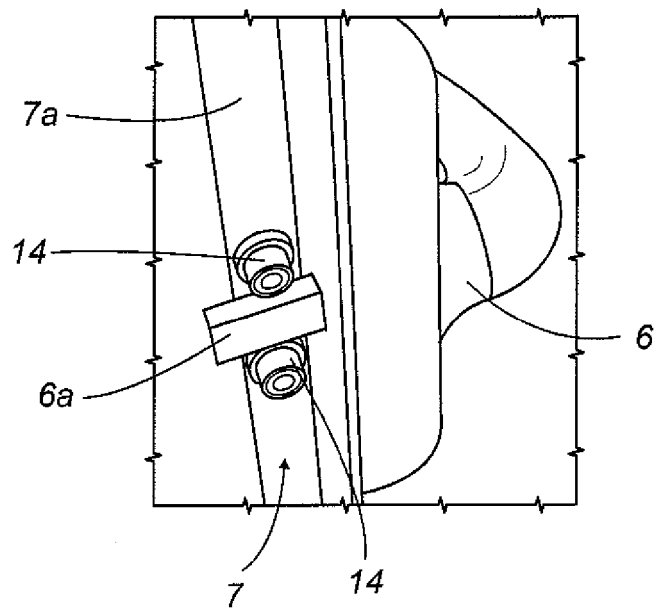
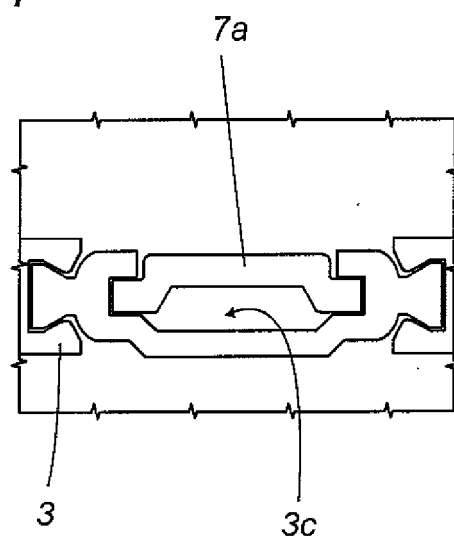


FIG.4



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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