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(54) **FITTING FOR SLIDABLE DOORS OR WINDOWS AND SYSTEM, DOOR AND WINDOW
COMPRISING THE FITTING**

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Description

Technical field

[0001] The invention relates to a fitting for slidable doors or windows that is configured to allow rectilinear displacement of a door leaf or a window sash in a direction parallel with the extension plane of the door leaf or window sash, respectively, as well as in a direction perpendicular to this plane. The invention also relates to a system, a sliding door and a sliding window comprising at least one such fitting.

Background and prior art

[0002] Sliding doors, such as patio doors, often comprise one or more door leaves that are rectilinearly displaceable between open and closed positions, along a lower rail arranged in a lower frame portion and an upper rail, parallel with the lower rail, arranged in an upper frame portion. The door leaf usually comprises lower and upper sliding door fittings that cooperate with the lower and upper rail to guide the door leaf during its rectilinear displacement along the rails. For heavier door leaves, the lower and/or upper sliding door fittings may comprise wheels resting on the respective rail in order to reduce the friction during said sliding movement.

[0003] In order to achieve a good sealing in the closed position, some sliding doors may be arranged so that the door leaf during closing is also displaced perpendicularly to the displacement direction parallel with the rails, i.e., in a direction towards a sealing surface of the door frame. The frame and/or the door leaf may be provided with one or more sealing strips that are compressed during the displacement against the sealing surface such that a good sealing between the door leaf and the frame is achieved. When opening the door, the door leaf is first displaced outwardly in a direction away from the sealing surface, so that the displacement parallel with the rails can be performed without friction increasing contact between the door leaf and the frame. The sliding door fittings may here also be configured to, in addition to guide the movement parallel with the rails, also bring about the displacement in a direction towards and away from the sealing surface of the frame. To actuate such sliding door fittings, the door leaf may be provided with an espagnolette comprising a, for example with a handle, controllable pull rod connected to the sliding door fitting. The espagnolette may also in a conventional manner be connected to one or more crossbars that in the closed position engage with corresponding edge plates of the frame for locking of the door.

[0004] A corresponding arrangement and fitting can also be provided for slidable windows.

[0005] WO 2012/042409 A1 shows an arrangement for slidable doors or windows, comprising an actuating arrangement and a fitting that allows displacement of the door leaf and the window sash, respectively, along two

directions perpendicular to each other. The fitting comprises a base member fixed to the door leaf or the window sash that receives an intermediate holder which in turn receives a wheel carrier with two wheels for supporting contact against a rail fixed to a frame. The wheel carrier is rotatably arranged about an axle parallel to the rail, relative to the intermediate holder. The fitting further comprises an actuating bar coupled to the actuating arrangement and that is engaged with an actuating member. The actuating member comprises a protruding part that is received in an oblique activation slot provided in a holder, which is arranged in line with the base member and fixated to the door leaf or the window sash, respectively, and to the base member. By displacing the actuating bar parallel with the length direction of the rail, the displacement of the actuating member in the oblique activation slot generates a lateral displacement of the actuating member, the holder and thereby the door leaf or the window sash, respectively, in a direction towards or away from the frame. During this displacement, the rotatability of the wheel carrier relative to the intermediate holder allows the wheels to maintain their contact with the rail while following the movement of the fitting and the door leaf or window sash, respectively, in the direction towards and away from the frame.

Summary of the invention

[0006] One object of the present invention is to provide an improved fitting for slidable doors and windows.

[0007] A further object is to provide a fitting with a simple construction and that comprises comparatively few parts.

[0008] A still further object is to provide a fitting that results in a comparatively low wear on components in the fitting and components cooperating with the fitting.

[0009] A still further object is to provide a fitting that requires less space and has comparatively small mounting dimensions, in particular a comparatively low mounting height.

[0010] A still further object is to provide a fitting that results in a good function and maneuverability also with comparatively heavy doors and windows.

[0011] These objects and further objects are achieved, according to a first aspect of the invention, by a fitting as defined in the preamble of claim 1 and that comprises the particular technical features as defined in the characterizing portion of the claim.

[0012] The fitting according to the invention is adapted to be used with displaceable doors and windows. The fitting comprises a base member configured to be fixated to a door leaf or a window sash that is rectilinearly displaceable in a first displacement direction, along a rail fixated along a frame portion. A guiding member is fixated to the base member and displaceable relative to the base member in a second displacement direction, perpendicular to the first displacement direction, and has a guiding element configured to guidingly engage with the rail. An

activation member is connectable with an espagnolette at the door leaf or window sash and configured to bring about the displacement of the base member relative to the guiding member. The activation member is arranged between the base member and the guiding member and displaceable relative to the base member in the first displacement direction and has at least one activation slot. The activation slot extends at an angle to the first displacement direction and cooperates with an activation tap fixated to the guiding member and received in an elongated hole in the base member, extending in the second displacement direction, in order to bring about displacement of the base member relative to the guiding member in the second displacement direction by displacing the activation member relative to the base member in the first displacement direction.

[0013] Due to the cooperation between the guiding element and a rectilinear rail fixated to the frame, guiding of the door leaf or window sash during its displacement in a first direction parallel with the rail, i.e., parallel with the extension plane of the door leaf or window sash, respectively, is accomplished in a simple and effective manner. The arrangement of the base member, the guiding member and the activation member results in that relative displacement between the base member and the activation member only takes place in the first displacement direction and that relative displacement between the base member and the guiding member in turn only takes place in the second displacement direction. The desired displacement of the door leaf or window sash in the second displacement direction, perpendicular to the rail, is thereby achieved in a simple and reliable manner with comparatively few moveable parts. The arrangement also results in that the displacement perpendicularly to the length direction of the rail can be accomplished without the need for displacing the guiding member relative to the rail in the second displacement direction, perpendicular to the length direction of the rail. Thereby, it is possible to essentially reduce the wear on the rail, on the guiding element of the guiding member and on other parts in contact with the rail, such as for example load bearing wheels, that in previous solutions are imparted a lateral displacement relative to the rail when the door leaf or window sash is to be displaced sideways. A further advantage with the fitting according to the invention is that the window or the door can be provided with two or more sealing strips arranged outside each other. Since the fitting allows closing of the door leaf or window sash by first displacing the door leaf or window sash in the first direction and thereafter completing the closing by displacement in the second direction, several sealing strips arranged outside each other can be compressed during the final displacement without these sealing strips preventing or render more difficult the displacement in the first displacement direction. Furthermore, the fitting results in that hook bolts or other locking members that are used to lock the door leaf or window sash do not need to be used for the final tightening to the fully closed po-

sition, which is the case for several previously known solutions. Thereby, the wear on such hook bolts or other locking members and the edge plates with which they cooperate, is reduced. Since the activation member is arranged between the base member and the guiding member, a sandwich construction is established with which the dimensions of the fitting, in particular in the length direction of the rail, can be kept comparatively small.

[0014] The activation member preferably comprises two activation slots, each of which cooperates with a respective activation tap. Thereby, a reliable simultaneous lateral displacement can be achieved along the entire length of the fitting in a simple manner.

[0015] The fitting preferably comprises at least one wheel that is rotationally journaled to the base member and that extends through a respective wheel opening in the base member, the activation member and the guiding member for supportingly contacting the rail. Thereby, the friction between the fitting and the rail during displacement of the door leaf or the window sash in the length direction of the rail, is reduced. In this manner, the fitting can also be used on relatively heavy door leaves and window sashes without requiring large displacement forces in the length direction or causing a large wear on the fitting or the rail.

[0016] The base member is preferably displaceable in the second displacement direction relative to the wheel or wheels. In this manner, the need for the wheel to move in the lateral direction relative to the rail during the sideways displacement of the door leaf or window sash, is eliminated. This in turn reduces the wear on the wheels and the rail.

[0017] The wheel is preferably fixated to an axle displaceable in the second displacement direction, relative to the base member. In this manner, a good guiding of the wheel in its roll direction and sideways displacement of the wheel relative to the base member is achieved in a simple and reliable way.

[0018] Alternatively, the axle may be fixated relative to the base member, whereby the wheel, and possibly an intermediate bearing, is displaceable in the second displacement direction relative to the axle.

[0019] In some embodiments, the guiding element preferably comprises two protruding guiding bosses configured to receive a part of the rail between them. These fittings are preferably used to guide the lower end of the door leaf or window sash. Then, the fitting can be simply constructed with a load bearing wheel arranged between the guiding bosses to contact the part of the rail between the guiding bosses. This type of fitting is best suitable for rails with an upwardly protruding guide or similar that can be received between the guiding bosses and against which the wheel or wheels can bear.

[0020] In other embodiments, the guiding element preferably comprises a protruding guiding flange configured to be guidingly received in a guiding channel arranged in the rail. Such fittings are suitable for being ar-

ranged at the upper end of the door leaf or window sash, where the fittings do not carry the weight of the window leaf or window sash. The protruding flange may be very simply constructed but nevertheless assure an adequate guiding in the length direction of the rail and constitute a reliable support for achieving the lateral displacement. Fittings according to this embodiment are best suitable for rails having an open channel facing the door leaf or window sash, where the channel has two parallel side walls, against which the guiding flange can guidingly engage.

[0021] According to one embodiment, the activation slot or activation slots are straight-lined. Such slots may be realized with a very simple machining operation, such as for example a milling operation or similar. Such straight-lined slots consequently contribute to a simple and economically efficient manufacture.

[0022] Alternatively, the activation slot or activation slots may be curvilinearly formed. The slots may for example exhibit a generally S-formed extension, where the end parts of the both slots extend substantially parallel to the length direction of the rail and an intermediate part extends with an angle of between 15 - 60° in relation to the length direction of the rail, between the both ends. When the activation member has been displaced such that the door leaf or window sash has adopted its closed position against the frame, the activation tap is received in one of the end parts. In this manner, a self-locking effect is achieved that render more difficult the breaking open of the door leaf or window sash by applying a force in the lateral direction out from the frame. If both ends of the slot are arranged substantially parallel with the length direction of the rail, such self-locking effect is achieved for both the closed position against the frame and the open position laterally displaced from the frame of the door leaf or window sash.

[0023] In case such self-locking is desirable only in one position, for example in the closed position, it is sufficient that only one corresponding end of the slot extends substantially in the length direction of the rail.

[0024] In order to further increase the self-locking effect, it is also possible to configure one or both end parts of the rail such that they extend at an angle with respect to the length direction of the rail, where the angle has a sign opposite to the sign of the angle of the intermediate part to the length direction of the rail.

[0025] Regardless of the extension direction of the end parts of the slot, the angle of the intermediate part to the length direction may be selected to bring about a desired ratio between the force applied to the activation member in the length direction that is transmitted to a lateral force acting on the door leaf or window by the oblique slots. Depending on for example the lever length of the actuating handle, or similar, with which the activation member is maneuvered and the required contact force in closed position, the so called strip pressure, the angle can be selected so that the required strip pressure is achieved with a desired actuating force.

[0026] It is further possible to configure the intermediate part of the activation slot with a variable angle to the length direction of the rail, along the length of the intermediate part. Thereby, it is possible to accomplish a variable force ratio during the closing and tightening displacement in the second displacement direction of the door leaf or window sash. It may for example be desirable to configure the slot with increasing force ratio in the closing direction so that a relatively low final actuating force on the actuating member generates a relatively high strip pressure.

[0027] The activation member may comprise at least one coupling portion for connecting with the espagnolette, where the coupling portion is arranged at a centre line of the activation member, which centre line extends in the first displacement direction. Thereby, it is possible to arrange one or more fittings in line and coaxially with respect to a pull rod of the espagnolette.

[0028] In case the activation member is configured with such coupling portion in each end, several consecutive fittings may be linked by intermediate pull rods.

[0029] Alternatively, or in combination with the above embodiment, the activation member may comprise at least one coupling portion for connecting with the espagnolette, where the coupling portion protrudes laterally with respect to a centre line of the activation member, which centre line extends in the first displacement direction. Such laterally protruding coupling portion increases the freedom to mount the fitting at an optional position of the door leaf or window sash. Furthermore, this configuration enables the fittings to be placed independently of the placing of the pull rods of the espagnolette. Additionally, in this manner, one single pull rod can be coupled to several consecutive fittings in a very simple way.

[0030] The activation member is preferably formed from a metal plate. Thereby, a stable and reliable activation member that only slightly adds to the mounting height of the fitting, is achieved.

[0031] The invention also relates to a system for slidable doors or windows comprising an espagnolette with a manoeuvrable and rectilinearly displaceable pull rod and at least one fitting as described above, connected to the pull rod.

[0032] The system preferably comprises at least two lower fittings, each comprising at least one wheel, and at least two upper fittings.

[0033] In such system, the pull rod may comprise a flat bar with a generally rectangular cross section arranged edgewise at the side of the fitting. Thereby, one single pull rod can be coupled to several consecutive fittings. By arranging the flat bar edgewise next to the fitting, the mounting dimensions in the lateral direction can be kept small, which enables mounting also in door leaves and window sashes with low thickness.

[0034] The flat bar preferably comprises a recess in which one laterally protruding coupling portion of the activation member of the fitting engages for connecting the pull rod and the activation member. Thereby, a very sim-

ple and reliable connection is realized. This embodiment also enables the provision of standardized pull rods comprising evenly distributed coupling recesses that during mounting easily can be cut into desired lengths and be connected with a desired number of fittings in line at the upper or lower end of the door leaf or window sash.

[0035] The invention also relates to a slidable door comprising a door leaf and a door frame having at least one rail, where the door leaf is rectilinearly displaceable along the rail and comprises a system as described above.

[0036] Furthermore, the invention relates to a slidable window comprising a window sash and a window frame having at least one rail, where the window sash is rectilinearly displaceable in the first displacement direction along the rail and comprises a system as described above.

[0037] Further objects and advantages of the invention will be apparent from the following detailed description of embodiments and from the claims.

Brief description of the drawings

[0038] In the following, various exemplified embodiments of the invention are described with reference to the drawings, in which:

Fig. 1 is a perspective view showing a window with a slidable window door.

Fig. 2 is a side view of the window of Fig. 1.

Fig. 3 is an enlarged side view corresponding to Fig. 2 and with some regions omitted.

Fig. 4 is a perspective view of an espagnolette included in the window of Fig. 1.

Fig. 5a is a perspective view of a fitting according to a first embodiment of the invention.

Fig. 5b is an exploded view of the fitting of Fig. 5a.

Figs. 6a and 6b are cross sections showing the fitting of Fig. 5a mounted to a window door, and adopting two different positions.

Fig. 7 is an exploded perspective view of a fitting according to a second embodiment of the invention.

Fig. 8 is a perspective view of a fitting according to a third embodiment of the invention.

Fig. 9 is a perspective view showing the fitting of Fig. 7 mounted to a window door.

Detailed description of example embodiments

[0039] In the following, some example embodiments of the invention are described in more detail with reference to the drawings. The invention is however not limited to these examples and may be modified in many ways within the scope of the following claims. The description of example embodiments is presented in order to give a person skilled in the art a full understanding of the invention and how it may be realized. Recurring reference numbers are intended to denote same parts and elements throughout the entire description.

[0040] Fig. 1 shows a window comprising a fixed window frame 1, a fixed window sash 2 and an openable window sash 3 that is displaceable relative to the window frame 1 and the fixed window sash 2. The openable window sash 3 is displaceable along a first rectilinear displacement direction that is horizontal and parallel to the general extension plane of the window.

[0041] Fig. 2 shows the window in a side view, in enlarged scale and Fig. 3 shows the same side view in a more enlarged scale with some parts omitted. As best seen in Fig. 3, a lower rail 4 is fixated to a lower frame portion of the frame 1. An upper rail 5 is in a corresponding way fixated to an upper frame portion of the frame 1. The rails are constituted by elongated profile elements extending in parallel with the general extension plane of the window and in parallel with the length directions of the lower and upper frame portions. The rails 4, 5 consequently have a length axis and a length direction that are parallel to the first displacement direction of the openable window sash 3.

[0042] The lower rail 4 is arranged below the openable window sash 3 and comprises a guide 4a protruding in a direction towards the window sash and extending substantially along the entire length of the rail 4. The upper rail 5 is arranged above the openable window sash 3 and comprises an open guiding channel 5a facing the window sash 3. The guiding channel 5a has a generally U-shaped cross section with an upper bottom and two facing side walls, substantially perpendicular to the bottom, protruding towards the openable window sash 3.

[0043] In the illustrated example, the openable window sash 3 and both rails 4, 5 are arranged generally outside the fixed window sash 2. When the openable window sash 3 is displaced in the first displacement direction, the openable window sash 3 is consequently located outside the fixed window sash 2.

[0044] As is best illustrated by Figs. 2 and 4, an actuating handle 6 is arranged on the inside of the openable window sash 3. The actuating handle 6 is connected to an espagnolette 7 that extends along the long side and the upper and lower short sides of the openable window in a conventional manner. In Fig. 4, the espagnolette 7 is shown with an actuating handle 6 but without the openable window sash. The espagnolette 7 comprises a lock housing 8, several pull rods 9, three hook bolts 10 and two upper fittings 20 according to the invention and two

lower fittings 40 according to the invention. The hook bolts 10 and the fittings 20, 40 are connected to the lock housing 8 via the pull rods 9 and can be actuated by the actuating handle 6.

[0045] In Figs. 5a, 5b, 6a and 6b, a fitting 40 according to a first embodiment of the invention is illustrated. The fitting 40 is intended to constitute a lower fitting and to be fixated countersunk in a milled or in other ways prepared recess in a lower end surface of the door leaf or window sash. The fitting 40 comprises a base member 41, a guiding member 42 and an activation member 43. The base member 41 and the guiding member 42 are constructed from an injection moulded polymer material. The activation member 43 is formed from a metal plate. The fitting 40, the base member 41, the guiding member 42 and the activation member 43 are elongated and have a length axis extending in parallel with the length direction of the rail with which the fitting will cooperate. As can be clearly seen in Fig. 5b, the activation member 43 is arranged between the base member 41 and the guiding member 42 so that the fitting 40 forms a sandwich construction. Thereby, the length and width of the fitting can be kept comparatively low. Due to the formation of the activation member 43 as a relatively thin plate, also the height of the fitting 40 can be kept low.

[0046] For fixation of the fitting 40 in the recess of the door leaf or window sash, the base member comprises four mounting holes 44 for receiving respective fixation screws (not shown). The orifices (not shown) of the mounting holes 44 facing the guiding member are conical for receiving the screw heads of the mounting screws, so that these do not prevent the movement of the activation member 43 relative to the base member 41. The base member comprises two laterally facing axle apertures 45 for receiving a wheel axle 46. In the illustrated example, the axle apertures 45 are open in a downward direction, towards the guiding member, for facilitating the mounting of the wheel axle 46. It is however also possible to make the axle apertures cylindrical, for example circular-cylindrical. A wheel 47 is rotatably fixated to the wheel axle 46 by a ball-bearing. The base member 41 comprises a first wheel opening 48, in which the wheel 47 is received. The first wheel opening 48 is wider than the width of the wheel, so that the wheel 47 can be laterally displaced relative to the base member 41. The base member 41 also comprises two elongated holes 49 that are arranged on either side, in the length direction of the fitting, of the wheel opening 48, and that extend perpendicular to the length direction of the fitting. Two pairs of protruding guiding bosses 58, 59 are provided at the base member 41, at a side facing the guiding member 42 (see also Fig. 7).

[0047] The guiding member 42 comprises two guiding bosses 50, protruding downwardly in a direction away from the base member 41, extending in parallel along a substantial part of the length of the fitting. The guiding bosses 50 form a guiding member channel 50a in between them that guidingly receives a part of the guide 4a

of the rail 4 when the fitting 40 is mounted. The guiding member 42 also comprises a second wheel opening 51 extending through the guiding member 42 and ending centrally in the guiding member channel 40a. The second wheel opening 51 has a width that substantially conforms to the width of the wheel 47. A circular-cylindrical activation tap through hole 52 is arranged at a centre line, near each of both ends of the guiding member 42.

[0048] The activation member 43 has a width that substantially conforms to the distance between the guiding bosses 58, resp. 59, in each pair of guiding bosses. Thereby, the activation member 43 is guided to be displaced relative to the base member 41 only in the first displacement direction, while relative displacement between these parts in the second displacement direction is prevented by the guiding bosses 58, 59. The thickness of the plate formed activation member 43 substantially conforms to the protrusion height of the guiding bosses 58, 59. The activation member is thereby guidingly received between the guiding bosses 58, resp. 59 in both pairs. Furthermore, the surface of the activation member 43 facing the guiding member is arranged substantially in the same plane as the end planes of the guiding bosses 58, 59, so that the upper plane of the guiding member can simultaneously contact the activation member 43 and the guiding bosses 58, 59. The activation member 43 comprises a centrally located third wheel opening 53 extending through the activation member 43. The width of the third wheel opening 53 is larger than the width of the wheel 47 so that the activation member 43 can be displaced in the second displacement direction relative to the wheel 47. In order to allow a displacement of the activation member 43 in the length direction relative to the wheel 47, the length of the third wheel opening 53 is longer than the chords of the wheel extending in the plane of the activation member 43. The activation member 43 further comprises two activation slots 54 extending through the activation member 43. The activation slots 54 are arranged on either side, in the length direction, of the third wheel opening 53. Both activation slots are substantially identically formed and each comprising two end parts 54a, 54b extending substantially parallel with the activation member 43 and thereby the length direction of the fitting 40. An intermediate part 54c connects both end parts 54a, 54b. The intermediate part is in the illustrated example rectilinear and is arranged at a non-zero angle with respect to the length direction of the fitting 40. In the exemplified activation slot 54, the intermediate part 54c is arranged at an angle of about 30° to the length direction. By selecting an appropriate such angle, it is possible to determine the ratio between the displacements in the first and second displacement directions. Suitable angles are within the interval 10-50°. The activation member further comprises a laterally protruding coupling portion 55 with an engagement member 56 that is arranged to engage an opening or other corresponding engagement member of a pull rod of an espagnolette.

[0049] The base member 41, the guiding member 42

and the activation member 43 are joined by two activation taps 57 that each comprises a head 57a. Each activation tap 57 extends through one respective elongated hole 49, activation slot 54 and activation tap hole 52. At the orifices of the activation tap holes 52 facing away from the base member 41 (not shown), after assembling the fitting, the ends of the activation taps are expanded so that the diameters of these ends are larger than the diameter of the respective activation tap hole 52. Thereby, all components of the fitting are joined as one unit. The cooperation of the activation taps 57 with the activation tap holes 52 and the elongated holes 49 of the base member 41 results in that a relative displacement between the base member 41 and the guiding member 42 can only take place in the second displacement direction while a relative displacement between these parts in the first displacement direction is prevented.

[0050] As most clearly seen in Figs. 6a and 6b, the fitting is in use fixated in a recess in a lower end surface of the window sash 3 of a window door. A rail 4 with an upwardly protruding guide 4a is fixated to the lower frame portion 1. A part of the guide 4a is received in the guiding member channel 50a so that the wheel 47 bears against the upper surface of the guide 4a. In this manner, the fitting 40 and thereby the window sash 3 are rectilinearly displaceable in a first displacement direction along the rail 4. In Fig. 6a, the window sash 3 is shown when it has been displaced in the first displacement direction to an end position corresponding to a closed position. The lower frame portion 1 comprises a strip part 1a with a first strip channel 1b in which a first sealing strip 1c (see Fig. 3) is arranged. The window sash 3 is provided with a second strip channel 3b in which a second sealing strip 3c (see Fig. 3) is arranged. In the position illustrated in Fig. 6, the window sash is located at a distance from the strip part 1a and the sealing strip. The first strip channel 1b and the first sealing strip 1c are arranged inside of the second strip channel 3b and the second sealing strip 3c. In order to completely close the window door from this position, the window sash needs to be displaced against the strip part 1a, in a second displacement direction that is perpendicular to the first displacement direction. This is accomplished by displacing a pull rod 9, connected to the coupling portion 55 of the fitting via the engagement member 56, by the actuating the handle 6.

[0051] As illustrated in Figs. 5a and 5b, the coupling portion 55 and thereby the activation member 43 should be displaced to the right in the figures to accomplish the closing displacement in the second displacement direction. The activation member 43 is then displaced in the length direction of the fitting 40 relative to the base member 41 and the guiding member. Since the channel 50a of the guiding member 42 guidingly receives the guide 4a, the guiding member will not be displaced in any lateral direction. Also the wheel 47, that is laterally guidingly received in the second wheel opening 51 of the guiding member, maintains its position relative to the rail 4 and the guide 4a. On the contrary, the activation member 43

will, due to the cooperation between the activation taps 57, the activation tap holes 52 and the oblique intermediate parts 54c of the activation slots 54, be displaced towards the strip part 1a in the second displacement direction. Since the activation member 43 is guidingly received between the guiding bosses 58, 59, the base member 41 and thereby the window sash will follow the lateral displacement of the activation member 43. Thereby, a complete closing of the window door is accomplished in a very simple and reliable manner whereby the sealing strips 1c, 3c can be compressed to a desired strip pressure. In the illustrated example, the first sealing strip 1c is compressed between the window sash 3 and the strip part 1a of the frame 1, while the second sealing strip 3c is compressed or deformed by beginning to butt against an inclined surface of the lower rail 4.

[0052] A particular and essential advantage with the fitting described above is that the wheel 47 during lateral displacement of base member in the second displacement direction does not follow the base member but instead maintains its position relative to the rail 4 and the guide 4a. Thereby, the wear on the wheel 47 and the guide 4a is substantially reduced.

[0053] In Fig. 7, a fitting 20 according to a second embodiment is shown. This fitting 20 is intended to constitute an upper fitting and to cooperate with a rail 5 comprising a guiding channel 5a (see Fig. 3). The fitting 20 comprises a base member 41, an activation member 43 and two activation taps 57. These components are identical to the corresponding components described above with reference to Figs. 5a, 5b, 6a and 6b and are therefore referred to with the same reference signs also in Fig. 7. The fitting also comprises a guiding member 142. Since the fitting 20 is intended to constitute an upper fitting, the guiding member 142 is in this embodiment arranged at the top and the base member 41 at the bottom. As in the first embodiment, the activation member 43 is arranged between the base member 41 and the guiding member 142. The guiding member comprises two activation tap holes 152. Instead of being provided with guiding bosses, defining a guiding channel, and a wheel, the guiding member 142 comprises a guiding flange 150 upwardly protruding from its upper side. The guiding flange 150 extends in the length direction of the fitting, along a centre line. In the illustrated example, the guiding flange comprises an intermediate portion 150a having a lateral width somewhat larger than the width of the remaining portions of the guiding flange. Thereby, the friction between the guiding flange 150 and the guiding channel 5a is reduced, compared with if the guiding flange would have had the same width along its entire length. The width of the intermediate portion 150a substantially conforms to the width of the guiding channel 5a in the rail 5. In this manner, the guiding member 142 and thereby the fitting 20 can be displaced along the rail 5 in the first displacement direction parallel with the length direction of the rail 5.

[0054] The function of the fitting 20 substantially conforms to the function of the above described fitting 40.

The only difference is that the guiding flange 150 does not carry any load of the window sash and that it is laterally guided by bearing against the lengthwise interior side walls of the guiding channel 5a.

[0055] The fitting 20 according to the second embodiment can thereby be said to constitute a further simplification of the fitting according to the invention. A particular advantage with the fitting 20 according to the second embodiment is that all included components except the guiding member 142 can be identic to the corresponding components of the lower fitting 40. Thereby, manufacture, warehousing and mounting is considerably facilitated while the costs associated with these moments are reduced.

[0056] As can be seen in Fig. 3, an upper first sealing strip 1c' is fixated to the upper frame portion of the frame 1 and an upper second sealing strip 3c' is fixated to the window sash 3. During displacement of the window sash in the second displacement direction, the upper sealing strip 1c' is compressed and the upper second sealing strip 3c' will begin to butt against a strip support 5c arranged on the upper rail 5.

[0057] In the illustrated examples, the first sealing strips are arranged on the frame and the second sealing strips are arranged on the window sash. It should however be realized that one, two or several sealing strips may be fixated either on the frame or on the window sash or door leaf.

[0058] In Fig. 8, a fitting 220 according to a third embodiment is illustrated. Also this fitting 220 is intended to constitute an upper fitting and comprises a base member 41, a guiding member 142 and activation taps 57 that are identic to the corresponding components of the fitting in Fig. 7. The fitting in Fig. 8 differs from that in Fig. 7 in that the activation member 243 comprises two coupling portions 255 centrally located at a respective end of the activation member 243. Both coupling portions 255 protrude in the length direction and are provided with coupling holes 256 for connection with a respective pull rod of an espagnolette. The fitting 220 according to the third embodiment is fixated in a recess that is concentrically arranged with a pull rod channel in the window sash or window leaf. Due to the provision of coupling portions 255 at both ends of the activation member 243, the actuating motion of the espagnolette can be easily transmitted to several consecutive fittings in line, by pull rods arranged between the fittings.

[0059] In an embodiment not illustrated, the activation member of the fitting comprises both laterally protruding coupling portions of the type or similar type as shown in Figs. 5a and 5b and lengthwise protruding coupling portions of the type or similar type as shown in Fig. 8. Such configured fittings result in that one single fitting can be used in installations both where the fitting is arranged in line with the pull rod or pull rods and in installations where the fitting is arranged next to the pull rod or pull rods.

[0060] It should further be realized that also lower fittings of the type shown in Figs. 5a and 5b may be pro-

vided with coupling portions of the types and combinations just described. It should also be realized that the various embodiments of the fitting according to the invention result in a simple installation, connection and actuation of several consecutive fittings arranged in line. This is a great advantage particularly for heavier door leafs and window sashes, since such installation of several fittings reduces the load on each fitting and thereby the wear on the fitting and the rail. Furthermore, such installation contributes to reducing the friction between each fitting and the rail whereby a lower force is required to accomplish the displacement in the first displacement direction.

[0061] In Fig. 9, the upper fitting 20 according to the second embodiment is shown mounted to a window sash 3. As can be seen in Fig. 9, the fitting is here maneuvered by a pull rod 109 extending at the side of the fitting. The pull rod 109 exhibits a rectangular cross section and is received in an elongated pull rod channel 3a that is arranged in the window sash 3. The pull rod is edgewise oriented in the pull rod channel 3a. The pull rod comprises several coupling holes 109a (only one shown) evenly distributed along the length of the pull rod 109. The laterally protruding engagement member 56 of the fitting 20 is received in one of the coupling holes 109a so that the activation member in this manner is connected with the pull rod and the espagnolette in which it is included. This embodiment entails a very simple and reliable connection between the fitting 20 and the pull rod 109. Due to the pull rod 109 being arranged edgewise, the installation further requires only a relatively small space in the lateral direction of the window sash 3. This constitutes a considerable advantage for thin window sashes. Furthermore, with this embodiment it is possible to produce the pull rods with standardized lengths and later during the assembly on the window sash or door leaf cut the pull rod to a suitable length. The positioning of one or several fittings along the window sash or door leaf may then be adapted so that the laterally protruding engagement members coincide with the coupling holes 109a of the pull rod.

[0062] In the foregoing, different embodiments of the invention have been described. It should however be realized that the invention is not limited to these embodiments and that the invention can be freely varied within the scope of the following claims. For example, the above described different components and features may be combined between the described different embodiments.

Claims

1. A fitting (20, 40, 220) for sliding doors and windows comprising:

- a base member (41) configured to be fixated to a door leaf or a window sash that is rectilinearly displaceable in a first displacement direction

- along a rail (4, 5) fixated along a frame portion,
 - a guiding member (42, 142) fixated to the base member and displaceable relative to the base member in a second displacement direction, perpendicular to the first displacement direction, and that has at least one guiding element (50, 50) arranged to guidingly engage with the rail,
 - an activation member (43, 243) connectable with an espagnolette (7) at the door leaf or window sash and configured to bring about the displacement of the base member relative to the guiding member, **characterized in that** the activation member is arranged between the base member and the guiding member and displaceable relative to the base member in the first displacement direction and has at least one activation slot (54), extending at an angle to the first displacement direction, configured to cooperate with at least one activation tap (57) fixated to the guiding member and received in an elongated hole (49) in the base member, extending in the second displacement direction, in order to bring about displacement of the base member relative to the guiding member in the second displacement direction by displacing the activation member relative to the base member in the first displacement direction.
2. A fitting according to claim 1, wherein the activation member (43, 243) comprises two activation slots (54), each of which being configured to cooperate with a respective activation tap (57).
 3. A fitting according to claim 1 or 2, comprising at least one wheel (47) that is rotationally journaled to the base member (41) and that extends through a respective wheel opening (48, 53, 51) in the base member, the activation member (43, 243) and the guiding member (42, 142) for supportingly contacting the rail.
 4. A fitting according to claim 3, wherein the base member (41) is displaceable in the second displacement direction, relative to the wheel (47).
 5. A fitting according to claim 4, wherein the wheel (47) is fixated to an axle (46) displaceable in the second displacement direction, relative to the base member (41).
 6. A fitting according to any of claims 1-5, wherein the the guiding element comprises two protruding guiding bosses (50) configured to receive a part of the rail (4) between them.
 7. A fitting according to any of claims 1-5, wherein the guiding element comprises a protruding guiding flange (150) configured to be guidingly received in a guiding channel (5a) arranged in the rail (5).
 8. A fitting according to any of claims 1-7, wherein the activation slot or activation slots are straight-lined.
 9. A fitting according to any of claims 1-7, wherein the activation slot or activation slots (54) are curvilinearly formed.
 10. A fitting according to any of claims 1-9, wherein the activation member (243) comprises at least one coupling portion (255) for connecting with an espagnolette, where the coupling portion is arranged at a centre line of the activation member, which centre line extends in the first displacement direction.
 11. A fitting according to any of claims 1-9, wherein the activation member (43) comprises at least one coupling portion (55) for connecting with the espagnolette, where the coupling portion protrudes laterally with respect to a centre line of the activation member, which centre line extends in the first displacement direction.
 12. A fitting according to any of claims 1-11, wherein the activation member is formed from a metal plate.
 13. A system for slidable doors or windows comprising an espagnolette (7) with a manoeuvrable and rectilinearly displaceable pull rod (9) and at least one fitting (20, 40) according to any of claims 1-12 connected to the pull rod.
 14. A system according to claim 13, comprising at least two lower fittings (40) according to any of claims 1-12, which lower fittings each comprises at least one wheel (47), and at least two upper fittings (20) according to any of claims 1-12.
 15. A system according to claim 13 or 14, wherein the pull rod comprises a flat bar (109) with a generally rectangular cross section arranged edgewise at the side of the fitting (20).
 16. A system according to claim 15, wherein the flat bar (109) comprises a recess (109a) in which one laterally protruding coupling portion (56) of the activation member of the fitting can engage to connect the pull rod and the activation member (43).
 17. A slidable door comprising a door leaf and a door frame having at least one rail (4, 5), where the door leaf is rectilinearly displaceable in the first displacement direction along the rail and comprises a system according to any of claims 13-16.
 18. A slidable window comprising a window sash (3) and a window frame (1) having at least one rail (4, 5), which window sash is rectilinearly displaceable in the first displacement direction along the rail and

comprises a system according to any of claims 13-16.

Patentansprüche

1. Beschlag (20, 40, 220) für Schiebetüren und Schiebefenster, umfassend:

- ein Grundelement (41), das so eingerichtet ist, dass es an einem Türblatt oder einem Fensterflügel befestigt wird, das bzw. der in einer ersten Verschieberichtung entlang einer Schiene (4, 5), die einen Rahmenabschnitt entlang befestigt ist, geradlinig verschiebbar ist,
- ein Führungsglied (42, 142), das an dem Grundelement befestigt und bezogen auf das Grundelement in einer zweiten Verschieberichtung senkrecht zur ersten Verschieberichtung verschiebbar ist und das mindestens ein Führungselement (50, 150) aufweist, das so angeordnet ist, dass es führend mit der Schiene in Eingriff gelangt,
- ein Aktivierungselement (43, 243), das mit einem Stangenverschluss (7) am Türblatt oder Fensterflügel verbindbar ist und so eingerichtet ist, dass es die Verschiebung des Grundelements bezogen auf das Führungsglied bewirkt, **dadurch gekennzeichnet, dass**

das Aktivierungselement zwischen dem Grundelement und dem Führungsglied angeordnet ist und bezogen auf das Grundelement in der ersten Verschieberichtung verschiebbar ist und mindestens einen unter einem Winkel zu ersten Verschieberichtung verlaufenden Aktivierungsschlitz (54) aufweist, der so eingerichtet ist, dass er mit mindestens einem Aktivierungsgewindeelement (57) zusammenarbeitet, das an dem Führungsglied befestigt und in einem Langloch (49) im Grundelement aufgenommen ist, das in der zweiten Verschieberichtung verläuft, damit es eine Verschiebung des Grundelements bezogen auf das Führungsglied in der zweiten Verschieberichtung bewirkt, indem es das Aktivierungselement bezogen auf das Grundelement in der ersten Verschieberichtung verschiebt.

2. Beschlag nach Anspruch 1, wobei das Aktivierungselement (43, 243) zwei Aktivierungsschlitze (54) umfasst, von denen jeder so eingerichtet ist, dass er mit einem entsprechenden Aktivierungsgewindeelement (57) zusammenarbeitet.
3. Beschlag nach Anspruch 1 oder 2, der mindestens ein Rad (47) umfasst, das drehbar am Grundelement (41) gelagert ist und das durch eine entsprechende Radöffnung (48, 53, 51) im Grundelement, Aktivierungselement (43, 243) und Führungsglied (42, 142)

verläuft, um sich abstützend die Schiene zu berühren.

4. Beschlag nach Anspruch 3, wobei das Grundelement (41) in der zweiten Verschieberichtung bezogen auf das Rad (47) verschiebbar ist.
5. Beschlag nach Anspruch 4, wobei das Rad (47) an einer Achse (46) befestigt ist, die in der zweiten Verschieberichtung bezogen auf das Grundelement (41) verschiebbar ist.
6. Beschlag nach einem der Ansprüche 1 bis 5, wobei das Führungselement zwei vorragende Führungsvorsprünge (50) umfasst, die so eingerichtet sind, dass sie einen Teil der Schiene (4) dazwischen aufnehmen.
7. Beschlag nach einem der Ansprüche 1 bis 5, wobei das Führungselement einen vorragenden Führungsflansch (150) umfasst, der so eingerichtet ist, dass er führend in einem Führungskanal (5a) aufgenommen ist, der in der Schiene (5) angeordnet ist.
8. Beschlag nach einem der Ansprüche 1 bis 7, wobei der Aktivierungsschlitz oder die Aktivierungsschlitze gerade ist bzw. sind.
9. Beschlag nach einem der Ansprüche 1 bis 7, wobei der Aktivierungsschlitz oder die Aktivierungsschlitze (54) gebogen ausgebildet ist bzw. sind.
10. Beschlag nach einem der Ansprüche 1 bis 9, wobei das Aktivierungselement (243) mindestens einen Verbindungsabschnitt (255) zum Verbinden mit einem Stangenverschluss umfasst, wobei der Verbindungsabschnitt auf einer Mittellinie des Aktivierungselements angeordnet ist, wobei die Mittellinie in der ersten Verschieberichtung verläuft.
11. Beschlag nach einem der Ansprüche 1 bis 9, wobei das Aktivierungselement (43) mindestens einen Verbindungsabschnitt (55) zum Verbinden mit dem Druckstangenverschluss umfasst, wobei der Verbindungsabschnitt bezogen auf eine Mittellinie des Aktivierungselements seitlich vorragt, wobei die Mittellinie in der ersten Verschieberichtung verläuft.
12. Beschlag nach einem der Ansprüche 1 bis 11, wobei das Aktivierungselement aus einer Metallplatte geformt ist.
13. System für Schiebetüren oder Schiebefenster, das einen Stangenverschluss (7) mit einer bedienbaren und geradlinig verschiebbaren Zugstange (9) und mindestens einen Beschlag (20, 40) nach einem der Ansprüche 1 bis 12, der mit der Zugstange verbunden ist, umfasst.

14. System nach Anspruch 13, das mindestens zwei untere Beschlüge (40) nach einem der Ansprüche 1 bis 12 umfasst, wobei die unteren Beschlüge jeweils mindestens ein Rad (47) umfassen, und mindestens zwei obere Beschlüge (20) nach einem der Ansprüche 1 bis 12. 5
15. System nach Anspruch 13 oder 14, wobei die Zugstange eine Flachstange (109) mit einem allgemein rechteckigen Querschnitt umfasst, die hochkant auf der Seite des Beschlugs (20) angeordnet ist. 10
16. System nach Anspruch 15, wobei die Flachstange (109) eine Aussparung (109a) umfasst, in die ein seitlich vorragender Verbindungsabschnitt (56) des Aktivierungselement des Beschlugs eingreifen und so die Zugstange und das Aktivierungselement (43) verbinden kann. 15
17. Schiebetür, die ein Türblatt und einen Türrahmen mit mindestens einer Schiene (4, 5) umfasst, wobei das Türblatt geradlinig in der ersten Verschieberichtung entlang der Schiene verschiebbar ist und ein System nach einem der Ansprüche 13 bis 16 umfasst. 20
18. Schiebefenster, das einen Fensterflügel (3) und einen Fensterrahmen (1) mit mindestens einer Schiene (4, 5) umfasst, wobei der Fensterflügel geradlinig in der ersten Verschieberichtung entlang der Schiene verschiebbar ist und ein System nach einem der Ansprüche 13 bis 16 umfasst. 30

Revendications

1. Ferrure (20, 40, 220) pour portes et fenêtres coulissantes, comprenant :

un élément de base (41) configuré pour être fixé sur un battant de porte ou sur un châssis de fenêtre déplaçable de façon linéaire dans une première direction de déplacement le long d'un rail (4, 5) fixé le long d'une partie de cadre,

- un élément de guidage (42, 142) fixé à l'élément de base et déplaçable par rapport à l'élément de base dans une deuxième direction de déplacement perpendiculaire à la première direction de déplacement, et lequel comporte au moins un organe de guidage (50, 150) disposé de manière à s'engager avec le rail pour le guidage,
- un élément d'activation (43, 243) apte à être relié à une espagnolette (7) sur le battant de porte ou le châssis de fenêtre et configuré pour provoquer le déplacement de l'élément de base par rapport à l'élément

de guidage, **caractérisée en ce que** l'élément d'activation est disposé entre l'élément de base et l'élément de guidage et déplaçable par rapport à l'élément de base dans la première direction de déplacement et comporte au moins une fente d'activation (54) s'étendant sous un angle par rapport à la première direction de déplacement, configuré pour coopérer avec au moins un robinet d'activation (57) fixé à l'élément de guidage et reçu dans un trou allongé (49) dans l'élément de base, lequel s'étend dans la direction de déplacement, afin de provoquer un déplacement de l'élément de base par rapport à l'élément de guidage dans la deuxième direction de déplacement, en déplaçant l'élément d'activation par rapport à l'élément de base dans la première direction de déplacement.

2. Ferrure selon la revendication 1, dans laquelle l'élément d'activation (43, 243) comprend deux fentes d'activation (54), chacune d'entre elles étant configurée pour coopérer avec un robinet d'activation (57) respectif.
3. Ferrure selon la revendication 1 ou 2, comprenant au moins une roue (47) tourillonnée de façon rotative à l'élément de base (41) et s'étendant à travers une ouverture de roue (48, 53, 51) respective dans l'élément de base, l'élément d'activation (43, 243) et l'élément de guidage (42, 142) pour toucher le rail de manière à le supporter.
4. Ferrure selon la revendication 3, dans laquelle l'élément de base (41) est déplaçable dans la deuxième direction de déplacement, par rapport à la roue (47).
5. Ferrure selon la revendication 4, dans laquelle la roue (47) est fixée à un axe (46) déplaçable dans la deuxième direction de déplacement, par rapport à l'élément de base (41).
6. Ferrure selon l'une quelconque des revendications 1 à 5, dans laquelle l'élément de guidage comprend deux bosses de guidage saillantes (50) configurées pour recevoir une partie du rail (4) entre celles-ci.
7. Ferrure selon l'une quelconque des revendications 1 à 5, dans laquelle l'élément de guidage comprend une bride de guidage saillante (150) configurée pour être reçue par guidage dans un canal de guidage (5a) disposé dans le rail (5).
8. Ferrure selon l'une quelconque des revendications 1 à 7, dans laquelle la fente d'activation ou les fentes d'activation (54) est/sont rectiligne(s).

9. Ferrure selon l'une quelconque des revendications 1 à 7, dans laquelle la fente d'activation ou les fentes d'activation (54) est/sont formée(s) de façon curvilinéaire.
10. Ferrure selon l'une quelconque des revendications 1 à 9, dans laquelle l'élément d'activation (243) comprend au moins une partie d'accouplement (255) pour être relié à une espagnolette, la partie d'accouplement étant disposée sur une ligne médiane de l'élément d'activation, ladite ligne médiane s'étendant dans la première direction de déplacement.
11. Ferrure selon l'une quelconque des revendications 1 à 9, dans laquelle l'élément d'activation (43) comprend au moins une partie d'accouplement (55) pour être relié à l'espagnolette, la partie d'accouplement faisant saillie latéralement par rapport à une ligne médiane de l'élément d'activation, ladite ligne médiane s'étendant dans la première direction de déplacement.
12. Ferrure selon l'une quelconque des revendications 1 à 11, dans laquelle l'élément d'activation est formé à partir d'une plaque métallique.
13. Système pour portes et fenêtre coulissantes comprenant une espagnolette (7) avec une tige de traction (9) apte à être manoeuvrée et déplacée de façon linéaire, et au moins une ferrure (20, 40) selon l'une quelconque des revendications 1 à 12 reliée à la tige de traction.
14. Système selon la revendications 13, comprenant au moins deux ferrures inférieures (40) selon l'une quelconque des revendications 1 à 12, lesdites ferrures inférieures comprenant respectivement au moins une roue (47), et au moins deux ferrures supérieures (20) selon l'une des revendications 1 à 12.
15. Système selon la revendication 13 ou 14, dans lequel la tige de traction comprend une barre plate (109) avec une section transversale généralement rectangulaire, disposée sur chant sur le côté de la ferrure (20).
16. Système selon la revendication 15, dans lequel la barre plate (109) comprend une cavité (109a) dans laquelle peut s'engager une partie d'accouplement faisant saillie latéralement (56) de l'élément d'activation de la ferrure, pour relier la tige de traction et l'élément d'activation (43).
17. Porte coulissante comprend un battant de porte et un cadre de porte comportant au moins un rail (4, 5), le battant de porte étant déplaçable de façon linéaire dans la première direction de déplacement le long du rail et comprenant un système selon l'une quelconque des revendications 13 à 16.
18. Fenêtre coulissante comprenant un châssis de fenêtre (3) et un cadre de fenêtre (1) comportant au moins un rail (4, 5), ledit châssis de fenêtre étant déplaçable de façon linéaire dans la première direction de déplacement le long du rail et comprenant un système selon l'une quelconque des revendications 13 à 16.

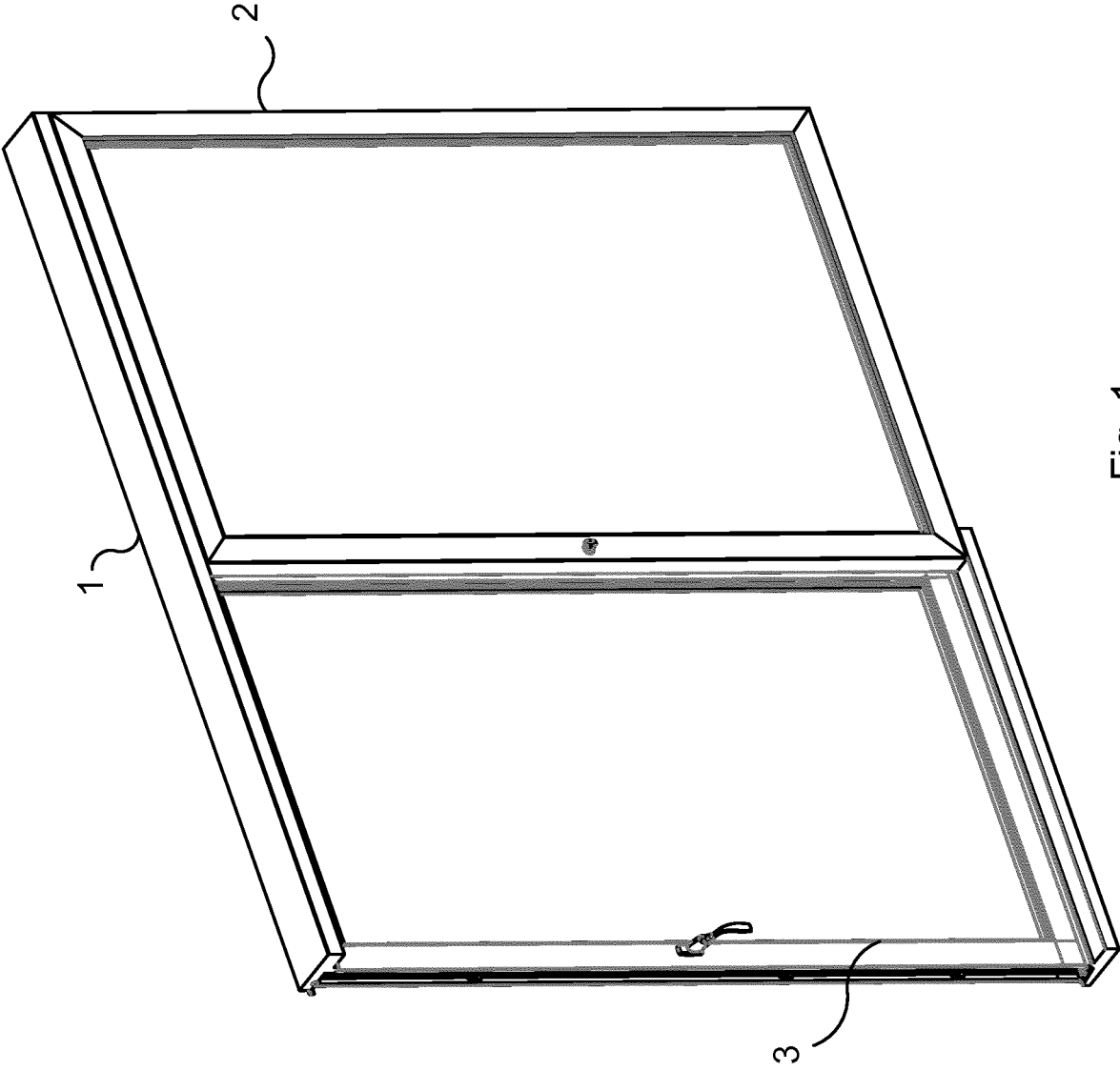


Fig. 1

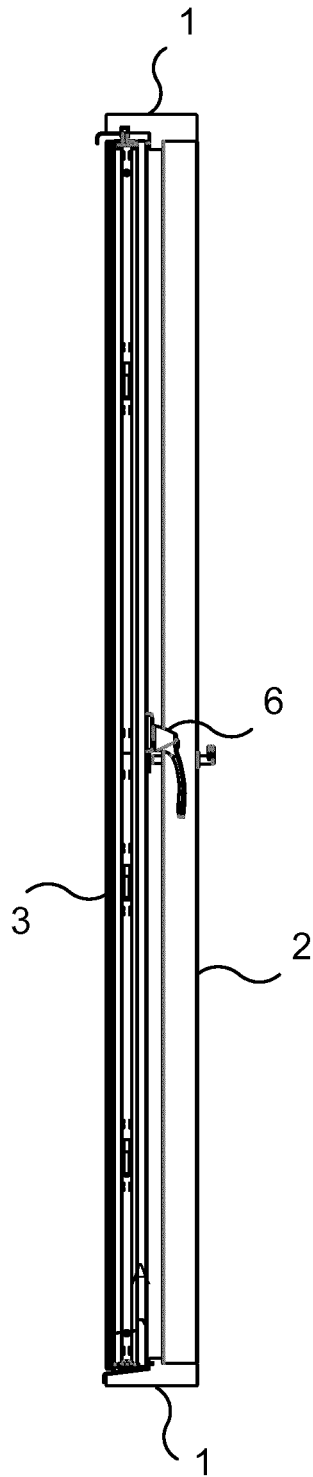


Fig. 2

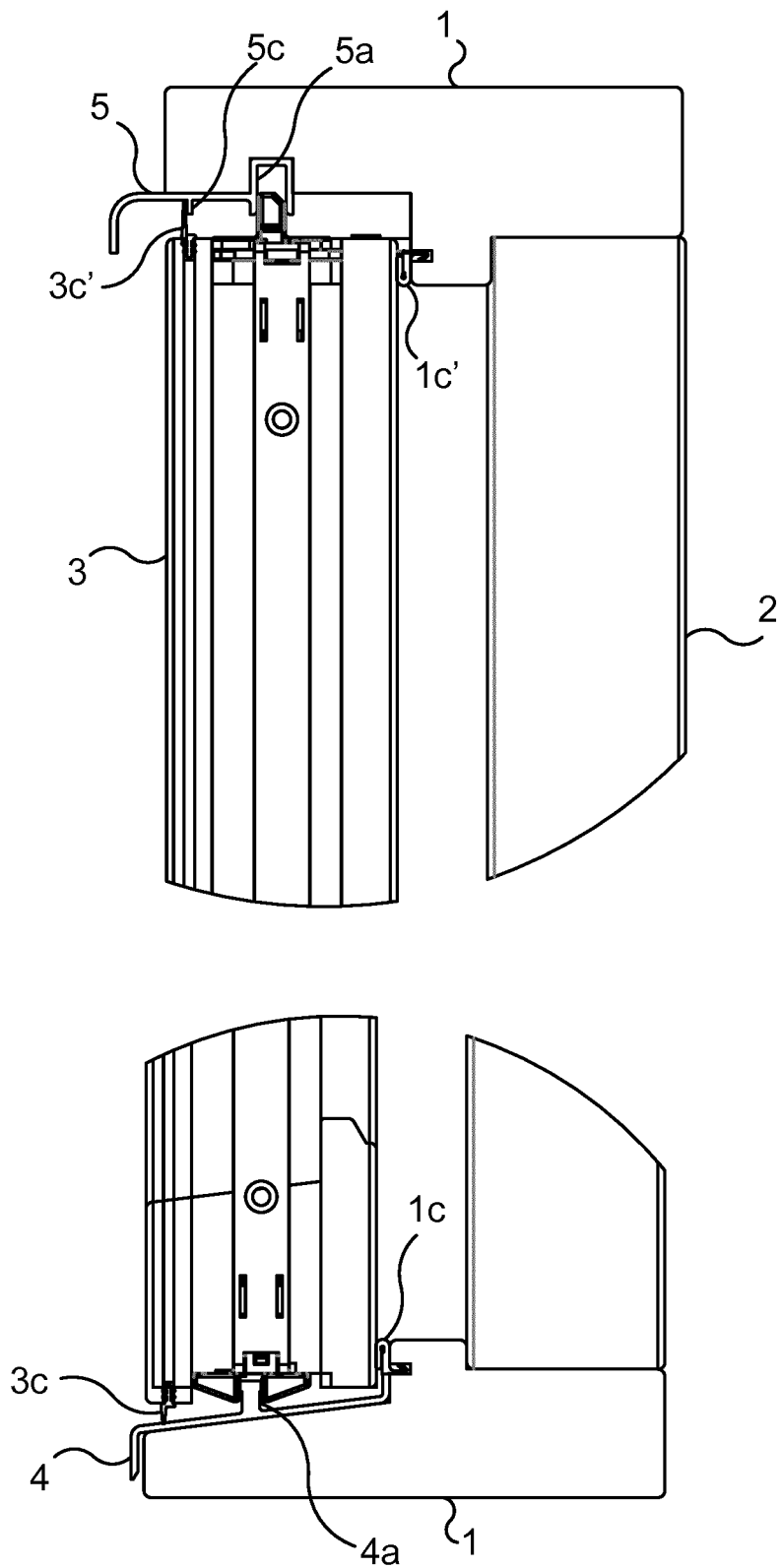


Fig. 3

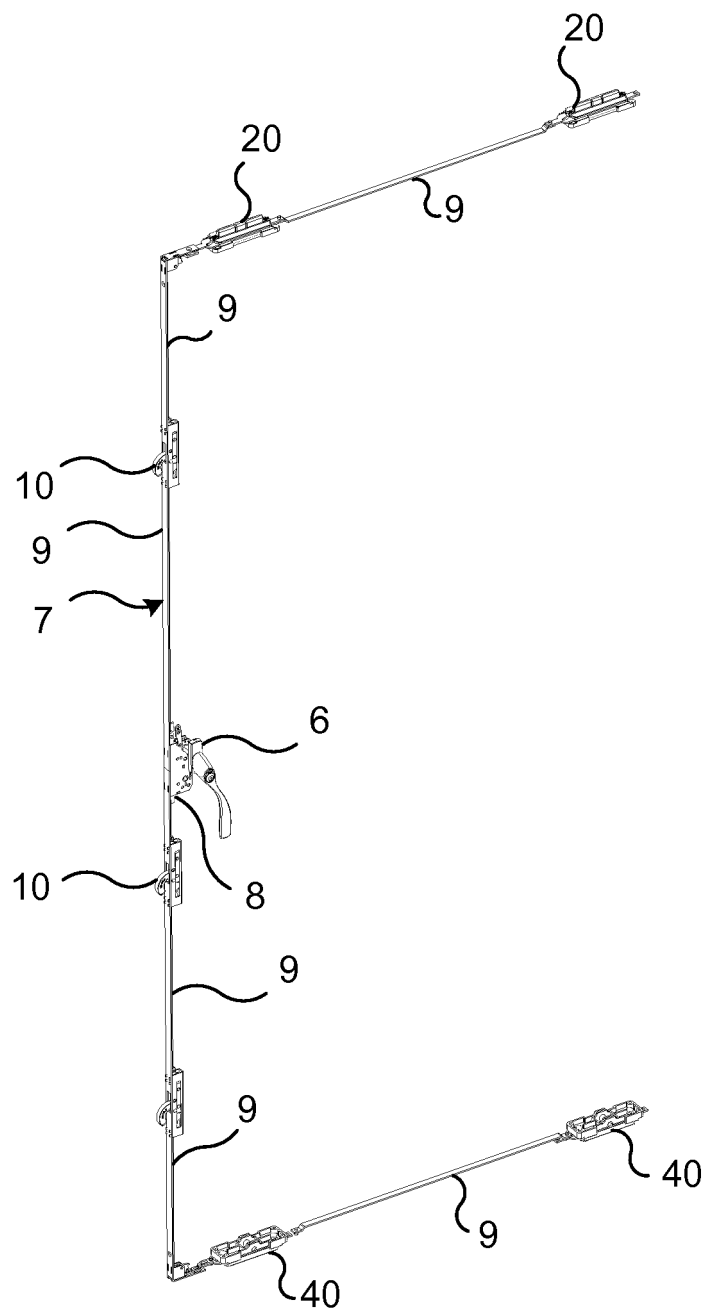
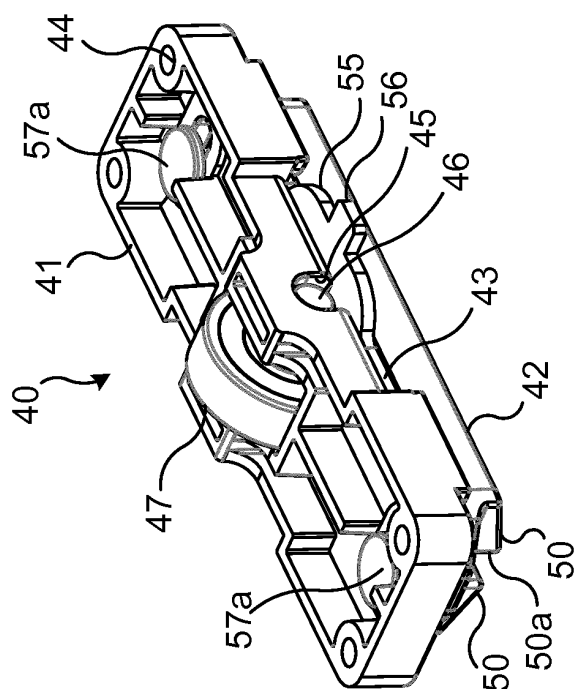
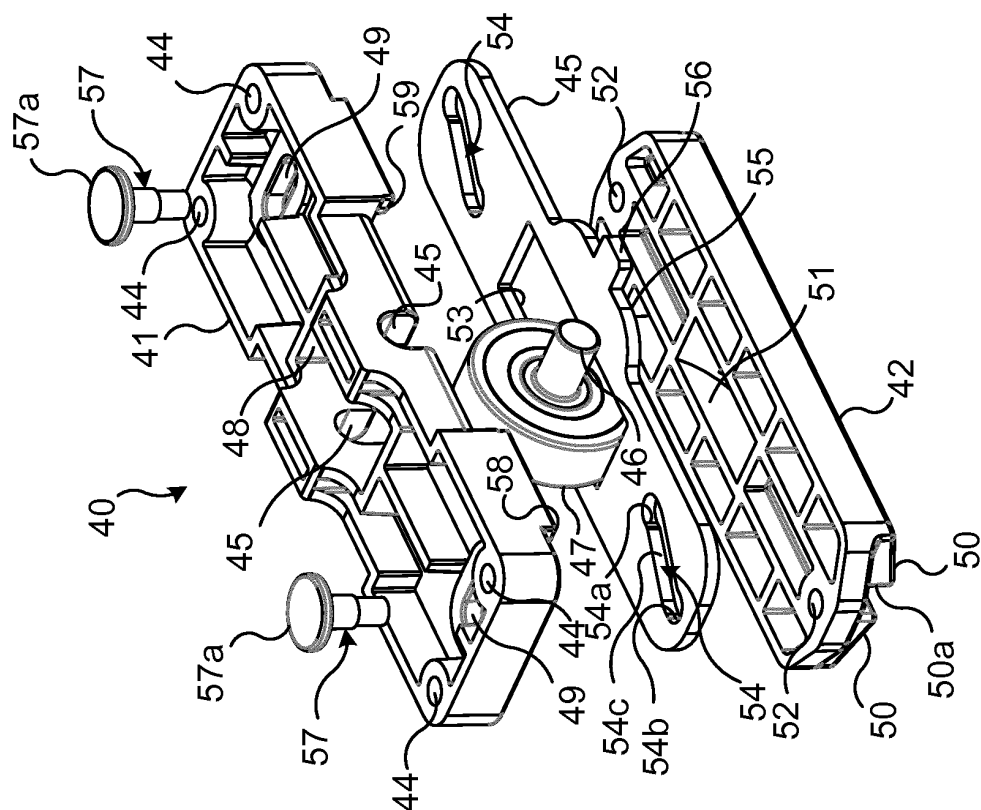


Fig. 4



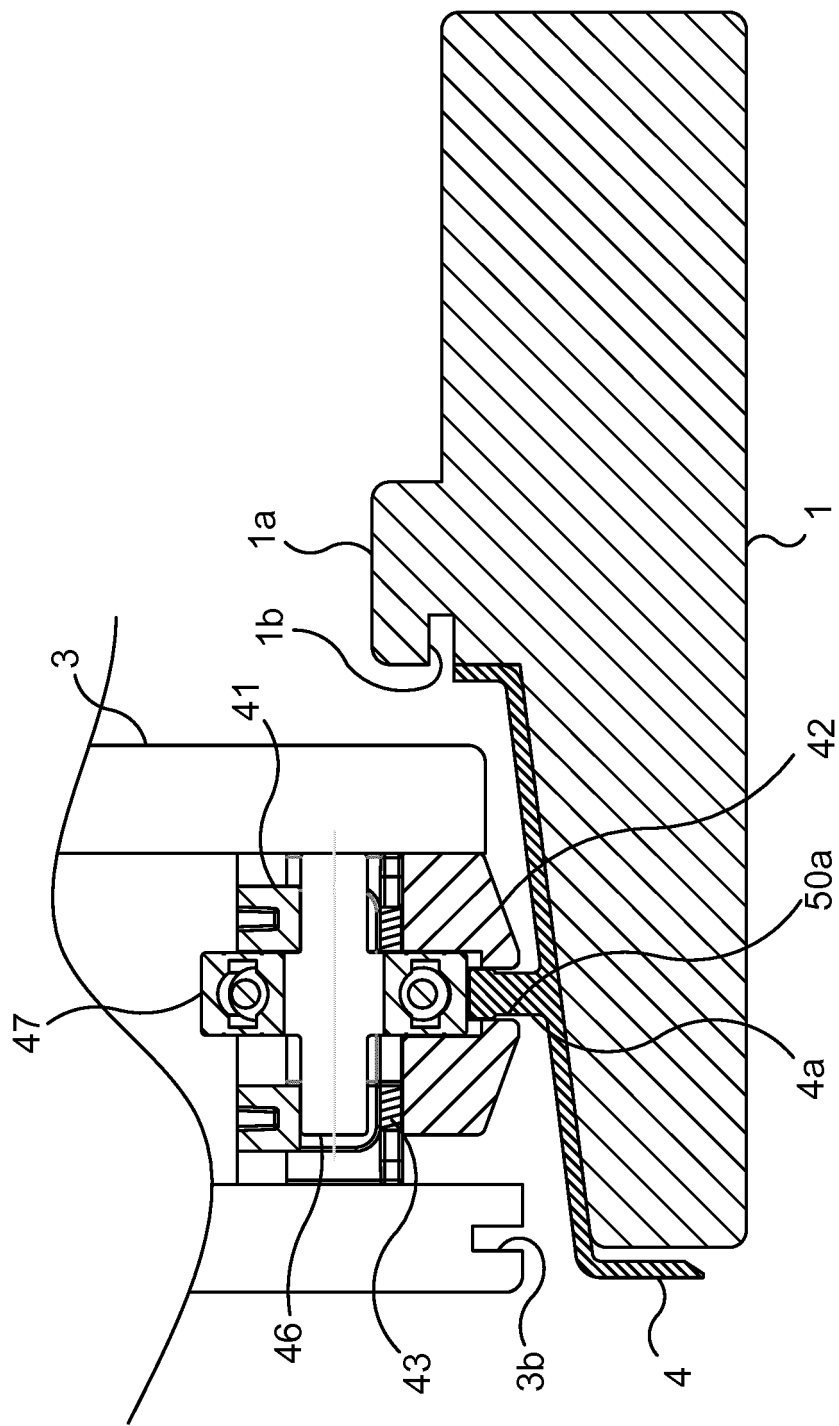


Fig. 6a

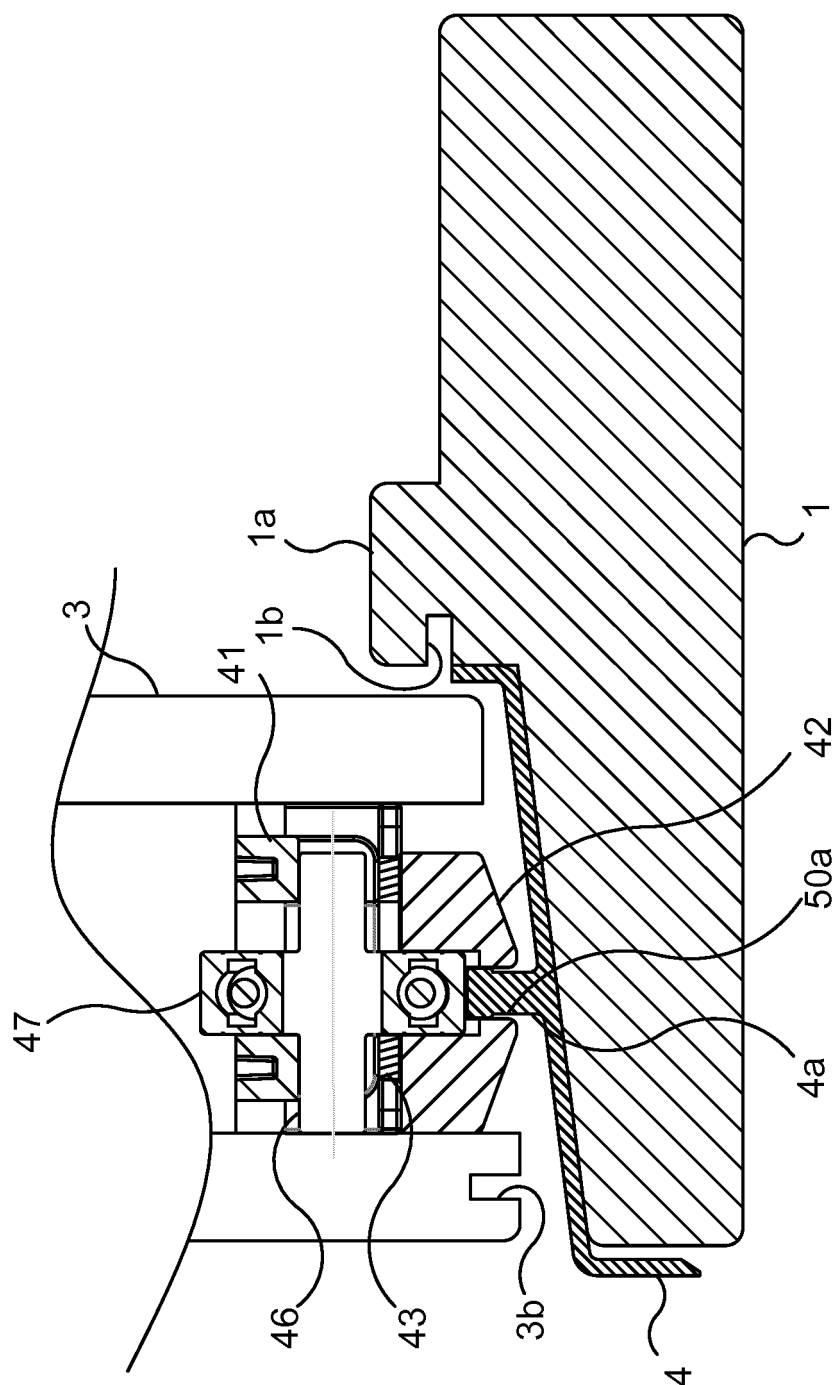


Fig. 6b

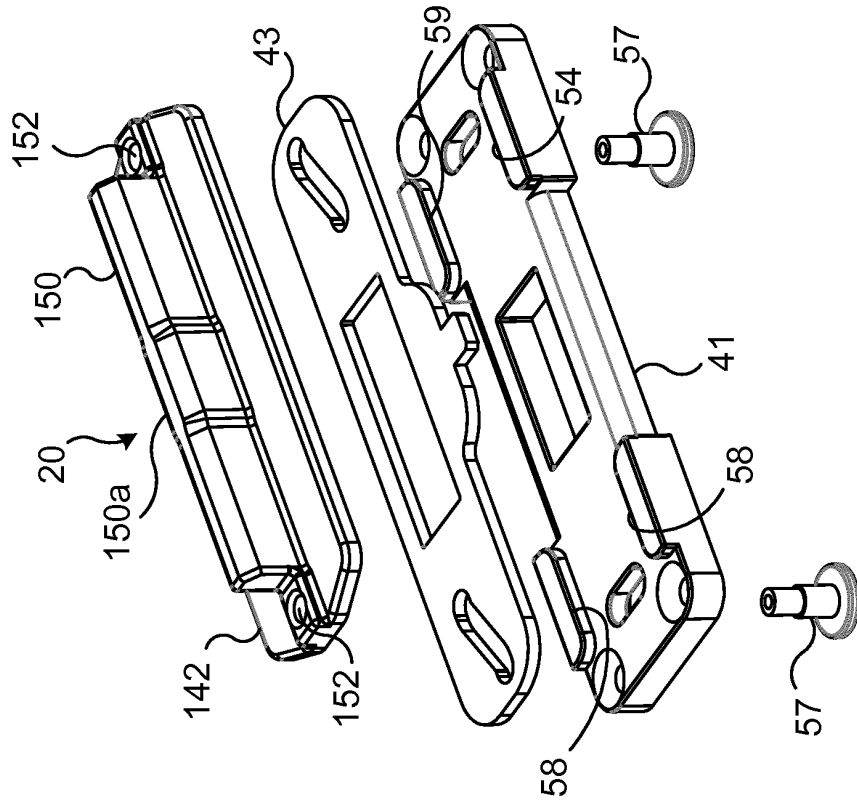


Fig. 7

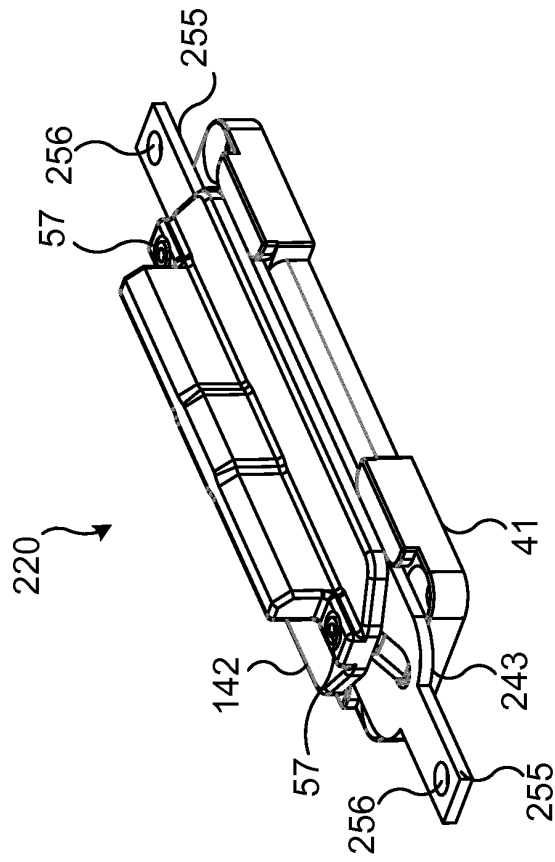


Fig. 8

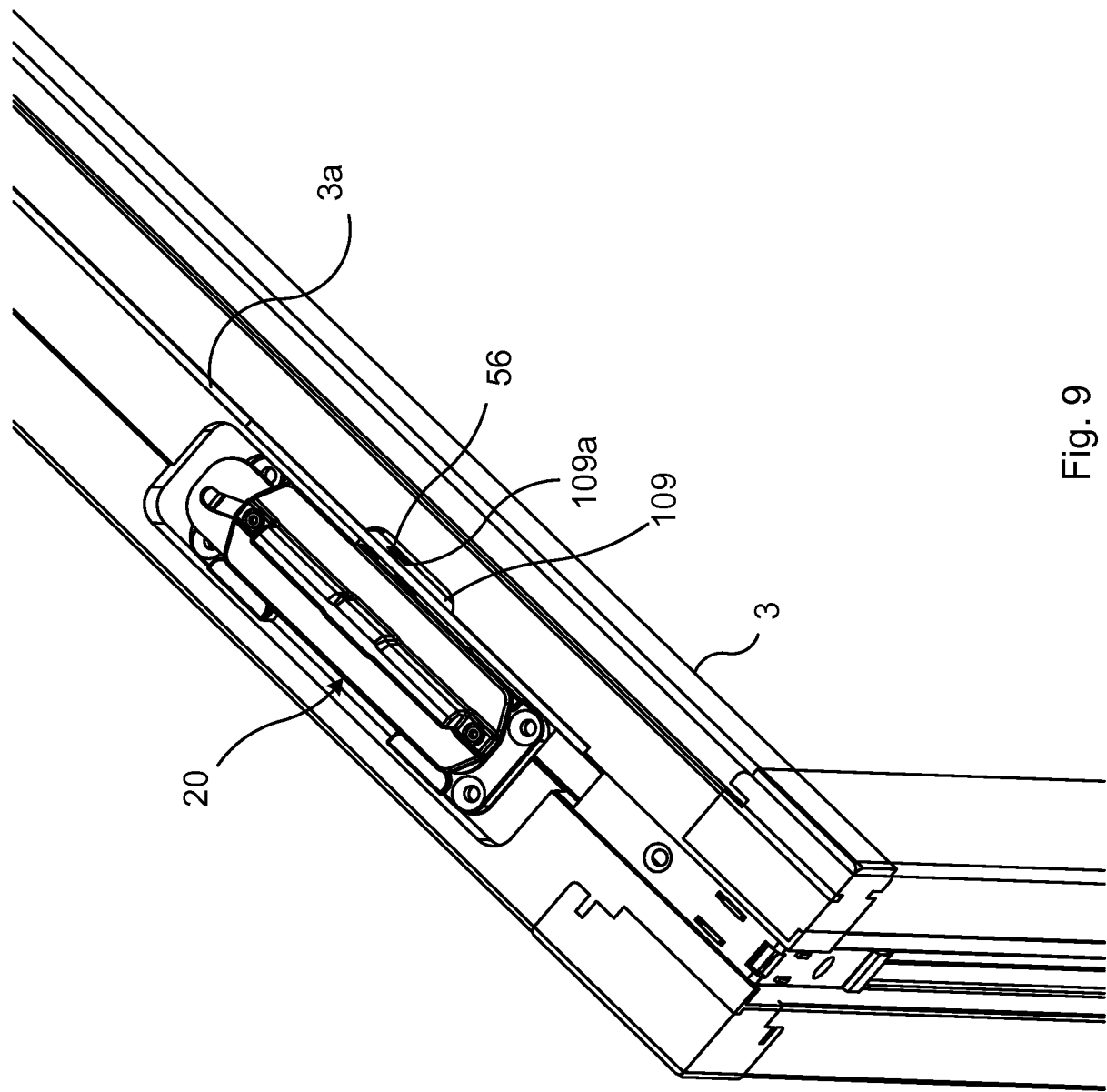


Fig. 9

REFERENCES CITED IN THE DESCRIPTION

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