(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 042 017 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
15.07.2020 Bulletin 2020/29

(21) Application number: **14777845.0**

(22) Date of filing: **03.09.2014**

(51) Int Cl.:
E05D 15/06 *(2006.01)* ***E05D 15/10*** *(2006.01)*

(86) International application number:
PCT/IB2014/064212

(87) International publication number:
WO 2015/033270 (12.03.2015 Gazette 2015/10)

(54) WEATHERTIGHT WINDOW OR DOOR HAVING AT LEAST ONE SLIDING WING

WINDDICHTES FENSTER ODER TÜR MIT MINDESTENS EINEM SCHIEBEFLÜGEL

FENÊTRE OU PORTE ÉTANCHE AUX INTEMPÉRIES POSSÉDANT AU MOINS UNE AILETTE COULISSANTE

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **06.09.2013 IT PN20130052**

(43) Date of publication of application:
13.07.2016 Bulletin 2016/28

(73) Proprietor: **Sossai, Ermenegildo**
31010 Mareno di Piave (TV) (IT)

(72) Inventor: **Sossai, Ermenegildo**
31010 Mareno di Piave (TV) (IT)

(74) Representative: **Cercenà, Alice et al**
Propria S.r.l.
Via della Colonna, 35
33170 Pordenone (IT)

(56) References cited:
EP-A2- 1 571 282 **WO-A1-94/27015**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 3 042 017 B1

Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a window or door, or front door, comprising at least a sliding wing according to a horizontal direction and weather-tight, thus adapted to be used both in the building sector, in particular civil and commercial, and in the watercraft sector, in order to removably close an opening formed on a wall.

BASIC TECHNIQUE OF THE INVENTION

[0002] Windows or doors with sliding wings are known and widely appreciated for those uses wherein it is required to avoid the bulk of wings turning onto hinges when opening and closing the same and thus make it possible a rational use of the spaces.

[0003] While windows or doors with sliding wings having a partition function of indoor spaces are quite largely used, that do not need weather-tight closing means, in the last years the challenge of builders has been that of proposing windows or doors with at least a sliding means and "weather-tight", that is, for example, adapted to be associated with an opening made on a wall separating an indoor space from the outdoor environment, therefore being suitable for ensuring the necessary characteristics of thermal, acoustic, waterproof and cold air tightness required by that use. To such purpose, said windows or doors have, therefore, to be provided with gaskets suitably arranged so that in the closed position the sliding wing presses against them achieving the required weather tightness.

[0004] The main problem which arises when making windows or doors with weather-tight sliding wings basically relates to the fact that, when opening and closing the wing, the scraping between the same wing and the gaskets produces a frictional force which causes a high resistance to movement, making the maneuvering operations difficult; further, such interference can, in the long run, cause a decrease in the weather tightness of the window or door.

[0005] In order to overcome such inconvenience, there have been suggested weather-tight windows or doors having sliding wings commonly called, in the field jargon, "lift and slide". Said windows or doors comprise a fixed frame formed by a plurality of section bars defining at least an upper cross member basically horizontal and a pair of side vertical uprights, said section bars being provided with suitable first gaskets and defining a lying plane for the frame.

[0006] Within said fixed frame at least one wing can slide thanks to sliding means such as a pair of carriages, associated to the lower edge of the wing and resting on a guide on the ground formed by a horizontal rail, which make it possible for the wing to slide between a closed position and a maneuvering and open position, always remaining on the same lying plane of the frame.

[0007] The passage between said two positions occurs by means of suitable control means which activate a lifting mechanism of the wing with respect to the carriage, thus distancing a gasket provided on the lower edge of the wing from the rail, and making it possible for the latter to slide freely. Anyway, during the lifting/lowering operations of the wing, the gaskets provided on the vertical uprights can be subject to rubbing against the same wing, thus causing the friction that makes the closing/opening operations difficult.

[0008] An alternative solution to the "slide and lift" one is described in the patent application EP1571282 which shows a weather-tight window or door, in particular a door, comprising at least a sliding wing in a perimetral frame and cooperating with sliding and tilting means in order to go from a closed position, wherein said wing is lying on the lying plane of the frame, and a sliding and opening position wherein said wing is lying on a plane parallel to the lying plane of the frame.

[0009] The frame comprises at least an upper horizontal cross member, a lower horizontal cross member arranged on the window or door sill of the opening, and a pair of parallel vertical uprights; these components are formed by corresponding section bars defining a seat wherein it is housed a tubular gasket suitable for ensuring the weather tightness of the window or door when the wing is in the closed position, that is it lies on the same plane defined by the frame and in abutment against said gasket.

[0010] In order to go from said closed position to said sliding/open position, said wing cooperates with sliding and tilting means comprising a carriage rotatably engaged with a portion of the lower edge of the sliding wing and lying on a guide, in particular a rail arranged on the lower cross member of the frame and having a curved head profile. At least one of said carriages comprises a fork hinged to the wing and rotatably supporting a wheel whose perimetral profile is concave and corresponding to that of the head profile of the rail.

[0011] When said wing is in the closed position, the fork is arranged vertically below the wing and the wheel rests perpendicularly on the rail. By means of a control member such as a handle, it is possible to impress a swing of the fork about the hinge thus inclining the wheel, which always stays into contact with the rail thanks to the conjugate profile of the two elements, and causing the distancing of the wing with respect to the perimetral frame, and its positioning on a plane parallel to the lying plane of the latter; thus the wing is disconnected from the gasket arranged on the frame and therefore free to slide thanks to the wheel rotation along the rail.

[0012] Both the just described solutions of the known art refer to windows or doors with a sliding wing and weather-tight, which require the use of a lower load bearing guide, in the form of a rail or track, whereon the wing slidably rests. Such guide can be housed in the lower cross member of the fixed frame or if this is not provided, can be lying directly on the window or door sill, coinciding

with the threshold if it is a sliding door or with the windowsill if it is a window.

[0013] WO94/27015 discloses a window or a door structure comprising a fixed frame and a sliding wing provided with sliding and tilting means formed by carriages equipped with wheels sliding along a guide and tilting around a pin arranged parallel to the guide. However, said tilting and sliding means and said guide are housed in correspondence of the upper crosspiece of the frame and also in correspondence of the lower crosspiece, i.e. on the door or window sill plane, and the entire weight of the wing is on the lower guide.

[0014] An inconvenience which arises in windows or doors with a sliding wing with a lower guide lies in the fact that this latter, besides being a dirt gathering place, it is greatly subject to wearing out and to atmospheric agents; these factors, in the long run can compromise the smoothness of the sliding movement of the wing and can make the closing and opening operations difficult.

[0015] In the case of a door, a further inconvenience lies in the fact that the lower guide is an obstacle for the people with impaired movement wheelchairs, prams and trolleys. Therefore, in some cases it is necessary to provide suitable ramps which facilitates the passing of the guide but they form undesired bulks, especially in the watercraft sector, for example in cruisers, where spaces in cabins are rather limited.

SUMMARY OF THE INVENTION

[0016] The main task of what is the object of the present invention is that of overcoming the inconveniences of the known technique devising a weather-tight window or door and provided with at least a sliding wheel which does not need horizontal guides or cross members on the ground, leaving the window or door sill completely free.

[0017] In the field of the above said task, an object of the present invention is that of making a convenient and operational window or door, for which the closing and opening operations are absolutely easy and can be carried out without any effort, even when the sliding wing is rather big and heavy.

[0018] A further object of the present invention is that of providing a window or door which is solid and long-lasting, without any need for particular maintenance.

[0019] The above said task, objects and advantages, as well as others which will become more apparent in the following description, are achieved by a window or door with a sliding wing as defined by claim 1.

BRIEF DESCRIPTION OF FIGURES

[0020] The appended claims define further characteristics of a sliding window or door according to the present invention which will be better described in the description of a particular, but not excluding, embodiment shown for exemplification only but not limited to in the appended drawings wherein:

- figure 1A shows, according to a front view, a sliding window or door according to the present invention having the wing in a closed position;
- figure 1B, shows, according to a front view, a sliding window or door according to the present invention having the wing in a complete open position;
- figure 2A is a sectional horizontal top view of a window or door according to the present invention with the wing in the closed position;
- figures 2B and 2C show the details circled in figure 2A suitably enlarged;
- figure 2C' is an enlarged horizontal sectional view the same as in figure 2C but in correspondence with the upper part of the wing;
- figure 3A is a sectional horizontal top view of a window or door according to the invention in a complete open position;
- figures 3B, 3C and 3D show the details circled in figure 3A suitably enlarged;
- figures 4A and 4B are vertical sectional views of a lower detail of the wing of a sliding window or door according to the invention, respectively in the closed position and in the open position;
- figures 5A and 5B are vertical sectional views of an upper detail of a sliding window or door according to the invention, respectively in the closed position and in the open position;
- figures 6A and 6B are front views of the upper part of a sliding window or door according to the present invention, respectively in the closed position and in the open position;
- figure 7 shows, according to an enlarged perspective view, a sliding and tilting means of a sliding window or door according to the invention;
- figure 8 shows an enlarged perspective view of lifting means of the wing of a sliding window or door according to the present invention;
- figures 9A-9F show a sequence of operational steps in order to achieve the opening of the wing of a window or door according to the invention;
- figures 10A-10D show a sequence of operational steps in order to achieve the closing of the wing of a window or door according to the invention;
- figure 11A and 11B show, in two different operational positions, a particularly advantageous embodiment of the sliding and tilting means of a window or door according to the present invention;
- figure 12 is a vertical sectional view of an embodiment detail of a window or door according to the invention applied in the watercraft sector.

DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

[0021] **With** reference to figures 1A and 1B, there is shown a window or door 1 according to the present invention, in particular a door, comprising a fixed frame 2 basically lying on a plane defined by a wall of a building

and associable to an opening A obtained on said wall.

[0022] In particular, said frame 2 comprises a plurality of section bars joined between them to form an upper perimetral cross member 2A, and a first and a second upright 2B, 2C, basically positioned vertical and parallel. It is to note that, according to a very advantageous characteristic of the invention, the frame 2 may not comprise a lower cross member associable to the base plane P of the opening A, or windowsill, leaving the latter completely free.

[0023] Said window or door 1 further comprises at least one wing 3, for example made of a flat plate in transparent material such as glass or of a wooden panel, possibly provided with an interface frame 4 whereon all conventional closing and against burglary accessories of the wing can be mounted.

[0024] Said wing is slidably movable between a closed position (figure 1A), wherein the opening A of the wall is completely closed and the wing 3 is placed between the uprights 2B and 2C, and an open position (figure 1B), wherein at least one portion of said opening A is free.

[0025] According to the invention, said window or door 1 further comprises sealing means 5 arranged so that, when said wing 3 is in the closed position, said opening A is closed, so that it is substantially water and air tight.

[0026] In particular, said sealing means 5 comprise first perimetral gaskets 5A associated to the fixed frame 2, in particular to the section bars forming said first cross member 2A and to said first and second perimetral uprights 2B, 2C, and a second gasket 5B, advantageously placed in correspondence with a portion of the lower edge of the wing 3.

[0027] In the closed position (figure 2A), said wing 3 lies on a first plane, wherein it abuts against said first gaskets 5A, as it can be seen in figures 2B and 2C, and its lower edge basically lies on said door or window sill P, so that said second gasket 5B is pressed against said door or window sill P by the weight of the same wing, as shown in figure 4A.

[0028] Consequently, in order to make the wing 3 slide freely, this has to be disconnected from said first and second gaskets 5A and 5B moved away from the door or window sill P so as to avoid its "scraping" when making it reach its open position; therefore, in said open position, said wing 3 lies on a second plane, parallel to said first plane, and is lifted from said door or window sill P, as it can be seen in figure 4B.

[0029] The movement of the wing 3 between said closed position and said open position can be carried out by the user thanks to a control member 99, such as a handle mounted on the wing 3 operating a moving mechanism 100 of the same wing, activating, in a coordinate way, sliding and tilting means 7 of the wing 3, lifting means 8 of the wing 3 and temporary locking means 9 of the wing 3.

[0030] Guiding means 6 are provided to accompany and control the movement of the wing 3 between the closed position and the open position, that is, between said first plane and said second plane preventing it from "flapping".

[0031] Said sliding and tilting means 7 comprise at least a pair of carriages 70, associated to the wing 3 and cooperating with a sliding guide 25, preferably formed by a basically horizontal and rectilinear rail. Said sliding guide 25 is arranged in correspondence of said upper cross member 2A of the fixed frame 2, and also it extends in an area adjacent the second upright 2C in order to allow the wing opening; said carriages 70 are therefore associated to a portion of the upper edge of the wing 3, or possibly to the upper cross member of its interface frame 4, and each comprises at least a sliding wheel adapted to support the wing 3 on said guide 25 and allowing its sliding movement between the closed position and the open position.

[0032] Advantageously, as it can be seen in figure 7, each wheel 71 comprises a grooved perimetral profile 71A, adapted to cooperate with the shape of the sliding guide 25, preferably having a basically circular section head.

[0033] For each carriage 70, a tilting fork 72 rotatably supports said wheel 71 about a first pin 73, arranged substantially transverse with respect to the extension of said guide 25 so as to allow the wheel rolling along said sliding guide 25. Said tilting fork 72 is rotatably articulated, around a second pin 75 extending along a parallel direction with respect to that of the extension of the guide 25, to a support element 74 engaged in an adjustable manner to the portion of the upper edge of the wing 3 or to the upper cross member of the interface frame 4.

[0034] The tilting fork 72 can swing (tilt) around said second pin 75 between a first position, shown in figure 5A, wherein it is arranged vertically lying on the guide 25, and a second position wherein it is inclined with respect to the same, causing said wheel 71 to incline as well which, thanks to its grooved perimetral profile, remains always in contact with the guide 25, as it can be seen in figure 5B.

[0035] In particular, when the tilting fork 72 is in said first position (figure 5A), the wing 3 is in the closed position, that is, it lies on said first plane and it abuts against said first perimetral gaskets 5A, whereas when the tilting fork 72 is in said second position (figure 5B), that is inclined, said wing 3 is in the open position, that is, it lies on said second plane therefore being distanced from said first gaskets 5A.

[0036] In order to ensure the tightness in the closed position, said wing 3 has to be arranged so that said second gasket 5B is pressed against said door or window sill P; on the contrary, in order to allow the free sliding to reach the open position, said wing 3 has to be arranged so that said second gasket 5B is lifted from the door or window sill P.

[0037] As shown in figure 6A, said sliding guide 25 has lowered seats 25A, arranged in correspondence of the areas wherein the wheels 71 of said pair of carriages 70 position themselves when said wing 3 is in the closed

position, positioning and keeping it at a lowered height with respect to its height in the open position, and consequently causing the pressing of said second gasket 5B against the door or window sill P of the door or window 1.

[0038] Possibly, as shown in figures 11A and 11B, said sliding and tilting means 7 can further comprise stop means 77 which determine the end points for the swinging movement of the wheel 71 around the rail 25; said stop means 77 are, for example, formed by a screw passing through the wheel 71, and associated to said fork 72. The head 77A of said screw 77 is housed in a slotted opening 78 provided on the support element 74 and it is adapted to abut against the opposed perimetral edges of said opening 78 when said wheel 71 reaches said first position and said second position, hence corresponding to the open and closed position of the wing. Moreover, an element against unhinging 26 such as a screw arranged vertically, can be provided in order to ensure greater safety preventing the wheel 71 from going off the rail 25. Advantageously, said second pin 75 is moreover shaped so as to allow a side adjustment movement of the fork 72 in order to align the descent of the wing 3 in the lowered seats 25A when closing.

[0039] In order to go from the closed position to the open position is therefore necessary to cause the wheels 71 of said pair of carriages 70 to exit the corresponding lowered seats 25A, as shown in figure 6B, lifting the wing 3 and consequently said second gasket 5B as well, from the door or window sill P.

[0040] For this purpose, the door or window 1 according to the invention comprises lifting means 8 of the wing 3, advantageously contained inside a housing 18 arranged on the wing 3, possibly in correspondence of the interface frame 4 and adjacent to said handle 99 in order to impress the necessary force on the wing 3 to make the wheels 71 of the carriages 70 exit the corresponding lowered seats 25A provided in the sliding guide 25.

[0041] With reference to figure 8, said lifting means 8 of the wing 3 comprise a drive means 81 such as a first toothed wheel effectively connected to the handle 99 and having, along at least a portion of the perimetral edge, of a first engaging toothing adapted to cooperate with a second engaging toothing 82A provided on the body of an actuator 82, preferably formed by a pin.

[0042] The operation of the handle 99 by the user involves a rotation of the wheel 81, whose toothing 81A, engaging with the corresponding second toothing 82A of the actuator 82, determines its axial movement from a rest position, wherein it is substantially retracted inside its housing 18, to a thrust position, wherein it is at least partially extracted out of said housing 18 and cooperates with an abutment means 85 suitably placed on the fixed frame 2.

[0043] The actuator 82 is further associated to a first elastic means 83, such as a coil spring, which constantly returns the pin 82 back to the rest position. A second elastic means 84, such as a compression spring, is connected to said actuator 82 and is adapted to reload the same, as later explained in greater detail.

[0044] According to an advantageous characteristic of the invention, said toothed wheel 81 comprises a first tooth 87 higher with respect to the remaining teeth of said first toothing 81A; in the same way, the second toothing 82A, provided on the body of said actuator 82, comprises a first groove 88 deeper and wider with respect to the others. In particular, when the actuator 82 is in the rest position, the first tooth 87 of said first toothing 81A is positioned in the first groove 88 of said second toothing 82A.

[0045] As already said, the handle 99 is also adapted to activate temporary means 9 comprising a vertical rod 91 associated to said wing 3 and axially movable, provided with a plurality of locking pins 92 adapted to removably cooperate with corresponding retaining hooks 93 provided on said first upright 2B of the fixed frame 2 for keeping said wing 3 in the closed position firmly pressed against said first gaskets 5A.

[0046] Finally, said guiding means 6 preferably comprise a plurality of wedges 61, that is suitably inclined surfaces, associated with said retaining hooks 93, as it can be seen in figure 3B so as to guide the nearing/distancing of pins 92, and hence of the wing 3, from the hooks 93, in particular in the final phase of its closing, when the pins 92 are arranged in the proximity of the hooks 93.

[0047] Moreover, advantageously, said guiding means 6 comprise at least one pin 65, advantageously fixed to the door or window sill P in correspondence with said second upright 2C of the frame (shown in figures 2C, 3C and 3D), adapted to slidably engage a guiding groove 66 substantially linear, provided on the lower edge of the wing and internally provided with a pair of cams 64, advantageously arranged in a terminal position of the groove 66, on the side of the wing opposed to the one whereto the handle is associated, which define a deviation within the groove 66. When the wing 3 is operated by means of the handle 99, for its opening or closing, the pin 65 acts as a slider, following the path defined by the groove 66 and, when it meets the cams 64, makes the trajectory of the wing 3 change, unbalancing it, and causing the passage of the wheels 71 of the carriages 70 to the sliding inclined passage.

[0048] **As** shown in figure 2C', said guiding means 6 further comprise an incline 62, provided in the upper part of the second upright 2C and in particular formed by an inclined portion adapted to cooperate with an inclined counter-shaped surface provided on the upper edge of the wing 3 to guide the passage of the wing 3 between said first and said second plane. The incline 62 further extends with a second linear portion in the area adjacent to the second upright 2C, to accompany the movement of the wing 3 up to the complete open position and to prevent it from "flapping".

[0049] The moving mechanism 100 of the wing works as follows: when the wing 3 is in said closed position, that is, it lies on the first plane, the handle 99 acquires a

first closed position, wherein it is preferably vertically arranged, with a maneuvering end 99A facing downward and said actuator 82 is arranged in the rest position (figure 9A), that is substantially retracted within said housing 18; the wheels 71 of the pair of sliding carriages 70 are in the first position, that is they are arranged perpendicularly on the sliding guide 25 (figure 5A) and positioned in correspondence of the lowered seats 25A (figure 6A); the locking pins 92 of the temporary locking means 9 are engaged within the corresponding retaining hooks 93 and keep the wing 3 firmly abutted against said first perimetral gasket 5A.

[0050] Holding the maneuvering end 99A of the handle 99, the user operates the moving mechanism 100 in order to achieve the opening of the wing 3, which involves the coordinate activation of said tilting/sliding means 7 of the wing, of said lifting mechanism 8 of the wing, and the concomitant unlocking of the temporary locking means 9 of the wing.

[0051] In fact, impressing a rotation of a first angle of the handle 99, this rotatably also drags said first wheel 81 in the same direction but, thanks to the increased width of said first groove 88, at first said rotation it is not useful for the operation of the actuator 82. As shown by the arrow in figure 9B, such rotation movement of the handle 99 anyway gives a vertical translation of the rod 91 and, consequently, of the locking pins 92 integral to it, starting their unhooking from the corresponding retaining hooks 93.

[0052] Going on with the rotation of the handle 99, the movement of the rod 91 for the unlocking continues up to the complete unhooking of the pins 92 off the hooks 93, and said first toothing 81A, and in particular said first tooth 87, starts to engage with the corresponding second toothing 82A provided on the actuator 82, impressing on it an axial sliding towards the extracted position, in contrast with said first elastic means 83 (figure 9C).

[0053] As the actuator 82 exits its housing 18 (figures 9D and 9E) its end rests on the surface 85A, advantageously inclined, of the abutment means 85 provided on the fixed frame 2, distancing the wing 3 from the first upright 2B. This movement impresses on the wheels 71 of said carriages 70 the necessary force to exit the lowering seats 25A within which they were previously house, until they place themselves on the rectilinear stretch of the sliding guide 25 (figure 6B), thus lifting the wing 3 with respect to the door or window sill P of the door or window 1. Possibly, the sliding guide can be provided with small teeth provided just above the lowered seats 25A, to prevent the wheels 71 of the carriages from falling back within the seats 25A once exited them.

[0054] Concurrently, the guiding means 6 of the wing 3 come into action: the wedges 61, provided in correspondence with the hooks 93, accompany the distancing movement of the pins 92, whereas the slider 65 fixed on the ground, meeting the cams 64 in the guiding groove 66, causes the lateral trajectory of the wing 3 to deviate. This deviation unbalances the forks 72 of the carriages 70, which tilting, incline the corresponding wheels 71 (figure 5B), making the wing 3 lie on said second plane, parallel to said first plane.

[0055] The mechanism 100 is designed so that, when the handle 99 has basically carried out a rotation of 180°, that is, it is arranged with its body vertically positioned and the maneuvering end 99A upwards (figure 9F), the engagement between said first toothing 81A and said second toothing 82A ends, and hence said first elastic means 83 reloads the actuator 82 in a retracted position, but which does not coincides with the rest position.

[0056] Now the wing 3 lies on said second plane, therefore being distanced from said first gaskets 5A, and lifted with respect to the closed position, so that also said second gasket 5B is disconnected from the window or door sill P, thus, the user can easily make the wing slide horizontally, dragging it thanks to the handle 99 until it reaches the desired open position.

[0057] In order to achieve again the weather tight closing of the window or door 1, the user drags the wing 3 in the closing direction, nearing it to the first upright 2B. When the wheels 71 of the carriages 70 get in the proximity of the corresponding lowered seats 25A on the sliding guides 25, because of the wing 3 inertia, they start to descend within them, therefore involving the lowering of the height of the wing 3 and a consequent nearing of the second gasket 5B to the window or door sill P (fig. 10A).

[0058] Concurrently, the pin 65, slidably engaged in the guiding groove 66, when it meets the deviation defined by the cams 64, deviates the closing trajectory of the wing 3, again unbalancing the forks 72 of the carriages 70, which consequently make the wheel acquire again the first position, as shown in figure 5A. Therefore the wing 3 is taken again onto said first plane, abutted against said first gaskets 5A.

[0059] In the meantime, the user start the rotation of the handle 99 into the opposed direction with respect to that of the open one; this involves the operation of the temporary locking means 9 which, making the rod 91 translate, takes the locking pins 92 back towards the respective retaining hooks 93 until their complete coupling (figures 10B and 10C). The wedges 61 associated to said hooks 93 guide the pins 92 to the coupling position.

[0060] The movement of the handle 99 involves the simultaneous rotation of the toothed wheel 81; however, because of the configuration of the elements constituting the lifting means 8, at first said first toothing 81A does not engage the second toothing 82A and therefore the actuator 82 remains in the retracted position previously reached.

[0061] The rotation of the handle 99 then continues freely until the first tooth 87, due to its increased dimension, impacts against the first tooth of the second toothing 82A: this causes a translation of the actuator 82 towards the inside of the housing 18, this time in contrast with said second elastic means 84 (fig. 10B). Concurrently, the tilting fork 72 of each of the two carriages 70 again

acquires the first position, therefore taking the wing 3 back to lie on said first plane.

[0062] Further rotating the handle 99 up to positioning it in the closed position, the first tooth 87 of the first toothing 81A is forced to pass over the corresponding first tooth of the second toothing 82A (figure 10C); as soon as this occurs, the actuator 82 is taken back, by said second elastic means 84, to its original rest position wherein the first tooth 87 is again positioned in the first groove 88 (figure 10D), thus completing the reloading of the actuator 82 and thus getting the mechanism 100 ready for a new opening cycle.

[0063] According to an embodiment not forming part of the invention, should a window or door 1 comprise a wing of relevant dimensions, in order to make it sure that the same does not bend if subject to strong stresses, such as the wind load, it is possible to provide a small step on the window or door sill P, against which the lower part of the wing 3 abuts in the closed position.

[0064] In figure 12 it is shown a situation wherein the window or door 1 according to the invention is applied in the watercraft sector. In fact, in order to ensure a greater water tightness on watercrafts, the cabins are generally separated from the deck by means of a gate B and therefore, in order to make it possible also for people with mobility impairment or wheelchairs, to access it, there can be provided access ramps R; in such a case it is therefore possible to provide a window or door, according to the present invention, without a guide on the ground, thus avoiding that the same is subject to wearing out or corrosion.

[0065] Moreover, thanks to the fact that there is not a lower guide, the height profile of the gate B is low with respect to the one which would be obtained providing a window or door according to the known art with a rail on the ground: hence, also the height and length of the access ramps R can be reduced.

[0066] Clearly, as it will be apparent to the skilled in the field, the wing 3 can be rollaway, that is, when opening, it can enter a counter-frame formed in the wall, or it can overlap a fixed wing; or else, the sliding wings can be a pair. In this latter case, anyway, the frame 2 shall preferably comprise a lower cross member provided with a corresponding gasket in order to ensure a sufficient tightness and therefore it might not be provided with lifting means 8.

[0067] In conclusion, from the foregoing, it is apparent that a window or door 1 according to the present invention achieves the objects and advantages first expected. In particular it has been obtained a weather-tight window or door and provided at least with a sliding wing which does not require horizontal guides or cross members on the ground, leaving the window or door sill of the same window or door completely free.

[0068] Further, the window or door of the invention is extremely convenient and operational, and the opening and closing operations are easy and can be carried out without any effort, even when the sliding wing is rather big and heavy. The window or door of the invention has been specifically designed so as to be solid and long-lasting, without any need for particular maintenance.

[0069] Of course, the invention can undergo a great number of modifications or variations without exiting the protection field of the present invention as defined by any one of the appended claims. Further, the materials used for the embodiment of the present invention, as well as the forms and dimensions of the single components, could be those most suitable according to specific requirements.

[0070] Materials which have proved to be particularly advantageous to make the frame 2, the interface frame 4 and the elements constituting the closing/opening mechanism 100 of the window or door 1 are materials such as aluminium and some reinforced polymeric materials, or materials obtained by means of the pultrusion process.

Claims

1. Window or door (1) comprising

- a fixed frame (2) associated with an opening (A) obtained in a wall and inferiorly provided with a base plane (P) which forms a window or door sill, said frame (2) comprising at least one upper cross member (2A), substantially horizontal, and a pair of uprights (2B, 2C), extending parallel and vertical,
- sealing means (5) comprising first gaskets (5A) associated with said upper cross member (2A) and with said uprights (2B, 2C),
- at least one movable wing (3) associated with sliding and tilting means (7) comprising at least a pair of carriages (70) provided with wheels (71) sliding and tilting on a guide (25) to move said wing (3) between a closed position, wherein said wing lies on a first plane abutting against said first gasket (5A), and an open position, wherein said wing lies on a second plane, parallel to said first plane, and is disconnected from said first gasket (5A),

wherein said sliding and tilting means (7) and said sliding guide (25) are housed in correspondence of said upper cross member (2A), each of said pair of carriages (70) comprising a fork (72) which rotatably supports said wheels (71) about a first pin (73) arranged substantially transverse with respect to the extension of said sliding guide (25), said fork (72) being rotatably articulated to a support element (74) associated with said wing (3) around a second pin (75) arranged parallel with respect to the extension of said sliding guide (25), wherein said sealing means (5) further comprise a second gasket (5B) associated with the lower edge of said wing (3) and

adapted to be pressed by the weight of the wing (3) on said door or window sill (P) of said opening (A) when said wing (3) is in the closed position, **characterized in that** said at least a pair of carriages (70) being associated to a portion of the upper edge of said wing (3) such that said wheels (71) support said wing (3) on said guide (25) leaving said window or door sill (P) of said opening (A) completely free, a moving mechanism (100) of the wing (3), operable by means of a control member (99) and comprising lifting means (8), being provided for lifting said wing (3) in the passage between said closed position and said open position, thus disconnecting said second gasket (5B) from said door or window sill (P) and allowing the free sliding of said wing (3).

2. Window or door (1) according to claim 1, wherein said sliding and tilting means (7) also comprise stop means (77) defining the end points for the tilting movement of said wheels (71) on said sliding guide (25), said stop means (77) being formed by a screw passing through each wheel (71) and fixed to said fork (72), the head (77A) of said screw (77) being arranged in a slotted opening (78) provided on said support element (74) and being adapted to cooperate with the opposite edges of said slotted opening (78) when said wheel (71) reaches the proper inclinations so that said wing (3) lies respectively on said first plane and on said second plane.

3. Window or door (1) according to claim 1, wherein said sliding guide (25) comprises a horizontal and rectilinear rail, said sliding guide (25) being provided with lowered seats (25A) arranged so as to accommodate the wheels (71) of said trolleys (70) when said wing (3) is in said closed position.

4. Window or door (1) according to claim 1 or 3, wherein said lifting means (8) comprise an actuator (82) axially movable between a rest position, wherein it is substantially retracted within a housing (18) provided on said wing (3) when said wing (3) is in said closed position, to a thrust position wherein said actuator (82) acts an abutment means (85) associated with said fixed frame (2) to force the wheels (71) out of said lowered seats (25A).

5. Window or door (1) according to claim 4, wherein said actuator (82) comprises a toothing (82A) adapted to be engaged with a corresponding toothing (81A) obtained on a drive means (81) connected with said control member (99).

6. Window or door (1) according to claim 4 or 5, wherein said lifting means (8) further comprise a first elastic means (83) adapted to return said actuator (82) back to the rest position and a second elastic means (84) for reloading said actuator (82).

7. Window or door (1) according to any one of the preceding claims, further comprising guide means (6) including a guiding groove (66) obtained on the lower edge of said wing (3) and adapted to be slidably engaged by a slider (65) disposed on said door or window sill (P) of said opening (A), said guiding groove (66) being provided with a pair of cams (64) for guiding the passage of said wing (3) between said closed position and said open position.

8. Window or door (1) according to any one of the preceding claims, wherein said moving mechanism (100) further includes temporary locking means (9) comprising a vertical rod (91) associated with said wing (3) and provided with a plurality of locking pins (92) adapted to be removably coupled with corresponding retaining hooks (93) provided on said frame (2) for locking said wing (3) in said closed position.

9. Window or door (1) according to claims 7 and 8, wherein said guide means (6) also comprise wedges (61) formed by inclined surfaces, associated with said retaining hooks (93) for guiding the coupling with said locking pins (92).

Patentansprüche

1. Fenster oder Tür (1), das/die umfasst:

- einen festen Rahmen (2), der mit einer in einer Wand ausgebildeten Öffnung (A) verbunden ist und in seinem unteren Teil mit einer Basisfläche (P) versehen ist, die eine Fensterbank oder Türschwelle bildet, wobei der Rahmen (2) wenigstens einen oberen, im Wesentlichen horizontalen Querträger (2A) sowie ein Paar Pfosten (2B, 2C) umfasst, die sich parallel und vertikal erstrecken,
- eine Dichtungseinrichtung (5), die erste Dichtungen (5A) umfasst, die mit dem oberen Querträger (2A) und mit den Pfosten (2B, 2C) verbunden sind,
- wenigstens einen beweglichen Flügel (3), der mit Schiebe-und-Kipp-Einrichtungen (7) verbunden ist, die wenigstens ein Paar mit Rädern (71) versehener Laufwagen (70) umfassen, die auf einer Führung (25) verschoben und gekippt werden, um den Flügel (3) zwischen einer geschlossenen Position, in der der Flügel auf einer ersten Ebene liegt, die an der ersten Dichtung (5A) anliegt, und einer offenen Position zu bewegen, in der der Flügel auf einer zweiten Ebene liegt, die parallel zu der ersten Ebene ist, und von der ersten Dichtung (5A) getrennt ist,

wobei die Schiebe-und-Kipp-Einrichtungen (7) so-

wie die Gleitführung (25) an dem oberen Querträger (2A) aufgenommen sind, das wenigstens eine Paar Laufwagen (70) mit einem Abschnitt der Oberkante des Flügels (3) so verbunden ist, dass die Räder (71) den Flügel (3) auf der Führung (25) tragen und die Fensterbank oder Türschwelle (P) der Öffnung (A) vollständig frei lassen, jeder der paarigen Laufwagen (70) eine Gabel (72) umfasst, die die Räder (71) um einen ersten Bolzen (73) herum drehbar lagert, der im Wesentlichen quer in Bezug auf die Ausdehnung der Gleitführung (25) angeordnet ist, die Gabel (72) an einem mit dem Flügel (3) verbundenen Lagerungselement (74) um einen zweiten Bolzen (75) herum drehbar angelenkt ist, der in Bezug auf die Ausdehnung der Gleitführung (25) parallel angeordnet ist, und die Dichtungseinrichtung (5) des Weiteren eine zweite Dichtung (5B) umfasst, die mit dem unteren Rand des Flügels (3) verbunden und so eingerichtet ist, dass sie durch das Gewicht des Flügels (3) an die Türschwelle oder Fensterbank (P) der Öffnung (A) gedrückt wird, wenn sich der Flügel (3) in der geschlossenen Position befindet,
dadurch gekennzeichnet, dass
ein Bewegungsmechanismus (100) des Flügels (3), der mittels eines Bedienelementes (99) betätigt werden kann und eine Hebeeinrichtung (8) umfasst, vorhanden ist, um den Flügel (3) beim Übergang zwischen der geschlossenen Position und der offenen Position anzuheben und so die zweite Dichtung (5B) von der Fensterbank oder Türschwelle (P) zu trennen und das freie Schieben des Flügels (3) zu ermöglichen.

2. Fenster oder Tür (1) nach Anspruch 1, wobei die Schiebe-und-Kipp-Einrichtungen (7) auch Anschlageinrichtungen (77) umfassen, die die Endpunkte für die Kippbewegung der Räder (71) auf der Gleitführung (25) bilden, die Anschlageinrichtungen (77) durch eine Schraube gebildet werden, die durch jedes Rad (71) hindurch verläuft und an der Gabel (72) befestigt ist, wobei der Kopf (77A) der Schraube (77) in einer an dem Lagerungselement (74) vorhandenen Schlitzöffnung (78) angeordnet und so eingerichtet ist, dass er mit den gegenüberliegenden Rändern der Schlitzöffnung (78) zusammenwirkt, wenn das Rad (71) die geeigneten Neigungen erreicht, so dass der Flügel (3) jeweils auf der ersten Ebene und auf der zweiten Ebene liegt.

3. Fenster oder Tür (1) nach Anspruch 1, wobei die Gleitführung (25) eine horizontale und geradlinige Schiene umfasst, die Gleitführung (25) mit abgesenkten Aufnahmen (25A) versehen ist, die so angeordnet sind, dass sie die Räder (71) der Laufwagen (70) aufnehmen, wenn sich der Flügel (3) in der geschlossenen Position befindet.

4. Fenster oder Tür (1) nach Anspruch 1 oder 3, wobei die Hebeeinrichtung (8) ein Betätigungselement (82) umfasst, das axial zwischen einer Ruheposition, in der es im Wesentlichen in ein an dem Flügel (3) vorhandenes Gehäuse (18) eingezogen ist, wenn sich der Flügel (3) in der geschlossenen Position befindet, und einer Schiebeposition bewegt werden kann, in der das Betätigungselement (82) als eine mit dem festen Rahmen (2) verbundene Anschlageinrichtung (85) wirkt, die die Räder (71) aus den abgesenkten Aufnahmen (25A) herausdrückt.

5. Fenster oder Tür (1) nach Anspruch 4, wobei das Betätigungselement (82) eine Verzahnung (82A) aufweist, die so eingerichtet ist, dass sie mit einer entsprechenden Verzahnung (81A) in Eingriff gebracht wird, die an einer mit dem Bedienelement (99) verbundenen Antriebseinrichtung (81) ausgebildet ist.

6. Fenster oder Tür (1) nach Anspruch 4 oder 5, wobei die Hebeeinrichtung (8) des Weiteren eine erste elastische Einrichtung(83),die so eingerichtet ist, dass sie das Betätigungselement (82) in die Ruheposition zurückstellt, sowie eine zweite elastische Einrichtung (84) zum erneuten Spannen des Betätigungselementes (82) umfasst.

7. Fenster oder Tür (1) nach einem der vorangehenden Ansprüche, das/die des Weiteren eine Führungseinrichtung (6) umfasst, die eine Führungsnut (66) enthält, die an der Unterkante des Flügels (3) ausgebildet und so eingerichtet ist, dass sie mit einem Schieber (65) gleitend in Eingriff gebracht wird, der an der Türschwelle oder Fensterbank (P) der Öffnung (A) angeordnet ist, wobei die Führungsnut (66) mit einem Paar Nocken (64) versehen ist, die den Übergang des Flügels (3) zwischen der geschlossenen Position und der offenen Position führen.

8. Fenster oder Tür (1) nach einem der vorangehenden Ansprüche, wobei der Bewegungsmechanismus (100) des Weiteren eine Einrichtung (9) zum vorübergehenden Arretieren enthält, die eine vertikale Stange (91) umfasst, die mit dem Flügel (3) verbunden und mit einer Vielzahl von Arretierstiften (92) versehen ist, die so eingerichtet sind, dass sie lösbar mit entsprechenden Haltehaken (93) gekoppelt werden, die an dem Rahmen (2) vorhanden sind, um den Flügel (3) in der geschlossenen Position zu arretieren.

9. Fenster oder Tür (1) nach den Ansprüchen 7 und 8, wobei die Führungseinrichtung (6) weiterhin Keile (61) umfasst, die durch geneigte Flächen gebildet werden und mit den Haltehaken (93) verbunden sind, um die Kopplung mit den Arretierstiften (92) zu führen.

Revendications

1. Fenêtre ou porte (1) comprenant

- un cadre fixe (2) associé à une ouverture (A) obtenue dans un mur et inférieurement pourvu d'un plan de base (P) qui forme un seuil de porte ou de fenêtre, ledit cadre (2) comprenant au moins une traverse supérieure (2A), sensiblement horizontale, et une paire de montants (2B, 2C), s'étendant parallèlement et verticalement,
- des moyens d'étanchéité (5) comprenant des premiers joints (5A) associés à ladite traverse supérieure (2A) et auxdits montants (2B, 2C),
- au moins une aile mobile (3) associée à des moyens de coulissement et d'inclinaison (7) comprenant au moins une paire de chariots (70) munis de roues (71) coulissantes et basculantes sur un guide (25) pour déplacer ladite aile (3) entre une position fermée, dans laquelle ladite aile se trouve sur un premier plan en butée contre ledit premier joint (5A), et une position ouverte, dans laquelle ladite aile se trouve sur un deuxième plan, parallèle audit premier plan, et est déconnectée dudit premier joint (5A),

dans laquelle lesdits moyens de coulissement et d'inclinaison (7) et ledit guide (25) coulissant sont logés en correspondance de ladite traverse supérieure (2A), ladite au moins une paire de charriots (70) étant associée à une partie du bord supérieur de ladite aile (3) de sorte que lesdites roues (71) supportent ladite aile (3) sur ledit guide (25) laissant ledit seuil de porte ou de fenêtre (P) de ladite ouverture (A) complètement libre,
chacun de ladite paire de chariots (70) comprend une fourche (72) qui supporte en rotation lesdites roues (71) autour d'un premier axe (73) disposé sensiblement transversalement par rapport à l'extension dudit guide (25) coulissant, ladite fourche (72) étant articulée en rotation à un élément de support (74) associé à ladite aile (3) autour d'un deuxième axe (75) disposé parallèlement par rapport à l'extension dudit guide (25) coulissant, dans laquelle lesdits moyens d'étanchéité (5) comprennent en outre un deuxième joint (5B) associé au bord inférieur de ladite aile (3) et adapté pour être pressé par le poids de l'aile (3) sur un seuil de porte ou de fenêtre (P) de ladite ouverture (A) lorsque ladite aile (3) est en position fermée,
caractérisée en ce que un mécanisme de déplacement (100) de l'aile (3), actionnable au moyen d'un organe de commande (99) et comprenant des moyens de levage (8), étant prévus pour soulever ladite aile (3) dans le passage entre ladite position fermée et ladite position ouverte, déconnectant ainsi ledit deuxième joint (5B) dudit seuil de porte ou de fenêtre (P) et permettant le coulissement libre de ladite aile (3).

2. Fenêtre ou porte (1) selon la revendication 1, dans laquelle lesdits moyens de coulissement et d'inclinaison (7) comprennent également des moyens d'arrêt (77) définissant les points d'extrémité pour le mouvement d'inclinaison desdites roues (71) sur ledit guide (25) coulissant, lesdits moyens d'arrêt (77) étant formés par une vis traversant chaque roue (71) et fixés à ladite fourche (72), la tête (77A) de ladite vis (77) étant disposée dans une ouverture fendue (78) prévue sur ledit support d'élément (74) et étant adaptée pour coopérer avec les bords opposés de ladite ouverture fendue (78) lorsque ladite roue (71) atteint les inclinaisons appropriées de sorte que ladite aile (3) repose respectivement sur ledit premier plan et sur ledit deuxième plan.

3. Fenêtre ou porte (1) selon la revendication 1, dans laquelle ledit guide (25) coulissant comprend un rail horizontal et rectiligne, ledit guide (25) coulissant étant pourvu de sièges abaissés (25A) agencés pour recevoir les roues (71) desdits chariots (70) lorsque ladite aile (3) est dans ladite position fermée.

4. Fenêtre ou porte (1) selon la revendication 1 ou 3, dans laquelle lesdits moyens de levage (8) comprennent un actionneur (82) mobile axialement entre une position de repos, dans laquelle il est sensiblement rétracté à l'intérieur d'un logement (18) prévu sur ladite aile (3) lorsque ladite aile (3) est dans ladite position fermée, vers une position de poussée dans laquelle ledit actionneur (82) agit sur un moyen de butée (85) associé audit cadre fixe (2) pour forcer les roues (71) hors desdits sièges abaissés (25A).

5. Fenêtre ou porte (1) selon la revendication 4, dans laquelle ledit actionneur (82) comprend une denture (82A) adaptée pour être engagée avec une denture correspondante (81A) obtenue sur un moyen d'entraînement (81) relié audit organe de commande (99).

6. Fenêtre ou porte (1) selon la revendication 4 ou 5, dans laquelle lesdits moyens de levage (8) comprennent en outre un premier moyen élastique (83) adapté pour ramener ledit actionneur (82) en position de repos et un deuxième moyen élastique (84) pour recharger ledit actionneur (82).

7. Fenêtre ou porte (1) selon l'une quelconque des revendications précédentes, comprenant en outre des moyens de guidage (6) comprenant une rainure de guidage (66) obtenue sur le bord inférieur de ladite aile (3) et adaptée pour être engagée de manière coulissante par un curseur (65) disposé sur un seuil de porte ou de fenêtre (P) de ladite ouverture (A), ladite rainure de guidage (66) étant pourvue d'une

paire de cames (64) pour guider le passage de ladite aile (3) entre ladite position fermée et ladite position ouverte.

8. Fenêtre ou porte (1) selon l'une quelconque des revendications précédentes, dans laquelle ledit mécanisme de déplacement (100) comprend en outre des moyens de verrouillage (9) temporaire comprenant une tige verticale (91) associée à ladite aile (3) et pourvue d'une pluralité de goupilles de verrouillage (92) adaptées pour être couplées de manière amovible avec des crochets de retenue (93) correspondants prévus sur ledit cadre (2) pour verrouiller ladite aile (3) dans ladite position fermée.

9. Fenêtre ou porte (1) selon les revendications 7 et 8, dans laquelle lesdits moyens de guidage (6) comprennent également des cales (61) formées par des surfaces inclinées, associées auxdits crochets de retenue (93) pour guider l'accouplement avec lesdites goupilles de verrouillage (92) .

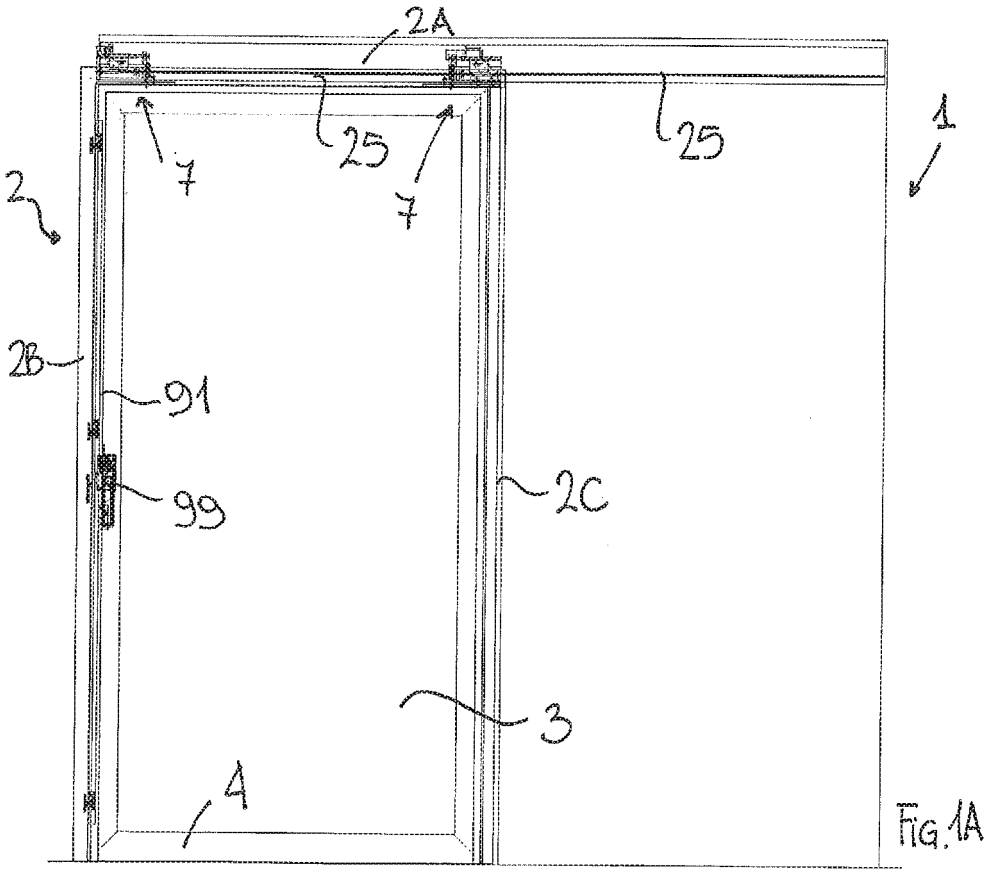


Fig.1A

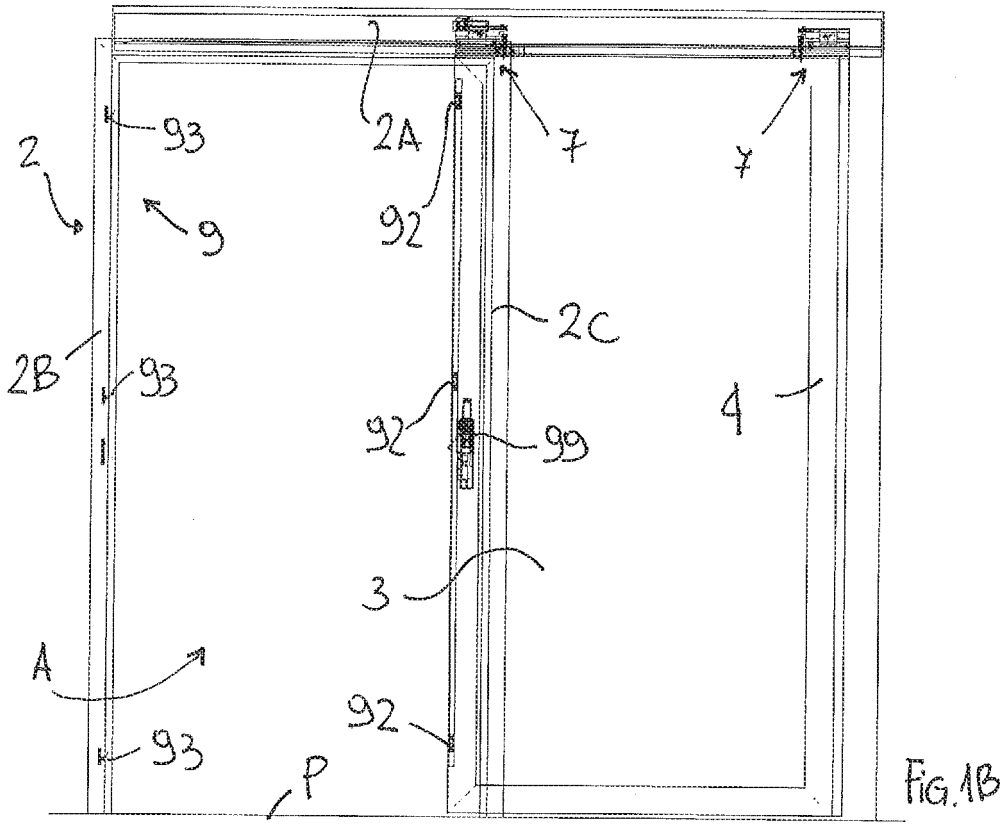


Fig.1B

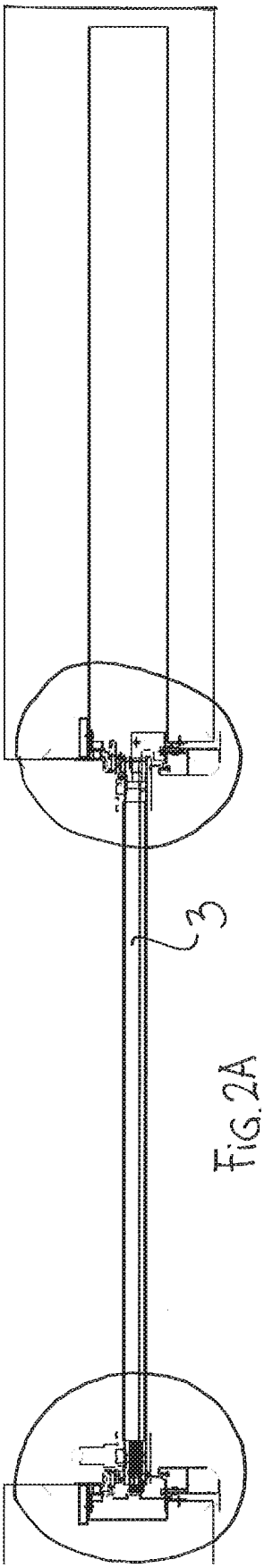


Fig. 2A

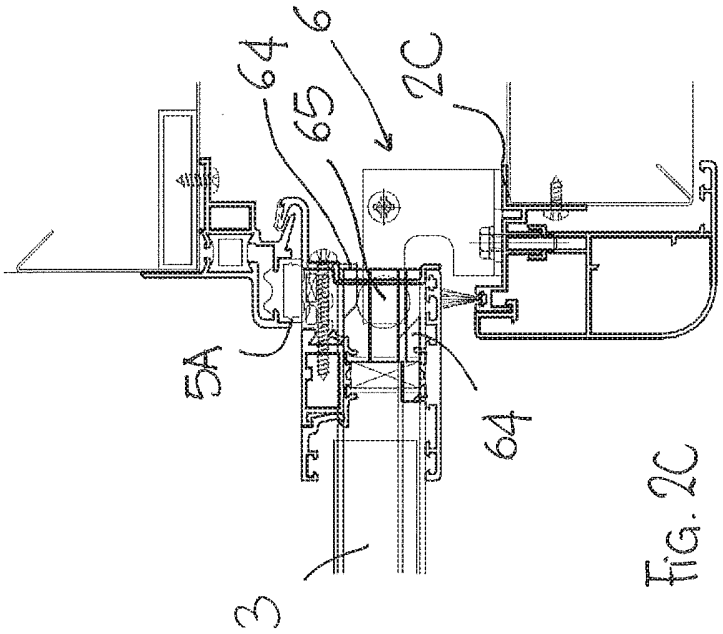


Fig. 2C

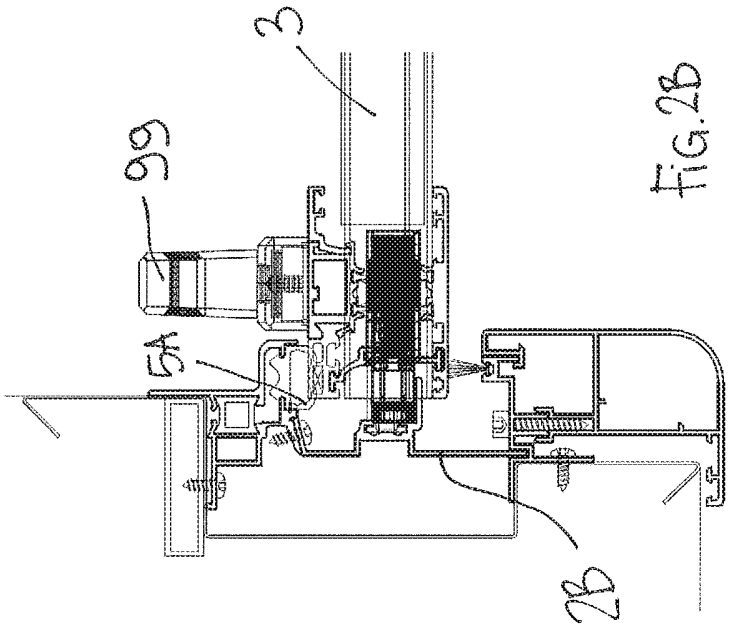


Fig. 2B

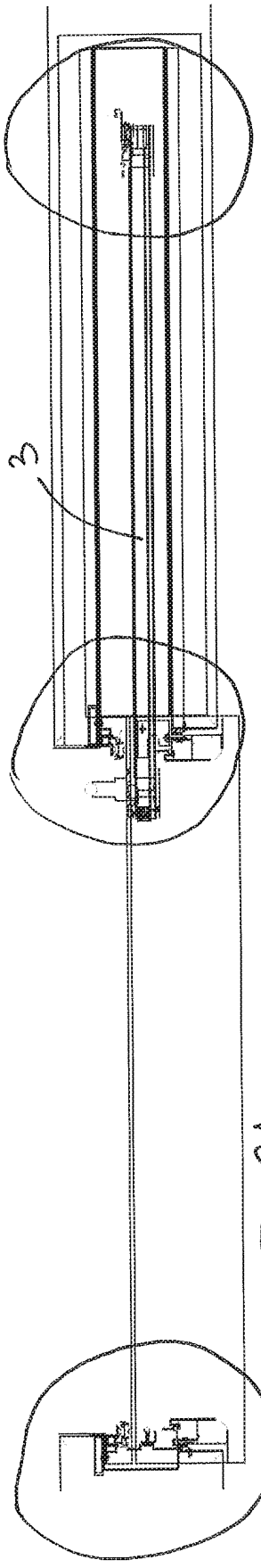


Fig. 3A

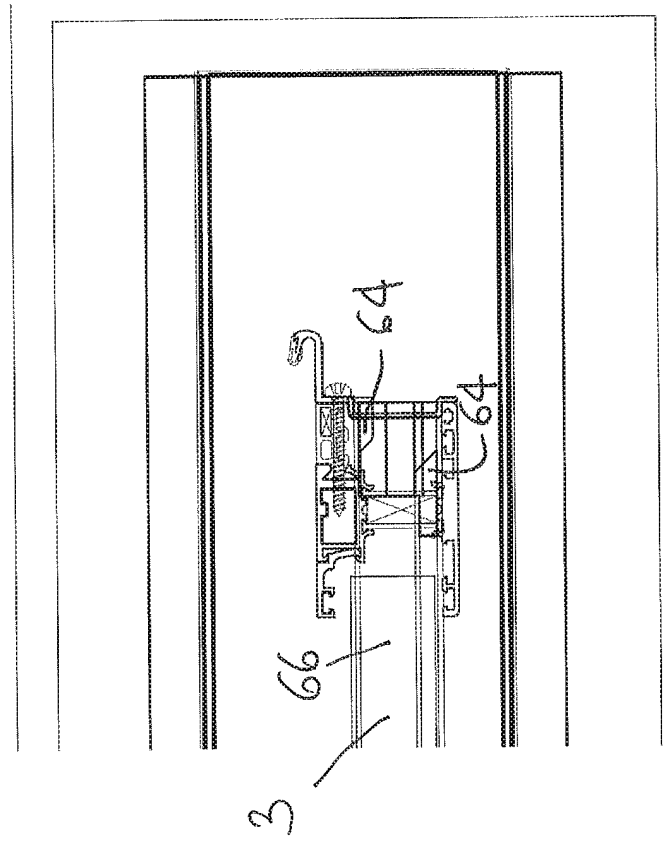


Fig. 3D

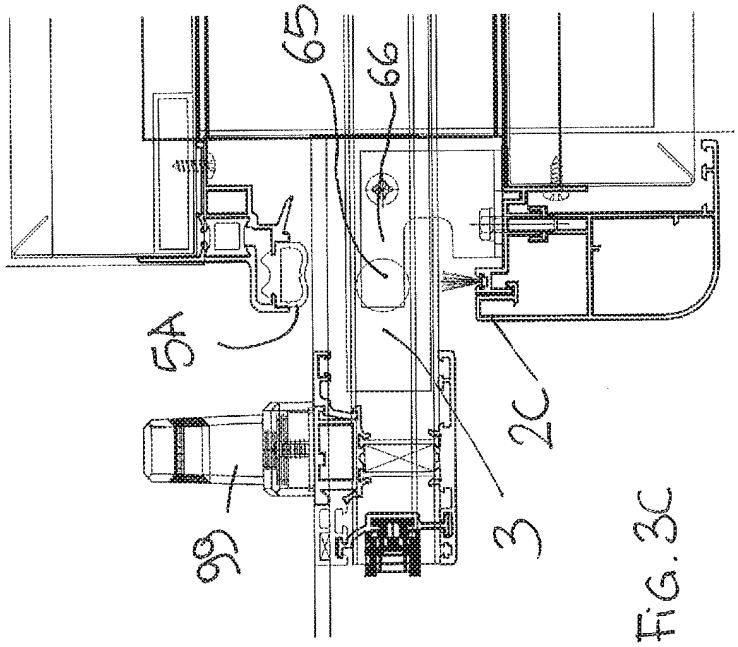


Fig. 3C

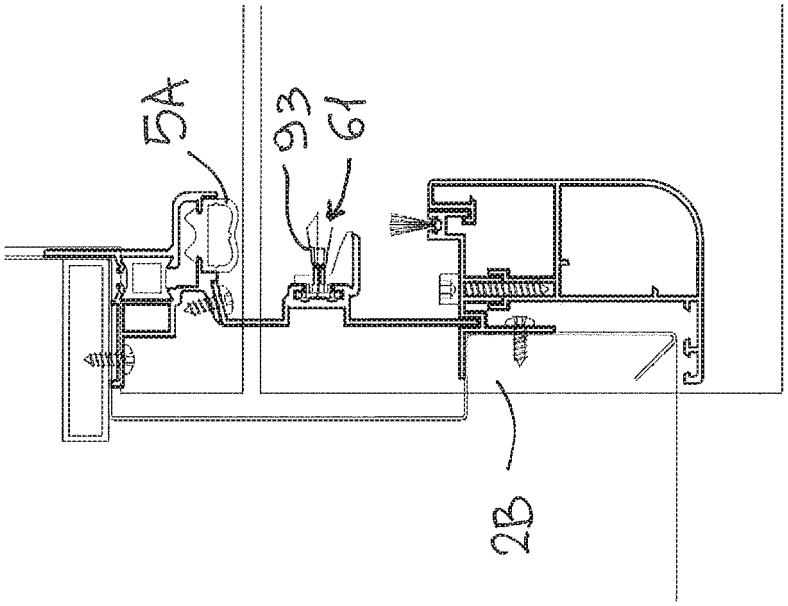


Fig. 3B

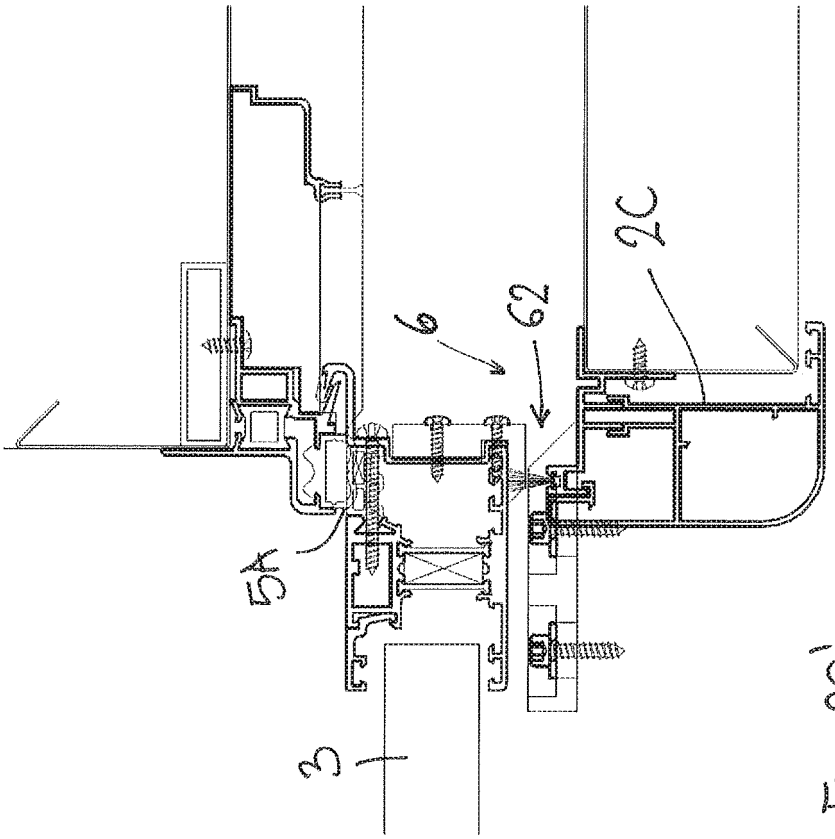


Fig. 2C'

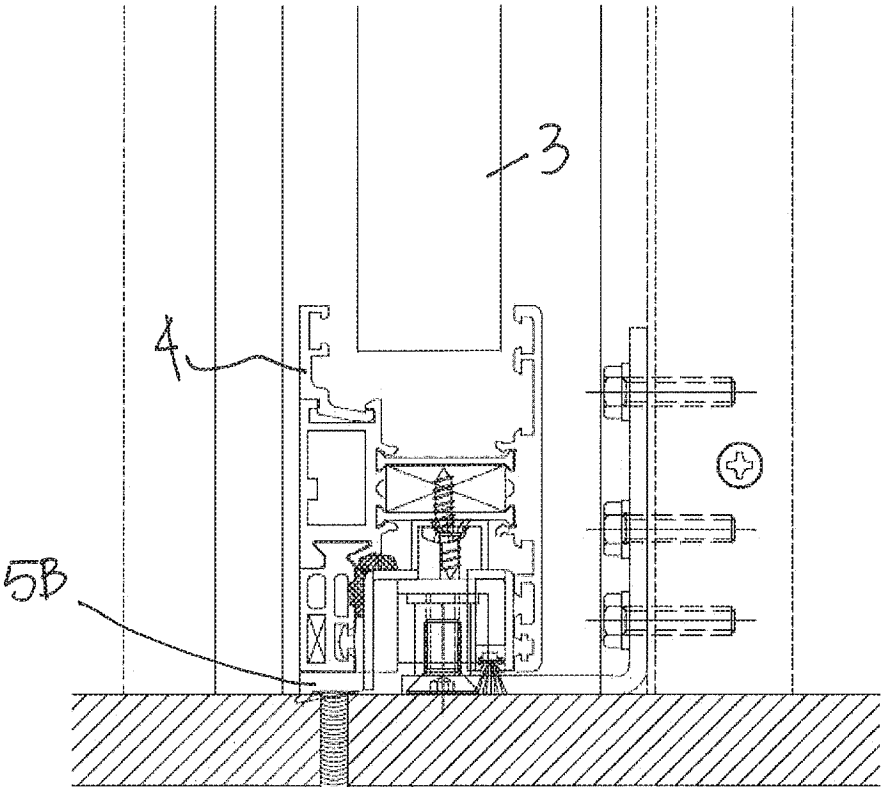


FIG. 4A

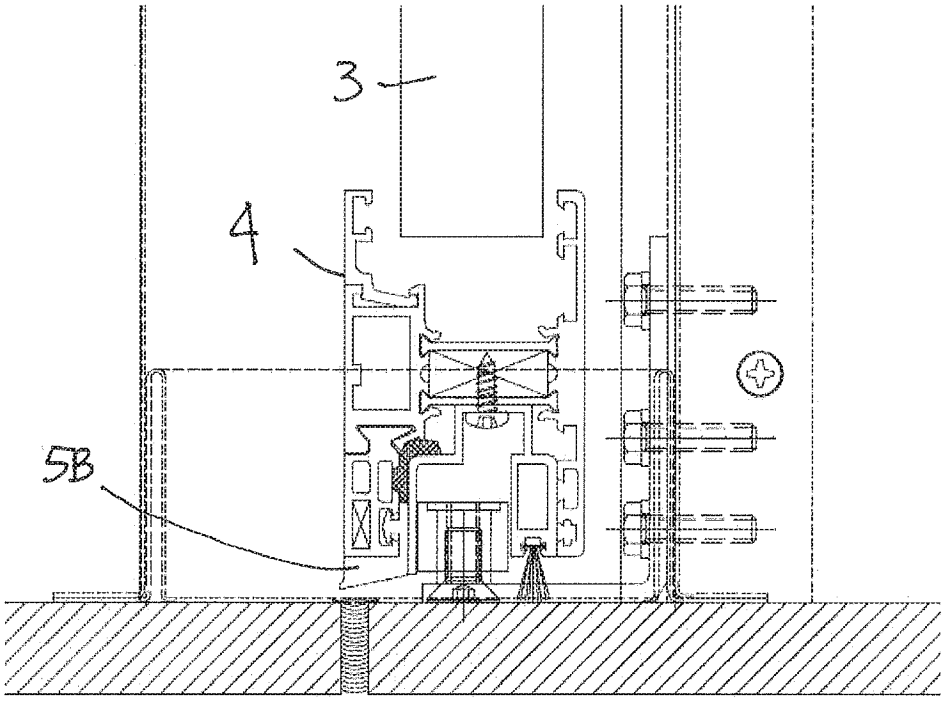


FIG. 4B

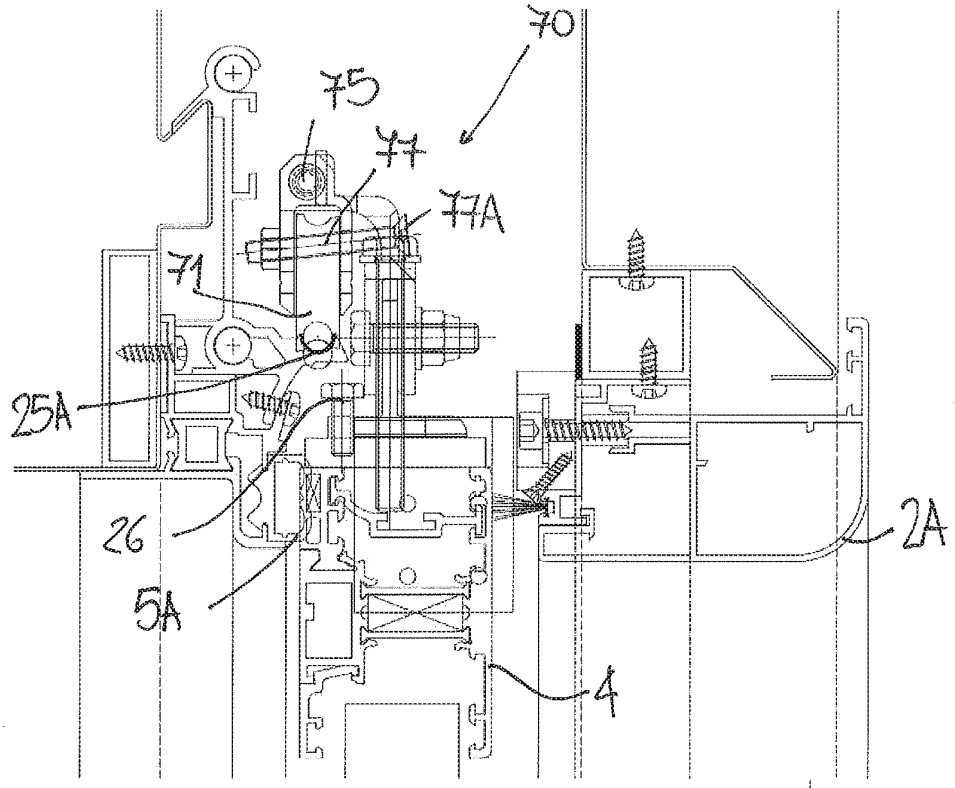


FIG. 5A

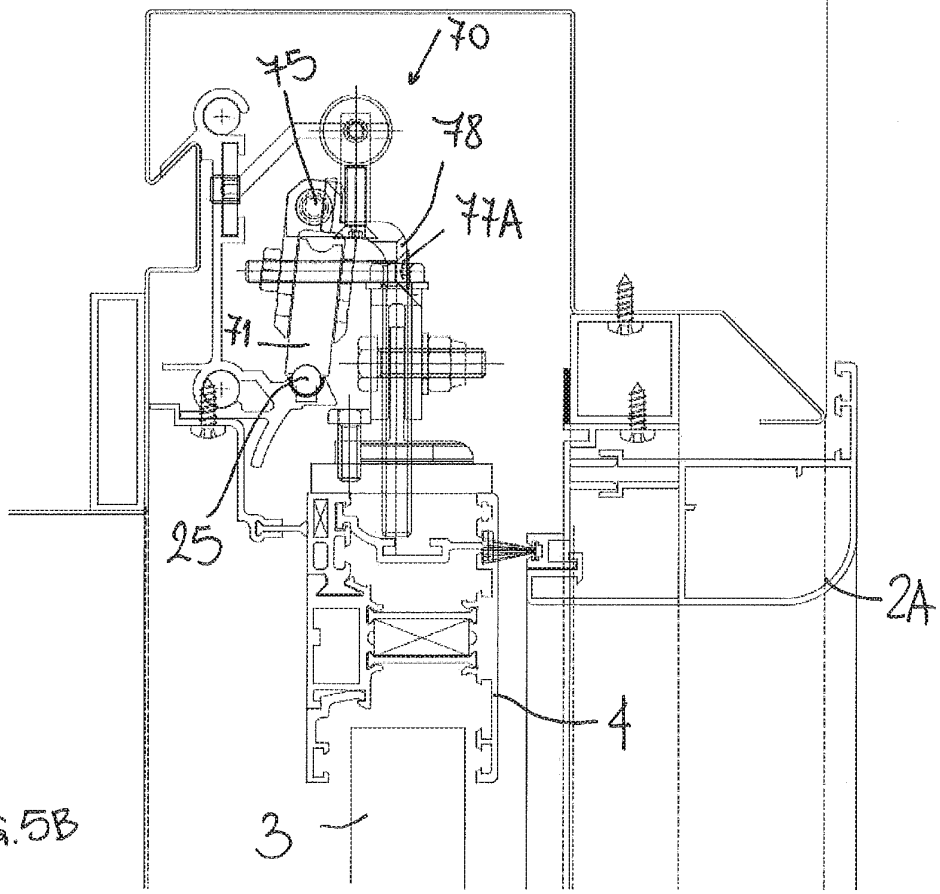


FIG. 5B

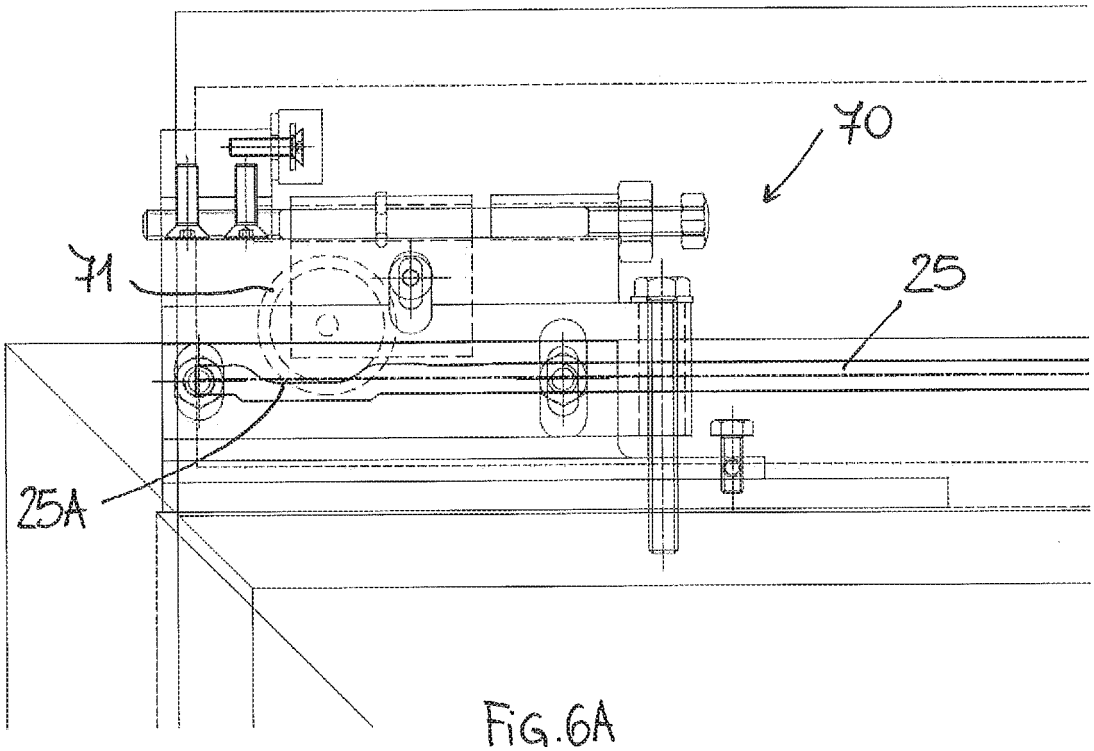


FIG.6A

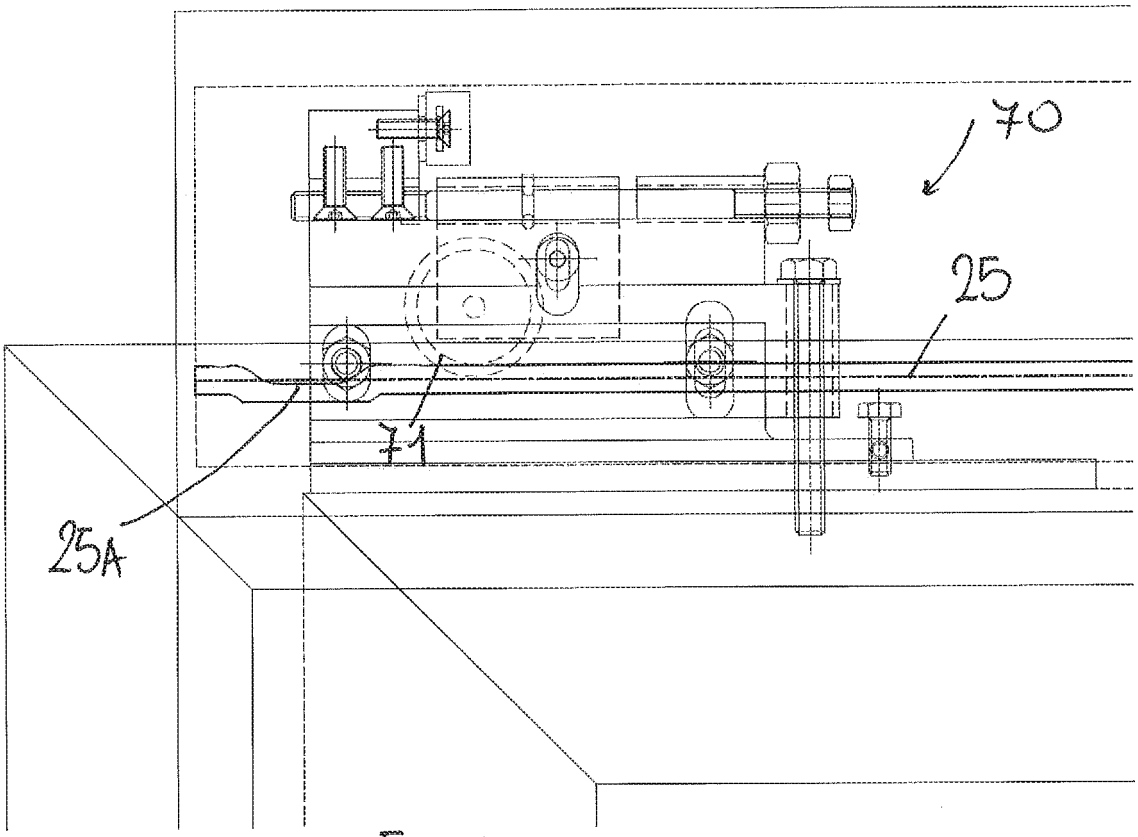


FIG.6B

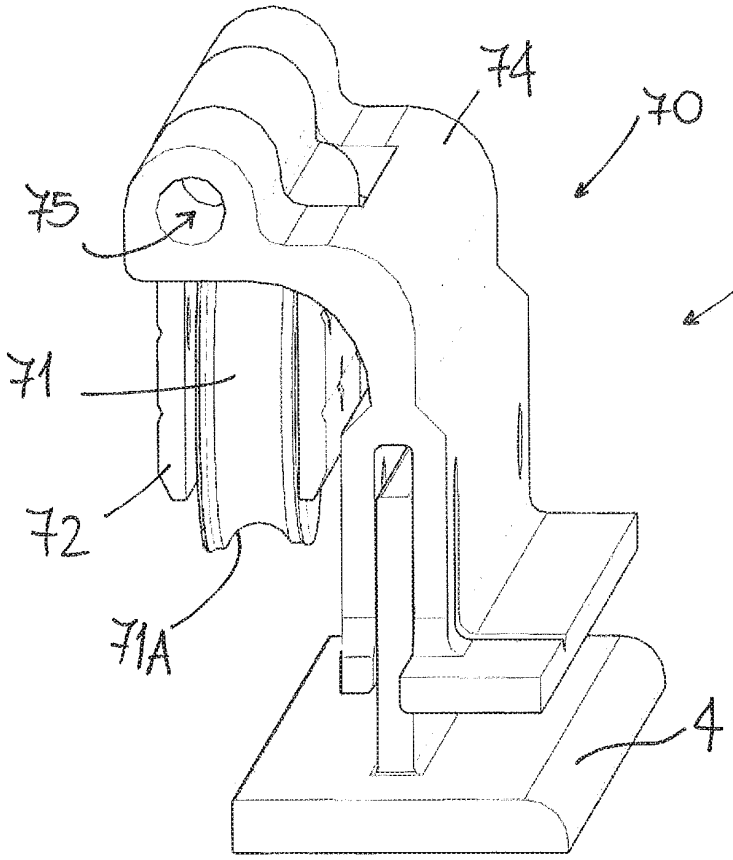


Fig. 7

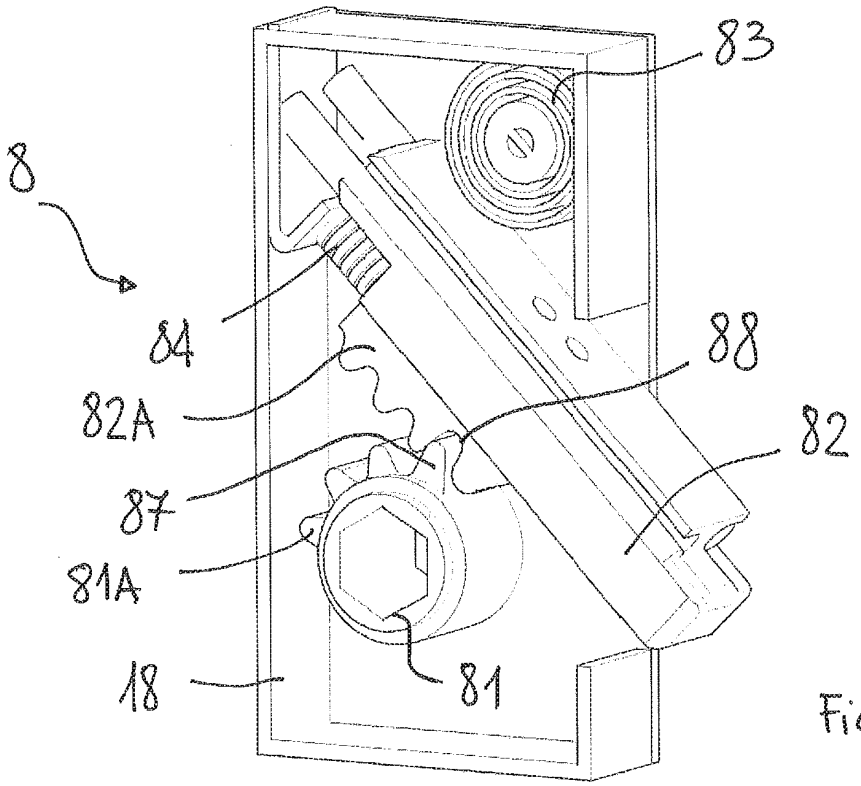
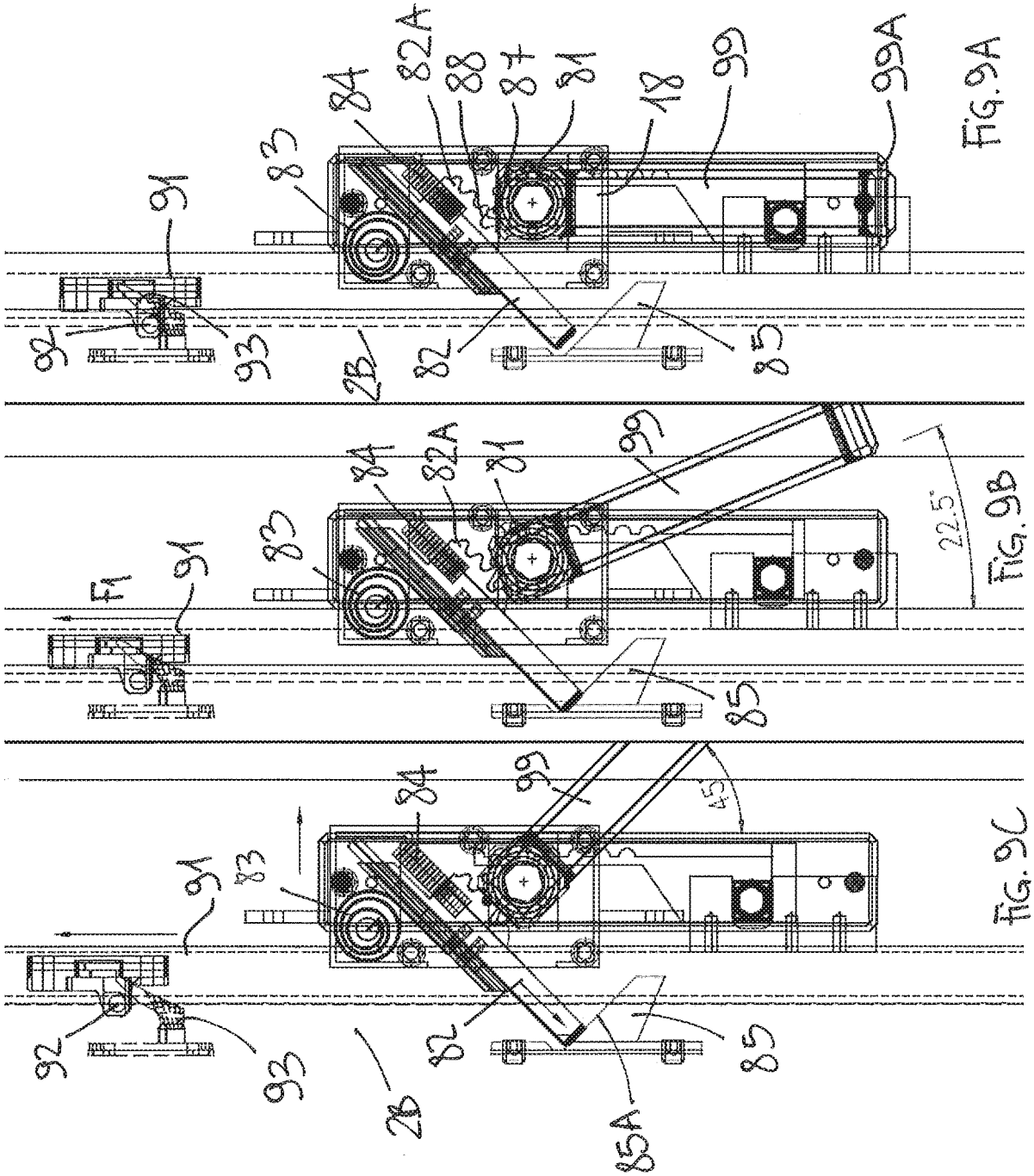
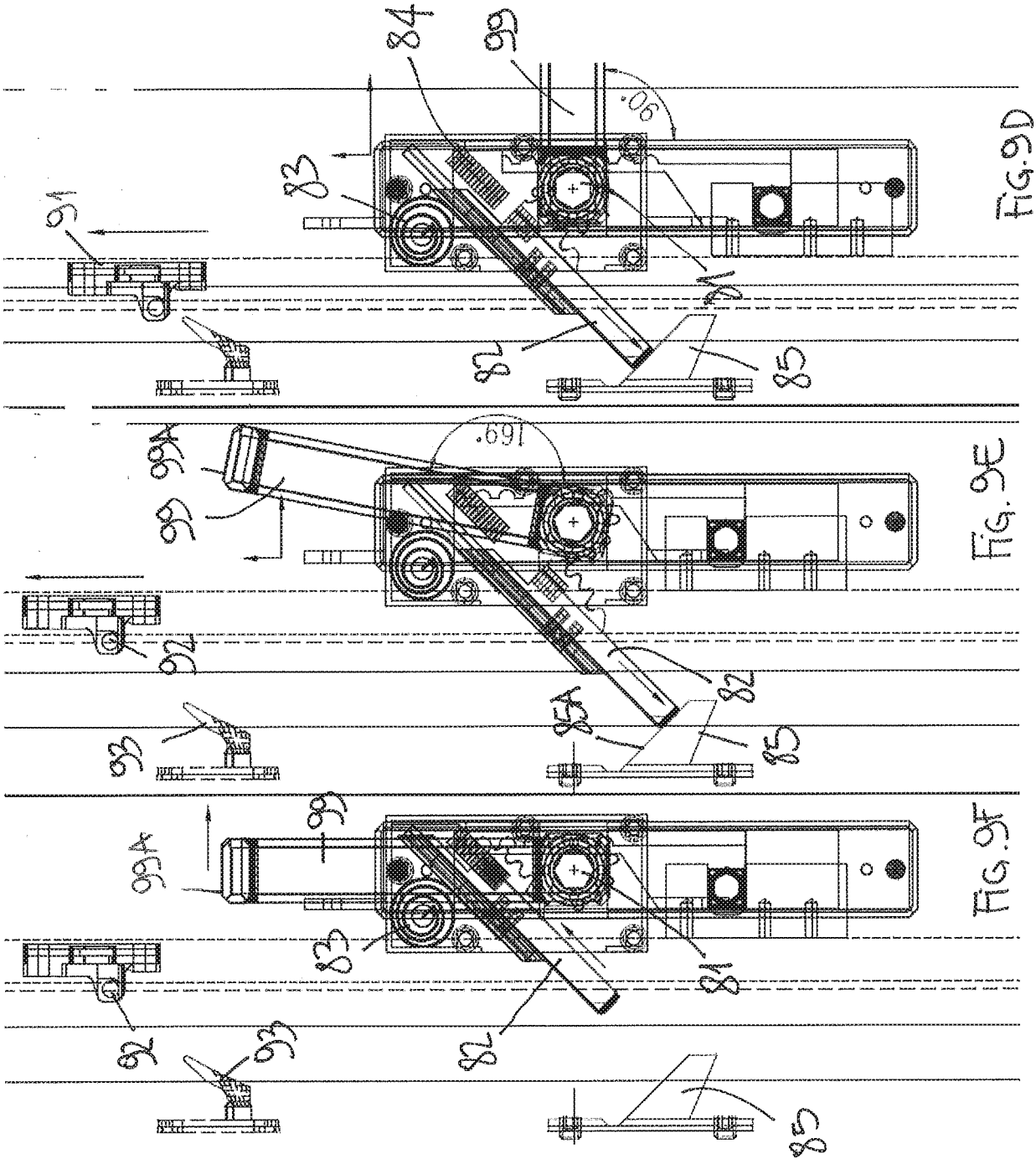


Fig. 8


84
82A
88
87
81
18
99
99A
83
91
92
93
28
82
85
FIG. 9A
84
82A
81
99
83
91
F1
22.5°
85
FIG. 9B
84
99
45°
83
91
92
93
28
82
85
85A
FIG. 9C


84
93
90°
83
91
81
87
85
FIG.9D
94
95
169°
92
82
86
FIG.9E
99
94'
84
FIG.9F

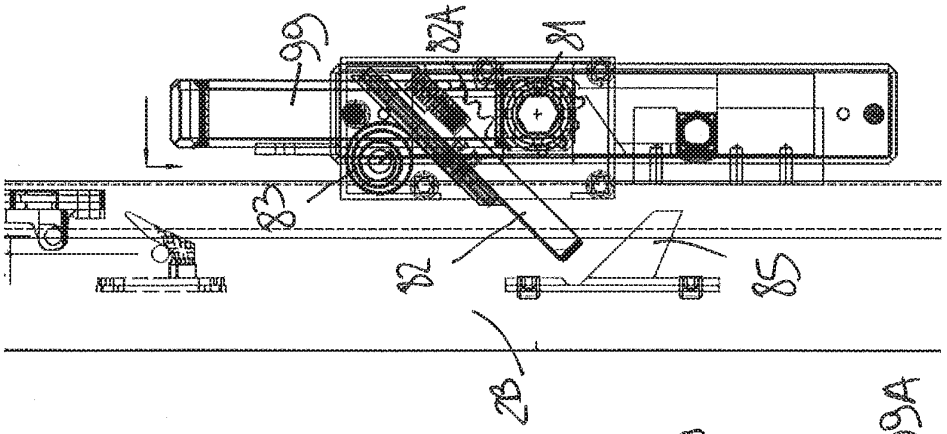


FIG. 10A

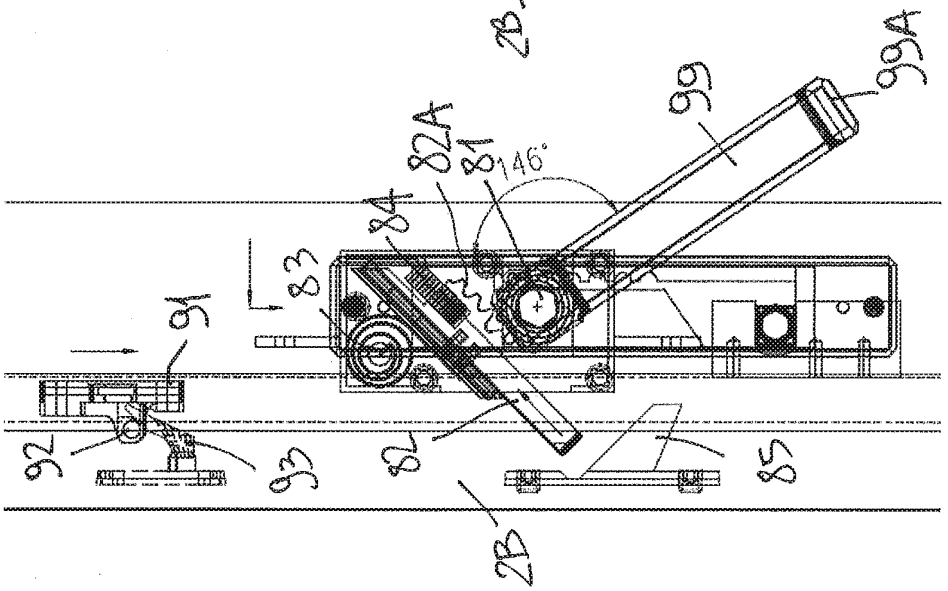


FIG. 10B

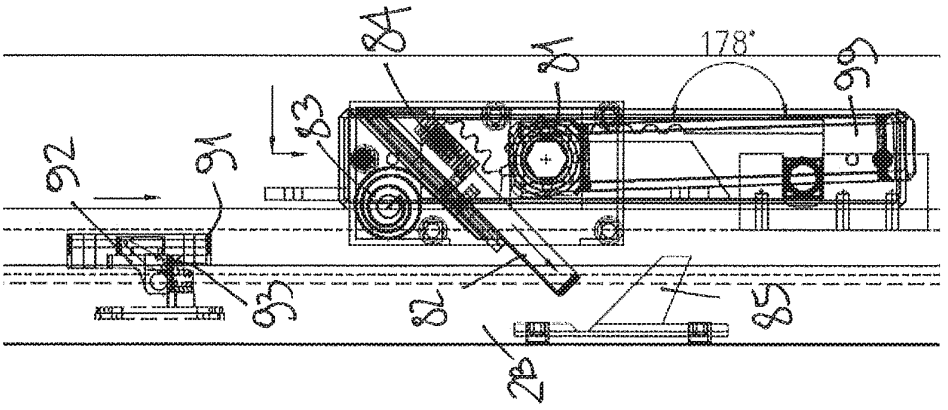


FIG. 10C

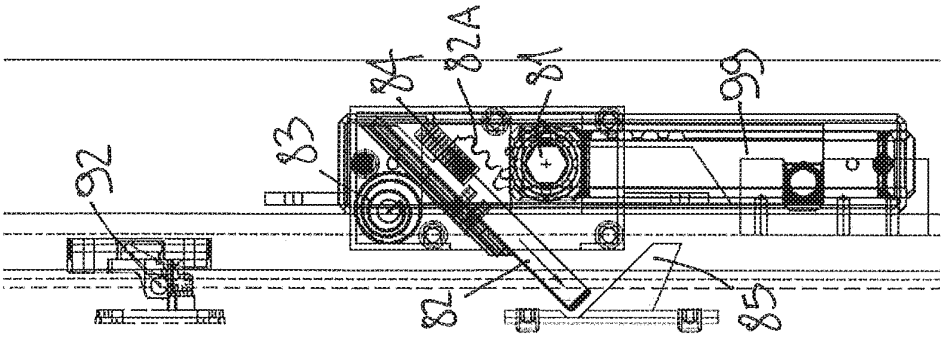


FIG. 10D

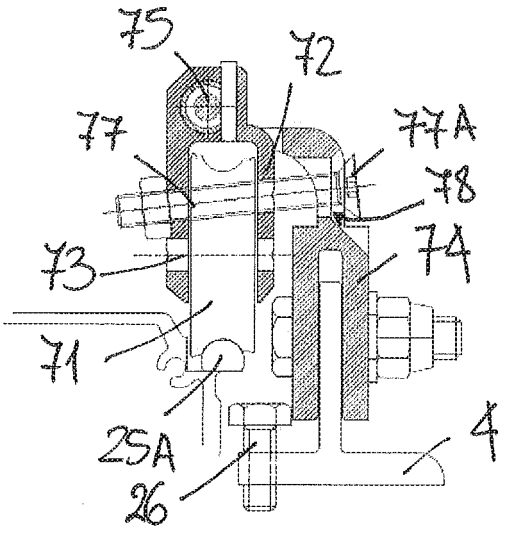


FIG. 11A

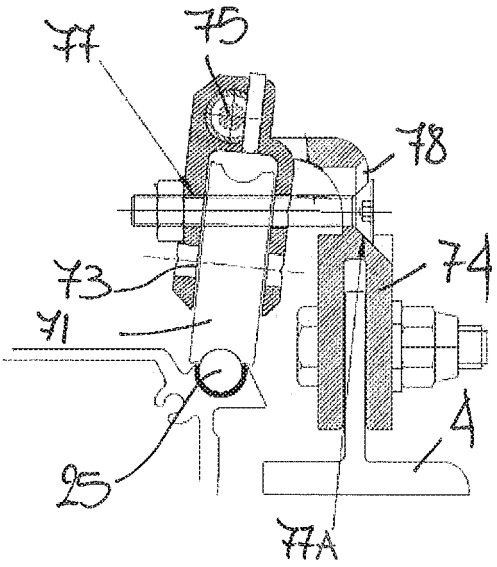


FIG. 11B

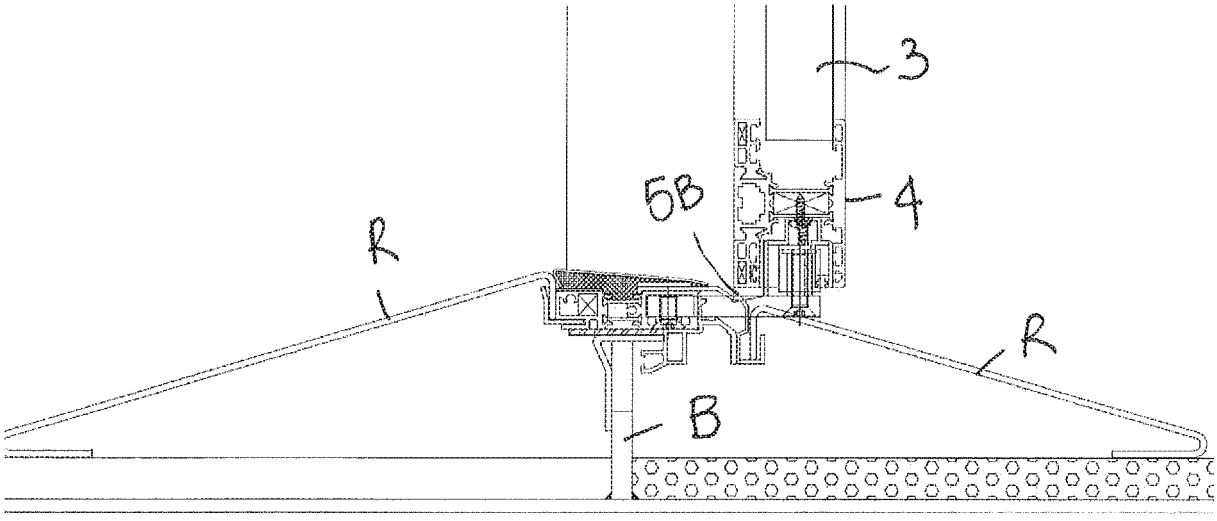


FIG. 12

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1571282 A **[0008]**
- WO 9427015 A **[0013]**