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

(11) EP 1 571 282 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.09.2005 Bulletin 2005/36

(51) Int Cl.[7]: **E06B 3/46**, E05B 65/08, E05D 15/10

(21) Application number: **05101543.6**

(22) Date of filing: **01.03.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

(30) Priority: **02.03.2004 IT TV20040021**

(71) Applicant: **SOMEC S.r.l.**
31020 Zoppe'di San Vendemiano TV (IT)

(72) Inventor: **Sossai, Ermenegildo**
31010, MARENO DI PIAVE TV (IT)

(74) Representative: **Modiano, Guido et al**
Dr. Modiano & Associati SpA
Via Meravigli, 16
20123 Milano (IT)

(54) Door or window particularly for buildings and/or waterfront

(57) A door or window, particularly for buildings and/or watercraft, comprising at least one leaf (38), which cooperates with sliding and tilting means (57) arranged inside a perimetric framework. There are also means for moving the at least one leaf along planes that are parallel thereto and means for temporarily locking the at least one leaf against a first gasket (7) provided on the perimetric framework.

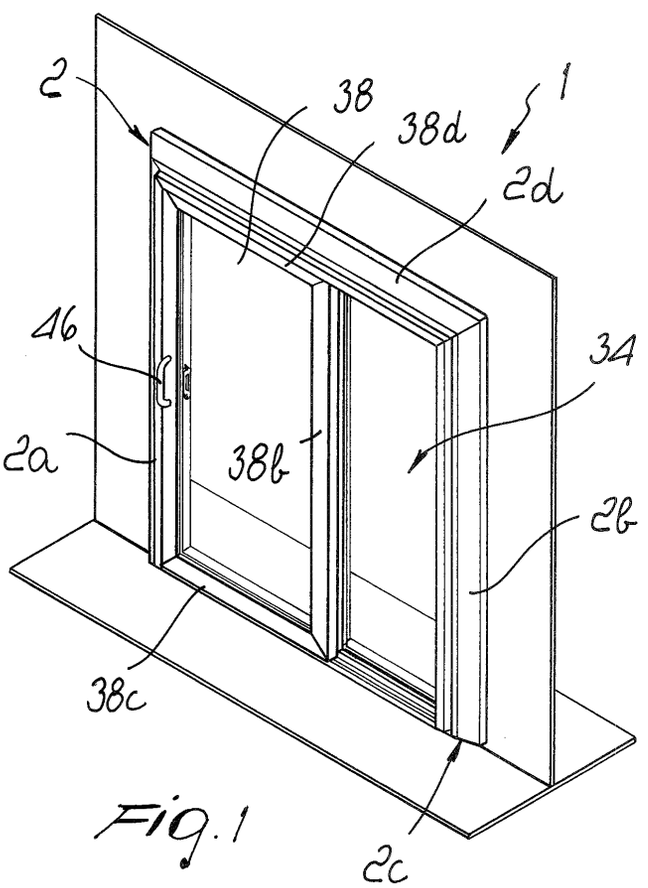

Fig. 1

EP 1 571 282 A2

Description

[0001] The present invention relates to a door or window particularly for buildings and/or watercraft.

[0002] The use of sliding doors or windows has been and still is widespread in many contexts, especially in order to meet the need to insert doors or windows in spaces in which one wishes to avoid the space occupation entailed by conventional doors that swing about hinges during opening or closing.

[0003] The use of sliding doors or windows is further widespread outside the building sector, in shipbuilding, a field in which, in addition to the need to utilize space rationally, the characteristics of resistance and waterproofing are particularly important, especially in the presence of atmospheric phenomena that can cause intense stresses to the structure of said door or window and the infiltration of cold air or water from the outside towards the interior environment.

[0004] Moreover, in a marine environment, the processes of degradation of materials, including the materials used in the manufacture of doors or windows, are accelerated considerably by the presence of high concentrations of corrosive agents in the atmosphere.

[0005] Known types of door or window are currently used, both in the construction sector and in the naval sector, which have one or more movable leaves that can slide with respect to a perimetric framework by way of devices that are generally located in the lower part of said framework and are constituted for example by carriages provided with bearings or self-lubricating pivots, which allow the movement of the one or more movable leaves.

[0006] These known types of door or window comprise, in order to ensure an intended seal against atmospheric agents, gaskets preferably of the lip type or brushes, which are arranged on the framework and forced against the one or more sliding leaves so as to offer a seal that to a certain extent is proportional to the pressure that they apply to said leaves.

[0007] The main drawback of this known type of door or window is that said gaskets or brushes, in order to offer the required performance, are pressed against said sliding leaves with a force that offers, during opening and closure of the leaves, strong resistance to the movement of said leaves due to their mutual sliding.

[0008] Another drawback of this known type of door or window relates to the fact that due to this interference the gaskets can undergo permanent deformations, which in the long term cause a decrease in the sealing performance against atmospheric agents of said door or window.

[0009] A second known type of door or window comprises a lever system, which is arranged at the lower region of the sliding leaves and is capable of lifting them and of making them exit from the seats provided in a lower region in the perimetric framework and of disconnecting them from the sealing gaskets, so as to prevent their sliding against them during opening and closing operations.

[0010] The main drawback of this second known type of door or window is that the lever system has high manufacturing costs, which limit its use to particularly high-value installations.

[0011] Another drawback is that this known type of sliding door or window can be used only in the building sector, since it cannot be adapted to naval applications.

[0012] The aim of the present invention is to solve the above-mentioned problems, eliminating the drawbacks of the cited background art, by providing a door or window that is capable of offering excellent sealing performance against the infiltration of air and water from the outside and of resistance to the action of wind and at the same time can be opened and closed easily.

[0013] Within this aim, an object of the invention is to provide a door or window that allows to offer high constancy in performance during its use.

[0014] Another object is to provide a door or window that allows to ensure a seal against the infiltration of air and water that is suitable for the external climate conditions and can be adapted to them.

[0015] Another object is to provide a door or window that is structurally simple and has low manufacturing costs.

[0016] This aim and these and other objects that will become better apparent hereinafter are achieved by a door or window, particularly for buildings and/or watercraft, characterized in that it comprises at least one leaf, which cooperates with sliding and tilting means arranged inside a perimetric framework, means being provided for moving said at least one leaf along planes that are parallel thereto, means being further provided for temporarily locking said at least one leaf against a first gasket provided on said perimetric framework.

[0017] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the door or window according to the invention in a closed position;

Figure 2 is a perspective view of the door or window in a fully open position;

Figure 3 is a front view of the door or window in the closed position;

Figure 4 is a sectional view, taken along the line IV-IV of Figure 3, of a detail of the door or window during a first step of the closure operation;

Figure 5 is a view, similar to Figure 4, of a detail of the door or window during a second step of the closure operation;

Figure 6 is a view, similar to Figure 5, of a detail of the door or window in the closed position;

Figures 7 and 8 are sectional views, taken along the line VII-VII of Figure 3, of a detail of the door or win-

dow respectively during a first step and a second step of the closure operation;
Figure 9 is a view, similar to Figures 7 and 8, of a detail of the door or window in the closed position;
Figures 10 and 11 are two perspective views of two details of the door or window;
Figure 12 is a perspective view of a detail of the door or window in the fully closed position;
Figure 13 is a sectional view, taken along the line XIII of Figure 6, of a detail of the door or window in the fully closed position;
Figure 14 is a sectional view, taken along the line XIV-XIV of Figure 2, of a detail of the door or window in the fully open position;
Figure 15 is a sectional view, taken along the line XV-XV of Figure 3, of a detail of the door or window in the closed position;
Figure 16 is a view, similar to Figure 15, of a detail of the door or window in the fully or partly open position;
Figure 17 is a sectional view, taken along the line XVII-XVII of Figure 3, of a detail of the door or window in the fully or partly open position;
Figure 18 is a view, similar to Figure 17, of a detail of the door or window in the closed position.

[0018] In the embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other embodiments.

[0019] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0020] With reference to the figures, the reference numeral 1 designates a door or window according to the invention, which comprises a perimetric framework 2 that is composed of a first vertical perimetric post 2a, a second vertical perimetric post 2b, a first lower perimetric cross-member 2c, and a second upper perimetric cross-member 2d.

[0021] Said perimetric framework further comprises a third vertical post 2e, which is arranged in an approximately intermediate position between the first and second perimetric posts 2a and 2b and is shallower than said posts, so that by being aligned with them on the inner side of the door or window 1 it is arranged internally with respect to the external face of said door or window.

[0022] The first perimetric post 2a is constituted by a first profiled element 3, which is made for example of metallic, plastic, composite or any other material that can be used in the manufacture of doors or windows, and can have a variously shaped external cross-section depending on the particular application, and has the function of providing a connection to the wall of the building or watercraft to which the door or window is applied, as well as an aesthetic function.

[0023] For example, the first profiled element can have a substantially L-shaped cross-section, which is optionally rounded, or a C-shaped cross-section or a cross-section that is shaped like a segment of a circle or ellipse.

[0024] The first profiled element 3 further has, proximate to its region that is adjacent to the external environment, a first external flap 4 and a second internal flap 5, which are parallel to each other and to the wall on which the door or window is installed; said flaps are directed toward the internal opening thereof, so as to form a first seat 6 that is longitudinal with respect to the first profiled element 3 and is arranged vertically along the entire first perimetric post 2a.

[0025] The second internal flap 5 supports a vertical portion of a first tubular gasket 7, which is accommodated within the first longitudinal seat 6 and has, at rest, an approximately rectangular cross-section, the longest side of which, directed toward the inside of the first seat 6, is convex, while the first external flap 4 supports two second gaskets 8, which also protrude toward the first seat 6.

[0026] The second internal flap 5 may further be approximately L-shaped, thus comprising a first tab 5a proximate to its free end, so as to contain laterally the first gasket 7.

[0027] A second profiled element 11 is coupled, for example by means of one or more first screws 10, to the bottom 9 of the first seat 6, protrudes inside the first seat 6 in a direction that is substantially parallel to the first and second flaps 4 and 5, and runs vertically approximately along the entire length of the first perimetric post 2a.

[0028] A second seat 12 is provided longitudinally to said second profiled element and proximate to the first gasket 7, has a circular cross-section and has an opening along a generatrix in order to accommodate a first guiding element 13 constituted by a cylinder that is preferably made of plastic material, which can be inserted longitudinally in the second seat 12 and can rotate freely axially within it, protruding from it with part of its cross-section at said opening provided in said second seat.

[0029] Advantageously, the second seat is arranged so that its opening, from which part of the first guiding element 13 protrudes, is directed toward the second flap 5 and is inclined with respect to it at a preset angle toward the internal opening of the door or window 1.

[0030] Approximately at the central region of the first perimetric post 2a, the second profiled element 11 supports a closure block 14, which protrudes parallel to the first and second flaps toward the internal opening of the door or window 1 and is constituted by a box-like body that forms internally a cavity 15 that is open at the front and along one of its sides.

[0031] The lower region of the cavity forms a first guide 15a, which is for example straight and open at the front, and whose first lateral walls 15b and 15c, which are parallel and straight, are inclined with respect to the vertical direction so as to approach the second flap 5

and the first gasket 7 as they descend.

[0032] Conveniently, the thickness of the first walls increases, toward the inside of the cavity 15, as they descend, so that inside the cavity there is a second wall 15d, which is inclined toward the inside of the cavity 15 and surrounds the perimeter of the first guide 15a.

[0033] Further, the second wall 15d slopes towards the first side walls 15a and 15b so as to form a flared portion that perimetrically surrounds the first guide 15a.

[0034] The second perimetric post 2b is constituted by a third profiled element 16, the cross-section of which is similar to the cross-section of the first profiled element 3 and has, proximate to its region that is adjacent to the external environment, a third external flap 17 and a fourth intermediate flap 18, which are parallel to each other and to the first and second flaps 4 and 5 provided on the first perimetric post 2a and are directed toward the internal opening of the door or window 1 so as to form a third seat 19, which is longitudinal with respect to the second profiled element 16 and is arranged vertically along the entire second perimetric post 2b.

[0035] The third and fourth flaps 17 and 18 are arranged respectively at the first and second flaps 4 and 5, so that the first seat 6 and the third seat 19 face each other.

[0036] Like the first flap 4, the third external flap 17 can support two second gaskets 8 that protrude inward toward the third seat 19.

[0037] The third profiled element 16, which constitutes the second perimetric post 2b, further comprises a fifth internal flap 20, which is parallel to the fourth flap 18 and forms with it a fourth seat 21.

[0038] Conveniently, the fourth seat 21 can be narrower than the first and third seats 6 and 19, while third gaskets 22 protrude toward the inside of the fourth seat from the fourth and fifth flaps 18 and 20.

[0039] The first and second perimetric posts 2a and 2b are connected in a lower region by the first perimetric cross-member 2c, which is constituted by a fourth profiled element 23 that has an approximately L-shaped external cross-section that is optionally rounded and a box-like internal structure.

[0040] The fourth profiled element 23 thus forms a fifth seat 24, which is open and longitudinal and arranged horizontally and is delimited, toward the inside of the door or window 1, by a third vertical wall 23a, which optionally in collaboration with a second horizontal tab 23b supports, along a portion thereof that is adjacent to the first perimetric post 2a, a horizontal portion of the first tubular gasket 7.

[0041] A third tab 23d protrudes vertically upward from a first base 23c of the fourth horizontal profiled element 23 that is adjacent to the third vertical wall 23a and delimits in a lower region the fifth seat 24; the tab supports a second guide 25, constituted for example by a rail, in which the upper head 25a has a curved profile that is constituted for example by a circular arc.

[0042] The rail can be constituted for example by a metallic rod, preferably made of steel, which has a circular cross-section and is connected to the third tab 23d by interposing an insert that is made for example of polyamide or other material.

[0043] The second perimetric cross-member 2d, which completes in an upper region the perimetric framework 2, is constituted by a fifth profiled element 26, which is similar to the first and third profiled elements 3 and 16 that constitute respectively the first and second perimetric posts and is provided, proximate to its region that is adjacent to the external environment, with a sixth external flap 27 and with a seventh internal flap 28, which are parallel to each other and to the wall on which the door or window is installed, and are directed downward, so as to form a sixth seat 29 that is longitudinal with respect to the fifth profiled element 26 and is arranged horizontally along the entire second perimetric cross-member 2d.

[0044] A pair of second gaskets 8 can protrude toward the inside of the sixth seat 29 from the sixth flap 27, while the seventh internal flap 28, optionally in collaboration with a fourth tab 28a that protrudes horizontally from its free end, supports, along a portion thereof that is adjacent to the first perimetric post 2a, a horizontal portion of the first tubular gasket 7.

[0045] Conveniently, the first perimetric post 2a, the second perimetric post 2b, the first perimetric cross-member 2c and the second perimetric cross-member 2d are connected to each other at their own ends, so that the first seat 6, the third seat 19, the fifth seat 24 and the sixth seat 29 are mutually adjacent, so as to form a single perimetric seat that is continuous along the entire profile of the perimetric framework.

[0046] Each one of the perimetric posts and cross-members can further be constituted by joining two or more partial profiled elements.

[0047] The first and second perimetric cross-members are further connected to each other approximately at their central region by the third intermediate post 2e, which is arranged vertically between the first and second perimetric posts.

[0048] The third post 2e is constituted by a sixth profiled element 30, which has for example an approximately rectangular cross-section from which an eighth flap 31 and a ninth flap 32 protrude horizontally and are directed toward the second perimetric post 2b, such flaps being parallel to each other so as to form a seventh seat 33 that conveniently has approximately the same width as the fourth seat 21, and supports third gaskets 22 that protrude toward the inside of the seventh seat 33.

[0049] The third post is arranged so that the seventh seat 33 is arranged at the fourth seat 21 and faces it, so that a first fixed glass pane 34, constituted for example by a double-glazing unit, can be accommodated therein so to occupy part of the opening of the door or window 1.

[0050] As an alternative, said first glass pane can be replaced with a transparent or opaque panel made of

the material that is most suitable for the intended type of finish or for the intended mechanical strength, for example plastic or metallic material or wood, in variable sizes.

[0051] Moreover, on the face of the third post that is directed toward the environment on the outside of the door or window 1, proximate to the first glass pane 34, there is a tenth flap 35, which is for example L-shaped and supports, at its free end directed toward the second perimetric post 2b, a fifth tab 35a, which has a circular arc-like cross-section that preferably is longer than a semicircle.

[0052] The fifth tab 35a forms an eighth seat 36, which has a circular cross-section and an opening along a generatrix that runs vertically, for example along the entire length of the third post 2e, in order to accommodate a second guiding element 37, which is similar to the first guiding element 13 and is also constituted by a cylinder that is preferably made of plastic material, which can be inserted longitudinally in the eighth seat 36 and can rotate freely axially inside it, protruding from it with part of its cross-section at the longitudinal opening provided in the eighth seat.

[0053] Advantageously, the eighth seat is arranged so that its region that opens toward the outside, from which part of the second guiding element 37 protrudes, is directed toward the third post 2e and is inclined with respect to it at a preset angle toward the second post 2b.

[0054] Further, the tenth flap forms, together with the surface of the third post 2e that is directed outward, a ninth seat 38 that is open outward.

[0055] Such surface of the third post 2e further supports a final vertical portion of the first tubular gasket 7, which is thus arranged along the first perimetric post 2a and the third post 2e, and along a portion of the first lower perimetric cross-member 2c and of the upper perimetric cross-member 2d, providing a closed path.

[0056] It is therefore possible to arrange a single first gasket 7 along all of the path, thus obtaining a single closed and continuous chamber arranged inside said first gasket.

[0057] Further, the door or window 1 comprises a leaf 38, the frame 39 of which is constituted by a fourth vertical post 39a, a fifth vertical post 39b, a third upper cross-member 39c, and a fourth lower cross-member 39d.

[0058] The fourth post 39a is constituted by a seventh profiled element 40, which in the example illustrated in the figures has an approximately H-shaped cross-section constituted by a first inner wing 40a and by a second outer wing 42b, which are parallel to each other and are connected by at least one first central body 40c that is transverse to them.

[0059] A ninth seat 41, directed toward the outside of the frame 39, and a tenth seat 42, directed toward the inside of said frame, are formed between said first and second wings.

[0060] The first wing 40a has, as its first free end 43 directed toward the outside of the frame 39, a first abutment 44, which in the example is formed by a first vertical surface 44a that is arranged on the internal side of the first wing 40, within the ninth seat 41, and is inclined with respect to said first wing, in that the first vertical surface 44a increases its distance from the first wing 40 as one moves along said first wing toward the second free end 45, directed toward the inside of the frame, of said wing.

[0061] Conveniently, the fourth post 39a, determined by the distance between the wings that constitute the seventh profiled element 40, is narrower than the first seat 6 provided in the first perimetric post 2a.

[0062] The seventh profiled element 40 can be optionally constituted by joining two or more partial profiled elements, and can have an internal structure provided with a plurality of central bodies so as to connect the wings, or can be internally solid, for example by having an approximately rectangular cross-section, the ninth and tenth seats 41 and 42 being formed at its opposite ends.

[0063] A first external handle 46 and a second internal handle 47 are coupled to the seventh profiled element 40 in an approximately central position; by means of said handles it is possible to operate a bolt 48 of a lock, which is fixed for example by means of a plate 48a to the first central body 40c of the seventh profiled element within the ninth seat 41.

[0064] The bolt 48 is composed of a stem 48b, which protrudes at right angles from the plate 48a toward the closure block 14, is preferably shaped like a parallelepiped and has two fourth flat walls 48c, which are parallel and inclined with respect to the vertical direction in that they approach the second flap 5 as they descend vertically.

[0065] Advantageously, the thickness of the stem 48b, which is determined by the distance of the two fourth parallel walls 48c, is slightly smaller, in order to allow its insertion, than the distance between the first side walls 15b and 15c of the first guide 15a provided on the closure block 14, while its inclination conveniently matches the inclination of said first side walls of the first guide 15a.

[0066] The free end of the stem 48b supports a second head 48d, which is constituted for example by a plate that is arranged with the inclination of said stem with respect to the vertical direction and in which the face 48e that is directed toward the plate 48a has a flared portion, which is orientated so as to reduce its thickness from the center toward the perimeter.

[0067] Moreover, said plate is inclined also with respect to a vertical plane so as to move away from the plate 48a as it descends vertically.

[0068] Advantageously, said inclination is equal to the inclination of the second wall 15d that surrounds the first guide 15a, while the flared region of the face 48e matches the flared region of the second wall 15d, so that said walls can mate slidingly and are guided by the stem 48b,

which can be accommodated detachably within the first guide 15a.

[0069] The fifth post 39b of the frame 39 is constituted by an eighth profiled element 49, which has for example a rectangular cross-section and has a pair of eleventh flaps 50, which are parallel and directed toward the inside of the frame, so as to form an eleventh seat 51 that is as wide as the tenth seat 42 provided on the fourth post 39a.

[0070] Conveniently, the thickness of the fifth post 2b is equal to the thickness of the fourth post 2a and therefore lower than the width of the third seat 19 provided on the third post 2b.

[0071] A second abutment 53 protrudes from the face 52 of the fifth post 39b, which is directed toward the internal environment delimited by the door or window 1, at its end that is directed toward the outside of the frame; the second abutment 53 is for example hook-shaped and is formed, in the illustrated example, by a second vertical surface 53a, which is inclined with respect to the plane of the leaf 38 by a preset angle and is conveniently parallel to the first surface 44a, in that said second surface 53a moves away from the face 52 of the fifth post 39b in the direction of the fourth post 39a.

[0072] The fourth and fifth posts 39a and 39b are joined in a lower region by the third lower cross-member 39c, which is constituted by a ninth profiled element 54, which is fully similar to the seventh profiled element 40 that constitutes the fourth post 39a and preferably has an H-shaped cross-section that is formed by a third internal wing 54a and by a fourth external wing 54b, which are mutually parallel and are joined by at least one second central body 54c that lies transversely thereto so as to form, at its opposite ends, a twelfth upper seat 55, which is directed toward the inside of the frame 39, and a thirteenth lower seat 56, which is directed toward the outside of the frame.

[0073] A sliding and tilting means 57 is accommodated within the thirteenth seat 56 and is composed, in the illustrated example, of a third approximately L-shaped abutment 58, which is rigidly coupled, by means of a first portion 58a, below the second central body 50c of the ninth profiled element 54, so that a second portion 58b thereof protrudes vertically downward from said second central body parallel to the third and fourth wings.

[0074] Optionally, the third abutment 58 can be composed of the joining of two separate portions, optionally made of mutually different materials, and be obtained by bending or extrusion.

[0075] At the free end 59 of the first portion 58a, at least one fork 61 is rotatably coupled to the third abutment 58 by means of at least one hinge 60, said fork being approximately U-shaped and arranged vertically and abutting, with a fifth external wing 61a thereof, against the second portion 58b of the third abutment 58.

[0076] The rotation of the at least one fork 61 is limited by the fact that its sixth internal wing 61b can instead abut against the third internal wing 54a of the ninth profiled element 54.

[0077] In this manner, the at least one fork 61 can move from a first position, also termed closed position, in which it is arranged vertically and abuts, with its fifth wing 61a, against the second portion 58b of the third abutment 58, to a second position, also termed actuation position, in which it is inclined, abutting with its sixth wing 61b against the third internal wing 54a of the ninth profiled element 54.

[0078] Said at least one fork further supports at least one wheel 62, which has a concave perimetric profile that appropriately matches the profile of the upper head 25a of the rail 25, provided on the first perimetric cross-member 2c.

[0079] Finally, the frame 39 is closed in an upper region by the fourth cross-member 39d, which is constituted by a tenth profiled element 63, on the lower face of which, directed toward the inside of the frame, there is a fourteenth seat 64, which is as wide as the tenth seat 42, the eleventh seat 51 and the twelfth seat 55, all of which are directed toward the inside of the frame 39.

[0080] The perimetric ends of a second glass pane 65 can be accommodated within said seats so as to complete the leaf 38.

[0081] Conveniently, the thicknesses of the third and fourth cross-members 39c and 39d are equal to the thicknesses of the fourth and fifth posts 39a and 39b, so that they are respectively narrower than the width of the fifth seat 24 and of the sixth seat 29, provided respectively in the first perimetric cross-member 2c and in the second perimetric cross-member 2d.

[0082] The leaf 38 can therefore be associated with the perimetric framework 2 by inserting the upper end of the fourth upper cross-member 39d within the sixth seat 29 formed in a lower region in the second perimetric cross-member 2d and by accommodating the lower end of the third lower cross-member 39c within the fifth seat 24 formed in the first perimetric cross-member 2c.

[0083] In this manner, the at least one wheel 62 rests on the second guide 25, allowing the leaf 38 to slide longitudinally with respect to the first and second perimetric cross-members on the plane of the door or window 1.

[0084] Since the first seat 6, the third seat 19, the fifth seat 24 and the sixth seat 29 formed in the perimetric framework 2 are wider than the frame 39 is deep, the leaf 38 can perform a translational motion at right angles to its sliding plane along the second guide 25 by way of the tilting means 57, moving away or toward the first perimetric gasket 7, depending on whether the at least one fork 61 is in the closed position or in the actuation position.

[0085] The operation of the door or window 1 according to the invention entails that in the actuation position, when the at least one fork 61 and the at least one wheel 62 are tilted, so that the sixth wing 61b of the at least one fork abuts against the third internal wing 54a of the third cross-member 39c, the leaf 38, which can slide, is in the position in which it is at its maximum distance from

the first gasket.

[0086] In this condition, the leaf 38 rests in an upper region on the sixth external flap of the second perimetric cross-member 2d by means of the second gaskets 8, which protrude from said flap and avoid direct contact of the leaf on the fifth profiled element 26.

[0087] The leaf 38 can thus slide freely, by way of the rotation of the at least one wheel 62, along the second guide 25 and can be actuated by means of the handles applied to it.

[0088] The extent of the movement of the leaf at right angles to its sliding plane is determined by the width of the sixth seat 29 formed in the second upper perimetric cross-member 2d, and by the maximum inclination with respect to the vertical direction allowed to the at least one fork 61 and to the at least one wheel 62.

[0089] Advantageously, said movement is such as to ensure the complete disengagement of the leaf 38 from the first tubular gasket 7 when said leaf is in the sliding position.

[0090] In this manner, the sliding of the leaf 38 along the second guide 25 is extremely easy, since no friction forces caused by its sliding on the first gasket 7 are generated.

[0091] In the fully open position, the fifth post 39b of the frame 38 is partially accommodated within the third seat 19, which is formed longitudinally with respect to the second perimetric post 2b and rests on the third external flap 17 thereof, by means of the second gaskets 8, as shown in Figure 10.

[0092] The door or window 1 is closed by means of a sliding action of the leaf 38, which is kept by its own weight in the actuation position and therefore disengaged from the first gasket 7, along the second guide 25, up to the point where the fourth post 39a is partially inserted within the first seat 6 formed longitudinally in the first perimetric post 2a.

[0093] As shown in Figure 4, the first abutment 44, provided on the fourth post 39a, thus makes contact, by means of its first vertical surface 44a, with the first guiding element 13, which imparts to the leaf 38 a thrust in a direction that is perpendicular to its sliding plane and is directed toward the environment on the inside of the door or window.

[0094] In this manner, part of the inertia possessed by the leaf 38 upon contact between the first abutment 44 and the first guiding element 13 is converted into a force that acts so as to move the first internal wing 40a of the fourth post 39a toward the first gasket 7, supported by the second internal flap 5 of the first perimetric post 2a.

[0095] The presence of the cylinder that can rotate freely about its own axis, constituting the first guiding element 13, allows gentle contact with the first abutment and allows to minimize friction forces generated between the leaf 38 and the framework 2.

[0096] Such movement of the leaf 38 is further assisted by the at least one wheel 62 and by the at least one fork 61, whose inclination with respect to the vertical direction tends to decrease.

[0097] Figure 5 illustrates an intermediate step of the process for closing the door or window 1, in which the first internal wing 40a of the fourth post 39a is in contact with the first gasket 7, while the bolt 48 of the lock is partially accommodated within the cavity 15 formed inside the closure block 14.

[0098] Final closure of the door or window 1 can therefore occur by means of an action on the first handle 46, by means of which the stem 48b of the bolt 48 is inserted within the first guide 15a provided in the closure block 14.

[0099] In this manner, the second head 48d of the bolt 48 is accommodated within the cavity 15, while its flared face 48e abuts against the second wall 15d, which has a similar flared portion, of the closure block 14.

[0100] An action on the handle entails a downward movement of the second head 48d, which by sliding on the second wall 15d places the fourth post 39a of the leaf 38 adjacent to the closure block 14.

[0101] Simultaneously, the stem 48d, by sliding within the first guide 15a, forces said fourth post 39a of the leaf 38 against the first gasket 7, defining the fully closed position of the door or window 1.

[0102] In this manner, the leaf 38 is subjected to an additional thrust, which acts so as to force the first wing 40a of the fourth post 39a against the vertical portion of the first gasket 7, which is supported by the second internal wing of the first perimetric post 2a, until a chosen compression of said first gasket is achieved, said compression being intended to achieve high impermeability of the door or window to atmospheric agents.

[0103] The closure block 14 can be coupled alternatively to the first perimetric post 2a by being rotated through 180°, so that the first guide 15a is arranged upward, in which case an action on the handle aimed at closing the door or window must impart an upward movement to the second head 48d.

[0104] Simultaneously with what occurs at the first perimetric post, during the closure process the second abutment 53, which protrudes from the fifth post 39b, makes contact with the second guiding element 37, which protrudes from the third intermediate post 2e, and is guided by it inside the eighth seat 36, so that the face 52 of the fifth post 39b is forced against the portion of the first gasket 7 that is supported by the third post 2e.

[0105] By virtue of the rigidity of the frame 39, the third and fourth cross-members 39c and 39d are simultaneously forced against the portions of the first gasket 7 that are supported respectively by the first and second perimetric cross-members 2c and 2d, so that the frame adheres along its entire perimeter against the first gasket 7.

[0106] Further, since the first tubular gasket 7 is arranged along a closed path, the force applied by the leaf 38 against it produces a reaction on the part of the air contained inside it, which produces excellent adhesion of said first gasket to the frame 39.

[0107] In this manner, excellent insulation between the environment on the inside of the door or window 1 and the outside environment is achieved, since the passage of cold air or water from one to the other is hindered by the presence of the first gasket thus compressed against the frame 39.

[0108] In this closed position, the at least one fork 61 and the at least one wheel 62 are arranged along an approximately vertical direction.

[0109] The door or window is opened by means of a process that is the reverse of the one described for closing it, since a movement of the handle produces, by way of the action applied by the bolt 48 to the cavity 15 during disengagement from the closure block 14, a force that acts on the fourth post 39a so as to move the leaf 38 away from the first gasket 7, said action being performed in a first step also by the air contained inside the first gasket 7.

[0110] In this manner, the at least one fork 61 and the at least one wheel 62 are again inclined with respect to the vertical direction, so that the weight of the leaf 38 produces a moment that acts so as to tilt further the at least one fork 61 until it abuts against the third internal wing 54a of the ninth profiled element 54, moving the leaf 38 further away from the first gasket 7, until the actuation position is reached.

[0111] By way of the possibility to disconnect the leaf 38 from the first gasket 7 during opening and closure maneuvers, the sliding of said leaf is extremely easy, while its compression against said first gasket occurs only during the last step of closure, when the sliding of the leaf is practically nil.

[0112] By way of the fact that the sliding leaf, when it is in the actuation position, does not slide against the first gasket, the wear of said first gasket is extremely modest and so is the possibility of imparting permanent mechanical deformations thereto or of said gasket undergoing rapid degradation as a consequence of repeated closure and opening of the door or window.

[0113] It has thus been found that the invention has achieved the intended aim and objects, a door or window having been provided which is capable of offering excellent performance in terms of tightness against infiltration of air and water from the outside and in terms of resistance to the action of wind and corrosion, at the same time allowing easy opening and closure thereof.

[0114] Another object is to provide a door or window that allows to offer a highly constant performance during its use and to ensure a tightness against air and water infiltration that is adequate for the external climate conditions.

[0115] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0116] Thus, for example, it is possible to use a first gasket 7 of the internally pressurized type, so as to adapt the performance in terms of tightness against infiltrations of atmospheric agents according to the actual external environmental conditions.

[0117] The pressure that acts inside the first gasket can conveniently be adjusted when the door or window is closed, and depressurization of said first gasket can be performed when the handle is operated for opening, so that no additional effort is required from the user.

[0118] As an alternative to this solution, or in combination with it, it is possible to use, in order to provide the first tubular gasket 7, a gasket of the type that can be heated electrically, so as to minimize the possibility of forming condensation on the perimetric regions of the glass panes on the internal side of the door or window.

[0119] Proximate to the frame 39, especially if said frame is made of metallic material, the temperature of the glass panes may in fact reach, even on the side that faces the internal environment, values that are low enough to cause condensation of ambient moisture, a phenomenon that is avoided by the presence of heated gaskets arranged proximate to said region.

[0120] As an alternative to these solutions, or in combination with them, it is further possible to use, in order to provide the first tubular gasket 7, a gasket that comprises hygroscopic elements, which are constituted for example by a layer of material that has a high atmospheric humidity absorption capacity and is applied to one or more external surfaces of said gasket.

[0121] If the degree of humidity that is present in the air of the environment on the outside of the door or window tends to increase, the layer of hygroscopic material that is present on the gasket undergoes a substantial increase in volume caused by absorption of part of said humidity.

[0122] The gasket is thus subjected to a further compression, accordingly increasing its insulation capacity simultaneously with the worsening of the external climate conditions, which is detected by way of the increase in the degree of humidity in the air.

[0123] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent according to specific requirements.

[0124] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

[0125] The characteristics indicated as advantageous, convenient or the like may also be omitted or replaced or be replaced with equivalents.

[0126] The disclosures in Italian Patent Application No. TV2004A000021 from which this application claims priority are incorporated herein by reference.

[0127] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of

example by such reference signs.

Claims

1. A door or window, particularly for buildings and/or watercraft, **characterized in that** it comprises at least one leaf, which cooperates with sliding and tilting means arranged inside a perimetric framework, means being provided for moving said at least one leaf along planes that are parallel thereto, means being further provided for temporarily locking said at least one leaf against a first gasket provided on said perimetric framework.

2. The door or window according to claim 1, **characterized in that** said perimetric framework comprises a first vertical perimetric post, a second vertical perimetric post, a third vertical post, a first lower perimetric cross-member, and a second upper perimetric cross-member, said third post being arranged in a position that is approximately intermediate between said first and second perimetric posts and being shallower than said posts and preferably aligned with them on the internal side of said door or window.

3. The door or window according to claims 1 and 2, **characterized in that** said first perimetric post is constituted by a first profiled element, on which there is a first longitudinal seat that is preferably formed by a first external flap and by a second internal flap, said flaps being mutually parallel and protruding toward the internal opening of said door or window, said second flap supporting a vertical portion of a first preferably tubular gasket that is accommodated within said first longitudinal seat.

4. The door or window according to claims 1 and 3, **characterized in that** said first gasket has, at rest, an approximately rectangular cross section, in which the longest side directed toward the inside of said first seat has a convex shape.

5. The door or window according to claims 1 and 4, **characterized in that** it comprises a second profiled element, which is coupled to the bottom of said first seat, protrudes inside it in a direction that is substantially parallel to said first and second flaps, and runs vertically along approximately the entire length of said first perimetric post.

6. The door or window according to claims 1 and 5, **characterized in that** a second seat is formed longitudinally to said second profiled element and proximate to said first gasket, has a circular cross-section and has an opening along a generatrix in order to accommodate a first guiding element, which is constituted by a cylinder that can be inserted longitudinally, is free to rotate in said second seat, and protrudes from it with part of its cross-section.

7. The door or window according to claims 1 and 6, **characterized in that** said opening provided in said second seat is obtained adjacent to said second flap and is inclined with respect to it by a preset angle towards the internal opening of said door or window.

8. The door or window according to claims 1 and 7, **characterized in that** said second profiled element supports, approximately at the central region of said first perimetric post, a closure block that protrudes parallel to said first and second flaps toward the internal opening of said door or window and is constituted by a box-like body that forms internally a cavity that is open at the front and optionally along one of its sides.

9. The door or window according to claims 1 and 8, **characterized in that** a first preferably rectilinear guide is formed below said cavity, its first parallel and straight side walls being inclined with respect to the vertical direction so as to approach said second flap and said first gasket as they descend vertically.

10. The door or window according to claims 1 and 9, **characterized in that** the thickness of said first walls increases toward the inside of said cavity as they descend, a second wall being thus formed inside said cavity and being inclined toward the inside of said cavity and delimiting the perimeter of said first guide.

11. The door or window according to claims 1 and 10, **characterized in that** said second wall slopes toward said first side walls so as to form a flared portion that surrounds perimetrically said first guide.

12. The door or window according to claims 1 and 11, **characterized in that** said second perimetric post is constituted by a third profiled element on which there is a third longitudinal seat that is formed by a third external flap and by a fourth intermediate flap, which are parallel to each other and to said first and second flaps and are directed toward the internal opening of said door or window and are arranged respectively at said first and second flaps and at said first and third seats and face each other.

13. The door or window according to claims 1 and 12, **characterized in that** said third profiled element comprises a fifth internal flap, which is parallel to said fourth flap and forms with it a fourth seat that

is narrower than said first and third seats.

14. The door or window according to claims 1 and 13, **characterized in that** said first and second perimetric posts are connected in a lower region by means of said first perimetric cross-member, which is constituted by a fourth profiled element, which has an approximately L-shaped cross-section and forms a fifth longitudinal seat that is open and arranged horizontally and is delimited vertically by a third vertical wall and by a first base that is adjacent to said third vertical wall.

15. The door or window according to claims 1 and 14, **characterized in that** said third vertical wall supports, along a portion that is adjacent to said first perimetric post, a horizontal portion of said first gasket, a third tab protruding vertically upward from said first base and supporting a second guide, preferably constituted by a rail in which the upper head has a curved profile that is preferably constituted by a circular arc.

16. The door or window according to claims 1 and 15, **characterized in that** said second perimetric cross-member connects in an upper region said first, second and third perimetric posts and is constituted by a fifth profiled element on which there is a sixth longitudinal seat that is preferably formed by a sixth external flap and by a seventh internal flap, which are parallel to each other and protrude vertically downward, said seventh flap supporting, along a portion that is adjacent to said first perimetric post, a horizontal portion of said first gasket.

17. The door or window according to claims 1 and 16, **characterized in that** said first and second perimetric posts and said first and second perimetric cross-members are connected to each other at their ends, said first and third and fifth and sixth seats being mutually adjacent so as to form a single perimetric seat that is continuous along the entire profile of said perimetric framework.

18. The door or window according to claims 1 and 17, **characterized in that** said third post is constituted by a sixth profiled element from which an eighth flap and a ninth flap protrude horizontally and are directed toward said second perimetric post, said flaps being mutually parallel, so as to form a seventh seat that is approximately as wide as said fourth seat and faces said fourth seat, so as to accommodate a first fixed glass pane, which is constituted by a double-glazing unit or by a transparent or opaque panel made of another material.

19. The door or window according to claims 1 and 18, **characterized in that** a preferably L-shaped tenth flap is provided proximate to said glass pane on a face of said third post that is directed toward the environment that lies outside said door or window and supports, at its free end directed toward said second perimetric post, a fifth tab, which forms an eighth seat that has a circular cross-section and is provided with an opening along a generatrix in order to accommodate a second guiding element constituted by a cylinder that can be inserted longitudinally and so that it can rotate freely in said eighth seat and protrudes from it along part of its cross-section.

20. The door or window according to claims 1 and 19, **characterized in that** said opening provided in said eighth seat is provided adjacent to said third post and is inclined with respect to it by a preset angle toward said second post.

21. The door or window according to claims 1 and 20, **characterized in that** said tenth flap forms, in collaboration with said surface of said third post that is directed outward, a ninth seat that is open outward.

22. The door or window according to claims 1 and 21, **characterized in that** said surface of said third post that is directed outward supports a vertical portion of said first gasket, which is arranged along said first perimetric post and said third post, and along a portion of said first and second perimetric cross-members, providing a closed path.

23. The door or window according to claims 1 and 22, **characterized in that** said leaf comprises a frame that is preferably constituted by a fourth vertical post, by a fifth vertical post, by a third upper cross-member and by a fourth lower cross-member.

24. The door or window according to claims 1 and 23, **characterized in that** said fourth post is constituted by a seventh profiled element, which has an approximately H-shaped cross-section obtained from a first internal wing and from a second external wing, which are parallel to each other and are connected by at least one first central body that lies transversely to them so as to form a ninth seat, which is directed toward the outside of said frame, and a tenth seat, which is directed toward the inside of said frame.

25. The door or window according to claims 1 and 24, **characterized in that** said first wing has, at its first free end that is directed toward the outside of said frame, means for moving said at least one leaf along planes that are parallel to it, said means comprising a first abutment, which is formed by a first vertical surface that is arranged on the internal side of said first wing inside said ninth seat, said first vertical surface being inclined with respect to said first wing

so as to move away from said first wing toward said second free end, which is directed toward the inside of said frame, of said first wing.

26. The door or window according to claims 1 and 25, **characterized in that** the thickness of said fourth post, determined by the distance between said first and second wings, is lower than the width of said first seat provided on said first perimetric post.

27. The door or window according to claims 1 and 26, **characterized in that** said fifth post is constituted by an eight profiled element on which an eleventh seat is formed, said seat being approximately as wide as said tenth seat, preferably formed by two eleventh flaps, which are parallel and directed toward the inside of said frame.

28. The door or window according to claims 1 and 27, **characterized in that** the thickness of said fifth post is equal to the thickness of said fourth post, which is smaller than the width of said third seat provided in said third post.

29. The door or window according to claims 1 and 28, **characterized in that** said means for moving said at least one leaf along planes that are parallel to it comprise a second abutment that protrudes, at its end directed toward the outside of said frame, from a face of said fifth post that is directed toward the internal environment delimited by said door or window, said second abutment being hook-shaped and being formed by a second vertical surface that is inclined with respect to the plane of said leaf at a preset angle, **in that** said second surface moves away from said fifth post in the direction of said fourth post and is parallel to said first surface.

30. The door or window according to claims 1 and 29, **characterized in that** said fourth and fifth posts are interconnected in a lower region by said third cross-member, which is constituted by a ninth profiled element, which preferably has an approximately H-shaped cross-section obtained from a third internal wing and a fourth external wing, which are parallel to each other and are joined by at least one second central body that lies transversely thereto, said wings forming, at the opposite ends of said cross-section, a twelfth upper seat, which is directed toward the inside of said frame, and a thirteenth lower seat, which is directed toward the outside of said frame, in order to accommodate said sliding and tilting means.

31. The door or window according to claims 1 and 30, **characterized in that** said sliding and tilting means comprise a third abutment, which is L-shaped and is rigidly coupled along a first portion below said second central body of said ninth profiled element, a second portion thereof protruding vertically downward from said second central body approximately parallel to said third and fourth wings.

32. The door or window according to claims 1 and 31, **characterized in that** said sliding and oscillation means comprise at least one fork, which is rigidly rotationally coupled to said third abutment at the free end of said first portion by means of at least one hinge, said at least one fork being approximately U-shaped and being arranged approximately vertically and abutting, with a fifth external wing thereof, against said second portion of said third abutment, so as to pass from a first position, also termed closure position, in which said fork is arranged vertically and abuts, with its fifth wing, against said second portion of said third abutment, to a second position, also termed actuation position, in which it is inclined, abutting with its said sixth wing against said third internal wing of said ninth profiled element.

33. The door or window according to claims 1 and 32, **characterized in that** said at least one fork supports at least one wheel, which has a concave perimetric profile that matches the profile of said upper head of said rail provided on said first perimetric cross-member.

34. The door or window according to claims 1 and 33, **characterized in that** said fourth cross-member is constituted by a tenth profiled element, on the lower face of which there is a fourteenth seat that is as wide as said tenth, eleventh and twelfth seats inside which the perimetric ends of a second glass pane can be accommodated.

35. The door or window according to claims 1 and 34, **characterized in that** the thickness of said third and fourth cross-members is equal to the thickness of said fourth and fifth posts and is smaller respectively than the width of said fifth and sixth seats, provided respectively in said first and second perimetric cross-members, said leaf being associable with said perimetric framework by inserting the upper end of said fourth upper cross-member in said sixth seat formed in a lower region on said second perimetric cross-member, and by accommodating the lower end of said lower third cross-member within said fifth seat, formed in said first perimetric cross-member, said at least one wheel resting on said second guide (25).

36. The door or window according to claims 1 and 35, **characterized in that** said means for temporarily locking said at least one leaf comprise a lock provided with a closure bolt, which can be operated

preferably by means of a first external handle and a second internal handle, said bolt being fixed, preferably by means of a plate, to said first central body of said seventh profiled element inside said ninth seat.

37. The door or window according to claims 1, 8 and 36, **characterized in that** said bolt is composed of a stem that protrudes at right angles from said plate toward said closure block, is shaped like a parallelepiped and has two flat and parallel walls that are inclined with respect to the vertical direction so that they approach said second flap as they descend vertically.

38. The door or window according to claims 1 and 37, **characterized in that** the thickness of said stem, determined by the distance between said two fourth parallel walls, in order to allow the insertion of said stem, is slightly less than the distance between said first side walls of said first guide provided on said closure block, its inclination matching the inclination of said first side walls of said first guide.

39. The door or window according to claims 1 and 38, **characterized in that** the free end of said stem supports a second head, which is preferably constituted by a plate that is arranged according to the inclination of said stem with respect to the vertical direction and in which the face that is directed toward said plate has a flared portion, which is orientated so that its thickness decreases from the center toward the perimeter.

40. The door or window according to claims 1 and 39, **characterized in that** said plate is inclined with respect to a vertical plane, **in that** it moves away from said plate as it descends, said inclination being equal to the inclination of said second wall that surrounds said first guide, said flared portion of said face that is directed toward said plate matching the flared portion of said second wall.

41. The door or window according to claims 1 and 2, **characterized in that** said first, second and third perimetric posts, said first and second perimetric cross-members, said fourth and fifth posts and said third and fourth cross-members are constituted by one or more partial profiled elements or by a single profiled element.

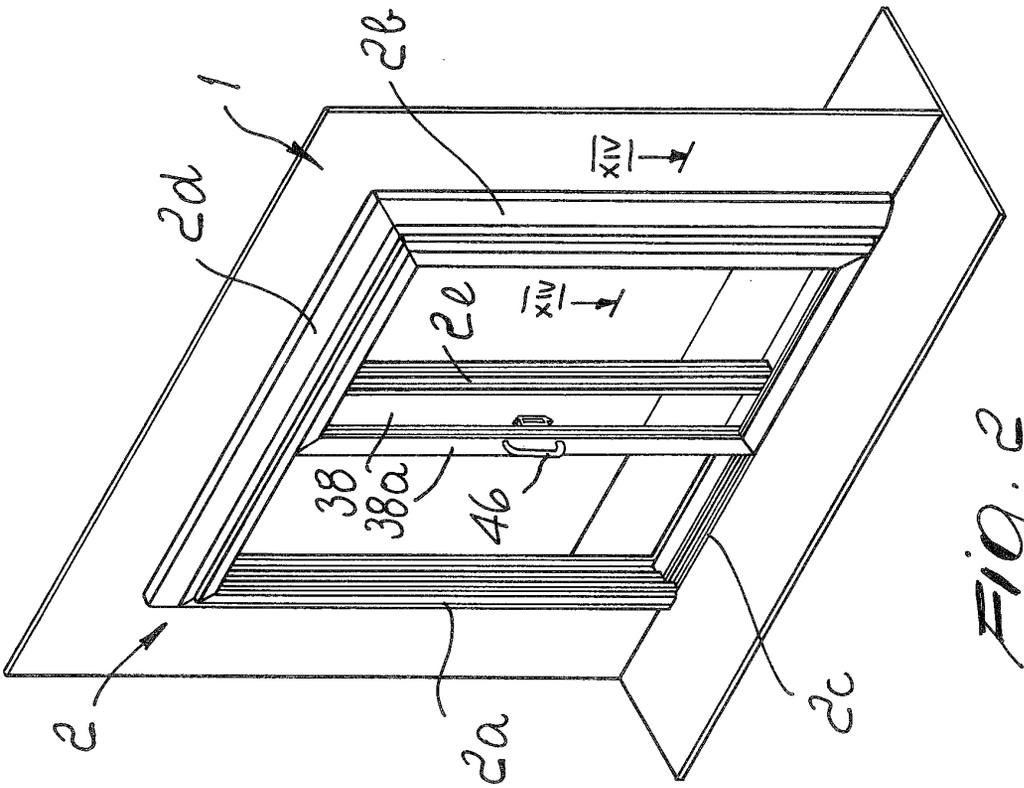
2b
1
2d
XIV
XIV
2e
38
38a
46
2
2a
2c

Fig. 2

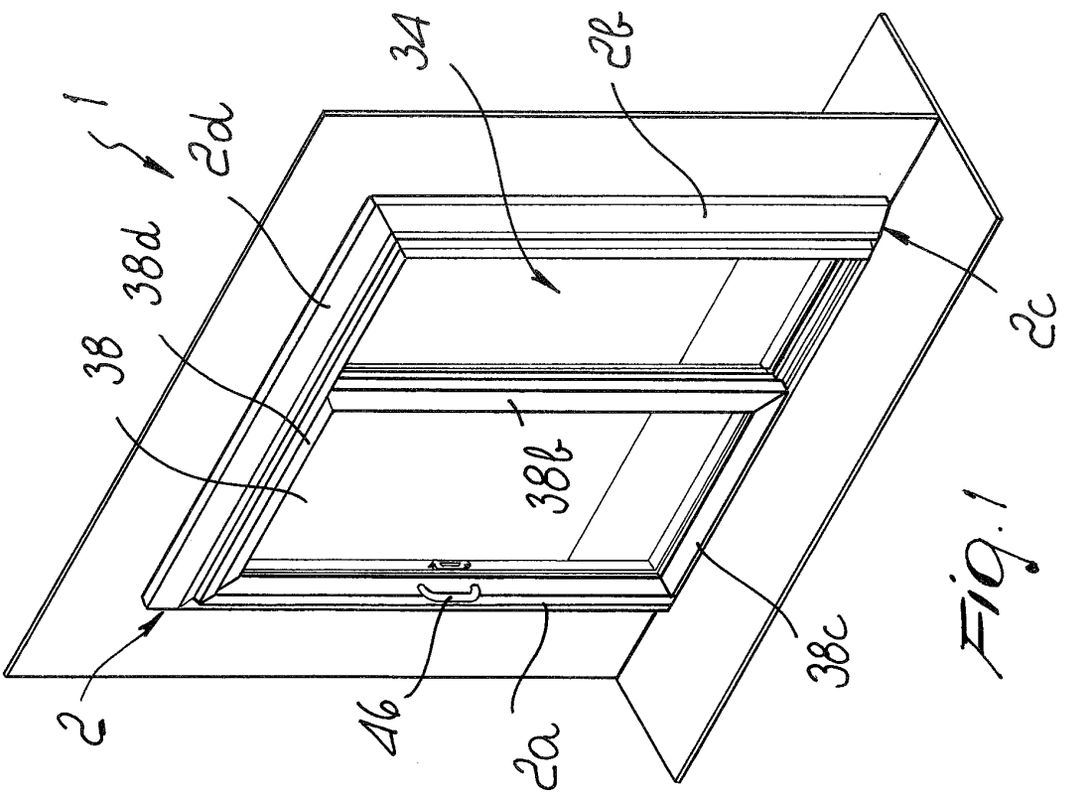
34
2b
1
2d
38d
38
38b
2c
2
46
2a
38c

Fig. 1

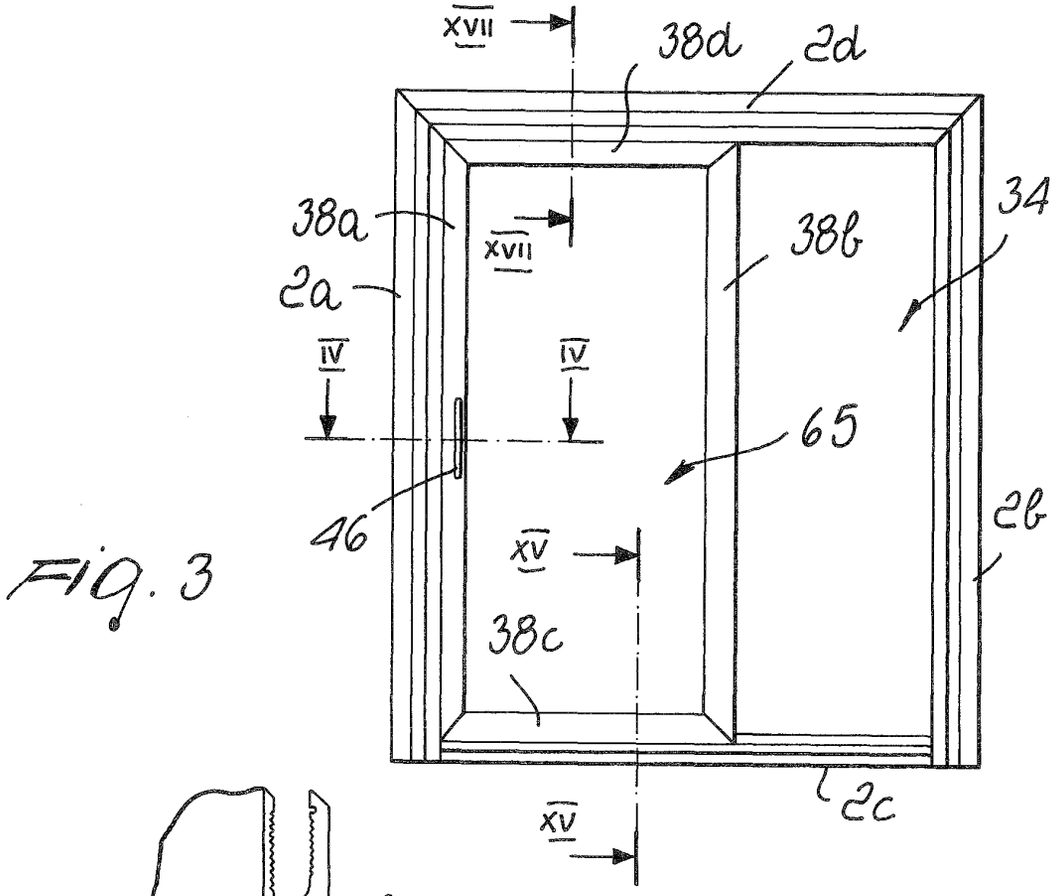
XVII
38d
2d
38a
XVII
38b
34
2a
IV
IV
65
46
2b
XV
38c
2c
XV

Fig. 3

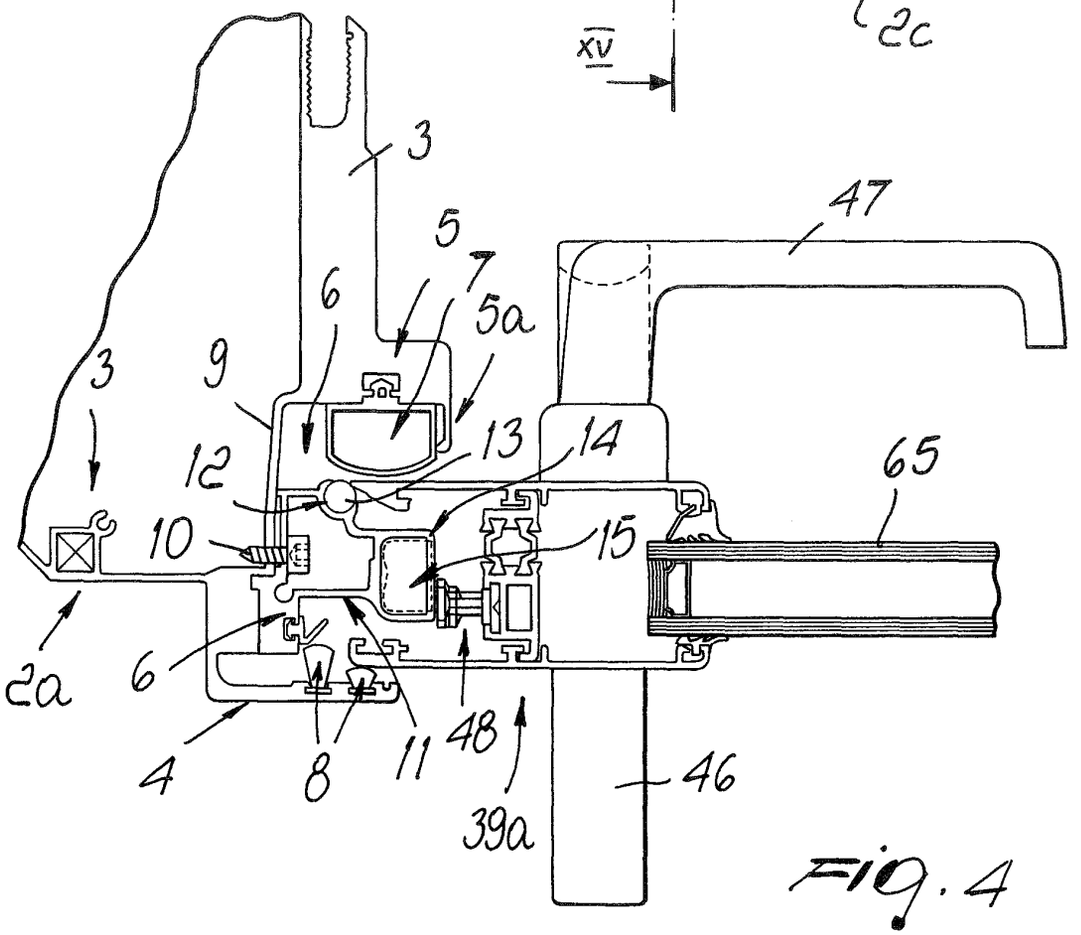
3
47
5
7
6
5a
3
9
13
14
65
12
10
15
2a
6
4
8
11
48
46
39a

Fig. 4

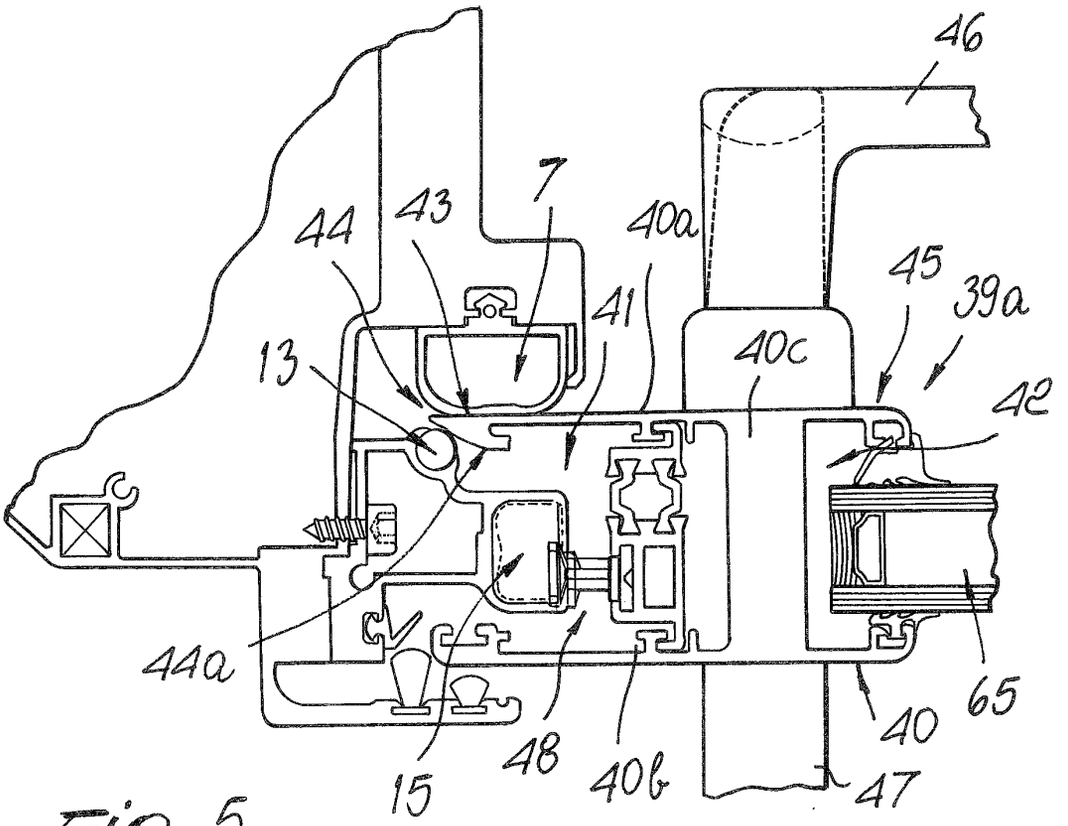
46
44
43
7
40a
45
39a
41
13
40c
42
44a
65
40
48
40b
15
47

Fig. 5

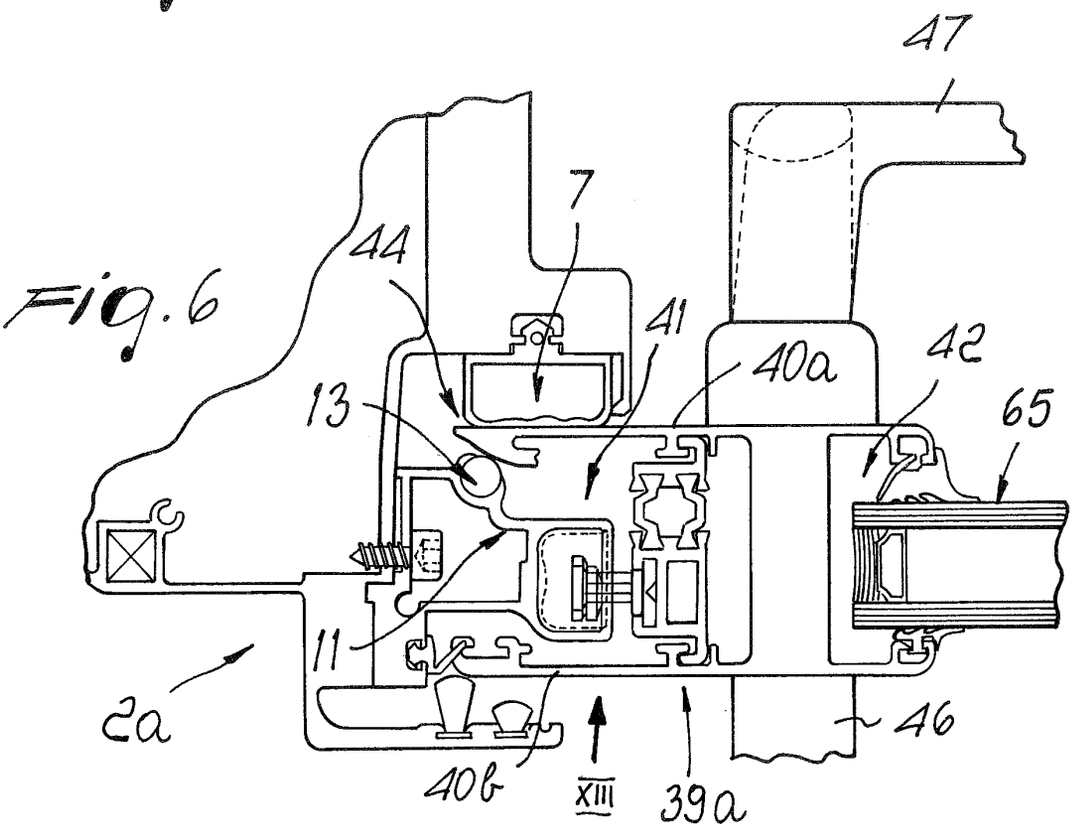
47
7
44
41
42
40a
13
65
11
2a
46
40b
XIII
39a

Fig. 6

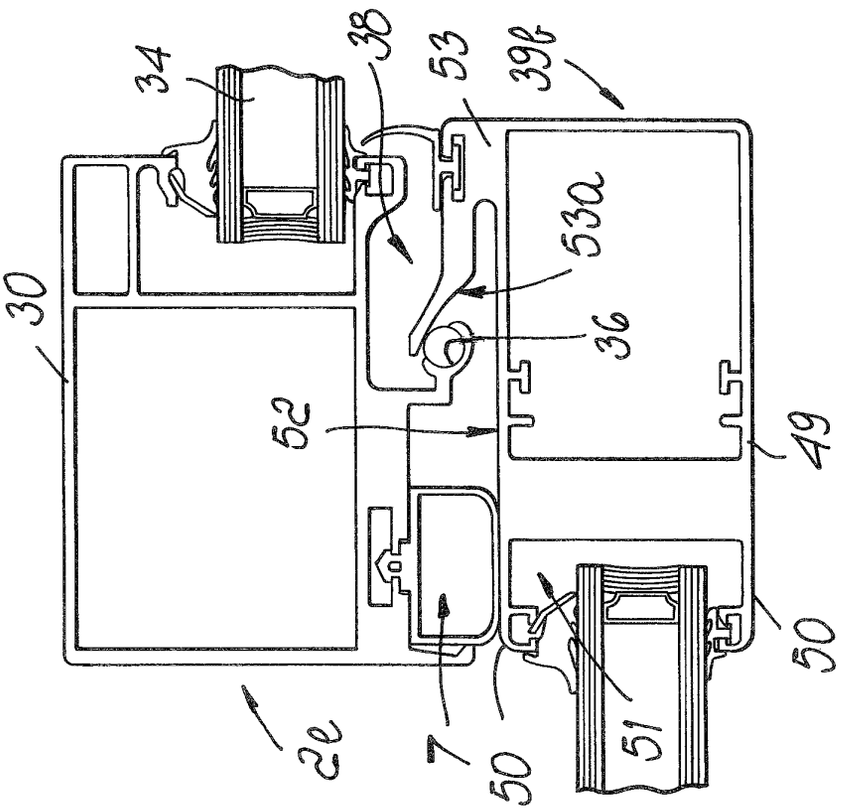
34
38
53
39b
53a
30
36
52
49
50
2e
7
50
51

Fig. 8

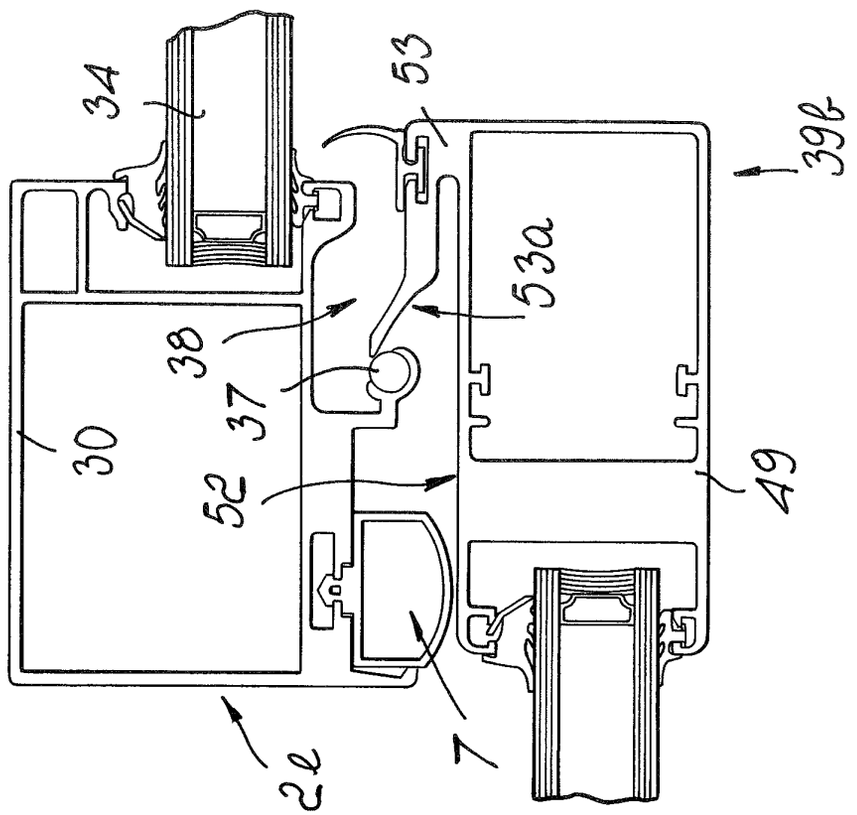
34
53
39b
53a
38
37
30
52
49
2e
7

Fig. 7

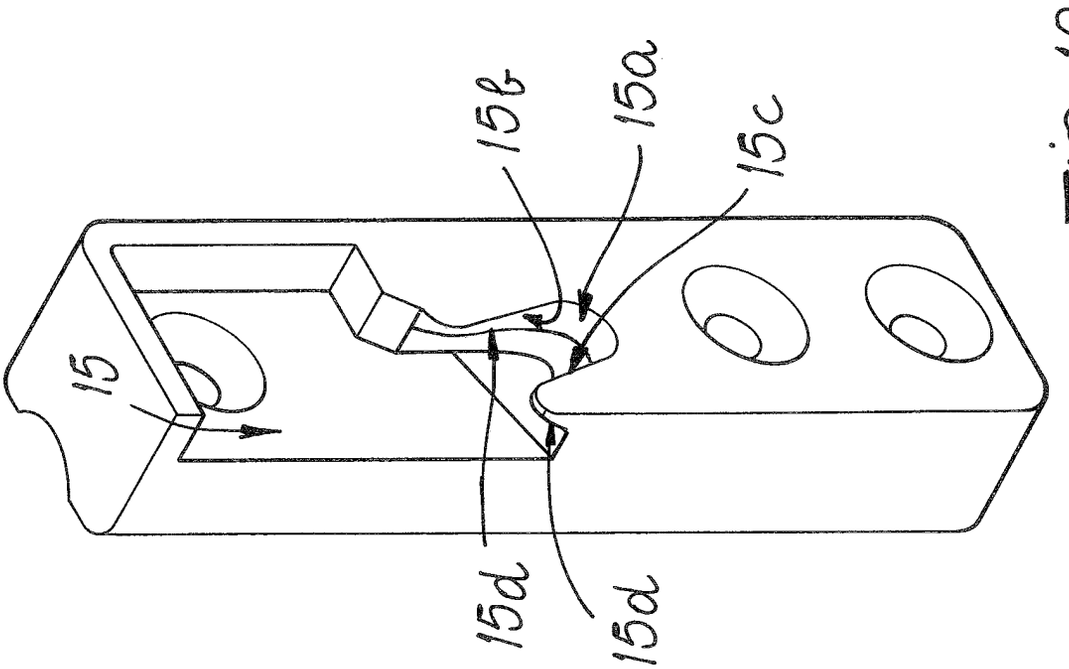
15b
15a
15c
15
15d
15d

Fig. 10

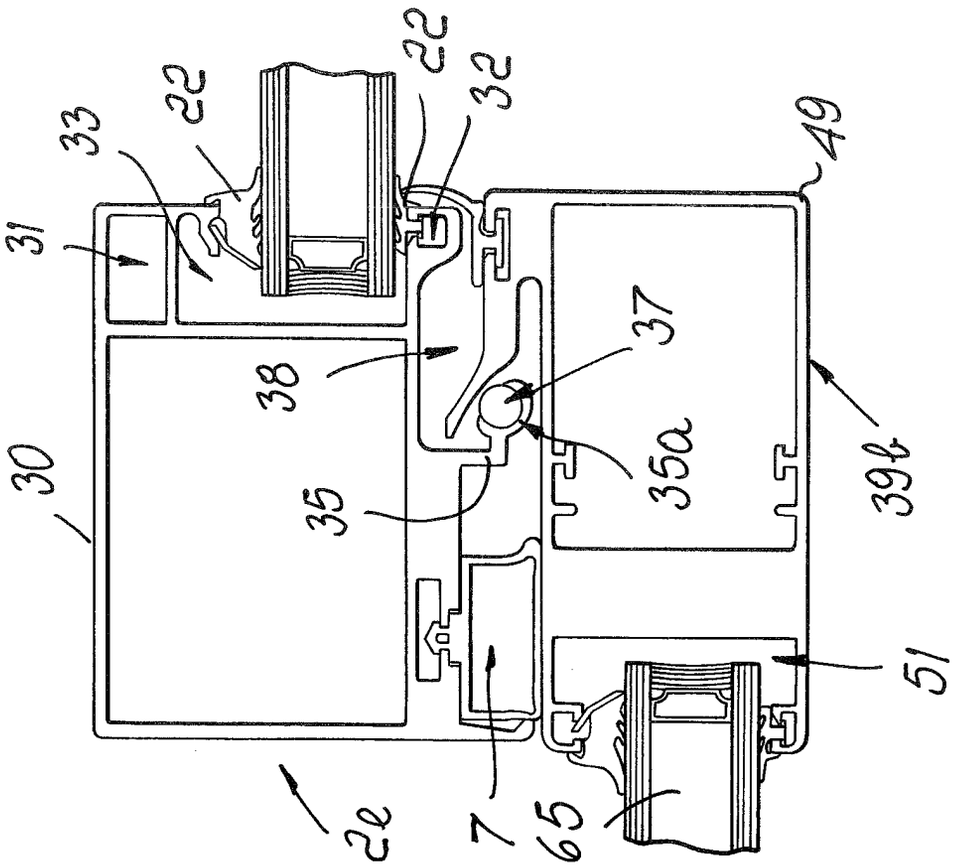
22
33
22
32
49
31
37
38
30
35
35a
39b
51
2e
7
65

Fig. 9

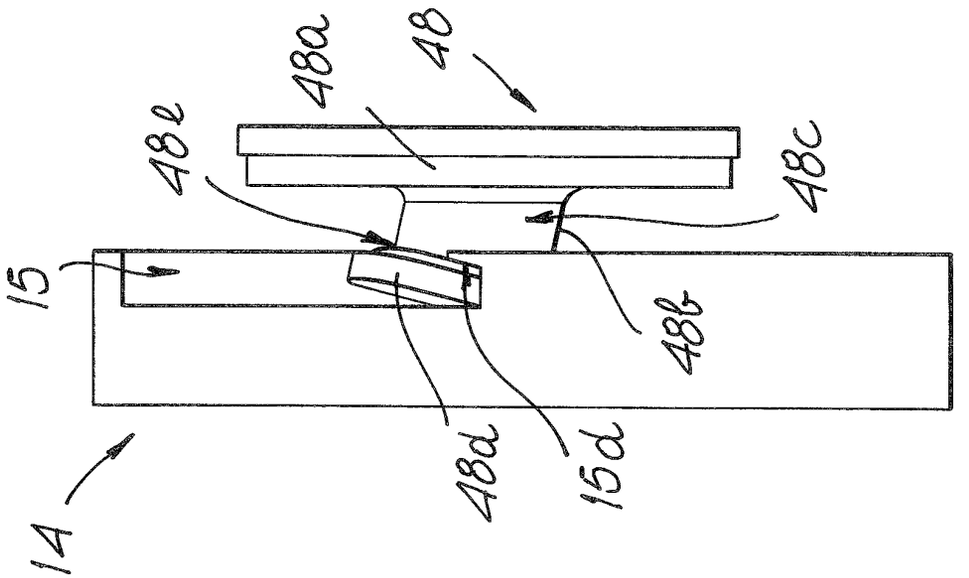

Fig. 13

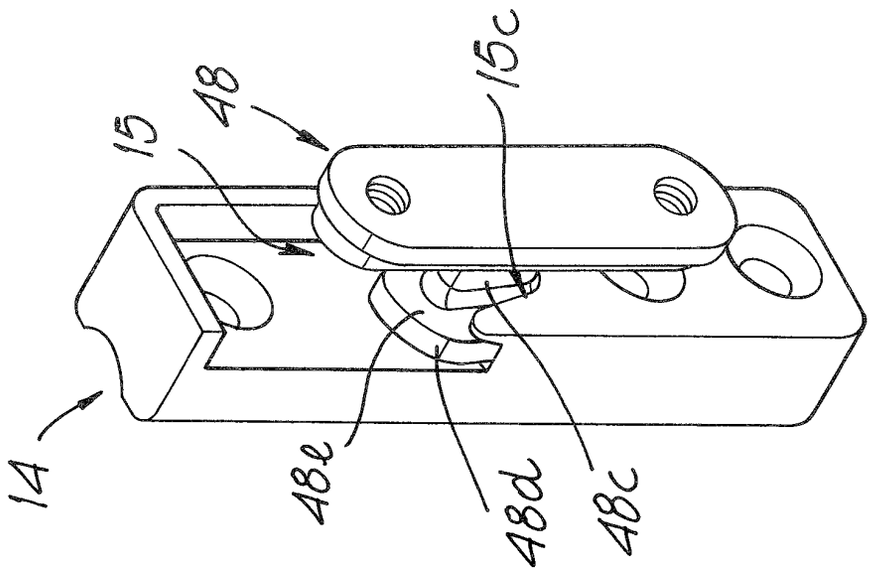

Fig. 12

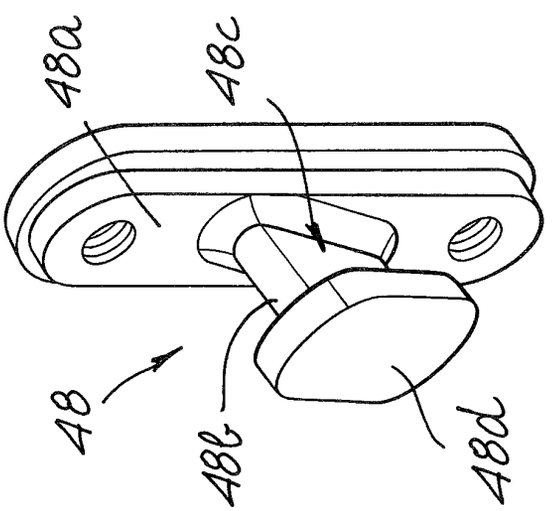

Fig. 11

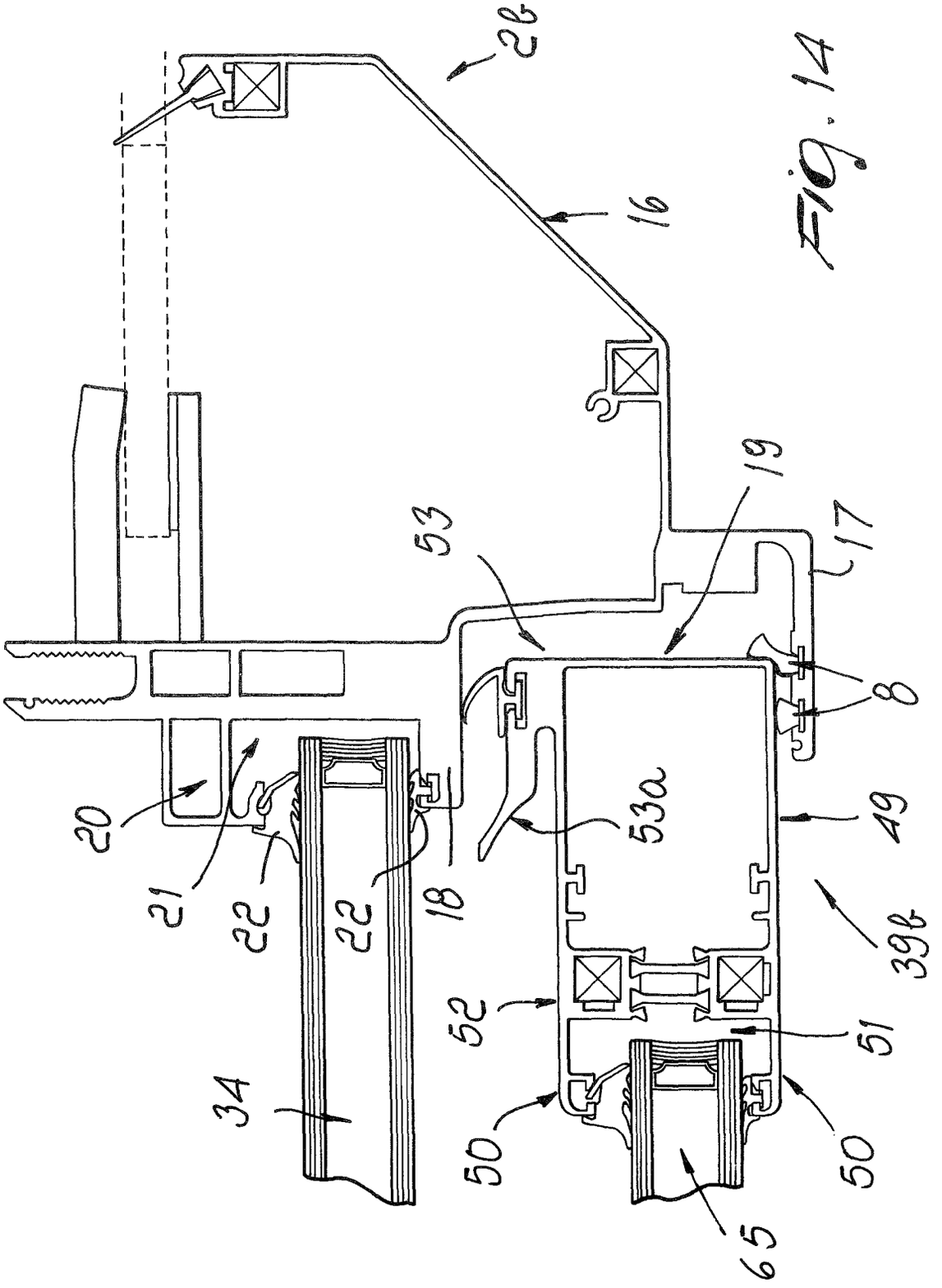

Fig. 14

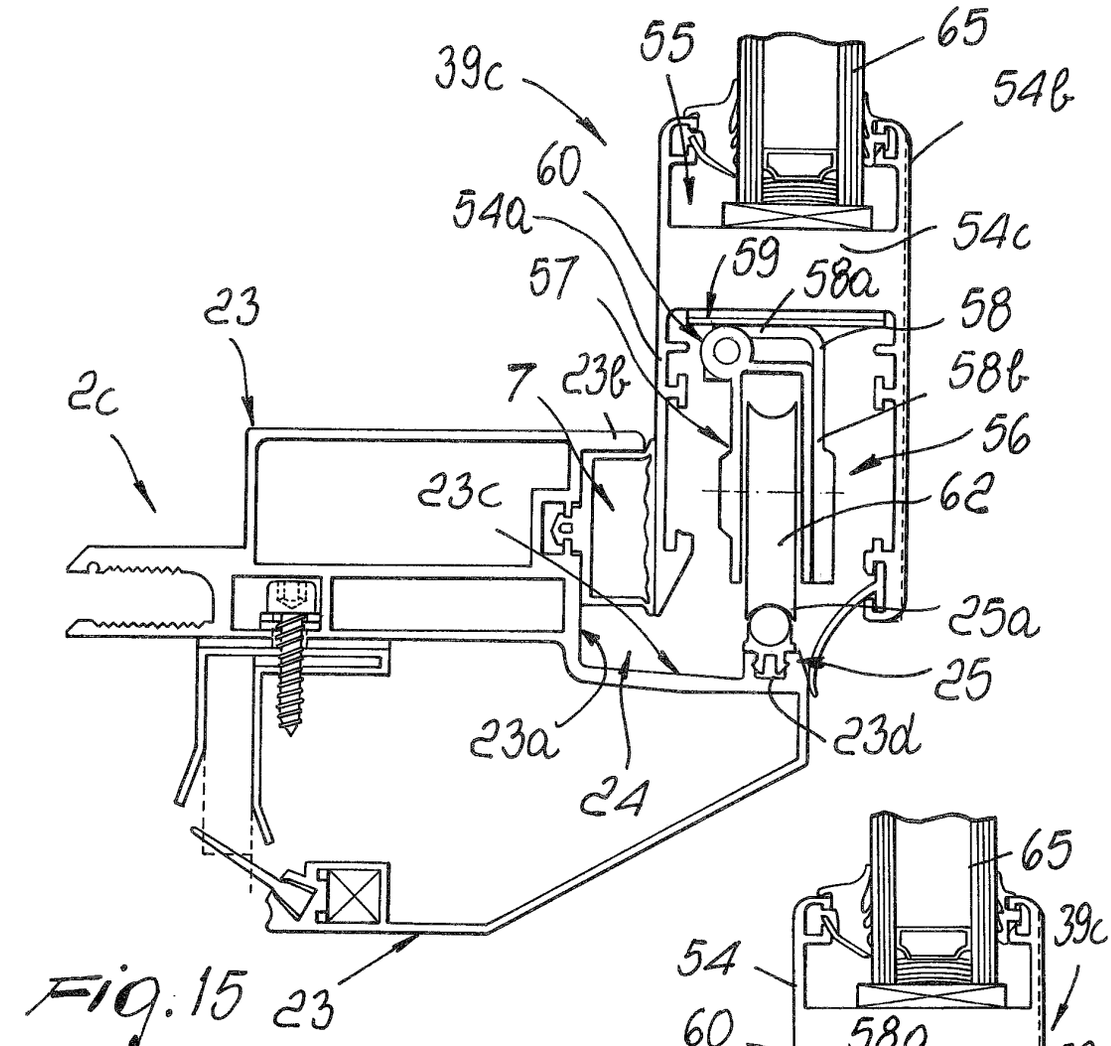
39c
55
65
54b
60
54a
54c
59
58a
57
58
23
58b
7
23b
56
2c
23c
62
25a
25
23a
23d
24
23

Fig. 15

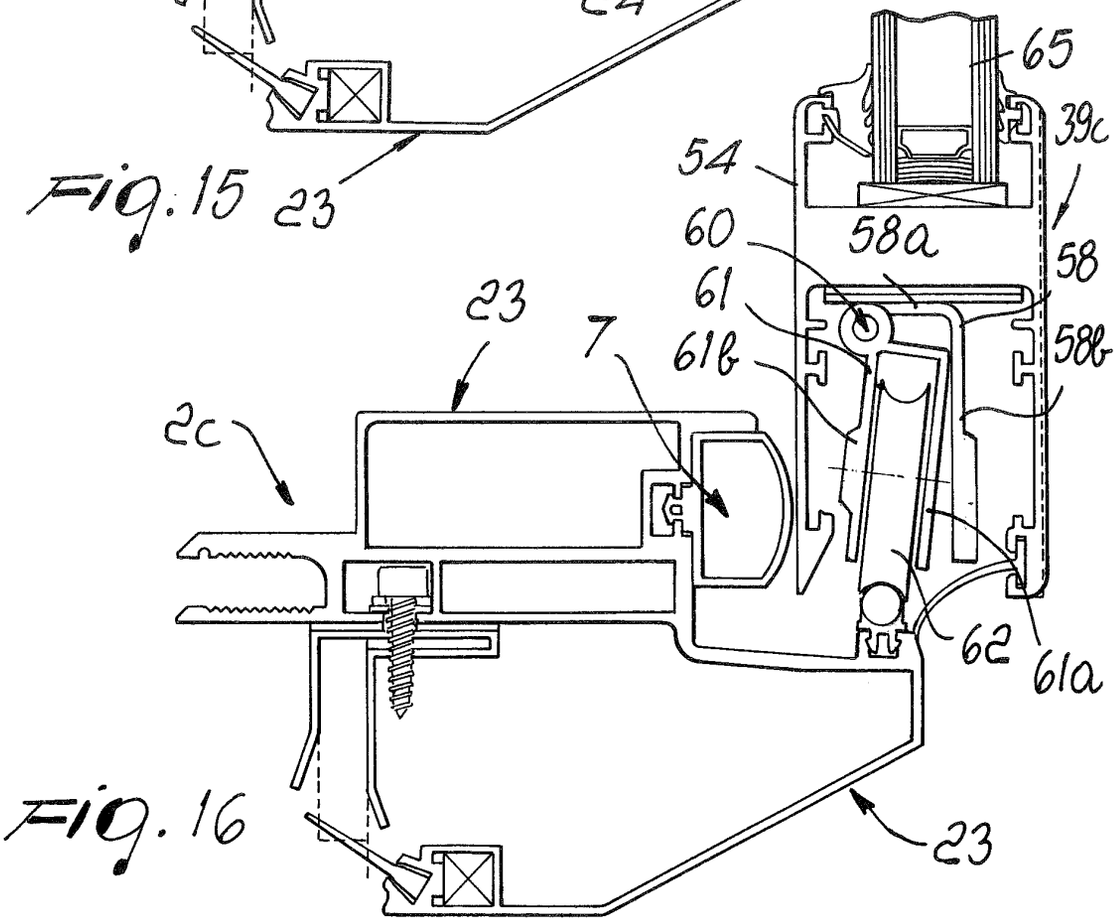
65
39c
54
58a
60
58
61
58b
61b
23
7
2c
62
61a
23

Fig. 16

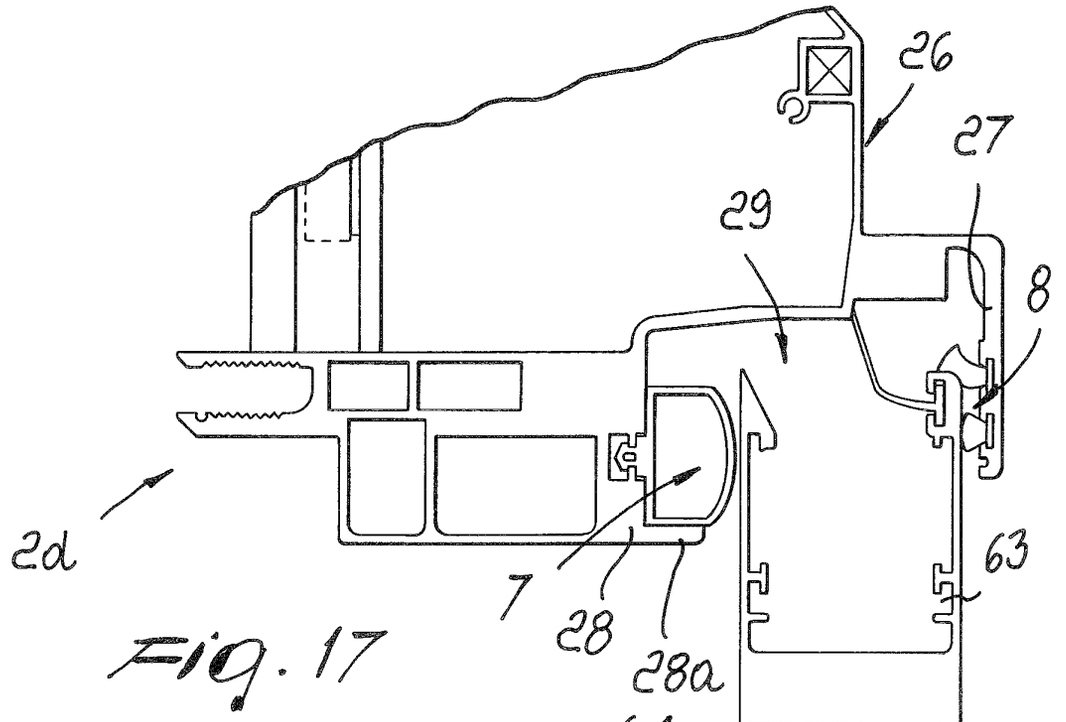

Fig. 17

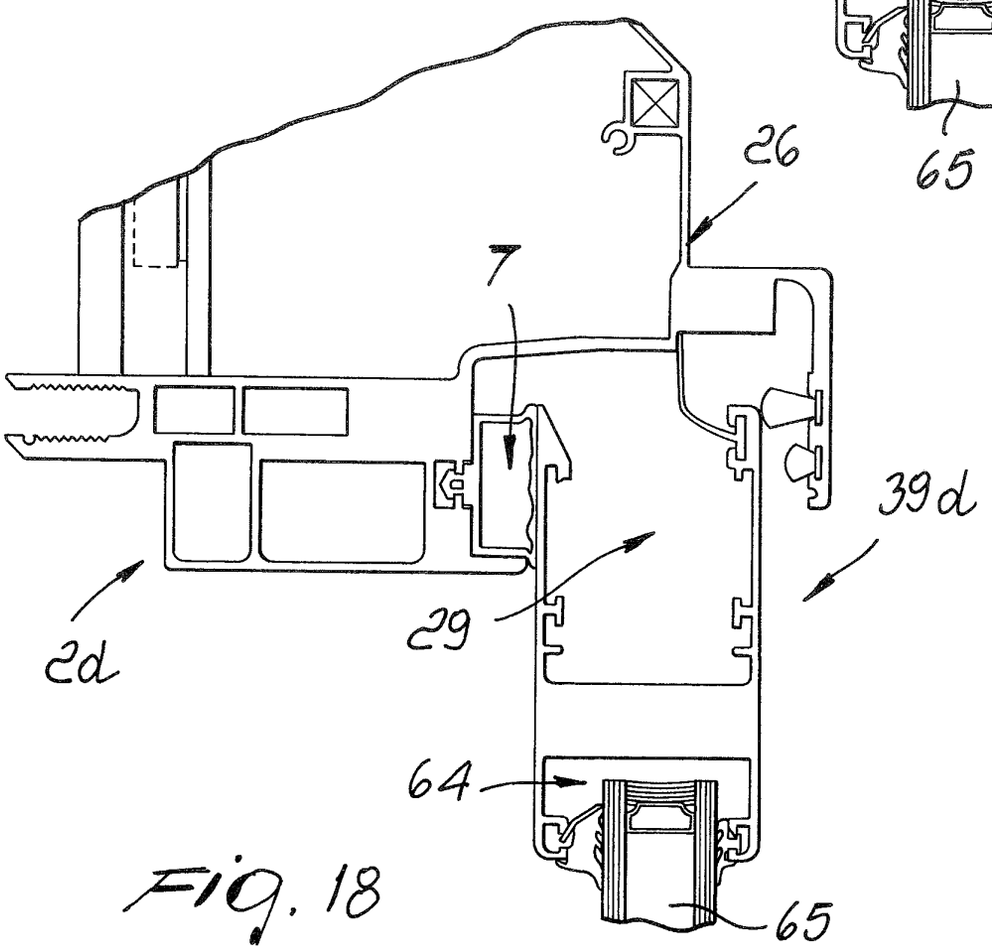

Fig. 18