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(54) **MOVABLE PANEL SYSTEM**

(57) The invention relates to a movable panel system (1) comprising a lower guide (2) restable on a ground plane (P), having an extension along a guide axis (G-G) and comprising at least one rail (20).

The movable panel system (1) comprises at least one panel (4a), preferably made of glass, supported on the lower guide (2), and rotating and sliding means comprising a base (6) fixed to the lower guide (2) and a carriage assembly (5) engaged at the lower edge (42a) of the panel (41).

The carriage assembly (5) comprises a supporting body (50), at least one wheel (51) engageable in a sliding manner to the rail (20), and a lifting device (52).

The panel (4a) is configurable along the guide axis (G-G) in a sliding configuration, in which the at least one wheel (51) engages the rail (20), and in an end configuration, in which the lifting device (52) engages the base (6), the at least one wheel (51) is lifted off the rail (51), and the panel (4a) is movable about a vertical axis (V-V).

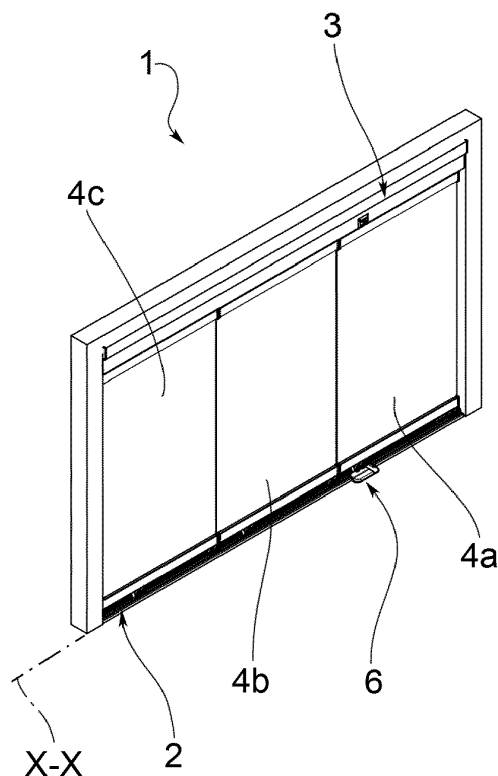


FIG.1

Description

[0001] The subject of the present invention is a movable panel system.

[0002] In the prior art, there are known solutions for movable panel systems that, according to requirements, make it possible to close off an environment, for example a veranda.

[0003] In particular, movable panel systems are known which are configurable in a closing configuration, in which the panels are arranged longitudinally and separate the two adjacent environments, and a packaged configuration, in which the panels are rotated and mutually adjacent, in such a way as to connect the two environments.

[0004] In the known embodiments, the panels are typically made of glass and are large in size, allowing for natural lighting of the environment, even with the panels in the closed position.

[0005] Within the sector, movable panel systems are known wherein said panels are engaged to an upper guide which is in turn attached to a ceiling or a beam whereupon, therefore, the full force of the weight of the panels is entirely born.

[0006] A typical problem of the known solutions is linked to the dimensions of the panels, which are increasingly greater both longitudinally and vertically. In fact, the increase in the size of the panels and the support and handling of the panels corresponds to an increase in the criticality of the design, production and operation of the support and handling systems.

[0007] Additionally, for some types of installations, for example for outdoor use, the characteristics of the building or the load-bearing structure do not permit the installation of known movable panel systems. In fact, large panels cause structural problems with pergolas, ceilings and/or upper beams.

[0008] The object of the present invention is to present a movable panel system that meets the aforementioned needs and overcomes the aforementioned disadvantages.

[0009] This object is achieved by the movable panel system claimed in claim 1. The claims dependent on these request protection for further features and entail further technical benefits.

[0010] Further features and advantages of the invention will be made readily apparent from the following description of preferred embodiment examples thereof, provided purely by way of non-limiting example, with reference to the accompanying figures, in which:

- Figures 1, 1a and 1b show a perspective view of the movable panel system in accordance with the present invention, according to a preferred embodiment, respectively in a closing configuration, in an intermediate opening configuration and in a packaged configuration;
- Figure 2 shows a side view of the movable panel system in Figure 1a;

- Figure 2a represents an enlarged detail of Figure 2 and highlights the panel in the end configuration;
- Figure 2b shows a cross-sectional view of the movable panel system along the section plane A-A of Figure 2a;
- Figure 3 shows a perspective view of some components of the rotation and sliding means of the movable panel system, according to a preferred embodiment;
- Figure 3a represents a side view of the components of Figure 3 engaged to the panel and the lower guide;
- Figures 4 and 4a show an enlarged detail of the movable panel system, in accordance with the present invention, according to a preferred embodiment, at two different angular positions of the panel configured in the end configuration;
- Figure 5 shows a perspective view of a load-bearing carriage assembly of the movable panel system, according to a preferred embodiment;
- Figure 5a shows a cross-sectional view of the movable panel system, according to a preferred embodiment, along the sectional plane B-B of Figure 2.

[0011] With reference to the accompanying figures, a movable panel system according to the present invention is indicated in the entirety thereof with the numeral 1.

[0012] According to the present invention, the movable panel system 1 comprises a lower guide 2 restable on a ground plane P.

[0013] According to a preferred embodiment, the movable panel system 1 also comprises an upper guide 3 vertically spaced apart from the lower guide 2.

[0014] According to a preferred embodiment, the lower guide 2, and preferably also the upper guide 3, is implemented at least partially by means of extrusion, for example in metal.

[0015] According to the present invention, the lower guide 2 comprises a rail, or first rail, 20 extending along a guide axis G-G.

[0016] According to a preferred embodiment, the movable panel system 1 extends mainly along a longitudinal axis X-X, for example parallel to a ground plane P.

[0017] According to a preferred embodiment, the guide axis G-G is parallel to the longitudinal axis X-X.

[0018] According to a different preferred embodiment, the guide axis G-G is curvilinear and/or straight in sections and extends mainly along the longitudinal axis X-X.

[0019] According to a preferred embodiment, the lower guide 2 also comprises a second rail, or auxiliary rail, 21 parallel to and transversely spaced apart from the first rail 20.

[0020] According to a preferred embodiment, the rail 20, and preferably also the auxiliary rail 21, has a T-shaped cross-section, comprising a rail stem 24 and a convex rail head 25.

[0021] According to a preferred embodiment, the lower guide 2 comprises at least one anti-lifting profile 27. Preferably, each anti-lifting profile 27 implements an under-

cut.

[0022] Preferably, the lower guide 2 comprises two anti-lifting profiles 27 extending along the guide axis G-G, which profiles are mutually spaced apart transversely, defining therebetween a safety housing 270.

[0023] According to a preferred embodiment, each anti-lifting profile 27 has an inverted L-shaped cross-section, preferably mutually facing one another, as shown for example in Figure 2b.

[0024] According to a preferred embodiment, the at least one anti-lifting profile 27 is transversely comprised between the two rails 20, 21.

[0025] According to the present invention, the movable panel system comprises at least one panel 4a of planar shape, preferably made of glass, supported in a sliding manner on the lower guide 2. The panel 4a comprises a lower edge 42.

[0026] Preferably, the panel 4a comprises, in addition, an upper edge 43a engaged, for example partially housed, within a sliding seat of the upper rail 3.

[0027] In accordance with the present invention, the movable panel system 1 comprises rotation and sliding means. The rotation and sliding means allow the panel 4a to slide along the guide axis G-G and allow the panel 4a to rotate. In other words, the rotation means make it possible for the movable panel system to be configured in a closing configuration in the packaged configuration.

[0028] Said rotation and sliding means comprise a base 6 fixed to the lower guide 2.

[0029] Said rotation and sliding means comprise a carriage assembly 5 that engages below the panel 4a, particularly at the lower edge 42a.

[0030] The carriage assembly 5 comprises a solid supporting body 50, preferably made as one piece.

[0031] According to a preferred embodiment, the supporting body 50 comprises a carriage axis C-C, preferably along which it extends.

[0032] According to one embodiment, said carriage assembly 5 is connected to the lower edge 42a by means of a box-shaped connection body 9, in which the lower edge 42a and the supporting body 50 are at least partially housed.

[0033] According to a different embodiment, the supporting body is directly fixed to the panel 4a, preferably fixed to the lower edge 42a, by means of coupling means, for example transverse screws.

[0034] According to the present invention, the carriage assembly 5 comprises at least one wheel 51 hinged to the supporting body 50 and engageable in a sliding manner to the rail 20.

[0035] According to a preferred embodiment, the carriage assembly 5 comprises a plurality of wheels 51.

[0036] According to a preferred embodiment, the carriage assembly 5 comprises at least one pair of rails 51 mutually spaced transversely. Said pair of wheels 51 comprising a first wheel engageable in a sliding manner to the rail 20 and a second wheel 51 engageable in a sliding manner to the auxiliary rail 21, along the guide

axis G-G.

[0037] According to a preferred embodiment, the carriage assembly 5 comprises at least two pairs of wheels.

[0038] According to a preferred embodiment, the at least one wheel 51 comprises a concave profile comprising a concave wheel surface intended to be in contact in a sliding manner with the rail head 25.

[0039] According to the present invention, the carriage assembly 5 also comprises a lifting device 52 engaged to the supporting body 50.

[0040] According to the present invention, the panel 4a is configurable along the guide axis G-G in a sliding configuration and in an end configuration. In the sliding configuration, the at least one wheel 51 engages the rail 20 in a sliding manner and the panel 4a is movable along the guide axis G-G. In the end configuration, the lifting device 52 engages the base 6 in such a way that the at least one wheel 51 is lifted from the rail 51 and the panel 4a is movable about a vertical axis V-V.

[0041] According to a preferred embodiment, in the end configuration, the panel 4a is in the vicinity of a longitudinal end of the lower guide 2, for example in the vicinity of a side wall or an upright of the movable panel system.

[0042] According to a preferred embodiment, in the end configuration, the panel 4a is at a predefined longitudinal position along the lower guide 2, for example at a position distal from a side wall or an upright of the movable panel system.

[0043] According to a preferred embodiment, in the end configuration, the entire panel 4a is in a vertically lifted position in relation to the position in which it is in the sliding configuration, as shown for example in Figure 2a.

[0044] According to a preferred embodiment, the base 6 is engaged to the rail 20.

[0045] According to a preferred embodiment, the base 6 interrupts the rail 20 along the guide axis G-G, as for example shown in Figures 4 and 4a.

[0046] Preferably, beyond the base 6, the rail 20 continues along the guide axis G-G.

[0047] According to a different preferred embodiment, the base 6 at least partially covers the rail 20 along the guide axis G-G.

[0048] In a preferred embodiment, the base 6 is a solid body, preferably made as one piece.

[0049] According to a preferred embodiment, the base 6 has a planar shape, having a first dimension along the guide axis G-G and a second dimension in the transverse direction the rail 20. Preferably, the base 6 has a reduced vertical dimension compared to the other two dimensions.

[0050] According to a preferred embodiment, the base 6 has a predominant dimension along the guide axis G-G.

[0051] According to a preferred embodiment, the base 6 comprises a height difference element 61 that comprises a lower portion 610 and an upper portion 611. With respect to the ground plane P, the lower portion 610 is

positioned at a first distance D1 and the upper portion 611 is positioned at a second distance D2. Specifically, the second distance D2 is greater than the first distance D1.

[0052] This means that, from the ground plane P, the upper portion 611 is positioned higher than the lower portion 610.

[0053] In other further words, the lower portion 610 and the upper portion 611 are mutually spaced apart vertically and along the guide axis G-G.

[0054] According to a preferred embodiment, the height difference element 61 is a slope or a plane that is inclined with respect to the ground plane P, comprising a surface extending between the lower portion 610 and the upper portion 611.

[0055] According to a preferred embodiment, the lower portion 610 and the upper portion 611 are the lower edge and upper edge, respectively, wherebetween the height difference element 61 extends along the guide axis G-G, as shown as an example in Figure 3.

[0056] According to a different preferred embodiment, the height difference element 61 is a chamfered or joined free edge of the base 6.

[0057] According to a further preferred embodiment, the height difference element 61 is a step or a plurality of steps.

[0058] According to a preferred embodiment, the height difference element 61 is proximal to the first rail 20.

[0059] According to a preferred embodiment, the height difference element 61 is adjacent to the first rail 20 in a direction transverse the guide axis G-G.

[0060] According to a preferred embodiment, the height difference element 61 is housed between the rail 20 and the auxiliary rail 21.

[0061] According to a preferred embodiment, the upper portion 611 of the height difference element 61 is arranged in the vicinity of the rail head 25.

[0062] According to a preferred embodiment, with respect to the ground plane P, an upper end portion of the rail head 25 is placed at a third distance D3.

[0063] According to a preferred embodiment, the third distance D3 is substantially equal to the second distance D2.

[0064] According to a preferred embodiment, the third distance D3 is greater than the second distance D2. Preferably, the rail head 25 protrudes from the upper portion 611.

[0065] According to a preferred embodiment, the lifting device 52 engages the height difference element 61 along the guide axis G-G to configure the panel 4a in the end configuration or in the sliding configuration.

[0066] According to a preferred embodiment, the lifting device 52 engages the height difference element 61 in a rotating manner.

[0067] According to a preferred embodiment, the lifting device 52 engages the height difference element 61 in a sliding manner.

[0068] According to a preferred embodiment, the lifting

device 52 engages the height difference element 61 in a gliding manner.

[0069] According to a preferred embodiment, the base 6 comprises a rotation surface 62 and, in the end configuration, the lifting device 52 is in contact with said rotation surface 62 in order to support the panel 4a in a rotating manner about the axis V-V.

[0070] According to a preferred embodiment, in the end configuration, the lifting device 52 rotates upon the rotation surface 62.

[0071] According to a different preferred embodiment, in the end configuration, the lifting device 52 glides upon the rotation surface 62.

[0072] Preferably, the rotation surface 62 extends in a direction transverse the rail 20.

[0073] According to a preferred embodiment, the rotation surface 62 extends from the upper portion 611, for example connected to it.

[0074] According to a preferred embodiment, the base 6 comprises a free edge 68 and the rotation surface 62 extends from the upper portion 611 to said free edge 68.

[0075] According to a preferred embodiment, the rotation surface 62 is a substantially planar surface extending parallel to the ground plane P.

[0076] According to a different preferred embodiment, the rotation surface 62 is inclined and convergent towards the ground plane P.

[0077] According to a preferred embodiment, the base 6 comprises a striker element 69 that extends along the guide axis G-G. Preferably, the striker element 69 has the shape of the rail head 25, for example a convex shape.

[0078] According to a preferred embodiment, the striker element 69 is at least partially aligned with the rail 20, preferably contiguous along the guide axis G-G.

[0079] According to a preferred embodiment, the striker element 69 is proximal to the height difference element 61, preferably proximal to the upper portion 611.

[0080] According to a preferred embodiment, the striker element 69 is tapered along the guide axis G-G.

[0081] According to a preferred embodiment, the base 6 comprises an intermediate surface 66 that is at least partially aligned with the rail 20 along the guide axis G-G.

[0082] According to a preferred embodiment, the intermediate surface 66 is at least partially aligned with the striker element 69 along the guide axis G-G. Preferably, the striker element 69 protrudes vertically from the intermediate surface 66.

[0083] In other words, preferably, the striker element 69 is comprised between the rail 20 and the intermediate surface 66 along the guide axis G-G.

[0084] According to a preferred embodiment, in an intermediate configuration of the panel 4a between the sliding configuration and the end configuration, the lifting device 52 is engaged to the height difference element 61 and the at least one wheel 51 is engaged to said intermediate surface 66.

[0085] According to a preferred embodiment, in the in-

intermediate configuration, the at least one wheel 51 disengages the rail 20 and slides along the intermediate surface 66.

[0086] According to a preferred embodiment, in the intermediate configuration, sliding along the guide axis G-G, the at least one wheel 51 sequentially engages the striker element 69 and the intermediate surface 66.

[0087] According to a preferred embodiment, in the intermediate configuration, the panel 4a is not rotatable about the vertical axis. Preferably, in the intermediate configuration, the striker element 69 prevents any transverse movement or rotation of the lifting device 52.

[0088] According to a preferred embodiment, the intermediate surface 66 is connected to the upper portion 611 of the height difference element 61.

[0089] According to a preferred embodiment, the intermediate surface 66 is connected to the rotation surface 62.

[0090] Preferably, with the lifting device 52 engaged to the upper portion 611 of the height difference element 61, the at least one wheel 51 is detached from the intermediate surface 66.

[0091] According to a preferred embodiment, in the sliding configuration, the at least one wheel 51 disengages from the rail 20 and continues on the intermediate surface 66. Preferably, with the lifting device 52 engaged to the height difference element 61, preferably to the upper portion 611, the at least one wheel 51 is detached from the intermediate surface 66.

[0092] According to a preferred embodiment, the base 6 has an extension that is substantially equal to the extension of the height difference element 61 along the guide axis G-G.

[0093] According to a preferred embodiment, the lifting device 52 comprises a rotational solid which comprises an outer surface 521. In the intermediate configuration of the panel 4a, the outer surface 521 engages the height difference element 61, preferably the upper portion 611.

[0094] According to a preferred embodiment, in the end configuration of the panel 4a, the outer surface 521 engages the rotation surface 62 of the base 6.

[0095] According to a preferred embodiment, the outer surface 521 is conical-frustum-shaped about a sliding device axis Q-Q that is incident to the wheel axis W-W.

[0096] Preferably, the sliding device axis Q-Q is the axis of rotation of the rotational solid.

[0097] According to a preferred embodiment, the rotational solid is a conical-frustum shaped wheel.

[0098] According to a preferred embodiment, in the end configuration, the lifting device 52 only allows the panel 4a to move in a rotating manner about the vertical axis V-V and prevents the movement thereof along the guide axis G-G.

[0099] According to a different preferred embodiment, the lifting device 52 comprises a ball. Preferably, the outer surface 521 is spherical about the sliding device axis Q-Q.

[0100] According to a preferred embodiment, the slid-

ing device axis Q-Q is parallel to and spaced from the carriage axis C-C, as shown as an example in Figures 2b and 3.

[0101] According to a preferred embodiment, the lifting device 52 is engaged to the supporting body 50 in an adjustable manner along the carriage axis C-C, for example by means of threaded members.

[0102] According to a preferred embodiment, the base 6 comprises a safety shelf 65 that extends along the guide axis G-G and makes an undercut.

[0103] According to a preferred embodiment, the safety shelf 65 protrudes at least partially into the safety housing 270.

[0104] According to a preferred embodiment, the safety shelf 65 is adjacent and contiguous to an anti-lifting profile 27 along the guide axis G-G.

[0105] According to a preferred embodiment, the carriage assembly 5 comprises an anti-lifting device 55. According to a preferred embodiment, the anti-lifting device 55 is engaged to the supporting body 50, for example protruding below from the supporting body 50.

[0106] According to a preferred embodiment, the anti-lifting device 55 comprises a transversely protruding safety element 551.

[0107] According to a preferred embodiment, the anti-lifting device 55 has a cylindrical shape and the safety element 551 has an annular shape, preferably coaxial, and is arranged at a lower end of the anti-lifting device 55.

[0108] In the sliding configuration, the anti-lifting device 55 is engageable in a sliding manner upon the lower guide 2, preferably within the safety housing 270.

[0109] Preferably, in the sliding configuration, the safety element 551 is engageable with at least one anti-lifting profile 27.

[0110] The engagement between the safety device 55, preferably the safety element 551, and the anti-lifting profile 27 prevents the detachment of the carriage assembly 5 from the lower guide 2, in the sliding configuration.

[0111] In the intermediate configuration, the safety device 55, preferably the safety element 551, is engageable to the safety shelf 65 in a sliding manner along the guide axis G-G.

[0112] The engagement between the safety device 55 and the safety shelf 65 prevents detachment of the carriage assembly 5 from the lower guide 2, in the intermediate configuration.

[0113] According to a preferred embodiment, the base 6 comprises a safety groove 60 that extends in a direction incident to the rail 20, such as transversely the guide axis G-G.

[0114] According to a preferred embodiment, the lower guide 2 comprises a safety window 275 that connects the safety housing 270 and the safety groove 60. Preferably, the safety window 275 is housed within an anti-lifting 27 profile and passes therethrough transversely.

[0115] When switching from the intermediate configuration to the end configuration, the anti-lifting device 55 passes through the safety window 275.

[0116] In the end configuration, the anti-lifting device 55 is released from the lower guide 2 and housed within the safety groove 60.

[0117] Preferably, in the end configuration, the anti-lifting device 55 is disengaged from the safety shelf 65.

[0118] In the end configuration, the rotation of the panel 4a corresponds to a movement and/or a rotation of the anti-lifting device 55 within the safety groove 60.

[0119] According to a preferred embodiment, the carriage assembly 5 comprises at least two wheels 51 mutually spaced along the carriage axis C-C and engageable to the rail 20.

[0120] According to a preferred embodiment, the lifting device 52 is at least partially aligned with said two wheels 51 mutually spaced along the carriage axis C-C, as shown as an example in Figure 2b.

[0121] According to a preferred embodiment, said at least two aligned wheels 51 are comprised between the anti-lifting device 55 and the lifting device 52 the carriage axis C-C.

[0122] According to a preferred embodiment, the rotation and sliding means also comprise a load-bearing carriage assembly 7 engaged at the lower edge 42a, for example spaced longitudinally from the carriage assembly 5. The load-bearing carriage assembly 7 comprises a thrust bearing and is suitable for supporting the panel 4a in a rotating and sliding manner on the lower guide 2.

[0123] According to a preferred embodiment, the load-bearing carriage assembly 7 comprises the base body 70, preferably made as one piece. Preferably, the thrust bearing is at least partially housed within said base body 70.

[0124] According to a preferred embodiment, the load-bearing carriage assembly 7 comprises at least one carrier wheel 71, hinged to the base body 70 and engaged in a sliding manner to the auxiliary rail 21 along the guide axis G-G.

[0125] Each carrier wheel 71 is hinged in a relevant axis that is orthogonal to the auxiliary rail 21.

[0126] Preferably, the load-bearing carriage assembly 7 comprises a plurality of carrier wheels 71 engaged at the auxiliary rail 21, for example, two carrier wheels 71 mutually spaced along the guide axis G-G.

[0127] The load-bearing carriage assembly 7 also comprises a rotation pivot 77, freely rotationally engaged to the base body 70 by means of the thrust bearing and solidly rotationally connected to the panel 4a, preferably engaged at the lower edge 42a, for example by means of a box-shaped connection body 9. Preferably, the rotation pivot 77 extends predominantly along the vertical V-V axis.

[0128] According to a preferred embodiment, the load-bearing carriage assembly 7 comprises at least one carrier wheel 71 engaged to the rail 20, for example two carrier wheels 71 mutually spaced along the carriage axis C-C.

[0129] According to a preferred embodiment, the carriage assembly 5 comprises at least one wheel 51 en-

gaged to the auxiliary rail 21, for example two wheels 51 mutually spaced along the carriage axis C-C.

[0130] According to a preferred embodiment, the load-bearing carriage assembly 7 comprises an anti-unhinging member 771 engaged in a sliding manner within the safety housing 270 and suitable for preventing the panel 4a from detaching from the lower guide 2.

[0131] Preferably, the anti-unhinging member 771 comprises a portion projecting transversely the guide axis G-G, which portion is suitable for engaging with the at least one safety profile 27 in order to prevent vertical lifting of the panel 4a.

[0132] According to a preferred embodiment, in the end configuration of the panel 4a, the panel 4a is positionable in a plurality of angular positions, wherein the rotational solid of the lifting device 52 is disengaged from the base 6, for example from the rotation surface 62, and the panel 4a is supported cantilevered on the lower guide 2 by means of the load-bearing carriage assembly 7.

[0133] That is to say that, with the rotational solid of the lifting device 52 disengaged from the base 6, the force of weight of the panel 4a is discharged onto the load-bearing carriage assembly 7.

[0134] According to a preferred embodiment, the movable panel system 1 comprises a plurality of panels 4a, 4b, 4c, each comprising a lower edge 42a, 42b, 42c, and preferably also an upper edge 43a, 43b, 43c.

[0135] According to a preferred embodiment, the rotation and sliding means comprise a single base 6.

[0136] According to a preferred embodiment, the lower guide 2 comprises only the rail 20 and the auxiliary rail 21.

[0137] According to a preferred embodiment, each particular panel 4a, 4b, 4c comprises a relevant carriage assembly 5 suitable for engaging said base 6, in the end configuration, in accordance with the aforementioned. In other words, each carriage assembly 5 of each panel 4a, 4b, 4c is arranged at a longitudinal position of the panel 4a, 4b, 4c in which it is engageable to the base 6.

[0138] Preferably, the rotation and sliding means comprise a load-bearing carriage assembly 7 for each panel 4a, 4b, 4c that is suitable for the cantilevered support of the relevant panel 4a, 4b, 4c on the lower guide 2.

[0139] Regarding the operation of the movable panel system, in the sliding configuration, the panel 4a is moved in a sliding manner along the lower guide 2. Continuing along the guide axis G-G, the sliding device 52 of the carriage assembly 5 engages the base 6, preferably engages the height difference element 61, in order to configure the panel 4a in the end configuration.

[0140] Preferably, in the intermediate configuration between the sliding configuration and the end configuration, the at least one wheel 51 slides on the intermediate surface 66 of the base 6 and the outer surface 521 of the rotational solid engages the height difference element 61.

[0141] Preferably, with the sliding device 52 engaged to the upper portion 611 of the height difference element 61, all of the wheels 51 of the carriage assembly 5 are lifted off the respective rails 20, 21.

[0142] Innovatively, the movable panel system fully fulfills the intended object in overcoming the typical problems of the prior art.

[0143] Advantageously, the movable panel system does not structurally burden ceilings and/or beams and/or lintels. Advantageously, the force of the weight of the panels is discharged onto the lower guide, obviating the problem of installations that engage ceilings and/or beams and/or lintels.

[0144] Advantageously, it is also possible to mount the movable panels system in outdoor installations that are typically lacking in structural load-bearing capacity. Advantageously, the upper rail does not have a panel support function, i.e. it does not support any weight. Advantageously, the upper guide is structurally simple and inexpensive to implement.

[0145] Advantageously, the ceiling and/or beam and/or lintel is free to flex, for example as a result of the action of snow accumulation or other structural elements, without affecting the sliding of the panels. Advantageously, the load generated by the panels bears upon the ground plane and is efficiently stabilized during rotation.

[0146] Advantageously, the panels are configurable between the sliding configuration and the end configuration in an extremely simple and intuitive way, obviating the need for additional devices or movements. Advantageously, in fact, the transition between one configuration and another is by means of continuously sliding the panel along the guide axis.

[0147] Advantageously, the presence of a height difference element facilitates switching between the panel configurations and provides feedback to the user.

[0148] Advantageously, the base facilitates panel movements in both longitudinal and rotational directions.

[0149] Advantageously, it is possible to move the panels independently of one another, both in a rotating manner and in a longitudinal sliding manner, using only one pair of rails.

[0150] Advantageously, the sliding and rotation of the panel is constantly performed safely. Advantageously, in fact, the anti-lifting device that departs from the lower guide, preferably departs from the safety shelf, enters the adjacent safety groove.

[0151] Advantageously, the lifting device is designed so that, in the end configuration, the rotational solid prevents axial movement and only allows for the rotation of the panel about the vertical axis.

[0152] Advantageously, the striker element ensures proper sliding of the wheels upon the base. Advantageously, in fact, the striker element ensures the correct positioning of the wheels upon the intermediate surface, in particular ensures the correct transit of the wheels departing from the rail.

[0153] Advantageously, the striker element prevents any early and improper rotation of the panel.

[0154] Advantageously, the lower guide and the base have small vertical dimensions and are not an obstacle to crossing. Advantageously, the issue of architectural

barriers is obviated.

[0155] It is clear that a person skilled in the art may make changes to the invention described above in order to meet contingent needs, which changes all fall within the scope of protection as defined in the following claims.

Claims

1. A movable panel system (1), comprising:

- i) a lower guide (2) comprising a rail (20), which extends along a guide axis (G-G), restable on a ground plane (P);
- ii) at least one panel (4a), preferably made of glass, supported in a sliding manner on the lower guide (2) and comprising a lower edge (42a);
- iii) rotation and sliding means comprising:

a) a carriage assembly (5) engaged at the lower edge (42a), comprising:

- a supporting body (50);
- at least one wheel (51) hinged to the supporting body (50) and engageable in a sliding manner to the rail (20);
- a lifting device (52) engaged to the supporting body (50) ;

b) a base (6) fixed to the lower guide (2);

wherein the panel (4a) is configurable along the guide axis (G-G) in:

- a sliding configuration, in which the at least one wheel (51) engages the rail (20);
- an end configuration, in which the lifting device (52) engages the base (6) and the at least one wheel (51) is lifted off the rail (51) so that the panel (4a) is movable about a vertical axis (V-V).

2. Movable panel system (1) according to claim 1, wherein the base (6) comprises a height difference element (61) that comprises a lower portion (610) and an upper portion (611), wherein, relative to the ground plane (P), the lower portion (610) is positioned at a first distance (D1) and the upper portion (611) is positioned at a second distance (D2), wherein the second distance (D2) is greater than the first distance (D1), wherein the lifting device (52) engages the height difference element (61) along the guide axis (G-G) to configure the panel (4a) in the end configuration or the sliding configuration.

3. Movable panel system (1) according to claim 2, wherein the lifting device (52) comprises a rotational solid which comprises an outer surface (521) suitable for engaging the height difference element (61).

4. Movable panel system (1) according to claim 3, wherein the outer surface (521) is conical-frustum-shaped about a sliding device axis (Q-Q), wherein the sliding device axis (Q-Q) is incident to the wheel axis (W-W). 5
5. Movable panel system (1) according to any one of claims 2 to 4, wherein the base (6) comprises a rotation surface (62) which extends from the upper portion (611), wherein, in the end configuration, the lifting device (52) engages said rotation surface (62). 10
6. Movable panel system (1) according to any one of the preceding claims, wherein the base (6) interrupts and/or at least partially covers the rail (20) along the guide axis (G-G). 15
7. A system (1) according to any one of the preceding claims, wherein the height difference element (61) is proximal to the rail (20). 20
8. Movable panel system (1) according to any one of the preceding claims, wherein the carriage assembly (5) comprises a carriage axis (C-C) and the lifting device (52) is at least partially aligned with the at least one wheel (51) along the carriage axis (C-C). 25
9. Movable panel system (1) according to claim 8, wherein the carriage assembly (5) comprises at least two wheels (51) mutually spaced along the carriage axis (C-C) and engageable in a sliding manner to the rail (20). 30
10. Movable panel system (1) according to any one of the preceding claims, wherein the base (6) comprises a safety groove (60) which extends in a direction incident to the rail (20), wherein the carriage assembly (5) comprises an anti-lifting device (55), which in the sliding configuration is engageable in a sliding manner with the lower guide (2) and in the end configuration is housed in the safety groove (60). 35 40
11. Movable panel system (1) according to claim 10, wherein the base (6) comprises a safety shelf (65), wherein, in an intermediate configuration between the sliding configuration and the end configuration, the anti-lifting device (55) is engageable to said safety shelf (65) in sliding along the guide axis (G-G). 45
12. Movable panel system (1) according to any one of the preceding claims, wherein the rotation and sliding means further comprise a load-bearing carriage assembly (7) engaged at the lower edge (42a) and suitable for supporting the panel (4a) in a rotating and sliding manner on the lower guide (2), wherein the load-bearing carriage assembly (7) comprises a thrust bearing. 50 55
13. Movable panel system (1) according to claim 12, wherein, in the end configuration, the panel (4a) is rotatable to a plurality of angular positions in which the lifting device (52) is disengaged from the base (6) and the panel (4a) is supported cantilevered on the lower guide (2) by means of the load-bearing carriage assembly (7).
14. Movable panel system (1) according to claim 12 or claim 13, wherein the lower guide (2) comprises a parallel auxiliary rail (21) transversely spaced from the rail (20), wherein the load-bearing assembly (7) comprises at least one carrier wheel (71) engaged to the auxiliary rail (21) in a sliding manner along the guide axis (G-G).
15. Movable panel system (1) according to one of the preceding claims, comprising a plurality of rotatable panels (4a, 4b, 4c), wherein the rotation and sliding means comprise a carriage assembly (5) for each panel (4a, 4b, 4c) .

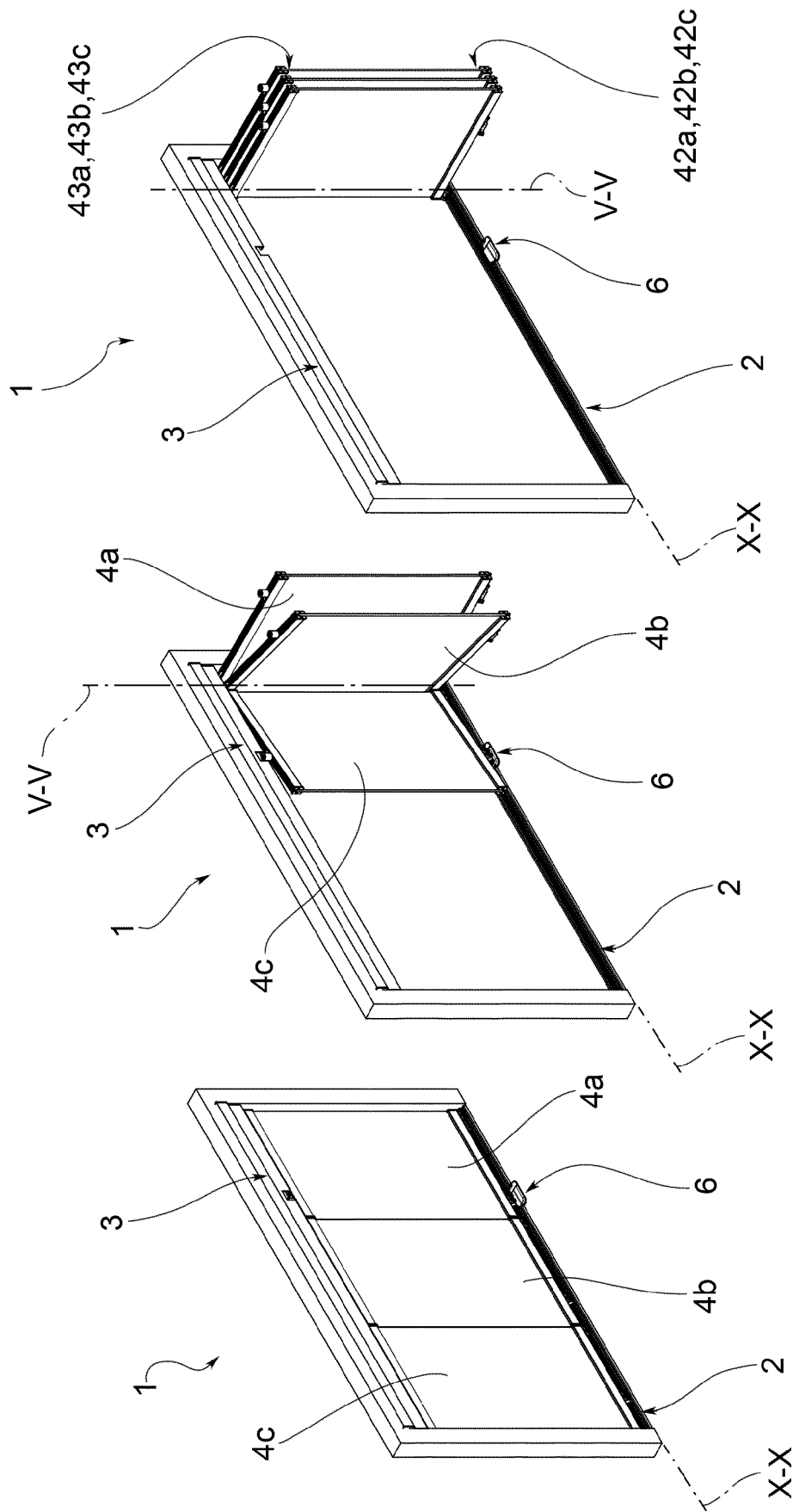
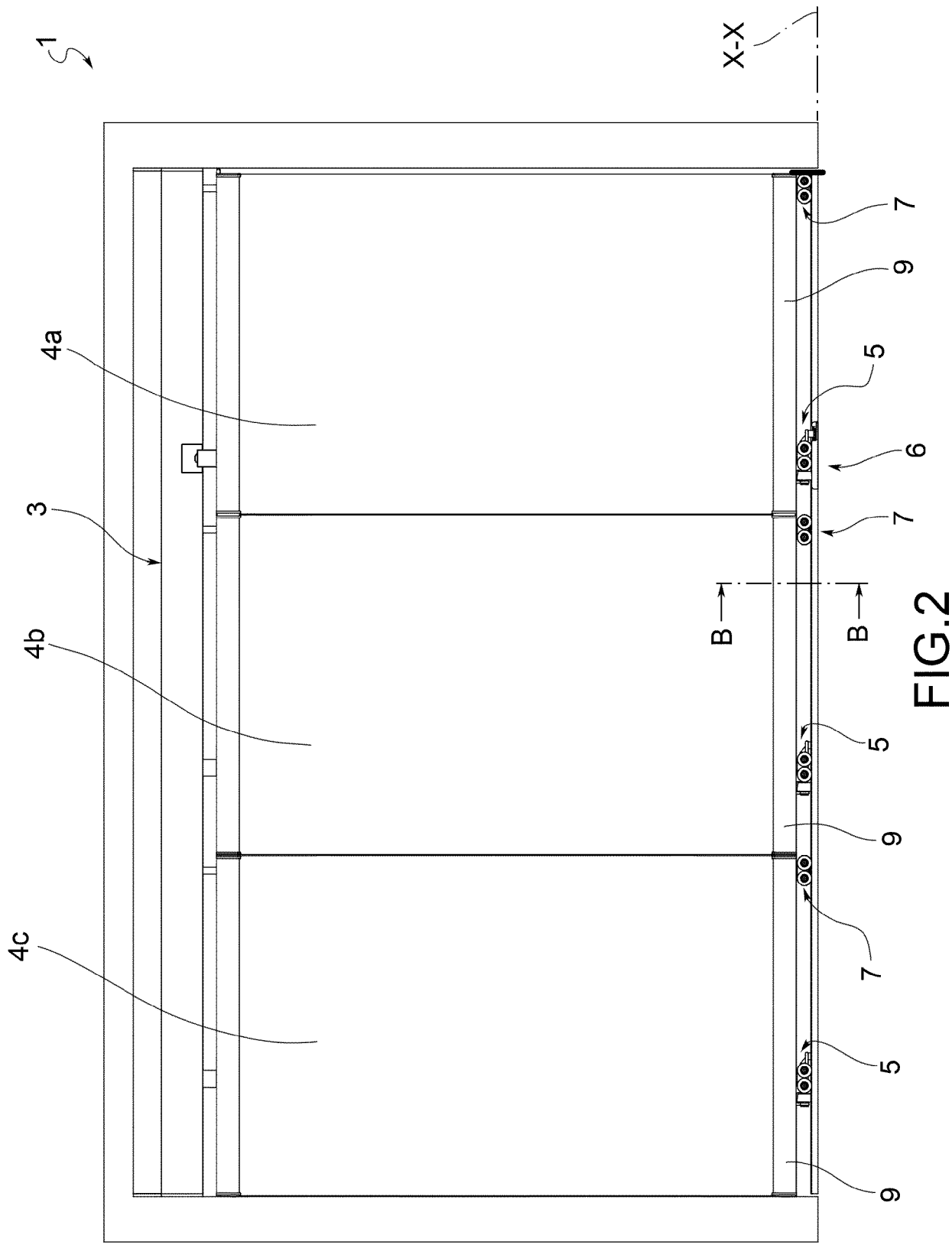


FIG.1b

FIG.1a

FIG.1



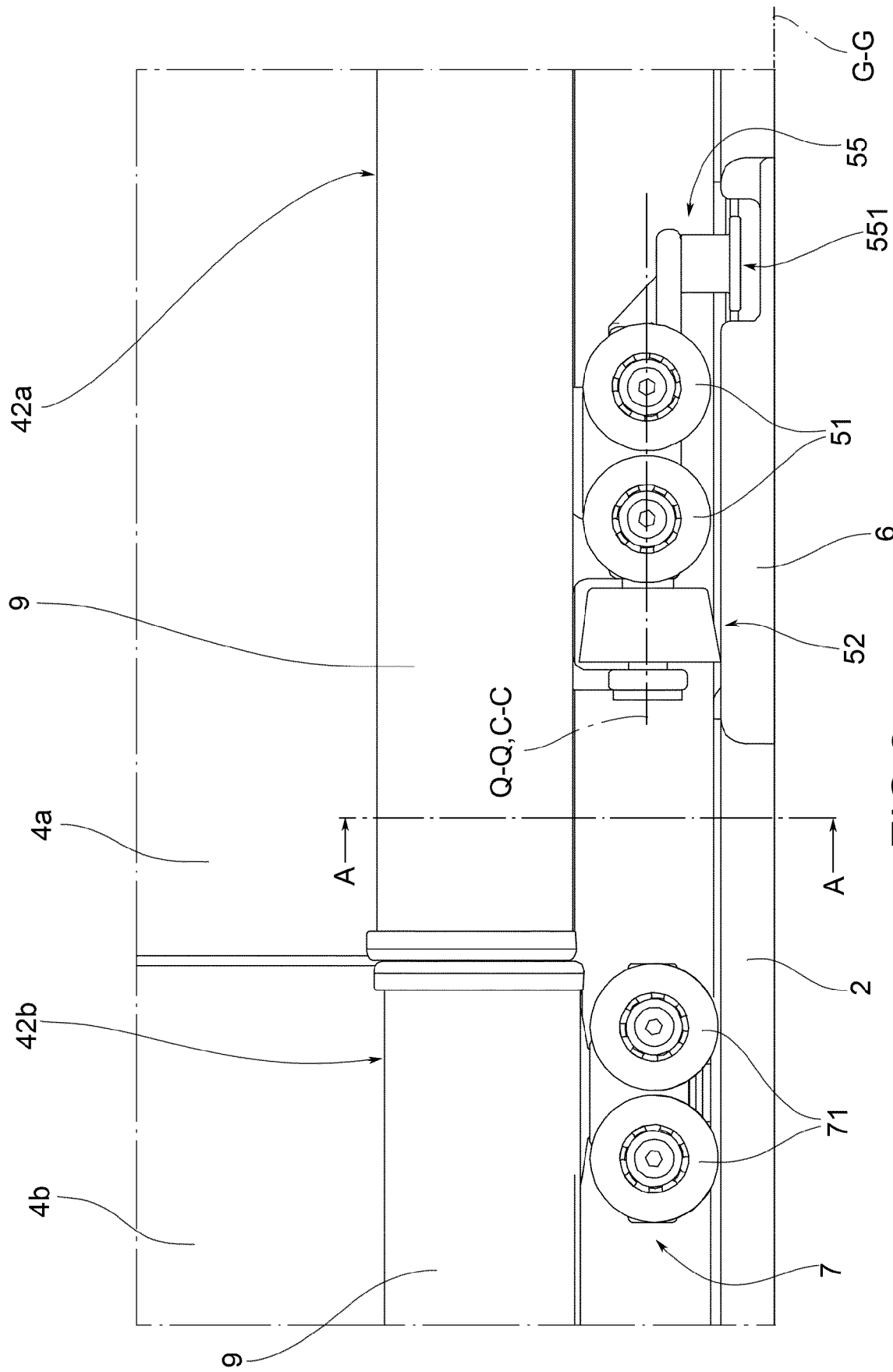


FIG. 2a

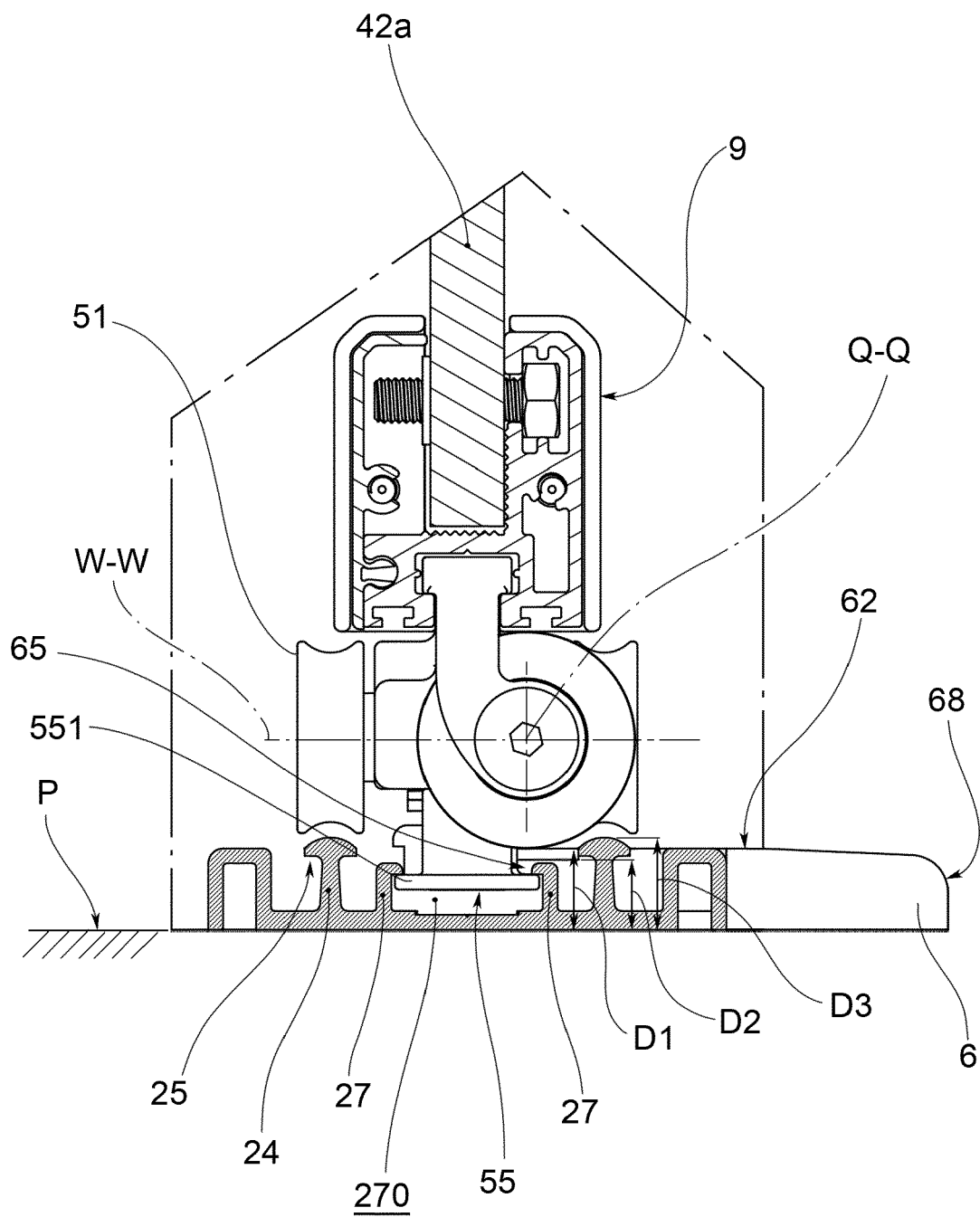


FIG.2b

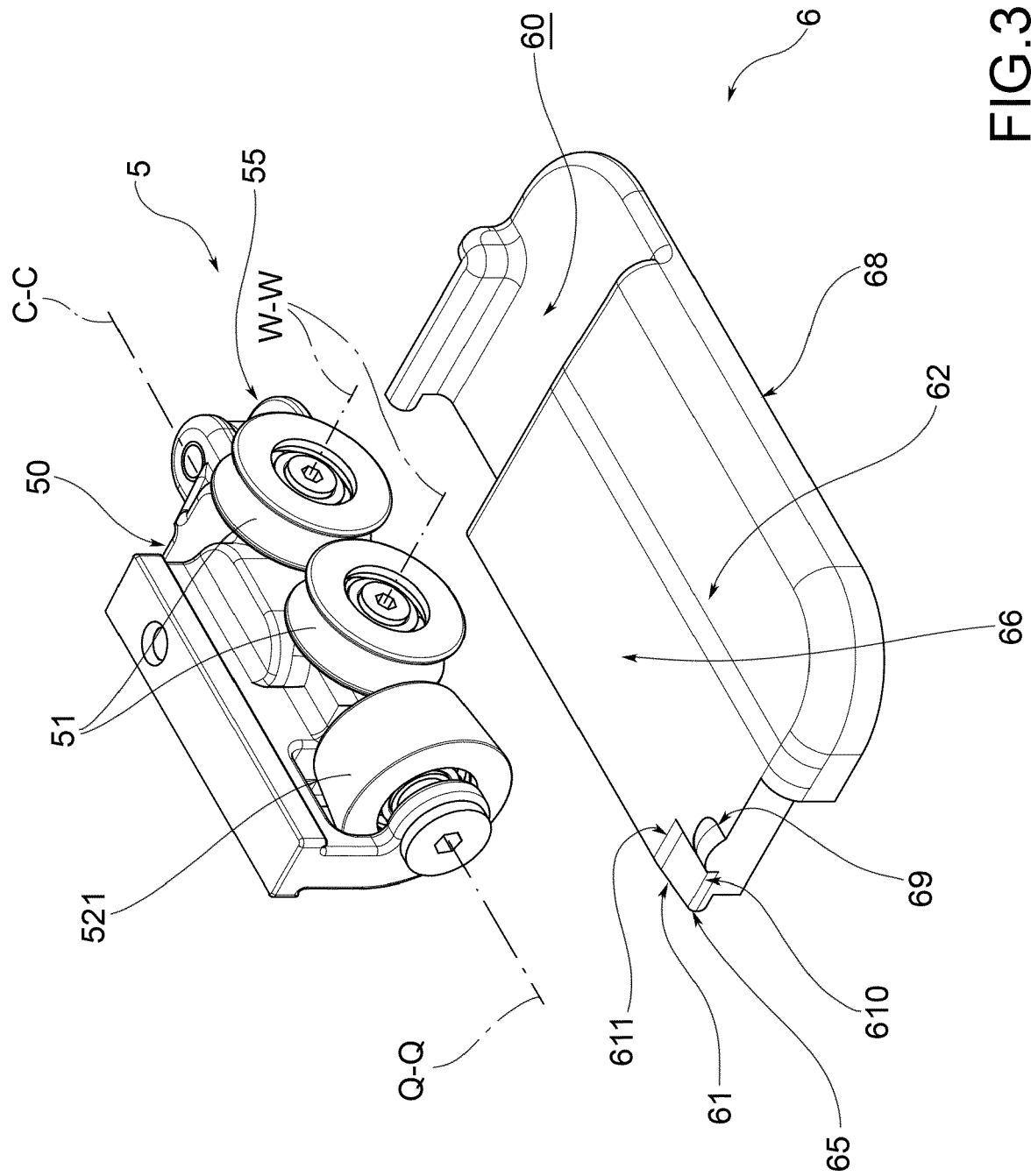


FIG.3

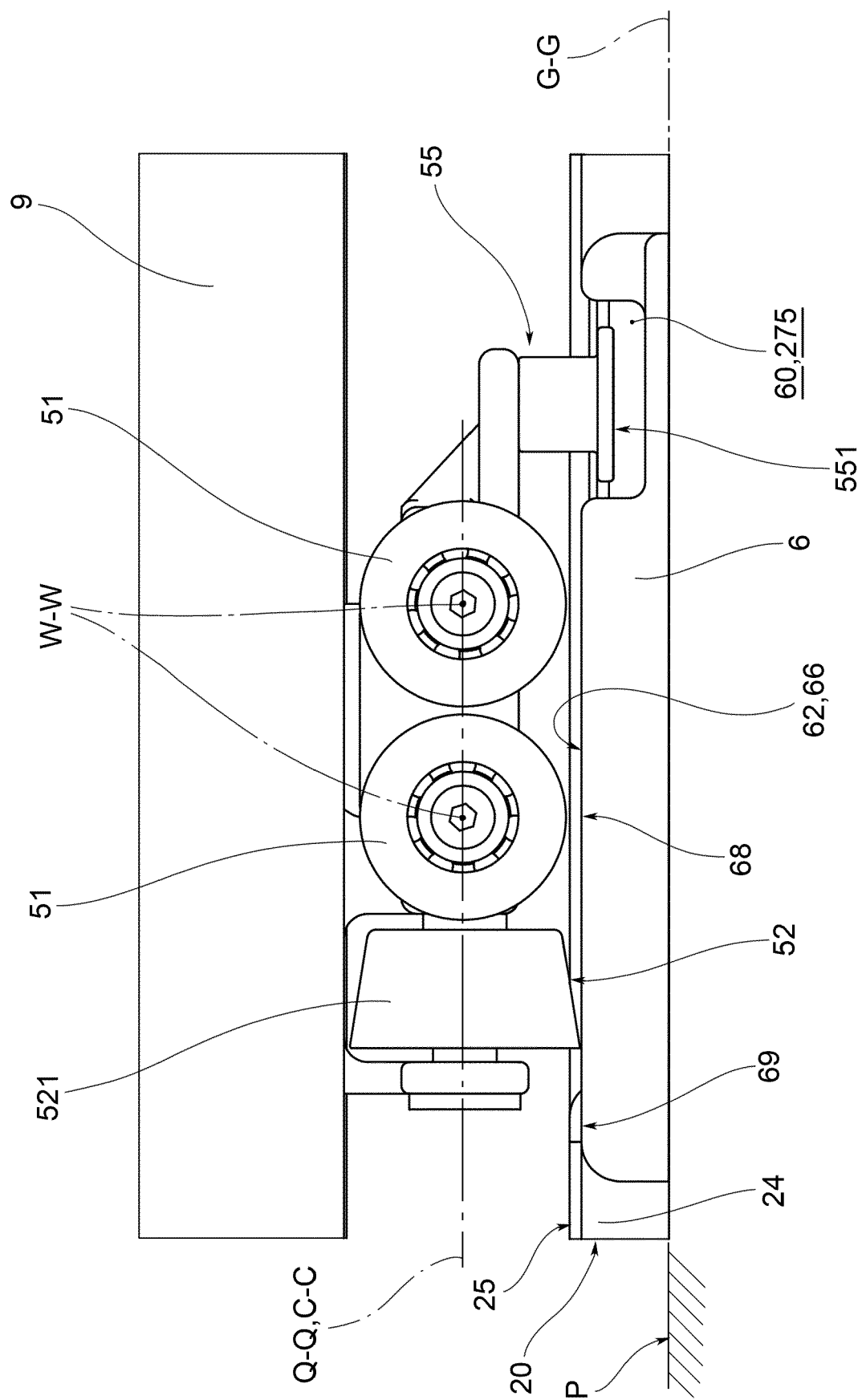
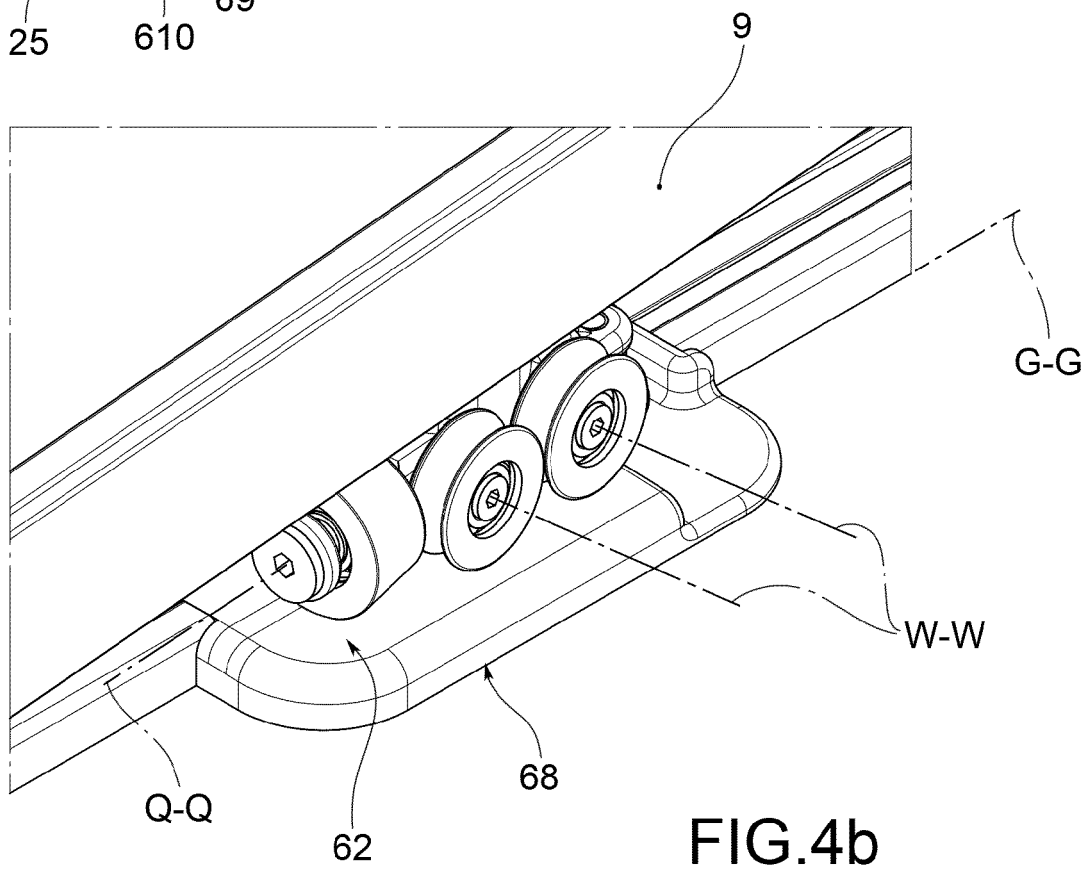
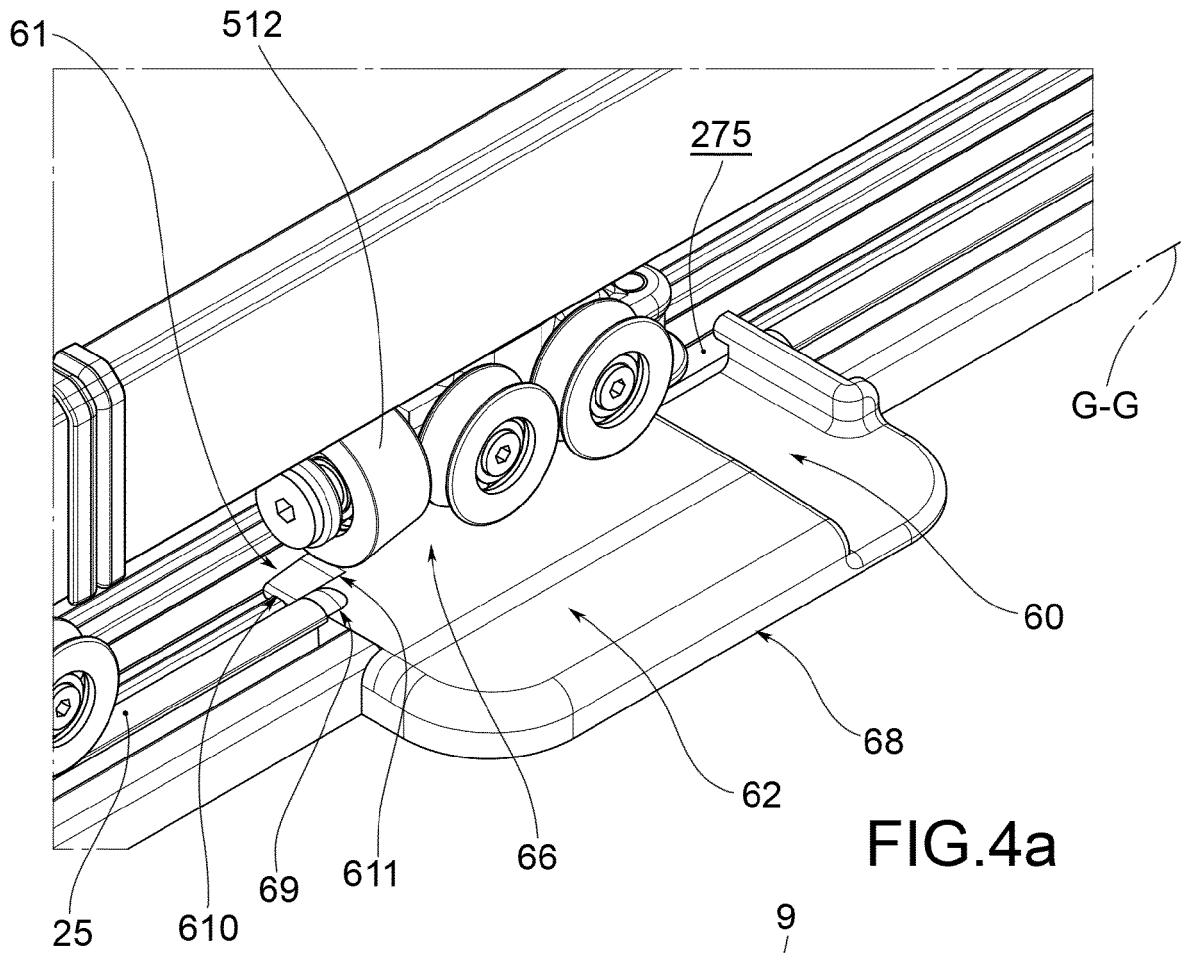
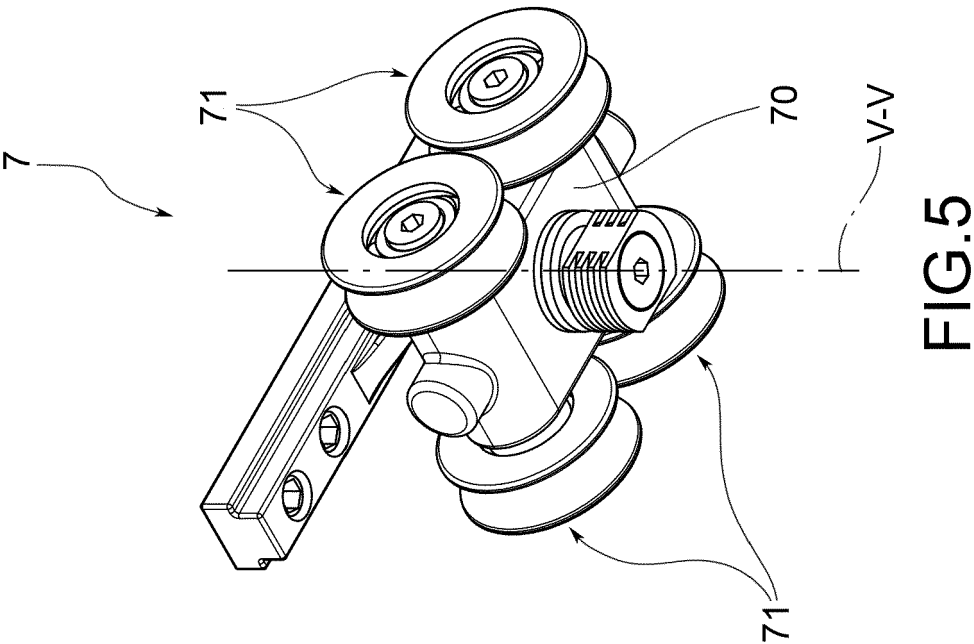
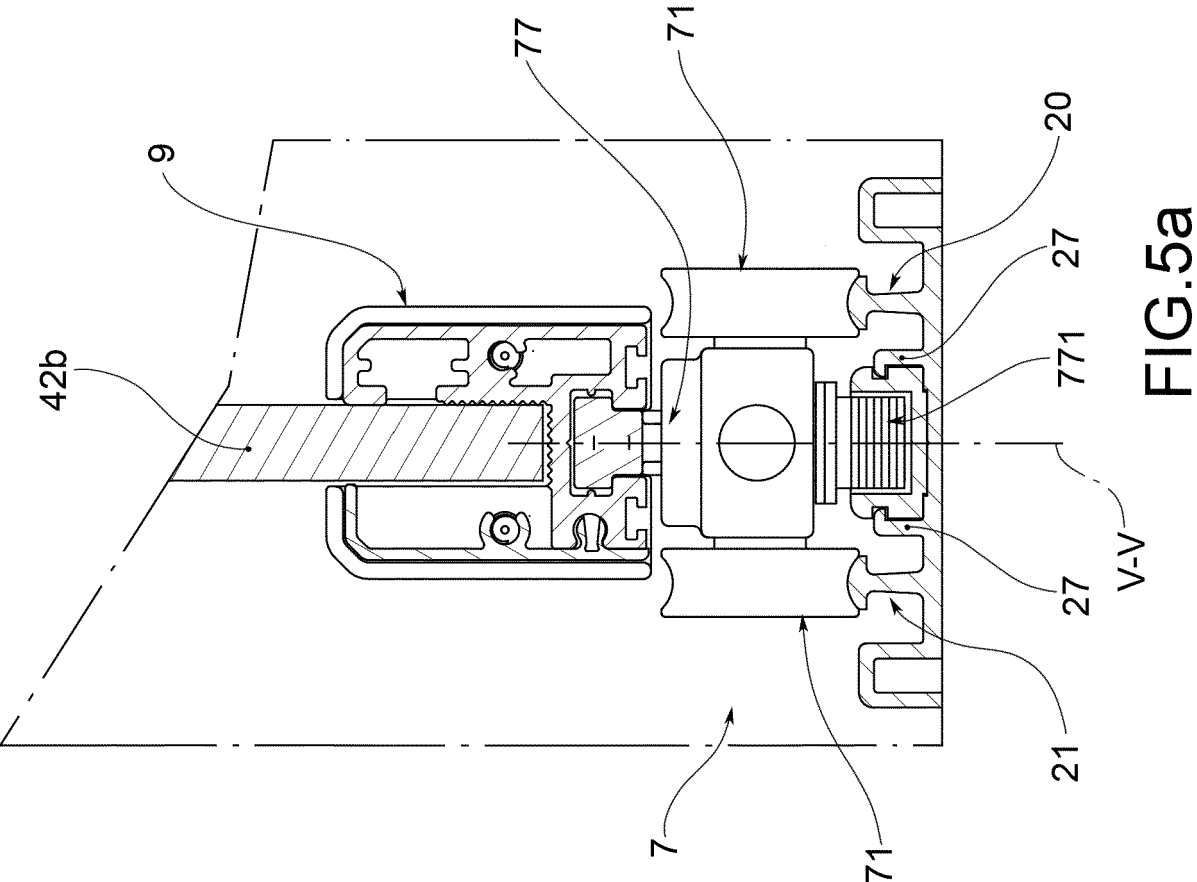


FIG. 3a







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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 7 August 2023	Examiner Klemke, Beate
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