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(54) **GLAZING ARRANGEMENT**

(57) The invention relates to a glazing arrangement for a balcony, terrace or a corresponding space, comprising, between a top rail (130) and a bottom rail (140) of the glazing arrangement, sliding window elements (611 to 114) which are movable into a parallel mutual position and into a successive mutual position and which are mutually out of line, and a motion engagement structure between the window elements. The motion engagement structure (612c, 612d, 613c) between the window

elements is a bypass structure, comprising a bypass motion engagement structure which in a first travel direction (A) is a tag-along structure but which in a second travel direction (B), the second travel direction being reverse with respect to the first travel direction, is a bypass structure, one or more single sliding window elements (612) thus also being arrangeable in motion not engaging with an adjacent sliding window element (613,611).

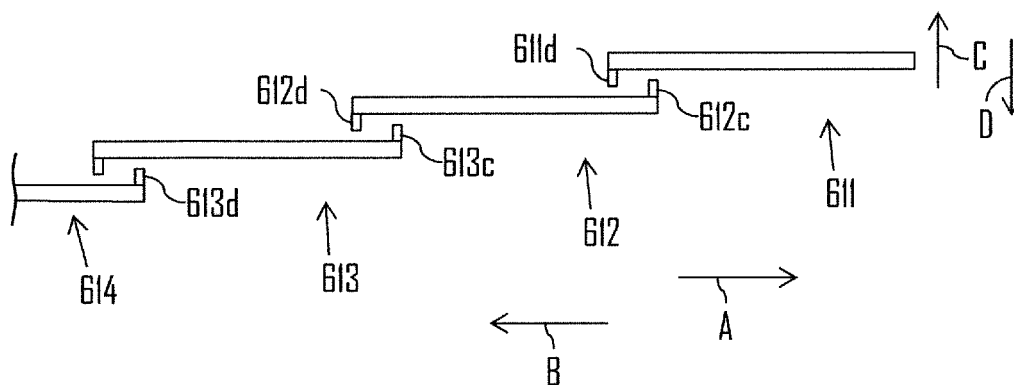


Fig. 6

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Description

Field

[0001] The invention relates to a glazing arrangement for a balcony, terrace or a corresponding space, comprising, between a top rail and a bottom rail of the glazing arrangement, sliding window elements which are movable into a parallel mutual position and into a successive mutual position and which are mutually out of line, and a motion engagement structure between the window elements.

Background

[0002] In a balcony or terrace, no walls blocking the visibility are desired but, on the other hand, an open balcony or terrace is windy and possibly cold, too. However, visibility and protection from wind can be accomplished by means of a sliding window arrangement which comprises a plurality of sliding window elements, usually made of glass. When necessary, the sliding window elements may also be drawn aside, i.e. the sliding window arrangement may be opened.

[0003] A basic structure in sliding window arrangements is one in which the sliding window elements are mutually out of line, in which case in an open position the sliding window elements reside in part or completely parallelly, from which position they may be moved into their mainly successive position such that when the sliding window elements are in a closed position, parallelism occurs mostly within the area of the ends of the sliding window elements.

[0004] In order to not to be compelled to move each sliding window element one by one to a desired location, it is known to use engagement members, such as motion engagement projections, between the sliding window elements so as to enable the motion of a sliding window element to be engaged with the next sliding window element, particularly such that the sliding window element being moved by a user pulls behind it the next sliding window element, in practice such that the engagement projection in a rear end of the element being moved engages the transfer motion to the engagement projection in an initial end of the next element.

[0005] Such glazing arrangements of the aforementioned kind are not satisfactory in their present form since they present problems because the motion engagement is such that the motion engagement projection of a single sliding window element remains located between two motion engagement projections provided at different ends of an adjacent sliding window element, in which case the result is that the motion engagement will inevitably be bidirectional because the sliding window element cannot be moved independently at all, which makes the glazing arrangement less susceptible to versatile use and being moved into a cleaning position, for instance.

[0006] Some other known solutions are disclosed in

documents WO 2008 108703 and US6276092, but these relate to glass pane elements which slide overlappingly and have frames and which are also rotatable into an open position with respect to a vertical axis, for instance in connection with cleaning, and these glass pane elements with frames do not reside parallelly within the area of the ends, the vertical frames interfering with a uniform glass pane element impression and making the elements more expensive to manufacture.

[0007] Thus, a need exists for a novel glazing arrangement.

Brief description

[0008] An object of the invention is to provide an improved glazing arrangement. This is achieved by a glazing arrangement which is characterized by the features disclosed in the characterizing part of the independent claim.

[0009] Preferred embodiments of the invention are disclosed in the dependent claims. The preferred embodiments enhance the advantages of the basic invention.

[0010] The glazing arrangement according to the invention provides several advantages, particularly in that the window elements of the glazing arrangement become more versatile to move, making the window elements easier for the user to move into a desired location for cleaning, for instance. It is possible to open the glazing arrangement in the middle towards the edges, in which case the space most advantageous for lounging in the middle of the balcony or terrace can be made open while the edges are protected by glazing at both ends or at one end only of a light opening, i.e. an installation opening. This enables the sliding glass pane elements having no vertical frames to be mutually unconcatenated for cleaning, for instance.

List of figures

[0011] The invention is now described in closer detail in connection with preferred embodiments and with reference to the accompanying drawings, in which

Figure 1 shows a glazing arrangement, when viewing from outside the space to be protected and from the left-hand side end,

Figure 2 shows the most left-hand side window elements of the elevation of the glazing arrangement, when viewing from outside the space to be protected and obliquely from the front left-hand side,

Figure 3 shows, obliquely from above, four parallel window elements together with end stoppers for their bottom profiles,

Figure 4 is a schematic diagram showing, as seen from a direction of a top rail, a first basic use situation when the window elements are in a closed position,

Figure 5 is a schematic diagram showing, as seen from the direction of the top rail, a second basic use

situation when the window elements have been moved in two groups from the middle to both edges, Figure 6 is a schematic diagram showing, as seen from the direction of the top rail, a placement of motion engagement members.

Description of embodiments

[0012] Referring to the figures, the glazing arrangement comprises at least two window elements, such as sliding window elements or other sliding pane elements, for instance four sliding window elements 311 to 314 in Figures 1 to 3, elements 411 to 414 in Figure 4, elements 511 to 514 in Figure 5, or elements 611 to 614 in Figure 6.

[0013] In Figures 1 to 3, for instance, each window 311 b to 314b may be made for instance of glass or another material that permeates light to a desired extent and in a desired manner. Each window element has a translucent sheet or pane, such as a glass pane 311 b, 312b, 313b, 314b. Underneath each pane or otherwise in a lower part as a horizontal frame, such as a bottom frame, are provided bottom strips 311a, 312a, 313a, 314a. The bottom strips may be strips made of an aluminium strip by extrusion, such as a profile strip, for example. In the examples shown in the figures, no top horizontal strip, i. e. top horizontal frame, is shown in the window elements but one may be provided if necessary. The bottom frame strip, such as 311 a, is the bottom frame strip of the sliding window element 311 with no vertical frames, via which the window element, such as 311, is supported on a bottom rail 140. The invention is also suitable for a glazing arrangement with vertical frames.

[0014] The window elements 311 to 314 are provided between a top rail structure 130 and a bottom rail structure 140. Between the window element and the rails 130, 140 may be provided (not shown) a slide pad or a roller structure. The rails 130, 140 may be made of aluminium by extrusion, for example.

[0015] A glazing arrangement for a balcony, terrace or a corresponding space is thus provided, comprising, between the top rail 130 and the bottom rail 140 of the glazing arrangement, sliding window elements 311 to 314 which have no vertical frames and which are movable into a parallel mutual position and into a successive mutual position and which are mutually out of line. When the sliding window elements are parallel, the glazing arrangement is in an open position. When the sliding window elements are in succession, although slightly out of line, the glazing arrangement is in a closed position.

[0016] Figures 2 to 3 in particular show that in an embodiment of the bottom rail 140 it is provided with parallel support parts, such as projections 141 to 144 for the bottom strips 311 a, 312a, 313a, 314a of the window elements 311 to 314. Thus, the support and/or motion guidance for the window elements is thus provided from underneath their bottom strip, by the support part projections 141 to 144 in the bottom rail 140.

[0017] As to Figures 2 to 3, it is to be noted that their

viewing direction is slightly obliquely from above, which is why it seems that the support parts 141 to 144 of the bottom rail 140 for the window elements 311 to 314 and the window elements thereabove were at a different height position; however, this is not the case but the window elements reside at the same height.

[0018] Referring particularly to Figure 6, in an embodiment the motion engagement structure between the window elements, for instance window elements 612, 613 in Figure 6, is a bypass structure, comprising a motion engagement structure member 612c which in a first travel direction A is a tag-along structure but which in a second travel direction B, which is reverse with respect to the first travel direction, is a bypass structure and which, when moving in direction B, actually does not engage to an adjacent window element 613 but the motion engagement member 612c passes by an end of the adjacent element with no motion engagement.

[0019] Thus, the single sliding window elements or at least some of them are also arrangeable in motion which does not engage to the adjacent sliding window element. A corresponding situation is shown in Figures 2 to 3 for instance such that the motion engagement projection 311c may have dragged the adjacent element 312 therealong because motion has been applied to the motion engagement member provided at the initial end (farther away from a viewer in Figure 3) of the adjacent element from the engagement member of the element 311 when the element 311 has been moved away from the viewer, but the motion of the element 311 towards the viewer is allowed to occur, since a final end (the end closer to the viewer in Figure 3) of the adjacent element 312 has no engagement projection towards the element 311 but the engagement projection 311 c of the element 311 is allowed to move along with the element 311 towards the viewer and bypass the element 312 since the right-hand side edge of an end stopper of the element 312 is located sufficiently high up, i.e. it determines therebelow a bypass area PASS, via which the motion engagement projection 311 c of the final end (closer to the viewer) of the element 311 is allowed to move when the element 311 is being moved.

[0020] In an embodiment, the motion engagement members in the motion engagement structure are provided in connection with the bottom strips 311a, 312a, 313a, 314a of the sliding window elements.

[0021] It can be seen in the figures that each motion engagement member is provided in an end stopper PL1 to PL4 or a corresponding additional piece for an end of the bottom strip to be used for covering a hole in an end of a profile-type bottom strip 111 a to 114a made of aluminium by extrusion, for instance. Instead of or in addition to the bottom strip 311 a, 312a, 313a, 314a, i.e. a horizontal strip, i.e. a glass pane strip, of a lower edge of the sliding window element, the engagement member and the bypass-enabling PASS structure may, however, also be provided in an upper edge of the window element, in a glass pane strip, i.e. a horizontal strip, provided therein.

The engagement member, such as 612c, 612d, 613c, may be in the strip end stopper, such as in an end plug, as a part to be added to the strip or as a structure machined in the strip.

[0022] Referring particularly to Figure 6 and to the features to be discussed below, in an embodiment the window elements, now referred to as 611 to 614, are concatenated with one another completely and a previous glass pane element follows the moving element when the elements are moved in Figure 6 to the right; correspondingly, the elements 611 to 614 detach from one another when the glass pane elements are moved in Figure 6 to the left, when starting from the top in Figure 6, i.e. the element 611. The principle of the concatenating motion in Figure 6 is a dragging one, i.e. the motion engagement projection 612d of a rear part of the window element, such as 612, drags the adjacent window element, such as 613, therealong by the motion engagement projection 613c provided in an initial part of that adjacent window element.

[0023] According to a feature, the motion engagement members, such as 612d, 612c, 613c, of the motion engagement structure are placed such that at least a certain sliding window element, such as 612, is provided with a first motion engagement member 612c in the initial part of the sliding window element, the initial part of the sliding window element being in travel direction directed in a first travel direction A. When viewing in a transverse direction of the sliding window element, the first motion engagement member 612c in question extends in a first transverse direction C, on which side resides an area of movement of the previous sliding window element 611. Further, this same certain sliding window element 612 is provided with a second motion engagement member 612d in a final part of the sliding window element, the final part of the sliding window element being in travel direction directed in a second travel direction B. When viewing in the transverse direction of the sliding window element, that second motion engagement member 612d of the certain sliding window element 612 extends in a second transverse direction D.

[0024] According to a feature, with respect to said certain sliding window element 612, the previous sliding window element 611 is provided with a motion engagement member in the final part of the sliding window element 611, the final part of the sliding window element being in travel direction directed in the second travel direction B. When viewing in the transverse direction of the sliding window element, the motion engagement member 611d in question in that previous sliding window element 611 extends in the second transverse direction D, i.e. to the side on which said certain sliding window element 612 in its initial part is provided with the first motion engagement member 612c. The motion engagement member 611 d of the final part of said previous sliding window element 611 is arranged to be brought into motion engagement with the first motion engagement member 612c in the initial part of said certain sliding window ele-

ment 611 in order to engage the motion from said previous sliding window element 611 to said certain sliding window element 612.

[0025] According to a feature, the sliding window element which is next with respect to that certain sliding window element 612, is provided with a motion engagement member in the initial part of the sliding window element, the initial part of the sliding window element being in travel direction directed in the first travel direction, and the motion engagement member in question in that next sliding window element extending, when viewing in the transverse direction of the sliding window element, in the first transverse direction, i.e. to the side on which said certain sliding window element in its final part is provided with the second motion engagement member, and that the second motion engagement member in the final part of said certain sliding window element is arranged to be brought into motion engagement with the motion engagement member of the initial part of said next sliding window element in order to engage the motion from said certain sliding window element to said next sliding window element.

[0026] In the motion engagement arrangement, the window element, such as 612 in Figure 6, or 312 in Figures 2 to 3, on the same side, i.e. the side facing the adjacent element, is provided with an engagement member only at one end, such as in the final part of the window element 612, 312. In such a case, the engagement projection, such as 613c or 313c, of the adjacent window element, such as 613 in Figure 6 or 313 in Figures 2 to 3, is not subjected to bidirectional engagement but enables a separate movement of the element in direction B, as shown in Figure 6. Thus, the motion engagement member of the window element in question cannot be caught in a "pocket" between two motion engagement members of the adjacent element since that adjacent element only has one motion engagement member in the direction of that window element in question.

[0027] Figure 4 is a schematic diagram showing, as seen from a direction of a top rail, a first basic use situation when the window elements are in a closed position. Starting from the left, a first and a second window element 411, 412 are concatenated to one another such that when the combination of the elements is moved to the right, the second window element 412 follows the first window element, or glass pane element. Starting from the left, a third and a fourth window element are concatenated to one another such that when the combination of the elements is moved to the right 4, element follows 3 element.

[0028] However, in the middle of the glazing, the second window element 412 and the third window element are separated from the concatenation of the elements by means of a bypass projection which allows a mutual bypass movement of the elements.

[0029] It is also possible that no bypass projection is used between the second and the third window element 412, 413. Then, in an embodiment, the window elements 411 to 414 are concatenated to one another completely,

and a previous element follows a moving glass pane element when the elements are being moved to the left in Figure 4; correspondingly, all glass pane elements 411 to 414 detach from one another when the glass pane elements are being moved to the right in Figure 4. The principle of the concatenating motion in Figure 4 in such a version is a pushing-ahead one. In Figure 4, the motion engagement members are 411 c to 413c and the motion engagement members in cooperation therewith being 412d to 414d.

[0030] Figure 5 is a schematic diagram showing, as seen from the direction of the top rail, a second basic use situation when window elements 511 to 514 have been moved as two groups to both edges, i.e. the window elements 511 to 512 to the left and the window elements 513 to 514 to the right. Also in Figure 5, the motion engagement members are provided between the elements, between the second and the third element 512, 513 the motion engagement members are ones that allow bypassing and include a PASS structure according to Figure 3, allowing a bypassing movement.

[0031] In an embodiment, the end stopper of the bottom strip, such as PL1, which comprises an engagement member pointing in the first transverse direction, is a piece substantially similar, but having its position rotated by half a turn, to an end stopper of the bottom strip which comprises an engagement member pointing in the second transverse direction. Such a situation occurs for instance with end stoppers located at different ends, i.e. the initial end and the final end, of the same window element, or with end stoppers located at different ends of adjacent window elements.

[0032] In an embodiment, both ends of the bottom strip of the window element, i.e. the glass pane strip of the window pane element, are provided with a substantially identical end plug, i.e. an end stopper PL1 to PL4, but the transverse projections of the end stoppers, i.e. the motion engagement members, such as 612c, 612d, however, point to different sides since the ends of the window element point by half a turn in different directions, i.e. in opposite directions. A lower edge of the end stopper of the window element is for instance provided with an L-shaped shoulder, i.e. projection, which, when being moved in the first direction A, tags an adjacent window element along with it. Since the part in the second end of the bottom strip of the window element is a similar part, this, together with the shortening PASS of the lower edge of the second side of the plug results in the window element not being moved along with the previous glass pane element when the window element is being moved in the second direction B but, in this case, the window element can be detached from the concatenation, to be a single window element that can be cleaned easily. The end plug, i.e. the end stopper PL1 to PL4, is substantially similar at all ends of all window elements, such as 611 to 614, or 311 to 314, of the glazing arrangement, or at least at the ends of window elements not being the first (the innermost) or the last (the outermost). This means that

when the end stoppers of adjacent window elements meet at the different ends (initial end, final end) of the window elements, i.e. when the adjacent window elements extend, when viewing from a direction of an end stopper, in different directions, a motion engagement is provided between the window elements, i.e. the motion of a window element is transferred to an adjacent window element. Such a situation occurs when the final end of the window element 612 meets with the initial end of the adjacent window element 613. In this situation, the motion engagement members of the different ends (initial part, final part) of the adjacent window elements extend in a direction between the window elements 612, 613, i.e. oppositely, so a motion engagement occurs. This is also the case between the elements 611, 612 and between the elements 613, 614.

[0033] But when the adjacent window elements, such as 612, 613, or 312, 313, point in the same direction when viewing from the direction of their end stopper, no motion engagement, i.e. transferring contact, occurs. Such is the situation when the initial ends of adjacent window elements meet. In this situation, only one of the motion engagement members of the same end (initial part/initial part) of the adjacent window elements extends in the direction between the window elements, so no motion engagement occurs. Thus, the motion engagement members in the adjacent window elements point in the same direction, i.e. not towards one another, so they do not meet.

[0034] It can be seen in the figures that the lower parts of the end stoppers PL1 to PL4 and also the motion engagement members are located in the area between the supporting and/or guiding projections of the window elements, which helps to keep the structure low and protected.

[0035] The structure according to the invention enables the window elements of a glazing arrangement with or without vertical frames and sliding overlappingly, i.e. parallelly, to move or not to move, as necessary, along with the adjacent (previous/next) window element. This function is to enable that in a typical situation, when moving a single glass pane, also the next glass pane elements follow the adjacent (previous/next) glass pane element upon closing the opening of the glazing arrangement. But in the same situation the window element may, however, be completely separated from the concatenation of the window elements for instance for cleaning, making such a wide, non-rotatable, i.e. sliding, window element easier to clean.

[0036] By positioning these end stoppers PL1 to PL4, such as end plugs, appropriately, the opening point of the glazing may be placed freely. In such a case, it is for instance possible to implement an overlappingly sliding glazing arrangement wherein the opening in the glazing opens up in two different directions, as in Figure 4, and the opening direction of both bundles of glass panes is from the middle towards an edge, i.e. towards different edges.

[0037] Any glass pane element of the installation opening may be handled in the opening as a single glass pane element independent from the concatenation of glass pane elements, in which case each glass pane element may be cleaned from the right-hand and the left-hand side of the single glass pane element. Also the overlap formed by the mutual overlapping of the glass pane elements in the end areas of the glass pane elements becomes undone, and it is possible to clean and dry also this area in the glass pane element. If the glass pane elements are wide, for instance 1000 mm, it is easier to clean the glass pane from outside the balcony/terrace space, as the wide element can be cleaned from inside, separately from the right-hand and separately from the left-hand side. In addition, it can be stated that it is almost impossible to clean an element having a width of for instance 1000 mm from one side only. When all glass pane elements are moved to a first edge of the opening and the glass pane elements are then started to be moved towards a second edge of the opening, the concatenation formed by the engagement members is consequently undone. The arrangement in question is a moving arrangement for sliding glass pane elements, comprising a concatenation which in a first direction is a tag-along structure and, upon moving the glass pane elements in a second direction, the moving arrangement is arranged to unconcatenate and enable each single element to be moved independently. The engagement members, i.e. the motion engagement projections, implementing the motion engagement between the elements are safe within the area between the support parts 141 to 144, i.e. the ridges/projections 141 to 144 guiding/supporting the slide of the elements, provided in the bottom rail.

[0038] It is apparent to a person skilled in the art that as technology advances, the basic idea of the invention may be implemented in many different ways. The invention and its embodiments are thus not restricted to the examples described above but may vary within the scope of the claims.

Claims

1. A glazing arrangement for a balcony, terrace or a corresponding space, comprising, between a top rail (130) and a bottom rail (140) of the glazing arrangement, sliding window elements (611 to 114) which are movable into a parallel mutual position and into a successive mutual position and which are mutually out of line, and a motion engagement structure between the window elements, **characterized in that** the motion engagement structure (612c, 612d, 613c) between the window elements is a bypass structure, comprising a bypass motion engagement structure which in a first travel direction is a tag-along structure but which in a second travel direction, the second travel direction being reverse with respect to the first travel direction, is a

bypass structure, one or more single sliding window elements (612) thus also being arrangeable in motion not engaging with an adjacent sliding window element (613, 611).

2. A glazing arrangement as claimed in claim 1, **characterized in that** the motion engagement members in the motion engagement structure are placed such that at least a certain sliding window element (612) is provided with a first motion engagement member (612c) in an initial part of the sliding window element, the initial part of the sliding window element being in travel direction directed in the first travel direction (A), and the first motion engagement member (612c) in question extending, when viewing in a transverse direction of the sliding window element, in a first transverse direction (C), on which side resides an area of movement of a previous sliding window element (611), and, further, this same certain sliding window element (612) is provided with a second motion engagement member (612d) in a final part of the sliding window element, the final part of the sliding window element being in travel direction directed in the second travel direction (B), and that, when viewing in the transverse direction of the sliding window element, that second motion engagement member (612d) of the certain sliding window element (612) extends in a second transverse direction (D).

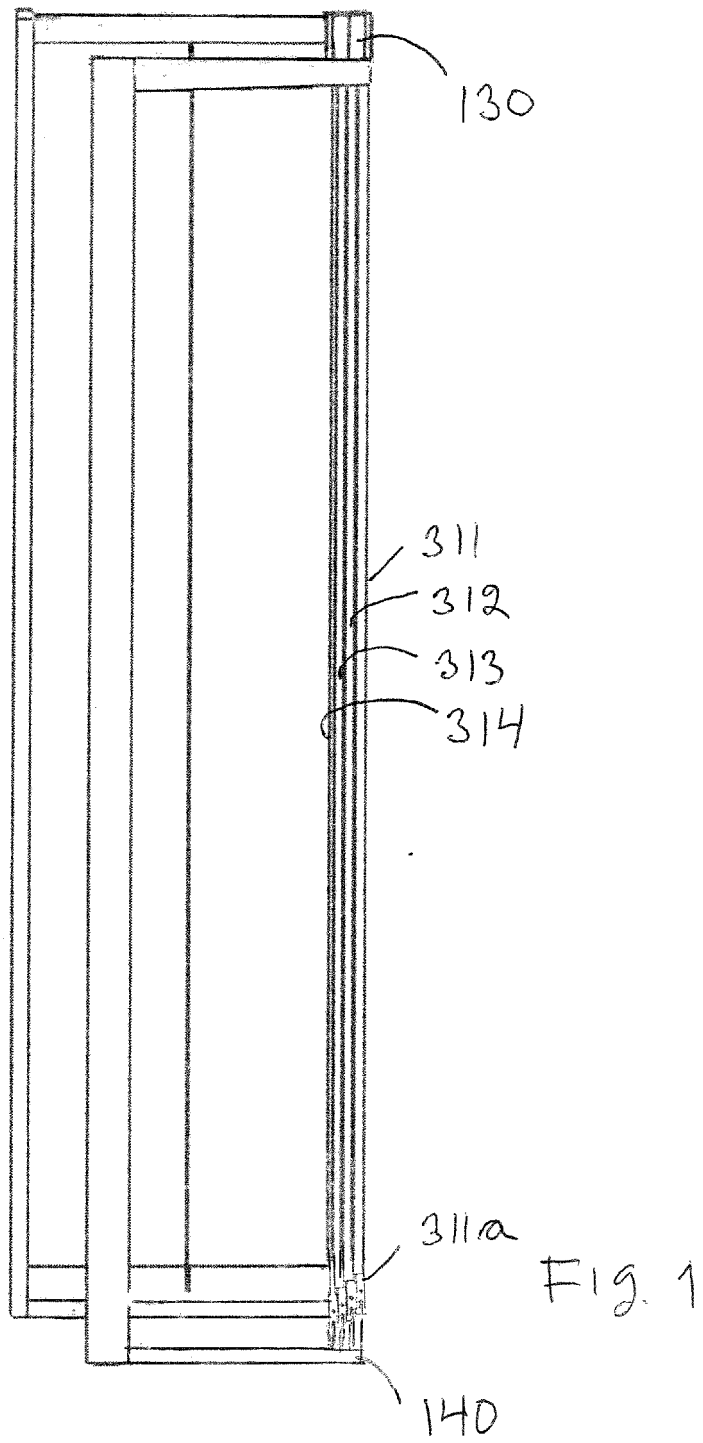
3. A glazing arrangement as claimed in claim 2, **characterized in that** with respect to said certain sliding window element (612), the previous sliding window element (611) is provided with a motion engagement member (611 d) in the final part of the sliding window element, the final part of the sliding window element (611) being in travel direction directed in the second travel direction (B), and the motion engagement member (611 d) in question **in that** previous sliding window element (611) extending, when viewing in the transverse direction of the sliding window element, in the second transverse direction (D), i.e. to the side on which said certain sliding window element (612) in its initial part is provided with the first motion engagement member (612c), and that the motion engagement member (611d) of the final part of said previous sliding window element (611) is arranged to be brought into motion engagement with the first motion engagement member (612c) in the initial part of said certain sliding window element (612) in order to engage the motion from said previous sliding window element (611) to said certain sliding window element (612).

4. A glazing arrangement as claimed in claim 2 or 3, **characterized in that** with respect to said certain sliding window element (612), the previous sliding window element (613) is provided with a motion engagement member (613c) in the initial part of the

sliding window element, the initial part of the sliding window element being in travel direction directed in the first travel direction (A), and the motion engagement member (613c) in question **in that** next sliding window element (613) extending, when viewing in the transverse direction of the sliding window element, in the first transverse direction (C), i.e. to the side on which said certain sliding window element (612) in its final part is provided with the second motion engagement member (612d), and that the second motion engagement member (612d) in the final part of said certain sliding window element (612) is arranged to be brought into motion engagement with the motion engagement member (613c) in the initial part of said next sliding window element (613) in order to engage the motion from said certain sliding window element (612) to said next sliding window element (613).

5. A glazing arrangement as claimed in any one of the preceding claims, **characterized in that** the motion engagement members in the motion engagement structure are provided in the bottom strips (311 a, 312a, 313a, 314a) or top strips of the sliding window elements (311 to 314).
6. A glazing arrangement as claimed in claim 5, **characterized in that** the motion engagement member is provided in an end stopper (PL1 to PL4) of an end of the bottom strip or the top strip.
7. A glazing arrangement as claimed in claim 6, **characterized in that** the end stopper (PL1 to PL4) of the bottom strip, which comprises an engagement member pointing in the first transverse direction, is a piece substantially similar, but rotated by half a turn, to an end stopper of the bottom strip which comprises an engagement member pointing in the second transverse direction.
8. A glazing arrangement as claimed in claim 1, **characterized in that** the sliding window elements (611 to 614, 311 to 414, 411 to 414, 511 to 514) have no vertical frames.
9. A glazing arrangement as claimed in any one of the preceding claims, **characterized in that** the motion engagement member (612c, 612d, 613c) is a structure to be added to or machined in the bottom strip, top strip or another support strip of the window element.

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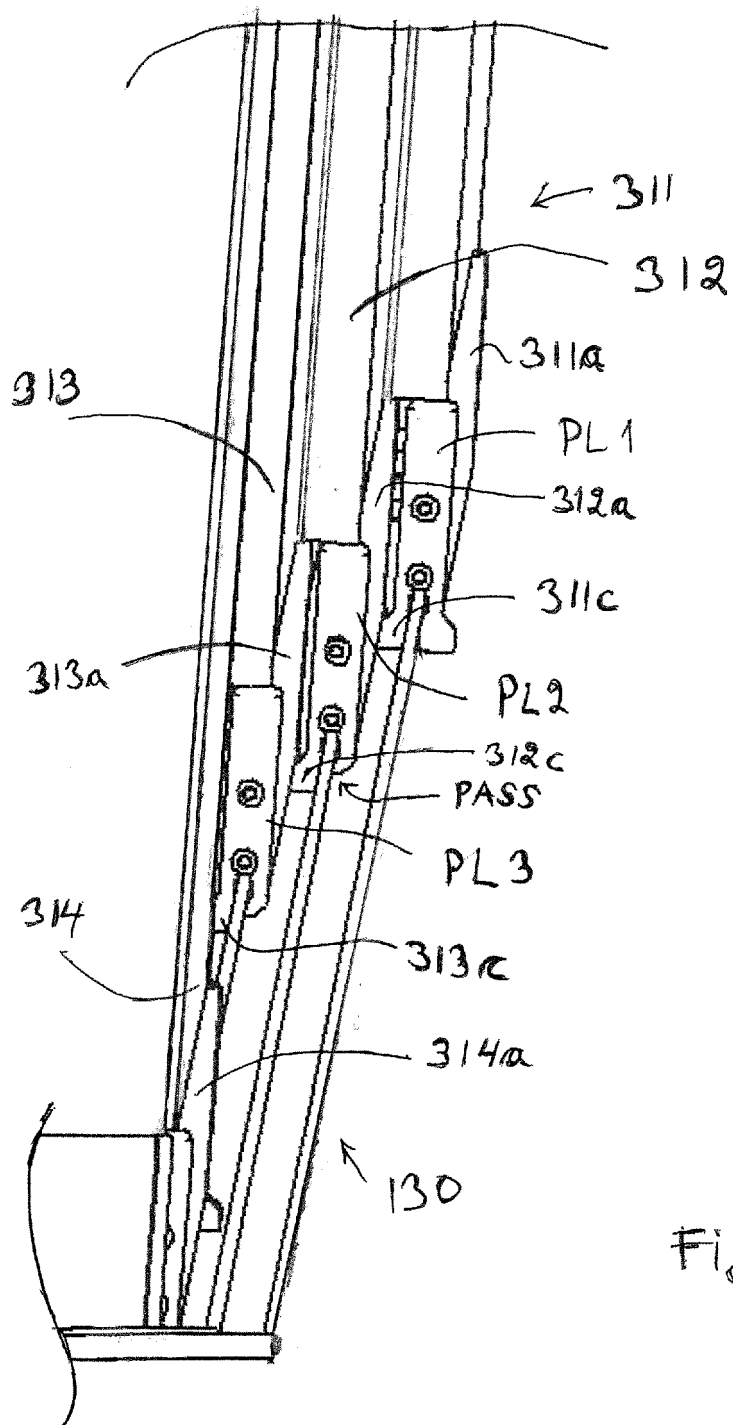
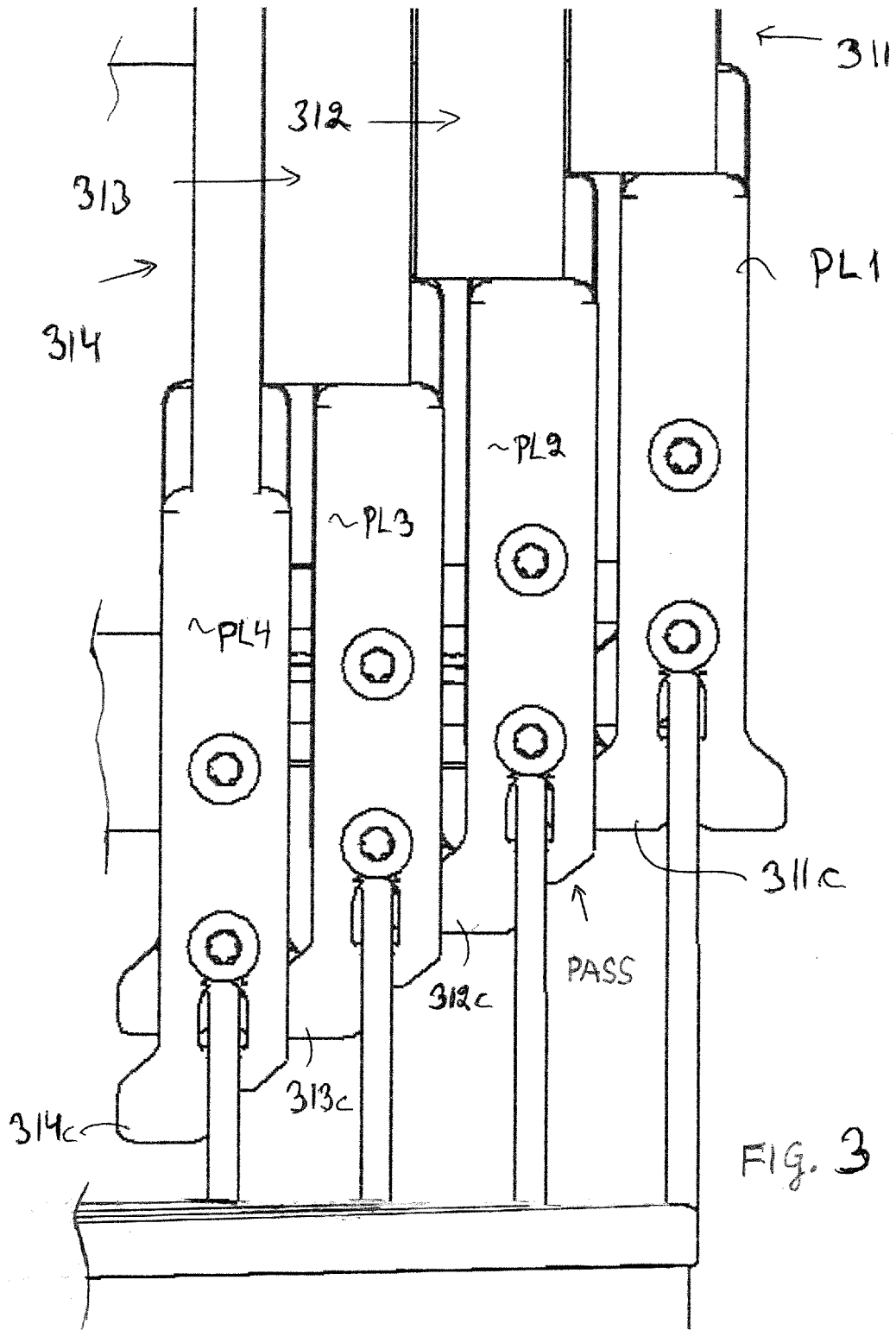


Fig. 2



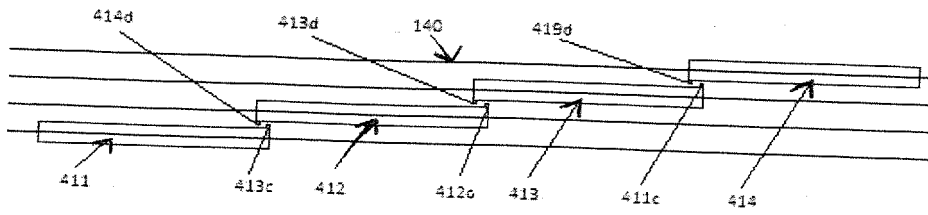


Fig. 4

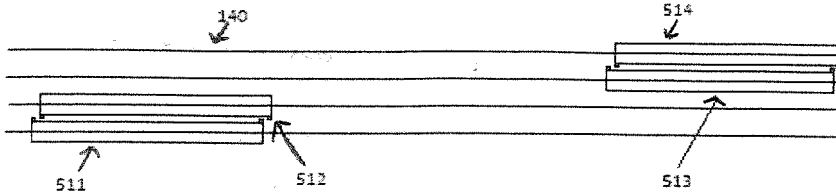


Fig 5

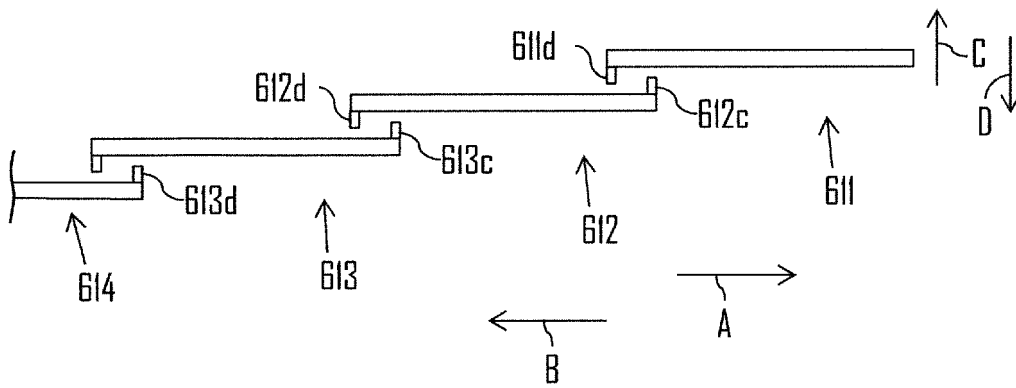


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 15 18 6667

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	WO 2008/108703 A1 (NORDISKA BALCO AB [SE]; BJOERKMAN LARS [SE]) 12 September 2008 (2008-09-12) * page 6, line 30 - page 8, line 25; figures 5,6,9 *	1-4	INV. E05F17/00 E06B3/46 ADD. E05D15/08
X	FR 2 378 162 A1 (EST REUNIS BOIS INDLS [FR]) 18 August 1978 (1978-08-18) * page 2, line 7 - page 3, line 35; figures 1-3 *	1-5,8,9	
X,D	US 6 276 092 B1 (NEO SER LEE [SI]) 21 August 2001 (2001-08-21) * column 3, line 33 - column 4, line 7; figures 1,3 *	1-4,6,7	
			TECHNICAL FIELDS SEARCHED (IPC)
			E05F E05D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 March 2016	Examiner Klemke, Beate
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.02 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
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