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• **Taylor, Geoffrey**
Preston, Lancashire PR3 0RD (GB)

(72) Inventors:
• **HAMMOND, Ernest**
Middlewich, Cheshire CW10 0HH (GB)
• **TAYLOR, Geoffrey**
Preston, Lancashire PR3 0RD (GB)

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(74) Representative: **HGF Limited**
1 City Walk
Leeds LS11 9DX (GB)

(71) Applicants:
• **Taylor, Sally**
Preston, Lancashire PR3 0RD (GB)

(54) **WINDOWS**

(57) A window 1 having a frame 2 and a sash 3 for receiving glazing GU, the frame 2 comprising a first frame element 2a joined to a second frame element 2b, the sash 3 having a first sash element 3a for receiving a glazing unit GU and a second sash element 3b for securing the glazing unit GU to the first sash element 3a,

the sash 3 being movably attached to the frame 2 and having a first lock element 6b wherein, in use, and with the sash 3 closed with respect to the frame 2 the first lock element 6b engages a second lock element 6a which extends through both the first frame part 2a and the second frame part 2b.

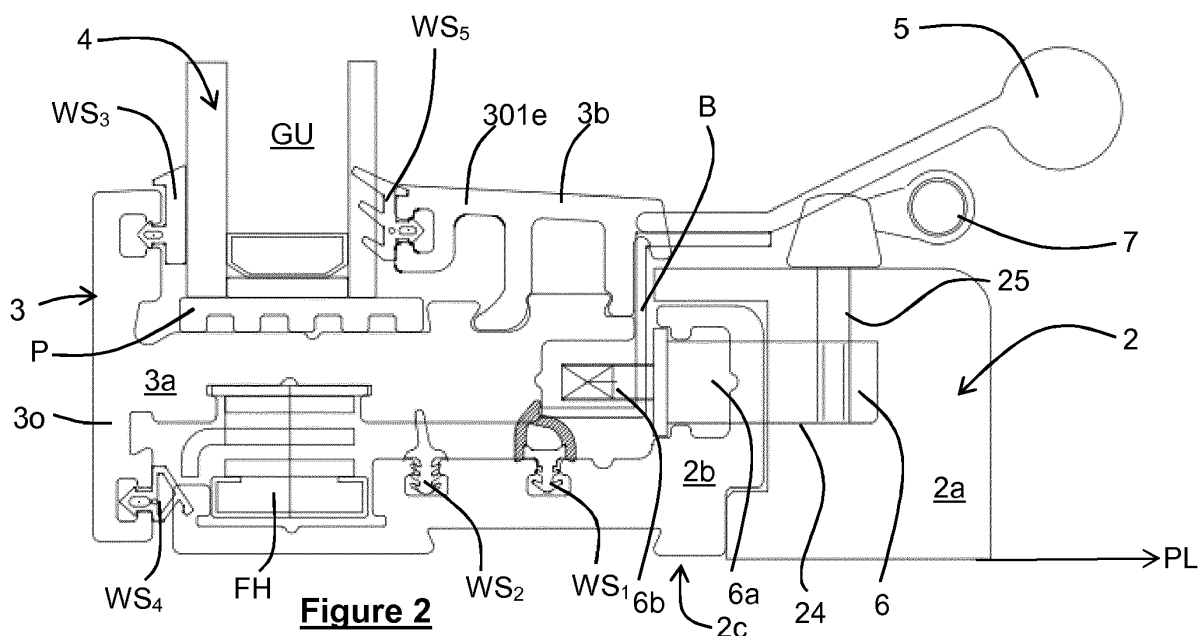


Figure 2

Description

[0001] This invention relates generally to a window and more particularly to windows for use in buildings and fixed structures.

[0002] Traditionally, windows comprise a frame and a sash. The frame, which is permanently attached to the building or other structure, provides the aperture in which the sash is fixedly or movably located. The sash holds the glazing.

[0003] Traditionally, window frames and sashes have been formed of wood (timber) or metal (iron, steel, aluminium). It is also known to use other materials such as plastics.

[0004] In the UK domestic market, plastics have become the material of choice because they can be mass fabricated and are cheap. In the most popular construction, PVC is extruded into hollow lengths or sections which are secured together to provide both the frame and the sash. Because of the nature of PVC, the sections are typically large and internal reinforcement (for example metal sections) may be used to impart upon a PVC section (and hence the so-formed window) the necessary rigidity. Because the sections are large, the visible area of the window is reduced and the area available for glazing is less than is often offered by traditional systems.

[0005] That said, although PVC sections have to be larger than corresponding aluminium sections to achieve the same dynamic performance, PVC is cheaper to produce and provides certain other benefits, such as increased thermal performance. Accordingly, there is often a trade-off between the aesthetics of the window and the cost to fabricate and/or install.

[0006] It is an object of the current invention to provide a window which has one or more of a low sight-line, large available glazing area and required (and preferably excellent) thermal performance. It is a further non-exclusive object of the invention to provide a window which is environmentally robust and, consequently, has a long life-time.

[0007] It is a further non-exclusive object to provide a window which is secure and/or is easy to install.

[0008] Other advantages of the invention will become apparent from the following.

[0009] A first aspect of the invention provides a window having a frame and a sash for receiving glazing, the frame comprising a first frame element permanently joined to a second frame element, the sash having a first sash element for receiving a glazing unit and a second sash element for securing the glazing unit to the first sash element, the sash being movably attached to the frame and having a first lock element wherein, in use, and with the sash closed with respect to the frame the first lock element engages a second lock element which extends through both the first frame part and the second frame part.

[0010] Preferably the first lock element is a lock keep and second lock element is the lock body or mechanism. Having the lock body in the frame is beneficial because it allows the sash components to be smaller than would otherwise be required and also allows a larger and/or more robust and/or more complex lock to be used. Locating the lock body in the frame may increase security.

[0011] The first frame element and the second frame element may be formed from the same or different materials. The first frame element may be visible from and face a first side of the window and the second frame element may be visible from and face a second side of the window.

[0012] A second aspect of the invention provides a window having a frame and a sash for receiving glazing, the frame comprising a first frame element permanently joined to a second frame element, the sash having a first sash element for receiving a glazing unit and a second sash element for securing the glazing unit to the first sash element, the first frame element and the second frame element being formed from different materials, the first frame element being visible from and facing a first side of the window and the second frame element being visible from and facing a second side of the window.

[0013] The sash may be movably secured to the frame.

[0014] The sash may carry a first lock element wherein, in use, and with the sash closed with respect to the frame the first lock element engages a second lock element which extends through the frame, and preferably through both the first frame element and the second frame element.

[0015] By using a first and second frame element, rather than a single unitary body, the choice of materials available to the fabricator and/or designer is wide. This means that aesthetics, cost and, for example, physical and/or thermal performance can be optimised according to location, climate, need and desire.

[0016] The first frame element may be formed from wood or timber. The second frame element may be formed from plastics material, for example a thermoset polymer. The second frame element may comprise fibre reinforced polymer (FRP). The second frame element may be a pultruded part. If the second side of the window is or corresponds to the outside of a structure or building the use of polymers, for example, thermoset polymers, and in particular FRP, e.g. pultruded sections, is beneficial because of the excellent environmental stability and, in the case of thermoset polymers, a low coefficient of thermal expansion. If the first side of the window corresponds to the inside of a structure the use of timber, for example, may be beneficial because of the physical properties and/or aesthetic qualities of timber and/or because of the different cost bases of timber products, for example variety of different types of timber (e.g. formed from hardwood or softwood). The timber may be a pressure treated and/or laminated timber structure. If laminated, the timber

may be laminated with a fascia material, for example to provide a preferred visual look.

[0017] The use of timber may be beneficial because it allows for robust lock components to be securely housed within the frame. It may be further beneficial because the lock does not intrude beyond the sight line, *i.e.* above the frame.

[0018] The first and second frame elements are preferably joined so as to define an aperture-facing or abutting surface, the aperture abutting surface being planar. The aperture abutting surface is preferably defined by the first frame element and the second frame element together.

[0019] Both the first frame element and the second frame element may be formed as solid components, rather than as hollow sections. This helps with rigidity and/or in providing a low sightline.

[0020] The first frame element and the second frame element may house lock components for securing the sash to the frame in use. Preferably the window comprises a slam lock or automatic dead latch, that being a lock which automatically locks when the sash is brought into closing relations with the frame.

[0021] The first sash element preferably carries a handle for manipulating the sash.

[0022] A further aspect of the invention provides a window having a frame and a sash, the frame being formed from a first and second frame element, both being formed of different materials, the sash being hingedly connected to the frame, the window having an exterior sight line of less than 60 mm and a U value of less than $1.15 \text{ Wm}^{-2}\text{K}^{-1}$.

[0023] The window may have an exterior sight line of less than 60 mm and/or a U value of from 0.5 to $1.15 \text{ Wm}^{-2}\text{K}^{-1}$, for example of from 0.5 to $0.8 \text{ Wm}^{-2}\text{K}^{-1}$ or from 1.0 to $1.15 \text{ Wm}^{-2}\text{K}^{-1}$, the former range preferably being in relation to a triple-glazed window and the latter range preferably being in relation to a double glazed window.

[0024] In order that the invention may be more fully understood it will now be described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 is a schematic view of a window according to the invention;

Figure 2 is sectional view through the window of Figure 1 in a direction parallel to line II-II;

Figure 2A is a sectional view of a first frame element of the window of Figure 2;

Figure 2B is a sectional view of a second frame element of the window of Figure 2;

Figure 2C is a sectional view of a sash of the window of Figure 2

Figure 3 is a sectional view through the window of Figure 1;

Figure 4 is a sectional view through an alternative second frame element for use in a window according to the invention;

Figure 5 is sectional view through an alternate window of the invention in a direction equivalent to that shown as line V-V in Figure 1;

Figure 6 is an alternative embodiment to that shown in Figure 2; and

Figure 7 shows the window of Figure 6 in a configuration equivalent to that shown in Figure 5.

[0025] Referring first to Figure 1, there is shown a window 1 having a frame 2, which is to be (or is) mounted in an aperture of a building or structure (not shown). The frame holds a sash 3 which retains glazing 4. As shown, the window 1 comprises two opening sashes 3o and one fixed sash 3f. Other configurations of window 1 are possible, for example a single window 1 having an opening or closed sash, double window and so on.

[0026] Each opening sash 3o is top hung so as to pivotally open by rotation about a hinge and is connected to the frame 2 via a side mounted friction hinge FH to allow the sash 3o to pivot and slide away from the top edge 2t of the frame 2. Other hinge arrangements may also be deployed, for example the sash 3o may be bottom hung or side hung or the window 1 may be partly or fully reversible to facilitate cleaning of windows 1 located at height.

[0027] Figure 2 provides a sectional view through a window 1 of Figure 1 at the bottom edge 2b of the frame 2 of the window 1 for one of the opening sashes 3o. Each of the frame 2, sash 3 and glazing 4 of the window 1 is shown. As shown, the glazing 4 is a double-glazing sealed unit. The sash 3 carries a handle 5. The sash 3 and frame 2 each carry elements of a lock 6 and the frame 2 carries a lock release lever 7. Alternatively, the lock release lever may be incorporated in the handle 5, or may be absent or provided elsewhere.

[0028] The frame 2 comprises a first frame element 2a and a second frame element 2b secured together. The two frame elements 2a, 2b together provide a wall surface 2c defining a plane PL.

[0029] As seen in Figure 2A, the first frame element 2a is a solid elongate body, usually formed of wood. The first frame element 2a has an interior facing surface 20 and an opposite surface 21. Extending between the room facing surface 20 and the exterior facing surface 21 is a wall facing surface 22, forming part of the wall surface 2c and an opposite surface 23.

[0030] The exterior facing surface 21 comprises a first lip portion 21a and a second lip portion 21 b each extending away from the interior facing surface 20 and defining therebetween a rebate 23. The first lip portion 21 a extends beyond the second lip portion 21 b. Extending into the first frame element 2a on at least one of the sides of the window 1 (and typically the bottom edge 2ii) from the exterior facing surface 21 is a rebate 24 (see Figure 2). The rebate 24 communicates, on said at least one side of the window 1, with a blind aperture 25 extending into the body from the opposite surface 23.

[0031] The second frame element 2b, which is preferably formed as a pultruded length of FRP, is shown in Figure 2B

and is a substantially "J" shaped member having a leg part 201 and a foot part 202 extending from the leg part 201.

[0032] The leg part 201 has a wall facing surface 203 which forms a part of the wall surface 2c. The obverse face 204 of the leg part 201 has plural elongate rebates 205 for accepting weather seals WS_1 , WS_2 . Towards a distal end 201 d of the leg part 201, the leg part 201 thins to define an elongate slot 206, for receiving, where appropriate or desired, a part of a hinge H, for example friction hinge FH, to facilitate the opening and closing of the window 1.

[0033] The foot part 202 comprises an interior facing surface 207 and an exterior facing surface 208. Extending away from the interior facing surface 207 is a return 209 which, together with the obverse face 204 of the leg part 201 defines an elongate rebate 211. Each of the return 209 and obverse face 204 carry facing abutment lips AL. An elongate cut-out 210 is provided at the connecting corner of the leg part 201 and foot part 202.

[0034] In use, the interior facing surface 207 of the foot part 202 abuts the opposite surface 23 of the first frame element 2a such that the second lip portion 21 b extends into the cut-out 210 and the first lip portion 21 aligns with the return 209, the lip portions 21 a, 21 b of the first frame element 2a thereby embracing the foot portion 202 of the second frame element 2b. The two frame elements 2a, 2b may be joined together by way of adhesives, screws, and/or other fasteners.

[0035] As will be appreciated, the first lip portion 21 a obscures the view of the return 209 of the second frame element 2b.

[0036] Turning now to Figure 2C, there is shown a sash 3' configured to receive a triple glazing unit (not shown). The difference between the sash 3 of Figure 2 and the sash 3' of Figure 3 is the second sash element 3b and 3b', advantageously the first sash element 3a being identical in both cases.

[0037] The first sash element 3a, which may be formed from pultruded FRP, has an elongate limb 31 extending in a plane parallel to the wall surface 2c and having a wall surface facing side 31w and an obverse, glazing facing side 31g. The elongate limb 31 further comprises, at a distal end 31 d, a pair of orthogonal webs, 32a, 32b extending in opposite directions and providing an exterior surface 33. The glazing facing surface 31g being disposed between a channel 31c proximate one of the webs 32a and an abutment face 31f. The abutment face 31f will typically support a packer element.

[0038] Each of the orthogonal webs 32a, 32b has, on a face obverse 34 to the exterior surface 33, an elongate slot 35 for carrying in each a weather seal WS_3 , WS_4 (see Figure 2). The proximal end 31 p of the elongate limb 31 has a pair of rebates 36 for receiving feet 303 of the second sash element 3b' (or indeed second sash element 3b as seen in Figure 2). The proximal end 31 p of the second sash element 3a also comprises an elongate cut-out 37. Between the distal and proximal ends 31 d, 31 p there is provided a slot 38 extending into the elongate limb 31 from the wall facing side 31w.

[0039] The second sash element 3b', which may be formed from plastics material (e.g. PVC), wood of similar design or aluminium, preferably PVC, comprises a pair of facing legs 301', interconnected by a roof portion 302'. Alternatively the second sash element 3b' may be formed from pultruded FRP although we have surprisingly found that pultruded FRP may make the section too stiff for some embodiments, for example embodiments where the window 1 is less than 600mm long. Each of the legs 301' terminate in a foot 303' for receipt in the rebates 36 of the first sash element 3a. In a preferred embodiment, the feet 303' snap fit in the rebates 36. An interior facing surface of the second sash element 3b' may comprise a decorative return 307'. The exterior facing surface of the second sash element 3b' may carry a rebate 303' for receipt of a weather seal WS_5 (see Figure 2).

[0040] As stated above, the second sash element 3b' is configured to allow receipt of a triple glazing unit in a window 1' of the invention. By providing an extension 301e (as shown in Figure 2) it is a trivial matter to configure the window 1 for receipt of a double glazing unit. Of course, this realises the opportunity for glazing upgrades or changes as may be required, and also ensures that the minimum of components need be changed when making such an alteration.

[0041] In order to fabricate a window 1, lengths of first frame element 2a and second frame element 2b are secured together and joined to form a peripheral frame 2 for receipt in an aperture, for example in a wall. Typically the lengths are mitred or part-mitred (or alternatively not mitred) and joined together by adhesives and/or physical fixings. The so-formed frame 2 is configured for the first frame element 2a to provide the room facing portion of the frame 2 and for the second frame element 2b to provide the exterior-facing portion of the frame 2. As stated above, the interior facing surface 207 of the foot part 202 of the second frame element 2b abuts the opposite surface 23 of the first frame element 2a such that the second lip portion 21 b extends into the cut-out 210 and the first lip portion 21 aligns with the return 209, the lip portions 21 a, 21 b of the first frame element 2a thereby embracing the foot portion 202 of the second frame element 2b. The two frame elements 2a, 2b may be joined together by way of adhesives, screws, and/or other fasteners. Thus, the first lip portion 21 a obscures the view of the return 209 of the second frame element 2b from the room facing side of the window 1.

[0042] Weather seals WS_1 , WS_2 are located in rebates 205 around the entire internal-facing periphery of the frame 2.

[0043] Lengths of first sash element 3a are then secured together to form a framework as part of the sash 3. Typically the pultruded lengths are mitred or part mitred (or alternatively not mitred) and joined together using adhesives, physical fixings and/or corner pieces. Weather seals WS_3 , WS_4 are located in rebates 35 around the entire periphery of the framework.

[0044] The so-formed sash framework is then joined to the frame 2 by way of hinges. As indicated in Figure 1, a typical friction hinge HF can be used. This hinged joining may be performed by locating and securing a first part of the friction

hinge FH in the rebate 206 of the second frame element 2b and a second part of the friction hinge FH in a facing rebate 38 of the first sash element 3a. Clearly, to effect an opening as shown in Figure 1 the hinge parts of each friction hinge FH will engage side portions of the frame 2 and sash 3, rather than along the top side 2t or bottom side 2b. By way of illustration, Figure 2 shows a friction hinge FH engaged within the respective rebates 206, 38.

[0045] The frame 2 and hinged first sash element 3a may now be secured within a wall aperture using securing or adhesive compounds as are known in the art. Additionally or alternatively the frame 2 can be secured in place using physical fixings (nail, screws or so on).

[0046] Glazing of the window 1 may take place either before or after the frame 2 is secured within an aperture. In either case, a glazing unit 4 (typically either a double glazed unit GU, Figure 2, or triple glazed unit) is located within the sash framework. Packing (P, Figure 2) may be provided to ensure that the glazing unit 4 is appropriately located on the glazing facing surface 31 g of the first sash element 3a, and which packing P may be aligned by abutment with the abutment face 31f. With the glazing in place, and engaging the weather seal WS₄ located in rebate 35 of web 32a, lengths of the second seal element 3b, 3b' carrying weather seal WS₅ are snap-fit into engagement with the first frame element 3a by engaging feet 303, 303' into rebates 36, the glazing unit 4 thereby being sealed in place by action of the engaging weather seals WS₄, WS₅.

[0047] In order to manipulate the window 1, and specifically the sash 3, a handle 5 is provided on the edge of the sash 3 opposite the pivot axis. As shown the handle 5 is secured to the sash 3 using a bracket B. In the alternative, the handle 5 may be located at any appropriate location.

[0048] In a preferred embodiment the window 1 comprises a lock 6, and preferably a slam lock (that being a lock which locks fast upon being closed and which requires further operation to disengage the same). The barrel 6a of the lock 6 is held within aperture 24 of the first frame element 2a and in elongate rebate 211 of the second frame element 2b with abutment lips AL providing an abutment surface for the lock barrel 6a. The locking component 6b is retained within the cut-out 37 of the first sash element 3a and may be retained by fasteners and/or may be held in place, at least in part, by the bracket B. As shown the window 1 comprises a lock release lever 7 to release the lock 6 once the window 1 has been closed and the lock 6 has engaged. As stated above, the lock release lever 7 may be of a different form or may be located elsewhere, such as within or on the handle 5.

[0049] By fabricating the frame 2 in two parts it is possible to provide different internal and external finishes, thereby enabling the internal and external characteristics of the window to be matched to likely environmental conditions. Moreover, the use of FRP and timber allows the window components to be strong, thereby reducing the physical bulk of the frame 2 and sash 3 components. Indeed, we have found that the exterior sight line ESL of the window 1, as seen in Figure 3 may be less than 60 mm and can be less than 55 mm, that the interior sight line ISL may be less than 50 mm and can be less than 45 mm and the depth D of the window 1 can be less than 140 mm and may be less than 135 mm for a triple glazed window. A low sight line is beneficial because it allows more natural light into a room. This can have positive environmental effects in, say, cloudy or dim conditions because the use of artificial lighting may be reduced. A low sight line is also of benefit environmentally because a larger glass area improves the U value of the window 1.

[0050] Also, because the window 1 is strong it facilitates security and allows robust locking components to be deployed. By locating the lock body or mechanism 6 in the frame 2, and specifically extending through the first frame element 2a and second frame element 2b, and by sizing the frame 2 appropriately, larger and more robust locks can be deployed than would otherwise be available. Because the lock mechanism is located or locatable in the frame 2 the sash 3 can be made smaller.

[0051] The internal beading of the window 1 means that glazing 4 can be replaced or upgraded easily and from the inside of a building. This increases security and/or is of particular importance when the windows 1 are installed at elevated positions, for example in tower blocks or other multi-storey buildings because it obviates the need for lifting apparatus to access the window 1.

[0052] Moreover, the use of pultruded FRP on the exterior facing surfaces of the window 1, ensures a durability, excellent thermal performance and a long lifetime. Moreover, it can also be fabricated to provide Class 0 or Class 1 fire resistance (for example by choosing appropriate resin systems). The use of pultruded sections is also beneficial because thin walled pultrusion can be used to generate fine features, such as the weather seal rebates. The provision of five weather seals WS₁₋₅, ensures that the window 1 has excellent thermal performance. Our tests show that the U value of the windows 1 of the invention is as follows:

Window Type	U Value / Wm ⁻¹ K ⁻¹	
	Centre Pane Value	Window of Invention
Double Glazed	1.0	1.0 - 1.15 (e.g. 1.08)
Triple Glazed	0.5	0.5 - 0.8 (e.g. 0.65)

[0053] This clearly shows how effective the window of the invention is vis-à-vis thermal performance.

[0054] The combination of a very low exterior and/or interior sight line, low bulk and fantastic thermal performance, which providing a durable and aesthetically pleasing window 1 are a consequence of window construction.

[0055] As stated in relation to Figure 1, windows of the invention can be fabricated as openable windows (e.g. Figure 2) and closed.

[0056] Figure 4 shows a second frame element 2b' for use with a closed window 1. This can be deployed together with the first frame element 2a, as disclosed above.

[0057] The second frame element 2b', which may be formed from timber or formed as a pultruded length of FRP, is shown in Figure 4 and is a substantially "J" shaped member having a leg part 201' and a foot part 202' extending from the leg part 201'.

[0058] The leg part 201' has a wall facing surface 203' which forms a part of the wall surface 2c'. The obverse face 204' of the leg part 201' receives, in use, a first sash element 3a, as described previously. A distal end 201d' of the leg part 201', provides the exterior facing portion of the frame element. The distal end 201 d' may be treated to ensure that the timber is environmentally robust. Alternatively a protective component can be secured to and/or over the distal end 201 d' to provide protection or the entire part 2b' may be treated to improve environmental protection.

[0059] The foot part 202' comprises an interior facing surface 207' which abuts the opposite surface 23 of the first frame element 2a such that the second lip portion 21 b extends into a cut-out 210' and the first lip portion 21 aligns with an upper surface 209, the lip portions 21 a, 21 b of the first frame element 2a thereby embracing the foot portion 202' of the second frame element 2b. The two frame elements 2a, 2b' may be joined together by way of adhesives, screws, and/or other fasteners.

[0060] Typically the second frame element 2b' will be used along the bottom edge 2b of the window 1.

[0061] Referring to Figure 5 there is shown a window 1', similar to that shown in Figure 1, in the region of a pillar PI between an opening window 1o' and a non-opening window 1c' (in both cases the glazing has been removed to improve visibility of the Figure). The opening window 1o' is shown as being slightly ajar.

[0062] At the pillar PI the first frame element 2a has been replaced by a pillar member PI which supports both a second frame element 2b' for the opening window 1o' and a second frame element 2b' for the non-opening window 1c'. In each case the second frame elements 2b' support a first and second sash element 3a', 3b', the first of the second frame elements 2b' supports a sash element 3a' hingedly to facilitate and allow opening of the window 1o', in the second case the second frame elements 2b' supports a sash element 3a' fixedly to prevent the sash element 3a' from opening.

[0063] Referring now to Figure 6, there is shown a window of the invention 100, which is a variation of the window of Figure 2 (like numerals are used but with a prefix 6 for identification purposes).

[0064] Each of a frame 62, sash 63 and glazing 64 of the window 100 is shown in Figure 6. The sash 63 carries a handle 65 secured thereto by a bracket B. The sash 63 and frame 62 each carry elements of a lock 66 and the frame 62 carries a lock release lever 67. Alternatively, the lock release lever may be incorporated into the handle 65, or may be absent or provided elsewhere.

[0065] The frame 62 comprises a first frame element 62a and a second frame element 62b secured together, for example in the manner described above in respect to the embodiment shown in Figure 2. The two frame elements 62a, 62b together provide a wall surface 62c defining a plane PL. The so-formed frame 62 is configured for the first frame element 62a to provide the room facing portion of the frame 62 and for the second frame element 62b to provide the exterior-facing portion of the frame 62.

[0066] The sash 63 comprises a first sash element 63a and a second sash element 63b. The second sash element 63b includes an optional extension 6310e configured so that the first and second sash elements 63a, 63b may allow receipt of a double glazing unit GU. The window 100 comprises an opening sash 63o. Other configurations of window 100 are possible, for example multiple opening sashes 63o and/or one or more closed or fixed sashes.

[0067] The sash 63 and frame 62 are joined together by way of hinges, for example friction hinges FH. Packing P may be provided to ensure that the glazing unit 4 is appropriately located on the glazing facing surface of the first sash element 3a. Weather seal WS₆₁ is located in a rebate around the entire internal-facing periphery of the frame 62. Weather seals WS₆₃, WS₆₄ are located in rebates around the entire periphery of the framework. A weather seal WS₆₅ may be received within a rebate in the exterior facing surface of the second sash element 3b.

[0068] The lock 66 comprises a barrel held within aperture 624 of the first frame element 62a and in a rebate (not shown) of the second frame element 62b. The first frame element 62a further comprises a blind aperture 625 which communicates with aperture 624 and extends into the body of the first frame element 62a from the surface opposite to that into which aperture 624 extends.

[0069] The principal difference between the embodiment shown in Figure 2 and that shown in Figure 6 is the location of one of the weather seals (WS₂ in Figure 2 and WS₆₂ in Figure 6). In this embodiment the weather seal WS₆₂ has been moved such that it bears between second sash element 63b and frame 62. This, surprisingly, helps with the opening of the window in some embodiments whilst not affecting the thermal performance.

[0070] The window 100 shown in Figure 6 may be assembled as described above in respect of the embodiment shown

in Figure 2.

[0071] Figure 7 shows a window 61' in the region of a pillar PI', having an opening sash 610' and a fixed sash 61c'. The opening sash 610' is identical to that shown in Figure 6 with the second weather seal WS₆₂' located between the pillar PI' and the second sash element 63b'. The opening sash 610' comprises a second frame element 62b'.

[0072] The fixed sash 61 c' may comprise, as a second frame element 62b", a wooden member or a plastics member. In each case the second frame elements 62b', 62b" support the first and second sash element 63a', 63b'. The first of the second frame elements 62b' supports a sash element 63a' hingedly to facility and allow opening of the window. The second of the second frame elements 62b" supports a sash element 63a' fixedly to prevent opening of the window.

[0073] Accordingly, the window 1 of the invention provides a robust window which can have an extremely long life, which providing excellent performance. Moreover the window 1 can be secure and can be adapted to provide plural aesthetic finishes whilst not compromising performance.

Claims

1. A window having a frame and a sash for receiving glazing, the frame comprising a first frame element joined, preferably permanently joined, to a second frame element, the sash having a first sash element for receiving a glazing unit and a second sash element for securing the glazing unit to the first sash element, the sash being movably attached to the frame and having a first lock element wherein, in use, and with the sash closed with respect to the frame the first lock element engages a second lock element which extends through both the first frame part and the second frame part.
2. A window according to Claim 1, wherein the first lock element is a lock keep and second lock element is the lock body or mechanism.
3. A window according to Claim 1 or 2, wherein the first frame element and the second frame element are be formed from the same or different materials.
4. A window according to any of Claims 1, 2 or 3, wherein the first frame element is visible from and face a first side of the window and the second frame element may be visible from and face a second side of the window.
5. A window having a frame and a sash for receiving glazing, the frame comprising a first frame element joined, preferably permanently joined, to a second frame element, the sash having a first sash element for receiving a glazing unit and a second sash element for securing the glazing unit to the first sash element, the first frame element and the second frame element being formed from different materials, the first frame element being visible from and facing a first side of the window and the second frame element being visible from and facing a second side of the window.
6. A window according to Claim 5, wherein the sash is movably secured to the frame.
7. A window according to Claim 5 or 6, wherein the sash carries a first lock element wherein, in use, and with the sash closed with respect to the frame the first lock element engages a second lock element which extends through the frame, and preferably through both the first frame element and the second frame element.
8. A window according to any preceding Claim, wherein the first frame element is formed from wood or timber.
9. A window according to any preceding Claim, wherein the second frame element is formed from a plastics material, for example a thermoset polymer.
10. A window according to any preceding Claim, wherein the second frame element comprises fibre reinforced polymer (FRP) and may be formed by pultrusion.
11. A window according to any preceding Claim, wherein the first and second frame elements are joined so as to define an aperture-facing or abutting surface, the aperture abutting surface being planar.
12. A window according to any preceding Claim, comprising a slam lock or automatic dead latch.
13. A window according to any preceding Claim, wherein the first sash element carries a handle for manipulating the sash.

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14. A window having a frame and a sash, the frame being formed from a first and second frame element, both being formed of different materials, the sash being hingedly connected to the frame, the window having an exterior sight line of less than 60 mm and a U value of less than $1.15 \text{ Wm}^{-2}\text{K}^{-1}$.

5 **15.** A window according to any preceding Claim, wherein the exterior sight line is less than 60 mm and/or the U value is from 0.5 to $1.15 \text{ Wm}^{-2}\text{K}^{-1}$.

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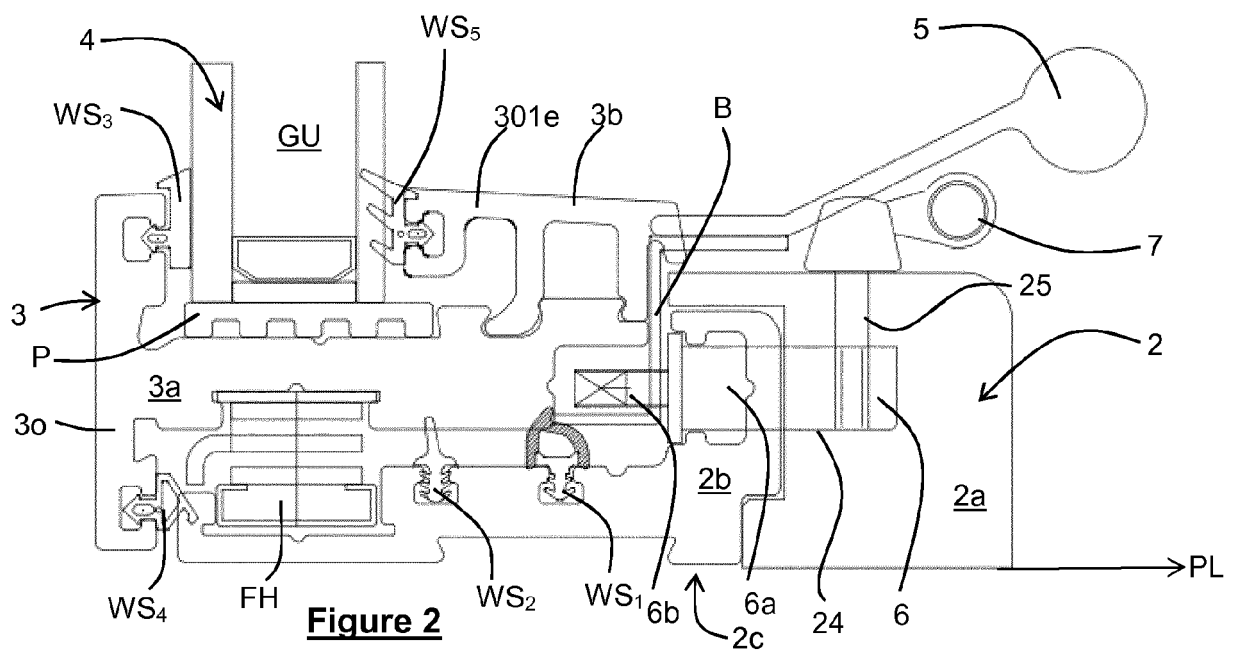
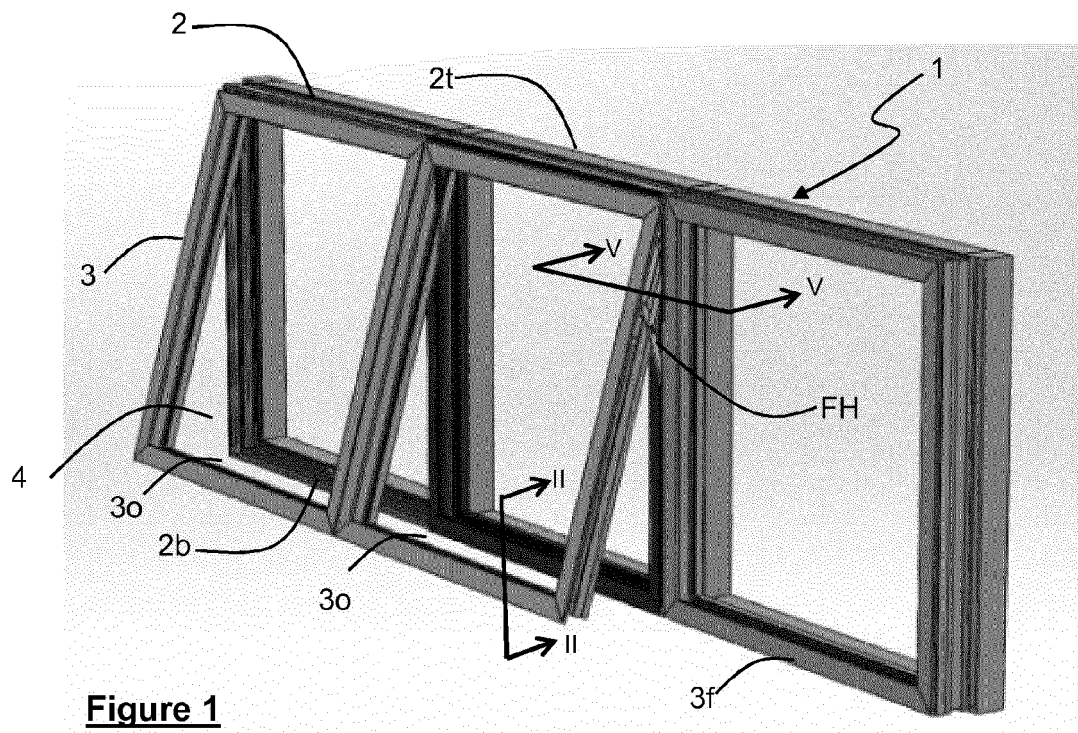
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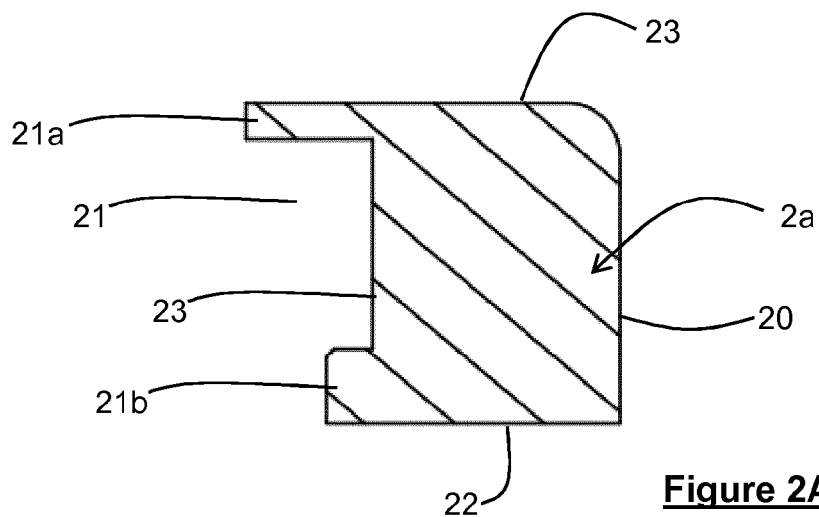


Figure 2A

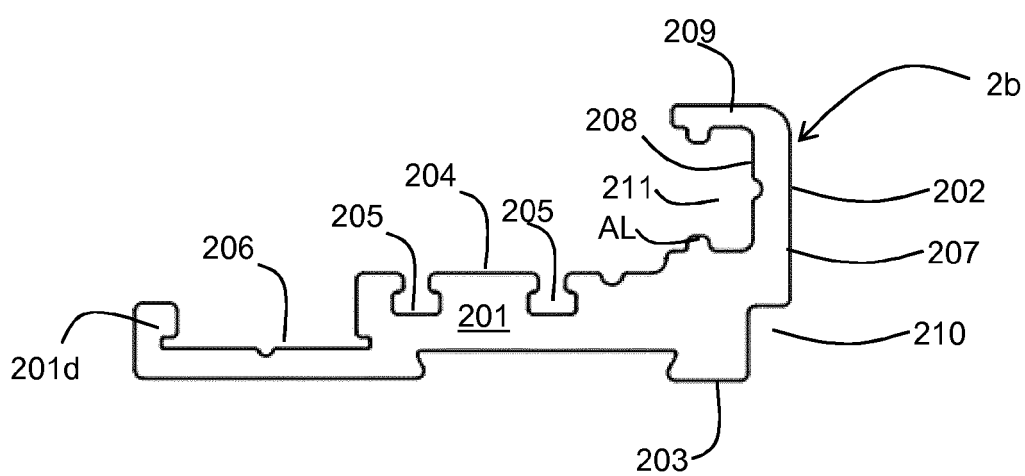


Figure 2B

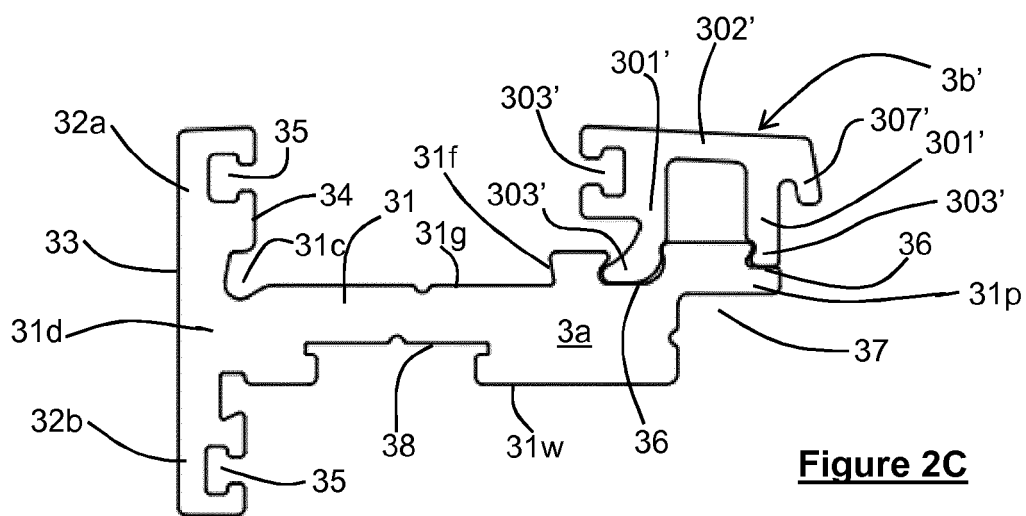


Figure 2C

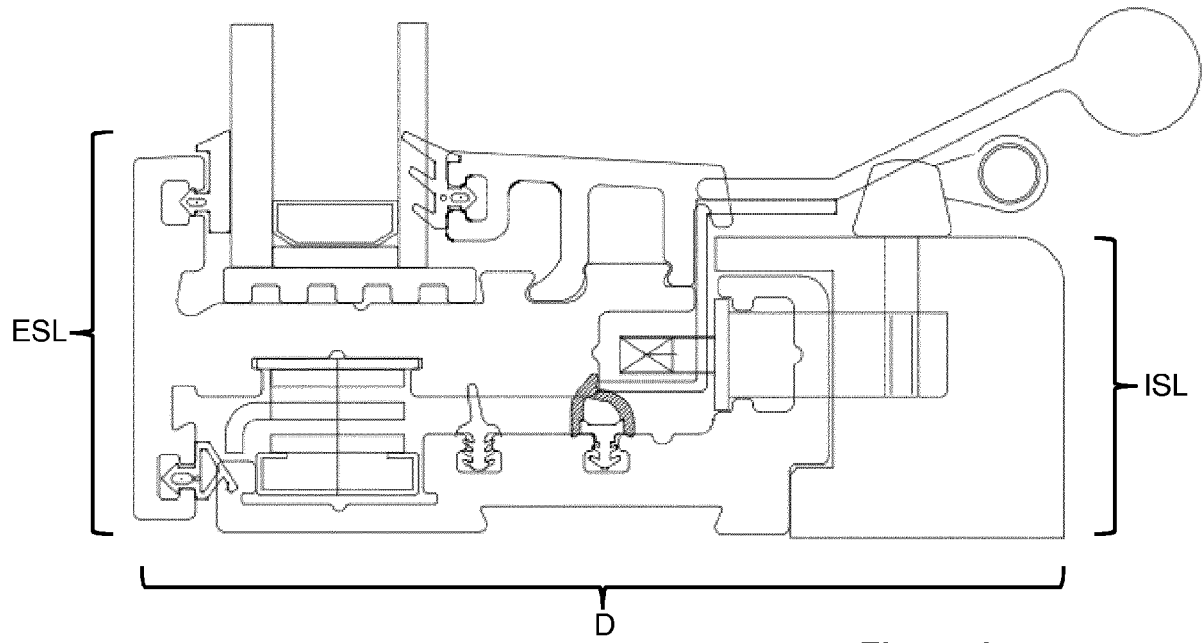


Figure 3

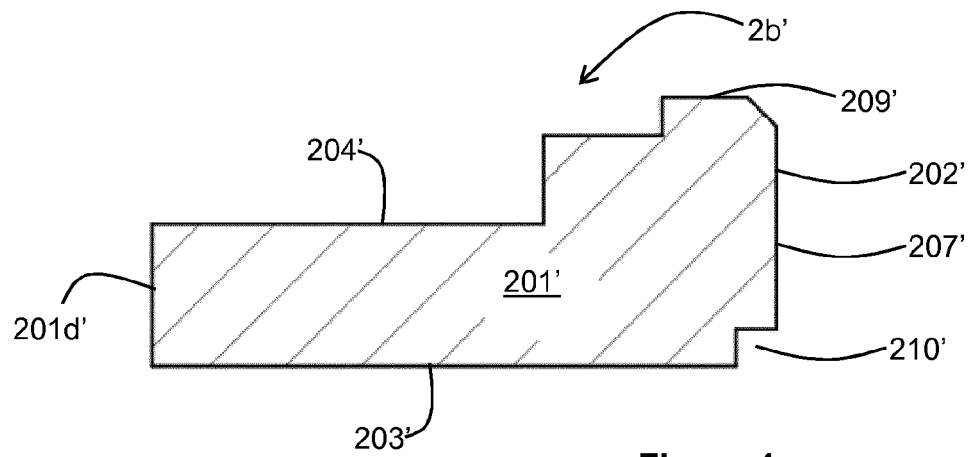


Figure 4

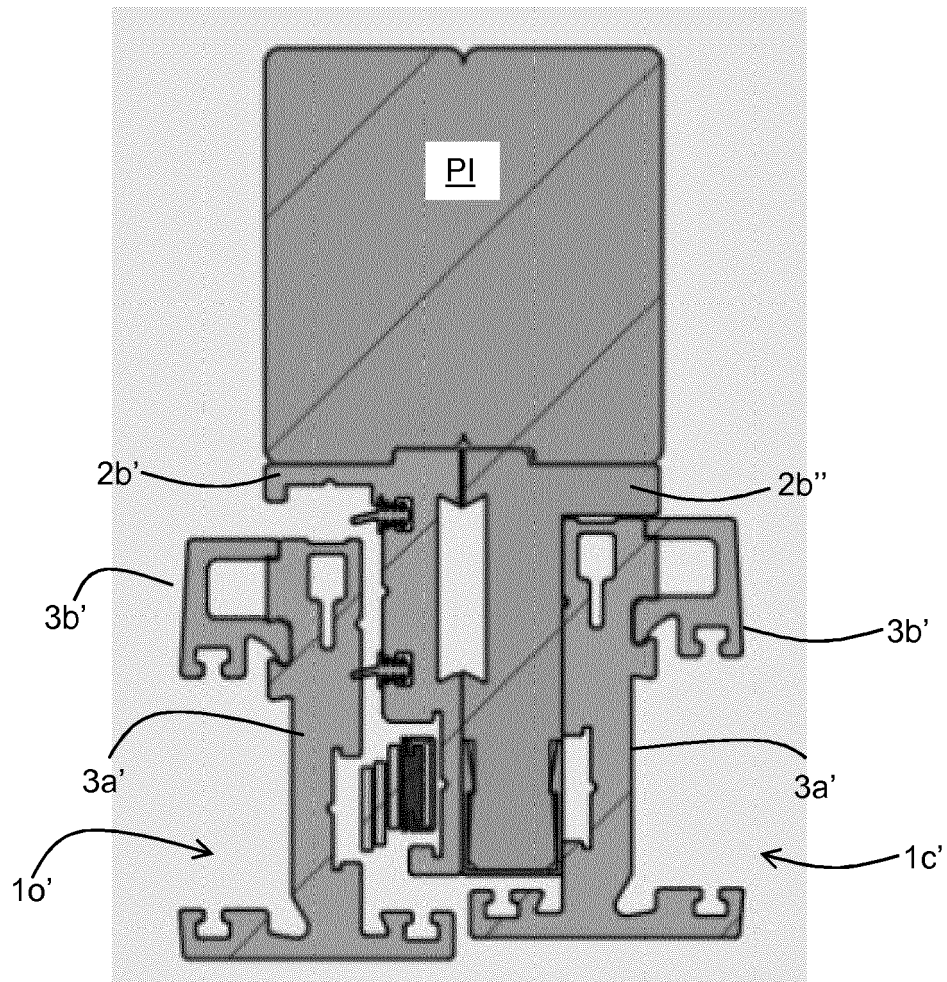
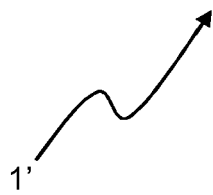
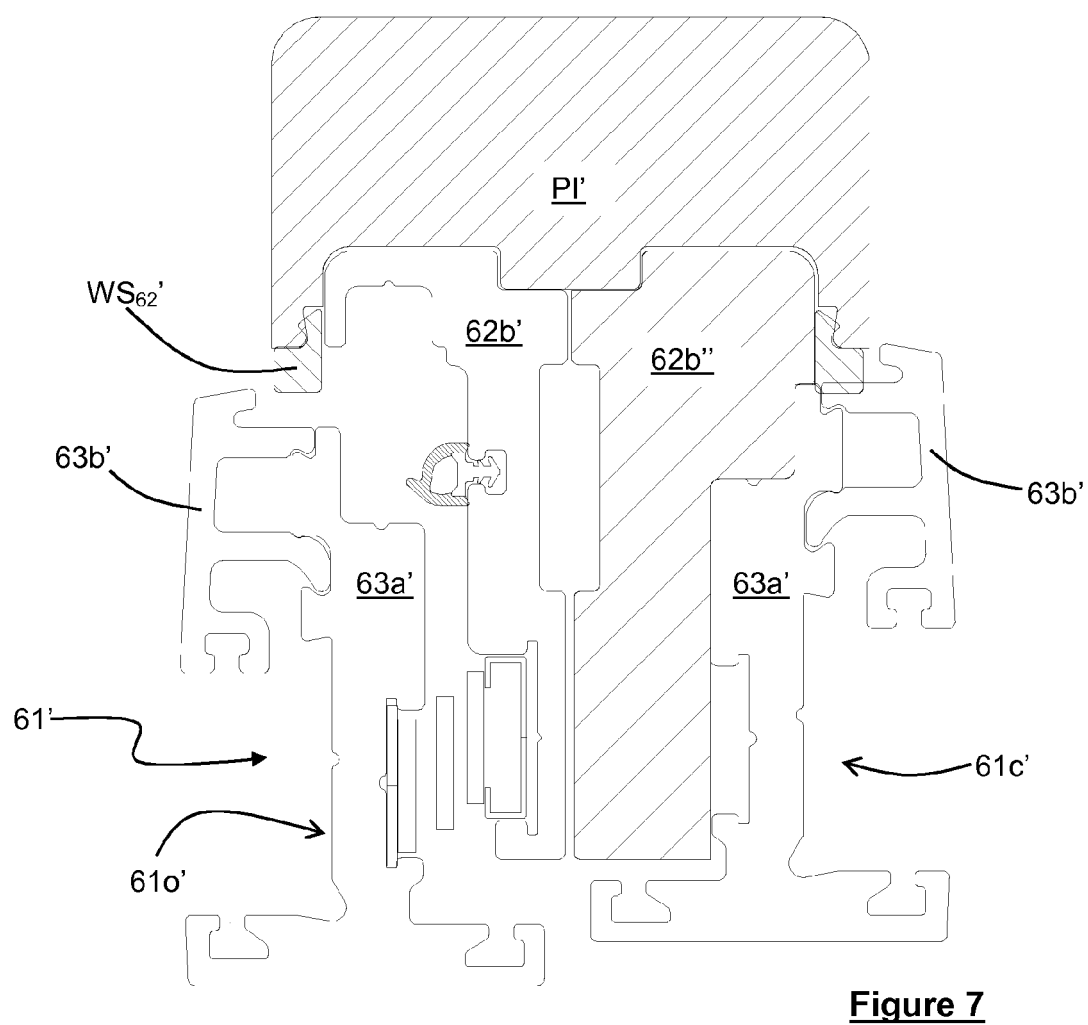
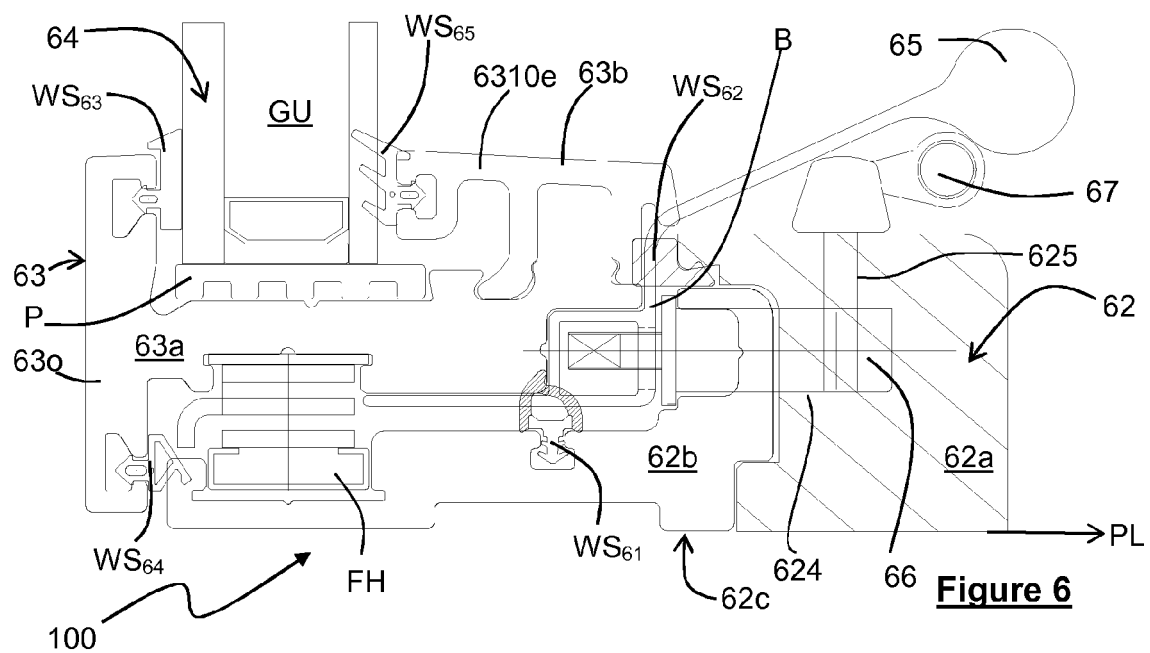


Figure 5







EUROPEAN SEARCH REPORT

 Application Number
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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 14 October 2016	Examiner Andlauer, Dominique
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

14-10-2016

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