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(54) **Thermally resistive window sash member and window assembly**

Wärmebeständiges Fensterrahmenglied und Fensteranordnung

Élément de châssis de fenêtre résistant à la chaleur et ensemble fenêtre

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**EP 2 674 561 B1**

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## Description

**[0001]** The current invention relates to a profile member of a window sash for an outwardly opening window assembly. From US 5 836 119 A, US 5 038 537 A, and DE 100 59 849 A1 outwardly opening window assemblies with a relevant profile member are known. The profile member comprises an outer element which comprises a surface which is in contact with a portion of the outer surface of a window pane when assembled, a flange which extends at least partially underneath the window pane when assembled and means for attaching mounting hardware to said outer element, a thermally resistive element which is connected to said flange at a location between the plane of the inside surface of the window pane and the plane of the outside surface of the window pane and which extends past the plane of the inside surface of the window pane when assembled, and an inner element which is connected to said thermally resistive element and which comprises a surface which is in contact with a portion of the inside surface of the window pane when assembled. Due to the thermally resistive element arranged between the inner element and the outer element, the thermal properties of the entire window are significantly improved. The invention also relates to a window assembly comprising at least one thermally resistive profile member.

**[0002]** A similar type of profile element is known for inwardly opening windows. See for example DE 94 12 123 U1, FR 2 802 969 A1, and DE 298 09 322 U1. However, outwardly opening window assemblies have some important differences from inwardly opening windows which have made it impossible to use the thermally resistive profile members known from inwardly opening windows for outwardly opening window assemblies.

**[0003]** One of these differences is that outwardly opening windows have the mounting hardware mounted on the outside of the window and the locking hardware mounted on the inside of the window. For example, hinges are mounted on the outer side of a profile member on one side of a window pane and an espagnolette is mounted on the inner side of a profile member on another side of the window pane. Therefore both the inner and the outer side of the profile members have to be strong.

**[0004]** Inwardly opening window assemblies usually have both the mounting hardware and the locking hardware connected to the inner side of the profile member. It is therefore possible to use the thermally resistive profile members as disclosed above. These profiles are characterized in that they have a strong inner side made from aluminium and a weak outer side made from a thermally resistive material, for example plastic. Therefore, these profiles will not work for outwardly opening window assemblies since the thermally resistive element is not strong enough to support the loads placed on the inner element of an outwardly opening window assembly.

**[0005]** A first aspect of the current invention is therefore to provide a profile member as mentioned in the opening

paragraph which has better thermal properties than the currently available profile members while still being strong enough to support the loads present in an outwardly opening window assembly.

**[0006]** The above mentioned aspect is solved in part by providing a profile member as mentioned in the opening paragraph where the connection between the thermally resistive element and the flange of said outer element is arranged along a connection plane which is at an angle to the plane of the window pane whereby the side of the thermally resistive element facing the centre of the window pane extends closer to the outside of the window than the side of the thermally resistive element facing away from the centre of the window pane. By arranging the connection plane in this manner, the distance between the cold outer element and the warm inside of the window can be increased. This increases the thermal properties of the window. It should be mentioned that the connection plane refers to the plane about which the points of connection between the thermally resistive element and the outer element are arranged. The points don't have to lie directly on the plane, but could be spaced about it.

**[0007]** In a preferred embodiment, the flange of the outer element could be formed as an essentially horizontal hollow box shaped section, where the innermost side of said essentially horizontal hollow box shaped section can be arranged at an angle in the same direction of rotation as the connection plane and that said side can be connected to a correspondingly angled surface on the thermally resistive element. In this way, the strength and stiffness of the outer element can be increased. Due to the angled side, the length of the support surface can be increased thereby increasing the strength of the connection between the thermally resistive element and the outer element.

**[0008]** In order to attach mounting hardware to the outer element said means for attaching mounting hardware could comprise a channel on the bottom surface of the essentially horizontal hollow box shaped section of the outer element. In order to optimize the strength of the channel, one of the channel walls could essentially be a continuation of the angled side of the essentially horizontal hollow box shaped section.

**[0009]** In another preferred embodiment, the flange of the outer element and the thermally resistive element can be connected together by a dovetail connection.

**[0010]** In order to further increase the strength of the connection between the thermally resistive element and the outer element, the outer element could comprise a supporting element which extends underneath a portion of the thermally resistive element to support the thermally resistive element against vertical loads in the downwards direction.

**[0011]** In a preferred embodiment, the inner element could have a hollow section and the locking hardware could be arranged inside said hollow section. In another embodiment, the inner element and the thermally resistive

tive element can be integrated into a single element.

**[0012]** It should be mentioned that in the current specification, mounting hardware is defined as the hardware which is used to hold the window sash connected to the window frame. For example, the hinges are considered to be mounting hardware. Locking hardware is defined as the hardware which keeps the window closed. For example, an espagnolette is considered to be locking hardware.

**[0013]** It should also be mentioned that the term "outwardly opening window assembly" when used in the current specification is to be understood as a window assembly where the "sash" is located outside the "frame". This means that even if the sash is permanently fixed to the frame, as long as the sash is outside of the frame, the window is considered to be an outwardly opening window assembly.

**[0014]** It should also be mentioned that when a term in this specification refers to an orientation, for example, upper, lower, etc. then this term is to be interpreted with respect to the orientation of the profile members as shown in the attached figures. The terms inside and outside respectively refer to the inside and the outside of the window assembly in the case that it were installed in a house. The description "centre of the window pane" refers to the centre of the entire window pane when it is seen from the outside, it does not refer to a point between the two panes of glass in a double glazed window pane.

**[0015]** In this respect it should also be mentioned, that if a feature of the profile element is described or claimed, the description or claim refers to the cross section of the profile element.

**[0016]** Furthermore, an object described as being "thermally resistive" in this specification is to be understood as being an object having a coefficient of thermal conduction which is lower than that of aluminium.

**[0017]** The invention will now be described in greater detail with reference to the embodiments shown in the attached figures. It is to be noted that the embodiments described herein are to be used as examples only and should not limit the scope of the invention in any way.

Figure 1 shows a cross section view of a prior art profile member for an outwardly opening window assembly.

Figure 2 shows a cross section view of a first embodiment of a profile member according to the current invention for an outwardly opening window assembly.

Figure 3 shows a cross section view of a second embodiment of a profile member according to the current invention for an outwardly opening window assembly.

Figure 4 shows a cross section view of a third embodiment of a profile member according to the cur-

rent invention for an outwardly opening window assembly.

Figure 5 shows a cross section view of a fourth embodiment of a profile member according to the current invention for an outwardly opening window assembly.

Figure 6 shows a perspective view of an embodiment of an outwardly opening window assembly according to one aspect of the current invention.

#### Detailed Description

**[0018]** Figure 1 shows a typical prior art profile member 1 of a window sash of an outwardly opening window assembly. The profile member 1 is shown attached to one edge 2 of a double glazed window pane 3. The window pane 3 has an outer surface 4 and an inner surface 5. The profile member 1 comprises an outer element 6 which is in contact with the outer surface 4 of the window pane and an inner element 7 which is in contact with the inside surface 5 of the window pane. The actual contact between the window pane and the sash elements is via seals 8,9 attached to the outer and inner elements 6,7 respectively. For the sake of the current specification, the outer element 6 is considered to have a surface 8 which is in contact with the outer surface 4 of the window pane and the inner element 7 is considered to have a surface 9 which is in contact with the inner surface 5 of the window pane. In this way, the seals 8,9 are considered to be parts of respectively the outer and inner elements.

**[0019]** The outer element 6 also comprises a flange 10 which extends underneath the edge 2 of the window pane 3 and extends from the outer surface of the window pane towards the inside of the window and past the plane 11 of the inside surface 5 of the window pane 3. In the current embodiment 1, the flange 10 is a horizontal flange, at least a part of which has a cross section in the shape of a hollow box. The hollow box gives extra strength to the profile element. On the lower side of the flange 10, a channel 12 is arranged whereby mounting means (not shown), such as hinges, tracks, and so on, can be attached. The channel 12, for the sake of the current specification, is considered to be a form of attachment means.

**[0020]** As can be seen from figure 1, the inner element 7 is connected to the portion 14 of the flange 10 which is located on the inner side of the plane 11 of the inside surface 5 of the window pane 3. The inner element 7 is connected to the flange via a channel 13 located on the upper side of the flange. In the current embodiment, the inner element 7 is made from a thermally resistive material, for example PVC, and the outer element 6 is made from aluminium for the sake of its strength properties.

**[0021]** In the case where locking hardware, such as an espagnolette, is added to the window sash, the locking hardware is attached to the portion 14 of the flange 10

which is located on the inner side of the plane 11. The locking hardware can in some cases be partially hidden from view within the inner element 7. Therefore, in the prior art solution shown in figure 1, it is necessary that the flange 10 of the outer element 6 is quite strong. This is because both mounting hardware and locking hardware are attachable to the flange 10.

**[0022]** In contrast, in order to insulate the warm inside of the window assembly from the cold outer side of the window pane, it is necessary for the inner element 7 to be thermally resistive. Since the strong outer element 6 is made from aluminium, it is very thermally conductive, which means that the innermost point 15 of the outer element 6 is roughly the same temperature as the outside surface 4 of the window pane 3. The plastic inner element 7 therefore, separates the warm inner surface 5 of the window pane 3 from the cold outer element 6. However, in the prior art, the distance "d" between the inside 16 of the window assembly and the innermost point 15 of the outer element 6 is rather small. The thermal insulating properties of the window are directly affected by the size of this gap. In addition, if the gap is too small and there is a large temperature difference between the inside temperature and the outside temperature, the inner surface of the window assembly will be cooled very strongly and there is a therefore a risk of condensation forming on the inner surface 5 of the window assembly. Note that the frame member 17 is typically made from wood which is very thermally resistive.

**[0023]** It is therefore well known that in order to increase the thermal properties of window assemblies it is desired to increase the distance "d" between the innermost point of the "cold" outer element and the inside of the window assembly. In the following, five different embodiments of profile members which have large distances "d" between the innermost point of the outer element and the inside of the window assembly are described.

**[0024]** Figure 2 shows a profile member 20 which has better thermal properties than the prior art profile member 1 shown in figure 1. The profile member 20 is again shown mounted at the edge 2 of a window pane 3. As before the window pane 3 has an outer surface 4 and an inner surface 5. A section of a wooden window frame 17 is also shown.

**[0025]** The profile member 20 comprises an outer element 21, an inner element 22, and a thermally resistive element 23. As in the prior art, the outer element 21 is in contact with the outer surface 4 of the window pane 3 via a seal 8 and the inner element 22 is in contact with the inner surface 5 of the window pane 3 via a seal 9. The outer element 21 is made of aluminium for the sake of its strength while the inner element 22 and the thermally resistive element 23 are made from a thermally resistive material. For example the inner element 22 could be made from PVC and the thermally resistive element 23 could be made from glass fibre re-enforced PA. However, many other types of materials could also be used. The materials can be chosen as a compromise between their

strength properties and their thermal properties in order that the final window assembly has the strength and thermal properties required for the specific application.

**[0026]** The outer element 21 comprises a horizontal flange 24 which extends under the edge 2 of the window pane 3. The thermally resistive element 23 connects to the flange 24 at a location which is between the plane 25 of the outside surface 4 of the window pane 3 and the plane 26 of the inside surface 5 of the window pane 3. It can be seen that the thermally resistive element 23 can be considered as a form of "extension" of the flange 24 of the outer element 21.

**[0027]** In this way, the distance "d" between the innermost point 27 of the thermally conductive outer element and the outermost point 28 of the inside surface of the window assembly is much larger than in the prior art. In this way, the thermal properties of a window assembly constructed from the profile elements as shown in figure 2, are much better than those of a window assembly constructed from the profile elements shown in figure 1.

**[0028]** The horizontal flange 24 of the outer element 21 is formed with a hollow box shaped portion. One side 29 of the hollow box shaped portion is arranged at an angle to the plane of the window pane. An attachment element 30 in the form of the female part of a dovetail joint is arranged on this angled side 29. The thermally resistive element 23 has a correspondingly angled side 31 and a corresponding attachment element 32 formed as the male part of a dovetail joint. Due to the angled surface, the area of contact between the thermally resistive element 23 and the flange 24 of the outer element 21 is increased. Due to this increased area of contact, the strength of the connection is increased. Furthermore, due to the increased length of the angled side 29, a wider dovetail joint can be used. This also increases the strength of the connection since the points of engagement of the dovetail joint are spaced further apart thereby increasing the moment which can be supported by the dovetail joint.

**[0029]** In order to further support the thermally resistive elements against vertical loads, the outer element 21 comprises a support element 36. In this case, the support element 36 is a horizontal flange which extends a short distance underneath the thermally resistive element 23. There is no "positive connection" between the support element 36 and the thermally resistive element 23. In this specification, positive connection is defined as a connection which works in both push and pull directions. In the current embodiment, the support element 36 supports the thermally resistive element via the contact between a surface of the support element and a surface of the thermally resistive element. Therefore, vertical downwardly directed loads on the thermally resistive element 23 will be supported by the support element 36. However, the absence of a positive connection between the two elements 23,36 makes it easy to assemble the two elements 23,36.

**[0030]** Please note that a virtual "connection plane" 33

could be drawn between the thermally resistive element 23 and the outer element 21. Note, the actual connection does not occur along a single plane, as is obvious from the figure. However, an imaginary "connection plane" 33 can be imagined as shown in figure 2. It can be seen that this "connection plane" 33 is angled with respect to the window pane such that the side 34 of the thermally resistive element which is closest to the centre of the window pane 3 extends closer to the outside of the window than the side 35 of the thermally resistive element which is farthest from the centre of the window. In this way, the shortest distance between the warm inside and the cold outer element 21 is increased in comparison to a thermally resistive element having a vertical plane of connection. If the plane of connection were angled the opposite way, then the distance between the warm inside and the cold outer element 21 would be reduced.

**[0031]** Note that in the case of the profile element shown in figure 2, there is a single positive point of connection between the thermally resistive element 23 and the outer element 21. By "positive" point of connection, is meant a point of connection which prevents relative motion between the two connected elements in both pull and push directions. This is in contrast to a simple support type of connection, as is the case between the flange 36 and the thermally resistive element 23. However, it could also be imagined that instead of a single positive point of connection, there could be two positive connection points. In this case, the two connection points would be offset from each other and placed such that the "connection plane" would also be angled as in the current embodiment.

**[0032]** As in the prior art, the outer element 21 also comprises a channel 37 for attaching mounting means (not shown). As was the case with the prior art profile, the channel 37 is arranged on the bottom surface of the box shaped hollow portion of the flange 24. In this embodiment however, one of the sides 38 of the channel 37 is arranged to be a continuation of the angled side 29 of the hollow flange 24 of the outer element 21. In this way, the strength of the outer element 21 is further optimized.

**[0033]** In the case of the current embodiment, the inner element and the thermally resistive element are two distinct elements which are assembled during assembly of the window sash, however, in another embodiment, it could be imagined that the two elements were integrated into a single element.

**[0034]** Figure 3 shows a second embodiment 40 of a profile member of a window sash of an outwardly opening window assembly. The second embodiment 40 is almost identical to the first embodiment 20, only the connection between the thermally resistive element 41 and the flange 42 of the outer element 43 is different, therefore, only this feature of this embodiment will be described.

**[0035]** In this embodiment, the upper surface 44 of the flange 42 of the outer element 41 is formed with an attachment element 45 in the form of the female part of a dovetail connection. The thermally resistive element 41

has a corresponding attachment element 46 in the form of the male part of a dovetail connection. The attachment element 46 extends a certain distance underneath the edge 2 of the window pane 3 towards the outside of the window in order to engage with the attachment element 45 in the upper surface of the flange 42. In this way, the connection plane 47 is further angled when compared with the first embodiment 20. This increases the strength properties of the profile. The thermal properties of the profile are also improved slightly with respect to the embodiment shown in figure 2 since the distance between the cold outer element and the warm inside is increased slightly.

**[0036]** As in the first embodiment 20, the outer element 43 also comprises a support element 48 to support the thermally resistive element 41 even further.

**[0037]** Figure 4 shows a third embodiment 60 of a profile member. As with the previous embodiment, the profile member 60 is almost identical to the first embodiment 20. The only difference is with the support element 61. Therefore only this feature will be described here.

**[0038]** In this embodiment, the support element 61 is formed as an upwardly facing hook which extends underneath the thermally resistive element 62 and supports the thermally resistive element 62 at a point 63 instead of over a large surface as in the previous two embodiments. The purpose of this embodiment is to show that the support element can be formed in different ways and should not be limited to an essentially horizontal flange as in the first embodiment.

**[0039]** Figure 5 shows a fourth embodiment 70 of a profile member. Again, the profile member 70 is almost identical to the first embodiment 20. Therefore only the differences between this embodiment and the first embodiment 20 will be described. In this embodiment 70, the side 71 of the flange 72 of the outer element 73 is vertical instead of angled. However, the "height" of the essentially horizontal box shaped section of the flange 72 is larger than with the previous embodiments. That is to say that the distance between the two horizontal sides 76, 77 is larger than with the previous embodiments. This means that the innermost side of the box shaped section is longer than with the previous embodiments, thereby allowing the "width" of the dovetail joint to be increased. This results in a strong connection even though there is no angled surface. This embodiment is well suited for outer elements 72 which have a "tall" flange 72. It should be noted that the strength of this embodiment is as good as the previous embodiments, however the thermal properties are not quite as good because the shortest distance between the cold outer element and the warm inside is reduced.

**[0040]** Figure 6 shows a schematic view of an embodiment of an outwardly opening window assembly 100 placed in an opening 101 in a wall 102. The window assembly 100 comprises a window frame 103, a window pane 104 and a window sash 105 arranged around the outside edge of the window pane 104. The window sash

105 is made up of four profile elements 105a, 105b, 105c, 105d, one along each edge of the window pane 104. Mounting hardware in the form of hinges 106 are connected to one of the profile elements 105d and locking hardware in the form of an espagnolette 107 is connected to another one of the profile elements 105b. This is a typical sort of outwardly opening window assembly.

**[0041]** As was previously mentioned, on outwardly opening window assemblies, mounting hardware, such as hinges, are typically attached to the outer part of the profile member and locking hardware, such as espagnolettes, are typically connected to the inner part of the profile member. It can therefore be said that a profile having a really strong connection between the inner part of the profile element and the outer part of the profile element is actually only really necessary on profile members to which locking hardware is connected.

**[0042]** Therefore, according to one aspect of the current invention, one way of improving the thermal properties of the window assembly 100 while maintaining the required strength properties of the window assembly 100, is to assemble the window sash using thermally optimized profiles 105a, 105c, 105d on the sides of the sash having no locking hardware and using a "strong" profiles 105b on the side of the sash on which locking hardware is mounted. In the current embodiment 100, the three thermally optimized profiles 105a, 105c, 105d are identical to one of the profiles shown in figures 2-5. The "strong" profile 105b of the current embodiment 100 is similar to the one shown in figure 1.

**[0043]** This principle could be used with other combinations of profile elements. In certain cases, locking hardware is mounted on two profile elements. In this case, the window assembly could be constructed with two thermally optimized profiles and two prior art type profiles. In general the combination of elements can be chosen in such a way that the resulting thermal and strength properties of the window assembly match the desired thermal and strength properties.

**[0044]** It should also be clear to the person skilled in the art that this aspect of the current invention, namely using a combination of "thermally optimized profiles" and "strong profiles", could be used both for outwardly opening as well as inwardly opening window assemblies.

## Claims

1. A profile member (20, 40, 60) of a window sash for an outwardly opening window assembly, said profile member (20, 40, 60) comprising:

- an outer element (21, 43) which comprises:
  - a surface (8) which is in contact with a portion of the outer surface (4) of a window pane (3) when assembled,
  - a flange (24, 42) which extends at least

partially underneath the window pane (3) when assembled and

- means (37) for attaching mounting hardware to said outer element (21, 43),
- a thermally resistive element (23, 41, 62) which is connected to said flange (24, 42) of said outer element (21, 43) at a location between the plane (26) of the inside surface (5) of the window pane (3) and the plane (25) of the outside surface (4) of the window pane (3) and which extends past the plane (26) of the inside surface (5) of the window pane (3) when assembled, and
- an inner element (22) which is connected to said thermally resistive element (23, 41, 62) and which comprises a surface (9) which is in contact with a portion of the inside surface (5) of the window pane (3) when assembled,

**characterized in that** the connection between the thermally resistive element (23, 41, 62) and the flange (24, 42) of said outer element (21, 43) is arranged along a connection plane (33, 47) which is at an angle to the plane of the window pane (3) whereby the side (34) of the thermally resistive element (23, 41, 62) facing the centre of the window pane (3) extends closer to the outside of the window than the side (35) of the thermally resistive element (23, 41, 62) facing away from the centre of the window pane (3).

2. A profile member according to claim 1, **characterized in that** there is a single positive point of connection between the thermally resistive element (23) and the outer element (21), wherein a positive point of connection is defined as a point of connection which prevents relative motion between the two connected elements in both pull and push directions.
3. A profile member according to claim 1, **characterized in that** the flange (24, 42) of the outer element (21, 43) is an essentially horizontal hollow box shaped section, where the innermost side of said essentially horizontal hollow box shaped section is arranged at an angle in the same direction of rotation as the connection plane (33, 47) and that said side is connected to a correspondingly angled surface on the thermally resistive element (23).
4. A profile member according to claim 2, **characterized in that** said means (37) for attaching mounting hardware comprises a channel (12) arranged on the bottom surface of the essentially horizontal hollow box shaped section of the outer element (21, 43) and that one of the channel walls is essentially a continuation of the angled side of the essentially horizontal

hollow box shaped section.

5. A profile member according to claim 1, 2 or 3, **characterized in that** the flange (24, 42) of the outer element (21, 43) and the thermally resistive element (23) are connected by a dovetail connection. 5
6. A profile member according to any one of claims 1-4, **characterized in that** the outer element (21, 43) comprises a supporting element (36) which extends underneath a portion of the thermally resistive element (23) to support the thermally resistive element against vertical loads in the downwards direction. 10
7. A profile member according to any one of claims 1-5, **characterized in that** the inner element (22) has a hollow section and that the locking hardware is arranged inside said hollow section. 15
8. A profile member according to any one of claims 1-6, **characterized in that** the inner element (22) and the thermally resistive element (23) are integrated into a single element. 20

#### Patentansprüche

1. Profilglied (20, 40, 60) eines Fensterrahmens für eine nach außen öffnende Fensterbaugruppe, das Profilglied (20, 40, 60) umfassend: 30
  - ein Außenelement (21, 43), welches Folgendes umfasst:
    - eine Oberfläche (8), die mit einem Abschnitt der Außenfläche (4) einer Fensterscheibe (3) in Kontakt ist, wenn sie zusammengebaut sind, 35
    - einen Flansch (24, 42), der sich zumindest teilweise unterhalb der Fensterscheibe (3) erstreckt, wenn sie zusammengebaut sind, und 40
    - Mittel (37) zum Anbringen von Montagekleinteilen am Außenelement (21, 43), 45
    - ein wärmebeständiges Element (23, 41, 62), das mit dem Flansch (24, 42) des Außenelements (21, 43) an einer Stelle zwischen der Ebene (26) der Innenseitenfläche (5) der Fensterscheibe (3) und der Ebene (25) der Außenseitenfläche (4) der Fensterscheibe (3) verbunden ist, und das sich an der Ebene (26) der Innenseitenfläche (5) der Fensterscheibe (3) vorbei erstreckt, wenn sie zusammengebaut sind, und 50
    - ein Innenelement (22), das mit dem wärmebeständigen Element (23, 41, 62) verbunden ist, und das eine Oberfläche (9) umfasst, die in Kontakt mit einem Abschnitt der 55

Innenseitenfläche (5) der Fensterscheibe (3) ist, wenn sie zusammengebaut sind, **dadurch gekennzeichnet, dass** die Verbindung zwischen dem wärmebeständigen Element (23, 41, 62) und dem Flansch (24, 42) des Außenelements (21, 43) entlang einer Verbindungsebene (33, 47) angeordnet ist, die in einem Winkel zur Ebene der Fensterscheibe (3) steht, wodurch sich die Seite (34) des wärmebeständigen Elements (23, 41, 62), die der Mitte der Fensterscheibe (3) zugekehrt ist, näher zur Außenseite des Fensters erstreckt als die Seite (35) des wärmebeständigen Elements (23, 41, 62), die von der Mitte der Fensterscheibe (3) weggekehrt ist.

2. Profilglied nach Anspruch 1, dass ein einzelner positiver Verbindungspunkt zwischen dem wärmebeständigen Element (23) und dem Außenelement (21) vorliegt, wobei ein positiver Verbindungspunkt als ein Verbindungspunkt definiert ist, der relative Bewegung zwischen den zwei verbundenen Elementen sowohl in der Zieh- als auch in der Drückrichtung verhindert. 25
3. Profilglied nach Anspruch 1, **dadurch gekennzeichnet, dass** der Flansch (24, 42) des Außenelements (21, 43) ein im Wesentlichen horizontaler hohler kastenförmiger Teilabschnitt ist, wobei die innerste Seite des im Wesentlichen horizontalen hohlen kastenförmigen Teilabschnitts in einem Winkel in derselben Drehrichtung wie die Verbindungsebene (33, 47) angeordnet ist, und dass die Seite mit einer entsprechend gewinkelten Oberfläche des wärmebeständigen Elements (23) verbunden ist. 30
4. Profilglied nach Anspruch 2, **dadurch gekennzeichnet, dass** das Mittel (37) zum Anbringen von Montagekleinteilen einen Kanal (12) umfasst, der auf der Bodenfläche des im Wesentlichen horizontalen hohlen kastenförmigen Teilabschnitts des Außenelements (21, 43) angeordnet ist, und dass eine der Kanalwände im Wesentlichen eine Fortsetzung der gewinkelten Seite des im Wesentlichen horizontalen hohlen kastenförmigen Teilabschnitts ist. 40
5. Profilglied nach einem der Ansprüche 1, 2 oder 3, **dadurch gekennzeichnet, dass** der Flansch (24, 42) des Außenelements (21, 43) und das wärmebeständige Element (23) durch eine Schwalbenschwanzverbindung verbunden sind. 45
6. Profilglied nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** das Außenelement (21, 43) ein Stützelement (36) umfasst, das sich unterhalb eines Abschnitts des wärmebeständigen Elements (23) zum Stützen des wärmebeständigen 50

Elements gegen vertikale Lasten in der Abwärtsrichtung erstreckt.

7. Profilglied nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** das Innenelement (22) einen hohlen Teilabschnitt aufweist, und dass die Sperrkleinteile innerhalb des hohlen Teilabschnitts angeordnet sind.
8. Profilglied nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** das Innenelement (22) und das wärmebeständige Element (23) in einem einzigen Element integriert sind.

### Revendications

1. Membre à profilé (20, 40, 60) d'un châssis de fenêtre pour un montage de fenêtre à ouverture vers l'extérieur, le membre à profilé (20, 40, 60) comprenant :
- un élément extérieur (21, 43) qui comprend :
    - une surface (8) qui est en contact avec une partie de la surface extérieure (4) d'un carreau de fenêtre (3) lorsqu'il est monté,
    - une bride (24, 42) qui s'étend au moins partiellement en-dessous du carreau de fenêtre (3) lorsqu'il est monté et
    - un moyen (37) pour fixer du matériel de montage sur l'élément extérieur (21, 43),
    - un élément à résistance thermique (23, 41, 62) qui est relié à la bride (24, 42) de l'élément extérieur (21, 43) à un emplacement entre le plan (26) de la surface intérieure (5) du carreau de fenêtre (3) et le plan (25) de la surface extérieure (4) du carreau de fenêtre (3) et qui s'étend après le plan (26) de la surface intérieure (5) du carreau de fenêtre (3) une fois monté, et
    - un élément intérieur (22) qui est relié à l'élément à résistance thermique (23, 41, 62) et qui comprend une surface (9) qui est en contact avec une partie de la surface intérieure (5) du carreau de fenêtre (3) une fois monté,
- caractérisé en ce que** la liaison entre l'élément à résistance thermique (23, 41, 62) et la bride (24, 42) de l'élément extérieur (21, 43) est agencée le long d'un plan de liaison (33, 47) qui est en angle avec le plan du carreau de fenêtre (3), sachant que le côté (34) de l'élément à résistance thermique (23, 41, 62) face au centre du carreau de fenêtre (3) s'étend plus près de l'extérieur de la fenêtre que le côté (35) de l'élément à résistance thermique (23, 41, 62) éloigné du centre du carreau de fenêtre (3).

2. Membre de profilé selon la revendication 1, **caractérisé en ce qu'il** y a un seul point de connexion positif entre l'élément à résistance thermique (23) et l'élément extérieur (21), sachant qu'un point de connexion positif est défini en tant que point de connexion, qui évite le mouvement relatif entre les deux éléments reliés à la fois dans les directions de poussée et d'avancée.
3. Membre de profilé selon la revendication 1, **caractérisé en ce que** la bride (24, 42) de l'élément extérieur (21, 43) est une section en forme de boîte creuse essentiellement horizontale, où le côté le plus à l'intérieur de la section en forme de boîte creuse essentiellement horizontale est agencé à un angle dans le même sens de rotation que le plan de liaison (33, 47) et que le côté est relié à une surface en angle correspondante sur l'élément à résistance thermique (23).
4. Membre de profilé selon la revendication 2, **caractérisé en ce que** le moyen (37) de fixation de matériel de montage comprend un canal (12) agencé sur le fond de la section en forme de boîte creuse essentiellement horizontale de l'élément extérieur (21, 43) et que l'une des parois du canal est essentiellement une continuation du côté en angle de la section en forme de boîte creuse essentiellement horizontale.
5. Membre de profilé selon la revendication 1, 2 ou 3, **caractérisé en ce que** la bride (24, 42) de l'élément extérieur (21, 43) et l'élément à résistance thermique (23) sont reliés par une liaison en queue d'aronde.
6. Membre de profilé selon l'une quelconque des revendications 1 à 4, **caractérisé en ce que** l'élément extérieur (21, 43) comprend un élément de support (36) qui s'étend en-dessous d'une partie de l'élément à résistance thermique (23) pour supporter l'élément à résistance thermique contre les charges verticales dans la direction descendante.
7. Membre de profilé selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** l'élément intérieur (22) présente une section creuse et que le matériel de verrouillage est agencé à l'intérieur de la section creuse.
8. Membre de profilé selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** l'élément intérieur (22) et l'élément à résistance thermique (23) sont intégrés en un seul élément.

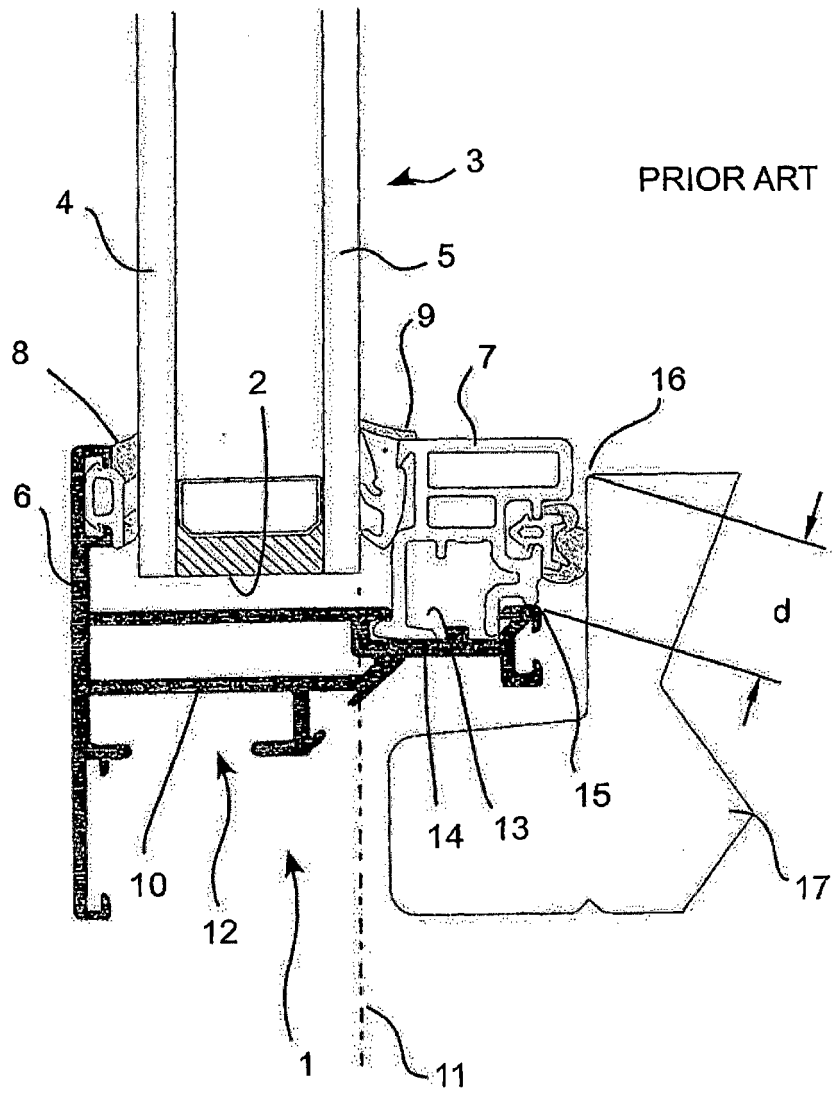


Fig. 1

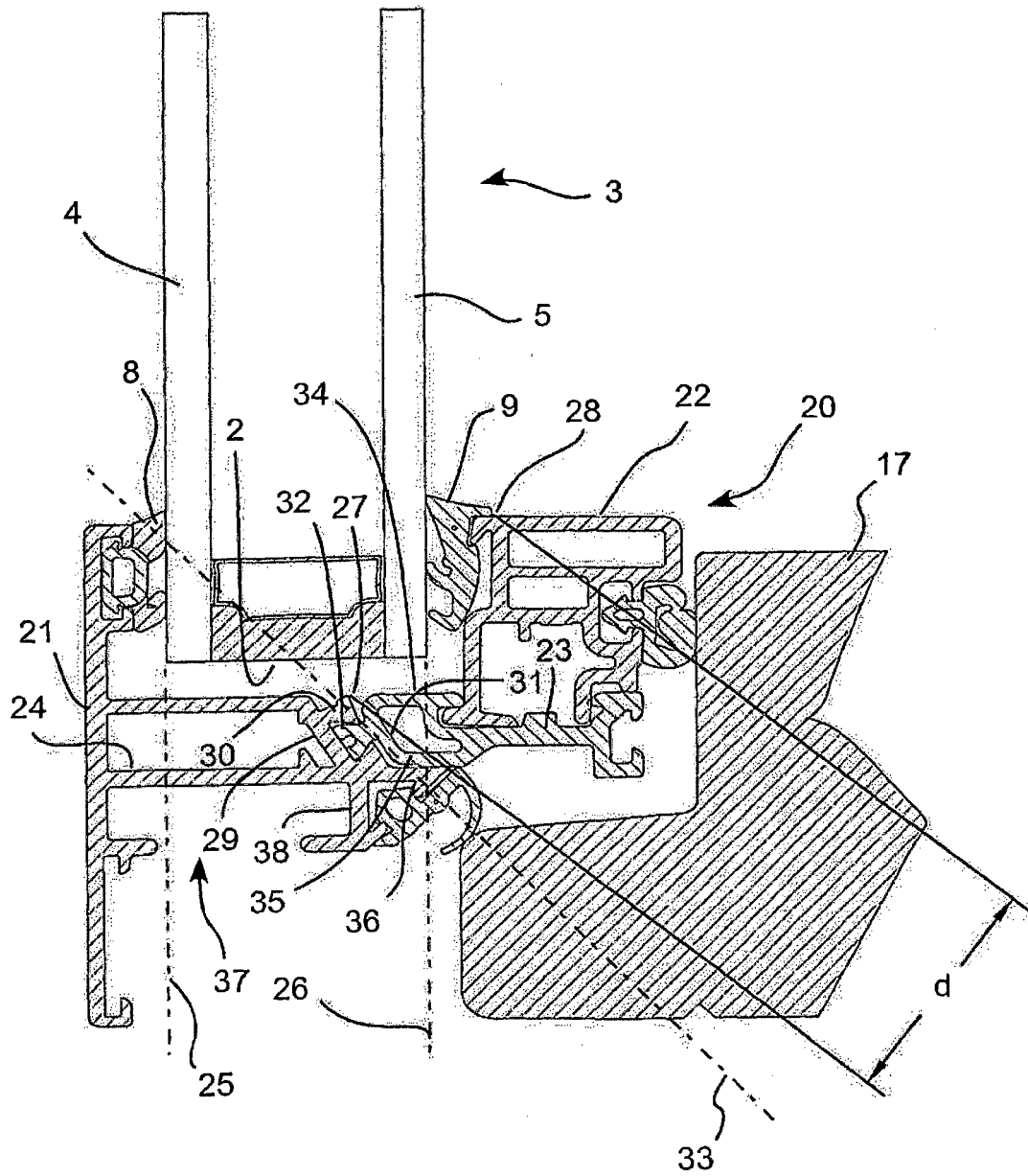


Fig. 2

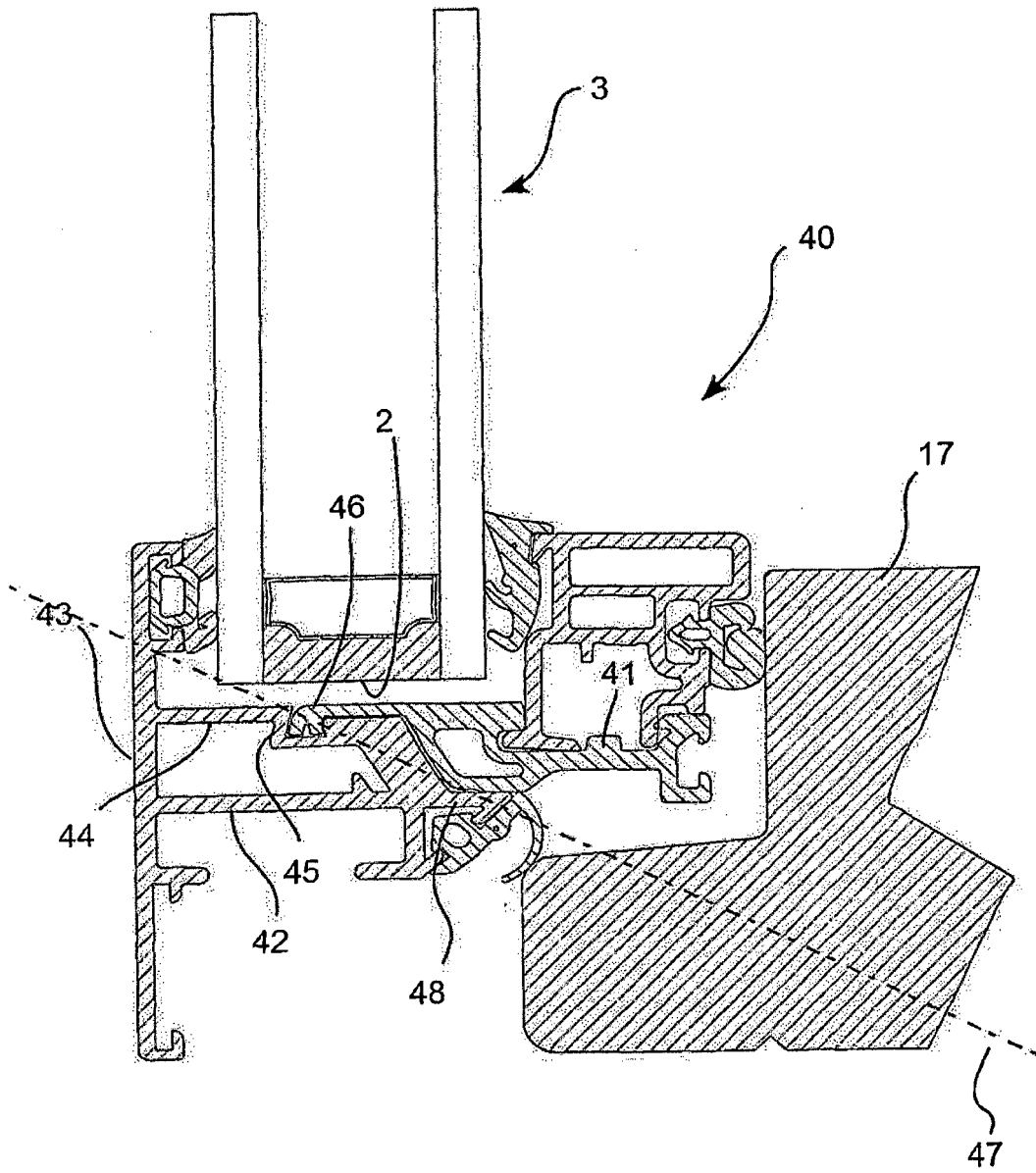


Fig. 3

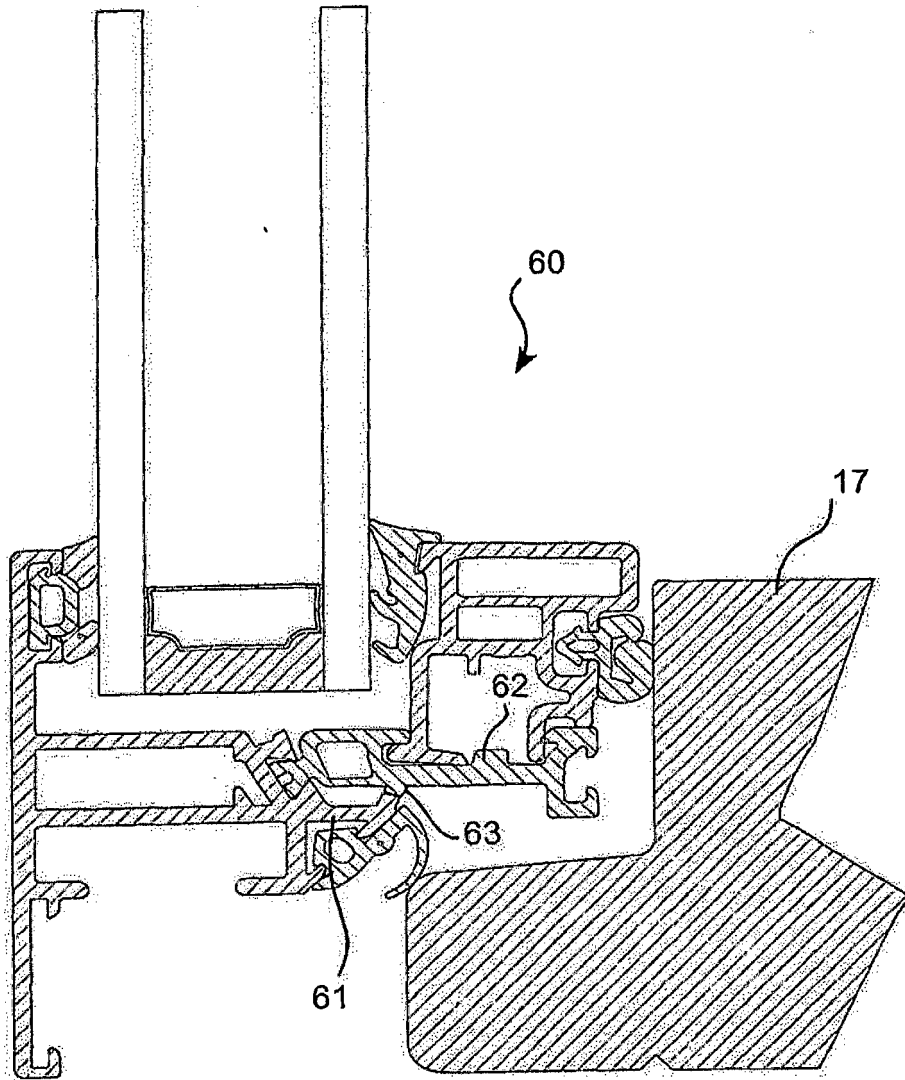


Fig. 4

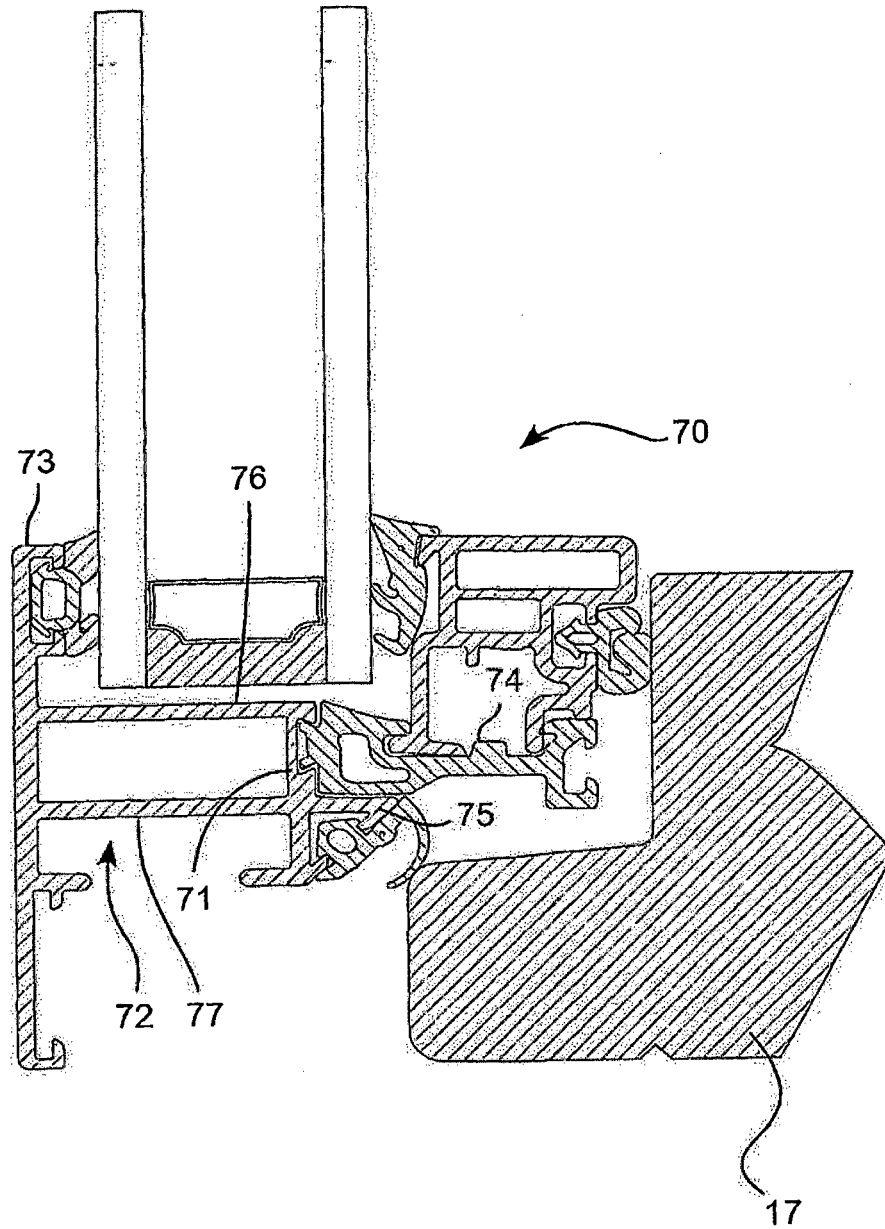


Fig. 5

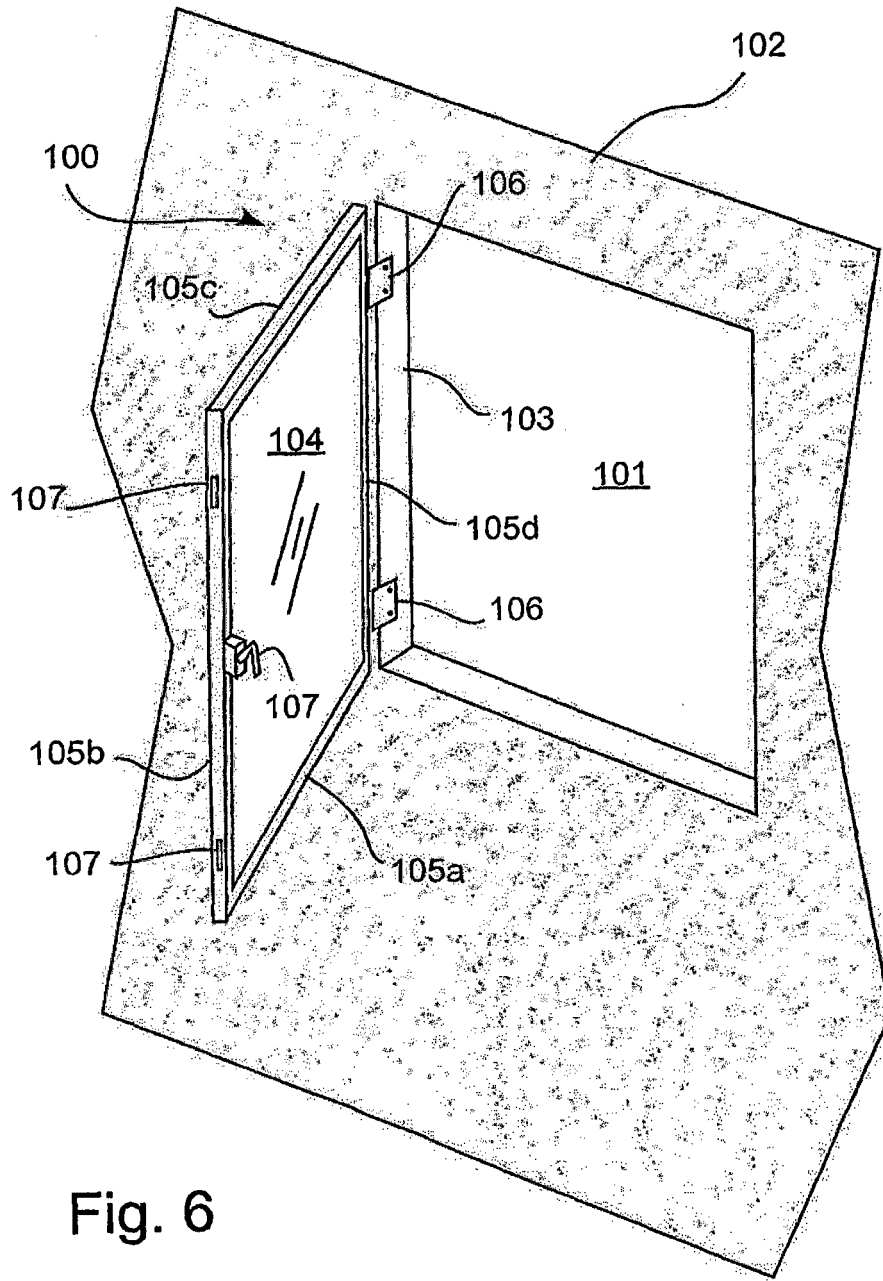


Fig. 6

**REFERENCES CITED IN THE DESCRIPTION**

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