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(54) INSULATING FRAME AND METHOD FOR INSTALLING THE SAME

(57) An insulating frame for a roof window mounted in an inclined roof structure of a building, comprising a set of roof connector brackets adapted for connecting the insulating frame to the roof structure is disclosed. Each of the roof connector brackets comprises a first connecting section and a second connecting section. The first connecting section is adapted for connecting to an attachment section of the insulating frame. The second connecting section is adapted for connecting to the roof structure and extends away from the inner opening of the insulating frame and beyond the outer side of the frame member to which the roof connector bracket is attached. The attachment section(s) allow attachment of each roof connector bracket at several different positions depending on the design of the roof structure. A method for installing an insulating frame in a roof structure is also disclosed.

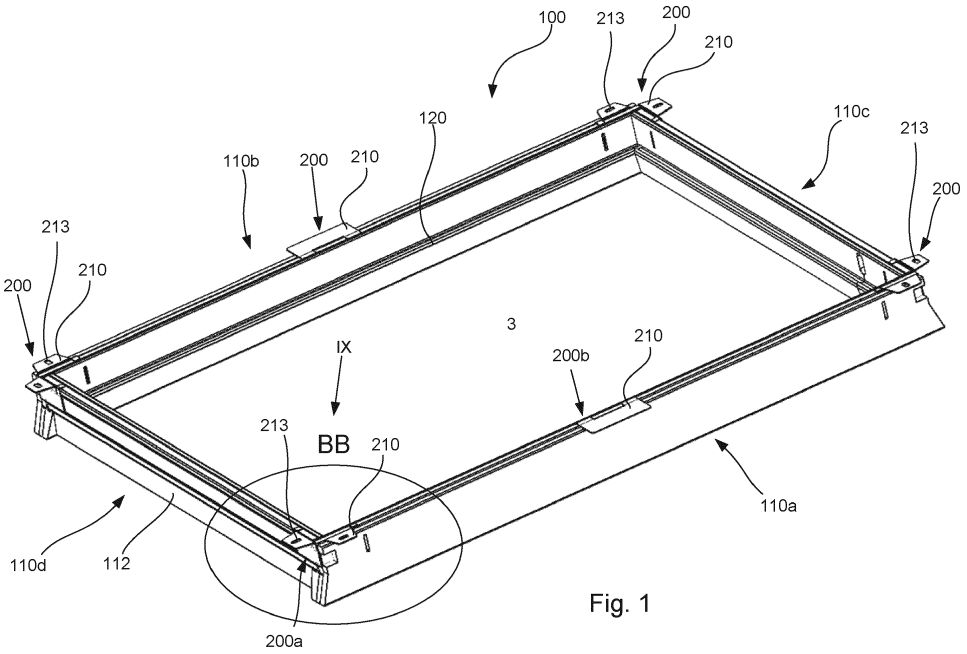

Fig. 1

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Description

[0001] The present invention relates to an insulating frame for a roof window mounted in an inclined roof structure of a building, comprising top, bottom and side frame members, each including an insulating member and a support member, and a plurality of connector brackets, said insulating frame defining an inner opening adapted to surround a frame of the roof window and said insulating frame having an interior side intended to face the interior of the building and an exterior side intended to face the exterior and each frame member having an inner side facing the inner opening and an outer side facing away from the inner opening, said insulating frame further defining a base plane at the interior side of the insulating frame members which is substantially parallel with the inner opening.

[0002] Such insulating frames have found wide use and considerably improved the insulating properties of inclined roofs with roof windows, as well as the ease with which a window may be installed in an inclined roof structure.

[0003] As is known to the person skilled in the art, installing a roof window in an inclined roof structure is a challenging task, particularly in windy, rainy or snowing conditions. This sometimes results in the insulating frame not being mounted correctly, which may consequently result in difficulties during the subsequent mounting of the window and other associated components such as a lining panel or an underroof collar. This may have a negative impact on the installation process and the insulating properties and thus the optimum performance of the insulating frame and associated window components is not realised.

[0004] In EP2677092A1 flanges on the support members are used for connecting the insulating frame to the roof structure and since they extend over substantially the entire length of the insulating frame members this insulating frame can easily be connected to virtually any roof structure. The insulating frame is simply inserted in the pre-made opening in the roof structure and the flanges on the support member will then automatically come into abutment with portions of the roof structure, such as battens, to which they may be attached.

[0005] The material consumption when making this insulating frame is, however, relatively high and there has been some concern that support members made from metal might form thermal bridges. It is therefore an object of the invention to provide an insulating frame that is at the same time easy to install and reduces the consumption of material, which is relatively expensive and/or having a relatively high environmental impact. It is a further object to provide an insulating frame with improved insulating properties.

[0006] In a first aspect of the invention at least one of these objects are met by an insulating frame as described above, where the insulating frame comprises a set of roof connector brackets adapted for connecting the insulating frame to the roof structure and at least one attachment section on an insulating member or a support member, wherein each of the roof connector brackets comprises a first connecting section and a second connecting section, where the first connecting section is connected to an attachment section in the assembled state of the insulating frame, and where the second connecting section is adapted for connecting to the roof structure and extends away from the inner opening of the insulating frame in the assembled state in parallel with the base plane and beyond the outer side of the frame member to which the roof connector bracket is attached, and where said attachment section(s) allow attachment of each roof connector bracket at several different positions depending on the design of the roof structure.

[0007] With this insulating frame, roof connector brackets can be attached at the positions fitting the design of the specific roof structure in which it is to be used, thus providing high versatility with a minimum material consumption.

[0008] Throughout this text the terms "top", "bottom" and "side" are used to indicate the intended position of different parts in the mounted position even though these parts may be located differently during for example storage and transportation or prior to assembly of the insulating frame. Likewise, the term "interior" and "exterior" are used to indicate that something is intended to face the interior or exterior of the building in which the roof window is mounted, respectively, and the terms "inner" and "outer" that something is intended for facing towards or away from the inner opening of the insulating frame, respectively, in the mounted state.

[0009] The roof connector brackets having a first connecting section adapted for connecting to the at least one attachment section may have the effect of improving handling and transportation as the connector brackets and the insulating frame members may be provided separately so that the insulating frame can be assembled in-situ.

[0010] One or more of the roof connector brackets may be adapted for displaceable attachment to the attachment section such that the one or more connector brackets may be moved along the length direction of the attachment section after being attached. This may have the effect of improving the ease of installation of the roof window as the position of the roof connector brackets may be adjusted once mounted e.g. by moving one or more roof connector brackets to a desired position e.g. a position where the roof connector bracket is located over a batten of the roof structure and may be connected thereto. This has the further effect that the risk of roof connector brackets being lost or forgotten is reduced compared to embodiments where they are to be attached by the installer.

[0011] The term "displaceable attachment" may be understood as being able to be moved along an attachment section in the length direction of an insulating frame member after being attached, without substantially damaging

the connector brackets and/or attachment section and/or support member and/or insulating member and/or frame member and/or insulating frame e.g. by pushing or pulling the connector bracket.

[0012] The roof connector brackets as such may be of different shapes, lengths, widths and/or heights. Likewise, the first connecting sections and/or second connecting sections of the roof connector brackets may be of different shapes lengths, widths and/or heights. This may have the effect that it allows the insulating frame to be adapted to a given roof structure by using the appropriate types of roof connector brackets.

[0013] The roof connector brackets may be made of wood, steel, stainless steel, aluminium, other metals, polymers, ceramics, glass fibre, composites and/or combinations thereof.

[0014] The roof connector brackets may comprise a support section. The support section may engage with the attachment section and/or support member and/or insulating member and/or insulating frame member. This may have the effect of improving the connection between the roof connector bracket and the insulating frame member and thus improving the strength and stability of the insulating frame. The support section may be in the form of a plate that is pressed into engagement.

[0015] The attachment section may be a separate element or be an integrated part of an insulating member or a support member. The attachment section may be made from a material different from the insulating and/or support member. This may have the effect that materials of the different components of the insulating frame may be optimised to the specific purpose such as thermal properties, strength, cost and/or ease of manufacture.

[0016] The attachment section may comprise interconnecting means for interconnecting with roof connector brackets. The interconnecting means may be in the form of channels or grooves adapted for engaging with first connecting sections of the roof connector brackets. The interconnecting means may be in the form of rivets, screws, nails, spikes, or the like.

[0017] The interconnecting means may for example engage by snap-locking, barbed sections, and/or press fitting.

[0018] A barbed section can include lugs, pins or other protrusions looking like semi-pierced fingernail detent formed into the connector bracket or guide member e.g. by punching or stamping. The barbed section may facilitate snap-locking.

[0019] The term "snap-locking" may be understood as the connector bracket mechanically fastening itself to the attachment section once it is brought into the correct position.

[0020] The length of the attachment section may be of substantially the same length as the insulating frame member and/or insulating member and/or support member. The length of the attachment section and/or the support member may be less than 3/4, 1/2, 1/3, 1/4, or 1/5 of the length of an insulating frame member. The insulating frame member may also comprise several attachment sections.

[0021] The attachment section being of substantially the same length as the insulating frame member may improve the ease of installation of the insulating frame as the connector bracket may then be placed at virtually any desired location on the attachment section e.g. at a location where the connector bracket will be proximal to a batten of the roof structure such that it may be connected thereto.

[0022] The attachment section may be a separate part of the insulating frame. This may have the effect that the attachment section may be selectively arranged at a desired location, such as near the battens of the roof structure. This may also have the effect that the insulating frame may be tailored to a certain roof structure by varying the number and location of the at least one attachment section.

[0023] The attachment section may be a different material to the rest of the insulating frame member. The attachment section may be a high density foam where the insulating member is a low density foam.

[0024] In an embodiment, the attachment section is located at an exterior side of an insulating frame member. This may have the advantage that it improves the ease with which roof connector brackets may be attached to the attachment section, thus improving the ease of installation of the insulating frame.

[0025] In an embodiment, the attachment section is made from a material chosen from the following group: wood, metal, polymer, high rigidity polymer foam such as EPS (expanded polystyrene) or combinations thereof, where the material may comprise perforations.

[0026] The attachment section may be made from the same material as the support member and vice versa. In one embodiment, the support member is made from a rigid insulating material, such as a non-elastic foamed polymer. The attachment section may then be a part of the support member.

[0027] The attachment sections may be adapted to interconnect with one or more other attachment sections, for example via a mortise joint or the like. In this way, it is for example possible to establish a continuous series of attachment sections extending along the entire insulating frame, and it is of course also possible to provide one continuous attachment section extending all the way around the insulating frame.

[0028] In an embodiment the first connecting section of the roof connector brackets is adapted for detachable attachment.

[0029] The term "detachable attachment" may be understood as being able to be removed by non-destructive mechanical action where neither the insulating frame, attachment section or connector bracket is substantially damaged and the connector bracket is able to be reattached to the attachment section. For example, by pulling the connector bracket off.

[0030] The roof connector brackets being detachable

may have the effect of improving the ease of installation of the insulating frame as a wrongly placed roof connector bracket may be detached and reattached at the required location. It may also improve the ease of transportation of the insulating frame as the roof connector brackets may be transported, packaged and/or shipped pre-attached to the insulating frame in a position optimal for packaging and transportation and then moved during installation. It may also improve maintenance, should it be required, as a potentially damaged roof connector bracket may simply be removed and replaced. It may also provide a greater flexibility of installation as the insulating frame may be adapted to different installation scenarios by varying the number and/or types of roof connector brackets used in-situ.

[0031] In an embodiment, the first connecting section extends over half or less than half the length of an insulating frame member.

[0032] In an embodiment, the first connecting section of the roof connector brackets are adapted for attachment via snap-locking.

[0033] This may have the advantage of improving the installation process as the roof connector brackets may simply be snap-locked onto the required location on the attachment section.

[0034] The first connecting sections may alternatively be adapted for being attached to the attachment section by screws, bolts, spikes or the like.

[0035] The first connection section may comprise a tab for releasing the roof connector bracket from the attachment section.

[0036] The first connecting section may comprise interconnecting means in the form of a barbed section. The barbed section can include lugs, pins or other protrusions looking like semi-pierced fingernail detent formed into the connector bracket or guide member e.g. by punching or stamping. The barbed section may facilitate snap-locking.

[0037] In an embodiment, the second connecting section of the roof connector brackets comprises means for attachment to a roof structure such as holes for screws, spikes, nails and the like.

[0038] The second connecting section may be in the form of one or more flanges extending over at least a part of the length of the roof connector bracket and projecting from the frame away from the opening in the mounted state. The flange may comprise a series of holes and/or recesses and/or openings adapted for allowing a screw, nail, rivet or spike to pass through for securing the connector bracket to a roof structure.

[0039] In an embodiment of the invention the insulating frame is provided as a kit for making an insulating frame according to one or more embodiments of the first aspect of the invention, comprising a plurality of insulating frame members and a plurality of roof connector brackets.

[0040] In a second aspect of the present invention, the above mentioned objects are met by a method for installing an insulating frame in a roof structure, comprising the steps of:

- providing top, bottom and side members of the insulating frame each including an insulating member and a support member, said insulating frame defining an inner opening adapted to surround a frame of the roof window and said insulating frame having an interior side intended to face the interior of the building and an exterior side intended to face the exterior and each frame member having an inner side facing the inner opening and an outer side facing away from the inner opening, said insulating frame further defining a base plane at the interior side of the insulating frame members which is substantially parallel with the inner opening, where the insulating frame comprises at least one attachment section, and
- providing a plurality of roof connector brackets, said roof connector brackets being adapted for connecting the insulating frame to the roof structure, and where each of the roof connector brackets comprises a first connecting section and a second connecting section, where the first connecting section is adapted for connecting to an attachment section, and where the second connecting section is adapted for connecting to the roof structure and extends away from the inner opening of the insulating frame in parallel with the base plane and beyond the outer side of the frame member to which the roof connector bracket is attached in the mounted state,
- connecting the roof connector brackets to the insulating frame member(s) or the roof structure via the first connecting section or second connecting section, respectively,
- connecting the roof connector brackets to the other of the insulating frame and roof structure via the first connecting section or second connecting section, respectively.

[0041] This may have the advantage of improving the ease of installation of the insulating frame, whilst also providing an insulating frame that is more versatile and easily adaptable to a given roof structure.

[0042] In a development of the previous embodiment a method for installing the insulating frame:

- the roof connector brackets are first connected to an attachment section via the first connecting section, and
- the insulating frame is subsequently connected to the roof structure via the second connecting section of the roof connector brackets.

[0043] It is within the scope of the invention to connect some roof connector brackets first to the insulating frame member(s) and then to the roof structure, while other roof connector brackets used for installing the same insulating frame are connected first to the roof structure and then to the insulating frame member(s). For example, roof

connector brackets at one side of the insulating frame may be connected first to the corresponding side insulating frame member while roof connector brackets at the opposite side of the insulating frame are connected first to the roof structure, so that the insulating frame can be swung into place in the opening in the roof structure.

[0044] In the following, embodiments of the invention will be explained in more detail with reference to the schematic drawings, in which:

Fig. 1 is a perspective view of an insulating frame according to the invention,

Fig. 2 is an enlarged view of the detail BB in Fig. 1,

Fig. 3 corresponds substantially to Fig. 2 but seen from a slightly different angle and where the roof connector bracket has been removed,

Fig. 4 is an enlarged view of the roof connector bracket as seen from the direction of arrow IX in Fig. 1,

Fig. 5 is a perspective view of a side insulating frame member of the type used in Fig. 1 with a different embodiment of a roof connector bracket,

Fig. 6 is an enlarged perspective view of the roof connector bracket in Fig. 5,

Fig. 7 is a perspective view of a corner of different embodiment of an insulating frame according to the invention,

Fig. 8 is a cross-sectional view of the side insulating frame member in Fig. 7 and a roof connector bracket, and

Fig. 9 is a cross-sectional view of another embodiment of a side insulating frame member and a roof connector bracket according to the invention.

[0045] An insulating frame 100 according to the invention will now be described in reference to Fig. 1. An insulating frame 100 like this is typically installed in a suitable opening in a roof structure (not shown). The insulating frame provides an insulating barrier at the interface between a roof window (not shown) and the roof structure, and facilitates easier mounting of the roof window by providing a predefined space adapted for the window. The frame 100 can be delivered as a complete kit for assembly including a plurality of insulating members 112, a plurality of support members 114 and a plurality of roof connector brackets 200, providing a convenient solution for the installer. The insulating frame 100 has an exterior side adapted to face away from the interior of the building (facing upwards in Fig. 1), and an interior side adapted for facing towards the interior of the building (facing downwards in Fig. 1). An insulating frame 100 like this, that can be efficiently assembled and adapted to a given window in-situ and is highly advantageous to the installer as the installer doesn't need to leave the installation site to undertake modifications to the insulating frame 100 that may be required to install the insulating frame. The insulating frame 100 may also be delivered in a partly or completely assembled state.

[0046] The insulating frame 100 comprises top 110c, bottom 110d and side insulating frame members 110a and 110b, which refer to their location when mounted, support members and a plurality of connector brackets 200 as will be discussed in more detail below. The insulating frame members 110a-110d define an inner opening 3. The insulating frame members comprise a ledge 120 projecting towards the inner opening 3, which is intended to project underneath a frame of a roof window, which the insulating frame 100 is intended to receive. The outer side of the insulating frame 100 is intended to face the opening in the roof structure.

[0047] The insulating members 112, which make up the majority of the volume of the insulating frame 100, are made from a material of a dimensionally stable nature having good thermal insulating properties. The insulating members of the side insulating frame members 110a, 110b further comprise a softer material on the outer side, which is compressible so as to allow it to yield and adapt to the shape of the opening in the roof structure. Further details of this are described in the applicants granted patent EP2677092B1. In this embodiment the insulating members of the side insulating frame members 110a, 110b are made from two types of polymer foam. It is, however, also possible to make them from a single material, and/or for the insulating members of the top and bottom insulating frame members 110c, 110d to be made from different materials or combinations of materials.

[0048] In this embodiment two different types of roof connector brackets 200a and 200b (which may be collectively referred with reference number 200) are used. The connector brackets 200 are attached to the attachment sections 500 of the insulating frame members 110d and 110a via their respective first connection sections 220 best seen in Fig. 4. It is noted, that the insulating frame 100 need not be attached to battens (not shown) or other parts of the roof structure, but may simply rest on top of these as the subsequent fastening of the roof window will also secure the insulating frame 100. However, to keep the insulating frame 100 in place before and during the installation of the window frame therein, it may be advantageous to attach at least some of the roof connector brackets 200 to the roof structure. For this purpose and for easing the later fastening of the window mounting brackets, holes 213, which allow a clamp, nail, spike or screw to pass, are provided in the second connecting sections 210. The features here described in relation to the bottom insulating frame member 110d and one of the side insulating frame member 110a also apply to the other side insulating frame member 110b and the top insulating frame member 110d, which are substantially the same.

[0049] The first type of roof connector bracket 200a used at the corners is an angular L shaped bracket having two legs, where each leg comprises a first connecting section 220, a second connecting section 210 and a support section 250 best seen in Fig. 4. The angular L shape allows the roof connector bracket 200a to be attached to two insulating frame members 110 such as shown in Fig.

1.

[0050] This roof connector bracket 200a also acts as a corner or frame connector bracket interconnecting the two insulating frame members with the additional advantages of the second connecting section 210 of a roof connector bracket 200. To this end, the first connecting section 220 of each leg of the roof connector bracket 200a comprises interconnecting means in the form of a barbed section, as shown in Fig. 4, which engage with the interconnecting means 130 (see Fig. 3) of attachment sections 500. Once the roof connector bracket 200a is attached to the attachment sections 500 via the first connecting sections 220, the support sections 250 are pressed and/or bent into engagement with the exterior side of the attachment sections 500. This improves the stability and strength of insulating frame 100. When the roof connecter bracket is interconnected with the two adjacent insulating frame members 110 it envelopes a corner of the insulating frame 100 as shown in Fig. 2. To improve the stability of the insulating frame 100, the attachment sections 500 are adapted to join together at the corners of the insulating frame 100 by a mortise joint 140.

[0051] The attachment sections in this embodiment are made from EPS foam, but other dimensionally stable materials might also be employed.

[0052] The second type of roof connector bracket 200b also attaches directly to the attachment section 500 and may be attached at any desired location along the attachment section 500. Although not shown in the figures, the second connecting section 210 of this roof connector bracket 200b may also comprise holes, openings and/or recesses allowing screws, spikes, nails and the like to pass through to secure the insulating frame 100 to a roof structure.

[0053] Fig. 5 shows a roof connector bracket 200b of the second type attached to an attachment section 500 via the brackets 200b first connecting section 220. The first connecting section 220 of this roof connector bracket 200b is better seen in the enlarged close-up view of the bracket 200b in Fig. 6. The first connecting section 220 of the bracket 200b comprises two barbed sections which engage with corresponding grooves in the attachment section 500 (best seen in Fig. 5) and snap-lock thereto.

[0054] Even though the bracket in Figs 5-6 is shorter than those shown in Fig. 1 it is to be understood that it serves the same purpose and has substantially the same features as described with reference to Fig. 1, and vice versa.

[0055] In the embodiment shown in Figs. 7 and 8, the insulating frame members 110 comprise an attachment section 600 that is a separate part to the insulating member 112 and which comprises one or more grooves or tracks 510 located at an exterior side of the insulating frame. Here, the attachment section 600 is arranged within a channel in the insulating frame member. The one or more grooves or tracks 510 of the attachment section 600 enables a roof connector bracket 200 adapted for displaceable attachment to be displaceably attached to an insulating frame member 110. This may have the advantage that the connector brackets 200 may be moved once it has been connected to the attachment section 600 and so allows for in-situ adjustment of the connector bracket 200 location, for example, to move it to a better suited mounting position near a batten of the roof structure. It provides the further advantage that the connector brackets 200 may be preconnected to the insulating frame 100 e.g. for packaging, shipping and/or optimisation of installation process efficiency, and then still be adapted in-situ to a specific roof structure on-site.

[0056] Attachment section 600 may be made from any suitable material such as for example foamed ABS, EPS, PP, GF, stainless steel, metals, polymers and/or combinations thereof.

[0057] In another embodiment, the attachment section 500 comprises a number of channels for connecting and supporting roof connector brackets 200 as seen in Fig. 9. In this embodiment the attachment section 500 is made of a high rigidity foam, which is substantially non-elastic, and the insulating member 112 is made of a lower rigidity foam. This allows the insulating frame 100 to retain its adaptability thanks to the lower rigidity foam that may be easily manipulated to fit a given opening in a roof structure, whilst the high rigidity foam provides the necessary strength and support to ensure adequate stability of the insulating frame as well as a secure connection of the connector bracket 200, while at the same time having insulating properties. In this embodiment, the connector brackets 200 may be connected to the attachment section 500 by sliding them into the channels of the attachment section 500. In the embodiment shown here, the attachment section 500 is made of an EPS foam. It is, however, also possible to make the attachment section 500 and/or the roof connector bracket 200 from a material, which has/have sufficient elasticity to allow the roof connector bracket to snap onto the attachment section.

[0058] It should also be noted that the support members 114 need not be separate parts to the attachment section as shown in Fig. 8, but may be an integral part of the attachment section 500, 600.

[0059] The roof connector brackets 200 may be adapted for detachable attachment such that they may be attached and detached from the attachment section 500, 600, for example to adapt the insulating frame 100 to a specific roof structure. This may be achieved by the connector bracket 200 being adapted for snap-locking, for example through a barbed section engaging with a complimenting interconnecting section on an attachment section such as in Figs. 4 and 6.

[0060] The connector brackets 200 may be made of a material chosen from the following group: wood, steel, stainless steel, aluminium, other metals, polymers, ceramics, glass fibre, composites and combinations thereof, but are preferably made of aluminium.

[0061] In the above, the inventive concept has been described with reference to a few embodiments. Howev-

er, as is readily appreciated by a person skilled in the art, other embodiments than the ones disclosed above are equally possible within the scope of the inventive concept, as defined by the appended claims.

List of references

[0062]

100	Insulating frame
110	Insulating frame member
112	Insulating member
114	Support member
120	Ledge
130	Interconnecting means
140	Mortise joint
200	Roof connector bracket
210	Second connecting section
211	Holes
213	Openings and/or recesses
220	First connecting section
230	Interconnecting means
240	Interconnecting means
250	Support section
300	Frame connector bracket
500	Attachment section
510	Groove or track
600	Attachment section

Claims

1. An insulating frame for a roof window mounted in an inclined roof structure of a building, comprising top, bottom and side frame members, each including an insulating member and a support member, and a plurality of connector brackets, said insulating frame defining an inner opening adapted to surround a frame of the roof window and said insulating frame having an interior side intended to face the interior of the building and an exterior side intended to face the exterior and each frame member having an inner side facing the inner opening and an outer side facing away from the inner opening, said insulating frame further defining a base plane at the interior side of the insulating frame members which is substantially parallel with the inner opening, **characterized in that** the insulating frame comprises a set of roof connector brackets adapted for connecting the insulating frame to the roof structure and at least one attachment section,
that each of the roof connector brackets comprises a first connecting section and a second connecting section, where the first connecting section is adapted for connecting to an attachment section, and where the second connecting section is adapted for connecting to the roof structure and extends away from the inner opening of the insulating frame in parallel with the base plane and beyond the outer side of the frame member to which the roof connector bracket is attached, and
that said attachment section(s) allow(s) attachment of each roof connector bracket at several different positions depending on the design of the roof structure.

2. The insulating frame according to any one of the preceding claims, wherein the first connecting section of the roof connector brackets is adapted for detachable attachment to an insulating frame member.

3. The insulating frame according to any one of the preceding claims, where the attachment section is located at an exterior side of a frame member.

4. The insulating frame according to any one of the preceding claims, wherein the roof connector brackets are adapted for displaceable attachment to the attachment section.

5. The insulating frame according to any one of the preceding claims, wherein the first connecting section of the roof connector brackets is adapted for attachment via snap-locking.

6. The insulating frame according to any one of the preceding claims, wherein the attachment section is a made from a material chosen from the following group: wood, steel, stainless steel, aluminium, other metals, polymers, foamed polymers, ceramics, glass fibre, or combinations thereof, where the material may comprise perforations.

7. The insulating frame according any of one of the preceding claims where the support member is made from a rigid insulating material, such as a non-elastic foamed polymer.

8. The insulating frame according any of one of the preceding claims where the second connecting section of the roof connector brackets comprises means for attachment to a roof structure such as holes for screws, spikes, nails and the like.

9. A kit for making an insulating frame according to one or more of claims 1-8, comprising a plurality of insulating frame members and a plurality of roof connector brackets.

10. Method for installing an insulating frame in a roof structure, comprising the steps of:

- providing top, bottom and side members of the insulating frame each including an insulating member and a support member, said insulating frame defining an inner opening adapted to sur-

round a frame of the roof window and said insulating frame having an interior side intended to face the interior of the building and an exterior side intended to face the exterior and each frame member having an inner side facing the inner opening and an outer side facing away from the inner opening, said insulating frame further defining a base plane at the interior side of the insulating frame members which is substantially parallel with the inner opening, where the insulating frame comprises at least one attachment section, and

- providing a plurality of roof connector brackets, said roof connector brackets being adapted for connecting the insulating frame to the roof structure, and where each of the roof connector brackets comprises a first connecting section and a second connecting section, where the first connecting section is adapted for connecting to an attachment section, and where the second connecting section is adapted for connecting to the roof structure and extends away from the inner opening of the insulating frame in parallel with the base plane and beyond the outer side of the frame member to which the roof connector bracket is attached in the mounted state,

  - connecting the roof connector brackets to the insulating frame member(s)and/or the roof structure via the first connecting section or second connecting section, respectively,
  - connecting the roof connector brackets to the other of the insulating frame and roof structure via the first connecting section or second connecting section, respectively.

11. Method for installing an insulating frame in a roof structure according to claim 10, where

- the roof connector brackets are first connected to an attachment section via the first connecting section, and
- the insulating frame is subsequently connected to the roof structure via the second connecting section of the roof connector brackets.

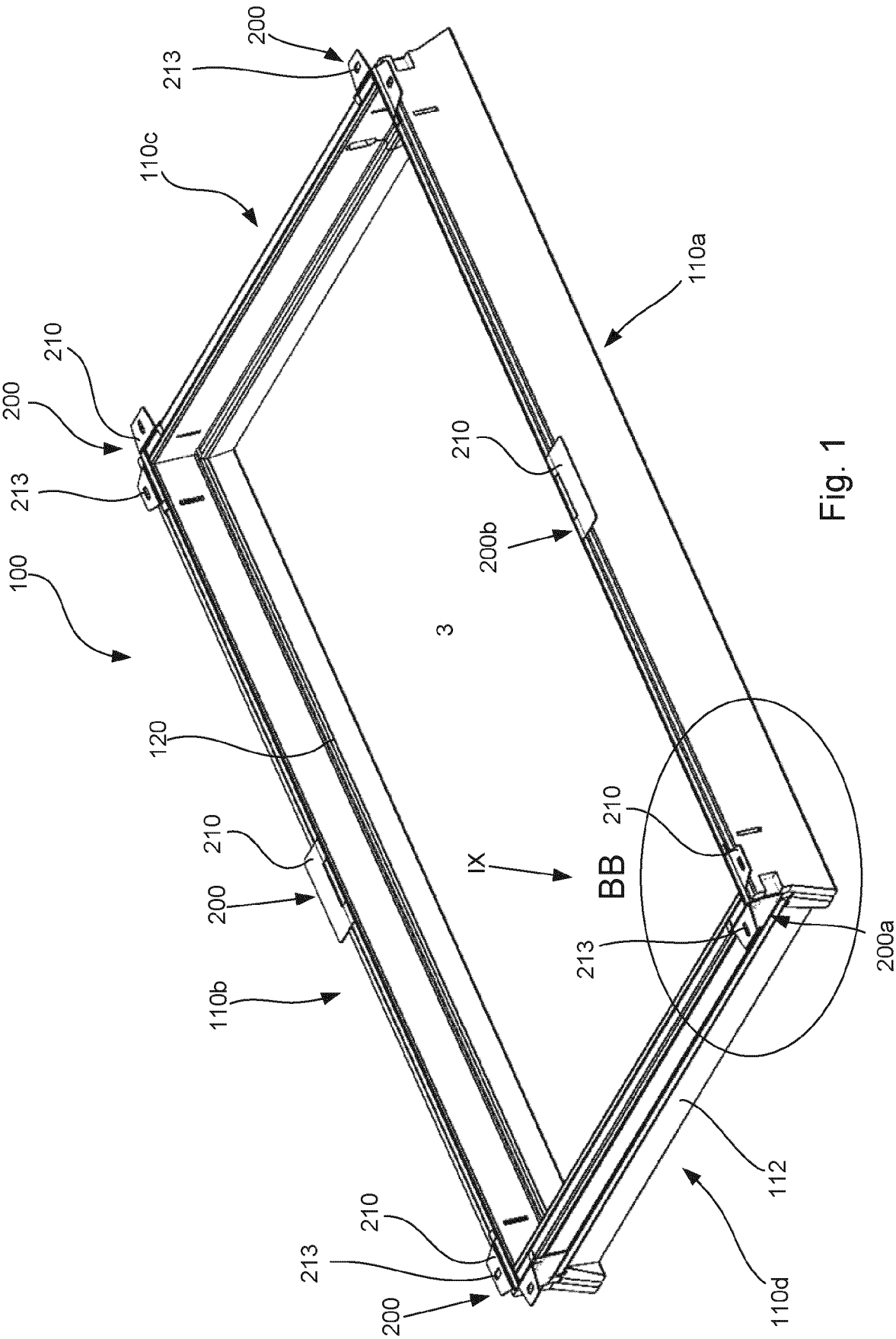
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Fig. 1

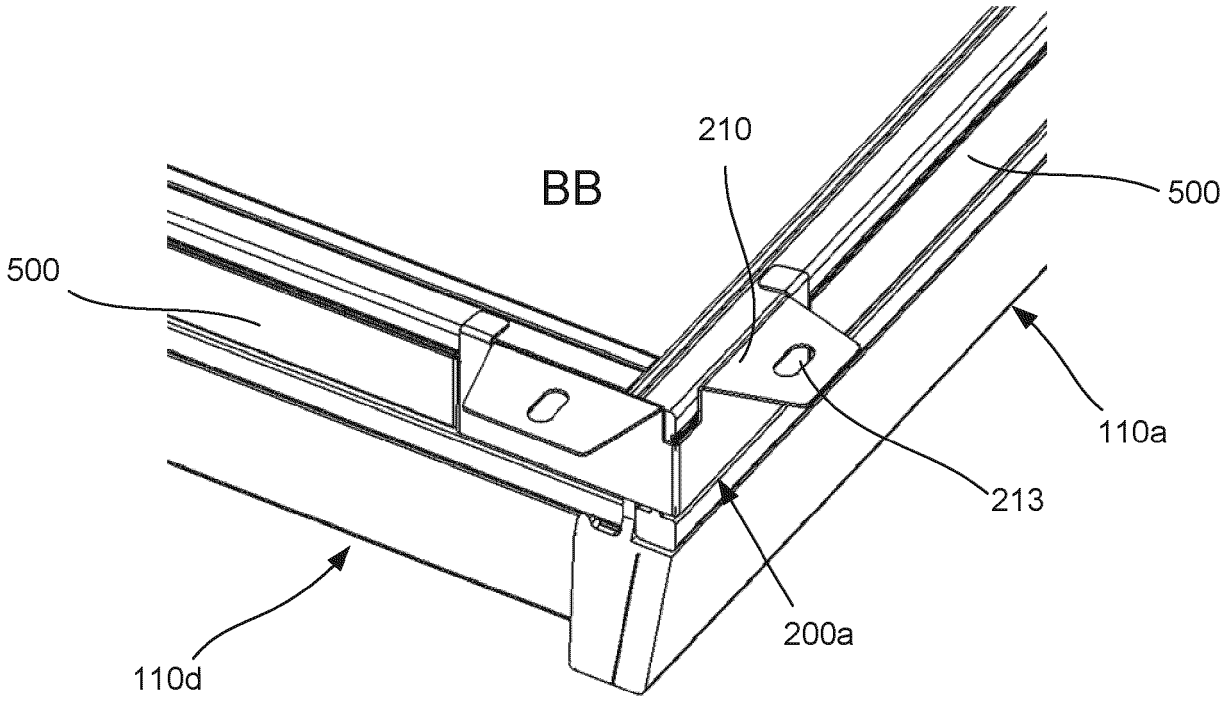

Fig. 2

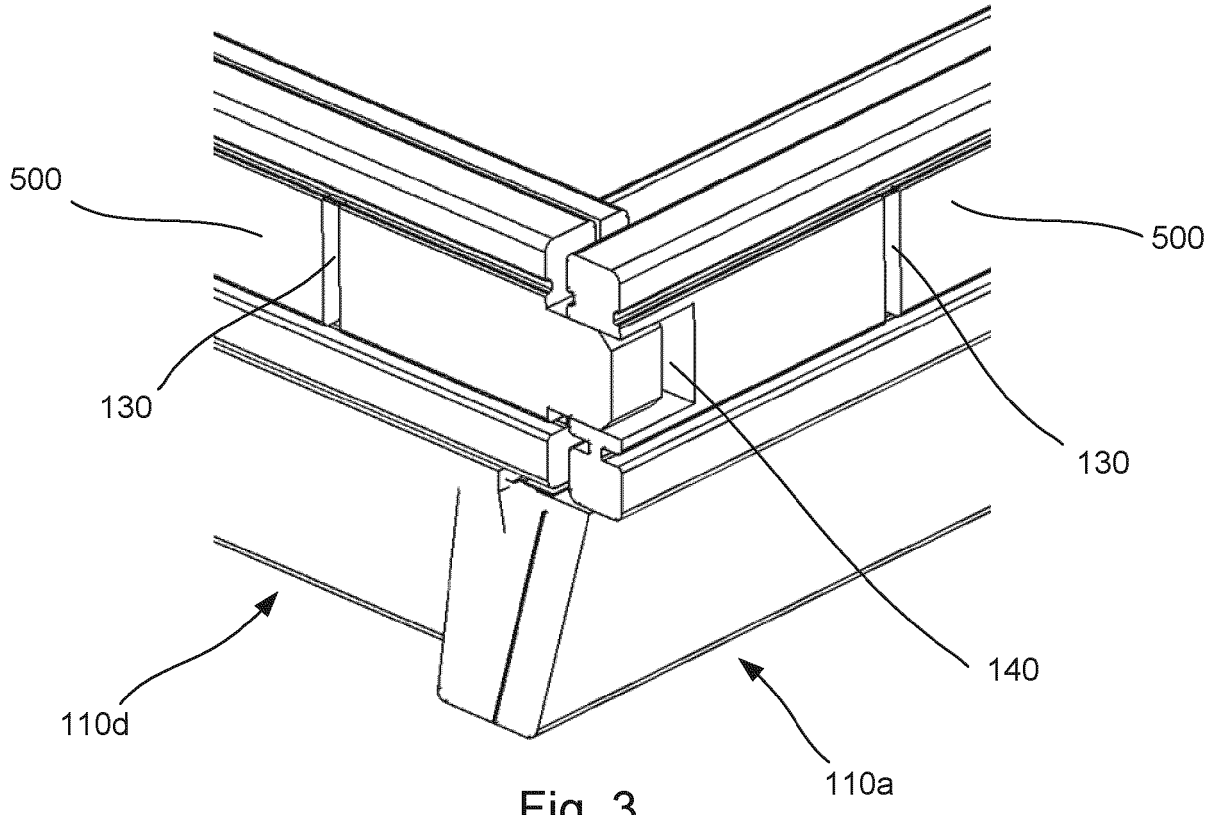

Fig. 3

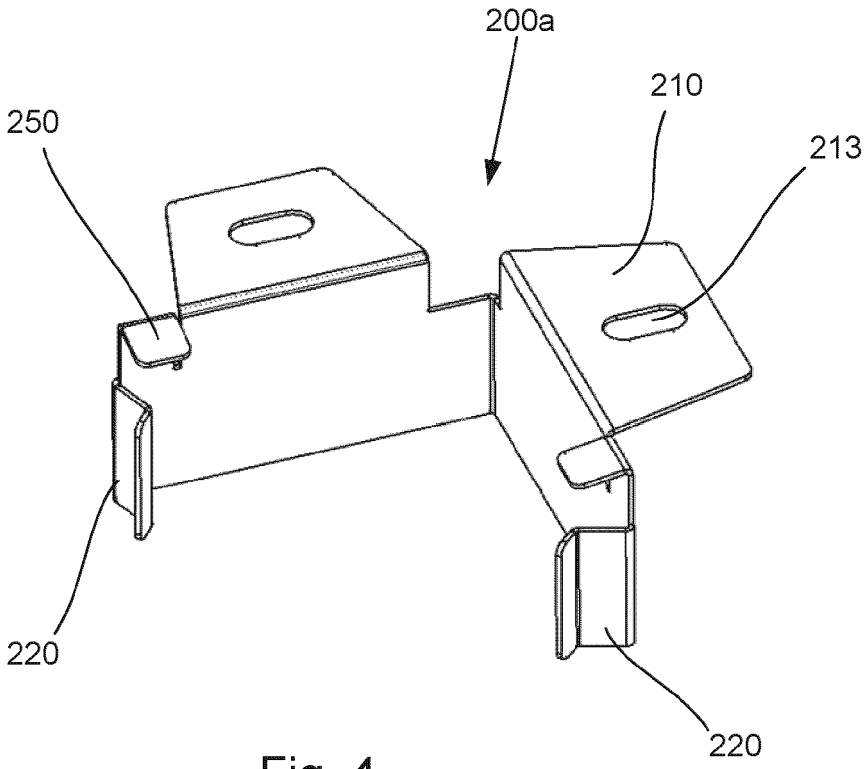

Fig. 4

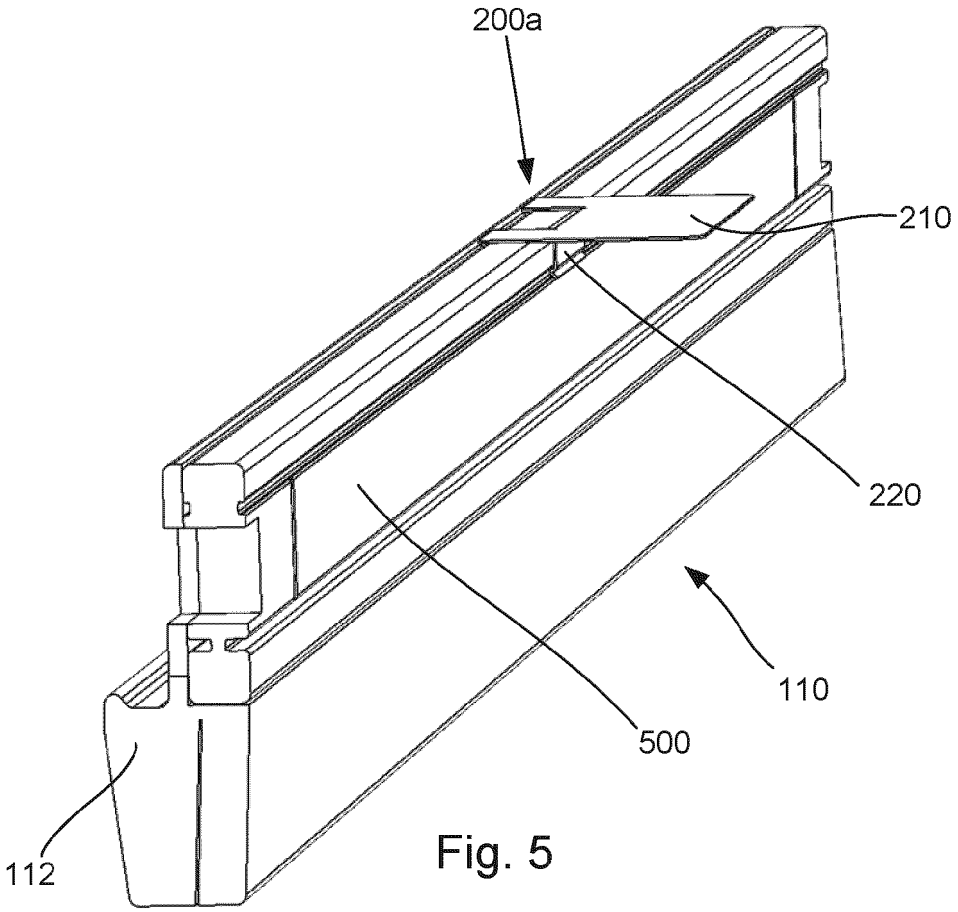

Fig. 5

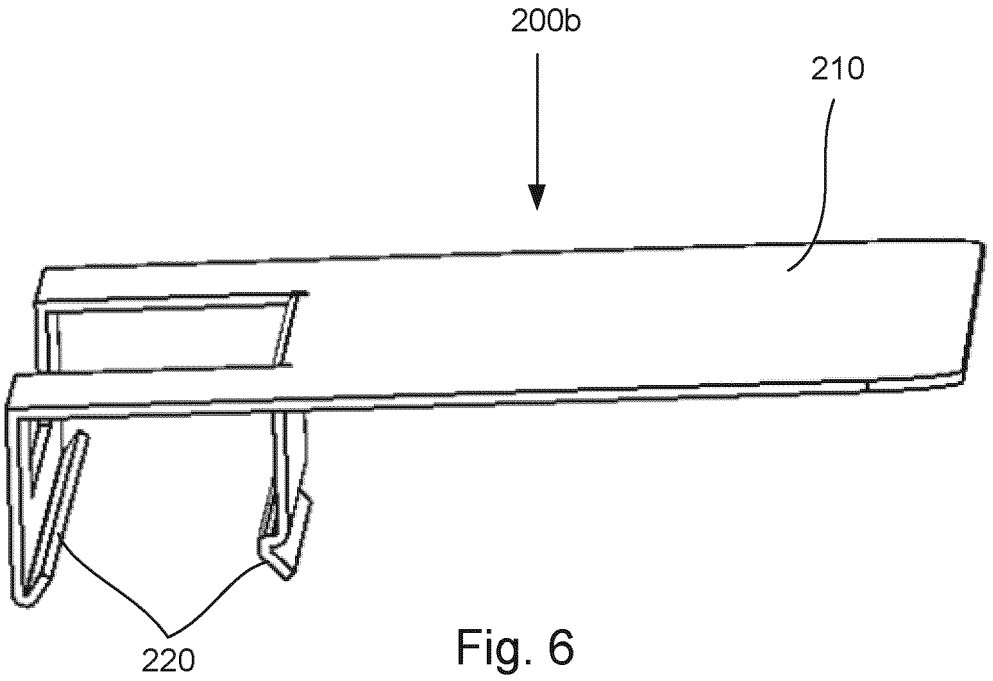

Fig. 6

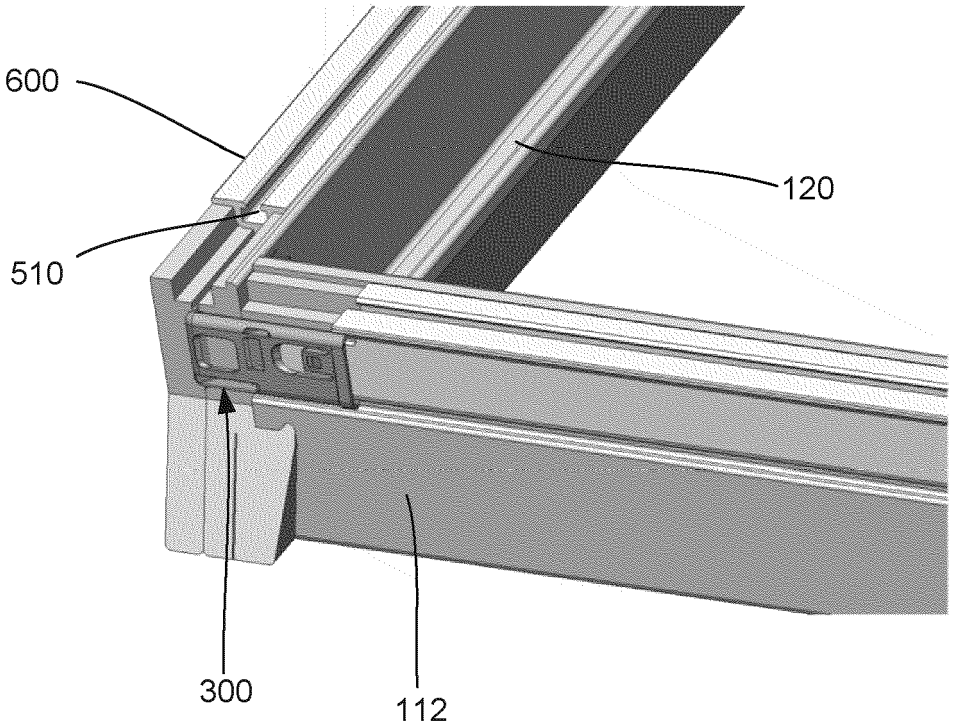

Fig. 7

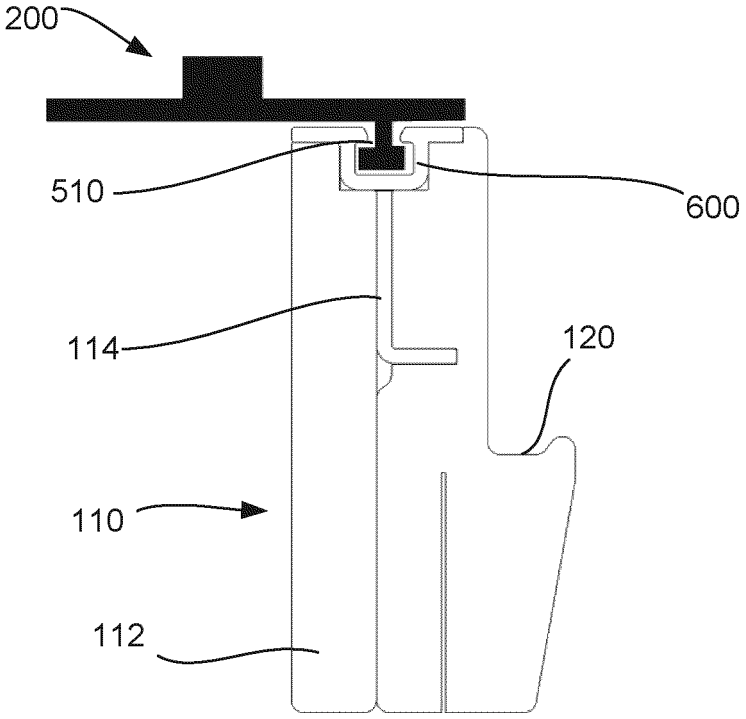

Fig. 8

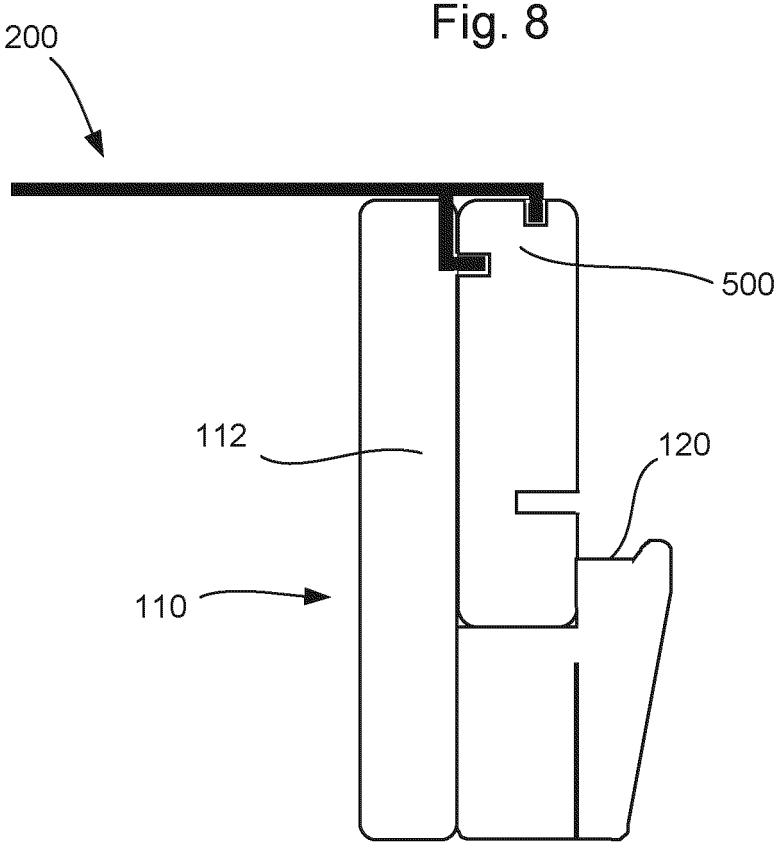

Fig. 9

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EUROPEAN SEARCH REPORT

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EP 20 15 2316

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	EP 1 061 199 A1 (VELUX IND AS [DK]) 20 December 2000 (2000-12-20) * paragraphs [0020], [0029] - [0034]; figures 1-7 *	1-11	INV. E04D13/03
X,D	EP 2 677 092 A1 (VKR HOLDING AS [DK]) 25 December 2013 (2013-12-25) * paragraph [0028] - paragraph [0049]; figures 2-15 *	1-6,8-11	
X	US 2012/167483 A1 (LINDGREN CLAES [DK] ET AL) 5 July 2012 (2012-07-05) * paragraphs [0089] - [0095]; figures 6-11 *	1-4,8-11	
X	US 2002/095884 A1 (LINDGREN CLAES [DK] ET AL) 25 July 2002 (2002-07-25) * paragraphs [0040], [0075] - [0079]; figures 2,11 *	1-4,8-11	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 March 2020	Leroux, Corentine

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13-03-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1061199 A1	20-12-2000	AT 349586 T	15-01-2007
		CZ 20002279 A3	14-02-2001
		DK 1061199 T3	10-04-2007
		EP 1061199 A1	20-12-2000
		HU 0002286 A2	28-03-2001
		PL 340861 A1	02-01-2001
		SK 9252000 A3	18-01-2001
EP 2677092 A1	25-12-2013	CN 103510662 A	15-01-2014
		DK 177645 B1	27-01-2014
		EA 201300596 A1	30-12-2013
		EP 2677092 A1	25-12-2013
		EP 2952646 A1	09-12-2015
		ES 2549222 T3	26-10-2015
		HU E027557 T2	28-10-2016
		PL 2677092 T3	29-01-2016
US 2012167483 A1	05-07-2012	CN 102561605 A	11-07-2012
		DK 2472027 T3	22-05-2017
		EP 2472027 A2	04-07-2012
		PL 2472027 T3	31-08-2017
		US 2012167483 A1	05-07-2012
US 2002095884 A1	25-07-2002	US 2002095884 A1	25-07-2002
		US 2002095886 A1	25-07-2002

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Patent documents cited in the description

- EP 2677092 A1 **[0004]**
- EP 2677092 B1 **[0047]**