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(54) **AN INSULATION MEMBER**

(57) An insulation member (1) for sealing a gap (5) between at least part of a window frame (2) and at least part of a frame (3) surrounding an aperture in a support structure (13) for receiving the window frame (2). The insulation member (1) has an elongate resilient member (4), the insulation member (1) having a width greater than a gap between mutually opposing surfaces of the window frame and the aperture frame. The elongate resilient member (4) being deformable between the mutually opposing surfaces so as to compressibly seal the gap.

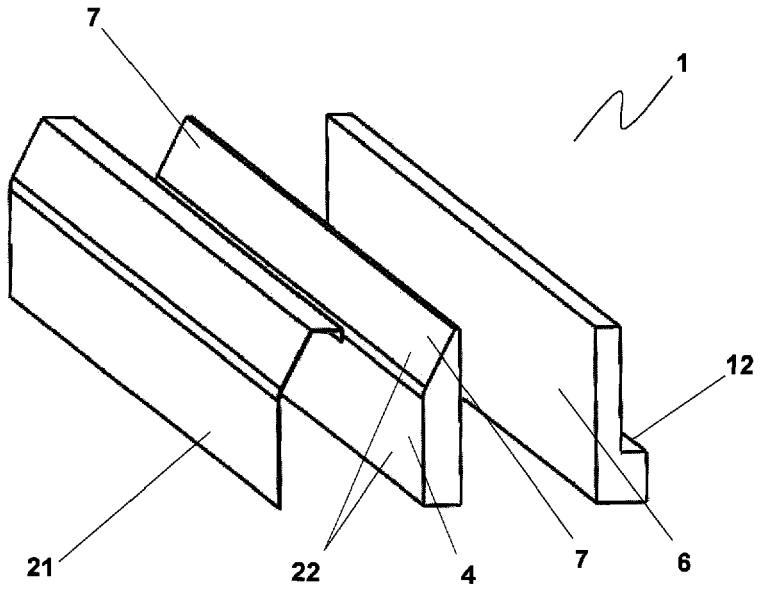

Figure 1

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Description

[0001] The present invention relates to an insulation member for a window and in particular to an insulation collar for a roof window.

[0002] The thermal transmittance U - value of roof window frames is currently considered to be too high and under certain conditions, the roof window frame material acts as a thermal bridge between the inside and the outside of a building. A significant thermal loss is occurring at the interface between the roof window frame and the roof insulation. In view of the current focus on thermal properties of all building products, this heat loss is a particular problem.

[0003] Attempts to solve this thermal loss problem and problems associated with installing the roof windows have been provided by the development of additional installation frames such as L-shaped wooden or foam installation frames or collars to provide support for the roof window and to provide an insulation lining for the aperture cut in the roof to receive the roof window frame. Additionally, bands have been designed for the part of the roof window frame which is buried within the roof structure after installation.

[0004] The installation of a roof window either retrospectively or during a new build poses significant problems in relation to the thermal insulation of the perimeter of the roof window frame relative to the remainder of the roof structure. It is common practice for the above mentioned insulation collars to be inserted into the framed opening cut into the roof for housing the roof window. A problem that arises by the imprecise nature of cutting a quadrangular aperture in a roof means that there are often gaps between the insulation collar for supporting the frame of the roof window and the frame encasing the opening cut in the roof for receiving the roof window. Traditionally these gaps are plugged with insulation by the roof window installer. Therefore the integrity of this thermal barrier as it is currently created between the insulation collar and the frame encasing the aperture has a number of points of weakness or potential failure. Initially, the accuracy of the aperture cut in the roof as well as the dimensions of the frame can vary during cutting and framing of the aperture and the dimensions of the insulation collars can also vary. As a result, gaps can occur between the insulation collar and the frame encasing the window receiving aperture. Finally, the care taken by the installer to block any naturally occurring gaps with insulation is a weak point especially where certain workers are not as conscientious as others.

[0005] It is an object of the present invention to obviate or mitigate the problems of air gaps occurring between a frame encasing a window receiving aperture and a window frame formed for insertion into the aperture or an insulation collar formed for receiving the window frame.

[0006] Accordingly, the present invention provides an insulation member for sealing a gap between at least part of a window frame and at least part of a frame surrounding an aperture in a support structure for receiving the window frame, the insulation member comprising an elongate resilient member, the insulation member having a width greater than a gap between mutually opposing surfaces of the window frame and the aperture frame, the elongate resilient member being deformable between the mutually opposing surfaces so as to compressibly seal the gap.

[0007] Ideally, the insulation member has a width greater than a gap between mutually opposing surfaces of a support and/or insulation collar of a window frame and the aperture frame. By support and/or insulation collar we mean any of a range of collars either insulation and/or support collars such as the installation frames or bands mentioned in paragraph 3, page 1. These support and/or insulation collars are provided generally although not exclusively around the portion of the roof widow frame which extends into or proximal to the inside of the building.

[0008] Ideally, the width of the insulation member can be variable along the length and/or height of the insulation member to accommodate varying widths of gaps between the mutually opposing surfaces along the length or height of the mutually opposing surfaces.

[0009] Preferably, a leading edge portion of the insulation member is tapered.

[0010] Ideally, the width of at least part of the insulation member is greater than the width of the narrowest gap between the mutually opposing surfaces.

[0011] Preferably, the width of at least part of the insulation member is greater than the width of the widest gap between the mutually opposing surfaces.

[0012] When we are referring to the gap between the mutually opposing surfaces we mean the gap between the main planar surfaces of the mutually opposing surfaces along the length and height of the gap.

[0013] Ideally, the elongate resilient member comprises a panel of insulation material.

[0014] Preferably, a leading edge portion of the panel of insulation material is tapered.

[0015] Preferably, a leading edge portion of the elongate resilient member is tapered.

[0016] By leading edge portion we mean the portion of the elongate resilient member or panel which is first offered up to the gap between the aperture frame and the window frame from underneath or above.

[0017] Preferably, the elongate resilient member is formed for engaging at least part of the aperture frame or window frame or support and/or insulation collar.

[0018] Ideally, the elongate resilient member is manufactured from an insulation foam.

[0019] Preferably, the elongate resilient member is manufactured from a low density insulation foam.

[0020] Ideally, the insulation member further comprises an elongate rigid member for engaging a portion of the window frame or aperture frame or support and/or insulation collar.

[0021] Ideally, the elongate rigid member is manufac-

tured from medium to high density foam.

[0022] Preferably, the elongate rigid member and the elongate resilient member are mountable in a back to back configuration.

[0023] Ideally, the elongate rigid member and the elongate resilient member are mountable in a back to back configuration with their top and bottom in alignment.

[0024] Ideally, the elongate rigid member is provided by a panel of medium to high density foam.

[0025] Preferably, one end of the elongate rigid member has a protruding section.

[0026] Ideally, the protruding section is formed for engaging an outside corner on the bottom of the window frame or support and/or insulation collar. Advantageously, this prevents the insulation member from being pressed too far into the gap between the window frame or support and/or insulation collar and the aperture frame.

[0027] Preferably, the elongate rigid member is coupled to the frame or support and/or insulation collar.

[0028] Ideally, the elongate rigid member is coupled to the frame or support and/or insulation collar by mechanical coupling means, boding or adhesive.

[0029] Preferably, the elongate rigid member has an L-shaped cross-section.

[0030] Ideally, the protruding foot of the L-shaped member is at the opposite end of the insulating member to the tapered end of the elongate resilient member.

[0031] Preferably, the elongate resilient member has a covering means covering at least part of the surface of the elongate resilient member formed for engaging the aperture frame or the window frame or support and/or insulation collar.

[0032] Ideally, the covering means is a covering sheet.

[0033] Preferably, the sheet is formed from a tough foil or tape. Advantageously, the sheet is resistant to tearing or puncturing during insertion of the insulation member into the gap between the aperture frame and the window frame or support and/or insulation collar. The tough sheet of covering material prevents tearing or crumbling of the low density foam of the elongate resilient member during insertion or rough handling during transport or storage.

[0034] Preferably, the covering means is a covering foil having a corresponding size to the main longitudinal exposed surface of the resilient member.

[0035] Accordingly, the present invention provides an insulation collar comprising at least four elongate insulation members as defined above joined about their ends forming a quadrangular shaped insulation collar defining a central aperture, each elongate insulation member having a main aperture facing surface and a main roof facing surface.

[0036] Preferably, the elongate rigid member is a wooden member.

[0037] Alternatively, a plastic or composite material can be used for the elongate rigid member. Any material with sufficient structural strength and durability can be used for the elongate rigid member of the insulation member.

[0038] In one embodiment of the invention, the insulation member reduces the thermal transmittance U-value of the gap between the roof window frame and the aperture frame by up to 30%.

[0039] In another embodiment of the invention, the insulation member reduces the thermal transmittance U-value of the gap between the roof window frame and the aperture frame by up to 40%.

[0040] In a further embodiment, the insulation member reduces the thermal transmittance U-value of the gap between the roof window frame and the aperture frame by up to 50% and most preferably up to 90%.

[0041] Preferably, the elongate resilient member has a generally uniform cross section along the length of the member.

[0042] Ideally, the rigid elongate member has a generally uniform cross-section along the length of the rigid elongate member.

[0043] Ideally, the elongate resilient member is provided by one of or any combination of polystyrene, polyurethane, polyisocyanurate, or polyethylene.

[0044] Ideally, the insulation members are combined into an insulation collar surrounding the perimeter of the window frame.

[0045] Preferably, the insulation collar has joints, most preferably mitre joints at the corners of the window frame.

[0046] Ideally, the insulation member covers the roof facing surface of the window frame housed within the roof.

[0047] Preferably, the insulation member covers the roof facing surface of the window frame or support and/or insulation collar up to a point in line with the top of batons on the roof.

[0048] Alternatively, the insulation member covers predetermined parts of the roof facing surface of the window frame or support and/or insulation collar.

[0049] Ideally, the elongate rigid members are combined into a reinforcing collar surrounding the perimeter of the window frame or support and/or insulation collar. Advantageously, the reinforcing collar provides the insulation member with additional strength.

[0050] Preferably, the reinforcing collar has joints, most preferably mitre joints at the corners of the roof window frame.

[0051] Ideally, the elongate rigid member covers the roof facing surface of the window frame or support and/or insulation collar housed within the boundary of the roof.

[0052] Alternatively, the elongate rigid member covers predetermined parts of the roof facing surface of the window frame or support and/or insulation collar.

[0053] Ideally, the elongate rigid member covers the roof facing surface of the window frame or support and/or insulation collar up to a point in line with the top of batons on the roof.

[0054] Preferably, the elongate resilient member and the elongate rigid member are joined in a back to back configuration so that the elongate resilient member and the elongate rigid member are substantially in alignment

along their corresponding upper and lower edges.

[0055] According to a further aspect of the invention, there is provided a roof window comprising an insulation member as outlined above.

[0056] Preferably, at least part of the gap between the mutually opposing surfaces of the roof window frame and the aperture frame are in the range of 10mm to 50mm, most preferably 20mm to 35mm.

[0057] Ideally, the width of at least part of the insulation member from aperture facing surface to roof facing surface is in the range of 20 mm to 60mm, most preferably 30mm to 45mm.

[0058] The invention will now be described with reference to the accompanying drawings which show by way of example only one embodiment of an insulation member for a roof window frame in accordance with the invention. In the drawings:

[0059] Figure 1 is a perspective exploded view of an insulation member of the present invention;

[0060] Figure 2 is a perspective view of an insulation member of the present invention;

[0061] Figure 3 is a vertical section through a roof window frame member having an insulation member in preparation for mounting thereon prior to installation in the aperture frame;

[0062] Figure 4 is a perspective view of a roof window frame member having an insulation member in preparation for mounting thereon prior to installation in the aperture frame;

[0063] Figure 5 is a vertical section through a roof window frame member having an insulation member mounted thereon installed in the aperture frame;

[0064] Figure 6 is a perspective view of a roof window frame member having an insulation member mounted thereon installed in the aperture frame;

[0065] Figure 7 is a front view showing the insulation member forming a collar around the perimeter of the window frame; and

[0066] Figure 8 is a perspective view of a corner section of the window frame showing the corner portion of the collar formed by the insulatio0n member around the window frame.

[0067] Referring to the drawings generally, there is shown an insulation member indicated generally by reference numeral 1 for sealing a gap 5 between a window frame 2 and a frame 3, see figures 3 to 5, surrounding an aperture in a roof structure 13 for receiving the window frame 2. The insulation member 1 has an elongate resilient member 4 and the insulation member 1 has a width greater than the gap 5 between mutually opposing surfaces of a window frame 2 and the aperture frame 3. The elongate resilient member 4 is deformable so as to compressibly seal the gap 5. The elongate resilient member 4 is a panel 4 of insulation material. A leading edge portion 7 of the panel 4 of insulation material is tapered. By leading edge portion 7 we mean the portion of the elongate resilient member 4 or panel which is first offered up to the gap 5 between the aperture frame 3 and the window frame 2 from underneath or above.

[0068] The elongate resilient member 4 is formed for engaging the aperture frame 3. The elongate resilient member 4 is manufactured from insulation foam. The elongate resilient member 4 is manufactured from low density foam. The insulation member 1 further has the elongate rigid member 6 for engaging the window frame 2. The elongate rigid member 6 is manufactured from medium to high density foam.

[0069] The elongate rigid member 6 and the elongate resilient member 4 are mounted in a back to back configuration. The elongate rigid member 6 is provided by a panel of medium to high density foam. One end 11 of the elongate rigid member 6 has a protruding section 12. The protruding section 12 is formed for engaging an outside corner 14 on the bottom of the window frame 2. Advantageously, this prevents the insulation member 1 from being pressed too far into the gap 5 between the window frame 2 and the aperture frame 3. The elongate rigid member 6 has an L-shaped cross-section. The protruding foot 12 of the L-shaped member 6 is at the opposite end of the insulating member 1 to the tapered portion 7 of the elongate resilient member 4.

[0070] The elongate resilient member 4 has a covering member 21 covering the surface 22 see Figure 1 and 2 of the elongate resilient member 4 formed for engaging the aperture frame 3. The covering member 21 is a covering sheet 21. The sheet 21 is formed from a tough foil or tape. Advantageously, the sheet 21 is resistant to tearing or puncturing during insertion of the insulation member 1 into the gap 5 between the aperture frame 3 and the window frame 2. The tough sheet 21 of covering material 21 prevents tearing or crumbling of the low density foam resilient member 4 during insertion or rough handling during transport or storage. The covering member 21 is a covering foil 21 having a corresponding size to the main longitudinal exposed surface 22 of the elongate resilient member 4. This surface 22 comprises the main outer planar surface of the panel 4 as well as the outer surface of tapered portion 7 of the panel 4. Advantageously, the covering foil 21 is an aluminium or similar material.

[0071] An insulation collar has four elongate insulation members 1 as defined above joined about their ends forming a quadrangular shaped insulation collar defining a central aperture for receiving the roof window frame 2. Each elongate insulation member 1 has a main aperture facing surface 25 and a main roof facing surface 26. The elongate rigid member 6 could also be provided by a wooden member, or a plastic or composite material can be used for the elongate rigid member 6. Any material with sufficient structural strength and durability which can act as insulation can be used for the elongate rigid member 6 of the insulation member 1. In one embodiment of the invention, the insulation member 1 reduces the thermal transmittance U-value of the gap between the roof window frame 2 and the aperture frame 3 by up to 30%. In another embodiment of the invention, the insulation

member 1 reduces the thermal transmittance U-value of the gap between the roof window frame 2 and the aperture frame 3 by up to 40%. In a further embodiment, the insulation member 1 reduces the thermal transmittance U-value of the gap between the roof window frame 2 and the aperture frame 3 by up to 50% most preferably up to 90%.

[0072] The elongate resilient member 4 has a generally uniform cross section along the length of the elongate resilient member 4. The rigid elongate member 6 has a generally uniform cross-section along the length of the rigid elongate member 6. The elongate resilient member 4 is provided by one of or any combination of polystyrene, polyurethane, polyisocyanurate or polyethylene.

[0073] The insulation members 1 are combined into an insulation collar 31 surrounding the perimeter of the window frame 3. The insulation collar 31 has joints at the corners of the roof window frame 3. The insulation member 1 covers the roof facing surface of the window frame 3 housed within the roof structure 13. The insulation member 1 covers the roof facing surface of the window frame 3 up to a point in line with the top of batons 30 on the roof structure 13, see Figure 6.

[0074] Alternatively, the insulation member 1 covers predetermined parts of the roof facing surface of the window frame 2. The elongate rigid members 6 are combined into a reinforcing collar 32 surrounding the perimeter of the window frame 2. Advantageously, the reinforcing collar 32 provides the insulation member 1 with additional strength. The reinforcing collar 32 has joints at the corners of the roof window frame 2. The elongate rigid member 6 covers the roof facing surface of the window frame 2 housed within the boundary of the roof. Alternatively, the elongate rigid member 6 covers predetermined parts of the roof facing surface of the window frame. The elongate rigid member 6 covers the roof facing surface of the window frame 2 up to a point in line with the top of batons 30 on the roof structure 13.

[0075] The elongate resilient member 4 and the elongate rigid member 6 are joined in a back to back configuration so that the elongate resilient member 4 and the elongate rigid member 6 are substantially in alignment along their corresponding upper and lower surfaces/edges 23, 24.

[0076] In relation to the detailed description of the different embodiments of the invention, it will be understood that one or more technical features of one embodiment can be used in combination with one or more technical features of any other embodiment where the transferred use of the one or more technical features would be immediately apparent to a person of ordinary skill in the art to carry out a similar function in a similar way on the other embodiment.

[0077] In the preceding discussion of the invention, unless stated to the contrary, the disclosure of alternative values for the upper or lower limit of the permitted range of a parameter, coupled with an indication that one of the said values is more highly preferred than the other, is to be construed as an implied statement that each intermediate value of said parameter, lying between the more preferred and the less preferred of said alternatives, is itself preferred to said less preferred value and also to each value lying between said less preferred value and said intermediate value.

[0078] The features disclosed in the foregoing description or the following drawings, expressed in their specific forms or in terms of a means for performing a disclosed function, or a method or a process of attaining the disclosed result, as appropriate, may separately, or in any combination of such features be utilised for realising the invention in diverse forms thereof as defined in the appended claims.

Claims

1. An insulation member (1) for sealing a gap (5) between at least part of a window frame (2) and at least part of a frame (3) surrounding an aperture in a support structure (13) for receiving the window frame (2), the insulation member (1) comprising an elongate resilient member (4), the insulation member (1) having a width greater than a gap between mutually opposing surfaces of the window frame and the aperture frame, the elongate resilient member (4) being deformable between the mutually opposing surfaces so as to compressibly seal the gap.

2. An insulation member (1) as claimed in claim 1, wherein the insulation member (1) has a width greater than a gap between mutually opposing surfaces of a support and/or insulation collar of a window frame (2) and the aperture frame (3).

3. An insulation member (1) as claimed in claim 1 or claim 2, wherein the width of the insulation member (1) can be variable along the length and/or height of the insulation member (1) to accommodate varying widths of gaps between the mutually opposing surfaces along the length or height of the mutually opposing surfaces.

4. An insulation member (1) as claimed in any one of the preceding claims, wherein a leading edge portion of the insulation member (1) is tapered.

5. An insulation member (1) as claimed in any one of the preceding claims, wherein the width of at least part of the insulation member (1) is greater than the width of the narrowest gap between the mutually opposing surfaces.

6. An insulation member (1) as claimed in any one of the preceding claims, wherein the width of at least part of the insulation member (1) is greater than the width of the widest gap between the mutually oppos-

ing surfaces.

7. An insulation member (1) as claimed in any one of the preceding claims, wherein the elongate resilient member (4) comprises a panel of insulation material where a leading edge portion of the panel of insulation material is tapered.

8. An insulation member (1) as claimed in any one of the preceding claims, wherein the elongate resilient member (4) is formed for engaging at least part of the aperture frame (3) or window frame (2) or support and/or insulation collar.

9. An insulation member (1) as claimed in any one of the preceding claims, wherein the elongate resilient member is manufactured from an insulation foam.

10. An insulation member (1) as claimed in any one of the preceding claims, wherein the insulation member (1) further comprises an elongate rigid member (6) for engaging a portion of the window frame (2) or aperture frame (3).

11. An insulation member (1) as claimed in claim 10, wherein the elongate rigid member (6) is manufactured from medium to high density foam.

12. An insulation member (1) as claimed in claim 10 or 11, wherein the elongate rigid member and the elongate resilient member are mountable in a back to back configuration.

13. An insulation member (1) as claimed in any one of claims 10 to 12, wherein one end of the elongate rigid member has a protruding section formed for engaging an outside corner on the bottom of the window frame.

14. An insulation member (1) as claimed in any one of the preceding claims, wherein the elongate resilient member has a covering means covering at least part of the surface of the elongate resilient member formed for engaging the aperture frame or the window frame.

15. A roof window comprising an insulation member (1) as claimed in any one of the preceding claims.

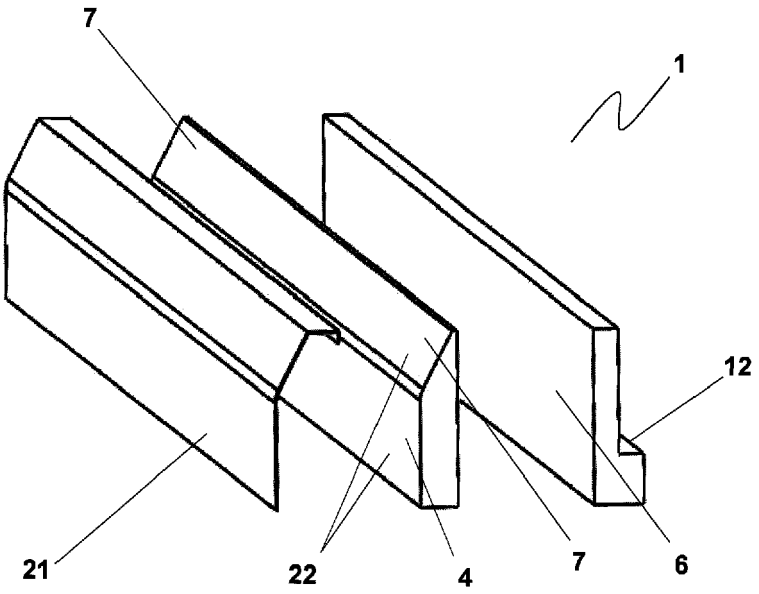

Figure 1

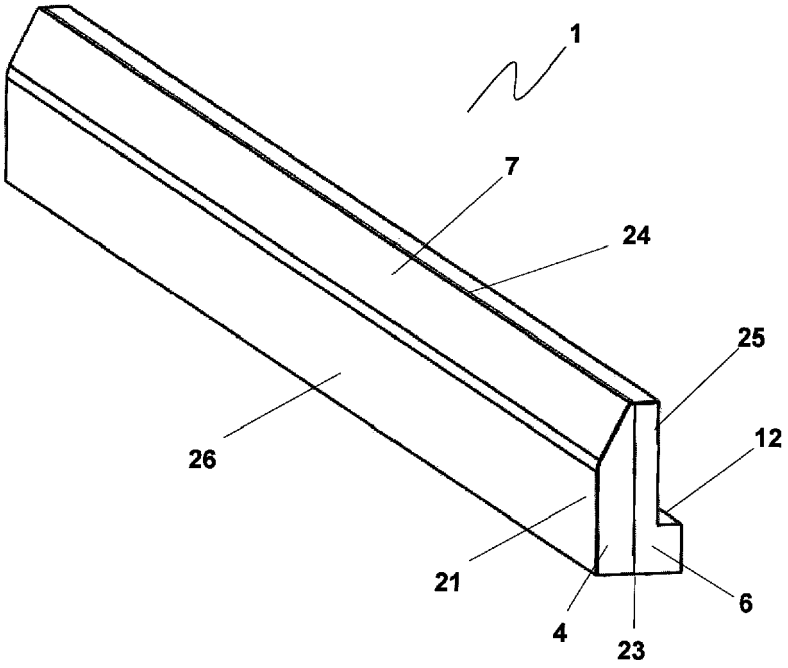

Figure 2

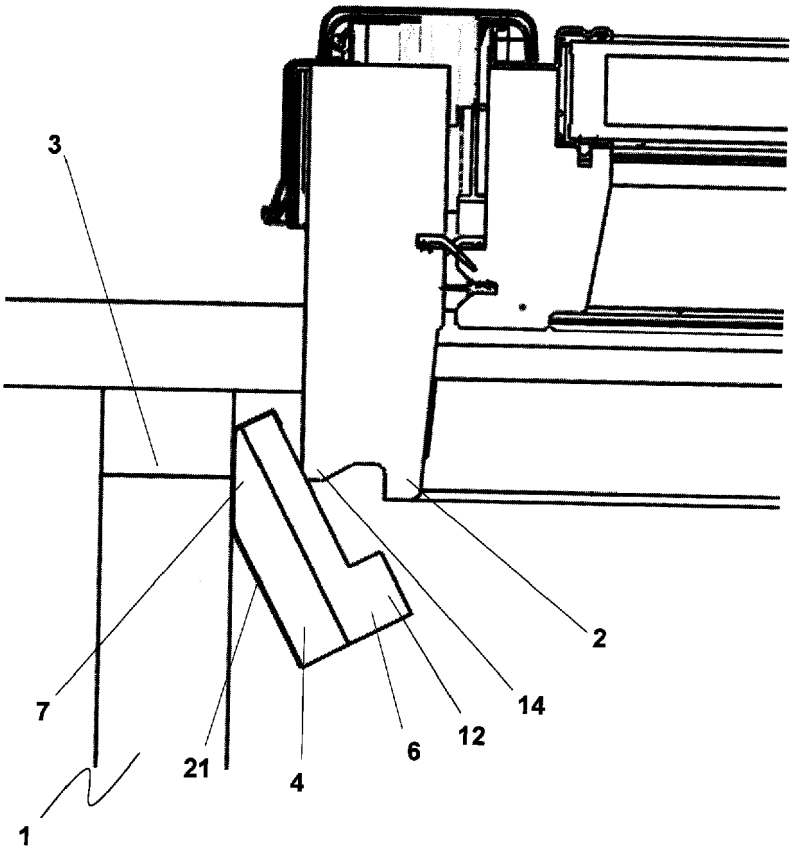

Figure 3

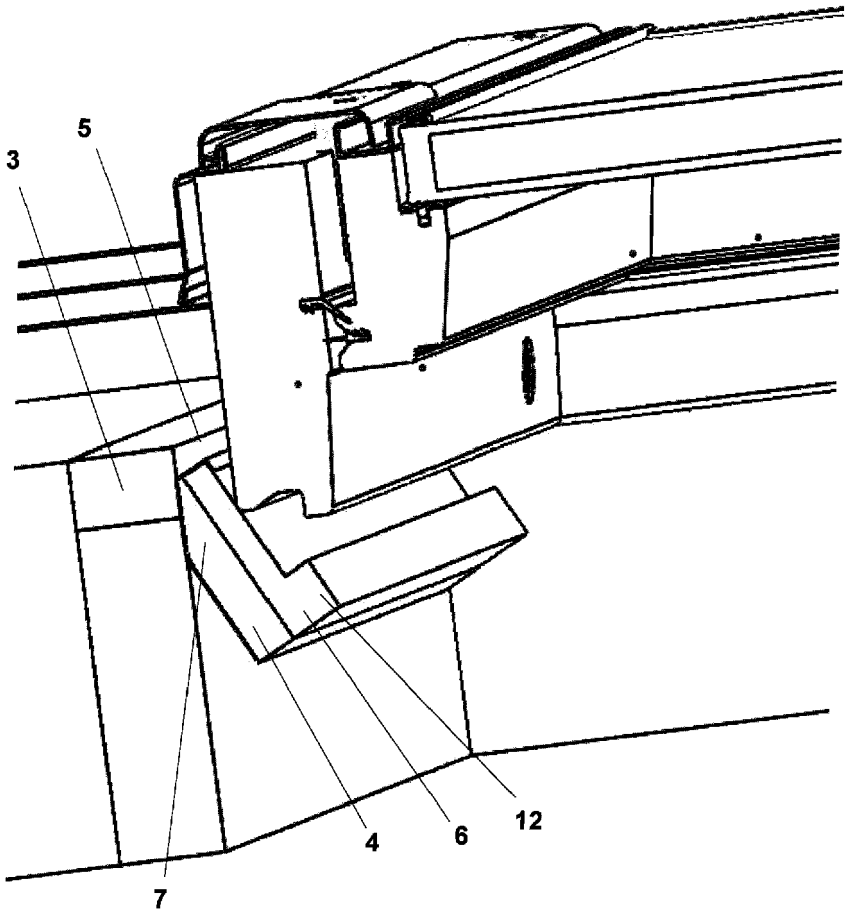

Figure 4

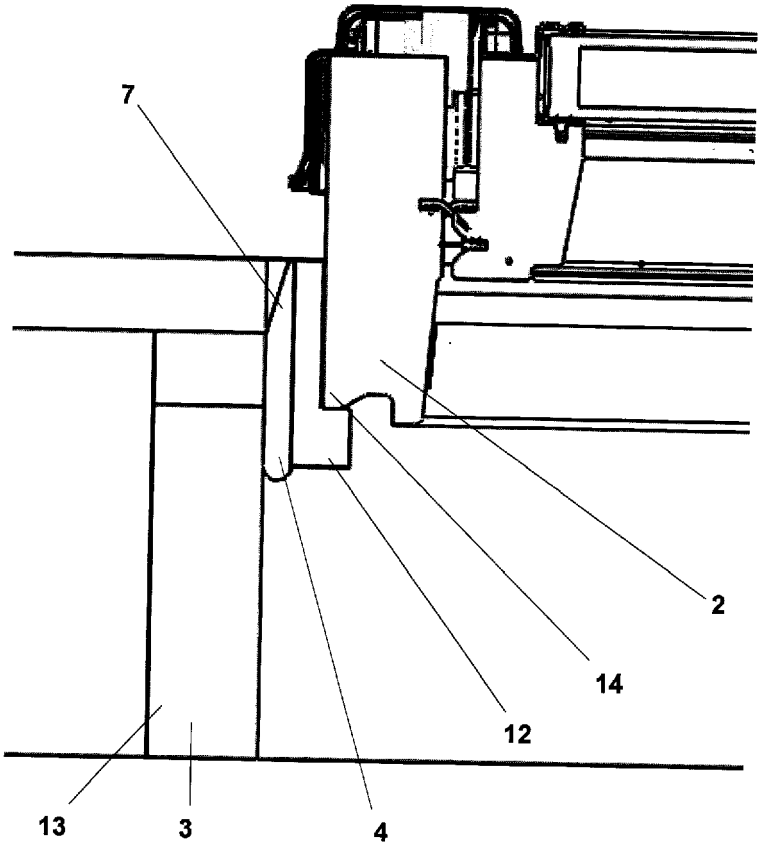

Figure 5

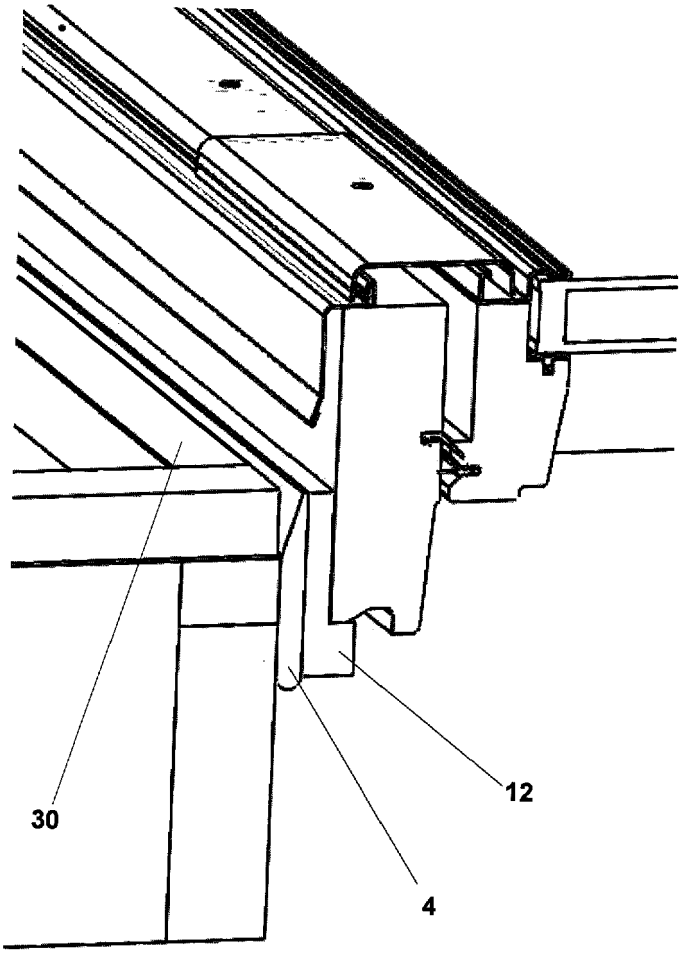

Figure 6

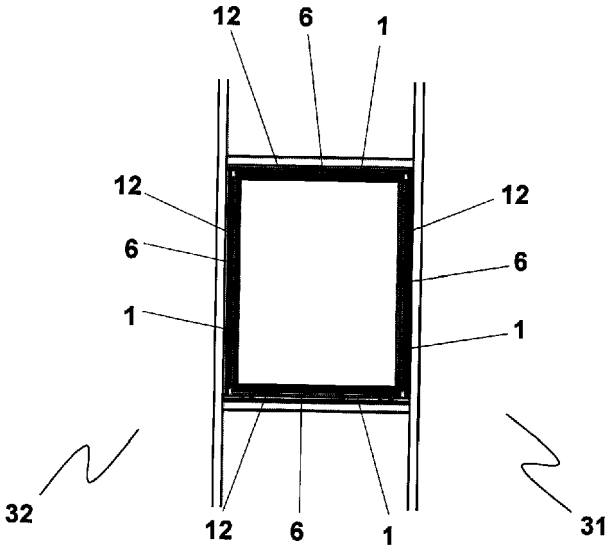

Figure 7

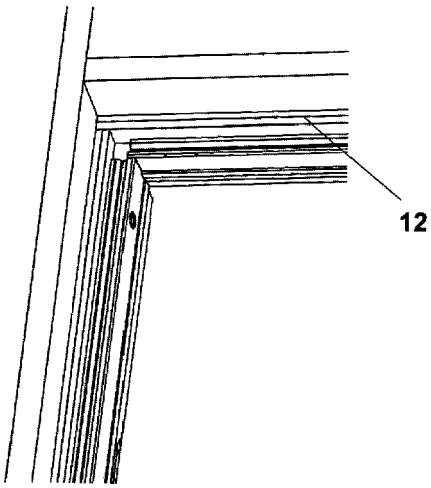

Figure 8

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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 7679

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 2 677 092 A1 (VKR HOLDING AS [DK]) 25 December 2013 (2013-12-25) * figures 1-5,11,13 * * paragraph [0001] * * paragraph [0034] * * paragraph [0018] * * paragraph [0021] * * paragraph [0056] *	1-15	INV. E04D13/03 ADD. E06B1/62
X	EP 1 739 247 A1 (VKR HOLDING AS [DK]) 3 January 2007 (2007-01-03) * figures 1,2,4,6 * * paragraph [0001] * * paragraph [0009] - paragraph [0011] * * paragraph [0014] * * paragraph [0018] - paragraph [0021] * * paragraph [0023] *	1-15	

TECHNICAL FIELDS SEARCHED (IPC)

E06B
E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 July 2015	Petrinja, Etiel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 15 7679

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
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23-07-2015

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