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(54) **An insulating frame for a roof window**

Dämmrahmen für ein Dachfenster

Châssis isolant pour une lucarne

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Description

[0001] The present invention relates to an insulating frame for insulating a roof window, said insulating frame comprising a plurality of insulating frame pieces surrounding an opening, the shape of which corresponds substantially to the shape of the roof window and the dimensions of which is larger than or corresponding to the outer dimensions of the roof window, each insulating frame piece having an inner side surface facing the opening, a bottom surface and at least one outer side surface facing away from the opening.

[0002] Such insulating frames are known from the applicant's own prior applications EP-A1-1 061 199 and WO 98/31896 as well as from EP-B1-0 679 773 and EP-B1-0 744 512. WO 98/31896 shows an insulating frame according to the preamble of claim 1. However, the former two of these do not address the problem of achieving an insulation of the part of the window projecting above the supporting structure and the solution proposed in latter two results in a dissatisfactory result, primarily due to a non-aesthetic appearance of the mounted window.

[0003] It is therefore the object of the invention to provide an insulating frame, which insulates the part of the roof window projecting above the supporting roof structure and which may be used without jeopardizing the aesthetic appearance of the window when mounted.

[0004] This object is achieved by an insulating frame according to claim 1.

[0005] The combination of a frame, which insulates the transition between the window and the supporting roof structure, and an upper section with a decreasing width and which insulates the part of the window projecting above the supporting structure, has been discovered to lead to a particularly effective insulation. Not only is the entire window frame insulated by a single frame unit, the decreasing width of the upper section both makes the installed window appear less voluminous seen from the outside and reduces the quantity of insulating material needed without influencing the general insulating properties of the construction.

[0006] According to the invention the upper section of the insulating frame piece(s) is substantially wedge shaped with an apex angle of 20-45 degrees. As the insulating frame does then not add any extra width at the top surface of the roof window, prior art cover and flashing members may be used by simply changing their bending angles or the position of the bend.

[0007] For the sake of simplicity of manufacture and installation it is preferred that the insulating frame consists of four frame pieces corresponding to the four sides of a rectangular roof window. These frame pieces may be manufactured separately, e.g. by extrusion or moulding, and subsequently joined together by means of suitable brackets or by welding or gluing, either at the factory or at the installation site. Alternatively some or all of the frame pieces may be moulded as one.

[0008] To allow a further optimization of the balance

between the aesthetic appearance of the window, which demands a slim design, and the need for insulation, which demands a relatively bulky design, it is preferred that the two side frame pieces being located at the sides of the window in the mounted state have upper sections with substantially identical cross sections and that the frame piece being located uppermost and/or the frame piece being located lowermost in the mounted state have upper sections with cross sections that differ from that of the side insulating frame pieces. It may particularly be advantageous if the upper section of the bottom frame piece has a smaller cross section than the others, as the connecting of the bottom flashing and cover members to the roof construction below the window is traditionally performed in a quite distinct way compared to the connecting of the top and side flashing and cover members. However, it may also be advantageous with a special design of the top frame piece e.g. when insulating a top-hung window where space is needed for the downwards turning of the cover member used on the top member of the window sash. In some embodiments it may even be advantageous that the top and/or bottom frame piece have no upper section at all.

[0009] As mentioned above, the need for insulation decreases towards the outer surface of the construction. A further optimization of the use of the insulating material may therefore be reached by shaping the insulating frame so that the width of the lower section of one or more frame pieces decreases continuously or stepwise in the height direction towards the upper section.

[0010] It is to be noted, that the distinction between an upper and a lower section is not to be considered as implying the need for any kind of physical boundaries, but only a difference in geometry and/or function.

[0011] The insulating frame may in principle be made from any material having insulating properties, but it is preferred that it is made from moulded or extruded foam plastic, such as polyurethane foam.

[0012] According to the invention, the roof window may bear on ledges on the sides of the insulating frame pieces that face the opening and the frame must therefore be able to transfer the load to the supporting roof structure. This may be achieved by making the insulating frame from a sufficiently strong and rigid material, but the insulating frame pieces may also be provided with one or more stiffening members such as lists or strips. The stiffening members may advantageously be used for supporting and attachment of mounting brackets for connecting the insulating frame to the supporting roof structure.

[0013] During installation of the roof window an under-roof or underroof collar is normally connected to the insulating frame to ensure a watertight construction. An extremely tight construction may, however, lead to the formation of condensation and it is therefore preferred that the second side of one or more of the insulating frame pieces are provided with projections and/or recesses allowing air passage between and/or through them in a direction perpendicular to the length of the insulating

frame piece.

The object of the invention is further achieved with a kit for mounting and insulation of a roof window, comprising an insulating frame according to claim 1, an underroof collar, at least one flashing member and at least one cover member, said insulating frame surrounding an opening larger than or corresponding to the external dimensions of the roof window to be mounted, so that the window may be placed within the opening, where the insulating frame includes a plurality of insulating frame pieces at least one of which have an upper section with a first side facing the opening and a second side facing a flashing and/or cover member when mounted, a bottom portion of the upper section having a predetermined maximum width, the width between the first side and the second side decreasing from said maximum width in the height direction of the upper section such that the second side forms a predetermined angle other than perpendicular with the bottom portion, and the first side having such a height that a relatively large portion of the distance existing between an lowermost level of the flashing member and an uppermost level of the cover member in the mounted state is overlapped by the upper section of the insulating frame piece, where that the underroof collar may be brought into contact with the insulating frame at or above the bottom portion of the upper section of the insulating frame, and where one or more of the flashing and/or cover members are shaped with angles corresponding to the angle determined by the decreasing width of the upper section.

[0014] The underroof or underroof collar may be attached to the insulating frame by any suitable means such as welding, gluing, mechanical fastening means, such as clamps, or friction between the material of the underroof or underroof collar and the insulating frame.

[0015] Likewise, the object of the invention is achieved by a roof structure with a roof window mounted in an insulating frame according to claim 1, said roof structure including a roofing, a supporting structure and an underroof comprising at least an external waterproof membrane and an insulating layer, said underroof being located between the roofing and the supporting structure and comprising an opening for mounting of the window, said insulating frame comprising a lower surface intended for resting against the upper surface of the underroof and with an opening, which corresponds to the opening in the underroof and which is larger than or corresponding to the external dimensions of the roof window, so that the window may be placed within the opening, where the insulating frame includes a plurality of insulating frame pieces at least one of which have an upper section with a first side intended to face a corresponding window frame piece and a second side intended to face a flashing and/or cover member, a bottom portion of the upper section having a predetermined maximum width, the width between the first side and the second side decreasing from said maximum width in the height direction of the upper section such that the second side forms a prede-

termined angle other than perpendicular with the bottom portion, and the first side having such a height that in the mounted state a relatively large portion of the window frame is overlapped by the upper section of the insulating frame.

[0016] In the following, the invention will be described in further detail by reference to the accompanying drawing showing two embodiments of the invention.

Fig. 1 shows an insulating frame according to the invention seen in a perspective view,

Fig. 2 a section of a side piece of the frame in Fig. 1, Fig. 3 a section of the bottom piece of the frame in Fig. 1,

Fig. 4 a roof window mounted in the insulating frame of Fig. 1 in a sectional view along the line IV-IV,

Fig. 5 a roof window mounted in the insulating frame of Fig. 1 in a sectional view along the line V-V, and Fig. 6 a section of a side piece corresponding to Fig. 2 with an underroof collar connected thereto.

[0017] An embodiment of the insulating frame 1 according to the invention is shown in Fig. 1. The frame consists of two side frame pieces 2a, 2b, a top frame piece 3 and a bottom frame piece 4, where the designations side, top and bottom refer to the orientation, when the frame has been mounted in an inclined roof. The frame encloses an opening 5, the shape and dimensions of which correspond to those of the window (not shown) to be insulated.

[0018] In this embodiment all of the frame pieces have a ledge 6 on the side surface facing the opening. This ledge is intended to fill the space underneath the part of the window frame 20 projection over the window casing 29, i.e. between the casing and the circumference of the window, and it may further function as a bearing for the window. The dimensions of the opening below these ledges are therefore somewhat smaller than those of the window, while the dimensions of the opening above are slightly larger. Typically, the ledges have a width of 5-15 millimetres and the oversize of the uppermost part of the opening in relation to the window amounts to 1-2 millimetres on each side.

[0019] It is preferred that the dimensions of the opening receiving the window correspond as closely as possible to the dimensions of the window to thereby achieve the tightest possible transition between the window and the insulating frame. The insulating frame may e.g. be attached to the window frame by gluing or the insulating frame may be made from an elastic material, allowing an expansion of the insulating frame during mounting and a subsequent contraction thereof to a close fit with the window frame. The latter may be achieved by forming the insulating frame from a soft foamed plastic.

[0020] Figs. 2 and 3 shows the lower part 7 of the frame below the ledges as rectangular and massive, but it is to be understood, that it may also shaped as e.g. a trapezoid and that the ledges may be replaced by continuous or

local projections (not shown). In the embodiment shown, the ledges are capable of supporting the entire weight of the window, but it is to be understood that the window may also be supported wholly or partly by mounting brackets. Likewise, it is to be understood that ledges or projections need not be present on any of or on all four frame pieces 2a, 2b, 3, 4 and that they need not be arranged symmetrically or evenly. Further, the ledges may be provided as or strengthened by separate members (not shown), which are embedded in or attached to the frame pieces.

[0021] The frame itself, which is preferably made of a foamed polymer, may for example be manufactured by moulding in one piece or by joining of four bevelled pieces. When using separate pieces these may be manufactured by extrusion of a continuous profile, which is subsequently cut to size in the appropriate lengths. This way of making the frame is particularly preferred, as the same profile may be used for frames of several different sizes by merely adjusting the length of each piece. In addition, the need for a number of different moulds is avoided.

[0022] The joining of separate frame pieces may be achieved by means of brackets, mechanical fastening means, welding, gluing etc. or a combination of such methods and separate corner sections may be employed.

[0023] If the insulating frame serves as a support for the window, a frame material with sufficient strength must of course be chosen, but in other cases any material with suitable insulating properties may be used. The joining of the frame may however be facilitated by choosing a relatively stiff material.

[0024] As may be seen from Fig. 1 and in particular Figs. 2 and 3, the cross section of the bottom frame piece 4 differs from that of the side and top frame pieces 2a, 2b, 3.

[0025] The upper sections of the side and top pieces have the cross sectional shape of a right-angled triangle with an apex angle of approximately 20 degrees. The distance from the ledge 6 on the inner surface to the top of the upper section 8 corresponds approximately to the height of the window frame 20, as may also be seen from Fig. 4. The window frame height is typically approximately 10 cm for standard type roof windows, but vary depending on the type, design and overall size of the window.

[0026] When using an insulating frame 1, which overlaps almost the entire height of the window frame 20, the apex of the triangle will be located just below the cover member 21 covering the upper surface of the window frame. However, a distance corresponding to e.g. three quarters of the window frame height may be adequate to provide a satisfactory insulation and such a reduction may ease the mounting of the flashing members 22 and cover members 21.

[0027] Fig. 3 shows the bottom frame piece 4 in detail. This frame piece has an upper section 8 with the general shape of an isosceles triangle, but where the hypotenuse

is replaced by a curved surface. This shape corresponds closely to the room available underneath a traditional lower flashing 23 as used with standard type roof window 19 as may be seen from Fig. 5. By choosing this shape the need for adaptation of the well-tried system of flashing member 23, cover member 24 and skirt member 25 for ensuring a watertight transition between the lowermost part of the window and the roofing below it, is avoided. If, however, such considerations are less important than the improvement of the insulation of the window, a more voluminous upper section may be used at the bottom frame piece as well.

[0028] As may also be seen from Fig. 5, the shape of the lower section of the top insulating frame piece 3 may vary from the one shown in Fig. 1. Thereby the insulating properties may be improved and the insulating frame may be adapted to correspond to the shape of the side casing 29. Such an adaptation has no influence on the design of the upper section of the insulating frame piece and thus does not necessitate an adaptation of the flashing member 30 and cover member 31 used at the top of the window 19.

[0029] The insulating frame shown in Fig. 1-3 is intended for use with a centre-hung window. It is to be understood, that some factors may need adaptation if the frame is to be used with other types of windows. For example the height of some of the insulating frame pieces may be relatively smaller, such that only a smaller part of the window frame is covered, or the triangular cross section may be modified to comprise a curved outer surface. This may e.g. be the case with the top frame piece, when the insulating frame is used for mounting a top-hung window. Likewise, an insulating frame for mounting of a centre-hung window may be provided with depressions (not shown) in the side frame pieces 2a, 2b below the hinge axis to thereby give room for the side cover members during opening of the window. This may e.g. be achieved by providing two side frame pieces at each side, one above and one below the hinge axis.

[0030] In Figs. 1 and 2 the outer surface 9 of the upper section 8 of the side frame piece are shown to have projecting buds 10 arranged in a continuous pattern. The purpose thereof is to create an air gap between the surface of the insulating frame 1 and an underroof collar 26, which, as shown in Fig. 6, is attached to the insulating frame to provide a watertight transition to the underroof. The air gap 27 ensures a ventilation of the space between the underroof and the insulating frame, which reduces condensation. In Fig. 6 arrows indicate the airflow.

[0031] The buds may be replaced by any other surface profile, which will ensure the ventilation, e.g. a series of recesses or grooves extending perpendicularly to the length of the frame piece.

[0032] Advantageously, all of the frame pieces are provided with such ventilation aids 10, but the aids may be different on the different frame pieces and may be distributed unevenly over the surface thereof. It is, however, to be understood that the ventilation aids may be com-

pletely omitted if using an underroof or underroof collar of a material, which allows diffusion of vapour towards the outside.

[0033] In Fig. 6 the attachment of the underroof collar 26 to the insulating frame 1 is achieved by means of clamps 28 but any suitable attachment means may be used as long as the air gap is ensured. In addition, the underroof collar may be attached to the window frame 20 (not shown in Fig. 6) above the insulating frame.

[0034] If the underroof is itself made from a relatively flexible sheet material, it may be attached directly to the insulating frame in a manner corresponding the one shown in Fig. 6 or to the window frame 20 without the need for an underroof collar 26.

[0035] Finally it is noted, that the person skilled in the art will be able to realise a number of different ways, in which the shapes of the upper and lower sections of the insulating frame pieces, the type of ledges, the use of ventilation aids etc. may be varied and combined without thereby departing from the scope defined by the claims.

Claims

1. An insulating frame (1) for insulating a roof window (19), said insulating frame comprising a plurality of monolithic insulating frame pieces (2a,2b,3,4) forming a single frame unit, which surrounds an opening (5), the shape of which corresponds substantially to the shape of the roof window (19) and the dimensions of which is larger than or corresponding to the outer dimensions of the roof window, each insulating frame piece having an inner side surface facing the opening, a bottom surface and at least one outer side surface facing away from the opening, where at least one of the insulating frame pieces comprises a lower section (7) and an upper section (8), where the upper section has a first side facing the opening and a second side (9) facing away from the opening, a bottom portion of the upper section having a predetermined maximum width, the width between the first side and the second side decreasing from said maximum width in the height direction of the upper section, the lower section (7) has a ledge (6) situated on the inner side surface, said ledge (6) being intended to be located under the roof window in the mounted state, **characterised in that** the first side of the upper section (8) has such a height between the top of the upper section and the ledge that the upper section of said at least one insulating frame piece will overlap at least three quarters of the height of the corresponding window frame piece (20) of the roof window (19) in the mounted state, and that the second side of the upper section (8) of said at least one insulating frame piece (2a, 2b, 3, 4) forms a predetermined angle other than perpendicular with the bottom portion so that the upper section is substantially wedge shaped with an apex angle of 20-45 degrees.
2. An insulating frame according to claim 1, **characterised in that** it consists of four frame pieces (2a,2b, 3,4) corresponding to the four sides of a rectangular roof window (19).
3. An insulating frame according to claim 2, **characterised in that** the two side frame pieces (2a,2b) being located at the sides of the window (19) in the mounted state have upper sections (8) with substantially identical cross sections and that the top frame piece (3) being located uppermost and/or the bottom frame piece (4) being located lowermost in the mounted state have upper sections (8) with cross sections that differ from that of the side frame pieces.
4. An insulating frame according to claim 3, **characterised in that** the top and/or bottom frame piece (3,4) have no upper section (8).
5. An insulating frame according to claim 1 or 2, **characterised in that** the width of the lower section (7) of one or more frame pieces (2a,2b,3,4) decreases continuously or stepwise in the height direction towards the upper section (8).
6. An insulating frame according to any of claims 1-5, **characterised in that** it is made from moulded or extruded foam plastic, such as polyurethane foam, or any other suitable material.
7. An insulating frame according to any of claims 1-6, **characterised in that** the insulating frame pieces (2a,2b,3,4) are provided with one or more stiffening members such as lists or strips.
8. An insulating frame according to claim 7, **characterised in that** the stiffening member may be used for supporting and attachment of mounting brackets for the roof window (19).
9. An insulating frame according to any of claims 1-8, **characterised in that** the second side (9) of one or more of the insulating frame pieces (2a,2b,3,4) are provided with projections (10) and/or recesses allowing air passage between and/or through them in a direction perpendicular to the length of the insulating frame piece.
10. A kit for mounting and insulation of a roof window (19), said kit comprising an insulating frame (1) according to claim 1, an underroof collar (26), at least one flashing member (22,23,30) and at least one cover member (21,24,31), where the opening (5) in said insulating frame is larger than or corresponding to the external dimensions of the roof window to be mounted, so that the window may be placed within the opening, where the second side (9) of the monolithic at least one insulating frame piece (2a,2b,3,4)

faces said at least one flashing and/or said at least one cover member (21,22,23,24,30,31) when mounted, **characterized in that** the first side of the upper section (8) of the at least one insulating frame piece (2a, 2b, 3, 4) has such a height between the top of the upper section and the ledge (6) that at least three quarters of the distance existing between a lowermost level of the flashing member and an uppermost level of the cover member in the mounted state is overlapped by the upper section of the at least one insulating frame piece, that the underroof collar (26) may be brought into contact with the insulating frame at or above the bottom portion of the upper section of the insulating frame, and that one or more of the flashing and/or one or more cover members (21,22,23,24,30,31) are shaped with angles corresponding to the angle determined by the decreasing width of the at least one insulating frame piece.

11. A kit according to claim 10, **characterized in that** the flashing and cover members (21,22,23,24,30,31) used in connection with the upper section (8) have interior bending angles approximately 90 degrees larger than the apex angle of the upper section.
12. A kit according to claim 10 or 11, **characterized in that** the second side of one or more of the insulating frame pieces are provided with projections and/or recesses allowing ventilation of the space between the insulating frame piece (2a, 2b, 3, 4) and the underroof collar (26).
13. A kit according to any of the claims 10-12, **characterized in that** the underroof collar (26) is attached to the insulating frame (1) by any suitable means such as welding, gluing, mechanical fastening means, such as clamps, or friction between the material of the underroof collar and the insulating frame.
14. A roof structure with a roof window (19) and an insulating frame (1) according to claim 1, said roof window (19) being mounted in said insulating frame (1), said roof structure including a roofing, a supporting structure and an underroof collar (26) comprising at least an external waterproof membrane and an insulating layer, said underroof being located between the roofing and the supporting structure and comprising an opening for mounting of the window, said insulating frame comprising a lower surface resting against the upper surface of the underroof and with an opening (5), which corresponds to the opening in the underroof and which is larger than or corresponding to the external dimensions of the roof window, so that the window may be placed within the opening, where at least one of the frame pieces has an upper section with a first side facing a corre-

sponding window frame piece and a second side (9) facing a flashing and/or cover member, **characterized in that** at least a part of the lower section (7) is located under the roof window and that the first side of the upper section (8) of said at least one insulating frame piece (2a,2b,3,4) has such a height that at least three quarters of the height between the top of the upper section and the ledge (6) of the window frame is overlapped by the upper section of the insulating frame.

15. A roof window (19) with an insulating frame (1) according to claim 1, where the opening (5) in the insulating frame has a shape, which corresponds substantially to the shape of the roof window, and dimensions, which are larger than or corresponding to the outer dimensions of the roof window, **characterized in that** at least a part of the lower section (7) is located under the roof window and that the first side of the upper section (8) of the at least one insulating frame piece (2a, 2b, 3, 4) has such a height between the top of the upper section and the ledge (6) that the at least one insulating frame piece overlaps at least three quarters of the height of the window frame piece (20).
16. A roof window (19) according to claim 15, further having an underroof collar (26), which is attached to the insulating frame at or above the bottom portion of the upper section of the insulating frame.
17. A method of insulating a roof window (19), where the roof window is arranged in an opening (5) in an insulating frame (1) comprising a plurality of monolithic insulating frame pieces (2a,2b,3,4) forming a single frame unit, which surrounds the opening (5), the shape of which corresponds substantially to the shape of the roof window and the dimensions of which is larger than or corresponding to the outer dimensions of the roof window, each insulating frame piece having an inner side surface facing the opening, a bottom surface and at least one outer side surface facing away from the opening, where at least one of the insulating frame pieces comprises a lower section (7) and an upper section (8), where the upper section has a first side facing the opening and a second side (9) facing away from the opening, a bottom portion of the upper section having a predetermined maximum width, the width between the first side and the second side decreasing from said maximum width in the height direction of the upper section, **characterised in that** the second side forms a predetermined angle other than perpendicular with the bottom portion so that the upper section is substantially wedge shaped with an apex angle of 20-45 degrees, the window is arranged in the insulating frame so that the upper section (8) of the at least one insulating frame piece overlaps at least three quarters

of the height of the corresponding window frame piece (20) of the roof window (19) and so that a ledge (6) on the surface of the lower section (7) facing the opening is located under the roof window.

18. A method according to claim 17, where an underroof collar (26) is attached to the insulating frame.
19. A method according to claim 17 or 18, where the insulating frame is attached to the roof window by gluing.
20. A method according to claim 17 or 18, where the insulating frame is expanded to allow mounting and where a close fit between the insulation frame and the roof window is achieved by a subsequent contraction of the insulating frame.

Patentansprüche

1. Dämmrahmen (1) zum Dämmen eines Dachfensters (19), wobei der Dämmrahmen eine Vielzahl von monolithischen Dämmrahmenteil (2a, 2b, 3, 4) umfasst, die eine einzelne Rahmeneinheit bilden, die eine Öffnung (5) umgibt, deren Form im Wesentlichen der Form des Dachfensters (19) entspricht und deren Abmessungen größer sind als die äußeren Abmessungen des Dachfensters oder diesen entsprechen, wobei jedes Dämmrahmenteil eine innere seitliche Oberfläche, die zu der Öffnung weist, eine untere Oberfläche und wenigstens eine äußere seitliche Oberfläche hat, die weg von der Öffnung weist, wobei wenigstens eines der Dämmrahmenteil einen unteren Abschnitt (7) und einen oberen Abschnitt (8) aufweist, wobei der obere Abschnitt eine erste Seite, die zu der Öffnung weist, und eine zweite Seite (9), die von der Öffnung weg weist, hat, wobei ein unterer Bereich des oberen Abschnitts eine vorgegebene maximale Breite hat, wobei die Breite zwischen der ersten Seite und der zweiten Seite von der maximalen Breite in der Höhenrichtung des oberen Abschnitts abnimmt, wobei der untere Abschnitt (7) einen Absatz (6) hat, der an der inneren seitlichen Oberfläche angeordnet ist, wobei der Absatz (6) vorgesehen ist, um im montierten Zustand unter dem Dachfenster angeordnet zu sein, **dadurch gekennzeichnet, dass** die erste Seite des oberen Abschnitts (8) eine solche Höhe zwischen der oberen Seite des oberen Abschnitts und dem Absatz hat, dass der obere Abschnitt des wenigstens einen Dämmrahmenteil wenigstens drei Viertel der Höhe des entsprechenden Fensterrahmenteil (20) des Dachfensters (19) im montierten Zustand überlappt, und dass die zweite Seite des oberen Abschnitts (8) des wenigstens einen Dämmrahmenteil (2a, 2b, 3, 4) einen vorgegebenen Winkel, der vom rechten Winkel abweicht, mit dem unteren Bereich bildet, so

dass der obere Abschnitt im Wesentlichen keilförmig mit einem Winkel an der Spitze von 20 bis 45 ° ausgebildet ist.

2. Dämmrahmen nach Anspruch 1, **dadurch gekennzeichnet, dass** er aus vier Rahmenteil (2a, 2b, 3, 4) besteht, die den vier Seiten eines rechtwinkligen Dachfensters (19) entsprechen.
3. Dämmrahmen nach Anspruch 2, **dadurch gekennzeichnet, dass** die zwei Seitenrahmenteil (2a, 2b), die im montierten Zustand an den Seiten des Fensters (19) angeordnet sind, obere Abschnitte (8) mit im Wesentlichen identischen Querschnitten haben und dass das obere Rahmenteil (3), das oberhalb angeordnet ist, und/oder das untere Rahmenteil (4), das im montierten Zustand unterhalb angeordnet ist, obere Abschnitte (8) mit Querschnitten haben, die von denen der seitlichen Rahmenteil abweichen.
4. Dämmrahmen nach Anspruch 3, **dadurch gekennzeichnet, dass** das obere und/oder untere Rahmenteil (3, 4) keinen oberen Abschnitt (8) hat.
5. Dämmrahmen nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Breite des unteren Abschnitts (7) von einem oder mehreren Rahmenteil (2a, 2b, 3, 4) kontinuierlich oder stufenweise in der Höhenrichtung hin zu dem oberen Abschnitt (8) abnimmt.
6. Dämmrahmen nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** er aus gegossenem oder extrudiertem geschäumtem Kunststoff gebildet ist, wie beispielsweise Polyurethanschaum oder einem anderen geeigneten Material.
7. Dämmrahmen nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** die Dämmrahmenteil (2a, 2b, 3, 4) mit einem oder mehreren Versteifungselementen versehen sind, wie beispielsweise Leisten oder Streifen.
8. Dämmrahmen nach Anspruch 7, **dadurch gekennzeichnet, dass** das Versteifungselement zum Halten und Befestigen von Befestigungsbügeln für das Dachfenster (19) verwendet werden kann.
9. Dämmrahmen nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** die zweite Seite (9) von einem oder mehreren der Dämmrahmenteil (2a, 2b, 3, 4) mit Vorsprüngen (10) und/oder Ausparungen versehen ist, die einen Luftdurchgang zwischen und/oder durch sie in einer Richtung senkrecht zu der Länge des Dämmrahmenteil ermöglichen.
10. Bausatz zum Montieren und Dämmen eines Dach-

- fensters (19), wobei der Bausatz einen Dämmrahmen (1) nach Anspruch 1, einen Unterdachanschlusskragen (26), wenigstens ein Eindeckungselement (22, 23, 30) und wenigstens ein Abdeckungselement (21, 24, 31) umfasst, wobei die Öffnung (5) in dem Dämmrahmen größer als die äußeren Abmessungen des Dachfensters, das montiert werden soll, ist oder diesen entspricht, so dass das Fenster in der Öffnung angeordnet werden kann, wobei die zweite Seite (9) des monolithischen wenigstens einen Dämmrahmenteils (2a, 2b, 3, 4) zu dem wenigstens einen Eindeckungs- und/oder dem wenigstens einen Abdeckungselement (21, 22, 23, 24, 30, 31) weist, wenn sie montiert sind, **dadurch gekennzeichnet, dass** die erste Seite des oberen Abschnitts (8) des wenigstens einen Dämmrahmenteils (2a, 2b, 3, 4) eine solche Höhe zwischen der Oberseite des oberen Abschnitts und dem Absatz (6) hat, dass wenigstens drei Viertel des Abstands, der zwischen einer untersten Höhe des Eindeckungselements und einer obersten Höhe des Abdeckungselements im montierten Zustand existiert, von dem oberen Abschnitt des wenigstens einen Dämmrahmenteils überlappt wird, dass der Unterdachanschlusskragen (26) in Kontakt mit dem Dämmrahmen bei oder über dem unteren Bereich des oberen Abschnitts des Dämmrahmens gebracht werden kann und dass eines oder mehrere der Eindeckungselements und/oder eines oder mehrere der Abdeckungselemente (21, 22, 23, 24, 30, 31) mit Winkeln ausgebildet sind, die dem Winkel, der durch die abnehmende Breite des wenigstens einen Dämmrahmenteils bestimmt ist, entspricht.
11. Bausatz nach Anspruch 10, **dadurch gekennzeichnet, dass** die Eindeckungs- und Abdeckungselemente (21, 22, 23, 24, 30, 31), die in Verbindung mit dem oberen Abschnitt (8) verwendet werden, innere Biegewinkel haben, die um etwa 90 ° größer als der Scheitelwinkel des oberen Abschnitts sind.
12. Bausatz nach Anspruch 10 oder 11, **dadurch gekennzeichnet, dass** die zweite Seite von einem oder mehreren der Dämmrahmenteile mit Vorsprüngen und/oder Aussparungen versehen ist, die eine Belüftung des Raums zwischen dem Dämmrahmenteil (2a, 2b, 3, 4) und dem Unterdachanschlusskragen (26) ermöglichen.
13. Bausatz nach einem der Ansprüche 10 bis 12, **dadurch gekennzeichnet, dass** der Unterdachanschlusskragen (26) an dem Dämmrahmen (1) durch ein geeignetes Mittel wie Schweißen, Kleben, mechanische Befestigungselemente wie Klemmen, oder Reibung zwischen dem Material des Unterdachanschlusskragens und des Dämmrahmens befestigt ist.
14. Dachaufbau mit einem Dachfenster (19) und einem Dämmrahmen (1) nach Anspruch 1, wobei das Dachfenster (19) in dem Dämmrahmen (1) angebracht ist, wobei der Dachaufbau eine Bedachung, einen Stützaufbau und ein Unterdachanschlusskragen (26) mit wenigstens einer äußeren wasserdichten Membran und einer Isolierschicht umfasst, wobei das Unterdach zwischen der Bedachung und dem Stützaufbau angeordnet ist und eine Öffnung zum Montieren des Fensters aufweist, wobei der Dämmrahmen eine untere Oberfläche, die an der oberen Oberfläche des Unterdachs anliegt, und eine Öffnung (5) aufweist, die der Öffnung in dem Unterdach entspricht und die größer als die äußeren Abmessungen des Dachfensters ist oder diesen entspricht, so dass das Fenster in der Öffnung angeordnet werden kann, wobei wenigstens eines der Rahmenteile einen oberen Abschnitt mit einer ersten Seite, die zu einem entsprechenden Fensterrahmenteil weist, und eine zweite Seite (9) hat, die zu einem Eindeckungs- und/oder Abdeckungselement weist, **dadurch gekennzeichnet, dass** wenigstens ein Teil des unteren Abschnitts (7) unter dem Dachfenster angeordnet ist und dass die erste Seite des oberen Abschnitts (8) des wenigstens einen Dämmrahmenteils (2a, 2b, 3, 4) eine solche Höhe hat, dass wenigstens drei Viertel der Höhe zwischen der oberen Seite des oberen Abschnitts und dem Absatz (6) des Fensterrahmens durch den oberen Abschnitt des Dämmrahmens überlappt ist.
15. Dachfenster (19) mit einem Dämmrahmen (1) nach Anspruch 1, wobei die Öffnung (5) in dem Dämmrahmen eine Form hat, die im Wesentlichen der Form des Dachfensters entspricht, und Abmessungen, die größer als die äußeren Abmessungen des Dachfensters sind oder diesen entsprechen, **dadurch gekennzeichnet, dass** wenigstens ein Teil des unteren Abschnitts (7) unter dem Dachfenster angeordnet ist, und dass die erste Seite des oberen Abschnitts (8) des wenigstens einen Dämmrahmenteils (2a, 2b, 3, 4) eine solche Höhe zwischen der Oberseite des oberen Abschnitts und dem Absatz (6) hat, dass das wenigstens eine Dämmrahmenteil wenigstens drei Viertel der Höhe des Fensterrahmenteils (20) überlappt.
16. Dachfenster (19) nach Anspruch 15, ferner mit einem Unterdachanschlusskragen (26), der an dem Dämmrahmen an oder über dem unteren Bereich des oberen Abschnitts des Dämmrahmens befestigt ist.
17. Verfahren zum Dämmen eines Dachfensters (19), wobei das Dachfenster in einer Öffnung (5) in einem Dämmrahmen (1) angeordnet ist, der eine Vielzahl von monolithischen Dämmrahmenteilen (2a, 2b, 3, 4) umfasst, die eine einzelne Rahmeneinheit bilden,

die die Öffnung (5) umgibt, wobei deren Form im Wesentlichen der Form des Dachfensters entspricht und deren Abmessungen größer als die äußeren Abmessungen des Dachfensters sind oder diesen entsprechen, wobei jedes Dämmrahmenteil eine innere seitliche Oberfläche, die zu der Öffnung weist, eine untere Oberfläche und wenigstens eine äußere seitliche Oberfläche hat, die weg von der Öffnung weist, wobei wenigstens eines der Dämmrahmentteile einen unteren Abschnitt (7) und einen oberen Abschnitt (8) aufweist, wobei der obere Abschnitt eine erste Seite hat, die zu der Öffnung weist, und eine zweite Seite (9), die von der Öffnung weg weist, wobei ein unterer Bereich des oberen Abschnitts eine vorgegebene maximale Breite hat, wobei die Breite zwischen der ersten Seite und der zweiten Seite von der maximalen Breite in der Höhenrichtung des oberen Abschnitts abnimmt, **dadurch gekennzeichnet, dass** die zweite Seite einen vorgegebenen Winkel, der vom rechten Winkel abweicht, mit dem unteren Bereich bildet, so dass der obere Abschnitt im Wesentlichen keilförmig mit einem Winkel an der Spitze von 20 bis 45 ° ausgebildet ist, wobei das Fenster in dem Dämmrahmen angeordnet wird, so dass der obere Abschnitt (8) des wenigstens einen Dämmrahmentteils wenigstens drei Viertel der Höhe des entsprechenden Fensterrahmentteils (20) des Dachfensters (19) überlappt, und dass ein Absatz (6) an der Oberfläche des unteren Abschnitts (7), die zu der Öffnung weist, unter dem Dachfenster angeordnet ist.

18. Verfahren nach Anspruch 17, wobei ein Unterdachanschlusskragen (26) an dem Dämmrahmen befestigt ist.
19. Verfahren nach Anspruch 17 oder 18, wobei der Dämmrahmen an dem Dachfenster durch Kleben befestigt ist.
20. Verfahren nach Anspruch 17 oder 18, wobei der Dämmrahmen ausgedehnt wird, um ein Montieren zu ermöglichen, und wobei ein enges Anliegen zwischen dem Dämmrahmen und dem Fenster durch ein darauffolgendes Zusammenziehen des Dämmrahmens erreicht wird.

Revendications

1. Châssis isolant (1) destiné à isoler une fenêtre de toit (19), ledit châssis isolant comprenant une pluralité de pièces monolithes de châssis isolant (2a, 2b, 3, 4) formant une unité de châssis unique, laquelle entoure une ouverture (5) dont la configuration correspond essentiellement à la configuration de la fenêtre de toit (19) et dont les dimensions sont plus grandes que les, ou correspondent aux, dimensions

extérieures de la fenêtre de toit, chaque pièce de châssis isolant ayant une surface latérale intérieure faisant face à l'ouverture, une surface inférieure et au moins une surface latérale extérieure opposée à distance de l'ouverture, dans lequel au moins l'une des pièces de châssis isolant comprend une section inférieure (7) et une section supérieure (8), dans lequel la section supérieure possède un premier côté faisant face à l'ouverture et un second côté (9) opposé à distance de l'ouverture, une partie inférieure de la section supérieure présentant une largeur maximale prédéterminée, la largeur comprise entre le premier côté et le second côté diminuant à partir de ladite largeur maximale dans la direction de la hauteur de la section supérieure, la section inférieure (7) comporte un rebord (6) située sur la surface latérale intérieure, ledit rebord (6) étant conçu pour être placé sous la fenêtre de toit dans la situation montée, **caractérisé en ce que** le premier côté de la section supérieure (8) présente une hauteur, entre le sommet de la section supérieure et le rebord, telle que la section supérieure de ladite au moins une pièce de châssis isolant se superposera à au moins trois quarts de la hauteur de la pièce correspondante de châssis de fenêtre (20) de la fenêtre de toit (19) dans la situation montée, et **en ce que** le second côté de la section supérieure (8) de ladite au moins une pièce de châssis isolant (2a, 2b, 3, 4) forme un angle prédéterminé, autre qu'un angle droit, avec la partie inférieure de sorte que la section supérieure est essentiellement configurée en forme de coin avec un angle au sommet de 20 à 45 degrés.

2. Châssis isolant selon la revendication 1, **caractérisé en ce qu'il** est constitué de quatre pièces de châssis (2a, 2b, 3, 4) correspondant aux quatre côtés d'une fenêtre de toit rectangulaire (19).
3. Châssis isolant selon la revendication 2, **caractérisé en ce que** les deux pièces latérales de châssis (2a, 2b) situées au niveau des côtés de la fenêtre (19), dans la situation montée, ont des sections supérieures (8) présentant des sections transversales essentiellement identiques et **en ce que** la pièce de châssis supérieure (3) qui est placée la plus vers le haut et/ou la pièce de châssis inférieure (4) placée la plus vers le bas dans la situation montée, ont des sections supérieures (8) présentant des sections transversales qui sont différentes de celles des pièces latérales de châssis.
4. Châssis isolant selon la revendication 3, **caractérisé en ce que** la pièce de châssis supérieure et/ou inférieure (3, 4) ne possède pas de section supérieure (8).
5. Châssis isolant selon la revendication 1 ou 2, **caractérisé en ce que** la largeur de la section inférieure

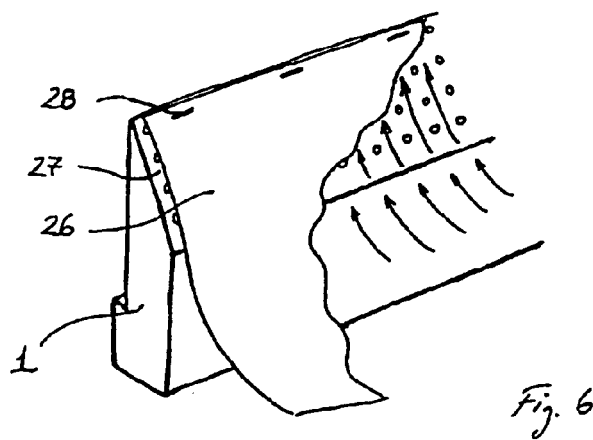
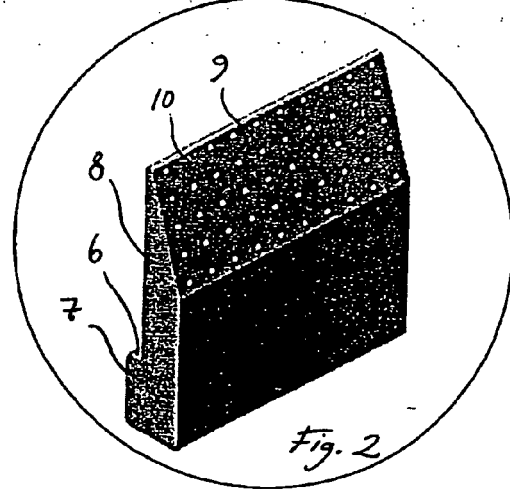
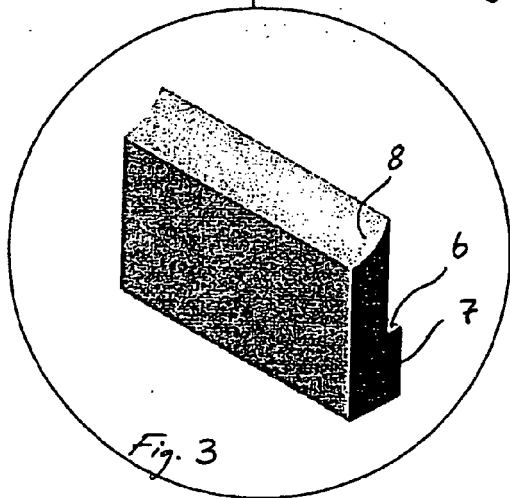
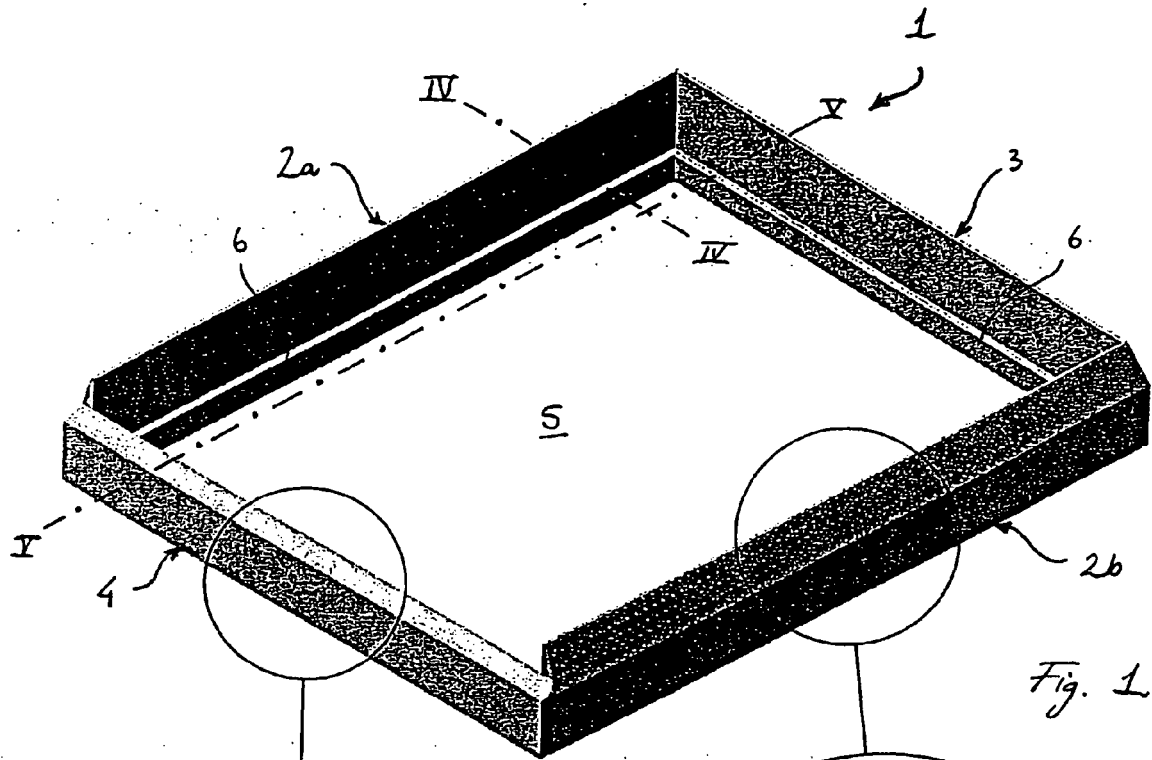
- (7) d'une ou de plusieurs pièce(s) de châssis (2a, 2b, 3, 4) diminue de façon continue ou par gradin dans la direction de la hauteur vers la section supérieure (8).
6. Châssis isolant selon l'une quelconque des revendications 1 à 5, **caractérisé en ce qu'il** est constitué d'une matière plastique expansée moulée ou extrudée, telle que de la mousse de polyuréthane, ou de tout autre matériau approprié.
7. Châssis isolant selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** les pièces de châssis isolant (2a, 2b, 3, 4) sont pourvues d'un ou de plusieurs élément(s) de raidissement tels que des liteaux ou des rubans.
8. Châssis isolant selon la revendication 7, **caractérisé en ce que** l'élément de raidissement peut être utilisé pour supporter et fixer des supports de montage destinés à la fenêtre de toit (19).
9. Châssis isolant selon l'une quelconque des revendications 1 à 8, **caractérisé en ce que** le second côté (9) de l'une ou de plusieurs des pièces de châssis isolant (2a, 2b, 3, 4) est doté de parties en saillie (10) et/ou d'évidements permettant le passage de l'air entre et/ou à travers eux dans une direction perpendiculaire à la longueur de la pièce de châssis isolant.
10. Kit de montage et d'isolation d'une fenêtre de toit (19), ledit kit comprenant un châssis isolant (1) selon la revendication 1, un collier de sous-toiture (26), au moins un élément de raccordement (22, 23, 30) et au moins un élément de recouvrement (21, 24, 31), dans lequel l'ouverture (5) dans ledit châssis isolant est plus grande que les, ou correspond aux, dimensions extérieures de la fenêtre de toit à monter, de sorte que la fenêtre peut être placée à l'intérieur de l'ouverture, dans lequel le second côté (9) de la, au moins une, pièce de châssis isolant monolithe (2a, 2b, 3, 4) fait face audit au moins un élément de raccordement et/ou de recouvrement (21, 22, 23, 24, 30, 31) lorsqu'il est monté, **caractérisé en ce que** le premier côté de la section supérieure (8) de la, au moins une, pièce de châssis isolant (2a, 2b, 3, 4) présente une hauteur entre le sommet de la section supérieure et la pièce d'appui (6), telle qu'au moins les trois quarts de la distance existant entre un niveau le plus bas de l'élément de raccordement et un niveau le plus élevé de l'élément de recouvrement, dans la situation montée, sont recouverts par la section supérieure de la, au moins une, pièce de châssis isolant, **en ce que** le col d'écran de sous-toiture (26) peut être amené en contact avec le châssis isolant au niveau, ou au dessus, de la partie inférieure de la section supérieure du châssis isolant, et **en ce que** un ou plusieurs des éléments de raccordement et/ou un ou plusieurs des éléments de recouvrement (21, 22, 23, 24, 30, 31) sont configurés avec des angles correspondant à l'angle déterminé par la largeur décroissante de la, au moins une, pièce de châssis isolant.
11. Kit selon la revendication 10, **caractérisé en ce que** les éléments de raccordement et de recouvrement (21, 22, 23, 24, 30, 31) utilisés en liaison avec la section supérieure (8) présentent des angles de courbure internes de 90 degrés environ plus grands que l'angle au sommet de la section supérieure.
12. Kit selon la revendication 10 ou 11, **caractérisé en ce que** le second côté de l'une ou de plusieurs des pièces de châssis isolant est prévu avec des parties en saillie et/ou des évidements permettant la ventilation de l'espace compris entre la pièce de châssis isolant (2a, 2b, 3, 4) et le collier de sous-toiture (26).
13. Kit selon l'une quelconque des revendications 10 à 12, **caractérisé en ce que** le collier de sous-toiture (26) est fixé au châssis isolant (1) par de quelconques moyens appropriés tels que soudure, colle, moyens mécaniques de fixation, tels que pattes de fixation à bloquer, ou par friction entre le matériau du collier de sous-toiture et le châssis isolant.
14. Structure de toit équipée d'une fenêtre de toit (19) et d'un châssis isolant (1) selon la revendication 1, ladite fenêtre de toit (19) étant montée dans ledit châssis isolant (1), ladite structure de toit comportant une recouvrement, une structure de support et un collier de sous-toiture (26) comprenant au moins une membrane étanche à l'eau externe et une couche isolante, ledit collier de sous-toiture étant placé entre la recouvrement et la structure de support et comprenant une ouverture permettant de monter la fenêtre, ledit châssis isolant comprenant une surface inférieure reposant contre la surface supérieure du collier de sous-toiture et étant dotée d'une ouverture (5), laquelle correspond à l'ouverture formée dans le collier et qui est supérieure, ou qui correspond, aux dimensions externes de la fenêtre de toit, de sorte que la fenêtre peut être placée à l'intérieur de l'ouverture, dans laquelle au moins l'une des pièces de châssis possède une section supérieure pourvue d'un premier côté faisant face à une pièce de châssis de fenêtre correspondante et un second côté (9) faisant face à un élément de raccordement et/ou à un élément de recouvrement, **caractérisée en ce que** au moins une partie de la section inférieure (7) est placée sous la fenêtre de toit et **en ce que** le premier côté de la section supérieure (8) de ladite au moins une pièce de châssis isolant (2a, 2b, 3, 4) présente

une hauteur telle qu'au moins les trois quarts de la hauteur comprise entre le sommet de la section supérieure et la pièce d'appui (6) du châssis de fenêtre sont recouverts par la section supérieure du châssis isolant.

15. Fenêtre de toit (19) dotée d'un châssis isolant (1) selon la revendication 1, dans laquelle l'ouverture (5) du châssis isolant présente une configuration qui correspond essentiellement à la configuration de la fenêtre de toit, et des dimensions qui sont supérieures ou correspondantes aux dimensions extérieures de la fenêtre de toit, **caractérisée en ce que** au moins une partie de la section inférieure (7) est placée sous la fenêtre de toit et **en ce que** le premier côté de la section supérieure (8) de la, au moins une, pièce de châssis isolant (2a, 2b, 3, 4) présente une hauteur entre le sommet de la section supérieure et la pièce d'appui (6) telle que la, au moins une, pièce de châssis isolant recouvre au moins les trois quarts de la hauteur de la pièce de châssis de fenêtre (20).
16. Fenêtre de toit (19) selon la revendication 15, comprenant, de plus, un collier de sous-toiture (26), lequel est fixé au châssis isolant au niveau de, ou au-dessus de la partie inférieure de la section supérieure du châssis isolant.
17. Procédé d'isolation d'une fenêtre de toit (19), dans lequel la fenêtre de toit est disposée dans une ouverture (5) dans un châssis isolant (1) comportant une pluralité de pièces monolithes de châssis isolant (2a, 2b, 3, 4) constituant une unité de châssis unique, laquelle entoure l'ouverture (5), dont la configuration correspond essentiellement à la configuration de la fenêtre de toit et dont les dimensions sont supérieures ou correspondent aux dimensions extérieures de la fenêtre de toit, chaque pièce de châssis isolant présentant une surface latérale intérieure faisant face à l'ouverture, une surface inférieure et au moins une surface latérale extérieure faisant face à distance de l'ouverture, dans lequel au moins l'une des pièces de châssis isolant comporte une section inférieure (7) et une section supérieure (8), dans lequel la section supérieure a un premier côté faisant face à l'ouverture et un second côté (9) faisant face à distance de l'ouverture, une partie inférieure de la section supérieure présentant une largeur maximale prédéterminée, la largeur comprise entre le premier côté et le second côté diminuant à partir de ladite largeur maximale dans la direction de la hauteur de la section supérieure, **caractérisé en ce que** le second côté forme un angle prédéterminé, autre qu'un angle droit, avec la partie inférieure de telle sorte que la section supérieure est configurée essentiellement en forme de coin avec un angle au sommet de 20 à 45 degrés, la fenêtre est agencée dans le châssis isolant de sorte que la section supérieure

(8) de la, au moins une, pièce de châssis isolant recouvre au moins les trois quarts de la hauteur de la pièce de châssis de fenêtre correspondante (20) de la fenêtre de toit (19) et de sorte qu'une pièce d'appui (6) présente sur la surface de la section inférieure (7) faisant face à l'ouverture soit placée sous la fenêtre de toit.

18. Procédé selon la revendication 17, dans lequel un collier de sous-toiture (26) est fixé au châssis isolant.
19. Procédé selon la revendication 17 ou 18, dans lequel le châssis isolant est fixé à la fenêtre de toit par collage.
20. Procédé selon la revendication 17 ou 18, dans lequel le châssis isolant est déployé afin d'en permettre le montage et dans lequel un ajustement serré entre le châssis d'isolation et la fenêtre de toit est obtenu par une contraction ultérieure du châssis isolant.



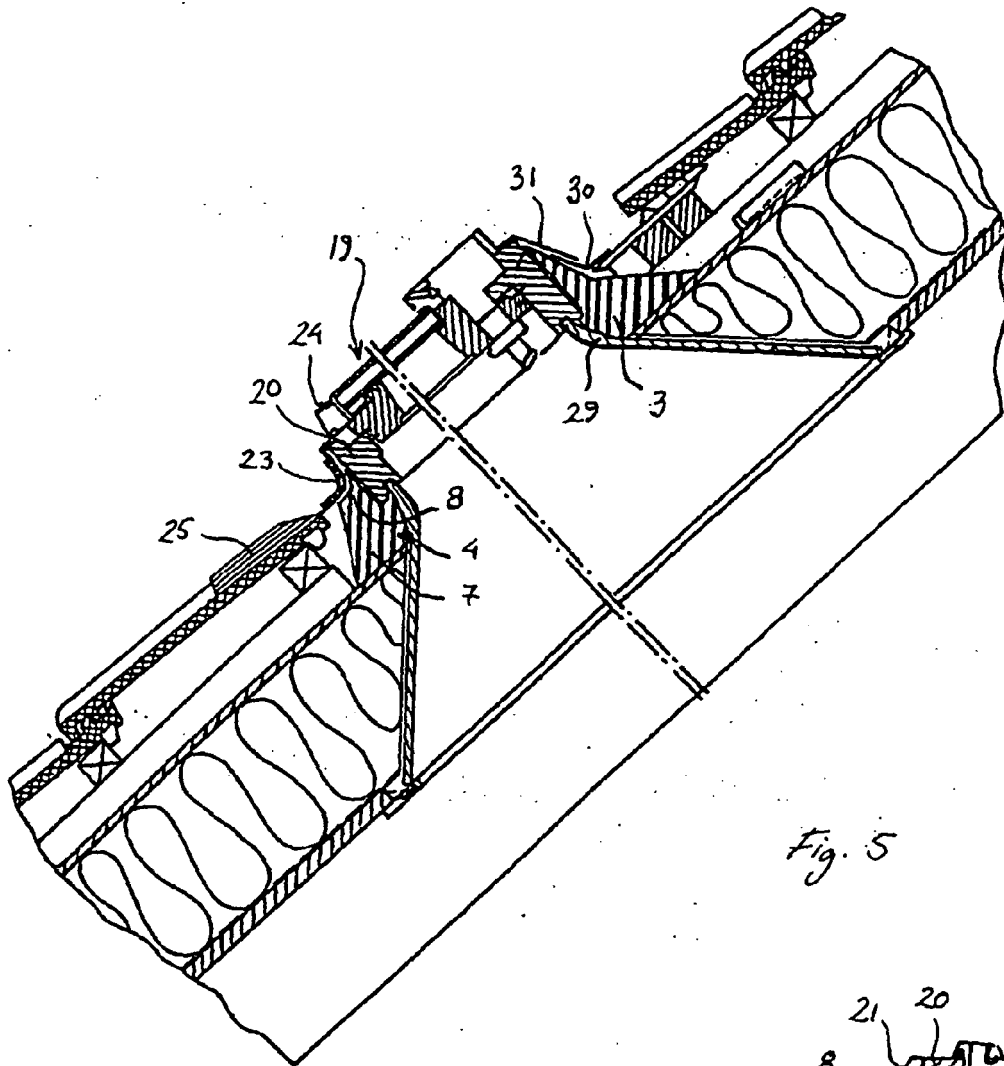


Fig. 5

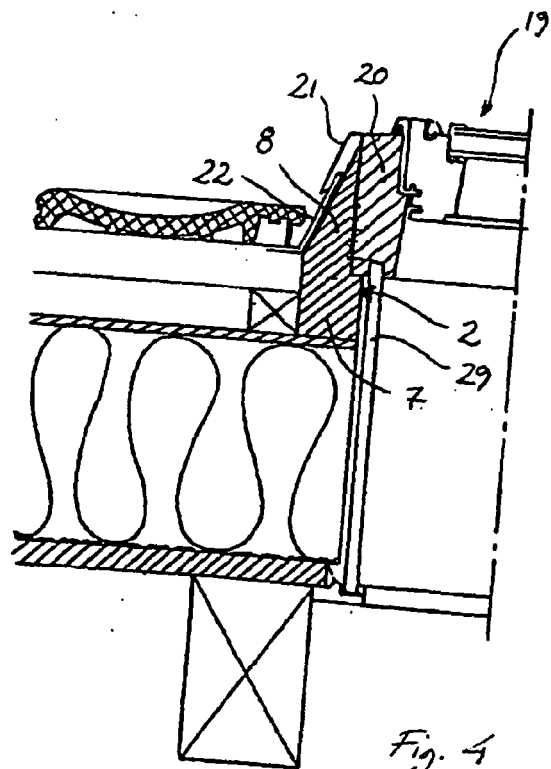


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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