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(54) AN INSTALLATION AID FOR USE WHEN MOUNTING A WINDOW FRAME IN A ROOF STRUCTURE OF A BUILDING, A SEALING COLLAR, AND A METHOD OF MOUNTING A WINDOW FRAME

(57) An installation aid is adapted for use when mounting a window frame in a roof structure of a building. The installation aid comprises a plate portion adapted for being arranged on an exterior side of the roof structure, so that it extends in parallel with the plane of the roof structure. The plate portion has top, bottom and side members defining an inner edge, said inner edge defining an opening, the shape and size of the opening substantially matching the shape and size of the window frame. The plate portion further comprises at least one receiving section adapted for accommodating a mounting bracket of the window frame. Such an installation aid may form part of a sealing collar. A method of mounting a window frame in a roof structure using an installation aid is also disclosed.

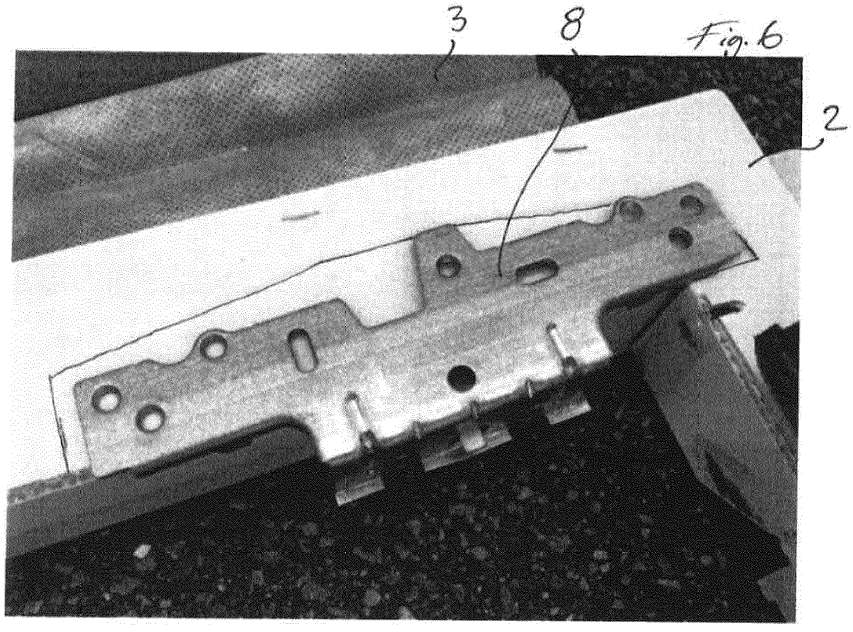

Fig. 6

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Description

[0001] The present invention relates to an installation aid adapted for use when mounting a window frame in a roof structure of a building, said installation aid comprising a plate portion adapted for being arranged on an exterior side of the roof structure, so that it extends in parallel with the plane of the roof structure. The invention further relates to a sealing collar including such an installation aid and a method of mounting a window frame.

[0002] Installation aids and sealing collars of this kind, which are used as aids when making an opening in the roof structure suitable for receiving the roof window frame, and/or for facilitating the weather-proofing of the connection between the window frame and the roof structure, have been described in the applications co-pending patent applications DK201670961A, DK201770342A, and EP3453811A, and not yet published DK201870317A. These previous applications and the information given therein with regards to the structure and use of the installation aids and sealing collars are hereby incorporated herein by reference.

[0003] When installing a roof window using an installation aid, the material of the installation aid may need some thickness to provide sufficient material strength, such as dimensional stability, for the window installation. As the roof window is typically mounted on top of the installation aid towards the exterior, this may, however, cause the roof window to lie above the roofing. This, in turn, may influence on the need for additional insulating and/or weather-proofing around the roof window. Moreover, it remains a problem to position the window frame correctly within the installation aid.

[0004] According to a first aspect, the present invention relates to an installation aid adapted for use when mounting a window frame in a roof structure of a building, said installation aid comprising a plate portion, wherein the plate portion has an interior side adapted to face the roof structure in the mounted state and an exterior side adapted to face the exterior, the plate portion having a thickness measured from the interior side to the exterior side, a length in a direction substantially parallel to the interior side and/or exterior side, and a width in a direction perpendicular to the length direction and substantially parallel to the interior side and/or exterior side, wherein the plate portion is adapted for being arranged on an exterior side of the roof structure, so that it extends in parallel with the plane of the roof structure, said plate portion matching the size and shape of the window frame, wherein

[0005] the plate portion has top, bottom and side members defining an inner edge and an outer edge opposite the inner edge, where said inner edge defines an opening at least when the sealing collar is in the mounted condition, where said plate portion is adapted for surrounding a window frame by the inner edge, and where shape and size of the opening substantially matches the shape and size of the window frame, at least when the installation aid is in the mounted condition, and wherein
the plate portion comprises at least one receiving section adapted for accommodating a mounting bracket of the window frame.

[0006] Thereby, the mounting bracket may be arranged at the receiving section such that the mounting bracket, towards the exterior, may lie substantially flush with the exterior side of the plate portion, or may stand out from the exterior side by only a part of its thickness. This, in turn, means that the positon of the roof window in relation to the plane of the roofing will not be affected by the presence of the plate portion. The receiving sections may furthermore provide guidance to the installer of the roof window of, where the mounting brackets are to be placed on the plate portion, thereby providing an easier and less time-consuming installation of the roof window. The guidance may be in the form a visual indication if the mounting bracket is positioned correctly or as tactile feed-back.

[0007] The opening matching the size and shape of the window frame means that the opening has at least the same dimensions as or larger dimensions than the outer dimensions of the window frame in the length and width direction. The dimensions of the opening is, however, preferably smaller than the outer dimensions of the window frame with the mounting bracket(s) mounted.

[0008] In an embodiment of the invention, the at least one receiving section comprises one of: a section of reduced material thickness, a section of compressible material, a cut-out, and/or an indication of where to remove material.

[0009] Thereby a guide may be provided, such that the mounting bracket can be positioned and/or may rest in the receiving section, whilst the installer secures the roof window to the roof structure. This may further be enhanced by positioning pins, knobs, buds, or the like, which may be provided to the at least one receiving section, by e.g. the compressible material or reduced material thickness.

[0010] In another embodiment of the invention, the dimensions of the at least one receiving section in the length direction and the width direction correspond to the outer dimensions of the mounting bracket of the window frame.

[0011] Thereby the entire width and length of the mounting bracket may be received and accommodated in the receiving section. This may, in turn, further allow for an increased stability, such that the window frame may rest on the plate portion by the mounting brackets. The length and width of the at least one receiving section are preferably equal to or larger than the length and width of the corresponding mounting bracket, which the receiving section is to accommodate.

[0012] In an embodiment of the invention, the plate portion comprises a plurality of receiving sections for receiving one mounting bracket of the window frame each.

[0013] Thereby, the same installation aid may be used for installing different windows, having window frames

with different mounting brackets or with the mounting brackets being positioned at different positions along the window frame. The installation aid may furthermore be used in situations, where a default or standard position of the mounting bracket on the window frame cannot be used for installation, e.g. due to conflict with the roof structure. In these cases, the plate portion may comprise another receiving section or set of receiving sections, such that the mounting bracket(s) can be fastened at the window frame at another position/other positions and subsequently arranged at the other receiving section/set of receiving sections.

[0014] In another embodiment of the invention, the at least one receiving section include an indication to an installer that a mounting bracket is to be arranged at said at least one receiving section.

[0015] The indication may, for instance, indicate that a given receiving section is adapted for receiving a particular mounting bracket, such as a mounting bracket of a window frame of a particular roof window. The indication may be provided in the shape of a graphical symbol, an outline of the mounting bracket, a piece of text, numbers, or the like.

[0016] In yet another embodiment of the invention, the plate portion comprises at least one first receiving section for accommodating a mounting bracket of a first roof window and a second receiving section for accommodating a mounting bracket of a second roof window, such that either the first roof window or the second roof window can be installed using the installation aid, wherein the mounting bracket of the first roof window and the mounting bracket of the second roof window are different.

[0017] This, again, allows for different types of roof windows to be installed using the same installation aid. In some embodiments, the plate portion is adapted for receiving mounting brackets of window frames of two or more windows, which are to be installed side-by-side. The two or more windows may have frames of similar sizes or different sizes, which may comprise similar or different mounting brackets. Correspondingly, the plate portion may comprise two or more side-by-side openings of the same or different sizes and may have several pluralities of receiving sections, which are different in dimensions or are alike. The mounting bracket of the first roof window and the mounting bracket of the second roof window may be different in size, shape and/or position.

[0018] In yet another embodiment of the invention, the at least one receiving section and/or other parts of the plate portion is made from a material selected from the group consisting of: cellulose-based materials, polymers, or combinations thereof.

[0019] The at least one receiving section and/or other parts of the plate portion is, in some embodiments, made from a material comprising structures selected from the group consisting of honeycomb, laminates, corrugations, channels, or any combination thereof.

[0020] In order to facilitate installation of the window frame, the plate portion is made of a dimensionally stable material, but the previous applications have not been very specific with regards to which materials are suitable for this purpose.

[0021] It has since been found that the following materials are particularly suitable for the at least one receiving section and/or other parts of the plate portion:

- Polyethylene (PE), polypropylene (PP), polyurethane (PU), polycarbonate (PC), and other polymers having similar weather resistance and low weight. Some of these materials, such as PC, are further transparent allowing the installer to see through the plate portion when handling the installation aid.
- Cardboard, particularly water-resistant cardboard due to its low price and low weight.
- Wood-based materials such as plywood, chip boards, and fiber boards due to their high strength, high availability, low price, and well-known performance in the building industry.
- Composites combining the advantageous properties of the above materials.

[0022] Likewise, it has been found that the following material structures are particularly suitable:

- Laminates, including plywood, due to their structural simplicity and low price.
- Honeycomb-structures and materials with bubble-shaped hollows, resembling bubble wrap, due to their high strength to weight ratio.
- Corrugated materials including corrugated cardboard and corrugated plastic, due to their high availability and high strength to weight ratio.
- Materials with channels, typically made by extrusion, due to their high availability and high strength to weight ratio.

[0023] The channels may be longitudinal, i.e. to extend along the length direction, or may be transverse to extend along the width direction of the installation aid. By using channels, corrugations, and/or honeycomb structures, the installation aid may be made from less material than required for a solid structure whilst maintaining the material rigidity and stability. This, in turn, allows for a lighter installation aid.

[0024] These materials and structures may in principle be combined in any way, but combination, which are presently preferred, are polymers with longitudinal channels and water-resistant corrugated cardboard.

[0025] It is, however, also possible to use simpler materials such as simple sheets of material, and sheets of polyethylene and polypropylene have been successfully applied in test installations.

[0026] Materials, which can be compressed during mounting of the window frame, include corrugated cardboard and other materials with integrated hollows or cavities. Alternatively, the plate portion may have sections

of reduced thickness at the places where it will come into contact with the mounting brackets of the roof window frame. Such sections may be achieved either by compression of the material, by removal of material, or by using less material. In any event, such sections of reduced thickness may aid in the installation process as they will serve as a clear indication where the mounting brackets should rest.

[0027] It is even possible to provide sections of the plate portion with projections matching with recesses or openings in the mounting brackets or vice versa.

[0028] Examples of materials suitable for removal of material are wood-based materials and laminates.

[0029] Polymers, and particularly thermoplastic polymers, are well-suited if wishing to provide the plate portion with advanced 3D shapes.

[0030] Using a plastic or elastic material allows sections of material to be bent in relation to the rest of the plate portion, thereby allowing the provision of a flap adapted for being bent out and for holding a tool and/or positioning the plate portion in relation to the roof structure. It is, however, also possible to provide one or more permanent projections for this purpose.

[0031] Flaps and/or projections may also be used for interconnecting different parts of an installation aid or sealing collar, typically by engaging them with corresponding recesses or openings in another part. One example is a plate portion made from separate top, bottom, and side members, which are arranged to overlap so that a flap in one part can be passed through an opening in another. Such an overlap may provide the plate portion with extra strength at the corners, but it is also possible to provide an overlap elsewhere, which may for example be relevant if using mounting brackets located at the corners of the window frame.

[0032] In some embodiments, the thickness of the plate portion does not exceed 6 mm and is preferably less than 5 mm.

[0033] In an embodiment of the invention, the installation aid further comprises a stabilizing portion with outer dimensions substantially matching the shape and size of the opening, where the stabilizing portion is arranged at the inner edge of the plate portion, where the stabilizing portion is attached to the inner edge of the plate portion at a plurality of points, whereby the plate portion is urged to maintain its desired dimensions in the mounted condition.

[0034] According to a second aspect, the invention relates to a sealing collar comprising an installation aid according to the first aspect of the invention, the sealing collar further comprising an underroof collar and/or an insulating element.

[0035] By the sealing collar comprising the installation aid with the advantages mentioned in relation to the first aspect of the invention and an underroof collar and/or an insulating element, an improved insulation and/or weather proofing of the roof window installation may be obtained.

[0036] According to a third aspect, the invention relates to a method of mounting a window frame in a roof structure of a building, the roof structure having an exterior side facing the exterior of the building and an interior side facing the interior of the building, the method comprising the steps of:

providing a window frame comprising at least one mounting bracket connected to said window frame;
providing an installation aid according to the first aspect of the invention;
mounting the installation aid on the exterior side the roof structure;
arranging the window frame in the opening of the plate portion such that each of the at least one mounting bracket is received at a corresponding receiving section of the plate portion;
fastening the mounting bracket to the roof structure by means of fastening means.

[0037] In an embodiment of the invention, the method further comprises the step of:
removing or compressing material at at least one receiving section.

[0038] In another embodiment of the invention, the method further comprises the step of:
checking whether each of the at least one mounting bracket of the window frame and the corresponding receiving section(s) are aligned, and, if they are not aligned, adjusting the position of the window frame and/or the mounting bracket relative to the window frame to align the at least one mounting brackets and the corresponding receiving section(s).

[0039] Details and embodiments of one aspect of the invention also applies to other aspects and vice versa unless specifically stated otherwise. It is obvious to the skilled man that the different components described herein can be combined with each other. In the following the invention will be described in more detail by way of example and with reference to the schematic drawings, where

Fig. 1 shows a perspective view of an installation aid according to the invention,
Fig. 2 shows a second embodiment of the installation aid arranged on a roof structure,
Fig. 3 shows third embodiment where an installation aid according to the invention is forming part of a sealing collar and is arranged on a roof structure,
Fig. 4 shows a fourth embodiment of an installation aid according to the invention and forming part of a sealing collar,
Fig. 5 shows the detail marked V in Fig. 4,
Fig. 6 corresponds to Fig. 5 but showing also a mounting bracket, Fig. 7 shows a fifth embodiment of an installation aid according to the invention and forming part of a sealing collar, and
Fig. 8 shows a sixth embodiment of an installation

aid according to the invention.

Fig. 9 shows a schematic plane view of a seventh embodiment of an installation aid according to the invention.

[0040] An installation aid 1 according to the invention is shown in Fig. 1. The plate portion 2 is here a single member with a central opening 270.

[0041] The reference numbers used in Fig. 1 will also be used in the following figures for features having substantially the same function, even though they are not necessarily identical. Throughout the drawing the same reference numbers have been used for features having substantially the same function.

[0042] A similar but slightly different installation aid is shown in Fig. 2, where the plate portion 2 has been arranged on an exterior side of a roof structure 5 including roofing 51, underroof 52, battens 53, and counter-battens 54 arranged on top of rafters (not shown), so that the plate portion extends in parallel with the plane of the roof structure. The central opening 270 is aligned with an opening 50 formed in the roof structure so that an installer (not shown) can stand inside the building with his upper body and arms on the outside of the opening and be able to reach the entire installation aid and surrounding parts of the roof structure. Using a transparent plate portion (not shown) may allow the installer to see the roof structure through the plate portion, which may facilitate installation.

[0043] When mounting a window frame in the roof structure 5 using this embodiment of the installation aid, the following sequence of steps is performed:

- Forming a preliminary opening 50 in the roof structure.
- Arranging an installation batten 55 at a position defining the position of the bottom of the window frame in the mounted state.
- Bending flaps formed by cut-outs 274 in the plate portion 2 of the installation aid 1 inwards and arranging the plate portion on top of the battens 53 so that two of the flaps rest on the installation batten 55 thereby positioning the plate portion in the direction of inclination of the roof. It is also possible to first arrange the plate portion and then bend the flaps to keep it in place.
- Attaching the plate portion 2 to the battens 53 and/or installation batten 55, for example by means of staples.
- Possibly arranging a second installation batten 56, drainage gutter, or tile support by using two other flaps bent out from cut-outs 274 in the plate portion as a support.
- Using the outer edges 28 extending in parallel with the direction of inclination of the roof structure 5 as drawing aids for transferring a cutting indication to at least the battens.
- Removing the installation aid 1 and using the just made cutting indications on the battens 53 as a guide for cutting a permanent opening in the roof structure.

[0044] As an alternative to the last two steps, it is also possible to simply use the outer edges 28 of the plate portion 2 as cutting guides advancing a jigsaw or the like (not shown) along these outer edges, and then subsequently removing the installation aid.

[0045] The parts of the plate portion 2 located on top of the installation battens 55, 56, i.e. outside the limits of the permanent opening in the roof structure, can be left on the roof structure 5 by cutting along the lines indicated by a second cut-out 272. These second cut-outs are sufficiently big to allow the blade of a jigsaw to pass through one of them and the other second cut-outs in the line will then guide the saw.

[0046] A third embodiment where the installation aid 1 forms part of a sealing collar is shown in Fig. 3. The installation aid is here provided with second cut-outs 272 not only at the top and bottom as in Fig. 2 but also along the outer edges 28 extending in parallel with the direction of inclination of the roof. These second cut-outs are well suited for assisting in the formation of the opening in the roof structure by serving as drawing or cutting guides as is here illustrated by a saw 6.

[0047] In this embodiment the parts of the plate portion 2 left after cutting out the opening in the roof structure forms a frame surrounding the opening. This frame may serve as a sealing frame surrounding the window frame (not shown) when it has been mounted and contributing to the weather-proofing of the finished structure. The part 19 which is shown in grey and which is removed when cutting the opening may be made from a different material than the rest of the plate portion and serve as a temporary stabilizing portion.

[0048] Furthermore, the plate portion 2 here serves as a point of attachment for an outer skirt portion 7 serving as an underroof collar, the plate portion thus replacing the inner un-pleated portion known from some traditional underroof collars. The attachment of the skirt portion or underroof collar 7 to an outer portion of the plate portion 2 at line 71 may be established as a part of the mounting process, or the underroof collar may be attached already in the state of delivery and kept enclosed in the plate portion 2 in the folded state as previously described with reference to insulating and weather-proofing elements.

[0049] Fig. 4 shows a fourth embodiment where the installation aid forms part of a sealing collar, where insulating and weather-proofing elements 3, including a set of wind-proof pads 31, insulating elements 32, and an underroof collar 33, are attached to the plate portion 2.

[0050] The detail marked V is shown in Figs 5 and 6. As may be seen a section 29 of the plate portion 2 has been compressed so that it is thinner than the rest of the plate portion. This section 29 corresponds in size to the size of a window mounting bracket as may be seen in Fig. 6.

[0051] Fig. 5 and 6 also show cuts 276 through the

material of the plate portion where flaps 274 have been bent down along the inner sides of the opening in the roof structure. These flaps serve to position the sealing collar in relation to the opening in the roof structure and to wind-proof the structure. As may be seen, the plate portion is here made of a corrugated polymer having a structure resembling corrugated cardboard and a thickness in the uncompressed state of approximately 6 mm.

[0052] Fig. 7 shows an alternative embodiment corresponding to the one in Fig. 6 except for having cut-outs 291 instead of the compressed sections so that the installation depth of the roof window frame is not influence by the presence of the plate portion 2. Furthermore, stabilizing portions 19 are provided to prevent the plate portion from warping, thus allowing the use of a less stiff material.

[0053] Fig. 8 shows a plate portion 2 composed of four separate members 11, 12, 13, 14, which are interconnected with an overlap at the corners. The dotted lines 15 indicate the edges of the overlapping sections, which are interconnected by welding. It is, however, also possible to use glue, adhesive, staples, bent flaps or other means. Broken lines 276 indicate where to bent the material in order bent the flaps 274 down along the inner sides of the opening in the roof structure. Depending on the material used it may be advantageous to provide a weakening of the material along these lines in order to facilitate the bending, for example by scoring as in Fig. 7.

[0054] Fig. 9 shows a plate portion 2' with the central opening 270 and a first plurality of receiving sections 29', a second plurality of receiving sections 29", and a third plurality of receiving sections 29"'. The first plurality of receiving sections 29' are adapted for receiving mounting brackets (not shown in Fig. 9) of a window frame of a first type of roof window. Correspondingly, the second plurality of receiving sections 29", and the third plurality of receiving sections 29'" are adapted for receiving mounting brackets of a window frame of second and third type of roof window, respectively. The first 29', second 29", and third plurality of receiving sections 29'" are, as shown in Fig. 9, different in shape and size, i.e. dimensions, and are arranged separately from each other. In some embodiments, the first 29', second 29", and third plurality of receiving sections 29'" are arranged such that they at least partially overlap at the plate portion 2'. In another embodiment, they have the same shape and size but be arranged at different positions at the plate portion 2'.

Claims

1. An installation aid adapted for use when mounting a window frame in a roof structure of a building, said installation aid comprising a plate portion adapted for being arranged on an exterior side of the roof structure, so that it extends in parallel with the plane of the roof structure, wherein the plate portion has an interior side adapted to face the roof structure in the mounted state and an exterior side adapted to face the exterior, the plate portion having a thickness measured from the interior side to the exterior side, a length in a direction substantially parallel to the interior side and/or exterior side, and a width in a direction perpendicular to the length direction and substantially parallel to the interior side and/or exterior side, wherein the plate portion has top, bottom and side members defining an inner edge and an outer edge opposite the inner edge, where said inner edge defines an opening at least when the sealing collar is in the mounted condition, where said plate portion is adapted for surrounding a window frame by the inner edge, and where shape and size of the opening substantially matches the shape and size of the window frame, at least when the installation aid is in the mounted condition, and wherein the plate portion comprises at least one receiving section adapted for accommodating a mounting bracket of the window frame.

2. An installation aid according to claim 1, wherein the at least one receiving section comprises one of: a section of reduced material thickness, a section of compressible material, a cut-out, and/or an indication of where to remove material.

3. An installation aid according to any one of the preceding claims, wherein the dimensions of the at least one receiving section in the length direction and the width direction correspond to the outer dimensions of the mounting bracket of the window frame.

4. An installation aid according to any one of the preceding claims, wherein the at least one receiving section is made from a material selected from the group consisting of: cellulose-based materials, polymers, or combinations thereof.

5. An installation aid according to any one of the preceding claims, wherein the at least one receiving section is made from a material comprising structures selected from the group consisting of honeycomb, laminates, corrugations, channels, or any combination thereof.

6. An installation aid according to any one of the preceding claims, wherein the plate portion comprises a plurality of receiving sections for receiving one mounting bracket of the window frame each.

7. An installation aid according to any one of the preceding claims wherein the at least one receiving section include an indication to an installer that a mounting bracket is to be arranged at said at least one receiving section.

8. An installation aid according to any one of the pre-

ceding claims, wherein the plate portion comprises at least one first receiving section for accommodating a mounting bracket of a first roof window and a second receiving section for accommodating a mounting bracket of a second roof window mounting bracket of the first roof window and the mounting bracket of the second roof window are different and/or positioned differently on the window frame, such that either the first roof window or the second roof window can be installed using the installation aid, wherein the.

9. An installation aid according to any one of the preceding claims, where the thickness of the plate portion in the mounted state in a direction perpendicular to the exterior side of the roof structure does not exceed 6 mm and is preferably less than 5 mm.

10. An installation aid according to any one of the preceding claims, further comprising a stabilizing portion with outer dimensions substantially matching the shape and size of the opening, where the stabilizing portion is arranged at the inner edge of the plate portion, where the stabilizing portion is attached to the inner edge of the plate portion at a plurality of points, whereby the plate portion is urged to maintain its desired shape and dimensions in the mounted condition.

11. A sealing collar comprising an installation aid according to any one of the preceding claims, the sealing collar further comprising an underroof collar and/or an insulating element.

12. A method of mounting a window frame in a roof structure of a building, the roof structure having an exterior side facing the exterior of the building and an interior side facing the interior of the building, the method comprising the steps of:

providing a window frame comprising at least one mounting bracket connected to said window frame;
providing an installation aid according to any one of claim 1-10;
mounting the installation aid on the exterior side the roof structure;
arranging the window frame in the opening of the plate portion such that each of the at least one mounting bracket is received at a corresponding receiving section of the plate portion;
fastening the mounting bracket to the roof structure by means of fastening means.

13. A method according to claim 12 further comprising the step of:
removing or compressing material at at least one receiving section.

14. A method according to claim 12 or 13 further comprising the step of:
checking whether each of the at least one mounting bracket of the window frame and the corresponding receiving section(s) are aligned, and, if they are not aligned, adjusting the position of the window frame and/or the mounting bracket relative to the window frame to align the at least one mounting bracket and the corresponding receiving section(s).

Fig. 1

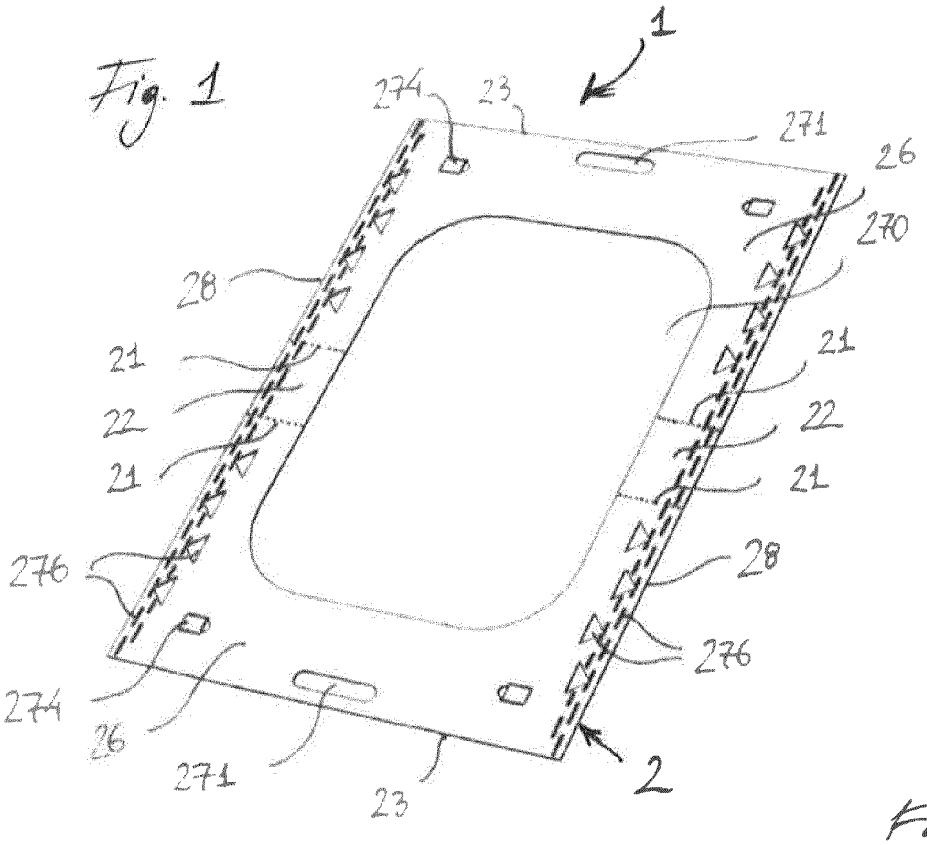
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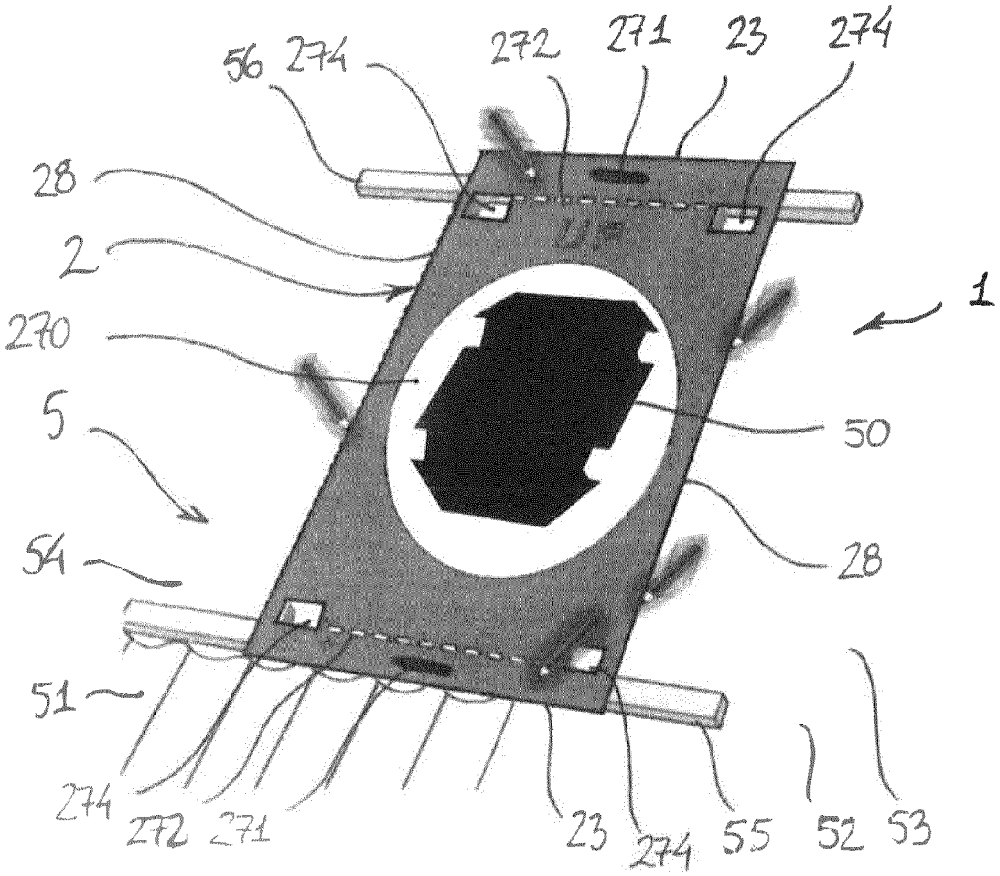
Fig. 2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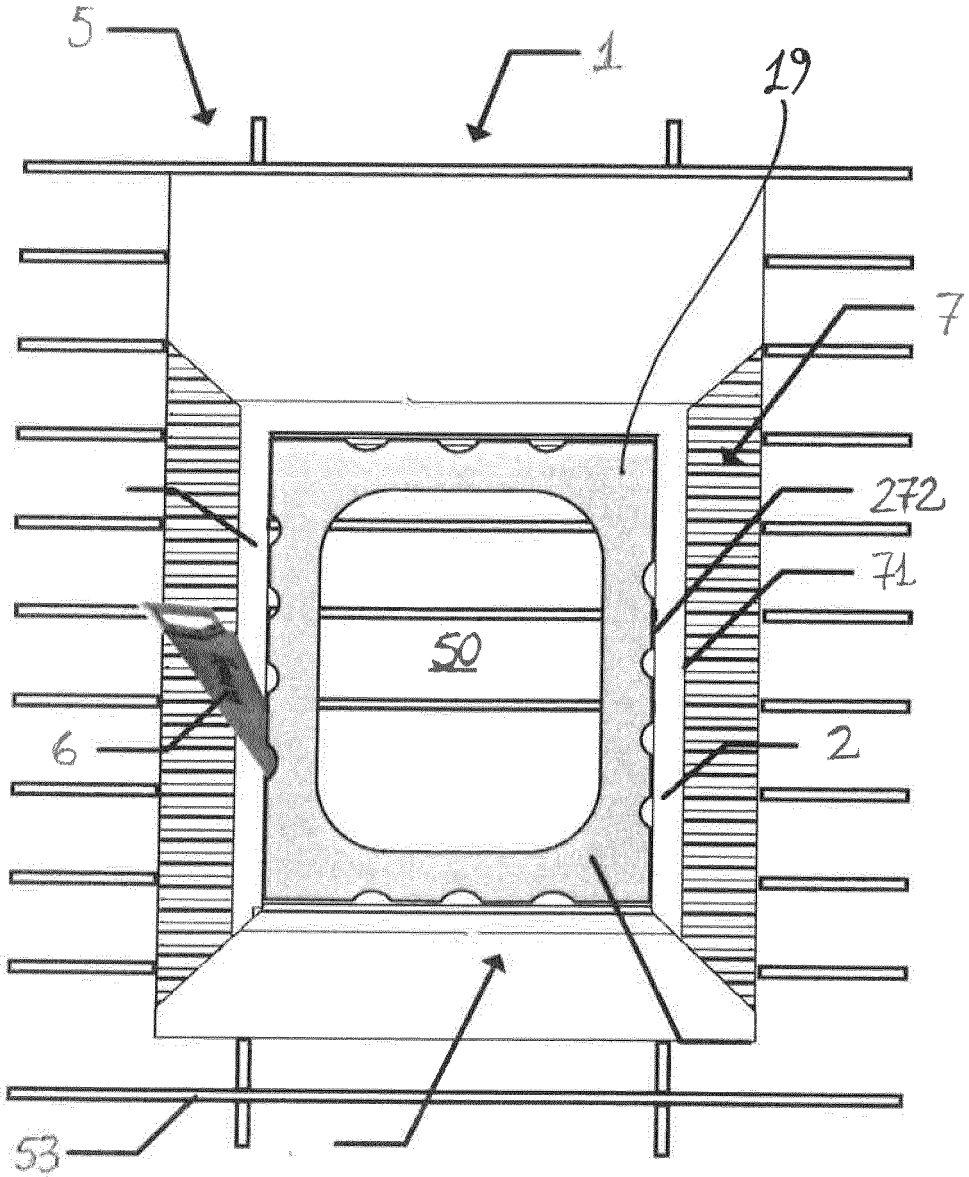

Fig. 3

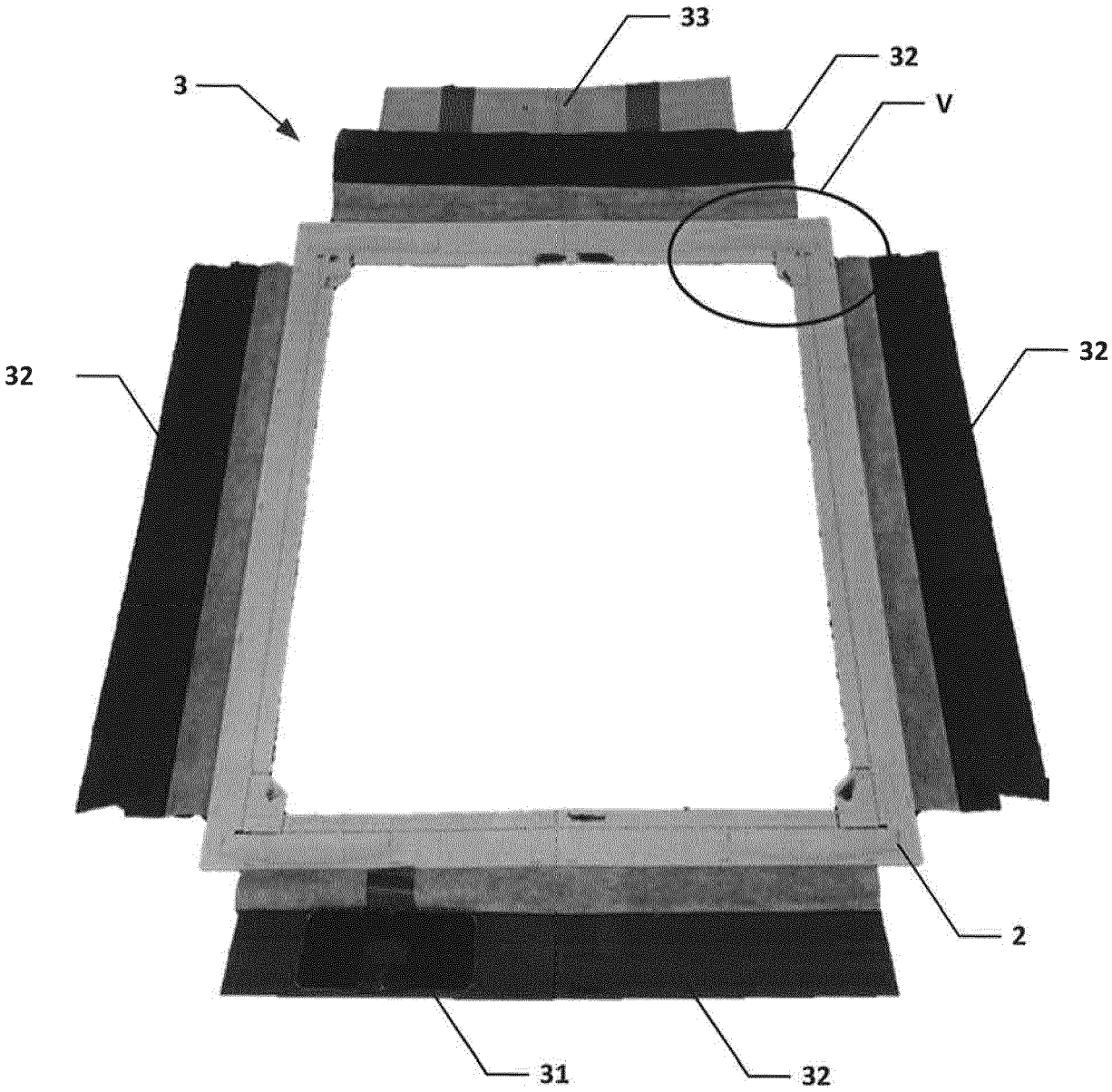

Fig. 4

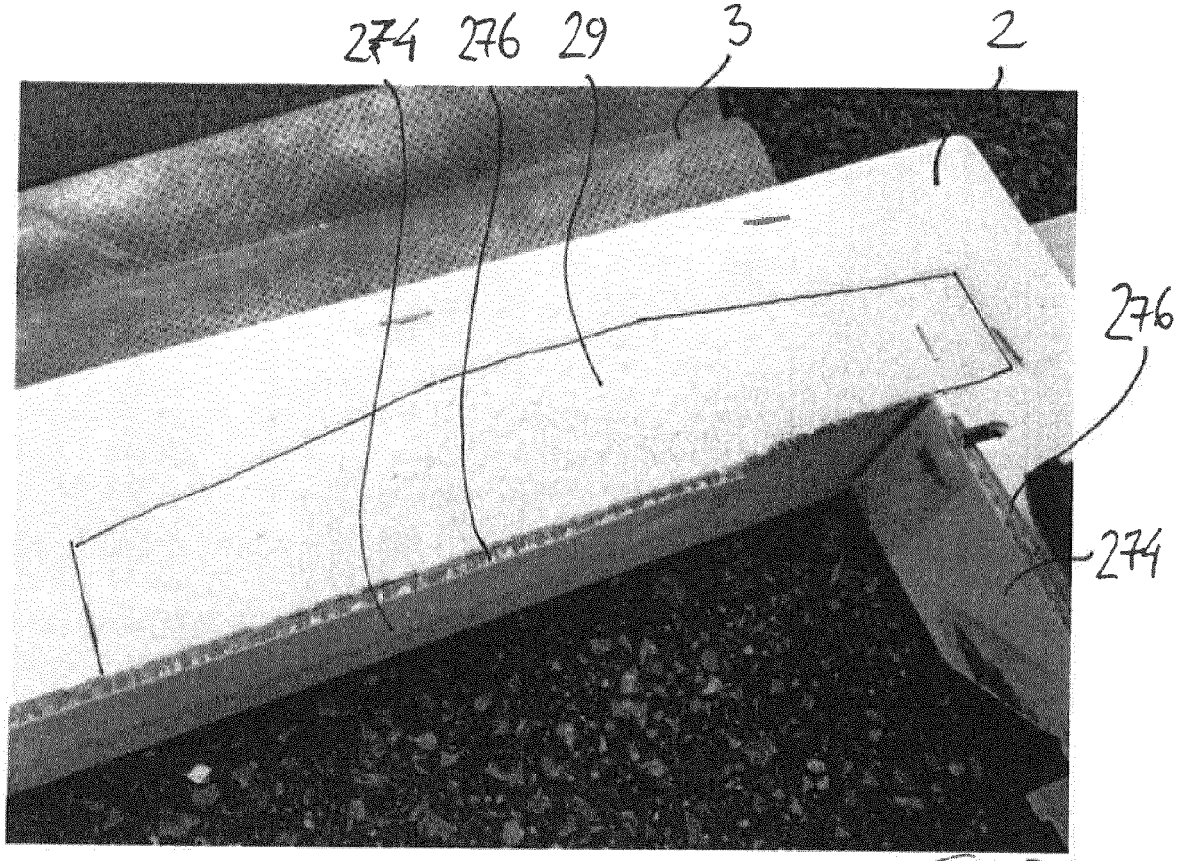

Fig. 5

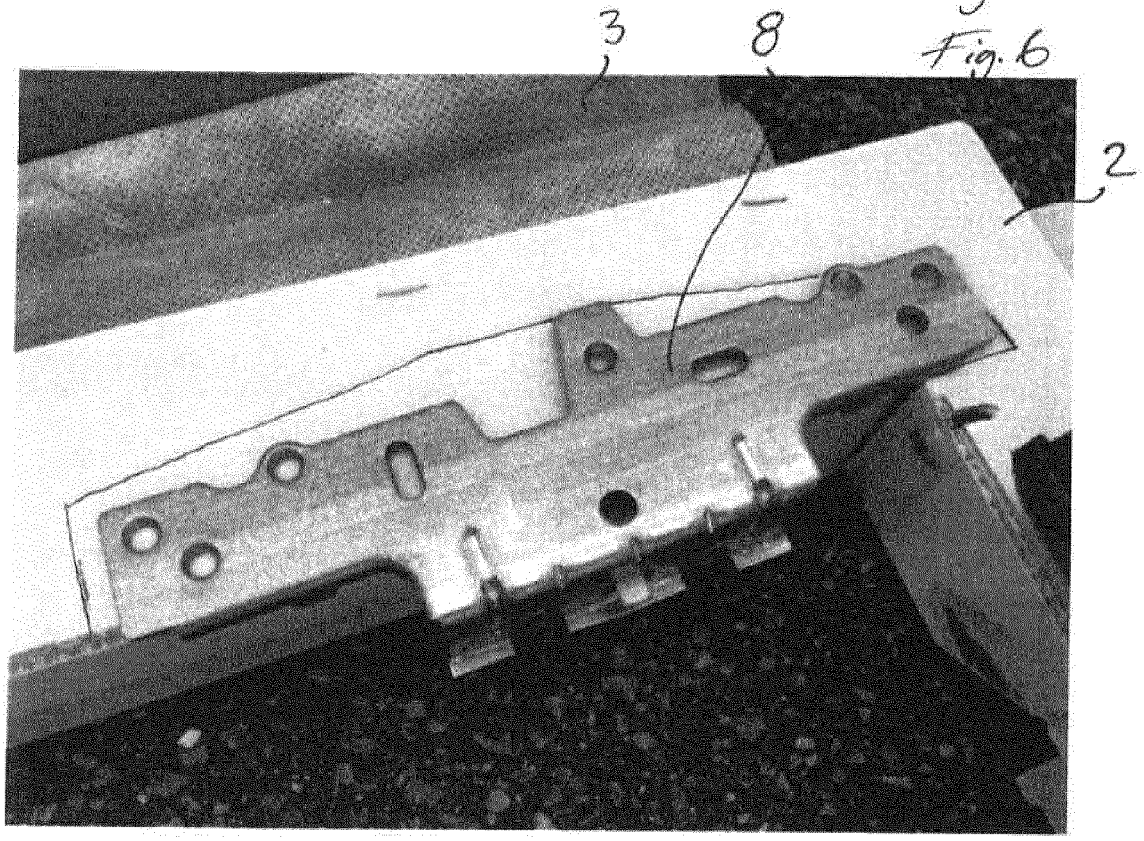

Fig. 6

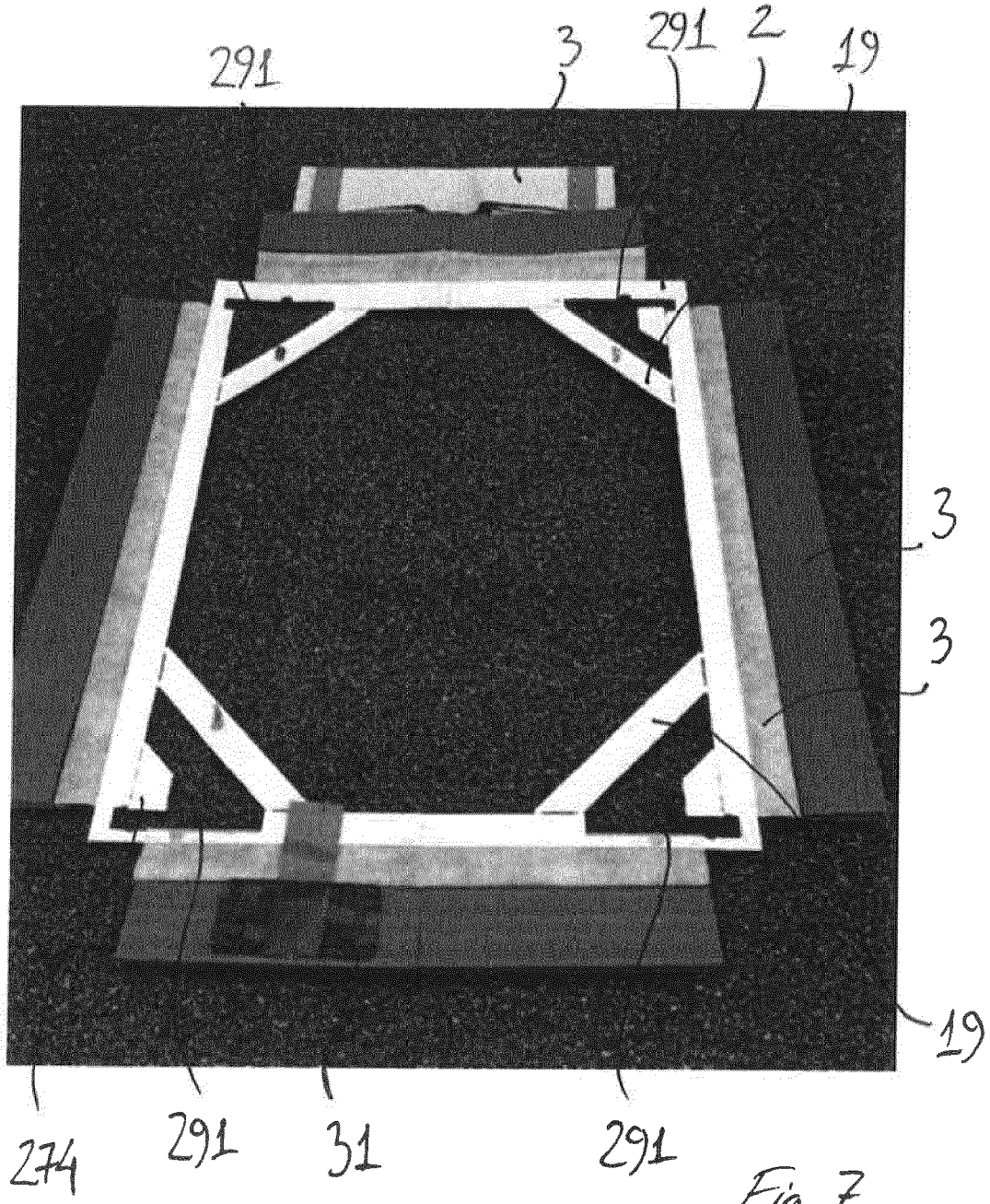

Fig. 7

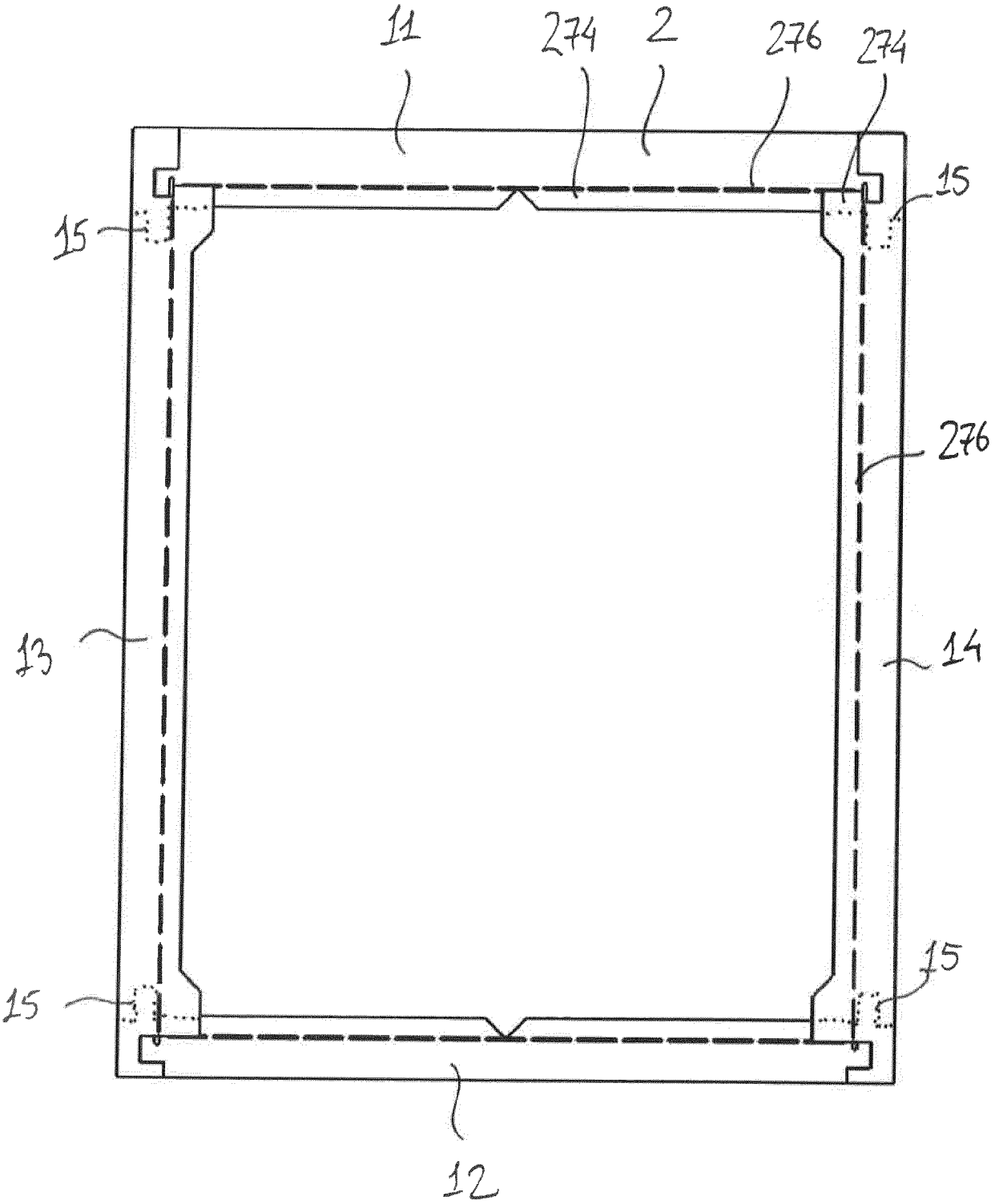

Fig. 8.

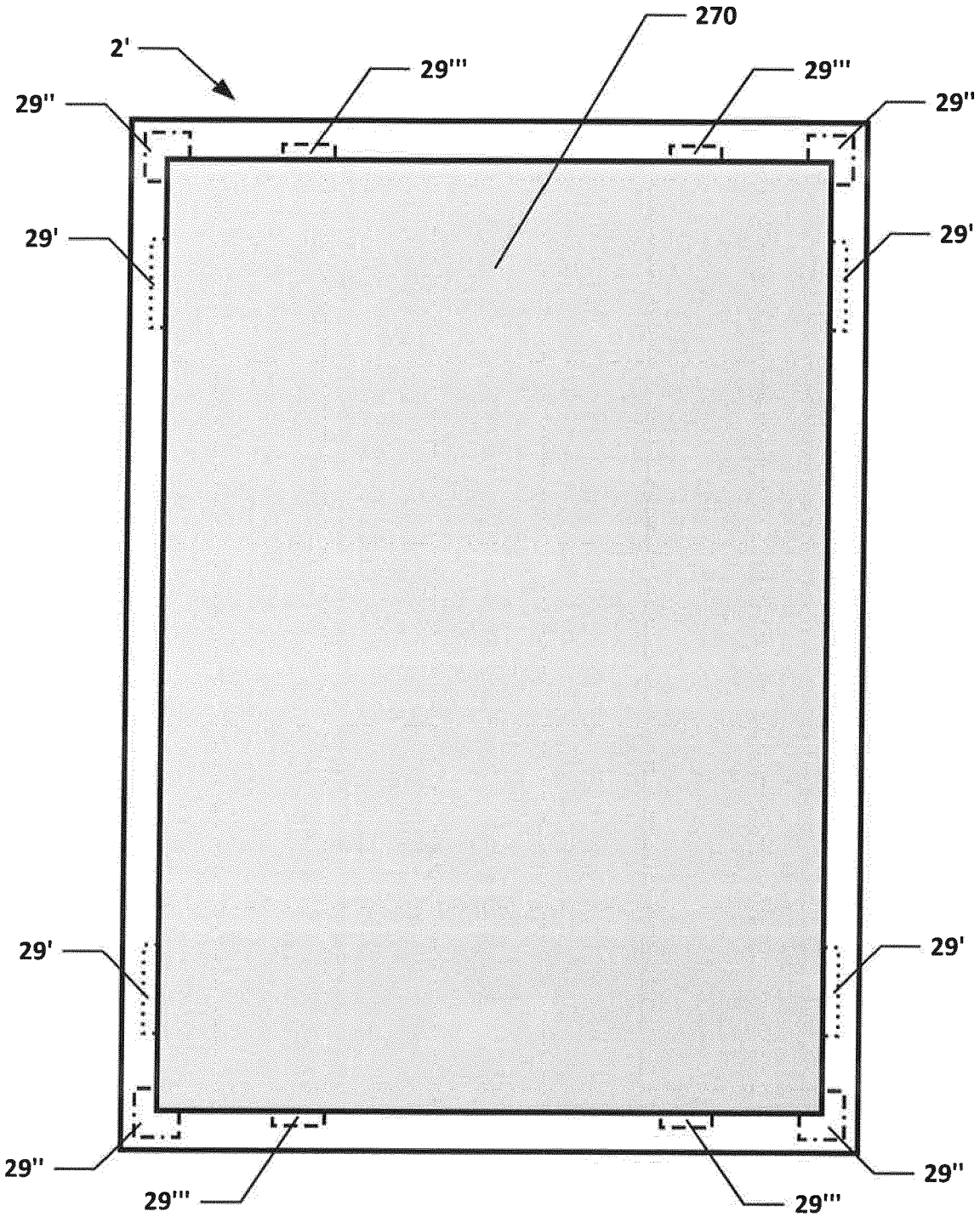

Fig. 9

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EUROPEAN SEARCH REPORT

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