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(54) **FLASHING MEMBER, ROOF STRUCTURE AND METHOD OF ADAPTING A FLASHING MEMBER FOR COVERING A GAP**

(57) A flashing member (1) for covering a gap between two roof penetrating structures (100, 200), the flashing member (1) comprising two engagement sections (13, 23) configured for engagement with the roof penetrating structures (100, 200), a connecting section

(2) extending between the engagement sections (13, 23), and a first protrusion (11) and a second protrusion (21) and the width of the connecting section is variable, and the engagement sections (13, 23) are flat.

Fig. 3

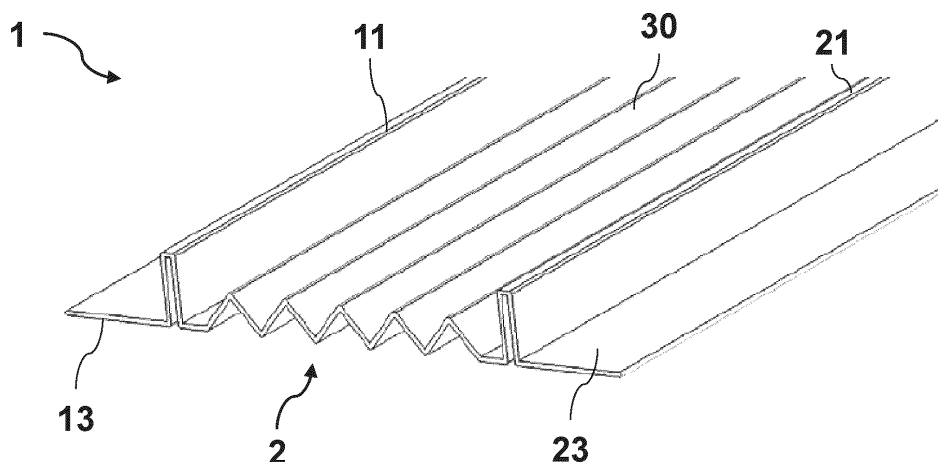


Fig. 4

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Description

Technical field

[0001] The present invention relates to a flashing member for covering a gap between a first roof penetrating structure and a second roof penetrating structure, the flashing member comprising a first engagement section configured for engagement with the first roof penetrating structure, a second engagement section configured for engagement with the second roof penetrating structure, and a connecting section extending between the first engagement section and the second engagement section, the connecting section defining a first plane. The invention furthermore relates to a roof structure comprising a first roof window, a second roof window and a flashing member, and a method of adapting a flashing member configured for covering a gap between a first roof penetrating structure and a second roof penetrating structure.

Background Art

[0002] Generally, in the field of installation of roof penetrating structures there is always a need to provide convenient flashing solutions that provide weatherproofing of a transition region between the roof and the roof penetrating structure and are reliable and easy to install. For the special case of two roof penetrating structures being closely placed next to each other, special flashing is needed as the space between the structures does not offer enough space to cover the area with conventional flashing solutions. Flashing solutions for two adjacently placed roof penetrating structures have been developed. For example, in DK154099 a flashing assembly for roof windows that are to be installed adjacent to each other is disclosed. This flashing assembly provides excellent weather proofing, but there is still a desire for a flashing assembly which is even easier to install.

[0003] With increasing awareness of sustainability, requirements for reduction and optimisation of materials, reuse, repurposing, and re-cycling are strict as regards modern day building components. In turn, this means that components of roof structures including roof windows and flashing assemblies do not only need to be sustainable to manufacture, transport and install, they also need to be easily disassembled.

[0004] While such existing flashing assemblies generally offer relatively well-functioning solutions, there is still room for improvement.

Summary of Invention

[0005] It is therefore an object of the invention to provide flashing member and a method, which makes a flashing assembly versatile and easy to install. A further object is to provide a flashing assembly which is easy to remove after installation.

[0006] In a first aspect, this and other objects are achieved by a flashing member of the kind mentioned in the introduction, which is furthermore characterised in that the width of the connecting section is variable, and that the flashing member further comprises a first protrusion and a second protrusion both projecting away from the first plane, and that the first engagement section and the second engagement section are flat and extending in parallel to the first plane.

[0007] Due to the first and second engagement sections being flat, the connection between the flashing member and the first and second roof penetrating structures entails that a low installation height is obtainable, i.e. the height from the gutter formed between the first and second protrusions and the interface with the roof penetrating structures. This is advantageous as often there is little space for such a flashing member in the height direction, i.e. the direction perpendicular to the first plane. For example, in the case that there are two roof penetrating structures installed on each side of a rafter, and the roof penetrating structures do not protrude excessively over the rafter - which is desirable as this offers less exposed surface which could introduce heat loss - the space that is available to install the flashing member is limited by the two flashing reception grooves and the rafter at the bottom. Furthermore, it is desirable to keep a low profile towards the top as that reduces the attack surface for wind. Thus, even a shallow gap may be flashed in an appropriate manner.

[0008] As mentioned, it is desirable to keep a low profile with roof penetrating structures, therefore, roofing such as roof tiles would make it impossible to insert the flashing member into the flashing reception grooves from a direction that is parallel to the major extension of the first or second flashing reception groove. Being able to vary the width allows the flashing member of this embodiment to be inserted in a direction that is perpendicular to a direction that is parallel to the major extension of the first or second flashing reception groove. In this way, the flashing member may be provided in a supply condition, in which the first and second engagement sections are in mutual engagement but in which the flashing member is in a non-expanded position, and brought to a mounted condition by first lowering the flashing member into the gap such that the bottom of the gutter formed by the connecting section is for instance located at substantially the same level as parts of the roof structure in the gap, and secondly moving the first and second engagement sections in mutually opposite directions and into engagement with the first and second roof penetrating structures.

[0009] Furthermore, the presence of the first and second protrusions makes it possible to provide protection of the parts of the roof penetrating structures interacting with the flashing member. This is particularly advantageous in such roof penetrating structures which comprise roof windows with interface units to interact with the engagement sections of the flashing member.

[0010] Finally, the first and second protrusions facilitate not only mounting, but also removal; during mounting, the installer may either push the protrusions manually, or by a suitable tool such as a hammer to move the flashing member into place. Conversely, in case it is desired to remove the flashing member, the protrusions may be moved in the direction towards each other, either manually or by means of a suitable tool such as a spatula.

[0011] The term "a first plane" is configured to encompass any plane extending between an upper surface and a lower surface of the connecting section.

[0012] In one embodiment, the first and second engagement sections substantially coincide with the first plane. By forming the first and second engagement sections not only flat but also substantially coinciding with the first plane, the connection between the flashing member and the first and second roof penetrating structures is substantially flush with the gutter formed between the first and second protrusions.

[0013] The term "substantially coincide" is configured to encompass marginal variations between the levels; for instance differences in the levels in the range of 1 to 5 mm.

[0014] In some embodiments the first protrusion and the second protrusion are projecting perpendicularly away from the first plane. Thereby the protrusions provide a hold for an operator to apply a force in either direction, i.e. towards the respective structure or away from the respective structure.

[0015] In some embodiments the connecting section comprises a first part and a second part, wherein the first part is configured to be slidably displaceable in relation to the second part. The first part and the second part allow the flashing member to expand in the width dimension as the two parts move in relation to each other in a mechanically simple yet reliable manner.

[0016] In some embodiments the first part comprises a first engagement portion, and the second part comprises a second engagement portion, wherein the first engagement portion and the second engagement portion are configured to engage each other to prevent the first part and the second part to come apart.

[0017] In a further development of the above-mentioned embodiments, the first part comprises a first leg portion and a second leg portion forming a pocket between them, and the second part comprises a leg portion insertable into said pocket to form a telescopic joint. This provides for a reliable joints between the two parts of the flashing member, which is nevertheless fully adjustable between a maximum and a minimum width.

[0018] In an alternative embodiment the connecting section comprises a corrugated part. The corrugated part allows the flashing member to expand in the width direction and therefore be inserted in shallow gaps where it is then expanded to flash those gaps. This embodiment has the advantage that the flashing member may be provided as an integral part, thus eliminating any risk of parts disassembling during transportation and/or handling.

[0019] In a second aspect, the invention also relates to a roof structure comprising a first roof window, a second roof window and a flashing member according to any previous embodiment, wherein the flashing member is installed between the first roof window and the second roof window.

[0020] In a third aspect of the invention, a method of adapting a flashing member is provided.

[0021] The method facilitates the flashing of a gap between two roof penetrating structures that are placed close to the exterior side of the roof, and therefore may have a shallow gap between them.

[0022] Other presently preferred embodiments and further advantages will be apparent from the subsequent detailed description and drawings.

[0023] A feature described in relation to one of the aspects may also be incorporated in the other aspect, and the advantage of the feature is applicable to all aspects in which it is incorporated.

Brief Description of Drawings

[0024] In the following description embodiments of the invention will be described with reference to the schematic drawings, in which

Fig. 1A is a cross-sectional view of a flashing member in an embodiment of the invention, in a position during installation between adjacent roof penetrating structures.

Fig. 1B is a cross-sectional view of the flashing member of Fig. 1A in another position during installation between the roof penetrating structures.

Fig. 1C is a cross-sectional view of the flashing member of Figs. 1A and 1B in an expanded state, in a mounted condition in which the flashing member is positioned between the adjacent roof penetrating structures.

Fig. 2A is a cross-sectional view of a flashing member in another embodiment of the invention, in a position during installation between adjacent roof penetrating structures.

Fig. 2B is a cross-sectional view of the flashing member of Fig. 2A in another position during installation between the roof penetrating structures.

Fig. 2C is a cross-sectional view of the flashing member of Figs. 2A and 2B in an expanded state, in a mounted condition in which the flashing member is positioned between adjacent roof penetrating structures.

Fig. 3 is a perspective and cross-sectional view of a flashing member in an embodiment of the flashing member with two parts.

Fig. 4 is a perspective and cross-sectional view of a flashing member in a further embodiment of the flashing member with a corrugated part.

Fig. 5 is a perspective and cross-sectional view of a roof structure comprising a first roof window, a sec-

ond roof window and a flashing member in an embodiment of the invention.

Fig. 6 is an exploded perspective view of the flashing member in the embodiment of Fig. 3.

Fig. 7 is an end view of the flashing member of Fig. 6 in one engaged position.

Fig. 8 is an end view of the flashing member of Fig. 6 in another engaged position.

Fig. 9 is a perspective view of a roof structure with four roof penetrating structures, during a step of installation.

Fig. 10 is a partial perspective views of the lower two roof penetrating roof structures of Fig. 9, during a further step of installation.

Figs. 11A and 11B are perspective views of a second part of a flashing member in alternative embodiments.

Fig. 12 is a perspective views of a first part and a second part of a two-part flashing member during assembly.

Fig. 13 is a perspective view of the two-part flashing member of Fig. 12 in an assembled condition.

Fig. 14 is a perspective view of the roof structure of Fig. 9 during engagement of the two-part flashing member of Fig. 13 in an installation step.

Figs. 15A and 15B are partial perspective views showing respective positions of the first part and the second part during adjustment of the mutual position in an installation step.

Fig. 16 is a partial perspective view of the roof structure of Fig. 14 in a further installation step.

Fig. 17 is a partial side sectional view showing the roof structure of Fig. 14 in a still further installation step.

Figs. 18A and 18B are partial perspective views of a flashing member in yet further installation step.

Detailed Description

[0025] In the following a detailed description of embodiments of the invention will be given with reference to the accompanying drawings. Starting out with Fig. 1A an embodiment of a flashing member 1 configured for covering a gap between a first roof penetrating structure 100 and a second roof penetrating structure 200 is shown. The roof penetrating structures 100, 200 may as indicated be represented by interface units of respective side members of stationary frames representing roof windows mounted adjacent to each other, side-by-side, in a sloped roof structure (not shown).

[0026] The flashing member 1 is situated above the roof penetrating structures 100, 200, i.e. on a level further to the exterior than the roof penetrating structures 100, 200. The flashing member 1 comprises a first engagement section 13 and a second engagement section 23, both the first engagement section 13 and the second engagement section 23 are configured to be received in flashing reception grooves 102, 202 of the roof penetrat-

ing structures 100, 200. The flashing reception grooves may extend along a whole side of the roof penetrating structures 100, 200. The first and second engagement sections 13, 23 are connected by a connecting section 2.

The connecting section 2 defines a first plane P1 generally extending between an upper surface 2a and a lower surface 2b of the connecting section 2.

[0027] The flashing member 1 is expandable in its width dimension. The connecting section 2 is configured to be variable in its width and thereby cause the flashing member 1 to be expandable. The width dimension may be understood as the dimension extending from left to right in the Figs. 1A - 1C and 2A - 2C.

[0028] In the embodiment of Figs. 1A to 1C, the connecting section 2 comprises a first part 10 and a second part 20. The first part 10 is formed such that it is slidably displaceable in relation to the second part 20. The first part 10 therefore so to say receives the second part 20 as will be described in further detail in the following.

[0029] The first part 10 and the second part 20 is in the embodiments shown each formed as a generally longitudinally extending profile element, having a length direction which in the installation situations to be described in the following is parallel to a slope direction D of the roof structure and extending into the plane of the drawing in Fig. 1.

[0030] As will be described in further detail below in connection with Fig. 3, the upper surface 2a of the connecting section 2 is formed on a first leg portion of the first part 10 of the flashing member 1 whereas the lower surface 2b is formed on a second leg portion of the first part 10, thereby delimiting a slit-shaped pocket in which the second part 20 is insertable by a leg portion and slidable so as to provide the adjustability of the flashing member 1 aimed at.

[0031] Also shown in Fig. 1A is a part of a roof structure 500 which may limit the depth of the flashing member 1 in an installed state.

[0032] The first roof penetrating structure 100 and the second roof penetrating structure 200 may be roof windows, but other structures such as solar panels etc. are conceivable as well.

[0033] The flashing member 1 further comprises a first protrusion 11 and a second protrusion 21. The first protrusion 11 is situated between the first engagement portion 13 and the connecting section 2. The second protrusion 21 is situated between the second engagement portion 23 and the connecting section 2. In the case that the gap of two adjacent roof penetrating structures is to be flashed, the flashing member 1 is inserted in the gap between the first roof penetrating structure 100 and the second roof penetrating structure 200.

[0034] In Fig. 1A, the flashing member 1 is shown in an assembled, but not yet expanded position. This position may for instance correspond to a supply condition of the flashing member 1.

[0035] The flashing member 1 can be inserted from the top in the gap as its width is smaller than the width of the

gap. The embodiment of a flashing member 1 inserted in the gap can be seen in Fig. 1B, in which the flashing member 1 assumes an intermediate position, i.e. it is located within the gap between the roof penetrating structures 100, 200 and is ready to be connected to the flashing reception grooves 102, 202.

[0036] Once the flashing member 1 has been inserted into the gap and is thus located in the appropriate height relative to the roof penetrating structures 100, 200, applying a force in the direction F2 to the exposed first protrusion 11 inserts the first engagement section 13 into the first flashing reception groove 102. An oppositely directed force in direction F3 expands the connecting section 2 in the width direction and inserts the second engagement section 23 into the second flashing reception groove 202. The expanded flashing member 1, with the first and second engagement sections 13, 23 inserted in the flashing reception grooves 102, 202, is shown in a cross-section in FIG 1C. The flashing member 1 now assumes a position corresponding to a mounted condition of the flashing member 1.

[0037] To prevent the first and the second parts 10, 20 from coming apart for instance in the supply condition, but also in the mounted condition, thereby compromising the weatherproofing of the flashing member 1, the first part 10 comprises a first engagement portion 12, and the second part 20 comprises a second engagement portion 22. These engagement portions 12, 22 may be formed as folded portions that engage each other to prevent an expansion beyond what would risk the weatherproofing of the flashing member 1. For instance, the first part 10 and the second part 20 may be made of a sheet material substantially as shown in Figs. 1A - 1C.

[0038] The flashing member 1 as a whole may be made from a sheet material that is formed by parallel folded portions, or bends. In particular the first and second protrusions 11, 21 and first and second engagement portions 12, 22 may be formed by bending a sheet-like material such as a sheet metal. However, the flashing member 1 could in principle be formed by extrusion, such as is indicated in the embodiment of Figs. 1A - 1C.

[0039] In Fig. 2A an alternative embodiment of the flashing member 1 is shown, in which the connecting section 2 comprises a corrugated part 30 that is configured to be stretched out to provide the variable width to the flashing member 1. The corrugated part 30 may be formed such that it does not increase the depth of the flashing member 1 substantially below the first and second engagement section. That means that almost all of the corrugated part 30 may be located above the first and second engagement sections 13, 23. This is important as it allows the flashing member 1 to flash a shallow gap, otherwise the corrugated part could collide with a roof structure. Thus, the flashing member 1 may be said to have a non-protruding property. In a preferred embodiment, the flashing member 1 may not protrude towards the roof in an installed state more than 30 mm. Thus, the flashing member can be used to flash the gap between

roof penetrating structures that are installed low in relation to the roof and span over parts of the roof structure 500 that are high up in the roof structure, i.e. towards the exterior surface of the roof, for example a roof rafter, without having to modify such roof structures. The first plane may be defined as the plane incorporating all lower creases of the corrugated section 30.

[0040] The first flashing reception groove 102 of the first roof penetrating structure 100 may as shown comprise first sealing protrusions 101 configured to make sealing contact with the first engagement section 13. The same may apply mutatis mutandis to the second flashing reception groove 202, which in the embodiment shown comprises second sealing protrusions 201.

[0041] The first protrusion 11 and the second protrusion 21 may be extending from the first plane by a distance of at least 15 mm. This may facilitate the use of the protrusions to push the engagement sections in or out of the flashing reception groove. The height of the protrusions 11, 21 helps them receiving the force that may be exerted on them by a hand, or a tool suitable for exerting a force on such structure, for example a mallet or hammer. The height of the protrusions may be beneficial as each protrusion 11, 21 covers the upper half of the respective flashing reception groove 102, 202 and thereby shields the sealing protrusions 101, 201 against radiation from the sun, wind, rain, dust, or dirt.

[0042] In the following, a method of installing a flashing member 1 for covering the gap between a first roof penetrating structure and a second roof penetrating structure will be described in some detail.

[0043] The method will be described with particular reference to the embodiments described in the above and shown in Figs. 1A - 1C and 2A - 2C in connection with the first roof penetrating structure 100 and the second roof penetrating structure 200.

[0044] A first step comprises inserting the flashing member 1 between the first roof penetrating structure 100 and the second roof penetrating structure 200. Arrow F1 indicates the movement of the flashing member that is necessary to place the flashing member 1 in the gap. Thereafter, the flashing member 1 can be expanded in the force directions indicated by F2, F3. For simplicity, the process is described for the first engagement section 13, but mutatis mutandis it applies to the second engagement section 23 as well. At first, the protrusion 11 is moved towards the first roof penetrating structure 100, and the first engagement section 13 is inserted in the first flashing reception groove 102, where it is held by the sealing protrusions 101. Thereafter, the second protrusion 21 is moved towards the direction of the second roof penetrating structure 200 and the second engagement section 23 is inserted in the second flashing reception groove 202, where the second engagement section 23 is held by the second sealing protrusions 201. This step also expands the flashing member 1 and closes the gap that was between the first and second roof penetrating structure 100, 200. Alternatively, the first and second

protrusion may be moved simultaneously towards the first and second flashing reception groove respectively, achieving the same expansion and closure of the gap. Even other combinations of movement patterns are conceivable.

[0045] By the configuration of the flashing member 1 according to the invention, it may further be possible to include a step of disengaging the flashing member 1 from the first and second roof penetrating structures 100, 200 by pulling the first engagement section 13 out of the first flashing reception groove 102 by applying a force onto the first protrusion 11. In case it is necessary to remove the flashing member from the gap when in an installed state, for example when a part of the roof underneath the flashing member needs to be accessed, this is a major advantage. To do that a spatula-like object may be wedged into a space between the first protrusion 11 and the first roof penetrating structure 100. This allows the user to apply a force that is pulling the first engagement section out of the first flashing reception groove 102.

[0046] In the following, two further embodiments will be described with reference to Figs. 3 and 4 which show the flashing member 1 in an inclined position indicating an exemplary position to be assumed by the flashing member 1 in the mounted condition between two adjacent roof penetrating structures (not shown). Elements having the same or analogous function as in the above embodiments shown in Figs. 1 and 2 are denoted by the same reference numerals throughout. Only differences to these embodiments will be described in detail.

[0047] In Fig. 3 an embodiment of the flashing member 1 is shown which corresponds to the embodiment of Figs. 1A - 1C in that the flashing member 1 is a two-part flashing member comprising first part 10 and second part 20. Both the first and second parts 10, 20 are in the embodiment shown formed by folding a sheet material such as a suitable metal material with bends to form the first part 10 and the second part 20 as follows.

[0048] The first part 10 comprises a first leg portion 10a and a second leg portion 10b forming a pocket 10c between them. The first leg portion 10a is formed by folding the material upon itself to form a double-walled structure. The second leg portion 10b is located with a gap relative to the lower wall of the first leg portion 10a such that the pocket 10c formed is substantially slit-shaped. At the free end edge of the second leg portion 10b, the first engagement portion 12 is formed, here as a flange formed by being bent back by an angle of more than 90 degrees and less than 180 degrees relative to the second leg portion 10b.

[0049] The second part 20 comprises a leg portion 20a insertable into the pocket 10c of the first part 10 to form a telescopic joint. The free end of the leg portion 20a comprises the second engagement portion 22, here formed as a flange formed by being bent back by an angle of more than 90 degrees and less than 180 degrees relative to the leg portion 20a.

[0050] Also indicated in Fig. 3 are general directions: Slope direction D, width direction W and height direction H.

[0051] It is noted that for the second engagement section 23 to coincide with the plane of the first engagement section 13, the bend that is connecting the second engagement section 23 with the second protrusion 21 has a different height from the bend connecting the second protrusion 21 with the leg portion 20a. This compensates for the fact that the second part 20 is partly located below the first part 10, partly above, thus allowing the insertion of the leg portion 20a of the second part 20 into the slit-shaped pocket 10c formed in the first part 10 in the width direction W. Thus, in a configuration in which the roof penetrating structures 100, 200 are at the same height, the engagement sections 13, 23 are parallel to the roofing and substantially located in the same plane in the height direction H, which may be beneficial in creating a tight seal with the sealing protrusions 101, 201 of the roof penetrating structures 100, 200.

[0052] In Fig. 4 an embodiment of a flashing member 1 is shown that has a corrugated part 30, and that corrugated part in Fig. 4 is located at the same height or above the engagement sections 13, 23 and thereby allows to flash shallow gaps between the roof penetrating structures 100, 200.

[0053] Turning now to Fig. 5, the flashing member 1 of the embodiment of Fig. 3 is shown in its mounted condition between two adjacent roof penetrating structures in the form of roof windows 100, 200.

[0054] The configuration of such roof windows is described in more detail in Applicant's published international application WO 2023/186250 A1, including an interface unit which forms the point of interaction with a flashing assembly of a single, isolated roof window.

[0055] As shown in Fig. 5, the first engagement portion 13 of the first part 10 of the flashing member 1 is inserted into the first flashing reception groove 102 of an interface unit of the left-hand roof window 100 and the second engagement portion 23 of the second part 20 is inserted into the second flashing reception groove 202 of an interface unit of the right-hand roof window 200. The first protrusion 11 has been pushed into engagement with the interface unit of the left-hand roof window 100 and correspondingly the second protrusion 21 into engagement with the interface unit of the right-hand roof window 200 such that watertightness is ensured, just as the respective protrusions 11, 22 protect the interface units from the surroundings by partly or entirely covering the openings into the flashing reception grooves 102, 202.

[0056] The interaction between the first part 10 and the second part 20 of the two-part flashing member 1 of the embodiment of Fig. 3 is shown in more detail with particular reference to Figs. 6 to 8:

During assembly of the flashing member 1, the second part 20 is introduced by its leg portion 20a including the second engagement portion 22 into the pocket 10c formed between the first leg portion 10a and the second

leg portion 10b of the first part 10. At the point of passage of the second engagement portion 22 over the first engagement portion 12, one or both of the first and second parts 10, 20 yield(s) to allow the engagement.

[0057] Once brought into engagement, the mutual position between the first and second parts 10, 20 is adjusted as desired.

[0058] In the position shown in Fig. 7, a maximum measure Dmax of the distance between the first and second protrusions 11, 12 is indicated. As shown, the first engagement portion 12 is in engagement with the second engagement portion 22, thus preventing the first and second parts 10, 20 from separating.

[0059] In the position shown in Fig. 8, a minimum measure Dmin is indicated. In this position, the leg portion 20a of the second part 20 has been inserted into the pocket 10c to its full extent.

[0060] Turning now to Figs. 9 to 18B, further aspects of the invention will be described in some detail with reference to a roof structure comprising four roof penetrating structures 100, 200, 300, 400. Elements having the same or analogous function as in the embodiments described in the above carry the same reference numerals.

[0061] The two lowermost roof penetrating structures 100, 200 as seen in the slope direction D are each provided with a bottom flashing member 144, 244 forming part of a flashing assembly.

[0062] Further components of the flashing assembly comprise a set of parts to form a two-part flashing member 1 of the type described with reference to Figs 1-8. Depending on the spacing between pairs of neighbouring roof penetrating structures 100, 200 and 300, 400, respectively, in the width direction W, two different second parts 20 and 20' is selected as indicated in Figs. 11A and 11B.

[0063] A first part 10 is provided, shown in Fig. 12. The first part 10 is formed with a first leg portion and a second leg portion forming a pocket between them (not indicated in detail) substantially as shown in Figs. 7 and 8. Furthermore, the first part 10 comprises a first protrusion 11 (cf. Fig. 17).

[0064] It is noted that in contrast to the embodiments of the parts of the flashing member of the embodiments shown in Figs. 1 to 8, the first and second parts 10, 20; 20' shown in Figs. 11A to 18B do not comprise respective flat engagement sections in parallel with the first plane P. However, the principles presently described are universally applicable to flashing members with and without such flat engagement sections.

[0065] In order to improve the installation conditions even further, the flashing assembly is provided with holding means. The holding means may be temporary to provide a provisional hold in an installation step, or form part of the permanent structure securing the flashing assembly to the roof penetrating structure(s) or the roof structure.

[0066] The holding means ensure that flashing members to be positioned between neighbouring roof pene-

trating structures with the length direction of the flashing member in parallel with the slope direction.

[0067] The holding means may be positive or non-positive.

[0068] The term "positive engagement" (German: formschlüssig) is to be interpreted as encompassing mechanical coupling of two otherwise separate components such that the design and geometry of the components prevent the coupling from being released unintentionally by forces to which the components are subjected during use, including in particular such mechanical couplings in which mutually complementary shapes of the respective components fit together in the engaged position, and in which intentional movement of at least one of the components out of the engaged position is required, typically involving at least partial movement of part(s) of one or both components in a direction at an angle to the intended movement. In other words, the term positive engagement is to be understood as any form of form-locking coupling in which the shapes or geometrical forms of two components interlock with each other in such a way that they create an engagement preventing disengagement until intentional release is carried out by an active or conscious action by a user.

[0069] As opposed hereto, "non-positive engagement" (German: kraftschlüssig) involves such engagement which only requires a force in the direction of intended movement to obtain release. A non-exhaustive list of examples of non-positive engagement means include frictional connections, magnetic connections, "soft" snap connections, etc. in which the engagement between the components is enabled by means of forces mainly in the tangential direction rather than the normal direction.

[0070] The holding means may be placed on any flashing member of the flashing assembly.

[0071] The holding means may comprise a substantially planar lug extending in a plane substantially parallel to any plane spanned by portions of a flashing member. The planar lug may be formed to extend in the plane spanned by the height direction H and slope direction D of a flashing member.

[0072] Such planar lug or lugs may be formed to protrude from the flashing member.

[0073] The shape of each planar lug may be chosen arbitrarily to conform to manufacturing, transportation, or installation requirements.

[0074] Each planar lug may be foldable about a folding line substantially parallel to the height direction H or slope direction D.

[0075] In the embodiment shown in more detail in Figs. 16 and 17, a substantially planar lug 14 is formed on the bottom flashing member 144 of the first roof penetrating structure 100.

[0076] The planar lug 14 here has a trapezoidal shape and protrudes from a perpendicular flange of the bottom flashing member 144 to extend in the plane spanned by the height direction H and the slope direction D.

[0077] The planar lug 14 is configured to be foldable

about a folding line substantially parallel to the slope direction D to abut the first protrusion 11 of the first part 10 of the flashing member 1 in a mounted condition of the flashing assembly.

[0078] Thus, in the mounted condition the trapezoidal lug 14 assumes a folded-back position substantially in parallel with its original plane and acts as a force-locking engagement means in hindering the flashing member 1 from sliding along the sloping roof by frictional forces.

[0079] The engagement may be reinforced by clamping the trapezoidal lug 14 manually, possibly by means of a suitable tool.

[0080] In the embodiment shown in more detail in Figs. 18A and 18B, a substantially planar lug 15 is formed on the first protrusion 11 of the first part 10 of the flashing member 1.

[0081] The planar lug 15 has a rectangular shape and protrudes from the first protrusion 11 to extend in the planned spanned by the height direction H and the slope direction D.

[0082] The planar lug 15 is configured to be foldable about a folding line substantially parallel to the height direction H to a position at right angles with its original plane to be brought into abutment with a portion of the first roof penetrating structure 100, typically at a corner of the stationary frame of a roof window, or at a portion of any insulation frame mounted to the frame. In this way, the rectangular lug 15 provides a form-locking engagement with the first roof penetrating structure 100, thus improving the retention of the flashing member 1 even further.

List of Reference Numerals

[0083]

1	flashing member
2	connecting section
	2a upper surface
	2b lower surface
10	first part
	10a first leg portion
	10b second leg portion
	10c pocket
11	first protrusion
12	first engagement portion
13	first engagement section
14	trapezoid lug
15	rectangular lug
20	second part
	20a leg portion
20'	second part (alternative embodiment)
21	second protrusion
22	second engagement portion

23	second engagement section
30	corrugated part
100	first roof penetrating structure
101	first sealing protrusions
5 102	first flashing reception groove
144	bottom flashing member
200	second roof penetrating structure
201	second sealing protrusions
202	second flashing reception groove
10 244	bottom flashing member
300	third roof penetrating structure
400	fourth roof penetrating structure
500	roof structure
15 F1	direction indicator
F2	direction indicator
F3	direction indicator
P1	first plane
20 D	slope direction
W	width direction
H	height direction

Dmax	maximum measure
25 Dmin	minimum measure

Claims

1. A flashing member (1) for covering a gap between a first roof penetrating structure (100) and a second roof penetrating structure (200), the flashing member (1) comprising a first engagement section (13) configured for engagement with the first roof penetrating structure (100), a second engagement section (23) configured for engagement with the second roof penetrating structure (200), and a connecting section (2) extending between the first engagement section (13) and the second engagement section (23), the connecting section (2) defining a first plane (P1), **characterised in that** the width of the connecting section (2) is variable, that the flashing member (1) further comprises a first protrusion (11) and a second protrusion (21) both projecting away from the first plane (P1), and that the first engagement section (13) and the second engagement section (23) are substantially flat and extending in parallel to the first plane.
2. A flashing member (1) according to claim 1, wherein the first and second engagement sections (13, 23) substantially coincide with the first plane (P1).
3. A flashing member according to claim 1 or 2, wherein the first protrusion (11) and the second protrusion (21) are projecting perpendicularly away from the first plane (P1).
4. A flashing member according to any one of the

preceding claims, wherein the connecting section (2) comprises a first part (10) and a second part (20), and wherein the first part (10) is slidably displaceable in relation to the second part (20) along the first plane (P1).

5. A flashing member according to claim 4, wherein the first part (10) comprises a first engagement portion (12), and the second part (20) comprises a second engagement portion (22), and wherein the first engagement portion (12) and the second engagement portion (22) are configured to engage each other to prevent the first part (10) and the second part (20) from coming apart.
6. A flashing member according to any one of claims 4 or 5, wherein the first part (10) comprises a first leg portion (10a) and a second leg portion (10b) forming a pocket (10c) between them, and wherein the second part (20) comprises a leg portion (20a) insertable into said pocket (10c) to form a telescopic joint.
7. A flashing member according to any one of claims 1 to 5, wherein the connecting section (2) comprises a corrugated part (30).
8. A flashing member (1) according to any one of the preceding claims, wherein the first protrusion (11) protrudes from the connecting section (2) by at least 15 mm, and the second protrusion (21) protrudes from the connecting section (2) by at least 15 mm.
9. A flashing member (1) according to any one of the preceding claims, wherein a flashing reception groove (102) of the first roof penetrating structure (100) comprises first sealing protrusions (101) configured to make sealing contact with the first engagement section (13).
10. A roof structure comprising a first roof window, a second roof window and a flashing member (1) according to any one of the preceding claims, wherein the flashing member (1) is installed between the first roof window and the second roof window, said first roof window constituting the first roof penetrating structure (100) and said second roof window constituting the second roof penetrating structure (200).
11. A method of adapting a flashing member (1) configured for covering a gap between a first roof penetrating structure (100) and a second roof penetrating structure (200), said flashing member (1) comprising a first engagement section (13) configured for engagement with the first roof penetrating structure (100) and a second engagement section configured for engagement with the second roof penetrating structure (200), said flashing member being placed between the first roof penetrating structure and the

second roof penetrating structure, with a connecting section (2) extending between the first engagement section (13) and the second engagement section (23), the connecting section (2) defining a first plane (P1), **characterised in that** said method comprises changing the width of the connecting section in a width direction by applying a force onto a first protrusion (11) in a first force direction (F2), and applying a force onto a second protrusion (21) in a second force direction (F3), said first protrusion (11) and said second protrusion (21) both projecting away from the first plane (P1), and said second force direction being opposite to the first force direction.

12. A method according to claim 11, where the first force direction is towards the first roof penetrating structure (100) and the second force direction is towards the second roof penetrating structure (200), so that the first engagement section (13) engages with the first roof penetrating structure and the second engagement section engages with the second roof penetrating structure.
13. A method according to claim 11, comprising the further step of disengaging the flashing member (1) from the roof penetrating structures (100, 200) where the first force direction is towards the second roof penetrating structure (100) and the second force direction is towards the first roof penetrating structure (200), so that the first engagement section (13) disengages from the first roof penetrating structure and the second engagement section disengages from the second roof penetrating structure.
14. A method according to 12, where the first engagement section (13) is inserted into a first flashing reception groove (102) and where the second engagement section (23) is inserted into a second flashing reception groove (202).
15. A method according to 13, where the first engagement section (13) is pulled out of a first flashing reception groove (102) and where the second engagement section (23) is pulled out of a second flashing reception groove (202).

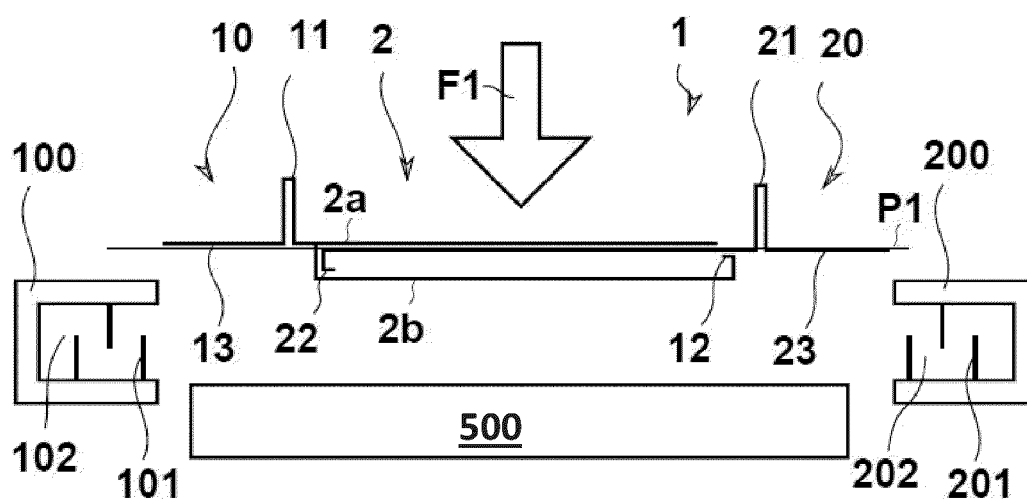


Fig. 1A

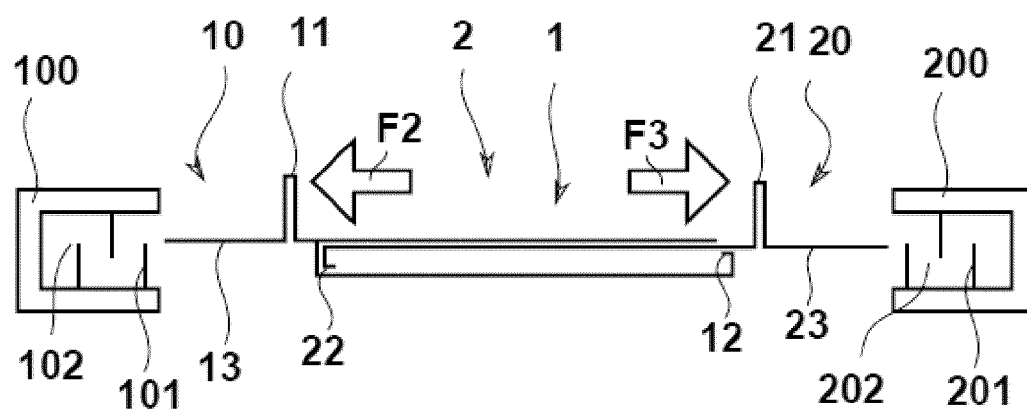


Fig. 1B

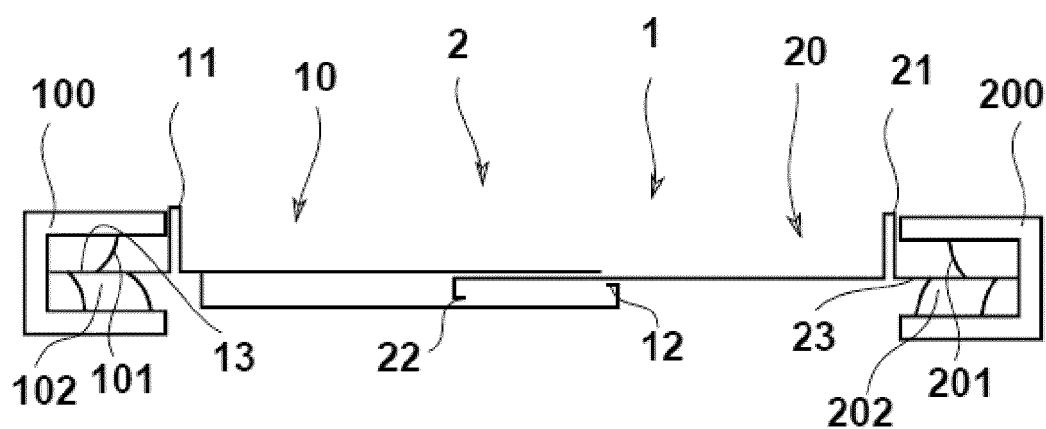


Fig. 1C

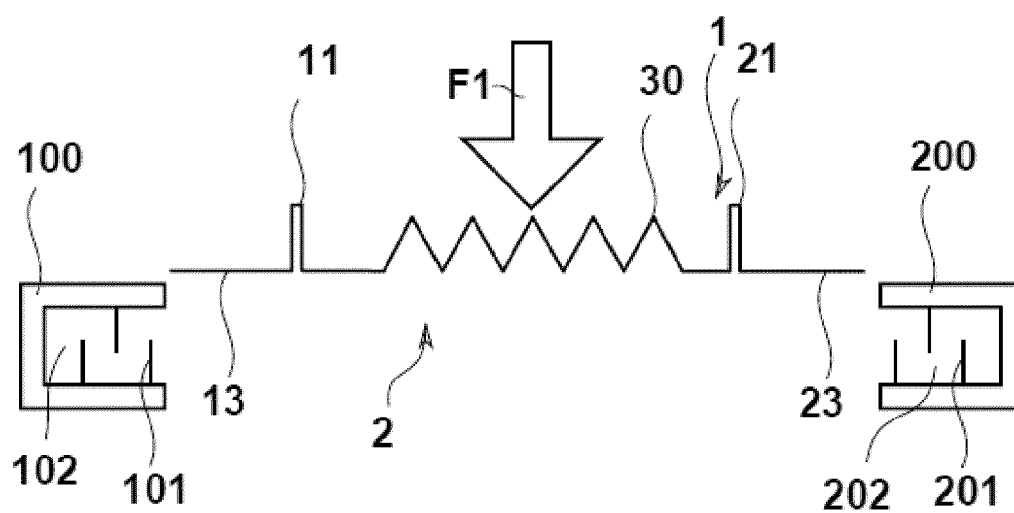


Fig. 2A

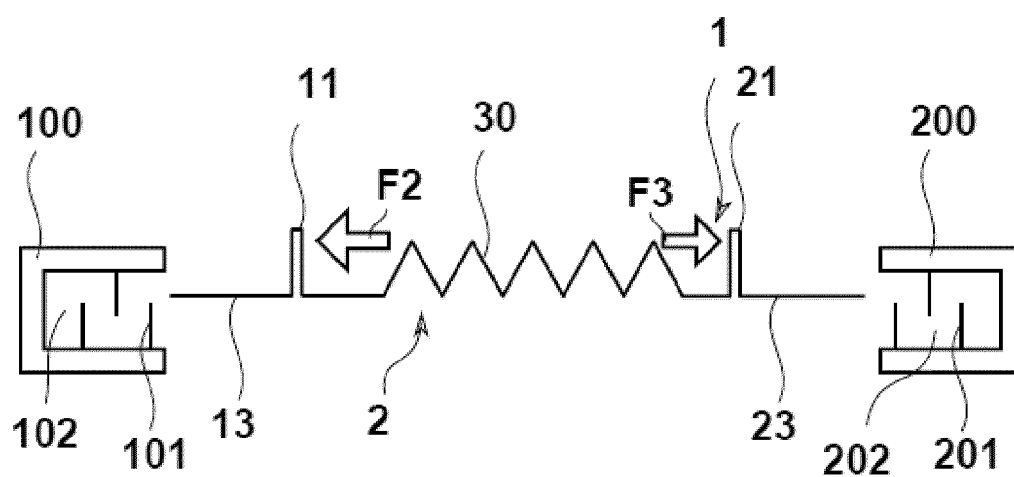


Fig. 2B

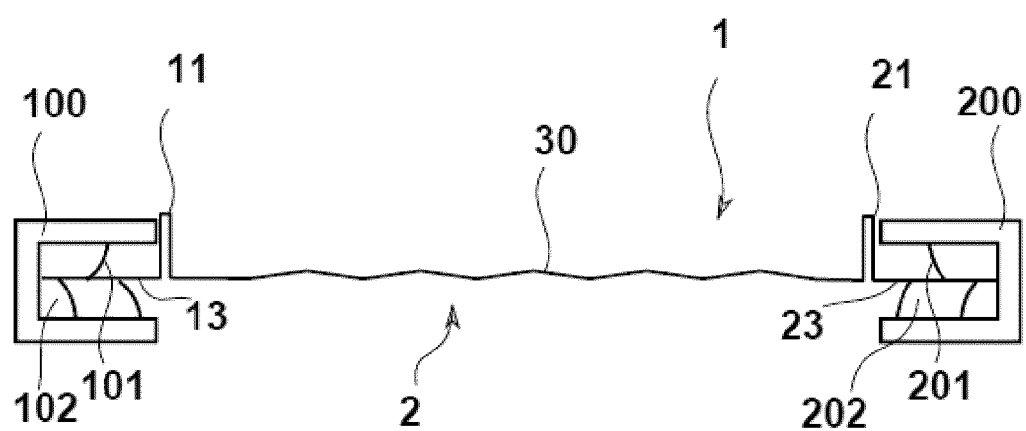
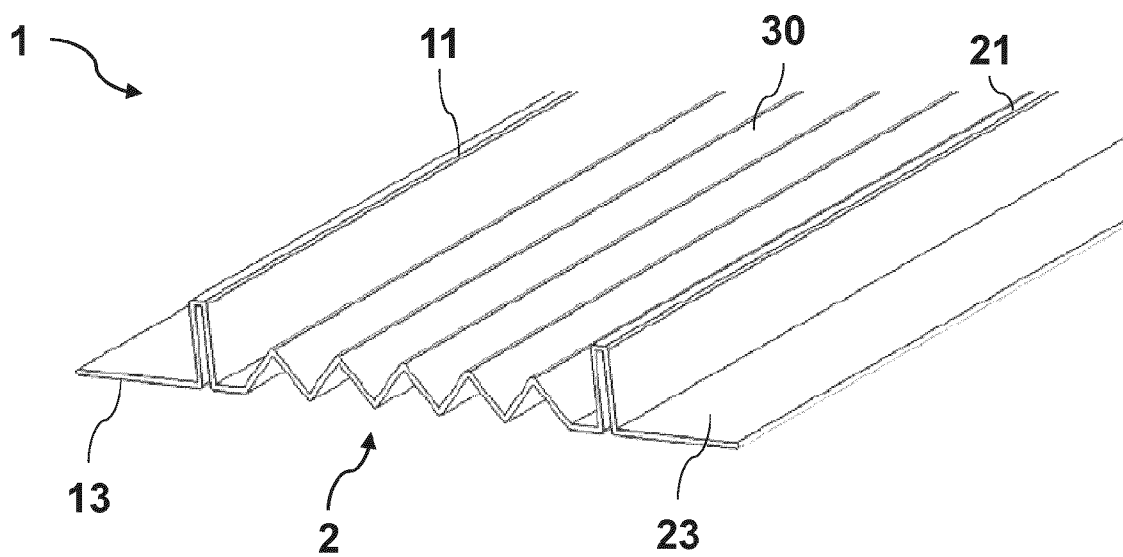
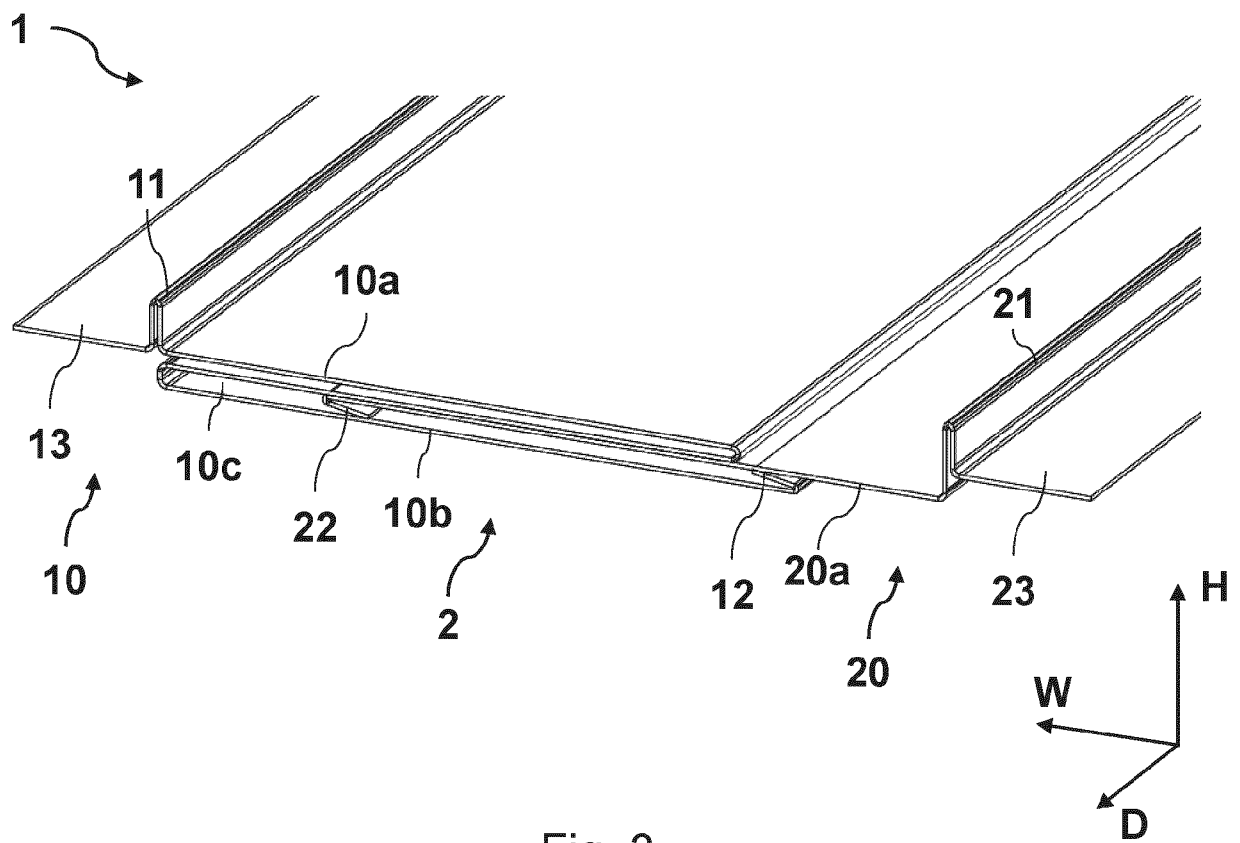


Fig. 2C



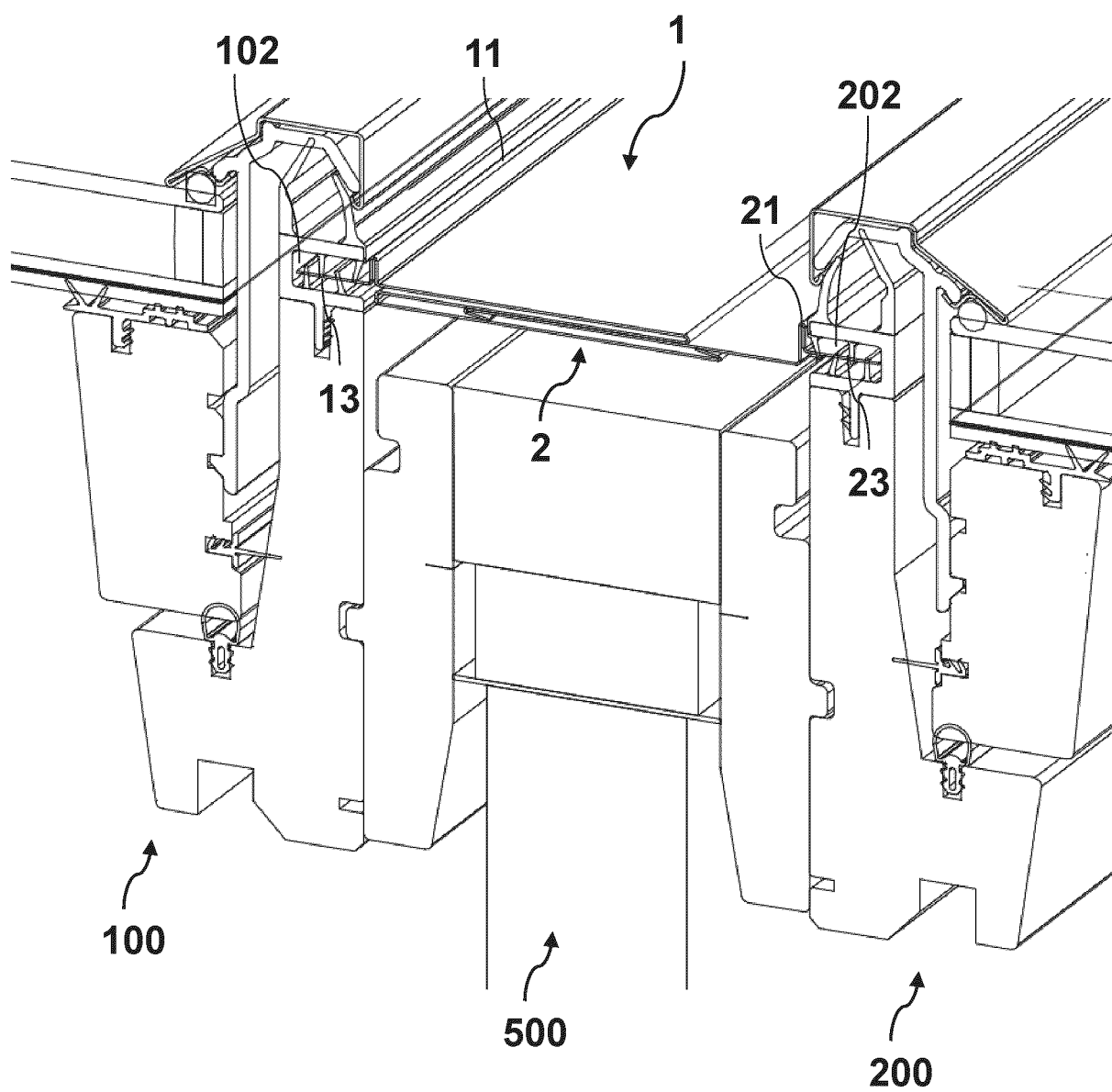


Fig. 5

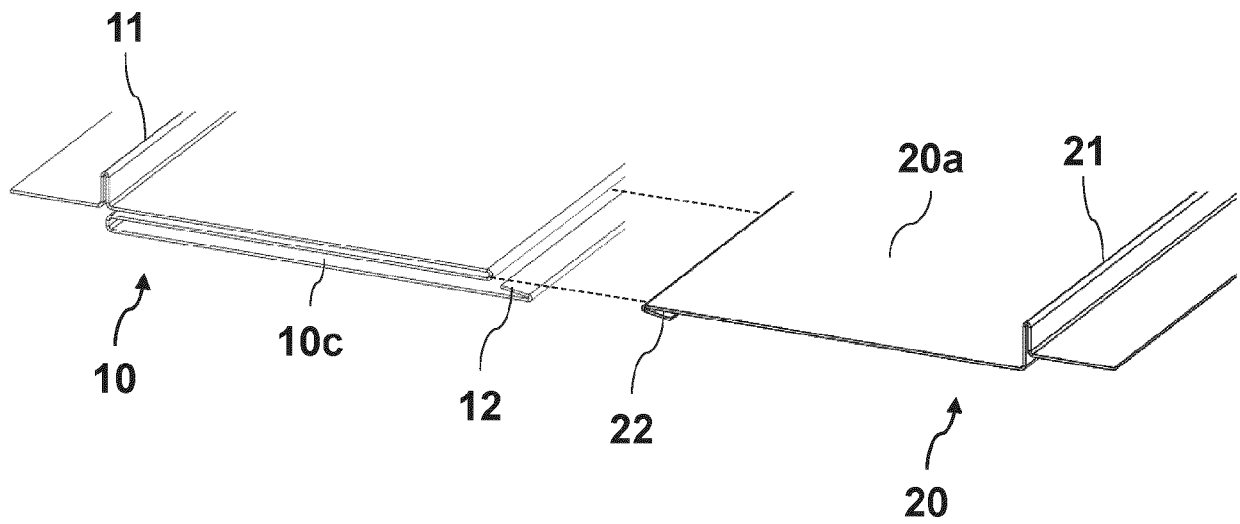


Fig. 6

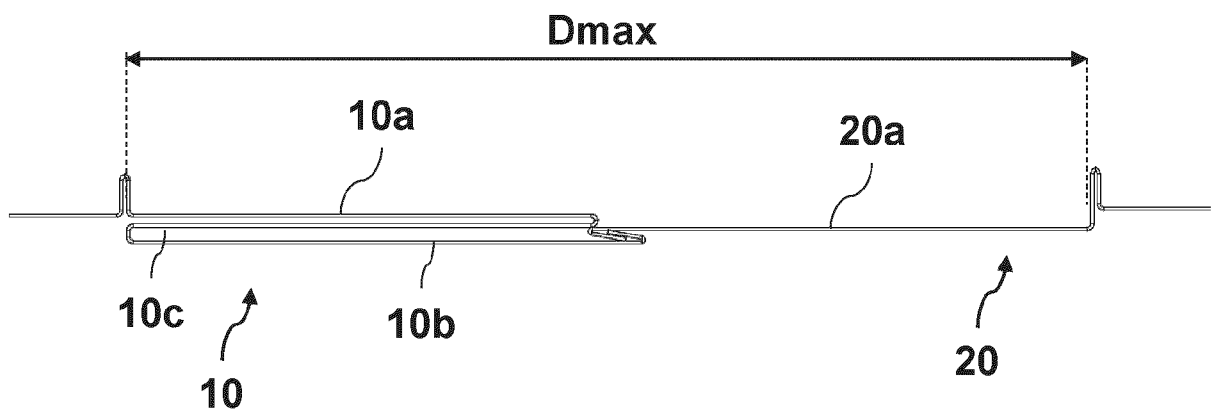


Fig. 7

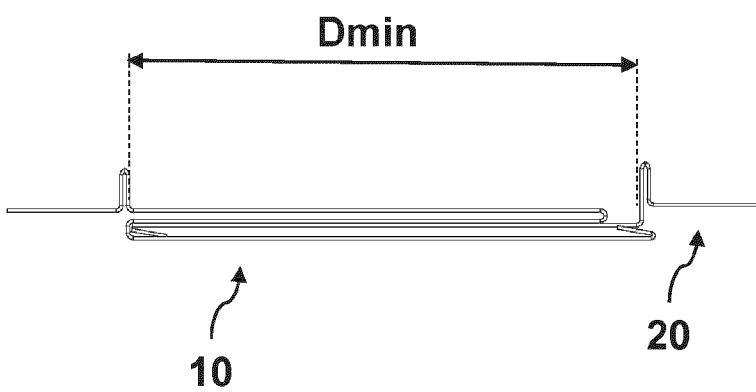


Fig. 8

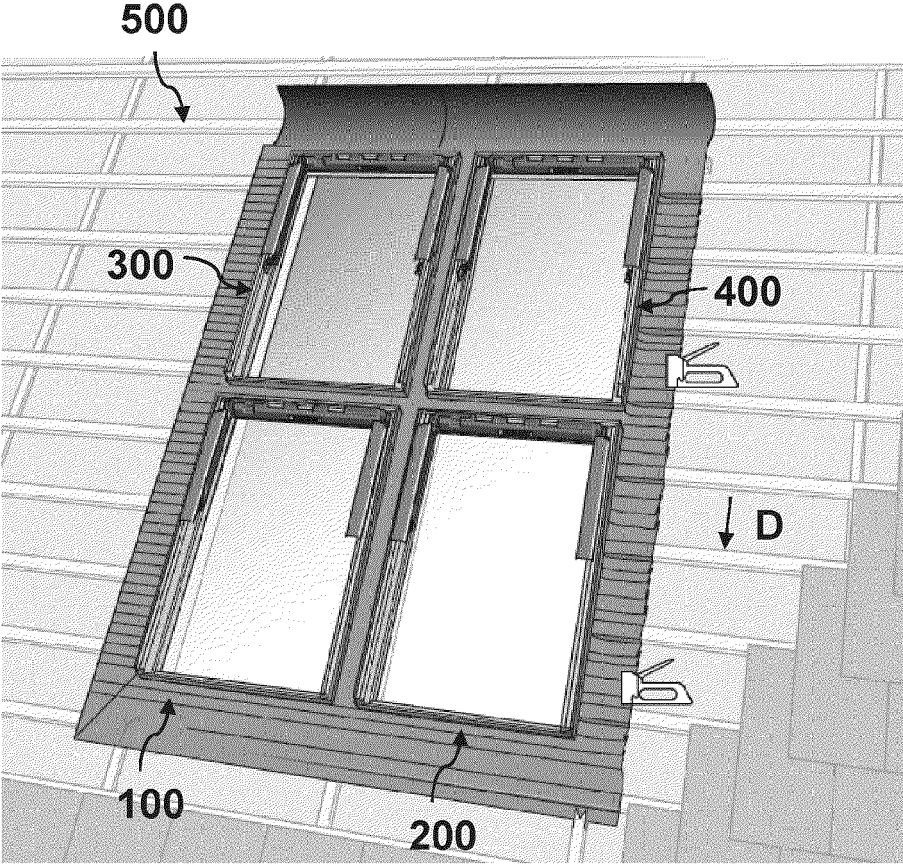


Fig. 9

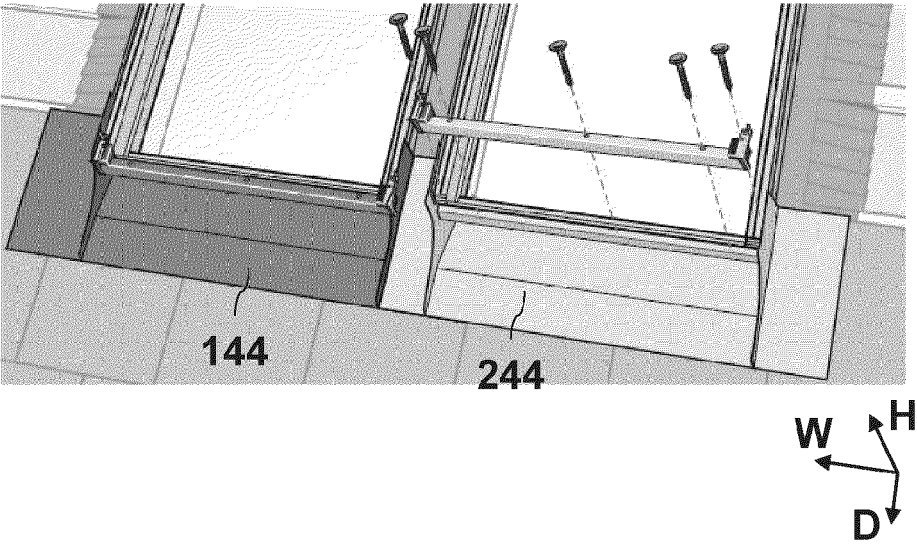


Fig. 10

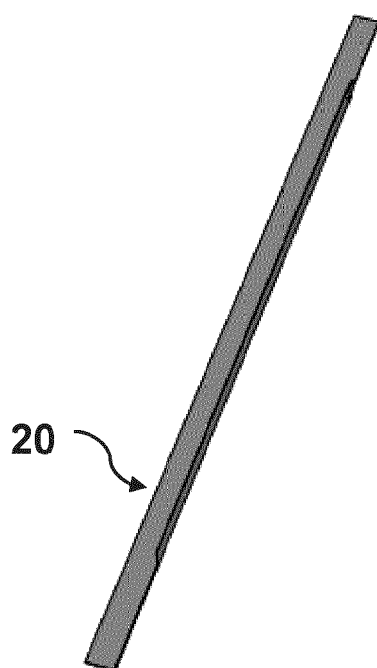


Fig. 11A

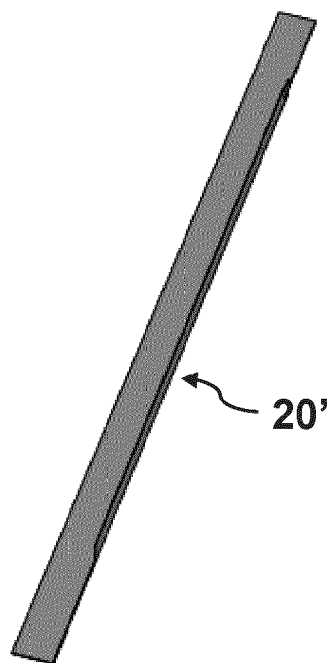


Fig. 11B

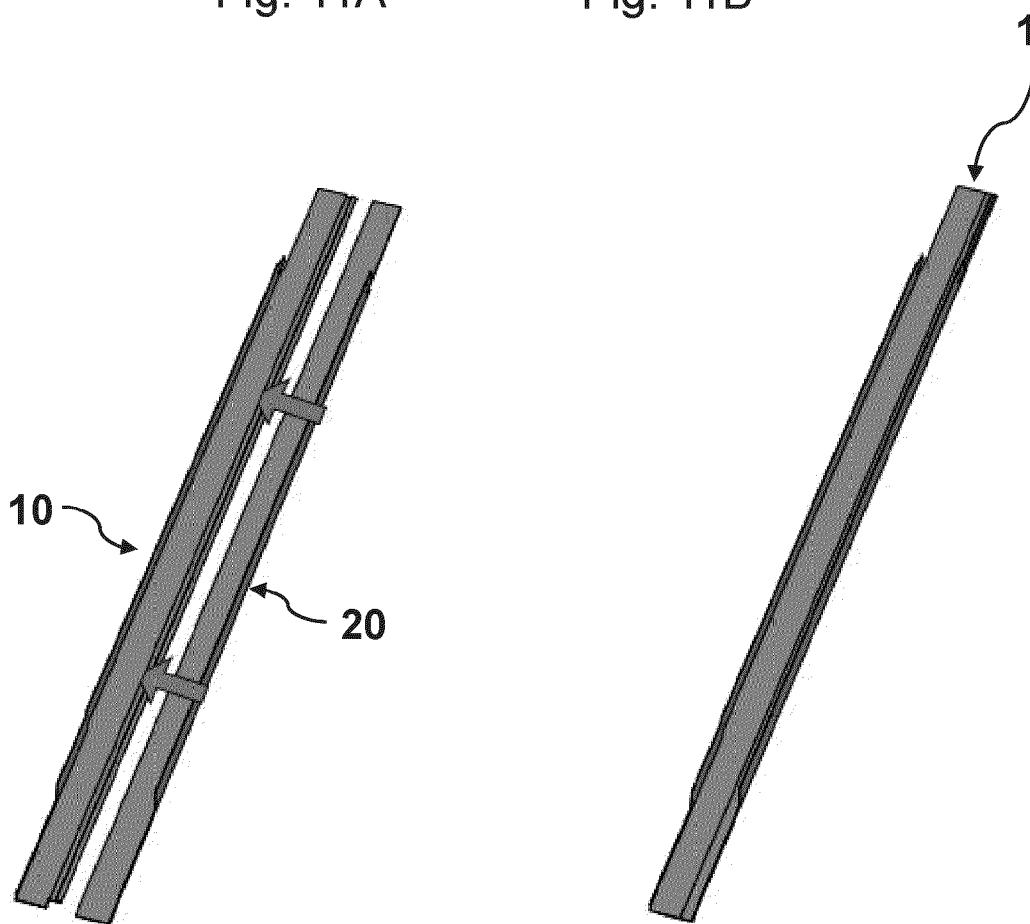


Fig. 12

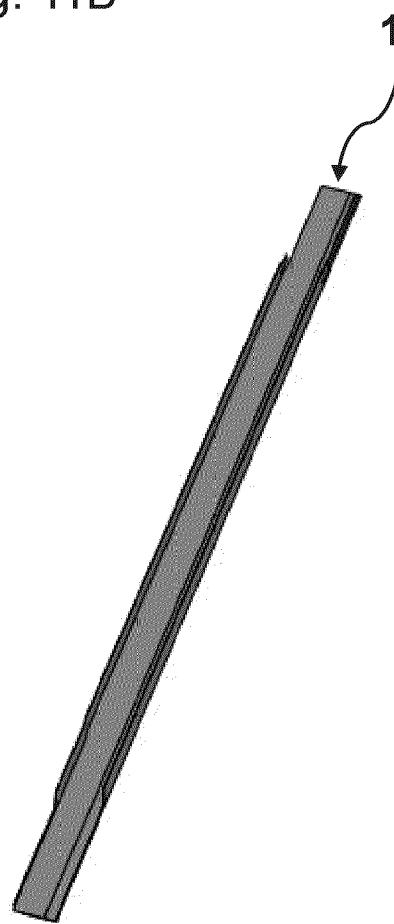


Fig. 13

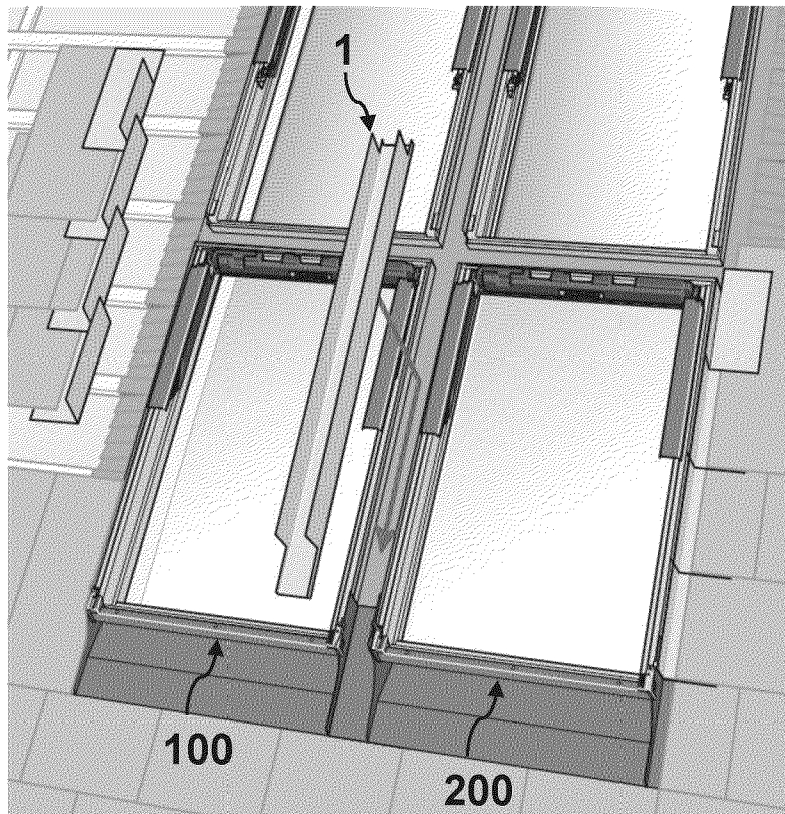


Fig. 14

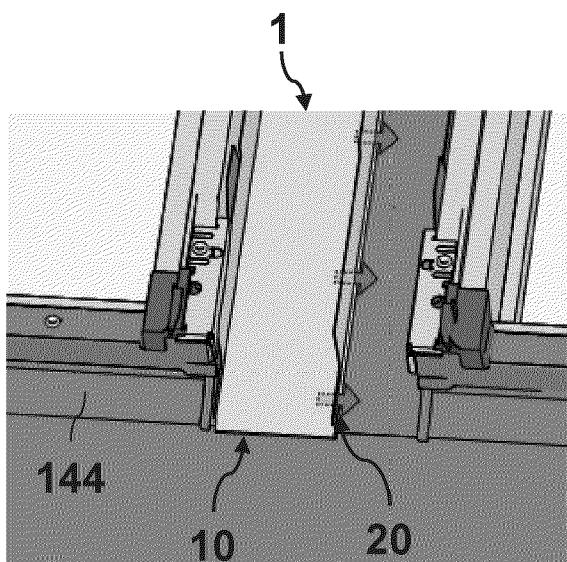


Fig. 15A

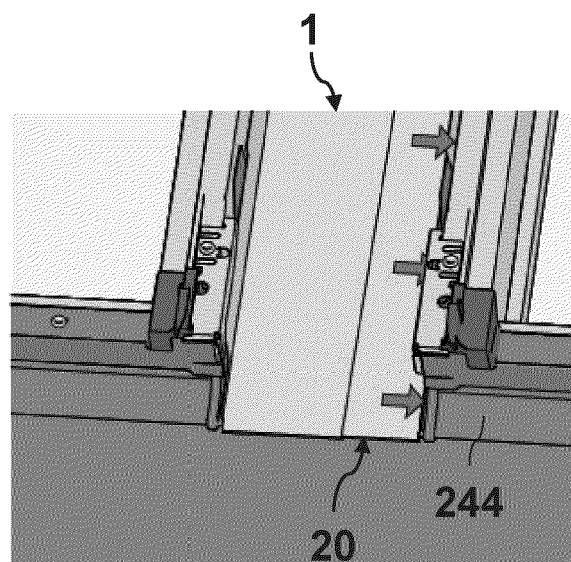


Fig. 15B

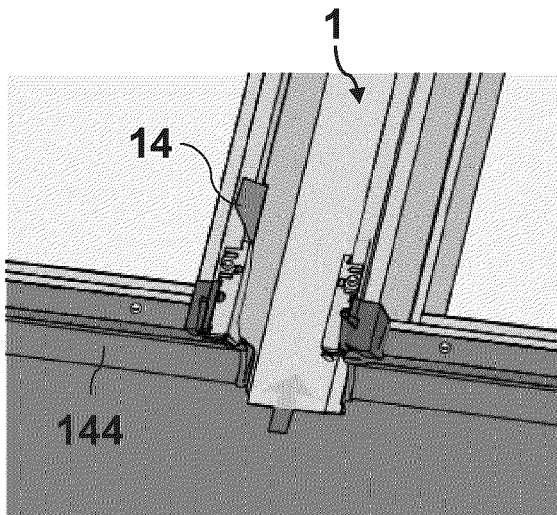


Fig. 16

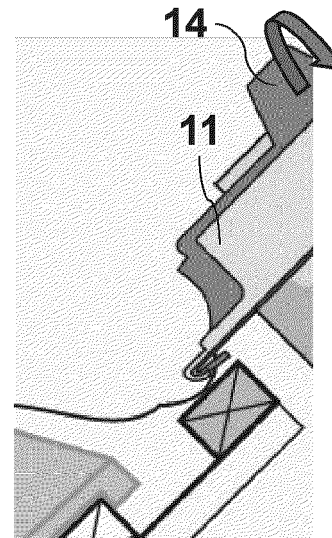


Fig. 17

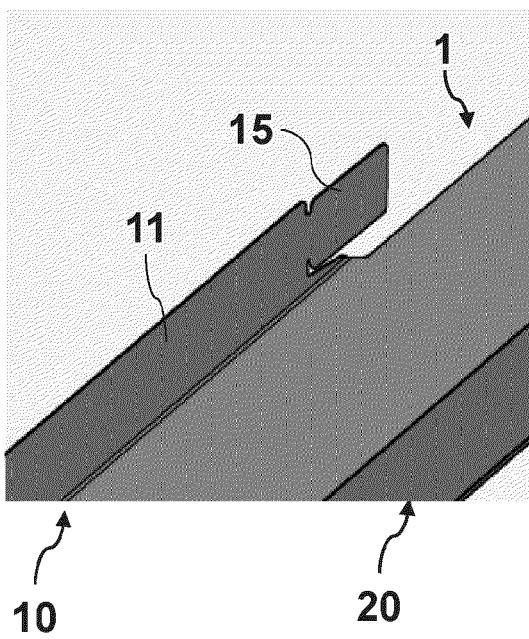


Fig. 18A

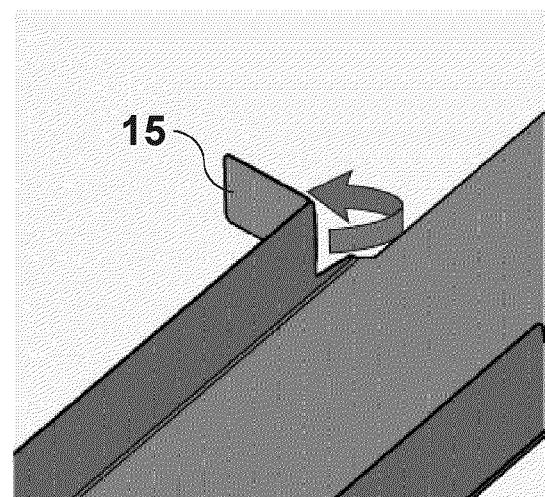


Fig. 18B



EUROPEAN SEARCH REPORT

Application Number

EP 24 20 4762

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 03/074812 A1 (VKR HOLDING AS [DK]; HENRIKSEN JENS-ULRIK HOLST [DK]) 12 September 2003 (2003-09-12) * pages 7-9; figures 3,4,5a-5c *	1,3,4, 7-10	INV. E04D13/03 E04D13/147
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X	ES 1 070 303 U (REINHARD EDER BLECHBAUGESELLSC [AT]) 20 July 2009 (2009-07-20) * figures 9,10,13 *	1-6,8,9	
A	WO 2023/186250 A1 (VKR HOLDING AS [DK]) 5 October 2023 (2023-10-05) * figure 9 *	9	
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			E04D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		21 February 2025	Leroux, Corentine
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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