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(54) **DORMER ASSEMBLY**

(57) Method of installing a dormer assembly comprising a dormer cheek, an upper section and a lower section, in a pitched roof comprising an underroof, rafters and/or battens, wherein the sections are adapted to adjoin the dormer cheek, the pitched roof and the opposite section. The method comprises the steps of: mounting a base frame, comprising frame members, onto

the rafters and/or battens, cutting a hole in the underroof, thereby creating flaps in the underroof extending along the frame members of the base frame, attaching the flaps of the underroof to the base frame members by folding the flaps.

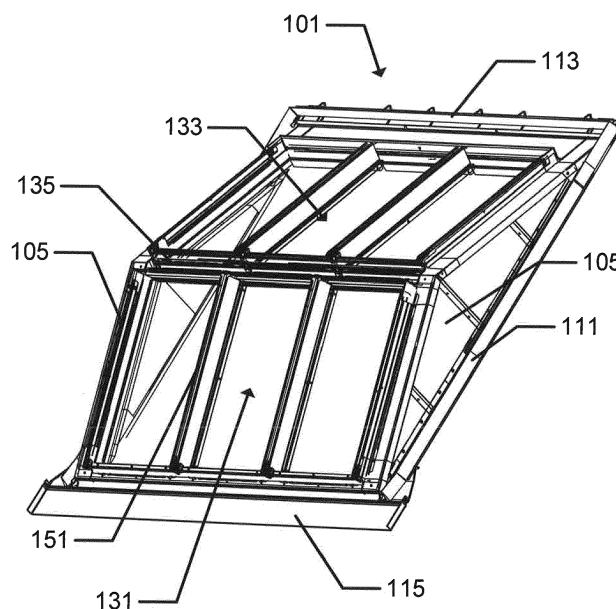


Fig. 1

Description

[0001] The present invention relates to a method of installing a dormer assembly comprising a dormer cheek, an upper section and a lower section, in a pitched roof, the pitched roof comprising an underroof, rafters and/or battens, wherein the upper section is adapted to adjoin the dormer cheek and the pitched roof; and the lower section is adapted to adjoin the dormer cheek and the pitched roof, the method comprises the steps of: mounting a base frame, comprising a bottom member, a first and a second side member and a top member, onto the rafters and/or battens, cutting a hole in the underroof, thereby creating flaps in the underroof extending along the bottom, top and side members of the base frame. The present invention furthermore relates to a dormer assembly that may be installed according to the invention.

[0002] It is known in the art to have dormers where at least two windows are arranged substantially vertically, when mounted in an inclined roof. The at least two windows may be arranged at different angles relative to the roof. When installing a dormer, a hole is made in the roof having dimensions substantially matching the dimensions of the dormer assembly.

[0003] When making a hole in the roof for installation of a dormer assembly, the water tightness of the roof is compromised.

[0004] Furthermore, the opening in the roof will likely also reduce the thermal insulating properties of the roof.

[0005] Therefore, it is an object of this invention to provide a method of installing a dormer assembly, while at the same time providing a watertight and insulated installation.

[0006] Furthermore, it is an object to provide a method to install a dormer, which is easy to perform.

[0007] In a first aspect, these and further objects are met by a method as mentioned in the introduction which further comprise a step of attaching the flaps of the underroof to the base frame members by folding the flaps such that they extend upwards substantially perpendicularly to the pitched roof along the inner side of the base frame members.

[0008] Consequently, a watertight transition from the roof to the base frame is obtained.

[0009] The attachment of the flaps may be performed by using nails, screws or staples.

[0010] In some embodiments the method further comprises placing insulation material having a lambda value below 0.1 w/mk, preferably below 0.04 w/mk, below the side members and between the battens for supporting the base frame.

[0011] The insulation material throughout this application, may be made of mineral wool, glass wool or stone wool.

[0012] In some embodiments the method may further comprise installing a top trimmer, a bottom trimmer and dormer cheeks onto the base frame, where the top trim-

mer is the trimmer arranged the highest on the roof. The trimmers are adapted to extend between the dormer cheeks.

[0013] The top and bottom trimmer and dormer cheeks may comprise aluminum and/or wood.

[0014] The dormer cheeks may comprise a frame structure substantially in the shape of a triangle, preferably an obtuse triangle. The end points of the triangle not being an obtuse angle may be cut off or cut short. The base of the triangle is mounted onto the base frame.

[0015] In some embodiments of the method a cross beam is placed connecting the two dormer cheeks and is parallel to the top and bottom trimmer. The cross beam may extend between the apexes of the obtuse angles of the triangular shaped frame structures. The cross beam divides the opening into two separate openings, where the opening adjacent to the top trimmer is called the upper opening, and the opening adjacent to the bottom trimmer is called the lower opening. The cross beam may be placed centrally relative to the top and bottom trimmer. The upper and lower openings are adapted to receive an upper and a lower section, respectively. Each of the upper and lower sections may comprise one or more windows.

[0016] In some embodiments a base board may be placed adjacent to the top member of the base frame, extending along the width of the dormer assembly.

[0017] In some embodiments the method further comprises installing an insulation wedge on top of the base board, adjacent to the dormer cheek, such that the wedge shape completes the angle of the triangle that has been cut short.

[0018] Consequently, an insulated transition from the roof to the base frame is obtained.

[0019] In some embodiments, the method may further comprise assembling at least one insulation frame comprising at least a top, bottom and two side members. The assembling may comprise the steps of connecting the two side members to the top member using a 90-degree angle connection clip at each connection, and connecting the bottom member to the two side members using a 90-degree angle connection clip at each connection.

[0020] The insulation frame may comprise multiple top, bottom and side members, to be used when there are multiple windows. Multiple members of the same type may be connected using a straight connection clip. The straight connection clip may have a tongue extending perpendicularly from the straight connection clip to enhance stability. Preferably all connection clips are received in a receiving element adapted to snap lock the connection clip in the correct position.

[0021] In some embodiments, the method further comprises mounting the at least one insulation frame. The insulation frame may be adapted to fit with the interior sides of the dormer cheeks, cross beam and either the top or bottom trimmer, where the outer dimensions of the insulation frame substantially match the inner dimensions of the opening in which it is being installed. The

insulation frame may be adapted to surround the window frames to be installed in the upper and lower sections.

[0022] In some embodiments, the method may further comprise installing at least one window frame inside the insulation frame.

[0023] More than one window frame may be installed inside the insulation frame. When installing more than one window frame, the window frames may be attached to each other at their adjoining sides, before mounting them inside the insulation frame. A window frame installed in the upper opening/section is called an upper window frame, conversely a window frame installed in the lower opening/section is called a lower window frame

[0024] In some embodiments the method may further comprise the step of installing an insulation layer between two adjacent window frames.

[0025] Consequently, thermal exchange between the interior and the exterior is reduced, when more than one window frame is installed.

[0026] In some embodiments the method may further comprise the step of mounting a waterproof underroof collar on the bottom trimmer and at the base of the dormer cheeks.

[0027] Consequently, a watertight transition around the opening in the roof is obtained along the sides and the bottom of the opening.

[0028] The waterproof underroof collar may be fixed to the bottom trimmer and dormer cheeks by staples, screws or nails. The waterproof underroof collar may be provided as individual elements for the bottom frame and the dormer cheeks, or be formed as a single entity.

[0029] In some embodiments the method may further comprise the step of installing an underroof membrane on the exterior of the dormer cheek.

[0030] Consequently, an improvement in the wind tightness is obtained.

[0031] The underroof membrane may be made from cardboard, plastic or wood. Installation of the underroof membrane may be performed using staples, nails or screws. The underroof membrane may be provided integrally with the dormer cheek.

[0032] In some embodiments the method may further comprise the step of installing a bottom frame flashing.

[0033] Consequently, the water tightness from the window to the roof is improved.

[0034] The installation of the bottom frame flashing may be preceded by a step involving cutting the roof tiles to allow for the installation of the bottom frame flashing.

[0035] The bottom frame flashing may be brought into engagement with the roof tiles by hand, thereby ensuring a sufficiently watertight transition from the dormer assembly to the roof.

[0036] In some embodiments the method may further comprise making preparation for the installation of a top drainage gutter above the dormer.

[0037] Consequently, rainwater running down the roof can be diverted around the dormer assembly, thereby reducing the risk of water penetrating the installation.

[0038] The top drainage gutter may be installed at an angle with respect to horizontal, whereby gravity can assist in diverting the water. The installation of the top drainage gutter may be performed by placing the top drainage gutter in the intended position and mark it with a pencil on the rafters of the roof. By cutting the rafters at the markings a portion of the rafters can be removed.

[0039] In some embodiments the method may further comprise installing a waterproof collar around the window frames.

[0040] Consequently, the space around the window frame is waterproofed.

[0041] The waterproof collar has an inner edge and an outer edge opposite of the inner edge. The inner edge of the waterproof collar is adapted for engagement with the window frames. The outer edge may be cut, whereby in situ modifications of the waterproof collar is possible. Adhesive tongues may be provided at the corners of the inner edge of the waterproof collar, whereby a tight connection between the waterproof collar and the window frames is ensured at the corners. A waterproof collar may be installed around the lower window frames and/or the upper window frames, respectively.

[0042] In some embodiments the method further comprise installing a top drainage gutter into the opening prepared in the rafters.

[0043] The top drainage gutter may be placed onto the waterproof collar installed around the upper window frames. The top drainage gutter may be fixed to the roof using screws. An upper outer edge of the waterproof collar installed around the upper window frames may extend beyond the top drainage gutter, whereby the excess material may be used to line the top drainage gutter. By lining the top drainage gutter with the waterproof collar, the waterproofness is increased further. The underroof may also be placed in the top drainage gutter on top of the waterproof collar. To ensure that both the waterproof collar and the underroof is maintained in the top drainage gutter, they may be fixated using a clips which engage with the top drainage gutter. The top drainage gutter may be provided with telescopic means, whereby its length can be modified in situ allowing it to be used with dormer assemblies of various sizes.

[0044] In some embodiments the method may further comprise installing a side flashing on the side of the dormer cheek.

[0045] Consequently, excess rainwater can be prevented from entering the opening from the side of the dormer assembly.

[0046] The side flashing may be provided with telescopic means allowing for in situ modifications of the length of the flashing. The side flashing may be attached to the battens using clips. The side flashing may be attached to the dormer cheek using nails or screws.

[0047] In some embodiments the method further comprise installing a cover element on the outer side of the underroof membrane on the dormer cheek. Consequently, the structural integrity of the dormer cheek is improved.

[0048] The cover element may be provided as a single cover element having dimensions matching the dimensions of the dormer cheek. The cover element may be provided as several cover elements adapted to be installed individually. The cover element may be installed by being slid into predefined grooves on an adjacent cover element, such that a cover element at least has a tongue or a groove or both on two opposing edges, such that they may be attached to each other. The cover element may be installed by screwing it onto the dormer cheek. The cover element may be made from aluminum, or another type of weather proof covering.

[0049] In some embodiments the method further comprise installing a bottom frame cover on the window frame.

[0050] The bottom frame cover may extend across all installed window frames. The bottom frame cover may be installed as a single entity or several entities for each window frame. The bottom frame cover may be attached using nails or screws.

[0051] In some embodiments the method may further comprise installing a cover onto the side member of the window frame.

[0052] In some embodiments the method may further comprise installing a U-shaped gutter on the side member of the window frame.

[0053] Consequently, the excess rainwater can be directed off of the window frame.

[0054] In some embodiments the method may further comprise installing a top cover on the top of the window frame.

[0055] The top cover may be attached to the window frame using screws or nails.

[0056] In some embodiments the method may further comprise installing a side frame cover between the window frame and the dormer cheek.

[0057] Consequently, the structural integrity of the dormer cheek is enhanced.

[0058] The side frame cover may be made of aluminum, wood, roofing felt or cardboard.

[0059] In some embodiments the method may further comprise installing a top flashing above the top trimmer of the dormer.

[0060] Consequently, rainwater is diverted away from the dormer assembly and the water tightness is improved.

[0061] The top flashing may be made from aluminum, wood, roofing felt or cardboard. The top flashing may be aligned with the side rain gutter, such that a uniform flashing is formed around the dormer.

[0062] In some embodiments the method further comprise placing roof tiles along the dormer assembly, whereby the roof tiles rest on the rain gutter.

[0063] Consequently, a water and wind tight transition from the roof to the dormer assembly is achieved.

[0064] A height of the side rain gutter may be cut to allow the smooth placement of the roof tiles. Material may be placed on the side rain gutter allowing to adjust the

height between the side rain gutter and the roof tile. Such material may be flexible foam.

[0065] In the following, the invention will be described in further detail with reference to the drawings in which:

Fig. 1 is a perspective view of a dormer assembly according to an embodiment of the invention, Figs. 2a to 7 are perspective views of embodiments of method steps according to the invention.

Fig. 1 shows a dormer assembly 101 comprising a lower section 131 and an upper section 133. The two sections 131, 133 are separated by a cross beam 135, which extends between the apexes of an obtuse angle of two dormer cheeks 105. In both the lower section 131 and the upper section 133, three window frames 151 are installed. A flashing system including a side flashing 111 and a top flashing 113 are used for collecting, draining e.g. rain water around and away from the dormer 101. A side flashing 111 is installed at the base of the dormer cheek 105. A top flashing 113 is installed above the upper opening 133, whereby the side flashing 111 and the top flashing 113 are connected at their ends. A bottom frame flashing 115 is installed below the lower section 131. Fig. 2a shows an embodiment of the method where an opening 202 is made in a roof 201 comprising an underroof 203, and the opening 202 is also made in the underroof 203. A base frame 205 is arranged around the opening 202, the base frame 205 comprises a top member 253, a bottom member 255 and two side members 251a, 251b. The underroof 203 extending into the opening 202 is cut in four separate flaps 231a, 231b, 233, 235 using a knife 293. Each of the four flaps 231a, 231b, 233, 235 is attach to their respective base frame 205 member 251a, 251b, 253, 255 with a staple gun 291. The flaps 231a, 231b, 233, 235 extend along an inner side 256 of the base frame members.

Fig. 2b shows an embodiment of two substantially triangular shaped frame structures 241 for the dormer cheeks. The frame structures 241 form an obtuse triangle. The frame structures 241 comprise a wooden frame 242, where insulation 243 is provided within the wooden frame 242 and an exterior facing panel element 244 is attached to the wooden frame 242. A cross beam 245 extends between the apexes of the obtuse angles of the triangular shaped frame structures 241. Furthermore, a wedged shaped piece of insulation 246 is positioned above the upper section of the dormer assembly 101, in parallel to the top member 253 of the base frame.

Fig. 3 shows an embodiment of the method where the underroof 203 has been attached to the base frame 205. At least one insulating member 307 is positioned between the side members 251a-b of the base frame 205 and the underroof 203.

Fig. 4a-b shows an embodiment of an insulating frame 401. Fig. 4a shows an embodiment of a

straight connection insulating frame 401. The insulating frame 401 comprises two frame elements 411, which are connected using a straight connection clip 413. This type of connection is used when several windows are adjoining each other. Fig. 4b shows an embodiment of an angled connection insulating frame 401. The insulating frame 401 comprises two frame elements 411, which are connected using an angled connection clip 413. A tongue 415 of insulation material is adapted to cover the connection clip 413, whereby an improved insulation is achieved. Fig. 5 shows an embodiment of a dormer assembly 101 installed in a roof 201. A waterproof underroof collar 505 is installed at the base of the dormer cheeks 105 and onto the bottom trimmer 535. In the embodiment of fig. 5 an exterior underroof membrane 537 is covering the frame structure 241. The exterior underroof membrane 537 is attached to the exterior side of the dormer cheek 105 using a stable gun 291.

Fig. 6a-c shows an embodiment of a method of installing a drainage gutter 633 between a sealing collar 631 and the underroof 203. Fig. 6a shows a sealing collar 631 arranged on a roof batten 213 of a roof 201. The sealing collar 631 extends beyond the roof batten 213 into an opening cut in a roof rafter 215. A drainage gutter 633 is arranged onto the sealing collar 631 and the underroof 203 of the roof 201 is cut. Fig. 6b shows the sealing collar 631 being arranged in the drainage gutter 633. Fig. 6c shows the underroof 203 of the roof 201 being arranged on top of the sealing collar 631 in the drainage gutter 633. The underroof 203 and the sealing collar 631 is fixed in the drainage gutter 633 using a clip 635.

Fig. 7 shows an embodiment of a method of installing a dormer assembly 101 in a roof 201. Multiple cover elements 751-754, are installed by mounting a top cover element 751 onto a dormer cheek 731, and then sliding the second most top cover element 752 into the top cover element 751, and sequentially mounting the remaining cover elements 753, 754 in a similar manner. Each cover element is provided with a tongue 755 and/or a groove 756, such that they are easily joined.

[0066] In general, the features of the embodiments shown and described may be combined freely and no features should be seen as essential unless stated so in the independent claims.

Claims

1. Method of installing a dormer assembly comprising a dormer cheek, an upper section and a lower section, in a pitched roof, the pitched roof comprising an underroof, rafters and/or battens, wherein the upper section and the lower section are adapted to adjoin

the dormer cheek and the pitched roof, the method comprises the steps of:

- mounting a base frame, comprising a bottom member, a first and a second side member and a top member, onto the rafters and/or battens,
- cutting a hole in the underroof, thereby creating flaps in the underroof extending along the bottom, top and side members of the base frame,
- attaching the flaps of the underroof to the base frame members by folding the flaps such that they extend upwards substantially perpendicularly to the pitched roof along an inner side of the base frame members.
2. Method according to claim 1, further comprising placing insulation material having a lambda value below 0.1 w/mk, preferably below 0.04 w/mk, below the side members and between the battens for supporting the base frame.
3. Method according to any one of the preceding claims, wherein the dormer cheek comprises a triangular frame structure covered with an exterior facing panel element, the method comprising providing the exterior facing panel element with an exterior underroof membrane.
4. Method according to any one of the preceding claims, wherein the lower section and/or upper section comprise(s) more than one window, the method further comprising placing insulation material having a lambda value below 0.1 w/mk, preferably below 0.04 w/mk, between each of the windows.
5. Method according to any one of the preceding claims, comprising providing the dormer cheek with a weatherproof cover, wherein the weatherproof cover is divided into two or more cover elements having at least four sides, wherein one or two sides of two opposing sides of each of the cover elements are provided with at least one of a tongue and/or a groove and are adapted to extend perpendicularly to pitched roof, wherein the cover elements are positioned in its mounted position by pushing the cover elements downwards in a direction perpendicularly to the roof such that a tongue on one cover element is adapted to slide in a groove of an adjacent cover element.
6. Dormer assembly in a pitched roof the dormer assembly comprising a dormer cheek, an upper section and a lower section, wherein the upper section and the lower section are adapted to adjoin the dormer cheek and the pitched roof, and the pitched roof comprises an underroof, rafters and/or battens and the dormer assembly comprising a top member, a bottom member, a first and a second side member con-

stituting a base frame, wherein the underroof comprises flaps attached to the base frame members such that they extend upwards substantially perpendicularly to the pitched roof along the inner side of the base frame members.

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7. Dormer assembly according to claim 6, further comprising insulation material having a lambda value below 0.1 w/mk, preferably below 0.04 w/mk, below the side members and between the battens for supporting the base frame. 10
8. Dormer assembly according to any one of claims 6 or 7, wherein the dormer cheek comprises a triangular frame structure covered with an exterior facing panel element, wherein an underroof membrane is provided on the exterior facing panel element. 15
9. Dormer assembly according to any one of claims 6-8, wherein the lower section and/or upper section comprise(s) more than one window, wherein insulation material having a lambda value below 0.1 w/mk, preferably below 0.04 w/mk, is positioned between each of the windows. 20
10. Dormer assembly according to any one of claims 6-9, wherein the dormer cheek further comprises a weatherproof cover wherein the weatherproof cover is divided into two or more cover elements having at least four sides, wherein one or two sides of two opposing sides of each of the cover elements are provided with at least one of a tongue and/or a groove and the two opposing sides are adapted to extend perpendicularly to pitched roof, wherein a tongue on one cover element is adapted to engage with a groove of an adjacent cover element. 25 30 35

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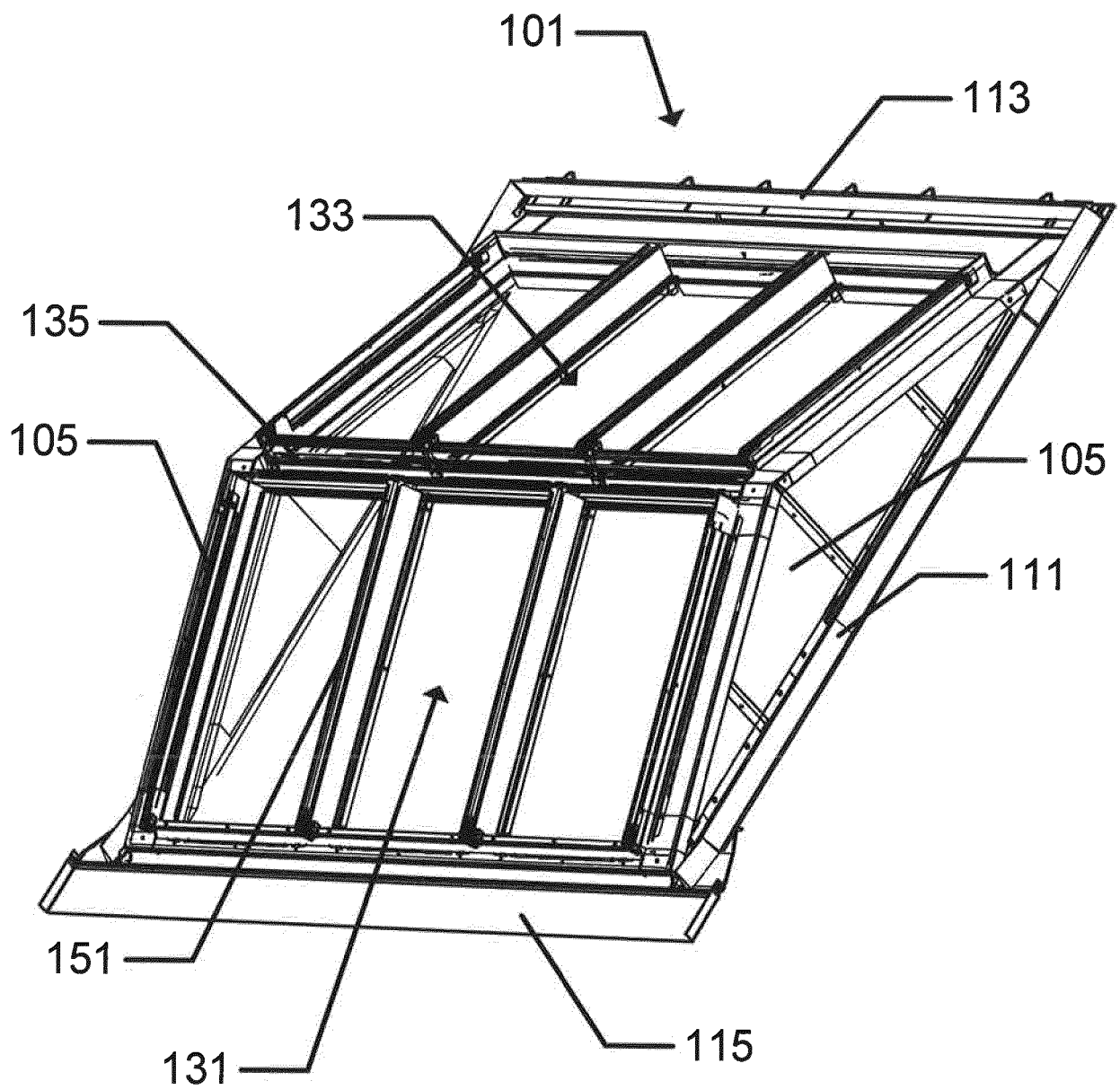


Fig. 1

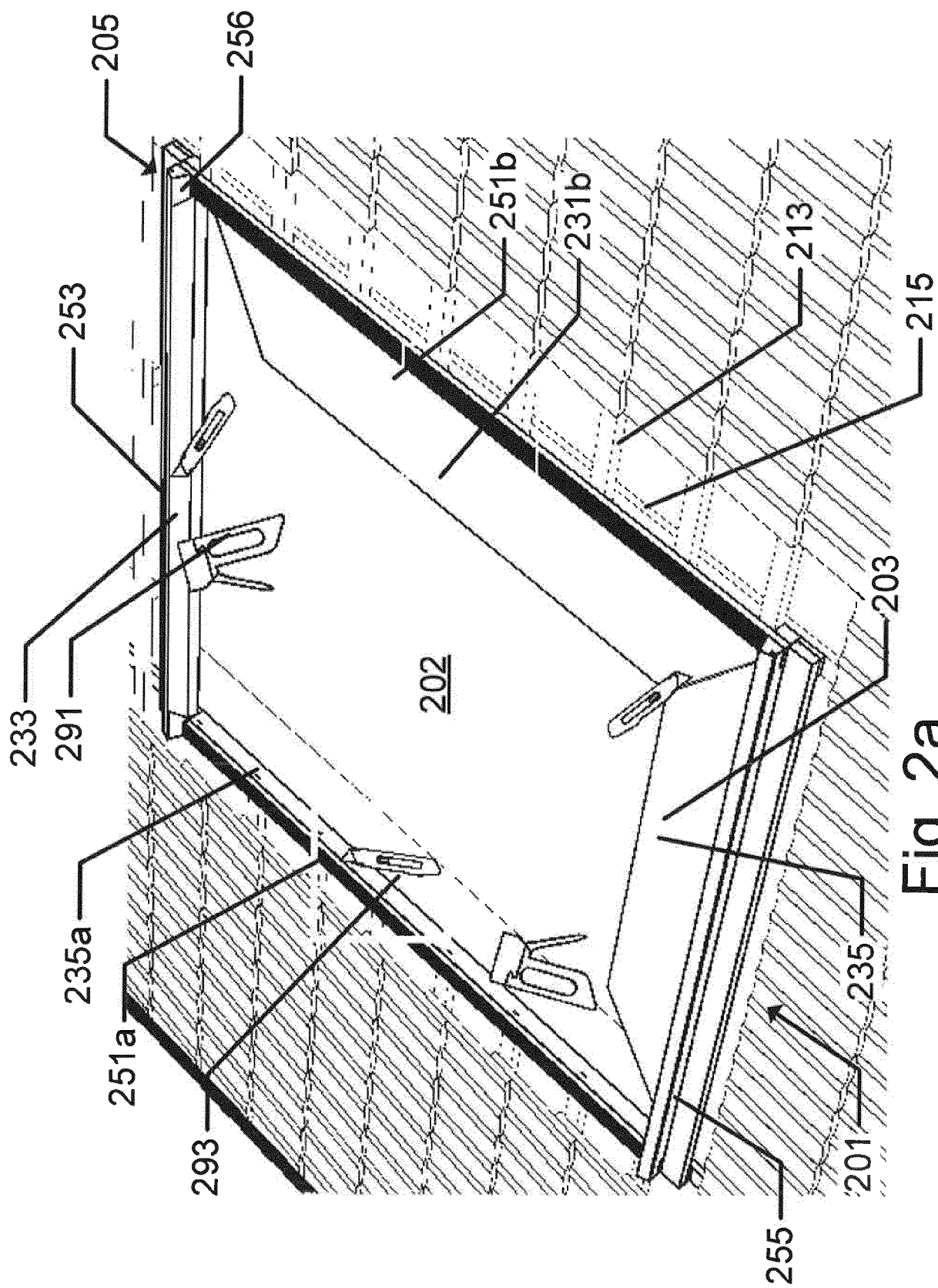


Fig. 2a

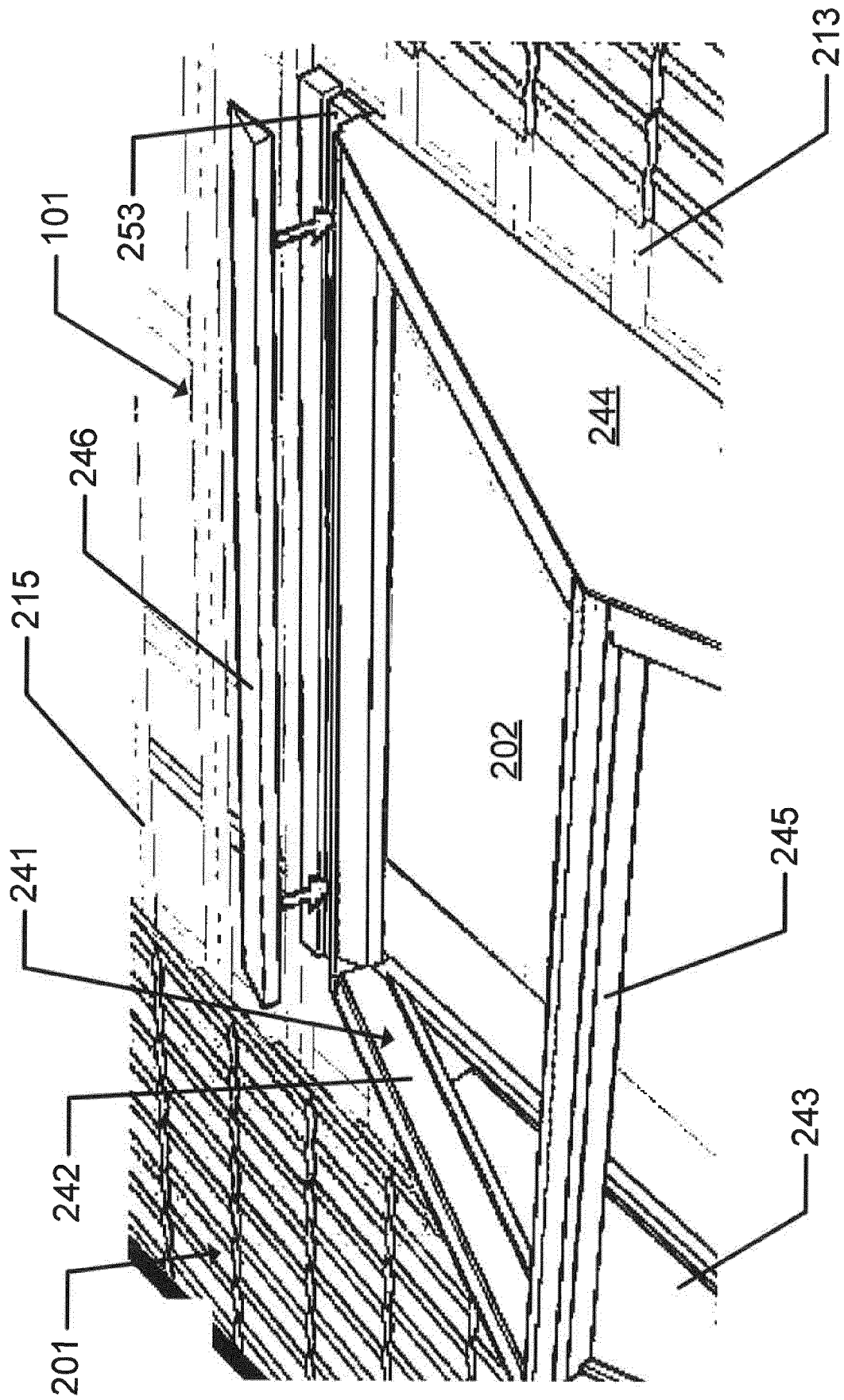


Fig. 2b

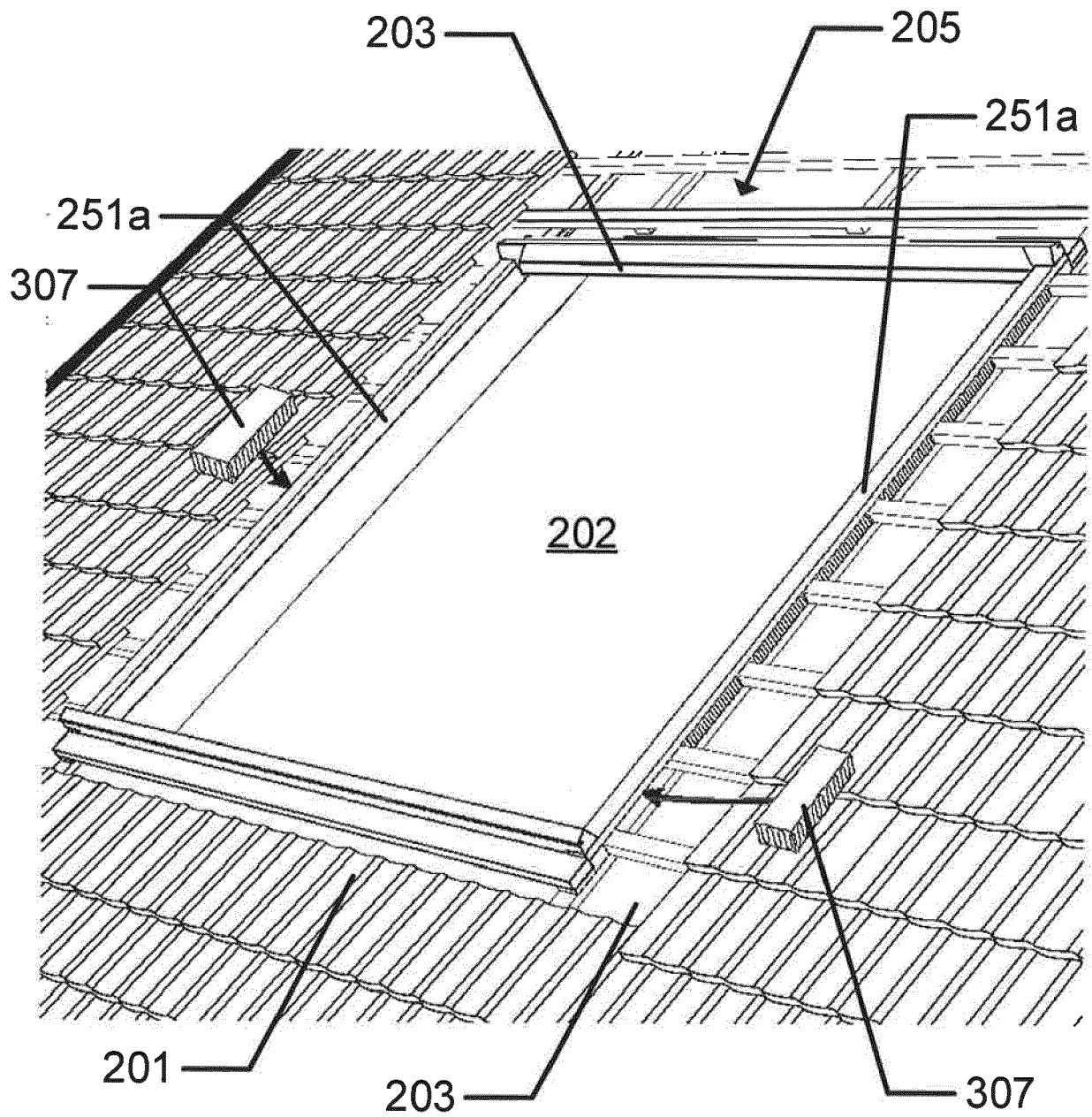


Fig. 3

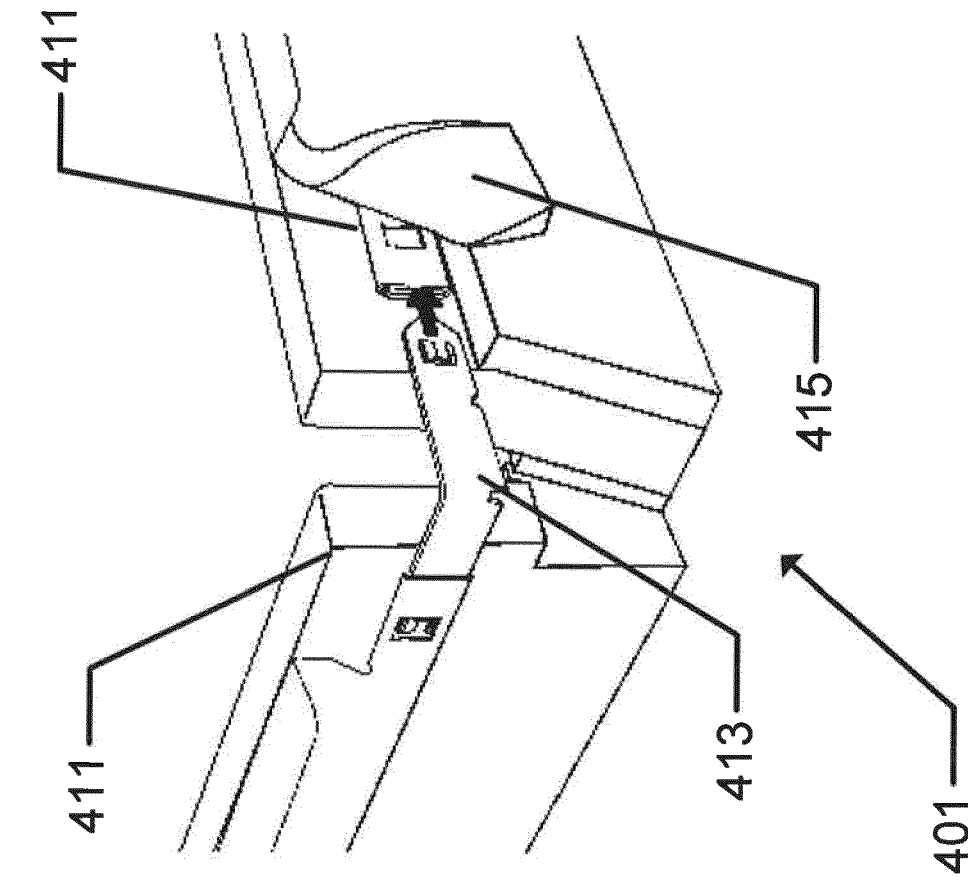


Fig. 4a

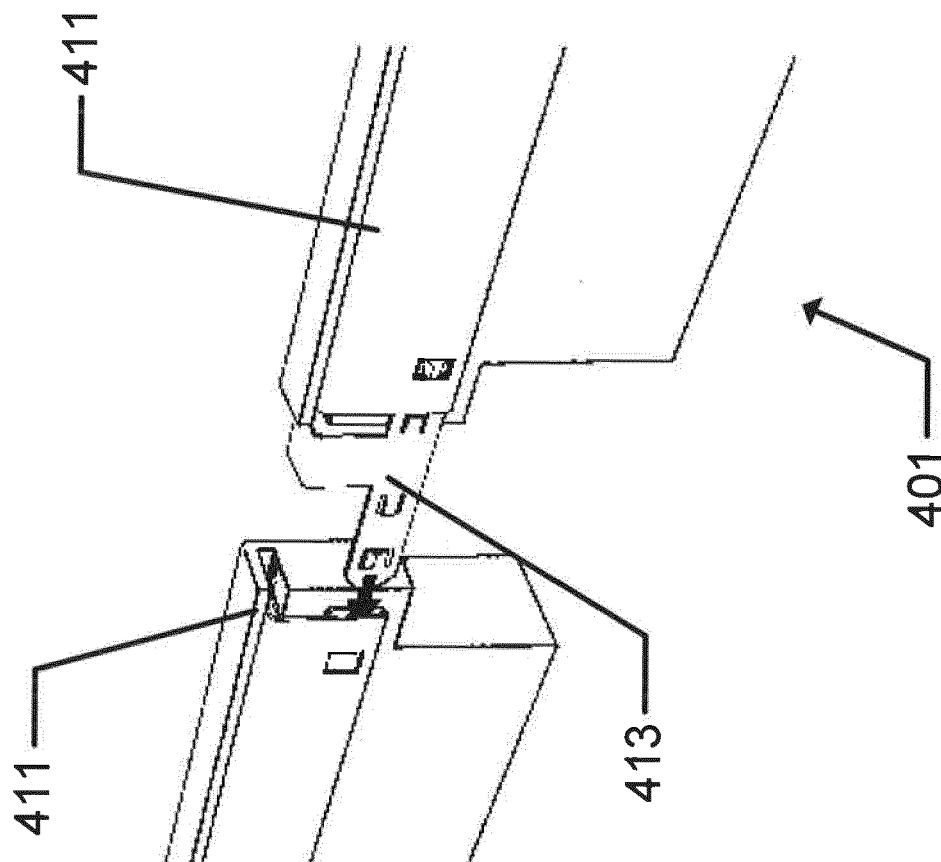
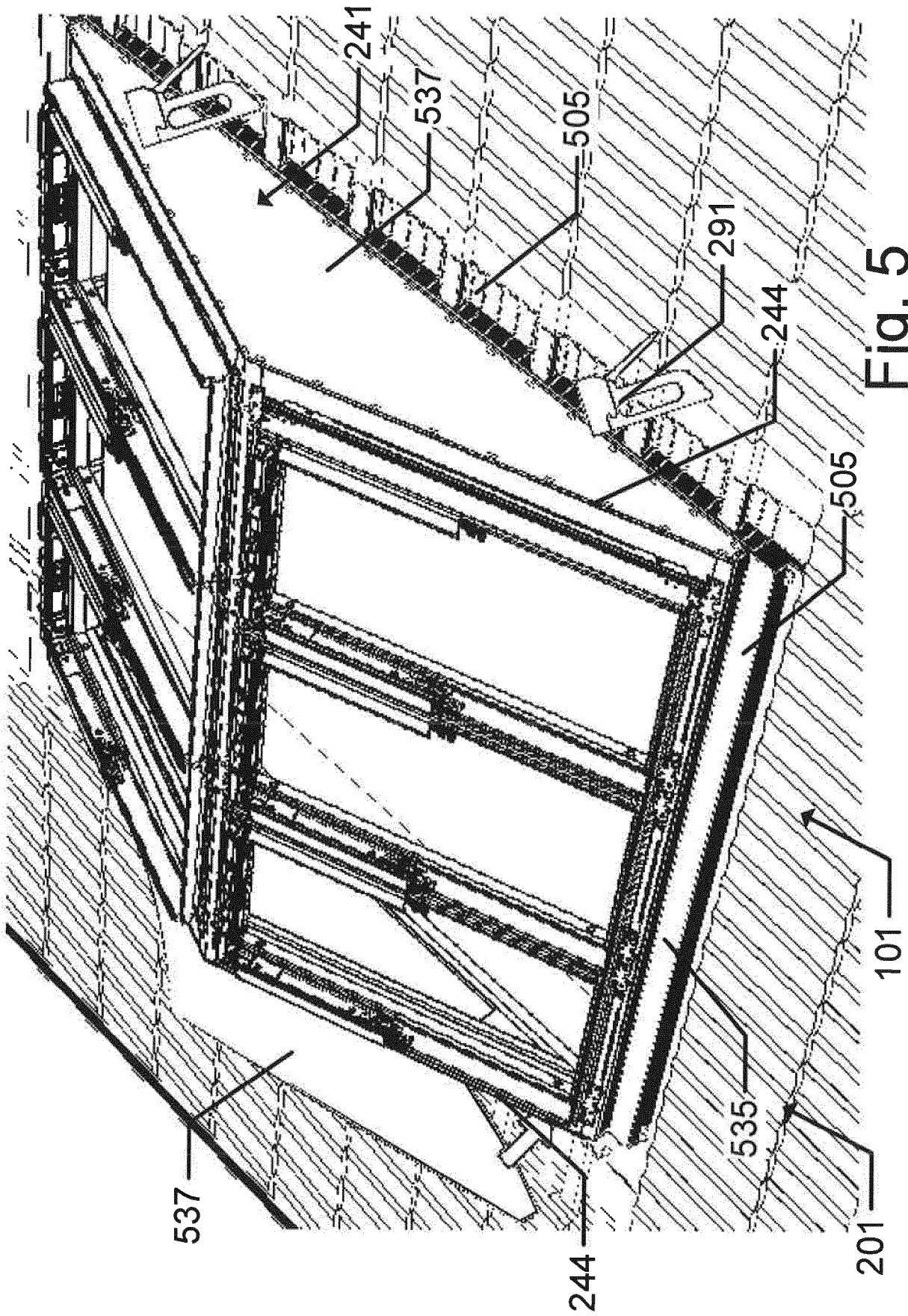


Fig. 4b



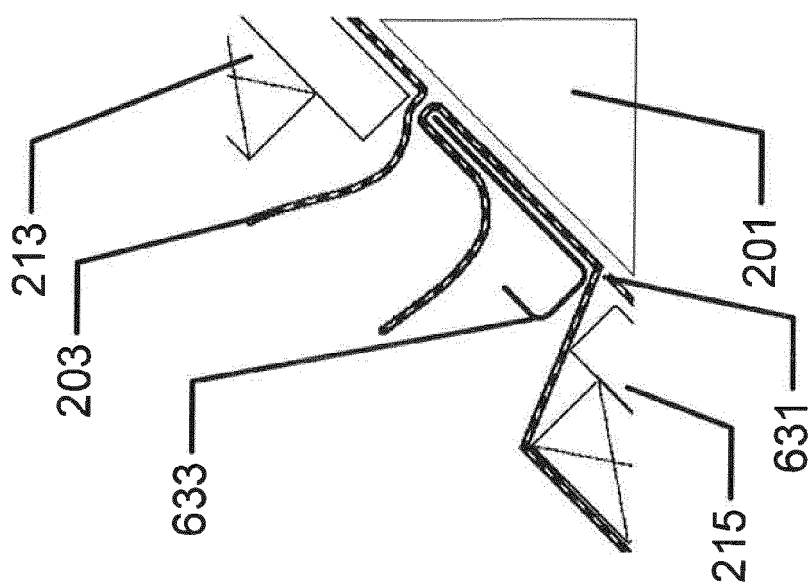


Fig. 6a

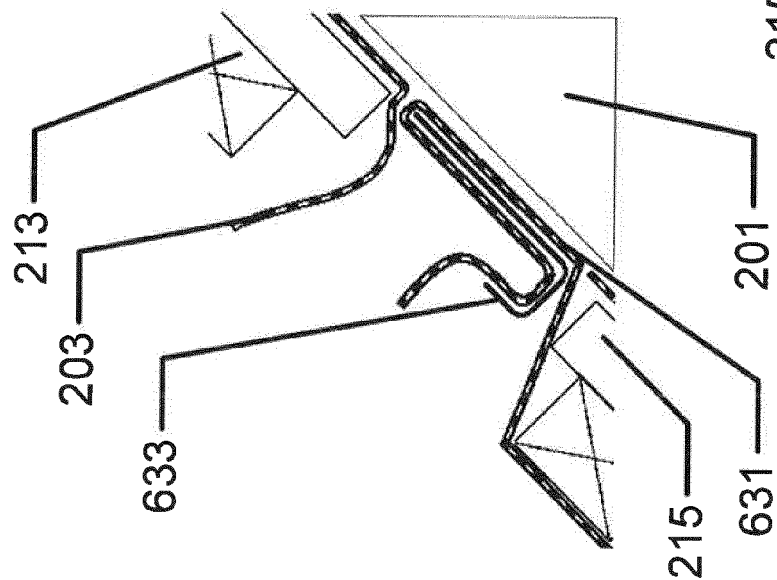


Fig. 6b

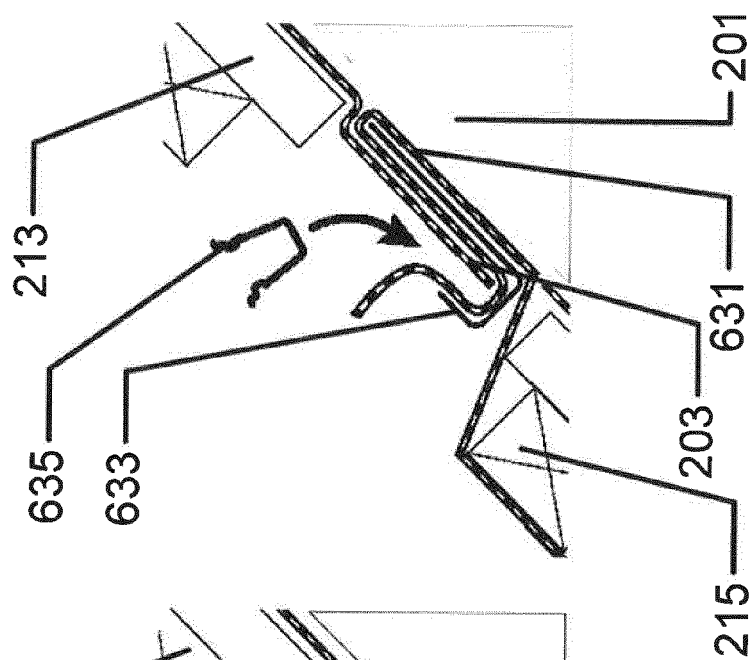


Fig. 6c

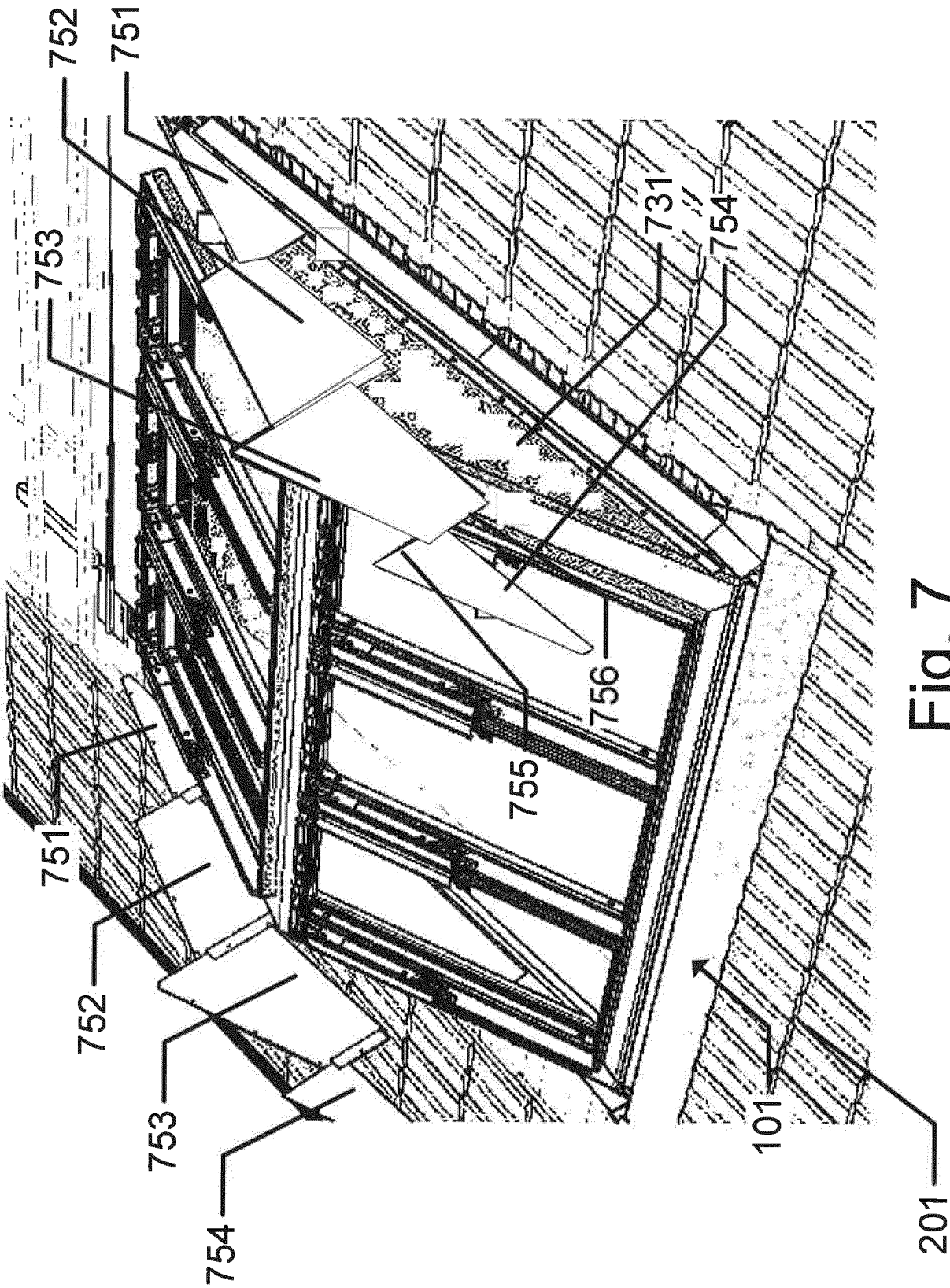


Fig. 7



EUROPEAN SEARCH REPORT

Application Number
EP 18 17 1456

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 256 224 A (STRINGER ROBERT WILLIAM [GB]) 2 December 1992 (1992-12-02)	6-10	INV. E04D13/02 E04B7/18
A	* figure 2 *	1-5	
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 October 2018	Examiner Tran, Kim Lien
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-10-2018

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