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(71) Applicant: **VKR Holding A/S**
2970 Hørsholm (DK)

(72) Inventor: **Melsen, Michael**
2970 Hørsholm (DK)

(74) Representative: **AWA Denmark A/S**
Strandgade 56
1401 Copenhagen K (DK)

(54) **METHOD OF MOUNTING A FLASHING ASSEMBLY AND ASSOCIATED FLASHING ASSEMBLY**

(57) The invention relates to method of mounting a flashing assembly (60), a flashing assembly and a roof structure. The method comprises mounting a flashing assembly (60) comprising a skirt member (20) and at least one flange member (40), the flange member (40) is positioned in extension of the skirt member (20). The method further comprises mounting roof covering elements (51), such that the at least one flange member (40) is at least partly covered by the roof covering elements (51) and removing a part of the flange member (40) that extends out from between the roof covering elements (51) thereby aligning a bottom edge of the flange member (40) with a bottom edge of the roof covering element (51) positioned on top of the flange member (40).

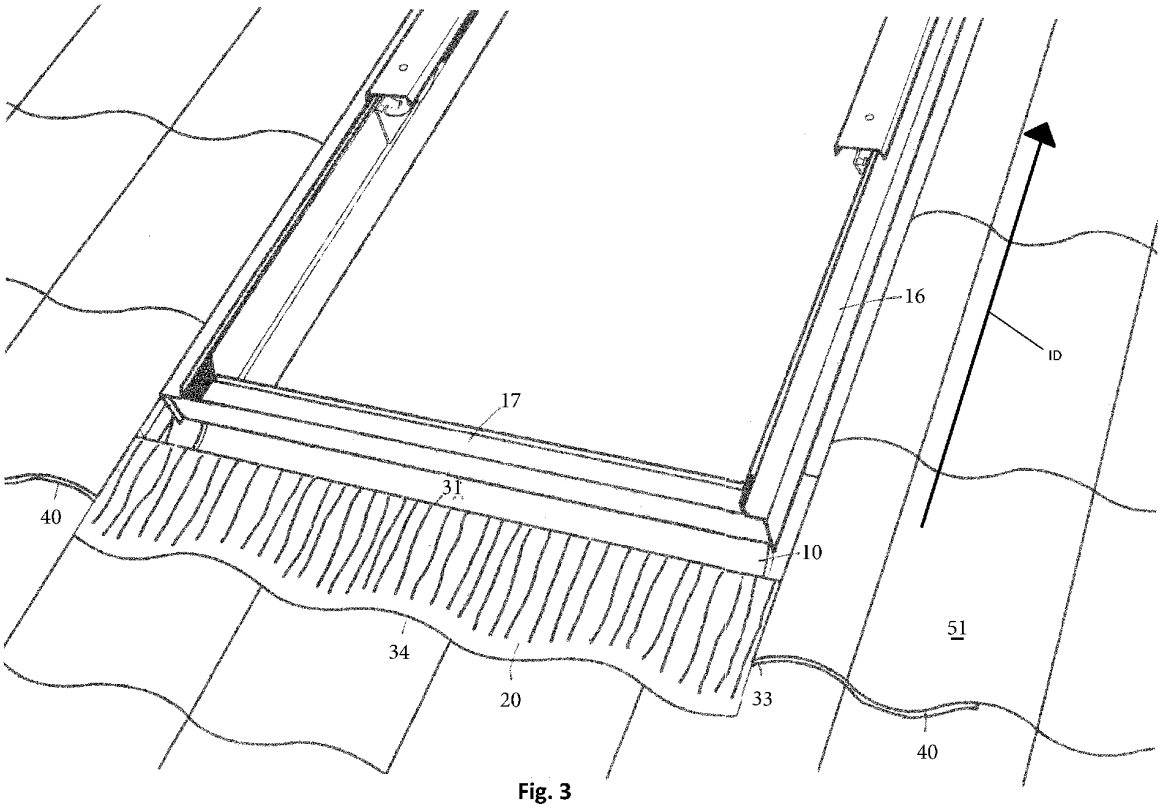

Fig. 3

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Description

[0001] The present invention relates to a method of mounting a flashing assembly according to claim 1. It further relates to a flashing assembly that may be mounted according to this method and a roof structure comprising the flashing assembly.

[0002] Skirt flashing elements, which typically comprise a skirt member adapted for resting on the outer surface of the roofing material and a plate or rail member to be attached to the roof penetrating structure, are used for sealing joints between building structures penetrating a roof surface, for example a joint between the frame of a roof window and the surrounding roofing material, particular at the lower horizontal member of the main frame of the roof window. The skirt member is important with regards to securing a well-fitting, stable and secure sealing of the joint between a roof penetrating structure and a roof surface, particularly when using an undulated roofing material such as tiles. The skirt member shall ideally provide for an easy mounting procedure, which ensures that the skirt member is firmly and closely mounted onto the roof surface and stays in this position for the entire lifetime of the flashing. In order to achieve this, the skirt member is made of a material, which is easy to bend, preferably by hand, and which has a relatively high weight and a low elasticity.

[0003] Skirt flashing elements have traditionally been made from lead plates with a thickness of approximately 1 mm. Lead as a flashing material has a number of advantages as it is very easy to deform with only a very limited elasticity, i.e. the lead plate substantially stays in the form into which it is initially bend without any elastic bouncing back. This inherent feature of lead is of great advantage when a lead-skirt is shaped directly onto for example an undulated roof surface, since such skirts cannot be bent in excess in order to compensate for possible elastic re-bouncing. Although lead is virtually non-elastic, there may be a minimal re-bouncing, but as lead is a very heavy material, gravity will keep the lead-skirt in close contact with the roof surface. The high weight also prevents the skirt from being lifted and bent backwards by heavy winds. Lead, however, is environmentally harmful and has therefore been forbidden for use in construction work in many countries.

[0004] Different kinds of skirt flashing elements having a sandwich structure with a stress damping and stabilizing layer of ductile material covered by a foil sheeting has been suggested as alternatives to lead. The core layer has typically been made out of a polymeric material or bitumen product, and the foil has typically been a thin metal foil, preferably aluminium foil.

[0005] For use on roof surfaces in the form of undulated tiles with very deep troughs these sandwich structures are typically wave-corrugated or pleated giving them a surplus of material, which allows them to stretch so that a good fit between the flashing and roofing may be obtained.

[0006] An example of a prior art document showing a wave corrugated flashing is EP2749707.

[0007] It is considered a problem with roof windows having a small width, where the width of the two flanges together is of the same or almost of the same width as the skirt member. The overall appearance of the flashing assembly suffers with such a dominant configuration.

[0008] The object of the invention is therefore to make an improved method of mounting a flashing assembly and an improved flashing assembly.

[0009] This is achieved for example by removing a part of the flange member that extends out from between the roof covering elements thereby aligning a bottom edge of the flange member with a bottom edge of the roof covering element positioned on top of the flange member.

[0010] This provides a uniform design that is functional and well fitted.

[0011] For instance, if a very overall slim design look of the roof window and the flashing assembly all together is wanted, it can be done by trimming of the flange member by for instance cutting away any excess material coming out under the overlaying roof covering elements. In this way, looking at the roof window, the flashing assembly and the roof covering all in their mounted positions, you would get the impression that the skirt so to speak just makes a continuation of the roof penetrating structure, e.g. the roof window and leaving the two flange members invisible underneath the roof covering elements.

[0012] Other embodiments mentioned in the description may also provide an improved flashing even if they do not include the above-mentioned feature of removing a part of the flange member.

[0013] According to an embodiment the method may further comprise the step of attaching a sealing member to the bottom of the roof penetrating structure. The sealing member may be provided with a tongue and the window frame with a groove, such that the sealing member is either slit into the groove or pressed into the groove or vice versa. A connection means, such as an adhesive may also be provided in between the window frame and sealing member.

[0014] According to the second aspect a flashing assembly is disclosed for use for a roof penetrating structure, preferably a window, in an inclined roof of a building, the inclined roof having an inclination direction and having roof covering elements, the roof penetrating structure comprising a top member and a bottom member extending across the inclination direction, and a first side member and a second side member connecting the top member with the bottom member extending in the inclination direction, the flashing assembly comprising:

a skirt member and at least one flange member, the skirt member having a first edge and a fourth edge extending across the inclination direction, the fourth edge being opposite the first edge the skirt member is configured for at least partly covering the roof covering elements facing the bottom of the roof penetrating structure, the flange

member is positioned in extension of the skirt member and the first and the fourth edge, such that the flange member is positioned at the first and/or the second side member of the roof penetrating structure, respectively, the flange member has an inner surface, adapted to face in an interior direction towards an interior of the building, wherein the flange member is pliable and is configured for being cut by a hand tool, along the roof covering element in a mounted position across the inclination direction.

[0015] The hand tool may be a pair of scissors or a pocket-knife.

[0016] What is meant by configured for being cut by a hand tool is that the person mounting the flashing assembly can use the tool already at hand to make the cut. There is no need to use heavy duty equipment or power tools like a nibbler or a saw.

[0017] According to an embodiment the flange member is flexible and/or pliable and/or formable. Thereby the roof covering elements may be positioned closely together, such that a tight fit is achieved as the flange member is not rumpled, but adjusts or conforms to the shape of the roof covering elements.

[0018] What is meant by being flexible is that the flange member is able to bend, preferably up to 150 degrees, more preferably up to 180 degrees, without breaking.

[0019] The flange member may be pleated, for example the flange member may be provided with box pleats, accordion pleats, inverted pleats or knife pleats.

[0020] The flange member may be plastic.

[0021] The flange member may comprise a main layer comprising an elastomer being plastic. It may further comprise a second layer comprising an elastomer being adhesive and elastic.

[0022] What is meant by the main layer being plastic is that the material is able to be deformed without rupture by the action of a force and remain deformed after the force is removed. It may have plastic properties similar to modelling clay or similar materials with ductile or like properties.

[0023] The flange member may alternatively or additionally be viscoelastic such that a faster deformation results in a higher degree of elasticity.

[0024] The elasticity of a second layer contributes to distributing the forces in the main layer when the flange member is being molded into place clinging to the roof covering elements. The elasticity also depends on the speed with which you pull the flange member. The faster you pull and/or provide an impulse to the material, the more elastic it will feel. If you slowly press on the material it will leave a mark and be permanently deformed.

[0025] The adhesiveness of the second layer contributes to holding the flange member in place during mounting, before a roof covering element may be placed on top of it, and subsequently holds it in place.

[0026] By using a flange member that has both plastic and elastic properties, it is possible to stretch the flange member so it adapts to the shape of the roof covering elements, e.g. such that conforms to the shape of the roof covering elements and stays in place after being mounted. It is thus possible to position the tiles or roofing material closely to the flashing and a closer fit is provided, in particular in low roof inclinations. When the tile or roofing material is brought closer together the corrugated part of the skirt member will also be pushed further down towards the roof. What is meant by corrugated, is that surplus material is available in the form of corrugations or pleats, for example box pleats, accordion pleats, inverted plats or knife pleats, so the material can reach down into the troughs of the roof covering elements. The skirt member may be plane as well, without corrugations.

[0027] The flange member may be configured to be positioned at least partly between the roof covering elements. A part of it may extend from between the roof covering elements on the outside of the roof.

[0028] The flange member may be adapted to lay flat and follow the surface of the roof covering element(s) by being elastic, but still maintain its shape after being modelled or by having surplus material. For example, the flange member may be flared such the flange member is progressively wider towards the bottom and/or may be pleated and/or stretchable. The flange member may be pleated, for example the flange member may be provided with box pleats, accordion pleats, inverted plats or knife pleats.

[0029] According to an embodiment the flange member may formable for substantially permanent deformation, and comprising an elastomer being plastic and/or a textile.

[0030] Textile may include anything made from fibrous materials. The term includes fabrics made of adhered fibers like felt, items made of relatively unmodified plant materials like materials used for baskets and mats, fabrics made of spun yarns such as knitted and woven cloth, and items made of synthetic linear elements such as for nylon window screens. The textile may be woven, nonwoven, spun or molded.

[0031] The flange member and/or the skirt member may be made without any metal or a minimum amount of metal. For example, the flange member and/or the skirt member may comprise less than 15% metal by volume, less than 10% metal by volume, less than 8% metal by volume or less than 5 % metal by volume. It could be a thin metal foil or metal particles in the flange and/or skirt member.

[0032] The flange member may comprise sailcloth, where the material(s) for the sailcloth is preferably selected from a group consisting of flax, hemp, cotton, nylon, polyester, aramids, and carbon fibers.

[0033] The flashing assembly is particularly suitable for undulated roof covering elements, such as tiles, but may also be used for flat roof covering elements.

[0034] The flange member has an inner surface, adapted to face in an interior direction towards an interior of the building.

[0035] The inner surface of the flange member may

have adhesive properties to provide at least a temporary attachment to the roof covering elements until roof covering elements have been positioned on top of the flange member, to provide an easier installation. The flange member may be repositionable even with adhesive properties. The inner surface may be provided with a release liner to protect an adhesive inner surface.

[0036] The flashing assembly may comprise a sealing member attachable to the bottom of the roof penetrating structure and the skirt member.

[0037] The flashing assembly may comprise a skirt member of a corrugated sheet material having a first edge attached to the sealing member in the mounted condition, and a fourth edge, opposite the first edge, and a second and a third edge connecting the first edge with the fourth edge, preferably the second and the third edges are substantially perpendicularly to the first edge. The skirt member may comprise metal, preferably aluminium.

[0038] The flange member may comprise metal particles, such as iron oxide.

[0039] According to an embodiment, the textile is impregnated and/or laminated and/or vulcanized. The purpose of this is to repel water.

[0040] The main layer may comprise mainly short chained elastomer. The second layer may comprise mainly long chained elastomer.

[0041] Preferably at least 90%, more preferably at least 95%, of the volume of the flange member consist of an elastomer. The elastomer may also be synthetic. The surface of the main layer facing the exterior may be covered by a thin foil, e.g. less than 0.5 mm thick, or provided with UV protection, e.g. a form of paint, or another exposure protection.

[0042] The flashing assembly is either delivered on site in one piece or is assembled on site. For example, the skirt member may be attached to the flange member or they may be attached to each other on site.

[0043] The inclination of the roof is preferably between 15 degrees and 70 degrees.

[0044] The roof covering elements may be tiles or other undulated roof covering elements.

[0045] The top, bottom and side members may have an interior side for facing in an interior direction towards an interior of the building in a mounted condition and an exterior side for facing in an exterior direction opposite the interior direction in the mounted condition.

[0046] The sealing member may be in the form of a rail or a plate material, usually metal, such as aluminum, adapted to cover a part of the space between the roof penetrating structure and the roof covering elements.

[0047] The skirt member may be used for covering the remaining space between the roof penetrating structure and the roof covering elements and part of the roof covering elements facing the roof penetrating structure, at the bottom of the roof penetrating structure.

[0048] The skirt member may be a laminated sheet material comprising a layer of aluminum, cobber or zinc or alloys thereof, and a polymer layer or bitumen layer. It may be coated or include fillers and/or adhesives.

[0049] According to an embodiment, the second and/or third edge of the skirt member, preferably positioned substantially perpendicular to the first and forth edge, may be positioned in continuation of the edge of the roof covering elements facing the first or the second side of the roof penetrating structure.

[0050] The flange member is preferably free from sheet metal but may comprise metal particles. It may also include fillers such as chalk.

[0051] The flange member may have a bottom edge extending across the inclination direction, wherein the bottom edge may be substantially in line with the roof covering element resting upon the flange member in the mounted position. Thereby the flange member becomes almost invisible in the mounted position, such that visually the width of the skirt member and flange member corresponds to the width of the window. In order to have a bottom edge of the flange member being in line with the overlaying roof covering element, the flange member is preferably adapted such that the piece of flange member that extends out between the roof covering elements is cut off after the roof covering elements has been mounted.

[0052] The flange member may have a break elongation of more than 250%, preferably more than 300%. When pulling the flange member over the roof covering elements, some areas of the flange member will be more exposed to being pulled than others. The break elongation makes it possible to stretch the material were needed, so the flange member can be moulded according to the roof covering elements.

[0053] The flange member may be around 20-30 cm wide and 20 - 30 cm long. It is preferably rectangular but may be semi-circular.

[0054] The main layer or the flange member may comprise material selected from a group consisting of Ethylene Propylene Diene Monomer (EPDM) and butyl and the second layer or flange member may preferably comprise butyl and/or resin. The flange member may comprise a rubber suitable for the purpose when it comes to its plastic and elastic properties. The butyl in the main layer is preferably substantially made from short chained butyl. The butyl of the second layer is preferably substantially made from long changed butyl or another long-chained rubber material, which contributes to the elasticity. The resin, or other tacky material, contributes to adhering the flange member to the roof covering elements. The second layer or bottom layer facing towards the interior of the building is preferably covered by a release liner, such that it is easier to handle the flange member during mounting.

[0055] The flange member may have a thickness between 1.5-4 mm, preferably between 1.5-3 mm in a pre-mounted, non-stretched, condition. When the flange member is mounted it may be formed or stretched such that is conforms to the shape of the roof covering elements. When it is mounted, the thickness may be reduced

to between 0.7 and 1 mm as the material is stretched. Because the flange member has a limited thickness, the roof covering elements is able to be positioned close to each other, as opposed to a corrugated or thicker material. The flange member may also be 1-2 mm thick in the pre-mounted, non-stretched, condition.

[0056] The main layer and/or the flange member has preferably a thickness between 1.2 - 1.7 mm, more preferably around 1.5 mm in the pre-mounted, non-stretched, condition. The second layer has preferably a thickness between 0.3 - 0.7 mm, preferably around 0.5 mm in the pre-mounted, non-stretched, condition.

[0057] In an embodiment the flange member and the skirt member constitute one piece or at least share a layer of material. They may be made from the same material as described for either the flange member or the skirt member in this application.

[0058] The flange member and the skirt member may be attached to each other in the mounted condition. They may be disconnected from each other before being mounted.

[0059] The flange member and the skirt member may be attached to each other by means of a connection means such as a snap fitting and/or an adhesive or welded together. They may also be laminated together.

[0060] The flange member may be provided with an attachment flange adapted to engage with gripping means, for example formed like an omega shape, on the skirt member.

[0061] The main layer or flange member may comprise a filler, preferably chalk, which contributes to the materials plasticity.

[0062] According to an embodiment, a flashing assembly is disclosed for use for a roof penetrating structure, preferably a window, in an inclined roof of a building, the inclined roof having an inclination direction and having roof covering elements, the roof penetrating structure comprising a top member and a bottom member extending across the inclination direction, and a first side member and a second side member connecting the top member with the bottom member extending in the inclination direction, the flashing assembly comprising:

- a sealing member attachable to the bottom of the roof penetrating structure,
- a skirt member of a corrugated sheet material having a first edge attached to the sealing member in the mounted condition, and a fourth edge, opposite the first edge, and a second and a third edge connecting the first edge with the fourth edge, preferably the second and the third edges are substantially perpendicularly to the first edge, the skirt member is configured for at least partly covering the roof covering elements facing the bottom of the roof penetrating structure, the skirt member comprising metal, preferably aluminium,
- a flange member attached or configured to be attached to the skirt member at the second and/or third edge, the second and/or third edge being configured to be positioned at the first and the second side of the roof penetrating structure respectively, characterized in that the flange member is flexible and comprises a main layer comprising an elastomer being plastic and a second layer comprising an elastomer being adhesive and elastic.

[0063] According to a third aspect a roof structure is disclosed, the roof structure comprising roof covering elements and a flashing assembly for a roof window, where the flashing assembly comprises a flange member positioned between the roof covering elements and wherein a bottom edge of the flange member is substantially aligned with a bottom edge of the roof covering elements covering the flange member. Any element mentioned above in relation to the flashing assembly and/or method may be included in the roof structure.

[0064] The invention will now be explained in closer detail with reference to embodiments shown in the drawings, in which

Fig. 1 shows an embodiment of a flashing assembly in a perspective view,

Fig. 2 shows an embodiment of a flashing assembly in a perspective view in a mounted condition,

Fig. 3 shows another embodiment of a flashing assembly in a perspective view in a mounted condition,

Fig. 4 shows a cross section of an embodiment of the flange member,

Fig 5 shows an embodiment of a snap fitting between the flange member and the skirt member,

Fig. 6 shows another embodiment of a flashing assembly in a perspective view,

Fig. 7 shows an embodiment of the flashing assembly in a perspective view, corresponding to the embodiment in fig. 3, however with more details and

Fig. 8 shows another embodiment of a flashing assembly in a perspective view in a mounted condition.

[0065] In the embodiment shown in Fig. 1, only a half section of the flashing assembly 60 is shown, and a corresponding mirror inverted image may be positioned in extension of the skirt member and the rail member. The flashing assembly 60 comprises a sealing member in the form of a rail element 10 and a skirt member 20. The rail element 10 is attached to the skirt member 20 along a first edge 31 thereof and serves as a connecting element between the skirt member 20 and, for example, the frame of a roof window (not shown) installed in an inclined roof. A flashing member 15 is attached to a flange member 40

and a number of sub-elements 12, 13, 14 are intended for being connected to the window and/or roof in a manner known per se.

[0066] The skirt member 20 is corrugated to provide a surplus of material in a direction along the skirts first edge 31 and fourth edge 34. In this embodiment the skirt member 20 is laminated. The skirt member 20 comprises first layer made from sheet aluminium with a thickness of 0,15 mm, which has been lacquered, which layer faces the exterior. The second cover layer is a cross-laminated foil of a polyolefin, preferable polyethylene, such as the one sold under the trademark Valeron® and with a thickness of 0,075 mm. The third cover layer is made from as polymer, such as polypropylene or polyethylene, or silicone coated paper. Other thicknesses may be used as well.

[0067] The skirt member 20 comprises a second edge 32 and a third edge (not shown) connecting the first edge 31 and fourth edge 34. A flange member 40 is attached both at the second edge 32 and the third edge (not shown) by a snap fitting. The skirt member 20 and the flange member 40 may be integrally formed. The flange member 40 is flexible and comprises mainly an elastomer. The flange member is abutting both the skirt member 20 and flashing member 15. The flange member 40 comprises a main layer 41 comprising butyl being plastic in its ability to be modelled according to the shape of the roof, and a second layer 42 comprising a butyl and resin, however with the abilities of being adhesive and elastic.

[0068] Fig. 2 shows the flashing assembly in the mounted condition. Here the roof penetrating structure 19 in the form of a window is mounted in the roof 50. The window comprises a first 16 and a second side member 18, connected by a bottom 17 and a top member (not shown). The roof 50 is covered by undulated roof covering elements 51 in the form of tiles. The flange member 40 is easily formed according to the shape of the tile, and the tile resting above the flange member 40 is brought close to the tile the flange member rests upon. The flange member may be stretched so that it can reach over the undulated roof covering elements 51. The flange member is not corrugated but is a flat piece of material. A close-fitting flashing assembly is thereby provided. The flange member may be pleated and still provide a tight fit.

[0069] Fig. 3 shows another embodiment of the flashing assembly in the mounted condition. In addition to the features mention under fig. 2, the flange member 40 has been cut off after being mounted, such that the flange member substantially does not extend out from between the roofing elements 51, but instead is in line with the bottom edge of the roof covering element 51 resting upon the flange member 40. The flange member 40 has a bottom edge 45 extending across the inclination direction ID, perpendicularly to the second edge 32 of the skirt member. That way the flange member is substantially invisible in the mounted position.

[0070] Fig. 4 shows an embodiment of a cross section of the flange member 40. The main layer 41 makes up about 90% of the volume of the flange member. The main layer 41 is in this embodiment is butyl rubber. The main layer 41 may be made out of EPDM instead or another rubber with similar plastic properties. The top layer 44 facing the exterior is a layer of UV protection. This could be dispensed with, in particular in cases were the bottom part of the flange member is cut off, so that it is in line with the roof covering element. A second layer 42 comprising butyl rubber and resin is positioned below the main layer 41. This layer is elastic and has adhesive properties. The third layer 43 is a release liner, so the flange member 40 is easier to work with during mounting, as the second layer 42 is somewhat sticky. The third layer 43 is removed before mounting of the flange member 40. The third layer 43 could be dispensed with as well.

[0071] Fig. 5 shows a cross section of a snap fitting 70 between the flange member 40 and the skirt member 20. The snap fitting comprises a protrusion 62 on the flange member 40, preferably extending along the edge of the flange member 40 facing the skirt member, and an omega shaped engagement means 61, enclosing the protrusion 40. The layers of the flange member and the skirt member is not shown.

[0072] Fig. 6 shows another embodiment of the flashing assembly in a semi mounted condition. Here it can clearly be seen how the flashing member 40 are modelled according to the roof covering elements and stays in place after it has been stretched into position. The plastic properties of the flange member help to keep it in place.

[0073] Fig. 7 shows an embodiment of the flashing assembly in a mounted condition. Here it can in particularly be seen how the whole window appears, when the bottom edges 45 of the flange members is in line with the overlaying roof covering elements 51.

[0074] Fig. 8 shows an embodiment of the flashing assembly in a mounted condition. Here the skirt member 20 and the flange member 40 are in one piece and comprising a layer of the same material. They may be made of the same material throughout. The flange member 40 has been cut such that the bottom edge of the flange member 40 is substantially aligned with the bottom edge 45 of the roof covering element 51 positioned on top of the flange member 40. Similar reference numbers are used for similar features throughout the application. Features from the first aspect may be combined with features from the second aspect and third aspect and vice versa and features from the different embodiments may be combined freely. Features from the independent claims may be dispensed with.

Claims

1. Method of mounting a flashing assembly (60) for use for a roof penetrating structure (19), preferably a window, in an inclined roof (50) of a building, the inclined roof having an inclination direction and roof covering elements (51), the roof penetrating structure (19) comprising a top member and a bottom member (17)

extending across the inclination direction, and a first side member (16) and a second side member (18) connecting the top member with the bottom member (17) extending in the inclination direction:

- mounting a flashing assembly (60) comprising a skirt member (20) and at least one flange member (40), the skirt member (22) having a first edge (31) and a fourth edge (34) extending across the inclination direction, the fourth edge (34) being opposite the first edge (31), the skirt member (20) is configured for at least partly covering the roof covering elements (51) facing the bottom of the roof penetrating structure (19), the flange member (40) is positioned in extension of the skirt member (20) and the first (31) and the fourth edge (34), such that the flange member (40) is positioned at the first and/or the second side member of the roof penetrating structure (19) respectively,
- mounting roof covering elements (51), such that the at least one flange member (40) is at least partly covered by the roof covering elements (51),
- **characterized by** removing a part of the flange member (40) that extends out from between the roof covering elements (51) thereby aligning a bottom edge of the flange member (40) with a bottom edge of the roof covering element (51) positioned on top of the flange member (40).

2. Method according to claim 1, further comprising the step of attaching a sealing member (10) to the bottom of the roof penetrating structure (19).

3. Flashing assembly (60) for use in a method according to any one of claims 1 or 2, for use for a roof penetrating structure (19), preferably a window, in an inclined roof (50) of a building, the inclined roof having an inclination direction and having roof covering elements (51), the roof penetrating structure (19) comprising a top member and a bottom member (17) extending across the inclination direction, and a first side member (16) and a second side member (18) connecting the top member with the bottom member (17) extending in the inclination direction, the flashing assembly (60) comprising:

a skirt member (20) and at least one flange member (40), the skirt member (22) having a first edge (31) and a fourth edge (34) extending across the inclination direction, the fourth edge (34) being opposite the first edge (31), the skirt member (20) is configured for at least partly covering the roof covering elements (51) facing the bottom of the roof penetrating structure (19), the flange member (40) is positioned in extension of the skirt member (20) and the first (31) and the fourth edge, such that the flange member is for being positioned at the first and/or the second side member of the roof penetrating structure (19) respectively, the flange member (40) has an inner surface, adapted to face in an interior direction towards an interior of the building,
characterized in that the flange member (40) is pliable and is configured for being cut by a hand tool, along the roof covering element in a mounted position across the inclination direction.

4. Flashing assembly (60) according to claim 3, wherein the flange member (40) is configured to be positioned at least partly between the roof covering elements (51).

5. Flashing assembly (60) according to claim 3 or 4, wherein the flange member (40) is stretchable and/or pleated and/or progressively wider towards the bottom.

6. Flashing assembly (60) according to any one of claims 3-5, wherein the inner surface is adhesive.

7. Flashing assembly (60) according to any one of claims 3-6, wherein the flange member (40) comprises a main layer (41) comprising an elastomer being plastic and a second layer (42) comprising an elastomer being adhesive and elastic.

8. Flashing assembly (60) according to any one of claims 3-7, wherein the flange member (40) has a bottom edge (45) extending across the inclination direction, wherein the bottom edge (45) is substantially in line with the roof covering element (51) resting upon the flange member (40) in the mounted position.

9. Flashing assembly (60) according to any one of claims 3-8, wherein the flange member (40) comprises sailcloth, where the material(s) for the sailcloth is preferably selected from a group consisting of flax, hemp, cotton, nylon, polyester, aramids, and carbon fibers.

10. Flashing assembly (60) according to any one of claims 3-9, wherein the flange member (40) is laminated and/or impregnated and/or vulcanized.

11. Flashing assembly (60) according to any one of claims 3-10, wherein the flange member (40) comprises metal particles, such as iron oxide.

12. Flashing assembly (60) according to any one of claims3-11, wherein the flange member (40) has a break elongation of more than 250%, preferably more than 300%.

13. Flashing assembly (60) according to any one of claims 3-12, wherein the flange member (40) comprises material selected from a group consisting of Ethylene Propylene Diene Monomer (EPDM) and butyl and the second layer preferably comprising butyl and/or resin.

14. Flashing assembly (60) according to any one of claims 3-13, wherein the flange member (40) has a thickness between 1.5-4 mm, preferably between 1.5-3 mm in a pre-mounted condition.

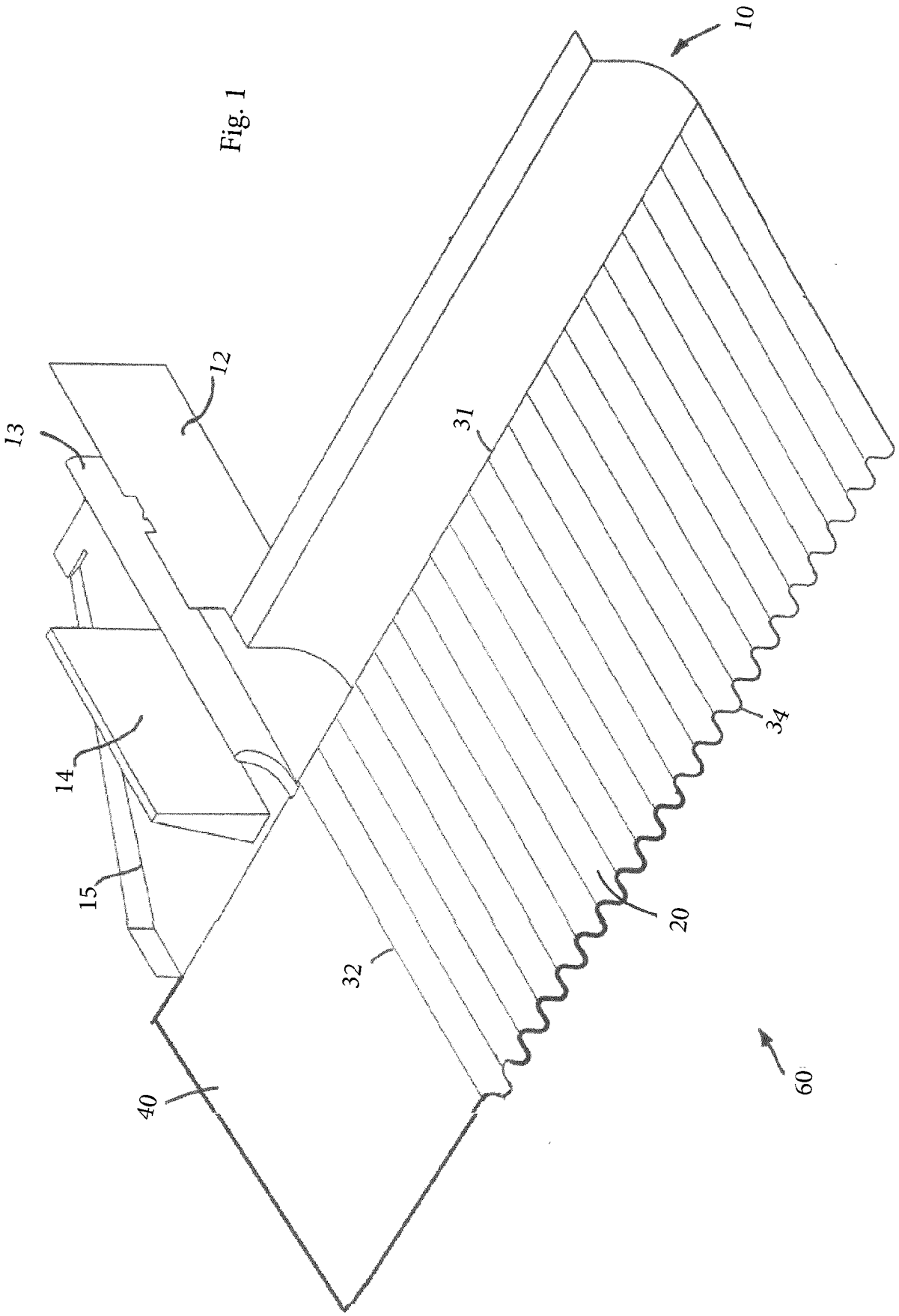
15. Flashing assembly according to any one of claims 3-14,
wherein the flange member (40) and the skirt member (20) constitutes one piece or at least share a layer of material.

16. Flashing assembly (60) according to any one of claims 3-14,
wherein the flange member (40) and the skirt member (20) is attached to each other by means of a connection means such as a snap fitting (70) and/or an adhesive.

17. Flashing assembly (60) according to any one of claims 3-16,
wherein the flange member (40) comprises a filler, preferably chalk.

18. Roof structure comprising:
roof covering elements (51) and a flashing assembly (60) for a roof window according to any one of claims 3-17, where the flashing assembly (60) comprises a flange member (40) positioned between the roof covering elements (51) and wherein a bottom edge (45) of the flange member (40) is substantially aligned with a bottom edge of the roof covering elements (51) covering the flange member (40).

Fig. 1



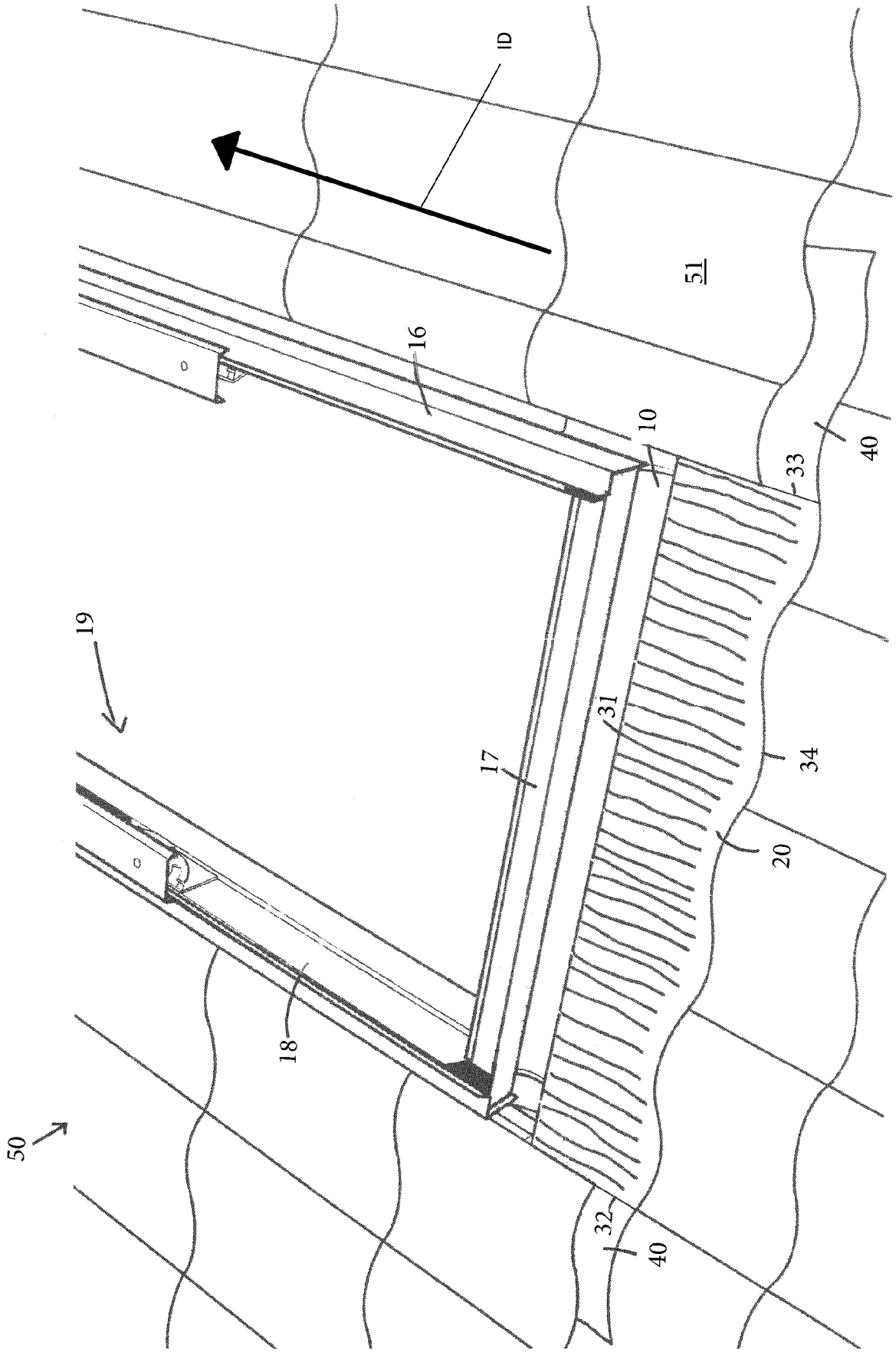


Fig. 2

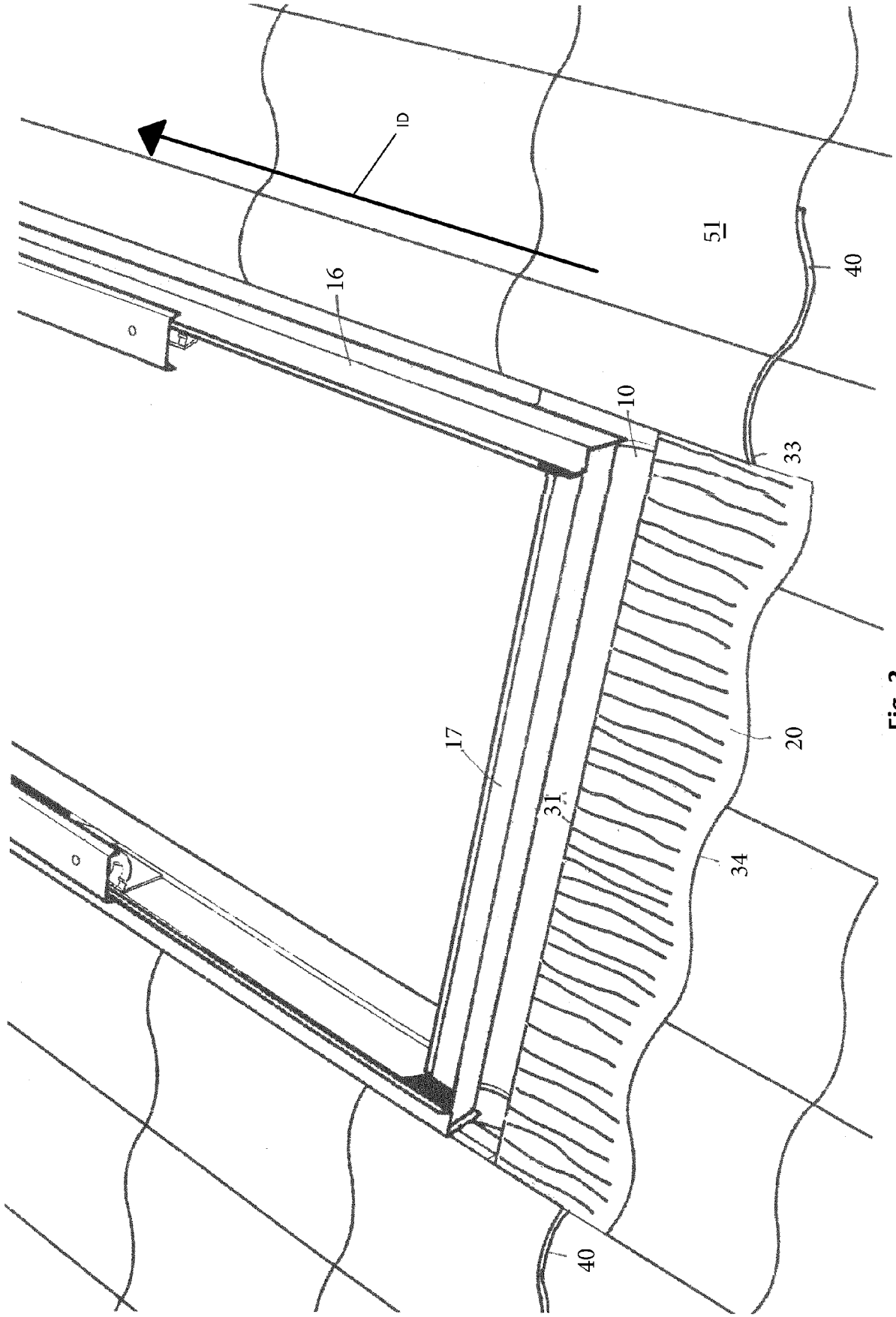
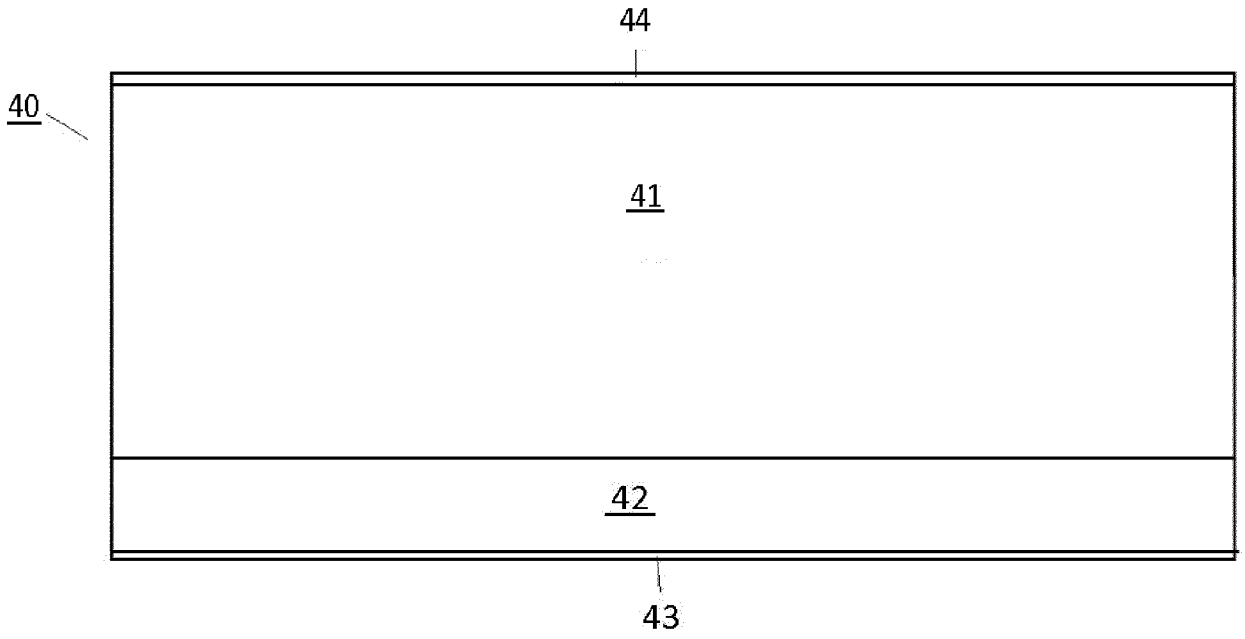


Fig. 3

Fig. 4



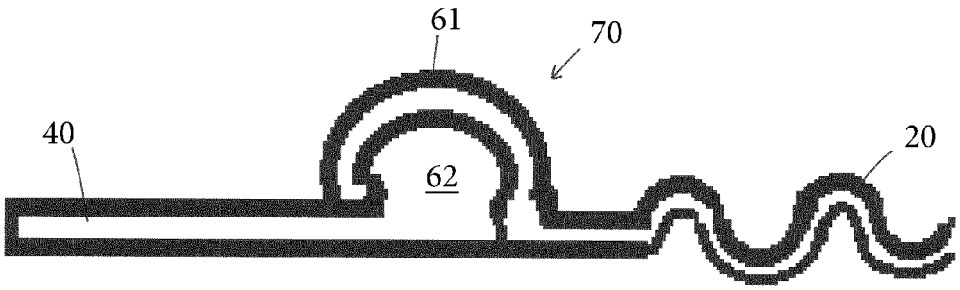


Fig. 5

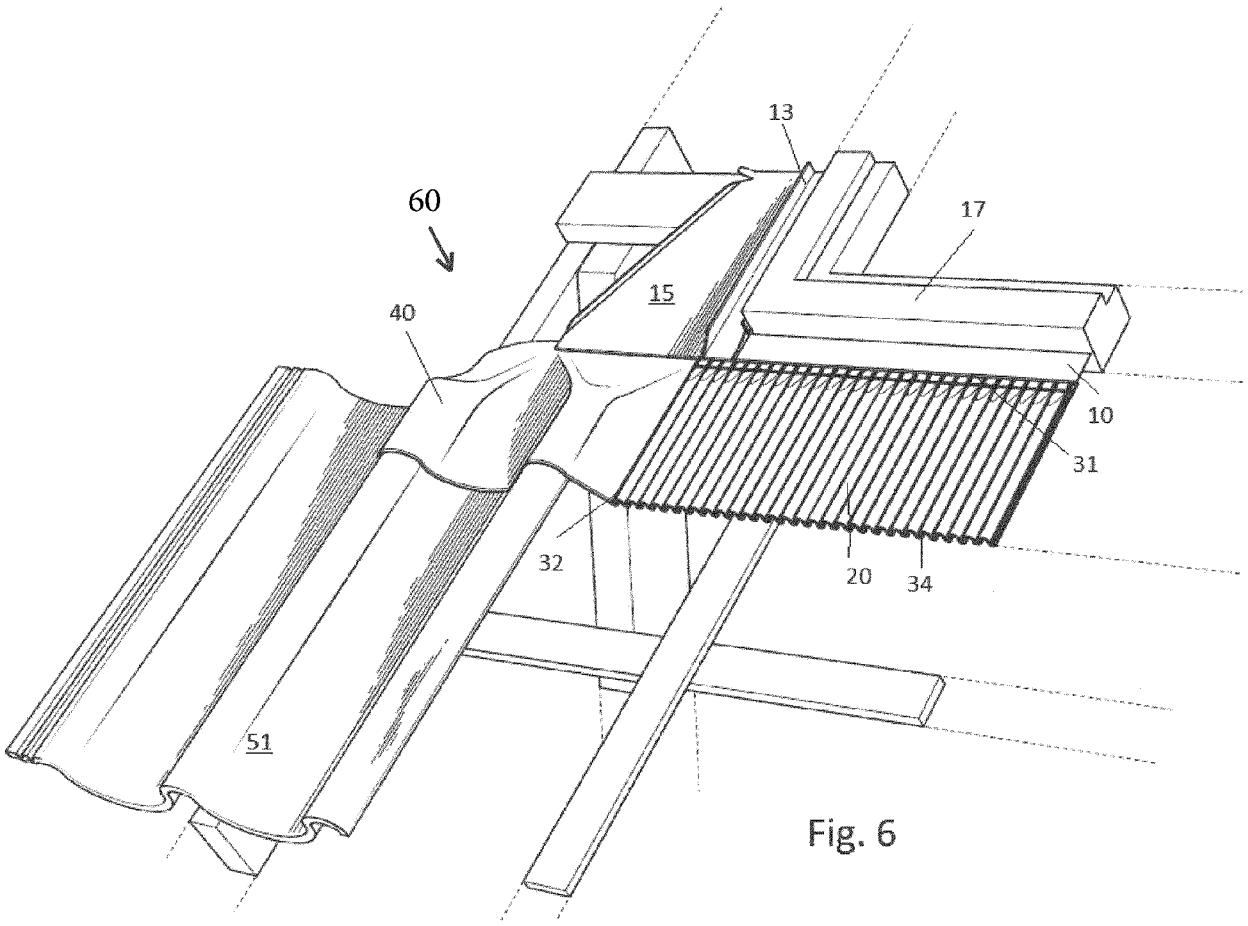


Fig. 6

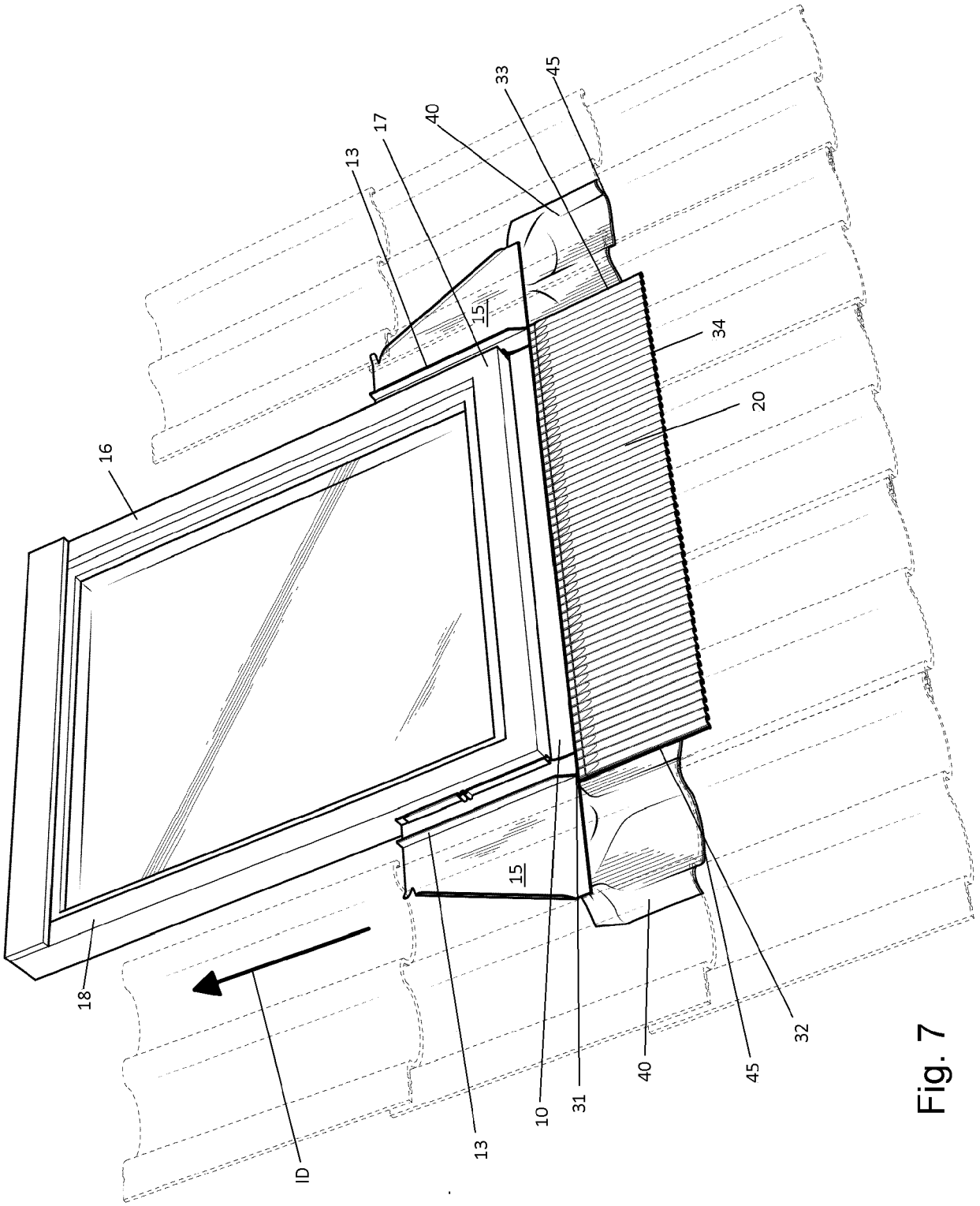


Fig. 7

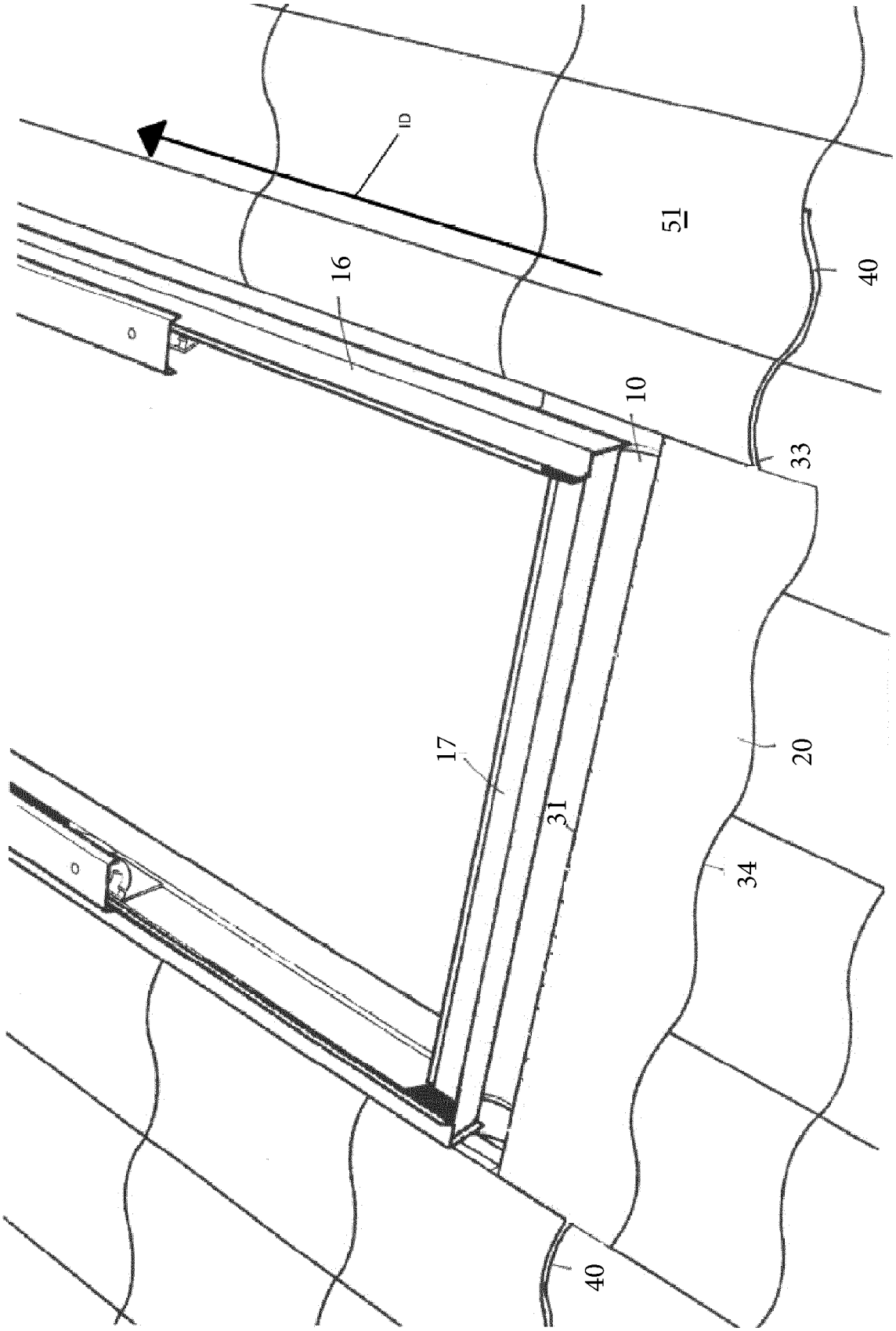


Fig.8

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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 3 323 957 A1 (FAKRO PP SP Z O O [PL]) 23 May 2018 (2018-05-23) * claim 1; figures 1-2 *	3-15,17, 18	INV. E04D13/147
X	JP 2006 225955 A (TOSTEM CORP) 31 August 2006 (2006-08-31) * figures 5A-5C *	1-15,17	
X	DE 25 54 341 B1 (BRAAS & CO GMBH) 8 June 1977 (1977-06-08) * paragraph [0011]; figure 3 *	1,3-15, 17	
X	DE 39 04 174 A1 (HANDEL & MACK GMBH & CO KG [DE]) 16 August 1990 (1990-08-16) * figures 1-2 *	3,16	
A	WO 01/23686 A1 (HAYNES ANDREW LEO [NZ]) 5 April 2001 (2001-04-05) * pages 12-13 *	6,7,9, 10,13,14	
A	CA 3 122 924 A1 (REDEAHOLD APELDOORN B V [NL]) 18 June 2020 (2020-06-18) * claims 4,9,10,13,29 *	10,12, 13,17	TECHNICAL FIELDS SEARCHED (IPC) E04D E04F
A	GB 2 184 685 A (BRAAS & CO GMBH) 1 July 1987 (1987-07-01) * column 2, line 35 *	17	
A	Velux Group: "Handboek voor de installatie van VELUX dakvensters", , 1 January 2014 (2014-01-01), pages 1-89, XP055500356, Retrieved from the Internet: URL:https://velcdn.azureedge.net/~/media/marketing/uk/brochures/installer_handbook.pdf [retrieved on 2018-08-16] * pages 23,34 *	1	

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 January 2022	Leroux, Corentine

CATEGORY OF CITED DOCUMENTS

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& : member of the same patent family, corresponding document

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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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11-01-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3323957 A1	23-05-2018	DE 202017007145 U1	16-09-2019
		EP 3323957 A1	23-05-2018
		PL 125780 U1	04-06-2018
JP 2006225955 A	31-08-2006	JP 4749735 B2	17-08-2011
		JP 2006225955 A	31-08-2006
DE 2554341 B1	08-06-1977	BE 848960 A	01-04-1977
		DE 2554341 B1	08-06-1977
DE 3904174 A1	16-08-1990	NONE	
WO 0123686 A1	05-04-2001	AU 782847 B2	01-09-2005
		EP 1246980 A1	09-10-2002
		WO 0123686 A1	05-04-2001
CA 3122924 A1	18-06-2020	CA 3122924 A1	18-06-2020
		EP 3902954 A1	03-11-2021
		WO 2020122727 A1	18-06-2020
GB 2184685 A	01-07-1987	AT 393996 B	10-01-1992
		DK 619486 A	20-06-1987
		FR 2594070 A1	14-08-1987
		GB 2184685 A	01-07-1987
		IT 1205541 B	23-03-1989
		NL 8603223 A	16-07-1987

EPO FORM P0459

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Patent documents cited in the description

- EP 2749707 A **[0006]**