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The invention relates to a method for packaging an underroof collar for use in water-proofing a joint between a roof structure and a window frame. Said method comprises the steps of: Folding along a first folding line extending substantially in parallel to the top and bottom collar members; folding along a second folding line extending substantially in parallel to the top and bottom collar members; folding along a third and a fourth folding line extending substantially in parallel to the side collar members; and folding the underroof collar along a fifth folding line extending substantially in parallel to the top and bottom collar members. It further relates to a packed underroof collar and to a method for mounting an underroof collar including unfolding steps.

Fortsættes...

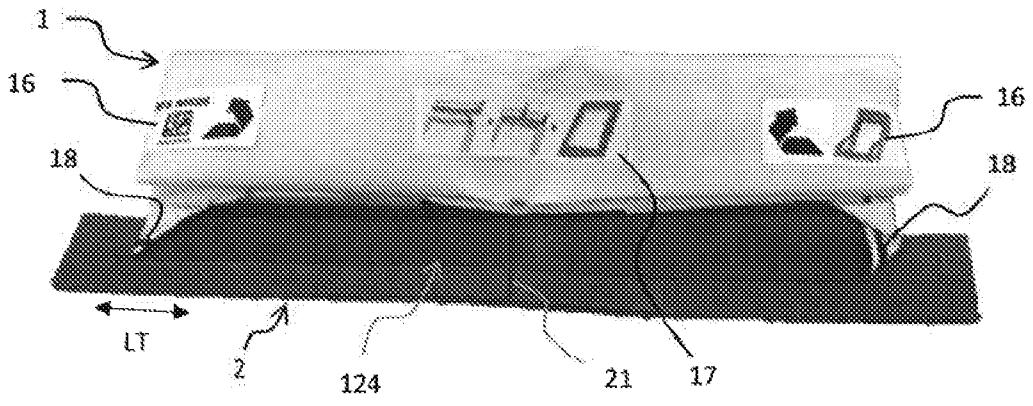


Fig. 15

Title of Invention

A method for packaging an underroof collar, a packed underroof collar, and a method for mounting an underroof collar

5 Technical Field

The present invention relates to a method for packaging an underroof collar for use in water-proofing the joint between a roof structure and a window frame, said underroof collar comprising a top collar member, a bottom collar member, and two side collar members for extending along a top frame member, 10 a bottom frame member, and two side frame members of a window frame, respectively, in a mounted state, each collar member including an inner rim part and an outer skirt part intended for coming into engagement with the roof structure, and said inner rim parts together delimiting a collar opening, at least in the mounted state, where each collar member has a length direction 15 extending in parallel with the inner rim part, and where each of said side collar members comprises a centre section extending between the top collar member and the bottom collar member along the collar opening. The invention further relates to a packed underroof collar and to a method for mounting an underroof collar.

20

Background Art

Underroof collars of the kind mentioned above are known for example from EP0994992B1, EP2952646A1, and EP2284329A2, and since they are made from soft textile-like materials they can be packaged in many ways. 25 Focus have, however, always been on making the packed underroof collar as compact as possible in order to reduce the space needed for storage and transportation.

In later years focus has shifted towards making the installation of roof window related products, such as underroof collars, easier in order to avoid 30 errors in mounting. One example is found in the applicants' own prior patent application WO2018/210937, where the underroof collar was provided with an engagement zone adapted for engagement with a window frame or the like.

It, however, remains a problem that underroof collars are relatively large and made from soft materials making them difficult to handle.

Summary of Invention

5 With this background, it is an object of the invention to provide a method for packaging an underroof collar and a packed underroof collar, which allows a reduction of the risk of error both in the packaging process and in the mounting of the underroof collar.

10 This and further objects are achieved with a method of the kind mentioned in the introduction which is furthermore characterised in the following sequence of steps:

A) Folding the underroof collar along a first folding line extending substantially in parallel to the top and bottom collar members, so that the top collar member is arranged on top of the bottom collar member or vice versa,

15 B) Folding the underroof collar along a second folding line extending substantially in parallel to the top and bottom collar members, so that at least part of the centre section of each side collar member is arranged on top of or underneath the top collar member, the bottom collar member, and/or a section of the side collar member located in continuation of the top collar member or
20 the bottom collar member when seen in the length direction of said top collar member or bottom collar member,

C) Folding the underroof collar along a third folding line and a fourth folding line both of which extend substantially in parallel to the side collar members one at each side of the underroof collar so that the side collar
25 members are arranged on top of or underneath the top and bottom collar members, and

D) Folding the underroof collar along a fifth folding line extending substantially in parallel to the top and bottom collar members.

30 By this particular sequence of folding steps, the underroof collar is packed in a manner, which is both comparatively easy to manage at the production site and facilitates installation of the underroof collar on a roof window mounted in a roof structure.

In a second aspect of the invention the above and further objects are achieved with a packed underroof collar for use in water-proofing the joint between a roof structure and a window frame, said underroof collar comprising a top collar member, a bottom collar member, and two side collar members for extending along a top frame member, a bottom frame member, and two side frame members of a window frame, respectively, in a mounted state, each collar member including an inner rim part and an outer skirt part intended for coming into engagement with the roof structure, and said inner rim parts together delimiting a collar opening, at least in the mounted state, where each collar member has a length direction extending in parallel with the inner rim part, and where each of said side collar members comprises a centre section extending between the top collar member and the bottom collar member along the collar opening, wherein the underroof collar is folded along a first folding line extending substantially in parallel to the top and bottom collar members, so that the two side collar members at each side are folded upon themselves and so that the top collar member is located on top of the bottom collar member or vice versa, that the underroof collar is folded along a second folding line extending substantially in parallel to the top and bottom collar members, so that at least part of the centre section of each side collar members is located on top of or underneath the top bottom member, the bottom collar member, and/or a section of the side collar member located in continuation of the top collar member or the bottom collar member when seen in the length direction of said top collar member or bottom collar member, that the underroof collar is folded along a third folding line and a fourth folding line extending substantially in parallel to the side collar members so that the side collar members are located on top of or underneath the top and bottom collar members, and that the underroof collar is folded along a fifth folding line extending substantially in parallel to the top and bottom collar members.

The embodiments and advantages, which will be described with reference to the first aspect of the invention also applies to the second aspect and vice versa unless otherwise stated.

The folding along the first folding line, so that the top collar member is

arranged on top of the bottom collar member or vice versa, means that the size of the underroof collar becomes more manageable, making the subsequent packaging steps more manageable. When unfolding the underroof collar during mounting, this folding step is reversed as the last one, and if doing so after
5 having arranged the top and bottom collar members along either the top or the bottom frame member of the window frame the result will be that the underroof collar comes easily into its intended position in relation to the window frame and the roof structure when performing the last unfolding step.

The first folding line may be positioned so that the inner rim parts of
10 the top and bottom collar member become aligned after the folding, but other relative positions are also possible. In one embodiment, outer edges of the top and bottom collar members opposite the inner rim parts become aligned after the folding. In any event the first folding line will be positioned about the middle of the centre section of the side collar members, so that the size of the
15 underroof collar folded along the first folding line is about half the size of the unfolded underroof collar.

The folding along the second folding line results in that at least part of the centre section of each side collar members is arranged on top of or underneath other parts of the underroof collar. This not only reduces the size
20 of the folded underroof collar but also means that the centre sections of the side collar members no longer project as two legs from the top and bottom collar members, thus making the folded underroof collar considerably more manageable. If the side collar members are so long that they still project from the top and bottom collar members after the folding along the second folding
25 line, they may be folded ones more along an additional folding line extending in parallel to the second folding line.

During unfolding this sequence of folding means that the centre section of the side collar members can be brought into position, one on each side of the window frame while still folded along the first folding line, i.e. before
30 unfolding the underroof collar completely. This reduces the risk of wind catching the underroof collar and making it difficult to position the side collar members.

The folding along the third folding line and the fourth folding line results

in the side collar members becoming arranged on top of or underneath the top and bottom collar members. This will contribute to reducing the risk of the side collar members unfolding unintentionally. In underroof collars for use on a roof covered with tiles or other roofing materials resting on laths, the side collar members are usually made with a surplus of material, for example by using a pleated fabric, and due to the surplus of material the risk of them becoming unfolded or otherwise disordered is high. Folding such side collar members onto or underneath the top and bottom frame members means that this risk is reduced.

10 After being folded along third and fourth folding lines the underroof collar may have a width, when seen in the length direction of the top collar member, corresponding substantially to the width of the window frame around which it is to be mounted. During mounting this can be used for positioning the underroof collar correctly in relation to the width of the window frame before
15 unfolding the side collar members along the third and fourth folding lines, thus reducing the need for repositioning the unfolded and substantially less manageable underroof collar. This effect is particularly pronounced in an embodiment where the third and fourth folding lines are substantially coinciding with the inner rims of the side collar members.

20 By the folding along the fifth folding line extending substantially in parallel to the top and bottom collar members the underroof collar becomes even more manageable and the dimensions thus obtained makes it fit well into the packaging used for other components used in the installation of a roof window. In one embodiment the underroof collar is further folded along a sixth
25 folding line extending substantially in parallel to the top and bottom collar members to make it even smaller.

 It is presently considered advantageous that, when folding along the fifth folding line, the underroof collar is folded so that at least the centre sections of the side collar members are arranged between sections of the top collar member and/or the bottom collar member. This entails that the outer surface of
30 the packed underroof collar consists substantially entirely of an uninterrupted section of the top or bottom collar member, which are typically made from a

smooth un-pleated fabric. Thereby the risk of the underroof collar becoming torn or unfolded due to rims, edges or folds being caught on other objects during handling of the underroof collar is considerably reduced.

In some underroof collars the top collar member is considerably wider
5 in a direction perpendicular to its length direction than the bottom collar member. To compensate for this difference and make the other folding steps easier, the underroof collar may be folded along a seventh folding line extending substantially in parallel to the top and bottom collar members before the folding along the first folding line. This results in one section of the top collar
10 member becoming arranged on top of or underneath another section of the top collar member.

The underroof collar may be fixated in the folded state by adding a least one fixation chosen from the group consisting of strings, straps, clips, staples, hook-an-loop type fasteners, adhesive tape, adhesive, and glue.

15 To further facilitate the installation of the underroof collar it may be attached to at least one mounting element, such as an insulating member. The mounting element may be arranged against or attached to the window frame or the roof structure before commencing the unfolding of the underroof collar, thus contributing to achieving a correct and stabile positioning of the underroof
20 collar in relation to the window frame.

The mounting element may comprise a fastener adapted for attachment to a window frame and/or the roof structure, such as a strip of an adhesive which may be covered by a cover member in a state of delivery. Similar fasteners may be provided on the inner rim parts of the collar members
25 not directly connected to the mounting element, and in embodiments without a mounting element all inner rim parts may be provided with one or more such fasteners.

If the mounting element is an insulating member, it may replace or supplement a member of an insulating frame or insulating assembly used for
30 insulating the joint between the window frame and roof structure.

The mounting element may also contribute to keeping the underroof collar in the folded or packed state, thereby replacing or supplementing the

abovementioned fixation(s).

A third aspect of the invention relates to a method for mounting an underroof collar so that it covers a joint between an inclined roof structure and a window frame, said underroof collar comprising a top collar member, a bottom collar member, and two side collar members for extending along a top frame member, a bottom frame member, and two side frame members of a window frame, respectively, in a mounted state, each collar member including an inner rim part and an outer skirt part intended for coming into engagement with the roof structure, and said inner rim parts together delimiting a collar opening, at least in the mounted state, where each collar member has a length direction extending in parallel with the inner rim part, and where each of said side collar members comprises a centre section extending between the top collar member and the bottom collar member along the collar opening. This method comprises the following steps:

15 H) Arranging a packed underroof collar at the top frame member of the window frame,

I) Attaching the inner rim part of the top collar member or a mounting element to which the inner rim part of the top collar member is attached to the top frame member,

20 J) Unfolding the underroof collar along a fifth folding line and possibly a sixth folding line extending substantially in parallel to the top and bottom collar members, so that the top and bottom collar members are arranged on an exterior surface of the roof structure above the window frame when seen in the direction of inclination of the roof structure, the bottom collar member being arranged on top of the top collar member,

25 K) Unfolding the underroof collar along a third folding line and a fourth folding line extending substantially in parallel to the side collar members so that the side collar members are arranged on top of the exterior surface of the roof structure above and to each side of the window frame, said side collar members being in a state, where they remain folded onto themselves,

30 L) Unfolding the underroof collar along a second folding line extending substantially in parallel to the top and bottom collar members, so that the side

collar members are brought down along the side frame member while remaining folded onto themselves,

M) Unfolding the underroof collar along a first folding line extending substantially in parallel to the top and bottom collar members, so that the side
5 collar members are unfolded entirely and so that the bottom collar member is passed over the window frame and down to a position below the bottom frame member when seen in the direction of inclination of the roof structure,

This sequence of steps ensures that all collar members are mounted correctly and not unfolded until other sections have been brought into place. In
10 this way the installer only needs to relate to one or two collar members at a time and as collar members not yet to be used remain folded, the risk of them being caught by wind is considerably reduced.

Before starting the unfolding of the underroof collar, one or more insulating members may be arranged along one or more window frame
15 members. These insulating members may be delivered together with the packed underroof collar, possibly be attached to it in a manner indicating an intended mounting sequence or position.

The method for mounting may also include attaching the side collar members and/or the bottom collar member directly or indirectly to the window
20 frame. In this way the underroof collar is fixated in the mounted position and subsequent displacement prevented. The fixation may also contribute to a wind-proofing of the finished roof structure if for example it is achieved with an uninterrupted strip of adhesive extending along the entire inner rim of the underroof collar.

25 To further reduce the risk of the underroof collar becoming caught by wind and/or displaced, one or more collar members may be attached to the roof structure, for example by means of staples being passed through the collar members in the vicinity of the outer edges and into laths or battens of the roof structure.

30

Brief Description of Drawings

In the following description embodiments of the invention will be

described with reference to the schematic drawings, in which

Fig. 1 shows an unfolded underroof collar in a perspective view to the left and in a front view to the right;

Figs 2-7 show the underroof collar in Fig. 1 in different stages of folding
5 in perspective views to the left and in front views to the right;

Fig. 8 shows an unfolded underroof collar in a perspective view to the left and in a front view to the right;

Figs 9-14 show the underroof collar in Fig. 8 in different stages of folding in perspective views to the left and in front views to the right;

10 Fig. 15 is a photo of a packed underroof collar;

Fig. 16 is a partially cut-away photo of an underroof collar arranged on top of a mounting element;

Fig. 17 is a partially cut-away photo of an underroof collar and a mounting element;

15 Fig. 18 is a photo of a packed underroof collar;

Fig. 19 illustrates the arrangement of a packed underroof collar at a top frame member of a window frame installed in an inclined roof structure;

Fig. 20 illustrates an initial stage of unfolding of the packed underroof collar in Fig. 19;

20 Fig. 21 illustrates a final stage of unfolding of the packed underroof collar in Figs 19 and 20;

Fig. 22 is a partially cut-away photo of packed underroof collar in Fig. 15 attached to a top frame member of a roof window frame;

25 Fig. 23 is a partially cut-away photo of an inner side of the mounting element of the packed underroof collar in Figs 15 and 22;

Fig. 24 shows a second embodiment of a mounting element; and

Fig. 25 shows the mounting element in Fig. 24 after mounting.

Description of Embodiments

30 Referring initially to Fig. 1, an underroof collar 1 for use in waterproofing the joint between a roof structure and a window frame is shown both in a perspective view to the left and in a front view to the right. It comprises a

bottom collar member 11, a top collar member 12, and two side collar members 13, 14 for extending along a bottom frame member, a top frame member, and two side frame members of a window frame, respectively, in a mounted state. Please note that for practical reasons the underroof collar has been illustrated
5 with the bottom collar member facing upwards in Fig. 1, i.e. opposite the intended orientation in the mounted state.

Each collar member includes an inner rim part 111, 121, 131, 141 and an outer edge 112, 122, 132, 142, and the inner rim parts together delimit a collar opening 15. The parts of the collar members extending away from the
10 inner rims towards the outer edges are configured for serving as outer skirt parts coming into engagement with the roof structure in the mounted state.

Each collar member has a length direction extending in parallel with the inner rim part, in Fig. 1 represented only by the length directions LB and LS of the bottom collar member and the left-hand side collar member, respectively.

15 All collar members are made from the same smooth fabric, such as a polypropylene non-woven with a wind-proofing layer, but whereas the bottom collar member 11 and the top collar member 12 are simple sheets of material, the side collar members 13, 14 are pleated. The pleating provides a surplus of material, which allows the side collar members to get down between laths of the roof structure and reach an underroof sandwiched between the lath and
20 rafters of the roof structure in a manner well-known to the skilled person.

In this embodiment, the joints between the side collar members 13, 14 and the bottom and top collar members 11, 12 extend at a 45 degrees angle from the corners of the collar opening 15 towards the outer edges 132, 142, but
25 it is to be understood that other angles are also possible. Particularly it is envisaged that the pleated side collar members may extend over the entire height of the underroof collar, so that outer end edges (not shown) extend in continuation of the outer edges 112, 122 of the bottom and top collar members, or that the side collar members end at level with the inner rim parts 111, 121 of the bottom and top collar members. The joints may be made by welding, gluing,
30 sowing or any other chemical or mechanical means which results in a wind-proof joint.

Turning now to Fig. 2, the underroof collar 1 has been folded along a first folding line I shown in Fig. 1 so that the bottom collar member 11 has been arranged on top of the top collar member 12 and so that the two side collar members 13, 14 are folded on top of themselves. This results in that the centre sections 133, 143 of the side collar members 13, 14 project as two legs from the top and bottom collar members in the folded state. In this embodiment, the outer edges 112, 122 of the bottom and top collar members have been aligned, and a section of the top collar member 12 close to the collar opening 15 is still visible due to the difference in size between the top collar member and the bottom collar member.

In the next folding step, the underroof collar is folded along a second folding line II shown in Fig. 2, thereby bringing the underroof collar into the state shown in Fig. 3. This means that the centre sections of the side collar members 133, 143 are arranged on top of the bottom collar member as well as on top of the sections of the side collar members located in continuation of the bottom collar member when seen in the length direction LB. The second folding line here coincides with the inner rim part 121 of the top collar member 12, and the centre sections 133, 143 of the side collar members no longer project from the rest of the folded underroof collar. This results in a compact folded underroof collar and is therefore presently considered advantageous but need not be the case.

To achieve a further compacted state of the folded underroof collar it is now folded along a third folding line III and a fourth folding line IV shown in Fig. 3 to the state shown in Fig. 4. This means that the side collar members are arranged upside-down on top of the bottom collar member 11 and the section of the top collar member 12, which is still uncovered due to its larger size. In this way, the centre sections 133, 143 of the side collar members are sandwiched between the other parts of the underroof collar, thus protecting them from unintentional unfolding and also protecting the pleating.

A still further reduction of the size of the folded underroof collar and protection of edges, which might otherwise get caught on other things during handling of the packed underroof collar is achieved by folding along a fifth

folding line V in Fig. 4 to the state shown in Fig. 5, where only the top collar member 12 is exposed.

In this embodiment the underroof collar is folded one more time along a sixth folding line VI shown in Fig. 5 to the state shown in Fig. 6 and is then
5 attached to a mounting element 2 as shown in Fig. 7. The last folding ensures that the packed underroof collar is compact and corresponding substantially in size to the mounting element, which in turn has substantially the same size as an outer exposed surface of a roof window frame against which it is to be mounted.

10 Above the folding steps have been described with reference to embodiments, where sections of the underroof collar are always arranged on top of other sections. This is considered advantageous as it will then be possible to see if it has been folded correctly, but it is not excluded to make one or more of the folds so that the section in question is arranged underneath
15 another section or even between sections of an already folded underroof collar.

Turning now to Figs 8-14 a slightly different way of folding the underroof 1 is shown. It is to be understood that the underroof collar shown here is identical to the one in Fig 1-7 and as many of the folding steps are the same, only the differences will be described.

20 The packaging of the underroof collar here starts with a folding of the top collar member 12 along a folding line VII extending in parallel with the length direction LT of the top collar member, thereby bringing the underroof collar into the state shown in Fig. 9. When now folding along the folding line 1 as described above, so that the bottom collar member 11 is arranged on top of the
25 top collar member, the still uncovered section of the top collar member is considerably smaller than in the first embodiment as may be seen by comparing Fig. 10 to Fig. 2. Furthermore, when then folding along the folding line II shown in Fig. 10, the resulting folded underroof collar is also considerably smaller as is seen by comparing Fig. 11 to Fig. 3, and the folding along a sixth
30 folding as described above with reference to Figs 5 and 6 is therefore not needed.

A still further embodiment of a packed underroof collar 1 attached to a

mounting element 2 in the form a top insulating member adapted for insulating a top frame member of a roof window frame is shown in Fig. 15. Throughout this description, the same reference numbers will be used for elements having substantially the same function, even though they may not be identical.

5 As may be seen in Fig. 15, a section 124 of the top collar member has been left uncovered by the rest of the underroof collar, corresponding to the fifth folding line V being located somewhat below the middle in Fig. 12. The third and fourth folding lines III and IV have also been located slightly more towards the middle of the underroof collar than shown in Fig. 11, but the
10 underroof collar has otherwise been packed as illustrated in Fig. 8-14.

To keep the packed underroof collar in its folded state it has been provided with fixations 16 in the form of strips of adhesive tape at both ends, said strips of tape being folded around the ends so that it sticks to both the upper side and the lower side of the packed underroof collar.

15 Information regarding the intended use of the underroof collar has been provided both on the two strips 16 of adhesive tape and on a sticker 17 attached to the packed underroof collar, but it would also be possible to print information directly on the underroof collar.

The uncovered section 124 of the top collar member has been
20 attached to the mounting element by means of a strip of adhesive 18, which continues along the entire inner rim of the underroof formed by the inner rim parts of the respective collar member. Fig. 16 shows the top collar member 12 arranged on top of the mounting element 2 before being attached to it and above that the white back side 125 of a similar collar member, where the strip
25 of adhesive 18 is clearly seen. The strip of adhesive 18 may be covered with a cover strip, which is removed before attaching the underroof collar to the mounting element 2. The strip of adhesive 18, which can continue along the entire rim of the collar, may be covered by a cover strip, which can be removed before attaching the rim of the collar to the window frame members.

30 In this embodiment, the insulating member constituting the mounting element 2 is made with a recess 21 at the centre extending perpendicular to the length direction LT of the top collar member 12. The recess 21 may serve

to facilitate a correct relative positioning of the underroof collar 1 in the length direction by aligning it with an indentation 126 provided in the inner rim part of the top collar member, said indentation 126 being seen more clearly in Fig. 17.

As is also seen clearly in Fig. 17 the mounting element 2 is provided
5 with a further recess 22 extending in parallel with the length direction. By arranging the inner rim part 121 in parallel with this further recess 22 it is ensured that the underroof collar will be in correct height perpendicular to the plane of the roof when mounted on the window frame.

The recess 21 may have the further advantage that it allows the
10 packed underroof collar to be folded ones more to the even more compact state shown in Fig. 18.

Figs 19-21 show how the packed underroof collar 1 is mounted at the top frame member 31 of a roof window frame 3 and unfolded onto the roof structure 4 surrounding the roof window frame.

15 The mounting element 2 is provided with a fastener 23, here in the form of an adhesive covered by a cover strip 24, which is removed as indicated by the arrow in Fig. 19 before bringing the mounting element 2 into contact with the top frame member 31.

The removal of fixations 16 and the unfolding along the fifth and sixth
20 folding lines shown and described with reference to Figs 4-6 is shown in Fig. 20.

The unfolding of the first and second folding lines described with reference to Figs 1-3 is shown in Fig. 21.

Fig. 22 is a photo showing the packed underroof collar 1 in Fig. 15
25 arranged against a top frame member of a roof window frame 3. Mounting against the top frame member is considered advantageous as gravity will help with the installation of the underroof collar, but it is not excluded to start from another position.

Fig. 23 is a photo of the inner side of the mounting element 2 facing
30 the top frame of the window frame 3 in Fig. 22. In addition to the fastener 23, which consists of five parallel strips of adhesive and is here covered by a transparent cover layer, it comprises a recess 25. The recess 25 is configured

for making room for wiring connected to electronic equipment on the window, such as an electric operator, a rain sensor or the like so that the insulating material of the mounting element is not compressed to a degree where it influences the insulating properties to any considerable degree. The recess
5 may also be used for positioning the packed underroof collar correctly by fitting over a projection on the window frame only when mounted correctly. For the same purpose, lines or patterns may be provided, for example by printing or melting the material.

Even though the fastener 23 has been described as an adhesive in all
10 of the embodiments above it is also possible to use a mechanical attachment such as clamps or nails.

The mounting elements 2 described above and shown in the drawing are insulating members made from foamed polyethylene (PE) with closed cells. This material is also widely used for insulating assemblies used with traditional
15 roof windows. Using the same material has the advantage that the installer will recognize the mounting element as being intended for forming part of the insulating assembly surrounding the roof window and that any potential for material deterioration caused by incompatibility between different materials is avoided. In addition, this material lives up to fire safety regulations.

20 Making the mounting element 2 from a flexible material allows it to adapt to and accommodate smaller variations in the shape of the window frame or items attached thereto, such as mounting bracket attachment sections, but recesses may be provided as described above with reference to the recess 25. It may also be advantageous to use a material, which allows for an easy
25 removal of a section of the mounting element, either at the production site or at the installation site, thereby creating a recess. For this purpose, weakenings may be provided in the material. It is also possible to make a section of the mounting element from a different material, which is for example relatively
30 easier to compress than the rest of the mounting element, such that this easily compressible material may yield and make room for a mounting bracket, wire or the like.

In one embodiment the insulating member serving as the mounting

element has a thickness of 8-10 mm in a direction perpendicular to the inner side. This will allow it to fit between a window top frame member and standard flashing assembly.

It is presently considered advantageous to make the insulating mounting element by extrusion as this allow easy shaping of the mounting
5 element and for a strip of adhesive to be added at the same time. The cross-wise recess can be made by cutting and milling, for example in connection with the cutting of the extruded member to the desired length of the mounting element.

10 Other geometries are possible and may be necessary if the mounting element is adapted for being arranged along a window bottom frame member or a window side frame member instead of along a window top frame member as described above.

An example of a mounting element with the potential for use both along
15 a top frame member and a bottom frame member of a roof window is shown in Fig. 24. This mounting element 2 consists of a top insulating member 26 for use along the top frame member 31 of the roof window and a bottom insulating member 27 for use along the bottom frame member 32 as shown in Fig. 25. Each insulating member 26, 27 is provided with a fastener 23 for attachment to
20 the respective frame member. As may be seen, each insulating member 26, 27 is shaped so that it fills out the space available between the respective frame member 31, 32 and a respective flashing member 33, 34 arranged to cover the joint between the frame member and the roof structure 4.

In the state of delivery shown in Fig. 24 the top insulating member 26
25 and the bottom insulating member 27 are interconnected along a separation line 28. The separation line may be either a weakening in the material if the two insulating members are made in one piece, or an interconnection of the two insulating members keeping them temporarily together, such as a weak adhesive or glue, a weld, or a mechanical fixation.

30 The underroof collar (not shown in Figs 24-25) is attached either to the top insulating member 26 or to the bottom insulating member 27 as described with reference to the other embodiments above, and before unfolding it the two

insulating members are separated along the separation line. The insulating member no longer connected to the underroof collar is mounted in its intended position along the roof window frame before mounting the underroof collar as described above. In a still further embodiment (not shown), where the mounting
5 element is attached to the top collar member, a separate insulating element and/or stiffening element may also be attached to the bottom collar member or vice versa. Incorporating an insulating element may contribute to an alternative provision of an insulating frame surrounding the window frame in the mounted state, and the provision of a stiffening element may contribute to making the
10 underroof collar easier to handle, particularly during installation. It is to be understood that one element may have both insulating and stiffening properties, but that two separate elements may also be provided.

The mounting element may alternatively be made from a plate material. This may particularly be advantageous if the window frame member
15 along which the mounting element is to be arranged is without any substantial shape variations, such that a tight fit with the plate material may be achieved over substantially the entire length of the window frame member.

The plate material may for example be made from a material chosen from the group comprising: polymers, such as polyethylene (PE),
20 polypropylene (PP), polyurethane (PU), polycarbonate (PC) which may possibly be foamed, paper, such as waterproof corrugated cardboard, wood, such as plywood or wood fibre boards, mineral wool, and composites.

The plate material may for example be made from a material chosen from the group comprising: Laminates, honeycomb-structures, channel plates,
25 bubble plates, perforated plates, extruded materials, foamed or expanded materials, and moulded materials.

The connection between the underroof collar and the mounting element may for example be achieved by means of a double-sided adhesive tape, but it is also envisaged to use adhesives or glue, such as a hold-melt, or
30 welding. Welding has the advantages that no further material is added but will of course require that at least one of the materials used for the underroof collar and mounting element can be melted.

It is presently considered advantageous that the underroof collar is made from a three-layer fabric comprising a polypropylene (PP) textile, for example a felt or a non-woven, and a wind-proof sheet material. In one embodiment it is a flexible laminated polypropylene sheet according to EN 5 13859-1. Polypropylene may also be combined with high density polyethylene (HDPE).

List of reference numerals

1	Underroof collar
11	Bottom collar member
111	Inner rim part of bottom collar member
112	Outer edge of bottom collar member
12	Top collar member
121	Inner rim part of top collar member
122	Outer edge of top collar member
124	Uncovered section
125	Back side
126	Indentation
13	Side collar member
131	Inner rim part of side collar member
132	Outer edge of side collar member
133	Centre section
14	Side collar member
141	Inner rim part of side collar member
142	Outer edge of side collar member
143	Centre section
15	Collar opening
16	Fixation
17	Sticker
18	Strip of adhesive
2	Mounting element
21	Recess
22	Recess
23	Fastener
24	Cover strip
25	Recess
26	Top insulating member
27	Bottom insulating member
28	Separation line
3	Roof window frame
31	Top frame member
32	Bottom frame member

- 33 Top flashing member
- 34 Bottom flashing member
- 4 Roof structure
 - I First folding line
 - II Second folding line
 - III Third folding line
 - IV Fourth folding line
 - V Fifth folding line
 - VI Sixth folding line
 - VII Seventh folding line
- LB Length direction of bottom collar member
- LS Length direction of side collar member
- LT Length direction of top collar member

Patentkrav

1. Fremgangsmåde til pakning af en undertagkrave (1) til brug ved vand-tætning af en samling imellem en tagkonstruktion (4) og en karm (3) af et vindue, hvor nævnte undertagkrave (1) omfatter et kravetopstykke (12), et
5 kravebundstykke (11), og to kravesidestykker (13, 14) til at strække sig langs henholdsvis et karmtopstykke (31), et karmbundstykke (32), og to karmsidestykker af en karm af et vindue i en monteret tilstand, hvor hvert kravestykke (11, 12, 13, 14) indbefatter en indre randdel (111, 121, 131, 141) og en ydre skørtedel, der er beregnet til at komme i indgreb med
10 tagkonstruktionen (4), og nævnte indre randdele (111, 121, 131, 141), i det mindste i den monterede tilstand, til sammen afgrænser en kraveåbning (15), hvor hvert kravestykke (11, 12, 13, 14) har en længderetning (LB, LS, LT), der strækker sig parallelt med den indre randdel (111, 121, 131, 141), og hvor hvert af nævnte kravesidestykker (11, 12, 13, 14) omfatter et midterafsnit, der
15 strækker sig imellem kravetopstykket (12) og kravebundstykket (11) langs kraveåbningen (15),

kendetegnet ved at nævnte fremgangsmåde omfatter følgende trin:

A) At folde undertagkraven (1) langs en første foldelinje (I), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11,
20 12), således at kravetopstykket (12) anbringes oven på kravebundstykket (11) eller vice versa,

B) At folde undertagkraven (1) langs en anden foldelinje (II), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11,
25 12), således at i det mindste en del af midterafsnittet (133, 143) af hvert kravesidestykke (13, 14) anbringes oven på eller neden under kravetopstykket (12), kravebundstykket (11), og/eller et afsnit af kravesidestykket (13, 14) beliggende i forlængelse af kravetopstykket (12) eller kravebundstykket (11) når set i længderetningen (LT; LB) af nævnte kravetopstykke (12) eller kravebundstykke (11),

30 C) At folde undertagkraven (1) langs en tredje foldelinje (III) og en fjerde foldelinje (IV), der strækker sig i hovedsagen parallelt med kravesidestykkerne (13, 14), således at kravesidestykkerne (13, 14) anbringes

oven på eller neden under kravetop- og kravebundstykkerne (11, 12), og

D) At folde undertagkraven (1) langs en femte foldelinje (V), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12).

5 2. Fremgangsmåde ifølge krav 1, hvor den tredje og fjerde foldelinje (III, IV) er i hovedsagen sammenfaldende med de indre rande (131, 141) af kravesidestykkerne (13, 14).

 3. Fremgangsmåde ifølge krav 1 eller 2, hvor undertagkraven (1) under trin D) foldes således, at midterafsnittene (133, 143) af
10 kravesidestykkerne (13, 14) anbringes mellem afsnit af kravetopstykket (12) og/eller kravebundstykket (11).

 4. Fremgangsmåde ifølge et eller flere af kravene 1-3, yderligere omfattende følgende trin, som foretages efter trin D):

 E) At folde undertagkraven (1) langs en sjette foldelinje (VI), der
15 strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12).

 5. Fremgangsmåde ifølge et eller flere af kravene 1-4, yderligere omfattende følgende trin, som foretages før trin A):

 F) At folde undertagkraven (1) langs en syvende foldelinje (VII), der
20 strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12), hvorved et afsnit af kravetopstykket (12) anbringes oven på eller neden under et andet afsnit af kravetopstykket (12).

 6. Fremgangsmåde ifølge et eller flere af kravene 1-5, yderligere omfattende følgende trin:

25 G) At fastgøre undertagkraven (1) til i det mindste et monteringsselement (2), såsom et isoleringsselement.

 7. Pakket undertagkrave (1) til brug ved vand-tætning af samlingen imellem en tagkonstruktion (4) og en karm (3) af et vindue, hvor nævnte undertagkrave (1) omfatter et kravetopstykke (12), et kravebundstykke (11), og
30 to kravesidestykker (13, 14) til at strække sig langs henholdsvis et karmtopstykke (31), et karmbundstykke (32), og to karmsidestykker af en karm af et vindue i en monteret tilstand, hvor hvert kravestykke (11, 12, 13, 14)

indbefatter en indre randdel (111, 121, 131, 141) og en ydre skørtedel, der er beregnet til at komme i indgreb med tagkonstruktionen (4), og nævnte indre randdele (111, 121, 131, 141), i det mindste i den monterede tilstand, til sammen afgrænser en kraveåbning (15), hvor hvert kravestykke (11, 12, 13, 5 14) har en længderetning (LB, LT, LS), der strækker sig parallelt med den indre randdel (111, 121, 131, 141), og hvor hvert af nævnte kravesidestykker (13, 14) omfatter et midterafsnit (133, 143), der strækker sig imellem kravetopstykket (12) og kravebundstykket (11) langs kraveåbningen (15),

kendetegnet ved at undertagkraven (1) er foldet langs en første 10 foldelinje (I), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12), således at kravetopstykket (12) er beliggende oven på kravebundstykket (11) eller vice versa, at undertagkraven (1) er foldet langs en anden foldelinje (II), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12), således at i det mindste en del af 15 midterafsnittet (133, 143) af hvert kravesidestykke (13, 14) er beliggende oven på eller neden under kravetopstykket (12), kravebundstykket (11), og/eller et afsnit af kravesidestykket (13, 14) beliggende i forlængelse af kravetopstykket (12) eller kravebundstykket (11) når set i længderetningen (LT, LB) af nævnte kravetopstykke (12) eller kravebundstykke (11), at undertagkraven (1) er foldet 20 langs en tredje foldelinje (III) og en fjerde foldelinje (IV), der strækker sig i hovedsagen parallelt med kravesidestykkerne (13, 14), således at kravesidestykkerne (13, 14) er beliggende oven på eller neden under kravetop- og kravebundstykkerne (11, 12), og at undertagkraven (1) er foldet langs en femte foldelinje (V), der strækker sig i hovedsagen parallelt med kravetop- og 25 kravebundstykkerne (11, 12).

8. Pakket undertagkrave ifølge krav 7, hvor undertagkraven (1) er foldet langs en sjette foldelinje (VI), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12), og/eller hvor undertagkraven (1) er foldet langs en syvende foldelinje (VII), der strækker sig i hovedsagen parallelt 30 med kravetop- og kravebundstykkerne (11, 12).

9. Pakket undertagkrave ifølge krav 7 eller 8, hvor kravesidestykkerne (13, 14) er anbragt mellem afsnit af kravetopstykket (12) og/eller

kravebundstykket (11), således at den udvendige overflade af den pakkede undertagkrave (1) udgøres i hovedsagen fuldstændigt af et ubrudt afsnit af kravetop- eller kravebundstykket (11, 12).

10. Pakket undertagkrave ifølge et eller flere af kravene 7-9, hvor
5 undertagkraven (1) er fastgjort til i det mindste et monteringsselement (2), såsom et isoleringselement, hvilket monteringsselement (2) eventuelt omfatter en fastgørelsesindretning (23), der er indrettet til fastgørelse til en karm af et vindue, og/eller hvor i det mindste en fiksering (16) holder undertagkraven (1) i den pakkede tilstand.

10 11. Fremgangsmåde til montering af en undertagkrave (1) således at den dækker en samling imellem en skrå tagkonstruktion (4) og en karm (3) af et vindue, hvor nævnte undertagkrave (1) omfatter et kravetopstykke (12), et kravebundstykke (11), og to kravesidestykker (13, 14) til at strække sig langs henholdsvis et karmtopstykke (31), et karmbundstykke (32), og to
15 karmsidestykker af en karm af et vindue i en monteret tilstand, hvor hvert kravestykke (11, 12, 13, 14) indbefatter en indre randdel (111, 121, 131, 141) og en ydre skørtedel, der er beregnet til at komme i indgreb med tagkonstruktionen (4), og nævnte indre randdele (111, 121, 131, 141), i det mindste i den monterede tilstand, til sammen afgrænser en kraveåbning (15),
20 hvor hvert kravestykke (11, 12, 13, 14) har en længderetning (LB, LT, LS), der strækker sig parallelt med den indre randdel (111, 121, 131, 141), og hvor hvert af nævnte kravesidestykker (13, 14) omfatter et midterafsnit (133, 143), der strækker sig imellem kravetopstykket (12) og kravebundstykket (11) langs kraveåbningen (15),

25 hvor nævnte fremgangsmåde omfatter følgende trin:

H) At anbringe en pakked undertagkrave (1) ved karmtopstykket (31) af karmen (3) af vinduet,

I) At fastgøre den indre randdel (121) af kravetopstykket (12) eller et monteringsselement (2), til hvilket den indre randdel (121) af kravetopstykket
30 (12) er fastgjort, til karmtopstykket (31),

kendetegnet ved at nævnte fremgangsmåde yderligere omfatter følgende trin:

J) At folde undertagkraven (1) ud langs en femte foldelinje (V) og eventuelt en sjette foldelinje (VI), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12), således at kravetop- og kravebundstykkerne (11, 12) anbringes på en udvendig overflade af tagkonstruktionen (4) over karmen (3) af vinduet når set i hældningsretningen for tagkonstruktionen (4), idet kravebundstykket (11) er anbragt oven på kravetopstykket (12),

K) At folde undertagkraven (1) ud langs en tredje foldelinje (III) og en fjerde foldelinje (IV), der strækker sig i hovedsagen parallelt med kravesidestykkerne (13, 14), således at kravesidestykkerne (13, 14) anbringes oven på den udvendige overflade af tagkonstruktionen (4) over og til hver side for karmen (3) af vinduet, idet kravesidestykkerne (13, 14) er i en tilstand, hvor de forbliver foldet op på sig selv,

L) At folde undertagkraven (1) ud langs en anden foldelinje (II), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12), således at kravesidestykkerne (11, 12) bringes ned langs karmsidestykkerne, mens de forbliver foldet op på sig selv,

M) At folde undertagkraven (1) ud langs en første foldelinje (I), der strækker sig i hovedsagen parallelt med kravetop- og kravebundstykkerne (11, 12), således at kravesidestykkerne (13, 14) foldes fuldstændigt ud, og således at kravebundstykket (11) passerer over karmen (3) af vinduet og ned til en position under karmbundstykket (32) når set i hældningsretningen for tagkonstruktionen (4).

12. Fremgangsmåde ifølge krav 11, yderligere omfattende et eller flere af følgende trin:

N) At anbringe et eller flere isoleringselementer (26, 27) langs et eller flere karmstykker af vinduet før trin H),

O) At fastgøre kravesidestykkerne (13, 14) og/eller kravebundstykket (11) direkte eller indirekte til karmen (3) af vinduet efter eller under trin M), og

P) At fastgøre et eller flere kravestykker (11, 12, 13, 14) til tagkonstruktionen (4).

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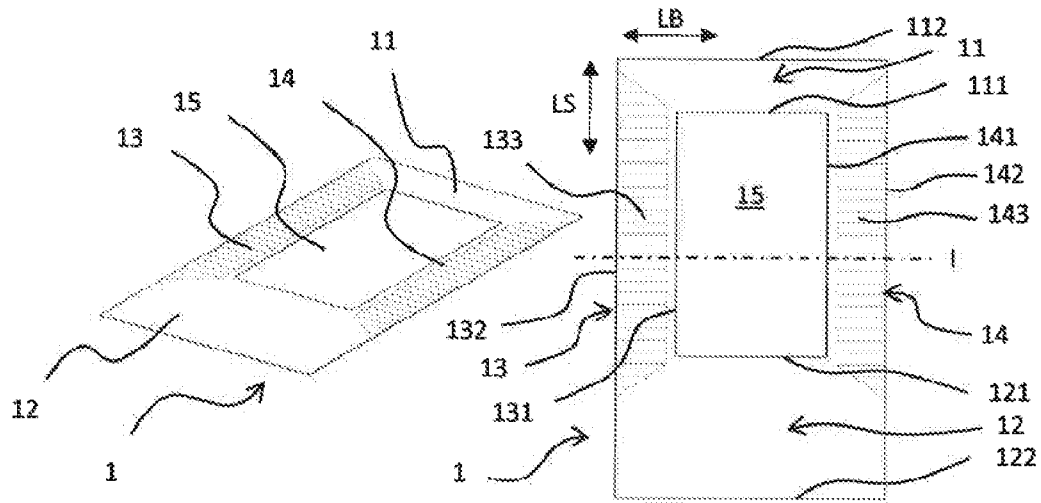


Fig. 1

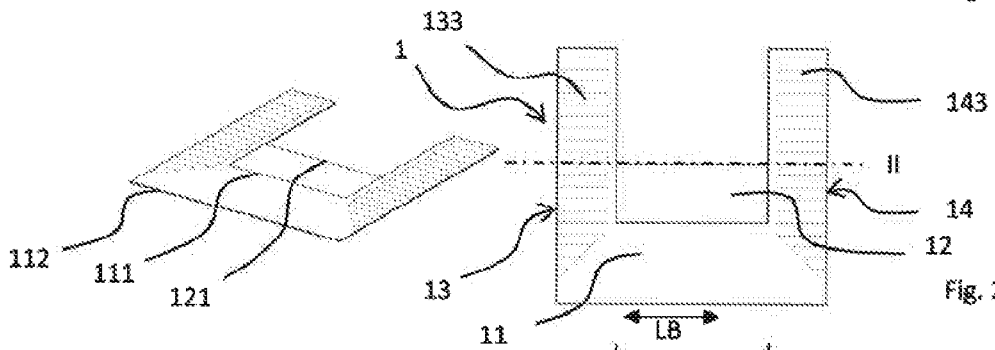


Fig. 2

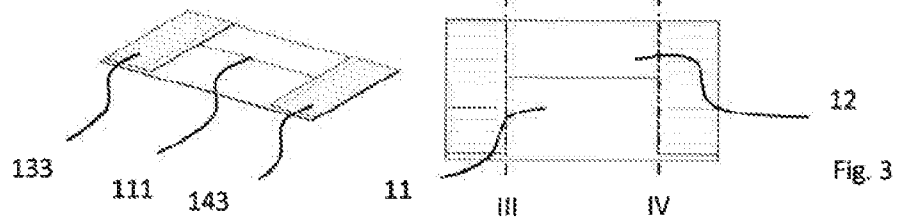


Fig. 3

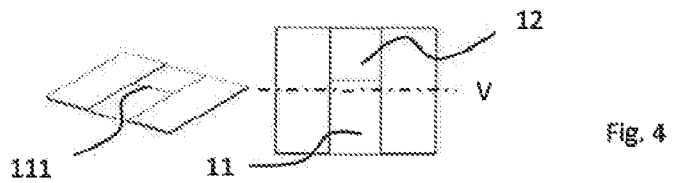


Fig. 4

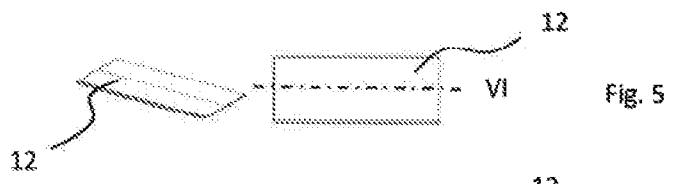


Fig. 5

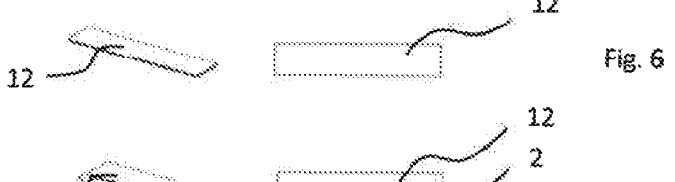


Fig. 6

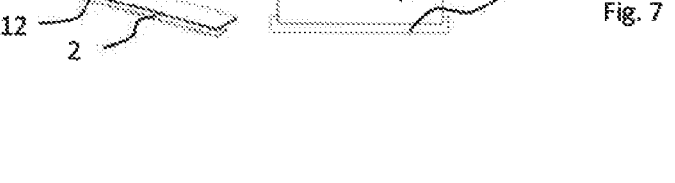


Fig. 7

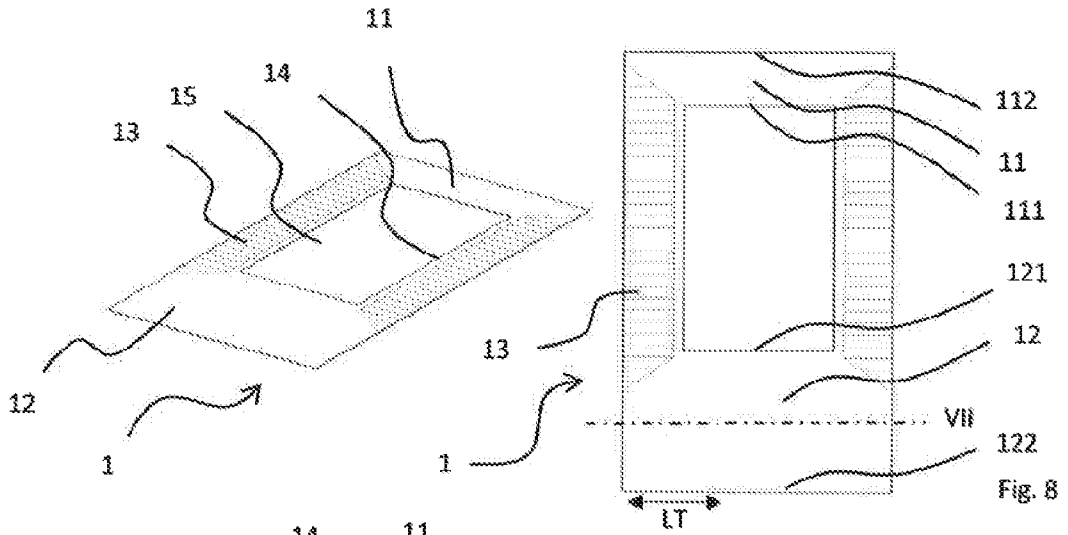


Fig. 8

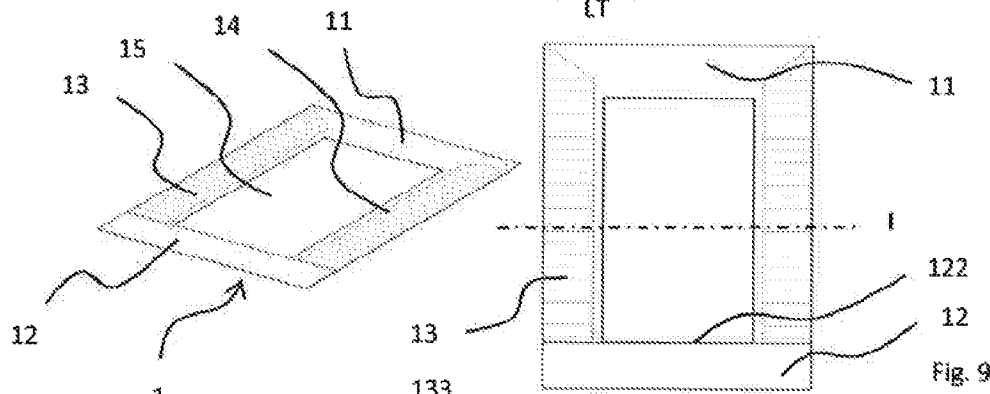


Fig. 9

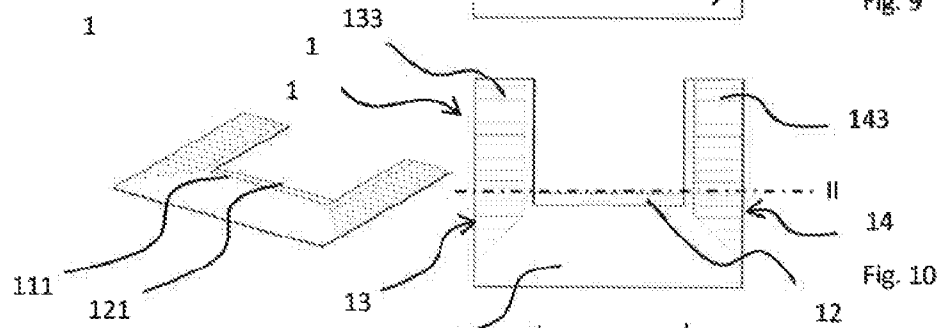


Fig. 10

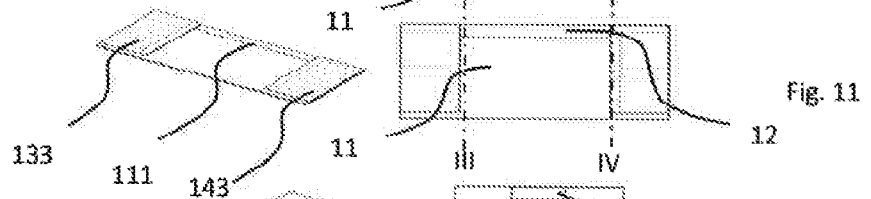


Fig. 11

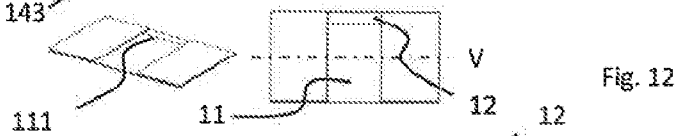


Fig. 12

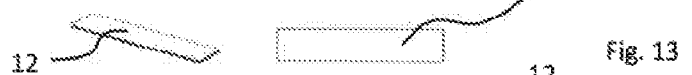


Fig. 13

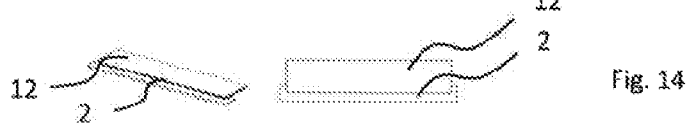


Fig. 14

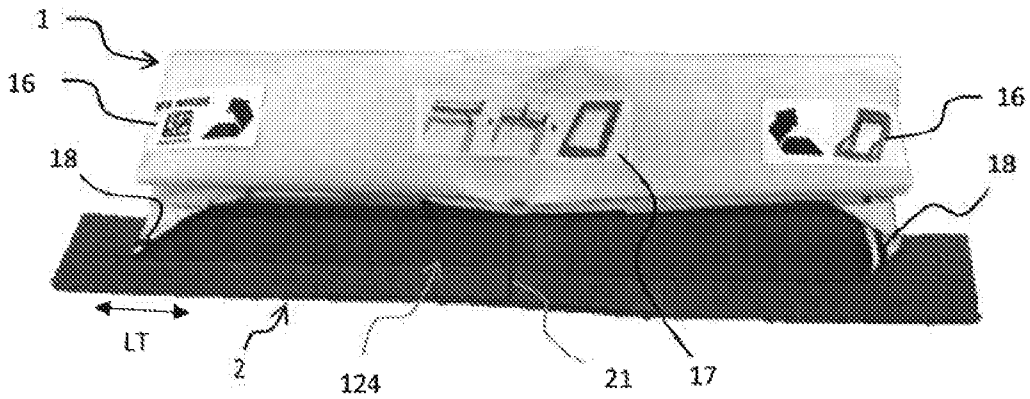


Fig. 15

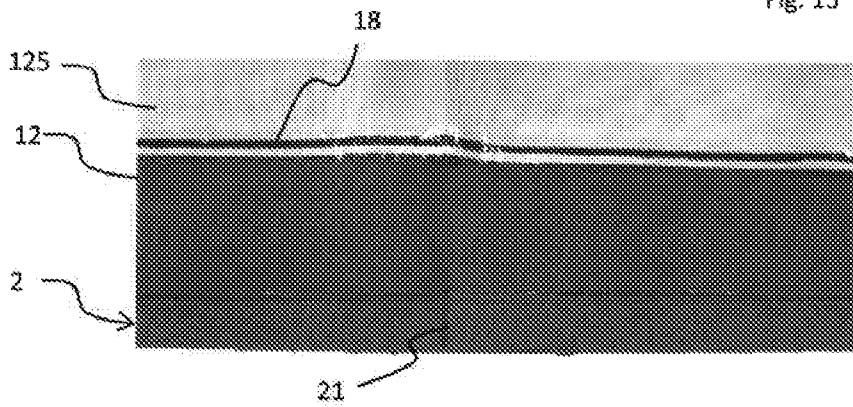


Fig. 16

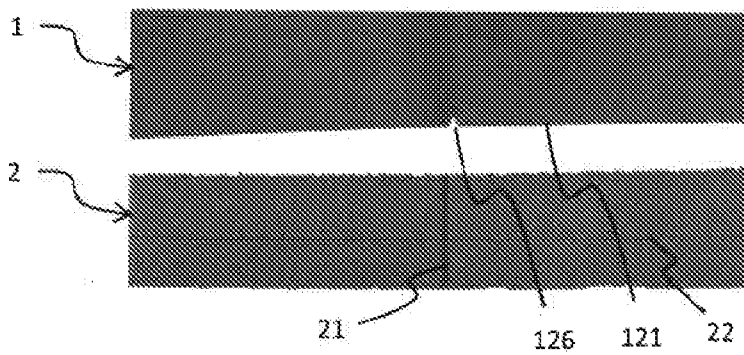


Fig. 17

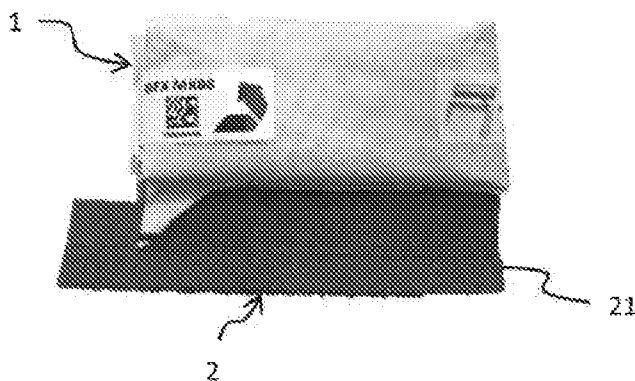


Fig. 18

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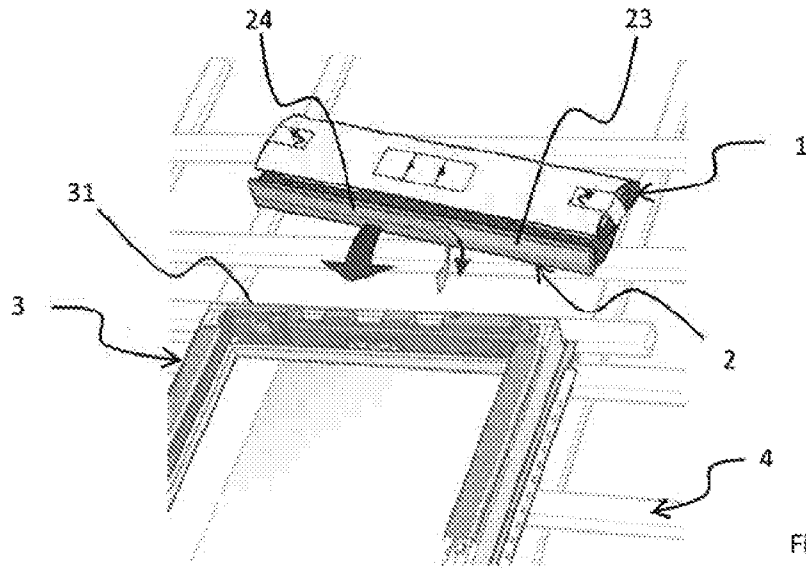


Fig. 19

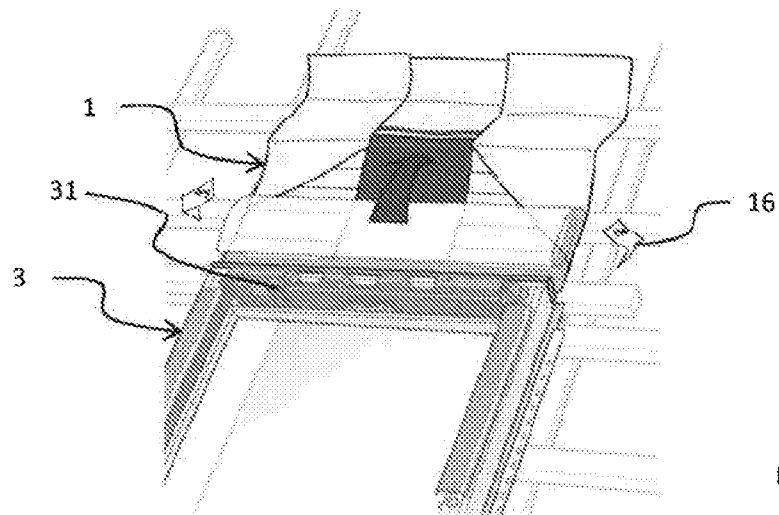


Fig. 20

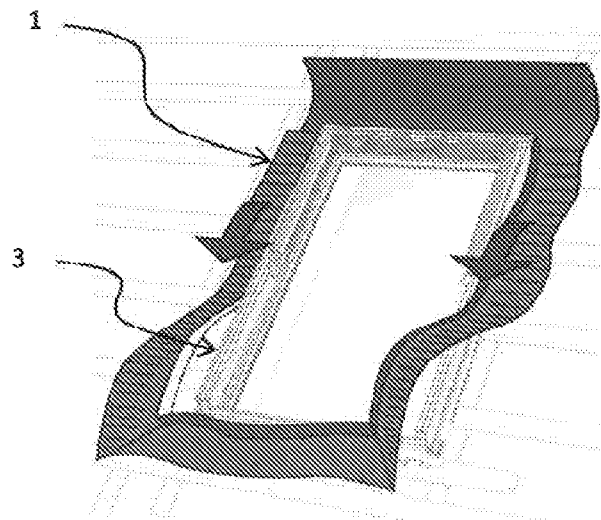


Fig. 21

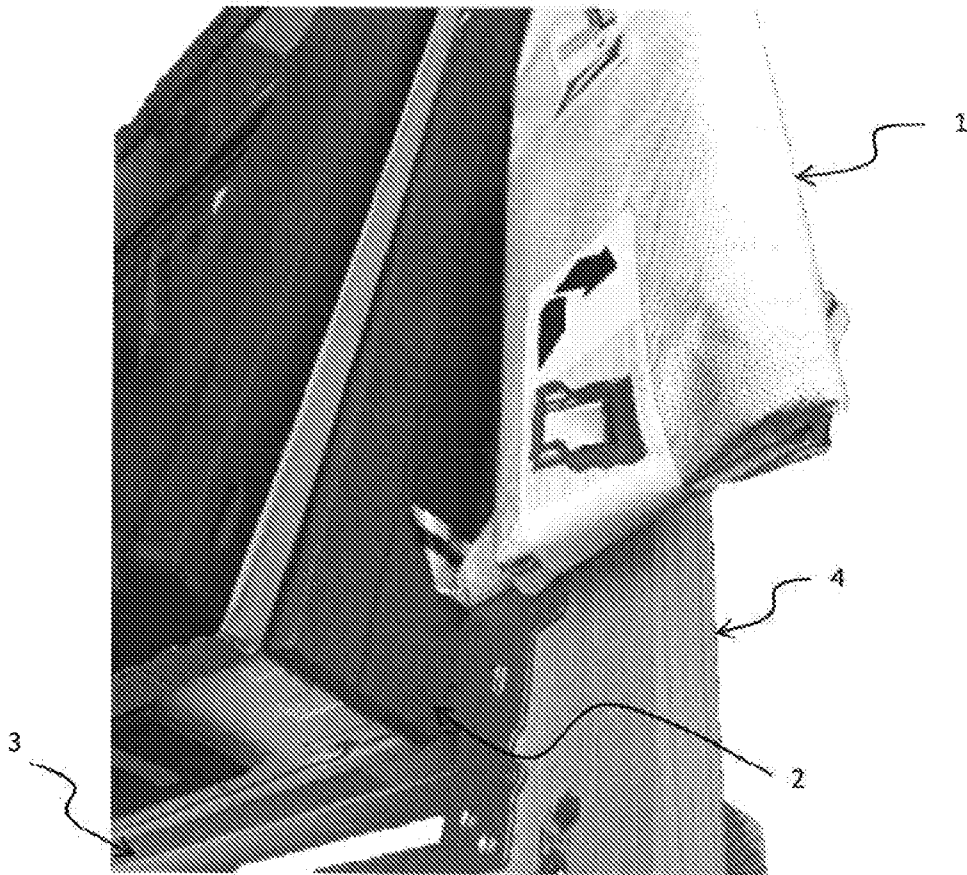


Fig. 22

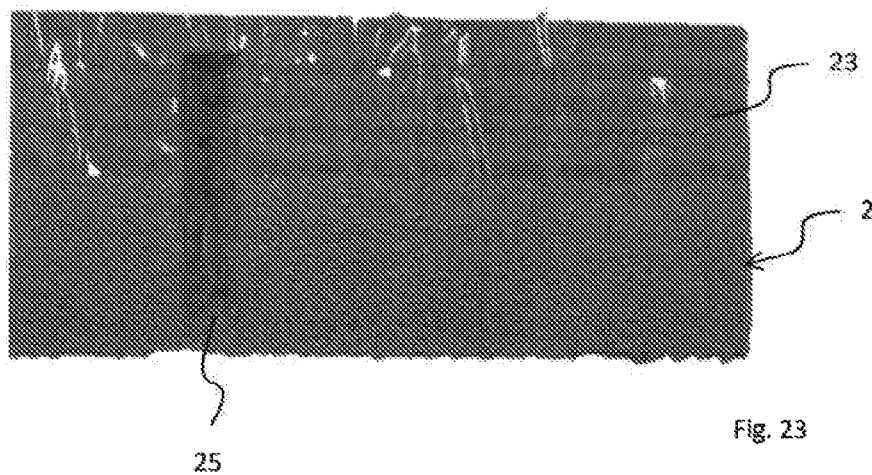


Fig. 23

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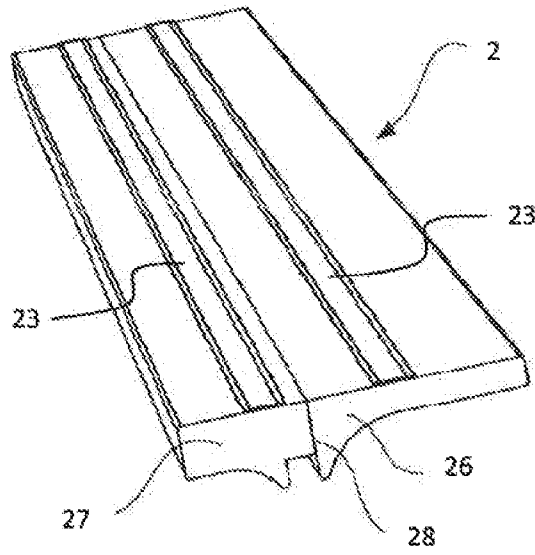


Fig. 24

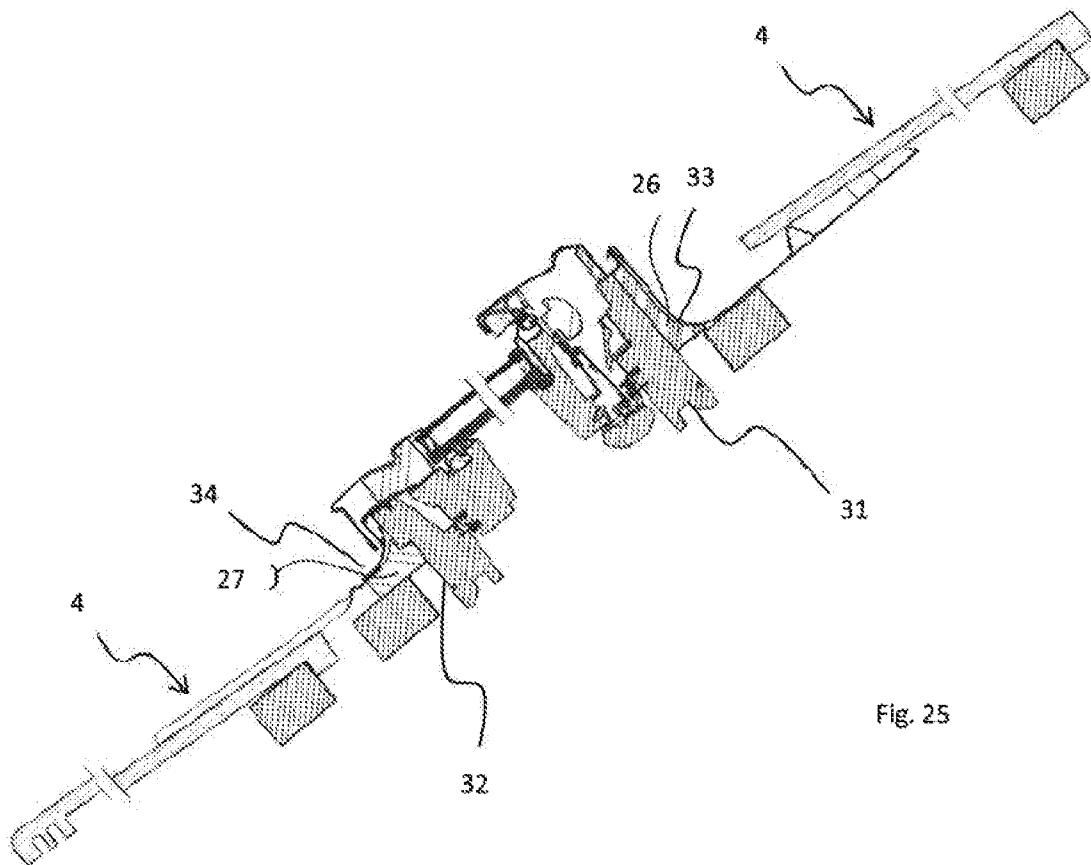


Fig. 25

SEARCH REPORT - PATENT		Application No. PA 2020 70178
1. <input type="checkbox"/> Certain claims were found unsearchable (See Box No. I).		
2. <input type="checkbox"/> Unity of invention is lacking prior to search (See Box No. II).		
A. CLASSIFICATION OF SUBJECT MATTER E04D 13/14 (2006.01), E04D 13/03 (2006.01) According to International Patent Classification (IPC)		
B. FIELDS SEARCHED		
PCT-minimum documentation searched (classification system followed by classification symbols) IPC&CPC: E04D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched DK, NO, SE, FI: IPC-classes as above in box A.		
Electronic database consulted during the search (name of database and, where practicable, search terms used) EPODOC, WPI, FULL TEXT: ENGLISH		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant for claim No.
D, A	WO 2018/210937 A1 (VKR HOLDING AS) 2018.11.22, see whole document.	1-12
D, A	EP 2952646 A1 (VKR HOLDING AS) 2015.12.09, see whole document.	1-12
D, A	EP 2284329 A2 (FAKRO PP SPOLKA ZOO) 2011.02.16, see whole document.	1-12
D, A	EP 0994992 A1 (VKR HOLDING AS) 2000.04.26, see whole document.	1-12
<input type="checkbox"/> Further documents are listed in the continuation of Box C.		
* Special categories of cited documents: "A" Document defining the general state of the art which is not considered to be of particular relevance. "D" Document cited in the application. "E" Earlier application or patent but published on or after the filing date. "L" Document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified). "O" Document referring to an oral disclosure, use, exhibition or other means.	"P" Document published prior to the filing date but later than the priority date claimed. "T" Document not in conflict with the application but cited to understand the principle or theory underlying the invention. "X" Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone. "Y" Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" Document member of the same patent family.	
Danish Patent and Trademark Office Helgeshøj Allé 81 DK-2630 Taastrup Denmark Telephone No. +45 4350 8000 Facsimile No. +45 4350 8001	Date of completion of the search report 16 September 2020	
	Authorized officer Flemming Christensen Telephone No. +45 4350 8247	

SEARCH REPORT - PATENT		Application No. PA 2020 70178
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant for claim No.

Box No. I Observations where certain claims were found unsearchable

This search report has not been established in respect of certain claims for the following reasons:

1. Claims Nos.:

because they relate to subject matter not required to be searched, namely:

2. Claims Nos.:

because they relate to parts of the patent application that do not comply with the prescribed requirements to such an extent that no meaningful search can be carried out, specifically:

3. Claims Nos.:

because of other matters.

Box No. II Observations where unity of invention is lacking prior to the search

The Danish Patent and Trademark Office found multiple inventions in this patent application, as follows:

SUPPLEMENTAL BOX

Continuation of Box [.]