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(54) **Assembly of two building members, a retaining element and a covering element and use thereof**

(57) The present invention relates to an assembly of two building members (A,B), a retaining element (7) and

a covering element (12). The present invention also relates to such an assembly when used in a roof and/or facade construction for a building.

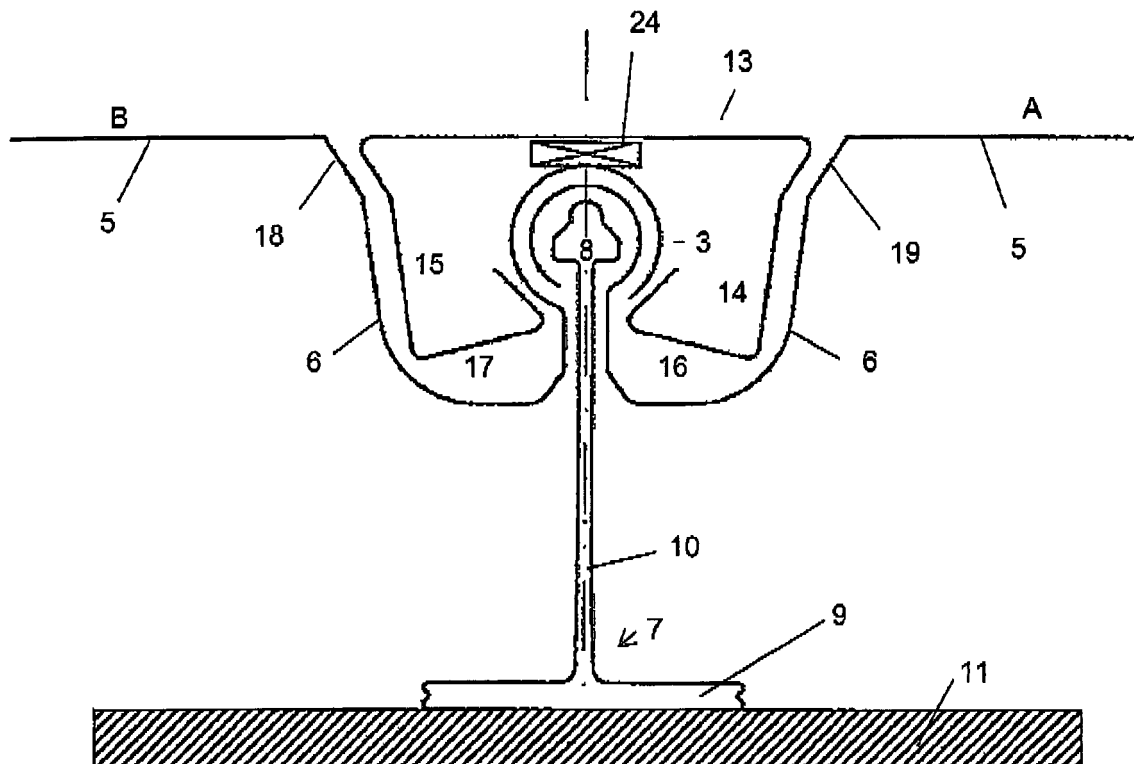


FIG. 3

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Description

[0001] The present invention relates to an assembly of two building members, a retaining element and a covering element. The present invention also relates to the use of such an assembly in a roof and/or façade construction for a building.

[0002] An example of an assembly for use in roof sections, wall sections and the like is disclosed in WO2005/021887. The assembly comprises building members which comprise upstanding flanges and curved portions on opposite edges of the building members. These flanges are designed so as to co-operate with flanges of adjacent building members and thereby form a standing seam. The standing seam is supported by a retaining element which comprises a head portion, a base for securing to a support member, such as a roof girder, and a web portion joining the head portion to the base portion, wherein the co-operating curved portions of the adjacent building members surround the head portion. Between the upstanding flanges the building member comprises an intermediate portion which is raised. A gap exists between the raised portion of one building member and the raised portion of the adjacent building member. In this gap the standing seam is located. This gap is bridged using a bridging element (or covering element), which is fixed to the curved portion of the standing seam by clamping the bridging element on the curved portions of the upstanding flanges. For this clamping action it is essential that the bridging element comprises depending parts which closely surround the top portion of the standing seam. A disadvantage of this known combination of building members, bridging element and retaining element is that the bridging element may become dislocated once the clamping force becomes insufficient. This may occur due to degradation of the clamping elements, due to faulty mounting of the bridging element excessive wind force or other natural influences. This snapping off may be prevented by fixing the bridging element during mounting or repair using fastening means, such as screws, but this is costly because it takes time to fasten the bridging elements, it affects the aesthetic value of the roof or façade, and it may provide initiation points for corrosion or leakage.

[0003] It is an object of the present invention to provide an improved assembly of two building members, a retaining element and a covering element.

[0004] It is also an object of the invention to provide an assembly of two building members, a retaining element and covering element having a compact and stable connection between the building members, retaining element and covering element.

[0005] It is also an object of the invention to provide an assembly of two building members, a retaining element and covering element which is easy and quick to install without additional fastening means, but which provides a very sturdy connection once installed.

[0006] It is also an object of the invention to provide a

covering element which is easy and cheap to produce.

[0007] One or more of the objects of the invention is achieved by an assembly of two adjoining building members, wherein the building members comprise upstanding flanges on opposite edges and an intermediate portion between the upstanding flanges where the upstanding flanges have a curved portion at their free end, the curved portion comprising an upper part and a lower part, the curved portion and the upstanding flange of one building member being designed so as to co-operate with the curved portion and the upstanding flange of the adjoining building member and form a standing seam, wherein the intermediate portion comprises a raised portion, extending to a height of at least half the height of the upstanding flanges, and connecting portions which connect the upstanding flanges to the raised portion, the assembly also comprising a retaining element, wherein the retaining element comprises a head portion, a base for securing to a support member and a web portion joining the head portion to the base portion, wherein the head portion supports at least the curved portion of one upstanding flange on one building member and one upstanding flange on the other building member and wherein the combination further comprises a covering element extending at least partially between building member and other building member over the head of the retaining element, characterised in that the covering element comprises a covering portion, the covering element being provided with at least two longitudinally extending and downwardly depending flanges, said flanges being provided with means for fixedly holding the covering element, said means acting substantially on the lower part or parts of the curved portion or portions.

[0008] The covering element, which comprises a covering portion, is provided with at least two longitudinally extending and downwardly depending flanges. Each of these flanges extends into the gap between the upstanding flanges and the connecting portion. The flanges are provided with means which enable fixedly holding the covering element by acting substantially on the lower part or parts of the curved portion or portions. Since the curved portion of two adjacent building members co-operate and thus substantially show an annular or even circular cross-section, the diameter of which is larger than the width of the two adjacent upstanding flanges, the standing seam substantially has a shape corresponding to a lolly-pop, where the stick of the lolly-pop corresponds to the two adjacent upstanding flanges. By designing the means for fixedly holding the covering element in such a way that the means act substantially on the lower part or parts of the co-operating curved portions of the adjacent building members, a force has to be overcome to release the covering element. When designing and dimensioning the covering element, the magnitude of the force with which it acts on the lower part or parts of the co-operating curved portions and the force which is required to overcome the resistance to release can be chosen. This allows easy mounting, without the need for additional fastening ele-

ments, whereas it can not be easily undesirably dislocated or removed. When using the assembly according to the invention in a roof or façade construction or the like, wind suction on the roof or façade can be very high. Consequently, it is important that the clamping action of the cover onto the co-operating curved portions of the adjacent building members has to be such that the cover cannot come off as a result of the wind-suction, but also that it does not rattle or provide any other kind of undesired movement.

[0009] In an embodiment of the invention the means for fixedly holding the covering element enable mounting of the covering element in a mounting direction z and prevent dismounting in the reverse direction $-z$. This means that the covering element is substantially a one-way system. To remove the covering element a much larger force is needed than to mount it. In extreme cases, where the release force is chosen very high, the covering element may only be removable by cutting through the covering element. A replacement part can then be easily mounted, again in such a one-way manner, to replace the removed covering element.

[0010] In an embodiment of the invention the means for fixedly holding the covering element about the lower part or parts of the curved portion or portions when mounted. This abutment results in the clamping action against the lower part or parts of the curved portion or portions.

[0011] In an embodiment of the invention the covering element comprises a substantially quadrangular covering portion having a first longitudinally extending edge and a second longitudinally extending edge, the covering element at the longitudinal edges being provided with longitudinally extending and downwardly depending first flanges, the first flanges being provided with second flanges extending towards and extending towards, and preferably, the lower part or parts of the curved portion or portions. This embodiment provides a covering element which may be produced from a single piece of material, for instance by roll-forming or bending. This allows for a very cheap and simple way to produce the covering element. The building element according to the state of the art has to be provided with the depending parts for closely surrounding the top portion of the standing seam, and these are produced by extruding the complete bridging element, which is expensive and limits the choice of materials to be used, or it requires a separate action to fix the depending parts to the element providing the bridging function. These separate actions are costly and not easy to perform in the building practice thereby introducing potential risk for insufficiency of the clamping force.

[0012] In an embodiment of the invention the distance x_1 between the free edges of the second flanges prior to mounting is smaller than the diameter y of the cooperating curved portions when seen in the mounting direction of the covering element, and wherein the distance x_2 between the free edges of the second flanges after mounting is smaller than y and equal to or larger than x_1 .

This embodiment enables snap-on, clamp-on mounting of the covering element over the wide part of the standing seam (cf. the candy on the lolly-pop). In order to increase the distance x_1 to y , a certain mounting force has overcome. The resilience of the covering element then ensures that the distance decreases again to below y . Depending on the width of the cooperating upstanding flanges, the distance will relax back to x_1 or to a value x_2 between x_1 and y .

[0013] In an embodiment of the invention the covering portion with the at least two longitudinally extending and downwardly depending flanges and the means enclose a channel comprising two sub-channels for accommodating wiring, tubing, insulation and the like. The channel is divided into two sub-channels by the co-operating curved portions of the adjacent building members, and the head and part of the stem of the retaining element. This channel or the sub-channels can be used for accommodating electrical wiring, tubing, insulation, etc. In these channels these wirings, tubings, or insulation is well protected.

[0014] In an embodiment of the invention the covering element is made from an elastic material, such as a metal or a polymer, preferably by roll-forming, bending or extrusion. The metal is preferably steel, a steel alloy, aluminium or an aluminium alloy. The advantage of steel is that it can be made thin, and is very flexible, although it has to be protected against corrosion. This can be done by coating the steel with a metallic coating, such as zinc or the like, or with an organic coating, or with an inorganic coating, such as hydrophilic or photoactive surfaces, for instance based on titanium-dioxide. The steel alloy may also be a stainless steel. In order to increase the clamping force a spring steel may be used. In this case the higher costs of the steel base may offset the lower costs for corrosion protection. The advantage of aluminium or an aluminium alloy, such as AA3004, is that it has a better corrosion resistance. For aesthetic purposes, but also for protection, the covering portion may, at least on the side facing away from the retaining element, be provided with a coating or a covering layer. When the covering element is made from a polymer, for instance by extrusion, the appearance, particularly of the visible top surface of the covering portion, may be selected so as to resemble a metallic surface or to resemble the surface of the raised portions of the building members.

[0015] In an embodiment of the invention a resilient member is provided between the covering portion and the upper part or parts of the of the curved portion or portions, said member being compressed during mounting of the covering element and at least partly relaxed after mounting of the covering element. The presence of the resilient member assists in the build-up of a clamping action against the lower part or parts of the curved portion or portions, because it exerts an upward force on the covering element in the direction $-z$. The resilient member also takes away any clearance there may be between the covering portion and the upper part or parts of the

curved portion or portions, thereby for instance eliminating any undesirable movement or rattling of the covering element. The resilient member may be an elastic compound such as an elastomer, a rubber or a resilient foam, and it may be distributed longitudinally extending along the covering element, at least at the location where there is contact between the covering portion and the upper part or parts of the of the curved portion or portions. Alternatively, there may be patches of the resilient member at selected positions only. In an embodiment resilient members are provided between the cover and the building members at to increase the clamping action, or to prevent undesired movement of the cover with respect to the building members. Examples of locations where the resilient members may be provided are in the accompanying figures. These resilient members may be used in addition to or instead of the resilient member between the covering portion and the upper part or parts of the curved portion or portions.

[0016] In an embodiment according to the invention, wherein the raised portion of at least part of the building members is at least partly, but preferably substantially entirely, provided with photovoltaic cells, preferably in the form of flexible mats. The wires extending from these cells may be placed in one of the aforementioned channels or subchannels.

[0017] The raised portion of the building members preferably extends to a height substantially equal to or greater than the height of the upstanding flange or flanges and at least partially conceals from view the upstanding flange(s) that are supported on the retaining element, any cables, pipes, lighting means etc. and the retaining element itself. The appearance of the outer surface of e.g. a roof made using the building members thereby becomes one of a substantially non-ridged surface. The raised portion of the building member also preferably extends across at least half of the intermediate portion.

[0018] The raised portion of the building members preferably extends to a height substantially equal to the height of the upstanding flanges. The appearance of the outer surface of e.g. a roof made using the building members thereby becomes one of a substantially non-ridged surface and the amount of material required to make the building member is reduced.

[0019] The upstanding flanges and connecting portions preferably form channels substantially U-shaped in cross-section for ease of construction. The channel formed by the upstanding flanges and connecting portions may also be, for example, substantially V-shaped in cross-section thereby providing more precise positioning and guidance of pipes and cables etc. The channel may also be substantially teardrop shaped in cross-section or substantially egg-shaped or substantially circular in cross-section to provide more precise positioning and guidance of pipes and cables etc. It is evident, that when a different channel form is used, that the covering element has to be designed to take this into account.

[0020] The surfaces of the building members may be

provided with a particular surface finish or pattern by, for example, embossing, to provide a durable attractive appearance which is able to withstand weathering etc without a significant deterioration in appearance during its economic lifetime.

[0021] The building members are preferably made from metal sheet for its durability and surface appearance and more preferably alloyed aluminium sheet for ease of forming. The metal or alloyed aluminium sheet is preferably roll-formed. The building members may also be made from plastic which is durable and resistant to temperature variations.

[0022] The raised portion of the building members may preferably be provided with stiffening means for reducing any residual stresses present in the building member. The portion may be stiffened using for example a composite material such as a metal/plastic laminate or a metal/plastic/metal laminate. The portion may also be stiffened using material in for example honeycomb or waved form. The stiffening material is preferably applied below the raised portion so it is not visible.

[0023] The covering element may be at a height equal to or greater than the height of the raised portions of the two building members. The covering element may be raised above the height of the raised portions of the two building members to increase the visibility of the light from light emitting means in the channels.

[0024] The covering element may extend from the raised portion of one building member over the head of the retaining element to the raised portion of the other building member to reduce the amount of water that enters the channel.

[0025] The covering element preferably extends straight across between the raised portions of the building elements at substantially the same height as the raised portions of the building elements, thereby giving the outer surface of the combination a substantially smooth or non-ridged appearance.

[0026] The covering element may also e.g. curve over the retaining element from the raised portion of building member A over the head of the retaining element to the raised portion of building member B to provide an attractive outer surface appearance.

[0027] The covering element may be made from a different material to that of the building members or may be provided with a different outer surface finish or colour to that of the building members or other covering elements to provide an attractive surface appearance.

[0028] The covering element is preferably made from metal to provide strength and resilience and more preferably from alloyed aluminium. The covering element may be extrusion formed which provides a cost-effective method of production.

[0029] At least the upper surface part of the covering element may be covered with a layer of material. The upper surface of the covering element is the surface facing away from the retaining element. This gives the option of providing attractive surface finishes different from

those achievable by extrusion forming. The layer of material is preferably made from the same material as the building sheets are made from, so a uniform appearance results.

[0030] The material is preferably wrapped around the covering element thereby avoiding the need for fixing means such as screws, pins etc.

[0031] Several covering elements may be positioned at intervals along the length of a building member and a single piece of the layer material may cover more than one covering element and extend between covering elements. This reduces the number of covering elements required whilst still providing an attractive outer appearance and sufficient fixation for the layer material.

[0032] The present invention also relates to a roof or façade construction for a building comprising a combination.

[0033] The present invention is described further by way of example with reference to the accompanying schematic drawings in which:

Figure 1 shows a cross section through a building member which may be used in the combination of the invention.

Figure 2 and 3 show a cross section through a cladding system for roofs or walls comprising a combination of two building members, a retaining element and a covering element according to the invention.

Fig 3a shows an enlarged portion of Figure 3.

Figure 4 defines the distances x_1 , y and x_2 , as well as the location of the lower part or parts of the curved portion or portions and the upper part or parts of the curved portion or portions.

Figure 5, 6 and 7 show alternative embodiments for the covering elements.

[0034] Figure 1 shows building member A comprising two upstanding flanges 2 on opposite sides of the building member. The upstanding flanges have curved portions 3 at their free end. The curved portions are of different sizes and one upstanding flange extends slightly higher than the other. The intermediate portion 4 of the building member extends between the upstanding flanges. The intermediate portion comprises a raised portion 5 and connecting portions 6 which connect the upstanding flanges to the raised portion. In the particular embodiment shown in figure 1 the height h_2 of raised portion 5 is substantially equal to height h_1 of the highest upstanding flange. The height h_2 of the raised portion 5 may be substantially equal to or greater than half the height of the upstanding flange 2 h_1 , i.e. $h_2 = (h_1/2)$. If the flanges are of different heights the height of the upstanding flanges is taken to be the height h_1 of the taller upstanding flange. An upstanding flange 2 and a connecting portion 6 form a channel substantially U-shaped in cross-section in the particular embodiment shown in Figure 1. These channels can act as receptacles for items such as cables and pipes for e.g. electricity provision or solar installa-

tions such as for electricity generation or water heating. The channels can also act as receptacles for lighting means for providing external illumination. In the particular embodiment shown in Figure 1 the raised portion 5 of the building member extends across more than half of the intermediate portion 4.

[0035] Figure 2 shows a combination of two building members A and B, a retaining element 7 and a covering element 12 which make up a cladding system for roofs or walls. Only one of the upstanding flanges 2 from each building member is shown. The upstanding flanges have curved portions at their free end 3. The intermediate portion comprises a raised portion 5 and connecting portions 6 which connect the upstanding flanges to the raised portion. Only one connecting portion 6 is shown for each building member A and B. Retaining element 7 comprises a head portion 8, a base 9 for securing to a support member 11 and a web portion 10 joining the head portion 8 to the base portion 9. The curved portions 3 of the upstanding flanges 2 of the building members curve closely around the head portion 8 of the retaining element 7. The curved portion 3 of the building member B closely surrounds or overlaps the curved portion 3 of the upstanding flange 2 of the building member A. The curved portion 3 of the upstanding flange 2 of the building member A may also support the curved portion 3 of the upstanding flange 2 of the building member B. A covering element 12 extends between the raised portions 5 of building members A and B. In the particular embodiment illustrated in Figure 2 the covering element 12 does not extend higher or lower than the raised portions 5 of the building members A and B. The covering element 12 has downwardly depending flanges 14, 15 provided with second flanges 16, 17 extending towards, and preferably abutting, the lower part or parts (3b) of the curved portion or portions (3) and thereby attach or secure the covering element. The second flanges may abut the lower part or parts (3b) of the curved portion or portions (3) substantially perpendicularly. In the particular embodiment illustrated in Figure 2 the covering element is shaped such that it abuts the building members A and B at locations 18 and 19 where a complementary shape is provided so as to provide a snug fit for improving the fixing of the covering element and preventing it turning. In the figure a space is shown between the covering element and locations 18 and 19 for the sake of clarity. In this space a resilient member may be provided to improve the fit (not shown). The locations 18 and 19 may be given a different shape if the corresponding abutting parts of the covering element are provided with a different shape.

[0036] Figure 3 shows an alternative cross-section of the covering element 12. The second flanges 16, 17 are provided with a third flange 23 and 24 so as to provide an abutment wherein at the abutting location, the third flange and the tangent to the curved portion are substantially parallel. Depending on the shape of the cross-section, and particularly of the shape of the flanges, the type of abutment may be between perpendicular and parallel

abutment as described hereinabove. The enlarged portion in Figure 3a shows a number of potential locations for resilient member to improve the fit or clamping action of the cover at the locations 24a. One or more of these or alternative locations may be selected. They may be used in addition to or instead of the resilient member 24.

[0037] Figure 4 schematically shows the distances x_1 , y and x_2 , as well as the location of the lower part or parts 3b of the curved portion or portions 3 and the upper part or parts 3a of the curved portion or portions 3, and the orientation of a positive z-direction. The lower parts 3b are defined by the parts under the dashed line, and the upper parts 3a are defined by the parts above the dashed line. The dashed line is drawn where the co-operating parts of the curved portions of building member A and B is the widest as seen from the z-direction.

[0038] Figure 5 and 6 show alternative embodiments for the covering elements. These embodiments allow to span a wider gap. Figure 7 shows an alternative embodiment for the covering element wherein the flanges 14, 15, 16 and 17 have been given a smooth form rather than the straight flanges of Figure 3.

[0039] The building members may be made from metal or plastic. The metal used is preferably an aluminium alloy e.g. AA3004. The building members A,B may be formed by roll forming or folding or a combination of both. The upstanding flanges 2 may be of different heights. If the flanges are of different heights the height of the upstanding flanges is taken to be the height of the taller upstanding flange.

[0040] The channels formed by the upstanding flanges and the connecting portions may be substantially U-shaped, V-shaped, teardrop shaped, egg-shaped or circular in cross-section.

[0041] The surfaces of the building members A, B may be decorated or provided with an attractive finish by e.g. embossing.

[0042] The raised portion of the building members A, B may be stiffened. The portion may be stiffened using for example a composite material such as a metal/plastic laminate or a metal/plastic/metal laminate. The portion may also be stiffened using material in for example honeycomb or waved form. The stiffening material is preferably applied below the raised portion so it is not visible.

[0043] The covering element 12 may not extend fully across the gap between the raised portions of building members A and B.

[0044] The covering element may be raised above the height of the raised portions of building members A and B or may be at a height equal to or greater than the height of the raised portions of building members A and B. At least part of the covering element may be below the raised portions of building members A and B.

[0045] The covering element may e.g. curve over the retaining element from the raised portion of building member A over the head of the retaining element to the raised portion of building member B or may extend straight across.

[0046] The covering element may be made from a different material to that of the building members or may be provided with a different outer surface finish or colour to that of the building members or other covering elements.

Covering elements of different finishes or colours can be for example alternated in a roof or facade structure to provide an unusual and eye-catching appearance.

[0047] The covering element may be extrusion formed and is preferably made from an aluminium alloy. At least the upper surface part of the covering element may be covered with a layer of material. The upper surface of the covering element is the surface facing away from the retaining element. The layer of material may be the same material as the building members are made from in order to provide a uniform appearance. The layer of material may be wrapped around the upper surface of the covering element.

[0048] The covering elements may be elongate up to the same length as the building members or may be considerably shorter than the building members. Several covering elements may be positioned at intervals along the length of a building member and a single piece of the layer material may cover more than one covering element and extend between covering elements.

[0049] The building members and/or covering elements may be tapered or curved or a combination of both.

[0050] Multiple combinations according to the invention can be used to form a large smooth area of roof or wall,

[0051] In the figures the building members and retaining element are shown in the positions they would be in when positioned on a roof in a substantially horizontal position. The height h_1 of the upstanding flange is the distance from the base of the upstanding flange to the furthest extension of the upstanding flange. The base of the upstanding flange is the point at which the upstanding flange joins the connecting portion 6. The flanges may be of different heights in which case the height of the upstanding flanges is taken to be the greater of the two heights. The height h_2 of the raised portion is the elevation of the raised portion 5 from the deepest part of the channel 12 formed by the connecting portions 6.

[0052] Having now fully described the invention, it will be apparent to one of ordinary skill in the art that many changes and modifications can be made without departing from the scope of the invention as herein described. The embodiments have all been described in the horizontal orientation, such as on a roof like structure. However, it will be clear that the invention is also embodied in embodiments which have a different orientation than the horizontal, such as a façade, or a sloping roof or façade.

Claims

1. Assembly of two adjoining building members (A,B), wherein the building members comprise upstanding

- flanges (2) on opposite edges and an intermediate portion (4) between the upstanding flanges where the upstanding flanges have a curved portion (3) at their free end, the curved portion comprising an upper part (3a) and a lower part (3b), the curved portion (3) and the upstanding flange (2) of one building member (A) being designed so as to co-operate with the curved portion (3) and the upstanding flange (2) of the adjoining building member (B) and form a standing seam, wherein the intermediate portion (4) comprises, a raised portion (5), extending to a height of at least half the height of the upstanding flanges (2), and connecting portions (6) which connect the upstanding flanges (2) to the raised portion (5), the assembly also comprising a retaining element (7), wherein the retaining element comprises a head portion (8), a base (9) for securing to a support member and a web portion (10) joining the head portion to the base portion, wherein the head portion supports at least the curved portion (3) of one upstanding flange (2) on one building member (A) and one upstanding flange (2) on the other building member (B) and wherein the combination further comprises a covering element (12) extending at least partially between building member (A) and other building member (B) over the head (8) of the retaining element (7), wherein the covering element (12) comprises a covering portion (13), the covering element being provided with at least two longitudinally extending and downwardly depending flanges (14,15), said flanges (14, 15) being provided with means (16, 17) for fixedly holding the covering element (12), said means acting substantially on the lower part or parts (3b) of the curved portion or portions (3).
2. Assembly according to claim 1, wherein the means (16, 17) for fixedly holding the covering element (12) enable mounting of the covering element (12) in a mounting direction (z) and prevent dismounting in the reverse direction (-z).
 3. Assembly according to claim 1 or 2, wherein the means (16, 17) for fixedly holding the covering element (12) abut the lower part or parts (3b) of the curved portion or portions (3) when mounted.
 4. Assembly according to any one of the preceding claims wherein the covering element comprises a substantially quadrangular covering portion (13) having a first longitudinally extending edge (13a) and a second longitudinally extending edge (13b), the covering element at the longitudinal edges (13a, 13b) being provided with longitudinally extending and downwardly depending first flanges (14,15), the first flanges being provided with second flanges (16,17) extending towards, and preferably abutting, the lower part or parts (3b) of the curved portion or portions (3).
 5. Assembly according to any one of the preceding claims wherein the distance x_1 between the free edges of the second flanges (16,17) prior to mounting is smaller than the diameter y of the cooperating curved portions (3) when seen in the mounting direction (z) of the covering element, and wherein the distance x_2 between the free edges of the second flanges (16,17) after mounting is smaller than y and equal to or larger than x_1 .
 6. Assembly according to any one of the preceding claims wherein the covering portion with the at least two longitudinally extending and downwardly depending flanges (14,15) and the means (16, 17) enclose a channel (22) comprising two sub-channels (22a, 22b) for accommodating wiring, tubing, insulation and the like.
 7. Assembly according to any one of the preceding claims wherein the covering element is made from an elastic material, such as a metal or a polymer, preferably by roll-forming or extrusion material, preferably wherein the covering element is made from steel, a steel alloy, aluminium or an aluminium alloy.
 8. Assembly according to any one of the preceding claims wherein a resilient member (19) is provided between the covering portion (13) and the upper part or parts (3a) of the of the curved portion or portions (3), said member (19) being compressed during mounting of the covering element and at least partly relaxed after mounting of the covering element.
 9. Assembly according to claim 5, wherein the resilient member (19) is an elastic compound such as an elastomer, a rubber or a resilient foam, preferably longitudinally extending along the covering element.
 10. Assembly according to claim 2, wherein the raised portion (5) of the building members (A, B) is provided with photovoltaic cells (21), preferably in the form of flexible mats.
 11. Assembly according to claim 1, wherein the raised portion (5) of the building members (A, B) extends to a height greater than the height of the upstanding flanges (2), and wherein the covering element (12) extends straight across between the raised portions (5) of the building elements (A,B) at substantially the same height as the raised portions (5) of the building elements (A,B).
 12. Roof construction for or on a building comprising the assembly according to any of the preceding claims.
 13. Façade construction for or on a building comprising the assembly according to any of the preceding claims.

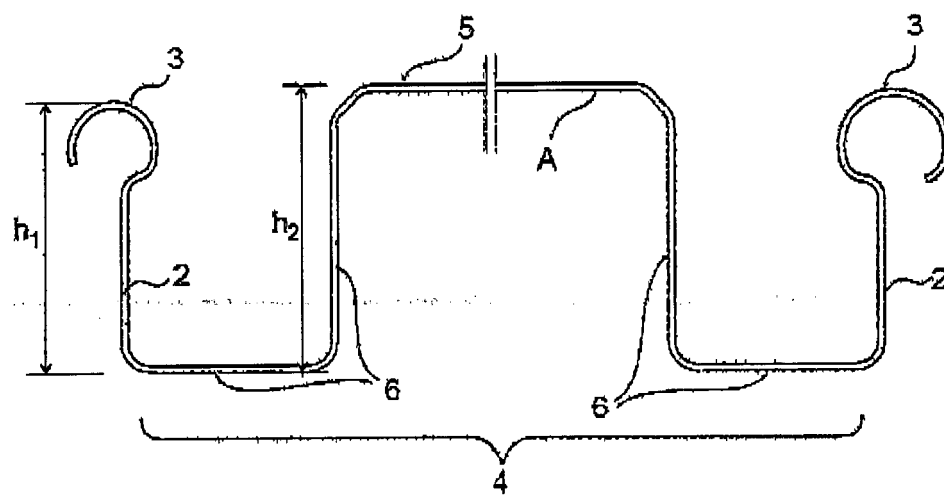


FIG. 1

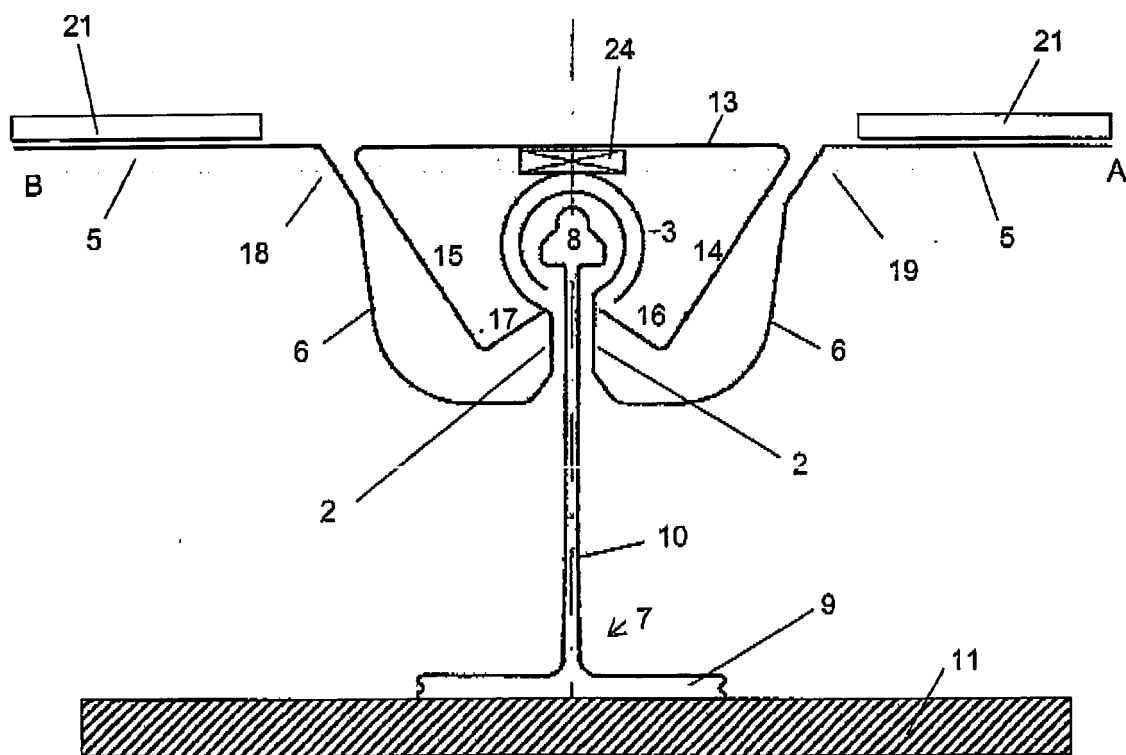


FIG. 2

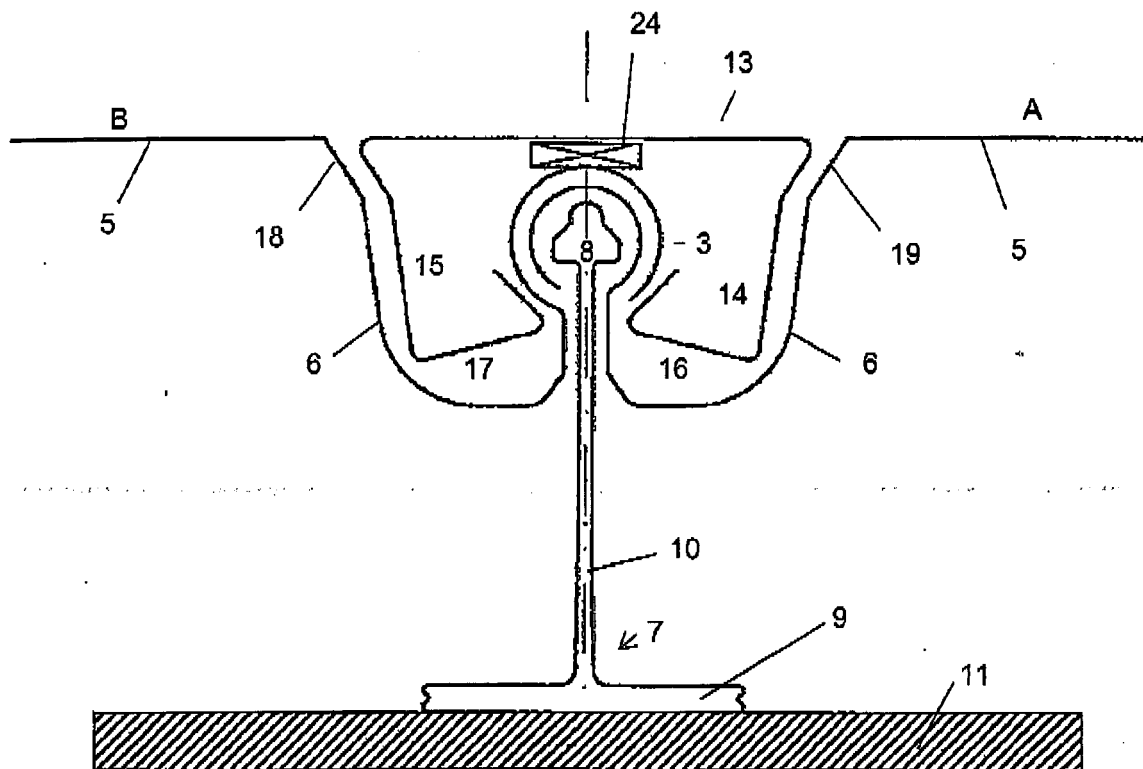


FIG. 3

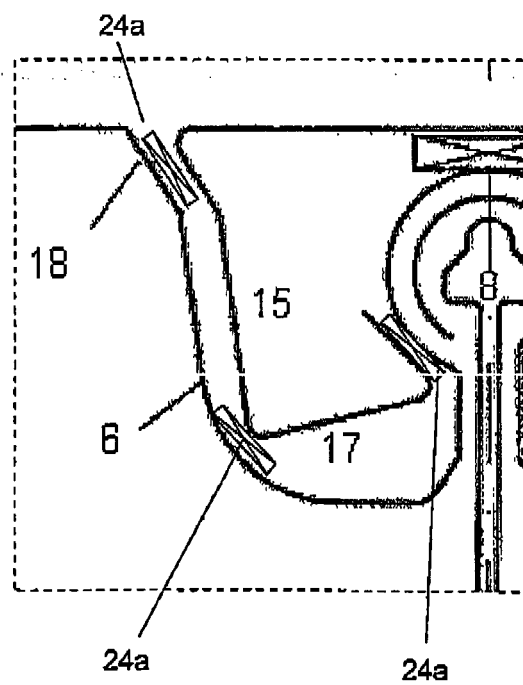


FIG. 3a

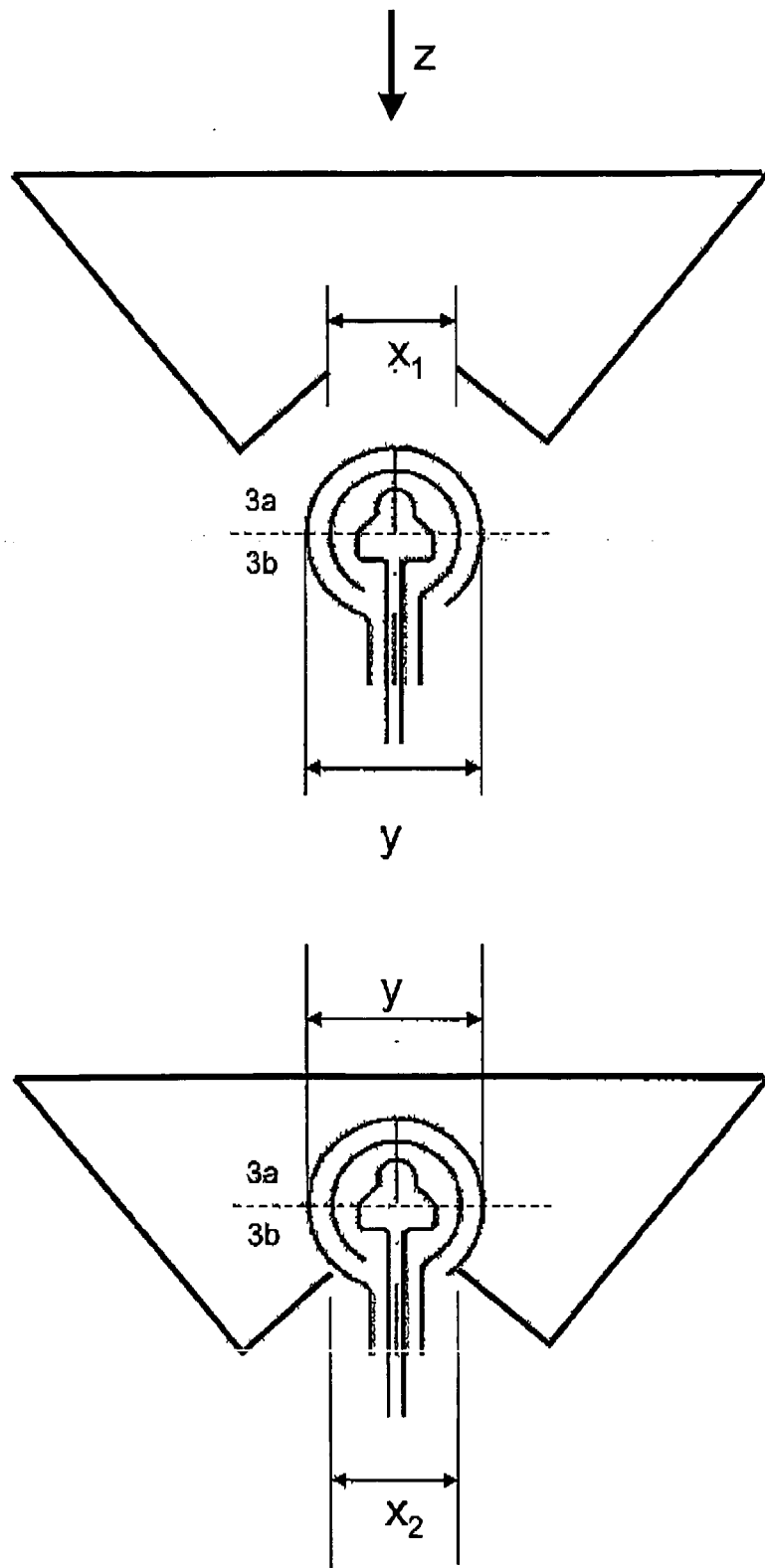


FIG. 4

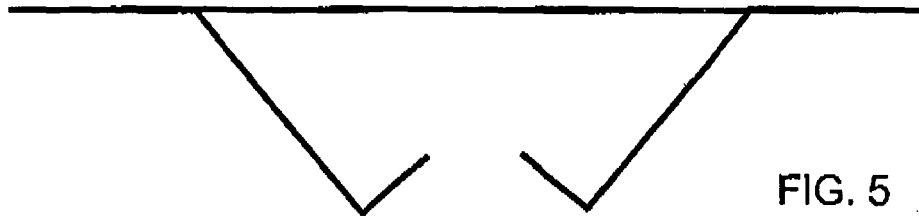


FIG. 5

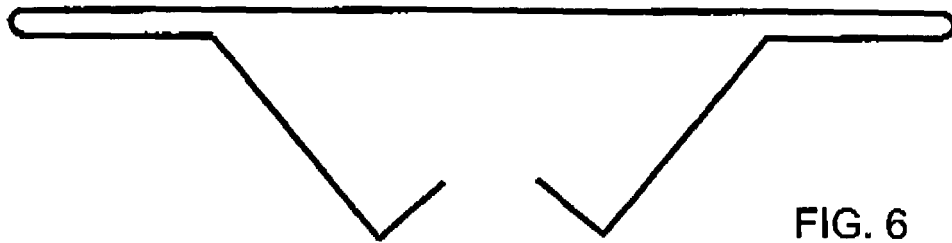


FIG. 6

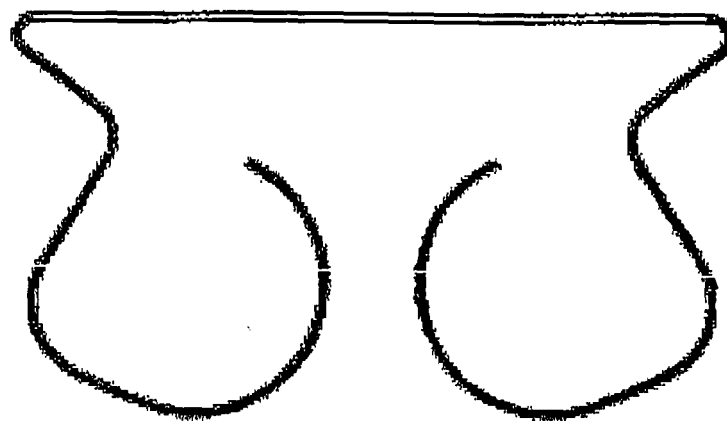


FIG. 7



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 02 2004

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
D,A	WO 2005/021887 A (CORUS BAUSYSTEME GMBH [DE]; DOEHREN HANS-JUERGEN [DE]; PRITZKOW JAN WO) 10 March 2005 (2005-03-10) -----		INV. E04D3/366 E04D3/362 E04F13/08 E04F13/12
A	GB 2 301 849 A (MOORE BARRIE PETER [GB]) 18 December 1996 (1996-12-18) -----		
A	JP 11 247368 A (GANTAN BEAUTY KOGYO KK) 14 September 1999 (1999-09-14) -----		
			TECHNICAL FIELDS SEARCHED (IPC)
			E04D E04F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 February 2007	Examiner Vratsanou, Violandi
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

3
EPO FORM 1503 03.82 (P04C01)

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ON EUROPEAN PATENT APPLICATION NO.**

EP 06 02 2004

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23-02-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005021887 A	10-03-2005	NONE	
GB 2301849 A	18-12-1996	US 6000393 A	14-12-1999
JP 11247368 A	14-09-1999	JP 3308890 B2	29-07-2002

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2005021887 A [0002]