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(54) WINDOW LINING ASSEMBLY WITH IMPROVED FITTINGS AND METHOD FOR INSTALLING SUCH A LINING ASSEMBLY ON A WINDOW

(57) In a lining assembly (2) for a window (1) comprising a frame (10) defining a frame plane, a set of lining panels (20) and a plurality of fittings (8, 9) are provided to establish connection between the window frame (19) and the lining panels in a mounted position of the lining assembly (2). Each fitting includes a frame fitting part (9) and a lining panel fitting part (8). The frame fitting part (9) has a flange portion (91) to be fastened to the window frame (10) and a leg portion (92) extending at an angle from the flange portion (91) and including engagement means (96, 97) facing the lining panel (20) in the mounted position. The lining panel fitting part (8) has a plane base portion (81) to abut an outer surface of the lining panel (20) and engagement means (82) protruding from the base portion (81) in a direction away from the lining panel (20). The engagement means of the lining panel fitting part (8) are configured to be engaged with the engagement means of the frame fitting part (9) during movement of the lining panel (20) relative to the frame (10) of the window (1) from a supply position to the mounted position of the lining assembly (2). The leg portion (92) of the frame fitting part (9) is provided with at least two engagement sections (96, 97) and the base portion (81) of the lining panel fitting part (8) is provided with a single engagement section (82) to allow each lining panel (20) to be retained by means of the fittings (8, 9) in a first partially inserted position and in a fully inserted mounted position relative to the window frame (10).

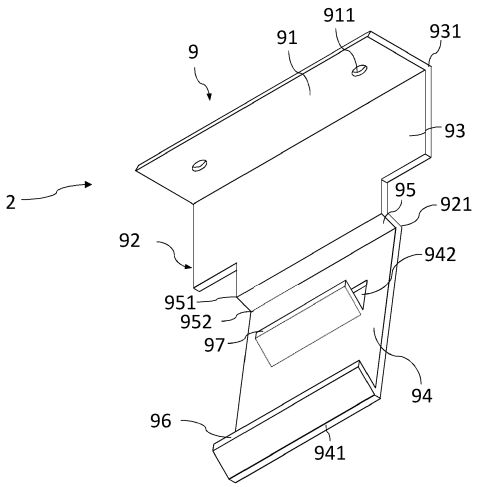

Fig. 4

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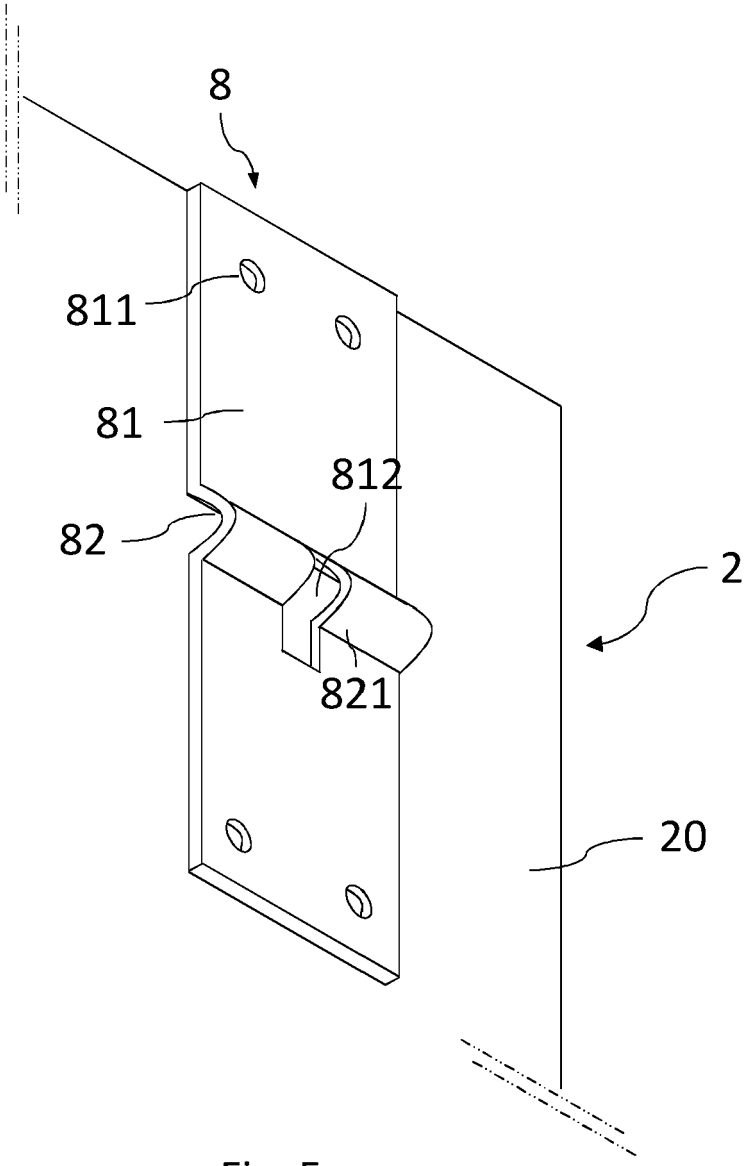

Fig. 5

Description

Technical Field

[0001] The present invention relates to a lining assembly for a window comprising a frame defining a frame plane, said window lining assembly comprising a set of lining panels and a plurality of fittings configured to provide connection between the window frame and the lining panels in a mounted position of the lining assembly, each fitting including a frame fitting part and a lining panel fitting part, in which the frame fitting part is configured to be connected to the window frame and has a flange portion to be fastened to the window frame to extend in a first plane in parallel with the frame plane and a leg portion extending at an angle from the flange portion and including engagement means facing the lining panel in the mounted position, and in which the lining panel fitting part is configured to be connected to a respective lining panel and has a substantially plane base portion to abut an outer surface of the lining panel and engagement means protruding from the base portion in a direction away from the lining panel, the engagement means of the lining panel fitting part being configured to be engaged with the engagement means of the frame fitting part during movement of the lining panel relative to the frame of the window from a supply position to the mounted position of the lining assembly. The invention also relates to a method for installing a lining assembly on a window.

Background Art

[0002] When installing windows in a façade or a roof, it is desirable to make the transition between the window frame and the inner wall or ceiling of the room of the building smooth, compact and of a pleasant appearance, while minimizing any potential thermal losses. The transition is most often made up of a so-called window lining having dimensions to span the distance between the inner side of the window frame to the inner wall or the loft of the room. In windows installed in a facade, i.e. substantially vertically, the lining is constituted basically of a box-shaped element having two side members, a top member, and a bottom member, all being of a substantially rectangular shape and positioned at right angles to the window frame. The members are traditionally formed of panels or plates of such materials as plywood, gypsum or chipboard or foamed PVC.

[0003] In windows mounted in a roof, the geometry of the lining is more complicated. Thus, in roof windows mounted in an inclined roof surface, the side members are traditionally positioned at right angles to the window frame, as in facade windows, but the top member is most often substantially horizontal and the bottom member substantially vertical, or the top member and bottom member assume other angles with the window frame. A number of grounds for this particular design exist, one being that the horizontal top member allows for an increased influx of light, another that the vertical bottom member makes it possible to access the bottom of the window and optimise the space of the room. Thus, the top member and the bottom member form an angle other than 90° with the window frame, and the side members have a trapezoidal shape. In other roof windows, such as skylight windows mounted on a flat roof, in a ceiling, or in or roof light systems mounted in other structural components of a building, other configurations of the shaft at the transition from the window to the interior are conceivable as well.

[0004] Regardless of the installation conditions, the lining panels are connected to the frame of the window, not only in the final mounted condition, but are traditionally also disconnected and re-connected during installation, since measurement and marking of cutting or sawing lines are necessary to obtain an acceptable transition to the inner wall.

[0005] In the prior art, several solutions have been proposed to facilitate the installation and reduce the amount of manual adjustment needed and the risk of incorrect installation. Examples are shown for instance in EP 17 399 B1, EP 287 362 B1, EP 2 615 219 A1, EP 2 860 487 A1 and WO 02/20914 A1 (corresponding to Applicant's registered utility models DE 201 80 392 U1 and DK 2003 00079 U3).

[0006] Fittings for mounting window linings to the fixed surfaces or frame members surrounding a frame opening are well known in the art. In this regard, to easily mount a window covering in an 'in-groove' position (i.e. lateral to the plane of the frame opening), different types of mountings or brackets are known. These brackets when mounted, usually allow the head rail of the lining assembly to be slid into engagement with the brackets and subsequently held in place between them.

[0007] Even though the arrangements disclosed in the above-mentioned documents facilitate the mounting of the lining panel to some extent, there is still a need for simplified and flexible manufacture and installation of lining panels. The fittings or brackets of the prior art installation systems are typically dependent on sufficient circumferential space in order to allow the installation to be performed correctly.

[0008] This need is accentuated by the increasing width of the product range to be accommodated by the fittings of the installation system, and also in dependence on auxiliary equipment such as climate-proofing collars, additional insulation, or the like. Finally, the installation conditions contribute to the challenges during mounting of the lining on a window. Particularly in windows in horizontal or inclined surfaces, sufficient force needs to be applied to the window lining to make the fittings grip and retain the lining in a mounted position. The necessary force to be applied may be increased when additional elements are applied between the lining and the window frame (e.g. a vapour barrier), as higher force will be needed to move, squeeze or compress these elements.

Summary of Invention

[0009] With this background, it is therefore an object of the invention to provide a lining assembly, which is more effective, versatile, and flexible as regards installation conditions.

[0010] This and further objects are achieved with a lining assembly of the kind mentioned in the introduction which is furthermore characterised in that the leg portion of the frame fitting part is provided with at least two engagement sections and the base portion of the lining panel fitting part is provided with a single engagement section to allow each lining panel to be retained by means of the fittings in a first partially inserted position and in a fully inserted mounted position relative to the window frame.

[0011] This solution results in a stable and effective window lining assembly, which is easy to position for proper installation. Moreover, simple, safe and uncomplicated fittings are enabled. In addition, the need of additional securing means of the lining assembly is obviated. During installation, the fitter is able to let go of the lining panels and with both hands press hard on a part area of the lining until the fittings in this part area are engaged. Subsequently, the fitter can press against other part areas of the lining in the same way until all fittings have reached their final, mounted position. As the lining is thus pressed into place in two or more operational steps, far less force is required for the pressing-in than is the case with the prior art linings, where a large overall force is required to press the lining into place in the mounted position in one operation, or alternatively where one person presses in several operations while others are holding the lining. Therefore, even in case of large skylights the lining can normally easily be mounted by a single fitter. The provision of a lining panel fitting part, with a single engagement section, makes it possible to provide the lining panel fitting part with small dimension and thus allows for a minimal interference with the lining panel itself while at the same time protecting the material of the lining panel and providing the multi-step engagement with the at least two engagement sections of the frame fitting part. In case the lining assembly requires measurement and adaptation of the width of the lining panels, the lining panels are easily disconnected from the window frame by releasing the engagement between the respective engagement sections of the frame fitting part and the lining panel fitting part.

[0012] In a presently preferred embodiment, the leg portion of the frame fitting part comprises an offsetting section dividing the leg portion into a first leg section and a second leg section, the first leg section extending in a second plane from an edge of the first leg section, at the flange portion, to a first end of the offsetting section, the offsetting section extending in a direction away from the second plane relative to the flange portion to define an apex of the leg portion at an offsetting distance, and wherein the second leg section extends within the offsetting distance. In this way, the transverse dimensions of the entire frame fitting part are reduced, thus making it possible to install the lining panel even in very restricted spaces. In turn, this renders the transition between the window frame and the surrounding inner wall or ceiling slender and appealing.

[0013] In a development of this preferred embodiment, each of the engagement sections of the frame fitting part is resiliently engageable with and disengageable from the engagement section of the lining panel fitting. Resilience of the engagement section(s) of one or both of the lining panel fitting part and the frame fitting part provides for a large degree of freedom in the design of the fitting parts.

[0014] In a further development of this preferred embodiment, the resilient engagement is intended to take place at displacement of the leg portion in a direction away from the second plane and the lining panel. Even though this requires additional space around the window frame and the lining panel, suitable dimensioning of the engagement sections and other sections of the fitting parts renders such requirements acceptable in most fields of application.

[0015] In a yet further development of this preferred embodiment, the second leg section extends in an inclined plane from the second end of the offsetting section in a direction towards the second plane, and wherein, at resilient engagement with and disengagement from, each of the engagement sections of the frame fitting part at displacement of the leg portion in the direction away from the second plane and the lining panel, the leg portion keeps within the offsetting distance of the leg portion of the frame fitting part. This facilitates the installation even further, since the release of the engagement is carried out easily even in very restricted spaces, as the leg portion of the frame fitting parts has a limited travel not exceeding the offsetting distance.

[0016] In a further presently preferred embodiment, the engagement section of the lining panel fitting comprises an abutment surface to resiliently engage and disengage the at least two engagement sections of the leg portion of the frame fitting part. This provides for a mechanically simple and reliable solution.

[0017] In a development of this further embodiment, each frame fitting part is formed as a clip in which the at least two engagement sections comprise hooks protruding from the second leg section to abut the abutment surface of the lining panel fitting part. The provision of hooks on a clip has proven to provide safe engagement while at the same time accommodating the need to disengage relatively easily.

[0018] A particularly efficient engagement is provided in an embodiment in which the frame fitting part and the lining panel fitting part are prevented from being disengaged from each other by means of a snap lock effect. The snap lock may involve either positive or non-positive engagement between the engagement sections of the frame fitting part and the lining panel fitting part, respectively.

[0019] The frame fitting part and/or the lining panel fitting part may be formed as one-piece elements, the at least two engagement sections of the frame fitting part being then preferably formed as bent lugs of the material of the second leg section of the leg portion of the frame fitting part, and/or the engagement section of the lining panel fitting part being preferably formed as a wave-shaped projection. One-piece elements provide for ease of manufacture with a minimum of excess material.

[0020] Alternatively, the frame fitting part and/or the lining fitting part are formed by two or more elements, preferably the frame fitting part comprises an additional leg section connected to the second leg section comprising at least one of the engagement sections. While involving additional material and an additional assembling step compared to the one-piece solution, this solution may also involve advantages from a cost and strength point of view.

[0021] Preferably, the frame fitting part comprises bent spring sheet material. In this way, a sturdy element is provided into which it is possible to incorporate suitable engagement sections.

[0022] In another presently preferred embodiment, the engagement sections of the frame fitting part are mutually spaced in a direction at right angles to the first plane of the frame fitting part by a predefined distance, preferably in the range of 10 to 30 mm, more preferably about 20 mm. Dimensions of such magnitudes provide for a suitable intermediate position near the final and mounted condition.

[0023] In a development of the above-mentioned presently preferred embodiment, the offsetting section forms an angle of 30 to 60°, preferably about 45°, with the second plane of the frame fitting part, and preferably has a length in the range 2 to 8 mm, preferably about 5 mm. Such dimensions provide for smooth performance during manufacture and installation, and in use.

[0024] In a development of the embodiment, in which the second leg section extends in an inclined plane from the second end of the offsetting section, an angle with the second plane of the frame fitting part of 2 to 15°, preferably about 5 to 10°, more preferably about 7°. This has shown to provide an appropriate balance of limitation of the required space for handling the engagement and not interfering with the installation process.

[0025] In an embodiment, which is particularly advantageous in terms of the possibilities for disengagement, an aperture is formed in each lining panel fitting and a counterpart aperture is formed in each lining panel such that the apertures are brought to coincide when the lining panel fitting is fastened to the lining panel, allowing the frame fitting part to be pressed away from the lining panel fitting part by insertion of a tool in the apertures.

[0026] In order to improve the positioning of the lining panel relative to the window frame even further, a plurality of clip elements may be provided for fastening to the lining panel, each clip element comprising a plate section to abut the outer surface of the lining panel and a grip section to engage with an edge portion of the lining panel. In this way, better control of any gap between the lining panel and the window frame is provided, such that any rattling or skewing of the lining panel is prevented.

[0027] In yet another presently preferred embodiment, the leg portion of the frame fitting part is provided with two juxtaposed second engagement sections. This has proven advantageous during installation, as engagement and disengagement are facilitated.

[0028] In another presently preferred embodiment, the frame fitting part is provided with at least one barb at the first leg section and/or at the flange portion. This provides for a particularly easy installation, since the barb or barbs of frame fitting part may be pressed into the material of the window frame, thus providing for an at least temporary retention requiring no tools, following which the installer may secure the frame fitting part with fastening means such as screws.

[0029] In an embodiment, the frame fitting part has a height in the range 50 to 110mm, preferably about 80mm and a width in the range 30 to 90mm, preferably about 60mm. The width extends in a width direction which is perpendicular to the height direction.

[0030] In a second aspect, a method for installing a lining assembly on a window is provided.

[0031] Other presently preferred embodiments and further advantages will be apparent from the subsequent detailed description and drawings.

Brief Description of Drawings

[0032] In the following description embodiments of the invention will be described with reference to the schematic drawings, in which

Fig. 1 is a perspective view of a prior art installation system comprising a roof window and a lining panel with prior art fittings;

Fig. 2 is an enlarged cut-out of the prior art installation system of Fig. 1, including also a vapour barrier collar;

Fig. 3 is a schematic cross-sectional view, on a larger scale, of the prior art installation system of Figs 1 and 2;

Figs 4 and 5 are schematic perspective views of details of a first embodiment of a lining assembly according to the invention;

Figs 6 and 7 are views corresponding to Figs 4 and 5 of details of a second embodiment of a lining assembly according to the invention;

Fig. 8 is a side view of a frame fitting part of a lining assembly in a third embodiment according to the invention;

Fig. 9 is a front view of the frame fitting part of Fig. 8;

Fig. 10 is a side view of a lining panel fitting part of a lining assembly in a third embodiment according to the invention;

Fig. 11 is a front view of the lining panel fitting part

of Fig. 10;
Fig. 12 is a perspective view of the lining panel fitting part of Fig. 10;
Fig. 13 is a partial perspective view of a further embodiment of the lining assembly according to the invention;
Fig. 14 is a front view of a fourth embodiment of the frame fitting part according to the invention;
Fig. 15 is a side view of the frame fitting part of Fig. 14; and
Fig. 16 is a perspective view of the frame fitting part of Fig. 14.

Description of Embodiments

[0033] Referring initially to Figs 1 to 3, the general configuration of an installation system according to prior art is shown. A roof window generally designated 1 is shown installed in an aperture 4 in an inclined inner wall 3. A prior art lining assembly generally designated 2' is shown in an assembled but not yet mounted condition. The construction of the lining assembly 2' is described in more detail in Applicant's EP 2 860 487 A1, EP 2 700 780 B1 and 2 700 781 B1. In general, the lining assembly 2' comprises a lining panel frame composed by four lining panels 20', a set of fittings, and possible auxiliary equipment, including for instance a vapour barrier collar 5 mounted in a groove 6 in a frame 10 of the roof window, for instance as described and shown in Applicant's EP 2 2463 893 B1.

[0034] As indicated in Figs 1 to 3, prior art fitting parts 8' and 9' are mounted on one or more of the lining panels 20' of the lining assembly 2' and in the groove 6 of the frame of the roof window 1 respectively, by suitable fastening means including a screw 7' in the groove 6. Corresponding fitting parts may be mounted throughout the circumference of the window 1 and the lining assembly 2', respectively. Referring in particular to Fig. 3, the lining panel 20' is moved in the direction of arrow U, during mounting, until the fitting part 8' clicks into fitting part 9', thereby attaining the mounted condition of the installation system.

[0035] In the following, embodiments of fittings to replace the fitting parts of the prior art will be described. Reference will be made to the roof window 1 including the frame 10 and groove 6, extending circumferentially in the frame 10 of the roof window 1. A vapour barrier collar as vapour barrier collar 5 of the installation system shown in Figs 1 to 3 may be present as well. It is apparent that these units may form part of a lining assembly according to the present invention as well, either as they are shown or described, or with modifications readily accessible to the person skilled in the art.

[0036] Referring initially to Figs 4 and 5, the general configuration of a first embodiment of a lining assembly 2 is shown. As in the prior art, the lining assembly 2 is intended for a window comprising a frame, such as the window 1 with its frame 10 shown in the prior art. The frame 10 defines a frame plane, which is typically parallel with the roof surface in which the window is mounted.

[0037] As in the prior art, the window lining assembly 2 comprises a set of lining panels 20. In the typical mounted position, four lining panels form a coherent lining panel frame of a rectangular or trapezoidal cross-section. The lining assembly 2 further comprises a plurality of fittings 8, 9 configured to provide connection between the window frame 10 and the lining panels 20 in a mounted position of the lining assembly 2. Each fitting includes a frame fitting part 9 and a lining panel fitting part 8, of which the frame fitting part 9 is configured to be connected to the window frame 10 and has a flange portion 91 to be fastened to the window frame 10 to extend in a first plane xpl (cf. Fig. 8) in parallel with the frame plane and a leg portion 92 extending at an angle from the flange portion 91 and including engagement means 96, 97 facing the lining panel 20 in the mounted position. The lining panel fitting part 8 is shown connected to a respective lining panel 20 and has a substantially plane base portion 81 to abut an outer surface of the lining panel 20 and engagement means 82 protruding from the base portion 81 in a direction away from the lining panel 20. Further details shown in the drawings but not described in further detail are holes 811 in the base portion 81 of the lining panel fitting part 8, and holes 911 in the flange portion 91 of the frame fitting part 9, to allow the introduction of fasteners such as screws.

[0038] As will be described in further detail below, the engagement means 82 of the lining panel fitting part 8 are configured to be engaged with the engagement means of the frame fitting part 9 during movement of the lining panel 20 relative to the frame 10 of the window 1 from a supply position to the mounted position of the lining assembly 2.

[0039] The above-mentioned considerations apply also to the second embodiment shown in Figs 6 to 7, and to the third embodiment shown in Figs 8 to 11. Elements having the same or analogous function as in the first embodiment carry the same reference numerals to which 100 and 200, respectively, has been added. Features common to all embodiments will be described jointly where appropriate below, and in the description of the second and third embodiments, only differences will be described in detail.

[0040] The leg portion 92 of the first embodiment frame fitting part 9, and also the counterpart leg portion 192; 292; 392 of the frame fitting part 109; 209; 309 in the second, third and fourth embodiment, is provided with at least two engagement sections 96, 97; 196, 197; 296, 297; 396, 397. In all of the embodiments, two engagement sections are provided. However, three or even more engagement sections are conceivable.

[0041] The base portion 81; 181; 281 of the lining panel fitting part 8; 108; 208 of each of the three embodiments is provided with a single engagement section 82; 182; 282.

[0042] In this way, each lining panel 20 can be retained by means of the fittings 8, 9; 108; 109; 208, 209; 309 in

a first partially inserted position and in a fully inserted mounted position relative to the window frame 10.

[0043] In the embodiments shown, the leg portion 92; 192; 292; 392 of the frame fitting part 9; 109; 209; 309 comprises an offsetting section 95; 195; 295; 395 dividing the leg portion 92; 192; 292; 392 into a first leg section 93; 193; 293; 393 and a second leg section 94; 194; 294; 394.

[0044] The first leg section 93; 193; 293 extends in a second plane ypl (cf. Fig. 8) from an edge 931; 2931 of the first leg section 93; 193; 293, at the flange portion 91; 191; 291, to a first end 951; 2951 of the offsetting section 95; 195; 295. Here, the second plane ypl is perpendicular to the first plane xpl and consequently, the first leg section 93 of the leg portion 92 is at right angles to the flange portion 91. The offsetting section 95; 195; 295 extends in a direction away from the second plane ypl relative to the flange portion 91; 191; 291 to define an apex 921; 2921 of the leg portion 92; 192; 292 at an offsetting distance ofd.

[0045] Similar applies to the fourth embodiment of Figs 14 to 16, in which the first leg section 393 also extends in the second plane ypl until a first end 3951 of the offsetting section 395. The offsetting section 395 extends in a direction away from the second plane ypl relative to the flange portion 391 to define an apex 3921 of the leg portion 392 at an offsetting distance ofd.

[0046] In the first, second and third embodiments, the second leg section 94; 194; 294 extends in an inclined plane ipl from a second end 952; 2952 of the offsetting section in a direction towards the second plane ypl. Each of the engagement sections 96, 97; 196, 197; 296, 297 of the frame fitting part 9; 109; 209 is resiliently engageable with and disengageable from the engagement section 82; 182; 282 of the lining panel fitting 8; 108; 208 at displacement of the leg portion 92; 192; 292 in a direction away from the second plane ypl and the lining panel 20 while keeping within the offsetting distance ofd of the leg portion 92; 192; 292 of the frame fitting part 9; 109; 209.

[0047] Referring to the notation shown only in Fig. 8 and Fig. 15, it is noted that the apex 2921; 3921 is located substantially at the second end 2952; 3952 of the offsetting section 295 in the embodiments shown. It is also possible to have an offsetting section with an apex located at another position along the offsetting section.

[0048] As shown in Figs 5 and 10, the engagement section 82; 182; 282 of the lining panel fitting 8; 108; 208 comprises an abutment surface 821; 2821 to resiliently engage and disengage the at least two engagement sections 96, 97; 196, 197; 296, 297 of the leg portion 92; 192; 292 of the frame fitting part 9; 109; 209.

[0049] In all of the embodiments shown, each frame fitting part 9; 109; 209; 309 is formed as a clip in which the at least two engagement sections comprise hooks 96, 97; 196, 197; 296, 297; 396, 397 protruding from the second leg section 94; 194; 294; 394 to abut the abutment surface 821; 2821 of the lining panel fitting part 8; 108; 208.

[0050] Whereas other engagement forms are conceivable, it is presently preferred that the frame fitting part 9; 109; 209; 309 and the lining panel fitting part 8; 108; 208 are prevented from being disengaged from each other by means of a snap lock effect. The lining panel fitting part 309 engages with the frame fitting part 208. Within the context of the present invention, the term snap lock entails a positive engagement between two parts which is releasable only by activating at least one of the parts in another direction than the engagement direction.

[0051] Referring now in particular to the first embodiment, it is shown how the frame fitting part 9 is formed as a one-piece element. The two engagement sections 96, 97 of the frame fitting part 9 are here formed as bent lugs of the material of the second leg section 94 of the leg portion 92 of the frame fitting part 9.

[0052] In the second and third embodiments, the frame fitting part 109; 209 is formed by two elements, namely the frame fitting part 109; 209 comprises an additional leg section 198; 298 connected to the second leg section 194; 294 and comprises one or both the engagement sections 196, 197; 297. Referring to the third embodiment, in particular Fig. 9, the additional leg section 298 is fastened to the second leg section 294 of the leg portion 292 by a set of rivets 299.

[0053] In all of the embodiments, the lining panel fitting part 8; 108; 208 is formed as a one-piece element. The only engagement section 82; 182; 282 of the lining panel fitting part 8; 108; 208 is formed as a wave-shaped projection. It is also conceivable though to form also the lining fitting part by two or more elements.

[0054] The choice of material for the fitting parts may in principle be made in any suitable manner as long as the requirements to proper functioning and durability are fulfilled. It is advantageous that the frame fitting part 9; 109; 209 comprises bent spring sheet material.

[0055] The dimensions and configuration of the fitting parts may also in principle be chosen in any suitable way. It is advantageous though that the engagement sections 96, 97; 196, 197; 296, 297 of the frame fitting part 9; 109; 209 are mutually spaced in a direction at right angles to the first plane xpl of the frame fitting part by a predefined distance emd. This distance preferably lies in the range of 10 to 30 mm, in the third embodiment exemplary about 20 mm.

[0056] The offsetting section 95; 295; 395 may form an angle with the second plane ypl of the frame fitting part 9; 109; 209; 309. A suitable range is 30 to 60°, here about 45°. A suitable length range is 2 to 8 mm, in the third embodiment about 5 mm.

[0057] The second leg section 94; 194; 294 forms an angle α with the second plane ypl of the frame fitting part 9; 109; 209 of 2 to 15°, preferably about 5 to 10°. In the third embodiment, the angle is about 7°. In the fourth embodiment shown in Figs 14 to 16, the angle is 0°, since the second leg section 394 forms a right angle with the first plane xpl.

[0058] To allow for insertion of a tool to release the

engagement of the lining panel 20 with the window frame 10, an aperture 812; 1812; 2812 is formed in each lining panel fitting 8; 108; 208 and a counterpart aperture is formed in each lining panel 20 such that the apertures are brought to coincide when the lining panel fitting is fastened to the lining panel, allowing the frame fitting part 9; 109; 209 to be pressed away from the lining panel fitting part by insertion of a tool in the apertures. Thereby, the engagement is released and the lining panel may be removed from the window.

[0059] Turning to Fig. 13, a plurality of clip elements 30 may be provided for fastening to the lining panel 20, each clip element 30 comprising a plate section 31 to abut the outer surface of the lining panel 20 and a grip section 31 to engage with an edge portion of the lining panel 20. The provision of clip elements, which may be adhered to the lining panels, provide for a better control of the gap between the lining panel and the window frame.

[0060] Referring to Figs 14 to 16, a fourth embodiment of the frame fitting part 9 is shown where in the middle of the first leg section of the frame fitting part 309, a punch 400 is comprised for increased strength (shown in Fig. 14). The punch 400 is semi-circle shaped. The frame fitting part 309 further comprises barbs 399, which are projections formed at the upper part of the first leg section 393 and/or at the edge of the flange portion 391 to facilitate at least temporary fastening of the frame fitting part 309 on the frame in that the barbs 399 of the frame fitting part 309 dig into the groove of the frame, thereby leaving the frame fitting part 309 hanging while the installer is free to position fasteners such as screws. Each barb 399 is formed by the projection being bent by 15°. In this embodiment, two juxtaposed second engagement sections 397 are comprised in the first leg section 394 and two cut-outs 3942 are located adjacent to the engagement sections facing towards the first engagement section 396. Alternatively, one second engagement section and one cut-out may replace the two sections, and two cut-outs extending substantially from one end of the frame fitting part 309 to the other.

[0061] In the following, a method for installing a lining assembly 2, for instance as described in any one of the above embodiments, on a window 1 installed in a building surface and comprising a frame 10 will be described in some detail. The method comprises the steps of:

providing the lining assembly with a set of lining panels 20 and a plurality of fittings 8, 9, each fitting comprising a frame fitting part 9 with at least two engagement sections 96, 97 and a lining panel fitting part 8 with a single engagement section 82,
providing an aperture in the building surface,
connecting the frame fitting parts 9 to the window frame 10,
connecting the lining panel fitting parts 8 to the lining panels 20,
connecting the lining panels to each other to form a coherent lining panel frame,
positioning the lining panel frame relative to the building surface aperture and the window frame,
connecting the lining panel frame to the window frame by

- first moving the lining panel frame in the direction of the window frame and bringing the engaging section of each lining panel fitting part into engagement with a first engagement section of the respective frame fitting part to attain a partially inserted position, and
- secondly moving the lining panel frame further in the direction of the window frame and bringing the engaging section of each lining panel fitting part into engagement with a second engagement section of the respective frame fitting part to attain a mounted position of the lining assembly.

[0062] Most often, it will not be possible to foresee the thickness of the inner wall (or ceiling) of the building in which the window is installed and the lining assembly is to be mounted. In those cases, the lining panels need to be adapted. This may be carried out in the following way, before the step of connecting the lining panels to each other to form a coherent lining panel frame:

at least one lining panel is connected to the window frame,
the lining panel is measured and/or marked relative to the inner wall,
the lining panel is disconnected by releasing the engagement between the frame fitting part and the lining panel fitting part of each fitting, and
the at least one lining panel and the remaining lining panels are adapted by cutting.

[0063] Further auxiliary equipment may be provided, including measurement tools, vapour barrier and/or insulation collars etc.

[0064] The invention is not limited to the embodiments shown and described in the above, but various modifications and combinations may be carried out.

List of reference numerals

[0065]

1	roof window
	10 frame
2'	prior art lining assembly
	20' prior art lining panel
3	inner wall
4	aperture in inner wall
5	vapour barrier collar
6	groove in frame
7'	prior art fastening means

8' prior art fitting part
9' prior art fitting part

2 lining assembly
20 lining panel
8 lining panel fitting part
81 base portion
811 holes for fastening means
812 aperture
82 engagement means
821 abutment surface
9 frame fitting part
91 flange portion
911 holes for fastening means
92 leg portion
921 apex of leg portion
93 first leg section
931 edge of first leg section
94 second leg section
941 edge of second leg section
942 cut-out
95 offsetting section
951 first end of offsetting section
952 second end of offsetting section
96 first engagement section
97 second engagement section

108 lining panel fitting part
181 base portion
1812 aperture
182 engagement means
109 frame fitting part
191 flange portion
192 leg portion
193 first leg section
194 second leg section
195 offsetting section
196 first engagement section
197 second engagement section
198 additional leg section

208 lining panel fitting part
281 base portion
2812 aperture
282 engagement means
2821 abutment surface
283 flange portion
2831 spikes
209 frame fitting part
291 flange portion
292 leg portion
2921 apex of leg portion
293 first leg section
2931 edge of first leg section
294 second leg section
2941 edge of second leg section
295 offsetting section
2951 first end of offsetting section
2952 second end of offsetting section
296 first engagement section
297 second engagement section
298 additional leg section
299 rivets

309 frame fitting part
391 flange portion
392 leg portion
3921 apex of leg portion
393 first leg section
394 second leg section
3942 cut-out
395 offsetting section
3951 first end of offsetting section
3952 second end of offsetting section
396 first engagement section
397 second engagement section
399 barb
400 punch
30 clip element
31 plate section
32 grip section
α angle
emd engagement means distance
ipl inclined plane
ofd offsetting distance
U arrow
xpl first plane
ypl second plane

Claims

1. A lining assembly (2) for a window (1) comprising a frame (10) defining a frame plane, said window lining assembly (2) comprising a set of lining panels (20) and a plurality of fittings (8, 9) configured to provide connection between the window frame (10) and the lining panels in a mounted position of the lining assembly (2), each fitting including a frame fitting part (9) and a lining panel fitting part (8), in which the frame fitting part (9) is configured to be connected to the window frame (10) and has a flange portion (91) to be fastened to the window frame (10) to extend in a first plane (xpl) in parallel with the frame plane and a leg portion (92) extending at an angle from the flange portion (91) and including engagement means (96, 97) facing the lining panel (20) in the mounted position, and in which the lining panel fitting part (8) is configured to be connected to a respective lining panel (20) and has a substantially plane base portion (81) to abut an outer surface of the lining panel (20) and engagement means (82) protruding from the base portion (81) in a direction away from the lining panel (20), the engagement means of the lining panel fitting part (8) being configured to be engaged with the engagement means

of the frame fitting part (9) during movement of the lining panel (20) relative to the frame (10) of the window (1) from a supply position to the mounted position of the lining assembly (2),
characterised in that the leg portion (92; 192; 292; 392) of the frame fitting part (9; 109; 209; 309) is provided with at least two engagement sections (96, 97; 196, 197; 296, 297; 396, 397) and the base portion (81; 181; 281) of the lining panel fitting part (8; 108; 208) is provided with a single engagement section (82; 182; 282) to allow each lining panel (20) to be retained by means of the fittings (8, 9; 108; 109; 208, 209; 309) in a first partially inserted position and in a fully inserted mounted position relative to the window frame (10).

2. A window lining assembly according to claim 1, wherein the leg portion (92; 192; 292; 392) of the frame fitting part (9; 109; 209; 309) comprises an offsetting section (95; 195; 295; 395) dividing the leg portion (92; 192; 292; 392) into a first leg section (93; 193; 293; 393) and a second leg section (94; 194; 294; 394), the first leg section extending in a second plane (ypl) from an edge (931; 2931) of the first leg section (93; 193; 293; 393), at the flange portion (91; 191; 291; 392), to a first end (951; 2951; 3951) of the offsetting section, the offsetting section extending from the first end (951; 2951; 3951) to a second end (952; 2952; 3952) in a direction away from the second plane (ypl) relative to the flange portion (91; 191; 291; 391) to define an apex (921; 2921; 3921) of the leg portion (92; 192; 292; 392) at an offsetting distance (ofd), and wherein the second leg section (94; 194; 294; 394) extends within the offsetting distance (ofd).

3. A window lining assembly according to claim 2, wherein each of the engagement sections (96, 97; 196, 197; 296, 297; 396, 397) of the frame fitting part (9; 109; 209; 309) is resiliently engageable with and disengageable from the engagement section (82; 182; 282) of the lining panel fitting (8; 108; 208).

4. A window lining assembly according to claim 3, wherein the resilient engagement is intended to take place at displacement of the leg portion (92; 192; 292; 392) in a direction away from the second plane (ypl) and the lining panel (20).

5. A window lining assembly according to claim 4, wherein the second leg section (94; 194; 294) extends in an inclined plane (ipl) from the second end (952; 2952) of the offsetting section (95; 195; 295) in a direction towards the second plane (ypl), and wherein, at resilient engagement with and disengagement from, each of the engagement sections (96, 97; 196, 197; 296, 297) of the frame fitting part (9; 109; 209) at displacement of the leg portion (92; 192; 292) in the direction away from the second plane (ypl) and the lining panel (20), the leg portion (92; 192; 292) keeps within the offsetting distance (ofd) of the leg portion (92; 192; 292) of the frame fitting part (9; 109; 209).

6. A window lining assembly according to any one of claims 3 to 5, wherein the engagement section (82; 182; 282) of the lining panel fitting (8; 108; 208) comprises an abutment surface (821; 2821) to resiliently engage and disengage the at least two engagement sections (96, 97; 196, 197; 296, 297; 396, 397) of the leg portion (92; 192; 292; 392) of the frame fitting part (9; 109; 209; 309).

7. A window lining assembly according to claim 6, wherein each frame fitting part (9; 109; 209; 309) is formed as a clip in which the at least two engagement sections comprise hooks (96, 97; 196, 197; 296, 297; 396, 397) protruding from the second leg section (94; 194; 294; 394) to abut the abutment surface (821; 2821) of the lining panel fitting part (8; 108; 208).

8. A window lining assembly according to any one of claims 3 to 7, wherein the frame fitting part (9; 109; 209; 309) and the lining panel fitting part (8; 108; 208) are prevented from being disengaged from each other by means of a snap lock effect.

9. A window lining assembly according to any one of the preceding claims, wherein the frame fitting part (9; 309) and/or the lining panel fitting part (8; 108; 208) are formed as one-piece elements, the at least two engagement sections (96, 97; 396, 397) of the frame fitting part (9; 309) being preferably formed as bent lugs of the material of the second leg section (94; 394) of the leg portion (92; 392) of the frame fitting part (9; 309), and/or the engagement section (82; 182; 282) of the lining panel fitting part (8; 108; 208) being preferably formed as a wave-shaped projection.

10. A window lining assembly according to any one of claims 1 to 8, wherein the frame fitting part (109; 209) and/or the lining fitting part are formed by two or more elements, preferably the frame fitting part (109; 209) comprises an additional leg section (198; 298) connected to the second leg section (194; 294) comprising at least one of the engagement sections (196, 197; 297).

11. A window lining assembly according to claim 9 or 10, wherein the frame fitting part (9; 109; 209; 309) comprises bent spring sheet material.

12. A window lining assembly according to any one of the preceding claims, wherein the engagement sections (96, 97; 196, 197; 296, 297; 396, 397) of the

frame fitting part (9; 109; 209) are mutually spaced in a direction at right angles to the first plane (xpl) of the frame fitting part by a predefined distance (emd), preferably in the range of 10 to 30 mm, more preferably about 20 mm.

13. A window lining assembly according to any one of claims 2 to 12, wherein the offsetting section (95; 295; 395) forms an angle of 30 to 60°, preferably about 45°, with the second plane (ypl) of the frame fitting part (9; 109; 209; 309), and preferably has a length in the range 2 to 8 mm, preferably about 5 mm.

14. A window lining assembly according to any one of claims 5 to 13, wherein the second leg section (94; 194; 294) forms an angle (α) with the second plane (ypl) of the frame fitting part (9; 109; 209) of 2 to 15°, preferably about 5 to 10°, more preferably about 7°.

15. A window lining assembly according to any one of the preceding claims, wherein an aperture (812; 1812; 2812) is formed in each lining panel fitting (8; 108; 208) and a counterpart aperture is formed in each lining panel (20) such that the apertures are brought to coincide when the lining panel fitting is fastened to the lining panel, allowing the frame fitting part (9; 109; 209; 309) to be pressed away from the lining panel fitting part by insertion of a tool in the apertures.

16. A window lining assembly according to any one of the preceding claims, wherein a plurality of clip elements (30) is provided for fastening to the lining panel (20), each clip element (30) comprising a plate section (31) to abut the outer surface of the lining panel (20) and a grip section (31) to engage with an edge portion of the lining panel (20).

17. A window lining assembly according to any one of the preceding claims, wherein the leg portion (392) of the frame fitting part (309) is provided with two juxtaposed second engagement sections (397).

18. A window lining assembly according to any one of the preceding claims, wherein the frame fitting part (309) is provided with at least one barb (399) at the first leg section (393) and/or at the flange portion (391).

19. A method for installing a lining assembly (2) on a window (1) installed in a building surface and comprising a frame (10), comprising the steps of:

providing the lining assembly with a set of lining panels (20) and a plurality of fittings (8, 9), each fitting comprising a frame fitting part (9) with at least two engagement sections (96, 97) and a lining panel fitting part (8) with a single engagement section (82),
providing an aperture in the building surface,
connecting the frame fitting parts (9) to the window frame (10),
connecting the lining panel fitting parts (8) to the lining panels (20),
connecting the lining panels to each other to form a coherent lining panel frame,
positioning the lining panel frame relative to the building surface aperture and the window frame,
connecting the lining panel frame to the window frame by

- first moving the lining panel frame in the direction of the window frame and bringing the engaging section of each lining panel fitting part into engagement with a first engagement section of the respective frame fitting part to attain a partially inserted position, and
- secondly moving the lining panel frame further in the direction of the window frame and bringing the engaging section of each lining panel fitting part into engagement with a second engagement section of the respective frame fitting part to attain a mounted position of the lining assembly.

20. The method of claim 19, wherein the following steps are carried out before the step of connecting the lining panels to each other to form a coherent lining panel frame:

at least one lining panel is connected to the window frame,
the lining panel is measured and/or marked relative to the inner wall,
the lining panel is disconnected by releasing the engagement between the frame fitting part and the lining panel fitting part of each fitting, and
the at least one lining panel and the remaining lining panels are adapted by cutting.

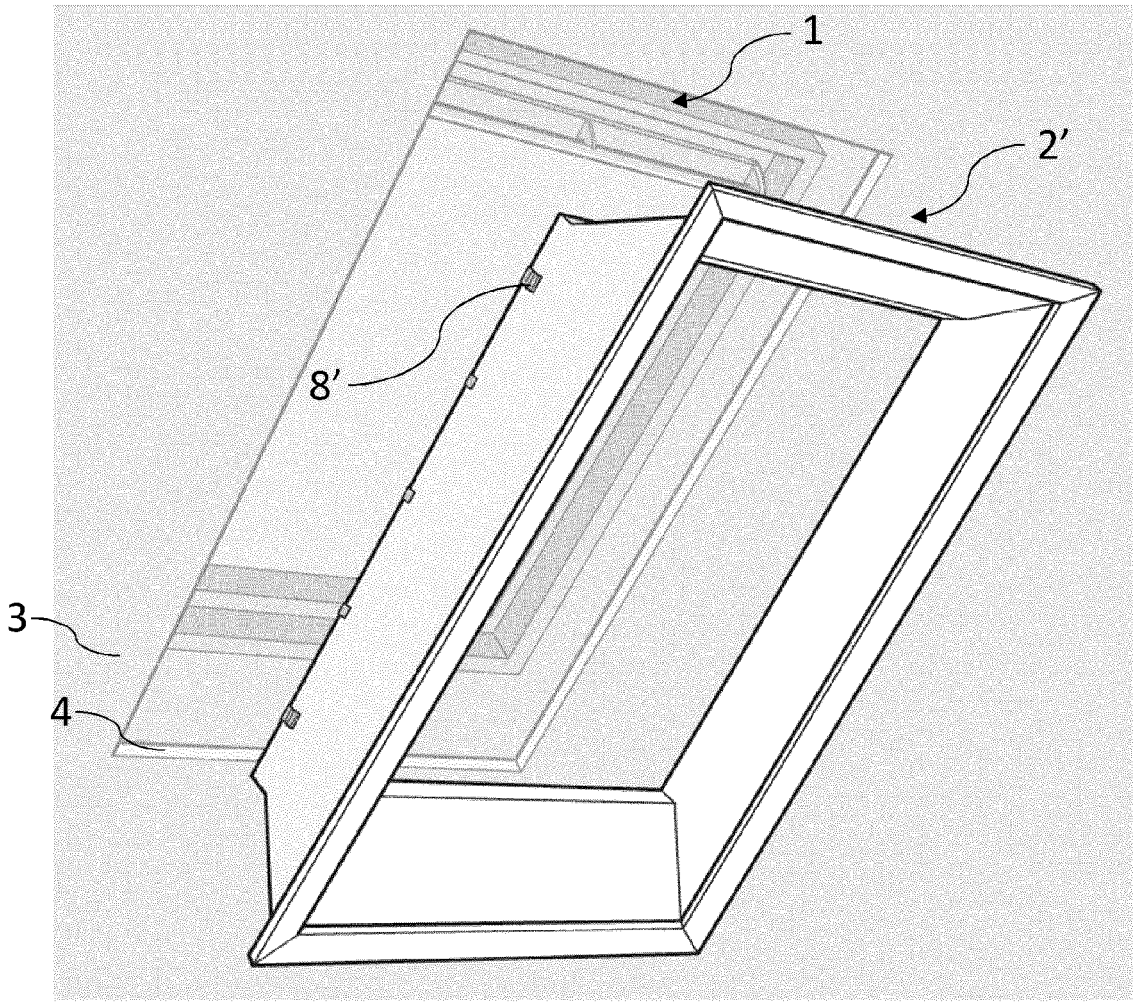

Fig. 1 (PRIOR ART)

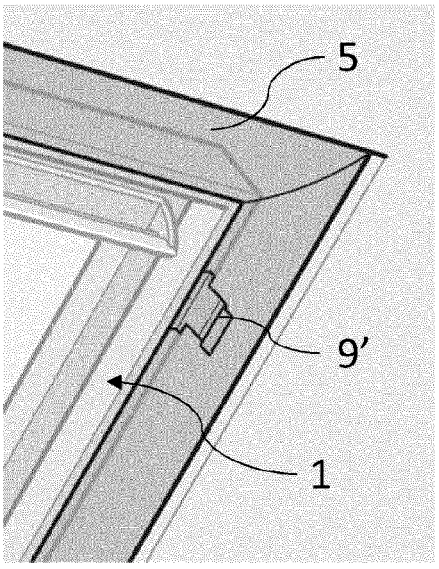

Fig. 2 (PRIOR ART)

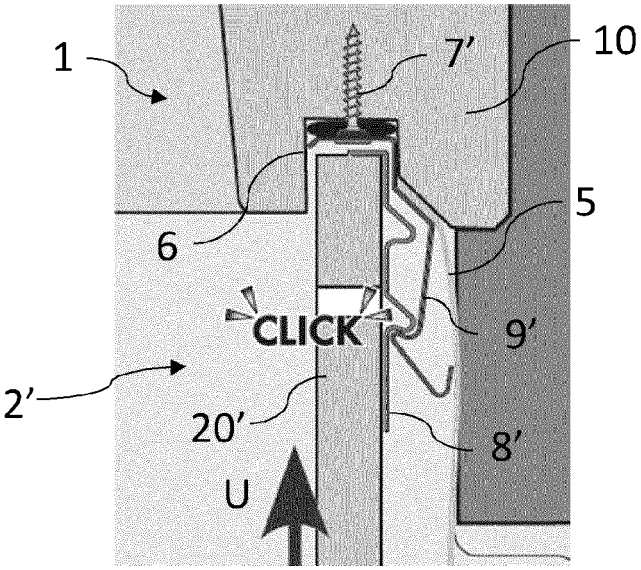

Fig. 3 (PRIOR ART)

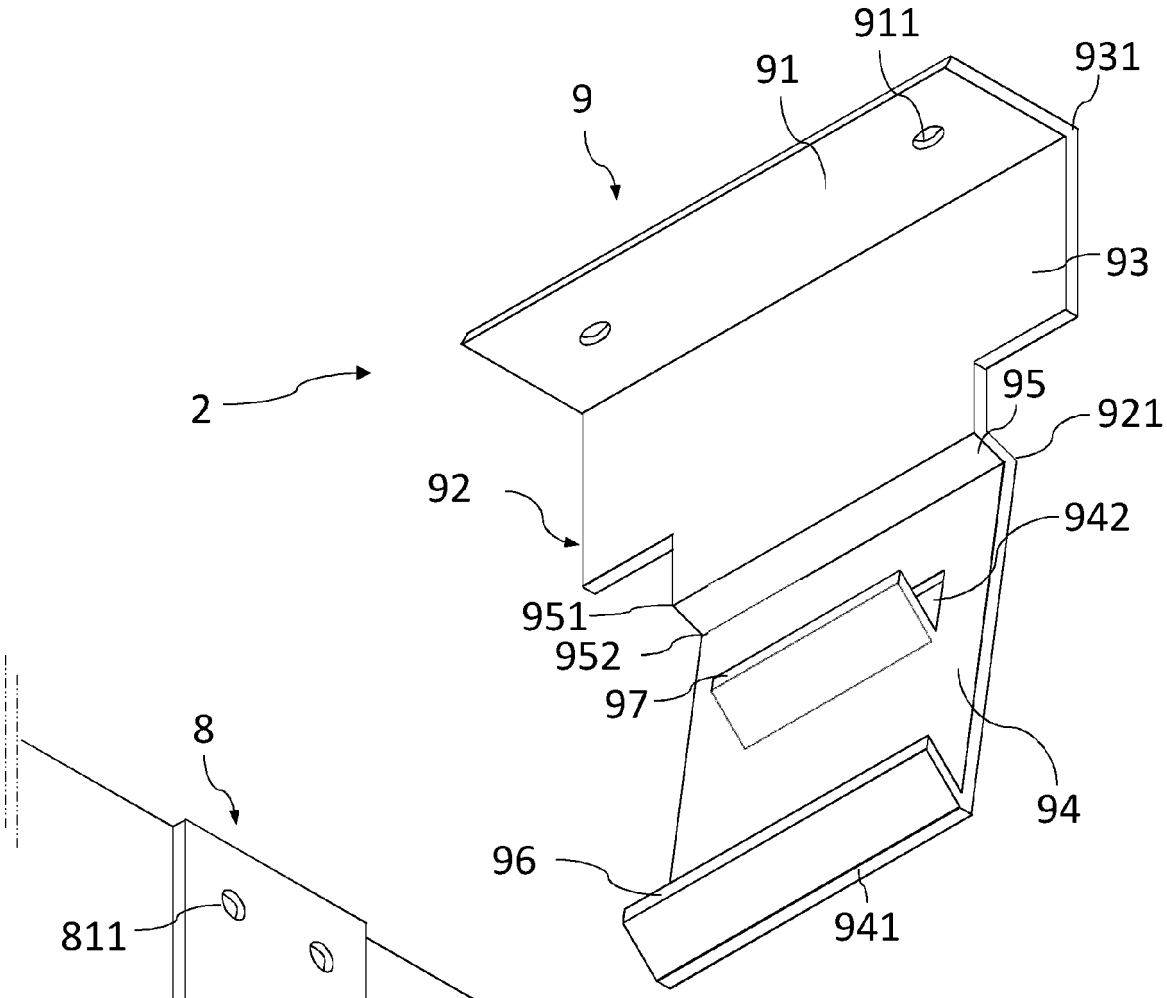
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Fig. 4

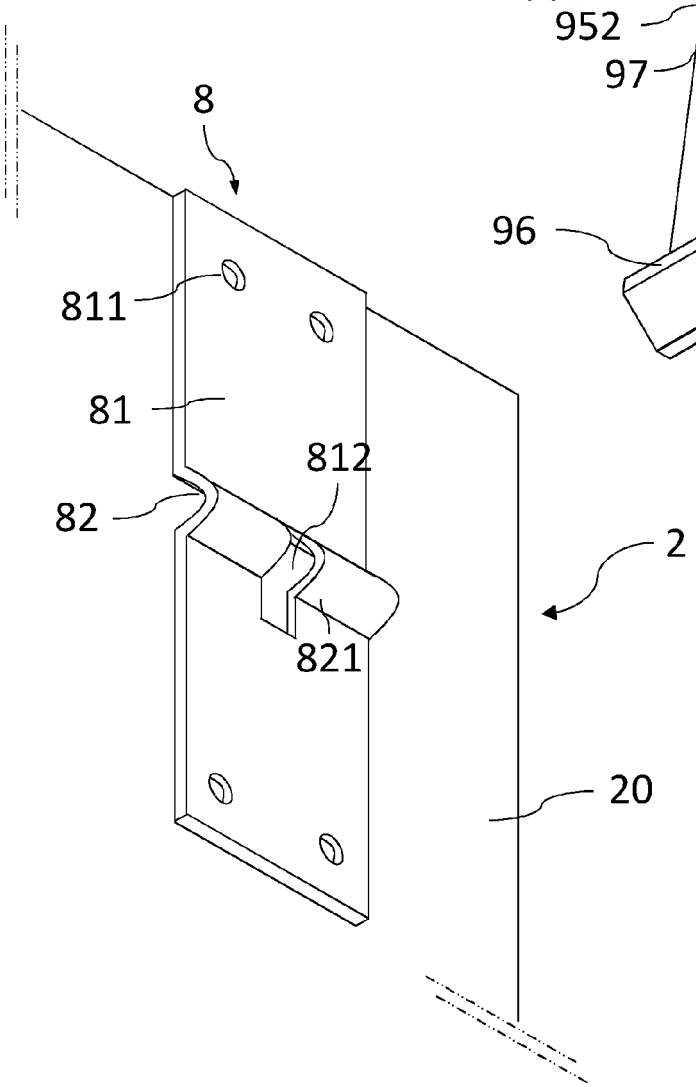
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Fig. 5

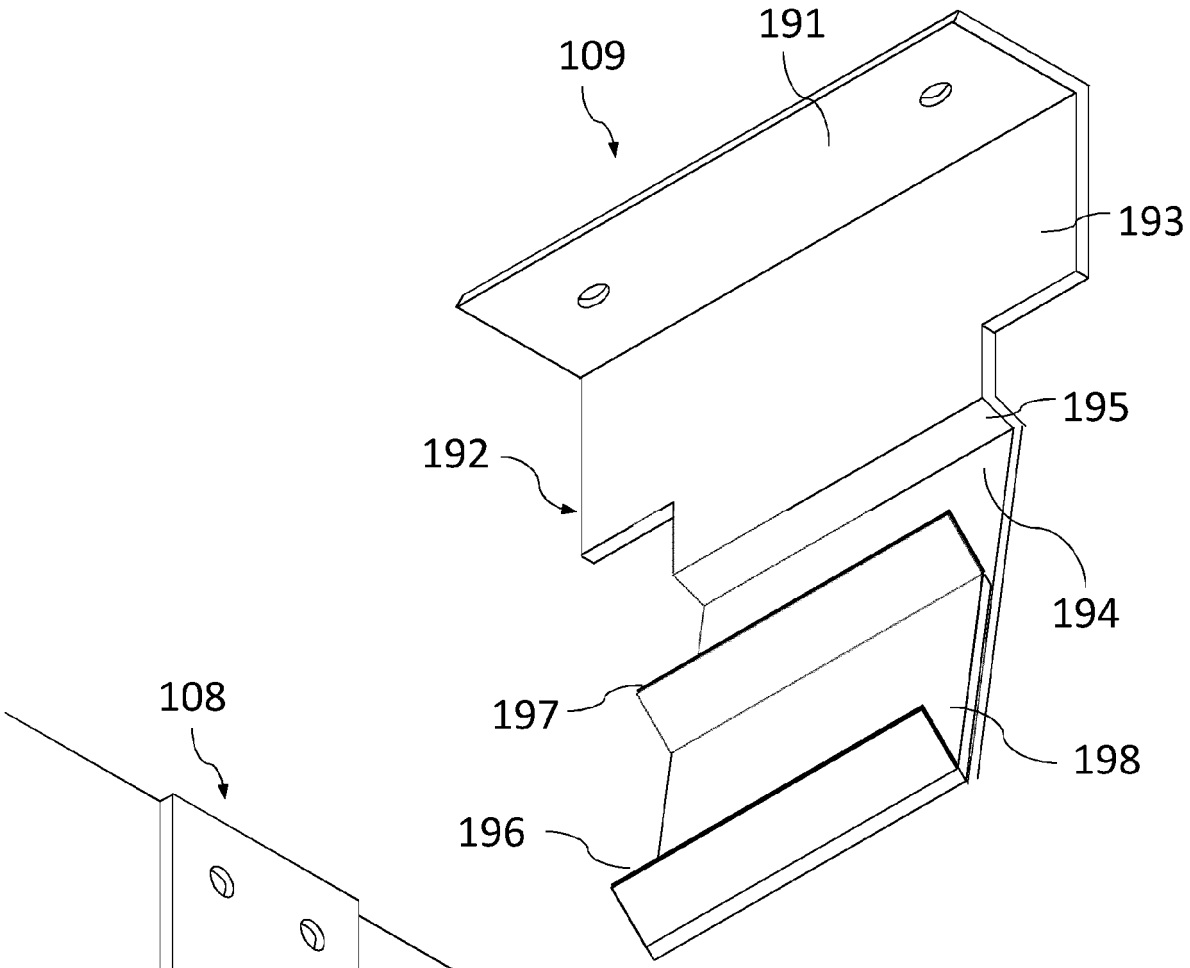

Fig. 6

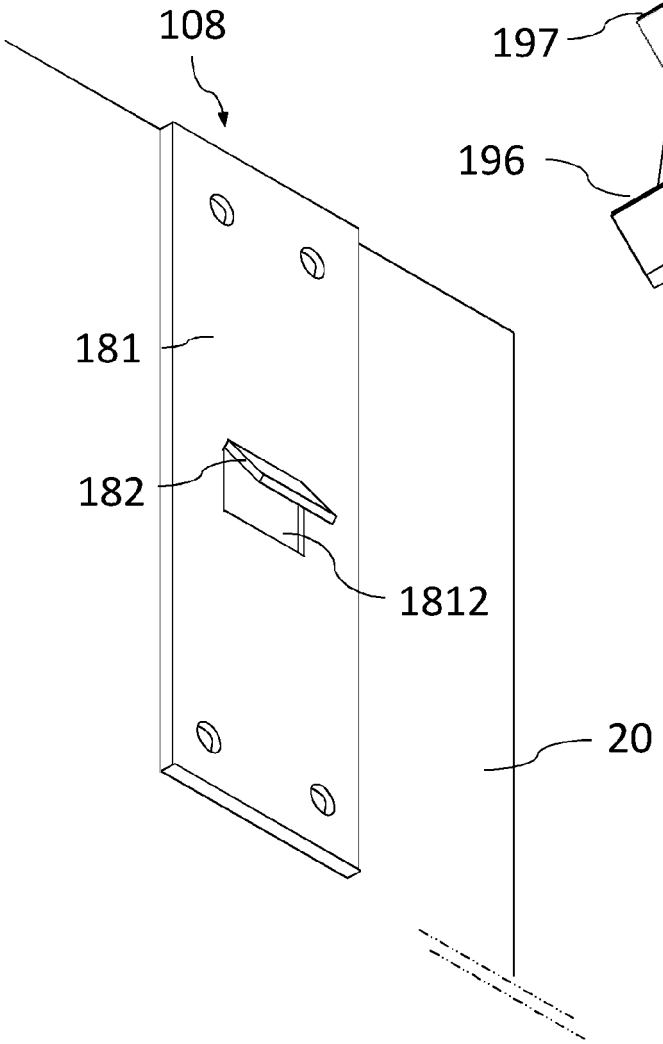

Fig. 7

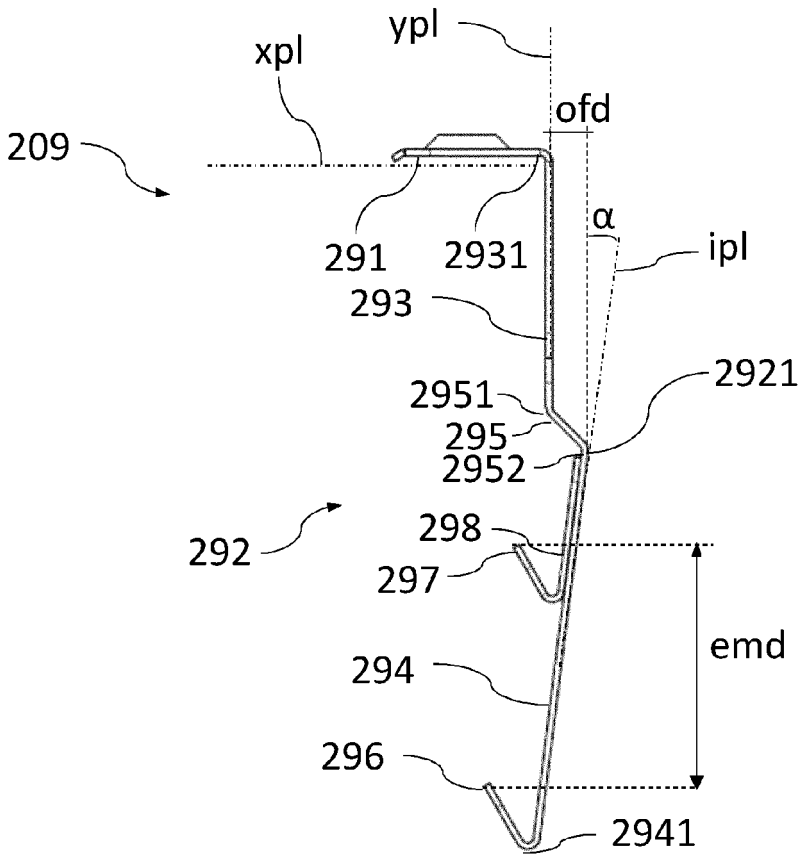
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Fig. 8

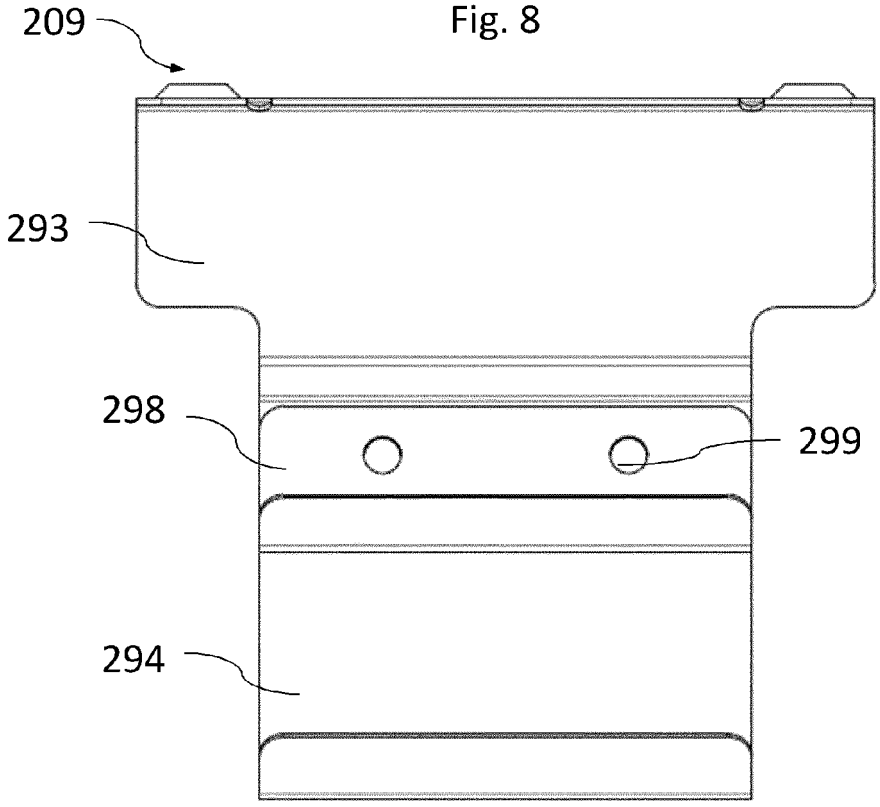
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Fig. 9

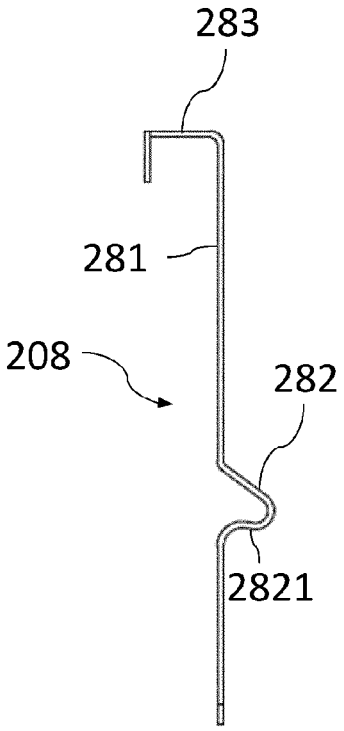

Fig. 10

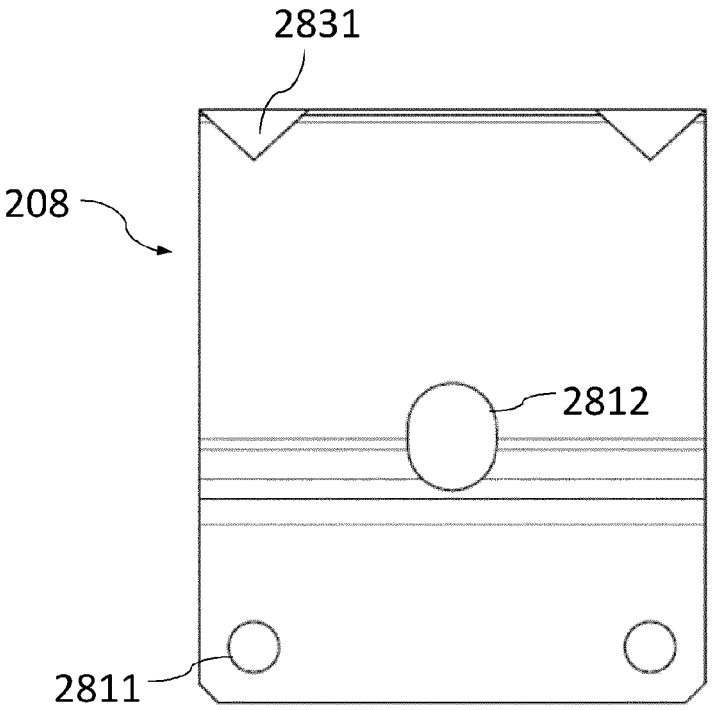

Fig. 11

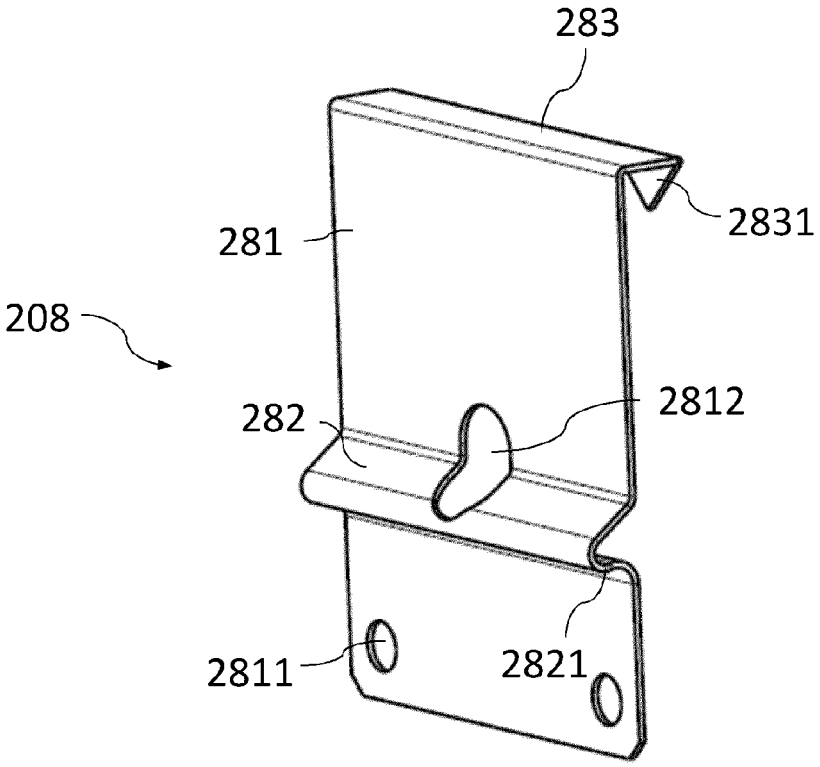

Fig. 12

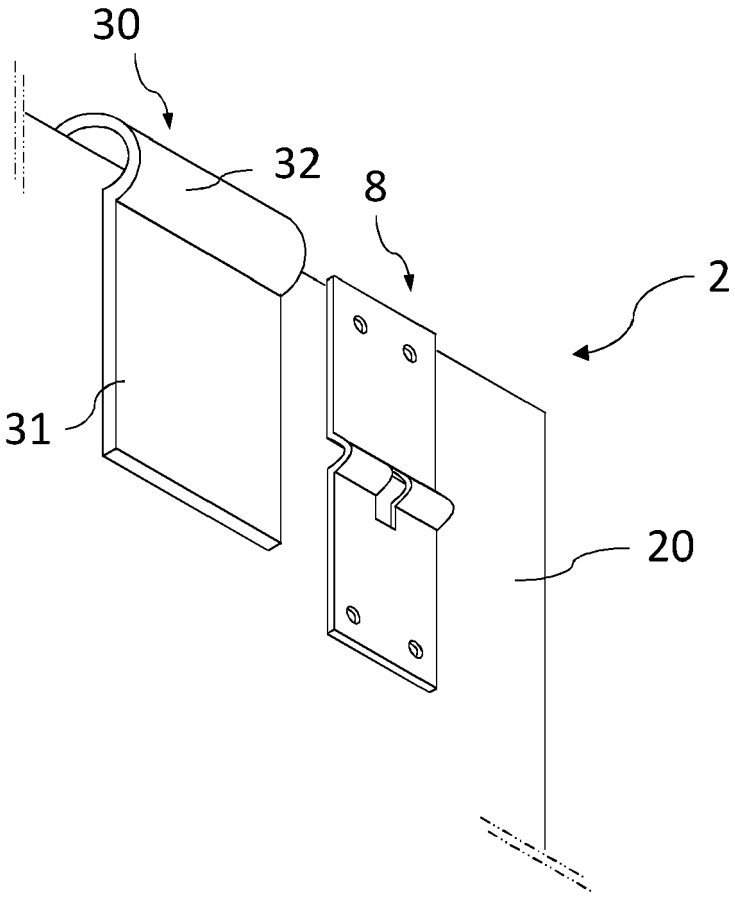

Fig. 13

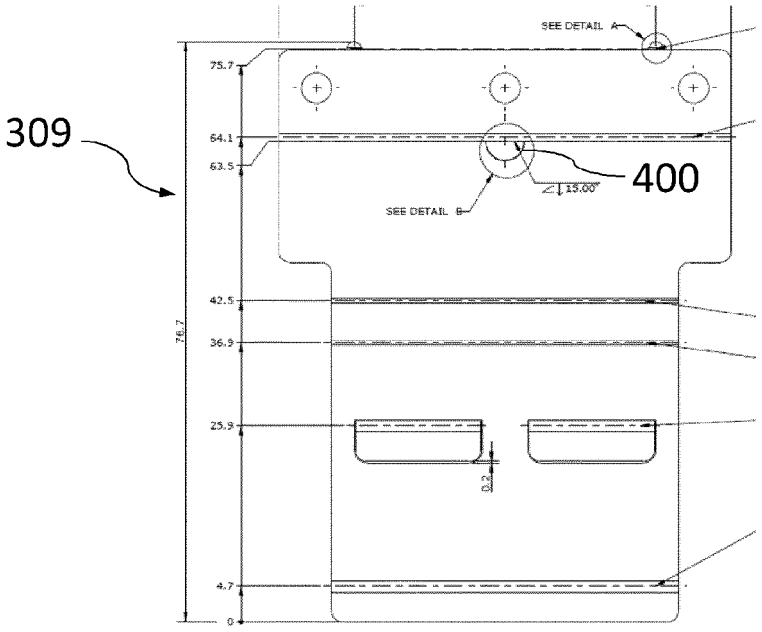

Fig. 14

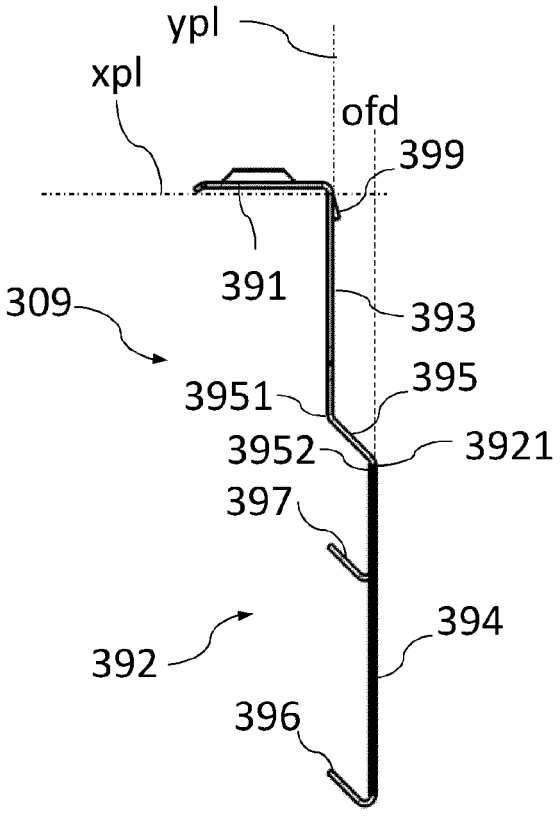

Fig. 15

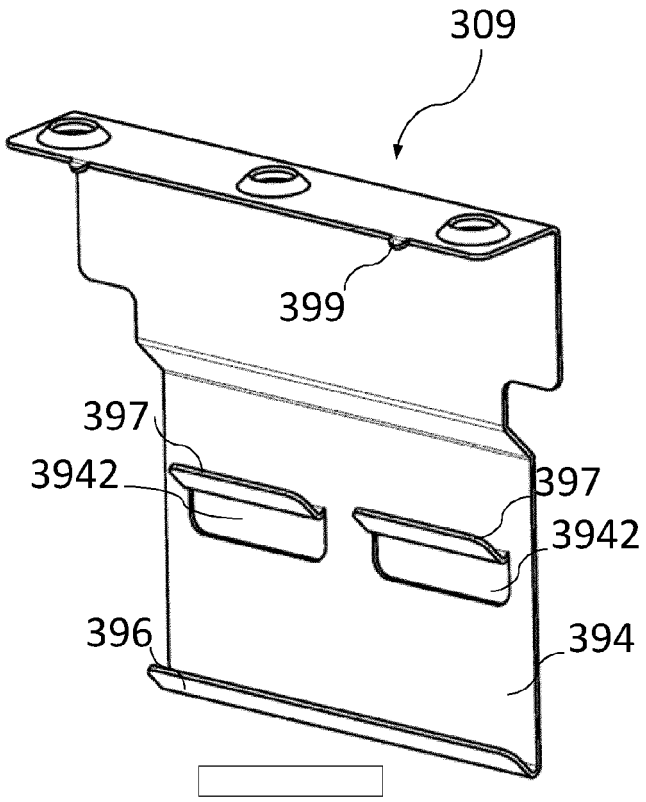

Fig. 16

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EUROPEAN SEARCH REPORT

Application Number
EP 20 19 5721

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	WO 02/20914 A1 (VKR HOLDING AS [DK]; SCHLEIN CARSTEN [DK]) 14 March 2002 (2002-03-14) * figures 1,2,5-8, 10 * * page 11, line 6 - page 12, line 9 * * page 12, lines 20-34 * * page 13, lines 21-24 *	1,9-12, 15,17-20	INV. E06B1/04 E04D13/03 E06B1/34
A	US 5 544 455 A (DEBLOCK DAVID A [US]) 13 August 1996 (1996-08-13) * figures *	1-20	
A,D	EP 2 700 780 B1 (VKR HOLDING AS [DK]) 12 October 2016 (2016-10-12) * figures *	1-20	

TECHNICAL FIELDS SEARCHED (IPC)

E06B
E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 November 2020	Tran, Kim Lien

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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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

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 19 5721

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17-11-2020

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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