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(71) Applicant: **Corradi S.r.l.**
40013 Castel Maggiore (BO) (IT)

(72) Inventor: **REBONATO, Armando**
40068 San Lazzaro (IT)

(74) Representative: **Winger**
Mouterij 16 bus 101
3190 Boortmeerbeek (BE)

(54) **TERRACE CANOPY**

(57) A terrace canopy is provided, comprising a frame including a first and second beams. The frame forms a plane being substantially horizontal with respect to the ground when the terrace canopy is installed. Each beam of the frame comprises a gutter with a collecting wall for collecting rainwater, including a depression for reducing dirt buildup. The beam and gutter form one single beam profile piece, so the gutter is an integral part of the beam. The first and second beam, in particular each beam of the frame, have the same profile.

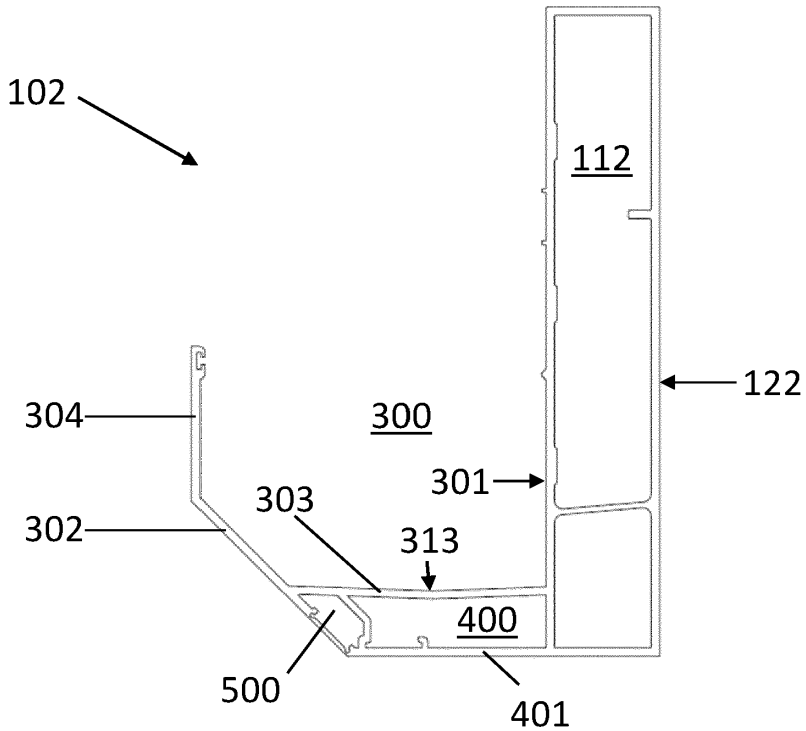

FIG 3

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Description

Field of the invention

[0001] The invention relates to the field of terrace canopies. More specifically it relates to terrace canopies with operable roofs with improved drainage.

Background of the invention

[0002] Terrace canopies with operable roofs include mechanisms that allow opening and closing the roof for allowing or blocking the entrance of sunlight. These mechanisms usually require a gap between different movable parts of the roof and/or between a movable part and the frame holding it. Water from rain, snow, etc. may leak inside the area protected by the canopy, even if the roof is closed. The installation of gutters in the frame is a cumbersome process and requires further installation of drainage. However, the canopies require a compact design and easy assembly.

[0003] These additional elements usually require maintenance, since they are prone to accumulation of debris and clogging. Moreover, they require a proper alignment and sealing, otherwise they also may leak.

Summary of the invention

[0004] It is an object of embodiments of the present invention to provide a resilient terrace canopy suitable for controllable roofs, with an easy manufacturing and assembly procedure, effective drainage, and protection against leaks.

[0005] In a first aspect, the present invention provides a terrace canopy comprising a frame including a first and second beams. The frame forms a plane being substantially horizontal with respect to the ground when the terrace canopy is installed. The beams can be attached to each other using for example a corner element, e.g. an angled plate or bracket or the like, forming a corner. The corner element may also be attached to the support structure holding the frame. In some embodiments, the terrace canopy may include at least one support pillar for holding the frame, which extends vertically from the ground and supports the frame. A corner element can be secured to the pillar and to each of the two beams when installed, combining attachment of the beams to each other and to the pillar.

[0006] Each beam of the frame comprises a gutter with a collecting wall for collecting rainwater, wherein the beam and gutter form one single beam profile piece, so the gutter is an integral part of the beam. Thus, the gutter cannot be separated from the rest of the beam without cutting or breaking the beam. The first and second beam, in particular each beam of the frame, have the same profile. This means that the beams are all manufactured equal to each other. The cross-section perpendicular to the longitudinal direction of the beam is the same for each beam before installation. This simplifies manufacturing and improves assembly tolerances. The beams are attached so that their gutters connect to each other, so the collected water can be directed to an opening for drainage.

[0007] Further, the gutter comprises a chamber defined by an upper wall, which is the same as the collecting wall of the gutter. The chamber is also defined by its lower wall separating the chamber from the exterior of the beam, facing the underside of the canopy when installed. The chamber allows fixing accessories to the beam if needed, e.g. by means of screws or the like, without piercing through the collecting wall.

[0008] It is an advantage of embodiments of the present invention that attachments can be provided by drilling on the external side of the gutter with no risk of water damage on the attachment, since the chamber provides spacing so that the attachment does not reach the collector side of the gutter. It is an advantage of embodiments of the present invention that the gutter can be divided in an upper portion for collecting water and a bottom chamber for allowing drilling. It is a further advantage that the resistance to e.g. bending or torsion of the beam is increased thanks to the chamber. It is an advantage that the area under the terrace canopy has good protection against rain and leak, without reducing the amount of light, e.g. sunlight, that can reach the area through the roof when the roof is open. It is an advantage that beams made as a single piece are structurally advantageous. It is an advantage that the construction is simple since only one type of beam is required. It is a further advantage that all beams can easily have their gutters connected, allowing evacuation via one single drain.

[0009] In some embodiments, the profile of the collecting wall of the gutter comprises a depression for reducing dirt buildup. It is an advantage of embodiments of the present invention that stagnation of rainwater collected in the gutter and clogging is reduced or prevented, so drainage is facilitated.

[0010] In some embodiments including a support pillar, the support pillar comprises an internal drain for the evacuation of the water from the gutters of the beams.

[0011] It is an advantage of embodiments of the present invention that the support pillar can also behave as a drain, so no outside spout is required.

[0012] In some embodiments, the beam comprises a guide for installing an illumination system, to illuminate the area underneath the canopy.

[0013] It is an advantage of embodiments of the present invention that the gutter of the drainage system can double as holder of the illumination system for illuminating the roofed space. It is an additional advantage that the illumination system can be waterproof. In particular embodiments, the guide is provided adjacent to the chamber. It is an advantage of embodiments of the present invention that the illumination system can be installed easily. It is a further advantage that the illumination can be

provided on the angled wall, and on the bottom zone of the beam, thus direction light to the central area covered by the terrace canopy, and reducing shading from the external wall of the beam, thus optimizing illumination.

[0014] In some embodiments, the gutter further comprises a wall extending upwards from the collecting wall when installed. The wall is an angled wall which forms an angle with the horizontal between 30° and 55° when installed. It is an advantage of embodiments that water can be collected without spreading thin on a large surface, thus reducing or avoiding dirt buildup. In particular embodiments, the gutter further comprises an extension being vertical when installed, extending from an end of the angled wall, being the end away from the collecting wall. It is an advantage of embodiments of the present invention that splashing is reduced or prevented.

[0015] In some embodiments, the beams to be joined in a corner are cut symmetrically (e.g. at a 45-degree angle) for symmetric joining of pairs of beams at a corner. It is an advantage that beams can be aligned accurately to form corners (e.g. 90- degree corners) by joining them at the angled cutting line.

[0016] In some embodiments, the chamber comprises a receiving means for sliding and aligning to the beam an alignment piece for linking two beams at a 90-degree angle. It is an advantage of embodiments of the present invention that good alignment can be provided.

[0017] In some embodiments, the terrace canopy further comprises an alignment piece wherein the alignment piece comprises a movable frictional element for fixing the position of the beam. It is an advantage that reliable fixation at an angle can be provided, for example by rotating circular blades or the like to fix its position.

[0018] In some embodiments, the terrace canopy further comprises a corner gutter block for receiving the end of two gutters in an angle. It is an advantage of embodiments of the present invention that alignment and reliable fixation can be provided with no need to pierce the gutter. It is a further advantage that drainage is improved since the water is reliable directed to the drain. In particular embodiments, the gutter block further comprises a drain opening for receiving and draining away rainwater from both gutters through the support pillar. It is an advantage of embodiments of the present invention that drainage can be provided while protecting other parts, such as the alignment piece at the chamber, from water damage.

[0019] In some embodiments, the beams comprise a cut at an external side of the corner formed by the two beams, wherein the external corner is the corner facing away the terrace canopy centre. It is an advantage of embodiments of the present invention that electric components can be accessed at the corners of the frame.

[0020] In some embodiments, the terrace canopy further comprises an operable roof comprising movable elements attached to the frame.

[0021] It is an advantage of embodiments of the present invention that a louvered or retractable terrace cover with good protection against rain is obtained. It is an additional advantage that any rainwater leaking between the frame and the movable elements is collected by the gutter of the beams.

[0022] In a further aspect, the present invention provides a kit of parts for assembling a terrace canopy, comprising a plurality of beams comprising an integrated gutter, the gutter being part of the beam as a single beam profile piece. The beams have all the same profile. The gutter comprises a collecting wall for collecting water, a wall facing the inner part of the terrace canopy when installed, and a closed chamber between the collecting wall and an exterior lower wall. The kit also comprises a corner element that can be attached to two adjacent beams forming corner.

[0023] In some embodiments the kit may further include at least one pillar for supporting the corner element.

[0024] In some embodiments, the wall of the gutter extending from the collecting wall is an angled wall which forms an angle with the horizontal between 30° and 55°.

[0025] Particular and preferred aspects of the invention are set out in the accompanying independent and dependent claims. Features from the dependent claims may be combined with features of the independent claims and with features of other dependent claims as appropriate and not merely as explicitly set out in the claims.

[0026] These and other aspects of the invention will be apparent from and elucidated with reference to the embodiment(s) described hereinafter.

Brief description of the drawings

[0027]

FIG 1 illustrates a terrace canopy.

FIG 2 illustrates a pillar with a corner element for a terrace canopy in accordance with some embodiments of the present invention.

FIG 3 and FIG 4 illustrate a profile or cross section, and a zoomed detail, of a beam for a terrace canopy in accordance with embodiments of the present invention.

FIG 5 illustrates a profile of an alternative beam for a terrace canopy in accordance with embodiments of the present invention.

FIG 6 illustrates a corner formed by two beams for a terrace canopy in accordance with embodiments of the present invention, showing their mechanical link.

FIG 7, FIG 8 and FIG 9 show three different embodiments of an alignment piece for a terrace canopy in accordance with embodiments of the present invention.

FIG 10 illustrates the profile of FIG 5 including two alignment pieces.

FIG 11 illustrates a top view of a corner formed by two beams for a terrace canopy in accordance with embodiments of the present invention, linked by two

alignment pieces.

FIG 12 illustrates the front surfaces of two beams, on the side opposite to the gutter, where an opening is provided to have access to the inside of the structural portion of the beam.

FIG 13 shows a similar view as FIG 6, including a gutter block to protect the alignment piece and to improve drainage from the gutter.

FIG 14 and FIG 15 illustrate respectively a profile of an alternative beam in accordance with embodiments of the present invention, and a detail of the collecting wall thereof.

[0028] The drawings are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated and not drawn on scale for illustrative purposes.

[0029] Any reference signs in the claims shall not be construed as limiting the scope.

[0030] In the different drawings, the same reference signs refer to the same or analogous elements.

Detailed description of illustrative embodiments

[0031] The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The dimensions and the relative dimensions do not correspond to actual reductions to practice of the invention.

[0032] Furthermore, the terms first, second and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequence, either temporally, spatially, in ranking or in any other manner. It is to be understood that the terms so used are interchangeable under appropriate circumstances and that the embodiments of the invention described herein are capable of operation in other sequences than described or illustrated herein.

[0033] Moreover, the terms top, under and the like in the description and the claims are used for descriptive purposes and not necessarily for describing relative positions. It is to be understood that the terms so used are interchangeable under appropriate circumstances and that the embodiments of the invention described herein are capable of operation in other orientations than described or illustrated herein.

[0034] It is to be noticed that the term "comprising", used in the claims, should not be interpreted as being restricted to the means listed thereafter; it does not exclude other elements or steps. It is thus to be interpreted as specifying the presence of the stated features, integers, steps or components as referred to, but does not preclude the presence or addition of one or more other features, integers, steps or components, or groups thereof. The term "comprising" therefore covers the situation where only the stated features are present and the situation where these features and one or more other features are present. Thus, the scope of the expression "a device comprising means A and B" should not be interpreted as being limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B.

[0035] Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment, but may. Furthermore, the particular features, structures or characteristics may be combined in any suitable manner, as would be apparent to one of ordinary skill in the art from this disclosure, in one or more embodiments.

[0036] Similarly it should be appreciated that in the description of exemplary embodiments of the invention, various features of the invention are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of one or more of the various inventive aspects. This method of disclosure, however, is not to be interpreted as reflecting an intention that the claimed invention requires more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed embodiment. Thus, the claims following the detailed description are hereby expressly incorporated into this detailed description, with each claim standing on its own as a separate embodiment of this invention.

[0037] Furthermore, while some embodiments described herein include some, but not other features included in other embodiments, combinations of features of different embodiments are meant to be within the scope of the invention, and form different embodiments, as would be understood by those in the art. For example, in the following claims, any of the claimed embodiments can be used in any combination.

[0038] In the description provided herein, numerous specific details are set forth. However, it is understood that embodiments of the invention may be practiced without these specific details. In other instances, well-known methods, structures and techniques have not been shown in detail in order not to obscure an understanding of this description.

[0039] Where in embodiments of the present invention reference is made to "vertical" and "horizontal", reference is made to relative positions with respect to the ground when the device is assembled. Thus, vertical and horizontal are directions which are perpendicular to each other, wherein vertical is the direction substantially perpendicular to the ground, and horizontal is the direction substantially parallel to the ground.

[0040] Where in embodiments of the present invention

reference is made to "terrace canopy", reference is made to any framed covering for an exterior for protection against exposure weather conditions such as rain, sunlight, snow, etc. Terrace canopies are usually arranged to screen off or, on the contrary, to clear an outdoor area. For example, such terrace canopies are often arranged at houses, restaurants, shops, etc. to screen an outdoor terrace or the like from sun rays, precipitation and/or wind or, alternatively, to temporarily let in sun rays. These terrace canopies can, for example, be implemented in the form of canopies, pergolas, verandas, carports, a pavilion, etc. A terrace canopy may be attached to a wall of a building, with or without additional support pillars, or it may stand on its own with pillars. An operable roof held by one or more walls can also be considered a canopy, and since the roof can be opened, it can also be considered a 'terrace canopy', even if walled.

[0041] Although in the description reference is made to 'water', it is noted that the application can be used to precipitation fluids in general, including rainwater, melting hail, melting snow, slurry or mud from rain dust and the like.

[0042] FIG 1 shows a perspective view of such a standalone terrace canopy 100, comprising a frame 101 formed by beams 102. The beams may be made of a suitable light weight metal, such as for example aluminium. However, alternative embodiments are possible, in which these structural profiles comprises and/or consists of one or more of the following: metal; aluminium; plastic; or any other suitable light material for exterior exposure to elements and suitable for load carrying, such as for example roof elements, and/or external load resistance, such as for example against load from snow, rain, wind, ... The frame is held by at least one column or pillar 103. The frame supports a roofing structure 104, in particular an operable roof.

[0043] Where in embodiments of the present invention reference is made to "operable roof" reference is made to a roof comprising one or more roof segments such as lamellas, canvas, louvres or the like, which can be opened or closed for allowing or blocking light and/or rain through the roof. In general, the roof segment or segments are held by at least some profiles of the frame of the terrace canopy. For example, one or more slidable beams can hold a canvas (or several canvas segments). For example, a single rollable canvas may be guided by the frame, in particular by two opposite beams. For example, tiltable louvers may be held by the frame.

[0044] Water tightness is usually difficult to achieve in such operable roofs. First, some roof segments 105 may be flexible, e.g. in the case of a canvas roof. In such cases, rainwater or even snow may load the canvas and leak on the sides, at the junction between the segment and the frame. Some roof segments are rigid (such as louvers) and the junction between the segment and the frame can be a sealing junction, providing watertightness to at least some degree. At the time of mounting the patio cover, a solid sealing could be realized, especially if the pieces are carefully manufactured, custom made and fitted together. Even in these cases, under the influence of aging, changing weather conditions, temperature variations, load ... leaks usually appear. Typically, however, tolerances between the pieces of the segments and the frame need to be considered, especially in operable roofs where the roof segment can move (turn, slide etc) relative to the frame. Thus, watertight sealing between the frame and the segments is not an essential aim and often not possible even in the case of rigid roof segments, so there is usually a gap between the frame and the roof segment or segments, regardless of the segment being flexible or rigid.

[0045] Because of this gap between the frame and the roof segment(s), a drainage system is required to collect rainwater from the roofing when closed. The drainage system includes a gutter along the frame for collecting rainwater leaking through the gap.

[0046] In a first aspect, the present invention provides a terrace canopy including a frame formed by beams. Although the present invention is explained with reference to a standalone canopy, the skilled person understands that this is applicable to other canopies, e.g. canopies supported by an exterior wall or integrated in a roof. The beams are horizontal when assembled. The optional support pillar raises vertically from the ground when assembled.

[0047] For example, the beams and the pillar may be linked indirectly, by a corner element which includes attachment means for attaching to the pillar and to each beam. FIG 2 shows an exemplary corner element 200 formed by a sheet 201 of material (e.g. metal) bent and shaped so it fits a pillar 103, and includes one or more holes (not shown, hidden by the pillar 103) to introduce a screw or bolt or the like and fix it to the pillar 103. In the case of the figure, the corner element 200 holds to two walls 113 of a pillar (e.g. inner walls facing the inside of the canopy) with polygonal section (e.g. square pillar 103). The corner element 200 may include another two areas 202 for attachment to a first and second beams 102 which form a corner of the frame 101. Each area 202 includes several attachments means 203 as before, e.g. holes, to fix each beams 102 to the corner element 200. Thus, the beams 102 are not directly supported by the pillar 103, but by the corner element 200 introduced in the pillar 103.

[0048] The present invention provides a beam with an integral gutter for draining away water. The gutter may have two opposite walls. The first wall is connected to the frame. The second wall extends so as prevent splashing and retain the water from the gap. Then the water can be sent to an opening, usually on a corner, for drainage. The drainage can be done through e.g. a pillar. Although the figures show a terrace canopy with at least one pillar (in particular, a standalone canopy), the present invention is not limited to a terrace canopy comprising a frame supported by pillars. The frame may be held by one or more support structures such as building walls, e.g. as a hanging terrace canopy, or integrated in a larger roof. This can

be made by known means. The gutters of the beams of the frame are in any case connected to each other and to at least one opening for draining away the rainwater, and the evacuation can be done with a traditional system, e.g. a regular roof drainage, through the outer side wall of the gutter, a spout inside or attached to a wall, etc.

[0049] It is noted that the support beam and the gutter form a single piece, for example are formed as a single piece. The gutter does not need to be linked to the beam, since they are integral. The single-piece beams have a side facing the inside of the terrace canopy which include the gutter, and an opposite side facing the open exterior of the terrace canopy. Since the beams extend substantially the whole length of each side of the frame, providing a beam and gutter as a single piece is counterintuitive because of the difficulty to produce them. Beams need to follow structural requirements for canopies. Canopies may be up to 5 m wide or even more, and up to 7 m long or even more, however the deviation should be small. They need to be strong enough to hold the operable roof. They also need to withstand heavy loads, for example due to snow, even up to 200 kg/m^2. So, in order to obtain these characteristics, usually several pieces are formed, e.g. structural and load-bearing beams with an attached gutter. It has been surprisingly found that, by providing the beam and gutter as a single piece, the load requirements are fulfilled with slimmer beams and materials, since there is no joined pieces or articulate parts that may suffer high stress and disjoin. Thus, the frame itself can be made lighter without compromising the strength. As for the deviation and tolerance, processes such as extrusion may allow guttered beam production with a deviation of 1 mm, or less, per 4 m. The frame may be part of a roof or attached to a support structure, e.g. a building wall, by known means. The frame may also be supported by pillars as shown in FIG 1 and FIG 2.

[0050] FIG 3 shows a profile of a beam 102 integrating a gutter 300. The same profile may be used in two adjacent beams 102 in a corner of the frame 101 in a canopy such as the one in FIG 1. This means that the beams may be the same type of beam, being only different in the length and in the presence of mechanical elements, which may be present only in some of the beams for operating the operable roof 104.

[0051] There is no articulate or attachment between the structural part 112 of the beam 102 and the gutter 300, since they form one single piece. The front surface 122 of the beam 102 may face the exterior, away from the roofing element, while the gutter 300 faces the inside of the canopy. When the operable roof is closed, water (from rain, snow, etc) may leak at the sides of the roof, between the roof 104 and the frame 101 holding it. The gutter 300 facing the inside of the canopy 100 can collect this water.

[0052] Since the gutter 300 is placed between the frame and the roofing segments, when the roofing segments are open, the gutter may reduce the aperture and block part of the light entering through the open roof, in particular on the area beneath the frame. The embodiment of the figure provides a gutter including a first wall 301 provided by the structural part 112 and an opposite second wall 302, wherein the second wall forms an angle with the horizontal between 35° and 55°, for example around 45°, when the beam is installed. The amount of light blocked by the gutter is reduced, allowing a better natural illumination within the terrace canopy. Hence, the gutter 300 has an external side which allows good illumination of the terrace canopy when light is allowed. In this particular embodiment, the first wall 301 forms a vertical wall of the gutter. The angled wall 302 is connected to the first wall 301 through a bottom wall, or collecting wall 303, which receives and collects the water. The volume of water does not spread in a large surface, so a larger flow of water can be obtained, reducing or avoiding dirt buildup. Thus, rainwater is reliably collected and redirected to drainage through the gutter 300.

[0053] A vertical extension wall 304 may be attached to the angled wall 302 opposite to the collecting wall 303 of the gutter. The vertical extension 312 prevents splashing.

[0054] However, the present invention is not limited to a gutter with a 45 degree-angled outside wall 302, and the outside wall may be simply vertical, giving the gutter an external shape of a square tube.

[0055] In some embodiments, the collecting wall 303 of the gutter may be shaped so that it has a depression 313, e.g. an indentation, a crease or a groove. Particles such as dust and sand may be present in the gutter 300, for example after being deposited on the roof and washed away into the gutter. If the collecting wall is flat, clumps may form from the water, dust and sand, and clog the gutter and/or drain. With the collecting wall including an depression 313, reliable drainage is provided. In the particular example of the figure, the collecting wall 303 forms an open angle, or V-shape, with the corner being a groove or crease. In embodiments, the gutter has an angled wall 302 combined with the depression 313, further improving the water drainage.

[0056] At least a further chamber 400 may be provided on the gutter, in particular on one of the walls of the gutter. The chamber 400 is defined by a portion of said wall (in the case of FIG 3, a portion of the bottom) and at least a further wall being an external wall 401, thus creating a space sealed from water that may be present in the gutter 300. The chamber basically provides a closed gutter within a gutter for water. This chamber may extend along at least part of the collecting wall 303, the present invention not being limited to that configuration. For example, more than one chamber may be provided, for example two chambers separated by a wall, improving reinforcement of the gutter.

[0057] As shown in FIG 3, the at least one chamber is preferably provided underneath the gutter, between the collecting wall 303 of the gutter and the external wall 401 facing the zone covered by the canopy.

[0058] When an attachment means (nail, screw, etc.) is provided on the external wall 401, the attachment means

enters the chamber 400 and does not pierce the collecting wall 303, so rainwater does not reach the attachment means. The walls 303, 401 of the chamber may act as an additional structural element that strengthens the beam 102, e.g. against bending.

[0059] In some embodiments, the terrace canopy 100 includes means to install an illumination system along the beams 102, or it may include the illumination system. This may comprise LEDs, for example a LED strip. The illumination system may be provided on an attachment region along the outside part of the gutter. For example, the attachment region may comprise a guide next to the chamber 400. In some embodiments, the attachment region may comprise an additional chamber 500 adjacent to the closed chamber 400.

[0060] FIG 4 shows in detail the lower part of gutter of FIG 3, including the closed chamber 400 explained earlier, and the second chamber 500. A wall 501 separates both chambers 400, 500. The second chamber 500 may be openable, by removal of a tab 502, for example by peeling a removable tab 502. The chamber 500 may include a guide for the illumination system. The chamber or illumination system may also include a transparent screen or the like, so the chamber 500 does not need to remain open.

[0061] Since the illumination guide formed by the openable chamber 500 is situated underneath the collecting wall 303 of the gutter, the light travels downwards from the edge of the lower wall, reducing shading and reducing the amount of lost illumination projected towards the roof. The illumination system is nested within the drainage system (at the gutter), so a highly compact illumination system can be obtained. No exposed cables are required. The guide for the illumination system can be placed so that the light is projected towards the centre of the canopy. This can be easily achievable if the second chamber 500 opens to the angled wall, if such wall is present. Thus, the angled wall 302 has the additional role of directing the light towards the centre of the terrace canopy. An illuminated space can be created at the centre of the terrace canopy even if there is no external or natural light. This is achieved without the use of additional lamps or light projectors.

[0062] Optionally, the openable chamber 500 may include the illumination system and optionally a transparent or translucid screen separating the source of light from the exterior.

[0063] As mentioned earlier, the gutter does not need to include an angled wall. FIG 5 shows a detail of the gutter 500 in the profile of an alternative beam in accordance with embodiments of the present invention. It comprises a chamber 610 below the gutter 600, between a water collecting wall 603 and an external wall 601. Next to the chamber, a guide or separate chamber 510 for a lighting system can be provided, as shown in previous embodiments.

[0064] The water collecting wall 603 has a depression 613, as a V-shape or a crease for improving drainage as explained. The collecting wall 603 includes a first surface 614 and a second surface 615, the first and/or second surface being inclined with respect to the horizontal (the ground level) so as to facilitate water flow, preferably both surfaces being inclined. The surfaces meet at the depression 613. The inclination of the first and/or second surfaces is 2 degrees or more, up to 45 degrees.

[0065] The gutter 600 also comprises a vertical wall 604 which extends all the way to the external wall 601, or optionally to second chamber 510 for an illumination system. Optionally, the gutter 600 may include a wall 602 forming an angle, e.g. an internal wall 602 forming an angle, e.g. an angle between 35 and 55 degrees, extending upwards from the collecting wall 603, thus improving water collection as explained with reference to FIG 3 and FIG 4. For example the angled wall may join the collecting wall 603 of the gutter 600 with the vertical wall 604. This improves water collection and prevents splashing, without constraining external design of the beam.

[0066] FIG 14 shows the cross section of an alternative beam in accordance with embodiments of the present invention. The gutter 620 of the beam includes a collecting wall 631 with multiple inclinations and a depression 633, forming a 'gutter within a gutter' for better collecting and evacuating not only water (e.g. rainwater) but also solid particles and the like, e.g. dust. The depression is limited by two inclined wall portions 632, 634.

[0067] The bottom of the depression 633 is the lowest portion of the gutter. The bottom of the depression has a width W2. The width of the gutter can be defined as the distance W1 between the walls defining the gutter, e.g. the vertical wall 621 of the beam and the vertical wall 624 opposite to the beam, towards the inner side of the pergola. A relationship can be defined between the depression width W2 and the gutter width W1. In some embodiments, the depression width W2 is equal or below to 30%, preferably below 20%, even more preferably below 15% of the gutter width W1. In some embodiments, such as the embodiment shown in FIG 3 ("V" shape depression), the relationship is 0%. For example, with reference back to FIG 5, the wall portions 614, 615 delimit a depression 613 with a width of 0, so the wall portions meet at the angle.

[0068] The efficiency of water and dirt evacuation can be improved by adjusting the width ratio, in particular the amount of water and the speed of evacuation, depending on e.g. usual weather conditions and dust in the zone where the canopy is installed. A further wall 635 redirects water to the depression 633, being water adjacent to one of the wall portions 634 and extending away from the depression, e.g. towards the side wall being a vertical wall 624.

[0069] FIG 15 shows a detail of the bottom of the depression 633 and the adjacent wall portions. In some embodiments the bottom of the depression 633 may comprise a horizontal wall. The two inclined wall portions 632, 634 are delimiting portions which define the depression 633. These delimiting portions have each an inclina-

tion angle α, γ which may be the same or different. The wall portion 635 connected to one of the wall portions 634 extends away from the depression and towards the vertical wall 624. This wall portion 635 may also be inclined, having for example with an angle β. The inclination angles α, β and γ may be 2 degrees or more, up to 45 degrees. An inclination of the wall portions within this range allows efficient water collection and evacuation (and also of the dust and dirt present therein). In the embodiment of FIG 15, β is much smaller than γ, but other possibilities may be available.

[0070] In embodiments of the present invention, the at least two beams joining in a corner have the same beam profile (e.g. include a gutter formed in a single piece). In some embodiments, every side of the canopy's frame uses the same beam profile. This means that every side of the canopy has a gutter. For example all the beams of the roof frame may have the same profile (same cross section when made), for instance the one of FIG 4, or alternatively the one of FIG 5.

[0071] In some embodiments, the beams are linked so that their gutters are connected. The drainage system of the canopy includes a single gutter formed by linking each gutter of the beams forming the frame. Since there is only one gutter surrounding the whole frame, the number of drains can be reduced. For example, a single drain may be provided.

[0072] Beams are usually sized by cutting them perpendicularly to the longitudinal direction of the beam, since it is easy. In some embodiments of the present invention, the beams may be cut so that they fit at the corner symmetrically, or at least the part of the beam that will be used to provide fixation to the adjacent beam is cut to fit with mirror symmetry. In some embodiments, the beams 102, 106 are cut at 45 degrees and joined at the cutting line 10 shown in FIG 6. This allows to easily provide a continuous gutter corner.

[0073] In the embodiment of the figure, the gutters are also adapted so the water can be delivered to a drain. For example, the collecting walls may include an opening 700. The drain may be provided as explained earlier, inside a roof or wall holding the frame of the canopy, or optionally within a pillar 103 at the corner, if one or more pillars are used. Although an outside drain can be used, it is not required, thus obtaining a compact canopy which is easy to install. The water may be removed through a spout 123, as shown in FIG 1.

[0074] In embodiments where all sides of the frame include gutter, e.g. if the beams have the same profile, and the gutters are connected, e.g. if the beams are cut at 45 degrees and joined at the corner, then only one pillar may include such drain. However, more than one pillar may include the drain, e.g. every pillar.

[0075] To avoid leak at the junction of gutters of different beams, they should be kept well aligned and fixed together. FIG 6 also shows an alignment piece 800 attached to both adjacent beams 102, 106 joined at the corner of the frame. The attachment may advantageously simple, e.g. by mechanical attachment (pressure, friction, etc) of receiving means in the beam against the alignment piece 800. For example, returning to FIG 4, the receiving means 402 of the chamber 400 of each beam may include a hook, and the alignment piece may hold to both beams by their respective hook. Although FIG 4 shows a hook as receiving means 402, the present invention is not limited thereto, and the receiving means 402 may be a protruding extension adapted to hold the corner piece (e.g. the plate), or a wall between the collecting wall 303 and the lower wall 401, thus providing the gutter with two closed chambers (not pictured).

[0076] The alignment piece 800 may be a corner plate with two arms, each arm being able to slide into the hook of the chamber in each beam, as shown in FIG 3. This improves alignment of the beams.

[0077] The corner piece may have the shape of an L. The alignment piece may comprise fixing means for fixing the position of the piece and the beam attached to it. For example, the corner piece of FIG 7 includes a fitting means, in this case an edge 801, made to fit into the receiving means 402 (e.g. hook), and a fixing portion 803 on each arm for fixing the position in the beam. Such corner plates are inexpensive and provide good alignment. The mounting is done as follows. The edge 801 of the corner piece is slid into the hook of the chamber. The fixing portion 803 includes a screwhead 804 connected to a friction element 805, e.g. a blade 805 which can be rotated into a locking position. The blade 805 is inside a depression 806 in a retracted position when the corner piece is slid into the hook. After insertion, the screwhead 804 is turned, so the blade 805 extends from under the depression 806 and contacts a wall of the chamber 400, for example frictionally contacts a recess 403 provided on the wall 501 as shown in FIG 4. Thus, the arm of the corner piece is secured by its edge 801 to the hook of the beam, and by the blade 805 of the securing portion 803 against the recess 403 of the beam. Since each arm of the corner piece is secured in the same way to each beam 102, 106, the beams are aligned at a square angle, which improves sealing of the beams at the corner, as well as alignment between the gutters of the different beams.

[0078] The collecting wall 303 may include a cut profile 701 to allow reaching the fixing means (e.g. the screwhead) of the alignment piece 800. In the figure, the cut profile 701 is a continuation of the opening 700 for draining water away.

[0079] Other alignment pieces can be used. For example, FIG 8 and FIG 9 show each an alignment piece 810, 820 comprising an adjustable clamp or bracket including two clamping arms. The arms form 90-degree angle. The fixing means comprises a fixing portion 813, 823 for varying the distance between the clamping arms. The adjusting means may be any suitable device that allows pressing the arms together. Each arm also includes fitting means 811, 821 suitable to be attached to a receiving means in a respective beam, so when each arm is attached to a respective beam, these beams can

be joined together thanks to the adjusting means. This allows a very effective alignment and clamping, closing any gap between the beams (in particular, the gutter of the beams). In other words, the type and position of the fitting means and of the receiving means in the beam are adapted so they can fit each other.

[0080] In particular FIG 8 shows an alternative alignment piece 810 including fitting means 811 on each arm 812, for example railings suitable to fit the receiving means, for example guiding tabs 611, in the chamber 610 of the beam (e.g. the beam shown in FIG 5, not being limited thereto). This helps improving the alignment of the adjacent beams in the corner, thus reducing gaps at the joints and corners. Additional attachment means 814, 824 can be added to the fixing means, for example, as shown in the figure, screws, which can be used to improve the attachment to the beam. These screws are provided through the arms contact the receiving means (e.g. guiding tabs 611) where the arms are inserted. Thus, the arms are locked frictionally to the receiving means of the beam. As it has been shown previously, e.g. with reference to embodiment shown in FIG 7, the attachment means is not limited to screws whose shafts frictionally interact with the beams.. In the example of the figure, the fixing portion 815 of the fixing means further comprises a screw extending from, and in the direction of, one of the arms 812. The screw 815 threads a hole through the other arm, so the arms (and the parts of the beam attached to them via the railings) can be pressed together.

[0081] Another alternative alignment piece 820 is shown in FIG 9, which similarly to the previous one is formed by two arms in a square angle joined together by a fixing portion 825 (screw). However, the arms 822 are cut so that the surface of the faces in contact with each other, or at least part of them, forms an angle with the longitudinal direction of the arm 822.

[0082] The fitting means 801, 811 of the alignment pieces shown in FIG 7 and FIG 8, is adapted (positioned) so as to align two coplanar walls, as in FIG 6. For example, one arm of the alignment piece of FIG 8 would fit on the guiding tabs 611 at the chamber 610 of a beam forming one side of the corner, and the other arm would fit on the guide at the chamber of the beam at the other side of the corner, the guides being coplanar. This is not the only option, for example the alignment piece of FIG 9 has the fitting means positioned so they can fit on guides of planes forming an angle (e.g. perpendicular). The screw (fixing portion 825) threads both arms at the corner so that when installed at the corner it is easier to tighten. Additional elements such as the attachment means 804, 814, 824 can be used in any of the alignment pieces (screws, optionally connected to moveable blades, etc).

[0083] FIG 10 shows the profile of a beam including the alignment pieces. The chamber 610 under the gutter 600 receives an alignment piece 810 such as the one shown in FIG 8, attached to receiving means. At the vertical side wall, another alignment piece 820 is shown, such as the one in FIG 9. For this, the vertical wall of the beam includes another receiving means 605 (see FIG 5) which can in general be used to attach anti-splash device, rubbers, etc. At the corner however, the receiving means 605 of the wall can attach to railings 821 of the alignment piece shown in FIG 9.

[0084] FIG 11 shows a top view of a 90-degree corner between two beams 1101, 1102 joined by two L-shaped alignment pieces 810, 820. The chamber under the gutter of each beam is aligned and joined by one of the alignment pieces 810. The vertical wall 604 of each beam also receives an alignment piece 820. After joining both walls, the arms are tightened together with the fixing portion by bringing the arms together (e.g. by fastening the screw). The alignment between the gutters is improved, reducing the gaps therebetween. The vertical walls 604 of the beams are also aligned and pushed against each other in a corner, leaving no gap. The seams can be covered with sealant material, if desired.

[0085] Any of the alignment means can be applied to any embodiment of the present invention, even more than one, e.g. a combination of different alignment pieces as shown in FIG 10 and FIG 11. For example, the beam with the angled wall shown in FIG 4 may include a receiving means 402 and additional receiving means 404 for more than one alignment piece. The corner pieces of FIG 11 show that they are joined at a 45-degree cut 1103, including a water draining hole, and also showing a cut on the structural portion of each beam, leaving an opening or aperture 1104 on the external side of the frame at the corner. The external side is the side facing outside the canopy, thus facing away the canopy centre. The reason for this special shaping is explained in the following.

[0086] FIG 12 shows the front surfaces 122, 126 of two beams 102, 106 forming a corner and being supported by a corner element 200. In this particular embodiment including a pillar, the corner element 200 is also attached to the pillar 103 by screws or bolts or the like. Each beam comprises a corner cut 702, 703 forming an aperture at the external part of the corner of the frame, thus facing the external side of the canopy. The aperture allows accessing the inside of the beam, for example the structural part 112 of the beam holding the gutter part. FIG 12 shows the corner element 200 attached to each beam 102, 106 by means of nuts 204 secured to screws (not shown) through the holes 203 (as shown in FIG 2). These nuts can be easily accessed thanks to the cut 702, and they can be protected within the structural portion 112 of the beam, instead of providing the nut 204 outside the beam and potentially in contact with water. The inside part of the beam may further include electronics and motors and other devices for controlling movable parts of the operable roof, and this cut out allows easy accession to provide connections, etc. In some embodiments of the present invention, only one beam may comprise a cut, but in order to make provide a large enough aperture, it is preferred that both beams include the cut at the corner,

thus improving accessibility. A cover piece 107, shown in FIG 1, may be used to close the opening provided by the cut or cuts, e.g. after installation. The cover piece prevents water, moisture and other environmental hazards from reaching the electronics and motors. If the frame is integrated in a larger roof, for example a roof held by one or more walls, a separate cover piece is not needed.

[0087] Returning to FIG 6, since cuts 701 are provided to allow the introduction of the alignment piece 800, water in the gutter may leak over the alignment piece 800, which is usually metallic and may be damaged by long periods of contact with water. In some embodiments of the present invention, in order to prevent contact between water and the alignment piece 800, and to further improve alignment of the beams and gutters of different beams, an additional gutter block 900 can be further provided at the corner, as shown in FIG 13. The gutter block 900 is a structure that allows the passage of water and engages and joins the gutter of each beam, improving alignment and reducing leakage at the joints of the gutters in the 45-degree cuts. It may include structural reinforcements to fit in the gutters of each beam, with walls 901 abutting the walls 301 of the gutter (e.g. each wall of the gutter), and openings 902 to allow the passage of water. The gutter block also may include rivets 903 or the like to engage with the alignment piece, e.g. with the hole 807 in the alignment piece (FIG 7), thus improving alignment of the block.

[0088] The gutter block 900 is preferably attached to the gutter without having to pierce holes through the gutter. For example, the gutter block has protrusions 904 for attachment to the gutter, the protrusions being chambers configured to include a filler for sealing and attaching the gutter block 900 to the gutter of each beam of the corner. The filler can be introduced through inlets 914 on the protrusion, after placement of the gutter block 900. The filler contacts the gutter wall beneath and fixes the block 900 in place. The protrusions 904 may include a depression or gap 905 for example a V-shape gap, for reducing the resistance to the flow of water through the block 900. In some embodiments, the gap 905 may be aligned with the depression 313 in the collecting wall, which improves evacuation of the water and dirt and avoid buildup. The gap 905 can be suitable for the particular depression of the collecting wall, for example the width of the gap can be adjusted to the width W2 of the depression.

[0089] In some embodiments, the gutter block 900 of FIG 13 also comprises a drainage opening 906 in fluid communication with the opening 700 (FIG 6). The drainage opening 906 of the gutter block 900 engages with the drainage for water evacuation, e.g. through a 103. The opening may further comprise walls extending towards the drainage system down a holding wall pillar, for protecting the alignment piece in the chambers of the beams. The drainage opening 906 may not be present in those corners with no opening 700 on the gutter or gutters.

[0090] In a further aspect, the present invention provides a kit of parts for assembling a terrace canopy in accordance with embodiments of the previous aspect. The kit comprises a plurality of beams which may have all the same cross section, e.g. the same profile. The beams comprise a gutter, the structural portion of the beam and the gutter formed as a single piece. A closed chamber is provided between the bottom wall of the gutter (collecting wall 303) and an external, lower, wall 401. The collecting wall may include a depression 313 extending the whole length of the gutter for improving drainage of the gutter. An attachment zone for an illumination system may be provided in the lower part of the gutter, e.g. next to the chamber. The kit may further comprise a pillar including an internal drainage system, or simply drain. The kit may further comprise a corner element 200 for attaching two beams to each other as a corner of the frame. If a pillar is present, the corner element may be introduced and fixed to a pillar of the canopy. To install the frame, the beams are cut at 45 degrees and attached to a corner element, which can be attached to a pillar of the canopy if present, or to any other supporting structure if needed. Additional cuts can be provided on the external part, providing a corner aperture which allows access to electronics, motors and such for providing motion to the controllable roof held by the beams. The gutters may also include openings for draining the water from the gutters, e.g. connecting the openings to the drain of the pillar. The kit may further comprise an alignment piece 800, so the beams are attached to each other and aligned also by said alignment piece attached to the chamber of the gutter as mentioned earlier. Thus, the gutters of different beams can be well aligned with each other and reduce leaks. Finally, the kit may comprise a corner block 900 as described earlier, for improving alignment of the beams, for improving drainage by providing a drain opening, and optionally for protecting the alignment piece 800 from water damage.

Claims

1. A terrace canopy (100) comprising a frame (101) including a first and second beams (102, 106),

a corner element (200) secured to the first and second beams when installed,
wherein the beams comprise a gutter (300, 600, 620) with a collecting wall (303, 603) for collecting rainwater,
wherein the gutter comprises a chamber (400, 610) defined by an upper wall being the collecting wall (303, 603, 631) of the gutter, and a lower wall (401, 601) facing the exterior of the beam,
for allowing to fix accessories to the beam without piercing through the collecting wall,
wherein the beam and gutter form one single beam profile piece,

and wherein the first and second beams of the terrace canopy have the same profile, wherein the profile of the collecting wall (303, 603, 631) of the gutter comprises a depression (313, 613, 633) for reducing dirt buildup.

2. The terrace canopy of the previous claim further comprising a support pillar (103) for holding the frame, the beams being horizontal and perpendicular to the support pillar when installed, and the corner element (200) being additionally secured to the support pillar (103) when installed.

3. The terrace canopy of any one of the previous claims wherein the beam comprises a guide (500, 510) for installing an illumination system, to illuminate the area underneath the canopy.

4. The terrace canopy of claim 3 wherein the guide (500, 510) is provided adjacent to the chamber (400, 610).

5. The terrace canopy of any one of the previous claims wherein the gutter further comprises a wall (302, 602) extending upwards from the collecting wall (303, 603) when installed, the wall (302, 602) being an angled wall which forms an angle with the horizontal between 30° and 55° when installed.

6. The terrace canopy of any one of the previous claims, wherein the gutter further comprises a vertical wall (304, 604) being vertical when installed, extending away from the collecting wall (303, 603) and opposite to the beam.

7. The terrace canopy of any one of the previous claims wherein the beams are cut at a 45-degree angle for symmetric joining of pairs of beams at a corner.

8. The terrace canopy of any one of the previous claims, wherein the chamber comprises a receiving means (402, 611) for sliding and aligning to the beam an alignment piece (800, 810, 820) for linking two beams at a 90-degree angle.

9. The terrace canopy of the previous claim further comprising the alignment piece (800, 810, 820) wherein the alignment piece comprises a movable frictional element (805, 814, 824) for fixing the position of the beam.

10. The terrace canopy of any one of the previous claims further comprising a corner gutter block (900) for receiving the end of two gutters in an angle.

11. The terrace canopy of the previous claim wherein the gutter block (900) further comprises a drain opening (906) for receiving and draining away rainwater from both gutters.

12. The terrace canopy of any one of the previous claims, wherein the beams comprise a cut (702, 703) at external side of the corner formed by the two beams, wherein the external corner is the corner facing away the terrace canopy centre.

13. The terrace canopy of any one of the previous claims further comprising an operable roof (104) comprising movable elements attached to the frame.

14. A kit of parts for assembling a terrace canopy, comprising

a plurality of beams (102, 106) comprising an integrated gutter (300, 600, 620) forming one ingle beam profile piece, wherein the beams have the same profile, the gutter comprising a collecting wall (303, 603) for collecting water, a wall (302, 602) extending upwards from the collecting wall (303, 603), and a closed chamber (400,610) between the collecting wall and an exterior lower wall,

a corner element (200) that can be attached to two adjacent beams forming a corner, , wherein the profile of the collecting wall (303, 603) of the gutter comprises a depression (313, 613) for reducing dirt buildup.

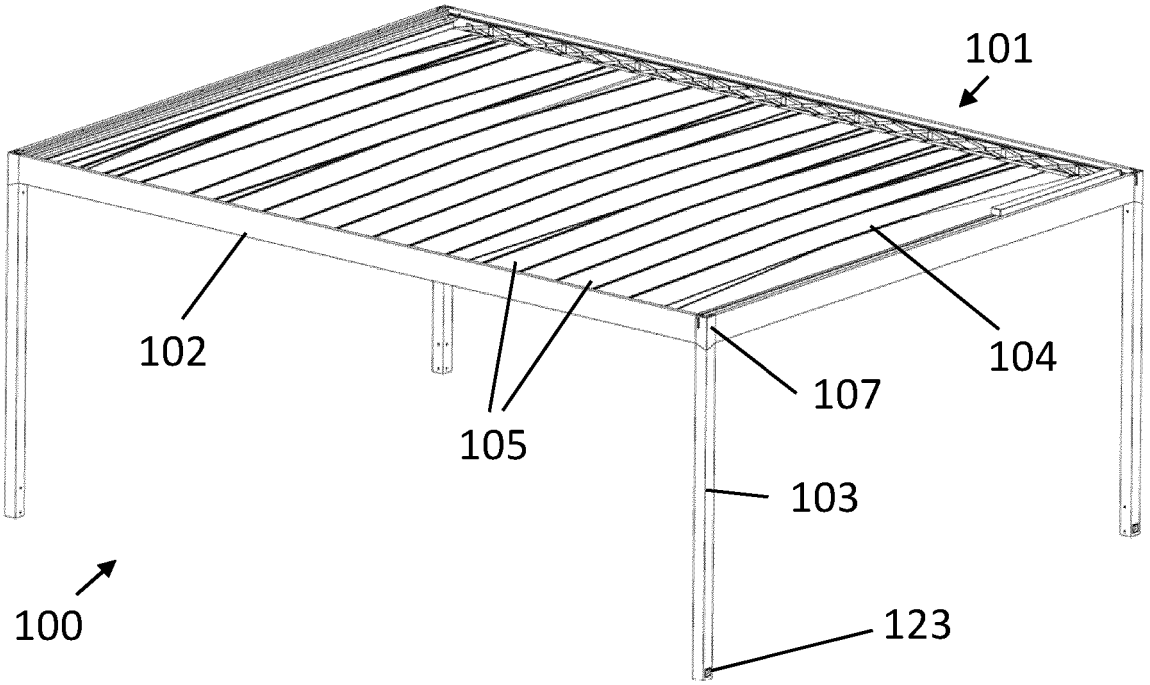

FIG 1

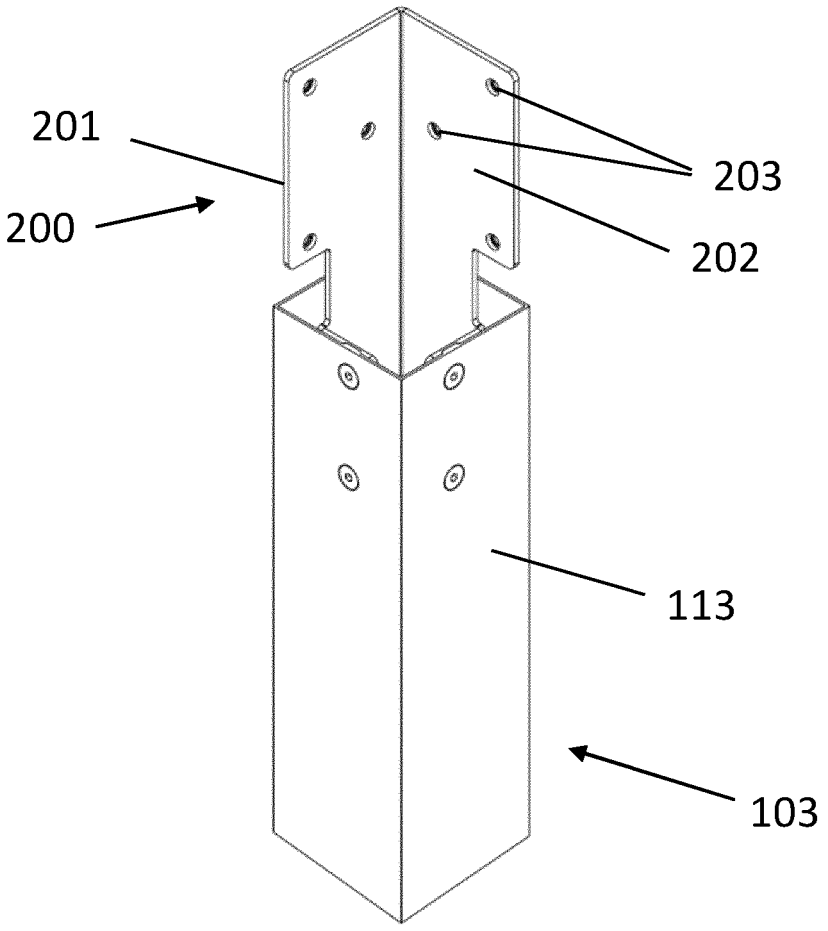

FIG 2

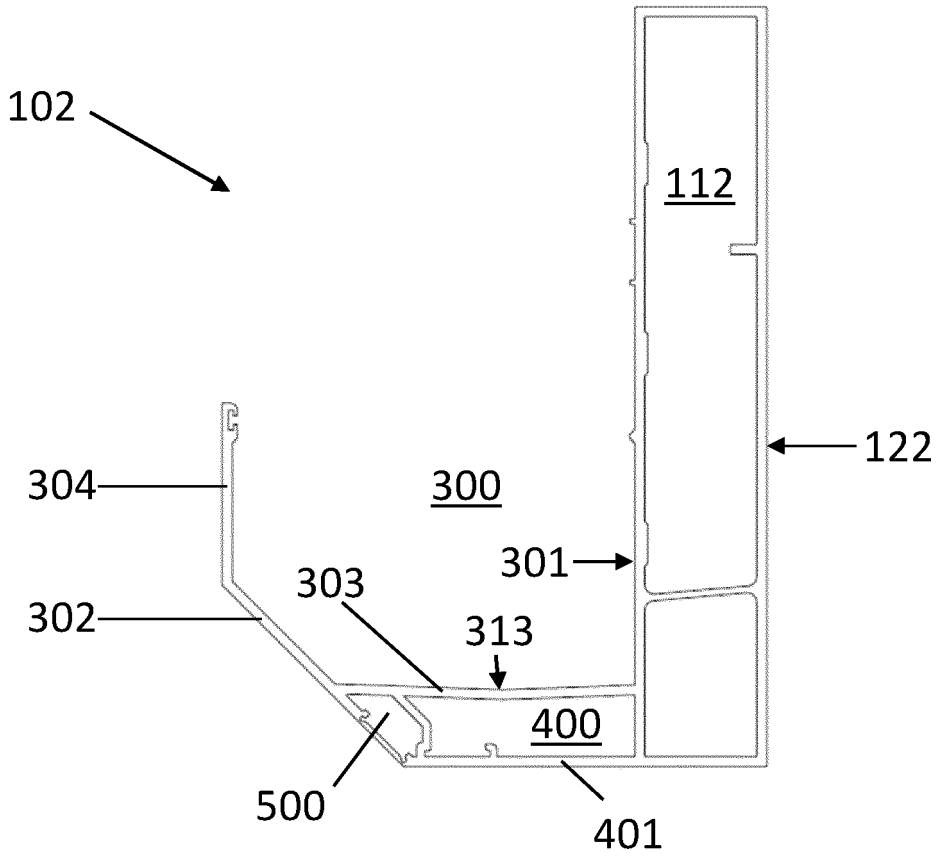
102
112
122
304
300
301
303
302
313
400
500
401

FIG 3

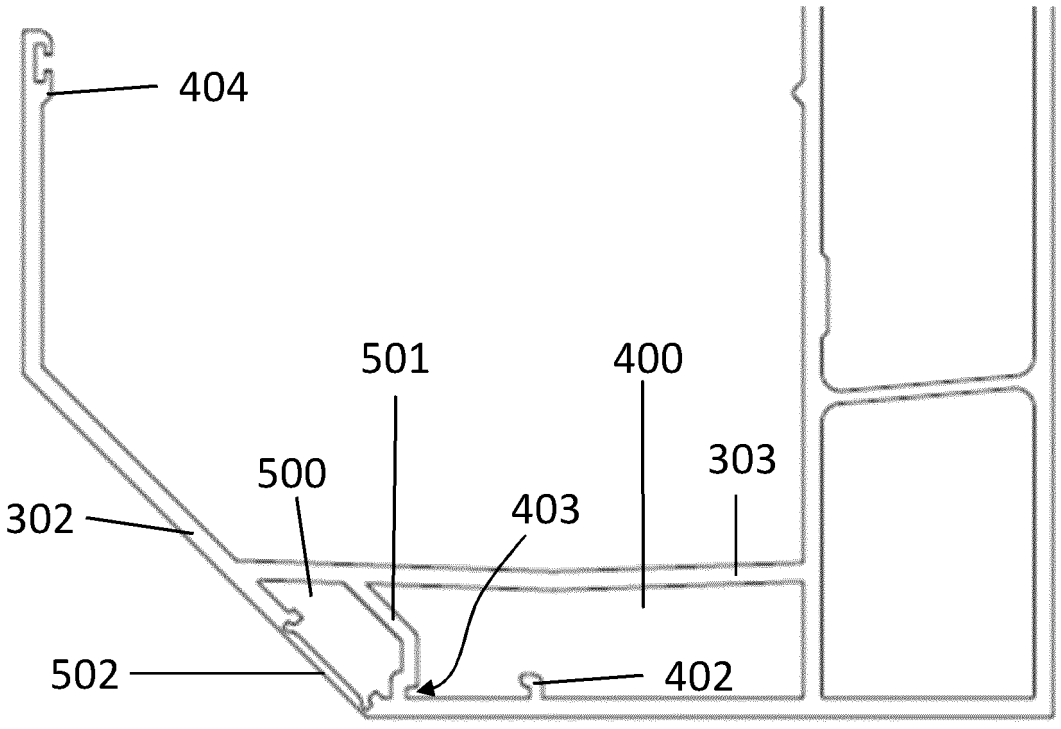
404
501
400
500
303
302
403
502
402

FIG 4

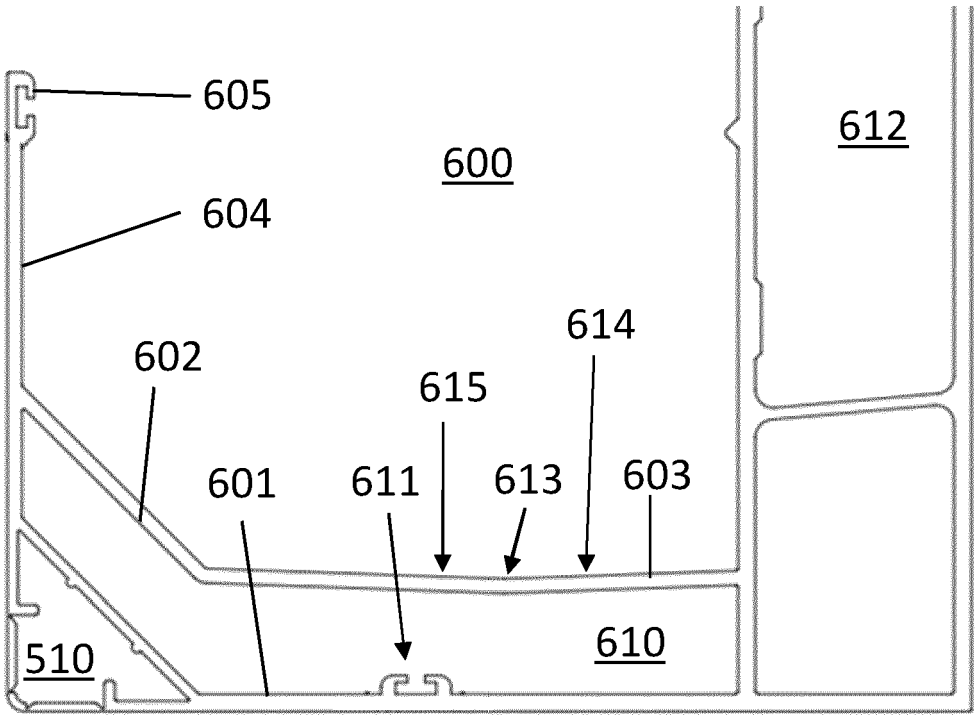
605
604
602
601
611
615
613
614
603
600
612
610
510

FIG 5

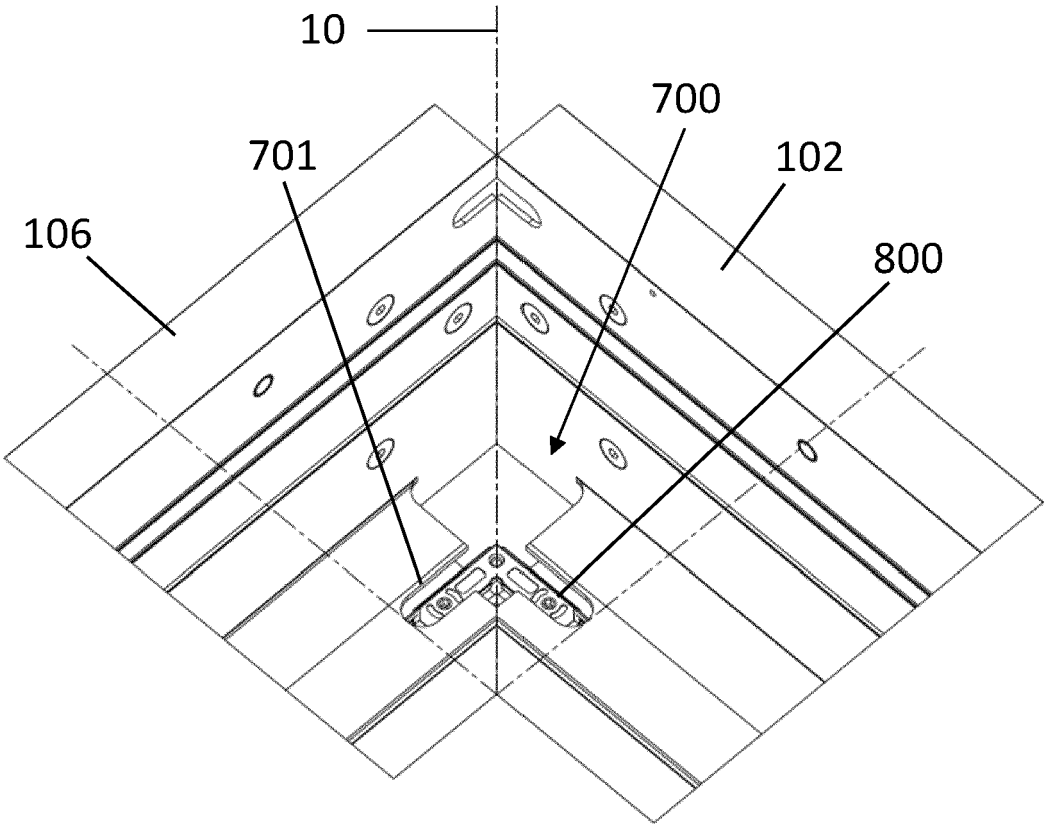
10
700
701
102
106
800

FIG 6

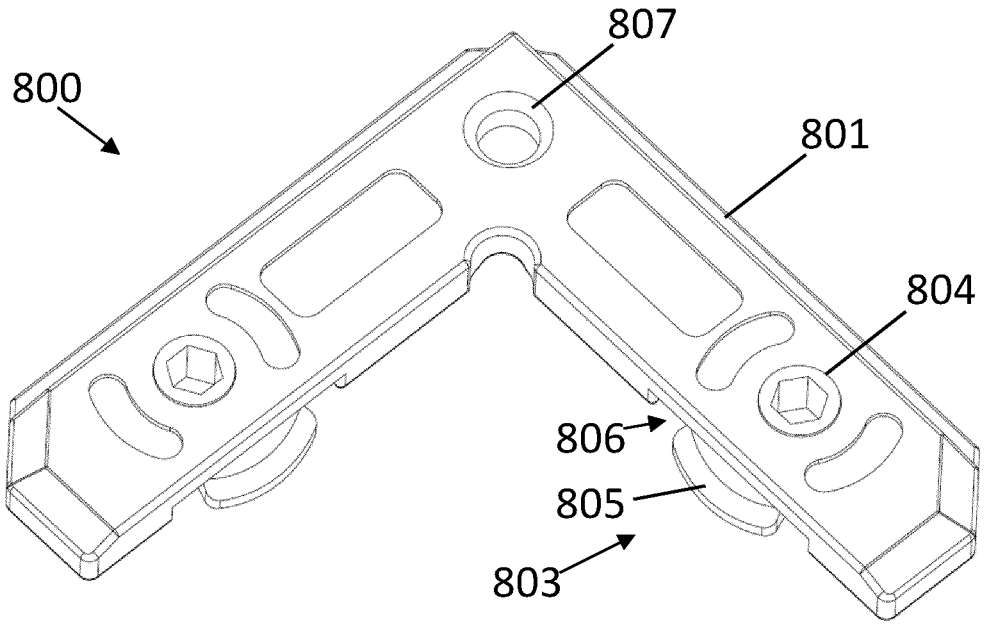

FIG 7

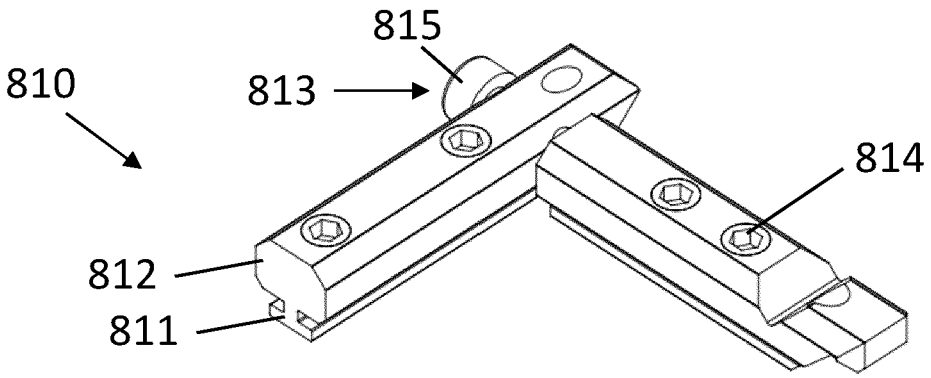

FIG 8

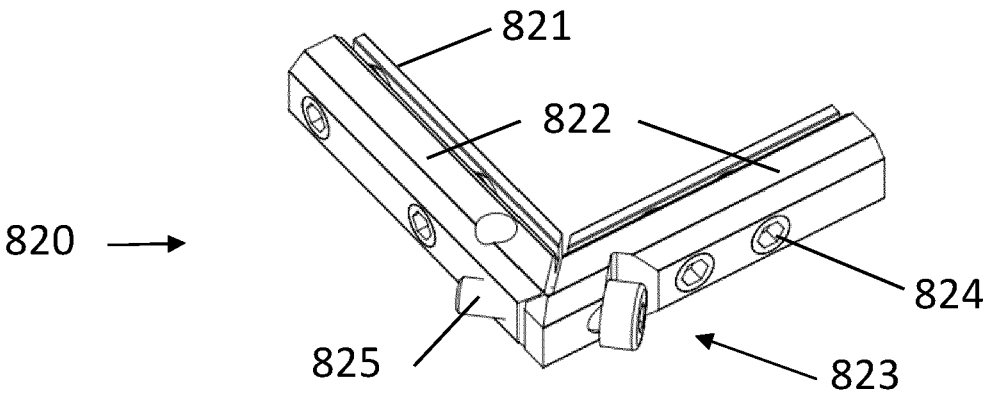

FIG 9

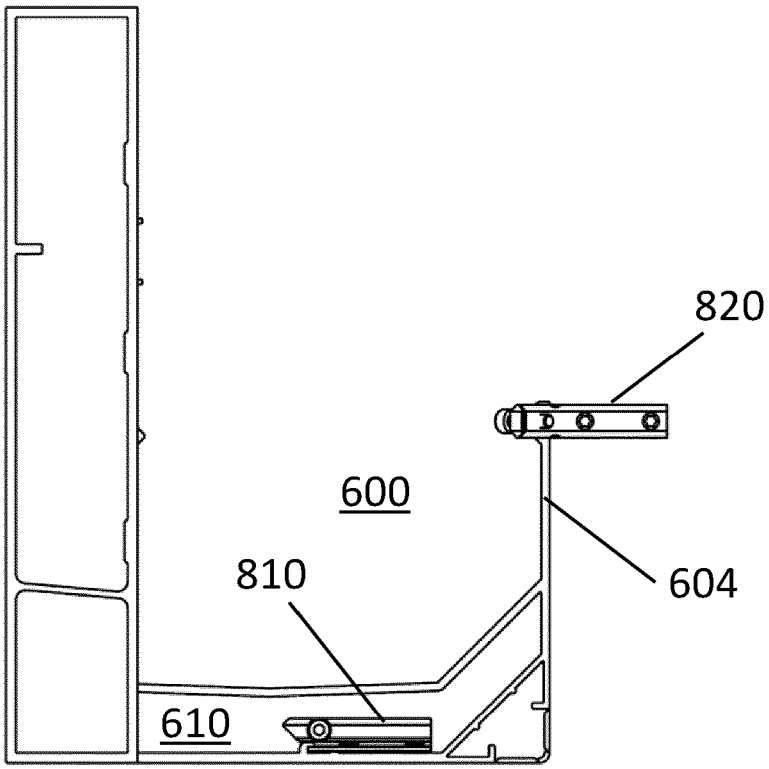

FIG 10

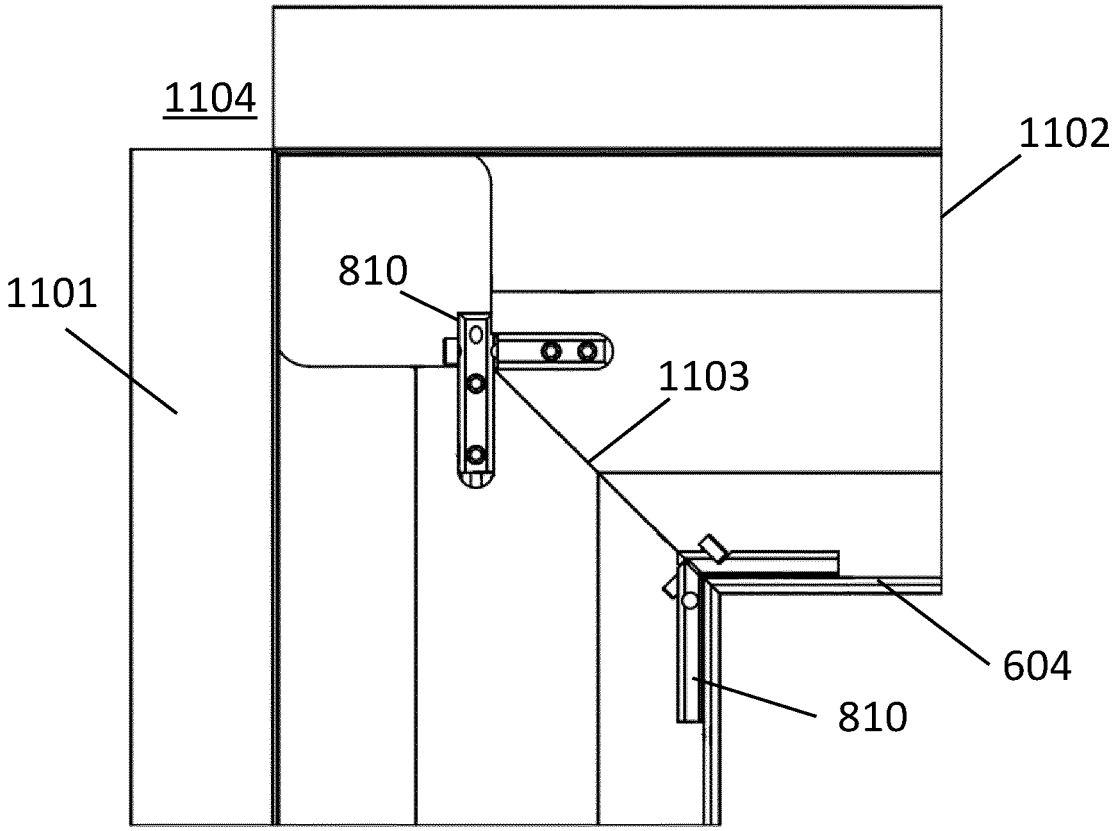

FIG 11

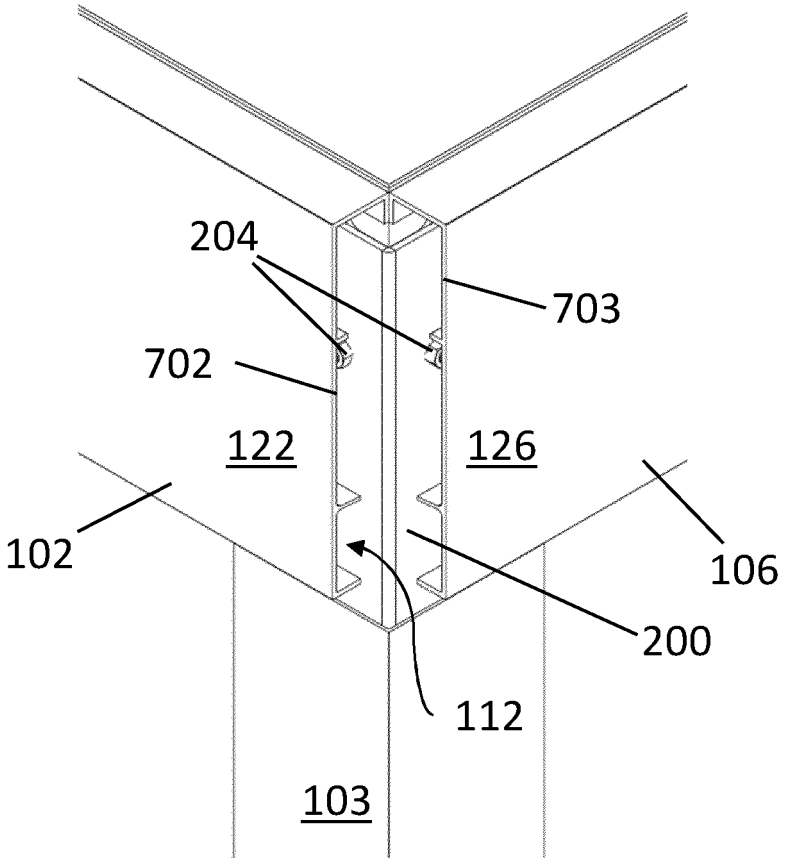
204
703
702
122
126
102
106
200
112
103

FIG 12

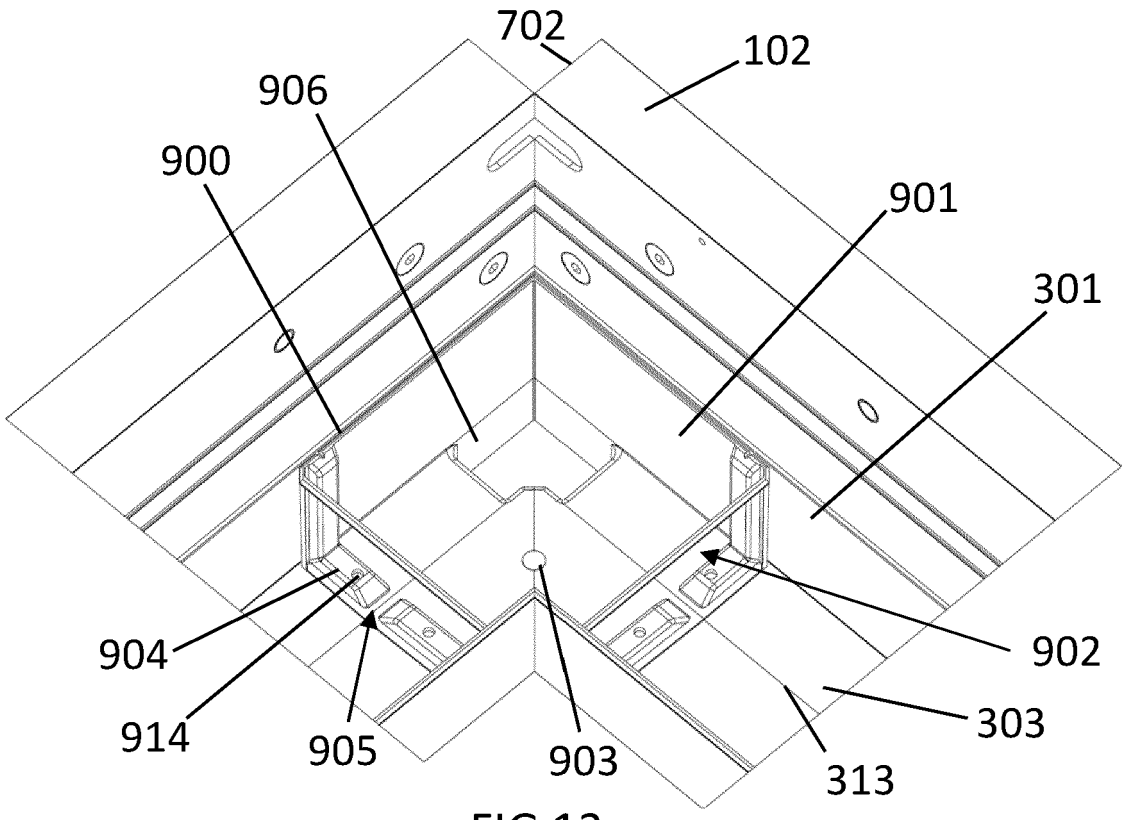
702
102
906
900
901
301
904
914
905
903
902
303
313

FIG 13

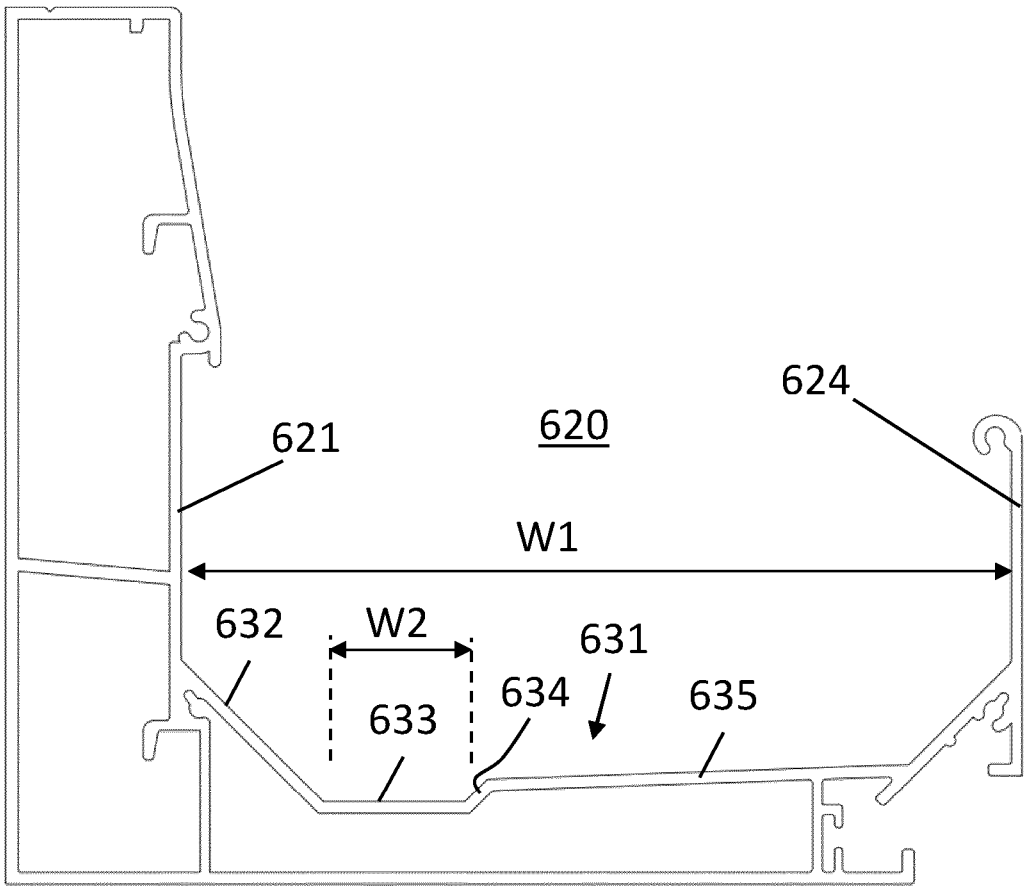

FIG 14

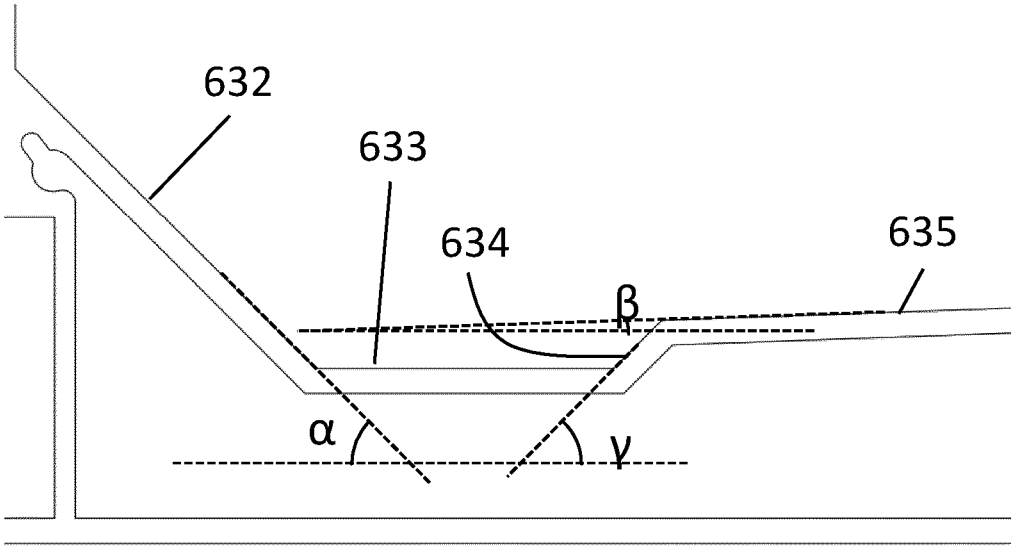

FIG 15

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European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 19 0775

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	FR 3 055 637 A1 (PEUCHOT ALAIN HENRI [FR]) 9 March 2018 (2018-03-09) * figures 1,2,4,8 * * page 2, lines 26-29 * * page 9, lines 1-2 *	1-14	INV. E04B7/16 E04F10/10 E04D13/064 E04D13/08 E04H6/02
Y	FR 3 122 682 A1 (CONCEPT ALU [FR]) 11 November 2022 (2022-11-11) * figure 2 *	1-14	
Y	IT BA20 130 063 U1 (DIRELLO SALVATORE) 31 March 2015 (2015-03-31) * figure 7 *	3,4	
Y	WO 2023/000495 A1 (ZHEJIANG YOTRIO GROUP CO LTD [CN]) 26 January 2023 (2023-01-26) * figure 4 *	10,11	

TECHNICAL FIELDS SEARCHED (IPC)

E04B
E04F
E04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 November 2024	Tran, Kim Lien

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 19 0775

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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21-11-2024

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