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(54) OUTDOOR AWNING AND METHOD FOR OPERATING SAID AWNING

(57) Outdoor awning, which comprises: a support structure (2) provided with two longitudinal members (3) on which multiple transverse profiles (10) are slidably mounted; a sheet (11) supported by the transverse profiles (10) and provided with two longitudinal edges (12) positioned along the respective longitudinal members (3); two longitudinal gutters (15) positioned below the sheet (11) at the respective longitudinal edges (12) of the latter. The outdoor awning also comprises a protection device (100) mechanically connected to the support structure (2), arranged at the respective longitudinal gutter (15) and actuatable to prevent drops of rainwater that fell into the longitudinal gutter (15) from splashing outside the latter. The aforesaid protection device (100) comprises an articulated quadrilateral (101) and actuation means (106) adapted to act on the articulated quadrilateral (101) in order to move a movable wall (105) of the latter between a retreated position, when the sheet (11) is in collected position, and an advanced position, when the sheet (11) is in extended position.

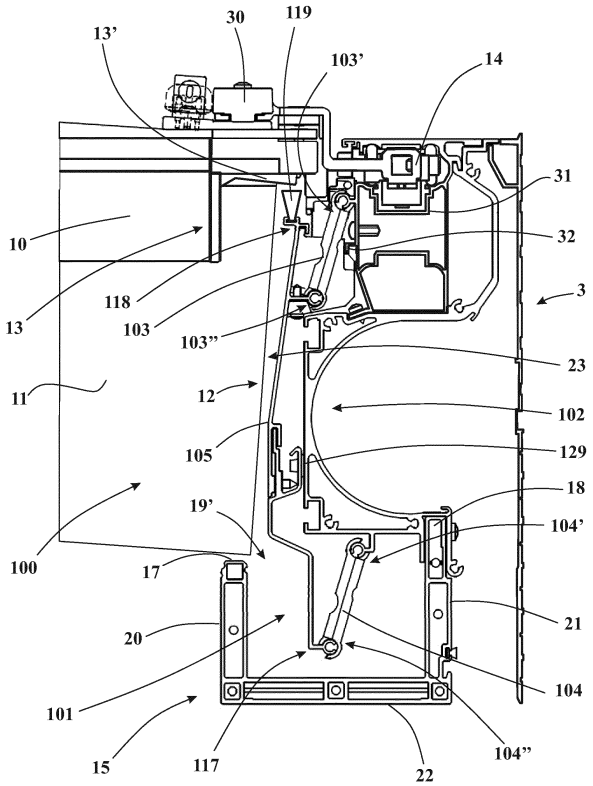

Fig. 3

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Description

Field of application

[0001] The present invention regards an outdoor awning and a method for operating said awning, according to the preamble of the respective independent claims.

[0002] The present awning is intended to be employed for covering external surfaces, protecting them from weathering agents and in particular from the sun and rain.

[0003] More particularly, the awning, object of the present invention is advantageously employable for making pergolas, verandas and more generally cover structures, both in gardens of private homes and in open public spaces, such as restaurants, hotels, bathing establishments or other structures.

[0004] The present awning and method therefore fall within the industrial field of the production of awnings for covering outdoor settings.

State of the art

[0005] Numerous solutions of outdoor awnings are known on the market which comprise a support structure fixed to the ground, provided with two longitudinal members between which a sheet is suspended for covering an underlying surface of the ground. More in detail, the two longitudinal members are supported at the front and back by corresponding pairs of columns fixed on the lower part to the ground and connected on the upper part to each other by means of corresponding beams arranged orthogonal to the longitudinal members.

[0006] The sheet of the awning is suspended above the surface to be covered, constrained to a plurality of section-breaker profiles, which are arranged transverse to the longitudinal members and are slidably engaged at their ends in longitudinal guides arranged on such longitudinal members, for example by means of sliding trolleys.

[0007] In addition, the awning comprises driving belts housed within the longitudinal guides of the longitudinal members and adapted to move the section-breaker profiles along the guides themselves in order to move the sheet between an extended position, in which the latter is extended above surface to be covered, and a collected position, in which the aforesaid section-breaker profiles are next to each other with the sheet which is collected in a plurality of side-by-side pitches, each of which extended between a pair of successive profiles.

[0008] More in detail the awnings of the above-described known type comprise four gutters, of which two longitudinal gutters are arranged below the corresponding longitudinal members and two transverse gutters are arranged below the corresponding beams, and adapted to collect the rainwater that falls from the sheet.

[0009] Each gutter is provided on the upper part with an external edge, fixed to the corresponding longitudinal member, and with an internal edge arranged below the sheet, in a manner such that such edges delimit an upper opening between them through which the water, which falls from the sheet, enters into the gutters.

[0010] In addition, each gutter is fixed at the ends thereof to the two columns to which the overlying longitudinal member is fixed. The columns of the support structure of the awning are obtained by means of two hollow tubular sections and are provided with an opening of connection with the gutter in order to allow the water collected in the latter to fall inside the column and exit outward through a hole made at the base of the column itself.

[0011] One drawback of the above-described outdoor awning of known type consists of the fact that it is unable to efficiently protect the surface under the sheet from rain, since, when the rainwater falls from the sheet inside the underlying gutter, it hits the surface of the gutter itself, creating splashes that go beyond the internal edge of the gutter and which fall inside the surface below the sheet.

[0012] In order to at least partly resolve this drawback, known from the patent ITUD20120170 is an outdoor awning comprising an anti-drip device associated with each longitudinal gutter in order to prevent splashes of rainwater from going beyond the upper edge of the gutter itself.

[0013] In particular, such anti-drip device comprises an oscillating partition, which is arranged between the external edge and the internal edge of the gutter and is hinged to the gutter itself along a lower edge thereof arranged above the bottom of the gutter.

[0014] In operation, the partition is susceptible of being rotated, around the aforesaid lower edge, in order to take on an operating position when the sheet is in extended position, and a non-operating position when the sheet is in collected position. More in detail, in the operating position, an upper edge of the partition is positioned below the sheet in order to allow the drops of rainwater to fall within the gutter and prevent splashes of water from exiting the gutter, going beyond the internal edge thereof. When the partition is in non-operating position, its upper edge is positioned outside the bulk of the sheet so as to not interfere with the pitches of the sheet in collected position. Nevertheless, even the anti-drip device of the latter awning of known type has in practice proven that it does not lack drawbacks.

[0015] A first drawback is due to the fact that between the lower edge of the partition and the bottom of the gutter, an air space is present through which splashes of water can pass and exit from the gutter. For such reason, in particular, the anti-drip device provides for arranging a closure cover between the lower edge of the partition and the internal edge of the gutter, with consequent increase of the structural complexity and cost of the awning.

[0016] A further drawback lies in the fact that the drops of rainwater which reach the lateral edge of the sheet, due to the adhesion force between the water and the surface of the sheet, remain attached to the latter and flow on the lower face of the sheet towards the center of

the sheet itself, in this manner falling outside the corresponding gutter, inside the ground surface below the sheet of the awning.

Presentation of the invention

[0017] In this situation, the problem underlying the present invention is therefore that of overcoming the drawbacks shown by the outdoor awnings of known type, by providing an outdoor awning that is capable of efficiently preventing the outflow of water from the gutters.

[0018] A further object of the present invention is to provide an outdoor awning which allows preventing leaks of rainwater between the lateral edges of the sheet and the falling thereof on the surface below the sheet.

[0019] A further object of the present invention is to provide an outdoor awning that is structurally simple and inexpensive to make.

[0020] A further object of the present invention is to provide an outdoor awning which requires simple and quick maintenance.

Brief description of the drawings

[0021] The technical characteristics of the present invention, according to the aforesaid objects, can be clearly seen in the below-reported claims and the advantages thereof will be more evident in the following detailed description, made with reference to the enclosed drawings, which represent a merely exemplifying and non-limiting embodiment of the invention, in which:

- figure 1 shows a top perspective view of the outdoor awning, object of the present invention;
- figure 2 shows a bottom perspective view of the outdoor awning, object of the present invention;
- figure 3 shows a sectional view, with some parts removed, of the present awning at a longitudinal member of the latter, in which a protection device of the awning is arranged in a retreated position;
- figure 4 shows the protection device of figure 3 in an advanced position;
- figure 5 shows a detail of the present awning relative to actuation means for the protection device, with some parts removed in order to better illustrate other parts;
- figure 6 shows a top view of the actuation means of figure 5;
- figure 7 shows a perspective view of a detail of the present awning at one end of a longitudinal member, in which some parts were removed in order to better illustrate a return element of the actuation means for the protection device;
- figure 8 shows the return element of figure 7 in a top view;
- figure 9 shows a detail of the return element relative to pawls for retaining a movable cam of the actuation means.

Detailed description of a preferred embodiment

[0022] With reference to the enclosed drawings, reference number 1 overall indicates an outdoor awning according to the present invention.

[0023] The present awning 1 is advantageously recommended for making pergolas, verandas and more generally cover structures for outdoor settings, such as gardens of private homes and open public spaces, such as restaurants, hotels, bathing establishments or other structures, etc.

[0024] In accordance with the embodiments illustrated in the enclosed figures, the awning 1, object of the present invention, comprises a support structure 2 provided with at least two longitudinal members 3 that are parallel to each other and side-by-side, each of which longitudinally extended along an extension direction X between a front end 4 thereof and an opposite rear end 5 thereof.

[0025] Advantageously, the support structure 2 also comprises at least two front columns 6 abutted against the ground, each of which supporting the front end 4 of the corresponding longitudinal member 3, and at least one front beam 7 placed to connect the two front columns 6.

[0026] Advantageously, in accordance with the embodiment illustrated in figures 1 and 2, the support structure 2 of the awning 1 further comprises two rear columns 8 to which the rear ends 5 of the longitudinal members 3 are connected, and a rear beam 9 placed to connect the two aforesaid rear columns 8, in a manner such to obtain a load-bearing structure.

[0027] In accordance with a different non-illustrated embodiment, the support structure 2 of the awning 1 is provided with front columns 6 (which support the front ends 4 of the longitudinal members 3) and is next to a vertical wall (such as the wall of a building) to which the rear ends 5 of the longitudinal members 3 are anchored.

[0028] In accordance with a further different non-illustrated embodiment, the awning 1, along one of its longitudinal members 3, is next to a vertical support wall to which the aforesaid longitudinal member 3 is anchored. In accordance with the latter embodiment, in particular, the support structure 2 of the awning 1 comprises a front column 6 and a rear column 8 connected to the longitudinal member 3 which is not next to the vertical support wall.

[0029] Preferably, the longitudinal members 3 and the beams 7, 9 of the support structure 2 are arranged substantially horizontal, with the longitudinal members 3 positioned parallel to each other and facing, and orthogonal to the front 7 and rear 9 beams.

[0030] Each longitudinal member 3 is preferably obtained with a hollow metal section (in particular made of extruded aluminum) and is provided with a first longitudinal guide 31 parallel to the extension direction X of the longitudinal member 3 itself.

[0031] According to the present invention, the awning

1 comprises multiple transverse profiles 10 arranged between the longitudinal members 3, positioned orthogonal to the extension direction X, and slidably engaged with the first longitudinal guides 31 of the longitudinal members 3 themselves.

[0032] In addition, the awning 1 comprises a sheet 11 made of flexible material, which is supported by the aforesaid transverse profiles 10 and is extended between the two longitudinal members 3 in order to cover an underlying surface of the ground.

[0033] The sheet 11 of the awning 1 is provided with two longitudinal edges 12, which are positioned along the corresponding longitudinal members 3, in particular extended parallel to the extension direction X of the latter.

[0034] Preferably, the sheet 11 of the awning 1 is extended according to the extension direction X between a rear edge thereof, constrained to a fixed rear transverse profile 10, fixed to the rear ends 5 of the longitudinal members 3, and an opposite front edge, constrained to a front transverse profile 10.

[0035] Advantageously, each transverse profile 10 comprises a tubular section (in particular made of aluminum) and is preferably extended between two lateral terminations thereof 13, each of which arranged at the respective longitudinal side 12 of the sheet 11 and slidably engaged with the first longitudinal guide 31 of each longitudinal member 3.

[0036] In accordance with the embodiment illustrated in the enclosed figures, each transverse profile 10 is extended in a curved manner between its lateral terminations 13 with convexity directed upward, in a manner such to determine a form that is raised at the center of the sheet 11 in extended position, so as to facilitate the conveyance of the water (which falls on the sheet 11) towards the longitudinal edges 12 of the sheet 11 itself.

[0037] In accordance with a different non-illustrated embodiment in the enclosed figures, each transverse profile 10 is extended in a rectilinear manner between its lateral terminations 13. Optionally, in accordance with the latter embodiment, the transverse profiles 10 are arranged tilted with one of their lateral terminations 13 placed a higher height than that of the other lateral termination 13, in a manner such to determine a corresponding slope of the sheet 11 in extended position, so as to facilitate the conveyance of the water towards one of the longitudinal edges 12 (at lower height) of the sheet 11 itself. Advantageously, each lateral termination 13 of each transverse profile 10 is constrained to the first longitudinal guide 31 of the corresponding longitudinal member 3 by means of a trolley 14 slidably engaged with the first longitudinal guide 31 and fixed to the corresponding transverse profile 10.

[0038] Of course, without departing from the protection of the present patent, the present awning 1 can also comprise more than two longitudinal members 3 that are parallel to each other, and multiple sheets 11 each arranged between a corresponding pair of side-by-side longitudinal members 3.

[0039] The present awning 1 comprises driving means (not illustrated in the enclosed figures) mechanically connected to the transverse profiles 10 and adapted to move the latter along the first longitudinal guides 31 of the longitudinal members 3, in order to move the sheet 11 between an extended position, in which the sheet 11 is substantially extended above the underlying surface of the ground, and a collected position, in which the transverse profiles 10 are next to each other with the sheet 11 collected in a plurality of side-by-side pitches, each of which extended between a pair of successive transverse profiles 10.

[0040] In particular, the sheet 11 in extended position subtends, within the awning 1, a cover volume A which is extended, below the sheet 11 itself, within the longitudinal edges of the latter.

[0041] Advantageously, the driving means for moving the transverse profiles 10 preferably comprise two driving belts, each of which housed within the respective longitudinal member 3 and wound around a first and a second transmission pulley rotatably constrained to the support structure 2 respectively at the front and rear ends 4, 5 of the longitudinal member 3 itself.

[0042] Preferably, the present awning 1 comprises a motor (not illustrated), for example housed at the rear beam 9 of the support structure 2, and adapted to actuate the driving means in order to move the sheet 11.

[0043] More in detail, in operation, the motor is mechanically connected to the second transmission pulleys in order to actuate them to rotate around a rotation axis thereof so as to move the driving belts to advance in a first advancing sense V1 in order to bring the sheet 11 into the collected position, and in a second opposite advancing sense V2 in order to bring the sheet 11 into the extended position.

[0044] Of course, in accordance with a different embodiment, the means for driving the sheet 11 are manually actuatable, for example by means of an articulated driving rod engaged through a hoist to the shaft of the second transmission pulleys.

[0045] Advantageously, the sheet 11 of the present awning 1 is provided with a lower face 11' which, with the sheet 11 in extended position, is intended to be directed towards the underlying ground surface, and preferably with an upper face 11" opposite the lower face 11'.

[0046] Preferably, the transverse profiles 10 are arranged on the lower face 11' of the sheet 11 and are constrained to the latter at their lateral terminations 13. In particular, with reference to the examples of figures 3 and 4, each lateral termination 13 of each transverse profile 10 is fixed to the sheet 11 by means of a retention block 30 arranged on the upper face 11" of the sheet 11 and fixed to the corresponding lateral termination 13 in a manner such to retain the sheet 11 between the retention block 30 and the lateral termination 13 itself.

[0047] Preferably, each lateral termination 13 of the transverse profiles 10 is fixed to the corresponding retention block 30 by means of at least one bolt, passing

through the sheet 11, and adapted to pull each lateral termination 13 towards the corresponding retention block 30 in order to retain the sheet 11 between the latter.

[0048] According to the present invention, the support structure 2 comprises at least one longitudinal gutter 15, and preferably two longitudinal gutters 15, each of which at least partially positioned below the sheet 11 at the respective longitudinal edge 12 of the sheet 11 itself, in order to receive the rainwater that falls from the sheet 11.

[0049] Preferably, in accordance with the embodiment illustrated in figures 1 and 2, each longitudinal gutter 15 is positioned below the corresponding longitudinal member 3 and is extended parallel to the extension direction X of the latter, and in particular is fixed to the corresponding front 6 and rear 8 columns to which the overlying longitudinal member 3 is connected.

[0050] Advantageously, the awning 1 also comprises two transverse gutters 16', 16", of which a front gutter 16' is placed below the front edge of the sheet 11, when the latter is in extended position, and fixed to the front columns 6, and a rear gutter 16" is positioned below the rear edge of the sheet 11 and fixed to the rear columns 8.

[0051] Preferably, each longitudinal gutter 15 is provided with an internal side 17, arranged below the sheet 11, in particular within the aforesaid cover volume A, and an external side 18, arranged outside the cover volume A and preferably fixed to the corresponding longitudinal member 3.

[0052] The internal side 17 and the external side 18 of the longitudinal gutter 15 delimit an upper opening 19 between them, through which the water that fell from the sheet 11 is susceptible of entering into the underlying longitudinal gutter 15.

[0053] In particular, the upper opening 19 is extended longitudinally along substantially the entire extension of the longitudinal gutter 15 according to the extension X, and is positioned below the corresponding longitudinal edge 12 of the sheet 11 over the entire length of the latter so as to receive the water susceptible of falling from the sheet 11 itself.

[0054] Advantageously, each a longitudinal gutter 15 comprises a metal section extended parallel to the extension axis X between two opposite ends, preferably connected to the corresponding columns 6, 8.

[0055] Preferably, the metal section of the longitudinal gutter 15 is provided with an internal wall 20, which defines the aforesaid internal side 17, an external wall 21, which defines the aforesaid external side 18, and a bottom wall 22 placed to connect the internal wall 20 with the external wall 21, in a manner such that such walls delimit therebetween an internal volume of the longitudinal gutter 15 that is open at the top with the aforesaid upper opening 19.

[0056] Preferably, in accordance with the embodiment illustrated in figures 3 and 4, the external wall 21 of the longitudinal gutter 15 is fixed to the corresponding longitudinal member 3. In accordance with a different embodiment, such external wall 21 is separated by the longitudinal member 3, or, according to a further embodiment it is constituted by a corresponding portion of the longitudinal member 3 to which the bottom wall 22 of the longitudinal gutter 15 is for example fixed.

[0057] The metal section of each longitudinal gutter 15 is also provided, at its ends, with lateral openings connected to an internal cavity of a corresponding column 6, 8 (preferably obtained with a hollow tubular section) in order to allow the water collected in the longitudinal gutter 15 to fall within the column 6, 8 and exit outward through a discharge opening made at the base of the column 6, 8 itself.

[0058] Advantageously, in accordance with the embodiment illustrated in figure 3, the internal side 17 of each longitudinal gutter 15 delimits an open internal side 23, and in particular on the lower part it delimits the open internal side 23, which is crossed by the pitches of the sheet 11 when the latter is in collected position.

[0059] In this manner, in particular, the internal side 17 of the longitudinal gutter 15 is placed at a lower height than the pitches of the sheet 11 in collected position, in a manner such that such pitches do not interfere with the longitudinal gutter 15 passing through the aforesaid open internal side 23.

[0060] The present awning 1 also comprises at least one protection device 100 mechanically connected to the support structure 2 and arranged at the longitudinal gutter 15, and advantageously comprises two protection devices 100, one for each longitudinal gutter 15.

[0061] Each protection device 100 is actuatable to prevent drops of rainwater, that fell inside the corresponding longitudinal gutter 15, from splashing outside the latter, going beyond the internal side 17 and falling inside the ground portion covered by the sheet 11.

[0062] According to the idea underlying the present invention, each protection device 100 comprises an articulated quadrilateral 101, advantageously flat, and preferably constituted by an articulated parallelogram. Such articulated quadrilateral 101 is provided with a support member 102, with at least one first arm 103, with at least one second arm 104 and with a movable wall 105, as described in detail hereinbelow. More in detail, as illustrated in figures 3 and 4, the support member 102 is connected to the support structure 2. Preferably, the support member 102 is integral with the corresponding longitudinal member 3 and, in particular, in accordance with the embodiment of figures 3 and 4, comprises one or more portions of the longitudinal member 3.

[0063] Advantageously, the support member 102 is extended with elongated shape along the extension direction X, in particular substantially over the entire length of the corresponding longitudinal gutter 15.

[0064] In particular, the support member 102 is arranged laterally with respect to the longitudinal edge 12 of the sheet 11, spaced from such longitudinal edge 12, outside the cover volume A.

[0065] Preferably, the support member 102 is arranged, at least partly, above the corresponding longitu-

dinal gutter 15.

[0066] The movable wall 105 of the articulated quadrilateral 101 is extended longitudinally parallel to the extension direction X of the longitudinal member 3, preferably over the entire length of the corresponding longitudinal gutter 15, and is extended, transverse to the extension direction X, between a lower side 117 and an upper side 118.

[0067] Preferably, the movable wall 105 is arranged, according to its transverse extension, substantially vertically, in particular with its lower side 117 directed downward and its upper side 118 directed upward.

[0068] Advantageously, the movable wall 105 is provided with an internal face 115, directed towards the transverse profiles 10 and in particular towards the cover volume A of the awning 1, and an external face 116, directed in the direction opposite the internal face 115, and in particular directed towards the support member 102 of the corresponding articulated quadrilateral 101.

[0069] In particular, the movable wall 105 is obtained with a section (in a single body or multiple parts fixed to each other), preferably made of metal material (e.g. via extrusion) or, otherwise, made of plastic material.

[0070] The first and the second arm 103, 104 of the articulated quadrilateral 101 are placed to connect between the support member 102 and the movable wall 105. More in detail, the first arm 103 is extended between a first end 103', rotatably constrained to the support member 102, and a second end 103" rotatably constrained to the movable wall 105. The second arm 104 is extended between a third end 104' rotatably constrained to the support member 102 and a fourth end 104" rotatably constrained to the movable wall 105.

[0071] Advantageously, the arms 103, 104 of the articulated quadrilateral 101 are hinged to the support member 102 and to the movable wall 105 by means of turning pairs 120 having corresponding rotation axes parallel to each other and to the extension axis X, in a manner such that, in particular, the articulated quadrilateral 101 is configured for executing a flat motion on a displacement plane substantially orthogonal to the aforesaid extension axis X.

[0072] In particular, the turning pairs 120 are positioned at the respective end 103', 103", 104', 104" of the first and of the second arm 103, 104 of the articulated quadrilateral 101.

[0073] Preferably, in accordance with the embodiment illustrated in figures 3 and 4, the first end 103' of the first arm 103 and the third end 104' of the second arm 104 are hinged to the support member 102 respectively by means of a first appendage 121 and a third appendage 123, which are fixed to the support member 102 and are rotatably inserted, respectively in a first seat 125 made in the first arm 103 and in a third seat 127 made in the second arm 104.

[0074] In particular, the aforesaid first appendage 121 is projectingly extended from a lateral face of the support member 102 directed towards the cover volume A of the awning 1, and is preferably positioned in proximity to the first longitudinal guide 31 of the longitudinal member 3 to which the trolleys 14 of the transverse profiles 10 are constrained.

[0075] Suitably, the aforesaid third appendage 123 is projectingly extended from a bottom face of the support member 102 arranged across from the upper opening 19 of the longitudinal gutter 15, in particular to partially close such upper opening 19 starting from the external side 18 of the longitudinal gutter 15 itself.

[0076] Advantageously, the second end 103" of the first arm 103 and the fourth end 104" of the second arm 104 are hinged to the movable wall 105 by means of, respectively, a second appendage 122 and a fourth appendage 124, which are fixed to the movable wall 105 and are respectively rotatably inserted in a second seat 126 made in the first arm 103 and in a fourth seat 128 made in the second arm 104.

[0077] In particular, the aforesaid second and fourth appendage 122, 124 are respectively arranged in proximity to the upper side 118 and to the lower side 117 of the movable wall 105.

[0078] Preferably, the second and fourth appendage 122, 124 are projectingly extended from the external face 116 of the movable wall 105.

[0079] Advantageously, each appendage 121, 122, 123, 124 with the corresponding seat 125, 126, 127, 128 defines the respective turning pair 120 of the articulated quadrilateral 101. Preferably, the first arm 103 and the second arm 104 have the same length, by length it being intended the distance between the two ends of each arm.

[0080] In particular, the first arm 103 and the second arm 104 are made of a plastic material, e.g. by means of molding, or otherwise made of metal material.

[0081] Advantageously, the articulated quadrilateral 101 of each protection device 100 is provided with multiple first and second arms 103, 104, distributed according to the extension direction X along the longitudinal extension of the movable wall 105 and of the support member 102.

[0082] According to the present invention, the protection device 100 also comprises actuation means 106 adapted to act on the articulated quadrilateral in order to move the movable wall 105 between a retreated position (illustrated in the example of figure 3) and an advanced position (illustrated in the example of figure 4).

[0083] In particular, as described in detail hereinbelow, the retreated position of the movable wall 105 corresponds with a rest condition of the protection device 100 in order to allow the correct positioning of the pitches of the sheet 11 when the latter is in collected position. The advanced position of the movable wall 105 corresponds with an operating condition of the protection device 100 in order to prevent the water, which falls from the sheet 11 (in extended position) inside the longitudinal gutter 15, from splashing outside the latter on the area below the sheet 11.

[0084] More in detail, in the retreated position (illustrat-

ed in the example of figure 3), the first and second arm 103, 104 are advantageously rotated closer to the support member 102, positioning the movable wall 105 side-by-side the corresponding longitudinal edge 12 of the sheet 11 in the collected position, so to not obstruct the pitches that are formed when the sheet 11 is collected.

[0085] Preferably, the movable wall 105 in the retreated position is arranged outside the cover volume A of the awning 1 and spaced from the open internal side 23 of the longitudinal gutter 15, so as to allow the passage of the pitches of the sheet 11 in collected position. In particular, in the retreated position, the external face 116 of the movable wall 105 is arranged next to the support member 102, in particular abutting against the latter, for example by means of an abutment body 129 made of elastic material fixed on the external face 116 of the movable wall 105 itself.

[0086] In the advanced position (illustrated in the example of figure 4), the first and second arm 103, 104 are advantageously rotated away from the support member 102, positioning the movable wall 105 below the sheet 11 in the extended position.

[0087] Preferably, the movable wall 105 in the advanced position is arranged within the cover volume A, below the lower face 11' of the sheet 11 in extended position, so as to allow the water, susceptible of falling from the sheet 11, to enter into the underlying longitudinal gutter 15.

[0088] In particular, the movable wall 105 in the advanced position is arranged in a zone placed below the sheet 11, which is extended substantially between the internal side 17 of the longitudinal gutter 15 and the projection of the longitudinal edge 12 of the sheet 11 on the longitudinal gutter 15, in a manner such that the water falls from the sheet 11 and enters into the longitudinal gutter 15, passing through the upper opening 19 of the latter between the movable wall 105 and the internal side 102 of the longitudinal gutter 15 itself. In this manner, in particular, the splashes of water, generated by the drops that fall on the bottom wall 22 of the longitudinal gutter 15 and directed towards the open internal side 23 of the latter, are intercepted by the movable wall 105 which therefore prevents their exit from the longitudinal gutter 15 itself.

[0089] In operation, during the displacement of the movable wall 105 between the retreated position and the advanced position, the first and second arm 103, 104 rotate respectively around the first and the third end 103', 104', modifying the distance respectively of the second and fourth end 103", 104" from the support member 102, in a manner such to consequently modify the distance of the movable wall 105 from the support member 102.

[0090] Advantageously, in accordance with the embodiment illustrated in figure 3, in the aforesaid retreated position, the movable wall 105 is arranged to cross the upper opening 19 of the corresponding longitudinal gutter 15 and spaced from the internal side 17, delimiting with the latter a passage 19' of the upper opening 19 intended, in particular, to be crossed by possible water which, in the step of moving the sheet 11 from the extended position or the collected position, falls from the pitches of the sheet 11 since it had been previous accumulated on the sheet 11 when it was in extended position.

[0091] In accordance with the embodiment illustrated in figure 4, the movable wall 105 in the advanced position is placed substantially to close the open internal side 23 delimited on the lower part by the internal side 17 of the longitudinal gutter 15. Consequently, the rainwater that falls from the extended sheet 11 into the longitudinal gutter 15 is constrained within the latter and cannot fall into the ground area below the sheet 11, going beyond the internal side 17 through the open internal side 23 of the longitudinal gutter 15.

[0092] Preferably, the movable wall 105 is arranged to cross the upper opening 19 of the longitudinal gutter 15 also in the advanced position, in particular maintaining its lower side 117 at a lower height than that of the internal side 17 of the longitudinal gutter 15, in particular so as to avoid leaving vertical slits on the open internal side 23 of the longitudinal gutter 15, through which water splashes could exit outward. Advantageously, the movable wall 105 in the advanced position is substantially next to the internal wall 20 of the longitudinal gutter 15, with a possible spacing margin in order to prevent the contact with the latter.

[0093] Preferably, the movable wall 105 is on its internal face 115 provided with a recess in which the internal side 17 of the longitudinal gutter 15 is arranged when the movable wall 105 is in advanced position. In particular, the movable wall 105 comprises an upper portion, extended between the aforesaid recess and the upper side 118 of the movable wall 105 itself, and a lower portion extended at the aforesaid recess between the upper portion and the lower side 117 of the movable wall 105. In this manner, in particular, when the movable wall 105 is in the advanced position, the upper portion of the movable wall 105 is arranged above the internal side 17 of the longitudinal gutter 15 on the open internal side 23, simultaneously allowing the maintenance of the lower portion in the upper opening 19 of the longitudinal gutter 15 without being obstructed by the internal wall 20 of the longitudinal gutter 15 itself.

[0094] In accordance with the preferred embodiment, illustrated in figures 3 and 4, the movable wall 105 in the advanced position is advantageously placed at a higher height than the retreated position. In this manner, in particular, the movable wall 105 in the advanced position covers the open internal side 23 of the longitudinal gutter 15 up to a height suitable for efficiently preventing the outward exit of the water splashes.

[0095] Preferably, the lateral termination 13 of each transverse profile 10 is provided with a thinned end portion 13' which delimits a cavity that is occupied by the movable wall 105 in advanced position. In this manner, the displacement of the movable wall 105 into the advanced position, in particular moving upward, is facilitat-

ed since the movable wall 105 can be moved towards the cover volume A of the awning 1 and advantageously towards the lower face 11' of the sheet 11 without being obstructed by the transverse profiles 10.

[0096] Advantageously, with reference to the example of figure 4, when the movable wall 105 is in the advanced position, the upper side 118 of the movable wall 105 is placed adjacent to the lower face 11' of the sheet 11 in extended position, and in particular substantially in contact with such lower face 11'. In this manner, in particular, the upper side 118 of the movable wall 105 is capable of intercepting possible water drops which flow from the longitudinal edge 12 of the sheet 11 onto the lower face 11' of the latter, preventing such water drops from falling from the longitudinal gutters 15 onto the underlying surface of the ground.

[0097] Preferably, the upper side 118 of the movable wall 105 is provided with a flexible element 119 adapted to come into contact with the lower face 11' of the sheet 11 in the extended position.

[0098] In particular, such flexible element 119 is extended over the entire longitudinal length of the movable wall 105 and is preferably fixed on an upper edge of the metal section of the movable wall 105 itself.

[0099] For example, the flexible element 119 comprises a brush or an elastic strap which are susceptible of being bent, being abutted against the lower face 11' of the sheet 11 when the movable wall 105 is in raised position.

[0100] In particular, the flexible element 119 is susceptible of being bent against the thinned end portions of the lateral terminations 13 of the transverse profiles 10, in a manner such that part of the flexible element 119 (e.g. part of the bristles of the brush) go beyond such end portions, reaching the lower face 11' of the sheet 11.

[0101] Preferably, when the movable wall 105 is in retreated position, the arms 103, 104 are rotated towards the support member 102, and in particular towards the corresponding longitudinal member 3, in order to guide the movable wall 105 away from the cover volume of the awning 1. When the movable wall 105 is in advanced position, the arms 103, 104 are rotated towards the cover volume of the awning 1, so as to guide the movable wall 105 under the sheet 11.

[0102] Suitably, the arms 103, 104 of the articulated quadrilateral 101 have limited extension according to the extension direction X (e.g. on the order of several centimeters) so as to allow the passage of the water within the longitudinal gutter 15 when the movable wall 105 is in advanced position.

[0103] Advantageously, the actuation means 106 comprise at least one cam follower 107 (in particular a tappet), fixed to the external face 116 of each movable wall 105, and at least one movable cam 109 (in particular a translating shape), slidably mounted on the corresponding longitudinal member 3 along a second longitudinal guide 32 parallel to the extension direction X.

[0104] Advantageously, in accordance with the embodiment illustrated in figures 5 and 6, the movable cam 109 is projectingly extended towards the external face 116 of the movable wall 105, and is provided with at least one engagement surface 110 directed towards the external face 116 of the movable wall 105 and adapted to act on the cam follower 107. In particular, the engagement surface 110 of the movable cam 109 is tilted with respect to the extension direction X, extended closer to the movable wall 105 according to the second advancing sense V2 of the transverse profiles 10.

[0105] For example, the movable cam 109 of the actuation means 106 substantially has the form of a prism with triangular base with one lateral face in abutment against the longitudinal member 3 with which it is slidably engaged, and the remaining two lateral faces protruding, in projection from the longitudinal member 3 itself, towards the external face 116 of the movable wall 105.

[0106] Advantageously, the cam follower 107 is projectingly placed on the external face 116 of the movable wall 105 and is provided with a contact surface 108, in particular directed towards the corresponding longitudinal member 3 of the awning 1, and adapted to abut against the engagement surface 110 of the movable cam 109 in order to follow the profile thereof.

[0107] In particular, the contact surface 108 of the cam follower 107 is tilted with respect to the extension direction X extended away from the movable wall 105 according to the second advancing sense V2 of the transverse profiles 10.

[0108] For example, the cam follower 107 of the actuation means 106 substantially has the form of a prism with triangular base with lateral face in abutment against the external face 116 of the movable wall 105 on which it is fixed, and the remaining two lateral faces protruding, in projection from the external face 116 itself, towards the support member 102.

[0109] In operation, each movable cam 109 is adapted to thrust against the corresponding cam follower 107 in order to move the movable wall 105 between the retreated position and the advanced position. More in detail, one of the two protruding lateral faces of the movable cam 109, which defines the aforesaid engagement surface 110, is susceptible of sliding on a corresponding protruding lateral face of the cam follower 107, which defines the aforesaid contact surface 108, in order to push the cam follower 107 towards the cover volume A of the awning 1.

[0110] Advantageously, the actuation means 106 comprise multiple cam followers 107 and multiple movable cams 109 distributed, preferably equidistant, along the longitudinal extension respectively of the movable wall 105 and of the longitudinal member 3.

[0111] As stated above, the driving means for the present awning 1 are configured in order to move the transverse profiles 10 in the first advancing sense VI, in which they move the sheet 11 from the extended position to the collected position, and in the second advancing sense V2, in which they move the sheet 11 from the col-

lected position to the extended position.

[0112] Advantageously, the transverse profiles 10, moved in the second advancing sense V2, are susceptible of abutting against the movable cams 109, pushing them in the second advancing sense V2 and bringing them to abut against corresponding cam followers 107 fixed to the movable wall 105, in order bring the latter into advanced position. Advantageously, the actuation means 106 also comprise a return element 112 constrained to the support structure 2 and fixed to the movable cam 109. The return element 112 is provided with at least one elastic component 113 extensible according to the extension direction X and comprising for example a spring.

[0113] The elastic component 113 of the return element 112 is advantageously loaded during the displacement of the movable cam 109 in the second advancing sense V2. Consequently, the return element 112 exerts, on the movable cam 109, a return force in the first advancing sense V1, in a manner such that when the transverse profiles 10 are moved in the first advancing sense V1 in order to bring the sheet 11 into collected position, such return force brings the movable cam 109 to be moved in the same first advancing sense V1, in order to disengage the corresponding cam follower 107 and bring the movable wall 105 back into retreated position.

[0114] In accordance with the preferred embodiment illustrated in figures 7 and 8, the return element 112 comprises a cable 114 extended along the extension direction X, to which the movable cams 109 are fixed. Such cable 114 is constrained, at a first end thereof, to the support structure 2 of the awning 1, for example to one of the ends (e.g. the front end 4) of the longitudinal member 3, and at a second end thereof to the elastic component 113, which is constrained to the support structure 2, in particular to the other of the ends (e.g. the rear end 5) of the longitudinal member 3.

[0115] In operation, the movable cams 109, being moved in the second advancing sense V2, thrust by the transverse profiles 10, drive the cable 114 integral therewith, elongating the spring of the elastic component 113 and loading it. The spring thus loaded generates a return force which is exerted on the movable cam 109 and which brings the latter to disengage the corresponding cam follower 107 when the transverse profiles 10 are moved in the first advancing sense V1.

[0116] Advantageously, in accordance with the preferred embodiment in which the actuation means 106 of the protection device 100 comprise multiple movable cams 109, the cable 114 is integral with each of these in order to simultaneously move each movable cam 109 to be disengaged from the corresponding cam follower 107.

[0117] Advantageously, in accordance with the preferred embodiment illustrated in figure 9, each movable cam 109 (which in the illustration of figure 9 is partially covered by the movable wall 105) is provided with a through hole 130, through which the cable 114 of the return element 112 is inserted. The cable 114 is advantageously integral with each movable cam 109 by means of a pair of pawls 111 fixed to the cable 114 and respectively placed upstream and downstream of the movable cam 109, in abutment against the latter.

[0118] As stated above, in accordance with the preferred embodiment illustrated in figures 3 and 4, the movable wall 105 in the advanced position is advantageously placed at a higher height than the retreated position. Advantageously, then, the movable wall 105 is susceptible of passing from the advanced position to the retreated position, falling via gravity, when the movable cam 109 is disengaged from the cam follower 107.

[0119] Also forming an object of the present invention is a method for operating an outdoor awning of the above-described type, regarding which the same nomenclature will be employed hereinbelow for the sake of description simplicity.

[0120] The operating method comprises a first step of moving the sheet 11, in which the driving means actuate the transverse profiles 10 to slide along the first longitudinal guides 31 in order to move the sheet 11 in the second advancing sense V2 from the collected position to the extended position.

[0121] In accordance with the idea underlying the present invention, the aforesaid operating method also comprises a step of actuating the protection device 100, in which, during the first moving step, the actuation means 106 actuate the articulated quadrilateral 101 to move the movable wall 105 from the retreated position to the advanced position according to a movement trajectory having at least one horizontal component and at least one vertical component.

[0122] More in detail, during the first moving step, the transverse profiles 10 are brought into abutment against the movable cam 109, actuating it to slide along the second longitudinal guide 32 of the longitudinal member 3 in the second advancing sense V2 up to in turn abutting against the cam follower 107.

[0123] During the actuating step, the movable cam 109 slides with its engagement surface 110 on the contact surface 108 of the corresponding cam follower 107, pushing the latter towards the center of the awning 1 along a horizontal trajectory.

[0124] The displacement of the cam follower 107 towards the cover volume A of the awning 1 involves the opening of the articulated quadrilateral 101, with the first and second arm 103, 104 which respectively rotate around the first and third end 103', 104', lifting the movable wall 105 and moving it in the advanced position.

[0125] During the actuating step, the displacement of the movable cam 109 along the second advancing sense V2 advantageously loads the elastic component 113 of the return element 112, exerting a return force on the movable cam 109 in the first advancing sense V1.

[0126] Advantageously, the method for operating the outdoor awning 1 provides for a second step of moving the sheet 11, in which the driving means actuate the transverse profiles 10 to slide along the first longitudinal

guides 31 in order to move the sheet 11 in the first advancing sense V1 from the extended position to the collected position.

[0127] In such second moving step, the transverse profiles 10 are moved away from the movable cam 109. Consequently, the movable cam 109 is moved in the first advancing sense V1 by the return force exerted by the elastic component 113 of the return element 112, disengaging the cam follower 107.

[0128] The movable wall 105 is then free to fall via gravity, being moved from the advanced position to the retreated position by means of a rotation of the first and second arm 103, 104 around the corresponding first and third end 103', 104'.

[0129] Advantageously, the movable wall 105 in the retreated position opens the open internal side 23 delimited by the internal side 17 of the longitudinal gutter 15, and allows the sheet 11 to be bent into pitches without encountering the bulk of the movable wall 105.

[0130] The outdoor awning 1 and the operating method thus conceived therefore attain the pre-established objects.

Claims

1. Outdoor awning, which comprises:

- a support structure (2) provided with at least two longitudinal members (3) that are parallel to each other, each of which longitudinally extended along an extension direction (X) and provided with a first longitudinal guide (31) parallel to said extension direction (X);
- multiple transverse profiles (10) arranged between said longitudinal members (3) orthogonal to said extension direction (X), and slidably engaged with the first longitudinal guides (31) of said longitudinal members (3);
- at least one sheet (11) made of flexible material, which is supported by said transverse profiles (10) and is extended between two longitudinal edges (12) which are positioned along the respective longitudinal members (3);
- driving means mechanically connected to said transverse profiles (10) and adapted to move said transverse profiles (10) along the first longitudinal guides (31) of said longitudinal members (3), in order to move said sheet (11) between an extended position, in which said sheet (11) is substantially extended above an underlying surface of the ground, and a collected position, in which said transverse profiles (10) are next to each other with said sheet (11) collected in a plurality of side-by-side pitches, each of which extended between a pair of said successive transverse profiles (10);

said support structure (2) comprising at least one longitudinal gutter (15) at least partially positioned below said sheet (11) at the respective longitudinal edge (12) of said sheet (11);

said awning comprising at least one protection device (100) mechanically connected to said support structure (2), arranged at said longitudinal gutter (15) and actuatable to prevent drops of rainwater that fell into said longitudinal gutter (15) from being splashed outside said longitudinal gutter (15);

said awning being **characterized in that** said protection device (100) comprises:

- an articulated quadrilateral (101) which is provided with:
  - a support member (102) connected to said support structure (2);
  - a movable wall (105), longitudinally extended along said extension direction (X);
  - at least one first arm (103) and at least one second arm (104) placed to connect between said support member (102) and said movable wall (105);
- actuation means (106) adapted to act on said articulated quadrilateral (101) in order to move said movable wall (105) between:
  - a retreated position, in which said first and second arm (103, 104) position said movable wall (105) side-by-side the corresponding longitudinal edge (12) of said sheet (11) arranged in said collected position;
  - an advanced position, in which said first and second arm (103, 104) position said movable wall (105) below said sheet (11) arranged in said extended position.

2. Outdoor awning according to claim 1, **characterized in that** said articulated quadrilateral (101) is an articulated parallelogram.

3. Outdoor awning according to claim 2, wherein said longitudinal gutter (15) is provided with an internal side (17), arranged below said sheet (11), and an external side (18), and such internal side (17) and external side (18) delimit an upper opening (19) between them, through which the water that fell from said sheet (11) is susceptible of entering into said longitudinal gutter (15), said internal side (17) delimiting an open internal side (23) crossed by the pitches of said sheet (11) in said collected position; said awning being **characterized in that**:

- said movable wall (105) in said retreated position is arranged to cross said upper opening (19) and is spaced from said internal side (17), delimiting with said internal side (17) a passage (19') of said upper opening (19);
- said movable wall (105) in said advanced position is substantially arranged to close said open internal side (23).

4. Outdoor awning according to any one of the preceding claims, **characterized in that** said movable wall (105) is provided with an internal face (115) directed towards said transverse profiles (10), and with an external face (116) directed in the opposite sense with respect to said internal face (115);
said actuation means (106) comprising:

- at least one cam follower (107) fixed on the external face (116) of said movable wall (105);
- at least one movable cam (109), slidably mounted on the corresponding said longitudinal member (3) along a second longitudinal guide (32) parallel to said extension direction (X), and adapted to act on said cam follower (107) in order to move said movable wall (105) between said retreated position and said advanced position.

5. Outdoor awning according to claim 4, **characterized in that**:

- said driving means are configured for moving said transverse profiles (10) in a first advancing sense (VI) in which they move said sheet (11) from said extended position to said collected position, and in a second advancing sense (V2) in which they move said sheet (11) from said collected position to said extended position and move said movable cam (109) into said second advancing sense (V2), bringing said movable cam (109) to act on said cam follower (107) fixed to said movable wall (105);
- said actuation means (106) comprise a return element (112) constrained to said support structure (2) and fixed to said movable cam (109), and provided with at least one elastic component (113) extensible according to said extension direction (X) and loaded to exert, on said movable cam (109), a return force in said first advancing sense (VI) in order to disengage said cam follower (107) from said movable cam (109).

6. Outdoor awning according to any one of the preceding claims, **characterized in that** said movable wall (105) in said advanced position is placed at a higher height than said retreated position.

7. Outdoor awning according to claim 6, wherein said sheet (11) is provided with a lower face (11') which, with said sheet (11) in said extended position, is intended to be directed towards said surface of the ground;
said awning being **characterized in that** said movable wall (105) is extended, transverse to said extension direction (X), between a lower side (117) and an upper side (118), and such upper side (118), with said movable wall (105) in said advanced position, is placed adjacent to the lower face (11') of said sheet (11) arranged in said extended position.

8. Outdoor awning according to claim 7, **characterized in that** the upper side (118) of said movable wall (105) is provided with a flexible element (119) which, with said movable wall (105) in said advanced position, is in contact with the lower face (11') of said sheet (11) in said extended position.

9. Outdoor awning according to any one of the preceding claims, **characterized in that** the support member (102) of said articulated quadrilateral (101) is integral with said corresponding longitudinal member (3).

10. Method for operating an outdoor awning according to any one of the preceding claims, such method comprising a step of moving said sheet (11), in which said driving means actuate said transverse profiles (10) to slide along said first longitudinal guides (31) in order to move said sheet (11) between said collected position and said extended position;
said method being **characterized in that** it also comprises a step of actuating said protection device (100), in which, during said movement step, said actuation means (106) actuate said articulated quadrilateral (101) to move said movable wall (105) between said retreated position and said advanced position according to a movement trajectory having at least one horizontal component and at least one vertical component.

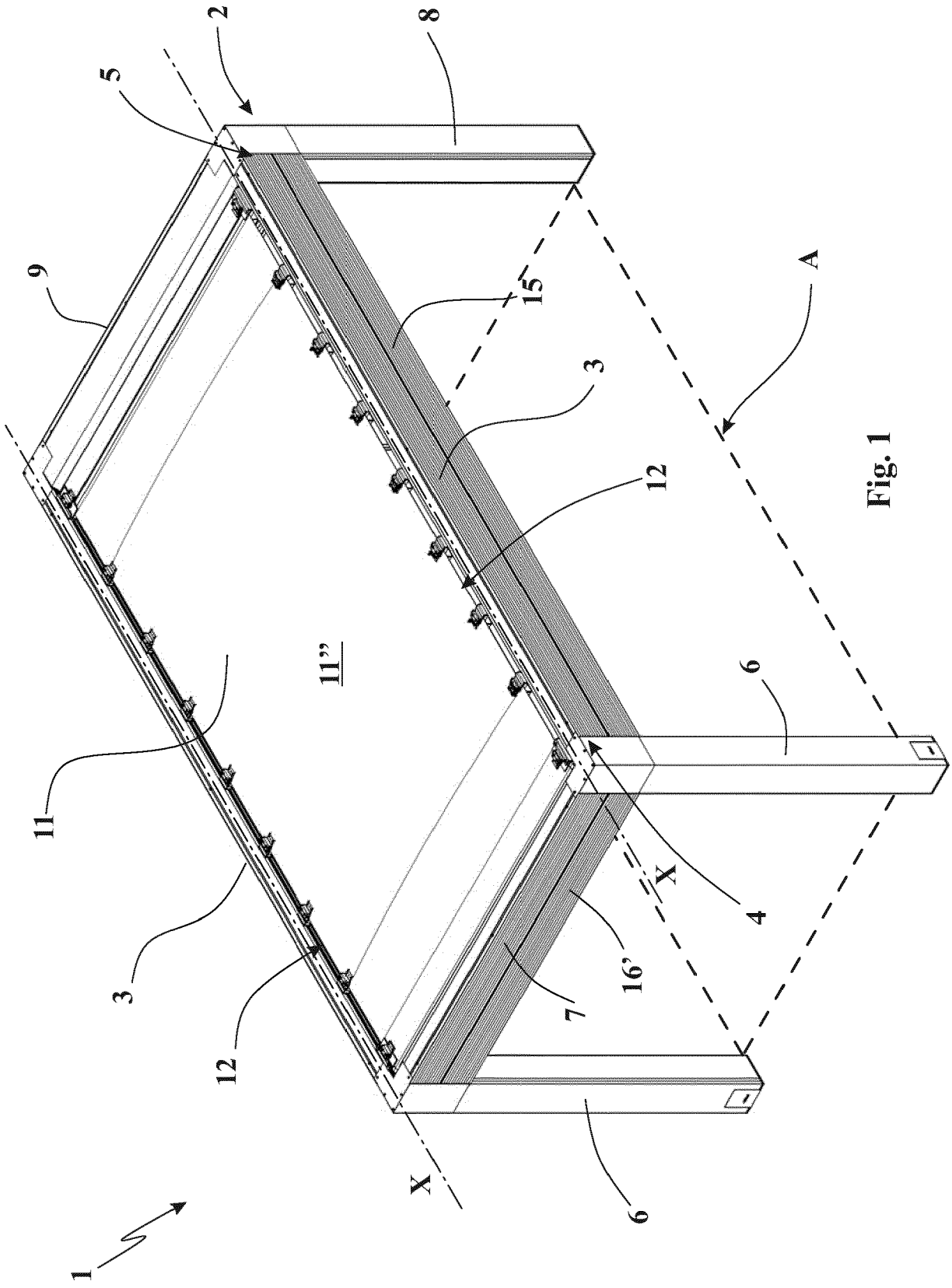


Fig. 1

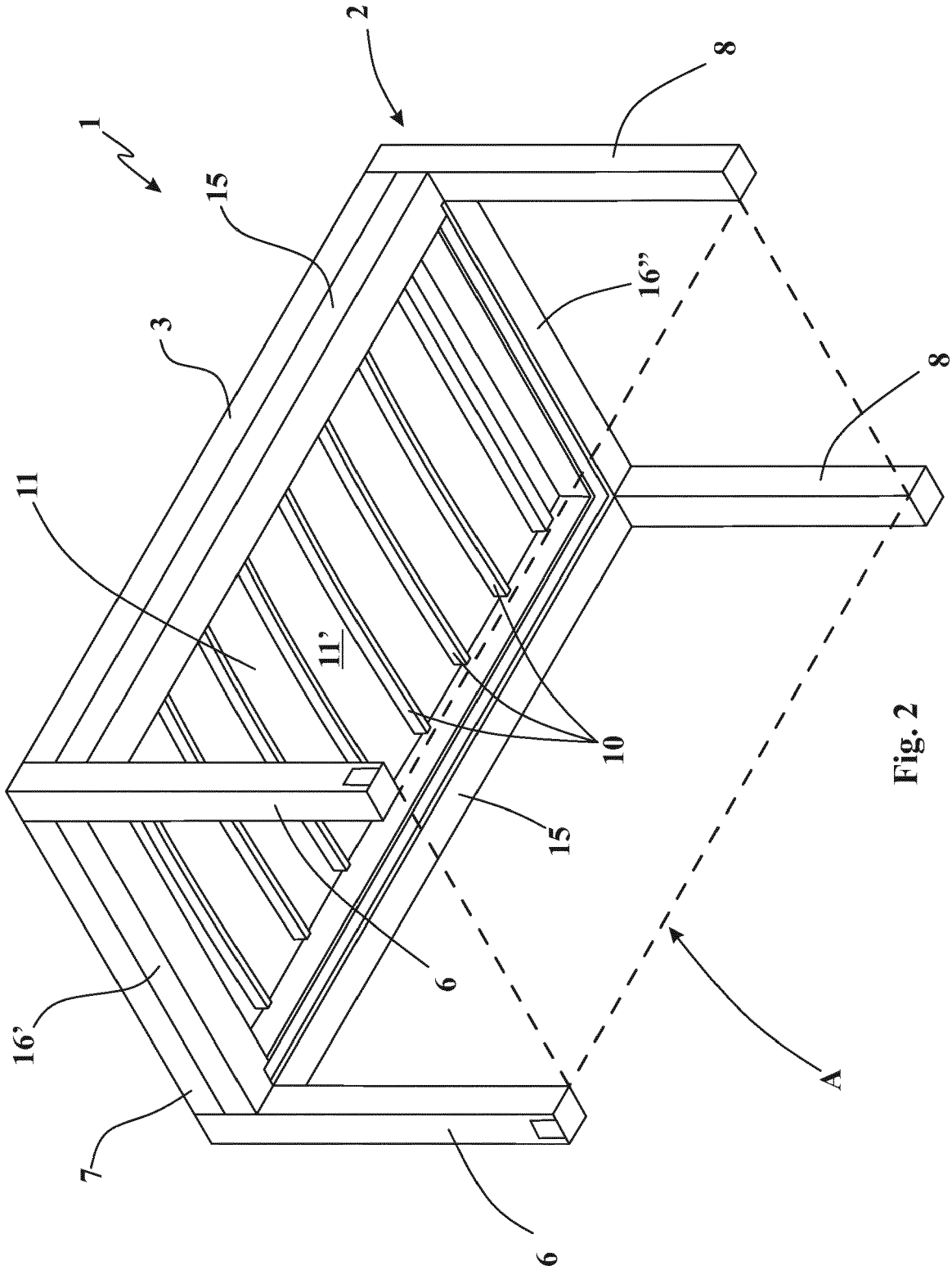
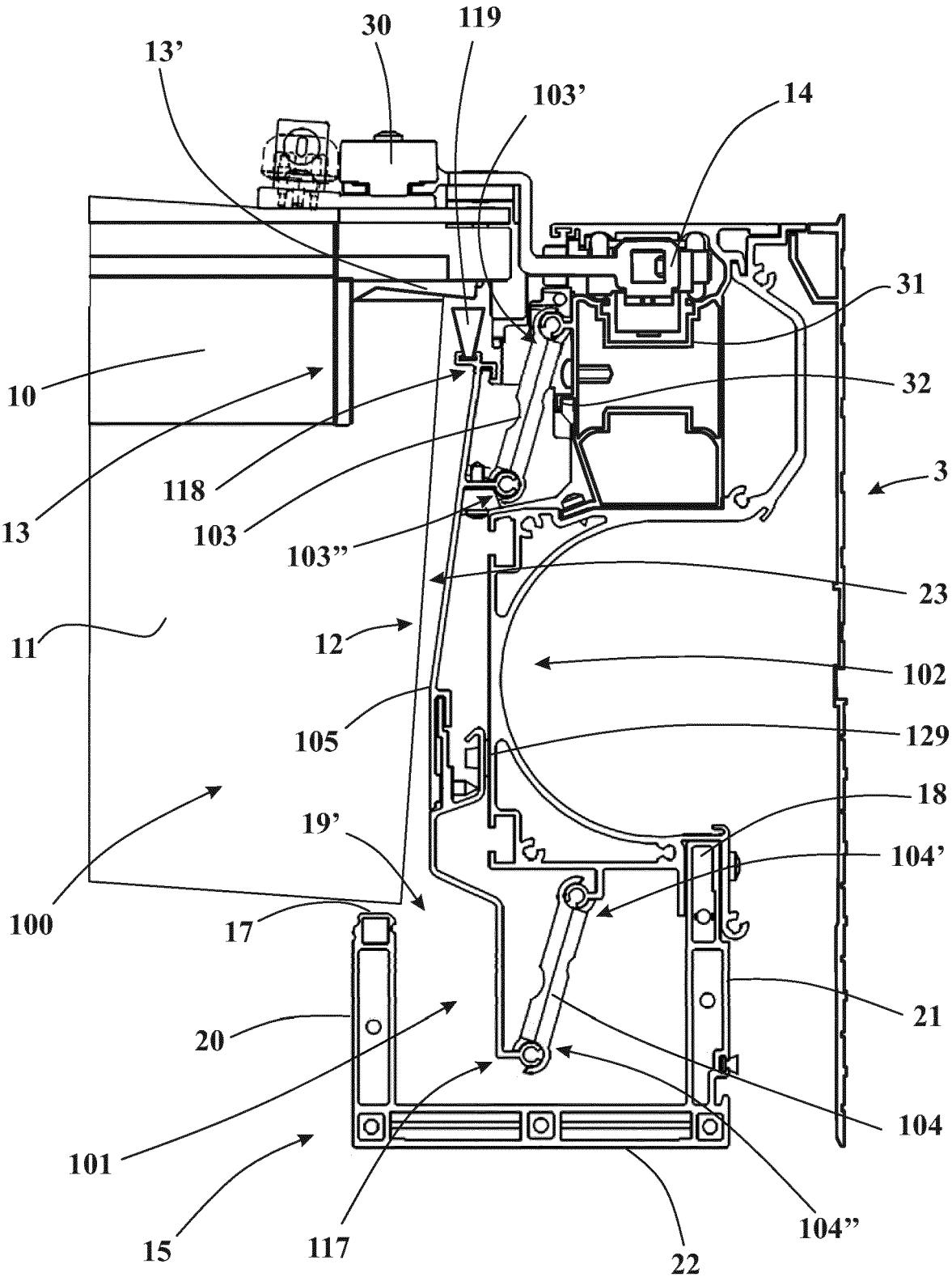


Fig. 2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103'
14
31
10
32
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23
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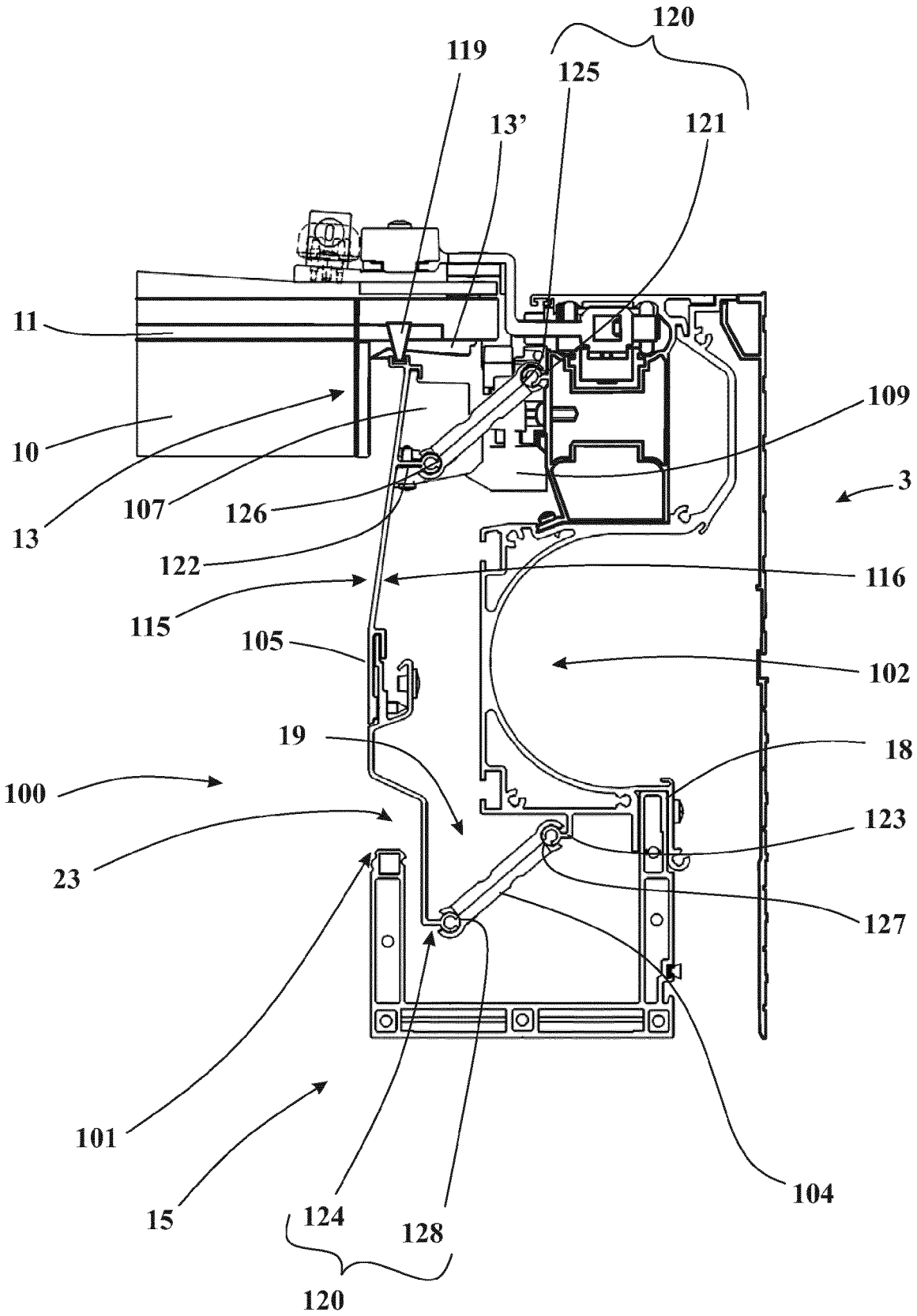
19'
104'
100
17
21
20
104
101
104"
15
117
22

Fig. 3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121
11
10
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107
126
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15
124
128
120

Fig. 4

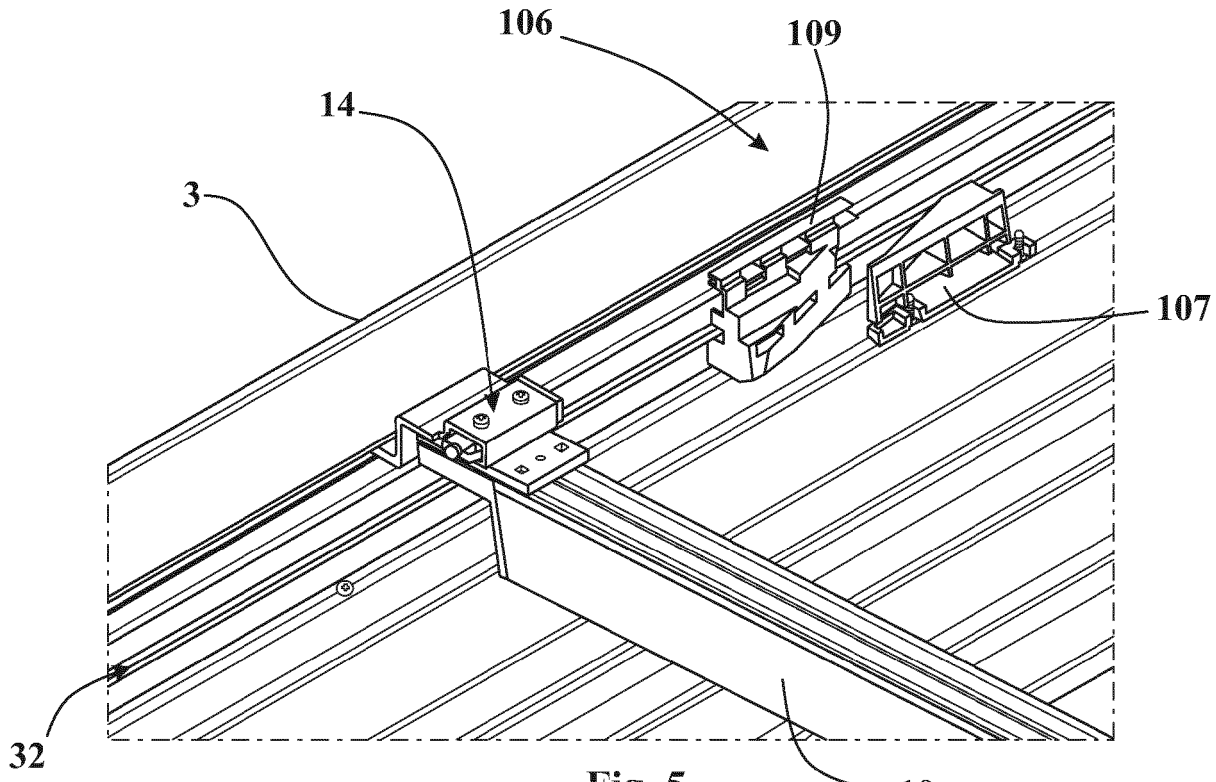

Fig. 5

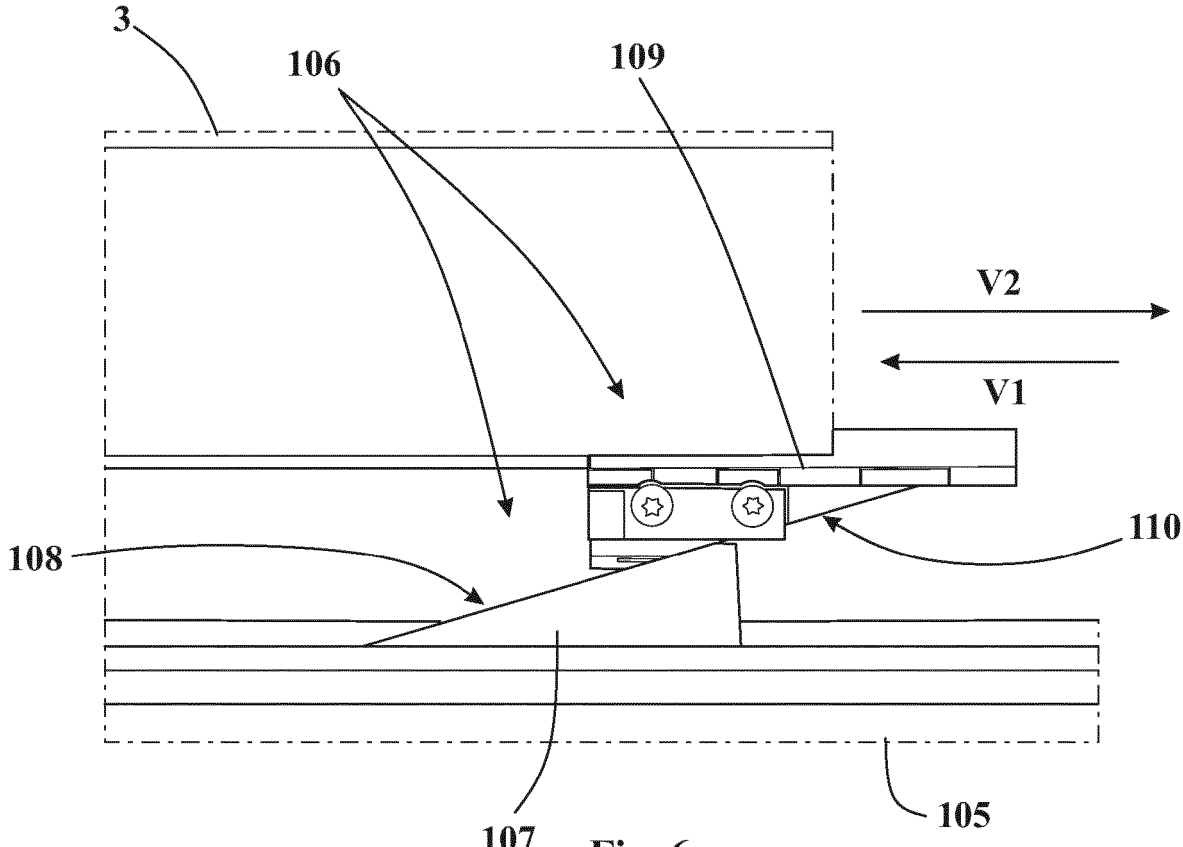

Fig. 6

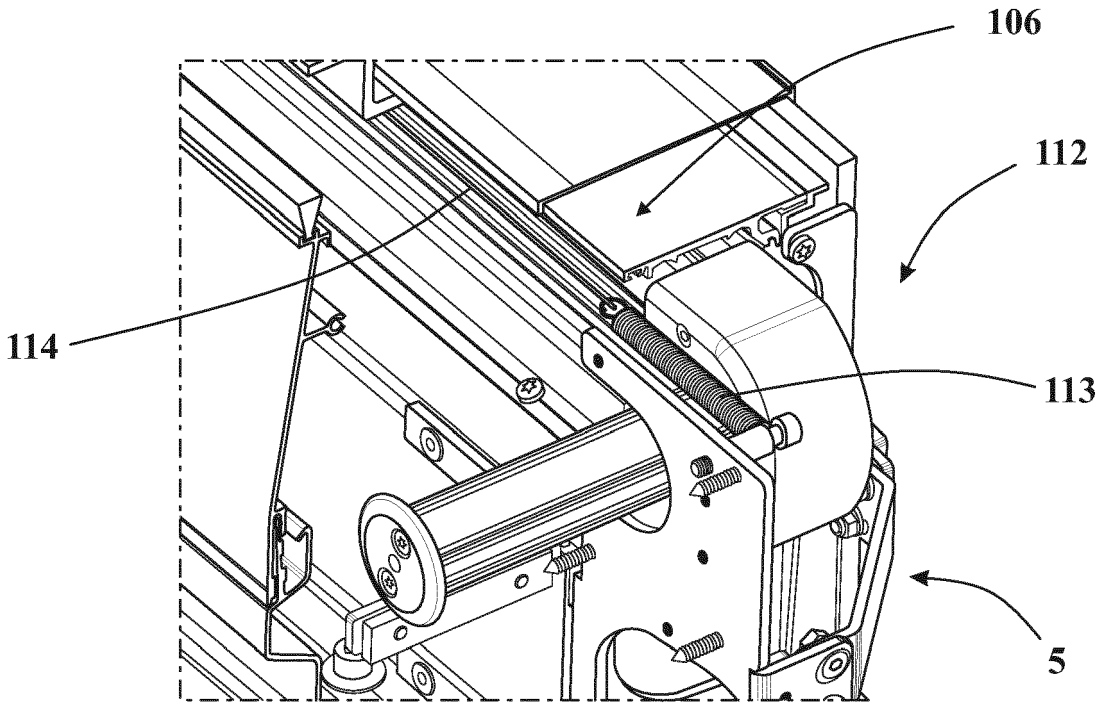

Fig. 7

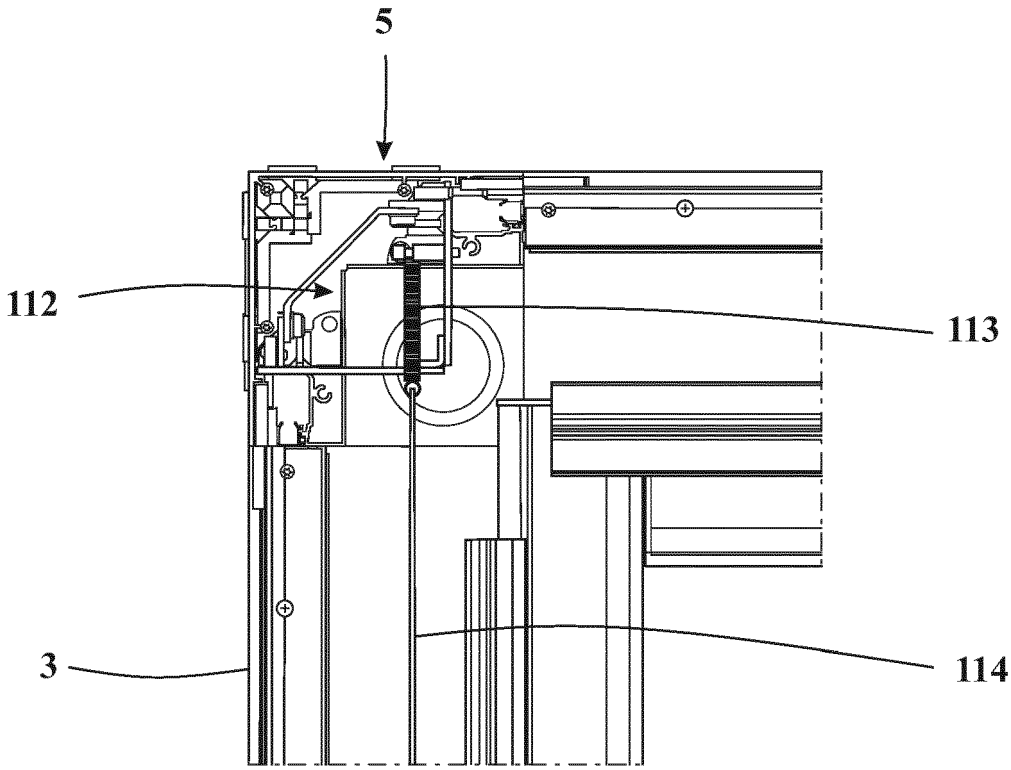

Fig. 8

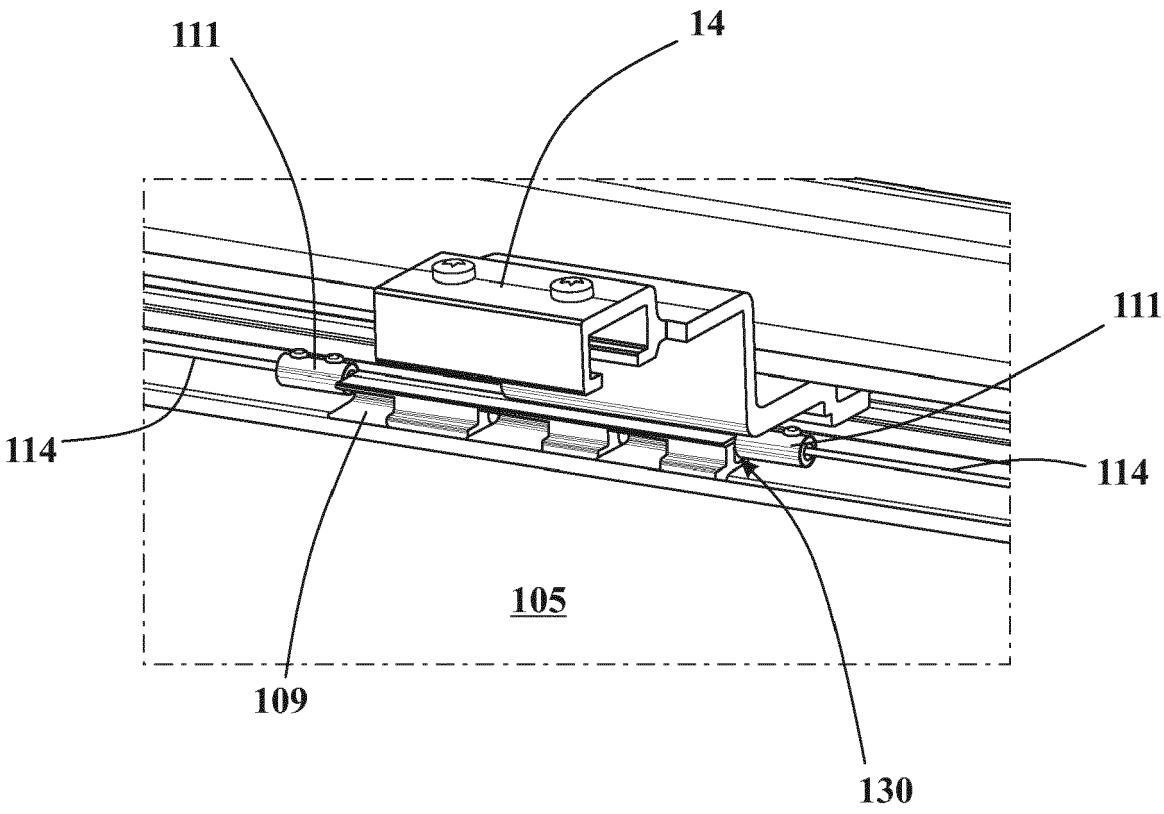

Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 18 20 7411

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 10 2016 001390 B3 (ELMENDORFF MICHAEL [DE]) 6 July 2017 (2017-07-06) * figures 1-4 *	1-10	INV. E04H15/18 E04H15/58 E04F10/02
A	DE 20 2014 003825 U1 (SCHMITZ WERKE [DE]) 5 June 2014 (2014-06-05) * figure 1 *	1-10	
A	GB 2 291 901 A (SMEADON JOHN DOUGLAS [GB]) 7 February 1996 (1996-02-07) * figure 1 *	1-10	

TECHNICAL FIELDS SEARCHED (IPC)
E04H
E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	6 March 2019	Brucksch, Carola

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06-03-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102016001390 B3	06-07-2017	NONE	
DE 202014003825 U1	05-06-2014	NONE	
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82