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(54) COVERING APPARATUS AND METHOD FOR MOUNTING SUCH A COVERING APPARATUS

(57) Covering apparatus (1), which comprises a support structure (2) provided with two lateral crosspieces (21), with a series of covering blades (3) supported by the lateral crosspieces (21), and with movement means (4) arranged for rotating the covering blades (3) around a corresponding rotation axis (R) and comprising a movement bar (40), movable along a plane orthogonal to the rotation axis (R) of the covering blades (3) in order to rotate them.

Each covering blade (3) comprises a first pin (32) rotatably constrained to the movement bar (40), and a second pin (33) rotatably constrained to the corresponding lateral crosspiece (21).

In addition, the movement bar (40) is provided with multiple first housing seats (5), each of which extended from a first passage opening (51) to a first abutment portion (52), which engagingly receives the first pin (32).

The covering apparatus (1) also comprises multiple first retention elements (6), each inserted in the corresponding first housing seat (5), engaged with the movement bar (40) and provided with a first blocking portion (61) in order to retain the first pin (32) within the first housing seat (5).

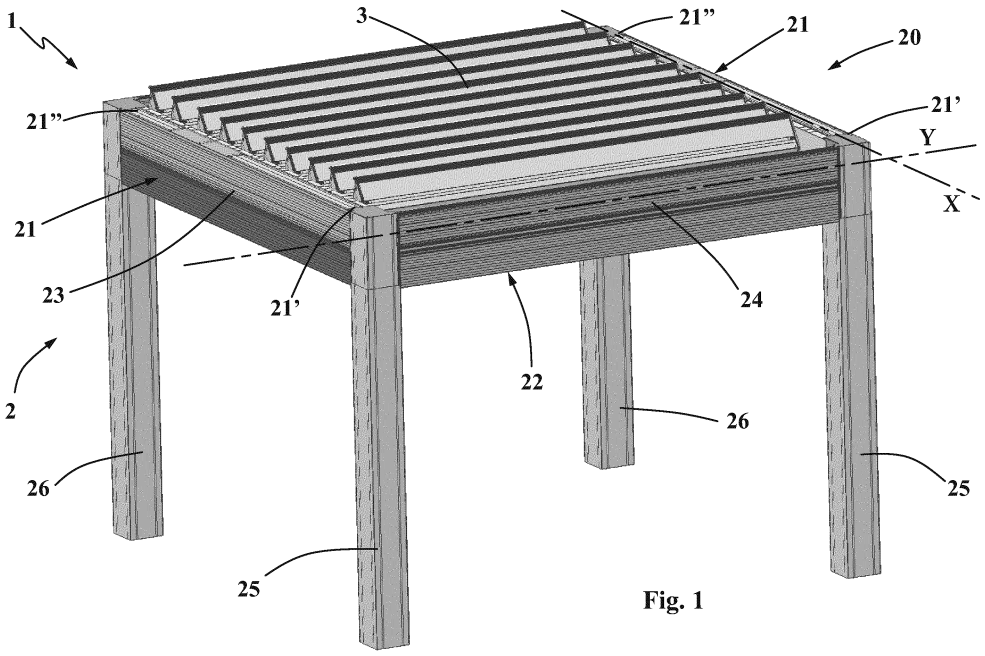

Fig. 1

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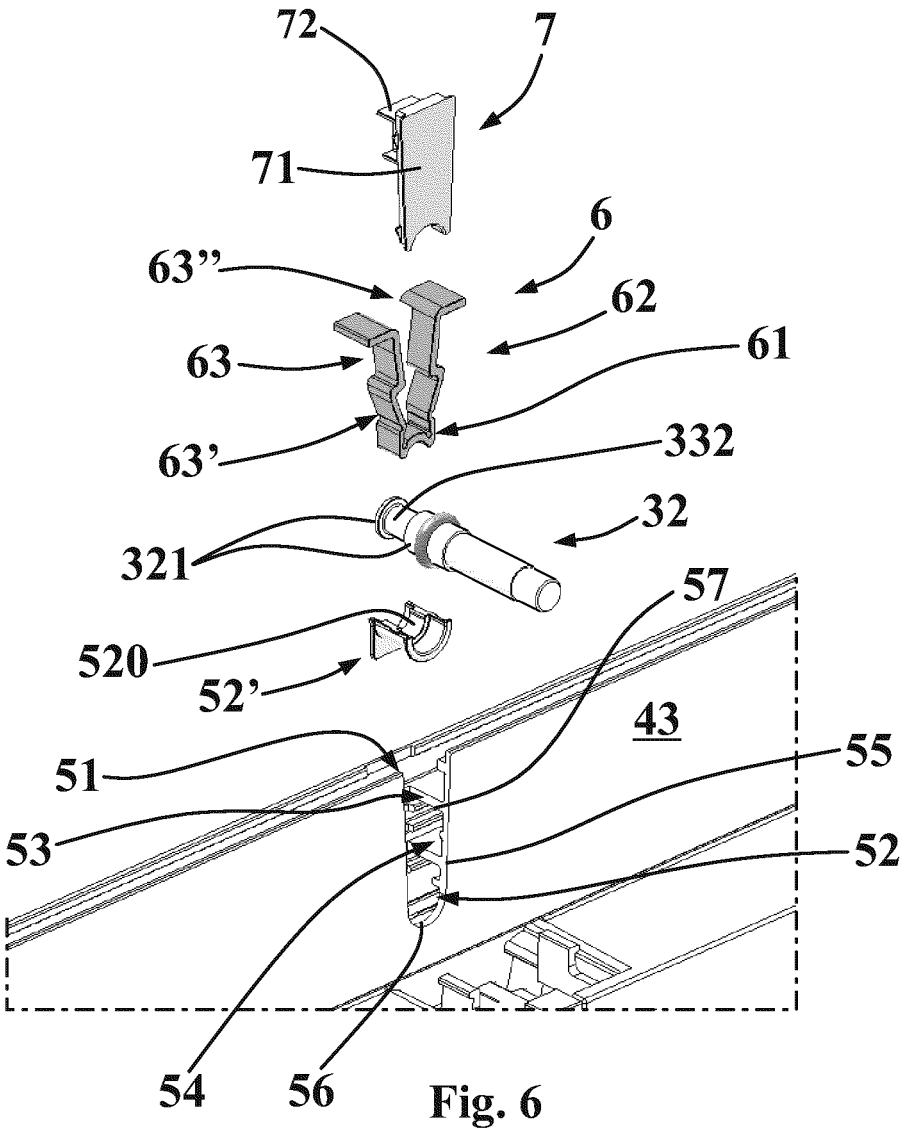

Fig. 6

Description

Field of application

[0001] The present invention regards a covering apparatus and a method for mounting a covering apparatus according to the preamble of the independent claims.

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

[0003] The present covering apparatus and method are indicated for making pergolas, verandas and more generally covering structures, both in gardens of private homes and in open spaces of public places, such as for example restaurants, hotels, bathing establishments or other structures.

[0004] The present covering apparatus and method of the present invention therefore fall within the industrial sector of the production of blinds for covering outside environments.

State of the art

[0005] Known on the market are numerous solutions of covering apparatuses for outdoor settings, termed brise soleil in the jargon of the field, which comprise a support structure, e.g. with canopy, fixed to the ground and provided with two lateral longitudinal members which support a series of oscillating blades adapted to protect an underlying ground surface.

[0006] Known for example are brise soleil covering apparatuses comprising a series of oscillating blades, each of which provided at the ends thereof with rotation pins hinged to the corresponding longitudinal members.

[0007] Such apparatuses also comprise movement means connected to the oscillating blades in order to actuate the latter to rotate between a closed position, in which the blades are placed substantially horizontal and partially superimposed on each other in order to prevent the passage of light and/or rain, and an open position, in which the blades are placed tilted, between them delimiting openings for the passage of light.

[0008] More in detail, the aforesaid movement means comprise two movement bars placed along the respective lateral longitudinal members and connected to the respective ends of the blades.

[0009] In particular, each blade is provided, at each end thereof, with a first pin, hinged to the corresponding lever pivoted to the corresponding movement bar, and with a second pin, hinged to the corresponding lateral longitudinal member, in a manner such to form, in substance, an articulated parallelogram kinematic mechanism.

[0010] In installation step, after the mounting of the support structure, the blades are rotatably mounted on the lateral longitudinal members by means of the corresponding second pins and are hinged to the movement bars by means of the corresponding first pins. The above-described covering apparatuses have in practice shown that they do not lack drawbacks.

[0011] A first drawback of the aforesaid known covering apparatuses lies in the fact that, in installation step, the mounting of the blades results long and complex, in particular since each second pin is connected to the respective movement bar by means of a corresponding screw, which must be inserted in a corresponding through hole of the movement bar on the side opposite the covering blade and screwed in a threaded hole made in the second pin itself. Therefore, since the apparatus can also comprise more than twenty covering blades, its mounting results not only very lengthy, having to tighten overall two screws for each covering blade (one per side), but also complex, since the tightening point is hard to identify and hard for the operators to reach.

[0012] Such problem is even more significant, the larger the covering apparatus is - i.e. such apparatus is provided with a greater number of covering blades.

[0013] A further drawback of the covering apparatuses of known type lies in the fact that, due to the above-described long and complex operations, also the inspection and maintenance of the parts inside the longitudinal members are consequently difficult to achieve, together with the disassembly for the possible substitution of the covering blades, in order to carry out cleaning operations, for maintenance and for accessing the upper part of the apparatus.

Presentation of the invention

[0014] In this situation, the problem underlying the present invention is therefore that of eliminating the drawbacks of the abovementioned solutions of known type, by providing a covering apparatus whose covering blades can be installed in a simple and quick manner.

[0015] A further object of the present invention is to provide a covering apparatus which also allows executing the maintenance and disassembly operations in a simpler and quicker manner.

[0016] A further object of the present invention is to provide a covering apparatus which is structurally simple and inexpensive to make.

[0017] A further object of the present invention is to provide a method for mounting a covering apparatus which is simple and quick to actuate.

Brief description of the drawings

[0018] The technical characteristics of the present invention, according to the aforesaid objects, can be clearly seen in the contents of 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 covering apparatus, object of the present invention;
- figure 2 shows a perspective view of a detail of the covering apparatus relative to a lateral crosspiece, to a movement bar and to the covering blades;
- figure 3 shows a perspective view from another angle of the detail of figure 2, with several components of the covering blades removed or transparent in order to better underline other components of the covering apparatus;
- figure 4 illustrates a front view of the detail of figure 3;
- figure 5 illustrates a perspective view of a detail relative to a portion of the movement bar at a point of connection with a covering blade by means of a corresponding first retention element;
- figure 6 illustrates an exploded perspective view from another angle of the detail in figure 5;
- figure 7 illustrates a perspective view of the first retention element illustrated in figures 5 and 6;
- figure 8 illustrates a front view of the first retention element of figure 7;
- figure 9 illustrates a perspective view of the closure body in figures 5 and 6, in accordance with the preferred embodiment of the invention;
- figure 10 illustrates a perspective view of a detail relative to a portion of a lateral crosspiece of the apparatus at a point of connection with a covering blade;
- figure 11 illustrates an exploded perspective view of the detail in figure 10.

Detailed description of a preferred embodiment

[0019] With reference to the enclosed drawings, reference number 1 overall indicates the covering apparatus, object of the present invention.

[0020] The present covering apparatus 1 is indicated for making pergolas, verandas and more generally structures for covering outside environments, such as for example gardens of private homes and open spaces of public places such as restaurants, hotels, bathing establishments etc.

[0021] In accordance with the embodiment illustrated in the enclosed figures the present covering apparatus 1 comprises a support structure 2 provided with a framework 20, advantageously quadrangular, which comprises two lateral crosspieces 21 that are parallel to and side-by-side each other. In addition, the support structure also preferably comprises two front crosspieces 22 that are parallel to and side-by-side each other, placed to connect the lateral crosspieces 21.

[0022] More in detail, each lateral crosspiece 21 is longitudinally extended, advantageously between a head portion 21' and a bottom portion 21", along a corresponding first extension direction X that is preferably substantially horizontal, and advantageously each front crosspiece 22 is longitudinally extended along a corresponding second extension direction Y substantially orthogonal to the first extension directions X of the lateral crosspieces 21.

[0023] In particular, one of the two front crosspieces 22 is placed to connect the head portions 21' of the lateral crosspieces 21, and the other of the front crosspieces 22 is placed to connect the bottom portions 21" of the lateral crosspieces 21 themselves. Advantageously, each crosspiece 21 and 22 of the support structure 2 respectively comprises a first and a second elongated profile 23 and 24, each preferably obtained with a metallic extrusion, in particular made of aluminum.

[0024] Advantageously, the support structure 2 comprises, in addition, two first columns 25 abutted against the ground, each of which supports the head portion 21' of the corresponding lateral crosspiece 21.

[0025] Preferably, the support structure 2 further comprises two second columns 26 placed to support the bottom portions 21" of the corresponding lateral crosspieces 21, in this manner attaining a load-bearing structure in particular with substantially parallelepiped shape.

[0026] Otherwise, in accordance with a different embodiment variant not illustrated in the enclosed figures, the support structure 2 of the covering apparatus 1 is leaned against a vertical wall (such as for example the wall of a building), to which the head portions 21' or the bottom portions 21" of the lateral crosspieces 21 are anchored.

[0027] In accordance with a further different embodiment variant not illustrated in the enclosed figures, the head portions 21' and the bottom portions 21" of the lateral crosspieces 21 of the support structure 2 are supported respectively by a first and by a second vertical wall that are facing each other, in a manner such that the support structure 2 of the covering apparatus 1 is interposed between the two aforesaid vertical walls. Advantageously, the aforesaid lateral crosspieces 21 and front crosspieces 22 of the framework 20 of the support structure 2 between them delimit an upper opening of the support structure 2 itself, placed above a ground surface intended to be protected by the covering apparatus 1.

[0028] According to the present invention, the covering apparatus 1 comprises a series of covering blades 3 placed one after the other according to the aforesaid first extension direction X of the lateral crosspieces 21, preferably from the head portions 21' to the bottom portions 21" of the lateral crosspieces 21, and advantageously actuatable in order to close the aforesaid upper opening of the support structure 2, so as to respectively cover the underlying ground surface in order to protect the latter from the sun and/or rain.

[0029] Of course, without departing from the protective scope of the present invention, the succession of the aforesaid covering blades 3 can be considered, in an entirely equivalent manner, in the direction opposite that considered above, i.e. from the bottom portions 21" to the head portions 21" of the lateral crosspieces 21.

[0030] Each covering blade 3 is extended, according to a longitudinal axis W thereof substantially orthogonal

to the first extension direction X (and preferably substantially horizontal), between two opposite ends 31 supported by the respective lateral crosspieces 21.

[0031] According to the present invention, the covering apparatus 1 comprises movement means 4 mechanically connected to the covering blades 3 and arranged for rotating each of the covering blades 3 around a corresponding rotation axis R, parallel to the longitudinal axis W, between a closed position and at least one open position.

[0032] In particular, the movement of the covering blades 3 between the closed position and the open position is any one movement that has at least one rotary component, for example a pure rotation movement (hence in particular with fixed rotation axis R) or a rotational-translational movement (hence in particular with movable rotation axis R). According to the invention, the movement means 4 comprise a movement bar 40, which is longitudinally extended along a main direction L substantially parallel to the first extension direction X and is extended, transverse to the main direction L, between an upper longitudinal edge 41 and a lower longitudinal edge 42.

[0033] Advantageously, the movement bar 40 is extended in thickness, in a direction parallel to the rotation axis R of the covering blades 3, between an internal face 43, directed towards the covering blades 3, and an external face 44, opposite the internal face 43. Preferably, the internal face 43 and the external face 44 are substantially flat and parall el.

[0034] In particular, the movement bar 40 is attained by means of an extruded profile, preferably metallic, e. g. made of aluminum.

[0035] In addition, the movement bar 40 is movable along a plane orthogonal to the rotation axis R of the covering blades 3 in order to move the covering blades 3 between the closed position and the open position.

[0036] Advantageously, the covering blades 3 in the closed position are placed to close the upper opening of the support structure 2, in a manner such to cover, in particular, the underlying ground surface.

[0037] Preferably, in the closed position, the covering blades 3 are placed one in contact with the next (advantageously also by means of seals), in order to close the upper opening of the support structure 2.

[0038] Advantageously, in the open position, the covering blades 3 are placed spaced one from the next, between them delimiting free openings, advantageously susceptible of being traversed by light and air.

[0039] In particular, each covering blade 3 is positionable between the closed position, in which it is substantially parallel to a plane defined by the rotation axes R of the covering blades 3, and an open position of maximum tilt, in which the covering blade 3 is tilted with an angle preferably greater than or equal to 90° with respect to the plane defined by the rotation axes R, and preferably comprised between about 100°-140°.

[0040] In addition, the covering blades 3 advantageously comprise, in a per se known manner, a central body 34, which is longitudinally extended, along the longitudinal axis W, between two corresponding ends 34', at which the ends 31 of the covering blade 3 are advantageously placed.

[0041] For example, the central body 34 comprises a metallic section (e.g. made of extruded aluminum) advantageously closed at its ends 34' by lateral caps 35.

[0042] According to the invention, with reference to figures 2-4, each covering blade 3 comprises a first pin 32 rotatably constrained to the movement bar 40 of the movement means 4, and a second pin 33 rotatably constrained to the corresponding lateral crosspiece 21.

[0043] Advantageously, the first pin 32 and the second pin 33 are fixed to a corresponding end 31 of the covering blade 3 in order to connect it to the movement means 4 and to the lateral crosspiece 21. In particular, each covering blade 3 comprises two second pins 33 fixed to the corresponding ends 31 of the covering blade 3 itself and hinged to the corresponding lateral crosspieces 21.

[0044] Preferably, each covering blade 3 comprises two first pins 32 fixed to the corresponding ends 31 of the covering blade 3 itself and hinged to two corresponding movement bars 40 placed at the respective lateral crosspieces 21 (as described more in detail hereinbelow).

[0045] Advantageously, one between the first and the second pin 32, 33, preferably the second pin 33, is placed aligned along the rotation axis R of the covering blade 3.

[0046] In accordance with the idea underlying the present invention, the movement bar 40 is provided with multiple first housing seats 5, each of which extended from a first passage opening 51, which is made on one between the upper longitudinal edge 41 and the lower longitudinal edge 42, and a first abutment portion 52, which engagingly receives the first pin 32.

[0047] In addition, the covering apparatus 1 comprises multiple first retention elements 6, each of which is inserted in the corresponding first housing seat 5, is engaged with the movement bar 40 and is provided at least with a first blocking portion 61 interposed between the first pin 32 and the first passage opening 51 in order to retain the first pin 32 within the first housing seat 5.

[0048] In accordance with the embodiment illustrated in the enclosed figures, the first passage opening 51 is advantageously placed on the upper longitudinal edge 41 of the movement bar 40.

[0049] In accordance with an alternative non-illustrated embodiment, the first passage opening 51 can be placed on the lower longitudinal edge 42 of the movement bar 40, without departing from the protective scope of the present patent.

[0050] Advantageously, the first housing seat 5 comprises two first opposite lateral walls 53, extended between the first abutment portion 52 and the first passage opening 51, and between which the first pin 32 and the first retention element 6 are placed. In particular, the first lateral walls 53 are preferably substantially rectilinear and can also be at least partially discontinuous, for example

in the event in which the movement bar 40 is obtained by means of an extruded section and/or at least partially hollow section. Preferably, the first housing seat 5 is extended along a rectilinear trajectory substantially perpendicular to the upper longitudinal edge 41 and/or to the lower longitudinal edge 42 of the movement bar 40.

[0051] In particular, the first housing seat 5 comprises two lateral edges 55 and an abutment edge 56 defined by the meeting of the internal face 43 of the movement bar 40 respectively with the first lateral walls 53 and with the first abutment portion 52 of the first housing seat 5.

[0052] Advantageously, the lateral edges 55 (and/or the first lateral walls 53) of the first housing seat 5 are divergent with respect to each other from the abutment edge 56 (and/or from the first abutment portion 52) towards the first passage opening 51, in particular such that the first passage opening 51 has greater size than the first abutment portion 52 of the first housing seat 5, and they are advantageously tilted with respect to the plane defined by the rotation axes R of the covering blades 3 by an angle comprised between 0 and 25°. In this manner, the insertion of the first pin 32 in the first housing seat 5 is facilitated.

[0053] Advantageously, each first housing seat 5 is obtained by means of a milling of the movement bar 40 made, in particular, starting from the upper edge 41 of the latter. Preferably, the first housing seats 5 are placed equidistant one from the next along the main direction L of the movement bar 40.

[0054] In accordance with the embodiment illustrated in figures 3-8, the first blocking portion 61 of the first retention element 6, and preferably also the first abutment portion 52 of the first housing seat 5, is partially countershaped with respect to the first pin 32. More in detail, the first blocking portion 61 of the first retention element 6 delimits, with the first abutment portion 52 of the first housing seat 5, a first pivoting cavity 60, preferably circular, in which it is inserted, in a rotatable manner and substantially to size, the first pin 32.

[0055] Advantageously, the first pin 32 is provided with substantially cylindrical shape in order to be rotatably housed in the first pivoting cavity 60. In particular, the first pin 32 is provided with two enlarged sections 321 and with a reduced section 322, which is interposed between the enlarged sections 321 and has size section smaller than the section of the enlarged sections 321. Preferably, the first pivoting cavity 60 is substantially flush with the reduced section 322 of the first pin 32 and, when the first retention element 6 is inserted in the first housing seat 5, its first blocking portion 61 is advantageously interposed between the enlarged sections 321 in a manner such to prevent the sliding of the first pin 32 and hence of the covering blade 3 along a direction parallel to the rotation axis R of the covering blades 3.

[0056] Of course, without departing from the protective scope of the present invention, the first pin 32 can be maintained fixed within the first housing seat 5 and be rotatably associated with the end 31 of the covering blade 3.

[0057] Advantageously, the first retention element 6 comprises at least one first fixing portion 62 that is elastically pliable and snap-engaged with the movement bar 40, in order to retain the first blocking portion 61 in the first housing seat 5.

[0058] More in detail, as illustrated in the enclosed figures 6-8, the first fixing portion 62 of the first retention element 6 comprises two elastically pliable first engagement wings 63, which are extended between corresponding first constrained portions 63', connected to each other by the first blocking portion 61, and corresponding first free portions 63", separate from each other. In particular, the first engagement wings 63 are advantageously thrust via elastic return against the corresponding first lateral walls 53 of the first housing seat 5.

[0059] Advantageously, each first engagement wing 63 is provided with a first internal surface 631, directed towards the first internal surface 631 of the opposite first engagement wing 63 of the same first retention element 6, and with a first external surface 632, opposite the first internal surface 631 of the same first engagement wing 63. Advantageously, each first engagement wing 63 is provided, preferably on the first external surface 632 thereof, with a first engagement projection 64 engaged in a corresponding first retention seat 54 of the corresponding first lateral wall 53 of the first housing seat 5.

[0060] More in detail, the first lateral wall 53 of the first housing seat 5 is provided with a first stop portion 57 and the first retention seat 54 is advantageously defined between the aforesaid first stop portion 57 and the first abutment portion 52 of the first housing seat 5.

[0061] Advantageously, for example during application (or removal), the aforesaid first engagement wings 63 are movable between a contracted position, in which the first engagement wings 63 are close to each other, and a blocking position, in which the first engagement wings 63 are further apart. In particular, with the first retention element 6 inserted in the first housing seat 5 and with the first engagement wings 63 in the blocking position, each first engagement projection 64 is placed between the first abutment portion 52 and the corresponding first stop portion 57 of the first lateral wall 53 of the first housing seat 5 in order to prevent the first retention element 6 to exit from the first housing seat 5.

[0062] Preferably, each first engagement wing 63 comprises a first grip portion 65, in particular at the first free portion 63" of the first engagement wing 63, which is intended to be grasped by an operator in order to move the first engagement wings 63 between the contracted position and the blocking position.

[0063] Advantageously, the first retention element 6 is "U" shaped, provided with a base section defined by the first blocking portion 61 and with two lateral sections defined by the first engagement wings 63.

[0064] Advantageously, the first retention element 6 is made of polymer material, e.g. of polyamide, in particular loaded with glass fiber.

[0065] In accordance with further non-illustrated embodiments, the first retention element 6 can be coupled to the movement bar 40 via fitting with shape coupling, or via friction, or by means of fixing means, such as for example screws.

[0066] In accordance with the preferred embodiment of the invention, illustrated in the enclosed figures 2-6, the first abutment portion 52 of the first housing seat 5 is provided with a covering body 52' on which the first pin 32 contacts.

[0067] Advantageously, the covering body 52' is provided with an abutment surface 520 partially counter-shaped with respect to the first pin 32. More in detail, the covering body 52' delimits the aforesaid first pivoting cavity 60 with the first blocking portion 61 of the first retention element 6.

[0068] Preferably, the covering body 52' is made of a material such that the friction coefficient between the covering body 52' and the first pin 32 is lower than the friction coefficient between the first pin 32 and the movement bar 40. For example, if the first pin 32 and the movement bar 40 are made of metal, in particular respectively steel and aluminum, the covering body 52' is made of polymer material, in particular of polyamide or PTFE. Consequently, the covering body 52' improves the rotation of the first pin 32 in the first housing seat 5 and reduces the wear thereof.

[0069] In accordance with the preferred embodiment of the invention, illustrated in the enclosed figures 2-6 and 9, the covering apparatus comprises multiple closure bodies 7, each of which inserted in the corresponding first housing seat 5 between the first engagement wings 63 of the first retention element 6. Advantageously, the closure bodies 7 are adapted to obstruct the first housing seat 5 in order to cover and/or block the first retention elements 6.

[0070] More in detail, each closure body 7 advantageously comprises a covering portion 71 at least partially counter-shaped with respect to the area defined by the lateral edges 55 of the first housing seat 5 and placed to cover such area. Preferably, the covering portion 71 of the closure body 7 is substantially coplanar with the internal face 43 of the movement bar 40.

[0071] Each closure body 7 advantageously comprises an attachment portion 72 extended starting from the covering portion 71, and preferably made in a single body therewith, and intended to mechanically connect the closure body 7 with the movement bar 40. In particular, the attachment portion 72 of the closure body 7 is at least partially placed between the first engagement wings 63 of the first retention element 6. Advantageously, the attachment portion 72 of the covering body 7 is provided with opposite attachment teeth 73 which are placed between the first abutment portion 52 and the corresponding first stop portion 57 of the first housing seat 5 in order to prevent the exit of the closure body 7 from the first housing seat 5.

[0072] Advantageously, the closure body 7 is made of polymer material, for example of polyamide, in particular loaded with glass fiber.

[0073] Preferably, the second pin 33 is associated with the corresponding lateral crosspiece 21 with a connection system analogous to that described above for connecting the first pin 32 to the movement bar 41.

[0074] More in detail, as illustrated in the enclosed figures 10 and 11, the lateral crosspiece 21 comprises, in addition to the first elongated profile 23, a coupling portion 27 which is longitudinally extended along the first extension direction X (and can be suitably formed by multiple distinct parts). In particular, the coupling portion 27 is fixed to the first elongated profile 23, preferably below the movement bar 40, and carries, mounted thereon, the second pins 33. Advantageously, the coupling portion 27 is extended transverse to the first extension direction X between an upper wall 271 and a lower wall 272.

[0075] Advantageously, in addition, the coupling portion 27 is extended parallel to the rotation axis R of the covering blades 3 between an internal wall 273, directed towards the covering blades 3, and an external wall 274, opposite the internal wall 273 and preferably fixed to the first elongated profile 23.

[0076] Advantageously, the coupling portion 27 is fixed to the first elongated profile 23 by means of shape coupling, in particular by means of sliding in a suitable elongated seat. Of course, without departing from the protective scope of the invention, the coupling portion can be fixed to the first elongated profile by means of different fixing means, per se known, such as screws.

[0077] Advantageously, the coupling portion 27 is provided with multiple second housing seats 8, each of which extended from a second passage opening 81, which is made on the upper wall 271 (or on the lower wall 272), and a second abutment portion 82, which engagingly receives the second pin 33.

[0078] In accordance with the embodiment illustrated in figures 10 and 11, the second pin 33 is retained in the corresponding second housing seat 8 by means of second retention elements 9, each of which is inserted in the corresponding second housing seat 8, is engaged with the coupling portion 27 and is provided at least with a second blocking portion 91 interposed between the second pin 33 and the second passage opening 81. Advantageously, the second housing seat 8 attained on the coupling portion 27 comprises at least two second opposite lateral walls 83, extended between the second abutment portion 82 and the second passage opening 81, and between which the second pin 33 and the second retention element 9 are placed.

[0079] Preferably, the second housing seat 8 is extended along a rectilinear trajectory substantially perpendicular to the upper wall 271 and/or to the lower wall 272 of the coupling portion 27.

[0080] In accordance with the embodiment illustrated in the enclosed figures 10 and 11, the second blocking portion 91 of the second retention element 9 intended to be mounted on the coupling portion 27, and preferably

also the second abutment portion 82 of the corresponding second housing seat 8, is partially counter-shaped with respect to the second pin 33.

[0081] More in detail, the second blocking portion 91 of the second retention element 9 delimits, with the second abutment portion 82 of the second housing seat 8, a second pivoting cavity 90, preferably circular, in which the second pin 33 is inserted, in a rotatable manner and substantially to size.

[0082] Advantageously, the second pin 33 is provided with substantially cylindrical shape in order to be rotatably housed in the second pivoting cavity 90.

[0083] Advantageously, the second retention element 9 associated with the coupling portion 27 comprises at least one second fixing portion 92 that is elastically pliable and snap-engaged with the coupling portion 27, in order to retain the second blocking portion 91 in the second housing seat 8.

[0084] More in detail, the second fixing portion 92 of the second retention element 9 comprises two elastically pliable second engagement wings 93, of the above-described type.

[0085] Therefore, advantageously, such second engagement wings 93 are extended between corresponding second constrained portions 93', connected to each other by the second blocking portion 91, and corresponding second free portions 93", separate from each other. In particular, the second engagement wings 93 are advantageously thrust via elastic return against the corresponding second lateral walls 83 of the second housing seat 8.

[0086] Advantageously, each second engagement wing 93 is provided with a second internal surface 931, directed towards the second internal surface 931 of the opposite second engagement wing 93 of the same second retention element 9, and with a second external surface 932, opposite the second internal surface 931 of the same second engagement wing 93.

[0087] Advantageously, each second engagement wing 93 is provided, preferably on its second external surface 932, with a second engagement projection 94 engaged in a corresponding second retention seat 84 of the respective second lateral wall 83 of the second housing seat 8.

[0088] More in detail, the second lateral wall 83 of the second housing seat 8 is provided with a second stop portion 85 and the second retention seat 84 is advantageously defined between the aforesaid second stop portion 85 and the second abutment portion 82 of the second housing seat 8.

[0089] As described above, the aforesaid second engagement wings 93 are advantageously movable between the contracted position and the blocking position and, with the second retention element 9 inserted in the second housing seat 8 and with the second engagement wings 93 in the blocking position, each second engagement projection 94 is placed between the second abutment portion 82 and the corresponding second stop portion 85 of the second lateral wall 83 of the second housing seat 8 in order to prevent the exit of the second retention element 9 from the second housing seat 8.

[0090] Preferably, each second engagement wing 93 also comprises a second grip portion 95, preferably at the second free portion 93" of the second engagement wing 93, which is intended to be grasped by an operator in order to move the second engagement wings 93 between the contracted position and the blocking position.

[0091] In addition, each second engagement wing 93 is advantageously provided, in this case, with a "V" shaped lower portion 96 interposed between the second constrained portion 93' and the second free portion 93", and preferably between the second constrained portion 93' and the second engagement projection 94. Such "V" shaped lower portions 96 are advantageously housed in corresponding lower recesses 86 of the second housing seat 8. In this manner, the stability of the second retention element 9 within the second housing seat 8 increases.

[0092] Advantageously, by means of the use of the above-described first retention elements 6 for positioning the first pins 32 and preferably also of the second retention elements 9 for positioning the second pins 33, the installation (and the disassembly) of the covering blades 3 on the covering apparatus 1 is particularly simple and quick, not requiring complex operations for the coupling of the first and second pins 32, 33 to the movement bar 40 and to the lateral crosspiece 21 of the covering apparatus 1.

[0093] In operation, with the covering apparatus 1 mounted, the covering blades 3 are moved in a per se known manner between the open position and the closed position by means of the movement of the movement bar 40.

[0094] More in detail, the movement bar 40, the lateral crosspiece 21 (in particular the coupling portion 27) and the covering blades 3 are advantageously connected to each other so as to form an articulated parallelogram structure. In particular, the engagement of the movement bar 40 with the first pins 32 connected to multiple covering blades 3 maintains the movement bar 40 substantially always at the same tilt (preferably horizontal) also during the entire movement thereof.

[0095] In this manner, the movement of the movement bar 40 along a plane orthogonal to the rotation axis R of the covering blades 3 carries the covering blades 3 themselves to rotate around the rotation axis R thereof. In particular, the movement bar 40 is advantageously translated along a substantially curved trajectory.

[0096] In operation, the movement bar 40 is actuatable, in a per se known manner, to be alternately moved towards the head portion 21' or the bottom portion 21" of the lateral crosspiece 21 so as to drive the opening or the closing of the covering blades 3.

[0097] The covering apparatus 1 advantageously comprises actuation means 10 mechanically connected to the movement bar 40 of the movement means 4 and

arranged for moving the movement bar 40 itself between a first end stop position, in which the movement bar 40 places the covering blades 3 in the closed position, and a second end stop position in which the movement bar 40 places the covering blades 3 in the open position. Advantageously, the actuation means 10 are susceptible of maintaining the position of the movement bar 40 in any one intermediate position between the first end stop position and the second end stop position in order to maintain the covering blades 3 at any one desired tilt.

[0098] For example, the aforesaid actuation means 10 can comprise a linear actuator having the jacket hinged to the support structure 2 and the stem hinged to the movement bar 40.

[0099] Advantageously, as anticipated above, in order to improve the distribution of the loads on the covering blades 3, the movement means 4 comprise two movement bars 40, each advantageously placed at the respective lateral crosspiece 21. In addition, at each end 31 of each covering blade 3, a corresponding first pin 32 is advantageously fixed, movable by the respective movement bar 40. Therefore, corresponding actuation means 10 are advantageously provided for each movement bar 40.

[0100] Of course, without departing from the protective scope of the invention, the actuation means 10 can be made of any other shape of known type. For example, they can comprise belt movement devices or actuators of a different type.

[0101] In accordance with a non-illustrated embodiment, the coupling portion 27 can also be movable with respect to the elongated profile 23 of the lateral crosspiece 21, since it can execute in particular a movement parallel to the plane orthogonal to the rotation axis R of the covering blades 3, e.g. a sliding movement parallel to the first extension direction X of the lateral crosspiece 21 itself.

[0102] Advantageously, in this embodiment, the coupling portion 27 is slidably constrained to the elongated profile 23, for example by means of a suitable elongated seat.

[0103] Of course, without departing from the protective scope of the invention, the coupling portion 27 can also be movable along any trajectory, for example analogous to the trajectory traveled by the movement bar 40.

[0104] Also forming the object of the present invention is a method for mounting a covering apparatus 1 of the above-described type, regarding which the reference numbers will be maintained for the sake of description clarity.

[0105] In particular, the method that is the object of the invention is intended to be employed in mounting the covering blades 3 on the support structure 2 of the above-described covering apparatus 1.

[0106] The method, object of the invention, comprises a step of arranging the support structure 2 with the aforesaid lateral crosspieces 21.

[0107] In particular, the support structure 2 can be mounted in a per se known manner by arranging for example the first and second columns 25, 26 (if present) and fixing the lateral crosspieces 21 thereto, or to corresponding vertical walls.

[0108] The method also comprises a step of mounting the covering blades 3, in which the second pins 33 are rotatably constrained to the corresponding lateral crosspieces 21, and the first pins 32 are rotatably constrained to the movement bar 40.

[0109] Advantageously, in the mounting step the second pins 33 are inserted in the corresponding second housing seats 8 of the coupling portion 27 through the second passage opening 81 and, subsequently, are blocked by inserting the second retention elements 9 in the second housing seats 8 themselves.

[0110] In accordance with the idea underlying the present invention, in the mounting step, each first pin 32 is inserted in the corresponding first housing seat 5 of the movement bar 40 through the first passage opening 51 up to abutting against the first abutment portion 52 of the first housing seat 5.

[0111] Subsequently, the first retention element 6 is inserted in the first housing seat 5 and constrained to the movement bar 40, with the first blocking portion 61 of the first retention element 6 placed between the first pin 32 and the first passage opening 51 in order to retain the first pin 32 within the first housing seat 5.

[0112] In particular, during the insertion of the first retention element 6 in the first housing seat 5, the first engagement wings 63 are advantageously thrust against each other in the contracted position by the operator or by the engagement against the first lateral wall 53 (in particular against the first stop portion 57) of the first housing seat 5, being elastically deformed.

[0113] Advantageously, when the first blocking portion 61 of the first retention element 6 is completely in the first housing seat 5 and/or the first engagement projections 64 are found engaged in the corresponding first retention seats 54 of the corresponding first lateral walls 53 of the first housing seat 5, the first engagement wings 63 return into the blocking position.

[0114] Advantageously, the method also comprises a step of inserting the covering body 52' in the first housing seat 5, executed before each first pin 32 is inserted in the corresponding first housing seat 5 of the movement bar 40. In particular, in the insertion step, the covering body 52' is inserted in the first housing seat 5 through the first passage opening 51, advantageously up to abutting against the abutment edge 56. Therefore, in the mounting step the first pin 32 is advantageously inserted in the corresponding first housing seat 5 of the movement bar 40 up to abutting against the covering body 52'.

[0115] Advantageously, the method also comprises a closing step, following the mounting step, in which each closure body 7 is inserted in the first housing seat 5 of the movement bar 40 in order to cover and/or block the corresponding first retention element 6. In particular, in the closing step, closure body 7 (preferably its attach-

ment portion 72) is inserted in the first housing seat 5 between the first engagement wings 63 of the first retention element 6.

[0116] Advantageously, in order to disassemble the covering blades 3 it is sufficient to execute the above-described operations in reverse order, removing the first retention elements 6 (and advantageously the second retention elements 9) and extracting the first pin 32 (and advantageously the second pin) 33 from the corresponding first housing seats 5 (and advantageously from the second housing seats 8).

[0117] The invention thus conceived therefore attains the pre-established objects.

Claims

1. Covering apparatus (1), which comprises:

- a support structure (2) provided with a framework (20), which comprises at least two lateral crosspieces (21) that are parallel to and side-by-side each other, each of which longitudinally is extended along a corresponding first extension direction (X);
- a series of covering blades (3) placed one after the other according to said first extension direction (X), each of said covering blades (3) being extended, according to a longitudinal axis (W) thereof substantially orthogonal to said first extension direction (X), between two opposite ends (31) supported by the respective said lateral crosspieces (21);
- movement means (4) mechanically connected to said covering blades (3) and arranged for rotating each of said covering blades (3) around a corresponding rotation axis (R), parallel to said longitudinal axis (W), between a closed position and at least one open position; said movement means (4) comprising a movement bar (40), which is longitudinally extended along a main direction (L) substantially parallel to said first extension direction (X) and is extended, transverse to said main direction (L), between an upper longitudinal edge (41) and a lower longitudinal edge (42);

said movement bar (40) being movable at least along a plane orthogonal to said rotation axis (R) of said covering blades (3) in order to move said covering blades (3) between said closed position and said open position;

each said covering blade (3) comprising a first pin (32) at least rotatably constrained to said movement bar (40), and a second pin (33) at least rotatably constrained to the corresponding said lateral crosspiece (21);

said covering apparatus (1) being **characterized in that** said movement bar (40) is provided with multiple first housing seats (5), each of which is extended from a first passage opening (51), which is made on one between said upper longitudinal edge (41) and said lower longitudinal edge (42), and a first abutment portion (52), which engagingly receives said first pin (32);

wherein said covering apparatus (1) comprises multiple first retention elements (6), each of which is inserted in the corresponding said first housing seat (5), is engaged with said movement bar (40) and is provided at least with a first blocking portion (61) interposed between said first pin (32) and said first passage opening (51) in order to retain said first pin (32) within said first housing seat (5).

2. Covering apparatus (1) according to claim 1, **characterized in that** said first passage opening (51) is placed on the upper longitudinal edge (41) of said movement bar (40).

3. Covering apparatus (1) according to claim 1 or 2, **characterized in that** the first blocking portion (61) of said first retention element (6) is partially countershaped with respect to said first pin (32).

4. Covering apparatus (1) according to claim 3, **characterized in that** the first blocking portion (61) of said first retention element (6) delimits, with the first abutment portion (52) of said first housing seat (5), a first pivoting cavity (60) in which said first pin (32) is inserted, in a rotatable manner and substantially to size.

5. Covering apparatus (1) according to any one of the preceding claims, **characterized in that** said first retention element (6) comprises at least one first fixing portion (62) that is elastically pliable and snap-engaged with said movement bar (40), in order to retain said first blocking portion (61) in said first housing seat (5).

6. Covering apparatus (1) according to any one of the preceding claims, **characterized in that** said first housing seat (5) comprises at least two opposite first lateral walls (53), extended between said first abutment portion (52) and said first passage opening (51), and between which said first pin (32) and said first retention element (6) are placed;

wherein the first fixing portion (62) of said first retention element (6) comprises two elastically pliable first engagement wings (63), which are extended between corresponding first constrained portions (63'), connected to each other by said first blocking portion (61), and corre-

sponding first free portions (63"), separate from each other;
wherein said first engagement wings (63) are thrust via elastic return against the corresponding said first lateral walls (53) of said first housing seat (5).

7. Covering apparatus (1) according to claim 6, **characterized in that** each said first engagement wing (63) is provided with a first engagement projection (64) engaged in a corresponding first retention seat (54) of the corresponding first lateral wall (53) of said first housing seat (5).

8. Covering apparatus (1) according to claim 6 or 7, **characterized in that** it comprises multiple closure bodies (7), each of which is inserted in the corresponding first housing seat (5) between the first engagement wings (63) of said first retention element (6).

9. Covering apparatus (1) according to any one of the preceding claims, **characterized in that** the first abutment portion (52) of said first housing seat (5) is provided with a covering body (52'), on which said first pin (32) contacts.

10. Method for mounting a covering apparatus (1) according to any one of the preceding claims, which comprises:

- a step of arranging said support structure (2) with said lateral crosspieces (21);
- a step of mounting said covering blades (3), in which said second pins (33) are rotatably constrained to the corresponding said lateral crosspieces (21), and said first pins (32) are rotatably constrained to said movement bar (40);

said method being **characterized in that**, in said mounting step, each said first pin (32) is inserted in the corresponding first housing seat (5) of said movement bar (40) through said first passage opening (51) up to abutting against the first abutment portion (52) of said first housing seat (5); subsequently, said first retention element (6) is inserted in said first housing seat (5) and constrained to said movement bar (40), with the first blocking portion (61) of said first retention element (6) placed between said first pin (32) and said first passage opening (51) in order to retain said first pin (32) within said first housing seat (5).

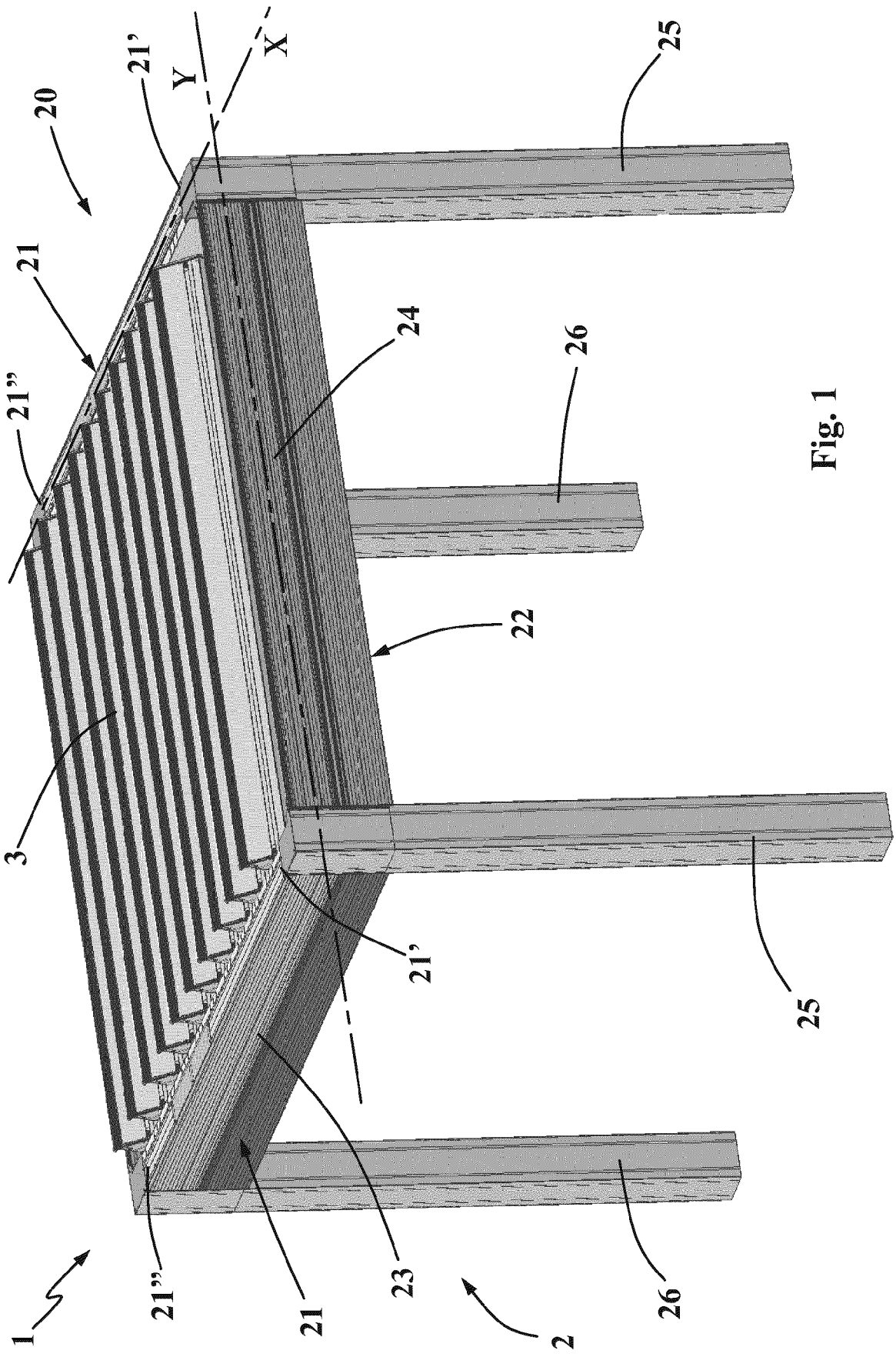

Fig. 1

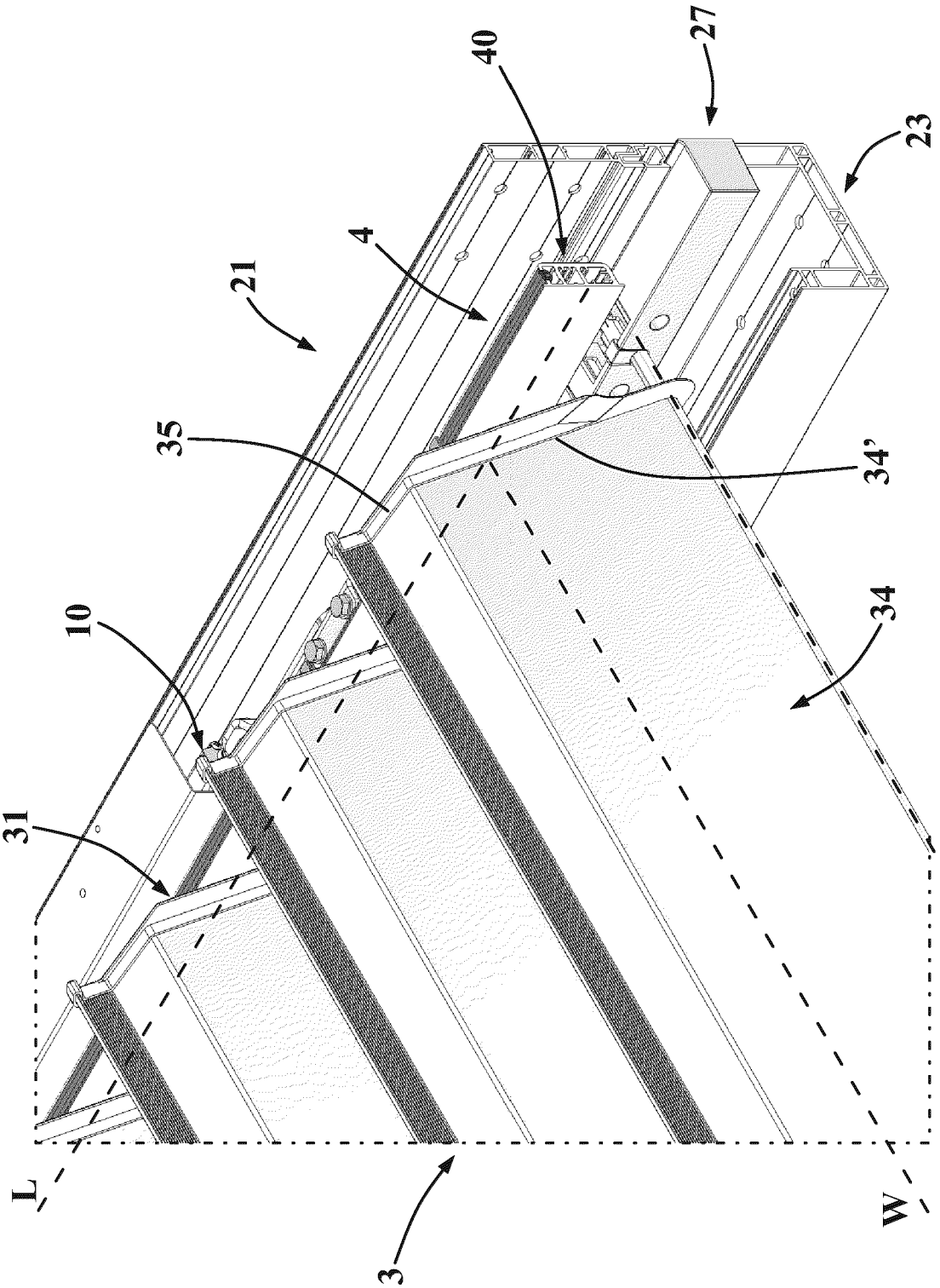

Fig. 2

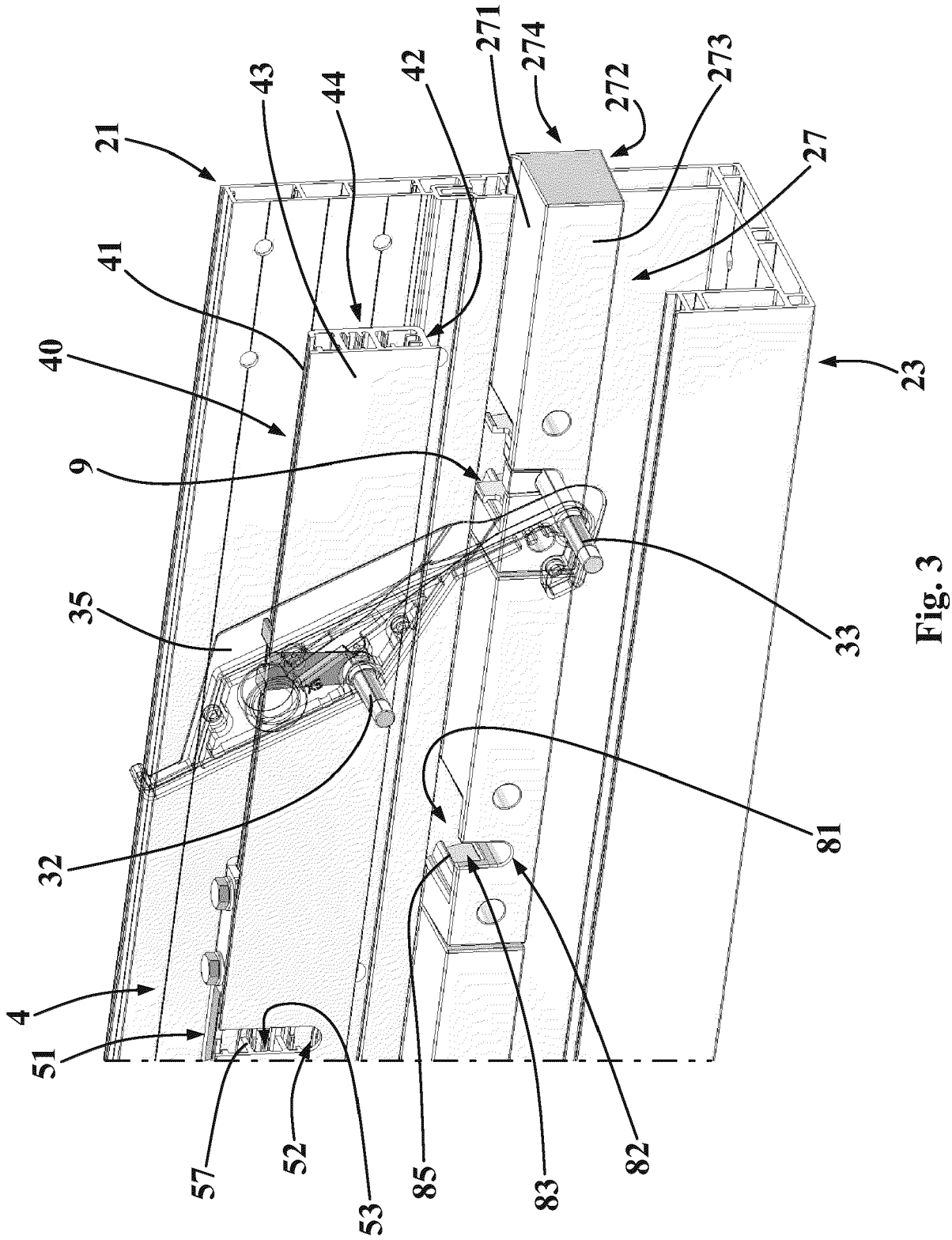
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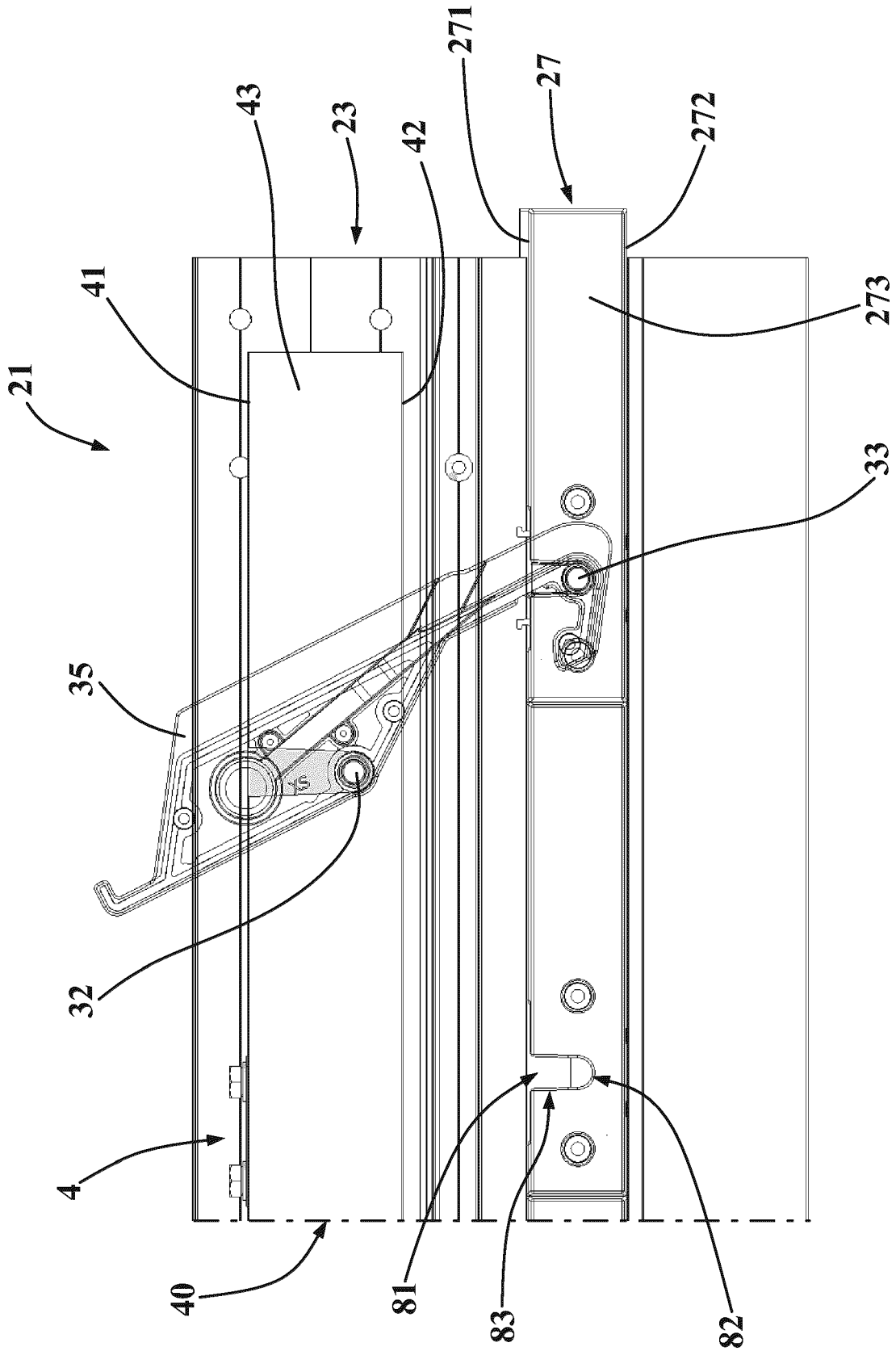
Fig. 3



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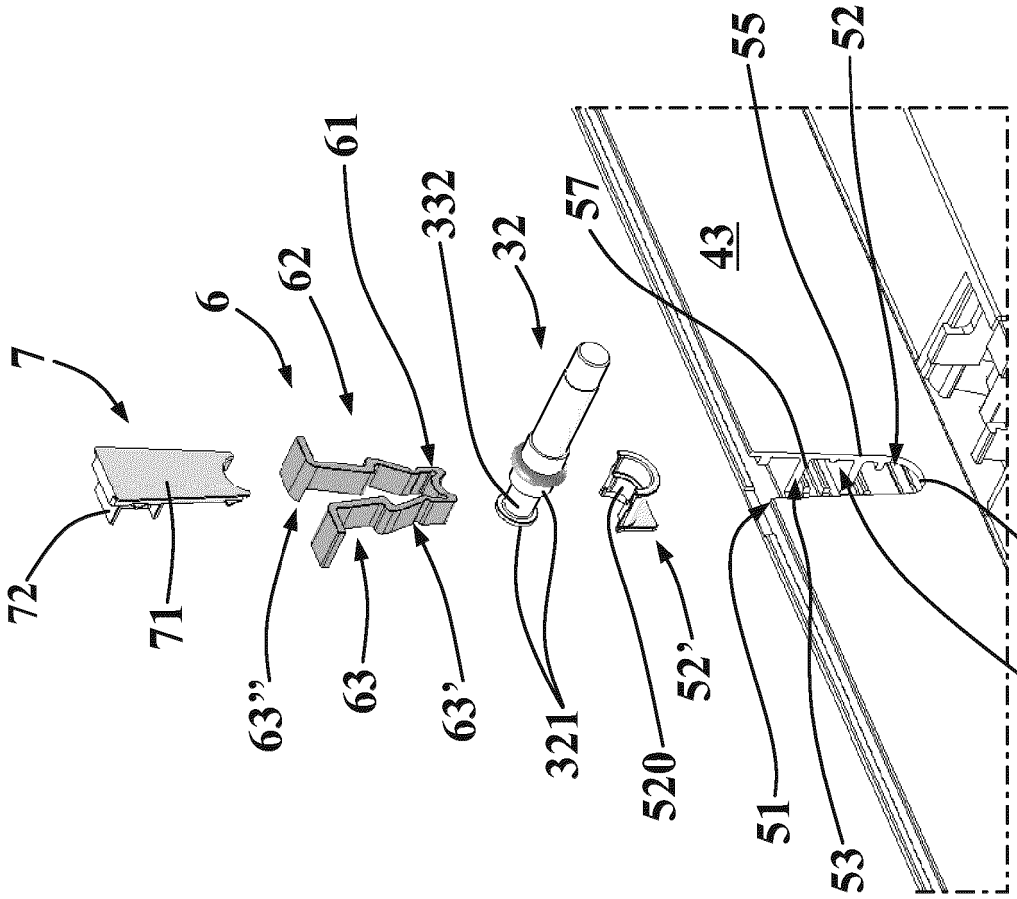
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Fig. 6

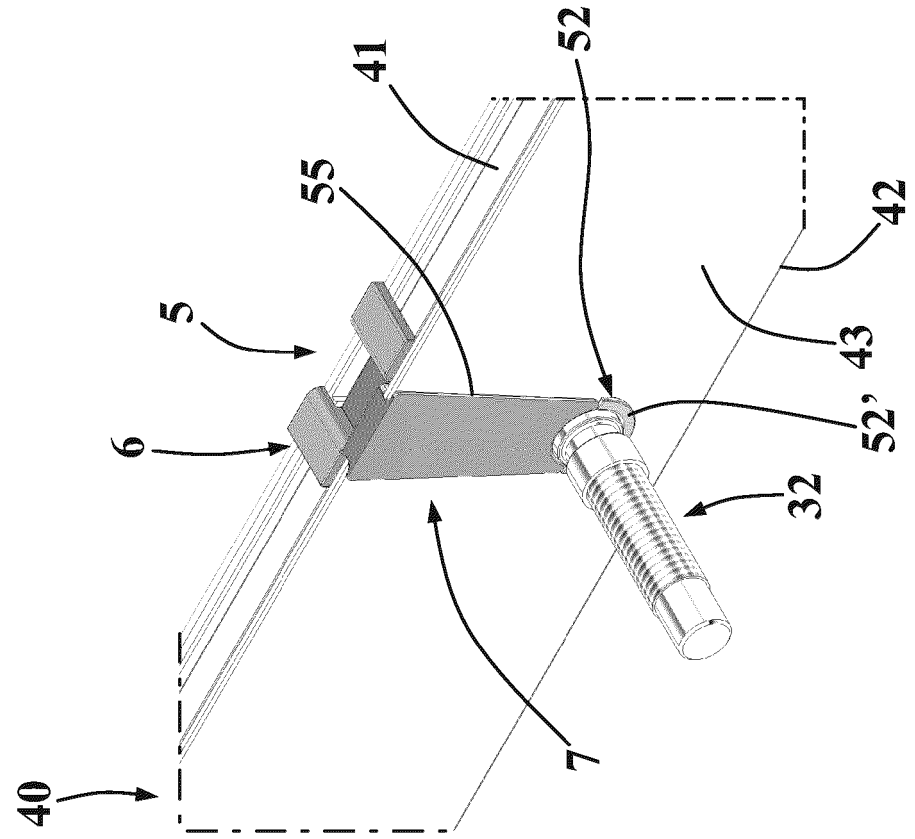
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Fig. 5

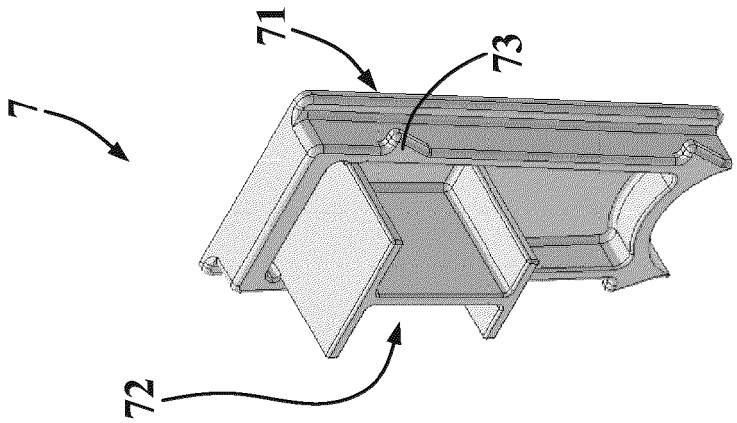

Fig. 9

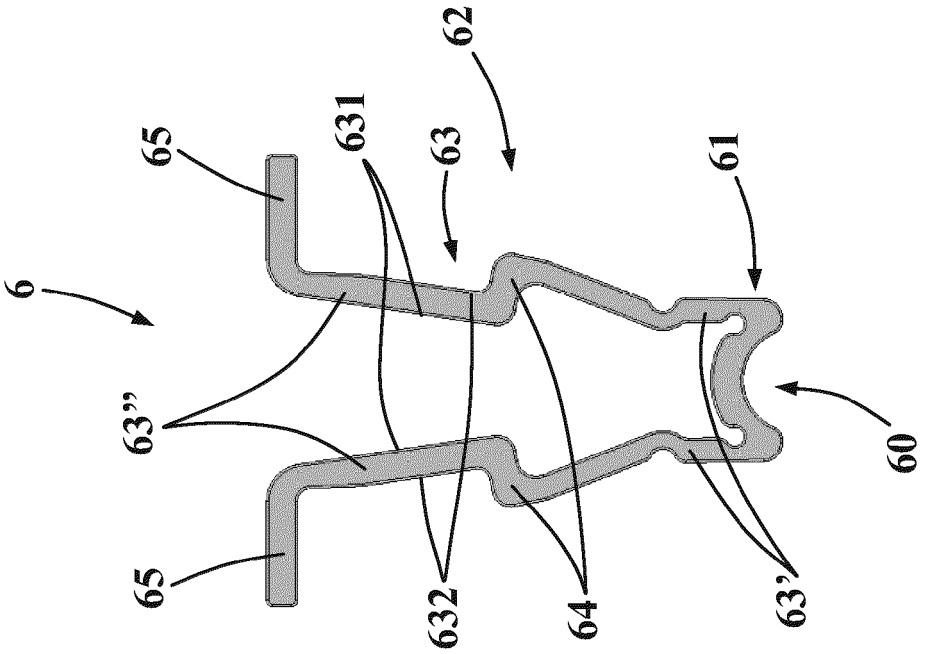

Fig. 8

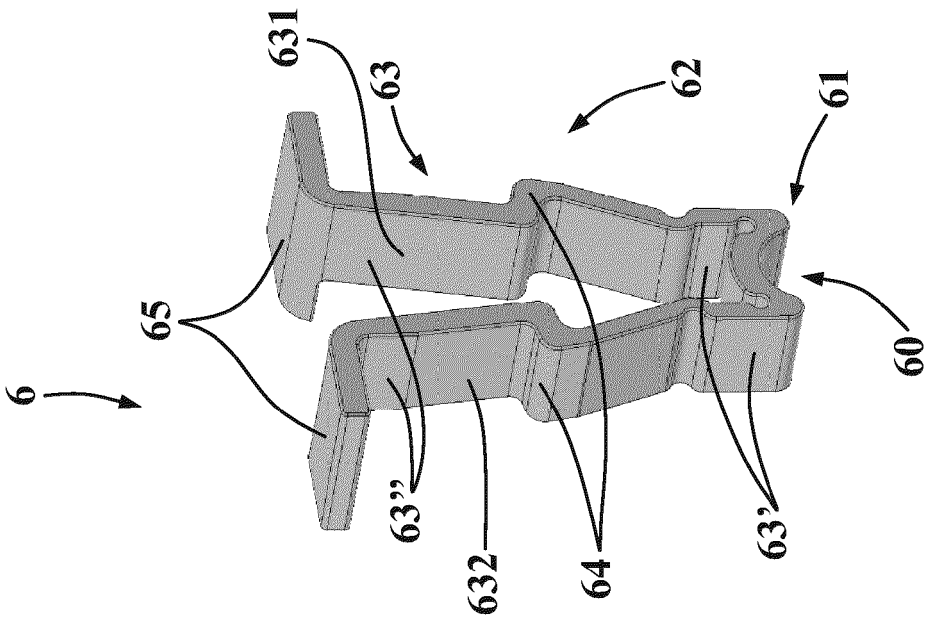

Fig. 7

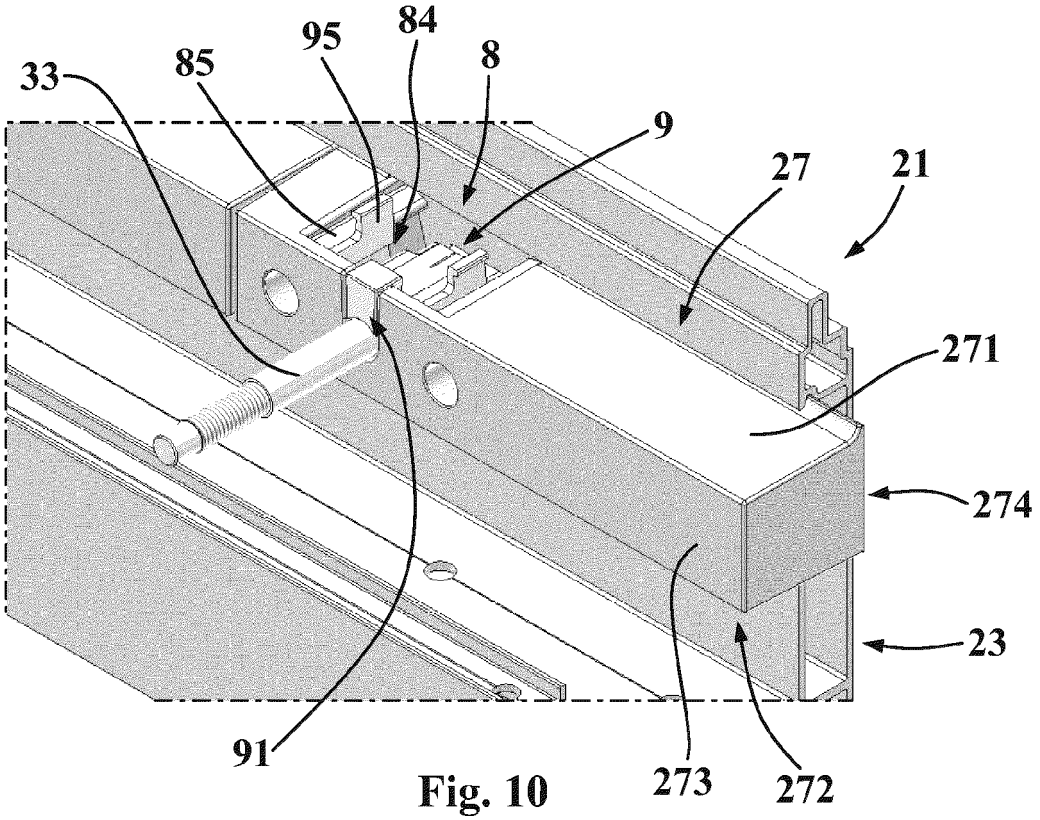
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Fig. 10

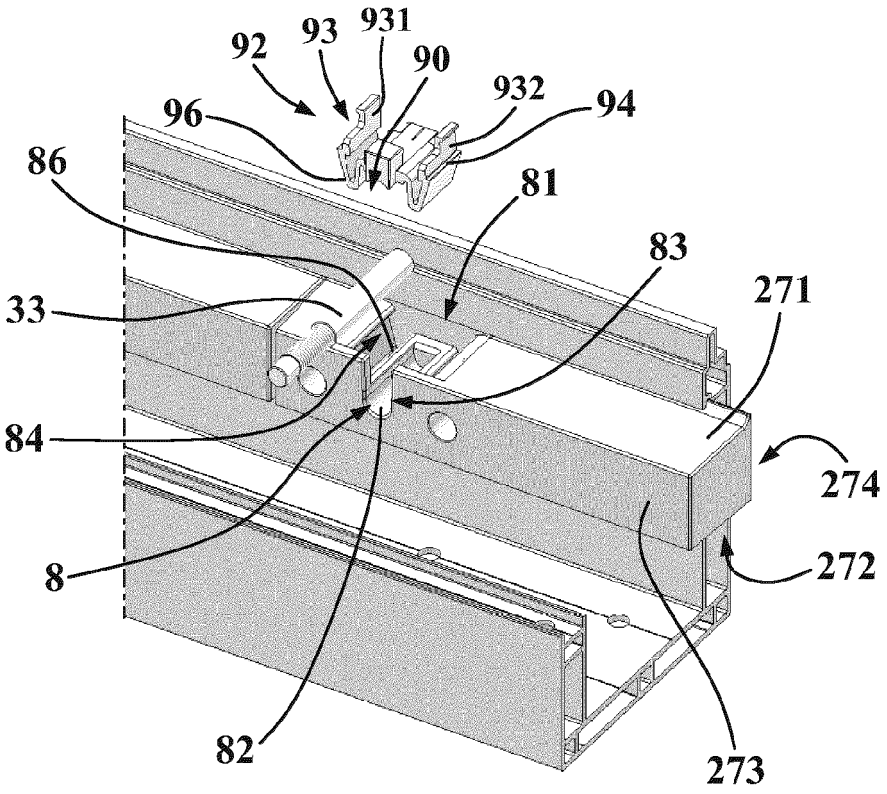
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Fig. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 21 20 6975

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 3 015 618 A1 (GIBUS SPA [IT]) 4 May 2016 (2016-05-04)	1-4,9	INV. E04B7/16
A	* paragraphs [0058] - [0060]; figures 2,4 *	5-8,10	E04F10/08
A	CN 111 608 338 A (GUANGZHOU GREENAWN AWNING TECH LTD) 1 September 2020 (2020-09-01) * figures 8,10 *	1-10	

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E04B
E04F

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 January 2022	Tran, Kim Lien

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24-01-2022

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