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(54) TRANSLUCENT MONOLITHIC STRUCTURAL PROFILE FOR THE CONFIGURATION OF VARIABLE-POSITION BLINDS IN RETRACTABLE PERGOLAS

(57) The present invention provides a device for closing pergolas, particularly a translucent structural profile for the configuration of louvres for sliding roofs of pergolas and facades, comprising: a first profile made of extruded translucent polymer (1) assembled with a second profile made of in an extruded metallic material (2) by means of a first and a second coupling; wherein the first coupling between the first profile (1) and the second profile (2) is generated by a curved termination (6) at the top of the first profile (1) and a crest-shaped termination (3) at the top of the second profile (2); wherein the second coupling between the first profile (1) and the second profile (2) is generated by a clip-type termination (9) at the bottom of the first profile (1) and a clip-type termination (10) at the bottom of the second profile (2); wherein said first and second couplings between the first and second profiles are press-fit couplings; wherein the first profile (1) and second profile (2) face one another longitudinally through the first and second press-fit couplings.

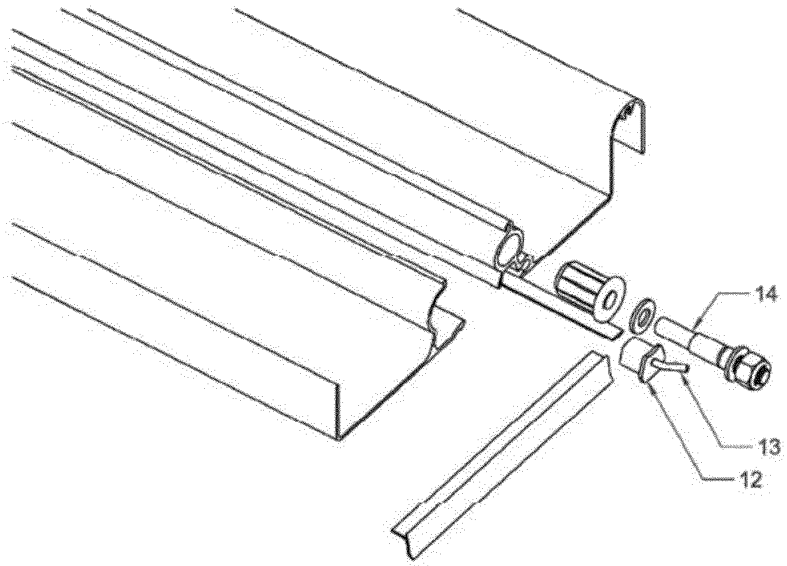

FIG. 2

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the technical field of construction systems and structures for coverings and facades of outdoor spaces to protect users from weather conditions present in the area where they are installed. Particularly, the present invention relates to structural profiles for the configuration of louvres for sliding or retractable roofs in pergola-type structures.

BACKGROUND OF THE INVENTION

[0002] Within the state of the art, there are multiple designs and constructive configurations of pergola structural systems for outdoor areas, in order to improve the thermal and weather conditions of people or users who use the areas protected by these systems.

[0003] In the patent literature, for example, document DE 20314390 is noted, describing a support device for an awning having an individually configurable standing unit available for a mobile home, a garden, a holiday home; wherein said device comprises two rods for a flexible roof, which can be moved outwards and inwards with respect to the awning. The awning comprises a strip of textile, preferably watertight material, which by means of cross rods and the guide rings (6) can slide on the rods (4) on guides arranged on two opposite outer walls of the device.

[0004] Invention patent EP 2722460 describes an extensible roller-type pergola inside a frame comprising an electronic lock, which measures the end position of the pergola for the adaptation of being extended and drawing in, as a result of the translation of an transverse end member. Likewise, said pergola comprises a structure together with several movable and attachment elements.

[0005] Invention patent EP 2730714 teaches a shed covering structure made of a material that provides protection against sun and rain, which comprises a plurality of adjoining and overlapping swinging blades, which are coupled to a drive mechanism adapted to work in a single operation, which in turn cause the blades to move gradually around their longitudinal axis, which means that it is being held in one position, to provide partial protection from the sun by the blades when they slide in a horizontal plane.

[0006] Patent document WO 2012/172128 describes a joint element used in pergola-type structures, specifically a joint element that can be used to support awnings or similar structures. The element of the invention consists of a fixed supporting part that is attached at one end of the longitudinal member in which the pulley-flanges of the longitudinal awning-pulling members are mounted, being designed to enable said assembly of said pulley-flanges without requiring any handling of the longitudinal member.

[0007] Patent document KR 101290734 teaches a pergola rafter and a pergola roof, wherein the pergola rafter consists of a prefabricated structure made of wood, a metallic material, and a synthetic resin material, which can be easily assembled. The frame comprises a top plate having planar geometry, a bottom plate separated downwards from the top plate by a set distance, and with an attached diaphragm.

[0008] Patent document NZ 552257 discloses a covering system that provides a retractable cover for a pergola or veranda-type structure. This invention has a roof portion that is normally open to the environment, and includes a substantially cylindrical shaft having a central longitudinal axis and a motor with which the cylindrical shaft is coupled such that the motor is operable to rotate the shaft about the longitudinal axis.

[0009] The prior art focuses on covering systems in pergolas, and in some cases in verandas, with different geometries and mechanisms that allow the opening of said closures, however, said mechanisms do not give rise to a built-in electric lighting system; therefore, it can be seen that there is a problem relating to lighting systems or mechanisms of retractable-type pergolas due to the type of configuration of the profiles of the slats or louvres present in their sliding roofs, which is due to the opacity of the extruded aluminium and other metallic elements from which the profiles of these slats are made, so that the diffusion of natural or artificial light to the interior of the structure implies the obligatory need to open or move the sliding roof of the pergola.

SUMMARY OF THE INVENTION

[0010] The present invention provides a translucent structural-type monolithic profile (4) for the configuration of louvres for sliding roofs of pergolas and facades, characterized in that it comprises: a first profile made of extruded translucent polymer (1) assembled with a second profile made of in an extruded metallic material (2) by means of a first and a second coupling; wherein the first coupling between the first profile (1) and the second profile (2) is generated by a curved termination (6) at the top of the first profile (1) and a crest-shaped termination (3) at the top of the second profile (2); wherein the second coupling between the first profile (1) and the second profile (2) is generated by a clip-type termination (9) at the bottom of the first profile (1) and a clip-type termination (10) at the bottom of the second profile (2); wherein said first and second couplings between the first and second profiles are press-fit couplings; and wherein the first profile (1) and second profile (2) face one another longitudinally through the first and second press-fit couplings.

[0011] In a preferred embodiment, the translucent structural-type monolithic profile (4) is characterized in that the translucent polymer is polycarbonate.

[0012] In another preferred embodiment, the translucent structural-type monolithic profile (4) is characterized in that the metallic material is aluminum.

[0013] In another preferred embodiment, the translu-

cent structural-type monolithic profile (4) is characterized in that it further comprises a cover with the geometry of the assembly of the first profile (1) and second profile (2) that is operatively coupled at the end of said assembly.

[0014] In a more preferred embodiment, the translucent structural-type monolithic profile (4) is characterized in that the inner faces of the first profile (1) and second profile (2) contain grooves for holding said cover.

[0015] In a preferred embodiment, the translucent structural-type monolithic profile (4) is characterized in that it further includes LED light strips (11).

[0016] In a more preferred embodiment, the translucent structural-type monolithic profile (4) is characterized in that the LED light strips (11) are connected to the profile by means of an electrical socket (12) with an electrical power cable (13), wherein the connection is controlled by a remote-controlled intelligent control center (14).

DESCRIPTION OF THE FIGURES

[0017]

Figure 1 illustrates a side view of the translucent structural monolithic profile of a first exemplary embodiment of the invention in different steps of the assembly of the profiles. A) coupling between the crest of the profile (2) and the curve of the profile (1), B) moment before the clip-type coupling between the first profile (1) and the second profile (2), C) moment when the second clip-type coupling is generated, generating the assembly between the first profile (1) and the second profile (2), and D) illustration of the structure that represents the assembly between the first profile (1) and the second profile (2).

Figure 2 illustrates an isometric view on one end of the translucent structural profile with an exploded view of the fastening components of the cover of the first exemplary embodiment.

Figure 3 illustrates a side view of the translucent structural monolithic profile of a second exemplary embodiment of the structure in different steps of the assembly of the profiles. A) coupling between the crest of the profile (2) and the curve of the profile (1), B) moment before the clip-type coupling between the first profile (1) and the second profile (2), C) moment when the second clip-type coupling is generated, generating the assembly between the first profile (1) and the second profile (2), and D) illustration of the structure that represents the assembly between the first profile (1) and the second profile (2).

Figure 4 illustrates an isometric view on one end of the translucent structural profile with an exploded view of the fastening components of the cover of the second exemplary embodiment.

Figure 5 illustrates a bottom view of a shed containing a plurality of structure profiles installed on the underside of its roof.

Figure 6 illustrates a top view of a shed containing a plurality of frame profiles installed on the underside of its roof.

Figure 7 illustrates a front view of a shed containing a plurality of frame profiles installed on the underside of its roof.

Figure 8 illustrates an isometric view of a shed containing a plurality of frame profiles installed on the underside of its roof during the day.

Figure 9 illustrates an isometric view of a shed containing a plurality of frame profiles installed on the underside of its roof at night.

OBJECT OF THE INVENTION

[0018] In a single object, the present invention discloses a translucent monolithic structural profile for the configuration of variable position louvres in sliding roofs of retractable pergola-type structures. The profile of the invention is made up of the coupling of a profile of extruded metallic material, preferably extruded aluminum, with a translucent profile made of a translucent polymer, preferably polycarbonate, attached by means of a press-fit coupling mechanism that does not require additional fastening elements such as screws or adhesive elements.

[0019] The previously described object, as well as the additional objects that may arise, will be described in detail and with the necessary sufficiency in the description disclosed below, which will constitute the foundation of the claims.

DETAILED DESCRIPTION OF THE INVENTION

[0020] The present invention arises in response to the need to provide solutions for thermal and lighting comfort in retractable louvred pergola structures, in particular, the transmission and diffusion of both natural light and artificial light to the interior of the structure, without having the need to move or open the sliding roof of the pergola to achieve this objective, with the involvement of the weather conditions present.

[0021] The description of the embodiment of the present invention is not intended to limit its scope, but rather to serve as a particular example thereof. A person skilled in the art is expected to understand that the equivalent embodiments do not depart from the spirit and scope of the present invention in its broadest form.

[0022] The present invention discloses a monolithic structural profile of the slat or louvre type from the attachment of structural profiles to be applied on sliding roofs of outdoor covering structures such as pergolas, sheds

or facades.

[0023] In the context of the present invention, and by way of general clarification throughout the entire description, a monolithic profile will be understood as the attachment of all the elements that make up the present device, or also louvres.

[0024] In the context of the present invention, and by way of general clarification throughout the entire description, a translucent structural profile will be understood as the structural monolithic profile without end caps or fastening elements.

[0025] The monolithic structural profile of the invention allows natural sunlight to pass through when the slats of a sliding roof of a pergola are in a horizontal, extended or closed position, through a translucent profile that includes the coupling of a first extruded profile made of a polymer (1), preferably polycarbonate, which diffuses light into the interior of the pergola.

[0026] The transverse plane of the translucent structural profile presents an irregular geometry and is adaptable to any type of extruded geometry with ribs on its inner face for the incorporation of fastening elements at the ends thereof.

[0027] The extruded translucent profile made of a polymer (1) is inserted into another extruded profile made of a metallic material (2).

[0028] In a more preferred embodiment, the translucent structural-type monolithic profile (4) is characterized in that the translucent polymer is polycarbonate.

[0029] In another more preferred embodiment, the translucent structural-type monolithic profile (4) is characterized in that the metallic material is aluminum.

[0030] The monolithic structural profile (4) made up of a first coupling of the first profile made of polycarbonate (1) and the second profile made of aluminum (2), which is generated by a curved termination (6) at the top of the first profile (1) and a crest-shaped termination (3) at the top of the second profile (2), which increases the resistance to deflection of the profile, compensating for the loss of deflection generated by the coupling of the first profile (1) and the second profile (2). The illustration at letter B of Figures 1 and 3 represents the fastening that is generated from said first coupling between the first profile (1) and the second profile (2).

[0031] To provide the necessary resistance, the monolithic structural profile (4) object of the present invention has a second coupling that attaches the first profile (1) and the second profile (2) together, being generated by a clip type termination (9) at the bottom of the first profile (1) and a clip-type termination (10) at the bottom of the second profile (2), generating a solid, composite material profile.

[0032] The illustration at letter C of Figures 1 and 3 shows the second clip-type coupling generated between the first profile (1) and the second profile (2); it has a mechanism that rotates downwards and rotates around the aluminum profile (2) describing a circular movement (8), automatically causing the coupling between the two profiles, facing one another. The rotation of the first profile (1) is generated from the support point that exists in the first coupling, through the first coupling that is generated by a curved termination (6) at the top of the first profile (1) and a crest-shaped termination (3) at the top of the second profile (2).

[0033] The illustration at letter D of Figures 1 and 3 shows the assembly generated between the first profile (1) and the second profile (2) generated by the first and second couplings, which generates an effect similar to that of a weld bead between profiles, along their entire length, without the need to add screw-type anchoring mechanisms, or glue or adhesives, thus forming a solid, composite material monolithic profile.

[0034] The surprising technical effect provided by the present invention that is the object of disclosure consists of the fact that the configuration provided by the solid monolithic composite profile has identical mechanical properties to those of conventional profiles made of a metallic material, preferably 100% extruded aluminum. However, unlike said conventional profiles, the profile of the present invention allows the passage of overhead light, that is, it replaces the opacity of aluminum profiles, transmitting and diffusing natural daylight into the interior of the pergola structure where they are installed, according to the requirements of users.

[0035] In another preferred embodiment, the translucent structural-type monolithic profile (4) is characterized in that it further comprises a cover with the geometry of the assembly of the first profile (1) and second profile (2) that is operatively coupled at the end of said assembly.

[0036] Figures 2 and 4 show an embodiment of the translucent structural-type monolithic profile (4) wherein the inner face of the first profile (1) and second profile (2) contain grooves for holding said cover.

[0037] Figure 5 shows an exemplary embodiment illustrating a pergola when the translucent monolithic profile is installed in an open manner under the roof of said pergola. Figures 6 and 7 show an exemplary embodiment when the translucent monolithic profile is open and closed, respectively.

[0038] In a particular modality of the invention, the monolithic profile can further include artificial lighting, preferably LED light strips (11) to diffuse lighting to the interior of the pergola structure where they are installed at night, as a result of their translucency.

[0039] Figures 8 and 9 show exemplary embodiments of the installation of the monolithic profile on a pergola, when it is in the presence of natural or day light, and in the presence of artificial light at night, respectively.

[0040] In said implementation modality, the LED lights (11) are connected to the profile by means of an electrical socket (12) with an electrical power cable (13), wherein the connection is controlled by a remote-controlled intelligent control center (14) which allows, at the time of the implementation of the profile inside the assembly of the pergola-type structure, the configuration of a watertight connection. In the preferred modality of said particular

implementation, the LED lights are located both on the upper side and on the underside of the roof of the pergola where the profiles of the invention are arranged in the configuration of the respective louvres.

[0041] The illustration at letter A of Figure 1 and Figure 3, shows that the monolithic profile of the present invention manages to configure slats or louvres that make up the swinging roof of pergola structures which configure bioclimatic pergola structures since they are translucent to and diffuse either natural light or artificial light, wherein the transmission and diffusion of light to the interior of the structure can be adjusted according to the user's requirements.

[0042] The foregoing does not affect the resistance and other mechanical conditions of the monolithic profile disclosed in this description, preserving the same deflection that conventional profiles made of a metallic material, preferably 100% aluminum, have as a result of the first and second coupling, making it possible to obtain a solid and monolithic element, with an aesthetic and luminous shape, both during the day and at night.

[0043] Although the present invention has been described with the preferred embodiments shown, it is understood that modifications and variations in keeping with the spirit and scope of this invention are to be understood within the scope of the appended claims.

Claims

1. A translucent structural-type monolithic profile (4) for the configuration of louvres for sliding roofs of pergolas and facades, **CHARACTERIZED in that** it comprises:

   - a first profile made of extruded translucent polymer (1) assembled with a second profile made of an extruded metallic material (2) by means of a first and a second coupling;
   - wherein the first coupling between the first profile (1) and the second profile (2) is generated by a curved termination (6) at the top of the first profile (1) and a crest-shaped termination (3) at the top of the second profile (2);
   - wherein the second coupling between the first profile (1) and the second profile (2) is generated by a clip-type termination (9) at the bottom of the first profile (1) and a clip-type termination (10) at the bottom of the second profile (2);
   - wherein said first and second couplings between the first and second profiles are press-fit couplings; and
   - wherein the first profile (1) and second profile (2) face one another longitudinally through the first and second press-fit couplings.

2. The translucent structural-type monolithic profile (4) according to claim 1, **CHARACTERIZED in that** the translucent polymer is polycarbonate.

3. The translucent structural-type monolithic profile (4) according to claim 1, **CHARACTERIZED in that** the metallic material is aluminium.

4. The translucent structural-type monolithic profile (4) according to claim 1, **CHARACTERIZED in that** it further comprises a cover with the geometry of the assembly of the first profile (1) and second profile (2) that is operatively coupled at the end of said assembly.

5. The translucent structural-type monolithic profile (4) according to claim 4, **CHARACTERIZED in that** the inner faces of the first profile (1) and second profile (2) contain grooves for holding said cover.

6. The translucent structural-type monolithic profile (4) according to claim 1, **CHARACTERIZED in that** it further includes LED light strips (11).

7. The translucent structural-type monolithic profile (4) according to claim 6, **CHARACTERIZED in that** the LED lights (11) are connected to the monolithic profile (4) by means of an electrical socket (12) with an electrical power cable (13), wherein the connection is controlled by a remote-controlled intelligent control center (14).

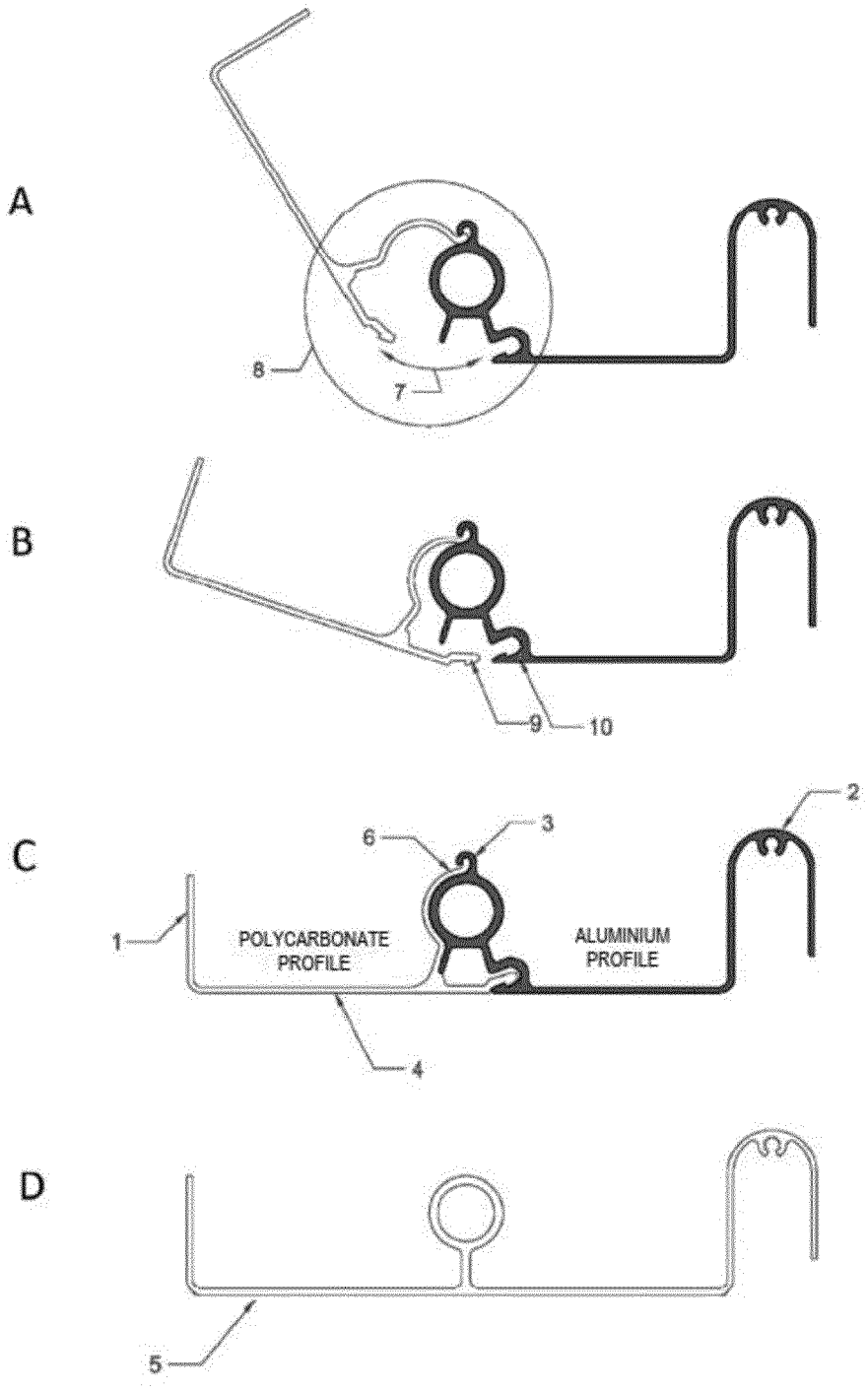
A
8
7
B
9
10
C
6
3
2
1
POLYCARBONATE PROFILE
ALUMINIUM PROFILE
4
D
5

FIG. 1

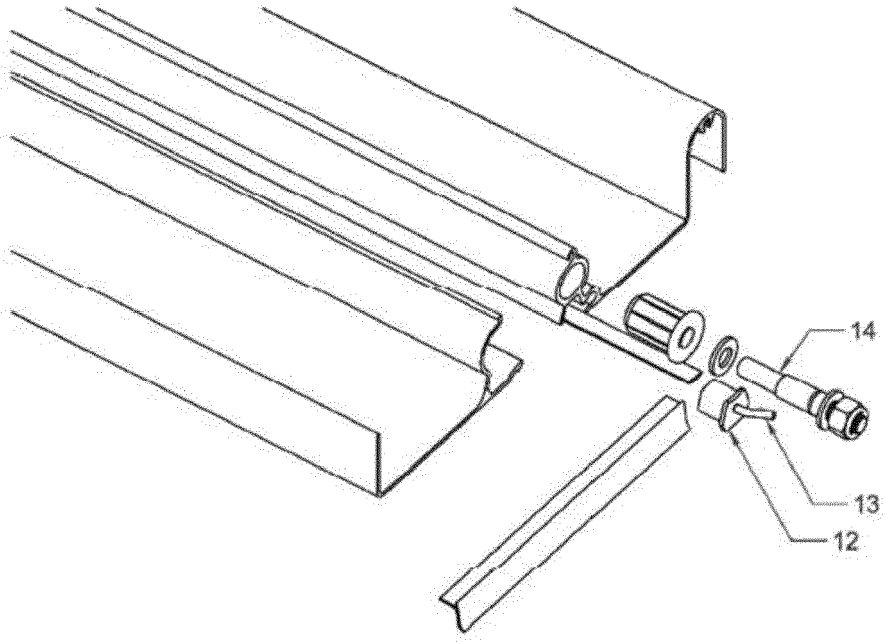

FIG. 2

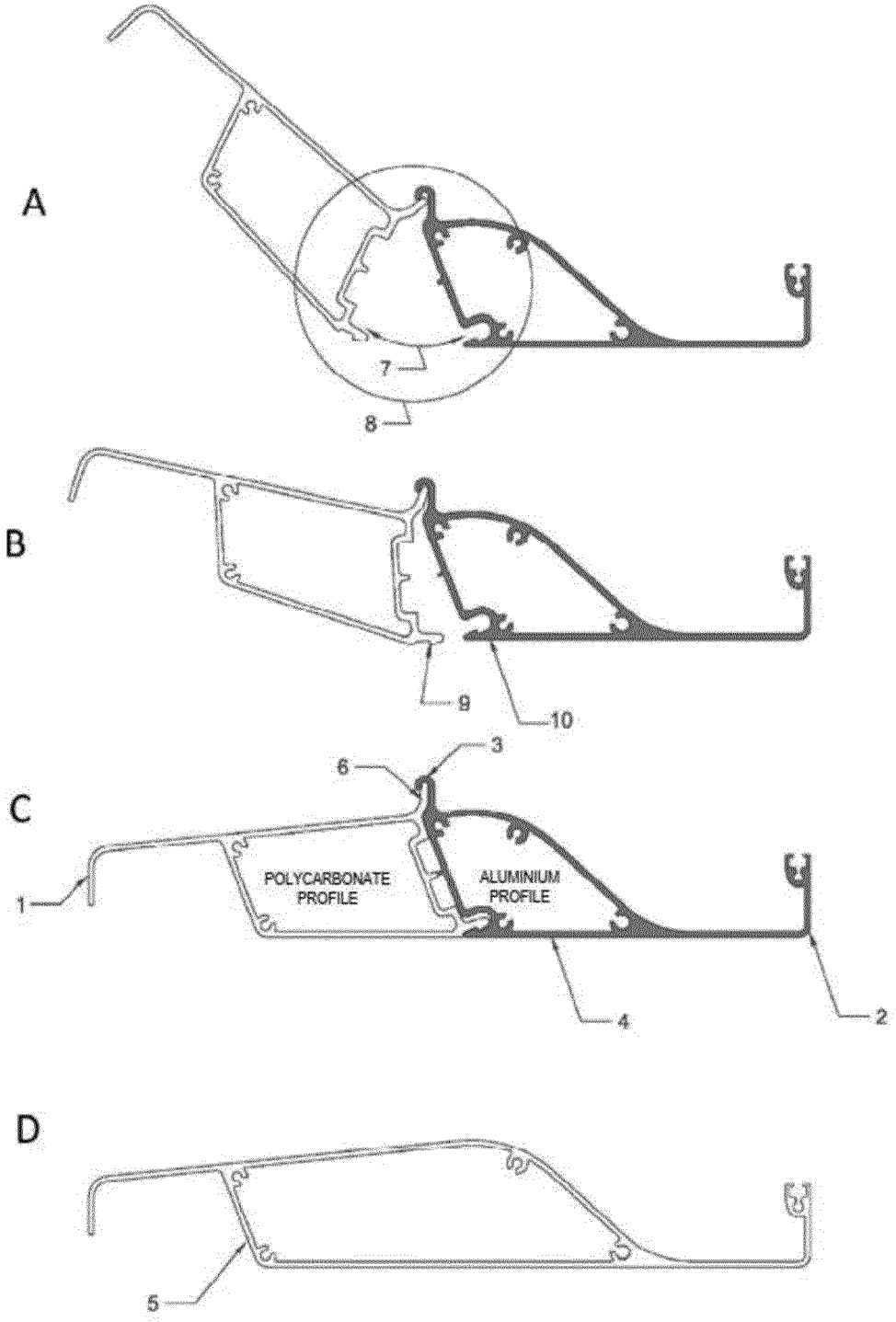
A
7
8
B
9
10
C
6
3
1
POLYCARBONATE PROFILE
ALUMINIUM PROFILE
4
2
D
5

FIG. 3

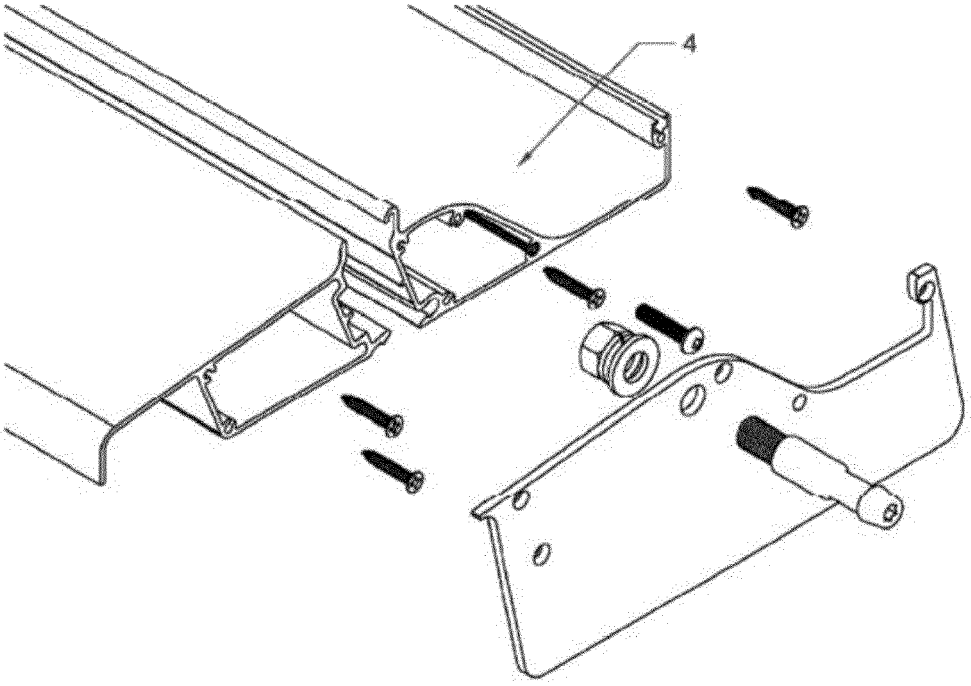

FIG. 4

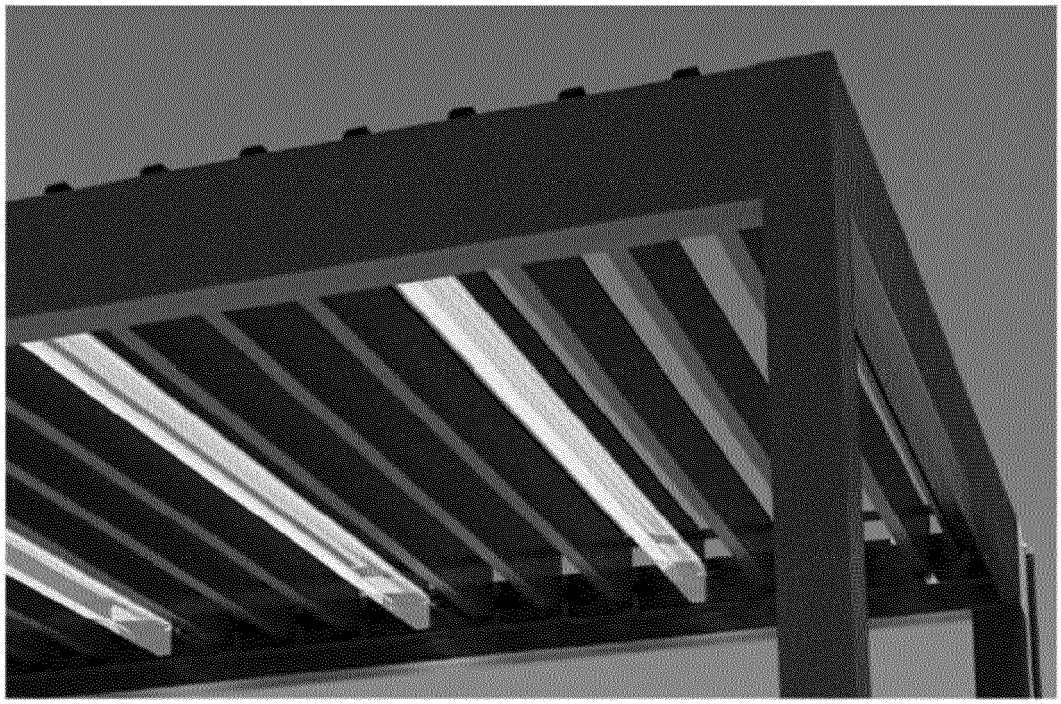

FIG. 5

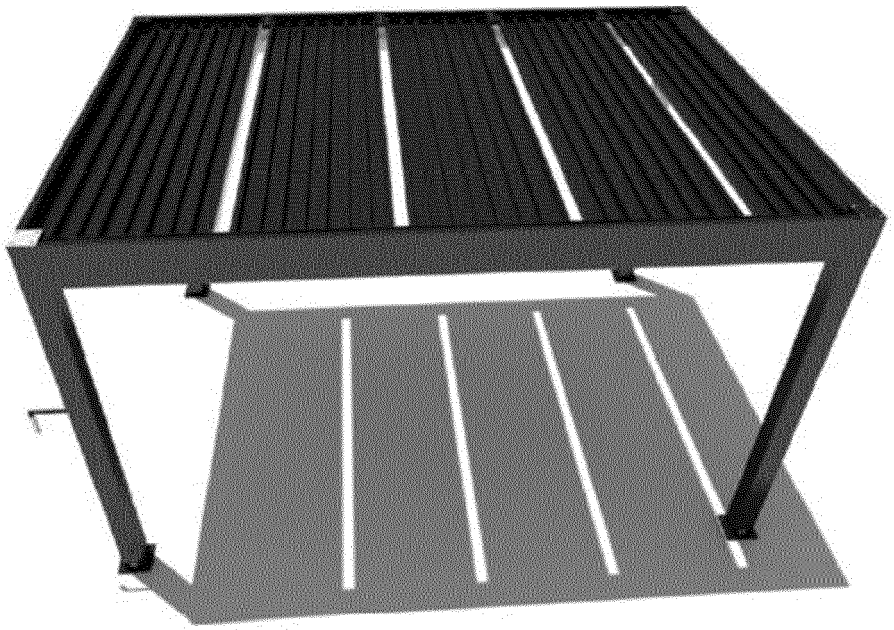

FIG. 6

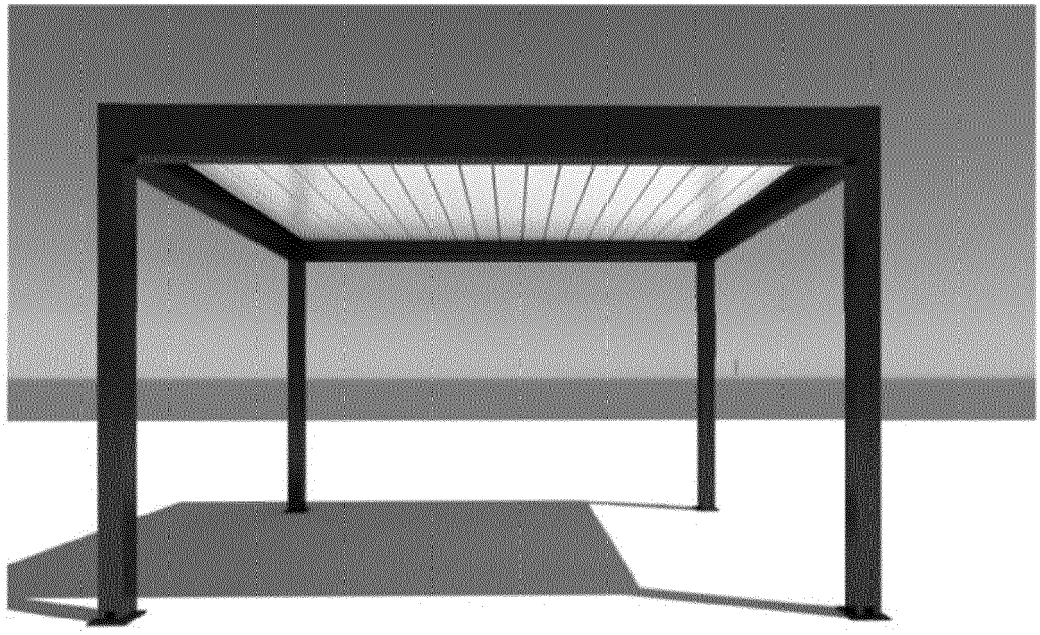

FIG. 7

FIG. 8

FIG. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 23 38 2695

DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	US 11 268 321 B2 (FROESE BRAD [US]) 8 March 2022 (2022-03-08) * figure 2 * * column 1, line 51 - line 58 *	6,7	TECHNICAL FIELDS SEARCHED (IPC) E04F E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	20 December 2023	Cornu, Olivier

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