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(54) Pitch awning and method for assembling a pitch awning

(57) Pitch awning which comprises a support structure (2), provided with at least two guides (4) which are extended along respective parallel extension directions (X' and X"), and a plurality of transverse profiles (5) mounted on the support structure (2) and slidably engaged, at the ends (5a) thereof, with the guides (4) and movable along a slide direction (X) parallel to the extension directions (X' and X") of the guides (4). Each of the transverse profiles (5) is provided with an upper face (6) on which at least one longitudinal groove (7) is obtained. The awning also comprises a covering sheet (8) supported by the transverse profiles (5) and movable between a collected position (A) and an extended position (B) through the sliding of the transverse profiles (5) along the slide direction (X) in a collection sense (R) and in an extension sense (E). The sheet (8) comprises a plurality of separate sheet portions (8') arranged in succession along the slide direction (X), each provided with a front edge (9) and with a rear edge (10), with respect to the extension sense (E), which are respectively fixed to two distinct adjacent profiles (5).

The rear edge (10) and the front edge (9) of two sheet portions (8') arranged in succession face one another at a same transverse profile (5) and are provided respectively with at least one first joining element (11) and with at least one second joining element (12) susceptible of being joined together in shape engagement to fix together the rear edge (10) and the front edge (9) of the sheet portions (8'). Each of the at least one first joining element (11) is susceptible of being fixed to the transverse profile (5), housed in shape engagement in one of the at least one longitudinal groove (7) of the transverse profile (5).

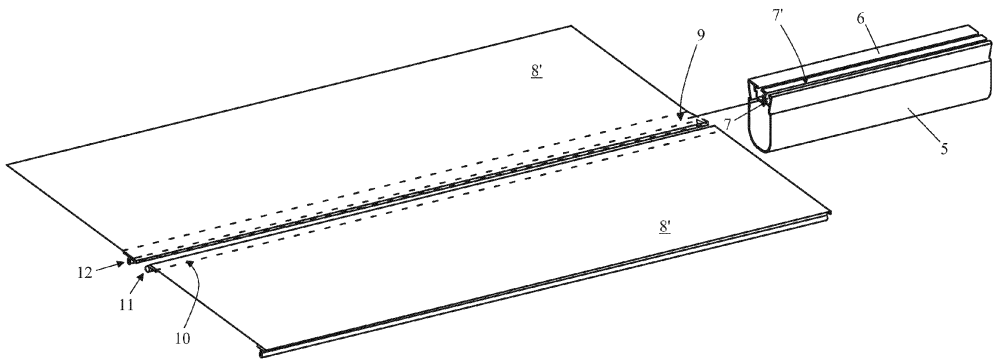

Fig. 3

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Description

Field of application

[0001] The present invention regards a pitch awning and a method for assembling a pitch awning, according to the preamble of the respective independent claims.

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

[0003] The awning, object of the present invention, is advantageously of pitch type, i.e. it is provided with a sheet movable between a collected position, in which it defines a plurality of pitches close to each other, and an extended position, in which it is at least partially extended above the area to be covered.

[0004] The present awning is therefore indicated for obtaining pergolas, verandas and more generally covered outside settings, both in gardens of private homes and in open public spaces, such as restaurants, hotels, bathing establishments or other structures.

[0005] The aforesaid awning can be anchored to the building wall, to the ceiling or to a truss of a building, or it can be of isolated type, being supported by a dedicated support structure of self-bearing type. The awning can also be associated with lateral closures for better protecting the covered setting from weathering agents and creating a greater separation with the external environment.

[0006] The awning, object of the present invention, therefore falls within the industrial field of the production of awnings for covering outside settings.

State of the art

[0007] Numerous pitch awning solutions are known on the market, which comprise a support structure, fixed to the ground and/or abutted against an external wall or the ceiling of a building. Such support structure is provided with at least two parallel lateral longitudinal members, supported at the desired height with respect to the ground by columns or by walls, substantially in a horizontal manner or slightly tilted.

[0008] The sheet of the awning, generally obtained in a single body, is suspended above the area to be covered and is fixed to a plurality of transverse profiles, which are arranged transverse to the lateral longitudinal members and are slidably engaged at their ends in guides arranged on the lateral longitudinal members themselves, by means of carriages or similar slidable guide means.

[0009] Also provided are drive means for moving the profiles along the guides of the longitudinal members, and hence for moving the sheet between a collected position, in which it attains a plurality of pitches or pockets side-by-side each other, each of which defined between a pair of successive profiles, and an extended position, in which the sheet is substantially spread above the area to be covered.

[0010] A first problem encountered in this type of pitch awning comprising a single-body sheet lies in the difficulty of managing the entire sheet during the operations of awning mounting or maintenance. A second problem of such pitch awnings of known type consists of the need to remove or substitute the entire sheet if the latter is dirtied or damaged, even in only one part thereof.

[0011] In order to facilitate the operations of mounting, maintenance, cleaning and possible substitution of the sheet, awnings have for some time been on the market that comprise a sheet made of a plurality of separate portions, joined in succession by the transverse profiles.

[0012] For such purpose, an awning is known from patent US2006219374 that is provided with a support framework and with a plurality of profiles fixed to the support framework. Each of the profiles is provided with a longitudinal groove open on one face of the profile itself directed towards the outside environment. The awning also comprises a sheet made of a plurality of separate sheet portions, each of which extended between two adjacent profiles, with the end edges of the sheet portions fixed to such profiles. More in detail, the end edges of two contiguous sheet portions are arranged superimposed inside the longitudinal groove of one crosspiece and are fixed to the internal surface of the latter through suitable fastening means, e.g. screws, clips or one or more adhesive layers. In addition, inside the longitudinal groove, to retain the superimposed edges of the two sheet portions, a flexible oblong body is housed which fills the internal volume of the groove, without however projecting onto the face of the transverse profile directed towards the outside environment and thus without being visible from the outside.

[0013] Nevertheless, the awning of known type described briefly above has in practice shown that it does not lack drawbacks. The main drawback of such awning lies in the fact that rainwater can be introduced inside the longitudinal groove, inserting itself in the interstices between the flexible body and the edges of the sheet portions, and thus leading to the formation of undesired water stagnation inside the groove itself.

[0014] In order to remedy such drawback, awnings have been designed that comprise a sheet formed by a plurality of distinct sheet portions, which are capable of ensuring optimal impermeability even at the junction zone between two contiguous sheet portions.

[0015] An awning embodiment of the latter type is described in the patent IT1378852. Such awning comprises a support structure provided with two parallel longitudinal members and a plurality of profiles slidably engaged at the ends thereof in facing guides arranged on the longitudinal members. The awning also comprises a sheet obtained with a plurality of distinct sheet portions, each of which connected to two adjacent profiles through respective end edges fixed to the latter. For such purpose, each profile is provided with a first longitudinal groove and a second longitudinal groove that are parallel and open on an upper face of the profile itself. In addition, the

end edges of each sheet portion are each provided with an engagement element, such engagement elements susceptible to being engaged respectively in the first longitudinal groove of a first crosspiece and in the second longitudinal groove of a second crosspiece contiguous with the first, in order to fix the sheet portion to the contiguous profiles themselves. Each profile is also provided with one central groove, defined between the two longitudinal grooves, it too open on the upper face of the profile and adapted to receive a sealing element in engagement. The latter is provided with an engagement stem, susceptible to being inserted in the central groove of the profile, and with an enlarged head susceptible to being arranged above the end edges of the sheets fixed to the profile, respectively engaged with the first and the second groove, in order to prevent the infiltration of water in such grooves.

[0016] The above-described awning of known type, nevertheless, even if it ensures an appropriate waterproofing of the covered environment defined by the awning, requires rather complex mounting operations, given the large number of pieces provided for engaging the sheet portions with the crosspiece and for ensuring an optimal waterproofing of the awning itself. In addition, the sealing elements, and in particular their enlarged heads, remain visible on the upper face of the covering sheet when the latter is in the collected position as well as when it is in the extended position, having considerable impact on the aesthetics of the awning itself.

Presentation of the invention

[0017] In this situation, the essential problem underlying the present invention is therefore to eliminate the drawbacks of the solutions of known type mentioned above, by providing a pitch awning which allows unloading the rainwater in an optimal manner.

[0018] A further object of the present invention is to provide a pitch awning which is simple and quick to mount.

[0019] Another object of the present invention is to provide a pitch awning which is simple and quick to maintain.

[0020] A further object of the present invention is to provide a pitch awning which is inexpensive to achieve, safe and entirely reliable in operation.

[0021] A further object of the present invention is to provide a pitch awning which has an appearance that is not damaged by means or elements adapted for ensuring the impermeability of the awning itself.

Brief description of the drawings

[0022] The technical characteristics of the finding, according to the aforesaid objects, can be clearly found 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:

FIG. 1 shows a side view of the pitch awning in accordance with the present invention;

FIGS. 2a and 2b show a top perspective view of the awning in accordance with the present invention, respectively in collected position and in extended position;

FIG. 3 shows an exploded view of a detail of the pitch awning, object of the present invention, relative to two end edges of provided contiguous sheet portions susceptible of being engaged with a provided crosspiece;

FIG. 4a shows a section view of a detail of an awning in accordance with the present invention according to a first embodiment, relative to a crosspiece and to two end edges of two contiguous sheet portions, engaged with each other and engaged with the crosspiece;

FIG. 4b shows an exploded view of the detail in section of Figure 4a;

FIG. 5a shows a section view of a detail of an awning in accordance with the present invention according to a second embodiment, relative to a crosspiece and to two end edges of two contiguous sheet portions, engaged with each other and engaged with the crosspiece;

FIG. 5b shows an exploded view of the detail in section of Figure 5a;

FIGS. 6 and 7 show a section view of a detail of an awning in accordance with the present invention respectively according to a third and fourth embodiment, relative to a crosspiece and to two end edges of two contiguous sheet portions, engaged with each other and engaged with the crosspiece;

FIG. 8 show a section view of a detail of an awning in accordance with the present invention according to a fifth embodiment, relative to a crosspiece and to two end edges of two contiguous sheet portions, engaged with each other and engaged with the crosspiece.

Detailed description of a preferred embodiment

[0023] With reference to the set of drawings, a pitch awning, object of the present invention, has been indicated in its entirety with the reference number 1.

[0024] The present awning 1 is indicated for the obtainment of pergolas, verandas and more generally covered outside settings, both in gardens of private homes and in open public spaces, such as restaurants, hotels, bathing establishments or other structures.

[0025] The aforesaid awning 1 can be anchored to a building wall, to the ceiling or to a truss of a building, and it may be supported with the aid of two or more columns or walls, or it may be of isolated type, as in the embodiment illustrated in the enclosed figures.

[0026] The awning 1 can also be associated with lateral

closures, not illustrated in detail since of *per se* known type, adapted to better protect the covered setting from weathering agents and create a greater separation with the external environment.

[0027] In accordance with the embodiment illustrated in the enclosed figures, the awning 1 is isolated and hence supported by a dedicated support structure 2, of self-bearing type, which comprises four or more columns 3 connected to each other by two or more longitudinal members, including two lateral longitudinal members 3'.

[0028] Hereinbelow, an isolated awning will be illustrated, i.e. one that is not anchored to a building wall or to the ceiling of a building, provided with only two lateral longitudinal members 3'; nevertheless, it is intended that the awning 1 can also be abutted against a wall or ceiling of a building and/or be provided with a greater number of longitudinal members - more than the two lateral longitudinal members 3' - without departing from the protective scope defined in the present patent. The support structure 2 of the awning can also comprise two or more transverse longitudinal members, including a front and a rear longitudinal member. The front transverse longitudinal member can be placed at a same height as the rear transverse longitudinal member, or it can be placed at a lower height and the lateral longitudinal members 3' can in such case be tilted.

[0029] The support structure 2 is provided with two or more lateral guides 4, which are extended along respective extension directions X' and X" that are parallel to each other. Advantageously, the guides 4 are provided on the lateral longitudinal members 3', in particular on the facing internal faces of the latter, and are for example obtained from extruded profiles. In accordance with the embodiment illustrated in the enclosed figures, the support structure 2, which comprises only two lateral longitudinal members 3', comprises only two guides 4.

[0030] The awning 1 also comprises a plurality of transverse profiles 5 mounted on the support structure 2, which are extended along a longitudinal direction Y, substantially orthogonal to the extension direction X' and X" of the guides 4.

[0031] The transverse profiles 5 are slidably engaged, at the ends 5a thereof, with the guides 4 and are movable along a slide direction X, parallel to the extension directions X' and X" of the guides 4.

[0032] More in detail, at the opposite ends 5a of each profile 5, respective carriages or similar slidable guide means are mounted, which are *per se* known to the man skilled in the art and hence not discussed in detail hereinbelow.

[0033] Each of the transverse profiles 5 is provided with an upper face 6, on which one or more longitudinal grooves 7 are obtained side-by-side on the same surface. In particular, on the upper face 6 of each transverse profile 5, one or more longitudinal openings 7' are obtained that are communicating with the respective longitudinal grooves 7, such openings 7' and grooves 7 substantially extended over the entire length of the transverse profile. In accordance with the embodiments illustrated in the enclosed figures, a single groove 7 is obtained on the upper face 6 of each transverse profile 5. Below in the description, reference will therefore be made to the illustrated case; nevertheless, it is intended that on the upper face 6 of each transverse profile 5, two or more grooves 7 could be obtained without departing from the protective scope defined by the present patent.

[0034] The awning 1 also comprises a covering sheet 8 supported by the profiles 5 and movable between a collected position A and an extended position B, through the sliding of the transverse profiles 5 along the slide direction X, in a collection sense R and in an extension sense E. In particular, the transverse profiles 5 are driven to slide by drive means, not illustrated in detail since they are of *per se* known type, which in particular act on a first front transverse profile 5' adapted to drive the remaining profiles therewith.

[0035] The sheet 8, when it is situated in the collected position A, attains a plurality of pitches or pockets side-by-side each other, each of which defined between a pair of successive profiles 5. When it is situated in the extended position B, the sheet 8 is substantially extended over the area to be covered.

[0036] The sheet 8 comprises a plurality of separate sheet portions 8' arranged in succession along the slide direction X, each provided with a front edge 9 and with a rear edge 10 - considered with respect to the extension sense E of the sheet 8 - which are respectively fixed to two distinct adjacent transverse profiles 5.

[0037] In accordance with the idea underlying the present invention, the rear edge 10 and the front edge 9 of two sheet portions 8' arranged in succession face one another at a same transverse profile 5, as in particular illustrated in Figures 4a-5a, and are provided respectively with one or more first joining elements 11 and with one or more second joining elements 12.

[0038] The first joining element 11 and the second joining element 12 are susceptible of being joined together in shape engagement to fix together the rear edge 10 and the front edge 9 of the two successive sheet portions 8'. In addition, the first joining element 11 is susceptible of being fixed to the transverse profile 5, housed in shape engagement in the longitudinal groove 7 of the profile 5.

[0039] The engagement of the first joining element 11 in the longitudinal groove 7 of the profile 5 ensures that the edges of the two separate sheet portions 8', fixed to each other via the mutual engagement of the first and second joining element 11 and 12, are fixed to a same transverse profile 5. The first and the second joining element 11 and 12 thus allow fixing together the adjacent edges of two separate sheet portions 8' and at the same time fixing such edges to the corresponding transverse profile 5, in such a manner allowing a quick and easy mounting and disassembly of the awning 1 in accordance with the present invention and facilitating the maintenance operations of the awning 1 itself.

[0040] The fact that the rear edge 10 and the front edge

9 of the two sheet portions 8' are facing, or at least partially superimposed at the transverse profile 5 to which they are fixed, ensures a continuity of the sheet 8; consequently, an optimal impermeability of the awning itself is ensured, preventing rainwater from infiltrating at the junction zones of the sheet portions 8' and, in particular, from infiltrating through the longitudinal opening 7' to the interior of the longitudinal grooves 7 of the transverse profiles 5. Advantageously, the front edge 9 comprises an extension band 9' that is extended beyond the groove 7, such that the longitudinal opening 7' is completely covered and the infiltration of water into the latter and into groove 7 is prevented.

[0041] Preferably, the front edge 9 of each of the sheet portions 8' is at least partially superimposed, in particular with its extension band 9', on the rear edge 10 of the sheet portion 8' successive thereto in the extension sense E of the sheet 8, obtaining an overall continuity of the awning for its entire extension and facilitating the downflow of rainwater away from the longitudinal opening 7' and in particular in the extension sense E of the sheet 8.

[0042] The impermeability of the awning 1 between the different sheet portions 8' that compose it is not obtained, as in known prior art solutions, due to the principle of engaging the contiguous edges of the sheet portions with the transverse profiles in slots arranged on the profiles in positions suitable for obtaining sheets on different levels, in a manner so as to form steps (appearing similar to roof tiles). In particular, the transverse profiles 5 do not require, in accordance with the present invention, the sheet portions 8' to have any step-like superimposition of the respective contiguous edges which are engaged in a single longitudinal groove 7. The impermeability is obtained by arranging the sheets in a single groove 7 in which the first joining element 11 and the second joining element 12 are susceptible of being joined together in shape engagement to fix together the rear edge 10 and the front edge 9 of the two successive sheet portions 8', ensuring a continuity of the sheet 8, with the sheet portions 8' arranged substantially coplanar.

[0043] In accordance with a preferred embodiment of the awning 1 according to the present invention illustrated in the enclosed figures, the first joining element 11 is provided with a first fastening portion 13 and with a first engagement portion 14, connected to the first fastening portion 13 and preferably in a single body therewith. The first fastening portion 13 is fixed to the rear edge 10 of a portion 8' of the covering sheet 8, and the first engagement portion 14 is provided with a first convexity 15, suitable for being housed in shape engagement in the longitudinal groove 7 of a transverse profile 5. More in detail, the first convexity 15 has width l greater than the width s of the longitudinal opening 7' and therefore remains retained in the longitudinal groove 7, maintaining the first joining element 12 engaged with the transverse profile 5. Preferably, the first convexity 15 is suitable for being housed with clearance in the longitudinal groove 7 of the profile 5. The first engagement portion 14 defines, on the upper part, a longitudinal seat 16.

[0044] The second joining element 12 is provided with a second fastening portion 17 and with a second engagement portion 18, connected to the second fastening portion 17 and preferably in a single body therewith.

[0045] The second fastening portion 17 is fixed to the front edge 9 of a sheet portion 8' and the second engagement portion 18 is provided with a second convexity 19 suitable for being housed, in shape engagement, in the longitudinal seat 16 of a first joining element 11 fixed to the rear edge 10 of a distinct sheet portion 8'.

[0046] Preferably, the second fastening portion 17 is fixed to the front edge 9 at the front end edge 28 of the sheet portion 8'.

[0047] In particular, according to the embodiments illustrated in Figures 4a-5b, the second fastening portion 17 is susceptible of resting on the rear edge of the sheet portion 8' to which the first joining element 11 is fixed, the latter fixed to the second joining element 12. In such a manner, the second fastening portion 17 substantially seals the facing edge portions of the contiguous sheet portions 8', fixed to each other.

[0048] In particular, the shape engagement between the first joining element 11 and the second joining element 12 can ensure that the second fastening portion 17 of the second joining element 12 is retained pressed against the rear edge 10, i.e. against the first joining element 11.

[0049] The first engagement portion 14 of the first joining element 11 is provided with a longitudinal slot 16' connected to the longitudinal seat 16, and in particular arranged on the upper part thereof. The longitudinal slot 16' is in particular aligned with the longitudinal opening 7' of the transverse profile 5 when the first engagement portion 14 of the first joining element 11 is housed in the groove 7, as illustrated in Figures 4a and 5a.

[0050] Advantageously, the first engagement portion 14 of the first joining element 11 is extended beyond the rear end edge 20 of the sheet portion 8', and in particular the longitudinal slot 16' is arranged beyond such rear end edge 20, in order to allow a facilitated insertion of the second engagement portion 18 of the second joining element 12 in the longitudinal seat 16 defined on the upper part by the first engagement portion 14.

[0051] Preferably, the first engagement portion 14 of the first joining element 11 is extended in proximity to the rear end edge 20, in particular with the longitudinal slot 16' arranged substantially contiguous with the rear end edge 20, such that when the end edges of the sheet portions 8' are fixed to each other and to the transverse profile 5, the first and the second joining elements 11 and 12 are not visible on the upper face of the covering sheet 8.

[0052] The second fastening portion 17 of the second joining element 12 terminates before the front end edge 28 of the sheet portion 8', allowing the latter to project beyond the fastening portion 17 to protect the joint. In such a manner, the sheet portions 8' that follow each

other along the slide direction X result substantially coplanar, conferring an aesthetically-pleasing continuous appearance to the awning 1, without steps.

[0053] In particular, in accordance with possible embodiments of the awning 1 according to the invention illustrated in Figures 6 and 7, the second fastening portion 17 of the second joining element 12 is contiguous with the rear end edge 20 of the sheet portion 8' carrying the first joining element 11 fixed, resulting arranged substantially as a continuation of such sheet portion.

[0054] According to a further embodiment of the awning 1 in accordance with the present invention illustrated in Figure 8, the second fastening portion 17 of the second joining element 12 is substantially housed in the longitudinal opening 7', with the extension band 9' of the front edge 9 of the sheet portion 8' which carries, fixed, the second joining element 12 that surmounts the rear end edge 20 of the sheet portion 8' carrying, fixed, the first joining element 11.

[0055] Of course, the second engagement portion 18 of the second joining element 12 can in such case be obtained according to any one of the embodiments described in detail hereinbelow, even if not expressly illustrated.

[0056] In accordance with a preferred embodiment of the awning 1 according to the present invention, the first joining element 11 and the second joining element 12 are extended over the entire length L, respectively, of the rear edge 10 and of the front edge 9 of the sheet portions 8', if the aforesaid length L is measured parallel to the longitudinal extension direction Y of the transverse profiles.

[0057] The fact that the first joining element 11 and the second joining element 12 are extended over the entire length L of the edges ensures that the edges of the contiguous sheet portions 8' are fixed to each other and to the transverse profile 5 along their entire extension; hence, this prevents there being zones of discontinuity in the mutual engagement of the edges and in the engagement of the latter to the transverse profile, a further guarantee of the impermeability of the awning 1.

[0058] Advantageously, the first fastening portion 13 of the first joining element 11 and the second fastening portion 17 of the second joining element 12 are each provided with a flat face 21 for fixing to the edges of the sheet portion 8', adapted to facilitate the adhesion (e.g. via gluing or the like) and the fixing of the joining element to the respective edge of the sheet portion 8'.

[0059] Preferably the second engagement portion 18 of the second joining element 12 comprises an enlarged head 22 connected to the second fastening portion 17 through a shank 23 and suitable for being inserted coaxially in the second longitudinal seat 16 defined by the first engagement portion 14 of the first joining element 11. The shank 23 advantageously has width d' lower than the width 1' of the longitudinal slot 16' and lower than the width s of the longitudinal opening 7', as illustrated in Figures 4a and 5a, such that it can be easily inserted and possibly made to slide in the longitudinal slot 16' and in the longitudinal opening 7' aligned therewith. The enlarged head 22 has width d greater than the width 1' of the longitudinal slot 16' and therefore remains retained in the longitudinal seat 16, maintaining the second joining element 12 engaged with the first joining element 11.

[0060] Preferably, the enlarged head 22 is housed with clearance in the longitudinal seat 16 of the first joining element 11.

[0061] In accordance with a first embodiment of the awning 1 according to the present invention illustrated in the Figures 3-4b, 6 and 8, the enlarged head 22 is defined by an elongated body, which is extended over the entire extension length L of the second joining element 12 and has an enlarged cross section with respect to the shank 23, such cross section preferably circular.

[0062] In accordance with a different embodiment of the awning 1 according to the present invention illustrated in the Figures 5a-5b and 7, the enlarged head 22 is defined by two elastically deformable flexible wings 24, which in particular are suitable for being inserted via elastic deformation in the longitudinal seat 16.

[0063] The first joining element 11 can in such case comprise a reinforcement portion 27 connected to the first engagement portion 14 and suitable for being interposed between the upper face 6 of the transverse profile 5 and the second fastening portion 17 of the second joining element 12.

[0064] In accordance with the embodiment of the awning 1 illustrated in Figure 5a, in which the second fastening portion 17 of the second joining element 12 is superimposed on the rear edge 10 of the sheet portion 8', the reinforcement portion 27 has a thickness equal to the thickness of the first fastening portion 13 plus the thickness of the sheet portion 8', as illustrated in Figure 5a.

[0065] Otherwise, in accordance with the embodiment of the awning 1 illustrated in Figure 7, in which the second fastening portion 17 of the second joining element 12 is arranged substantially as a continuation of the sheet portion 8' carrying, fixed, the first joining element 11, the reinforcement portion 27 has a thickness substantially equal to the thickness of the single first fastening portion 13.

[0066] If the enlarged head 22 is defined by two elastically deformable flexible wings 24, according to the embodiment illustrated in Figures 5a, 5b and 7, multiple joining elements 12 can be provided in such case on the front edge 9 of each sheet portion 8', such elements 12 arranged spaced from each other along the extension length L of the sheet portion 8'.

[0067] Advantageously, the flexible wings 24 each terminate with a hook portion 25 and the longitudinal seat 16 has two recesses 26 with concavity directed towards the concavity of the seat 16, i.e. in particular with concavity directed downward, adapted to receive and retain the hook portions 25 of the flexible wings 24, in order to oppose the extraction of the enlarged head 22 from the longitudinal seat 16 when a traction force is applied on

the second joining element 12 that is substantially orthogonal to the plane defined by the sheet portion 8', such force aimed to move the second joining element 12 away from the first joining element 11.

[0068] The first and the second joining element 11 and 12 are preferably made of a polymer material and can be obtained for example via extrusion. In addition, the first engagement portion 14 and, more particularly, the second engagement portion 18 can be made of a material different from the material constituting respectively the first and the second fastening portion 13 and 17, e.g. in order to allow greater elastic deformability of the engagement portions with respect to the corresponding fastening portions. The joining elements can in such case be obtained via co-extrusion, for example.

[0069] For the purposes of the present invention, the concave grooves and the seats described above can of course be substituted in an entirely equivalent manner by convex bodies and the convexities of the first and second joining element 11 and 12, adapted to be engaged in the concave grooves and seats, can consequently be substituted with corresponding concavities, so long as they are still adapted to achieve a mutual shape engagement. In addition, the longitudinal groove 7, the first engagement portion 14 and the second engagement portion 18 can have cross sections of any shape and not necessary round, as illustrated in the enclosed figures, so long as they are still able to achieve a mutual shape engagement.

[0070] Also forming the object of the present invention is a method for assembling a pitch awning of the type described up to now; the same reference numbers will be maintained hereinbelow.

[0071] The method comprises a first mechanical assembly step for the first convexity 15 of the first joining element 11 fixed to the rear edge 10 of a sheet portion 8' in retention relationship in the concavity of the longitudinal groove 7 obtained on the upper face 6 of a transverse profile 5.

[0072] In particular, such first mechanical assembly step is preferably obtained through axial insertion of the first engagement portion 14 of the first joining element 11 in the longitudinal groove 7 of the transverse profile 5.

[0073] The method also comprises a second mechanical assembly step for the second convexity 19 of the second joining element 12, fixed to the front edge 9 of a different sheet portion 8', in retention relationship in the longitudinal seat 16 of the first engagement portion 15 of the first joining element 11.

[0074] Such second mechanical assembly step can be obtained through axial insertion of the second engagement portion 18 of the second joining element 12 in the longitudinal seat 16 of the first engagement portion 14 of the first joining element 11.

[0075] Otherwise, the second mechanical assembly step can be obtained by frontally associating, with snap insertion, the first joining element 11 and the second joining element 12, through elastic deformation of one or both of the engagement portions 14 and 18.

[0076] More in detail, the rear edge 10 and the front edge 9 of two sheet portions 8' arranged in succession, respectively carrying, fixed, the first joining element 11 and the second joining element 12, are arranged facing, with the first and the second engagement portion 14 and 18 superimposed. The edges, and the respective joining elements, are then pressed towards each other in order to force the second engagement portion 18 to be inserted in the longitudinal seat 16 of the first engagement portion 14, through elastic deformation of the first or second engagement portion 14 or 18, or both.

[0077] In particular, when the second engagement portion 18 comprises an enlarged head 22 defined by two flexible wings 24, the latter are advantageously snap-inserted, via elastic deformation, in the longitudinal seat 16.

[0078] The first and the second mechanical assembly step can be executed in the order desired, i.e. in the order more suitable for ensuring a quick and simple assembly of both joining elements in the longitudinal groove 7 of the transverse profile 5.

[0079] The finding thus conceived therefore attains the pre-established objects.

[0080] Of course, in the practical achievement thereof, it can also assume shapes and configurations different from that illustrated above, without departing from the present protective scope.

[0081] In addition, all details can be substituted with technically equivalent elements, and the size, shape and materials used can be of any type as required.

Claims

1. Pitch awning which comprises:

- a support structure (2) provided with at least two guides (4) being extended along respective extension directions (X' and X") that are parallel to each other;
- a plurality of transverse profiles (5) mounted on said support structure (2) and slidably engaged, at the ends (5a) thereof, with said guides (4) and movable along a slide direction (X) parallel to said extension directions (X' and X") of said guides (4), each of said transverse profiles (5) being provided with an upper face (6) on which at least one longitudinal groove (7) is obtained;
- a covering sheet (8) supported by said transverse profiles (5) and movable between a collected position (A) and an extended position (B) through the sliding of said transverse profiles (5) along said slide direction (X) in a collection sense (R) and in an extension sense (E), said sheet (8) comprising a plurality of separate sheet portions (8') arranged in succession along said

slide direction (X), each provided with a front edge (9) and with a rear edge (10), with respect to said extension sense (E), which are respectively fixed to two distinct adjacent transverse profiles (5);
characterized in that the rear edge (10) and the front edge (9) of two sheet portions (8') arranged in succession face one another at a same transverse profile (5) and are provided, respectively, with at least one first joining element (11) and with at least one second joining element (12) susceptible of being joined together in shape engagement to fix together said rear edge (10) and said front edge (9) of said sheet portions (8'); said first joining element (11) being susceptible of being fixed to said transverse profile (5), housed in shape engagement in one of said at least one longitudinal groove (7) of said transverse profile (5).

2. Pitch awning according to claim 1, **characterized in that** said first joining element (11) is provided with a first fastening portion (13), fixed to the rear edge (10) of a sheet portion (8') of said covering sheet (8), and with a first engagement portion (14), connected to said first fastening portion (13), provided with a first convexity (15) suitable for being housed in shape engagement in one of said at least one longitudinal groove (7) of one of said transverse profiles (5), and defining on the upper part a longitudinal seat (16), and said second joining element (12) is provided with a second fastening portion (17), fixed to the front edge (9) of a sheet portion (8') of said covering sheet (8), and with a second engagement portion (18), connected to said second fastening portion (17) and provided with a second convexity suitable for being housed, in shape engagement, in said longitudinal seat (16).

3. Pitch awning according to claim 2, **characterized in that** said first fastening portion (13) and said second fastening portion (17) are each provided with a flat face (21) for fixing to the edges of said sheet portion (8').

4. Pitch awning according to claim 2 or 3, **characterized in that** said first joining element (11) and said second joining element (12) are extended over the entire length (L) respectively of the rear edge (10) and of the front edge (9) of said sheet portions (8').

5. Pitch awning according to any one of the claims from 2 to 4, **characterized in that** said first engagement portion (14) of said first joining element (11) is provided with a longitudinal slot (16') connected to said longitudinal seat (16).

6. Pitch awning according to claim 5, **characterized in that** the second engagement portion (18) of said second joining element (12) comprises an enlarged head (22) connected to said second fastening portion (17) through a shank (23) and suitable for being inserted coaxially in the longitudinal seat (16) defined by the first engagement portion (14) of said first joining element (11), said enlarged head (22) having width (d) greater than the width (1') of said longitudinal slot (16').

7. Pitch awning according to claim 6, **characterized in that** said enlarged head (22) is defined by two elastically deformable flexible wings (24).

8. Pitch awning according to claim 7, **characterized in that** each of said flexible wings (24) terminates with a hook portion (25) and the longitudinal seat (16) of said first joining element (11) has two recesses (26) with concavity directed towards the concavity of the seat (16).

9. Pitch awning according to any of the claims from 2 to 8, **characterized in that**, with the rear edge (10) and the front edge (9) of two sheet portions (8') arranged in succession fixed to each other, the second fastening portion (17) of said second joining element (12) fixed to said front edge (9) is arranged contiguous with the rear end edge (20) of said rear edge (10).

10. Method for assembling a pitch awning in accordance with claim 2, which comprises the following operative steps:

- a first mechanical assembly step for the first convexity (15) of said first joining element (11) fixed to said rear edge (10) of a front sheet portion (8') in retention relationship in the concavity of one of said at least one longitudinal groove (7) obtained on the upper face (6) of a transverse profile (5) of said plurality of transverse profiles;
- a second mechanical assembly step for the second convexity (19) of said second joining element (12) fixed to said front edge (9) of a rear sheet portion (8'), subsequent to said front sheet portion (8'), in retention relationship in said longitudinal seat (16) defined by the first engagement portion (14) of said first joining element (11).

11. Method according to claim 10, wherein said first mechanical assembly step is obtained through axial insertion of the first engagement portion (14) of said first joining element (11) in one of said at least one longitudinal groove (7) of said transverse profile (5).

12. Method according to claim 10, wherein said second mechanical assembly step is obtained through axial insertion of the second engagement portion (18) of

said second joining element (12) in the longitudinal seat (16) defined by the first engagement portion (14) of said first joining element (11).

13. Method according to claim 10, wherein said second mechanical assembly step is obtained by frontally associating said first joining element (11) and said second joining element (12), through elastic deformation of one or both said first engagement portion (14) and said second engagement portion (18).

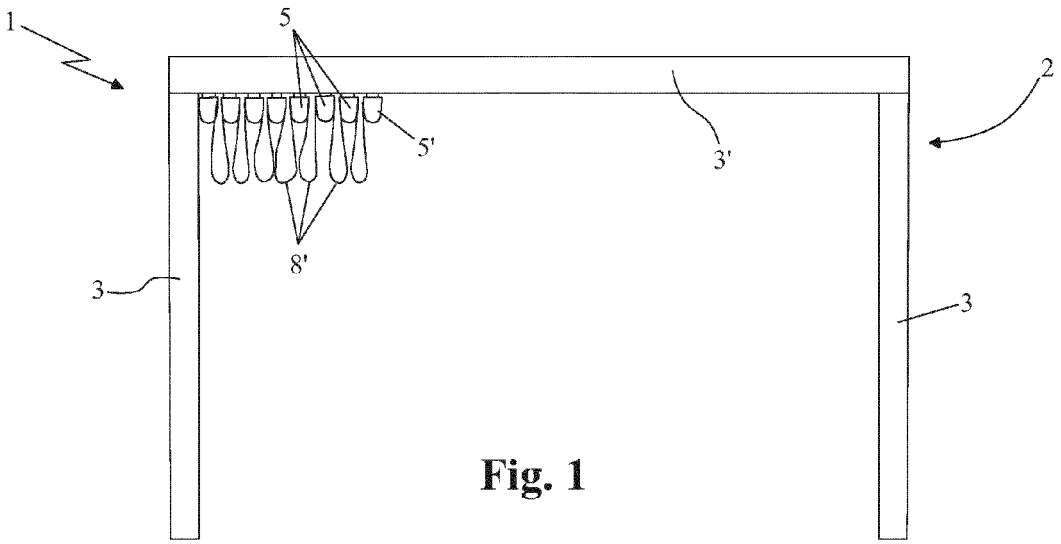

Fig. 1

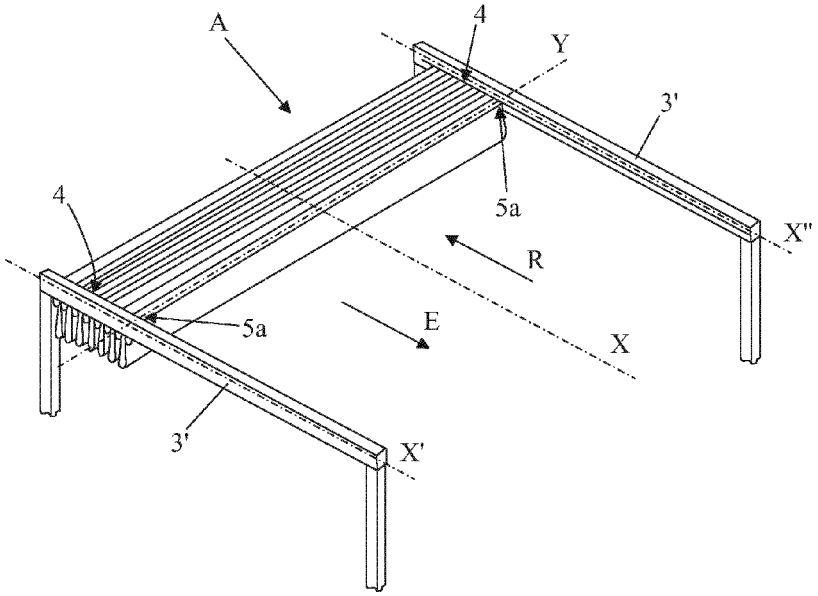

Fig. 2a

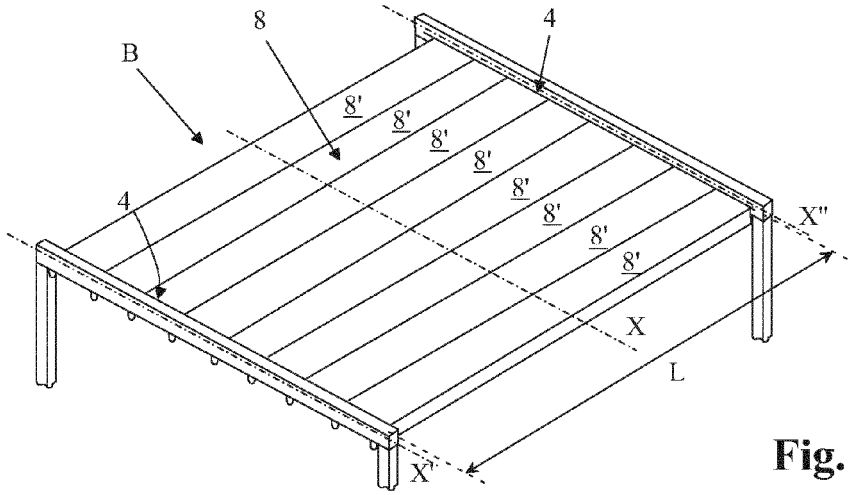

Fig. 2b

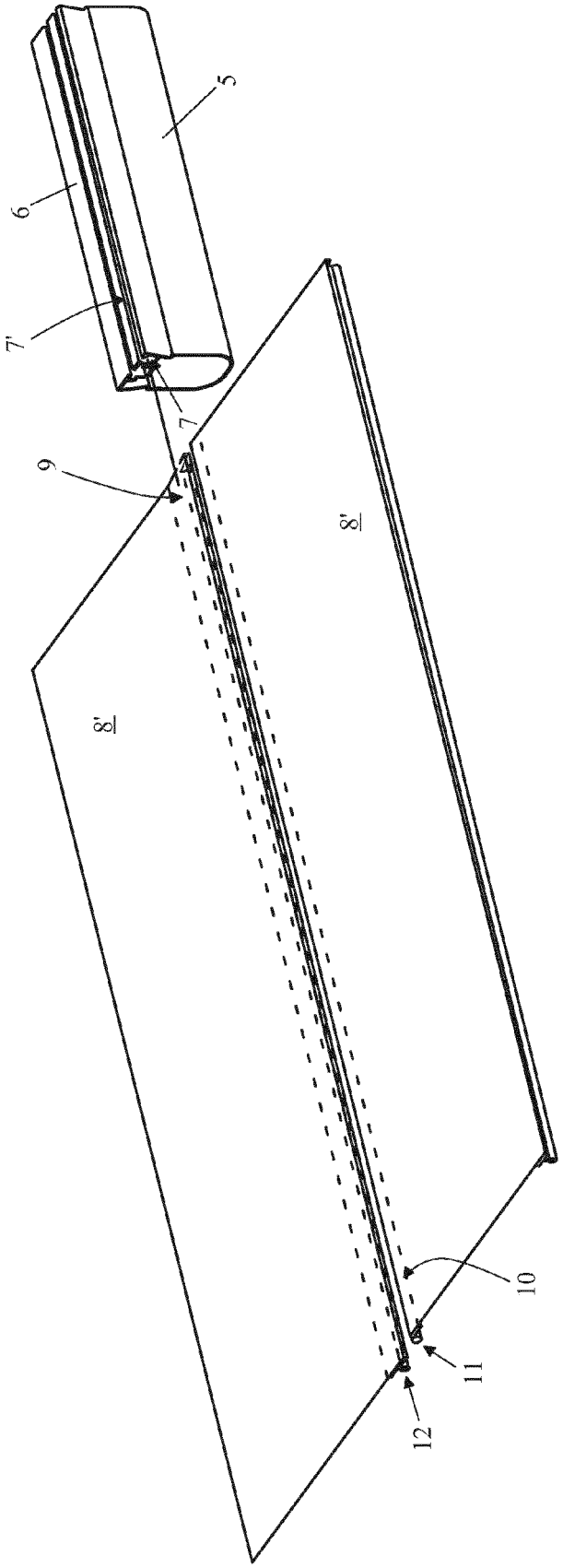

Fig. 3

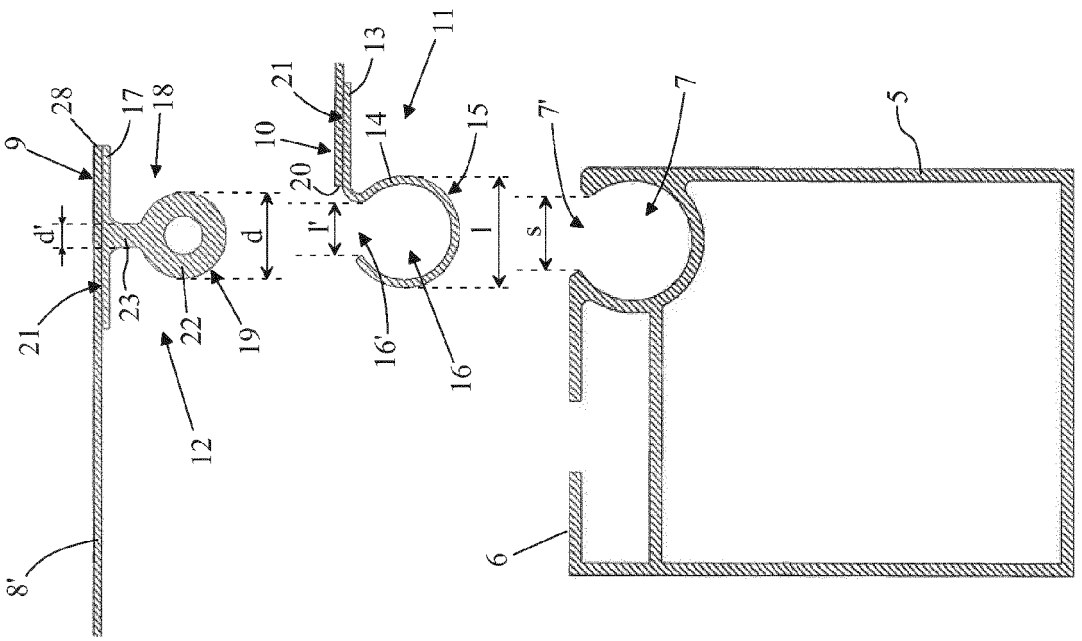
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Fig. 4b

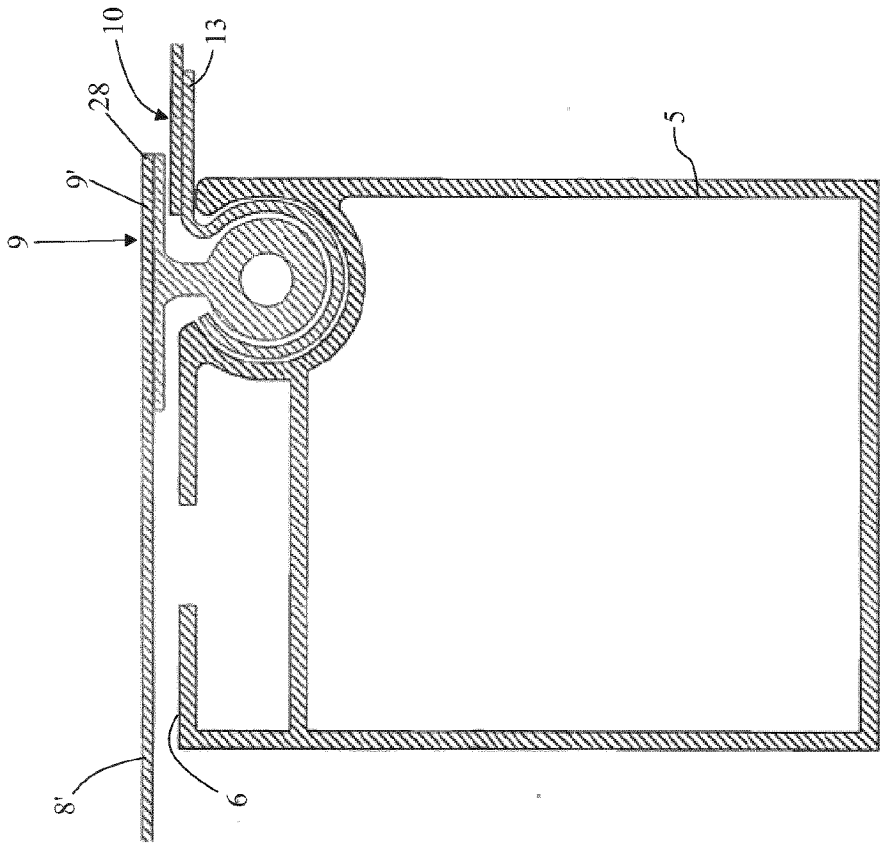
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Fig. 4a

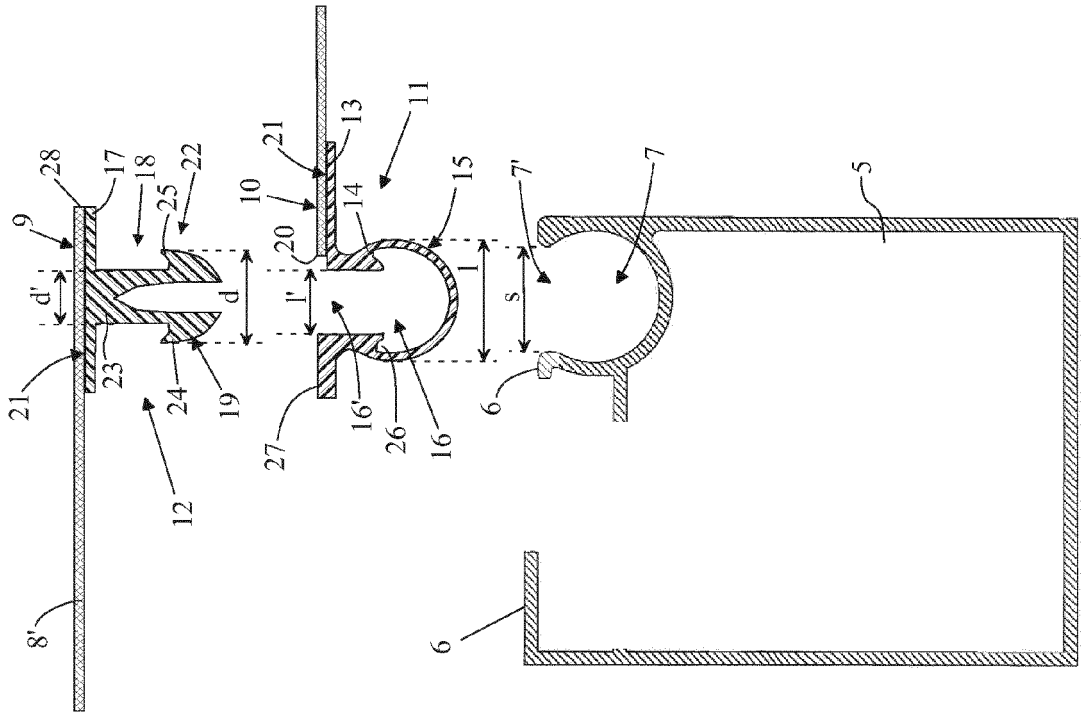
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Fig. 5b

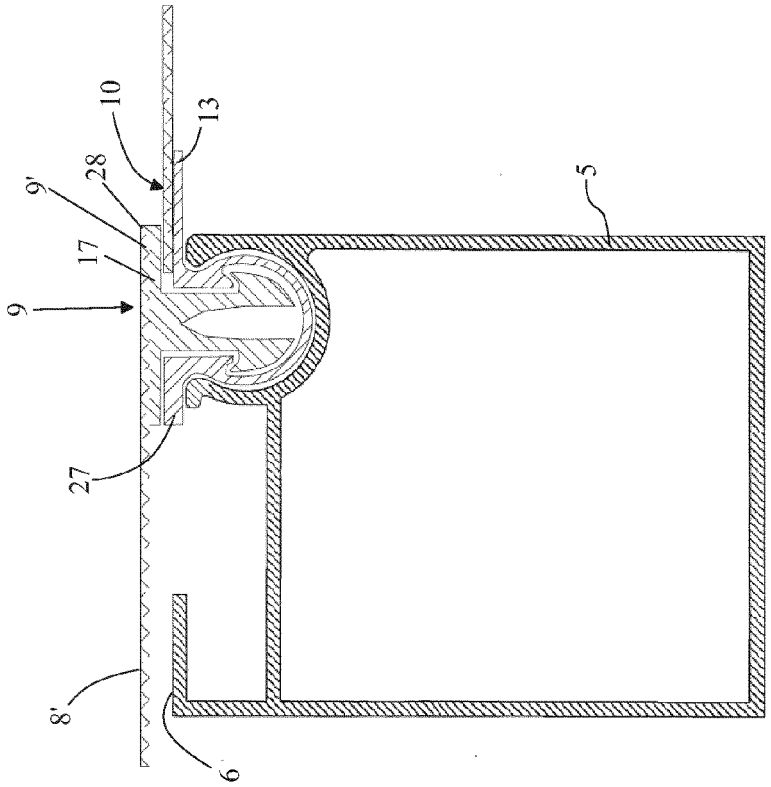
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Fig. 5a

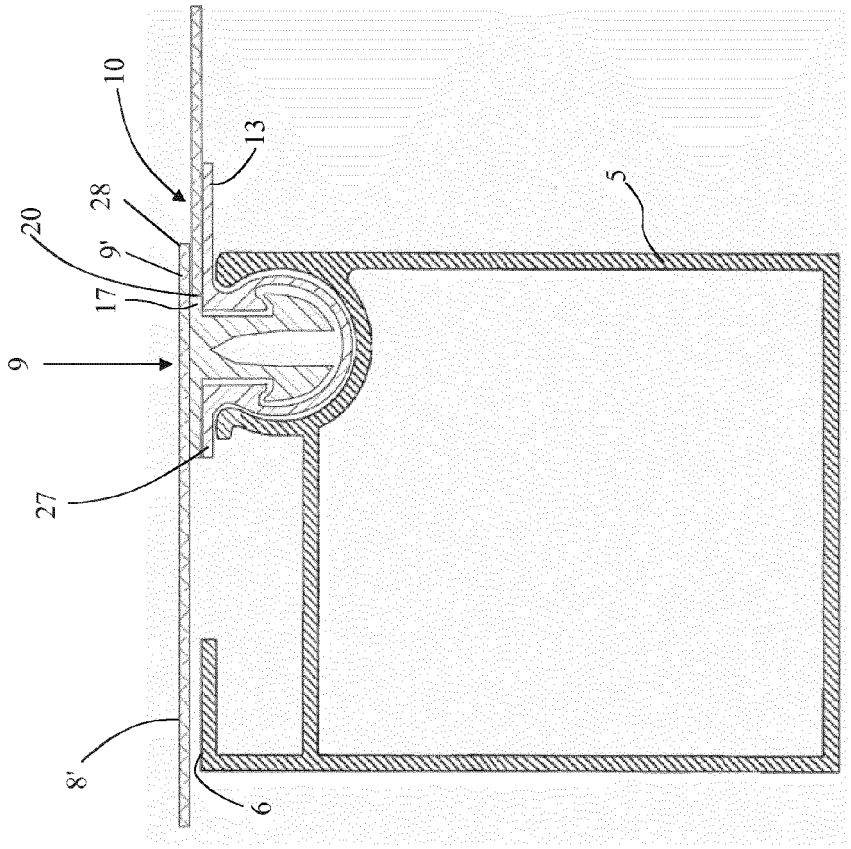

Fig. 7

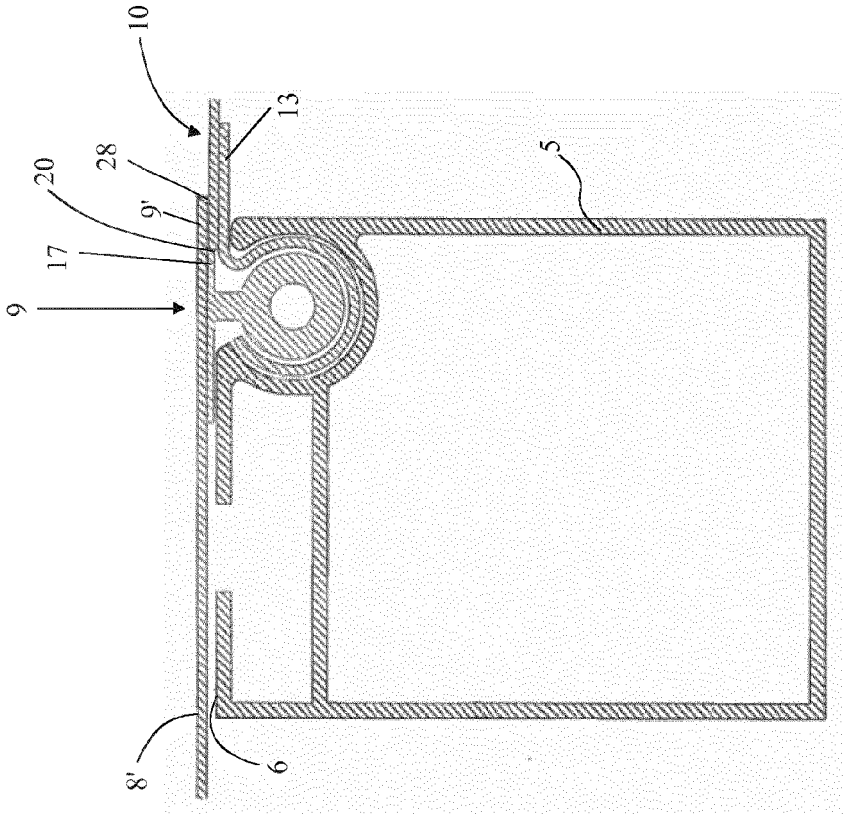

Fig. 6

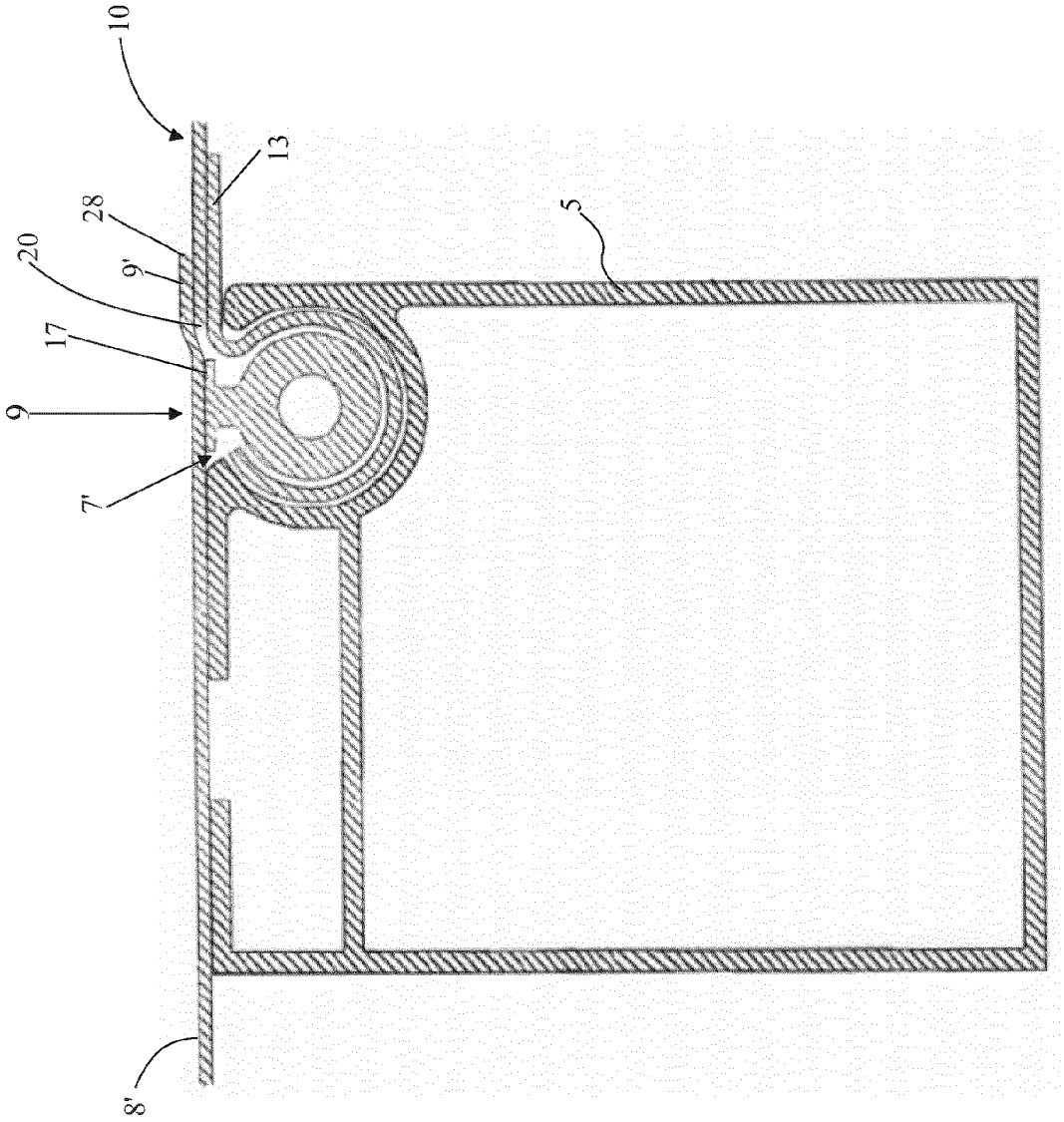

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 13 18 4652

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	EP 1 965 000 A2 (PROGETTOTENDA S P A [IT]) 3 September 2008 (2008-09-03) * the whole document *	1-13	INV. E04F10/02
A,D	US 2006/219374 A1 (MCKINNEY KENNON K [US]) 5 October 2006 (2006-10-05) * figures 8,9 *	1-13	
A	WO 03/062697 A1 (WILSON MICHAEL W [CA]) 31 July 2003 (2003-07-31) * figures 3,4 *	1-13	

TECHNICAL FIELDS SEARCHED (IPC)
E04F
E04H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 October 2013	Cornu, Olivier

CATEGORY OF CITED DOCUMENTS

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22-10-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1965000 A2	03-09-2008	NONE	
US 2006219374 A1	05-10-2006	NONE	
WO 03062697 A1	31-07-2003	CA 2472781 A1	31-07-2003
		US 2005106347 A1	19-05-2005
		WO 03062697 A1	31-07-2003

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

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Patent documents cited in the description

- US 2006219374 A **[0012]**
- IT 1378852 **[0015]**