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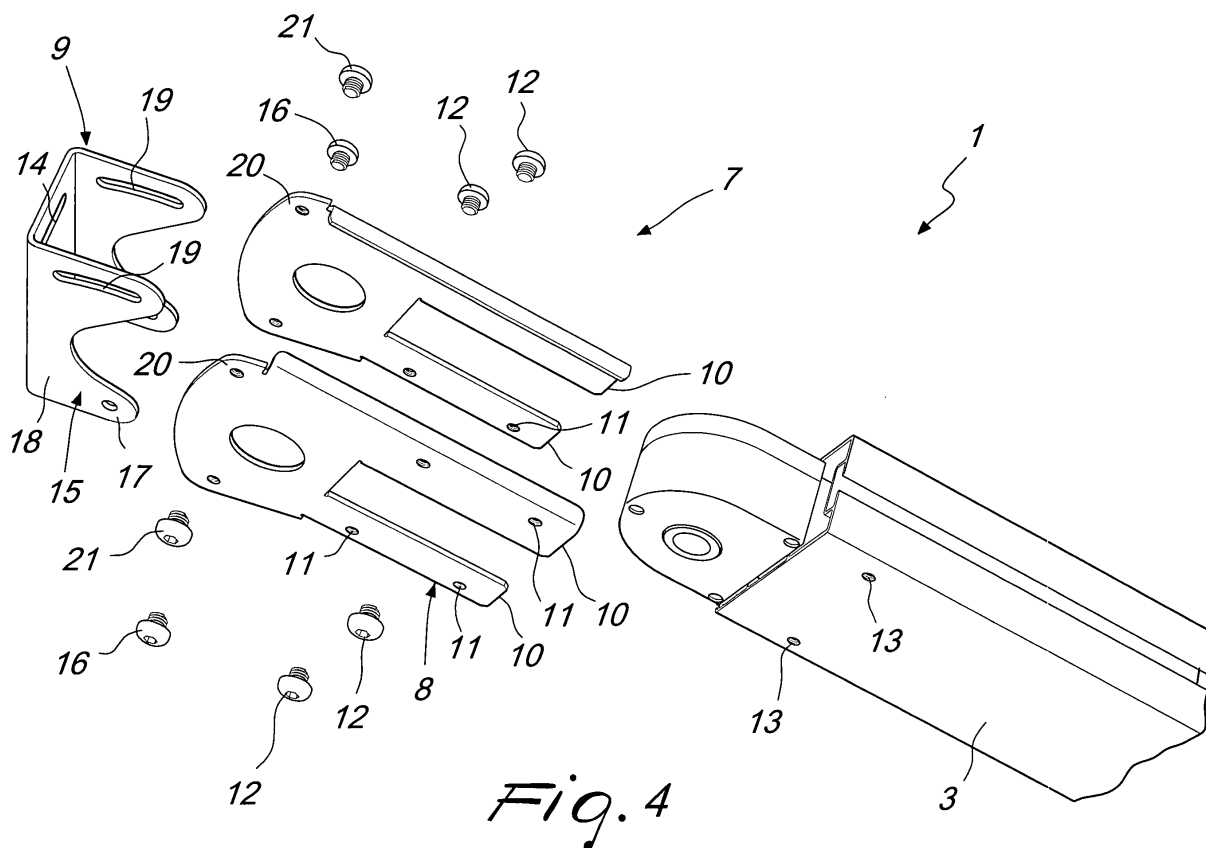
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AL BA MK RS(71) Applicant: **Corradi S.P.A.****40128 Bologna (IT)**(72) Inventor: **Grazioso, Luca****64020 Teramo, Frazione Sant'Atto (IT)**(74) Representative: **Modiano, Micaela Nadia et al****Dr. Modiano & Associati SpA****Via Meravigli 16****20123 Milano (IT)**(54) **Modular structure for outdoor use**

(57) A modular structure (1) for outdoor use, comprising at least one supporting column (2) which is rigidly coupled to the ground and at least one upper beam (3) which has a first portion which is rigidly coupled to a fixed wall and a second portion which is associated with the column (2). The at least one beam (3) and the at least

one column (2) are at least partially hollow. The structure (1) comprises at least one junction element (7) which is provided with a first end (8) which is suitable for stable insertion within a respective cavity (5) of the columns (2) and of the beams (3) and with a second end (9) which is suitable for fixing to a surface which faces the cavity (5) and is proximate thereto.

*Fig. 4***EP 2 110 484 A1**

Description

[0001] The present invention relates to a modular structure for outdoor use.

[0002] In the provision of structures of various kinds two intersecting structural elements frequently need to be coupled to each other.

[0003] Currently, locking elements are used which wrap around the intersecting heads of the elements, keeping them in the correct mutual position: in practice, by mutually clamping the structural elements a highly effective and stable connection is obtained, which however can be unsatisfactory from an aesthetic standpoint.

[0004] Further, such locking elements are adapted for the mutual coupling of structural elements only with pre-defined and limited angles of incidence.

[0005] If it is necessary to mate structural elements which are incident according to nonstandard angles, the standard practice is to use connecting plates (in practice, plates which must be superimposed on both elements and are fixed by way of screws or the like to the surface of such elements) or threaded connection means or direct welding of the two facing and proximate ends.

[0006] These solutions are extremely versatile and allow to adapt perfectly to any type of joint.

[0007] However, the use of plates and/or threaded means provides an aesthetically unsatisfactory product whose surfaces have discontinuities which can entail deposits of dirt (dust, et cetera) and possible rainwater infiltrations.

[0008] The solution that provides for welding leads to the provision of a product which is qualitatively and aesthetically ideal: however, the costs for welding on site (during the assembly of the structure) are extremely high and make this solution inapplicable for most small low-cost structures.

[0009] In particular, these solutions are of practical interest in structures for outdoor use such as pergolas, awnings and the like, which are constituted by generally metallic profiles which constitute beams and columns.

[0010] It should be noted that in the specific case of the above-mentioned structures for outdoor use, there is the need to provide elements which are adapted to ensure adaptation to the installation conditions.

[0011] The installation surfaces are frequently uneven (for example, they do not comply with standards of planarity and/or perpendicularity/parallel arrangement of contiguous planes) and it is therefore necessary to modify the structure during installation in order to adapt it to the unevenness.

[0012] In the case of structures with mutual fixings of the components by means of brackets and threaded joints, this is always possible without particular problems (as long as suitable adjustment margins are provided): however, these joints are scarcely suitable for the provision of structures for outdoor use of high aesthetic value or with a particularly painstaking design content.

[0013] These aesthetic drawbacks can be compensated

ed by adopting covering housings (when this is possible in terms of space available), with a substantial increase in production and installation costs.

[0014] The embodiment that provides for joining by welding, performed directly on site, is the one that ensures the best aesthetic result. However, the installation of a structure in which the joints between the components are all obtained by welding on site entails high costs, which normally cannot be sustained for structures suitable for merely supporting awnings, pergolas and the like.

[0015] It should be noted that in any case the connecting components often cause problems of various kinds: first of all, the protruding joints are dangerous; secondly, the accumulation of dirt and material at the connecting surfaces is such a problem as to require frequent cleaning interventions.

[0016] The facing and external surfaces of the connecting components can further be subjected to oxidation and/or corrosion phenomena which can cause the mutual permanent locking of the threaded elements, with consequent impossibility to provide disassembly (this compromises maintenance possibilities).

[0017] The aim of the present invention is to provide a modular structure for outdoor use which is suitable for installations on uneven surfaces as well.

[0018] Within this aim, an object of the present invention is to provide a modular structure for outdoor use in which the junction components that are visible from outside once the structure is installed are minimized and accordingly the accumulation of dirt in the interstices related thereto, the presence of protruding portions and any presence of oxidation and/or corrosion actions are also minimized.

[0019] Another object of the present invention is to provide a modular structure for outdoor use which has low costs, is relatively simple to provide in practice and is safe in application.

[0020] This aim and these and other objects, which will become better apparent hereinafter, are achieved by the present modular structure for outdoor use, of the type that comprises at least one supporting column which is rigidly coupled to the ground and at least one upper beam which has a first portion which is rigidly coupled to a fixed wall and a second portion which is associated with said column, **characterized in that** said at least one beam and said at least one column are at least partially hollow and in that it comprises at least one junction element which is provided with a first end which is suitable for stable insertion within a respective cavity of said columns and said beams and with a second end which is suitable for fixing to a surface which faces said cavity and is proximate thereto.

[0021] Further characteristics and advantages of the invention will become better apparent and evident from the following detailed description of a preferred but not exclusive embodiment of a modular structure for outdoor use, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a modular structure for outdoor use according to the invention;

Figure 2 is a front view of a profile of the modular structure for outdoor use according to the invention;

Figure 3 is a perspective view of a junction element of the modular structure for outdoor use according to the invention;

Figure 4 is an exploded perspective view of the modular structure for outdoor use according to the invention;

Figure 5 is a schematic perspective view of the modular structure for outdoor use according to the invention;

Figure 6 is a schematic perspective view of the modular structure for outdoor use according to the invention in a first assembly configuration;

Figure 7 is a schematic perspective view of the modular structure for outdoor use according to the invention in a second assembly configuration.

[0022] With reference to the figures, the reference numeral 1 generally designated a modular structure for outdoor use.

[0023] The modular structure 1 comprises at least one supporting column 2, which is rigidly coupled to the ground, and at least one upper beam 3, which has a first portion which is rigidly coupled to a fixed wall and a second portion which is associated with the column 2.

[0024] The beam 3 and the column 2 are at least partially hollow. In particular, they are constituted by profiles 4 which are provided with internal longitudinal chambers 5 which are mutually separated by suitable stiffening ribs 6: the chambers 5 constitute internal cavities of the profiles 4 which are adapted to ensure optimum mating with other components.

[0025] The structure 1 comprises at least one junction element 7, which has a first end 8 suitable for stable insertion within a respective cavity (chamber 5) of the columns 2 and/or of the beams 3 and a second end 9 suitable for fixing to a surface which faces the cavity (chamber 5) and is proximate thereto.

[0026] The junction element 7, in its first end 8, has at least one protruding wing 10 whose dimensions and shape are substantially complementary to those of the corresponding longitudinal chamber 5 of the profile 4 (column 2 or beam 3) with which it will be associated.

[0027] The protruding wing 10 has at least one through opening 11 for accommodating a transverse locking element 12: the element 12 can be constituted advantageously by a screw (for example of the self-tapping type) so that by tightening such screw the desired mating with the corresponding profile 4 is obtained.

[0028] The opening 11 is in fact aligned, when the first end 8 is inserted in the chamber 5 of the corresponding profile 4, with at least one respective hole 13 of the profile 4. The locking element 12, constituted in the specific example by a screw, but optionally providable by means of any fixing stem which acts as a pin or rivet, is suitable

for stable simultaneous insertion in the hole 13 and in the opening 11 for mutual locking: in the case of the screw, for example, such screw engages with its threads on the thread which is already present within the hole 13 and/or the opening 11 or, in the case of a self-tapping screw, it provides itself the thread along the inner rim of the hole 13 and of the opening 11 in order to mate them stably. The simultaneous presence of several locking elements 12 ensures optimum stability of the connection between the end 8 and the corresponding profile 4, since the provided connection is definitely statically highly redundant.

[0029] According to an embodiment of particular interest in practice and in application (shown in the accompanying figures and in particular in Figure 3), there are four protruding wings 10, one at each edge of the end 8 of the junction element 7. Each protruding wing 10 is provided with at least one respective opening 11, which is aligned, when the element 7 is mounted on the profile 4, with a respective hole 13 of the profile 4. This embodiment enhances stability, since it ensures a high degree of static redundancy. In this case, the wings 10 can positively have an angular cross-section: this constructive choice ensures greater structural rigidity, to the full benefit of the stability of the structure 1 according to the invention.

[0030] The second end 9, which is suitable for fixing to a surface which faces the cavity (chamber 5) and is proximate thereto, is substantially flat and has at least one eye 14, which is adapted to accommodate at least one suitable element for connection to the other component provided with the surface.

[0031] In practice, if the end 9 must be associated with a wall, the eyes 14 are preset to accommodate respective anchoring plugs which must be inserted stably in such wall; if instead the end 9 is to be associated with a surface of a profile 4 (column 2 or beam 3), the junction element 7 must be substantially aligned, in the assembly configuration, with a respective seat of the mating surface for the simultaneous accommodation of a respective connecting element, for example of the type of a threaded element. In this manner, a screw (or the pin or a rivet) can pass through the eye, engaging the surface of the profile stably to ensure optimum and stable mating of the parts.

[0032] The junction element 7 comprises a mutual articulation apparatus 15 which is interposed between the first end 8 and the second end 9.

[0033] The first end 8 can thus be oriented according to a plurality of different configurations with respect to the second end 9: this allows to arrange the two ends (and therefore the components that are coupled thereto) at different angles of mutual inclination, ensuring installation in any condition, since it is possible to adjust the inclination indeed as a function of the installation conditions of the structure 1.

[0034] The articulation apparatus 15 comprises a hinge 16 for connection between facing and contiguous

regions of the two ends 8 and 9: in particular, it is sufficient for the ends to have suitable lugs 17 which face each other and are proximate, and are affected by respective aligned holes in which it is possible to insert a common articulation pivot. Conveniently, the hinge 16 must be arranged proximate to a perimetric edge of the ends 8 and 9.

[0035] The mutual articulation apparatus 15 further comprises suitable laminas 18, which are provided with slots 19 and are rigidly coupled to one of the ends 8 and 9 (in particular, Figure 3 illustrates the case in which the laminas 18 are jointly connected to the end 9), and respective flaps 20, which are provided with through holes (not shown clearly in the figure) and are jointly connected to the other one of said ends (according to the embodiment of Figure 3, the flaps 20 are jointly connected to a portion of the end 8).

[0036] The slots 19 and the through holes are adapted to accommodate a respective pin 21, which can slide along the slot 19 jointly with the respective flap 20.

[0037] In this manner, the sliding of the flap 20 with respect to the slot 19 (without altering the fact that the two ends 8 and 9 are mutually pivoted with respect to the hinge 16) ensures the possible mutual orientation of the ends according to a plurality of different inclinations defined by the dimensions of the slots 19.

[0038] It has thus been shown that the invention achieves the proposed aim and objects.

[0039] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0040] All the details may further be replaced with other technically equivalent ones.

[0041] In the exemplary embodiments shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0042] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0043] In practice, the materials used, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0044] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A modular structure for outdoor use, of the type that comprises at least one supporting column (2) which

is rigidly coupled to the ground and at least one upper beam (3) which has a first portion which is rigidly coupled to a fixed wall and a second portion which is associated with said column (2), **characterized in that** said at least one beam (3) and said at least one column (2) are at least partially hollow and **in that** it comprises at least one junction element (7) which is provided with a first end (8) which is suitable for stable insertion within a respective cavity (5) of said columns (2) and said beams (3) and with a second end (9) which is suitable for fixing to a surface which faces said cavity (5) and is proximate thereto.

2. The modular structure according to claim 1, **characterized in that** said at least one column (2) and said at least one beam (3) are constituted by profiles (4) which are provided with internal longitudinal chambers (5) mutually separated by suitable stiffening ribs (6), said chambers (5) constituting said cavities (5).
3. The modular structure according to claims 1 and 2, **characterized in that** said junction element (7) has, in said first end (8) thereof, at least one protruding wing (10) whose dimensions and shape are substantially complementary to those of at least one of said internal longitudinal chambers (5) of the corresponding profile (4) with which it will be associated.
4. The modular structure according to claim 3, **characterized in that** said at least one protruding wing (10) has at least one through opening (11) for accommodating a transverse locking element (12), said opening (11) being aligned, when said first end (8) is inserted in the cavity (5) of the corresponding profile (4), with at least one respective hole (13) of said profile (4), at least one fixing stem, which constitutes the transverse element (12), being suitable for stable simultaneous insertion in said at least one hole (13) and in said at least one opening (11) for mutual locking.
5. The modular structure according to claims 3 and 4, **characterized in that** said protruding wings (10) are four, one at each edge of said end (8) of the junction element (7), each provided with at least one respective opening (11), which is aligned, when the element (7) is fitted to the profile (4), with a respective hole (13) of the profile (4).
6. The modular structure according to claim 1, **characterized in that** said second end (9), which is suitable for fixing to a surface which faces said cavity (5) and is proximate thereto, is substantially flat and provided with at least one eye (14) which is adapted to accommodate at least one suitable element for connection to the other component provided with said surface.

7. The modular structure according to claim 6, **characterized in that** said eye (14) of said junction element (7) is substantially aligned, in the assembly configuration, with a respective seat of said mating surface for the simultaneous accommodation of a respective connecting element, for example of the type of a threaded element. 5
8. The modular structure according to claim 1, **characterized in that** said at least one junction element (7) comprises a mutual articulation apparatus (15) which is interposed between said first end (8) and said second end (9), said first end (8) being orientable in a plurality of different configurations with respect to said second end (9). 10 15
9. The modular structure according to the preceding claim, **characterized in that** said mutual articulation apparatus (15) comprises a hinge (16) for connection between facing and contiguous regions of said two ends (8, 9). 20
10. The modular structure according to the preceding claim, **characterized in that** said mutual articulation apparatus (15) comprises suitable laminas (18), provided with slots (19) and rigidly coupled to one of said ends (8, 9), and respective flaps (20), provided with through holes jointly connected to the other one of said ends (9, 8), said slots (19) and said through holes being adapted to accommodate a respective pivot (21) which can slide along said slot (19) monolithically with the respective flap (20). 25 30

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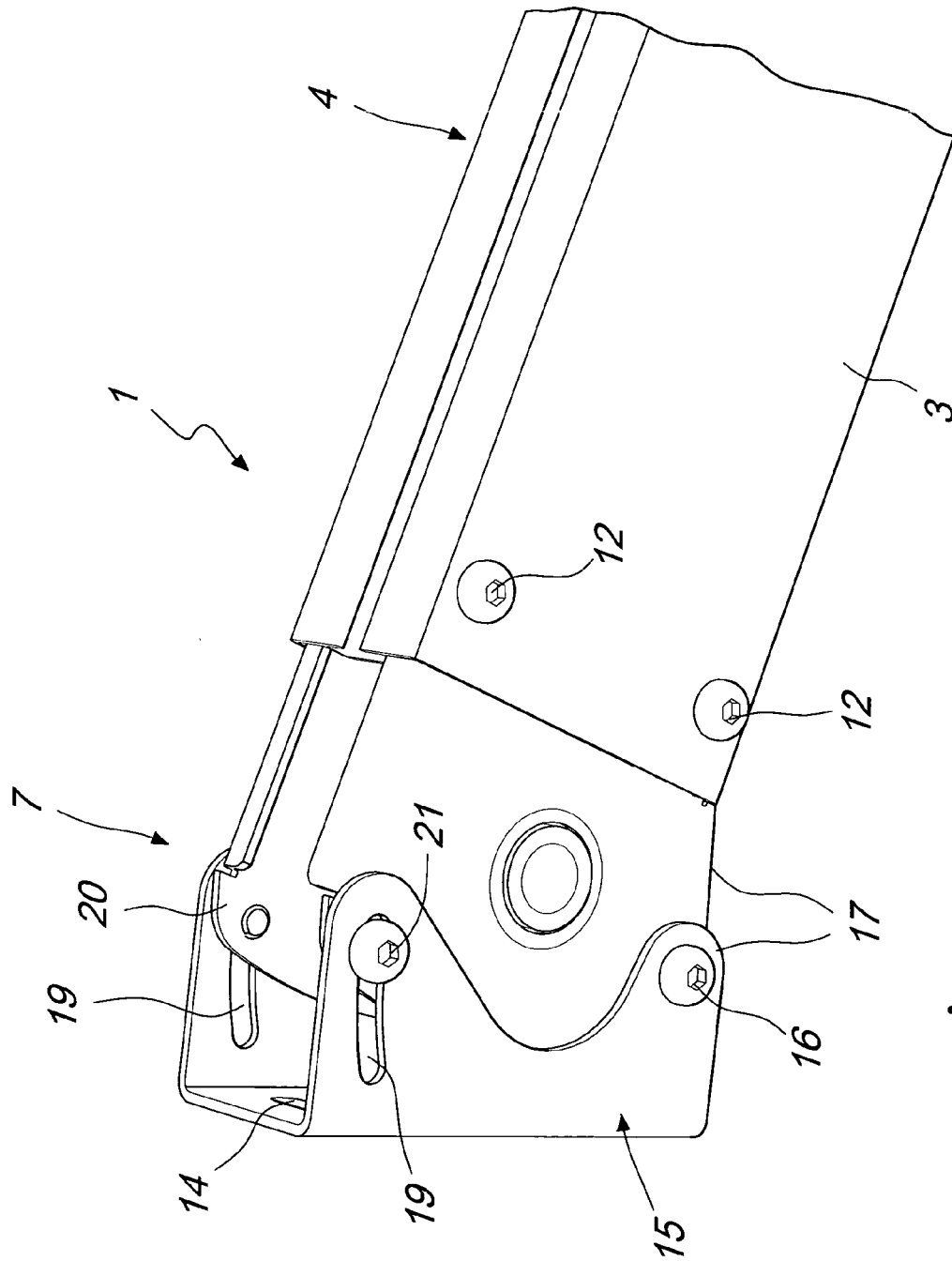


Fig. 1

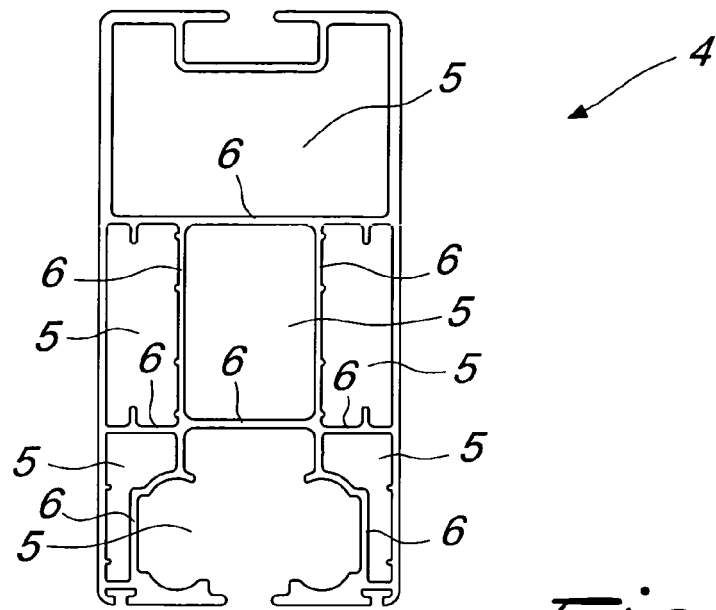


Fig. 2

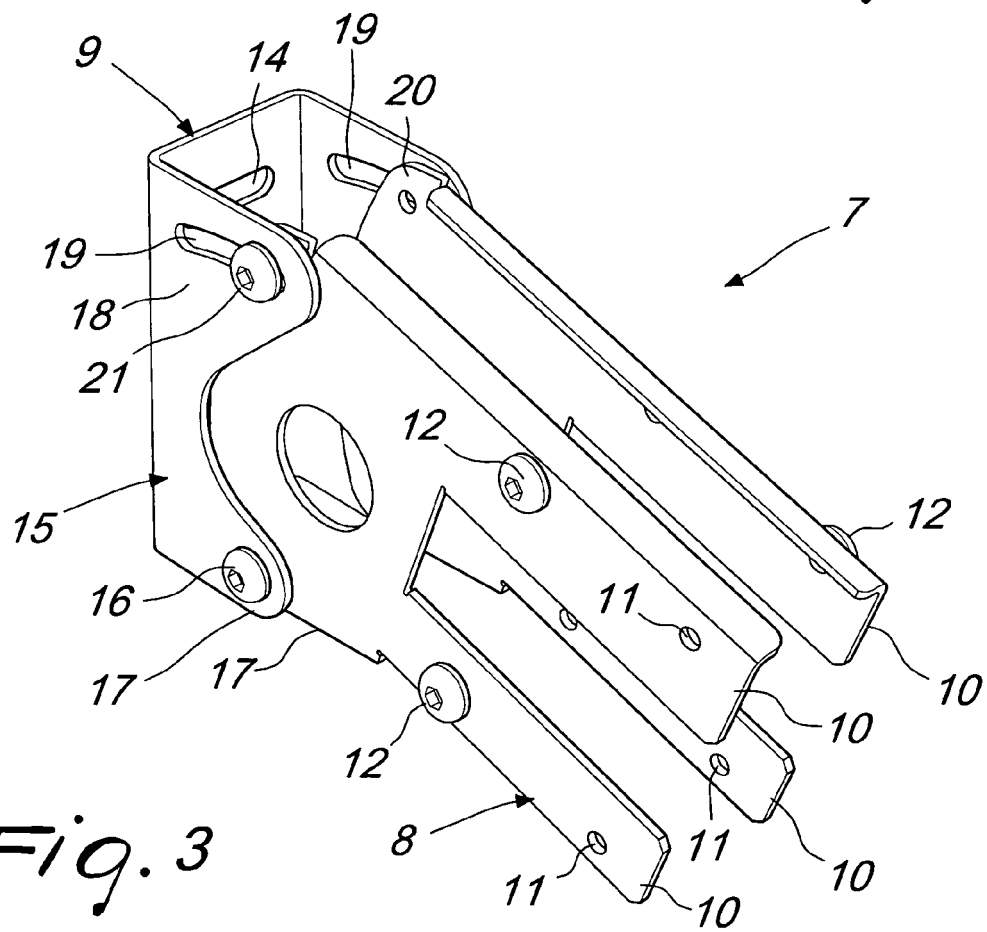


Fig. 3

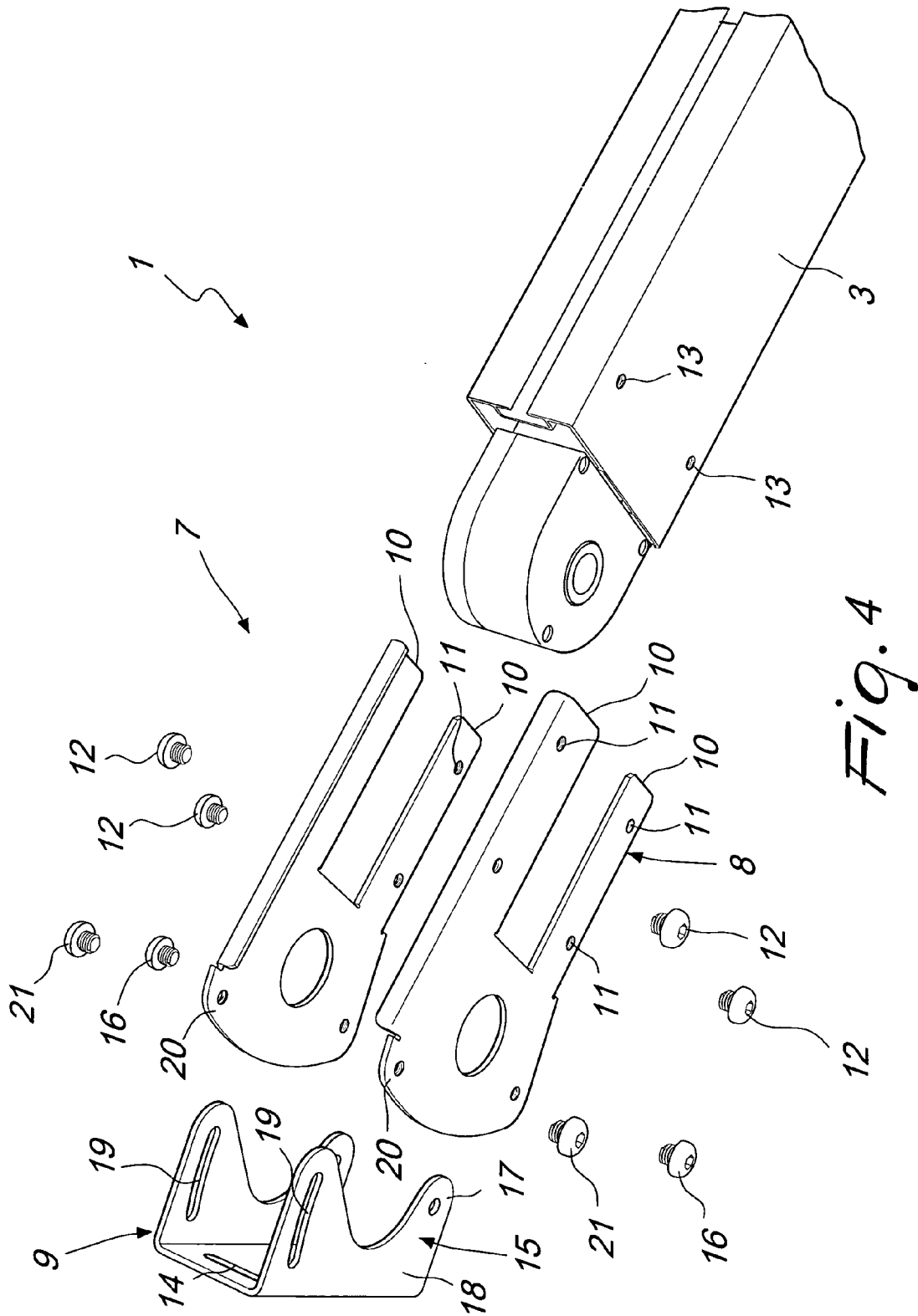


Fig. 4

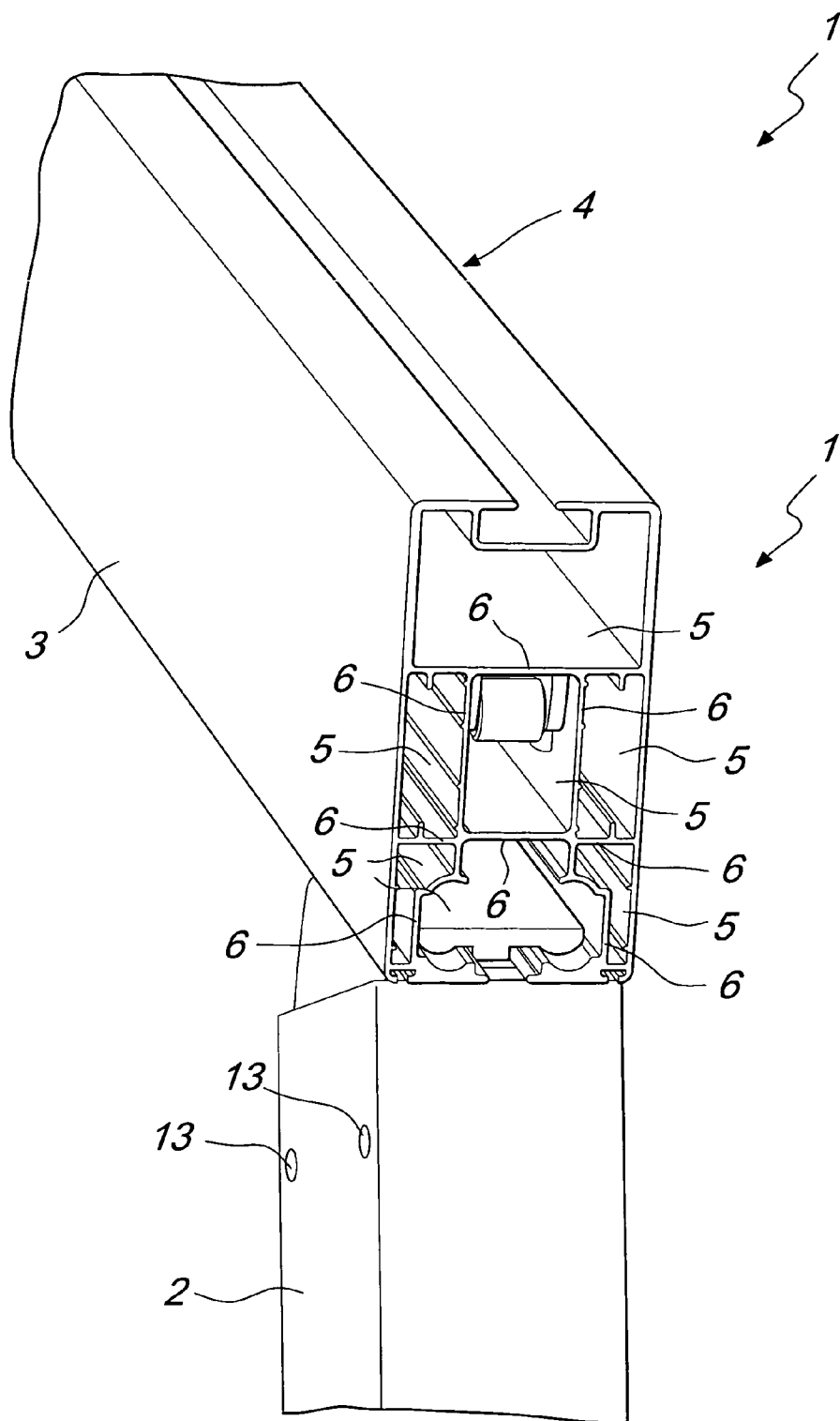


Fig. 5

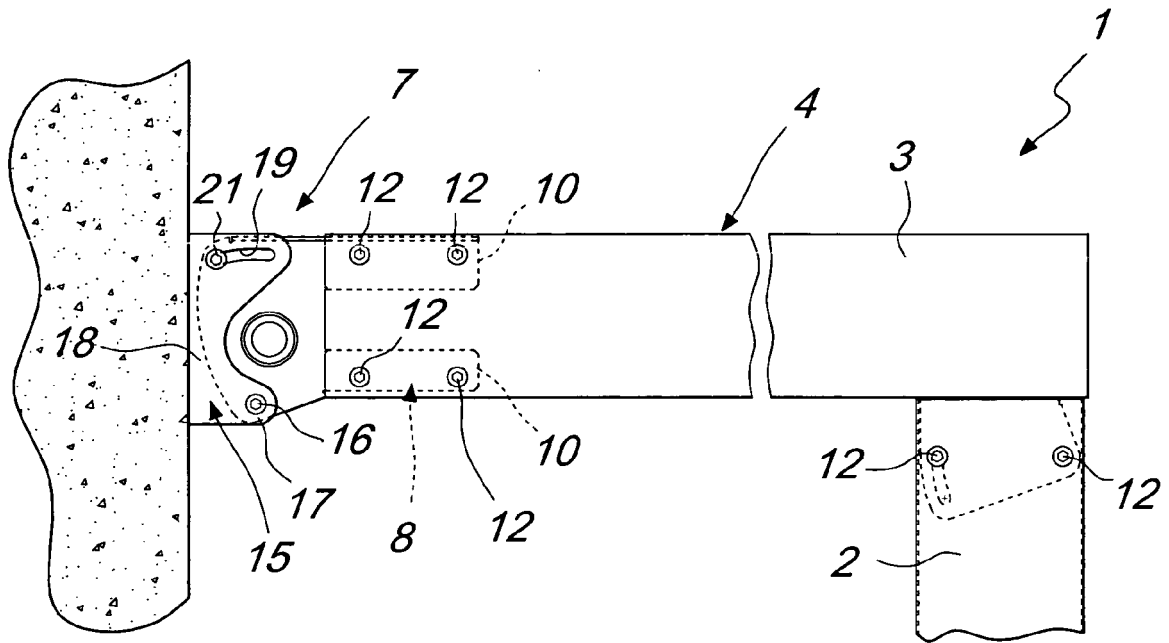


Fig. 6

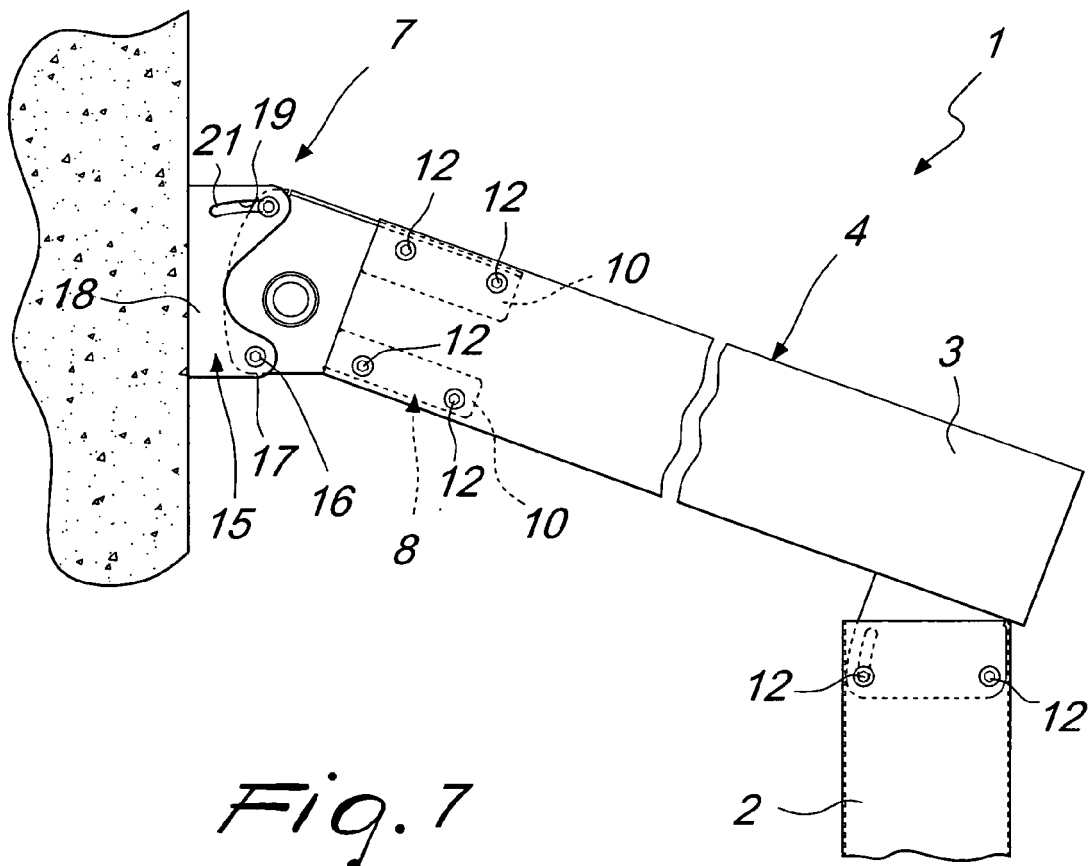


Fig. 7



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 08 42 5256

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 761 092 A (BLANCHET PATRICIA BHANG [FR]) 25 September 1998 (1998-09-25) * figures 1,8 *	1,3,6-9	INV. E04B1/00 E04B1/24
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			TECHNICAL FIELDS SEARCHED (IPC)
			E04B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 September 2008	Examiner Topcuoglu, Sadik Cem
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 42 5256

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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19-09-2008

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