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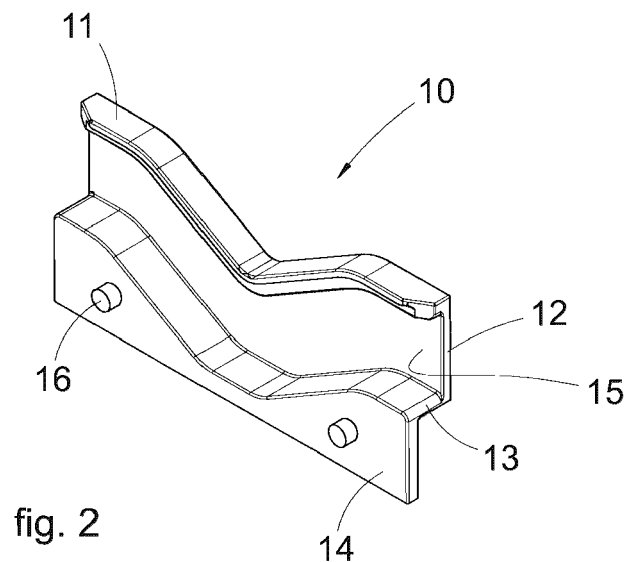
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(54)

COVERING APPARATUS AND GUIDE ELEMENT FOR A COVERING APPARATUS

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Covering apparatus (100) and guide element (10) for a covering apparatus (100) which comprises at least one cam guide (125) and at least one sliding element (126) sliding along the cam guide (125), wherein
- the guide element (10) comprises at least one containing wall (11) operatively counterposed to the cam guide (125), with respect to the sliding element (126).



Description

FIELD OF THE INVENTION

[0001] The present invention concerns a covering apparatus and a guide element for a solar covering apparatus, such as a pergola or other outdoor structure, with a covering and protection function, possibly also lateral, intended for civil use mainly supplementary to residential areas, but also for commercial, exhibition or public use.

[0002] The pergola is generally provided with an upper structure with which the covering elements cooperate, which generally create a desired condition of direct or indirect radiation, i.e., of passage of air, light and water, in the area below the upper structure.

[0003] The guide element is applied to maintain the covering elements under desired operating conditions, both under static operating conditions and operating conditions of reciprocal movement.

BACKGROUND OF THE INVENTION

[0004] Covering apparatuses of the pergola type, typically provided with a lower support structure, formed by a plurality of vertical structural support elements, also called uprights, able to support, at a certain height, from the floor or from the ground, an upper structure having the shape of a quadrangular frame are known. This upper structure is normally composed of support elements, typically horizontal or moderately inclined in the order of 5°-20°, with respect to the floor, also called carriers. In some cases, the aforementioned frame may lack a side, so that the upper support structure is substantially in the shape of a U. Alternatively, the upper support structure may also be partly attached to fixed support elements, for example to one or more walls of a building.

[0005] In any case, the upper structure is operatively associated to upper covering elements, or slats, advantageously movable between them to define at least a closing operating condition which corresponds to a covering condition, in which they are substantially adjacent to each other and define a real "roof" of the structure, and a plurality of opening conditions, which correspond to respective uncovering conditions, in which they are spaced apart from each other to define relative spaces, more or less wide, of passage of light and/or air or other atmospheric agents.

[0006] Among the various solutions of reciprocal movement of the slats, for example with rotation, folding, or others, solutions are known in which there is a relative movement between two groups of slats, so as to assume at least a substantially side by side covering condition and at least a partially superimposed condition of passage of light and air.

[0007] This type of solutions advantageously provide cam guides on which correlated cam followers will slide and which are provided on the second group of slats, i.e., the one that will be higher than the floor, in a mounted

condition.

[0008] In order to simplify the mounting operations of the second group of slats, these cam guides are advantageously open upwards, so that said second group can be rested with its cam followers on the relative cam guides, avoiding lateral slipping of the slats, screwing and/or other operations that, at height, may involve operational delays and risk for the operators.

[0009] However, this simplified solution may be deficient in the event that the second group of slats receives some stress from below, for example because of direct or indirect wind, i.e., due to an accidental impact or other unforeseen factors such as branches, leaves or other objects fallen by gravity on the cam guides.

[0010] It is clear that this type of situation can lead to an at least partial exit of the cam followers from the cam guides, with possible malfunctions or, worse, damages to the pergola, and consequent costs and times for intervention and repair.

[0011] Some known solutions of covering apparatus in which the movement of the covering elements is made by using cams are described in documents EP 3 854 956 A1, EP 3 913 161 A1 and WO 2020/074451 A1.

[0012] There is therefore a need to keep the cam followers operatively coupled with the cam guides, even in the event of unforeseen factors acting on the second group of blades or, more generally, on the cam follower, cam guides system.

[0013] In particular, one purpose of the present invention is to realize a guide element capable, on the one hand, of allowing the normal simplified mounting of the cam followers in the cam guides and, on the other hand, of substantially preventing the cam followers from accidentally exiting from the cam guides themselves.

[0014] Another purpose of the present invention is to develop a guide element that is simple and economical to realize, and that does not modify the aesthetic impact of the covering apparatus.

[0015] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0016] The present invention is set forth and characterized in the independent claims. The dependent claims describe other characteristics of the present invention or variants to the main inventive idea.

[0017] In accordance with the above purposes, a guide element according to the invention is applied to a covering apparatus of the type having at least an upper structure, provided with a plurality of covering elements, such as for example metal slats, which are reciprocally movable between them to define at least a covering operating condition, in which they substantially prevent the passage of light and/or air through the upper structure, and a plurality of opening conditions, in which they define

desired direct or indirect passages of light and/or air.

[0018] Reciprocal movement means that each covering element assumes different positions with respect to the others, both individually and in groups, as well as that this element can remain stationary and the others move reciprocally with respect to it, in order to define the aforementioned opening conditions or the covering condition.

[0019] This movement is normally guided by at least one cam guide, advantageously open upwards, and by at least one sliding element, the latter associated to at least a part of the covering elements and sliding along the cam guide.

[0020] In accordance with one aspect of the present invention, the guide element comprises at least one containing wall, which is operatively counterposed to the cam guide, with respect to the sliding element.

[0021] In this way, the sliding element is in an intermediate housing condition and contained between the cam guide, below, and the containing wall, above.

[0022] This housing condition, on the one hand, allows the sliding element to maintain a correct and effective travel along the cam guide and, at the same time, is contained above by the containing wall.

[0023] With the solution according to the present invention there is therefore a substantial prevention of the exit of the sliding element from the cam guide, particular in the conditions in which the covering element to which said sliding element is associated is accidentally stressed.

[0024] This advantage of the present invention allows to guarantee the effective cooperation between the sliding element and the cam guide, even in circumstances in which the covering element is bounced by the action of the wind, i.e., by an accidental impact or by other external factors.

[0025] In the same way, the containing wall, being counterposed to the cam guide, defines a protection for the guide itself, limiting to a minimum the possibility that leaves or other objects may settle by gravity on this guide, which may cause the sliding element to bounce, or even deviate.

[0026] Therefore, with the solution according to the present invention, the possible malfunctions due to the exit of the sliding element from the cam guide are substantially eliminated, consequently also reducing the times and the costs of maintenance and repair of the covering apparatus to which the present invention applies.

[0027] In accordance with one aspect of the present invention, the containing wall has a longitudinal shaping coordinated to the shaping of the cam guide.

[0028] This advantageous solution allows to guarantee a substantial uniformity of containment intervention in case of accidental lifting and, at the same time, to limit to a minimum possible vibrations and noise that may occur.

[0029] In accordance with one aspect of the present invention, in which the cam guide comprises at least a

first guide segment and a second guide segment contiguous and inclined with respect to the first guide segment, the containing wall has a longitudinal shaping coordinated both to the shaping of the first guide segment and to the shaping of the second guide segment.

[0030] In other words, the containing wall follows in a coordinated manner the course of the cam guide, so as to guarantee its effective containment action substantially in whatever position the sliding element is located and, therefore, substantially under any operating condition of reciprocal positioning of the covering elements.

[0031] In accordance with another aspect of the present invention, in which the cam guide is obtained on a guide profile, the guide element is provided with a support wall, which is inclined with respect to the containing wall, and with means for coupling with the cam guide, of the selectively removable type.

[0032] This aspect of the present invention allows, on the one hand, to selectively couple the guide element to the covering apparatus and, on the other hand, defines a structural impediment to the accidental exit of the sliding element from the cam guide, along a direction inclined with respect to the one managed by the containing wall.

[0033] These characteristics allow the sliding element to be contained in different directions, thus substantially preventing it from exiting from the cam guide, regardless of the type and of the direction of action of the accidental stress.

[0034] In addition, these features allow the guide element to be selectively removed and applied, for example during the steps of mounting the covering elements, in order to reduce the times and costs of intervention for mounting or replacing the covering elements, as well as to facilitate the same mounting operations for the benefit of the use and safety of operators.

[0035] Alternatively, or in association with this feature of selective removability, the containing wall may comprise at least a through aperture, which allows the insertion of the sliding element.

[0036] In accordance with a further aspect of the present invention, a rest wall is provided, which is placed operatively side by side with the cam guide and substantially counterposed to the containing wall.

[0037] In this way, a sliding seating is defined between the containing wall, the support wall and the rest wall, i.e., according to variants only between two of the three walls, within which the sliding element at least partially slides.

[0038] In accordance with a further aspect of the present invention, the coupling means comprise at least a coupling wall, selectively associable with the guide profile, and at least a coupling member provided at least partly on the coupling wall and at least partly on the guide profile.

[0039] In accordance with an advantageous embodiment variant of the present invention, the coupling member comprises at least a male interlocking element, provided on the coupling wall and at least a female inter-

locking element, provided on the guide profile.

[0040] According to some variants, this type of male-female coupling can be provided with a coupling system with screw and threaded hole, i.e., with bolt, or with dowel and slot, i.e., with elastic clips, as well as by shaped coupling between the coupling wall and the guide profile, i.e., other removable coupling solutions of substantially known type.

DESCRIPTION OF THE DRAWINGS

[0041] These and other aspects, characteristics and advantages of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 illustrates an axonometric view of a covering apparatus to which a guide element according to the present invention is applied;
- fig. 2 illustrates an axonometric view of a guide element according to the present invention;
- fig. 3 illustrates in section the element of fig. 2 applied to the apparatus of fig. 1;
- fig. 4 schematically illustrates the element of fig. 2 in a first operating condition of the apparatus of fig. 1;
- fig. 5 schematically illustrates the element of fig. 2 in a second operating condition of the apparatus of fig. 1;
- fig. 6 schematically illustrates a detail of the element of fig. 4;
- fig. 7 schematically illustrates a detail of the element of fig. 5;
- fig. 8 schematically illustrates a variant of the element of fig. 2;
- fig. 9 illustrates a variant of the element of fig. 2,
- fig. 10 illustrates an axonometric view of an enlarged detail of the covering apparatus to which the guide element is applied which is shown in a condition decoupled from the guide profile.

[0042] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can be conveniently combined or incorporated into other embodiments without further clarifications.

DESCRIPTION OF SOME EMBODIMENTS OF THE PRESENT INVENTION

[0043] Reference will now be made in detail to the possible embodiments of the invention, of which one or more examples are illustrated in the accompanying figures by way of non-limiting example. The phraseology and terminology used herein is also for non-limiting exemplary purposes.

[0044] The attached figures refer to a covering appa-

ratus and a guide element 10 applied to a covering apparatus, in this case, an outdoor pergola 100.

[0045] By way of description only, the pergola 100 typically comprises four vertical uprights 111 conformed to maintain an upper frame 112 under a desired lifting condition, the latter substantially formed by four horizontal carriers 113, possibly provided with relative gutters, not illustrated in the drawings.

[0046] Said frame 112 is conformed to support a plurality of covering slats 114 and 115, arranged substantially parallel to each other, so as to occupy the internal space thereof.

[0047] In this case, the slats indicated with reference numeral 114 are fixed with respect to the upper frame 112, while the slats indicated with reference numeral 115 are movable with respect to the slats 114.

[0048] In particular, each slat 114 is attached longitudinally to the opposite carriers 113 of the frame 112, while each slat 115 is attached longitudinally to opposite movement profiles 116 (only schematized in the figures), and which are associated sliding and substantially parallel with respect to the aforementioned carriers 113.

[0049] The movement profiles 116 are connected to an actuator (not illustrated) that causes their selective movement in one direction or the other, with respect to the carriers 113 to which they are associated.

[0050] Furthermore, for each side of the structure 112 a guide profile 124, attached substantially parallel to the corresponding carrier 113, is provided.

[0051] At least one cam guide 125, which comprises, in this case, a substantially V-shaped path defined by two first segments 128 with substantially linear course, and two second segments 129, inclined downwards with respect to the first segments 128, in continuity with each other, is obtained on one edge of said guide profile 124.

[0052] The movement profile 116 is also associated with relative cam follower elements 126 which cooperate with the cam guides 125 to cause the reciprocal positioning between the slats 114 and 115 in the envisaged operating conditions.

[0053] In this case, by way of non-limiting example, each cam follower element 126 comprises a support and a wheel, which translates along the first 128 and second 129 segments of the corresponding cam guide 125.

[0054] With particular reference to Figure 2, a guide element 10 according to the present invention generally comprises a containing wall 11, a support wall 12, a rest wall 13 and a coupling wall 14.

[0055] Advantageously, the guide element 10 is made by moulding plastic material, but it is not excluded that it can be made of metallic material, both by plastic deformation and by chip removal, i.e., to provide that its walls 11, 12, 13 and 14 can be made individually and coupled together in an integral manner, for example by welding, i.e., removable, for example by screwing, interlocking or otherwise.

[0056] The containing wall 11 has a course correlated to the shaping of the cam guide 125, as defined by the

V-shaped combination of the first segments 128 and of the second segments 129.

[0057] Operatively, the containing wall 11 is substantially counterposed to the cam guide 125, with respect to the position of the cam follower element 126, so as to contain, with a desired tolerance, any detachments of the latter from the cam guide 125 itself, particularly upwards.

[0058] The support wall 12 is obtained substantially orthogonal to the containing wall 11 and defines a substantial structural impediment to the accidental exit of the sliding element 126 from the cam guide 125, along a lateral direction. Furthermore, the support wall 12 defines a connection between the containing wall 11 and the rest wall 13.

[0059] In fact, the latter is obtained counterposed to the containing wall 11, so as to be placed operatively side by side with the cam guide 125.

[0060] This conformation connected between the containing wall 11, the support wall 12 and the rest wall 13, defines a sliding seating 15, inside which at least an end element of the wheel of the cam follower element 126 slides.

[0061] Therefore, this configuration allows to keep the cam follower element 126 contained at least between the containing wall 11 and the support wall 12, during the steps of travel of the cam guide 125 and, therefore, to guarantee a correct movement of the slats 115, with respect to the slats 114, regardless of external accidental actions such as wind, impacts or other.

[0062] The coupling wall 14 extends, in this case, below the rest wall 13 so as to offer its widest surface to the guide profile 124. In fact, the coupling wall 14 is operatively in contact with the guide profile 124.

[0063] Two coupling screws 16 are provided on the coupling wall 14, which are screwed into two corresponding coupling holes 17, the latter obtained in coordination on the guide profile 124.

[0064] Therefore, by means of the coupling screws 16 screwed into the corresponding holes 17, the coupling wall 14 is coupled to the guide profile 124 and then the guide element 10 to the pergola 100, see for example Fig. 10.

[0065] Clearly, the reverse operation is carried out by unscrewing the coupling screws 16, that is, the guide element 10 is temporarily disengaged from the pergola 100.

[0066] In the variant illustrated in fig. 8, it can be noted how the entire guide element 10 is elongated with respect to the solution described so far and illustrated so as to cover the entire operating travel "S" of the cam follower element 126. In this solution, in fact, the covering wall 11, the support wall 12, and the rest wall 13, cover the entire distance that can be travelled by the cam follower element 126, guaranteeing its containment and the correct cooperation with the cam guide 125, substantially under all possible operating conditions.

[0067] In this solution, an aperture 18 can be provided,

by means of which an insertion from above of the cam follower element 126, with relative movement profile 116 and covering slats 115, is allowed or favoured.

[0068] With particular reference to the variant illustrated in fig. 9, in which between the two second guide segments 129, it can be provided for a third guide segment 133, the covering wall 11 is conformed with a shaping similar to the cam guide 125 defined by the three guide segments 128, 129 and 133.

[0069] According to some variants, not illustrated in the attached figures, the covering wall 11 is conformed in coordination with the cam guide 125, even under conditions in which the three guide segments 128, 129 and 133, individually or in free combination with each other, have a curvilinear conformation (regular or irregular).

[0070] It is clear that modifications and/or additions of parts may be made to the covering apparatus 10 as described heretofore, without departing from the field and scope of the present invention, as defined by the claims.

[0071] In the following claims, the sole purpose of the references in brackets is to facilitate their reading and they must not be considered as restrictive factors with regard to the field of protection defined by the claims.

Claims

1. Covering apparatus (100) comprising at least a guide profile (124) on which at least a fixed cam guide (125) is obtained to which at least one sliding element (126) is slidably associated, and a guide element (10) distinct from said guide profile (124) and comprising at least one containing wall (11) operatively counterposed to said cam guide (125) with respect to said sliding element (126), **characterized in that** said guide element (10) comprises coupling means having at least a coupling wall (14), selectively associable with said guide profile (124), and at least a coupling member (16, 17) provided at least partly on said coupling wall (14) and at least partly on said guide profile (124).
2. Covering apparatus (100) as in claim 1, **characterized in that** said containing wall (11) has a longitudinal shaping coordinated with the longitudinal shaping of said cam guide (125).
3. Covering apparatus (100) as in one or the other of the previous claims, wherein said cam guide (125) comprises at least a first and second guide segment (128, 129) contiguous and inclined with respect to each other, **characterized in that** said containing wall (11) has a longitudinal shaping coordinated with the longitudinal shaping of both said first (128) and said second (129) guide segment.
4. Covering apparatus (100) as in one or the other of the previous claims, **characterized in that** said cou-

pling means (14, 16, 17) are of the selectively removable type for stable attachment to said guide profile (124).

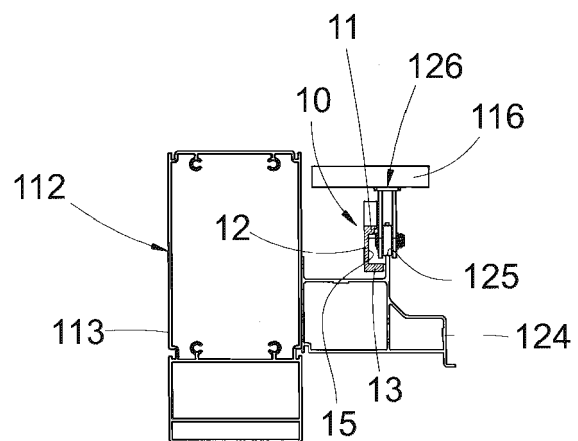
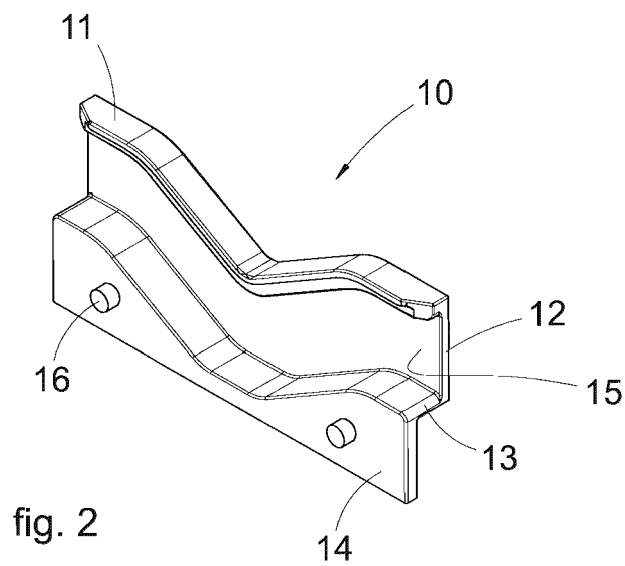
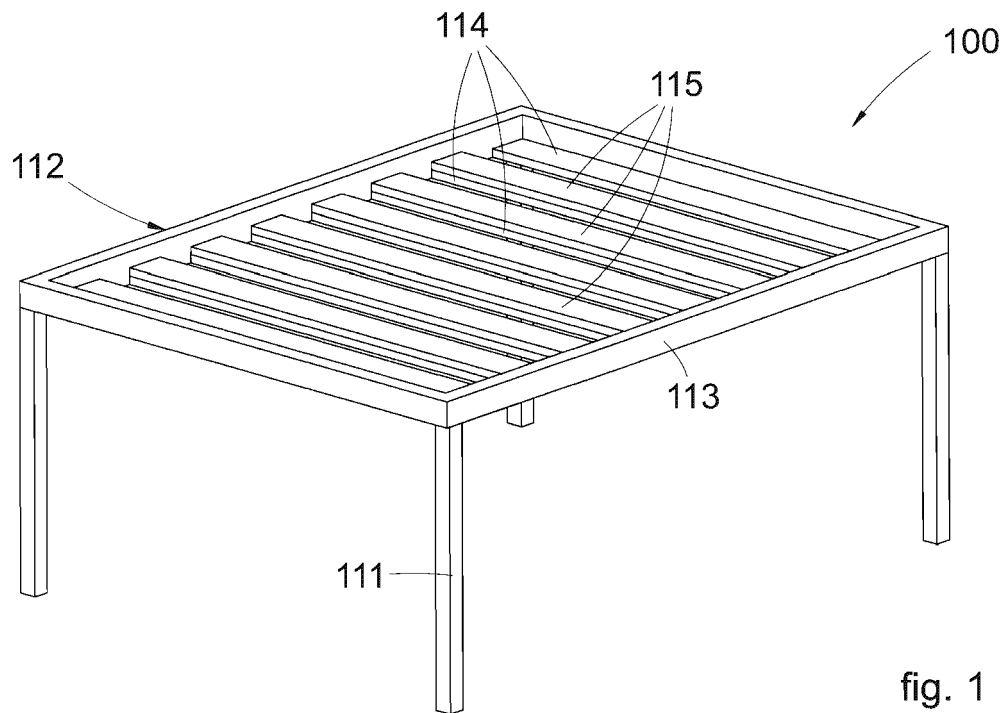
5. Covering apparatus (100) as in one or the other of the previous claims, **characterized in that** said guide element (10) comprises a rest wall (13) placed operatively side by side with said cam guide (125) and substantially counterposed to said containing wall (11), with respect to said sliding element (126). 5 10
6. Covering apparatus (100) as in claim 5, **characterized in that** said guide element (10) comprises a support wall (12) inclined with respect to said containing wall (11) and defining a connection between said containing wall (11) and said rest wall (13). 15
7. Covering apparatus (100) as in claim 6, **characterized in that** at least said containing wall (11) and said support wall (12) define a sliding seating (15) in which said sliding element (126) is at least partly able to slide. 20
8. Covering apparatus (100) as in claim 7, **characterized in that** said sliding seating (15) is also defined by said rest wall (13). 25
9. Covering apparatus (100) as in any of the previous claims, **characterized in that** said coupling member comprises at least a male interlocking element (16) provided on said coupling wall (14) and at least a female interlocking element (17) provided on said guide profile (124). 30
10. Guide element (10) as in one or the other of the previous claims, **characterized in that** said containing wall (11) comprises at least one aperture (18), for the insertion of said sliding element (126). 35

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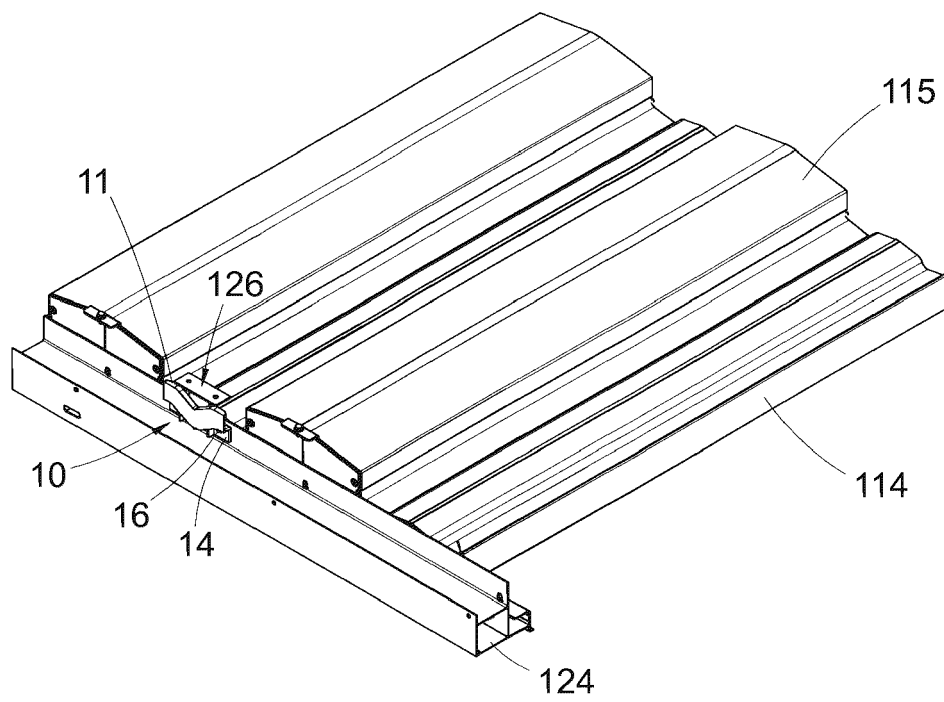


fig. 4

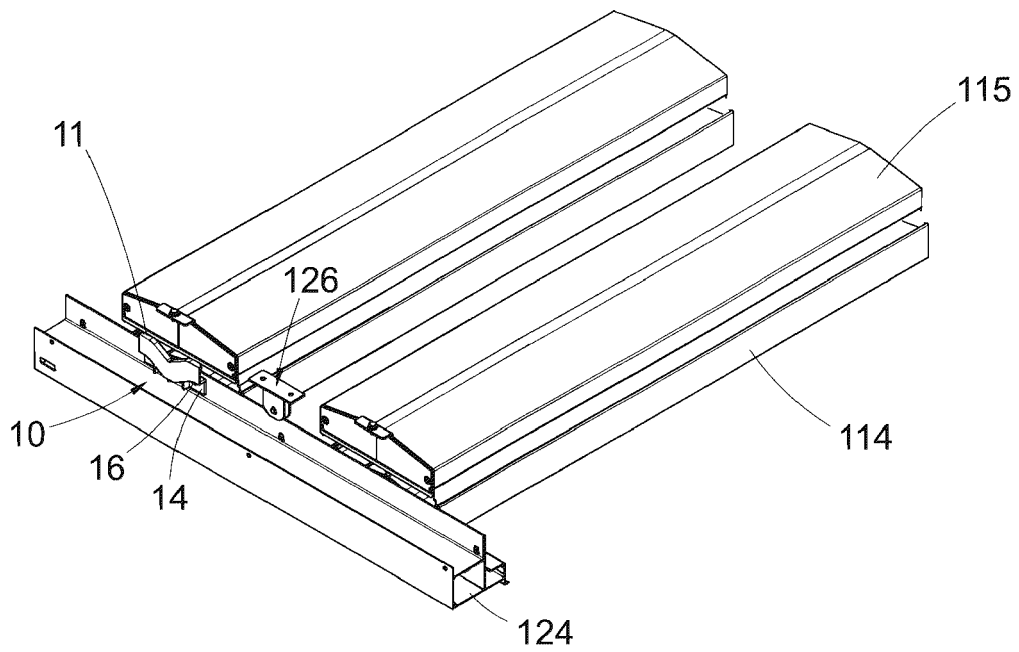


fig. 5

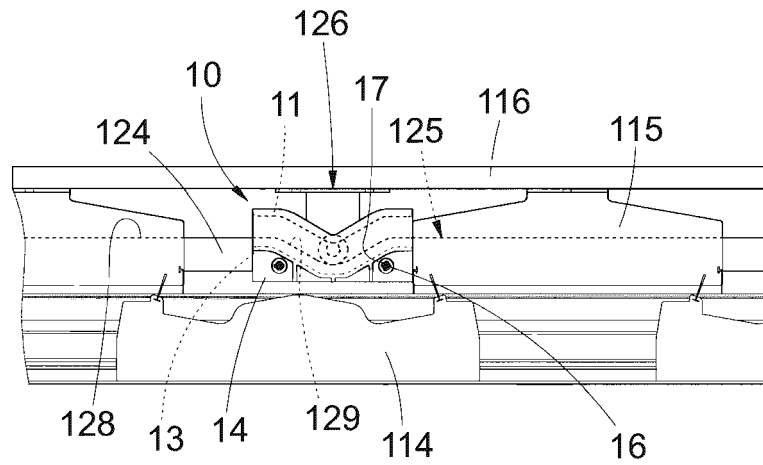


fig. 6

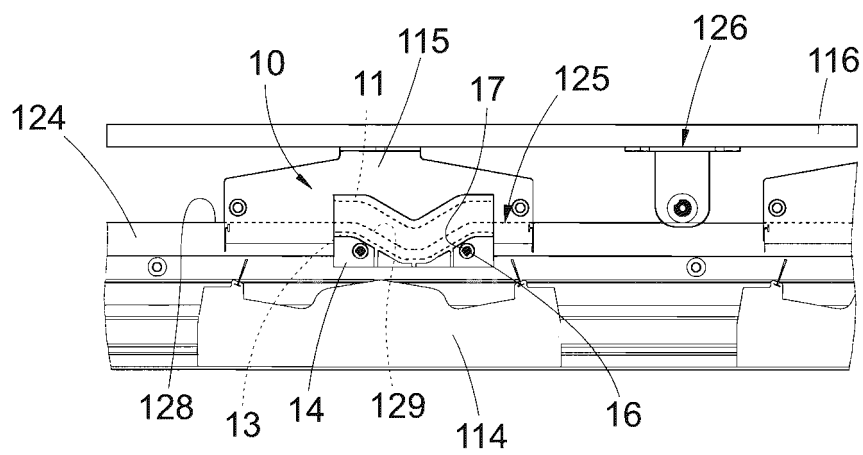


fig. 7

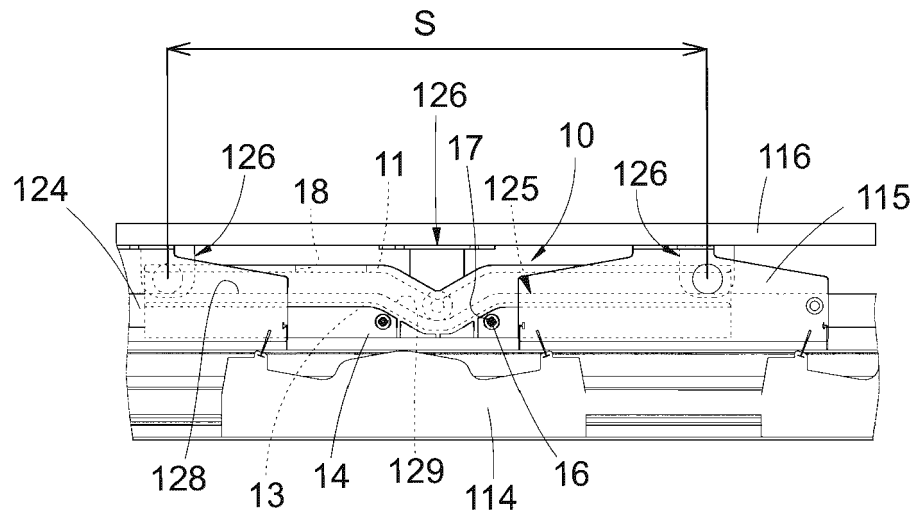


fig. 8

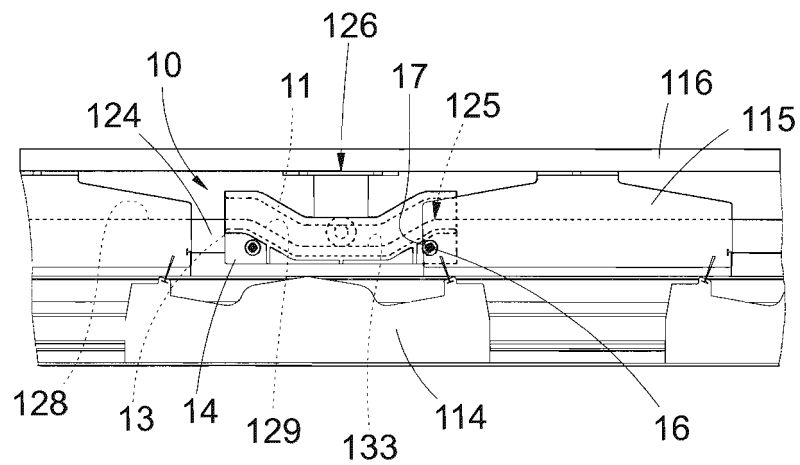


fig. 9

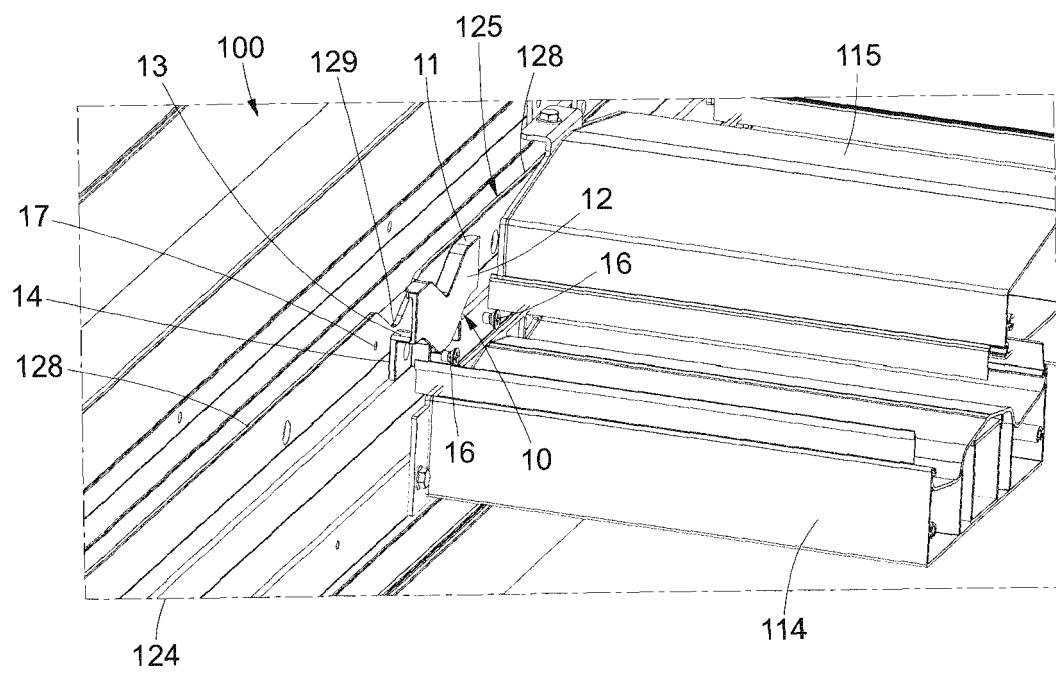


fig. 10



EUROPEAN SEARCH REPORT

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EPO FORM 1503 03.82 (P04C01)

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 23 February 2024	Examiner Kofoed, Peter
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	

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

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