(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 217 086 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
13.09.2017 Bulletin 2017/37

(51) Int Cl.:
F21V 21/005 *(2006.01)* ***F21V 23/06*** *(2006.01)*
F21S 2/00 *(2016.01)* *F21V 15/015* *(2006.01)*

(21) Application number: **16382107.7**

(22) Date of filing: **11.03.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(71) Applicant: **Simon, S.A.U.**
08013 Barcelona (ES)

(72) Inventors:
- **JORDANA CASAMITJANA, Francesc**
  08013 BARCELONA (ES)
- **PLAJA MIRÓ, Salvi**
  08013 BARCELONA (ES)
- **RIQUÈ REBULL, Adrià**
  08013 BARCELONA (ES)
- **REY SÁNCHEZ, David**
  08013 BARCELONA (ES)
- **LLIMOS SALAS, Ricard**
  08013 BARCELONA (ES)
- **BATISTE MAYAS, Clara**
  08013 BARCELONA (ES)

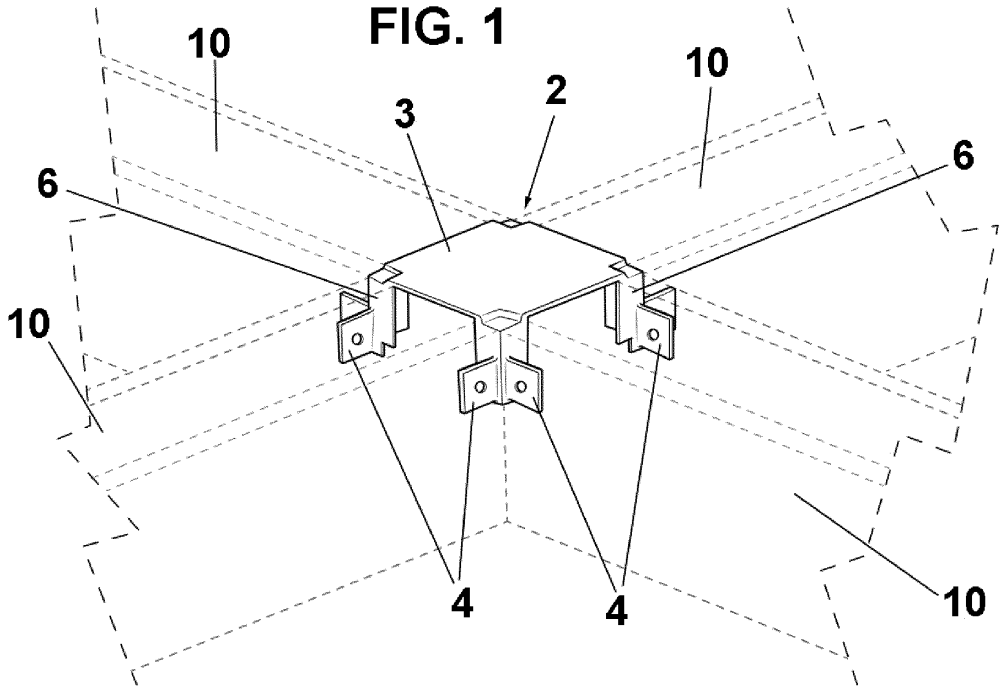
(74) Representative: **Herrero & Asociados, S.L.**
Cedaceros, 1
28014 Madrid (ES)

(54) MODULAR LIGHTING SYSTEM

(57) The lighting system comprises a plurality of lighting modules (1) housed inside at least two profiles (10), said profiles (10) being coupled to each other by means of at least one coupling element (2), characterised in that the or each coupling element (2) comprises a plate (3) and fixations (4) for fixing the coupling element (2) to at least two adjacent profiles (10).

It enables the provision of a modular lighting system formed by a plurality of lighting modules coupled to each other, wherein the lighting is continuous throughout the system, without there being any interruption at the ends of the lighting modules.

FIG. 1



EP 3 217 086 A1

Description

[0001] The present invention relates to a modular lighting system comprising a plurality of lighting modules coupled to each other.

Background of the invention

[0002] Modular lighting systems comprising a plurality of lighting modules, usually elongated, that are coupled to each other, both longitudinally and transversely, forming a desired layout, are well known.

[0003] The objective of these modular lighting systems is to minimise costs using lighting modules of a single type. To this end, the elongated lighting modules must be coupled by means of coupling elements disposed at their ends.

[0004] A drawback of the currently known modular lighting systems is that these coupling elements block the light in their mounted position, such that the lighting is not continuous throughout the lighting system, but rather is interrupted at the ends of each lighting module.

[0005] This drawback prevents the provision of the desired lighting and, also, is not aesthetically pleasing to users.

[0006] Also, the electrical connections between the modules are usually executed using terminal strips, which slows down installation, as the electrical connection between each module is executed individually and manually.

[0007] Therefore, the objective of the present invention is to provide a modular lighting system formed by a plurality of lighting modules coupled to each other, wherein lighting is continuous throughout the system, without there being any interruption at the ends of the lighting modules.

Description of the invention

[0008] The lighting system of the invention resolves the aforementioned drawbacks and has other advantages which are described below.

[0009] The lighting system in accordance with the present invention comprises a plurality of lighting modules housed inside at least two profiles, said profiles being coupled to each other by means of at least one coupling element, and is characterised in that the or each coupling element comprises a plate and fixations for fixing the coupling element to at least two adjacent profiles.

[0010] Due to this characteristic, the plate does not block the light emitted in the desired direction of lighting and the rest of the coupling element is substantially free from obstacles.

[0011] In accordance with two possible additional embodiments, depending on the number of lighting modules coupled, said coupling element comprises a lateral plate fixed to the end of two adjacent profiles, or said coupling element comprises two lateral plates joined together perpendicularly, also joined to two adjacent profiles.

[0012] In accordance with a preferred embodiment, said fixations are disposed on projections substantially perpendicular to said plate.

[0013] Also, said projections may be formed by two strips forming a right angle and, on each projection, the fixations may be formed by two tabs that form a right angle, said tabs being disposed on the vertex formed by said two strips.

[0014] Also advantageously, each lighting module comprises a rotary electrical connector next to each of its ends, each rotary electrical connector comprising a plurality of electrical connection projections. This rotary electrical connector makes it possible to use the same lighting module in the event of coupling the lighting modules longitudinally (one after another) or transversely (forming a right angle).

[0015] Additionally, the use of a link connector that connects two rotary connectors of two adjacent lighting modules is also envisaged, said link connector comprising terminals.

Brief description of the drawings

[0016] For the purpose of helping to make the foregoing description more readily understandable, it is accompanied by a set of drawings which, schematically and by way of illustration and not limitation, represent an embodiment.

Figure 1 shows an upper perspective view of four lighting modules housed inside corresponding profiles of the lighting system in accordance with the present invention, coupled to each other forming a cross-junction;

Figure 2 shows an upper perspective view of three lighting modules housed inside corresponding profiles of the lighting system in accordance with the present invention, coupled to each other forming a T-junction;

Figure 3 shows an upper perspective view of two lighting modules housed inside corresponding profiles of the lighting system in accordance with the present invention, coupled to each other forming right-angle junction;

Figure 4 shows an upper perspective view of the electrical connector between two lighting modules of the lighting system in accordance with the present invention; and

Figure 5 shows a lower perspective view of a lighting system in accordance with the present invention.

Description of a preferred embodiment

[0017] The lighting system in accordance with the present invention comprises a plurality of lighting modules 1 coupled to each other and housed in one or more profiles 10. One or more lighting modules 1 can be

housed inside a single profile 10 and the profiles 10 are made of an appropriate material to allow light to pass through.

[0018] In the present description and in the claims, "lighting module" is understood to be a body having light-emitting elements and a screen which allows light to pass through in the desired direction, wherein the lighting module is elongated. All the lighting modules of a lighting system in accordance with the present invention are preferably of the same length, although they may be of different lengths.

[0019] The profiles 10 may be joined together by means of coupling elements 2, which may be of three different types depending on the number of profiles 10 coupled to each other, as shown in figures 1 to 3.

[0020] However, all the coupling elements 2 include common characteristics that provide the technical advantage, which is the objective of the present invention, to provide continuous, uninterrupted lighting, as indicated previously.

[0021] Each coupling element 2 comprises a plate 3 and fixations 4 for fixing the coupling element 2 to at least two adjacent profiles 10. This basic embodiment of the coupling element 2 is shown in figure 1, for the coupling of four profiles 10 forming a cross-junction.

[0022] It should be understood that, when reference is made to the plate 3, this plate may be disposed in an upper, lateral or lower position depending on where the lighting system of the present invention is installed, such that this plate only blocks the light in a direction one does not wish to illuminate. Therefore, when the plate is disposed in an upper position, the lighting system will be mounted on the ceiling or near the ceiling; when it is disposed in a lateral position, the lighting system will be mounted on a wall; and when the plate is disposed in a lower position, the lighting system will be mounted on the floor, with the plate blocking the light towards the ceiling, wall or floor, respectively.

[0023] In accordance with the embodiment represented, said fixations 4 are disposed on projections 6 substantially perpendicular with respect to said plate 3. Additionally, in this embodiment, said projections are formed by two strips that form a right angle and in each projection 6 the fixations 4 may be formed by two tabs that form a right angle, wherein said tabs are disposed on the vertex formed by said two strips.

[0024] The tabs may be joined to each lighting module in any appropriate manner. For example, each strip may comprise a hole for inserting a nail or screw, or similar.

[0025] Figure 2 shows the coupling element 2 used to couple three profiles 10 to each other, forming a T-junction. In this embodiment, as opposed to the coupling element 2 of figure 1, it comprises a lateral plate 5 fixed to the ends of two adjacent profiles 10.

[0026] Figure 3 shows a coupling element 2 used to couple two profiles 10 to each other, forming a right-angle junction. In this embodiment, as opposed to the coupling element 2 of figure 1, it comprises two lateral plates 5 joined together forming a right angle, each of which is fixed to one end of said profiles 10. It should be noted that one of these lateral plates is not shown in figure 2, since it is on the rear side.

[0027] In order to use the same lighting module in the event of coupling the lighting modules longitudinally (one after the other) or transversely (forming a right angle), each lighting module 1 comprises a rotary connector 7 next to each of its ends, wherein each rotary electrical connector 7 comprises a plurality of electrical connection projections 8, as can be observed in figure 4.

[0028] It should be noted that figure 4 shows two lighting modules 1 to be connected one after the other. In the event that the lighting modules 1 are connected forming a right angle, the rotary connector 7 of each lighting module 1 will rotate 90 degrees.

[0029] In order to connect two lighting modules 1 to each other, a link connector 9 is used, having terminals 11 which enable the connection of more lighting modules 1 or the selection of lighting modules 1 that light up simultaneously in accordance with the electrical connections executed.

[0030] In figure 5, which shows a lighting system in accordance with the present invention from below, i.e. as a user would see it, it can be observed that the coupling elements do not block the light and the user cannot see any coupling element, as they are hidden.

[0031] This characteristic has technical advantages, as it does not affect the desired lighting and aesthetics, as mentioned earlier.

[0032] Despite the fact that reference has been made to a specific embodiment of the invention, it is evident for the person skilled in the art that numerous variations and changes may be made to the lighting system described, and that all the aforementioned details may be substituted by other technically equivalent ones, without detracting from the scope of protection defined by the attached claims.

Claims

1. A lighting system, which comprises a plurality of lighting modules (1) housed inside at least two profiles (10), said profiles (10) being coupled to each other by means of at least one coupling element (2), **characterised in that** the or each coupling element (2) comprises a plate (3) and fixations (4) for fixing the coupling element (2) to at least two adjacent profiles (10).

2. The lighting system, according to claim 1, wherein said coupling element (2) comprises a lateral plate (5) fixed to the end of said profile (1).

3. The lighting system, according to claim 1, wherein said coupling element (2) comprises two lateral plates (5) joined together, each of which is fixed to

the end of a profile (10).

4. The lighting system, according to claim 1, wherein said fixations (4) are disposed on projections (6) substantially perpendicular to said plate (3).

5. The lighting system, according to claim 4, wherein said projections (6) are formed by two strips that form a right angle.

6. The lighting system, according to claim 4, wherein in each projection (6) the fixations are formed by two tabs that form a right angle.

7. The lighting system, according to claims 5 and 6, wherein said tabs are disposed on the vertex formed by said two strips.

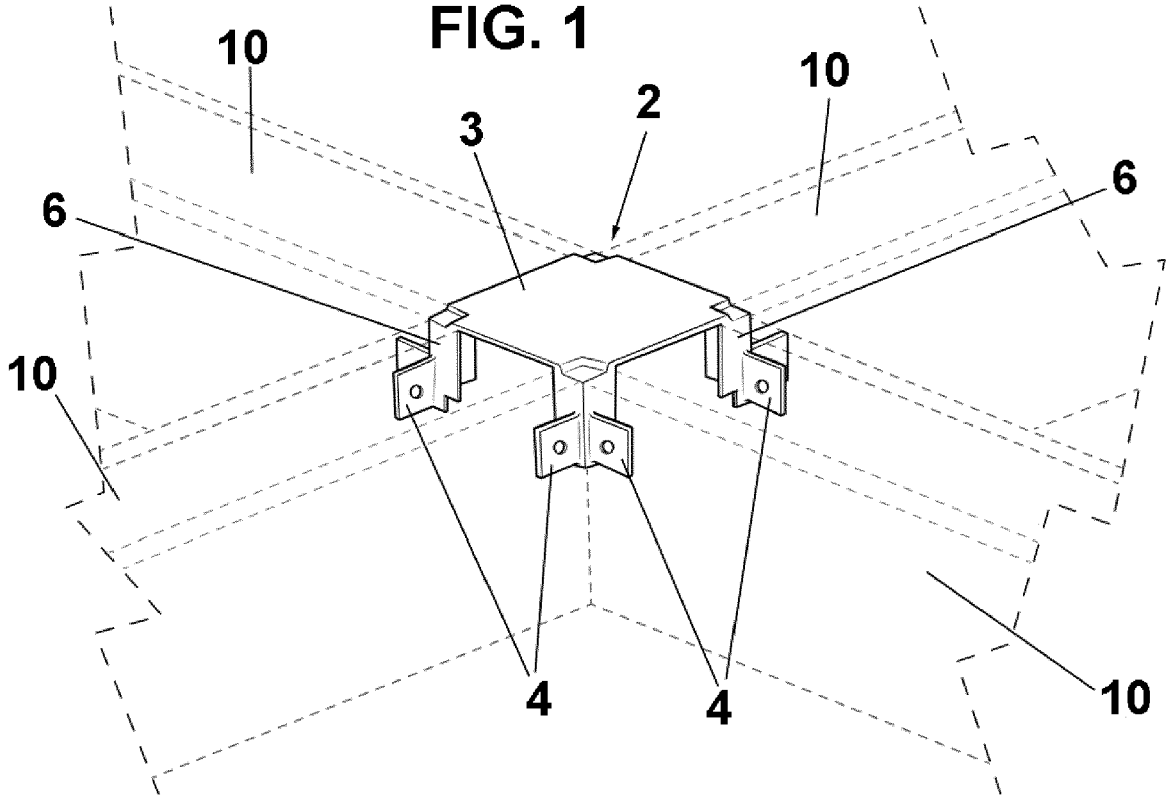
8. The lighting system, according to claim 1, wherein each lighting module (1) comprises a rotary connector (7) next to each of its ends.

9. The lighting system, according to claim 8, wherein each rotary electrical connector (7) comprises a plurality of electrical connection projections (8).

10. The lighting system, according to claim 8, which comprises a link connector (9) that connects two rotary connectors (7) of two adjacent lighting modules (1).

11. The lighting system, according to claim 10, wherein said link connector (9) comprises terminals (11).

FIG. 1



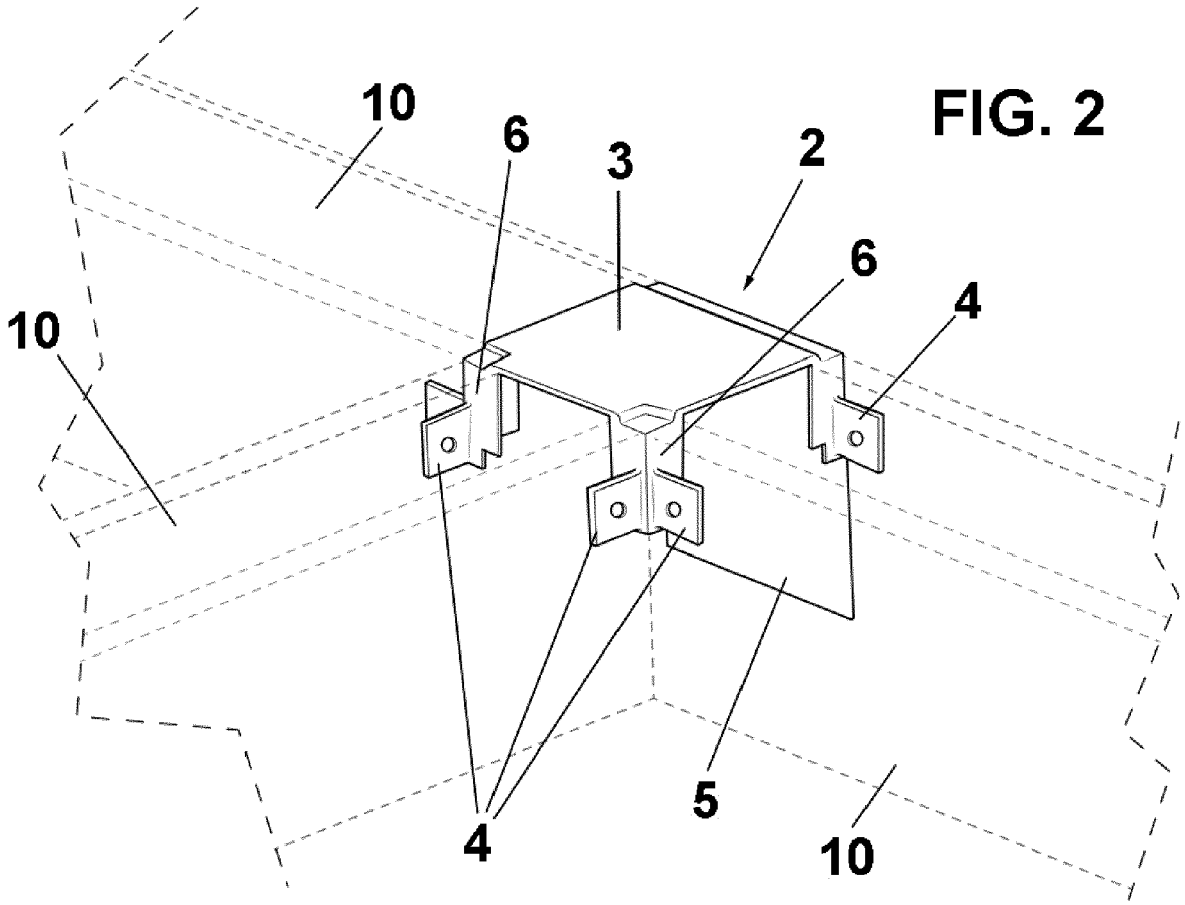


FIG. 2

FIG. 3

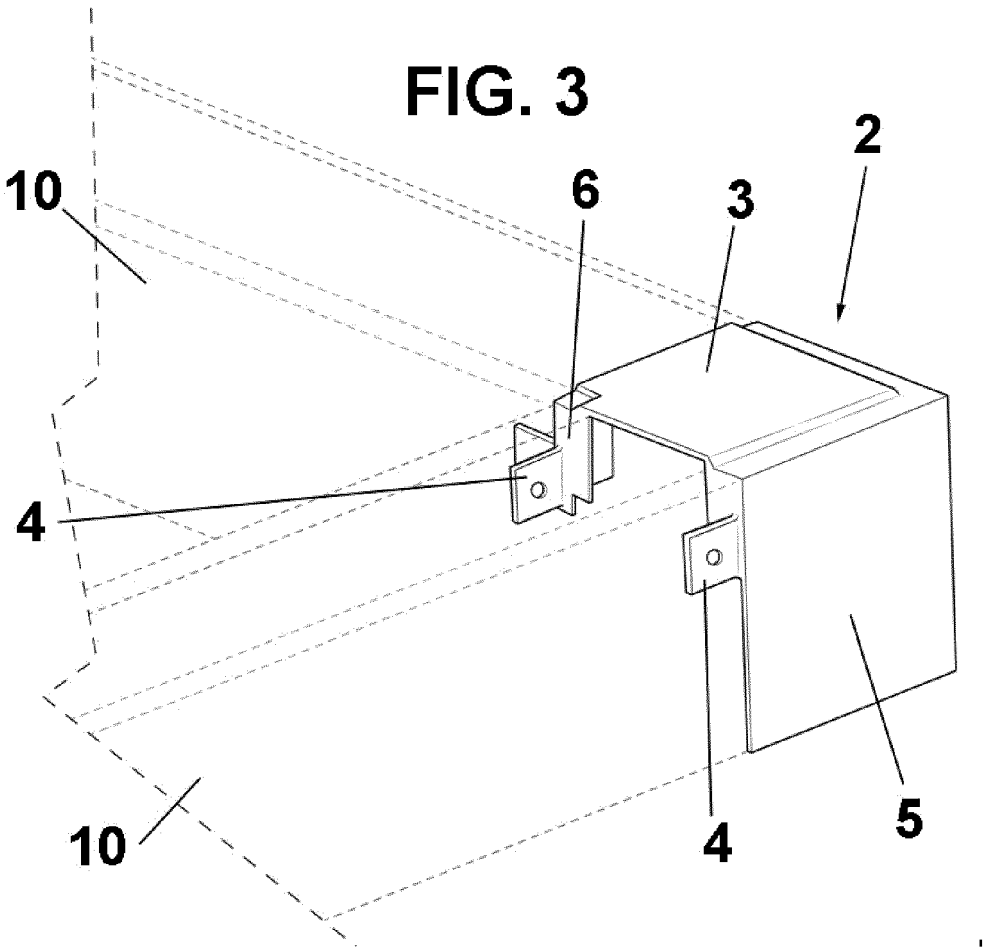
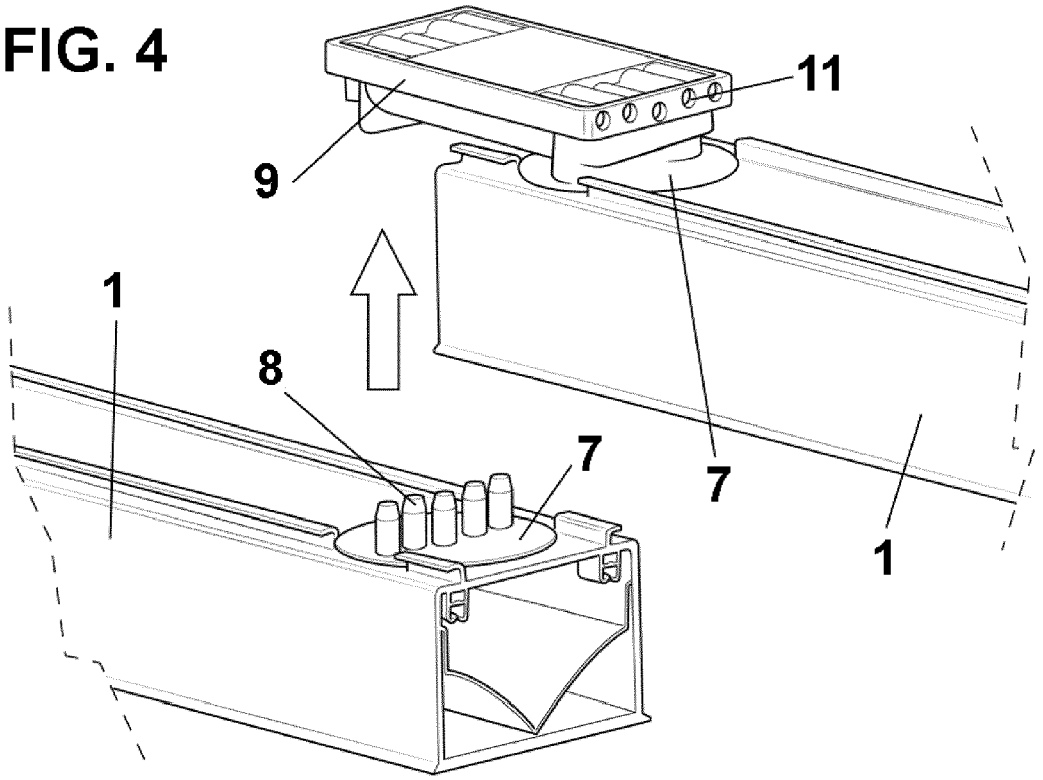


FIG. 4



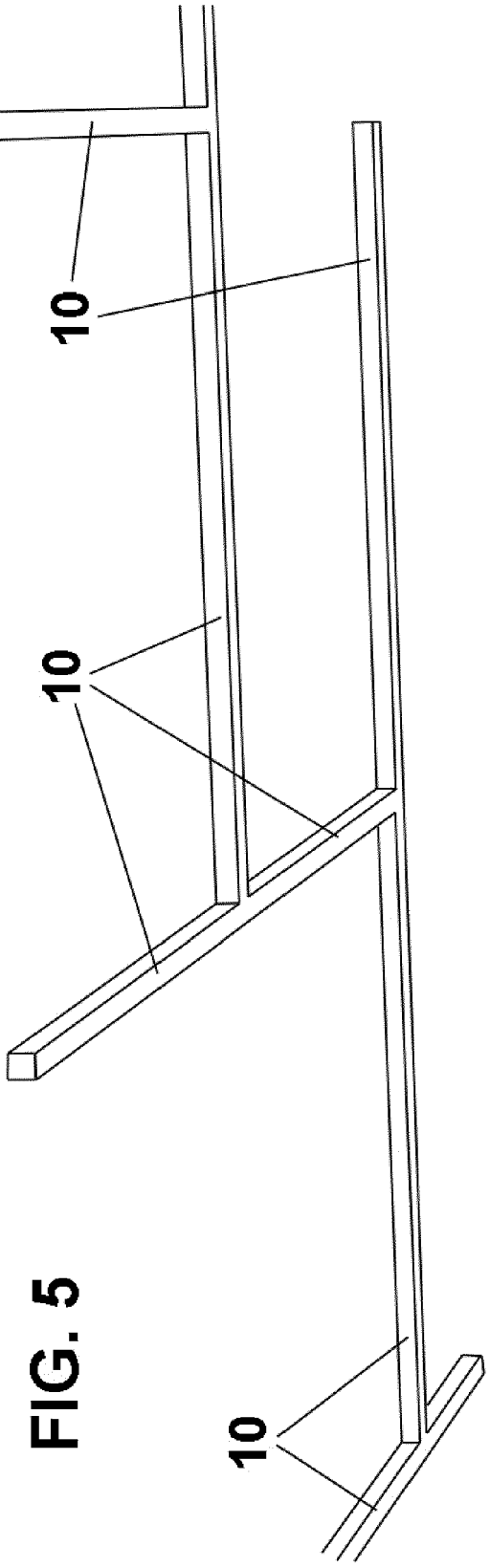


FIG. 5

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 16 38 2107

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	US 2014/177209 A1 (CARNEY ANTHONY JAMES [US] ET AL) 26 June 2014 (2014-06-26) * paragraph [0049] - paragraph [0050] * * paragraph [0077] * * paragraph [0086] - paragraph [0088] * * paragraph [0092] - paragraph [0098] * * figures 2, 14-22,29 *	1-11	INV. F21V21/005 F21V23/06 F21S2/00 ADD. F21V15/015
X	EP 1 980 785 A1 (TRILUX GMBH & CO KG [DE]) 15 October 2008 (2008-10-15) * paragraph [0020] - paragraph [0035] * * figures 1-8 *	1-3,8,9	
X	US 8 313 212 B1 (MAYER STANLEY [US] ET AL) 20 November 2012 (2012-11-20) * the whole document *	1,4,8-11	
X	US 2014/241008 A1 (KIM HAN GYOUL [KR] ET AL) 28 August 2014 (2014-08-28) * paragraph [0107] - paragraph [0115] * * figures 1,2,10-12 *	1-4,8-11	

TECHNICAL FIELDS SEARCHED (IPC)

F21V
F21S

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 May 2016	Demirel, Mehmet

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 38 2107

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

24-05-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014177209 A1	26-06-2014	EP 2564112 A2	06-03-2013
		EP 2990718 A1	02-03-2016
		US 2011285314 A1	24-11-2011
		US 2014177209 A1	26-06-2014
		WO 2011139764 A2	10-11-2011
EP 1980785 A1	15-10-2008	NONE	
US 8313212 B1	20-11-2012	NONE	
US 2014241008 A1	28-08-2014	NONE	

EPO FORM P0459

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