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(54) **PERGOLA WITH INTEGRATED ELECTRICAL INSTALLATION FOR LIGHTING**

(57) Pergola with integrated electrical installation for lighting, comprising an awning (2) supported on cross-bars (3) with sliding elements (4) which run along perpendicular guides (5) and, at least, one lighting lamp (6) in some of the bars which is powered from an electrical installation that runs fully built into the structure of the pergola (1) itself. The guides (5) are constituted by connector wires (51) and the sliding elements (4) by rolling

bolts (41) that, combining metal connection and insulation parts, connect the connection terminals of the wiring (61) of the lamp (6) of the crossbar in which they are incorporated with said connector wire (51) powered electrically. The connector wires (51) are inserted in longitudinal supports (7) and electrically powered, in each longitudinal support (7), alternating positive and negative charge.

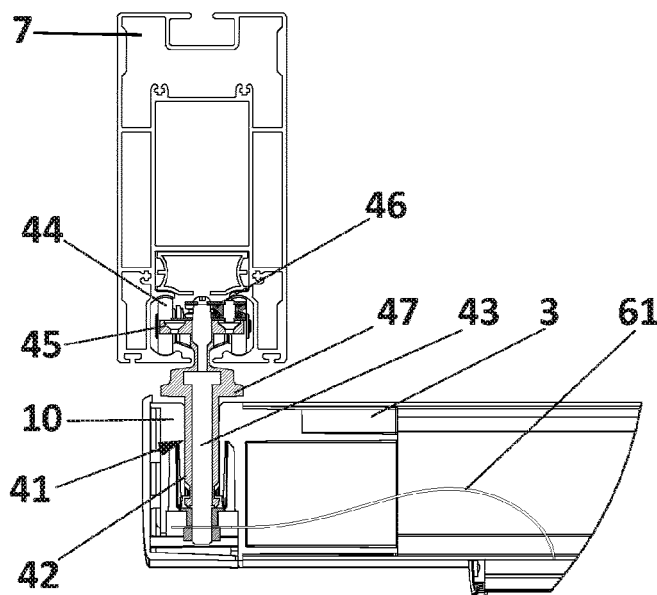


FIG. 6

Description

OBJECT AND FIELD OF INVENTION

[0001] The invention, as stated in the heading of this specification, relates to a pergola with integrated electrical installation for lighting, providing its intended function with advantages and characteristics, which will be described in detail below, which represent a novelty in the current state of the art.

[0002] More specifically, the object of the invention focuses on a pergola, which, being of the pleated retractable awning type, composed of an awning that runs between at least two guides that constitute longitudinal supports, dragged at various points in order to go from the folded position to the deployed position, and which, being designed to incorporate lighting elements incorporated into the crossbars spread across the awning to determine the above-mentioned fold-back pleats, it presents the particular feature of having a system of rolling bolts designed as a means to drag the awning along the guides of said longitudinal supports and, at the same time, determine the means of electrical connection for said lighting elements with the power outlet through the general pergola structure, forming a built-in system that is completely hidden in the structure.

[0003] The scope of the present invention falls within the sector of the industry engaged in the manufacture of awnings and pergolas, focusing specifically on the scope of pergolas with sliding awnings that incorporate electrical systems, mainly for lighting.

BACKGROUND OF THE INVENTION

[0004] As a reference to the current prior art, it should be noted that, although multiple types and models of pergolas as well as pergolas that incorporate lighting are known on the market, to the best of the applicant's knowledge, there is none having the technical, structural and constitutive characteristics specifically presented herein, as claimed.

[0005] In that sense, it is worth mentioning that most of the pergolas of the type in question, when they incorporate lighting from lamps incorporated into the structure thereof, the electrical installation is usually incorporated independently of the operation and sliding mechanisms of the awning, so the wiring connection of the lamps to the power outlet point is externally incorporated, and, in many cases, it becomes a troublesome nuisance when folding and extending the awning.

[0006] In fact, all pleated retractable pergolas, as in this case, are distinguished by the ability to minimise the space taken up by the fabric, through successive pleats thereof when the crossbars on which fabric itself rests approach each other. This is possible because said bars slide along guides that are incorporated in the longitudinal supports which constitute the bearing structure of the pergola itself.

[0007] In addition, in current pergolas, it is known that the area under the canopy is illuminated by lights attached to the above-mentioned crossbars of the fabric itself, which allows them to ensure a suitable and even light distribution. In the prior art it is known that such lights are powered through electrical wires, which are either placed and attached along the fabric, until reaching the bar where the lamp to be powered is incorporated, or said electrical wires are attached only at the ends of one bar and the next, thus allowing them to be folded together with the canvas.

[0008] These two solutions have huge drawbacks:

- Attaching the wires to the fabric requires numerous jobs and if the number of lights needs to be increased, the canvas needs to be manufactured anew.
- Attaching the wires hanging under the crossbars is an unsightly solution and complicates the possibility of laterally closing the pergola.
- Both systems require complex wiring in the installation phase.

[0009] The object of the present invention is thus to develop an improved system of the electrical installation that is built into the pergola structure itself, so that the sliding of the awning for folding and extending it does not affect the installation at all, since the electrical connection of the lighting system with the power outlet wiring is implemented through the sliding elements themselves, avoiding the aforementioned problems and disadvantages.

[0010] It should be noted, however, that there are documents in the prior art that disclose similar solutions, although resolved differently. In particular, Patent US 2015068569 A1, which describes an awning system that comprises two or more parallel elongated rods, one or more pieces of canopy that has two parallel edges, two or more elongated bars connected to each one of the two or more parallel elongated bars and joined to each one of the two parallel edges of the mechanism of one or more pieces of canopy, and at least one connection joined to each one of the elongated bars which have a connector that is capable of being suspended from a support. The elongated bars may include at least one lower cavity which has two channels each one configured to removably and slidingly receive each one of the elongated bars. The lower cavity can have a slot that is configured to removably and slidingly receive an accessory. Each one of the elongated bars may include at least one upper cavity configured to removably and slidingly receive each connection mechanism and a second accessory.

DESCRIPTION OF THE INVENTION

[0011] Thus, the pergola with integrated electrical installation for lighting proposed by the invention is configured as a novelty within its scope, while the characterising details that conveniently distinguish it are included in the final claims accompanying the present description.

[0012] Specifically, what the invention proposes, as noted above, is a pergola of the type composed of an awning that runs between longitudinal parallel supports, usually incorporated on supporting props at least at the distal ends when the pergola is installed attached to a façade, and that for the sliding of the awning from a folded position to an extended position, it is dragged at various points through a bearing elements provided at the respective ends of the crossbars upon which the canvas rests and which run along the longitudinal supports as a guide.

[0013] The pergola of the present invention further incorporates a lighting system based on lamps distributed on all or some of the crossbars, on the underside of the awning, whose electrical installation, i.e. the wiring and connection that takes the electricity from the power outlet, or where appropriate from the transformer, to the lamps, is designed to be fully built into the awning structure.

[0014] To do this, each of the longitudinal supports, as guide element, incorporates internally at least one electricity conductor wire that, at the appropriate end, conveniently connects to the electrical installation for awning operation or, directly, by means of the relevant transformer and rectifier, where applicable, to the power outlet through the corresponding connection.

[0015] This wire, which runs completely tautened, serves at the same time as guide for the rolling bolts that drag the awning by means of the crossbars whose ends it is coupled to and which are distributed across it, forming, when coming together, the pleats of the folded awning, and on which, in turn, lamps are incorporated inferiorly secured to the same by means of corresponding anchors. In addition, the two rolling bolts of each crossbar are electrically connected to lamps that are incorporated to its bar using electrical wires also housed inside the bar, being completely hidden from view.

[0016] Preferably, and since the electricity supply for lighting is preferably connected to the power supply through a transformer and rectifier, so that the supply is a low voltage and direct current supply, each rolling bolt of each bar end is connected to the positive or negative wire, which respectively connect with the lamp at each end of the bar, as the rolling bolts on a guide will be powered by a positive voltage and on the following guide by a negative voltage, thus, in each crossbar it is possible to power a lamp connecting it to the right and to the left in the two power supply poles.

[0017] With this, and thanks to the specific combination of electrically conductive metal parts and insulating plastic parts forming the rolling bolts, the electric current comes from the power supply to the lamps through the

taut conductor wires that serve as guides for the sliding of the rolling bolts and are inserted and hidden inside the longitudinal supports.

[0018] It should be noted that each crossbar does not necessarily incorporate lamps, and that a crossbar can incorporate one or more lamps, all of which, of course, will depend on the needs of each case and the dimensions of the pergola.

[0019] In short, the pergola of the invention is distinguished by the fact that in it the lighting lamps are placed on the supporting crossbars of the awning and are powered through the sliding elements themselves that allow the movement of those bars.

[0020] In particular, these sliding elements are composed of rolling bolts that run along a tautened wire as a guide through which they are powered by a positive voltage and a negative voltage alternately on each longitudinal support where said wire is housed.

[0021] Therefore it is possible to power a light by connecting it at the right and left to the two power supply poles on each bar.

[0022] These electrically powered rolling bolts are sliding, as they are provided with wheels, and allow the movement of the crossbars and consequently of the awning fabric.

[0023] At least one of such sliding bolts to be powered per guide, is equipped in its upper part with a series of wheels which ensure continued electrical contact with the power wire that is supported and insulated in a cavity inside the longitudinal support. Each longitudinal support has at least one wire alternately powered with positive or negative charge.

[0024] The main advantages of this technical solution are:

- That the canvas is completely independent of the electrical system, whereupon, the manufacture of the pergola is faster and cheaper.
- All wires and connections of the electrical installation are internal and therefore this guarantees a tidy and attractive design, and deterioration due to external causes is avoided.
- Installation is facilitated since the main wiring is inside of the longitudinal supports acting as guide, and this is done at the factory. Upon installation of the pergola only the lights need to be connected.

[0025] The pergola described with integrated electrical installation for lighting thus represents an innovation of structural and constituent characteristics unknown until now, reasons which linked to its practical utility, give it sufficient grounds to obtain the privilege of exclusivity applied for.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] To complete the description being made and in order to aid towards a better understanding of the characteristics of the invention, the present specification is accompanied by a set of drawings forming an integral part of the invention, where for purposes of illustration and in a non-limiting manner the following is shown:

Figure number 1.- Shows a perspective view from the bottom of an example of the pergola with integrated electrical installation for lighting object of the invention, showing its general configuration, as well as the main parts and elements that it comprises, in the absence of the supporting prop structure in which it is usually incorporated.

Figure number 2.- Shows an exploded view of one of crossbars that incorporate the lighting system lamps, showing the location of the guide bolts that determine the connection of the system with the support structure.

Figure number 3.- Shows a perspective view of one of the longitudinal supports, and, separately, the tensioned wire that is located internally and along which the guide bolts run maintaining the electrical connection.

Figure number 4.- Shows an enlarged view of the detail A indicated in figure 3 and which shows the configuration of the guide bolt, as well as its coupling to the connection wire.

Figure number 5.- Shows a sectional view, according to a cut along its longitudinal axis of one of the crossbars of the pergola, represented once assembled and coupled between the longitudinal supports with the respective guide bolts.

[0027] And figure number 6.- Shows an enlarged view of the detail B indicated in Figure 5, showing more clearly the arrangement of guide bolts on the longitudinal supports and attached to the crossbar.

DETAILED DESCRIPTION OF THE INVENTION

[0028] In view of the aforementioned figures and according to the numbering system used, an example of a preferred embodiment of the pergola with integrated electrical installation for lighting of the invention can be seen that comprises the parts and elements described in detail below.

[0029] Thus, as shown in said figures, the pergola (1) in question comprises, in a known way, an awning (2) supported on a plurality of crossbars (3) whose ends incorporate sliding elements (4) that run along guides (5) perpendicular to such crossbars (3), one, several or all

of the bars having at least one lighting lamp (6).

[0030] And, based on this already known configuration, the pergola (1) is distinguished by the fact that the lamp or lamps (6) are powered from an electrical installation that runs completely built into the structure of the pergola (1), since the guides (5) along which the sliding elements (4) run, consist of connector wires (51) inserted internally inside the respective longitudinal supports (7), and said sliding elements (4) consist of rolling bolts (41) which, combining metal connection parts and insulating plastic parts, connect the connection terminals of the wiring (61) of the lamp (6) with the connector wire (51) which, in each longitudinal support (7) is powered electrically, preferably, alternating positive and negative charge.

[0031] According to figure 2, it is noted how the lamp (6) is coupled to the lower part of the crossbars (3) by an anchoring profile (8) and a protective screen (9), the positive and negative wiring (61) being arranged at each end thereof inserted inside the bar itself reaching the ends of the bar, where respective plastic housings (10) are provided to receive the lower end of the respective rolling bolts (41) secured with corresponding fasteners (11).

[0032] For its part, figure 3 illustrates how the connector wire (51) which forms the guide (5) is maintained tensioned within the longitudinal support (7) by means of tensioners (52) and fasteners (53).

[0033] With regard to the rolling bolts (41), shown in figures 4 and 6, they are formed, essentially, from a lower rod (42), which is the part thereof that is inserted into the end of the crossbars (3), which forms a sheath that internally has a metal lug (43) which determines the connection point with the connection terminal of the wiring (61) of the lamps (6), and two differentiated groups of wheels in its upper part, this part being the one inserted into the longitudinal support (7), consisting of a main group (44) of vertical sliding rollers, that run supported on the cavity of the longitudinal support (7), and a secondary group (45) of horizontal guide rollers, between which the connector wire (51) runs forming the guide (5), which is secured, to prevent it from slipping out undesirably, between the respective plates (46) bolted to said secondary group of rollers (45) and to the body of the bolt.

[0034] Importantly, both the secondary group of rollers (45) and the plates (46) that secure it are made of metal, and are therefore conductive elements that provide electrical contact between the connector wire (51) and the inner metal lug (43) described above, as the latter emerges through the lower of said plates (46) to make contact with the rollers (45) and with the connector wire (51).

[0035] For its part, the other parts of the rolling bolt (4), that is to say, the lower rod (42), the main group of rollers (44) and an intermediate support part (47), as well as the central body of the bolt are made of plastic or rubber in the case of the main group rollers (44), and therefore, they constitute insulating elements.

[0036] Having sufficiently described the nature of the present invention, as well as its practical execution, it is not considered necessary to extend this description for

a person skilled in the art to understand its scope and the advantages that it provides, noting that, within its essence, it can be reduced to practice in different embodiments that differ in detail from that given by way of example, which will also be covered by the protection sought, provided its essence is not altered, changed or modified.

Claims

1. PERGOLA WITH INTEGRATED ELECTRICAL INSTALLATION FOR LIGHTING which, comprising an awning (2) supported on a plurality of crossbars (3) whose ends incorporate sliding elements (4), which run along guides (5) perpendicular to the said crossbars (3), wherein one, several, or all of the crossbars have at least one lighting lamp (6) powered from an electrical installation that runs fully built into the structure of the pergola (1) itself, is **characterised in that** the guides (5) along which the sliding elements (4) run, are constituted by connector wires (51) and said sliding elements (4) are constituted by rolling bolts (41) that, combining metal connection parts and plastic insulation parts, connect the connection terminals of the wiring (61) of the lamp (6) of the crossbar in which they are incorporated with said connector wire (51) which is powered electrically. 5
2. PERGOLA WITH INTEGRATED ELECTRICAL INSTALLATION FOR LIGHTING, according to claim 1, **characterised in that** the connector wires (51) which constitute the guides (5) of the sliding elements (4) are inserted internally inside the respective longitudinal supports (7). 10
3. PERGOLA WITH INTEGRATED ELECTRICAL INSTALLATION FOR LIGHTING, according to claim 2, **characterised in that** the connector wires (51) are electrically powered, in each longitudinal support (7), alternating positive and negative charge. 15
4. PERGOLA WITH INTEGRATED ELECTRICAL INSTALLATION FOR LIGHTING, according to claim 3, **characterised in that** the connector wire (51) which forms the guide (5) is maintained tautened within the longitudinal support (7) by means of tensors (52) and fasteners (53). 20
5. PERGOLA WITH INTEGRATED ELECTRICAL INSTALLATION FOR LIGHTING, according to any of claims 1 to 4, **characterised in that** the rolling bolts (41), are formed from a lower rod (42) which is inserted in the end of the crossbars (3), which forms a sheath that internally has a metal lug (43) which determines the connection point with the connection terminal of the wiring (61) of the lamps (6), and two groups of wheels in its upper part that is inserted into 25

the longitudinal support (7), a main group of sliding rollers (44), running supported in the cavity of the longitudinal support (7), and a secondary group of metal rollers (45) through which the connector wire (51) runs, while also being in contact with the inner metal lug (43). 30

6. PERGOLA WITH INTEGRATED ELECTRICAL INSTALLATION FOR LIGHTING, according to claim 5, **characterised in that** the secondary group of rollers (45) through which the connector wire (51) runs is secured, to prevent it from slipping out undesirably, between the respective metal plates (46) bolted to said secondary group of rollers (45) and to the body of the bolt. 35
7. PERGOLA WITH INTEGRATED ELECTRICAL INSTALLATION FOR LIGHTING, according to claims 5 and 6, **characterised in that** the lower rod (42), the main group of rollers (44) and an intermediate support part (47), as well as the central body of the bolt are made of plastic or rubber and constitute insulating elements. 40

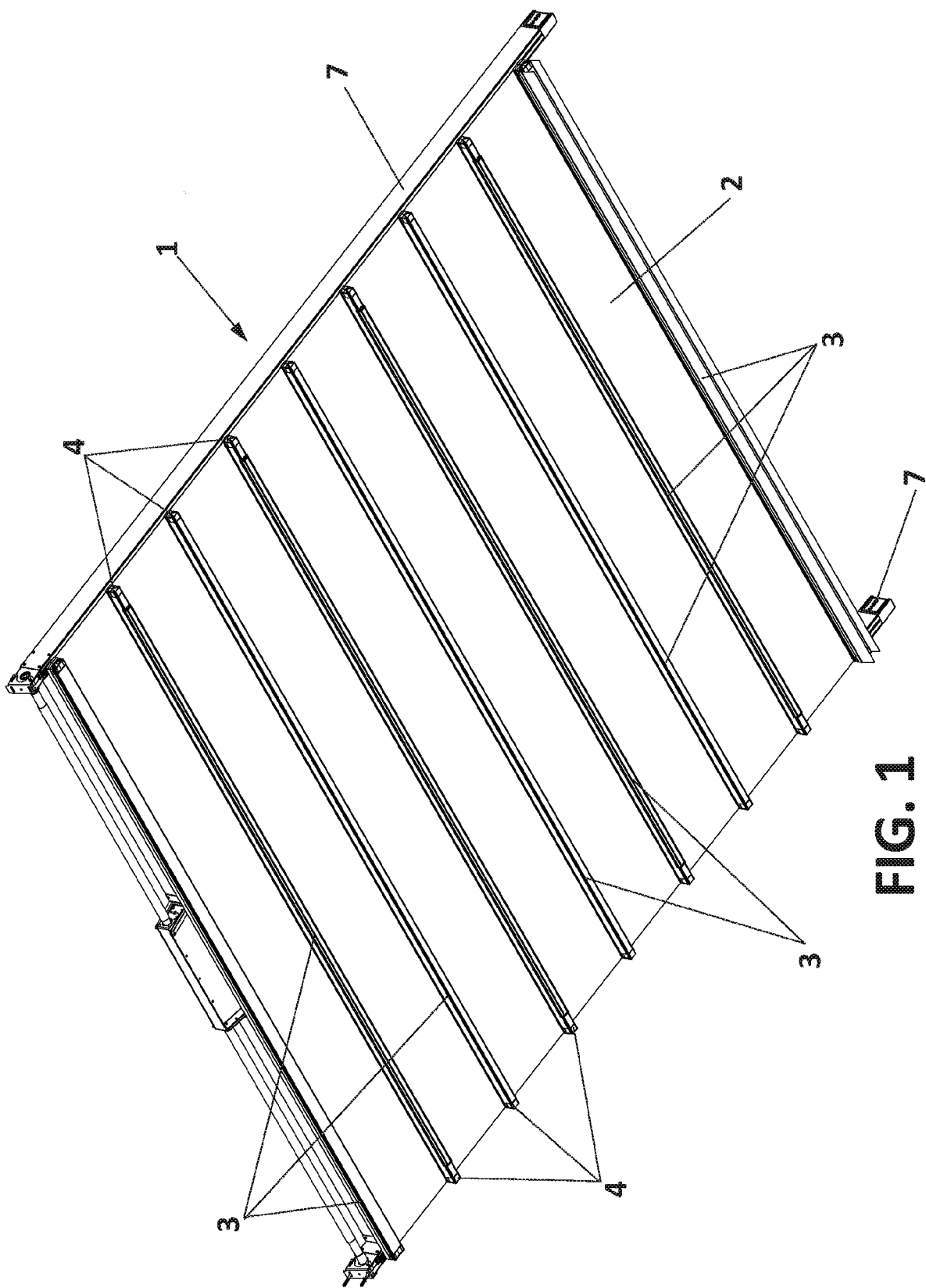


FIG. 1

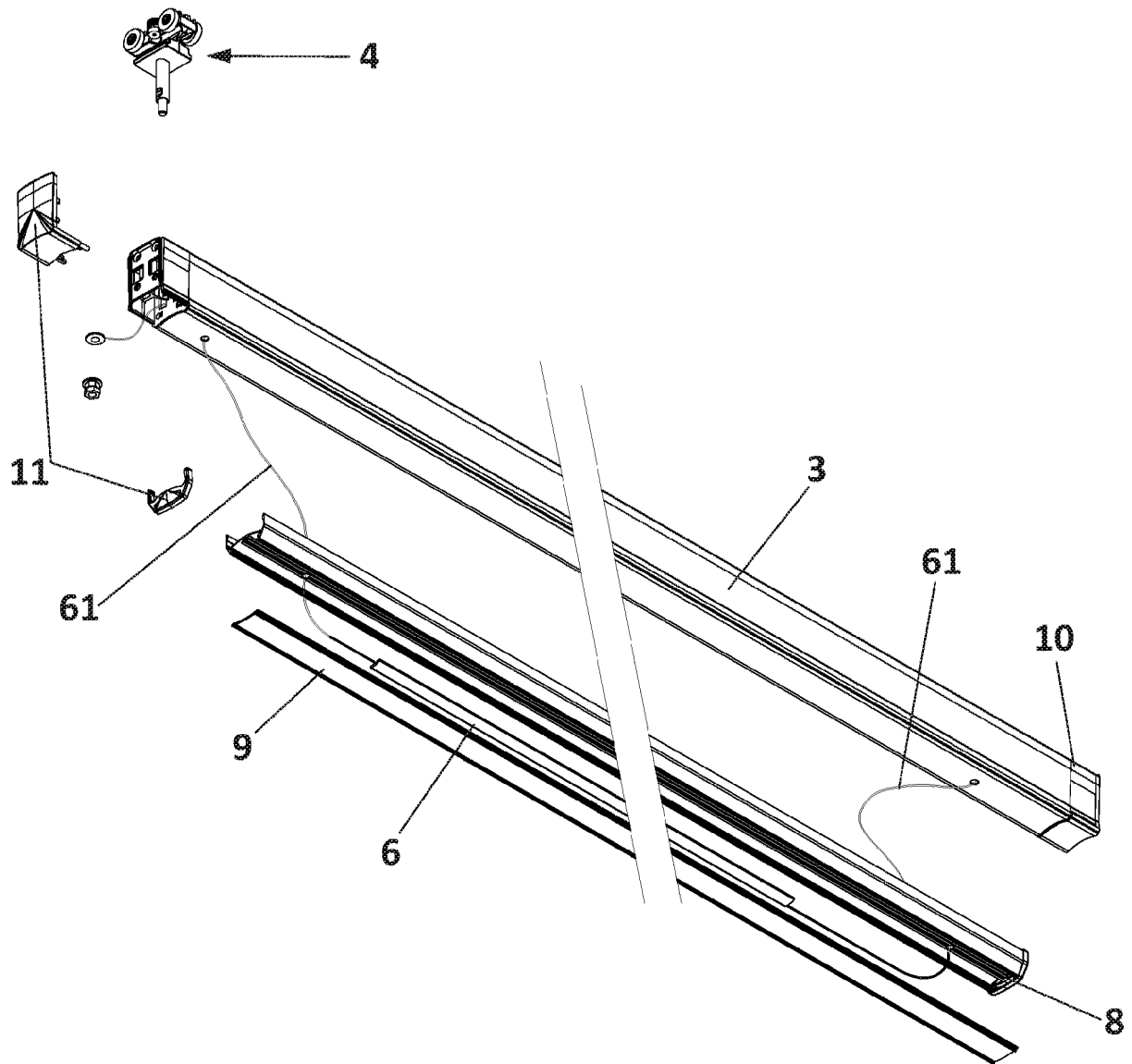
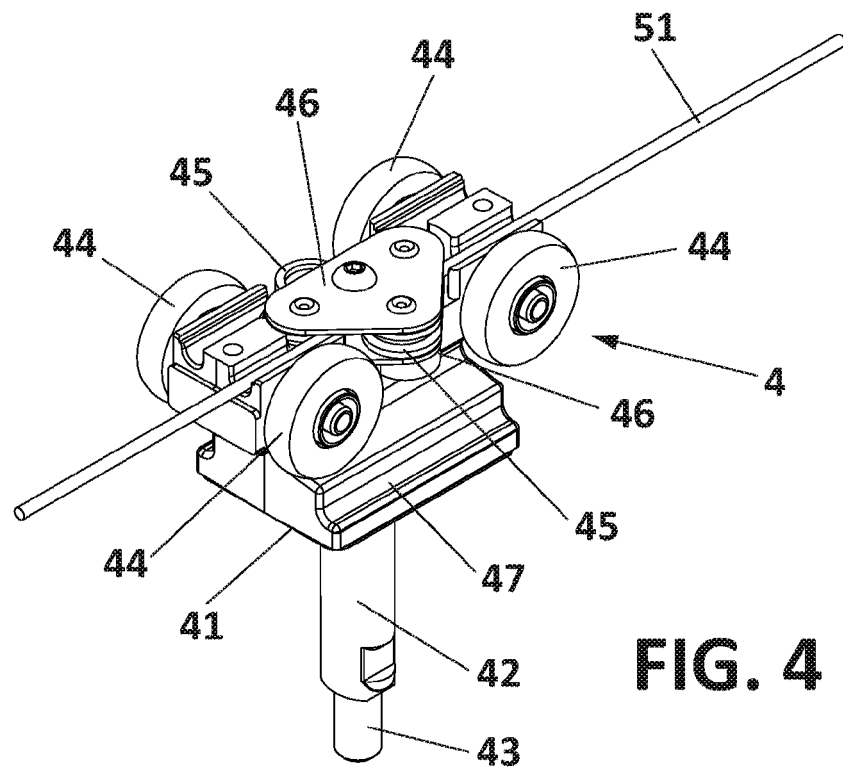
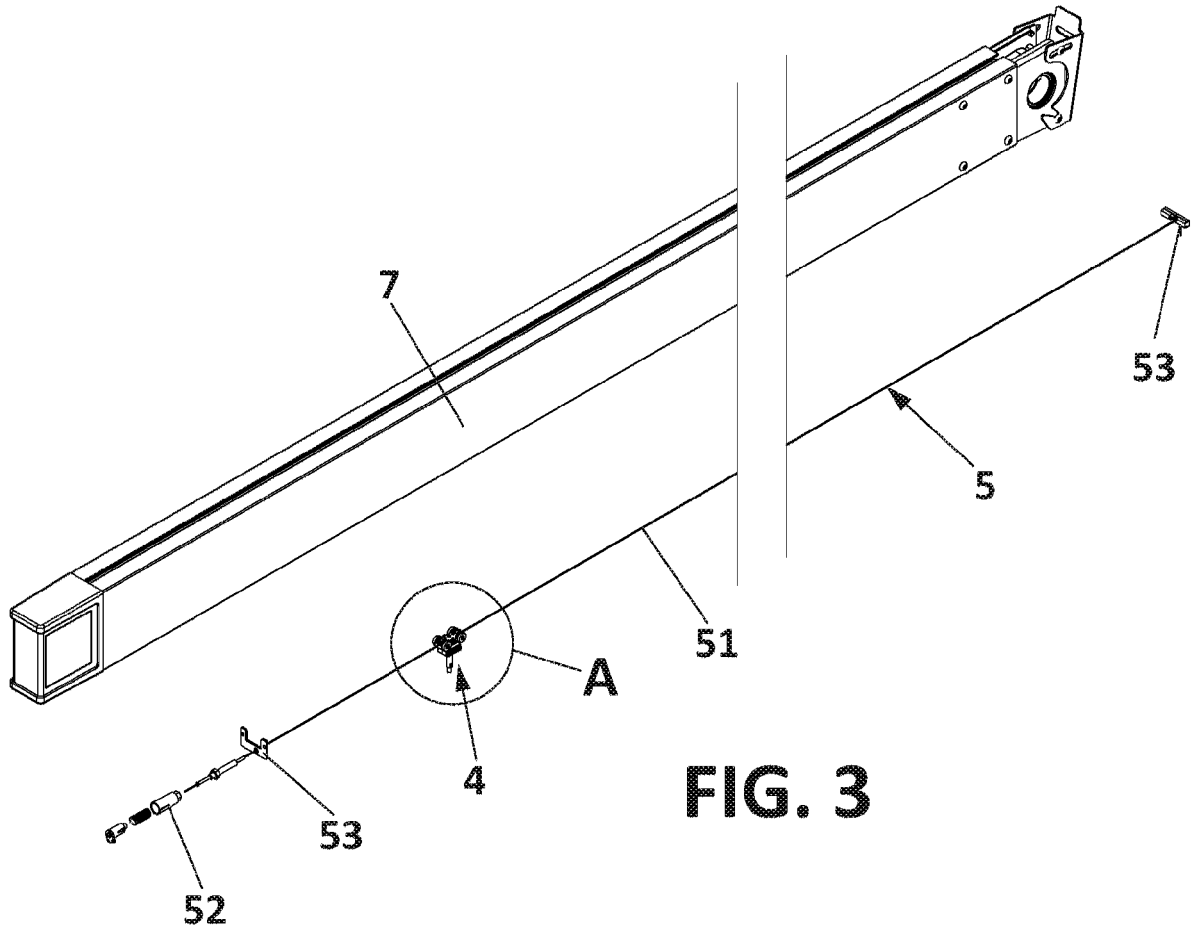


FIG. 2



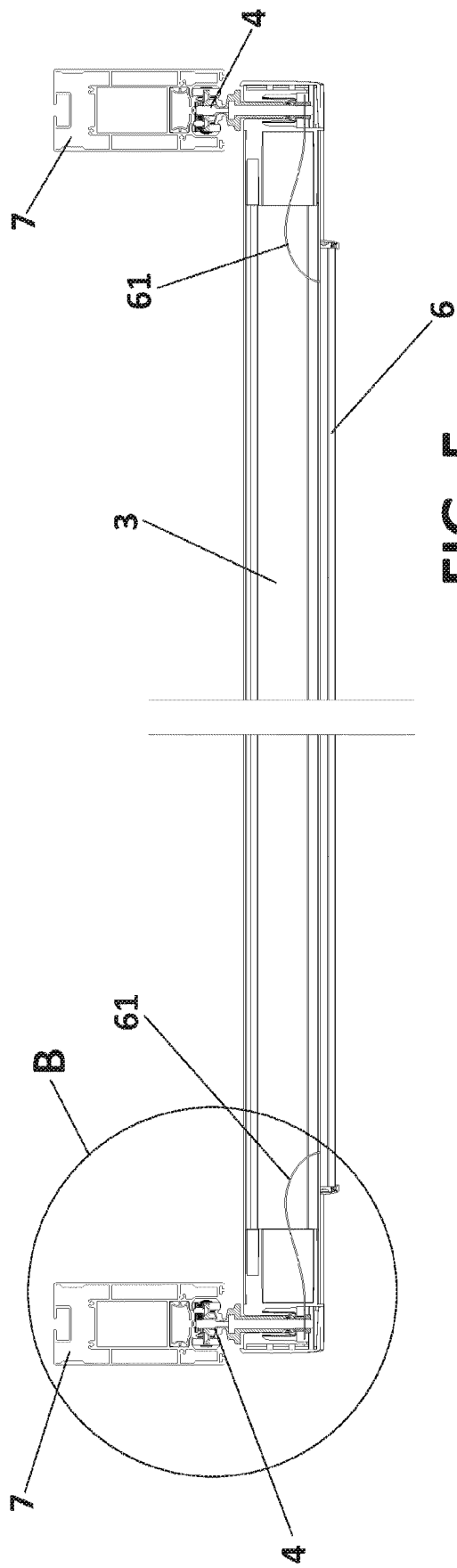


FIG. 5

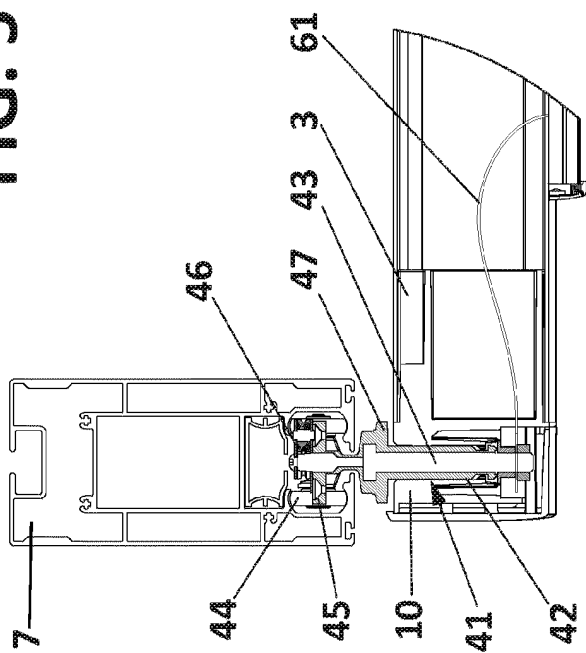


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070871

A. CLASSIFICATION OF SUBJECT MATTER

E04F10/00 (2006.01)*E04H15/10* (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E04F, E04H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2015068569 A1 (SHARGANI A) 12/03/2015, Page 1, paragraph [7] - page 5, paragraph[82]; figures.	1
A	JP 2014169564 A (TAKKANO KK) 18/09/2014, Abstract from DataBase WPI. Retrieved from EPOQUE; AN 2014-R41291	1

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

20/04/2017

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2016/070871

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US2015068569 A1	12.03.2015	US2017037635 A1 USD770643S S USD764262S S US2016130836 A1 US9470012 B2 US9255441 B2	09.02.2017 01.11.2016 23.08.2016 12.05.2016 18.10.2016 09.02.2016
JP20130041502	04.03.2013	NONE	

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2015068569 A1 [0010]