

(19)



(11)

EP 4 524 343 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
19.03.2025 Bulletin 2025/12

(51) International Patent Classification (IPC):
E04F 10/06 ^(2006.01) **E06B 9/42** ^(2006.01)
E06B 9/50 ^(2006.01) **E06B 9/72** ^(2006.01)

(21) Application number: **24192117.0**

(52) Cooperative Patent Classification (CPC):
E04F 10/0618; E04F 10/0648; E06B 9/174;
E06B 9/42; E06B 9/50; E06B 9/72

(22) Date of filing: **31.07.2024**

(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 ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

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(30) Priority: **29.08.2023 IT 202300017724**

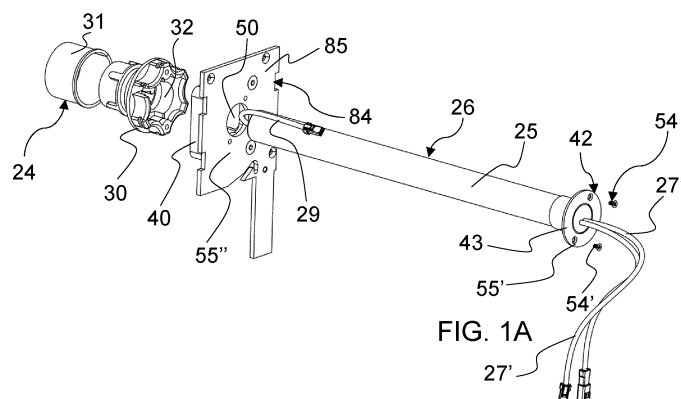
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(54) DEVICE FOR A ROLLER COVER INSTALLATION

(57) Device (1) for a roller cover installation (80), said device (1) being configured to be installed in a roller cover installation (80) of the type comprising a tubular shaft (82) which is actuated in rotation around its longitudinal development axis and also comprising a cover element (86) which has a flap fixed to the tubular shaft (82) and which, following the rotation of the tubular shaft (82), can be wound around said shaft and unwound from it, said device (1) being characterized by comprising:

- means (24) to idly support the tubular shaft (82) at a first longitudinal end (82') of the shaft itself,
- an electrical energy storage unit (26) which is configured to be inserted inside the tubular shaft (82) at said first longitudinal end (82') of said shaft,
and characterized in that said electrical energy storage unit (26) includes:

- a battery/ies body (25), which is configured to fit inside the tubular shaft (82),
- a head portion (42),
- at least one electrical connection cable (27, 27', 27'', 29) coming out of the battery/ies body (25),
and wherein the head portion (42) is configured to abut on an external support structure (84) of the tubular shaft (82) around a through hole (50) which is obtained in said external support structure (84) and which is configured to be passed through by the battery/ies body (25), or to abut on a head (30), which is configured to be internally constrained to said external support structure (84) of the tubular shaft (82), around a further through hole (32) which is obtained in said head (30) and which is configured to be passed through by the battery/ies body (25).

**FIG. 1A****EP 4 524 343 A1**

Description

TECHNICAL FIELD

[0001] The present invention concerns a device configured and intended to be used and mounted in a roller cover installation.

[0002] The present invention also concerns an apparatus, comprising said device, and configured and intended to be used and mounted in a roller cover installation.

[0003] The present invention also concerns a roller cover installation including said device.

STATE OF THE ART

[0004] In outdoor installations, roller awnings of the type comprising a cloth are known, which in the retracted awning condition is wound around a tubular shaft and in the unfolded awning condition it is unwound by said shaft and is kept extended by its connection with a flap to said tubular shaft and with the opposite flap to a rigid crosspiece which can be moved towards and away from the tubular shaft itself.

[0005] In the case of a cantilever awning, the rigid crosspiece is connected to the support structure of the tubular shaft via a pair of articulated arms, while in the case of a sliding awning the rigid crosspiece is made to slide with its ends along two fixed parallel tracks located on the sides of the surface that must be coverable by the unfolded awning.

[0006] In the case of cantilever awnings, it is also provided that the rigid crosspiece may have such a shape as to cover the awning, when it is wound around the tubular shaft, and to thus constitute a sort of protection box for the latter, which in this case is called a box awning.

[0007] Regardless of the type of awning, its motorization which leads to the winding of the cloth on the tubular shaft and its unwinding from the tubular shaft is obtained with a traditional tubular electric motor inserted inside the winding shaft and controlled, preferably via radio, directly by the user or by brightness and/or wind sensors. This solution is for example described in the roller covers described in AU 2014 200269, US2015/362896 and US2017/101820.

[0008] Currently the market requires to equip roller awnings with lights which can be used to illuminate the surface beneath the awning and/or to constitute courtesy lights and/or to create lighting effects, in particular RGB effects.

[0009] This need has been satisfied in awnings with articulated arms by applying these lights, preferably LED lights, to the arms themselves and/or to the rigid crosspiece and/or to the support structure of the awning, and in sliding awnings by applying these lights to the tracks and/or to the support uprights of the tracks and/or to other parts of the awning support structure.

[0010] However, all this entails the need to create a

lighting system with dedicated components which, together with the lights themselves, must be able to be applied to the support structure of the awning. In particular, a power supply and control unit for the lights must be provided, which in the known solutions is external or inserted in one of the support uprights of the awning, if provided. Furthermore, these are solutions with a certain complexity of installation, certainly unsatisfactory in particular in the case of awnings with articulated arms and therefore without uprights.

[0011] WO2019026032 describes a device, to be mounted on a roller cover installation, for controlling LED lights mounted on a component of the installation itself. In particular, the device of WO2019026032 includes a tubular casing which can be inserted and housed in the tubular shaft around which the cover element is wound/unwound and, inside said casing, the power supply for the LED lights, the control and operating unit for the LED lights, as well as a wireless receiver for receiving control signals from outside to control the LED lights based on these are housed. In one of its variants, the solution of WO2019026032 provides that, inside the casing of the device, a rechargeable battery is also housed which is accessible via a door obtained on the side wall of the tubular casing of the device.

[0012] Although particularly appreciated, the solution of WO2019026032 requires, in order to replace the battery, to completely extract/remove the tubular casing of the device from the tubular shaft, around which the cover element is wound, so as to be able to thus have access to the side door of the tubular casing of the device itself.

[0013] In some installations, both external and internal - for example for curtains cover windows, doors, windows or other openings in general - the spaces in length are particularly limited. In more detail, blinds of this type are, for example, "screen" type roller blinds. In these installations, a motorization device is provided which is inserted inside the winding shaft; generally, said motorization device includes a casing wherein a motor and also a battery to power the motor itself are inserted and housed. Even in such installations there is a need to be able to access the battery easily and quickly in order to carry out maintenance operations or replace it.

[0014] EP3671377 shows a device for a roller cover installation comprising a casing removably inserted inside a tubular shaft of said installation, inside which at least one receiver or transmitter connected to an amplifier and configured to receive audio signals from the outside, a control and command unit for the reproduction of the received audio signals to which the receiver/transmitter and the amplifier are connected and/or integrated, and a power supply to electrically power the components just described are housed.

[0015] EP1710389 concerns an electric device with a tubular motor for a motorized closing system having a tubular part, wherein the motor is integrated, with a section suitable for inserting the same part inside the winding shaft of the closing system cover, and having a second

part defining a head for attachment to a support flange, wherein a battery is inserted for the electrical supply of the tubular motor.

[0016] ES2275426 describes a programmable device for controlling the position of a curtain, shade or awning. The device can memorize different positions and reach them autonomously, without requiring electricity from the mains, even by setting certain times at which to change position. For this purpose, the device is connected to a solar panel. In this solution, an electric motor is positioned inside a tubular shaft and is supported by a head fixed to one end of the shaft by means of an intermediate piece.

OBJECTS OF THE INVENTION

[0017] The object of the invention is to propose a device for installing a roller cover which allows the drawbacks found in known solutions to be overcome, at least in part.

[0018] Another object of the invention is to allow quick and easy access to the electrical energy storage unit mounted inside the winding shaft of a roller cover installation.

[0019] Another object of the invention is to allow quick and easy replacement of the electrical energy storage unit mounted inside the winding shaft of a roller cover installation.

[0020] Another object of the invention is to have a stable positioning of the electrical energy storage unit, which is mounted inside the winding shaft of a roller cover installation, and to allow at the same time a quick and easy replacement of the same electricity storage unit.

[0021] Another object of the invention is to propose a device which can also be installed in conditions wherein the available spaces, particularly in length, are reduced.

[0022] Another object of the invention is to propose a device which allows, even when the device itself is installed, an easy and rapid replacement of the electrical energy storage unit mounted inside the winding shaft of a roller cover installation.

[0023] Another object of the invention is to propose a device which also acts as a lateral support for the shaft around which the cover element of the roller cover installation is wound/unwound.

[0024] Another object of the invention is to propose a device that can also be used in combination with photovoltaic panels or other renewable energy sources.

[0025] Another object of the invention is to propose a device with particularly small dimensions.

[0026] Another object of the invention is to propose a device that is simple and quick to install and maintain, even by non-specialized personnel, Another object of the invention is to propose a device that is structurally independent, autonomous and/or additional to the device provided for motorizing the roller cover installation.

[0027] Another object of the invention is to propose an apparatus which supports the shaft, around which the

cover element of the roller cover installation is wound/unwound, at both mutually opposite longitudinal ends of the shaft itself and which, at the same time, is simple and quick to install, as well as compact.

[0028] Another object of the invention is to propose an apparatus that allows the electrical power supply of the motor and/or other electrical users (such as for example lighting elements and/or an acoustic speaker) through the electrical energy of an electrical energy storage unit which is housed and mounted inside the same apparatus.

[0029] Another object of the invention is to propose an apparatus wherein the electrical energy storage unit is easy and rapid to access from the outside, even when the apparatus itself is already installed.

[0030] Another object of the invention is to propose an apparatus that allows the motor and/or other electrical users (such as for example lighting elements) to be powered in an eco-sustainable way.

[0031] Another object of the invention is to propose a device or apparatus that is an improvement and/or alternative to traditional ones.

[0032] Another object of the invention is to propose a device or apparatus which can be obtained in a simple, rapid and low-cost manner.

[0033] Another object of the invention is to propose a roller cover installation which can be obtained in a simple, rapid and low-cost way, which is simple and quick to install and maintain, as well as eco-sustainable.

SUMMARY OF THE INVENTION

[0034] All these objects, considered individually or in any combination thereof, and others which will result from the following description are achieved, according to the invention with a device for a roller cover installation as defined in claim 1 and by an apparatus according to claim 13.

DESCRIPTION OF THE FIGURES

[0035] The present invention is further clarified below in some of its preferred practical embodiments reported for purely illustrative and non-limiting purposes with reference to the attached drawings, wherein:

Figure 1A shows an exploded perspective view of a first embodiment of the device according to the invention,

Figure 1B shows a perspective view of the device in fig. 1A with the casing made transparent,

Figure 2A shows an exploded perspective view of a second embodiment of the device according to the invention,

Figure 2B shows a perspective view of the device in fig. 2A with the casing made transparent,

Figure 3A shows an exploded perspective view of a second embodiment of the device accord-

ing to the invention,
 Figure 3B shows a perspective view of the device in
 fig. 3A with the casing made transparent,
 Figure 4A shows an exploded perspective view of a
 second embodiment of the device accord-
 ing to the invention,
 Figure 4B shows a perspective view of the device in
 fig. 4A with the casing made transparent,
 Figure 5 shows a schematic view of an installation
 of the cantilever roller awning type with an
 apparatus according to the invention,
 Figure 6 shows a schematic view of the installation
 in fig. 5 with a variant of the apparatus ac-
 cording to the invention, and
 Figure 7 shows a schematic view of the installation
 in fig. 5 with a further variant of the appa-
 ratus according to the invention.
 Figure 8 shows a schematic view of a "screen" type
 roller cover installation, or with an awning
 which is movable in a substantially vertical
 direction, with an apparatus according to
 the invention.

DETAILED DESCRIPTION OF THE INVENTION AND OF SOME OF ITS PREFERRED EMBODIMENTS

[0036] As can be seen from the figures, the device according to the invention (indicated globally with the reference number 1) is applied/mounted, in the illustrated example, to a roller cover installation (indicated globally with the reference number 80).

[0037] The roller cover installation 80 comprises a tubular shaft 82, which is actuated (preferably motorized) in rotation about its longitudinal development axis, and also comprises a cover element 86 which has a flap attached to the tubular shaft 82 and which, following the rotation of the tubular shaft 82, can be wound around said shaft and unwound from it.

[0038] The device 1 is mounted inside the tubular shaft 82 at a first longitudinal end 82' of said tubular shaft 82.

[0039] Preferably, the roller cover installation 80 can be - from a structural point of view - of a traditional type. Preferably, the roller cover installation 80 is of the roller type. Preferably, the roller cover installation 80 is motorized but could also be moved manually.

[0040] For example, in a possible embodiment illustrated in figures 5 to 7, the roller cover installation 80 is of the cantilever roller awning type with articulated arms, i.e. it is of the type wherein the cover element 86 is defined by a cloth, which is wound around the tubular shaft 82 and unwound from it, and the installation also includes an external support structure 84 supporting the tubular shaft 82, a rigid crosspiece 88, to which the flap of the cover element 86 opposite to the one attached to the tubular shaft 82 is applied, and two pairs of articulated arms 89, which connect the rigid crosspiece 88 to the external support structure 84 and drive it in its translational movements with respect to it.

[0041] For example, in a possible embodiment illustrated in figure 8, the roller cover installation 80 can be of the roller awning type, both indoors and outdoors, to be used for windows, doors, glass windows or other openings in general, even in cases where the spaces in length are particularly limited. In more detail, awnings of this type are for example "screen" type roller blinds with the roller cover element 86 which can be defined by a "screen" type fabric cloth (i.e. with a perforated weave that allows to see outside and not vice versa) and/or darkening and/or filtering and/or mosquito net type.

[0042] Conveniently, the winding/unwinding of the cover element 86 can take place either along a substantially vertical direction (see fig. 8), or along a direction more or less inclined with respect to the vertical (see fig. 5 - 7).

[0043] In essence, the device 1 according to the present invention can be applied in any roller cover installation 80, whether inclined (cantilevered) or vertical (i.e. wherein the unwinding of the cover element is substantially vertical downwards), such as for example shutter, roller shutter, blackout/filtering curtain, mosquito net or even sectional door. In particular, the device can be used in outdoor installations but also in indoor installations - for example for curtains covering windows, doors, glass windows or other openings in general - where the spaces in length are particularly limited.

[0044] Conveniently, the winding/unwinding of the cover element 86 around the tubular shaft 82 can take place along lateral tracks for the element itself.

[0045] The tubular shaft 82 is internally hollow and can have any cross section. Preferably, the tubular shaft 82 can have a circular or polygonal section, for example hexagonal, octagonal or similar.

[0046] Conveniently, as mentioned, the roller cover installation 80 can also include an external support structure 84 for the tubular shaft 82 which is advantageously configured to be mounted to a fixed structure (not shown), for example to a wall surrounding the area of the installation 80.

[0047] Preferably, this external support structure 84 can include at least a pair of lateral brackets 85 which suitably support the tubular shaft 82 at the ends and are associated directly, or through other components, with a fixed structure, for example with a wall which surrounds the opening (window, door, glass, etc.) to be covered. Preferably, the external support structure 84 can also include a rigid band 87, which appropriately adheres to the fixed structure, for example to the wall, and which is fixed directly or by means of a further pair of fixing brackets to the fixed structure.

[0048] In a possible embodiment, the external support structure 84 can include a rigid band 87, which appropriately adheres to a fixed structure, for example to a wall of a building, and a pair of lateral brackets 85, preferably shaped like wings, which extend from said rigid band outwards and which suitably support the tubular shaft 82 at the ends.

[0049] Conveniently, in a possible embodiment, the

crosspiece 88 can be shaped so that when the cover element 86 is in a rolled up condition, the crosspiece itself adheres to the external support structure 84 and forms with this a sort of container or "box", which houses inside it the tubular shaft 82, the cover element 86 wound around it and also any articulated arms 89, which are in the folded condition.

[0050] Conveniently, in a possible embodiment, lighting elements 90 are mounted on the roller cover installation 80 and/or on the external and surrounding fixed structure of said installation. Advantageously, the lighting elements 90 can be mounted on any component of the installation roller shutter 80 and in any position of these. For example, the lighting elements 90 can be mounted on the external support structure 84 and/or on the rigid crosspiece 88 and/or on the tubular shaft 82 and/or even on the cover element 86.

[0051] Advantageously, the lighting elements 90 are light sources and, preferably, are LED strips that define monochromatic and/or RGB light sources. For example, the lighting elements 90 can be made up of at least one LED strip which includes a set of LED diodes, i.e. electronic components which emit light when powered by electricity. Conveniently, the LED diodes are fixed - preferably by welding - on a printed circuit board (PCB), preferably flexible, which performs the function of support and electrical connection. Advantageously, the LED diodes of the LED strip can be configured to emit monochromatic light or they can be of the RGB type.

DEVICE 1

[0052] The device 1 according to the invention is inserted inside the tubular shaft 82 and, in particular, it is inserted at a first end 82' of the tubular shaft 82.

[0053] The device 1 includes means 24 to idly support the tubular shaft 82 at a first end 82' of the shaft itself.

[0054] The device 1 includes an electrical energy storage unit 26 which is configured to be inserted inside the tubular shaft 82 at a first end 82' of said shaft. Preferably, the electrical energy storage unit 26 is configured to be removably inserted and housed within the tubular shaft 82.

[0055] Preferably, the device 1 comprises a head 30 which is configured to be constrained, preferably by means of fixing means 40, to an external support structure 84, preferably on a lateral bracket 85. Conveniently, said means 24 for idly supporting the tubular shaft 82 are mounted (at least in part) on said head 30. Conveniently, the head 30 can be configured so as to protrude at least in part from the tubular shaft 82.

[0056] The electrical energy storage unit 26 includes a battery/ies body 25, preferably with an elongated development, which is configured to be inserted inside the tubular shaft 82, and a head portion 42.

[0057] Preferably, said means 24 for idly supporting the tubular shaft 82 can be mounted, at least in part, on said head 30. Advantageously, the head portion 30 is

configured to be completely passed through by the battery/ies body 25. In particular, the head portion 30 includes a through hole 32 configured to be completely passed through by the battery/ies body 25 of the electrical energy storage unit 26.

[0058] Preferably, said means 24 for idly supporting the tubular shaft 82 can be mounted directly on the battery/ies body 25 of said electrical energy storage unit 26.

[0059] Preferably, said means 24 for idly supporting the tubular shaft 82 are not constrained to the external support structure 84 of the roller cover installation 80.

[0060] The electrical energy storage unit 26 includes at least one electrical connection cable 27 or 27' and 27'', which protrudes from the battery/ies body 25 of the electrical energy storage unit 26. Preferably, said at least one electrical connection cable 27 or 27' and 27'' emerges from a first base 25' (which is the one that remains external when the unit 26 is inserted into the tubular shaft 82) of the battery/ies body 25.

[0061] In a possible and preferred embodiment, said electrical energy storage unit 26 can include at least one further electrical connection cable 29 which emerges from a second base of the battery/ies body 25, wherein said second base is opposite to said first base 25' and is the one which is positioned most internally in the tubular shaft 82 when the unit 26 is inserted into the shaft itself.

[0062] The head portion 42 of the electrical energy storage unit 26 is configured to abut the external support structure 84 of the tubular shaft 82 around a through hole 50 configured to be passed through by the battery/ies body 25, or (in an embodiment not shown) to abut the head 30, which is configured to be internally constrained to said external support structure 84 of the tubular shaft 82, around a further through hole 32 of said head 30 which is configured to be passed through by the battery/ies body 25.

[0063] Preferably, the head portion 42 protrudes from the tubular shaft 82 to abut the external surface of said lateral bracket 85 which is around said through hole 50 obtained on said bracket or to abut the head 30 in the area around said further through hole 32 obtained on the head 30.

[0064] Conveniently, fixing means 40 can be provided which are configured to mechanically constrain said head 30 to the internal surface (which faces the tubular shaft 82) of the lateral bracket 85. Essentially, the head 30 can be fixed to the external support structure 84 while the means 24 (mounted directly on the head 30 or on another fixed element) support the first end 82' of the tubular shaft 82 idly (i.e. so as to decouple the rotation of the shaft with respect to a remaining portion which remains stationary and which is constrained by the fixing means to the external support structure 84).

[0065] The electrical energy storage unit 26 is therefore configured to be inserted inside the tubular shaft 82 passing through a corresponding through hole 50 obtained on the external support structure 84, preferably on

a lateral bracket 85 provided at said first end 82' of the tubular shaft 82, until it abuts on said external support structure 84, preferably to abut on the external surface of said lateral bracket 85 which is around said through hole 50.

[0066] Preferably, the head 30 - if provided - includes a further through hole 32 configured to be passed through by said electrical energy storage unit 26.

[0067] Conveniently, said through hole 50 can have the same shape and/or dimensions as or even different from those of the further through hole 32 of the head 30. Conveniently, said through hole 50 of the lateral bracket 85 faces the further through hole 32 of the head 30, to thus allow the insertion/extraction of the electrical storage unit 26 into/from the tubular shaft 82 without removing the head 30 and also without having to remove the lateral bracket 85.

[0068] Conveniently, the electrical energy storage unit 26 is configured to abut externally on said external support structure 84, preferably to come into abutment/contact with the external surface of said lateral bracket 85 which is around said through hole 50, or to enter into abutment/contact with the head 30.

[0069] Preferably, the head portion 42 is stably fixed to one end of the battery/ies body 25.

[0070] Preferably, the head portion 42 of the electrical energy storage unit 26 is configured to support the battery/ies body 25 of the same unit 26.

[0071] Conveniently, the further through hole 32 of the head 30 and the through hole 50 of the external support structure 84 are configured to allow the insertion and extraction of the battery/ies body 25 of said electrical storage unit 26. Conveniently, the further through hole 32 of the head 30 and the through hole 50 of the external support structure 84 are shaped and sized so as to allow their passthrough in both directions by the battery/ies body 25 of said electrical storage unit 26. In particular, the further through hole 32 of the head 30 and the through hole 50 of the external support structure 84 can have any shape, even different from the cross section of the battery/ies body 25, while being such as to allow the pass-through for inserting/extracting the battery/ies body 25.

[0072] Conveniently, the head portion 42 of the electrical energy storage unit 26 is configured (in terms of shape and dimensions) to prevent its complete pass-through (i.e. from side to side) through the through hole 50 obtained on the external structure of support 84, preferably on the lateral bracket 85 provided at the first end 82' of the tubular shaft 82, or through the further through hole 32 obtained on the head 30.

[0073] Advantageously, the head portion 42 of the electrical energy storage unit 26 therefore always remains external to the tubular shaft 82 and, in particular, the electrical energy storage unit 26 is thus easily accessible and withdrawable from the outside of the bracket side 85 or of the head 30. In essence, the extraction of the battery/ies body 25 can be carried out by acting on the head portion 42, thus avoiding pulling (and therefore

potentially damaging) the electrical connection cable 27 or 27' and 27".

[0074] Conveniently, the head portion 42 includes a flange 43 which is intended and configured to abut/contact with the external surface of the external support structure 84, and preferably of the lateral bracket 85, or of the head 30, respectively in particular at the area surrounding the through hole 50 of said external support structure 84, and preferably of said lateral bracket 85, or at the area surrounding the further through hole 32 of the head 30. Therefore, while the battery/ies body 25 of the electrical energy storage unit 26 passes through the through hole 50 and the further through hole 32, the flange 43 of the head portion 42 abuts with the lateral bracket 85 or with the head 30, thus preventing further insertion of the electrical energy storage unit 26. In essence, the head portion 42 of the electrical energy storage unit 26 thus prevents the further insertion of the unit itself inside the tubular shaft 82. In other words, the contact of the flange 43 of the head portion 42 on the external surface of the lateral bracket 85 or on the head 30 acts as a stop for the insertion of the electrical energy storage unit 26 inside the tubular shaft 82.

[0075] Conveniently, the flange 43 can comprise a flanged annular element into which the battery/ies body 25 is fitted and fixed. Preferably, the battery/ies body 25 comprises a first outermost base 25' (from which at least one connection cable emerges electrical 27 or 27' and 27") which is flush with the external face of the annular flanged element.

[0076] Preferably, the device 1 can comprise means 54 for the removable mechanical constraint of the electrical energy storage unit 26 to said external support structure 84, preferably to a lateral bracket 85, and/or (in an embodiment not shown here) to the head 30. Preferably, said constraint means 54 are configured to allow the removable mechanical fixing of the head portion 42 to the external support structure 84, preferably to the lateral bracket 85, and/or to the head 30.

[0077] Conveniently, these constraint means 54 can include mechanical engagement members 54' (for example screws or bolts with corresponding nuts) which pass through corresponding first openings 55' obtained on the head portion 42 of the unit 26 and which also pass through or engage in corresponding second openings 55" obtained on the external support structure 84, and preferably on the lateral bracket 85.

[0078] Advantageously, this allows the electrical energy storage unit 26 to be stably locked in position inside the tubular shaft 82.

[0079] Conveniently, the battery/ies body 25 of said at least one electric energy storage unit 26 can comprise an electric battery or be defined by at least one electric battery. Preferably, said electric battery is rechargeable. Conveniently, said electric battery, preferably rechargeable, can be of the traditional type.

[0080] Conveniently, the battery/ies body 25 of said electrical energy storage unit 26 can have a cylindrical,

box-like shape or in any case any shape such that it can be entirely housed and inserted inside the tubular shaft 82 or a casing 28 (if provided, as described below for some embodiments).

[0081] In a possible embodiment (see fig. 6 and 7), said electrical energy storage unit 26 includes a single electrical connection cable 27 which is used and configured both for the transfer of electrical energy from external photovoltaic panels 44 (or other renewable energy sources) towards the storage unit 26 and for the transfer of electrical energy from the storage unit 26 towards a motorization unit 92 external to the device 1 and/or other electrical users, such as for example towards the lighting elements 90.

[0082] In another possible embodiment (see fig. 5), said electrical energy storage unit 26 includes two electrical connection cables, and in particular a first electrical connection cable 27' used for the transfer of electrical energy from external photovoltaic panels 44 (or other renewable energy sources) towards the storage unit 26, and a second electrical connection cable 27'' for the transfer of electrical energy from the storage unit 26 towards an motorization unit 92 external to the device 1 and/or other electrical users, such as for example the lighting elements 90, and thus allow their power supply.

CASING 28

[0083] In some possible embodiments, the device 1 can also comprise a casing 28, preferably but not necessarily tubular in shape, which is removably inserted inside the tubular shaft 82. Preferably, the casing 28 is inserted entirely or for the most part within the first end 82' of the tubular shaft 82. Preferably, the casing 28 may be made of plastic. Conveniently, it is understood that the shape and dimensions of the casing 28 are not linked to those of the tubular shaft 82 although they must evidently be compatible with them. In particular, the casing 28 has a shape and size suitable to allow its insertion and housing inside the tubular shaft 82.

[0084] Conveniently, the casing 28 is removably associated with the head 30. Preferably, the casing 28 can be configured to attach removably to the head 30, in particular to an internal portion of the head 30. Preferably, said tubular casing 28 is hooked, preferably by means of clip fastening means, to the head 30. Preferably, in a possible embodiment, an internal portion of the head 30 is inserted into the casing 28 and these are then fixed to each other by means of a traditional first locking mechanical member 34 (for example a screw or a grub screw). Preferably, in more detail, the casing 28 and the internal portion of the head 30 which fits into the casing are provided with mutual engagement means, defined for example by protruding sections and hollow/holed counter-sections, to thus prevent movement of the casing with respect to the head 30, while the engagement defined by said first locking member 34 prevents the longitudinal extraction/movement of the casing 28 with respect to the head

30.

[0085] Conveniently, the casing 28 is configured to house said electrical energy storage unit 26, and in particular to house the battery/ies body 25 of said electrical energy storage unit. The casing 28 is removably associated to a head 30, which is configured to be internally constrained to said external support structure 84 of the tubular shaft 82. The head portion 42 is fixed to one end of the battery/ies body 25 and is configured to abut externally on an external support structure 84 of the tubular shaft 82 around a through hole 50 which is obtained in said external support structure 84.

[0086] Advantageously, the means 54 for the removable mechanical fixing of the electrical energy storage unit 26 to said external support structure 84 also allow a stable positioning of the unit 26 inside the casing 28.

[0087] Preferably, the electrical energy storage unit 26 is removably inserted and housed inside the casing 28.

[0088] In some possible embodiments wherein the device 1 also includes the casing 28, the electrical energy storage unit 26 can be inserted and housed entirely (see fig. 4A and 4B) or partially (see fig. 3A and 3B) inside the casing 28.

[0089] Conveniently, in a possible embodiment illustrated in fig. 3A and 3B, the battery/ies body 25 of the electrical energy storage unit 26 has a greater longitudinal development than that of the casing 28 which is open at its internal end, thus protruding from said internal end of the casing 28.

[0090] Conveniently, in a possible embodiment illustrated in fig. 4A and 4B, said at least one electrical energy storage unit 26 is exclusively and solely inserted inside the first end 82' of the tubular shaft 82 and/or the casing 28.

[0091] Preferably, inside the first end 82' of the tubular shaft 82 and/or inside the casing 28 a battery charging device or other accessories can be housed for the electrical recharging of the electrical energy storage unit 26.

[0092] Preferably, inside the first end 82' of the tubular shaft 82 and/or inside the casing 28 there is housed exclusively and only said at least one electrical energy storage unit 26 and, possibly, a battery charging device or other accessories for electrical charging of the electrical energy storage unit 26.

[0093] Preferably, in some possible embodiments, no control unit is housed inside the first end 82' of the tubular shaft 82 and/or inside the casing 28. Preferably, in some possible embodiments, no processor, microprocessor or microcontroller is housed inside the first end 82' of the tubular shaft 82 and/or inside the casing 28. Preferably, in some possible embodiments, no wireless receiver is housed inside the first end 82' of the tubular shaft 82 and/or inside the casing 28.

VERSION WITH MOTOR (fig. 2A + 2B)

[0094] Conveniently, in some possible embodiments, the device 1 also includes a motorization unit 92 to cause

the rotation of the tubular shaft 82 in both directions around its longitudinal development axis. The motorization unit 92 is structurally independent of the electrical energy storage unit 26. The motorization unit 92 and the electrical energy storage unit 26 are electrically connected or connectable to each other.

[0095] Preferably, in a possible embodiment illustrated in fig. 2A and 2B, the motorization unit 92 is housed within the casing 28. More preferably, the motorization unit 92 is removably housed within the casing 28.

[0096] Preferably, the motorization unit 92 includes its own containment structure 93 wherein an electric motor is housed. Conveniently, an output pinion 95 emerges from the containment structure 93 of the motorization unit 92 and also from the tubular casing 28, to which a drive adapter (not shown) of the tubular shaft 82 is intended to be associated.

[0097] Preferably, the motor of the motorization unit 92 is configured to provide a rotary motion as an output. Preferably, the motor of the motorization unit 92 comprises a traditional tubular electric operating/driving motor, preferably of a single-phase asynchronous type.

[0098] Preferably, a command and control unit for said motor is also housed inside the containment structure 93 of the motorization unit 92. More preferably, said control unit comprises a wireless receiver or transceiver.

[0099] Preferably, the electronic components for powering and controlling the motor can also be housed inside the containment structure 93 of the motorization unit 92. Conveniently, said components can include a power supply, a controller/processor and a receiver. More preferably, at least one electronic board for powering and controlling the motor can also be housed inside the containment structure 93 of the motorization unit 92. Conveniently, the motor control drivers are implemented in the controller/processor.

[0100] Conveniently, the receiver, which is housed inside the containment structure 93 of the motorization unit 92, is connected, via wireless and/or by wire, with the outside of the roller cover installation 80 to receive from the outside control signals to control, on the basis of these, the motor of the motorization unit 92. Preferably, the receiver is of the wireless type, preferably radio. Conveniently, through the receiver, the controller/processor can receive motor control signals from an external transmitter, and in particular from a remote control or even from a smartphone or other traditional wireless devices in general. Conveniently, the receiver can be connected via radio to other traditional sensors present in the environment. Conveniently, the receiver can be advantageously replaced by a transceiver, preferably radio, which in addition to sending corresponding control signals to the motor can remotely communicate its status and, preferably, also the operating parameters or the possible presence of anomalies or malfunctions. In particular, to this end, the transceiver, in addition to controlling/communicating with its receiver side with the motor, can transmit signals on the state of the motor itself with

the transmitter side. In essence, conveniently, in this way the user can remotely control, for example via a smartphone, the switching on, off and regulation of the motor and can receive, again with a smartphone, information on the current state of the motor.

[0101] The motorization unit 92 and the electrical energy storage unit 26 are structurally autonomous and independent.

[0102] The motorization unit 92 is electronically connected, preferably by cable and/or by means of a socket-plug type connection (also known as "plug-and-socket"), with the electrical energy storage unit 26 so that the motor of the motorization unit 92, housed inside the containment structure 93, is electrically powered by the electrical energy storage unit 26. Preferably, the motor power supply, which is housed inside the containment structure 93 of the motorization unit 92, is powered by the electrical energy storage unit 26.

[0103] Preferably, an electric wire 96 emerges from the containment structure 93 of the motorization unit 92 with a plug which is inserted into a socket associated with the further electrical connection cable 29 which exits from the battery/ies body 25 (and in particular from the second base) of the electrical energy storage unit 26, or vice versa. Conveniently, in other possible embodiments, a plug (without any wire) can be mounted directly on the containment structure 93 of the motorization unit 92 or the socket (without any cable) can be mounted directly on the body of the storage unit of electricity 26, or vice versa.

[0104] Conveniently, inside the casing 28, the motorization unit 92 is positioned more internally than the electrical energy storage unit 26. Conveniently, inside the casing 28, the motorization unit 92 and the electrical energy storage unit 26 are arranged side by side along the longitudinal development of the casing 28, with the motorization unit 92 positioned more internally in the casing 28 and the electrical energy storage unit 26 positioned more externally.

[0105] Conveniently, in a possible embodiment not shown here, the motorization unit 92 and the electrical energy storage unit 26 can also be provided - as described above - but without any casing 28. In particular, in this case, a further non-driven adapter can be mounted on the containment structure 93 of the motorization unit 92 to idly support the containment structure 93 inside the tubular shaft 82.

[0106] Conveniently, in another possible embodiment illustrated in figures 5 - 8, the motorization unit 92 - to cause the rotation of the shaft itself in both directions around its longitudinal development axis - can be inserted inside the tubular shaft 82 at a second end 82" of the shaft itself, i.e. at the end which is opposite to the first end 82' of the shaft at which the device 1 with only the electrical energy storage unit 26 is inserted. More in detail, suitably, even in this version (i.e. wherein the motorization unit 92 is inserted at the second end 82" of the tubular shaft 82), the motorization unit 92 can include one or more of the characteristics described

above with reference to the version wherein the unit itself is inserted (with or without the casing 28) at the first end 82' of the tubular shaft 82.

IDLE SUPPORT MEANS 24

[0107] As mentioned, the device 1 includes means 24 to idly support the tubular shaft 82, i.e. means to support the shaft itself and decouple the rotation of the tubular shaft 82 from a part which is constrained to the external support structure 84, preferably on a side bracket 85.

[0108] The idle support means 24 of the tubular shaft 82 can include at least one adapter which can be idly mounted on the head 30 and/or on the battery/ies body 25 and/or on the casing 28 (if provided). In particular, said at least one adapter is placed between the tubular shaft 82 and the respective element on which it is mounted which - as mentioned - can be the head 30 and/or the battery/ies body 25 and/or the casing 28 (if provided).

[0109] For example, said adapter can comprise a ball or roller bearing, or other equivalent members which allow the rotation of the tubular shaft 82 to be decoupled with respect to a corresponding part (which is mounted or defined by the head 30 and/or by the battery/ies body 25 and/or by the casing 28, if provided) which remains stationary.

[0110] Conveniently, in a possible embodiment, a pair of support adapters is provided, spaced apart from each other, and positioned so that a first adapter is positioned or in any case is closest to the innermost end of the battery/ies body 25 and/or of the casing 28, while a second adapter is positioned or in any case is closer to the outermost end of the battery/ies body 25 and/or of the casing 28.

[0111] Conveniently, in a possible embodiment which for example is particularly and advantageously suitable for installations of roller covers of the "screen" type or with awning movable in a substantially vertical direction, the means 24 can include at least one idle adapter which is precisely placed between the head 30 and the tubular shaft 82 and which is configured to rotate with said tubular shaft 82 and to allow the head 30 to idly support the tubular shaft 82. In particular, in this case, the head 30 alone can support the tubular shaft 82 so that the latter can rotate with respect to said head. Conveniently, if the tubular casing 28 is provided, the latter can be mounted on said head 30 so as to be supported exclusively by the head itself. Conveniently, the idle adapter of the means 24 includes a rotating ring 31, which is mounted idly on the head 30, and which is intended to be integral with a shaped element (not shown) which supports and comes into contact with the internal walls of the tubular shaft 82. In particular, the ring 31 is rotating with respect to the remaining fixed part of the head and supports the tubular shaft 82 at one of its ends by means of a shaped element (not shown). More in detail, a rotating ring 31 is mounted on the fixed (i.e. nonrotating) body of the head 30 and is made integral in rotation with the tubular shaft 82 and

rotates with respect to the fixed body of said head. Conveniently, an adapter for mounting the tubular shaft 82 is then mounted on the ring 31. In particular, a shaped element to support the shaft itself is interposed between the rotating ring 31 mounted on the head 30 and the tubular shaft 82. Conveniently, the rotating ring 31 supports the shaped element which thus allows coupling with the various shapes of the cross section of the shaft 82.

[0112] As mentioned, the device 1 can include means 40 for fixing the head 30 to the lateral bracket 85, which for example can be defined by a side plate, of the external support structure 84.

[0113] Preferably, in a possible embodiment, said fixing means 40 of the head 30 can include mechanical fixing members (screws, bolts with corresponding nuts, or other equivalent members) to fasten the head directly to the lateral bracket 85.

[0114] Preferably, in a possible embodiment, said fixing means 40 can comprise at least two elements that laterally grip an external portion (i.e. a portion that remains outside the tubular shaft 82) of the head 30, and of which at least one first clamping element can be configured so as to be fixed to the lateral bracket 85, preferably by means of second mechanical locking members (for example screws or bolts with corresponding nuts), while the other (second) clamping member is configured to be fixed to the first gripping element, to thus externally wrap - at least in part - the external portion of the head 30.

[0115] Conveniently, in a possible embodiment such as the one illustrated in the figures (which can be particularly and advantageously used for installations of "screen" type cover or with an awning movable in a substantially vertical direction), the removal and replacement of the electrical energy storage unit 26 can be carried out - if the lateral space available is sufficient - by making the battery/ies body 25 pass through the further through hole 32 of the head 30 and the through hole 50 of the lateral bracket 85.

[0116] The present invention also concerns an apparatus for a roller cover installation 80 of the type comprising a tubular shaft 82 rotating around its longitudinal development axis and a cover element 86 to be wound onto said tubular shaft 82 and to be unwound from it, and wherein said apparatus comprises a device 1, as described above, mounted at a first longitudinal end 82' of the tubular shaft 82, and wherein the electrical energy storage unit 26 of the device 1 is configured:

- so as to abut externally - and preferably to be fixed externally - on the external support structure 84,
- to be electrically connected via said at least one electrical connection cable 27 or 27' and 27'', directly or indirectly, with a motorization unit 92 and/or with other electrical users, for example with the lighting elements 90, to thus provide them with the electrical energy for their operation.

[0117] Preferably, in a possible embodiment of the

apparatus, the device 1 (see fig. 2A and 2B) also includes the motorization unit 92.

[0118] Preferably, in other possible embodiments of the apparatus, the motorization unit 92 is external and is not part of the device 1 and can be mounted in the tubular shaft 82 at the second end 82" of said shaft opposite to that (i.e. the first end 82') wherein said device is mounted, or (in a variant not shown) also at the same end (i.e. at the first end 82') of the tubular shaft 82.

[0119] Conveniently, the apparatus can comprise one or more photovoltaic panels 44 (which preferably can be connected in parallel to each other) which are electrically connected via said at least one electrical connection cable 27 or 27' and 27", directly or indirectly, with the electrical energy storage unit 26 of the device 1 to thus recharge said unit 26.

[0120] Conveniently, the electrical energy storage unit 26 of the device 1 can be electrically connected via said at least one cable 27 or 27' and 27" directly with the photovoltaic panels 44 and can also be electrically connected via said at least one cable 27 or 27' and 27" directly with said motorization unit 92 and/or with other electrical users.

[0121] Conveniently, in a possible embodiment represented for example in fig. 6, the electrical energy storage unit 26 of the device 1 can be electrically connected via said at least one cable 27 or 27' and 27" with the photovoltaic panels 44 and with said motorization unit 92 and/or with other electrical users via a "T" electrical connector 79.

[0122] Conveniently, in a possible embodiment represented for example in fig. 7, the electrical energy storage unit 26 of the device 1 can be electrically connected via said at least one cable 27 or 27' and 27" to a battery charger device 70 (which can be housed internally or externally with respect to the tubular casing 28 of the device 1) and which can be electrically connected with the photovoltaic panels 44 and can also be electrically connected with said motorization unit 92 and/or with other electrical users.

[0123] Conveniently, the lighting elements 90 are connected directly or indirectly to the electrical connection cable 27 or 27' and 27" of the electrical storage unit 26 of the device 1 housed in the tubular shaft 82.

[0124] Preferably, said at least one photovoltaic panel 44 can be mounted on the roller cover installation 80, for example it could be mounted on an element of the support structure 84, or it can be mounted externally.

[0125] Advantageously, by using the photovoltaic panels 44 to recharge the storage unit 26 of the device 1, the motorization unit 92 and/or the other users is/are independent of the external electrical network. In particular, by using the photovoltaic panels 44 and the device 1, the motorization and/or the other electrical users of the roller cover installation 80 become completely autonomous and independent from an electrical point of view.

[0126] The present invention also concerns a roller cover installation 80 comprising a tubular shaft 82 rotat-

ing around its longitudinal development axis and a cover element 86 to be wound on said tubular shaft 82 and to be unwound from it. The installation according to the invention is characterized in that it includes an apparatus as described above. In particular, the installation 80 includes a device 1, as described above, which is mounted at a first longitudinal end 82' of said shaft and which includes an electrical energy storage unit 26 which:

- 10 - it is configured so as to abut externally - and preferably to be fixed externally - on the external support structure 84,
- it is electrically rechargeable using at least one photovoltaic panel 44, and
- 15 - it is electrically connected with a motorization unit 92 of said tubular shaft 82 and/or with other electrical users (for example with lighting elements 90) to provide these with electrical energy for their operation.

[0127] From what has been said it is clear that the solution according to the invention is quite advantageous as:

- 25 - the device 1 allows to house the electrical storage unit to supply electrical energy to the motorization unit of the tubular shaft of the roller cover installation and/or to other electrical users and, at the same time, allows easy access and replacement of the unit itself,
- 30 - the connection of the electrical energy storage unit with the photovoltaic panels makes the entire apparatus and installation highly eco-sustainable, as well as substantially autonomous from an electrical point of view,
- 35 - the installation and removal of the device 1 is quite simple and rapid, as it can be carried out even without removing the support head of the tubular shaft and also without removing the lateral bracket to which the tubular shaft is fixed by means of said support head.

[0128] The present invention has been illustrated and described in some of its preferred embodiments, but it is understood that executive variations could be made to them in practice without departing from the scope of protection of the present patent for industrial invention.

Claims

- 50 1. Device (1) for a roller cover installation (80), said device (1) being configured to be installed in a roller cover installation (80) of the type comprising a tubular shaft (82) which is actuated in rotation around its longitudinal development axis and also comprising a cover element (86) which has a flap fixed to the tubular shaft (82) and which, following the rotation of the tubular shaft (82), can be wound around said

shaft and unwound from it, said device (1) being **characterized by** comprising:

- means (24) to idly support the tubular shaft (82) at a first longitudinal end (82') of the shaft itself,
- an electrical energy storage unit (26) which is configured to be inserted inside the tubular shaft (82) at said first longitudinal end (82') of said shaft,

and **characterized in that** said electrical energy storage unit (26) includes:

- a battery/ies body (25), which is configured to fit inside the tubular shaft (82),
- a head portion (42),
- at least one electrical connection cable (27, 27', 27'', 29) coming out of the battery/ies body (25),

and wherein the head portion (42) is configured to abut on an external support structure (84) of the tubular shaft (82) around a through hole (50) which is obtained in said external support structure (84) and which is configured to be passed through by the battery/ies body (25), or to abut on a head (30), which is configured to be internally constrained to said external support structure (84) of the tubular shaft (82), around a further through hole (32) which is obtained in said head (30) and which is configured to be passed through by the battery/ies body (25).

2. Device according to claim 1, **characterized by** comprising a head (30) which is configured to be constrained to an external support structure (84), preferably to a lateral bracket (85), and which is provided with said further through hole (32) configured to be passed through by said electrical energy storage unit (26).
3. Device according to one or more of the previous claims, **characterized in that** said means (24) for idly supporting the tubular shaft (82) are mounted, at least in part, on said head (30) and/or are mounted on the battery/ies body (25) of said electrical energy storage unit (26).
4. Device according to one or more of the previous claims, **characterized in that** it comprises means (54) for the removable mechanical constraint of the electrical energy storage unit (26) to said external support structure (84) and/or to said head (30).
5. Device according to one or more of the previous claims, **characterized in that** said head portion (42) of the electrical energy storage unit (26) is stably fixed to one end of the battery/ies body (25) and is configured to support the battery/ies body (25) of the same electrical energy storage unit (26).

6. Device according to one or more of the previous claims, **characterized in that**:

- said head portion (42) of the electrical energy storage unit (26) is configured to prevent its complete passage through said through hole (50) obtained in said external support structure (84) or through the further through hole (32) obtained on the head (30), and
- said head portion (42) includes a flange (43) which is intended and configured to abut/contact with the external surface of the external support structure (84) or of the head (30), respectively in particular at the area which surrounds the through hole (50) of said external support structure (84) or of the area surrounding the further through hole (32) of the head (30).

7. Device according to one or more of the previous claims, **characterized in that** it also includes a motorization unit (92) to cause the rotation of the tubular shaft (82) in both directions around its longitudinal development axis, and wherein:

- said motorization unit (92) is structurally independent from the electrical energy storage unit (26),
- said motorization unit (92) and said electrical energy storage unit (26) are electrically connected or connectable to each other via cable and/or via a socket-plug type connection.

8. Device according to one or more of the previous claims, **characterized in that** said motorization unit (92) includes a containment structure (93) which is structurally independent from the battery/ies body (25) of said electrical energy storage unit (26) and wherein an electric motor is housed and wherein a command and control unit for said motor is also housed, said control unit preferably including a wireless receiver or transceiver.

9. Device according to one or more of the previous claims, **characterized in that** it comprises a casing (28) which is configured to be removably insertable and housed, entirely or mostly, at said first longitudinal end (82') of said tubular shaft (82), said electrical energy storage unit (26) and, if provided, also said motorization unit (92) and/or, if provided, also a battery charging device or other accessories for electrically recharging the electrical energy storage unit (26) being arranged and housed in a removable manner inside said casing (28) of said device (1).

10. Device according to one or more of the previous claims, **characterized by** comprising a casing (28) for housing said electrical energy storage unit (26), and in particular for housing the battery/ies body (25)

of said unit of electrical energy storage, said casing (28) being removably associated with a head (30), which is configured to be internally constrained to said external support structure (84) of the tubular shaft (82).

11. Device according to one or more of the previous claims, **characterized in that** the head portion (42) is fixed to one end of the battery/ies body (25) and is configured to abut externally on an external support structure (84) of the tubular shaft (82) around a through hole (50) which is obtained in said external support structure (84).

12. Device according to one or more of the previous claims, **characterized in that** said at least one electrical connection cable (27, 27', 27'', 29) emerges from a first base (25') of the battery/ies body (25) and comprehends:

- a single electrical connection cable (27) for the transfer of electrical energy from external photovoltaic panels (44) to the storage unit (26) and for the transfer of electrical energy from the storage unit (26) to a motorization unit (92) of said tubular shaft (82) of the roller cover installation (80) and/or towards other electrical users, or
- a first electrical connection cable (27'') for the transfer of electrical energy from external photovoltaic panels (44) to the storage unit (26), and a second electrical connection cable (27'') for the transfer of electrical energy from the storage unit (26) towards a motorization unit (92) of said tubular shaft (82) of the roller cover installation (80) and/or towards other electrical users,

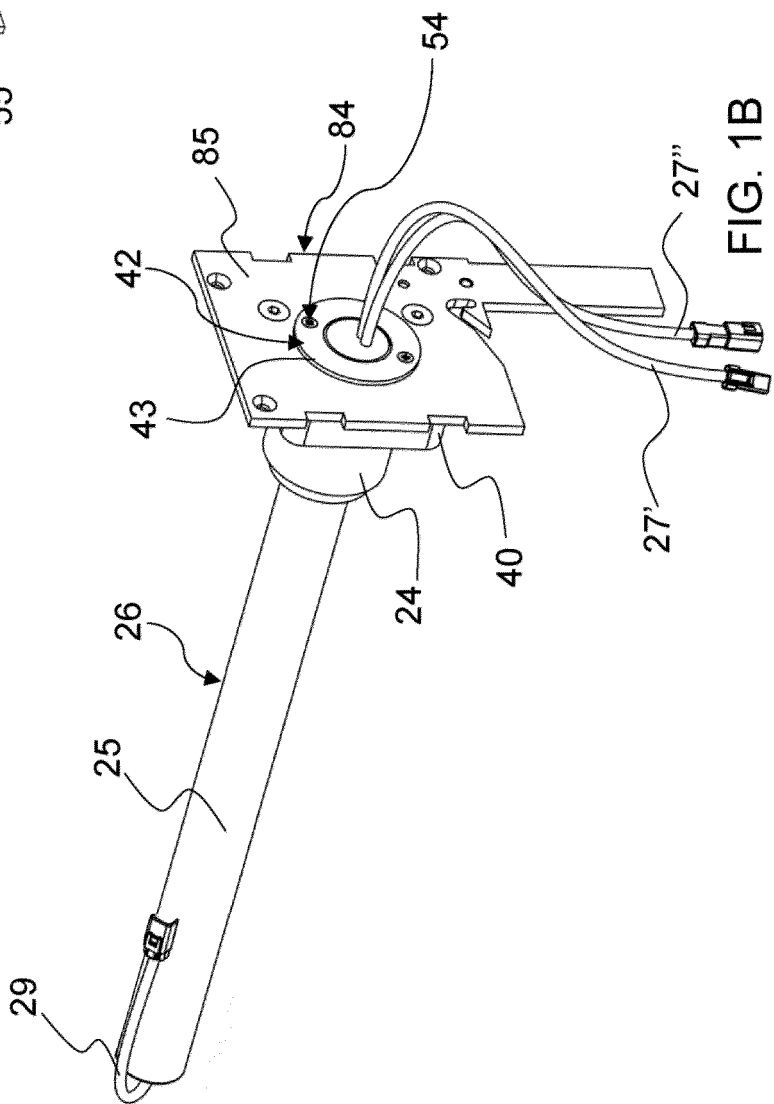
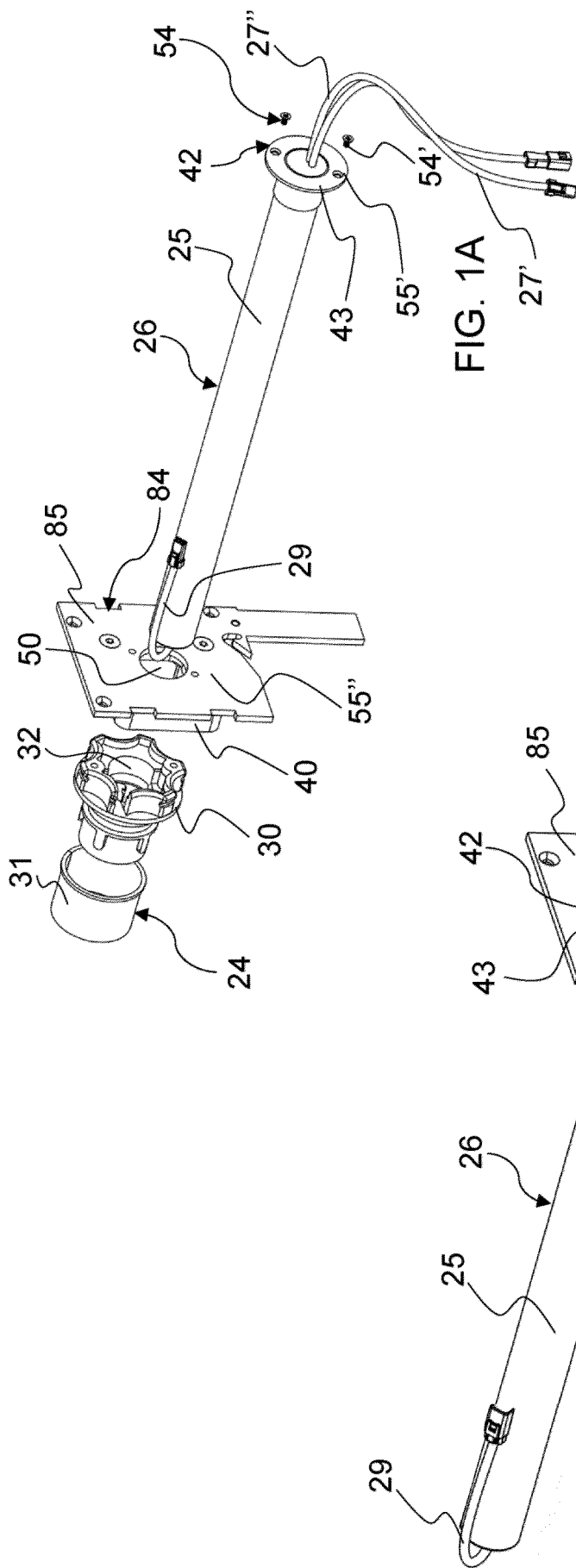
and, preferably, includes at least one further electrical connection cable (29) which comes out from the other base of the battery/ies body (25).

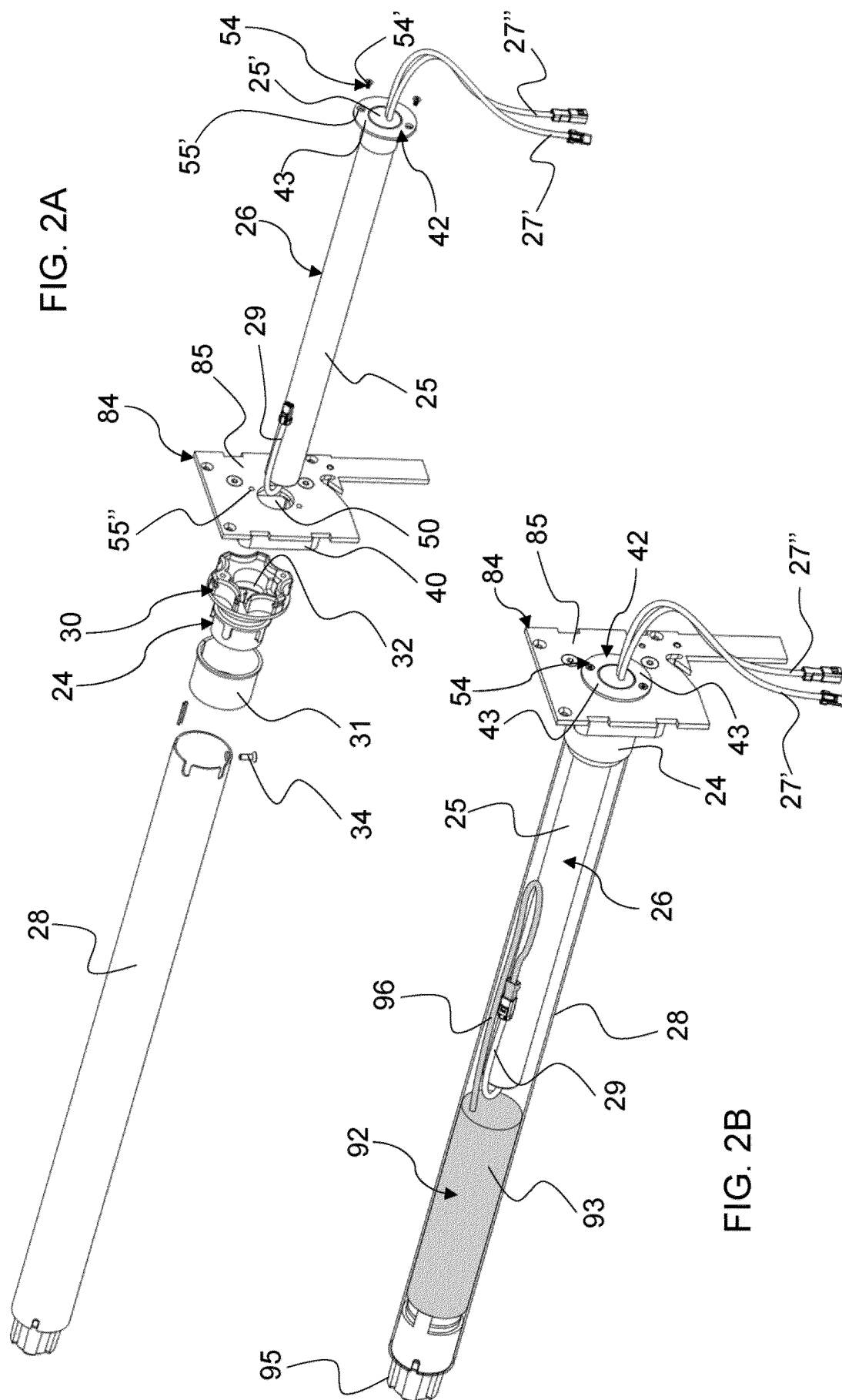
13. Apparatus for a roller cover installation (80), said apparatus being configured to be installed in a roller cover installation (80) of the type comprising a tubular shaft (82) which is actuated in rotation around its longitudinal development axis and comprising also a cover element (86) which has a flap fixed to the tubular shaft (82) and which, following the rotation of the tubular shaft (82), can be wound around said shaft and unwound from it, said apparatus being **characterized in that** it comprises a device (1) according to one or more of the previous claims, said device (1) being inserted and housed inside the tubular shaft (82) at a first end (82') of said tubular shaft (82) and wherein the electrical energy storage unit (26) of the device (1) is configured to be electrically connected via said at least one electrical connection cable (27, 27', 27'', 29), directly or indirectly, with a motorization unit (92) which is part of said

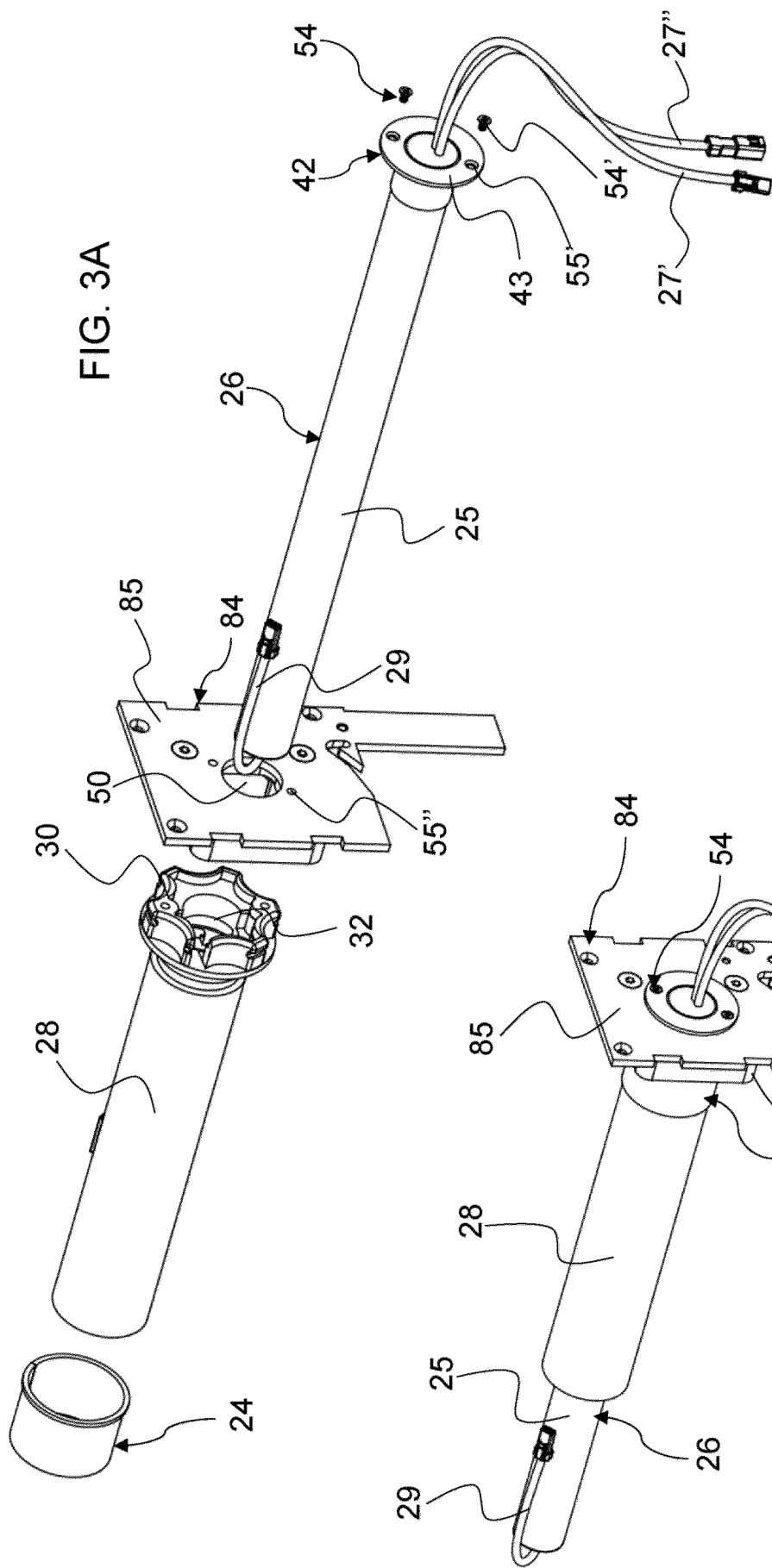
device (1) or which is external to said device (1) and/or with other electrical users, for example with lighting elements (90), to thus provide them with the electrical energy for their operation.

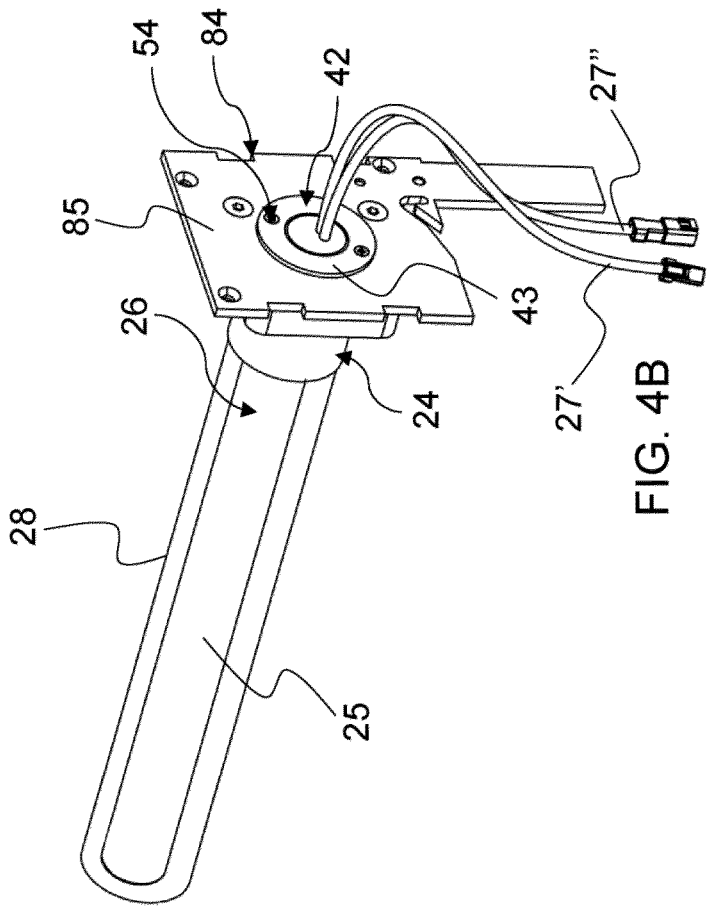
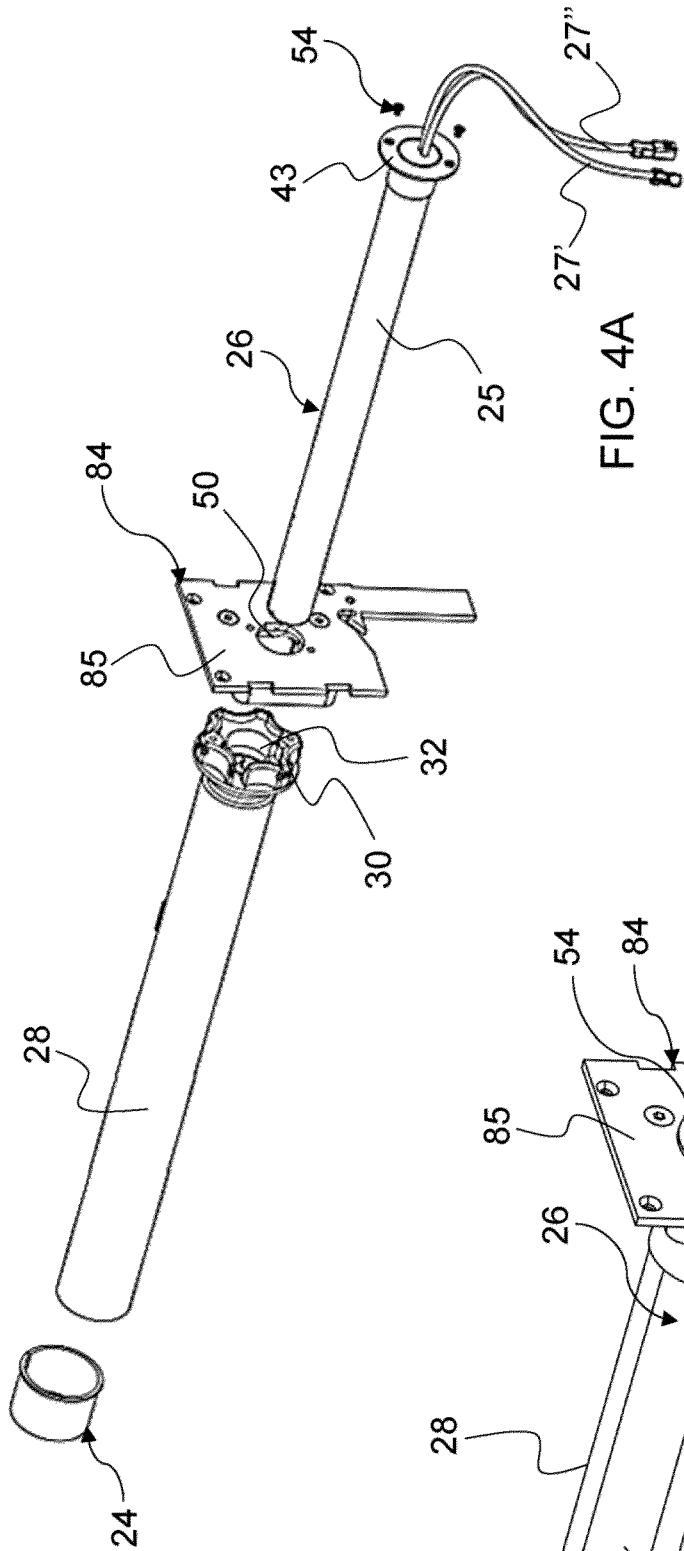
14. Apparatus according to the previous claim, **characterized in that** it comprises at least one photovoltaic panel (44) which is electrically connected via said at least one electrical connection cable (27, 27'), directly or indirectly, with the electrical energy storage unit (26) of the device (1) to thus recharge said unit (26).

15. Roller cover installation (80) comprising a tubular shaft (82) rotating around its longitudinal development axis and a cover element (86) to be wound on said tubular shaft (82) and to be unwound from it in a vertical or inclined/cantilevered direction, preferably said cover element (86) being of the type of blackout and/or filtering curtain, roller shutter, mosquito net or sectional door, said installation being **characterized by** comprising an apparatus according to claims 13 or 14.









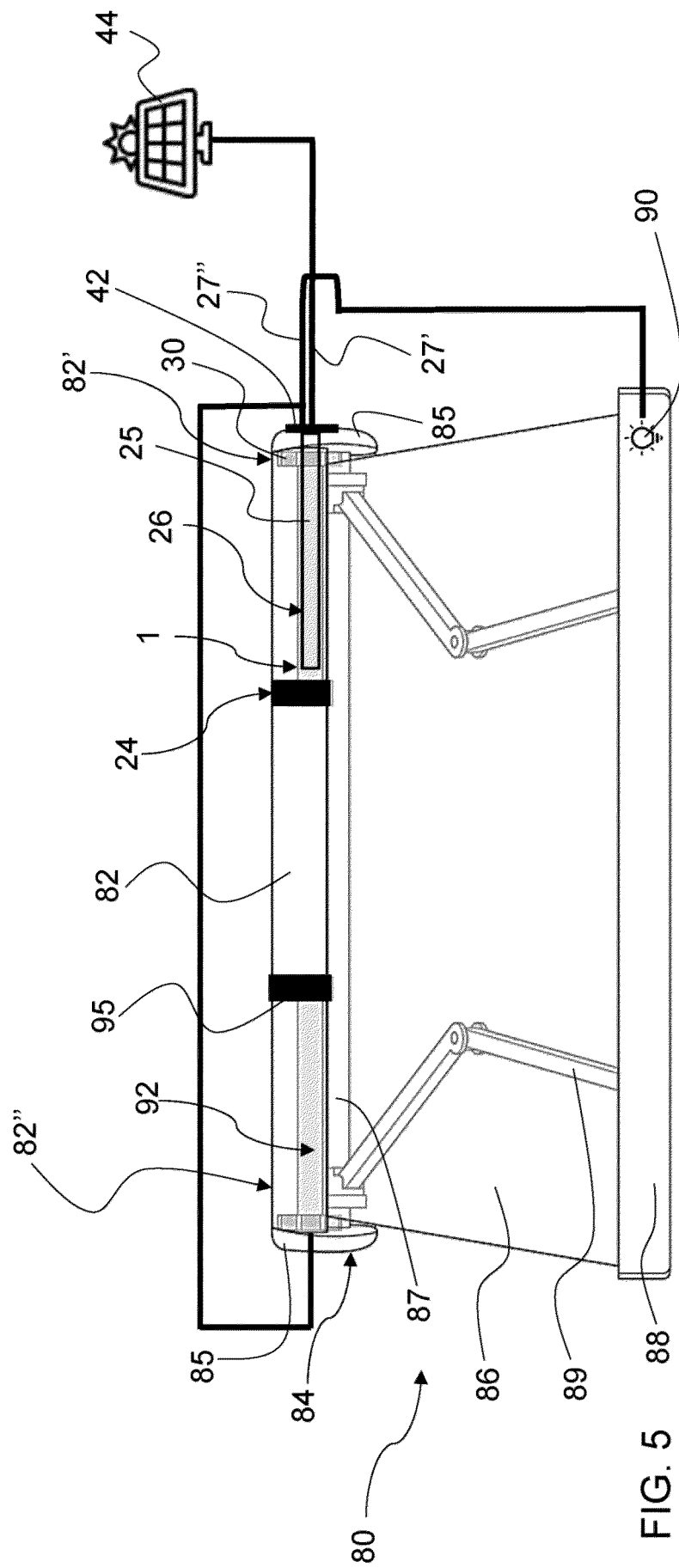
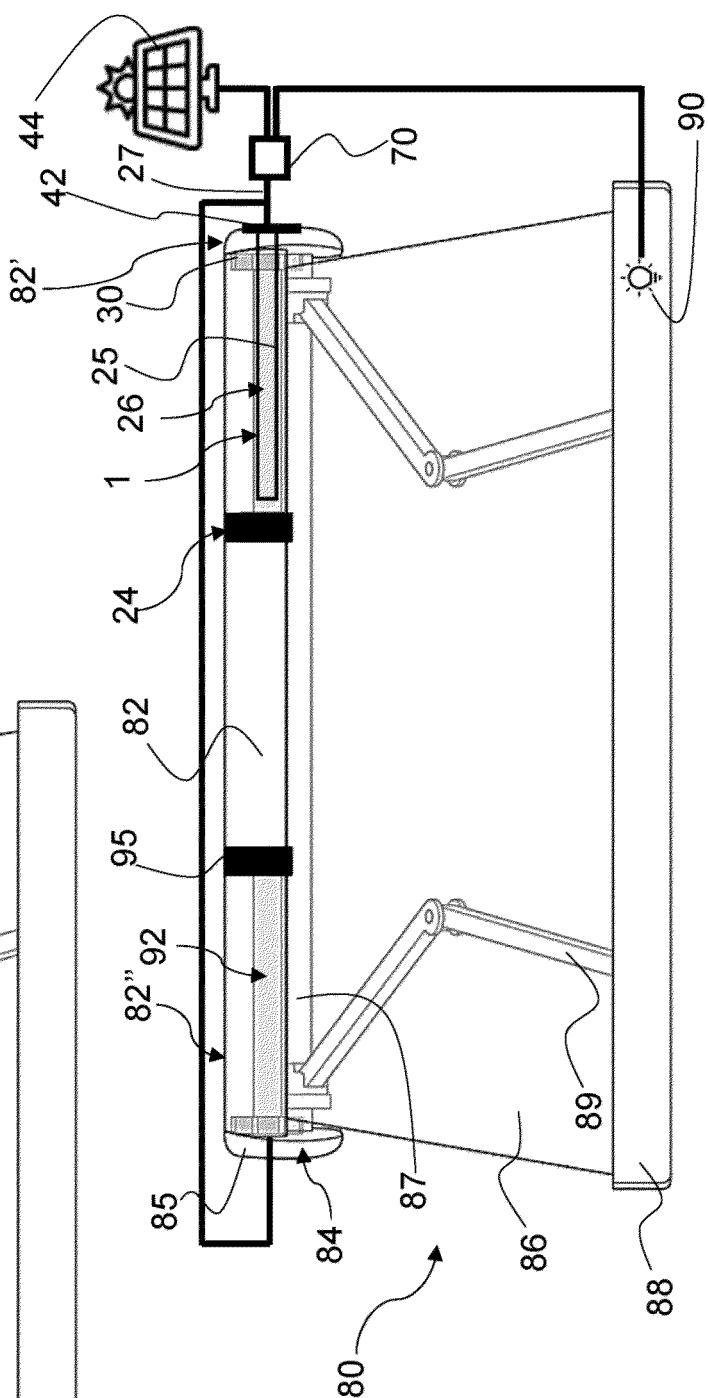
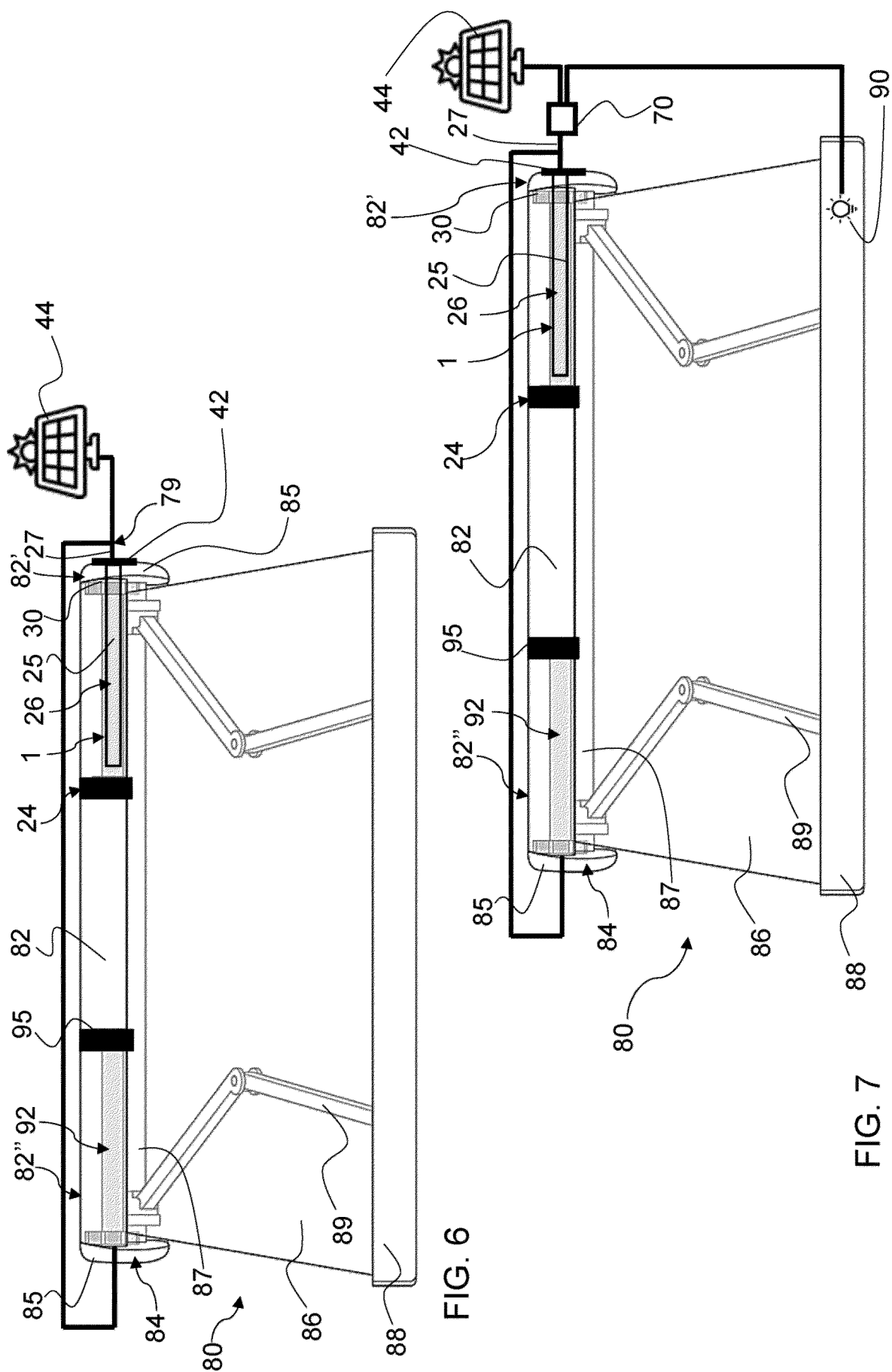


FIG. 5



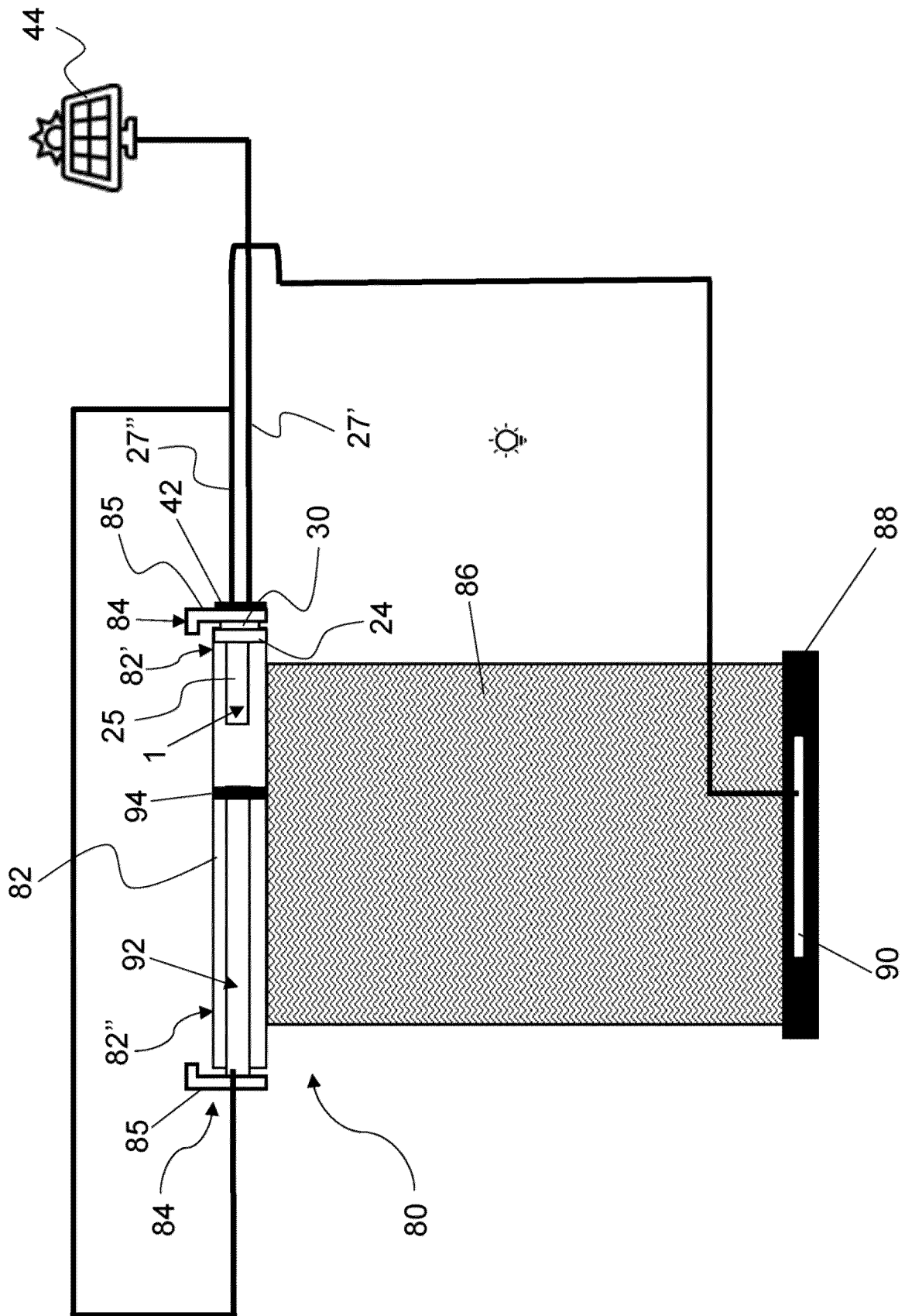


FIG. 8



EUROPEAN SEARCH REPORT

Application Number

EP 24 19 2117

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 3 671 377 A1 (TELECO AUTOMATION SRL [IT]) 24 June 2020 (2020-06-24) * abstract; figures 1-4 * * paragraphs [0048], [0077], [0078] * -----	1-15	INV. E04F10/06 E06B9/42 E06B9/50 E06B9/72
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X	ES 2 275 426 A1 (VENTAYOL I PINYOL JOAN [ES]) 1 June 2007 (2007-06-01) * abstract; claims 3,6; figures 1-3 * -----	1-15	
A	EP 3 219 898 A1 (VKR HOLDING AS [DK]) 20 September 2017 (2017-09-20) * abstract; figures 1-4 * * paragraphs [0030] - [0037] * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04F E06B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		3 February 2025	Wehland, Florian
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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