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

(11) **EP 1 908 893 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
09.04.2008 Bulletin 2008/15

(21) Application number: **05754713.5**

(22) Date of filing: **10.06.2005**

(51) Int Cl.:
E04F 10/06 *(2006.01)*

(86) International application number:
PCT/ES2005/000331

(87) International publication number:
WO 2006/134177 (21.12.2006 Gazette 2006/51)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR

(71) Applicant: **LLAZA, S.A.**
43206 Reus (Tarragona) (ES)

(72) Inventor: **LLAGOSTERA FORNS, Joan**
E-43206 Reus (Tarragona) (ES)

(74) Representative: **Gislon, Gabriele**
Torner, Juncosa i Associats, S.L.
c/ Bruc, 21
08010 Barcelona (ES)

(54) AWNING CASE ASSEMBLY COMPRISING A SUPPORT AND INCLINE-ADJUSTMENT DEVICE

(57) The invention relates to an awning housing assembly comprising a support and incline-adjustment device. Each end of the housing (40) comprises: a support piece (1) fixed to a wall or structure and provided with a flat portion (66); an end plate (2) fixed at one end of the housing (40), pivot connected to the flat portion (66) of the support piece (1), and provided with a recessed zone (8); means for adjusting the angular position of the housing (40), including a toothed wheel sector (3) formed along a peripheral edge (47) of the flat portion (66) of the support piece (1) and a rack (4) formed on a sliding piece (12) that is housed together with an actuation screw (5) in a cavity (7) in the end plate (2); and means for locking the end plate (2) in relation to the support piece (1) in a selected position.

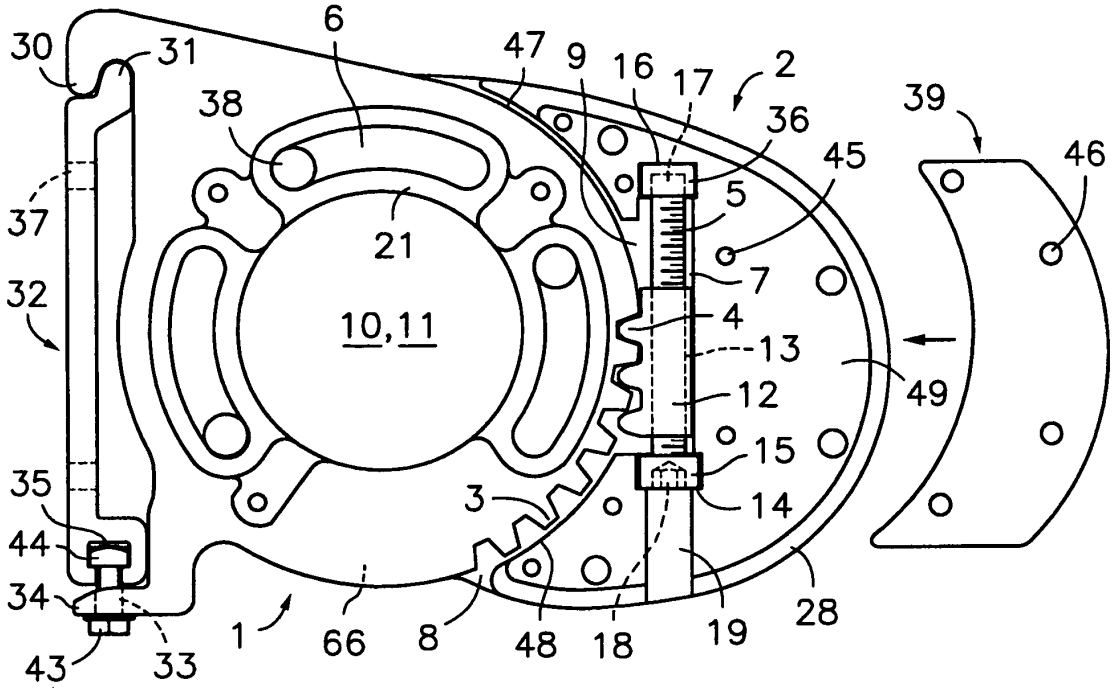

Fig.3

EP 1 908 893 A1

Description

Field of the Invention

[0001] The present invention generally relates to an awning housing assembly comprising a support and incline-adjustment device, and more specifically to an awning housing assembly with a support device comprising angular position adjustment means for changing the angular position of the housing in relation to support pieces adapted to be fixed in relation to a wall or another structure, and locking means for locking the housing in relation to said support pieces in a selected angular position.

State of the Prior Art

[0002] A type of awning is well known comprising a canvas, a winding tube on which said canvas is wound, a load bar joined to a front end of the canvas and extensible articulated arms connected to the load bar and elastically pushed to extend the canvas as it is unwound and to keep the canvas taut. A manual or motor-driven mechanism allows making the winding tube rotate so as to extend or draw in the canvas of the awning. The incorporation of the previous elements inside a housing which can be closed to protect them is also known. This housing is generally formed by an elongated casing provided with a front longitudinal opening through which the canvas passes, the load bar being configured to close said longitudinal opening in a folded awning situation, in which the arms are folded and housed inside the casing. The casing is closed at both side ends by end plates that are respectively pivot connected to a pair of support pieces adapted to be fixed in relation to a wall or another structure. Adjustment means allow adjusting and fixing the angular position of the end plates, and therefore of the housing, in relation to the support pieces.

[0003] European patent application EP 03380120.0, of this applicant, discloses a inclination-adjustable awning support device comprising a pair of support pieces fixed in relation to a wall or another structure, between which a protecting casing or housing for the awning is supported. The mentioned housing comprises a longitudinal profile laterally closed by a pair of end plates that are pivot connected to said support pieces. Each of these end plates of the casing includes, at its inner part, a support for a winding tube for a canvas, a hinging bracket for connecting a corresponding arm, and at its outer part, a projecting central stud passed through an opening of the corresponding support piece. A toothed wheel sector is formed in this projecting stud and meshed with a movable rack housed and guided in the support piece. The mentioned rack is formed in a piece coupled to a screw which can be actuated from outside to move the rack and thus make the toothed wheel and the housing rotate. Locking means for locking the end plates, and thus the housing, in relation to the support pieces in a selected angular position are also provided.

[0004] Although this system is fully operational, it has the drawback that the gap between each end plate of the casing and its corresponding support piece is exposed to dirt and can be seen from a position opposing the awning. The toothed wheel sector arranged in a central stud of the end plate is furthermore limited to a relatively small radius making a certain turning torque caused by the weight of the awning become a relatively large force applied to the teeth compared to that which would result from a toothed wheel with a larger radius.

[0005] An objective of the present invention is to contribute to overcoming the previous drawbacks by providing an awning housing assembly comprising a support and incline-adjustment device including a configuration for concealing and protecting the gap between the support pieces and the end plates and a toothed wheel and rack mechanism with a new arrangement allowing for a larger radius for the toothed wheel compared to the prior art devices.

Disclosure of the Invention

[0006] The present invention contributes to reaching the previous and other objectives by providing an awning housing assembly comprising a support and incline-adjustment device, of the type comprising, for each end of said housing, a support piece, adapted to be fixed in relation to a wall or another structure, and an end plate fixed to the corresponding end of the housing closing it laterally and coupled to said support piece such that it can rotate in relation to an axis. The device includes locking means for locking said end plate in relation to the support piece in a selected angular position, and is characterized in that the end plate has formed, around said rotation axis, a recessed zone adapted to house a flat portion of the support piece, the depth of said recessed zone of the end plate being equal to or greater than the thickness of said flat portion of the support piece.

[0007] In said flat portion of the support piece there is formed a central opening concentric with the rotation axis, and in said recessed zone of the end plate there is formed a central opening concentric with the rotation axis, and therefore coaxially aligned with said central opening of the support piece. The flat portion of the support piece has an edge having a circumference arch shape concentric with the rotation axis, said edge being facing a step having a circumference arch shape also concentric with the rotation axis and delimiting the recessed zone of the end plate. With this construction, the gap between the end plate and the support piece is protected and concealed by the mentioned step between the recessed zone and a non-recessed part of the end plate. This non-recessed part of the end plate further has sufficient thickness to optionally house a part of the angular position adjustment means including a toothed wheel and rack mechanism actuated by a screw to change the angular position of said end plate in relation to the support piece. The mentioned locking means conventionally comprise

at least one elongated hole with a circumference arch shape concentric with the rotation axis formed in the flat portion of the support piece, at least one fixing hole formed in the recessed zone of the end plate and facing said elongated hole of the support piece, and a lock screw installed through the elongated hole and the fixing hole such that upon being tightened, it presses the end plate against the support piece and thus locks them to one another by friction. It must be indicated, however, that other locking means, using a strap for example, are known in the state of the art, and are also applicable in the present invention.

[0008] A sector of said toothed wheel is formed in the peripheral zone of the support piece, whereas said rack is formed in a sliding piece housed in a cavity of the end plate formed next to the recessed zone. The rack and the toothed wheel sector are mutually meshed through a passageway between the mentioned cavity and the recessed zone. It will be observed that this arrangement is the reverse if that of the prior art devices, i.e., the toothed wheel is incorporated in the support piece instead of the end plate and the rack is housed in the end plate instead of the support piece. This allows placing the toothed wheel sector in the periphery of the support piece, reaching the maximum possible radius with the available material, and housing the rack in the non-recessed part of the end plate projecting from the support piece. The mentioned sliding piece includes a longitudinal threaded through hole in which said screw is coupled, said screw being trapped in the mentioned cavity by stops defined therein. In other words, the screw is prevented from moving in the cavity, although it can rotate about its longitudinal axis. The screw has a head with a coupling configuration adapted to be coupled by a tool, and the end plate comprises a passage communicating an outer edge of the end plate with the cavity. Said tool can thus access from the outside, through said passage, the mentioned coupling configuration of the screw head.

[0009] A rotation of the screw in either direction will move the sliding piece in which the rack is formed and the later, due to the mentioned meshing, will make the corresponding end plate rotate in either direction. The rotation of one of the end plates of the housing involves a change in the angular position of the housing assembly including the folding arms, which position determines the direction in which the canvas will extend.

[0010] The device includes several of the mentioned elongated holes in the form of a concentric arch, although only one would be enough. The path of each elongated hole coincides with the position of a corresponding fixing hole formed in the end plate in a range of angular positions of the end plate in relation to the support piece. The special configuration of the device of the present invention does not prevent the mentioned paths of the elongated holes from having a relatively large radius, which allows obtaining a sufficiently large braking torque due to the friction between the support piece and the end plate by means of a reasonable tightening torque of the screws. The locking of the end plates in relation to the support pieces by means of tightening the lock screws once the desired angular position has been reached, partially releases the teeth of the toothed wheels and the racks from any stress or strain. The toothed wheel and rack mechanisms thus only act during the adjustment of the angular position of the housing.

[0011] The fixing holes existing in the end plate can be threaded to be directly coupled to the lock screws. However, given that both the support piece and the end plate are intended so as to be manufactured from a relatively lightweight, resistant and inexpensive material, such as an aluminium alloy, for example, the thread of the holes could be too weak for steel screws. To overcome this drawback, each of said fixing holes has, on a side opposite to the support piece, a mouth defining a housing for a nut in which said lock screw passed through the elongated hole and through the fixing hole is coupled. The nut is obviously polygonal-shaped and is made from a sufficiently resistant material, and the housing prevents its rotation while the screw is tightened.

Brief Description of the Drawings

[0012] The previous and other features and advantages of the present invention will be more evident from the detailed description of an exemplary embodiment with reference to the attached drawings, in which:

Figure 1 is a side elevation view of a support device of an awning housing with incline-adjustment according to an exemplary embodiment of the present invention, applied to an end of the housing, wherefrom an outer cover has been removed to better show its components;

Figure 2 is a schematic cross-sectional view taken along line II-II of Figure 1;

Figure 3 is a side elevation view of an awning housing assembly comprising a support and incline-adjustment device according to another exemplary embodiment of the present invention, applied to another opposite end of the housing, and incorporating angular position adjustment means, wherefrom an outer cover has been removed to better show its components;

Figure 4 is a side elevation view of a support piece forming part of the device of Figure 3;

Figure 5 is a side elevation view of a rack device forming part of the device of Figure 3;

Figure 6 is a side elevation view of an end plate forming part of the device of Figure 3 showing its side adjacent to the support piece;

Figure 7 is a side elevation view of the end plate of Figure 6, showing its side opposite to the support piece, corresponding to the inside of the housing;

Figure 8 is a partial perspective view of the awning housing assembly comprising a support and incline-adjustment device according to the present inven-

tion, corresponding to one end of the housing;

Figure 9 is a partial perspective view of the housing assembly, showing the sections of the casing and of the load bar;

Figures 10 and 11 are cross-sectional views of the load bar and of the casing, respectively;

Figure 12 is a perspective view of a reinforcing piece of the load bar;

Figure 13 is a perspective view showing the reinforcing piece of Figure 12 internally fixed to a wall of the load bar;

Figure 14 is rear perspective view of a positioning piece provided to be internally fixed to a wall of the load bar; and

Figures 15A-15C are cross-sectional views showing a sequence of different positions of the load bar in relation to the casing in a final stage of a closing operation thereof.

Detailed Description of Exemplary Embodiments

[0013] Referring first to Figure 8, it shows an end of an awning provided with a housing 40 equipped with a support device with incline-adjustment according to the present invention. The awning comprises a winding tube 25 on which a canvas 26 of the awning is wound. A front end of the canvas 26 is joined to a load bar 42. Articulated folding arms 24 (of which only the elbow of one of them can be seen in Figure 8) are connected to the load bar and elastically pushed to extend the canvas as it is unwound and to keep the canvas taut at all times. A manual actuation mechanism (of which only a coupling 29 can be seen in Figure 8) allows making the winding tube 25 rotate to extend or draw in the canvas 26 of the awning. Alternatively, as is well known in the art of the sector, the mentioned actuation mechanism can be a motor-driven mechanism comprising an electric geared motor housed inside the winding tube without this altering the object of the present invention.

[0014] The mentioned housing 40 comprises an elongated casing 41 provided with a front longitudinal opening through which the canvas 26 can pass when the awning is in a completely or partially unfolded situation, and the load bar 42 is configured to close said longitudinal opening in a folded awning situation shown in Figure 8, at the same time enclosing the folding arms 24 folded inside the housing 40. The casing 41 is closed at both side ends by end plates 2 (only one of which is shown in Figure 8). The end plates 2 are fixedly joined to the elongated casing 41 by conventional means to form the housing 40. Each end plate 2 is pivot connected to a corresponding support piece 1 adapted to be fixed in relation to a wall or another structure. The housing 40 is thus supported between two support pieces 1 (only one of which is shown in Figure 8), being able to rotate about an imaginary rotation axis. The device comprises angular position adjustment means for changing the angular position of the end plates 2, and therefore of the housing 40, in relation to the support pieces 1, and locking means for locking the end plates 2, and therefore the housing 40, in relation to the support piece 1 in a selected angular position.

[0015] Figures 1 and 2 show the assembly of the support device according to an exemplary embodiment of the present invention without angular position adjustment means, applied to an end of the housing 40, for example. The end plate 2 has formed around said rotation axis a recessed zone 8 adapted to house a flat portion 66 of the support piece 1, such that a non-recessed part 49 of the end plate 2 conceals a gap between the support piece 1 and the end plate 2 from the front view. The depth of said recessed zone 8 of the end plate 2 is preferably equal to or greater than the thickness of said flat portion 66 of the support piece 1. A surface of the non-recessed part 49 of the end plate 2 is thus flush with or slightly more outward than a surface of the support piece 1. The mentioned non-recessed part 49 of the end plate 2 projects in front of the support piece 1. A central opening 10 concentric with the rotation axis is formed in said flat portion 66 of the support piece 1. Similarly, a central opening 11 concentric with the rotation axis is formed in said recessed zone 8 of the end plate 2.

[0016] When the support piece 1 and the end plate 2 are mutually coupled, the central openings 10, 11 of each of them are coaxially aligned with one another and with the rotation axis. The flat portion 66 of the support piece 1 has a peripheral edge 47 with a circumference arch shape concentric with the rotation axis and the recessed zone 8 of the end plate 2 is delimited by a step 48 with a circumference arch shape concentric with the rotation axis. When the support piece 1 and the end plate 2 are mutually coupled, the mentioned peripheral edge 47 having a circumference arch shape of the support piece 1 is facing and close to said step 48 of the end plate 2. The mentioned winding tube 25 of the canvas 26 is assembled inside the housing 40 such that it can rotate in relation to the rotation axis and to the support piece 1, and has a hollow inside which can be accessed through the mentioned central openings 10, 11 of the support piece 1 and of the end plate 2.

[0017] The device according to the embodiment of Figures 1 and 2 includes locking means for locking said end plate 2 in relation to the support piece 1 in a selected angular position, which means include elongated holes 6 in the support piece 1 facing fixing holes 38 in the end plate 2, and which will be described with more detail below in relation to Figures 4 to 7.

[0018] Figures 3 to 7 show the assembly of a support device according to another exemplary embodiment of the present invention including the mentioned angular position adjustment means, applied to the other opposite end of the housing 40, for example. In this case, a toothed wheel sector 3 is formed in a segment of the peripheral edge 47 of the support piece 1 having a circumference arch shape. A cavity 7 housing a sliding piece 12 having a toothing of rack 4 formed therein is formed in the non-recessed part 49 of the end plate 2, next to the step 48

delimiting the recessed zone 8. The mentioned toothed wheel sector 3 and said rack 4 are mutually meshed through a passageway 9 existing between the cavity 7 and the recessed zone 8 in the end plate 2 through the step 48. As better shown in Figure 5, the mentioned sliding piece 12 in which the rack 4 is formed is longitudinally traversed by a threaded hole 13 in which a screw 5 is coupled, such that a longitudinal axis of the screw 5 is parallel to the toothing of the rack 4.

[0019] The mentioned screw 5 has a head 15 and a final end 17, and said cavity 7 defines a head stop 14 to make contact with said head 15 of the screw 5 and an end stop 16 to make contact with said final end 17 of the screw 5, such that an axial movement of the screw 5 inside the cavity 7 is prevented by said head and end stops 14, 16. A friction bearing 36, which can be in the form of a cap, for example, is preferably placed between the final end 17 of the screw 5 and the mentioned end stop 16 of the cavity 7. An inner cover 39 (shown in a removed position in Figure 3) is adapted to be fixed to the non-recessed part 49 of the end plate 2, covering the cavity 7 for the purpose of retaining the screw 5 and the sliding piece 12 in the cavity 7. To that end, the end plate 2 and the inner cover 39 comprise, for example, respective holes 45, 46 for installing fixing screws (not shown). With this construction, a rotation of the screw 5 inside the cavity 7 causes a movement of the sliding piece 12 together with the rack 4, and the movement of the rack 4 causes a rotation of the end plate 2 and therewith the movement of the entire housing 40, in relation to the support piece 1.

[0020] The head 15 of the screw 5 comprises a coupling configuration 18 adapted to receive the coupling of a work head of a tool. A passage 19 communicating an outer edge of the non-recessed part 49 with the cavity 7 is formed in the end plate 2. Through said passage 19 the mentioned tool can access said coupling configuration 18 of the head 15 of the screw 5 from the outside. One type of suitable tool can be an Allen type key and the coupling configuration 18 can be a corresponding hexagonal cavity, although other types of tools and coupling configurations are possible.

[0021] Several elongated holes 6 are formed around the central opening 10 existing in the support piece 1, each of which holes defines a path with a circumference arch shape concentric with said central opening 10 and coinciding with the position of a corresponding fixing hole 38 formed in the end plate 2. In other words, the fixing holes 38 are facing to their corresponding elongated holes 6 in a range of angular positions of the end plate 2 in relation to the support piece 1. A lock screw (not shown) is passed through each elongated hole 6 and fixing hole 38, said lock screw being coupled to a nut (not shown) housed in a housing 20 defined in a mouth that each fixing hole 38 has on one side of the end plate 2 opposite to the support piece 1 (shown in Figure 7). The nut has a non-circular shape, typically a polygonal shape such as a standard hexagonal nut, for example, and said housing 20 is configured to prevent the rotation thereof. The support piece 1 defines a recess 21 around the elongated hole 6 to at least partly house a head of the lock screw and to provide a seat for said head.

[0022] The elongated holes 6, fixing holes 38, lock screws and corresponding nuts form the mentioned locking means and allow, by means of tightening the lock screws, locking by friction the end plates 2, and with them the housing 40, in relation to the support pieces 1 in an angular position that has been previously selected by the angular position adjustment means described above.

[0023] As shown in Figure 7, each end plate 2 comprises, on said side opposite to the corresponding support piece 1, a projection 22 adapted for the articulated joint of a corresponding folding arm 24 of the mentioned arms of the awning. The projection 22 is arranged between the appendages of a bracket existing in the proximal end of the arm and is traversed by a through hole 23 adapted to house a hinge pin. The winding tube 25 on which the canvas 26 of the awning is wound is arranged on the side of the end plate 2 opposite to the support piece 1 to rotate coaxially in relation to said central opening 11 of the end plate 2 and said central opening 10 of the support piece 1.

[0024] Returning to Figure 8, the device comprises an outer cover 27 having a first portion 27a adapted to be fixed in a peripheral configuration 28 formed in a peripheral zone of the end plate 2, following the contour thereof, and a second portion 27b adapted to cover part of the support piece 1. This second portion 27b of the outer cover 27 is not fixed to the support piece and can move in relation thereto when the end plate 2 changes its angular position in relation to the support piece 1. To that end, the second portion 27b has a segment with a circular contour concentric with the rotation axis, and therefore centered with the central opening 10 of the support piece 1. When the actuation mechanism for winding the awning is a manual type mechanism, as the housing shown in the figures, it is arranged on the side of the support piece 1 opposite to the end plate 2 and connected to the winding tube 25 through the central openings 10 and 11 of the support piece 1 and of the end plate 2. The manual actuation mechanism is housed under the outer cover 27, and it comprises a passage through which there projects a coupling 29 of said actuation mechanism adapted to be coupled by means of a rotation tool, such as a crank. In the event that the actuation mechanism was motor-driven, no element thereof would project from the outer cover 27.

[0025] The support piece 1 could be adapted to be directly fixed to a wall or another structure. However, in the embodiment shown, the device includes an anchoring device allowing a certain adjustment of the horizontal position of the awning during the assembly. The device thus comprises, for each end of the housing, an anchoring piece 32 (Figures 3 and 8) provided with openings 37 through which screws can be installed to fix it to a wall or another structure. This anchoring piece 32 has a hor-

izontal rib 31 formed such that it projects in an upper part and a housing 35 in the form of a lower longitudinal groove. The support piece I comprises, at an upper rear part, at least one engaging configuration 30 in the form of a hook adapted to engage in said rib 31 of said anchoring piece 32 and, at a lower rear part, an appendage 34 with at least one opening 33 arranged for the passage of a screw 43 intended to be screwed in a nut 44 trapped in said housing 35 of the anchoring piece 32. The engaging configurations 30 project laterally from the corresponding support pieces 1. During the assembly and before tightening the mentioned screws, the engaging configurations 30 of the support pieces 1, and with them the entire housing 40, can slide along the rib 31 of the anchoring piece 32 to adjust its position in the horizontal direction.

[0026] With reference now to Figures 9 to 11, the housing 40 comprises a casing 41 (individually shown in cross-section in Figure 11), the two end plates 2 to which said casing 41 is fixed at its ends, and the load bar 42 (individually shown in cross-section in Figure 10). The casing 41 is adapted to house the winding tube 25 with the canvas 26 wound thereon and has a longitudinal opening 50 allowing the passage of said canvas 26. The load bar 42 is fixed to a front edge of said canvas 26 (see also Figures 15A-15C). As has been described above, the folding arms 24 have proximal ends articulated with corresponding projections 22a existing in the lower faces of the end plates 2, on a side opposite to the support piece 1, and distal ends articulated with said load bar 42.

[0027] The casing 41 comprises an outer wall 55 surrounding the winding tube 25 and the canvas 26 at the upper, lower and rear sides, and a partition wall 56 surrounding the winding tube 25 and the canvas 26 at the front side except in the area of the mentioned longitudinal opening 50. The outer wall 55 of the casing 41 is advantageously formed by two extruded profiles 41a, 41b of a lightweight metal material, such as an aluminium alloy. In this case, the extruded profiles 41a, 41b are longitudinally connected to one another along a connecting line 71. However, the outer wall 55 of the casing 41 could be formed from a single profile with an equivalent result. One part of the outer wall 55 is a double wall forming one or more chambers 57 therein which, apart from offering additional protection for the housing, form important reinforcing and stiffening elements against bending and torsion. Inner surfaces of said outer wall 55 and of said partition wall 56 define a substantially cylindrical surface opposing the canvas 26 wound on the winding tube 25 and they preferably include a coating of plastic material with a low friction coefficient. In a folded awning situation (Figure 15C) the partition wall 56 is thus placed between the canvas 26 wound on the winding tube 25 and the folding arms 24.

[0028] The outer wall 55 has an upper front edge 62a and a lower front edge 62b. In the depicted embodiment, the partition wall 56 extends upwardly from said lower front edge 62b of the outer wall 55 and has a free upper edge in which a first coupling edge 52 of the casing 41 is longitudinally formed. This first coupling edge 52 of the casing 41 is located close to said upper front edge 62a of the outer wall 55 and separated from it by the longitudinal opening 50. A second coupling edge 54 of the casing 41 is longitudinally formed in the lower front edge 62b of said outer wall 55.

[0029] The load bar 42 is adapted to be coupled to the casing 41 in said folded awning situation, closing the longitudinal opening 50 and covering the folding arms 24. To that end, the load bar 42 comprises an externally convex closing wall 58 defining an inner hollow opposing the winding tube 25, i.e., the partition wall 56, and which can at least partly house the folding arms 24 in the folded awning situation. The mentioned closing wall 58 has an upper rear edge 70a and a lower rear edge 70b. A fixing configuration 64 adapted to fix said front edge of the canvas 26 by conventional means is longitudinally defined near said upper rear edge 70a, and a first coupling configuration 51 adapted to be coupled to the first coupling edge 52 of the casing 41 is longitudinally formed next to said fixing means 64. A second coupling configuration 53 is longitudinally formed next to said lower rear edge 70b, said second coupling configuration 53 being arranged at a distance from said first coupling configuration 51 and adapted to be coupled to said second longitudinal coupling edge 54 of the casing 41.

[0030] Although its use is not very common, in an embodiment not shown the housing 40 has a reverse construction, such that the longitudinal opening for the passage of the canvas is located at the lower part of the casing and the arms are located above the canvas.

[0031] Figure 12 shows a reinforcing piece 63 adapted to be internally fixed to the closing wall 58 of the load bar 42. Figure 13 shows said reinforcing piece 63 installed in a lower part of the closing wall 58 of the load bar 42. The reinforcing piece defines a strut 65 which is arranged between an upper part and a lower part of the closing wall 58, reinforcing it against bending, torsion and a tendency to be flattened, which is especially useful in very long load bars 42. In the closing wall 58 of the load bar 42 there can be assembled one or more of such reinforcing parts 63 in mid positions in which they do not interfere with the folding arms 24.

[0032] Figure 14 shows a positioning piece 59 adapted to be internally fixed to the closing wall 58 of the load bar 42. Two of these positioning pieces 59 are preferably assembled in the load bar 42 and located in positions in which slots 60 of the positioning pieces 59 cooperate with segments of the folding arms 24 to keep the folding arms 24 in a predetermined position inside the housing 40 in the folded awning situation. The positioning pieces 59 define slides 61 adapted to direct the folding arms 24 in a sliding manner up to said slots 60 during a closing operation of the housing. One of these positioning pieces 59 is shown assembled in the load bar 41 in Figures 15A-15C. The closing wall 58 of the load bar 42 is preferably formed from at least one extruded profile of a lightweight

metal material, such as an aluminium alloy, whereas the reinforcing pieces 63 and positioning pieces 59 are preferably molded from a plastic material or a relatively ductile material reducing friction and making the translational movement of the arms easier.

[0033] Several positions in a final stage of the closing operation of the housing are shown in the sequence of views of Figures 15A-15C. In Figure 15A, a rotation of the winding tube 25 in the suitable direction winds the canvas 26 around the winding tube 25 and the canvas 26 pulls the load bar 41 towards the casing 42. Conventional elastic means (not shown) applied to the folding arms 24 exert a suitable force to keep the canvas under tension whichever the position of the load bar 42, therefore, during the closing operation, the canvas 26 pulls the load bar against the force of said elastic means. Up to this point, the path of the closing movement of the load bar 42 has been determined by the folding movement of the folding arms 24. Figure 15B shows a later position in which the load bar 42 is closer to the casing 41. In this position, one part of the folding arms 24 has made contact with several of the mentioned slides 61 of the positioning pieces 59 and the folding arms 24 slide towards said slots 60 as the housing 40 is closed. Figure 15C shows the final stage of the closing operation. The first and second coupling configurations 51, 53 of the load bar 42 as well as the first and second coupling edges 52, 54 of the casing 41 are arranged such that during this final stage of the closing operation, the second coupling configuration 53 of the load bar 42 is first coupled to the second coupling edge 54 of the casing 41, forming a fulcrum line. A subsequent pulling force exerted by the canvas 26 on the fixing configuration 64, which is far from the second coupling configuration 53, causes a small rotation of the load bar 42 around said fulcrum line until the first coupling configuration 51 is coupled to the first coupling edge 52 of the casing 41, completing the closing operation of the housing 40.

[0034] End covers 68 provided with contours 69 facing the casing 41 are fixed at the ends of the load bar 42, and the end plates 2 comprise on their inner side, i.e. on the side opposite to the support piece 1, in addition to the mentioned articulated fixing projection 22 (Figures 2 and 7), ramps 67 adapted to cooperate with said contours 69 of the end covers 68 of the load bar, such that in the final stage of the closing operation of the casing 40 shown in Figure 15C, the cooperation of said ramps 67 with the contours 69 contributes to accurately driving the approaching movement of the load bar 42 until the final coupling of the first and second coupling configurations 51, 53 of the load bar 42 with the first and second coupling edges 52, 54 of the casing 41. In the closed position shown in Figure 15C, the upper front edge 62a of the outer wall 55 of the casing 41 forms a roof protecting the longitudinal opening 50 from the entrance of rainwater.

[0035] Several variations and modifications to the embodiment shown and described will readily occur to those skilled in the art without departing from the scope of the present invention as defined in the attached claims.

Claims

1. An awning housing assembly comprising a support and incline-adjustment device, of the type comprising, for each end of said housing (40):

   a support piece (1) adapted to be fixed in relation to a wall or another structure and provided with a flat portion (66);
   an end plate (2) fixed to the corresponding end of the housing (40) to laterally close it, and coupled to said support piece (1) such that it can rotate in relation to an axis, said end plate (2) having a recessed zone (8) formed around said rotation axis and adapted to house said flat portion (66) of the support piece (1);
   angular position adjustment means comprising, in at least one of the ends of the housing (40), a toothed wheel (3) and rack (4) mechanism actuated by a screw (5) to change the angular position of said end plate (2) in relation to the support piece (1); and
   locking means for locking said end plate (2) in relation to the support piece (1) in a selected angular position,

   characterized in that a sector of said toothed wheel (3) is formed in a peripheral edge (47) of said flat portion (66) of the support piece (1), and said rack (4) is formed in a sliding piece (12) housed together with said screw (5) in a cavity (7) of the end plate (2).

2. An assembly according to claim 1, **characterized in that** the end plate (2) comprises a step (48) delimiting said recessed zone (8), said cavity (7) being formed in a non-recessed part (49) and communicated with said recessed zone (8) by a passageway (9) through said step (48), said toothed wheel sector (3) of the support piece (1) being meshed with the rack (4) through said passageway (9).

3. An assembly according to claim 2, **characterized in that** said sliding piece (12) comprises a threaded through hole (13) in which the screw (5) is coupled and the cavity (7) defines a head stop (14) next to a head (15) of the screw (5) and an end stop (16) next to a final end (17) of the screw (5), said head stop (14) and end stop (16) being arranged to axially lock the screw (5) in the cavity (7).

4. An assembly according to claim 3, **characterized in that** the end plate (2) comprises a passage (19) communicating the cavity (7) with an outer edge of said one non-recessed part (49), the head (15) of the screw (5) being able to be accessed from the

outside through said passage (19).

5. An assembly according to claim 3, **characterized by** comprising an inner cover (39) adapted to be fixed to the non-recessed part (49) of the end plate (2), covering the cavity (7) to retain the screw (5) and the sliding piece (12) in the cavity (7).

6. An assembly according to claim 1, **characterized in that** said peripheral edge (47) of the flat portion (66) of the support piece (1) has a circumference arch shape concentric with the rotation axis, and the mentioned step (48) delimiting the recessed zone (8) of the end plate (2) also has a circumference arch shape concentric with the rotation axis, the peripheral edge (47) being facing and close to the step (48).

7. An assembly according to claim 1, **characterized in that** it comprises, for each end of the housing (40), an anchoring piece (32) adapted to be fixed to a wall or another structure, and the support piece (1) comprises, at an upper part, at least one engaging configuration (30) adapted to engage in a corresponding rib (31) formed in said anchoring piece (32) and, at a lower part, an appendage (34) provided with at least one opening (33) for the passage of a screw intended to be screwed in a nut trapped in a housing (35) of the anchoring piece (32).

8. An assembly according to claim 1, **characterized in that** the housing (40) comprises a casing (41) fixed at its ends to the end plates (2) and adapted to house a winding tube (25) with a canvas (26) wound thereon, said casing (41) having a longitudinal opening (50) allowing the passage of said canvas (26); and a load bar (42) fixed to a front edge of said canvas (26); and folding arms (24) having proximal ends articulated with the end plates (2) and distal ends articulated with said load bar (42), the load bar (42) being adapted to be coupled to the casing (41) in a folded awning situation, closing said longitudinal opening (50) and covering said folding arms (24), the load bar (42) comprising a longitudinal fixing configuration (64) adapted to fix said front edge of the canvas (26); a first longitudinal coupling configuration (51) adjacent to said fixing configuration (64) and adapted to be coupled to a first longitudinal coupling edge (52) of the casing (41); and a second longitudinal coupling configuration (53) arranged at a distance from said first coupling configuration (51) and adapted to be coupled to a second longitudinal coupling edge (54) of the casing (41), said first and second coupling configurations and edges (51, 52, 53, 54) being arranged such that, during an action for closing the housing by winding the canvas (26), the second coupling configuration (53) of the load bar (42) is first coupled to the second coupling edge (54) of the casing (41), forming a fulcrum line around which the load bar (42) can rotate due to a pulling force exerted by the canvas (26) on the fixing configuration (64) until the first coupling configuration (51) is coupled to the first coupling edge (52) of the casing (41).

9. An assembly according to claim 8, **characterized in that** the load bar (42) defines an inner hollow facung the winding tube (25), said hollow being able to at least partly house the folding arms (24) in said folded awning situation.

10. An assembly, according to claim 9, **characterized in that** the casing (41) comprises an outer wall (55) surrounding the winding tube (25) and the canvas (26) at the upper, lower and rear sides, and a partition wall (56) surrounding the winding tube (25) and the canvas (26) at the front side except in the area of the longitudinal opening (50), said partition wall (56) being placed between the canvas (26) wound on the winding tube (25) and the folding arms (24) in the folded awning situation.

11. An assembly according to claim 10, **characterized in that** the first coupling edge (52) of the casing (41) is formed at a free upper edge of said partition wall (56) close to an upper front edge (62a) of said outer wall (55) and separated from it by said longitudinal opening (50), and the second coupling edge (54) of the casing (41) is formed at a lower front edge (62b) of said outer wall (55).

12. An assembly according to claim 11, **characterized in that** the load bar (42) comprises an externally convex closing wall (58) defining said inner hollow and having an upper rear edge (70a) in which the first coupling configuration (51) of the load bar (42) is located and a lower rear edge (70b) in which the second coupling configuration (53) of the load bar (42) is located.

13. An assembly according to claim 10, **characterized in that** at least part of said outer wall (55) of the casing (41) is a double wall forming one or more chambers (57) therein.

14. An assembly according to claim 10, **characterized in that** inner surfaces of the outer wall (55) and of the partition wall (56) opposing the winding tube (25) and the canvas (26) include a coating of a plastic material with a low friction coefficient.

15. An assembly according to claim 12, **characterized in that** it comprises at least one reinforcing part (63) internally fixed to the closing wall (58) of the load bar (42), forming a strut (65) between an upper part and a lower part of the closing wall (58).

16. An assembly according to claim 12, **characterized by** comprising positioning parts (59) internally fixed to the closing wall (58) of the load bar (42) and defining slots (60) to keep the folding arms (24) in a predetermined position in the folded awning situation and slides (61) to direct the folding arms (24) in a sliding manner up to said slots (60) during a closing operation of the housing.

17. An assembly according to claim 8, **characterized in that** the casing (41) is formed from at least one extruded profile of a lightweight metal material.

18. An assembly according to claim 17, **characterized in that** the casing (41) is formed from two extruded profiles (4 1 a, 4 1 b) of a lightweight metal material longitudinally connected to one another.

19. An assembly according to claim 8, **characterized in that** the load bar (42) is formed from at least one extruded profile of a lightweight metal material.

20. An assembly according to claim 8, **characterized in that** the end plate (2) comprises, on a side opposite to the support piece (1), ramps (67) adapted to cooperate with contours (69) of end covers (68) fixed to the ends of the load bar (42).

21. An assembly according to claim 1, **characterized in that** it comprises an outer cover (27) having a first portion (27a) adapted to be fixed to a peripheral configuration (28) of the end plate (2) and a second portion (27b) adapted to cover part of the support piece (1).

22. An assembly according to claim 21, **characterized in that** said second portion (27b) of the outer cover (27) has a circular contour concentric with the rotation axis and can rotate in relation to the support piece (1) when the end plate (2) changes its angular position in relation to the support piece (1).

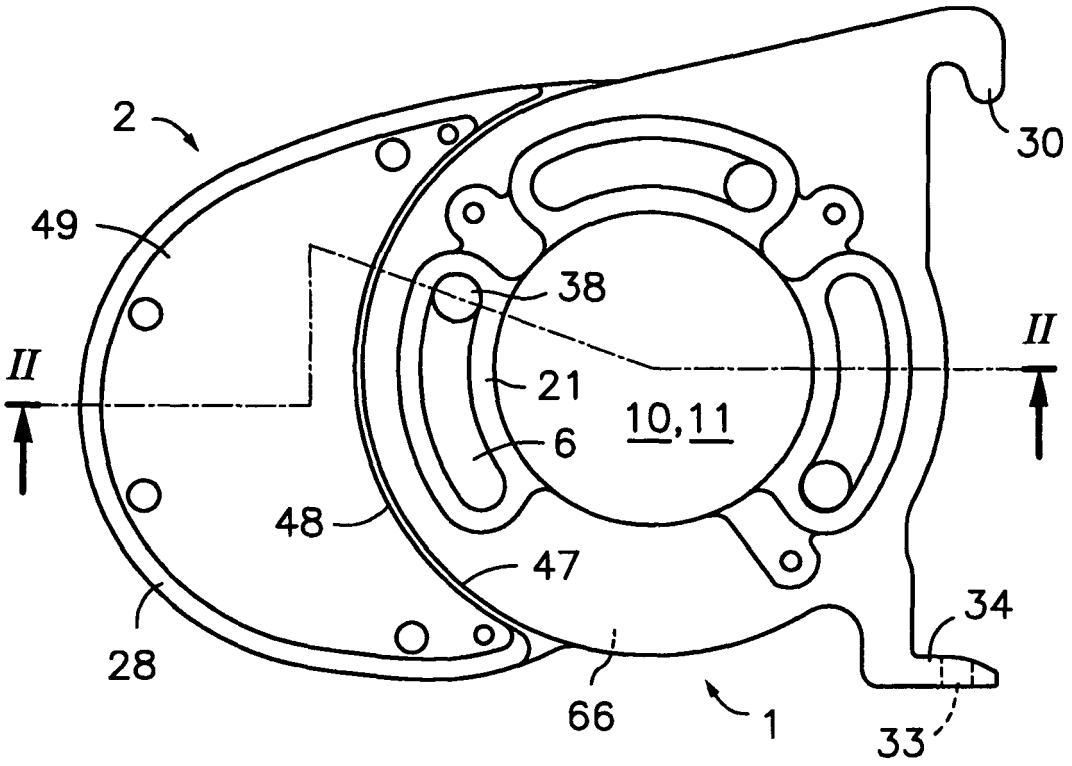
2
30
49
38
II
II
21
10,11
6
48
47
34
28
66
1
33

Fig. 1

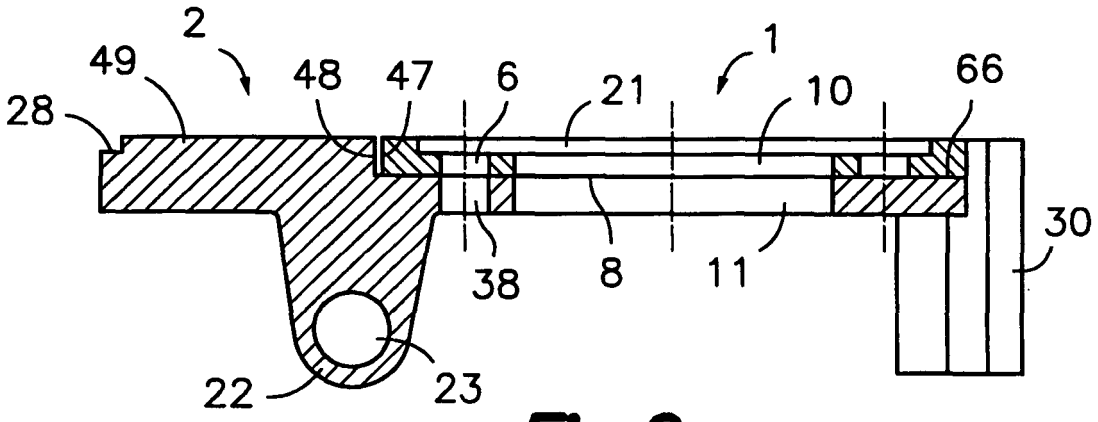
2
1
49
48
47
6
21
10
66
28
30
38
8
11
22
23

Fig. 2

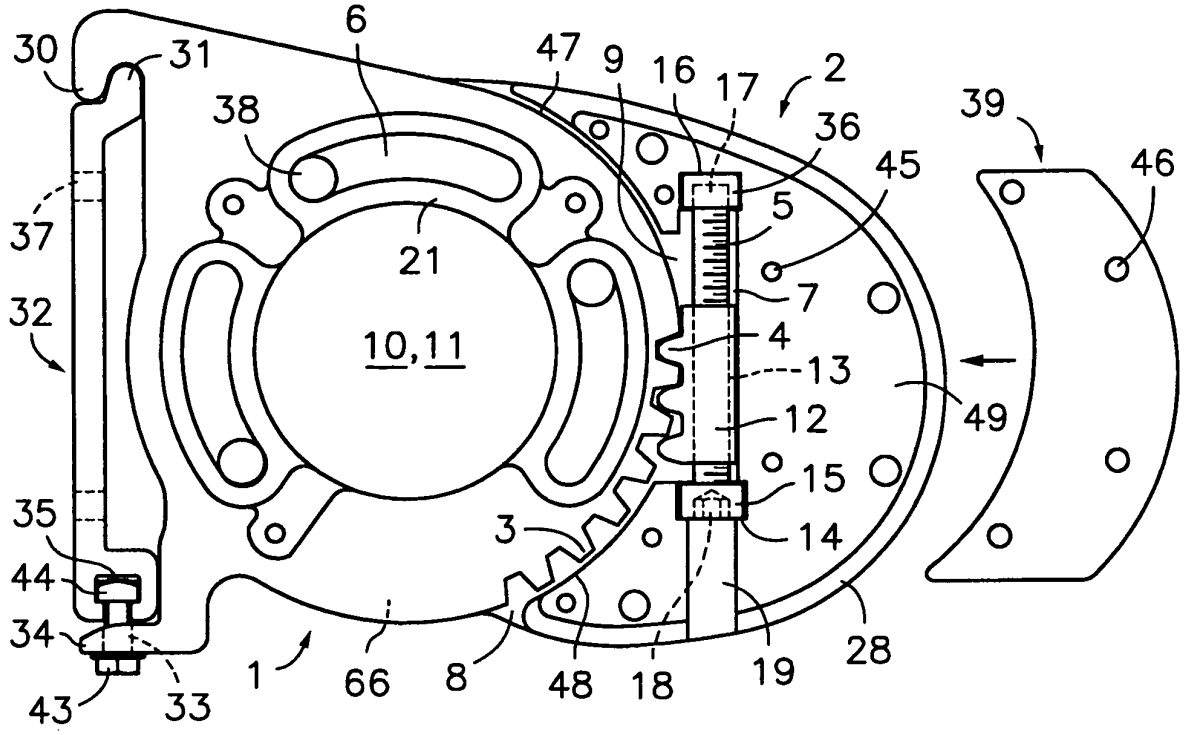

Fig.3

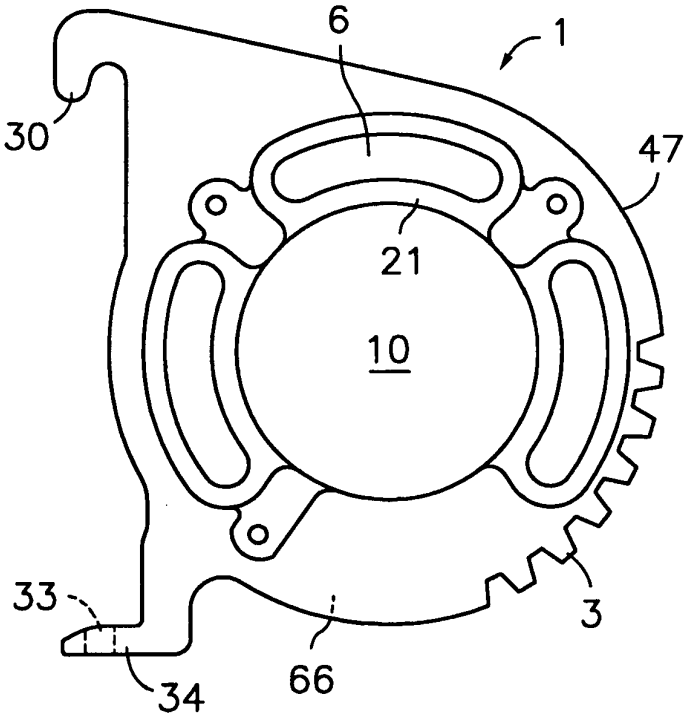

Fig.4

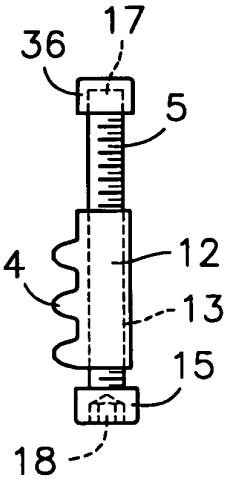

Fig.5

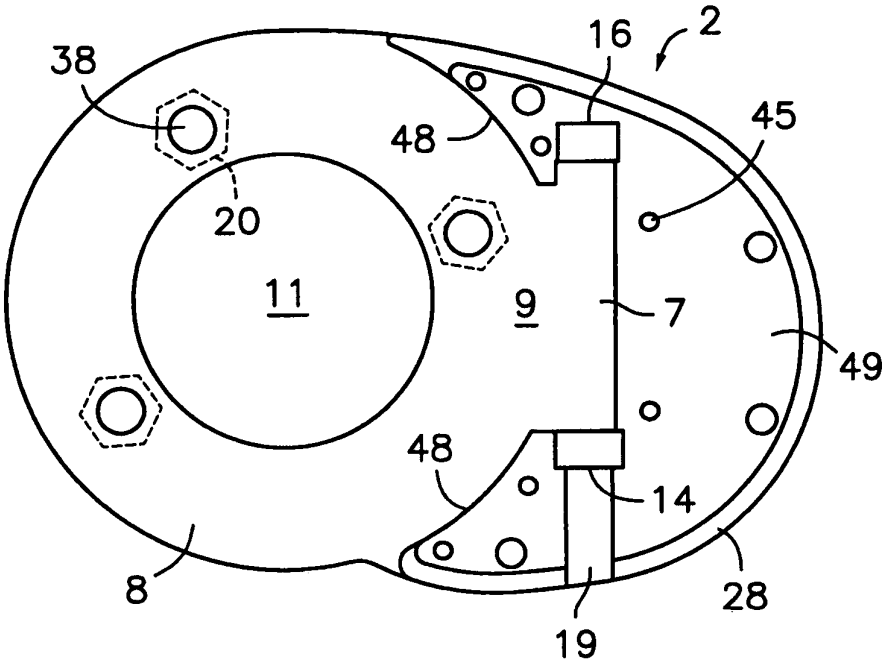

Fig.6

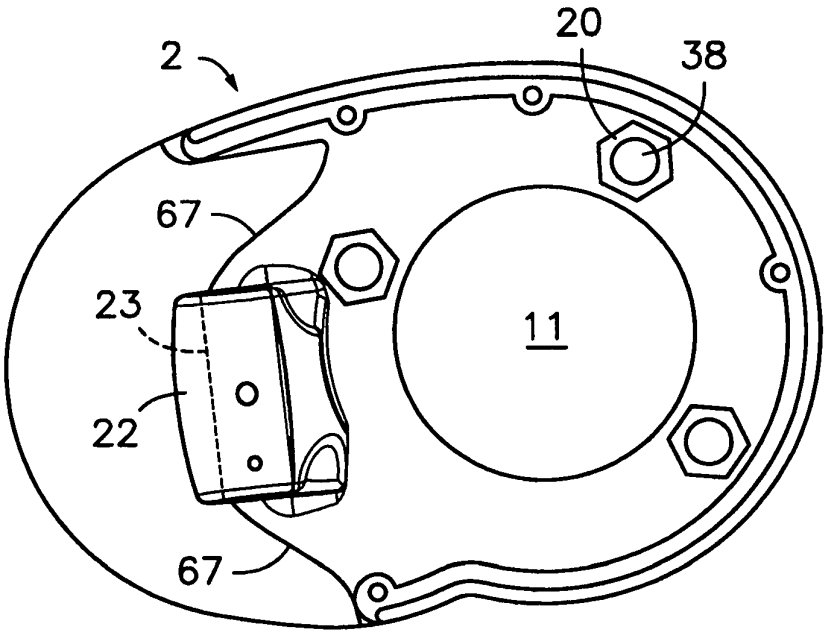

Fig.7

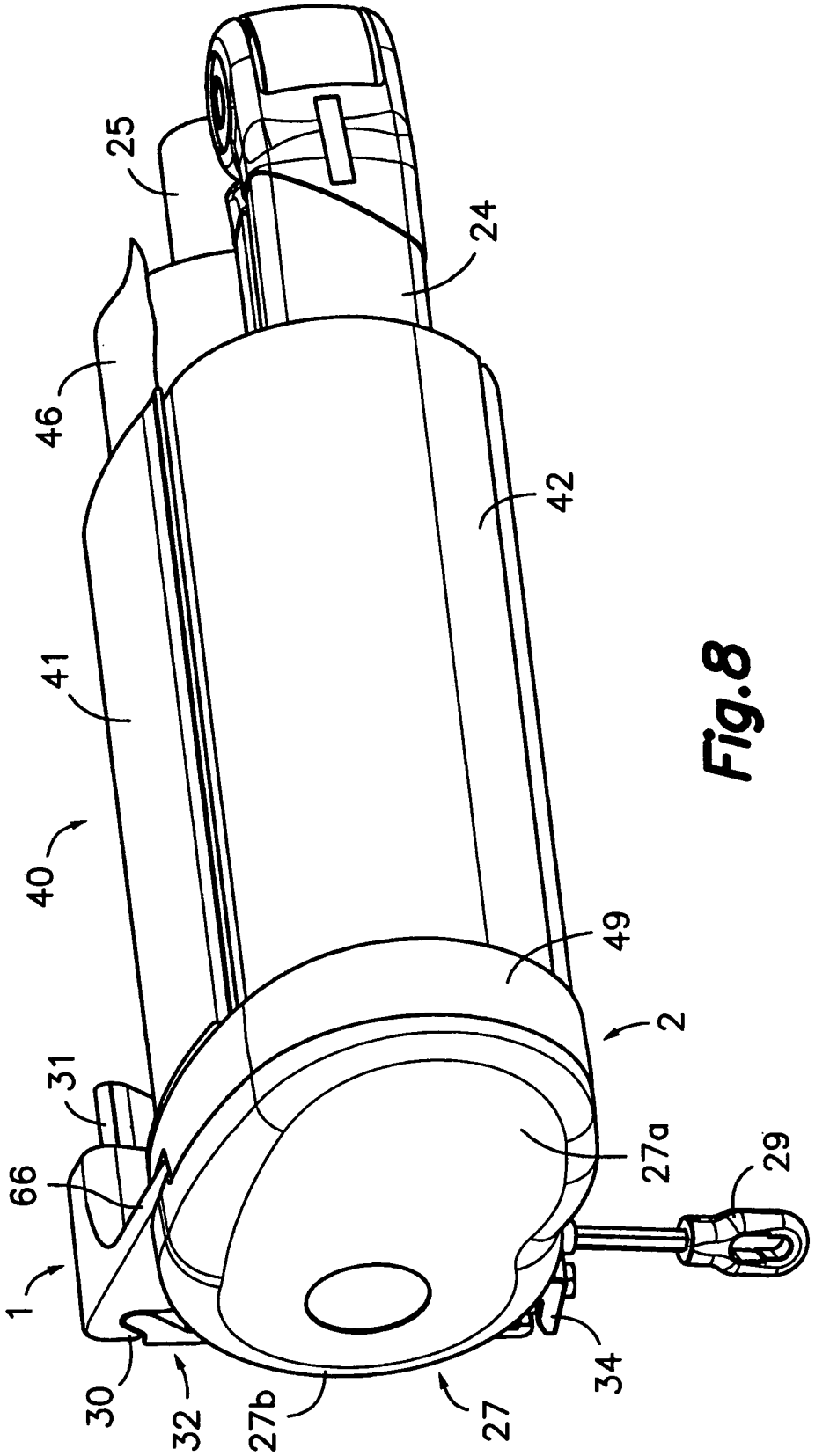

Fig.8

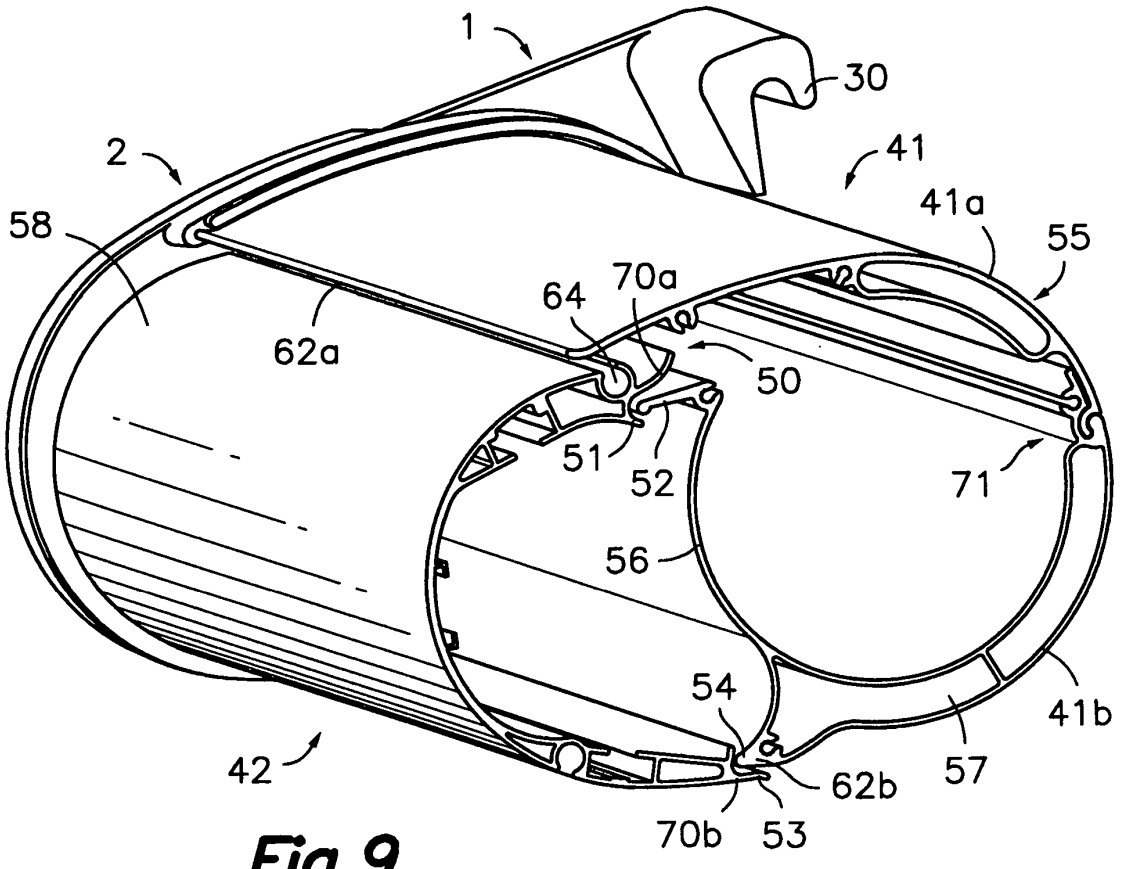

Fig.9

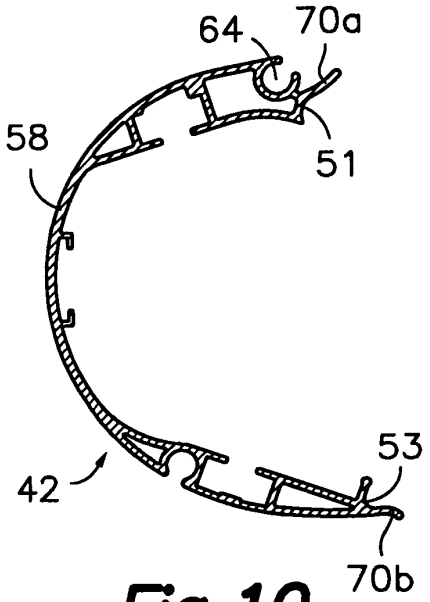

Fig.10

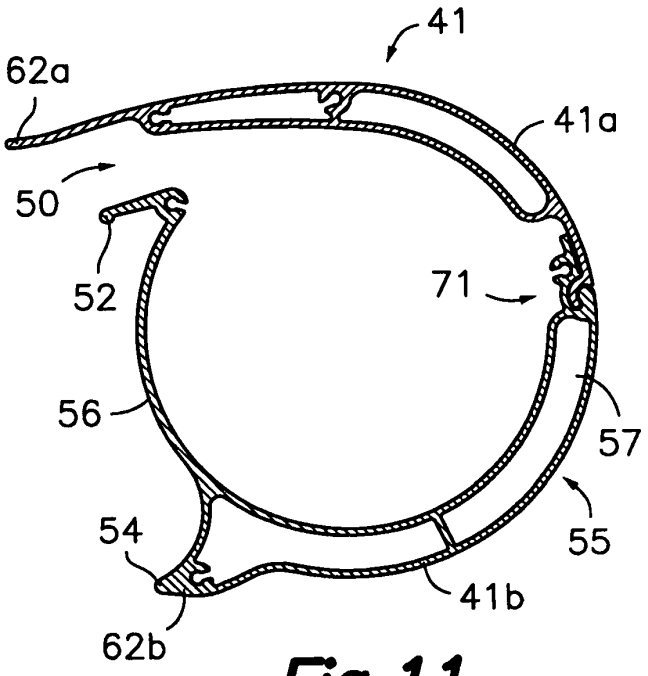

Fig.11

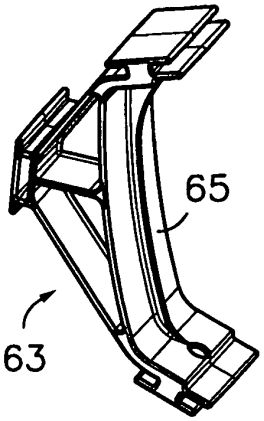

Fig. 12

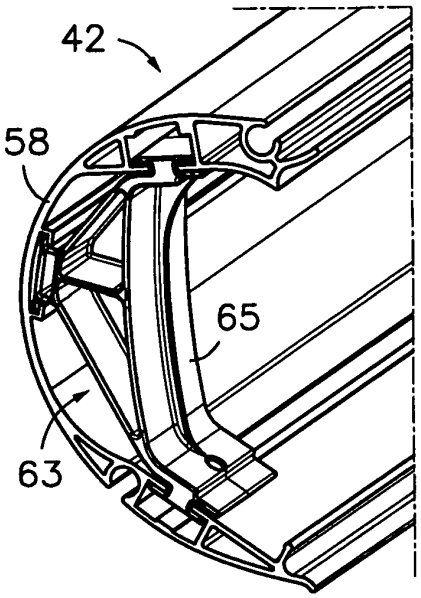

Fig. 13

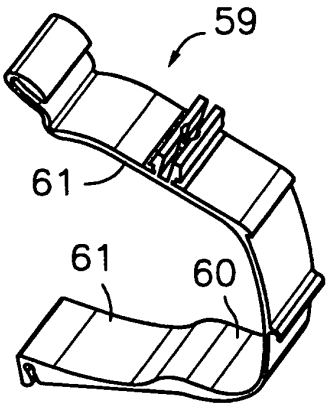

Fig. 14

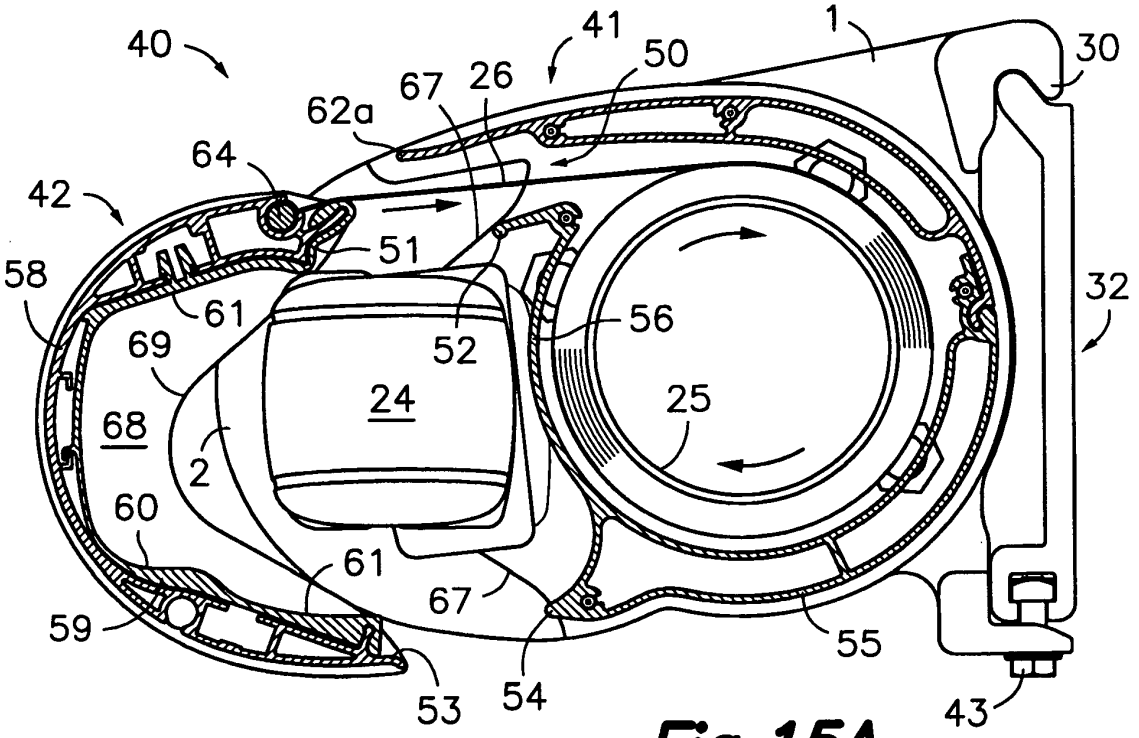

Fig. 15A

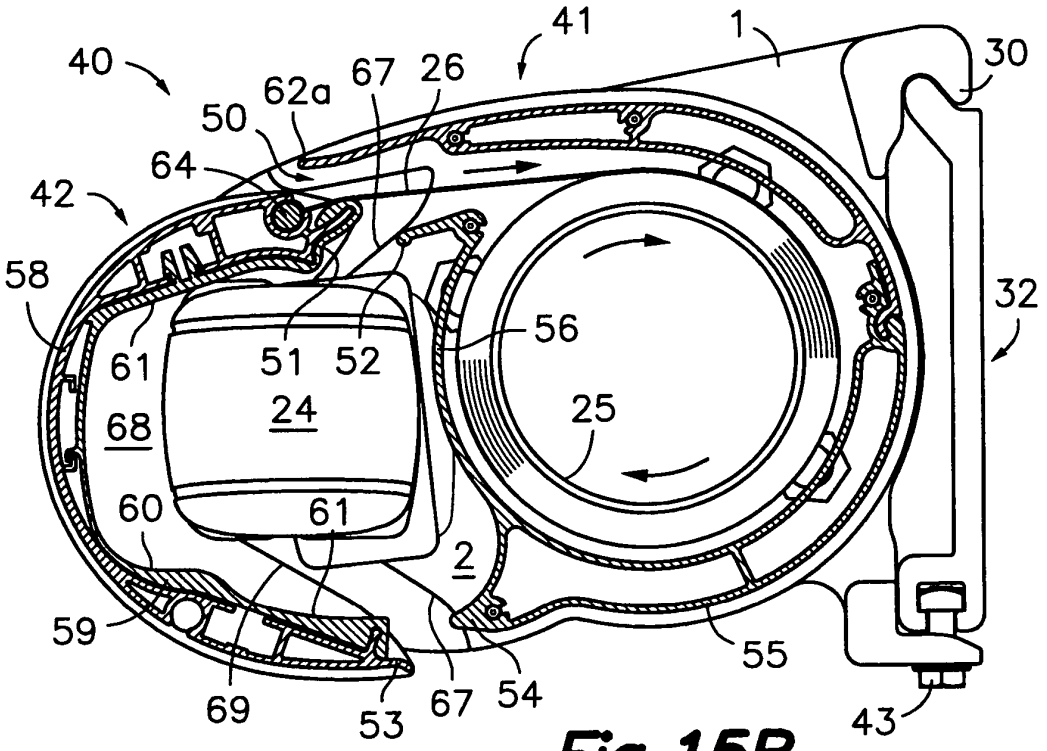

Fig. 15B

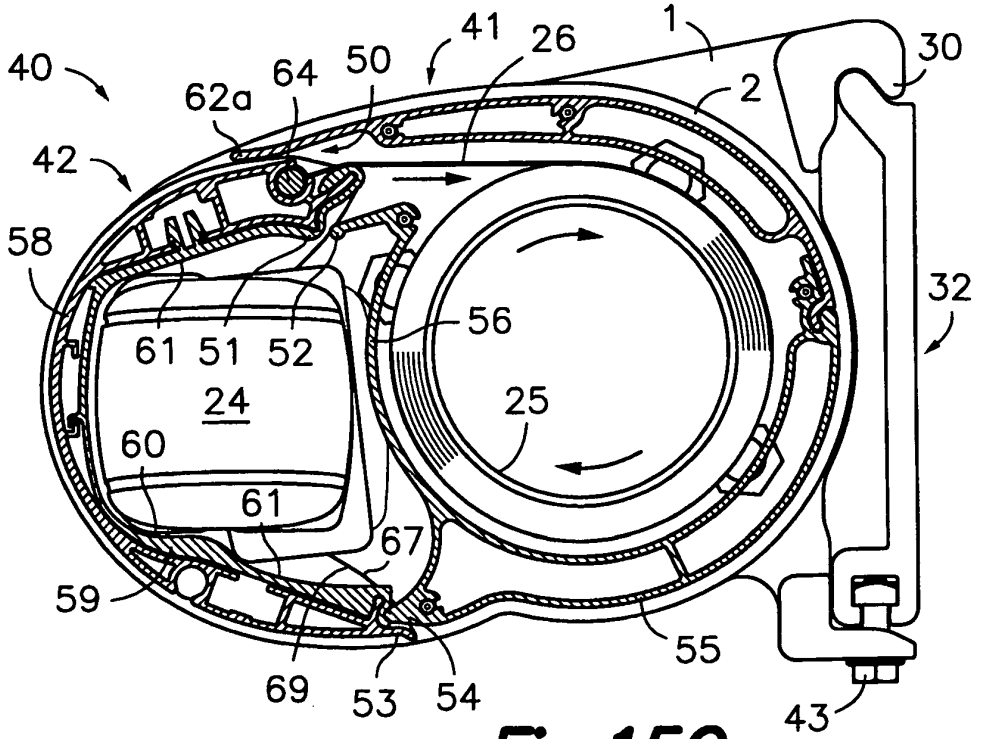

Fig. 15C

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2005/000331

A. CLASSIFICATION OF SUBJECT MATTER

CIP[7] E04F10/06

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)

CIP[7] E04F10+

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)

CIBEPAT,EPODOC,WPI,PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP1479846 A (LLAZA SA) 2004.11.24; column 5, line 39 - column 9, line 14; **abstract** y **drawings**	1-7, 20-22
A	FR2759402 A (MITJAVILA SA) 1998.08.14; page 3, line 20 - page 5, line 12; **abstract** y **drawings**	1-7
A	DE20120786 U (SCHOENE KG ROBERT) 2003.05.08; **all the document**	1-7
A	US2002069608 A (KRONER SVEN ; WESSELS BERNHARD) 2002.06.13; **all the document** .	

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
(03.10.2005)	(05.10.2005)
Name and mailing address of the ISA/	Authorized officer
Facsimile No.	Telephone No.

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2005/000331

EP 1479846 A	24.11.2004	EP 20030380120	19.05.2003
FR2759402 A B	14.08.1998	**NONE**	
DE20120786 U	08.05.2003	**NONE**	
US 2002069608 A	13.06.2002	DE 10061820 A	13.06.2002
		EP 1215349 A	19.06.2002
		EP 20010127796	22.11.2001
		JP 2002188263 A	05.07.2002
		CN 1358918 A	17.07.2002

Form PCT/ISA/210 (extra sheet) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 03380120 A **[0003]**