



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 120 539 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
01.08.2001 Bulletin 2001/31

(51) Int Cl.7: **E06B 9/70**

(21) Application number: **01101522.9**

(22) Date of filing: **24.01.2001**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(71) Applicant: **Fogolin, Paul**
35020 Ponte S. Nicolò (PD) (IT)

(72) Inventor: **Fogolin, Paul**
35020 Ponte S. Nicolò (PD) (IT)

(30) Priority: **25.01.2000 IT VE000003**

(74) Representative: **Piovesana, Paolo**
Corso del Popolo, 70
30172 Venezia-Mestre (IT)

(54) **Actuator for roller shutters**

(57) An actuator for roll shutters, comprising an electric motor (2) with stator (6), rotor (4) and electronic control unit (12), and a reduction gear (16), of which the entry is connected to said rotor (4) and the exit is connectable to the shaft (10) of the roll shutter, characterised in that the electric motor (2) is of stepping type and

has an overall size substantially such as to enable it to be housed, together with the electronic control unit (12), in a box support for the roll shutter shaft (10), and it having fixed to its exit shaft (18) a dragging member (20) to be inserted into the roll shutter shaft and be rotationally coupled to it.

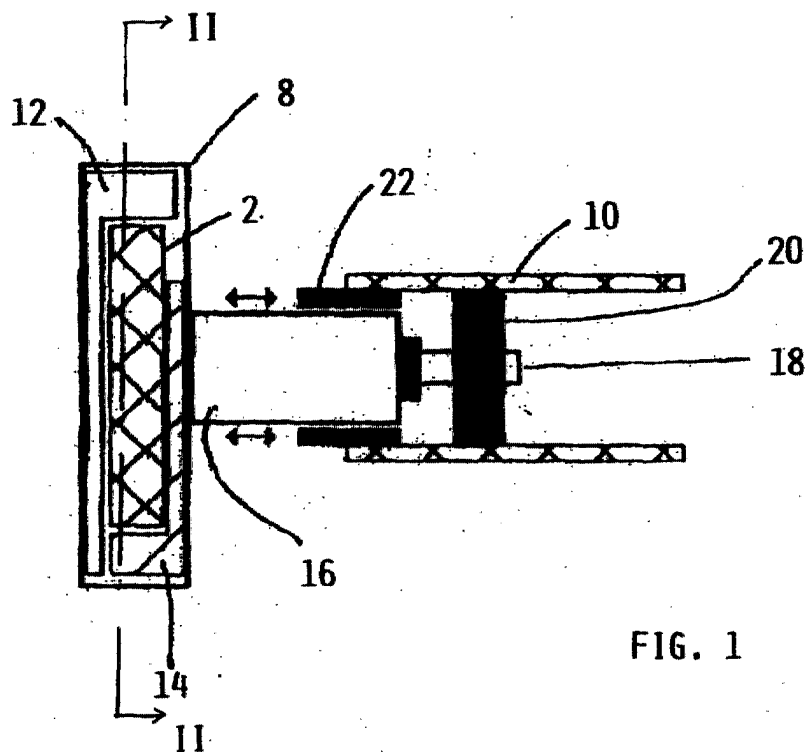


FIG. 1

EP 1 120 539 A2

Description

[0001] This invention relates to an actuator for roll shutter.

[0002] Geared motors for roll shutters are known. They comprise an electric motor, a reduction gear mechanically coupled to the rotor of the electric motor, means for coupling the exit shaft of the reduction gear to the winding shaft of the roll shutter, members for adjusting the end-of-travel positions of the roll shutter and an electric brake for the motor, to ensure stability of the roll shutter in any position.

[0003] Known geared motors for roll shutters are generally inserted into the hollow winding shaft of the roll shutter and have their exit shaft mechanically coupled to this latter, which at one end is supported on an idle support fixed to the structure of the shutter unit and at the other end is supported by said geared motor, which in its turn is fixed to the structure of the shutter unit.

[0004] In actuators of the most recent type, the supports for the roll shutter shaft are of box type and have a very small thickness (about 25 mm), but notwithstanding this, mounting the actuator on the shaft of the roll shutter does not represent a problem as this is generally done in the factory. However if the need arises to remove the actuator from the roll shutter shaft, this operation is in most cases fairly laborious because it requires the complete removal of the shaft from its supports, in order to then be able to axially withdraw the actuator from said shaft.

[0005] An object of the invention is to eliminate these drawbacks in order to be able to easily remove the actuator from the winding shaft of the roll shutter, without having to completely remove the shaft from its supports and without having in practice to release the roll shutter from the shaft.

[0006] This and other objects which will be apparent from the ensuing description are attained, according to the invention, by an actuator for roll shutters as described in claim 1

[0007] A preferred embodiment of the invention is described in detail hereinafter with reference to the accompanying drawings, in which:

Figure 1 is a schematic partial longitudinal section through an actuator of the invention coupled to the shaft of a roll shutter, and

Figure 2 is a cross-section therethrough on the line II-II of figure 1.

[0008] As can be seen from the figures, the actuator of the invention can be ideally divided into two parts. The first part consists of an electric motor 2 of stepping type, with a rotor 4 and stator 6, both housed in a box support 8, traditionally used to secure the roll shutter shaft 10 to the structure of the shutter unit.

[0009] Said box support 8 also houses the electronic control unit 12 for the actuator, and a release member

14. The box support 8 can also house the receiver apparatus for adjusting via radio the electronic travel limit switches for the motor 2.

[0010] The second part 16 of the actuator of the invention is of cylindrical form and constitutes the reduction gear, which has its casing mechanically secured to the casing of the electric motor 2, its entry shaft secured to the rotor 4, and its exit shaft 18 emerging from that end distant from the electric motor 2 and carrying fixed thereon a dragging wheel 20. This is interchangeable with others of different shape corresponding to the different cross-sections of the hollow roll shutter shafts available commercially.

[0011] The casing of the reduction gear 16 idly supports a support ring 22 which can be inserted, together with the dragging wheel 20, into the hollow roll shutter shaft 10 so that it rotatingly engages it, and at the same time is able to undergo limited axial sliding along the casing of the reduction gear.

[0012] The actuator of the invention is mounted by inserting its reduction gear 16 into the roll shaft 10 until the support ring 22 and the dragging wheel 20 have become rotatingly engaged with it. Given the limited axial length of that actuator part which can be inserted into said shaft 10, this insertion requires only small free distance external to the shaft, so that the shaft can remain secured at its other end to its traditional support and can also be slightly inclined, without the roll shutter having to be released.

[0013] When the actuator has been inserted into the shaft 10, the actuator can be fixed to the structure of the shutter unit by sliding the box support 8 along the guides (not shown) rigid with the structure, i.e. with a short horizontal movement perpendicular to the axis of the shaft 10. On terminating this movement, the end of the roll shutter shaft 10 will still be spaced from the box support 8.

[0014] Having completed the installation and made the necessary connections to the electricity supply, the actuator can be subjected to the usual travel limit switch adjustment, after which it is able to operate normally.

[0015] If the actuator is to be removed, the box support 8 for the motor 2 is firstly slid off the respective guides, this sliding being facilitated by the axial mobility of the reduction gear 16 relative to the support ring 22 and by the consequent capability of the box support 8 to be moved towards the shaft 10. After the box support 8 has been withdrawn from its guides and the shaft 10 has been inclined from its working position, the actuator is withdrawn axially from the shaft 10, without this having to be removed from the support which supports it at its other end and without the roll shutter having to be released.

[0016] In the case of a temporary failure in the electricity supply, the release member 14 can be operated, this being positioned external to the roll shutter shaft 10 and hence easily accessible from the outside.

[0017] By using a stepping motor of overall dimen-

sions such as to enable it to be housed inside a traditional box support for a roll shutter shaft, the actuator of the invention is particularly advantageous, and in particular:

- eliminates the power factor correction capacitor necessary in traditional induction motors, with consequent reduction in overall size,
- enables overall size to be further reduced because of the greater efficiency of a stepping motor compared with an induction motor,
- eliminates the need for a brake to lock the roll shutter motor when the motor is at rest,
- reduces the actuator cost because of the elimination of the motor locking system and because of a reduction in the copper quantity and rotating mass necessary in normal induction motors to achieve equal power,
- enables the motor to be powered by and be fixed directly on the printed circuit of the electronic unit which controls not only its operation but also the electronic travel limit switch settings and its command, which can be of radio or serial or manual type,
- enables the actuator to be replaced very quickly and easily, without having to release the roll shutter from its winding shaft.

motor (2) also houses a release member (14).

- 5 5. An actuator as claimed in claim 1, characterised in that the support ring (22) has axial mobility relative to the casing of the reduction gear (16).
6. An actuator as claimed in claim 1, characterised in that the dragging member (20) and the support ring (22) are of interchangeable type.

Claims

1. An actuator for roll shutters, comprising an electric motor (2) with stator (6), rotor (4) and electronic control unit (12), and a reduction gear (16), of which the entry is connected to said rotor (4) and the exit is connectable to the shaft (10) of the roll shutter, characterised in that the electric motor (2) is of stepping type and has an overall size substantially such as to enable it to be housed, together with the electronic control unit (12), in a box support for the roll shutter shaft (10), the reduction gear (16) being of cylindrical form, it supporting with its casing an idle ring (22) to be axially inserted into the roll shutter shaft (10), and it having fixed to its exit shaft (18) a dragging member (20) to be inserted into the roll shutter shaft and be rotationally coupled to it.
2. An actuator as claimed in claim 1, characterised in that the casing of the electric motor (2) houses the electronic travel limit switches in its interior.
3. An actuator as claimed in claim 2, characterised in that the box support (8) which houses the electric motor (2) also houses a receiver for the radio adjustment of the electronic travel limit switches.
4. An actuator as claimed in claim 2, characterised in that the box support (8) which houses the electric

