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(11) **EP 1 116 848 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.07.2001 Bulletin 2001/29

(51) Int Cl.7: **E05F 11/48, E05F 15/16**

(21) Application number: **01100056.9**

(22) Date of filing: **10.01.2001**

(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

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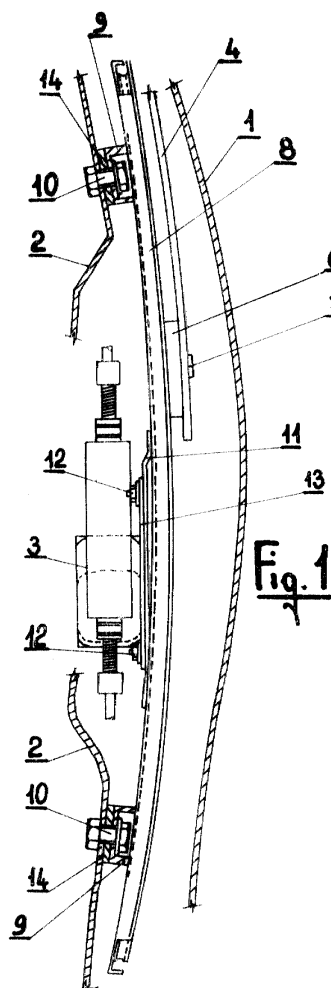
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(30) Priority: **14.01.2000 IT GE000002 U**

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(54) **Vehicle cable operated window regulator, with the geared motor secured to the window guide rail**

(57) Cable operated window regulator (5) driven by a geared motor (3) and fitted with a section (8) to guide the slider (6) moving the glass or crystal pane (4), the geared motor (3) being fixed to the guiding section (8) instead of inside of the inner door plate (2), whereas the devices (9) securing the guide (8) on the inner surface of the internal door plate (2) are provided with vibration dampers (14) to dampen the vibrations caused by the geared motor (3).



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Description

[0001] Nowadays, the windows of automobiles, trucks, vans and other automotive vehicles have mobile panes electrically operated to ventilate the vehicle.

[0002] According to normal solutions, the window panes are vertically sliding by means of a window regulator located inside the car door and driven by an electric geared motor secured on the inside of the inner door plate.

[0003] Unfortunately, this arrangement causes problems during assembly and noise problems due the vibrations caused by the geared motor which, as explained above, is directly secured inside the doorplate.

[0004] These known window regulators are single or double guide type.

[0005] This invention has the aim to reduce or eliminate the abovementioned drawbacks deriving from the fact that the geared motor is fastened to the inner doorplate.

[0006] According to a first solution of the invention, the geared motor casing is welded to a suitable plate which is anchored by suitable fittings to a counter plate directly welded to the slide guide along which the windowpane moves. This guide in turn is fixed inside the inner doorplate by anchor plates or U-bolts suitably mounted on the inner doorplate. In this way, the geared motor is independent of the inner doorplate, while greatly reducing or eliminating the afore said drawbacks. A second solution is also considered by this invention, by which the plate welded to the geared motor casing is directly fixed without counter plate, to the slide guide along which the windowpane moves, thus further simplifying the installation of the window regulator.

[0007] According to this invention, proper vibration dampers in elastic material may be provided, to be positioned between the U-bolts or the plates anchoring the slide guide to the inner plate of the vehicle; so as further to dampen the vibration noise produced by the geared motor.

[0008] The invention is illustrated for exemplification purposes in the attached drawing, in which:

Fig. 1 shows a vertical section of an exemplified car door provided with a window regulator according to a first solution of this invention,

Fig. 2 shows a front view from inside the vehicle illustrated in Fig. 1,

Fig. 3 shows a partial vertical section of a window regulator according to another solution of this invention.

[0009] With reference to these Figures, 1 refers to the outer door plate of an automotive vehicle, while 2 refers to the inner plate of this door.

[0010] The window regulator, as it is commonly known, consists of a geared motor 3, a sheathed cable 5 controlled by the geared motor, a slide 6 moved by the

cable 5 and a guide section 8 of the slide 6, fitted with a pin 7 which by entering a hole in the window, causes the window pane to slide along the guide section 8. This guide section 8 is secured on the inside of the inner door plate 2, by U-bolts or anchor plates 9 properly fastened by means of locking devices 10 of various nature, as generally known.

[0011] Obviously, the operation system by means of the pin 7 of the slide 6 may also be achieved by hooking up the glass pane with other means properly mounted on the slide.

[0012] According to a first solution of this invention, a plate 13 is welded onto the body or casing of the geared motor 3; while a counter plate 11, matching the plate 13 of the geared motor 3, is mounted in a suitable, almost central position of the guide section 8. This counter plate 11 is welded on the outside of the guide section 8.

[0013] The plate 13 and counter plate 11 are connected together by proper jointing devices 12, such as screws, bolts or other means.

[0014] The geared motor is thus secured to the guide section 8, which in turn is mounted on the inside of the inner door plate 2 thus reducing vibration noise propagation as compared with the known solution by which the geared motor is directly fitted to the inner door plate 2.

[0015] As a better guarantee against vibration noise, the devices 10, blocking the U-bolts 9 inside the inner door plate 2, are fitted with proper vibration dampers 14 in suitable soft and elastic material.

[0016] In another exemplifying implementation, the plate 13 is directly fastened by means of connecting devices 15, as bolts, on the guide section 8 of the glass pane 4, thus further simplifying the arrangement of the window regulator, while ensuring that the connecting devices 15 of the plate 13 on the guide section 8 will not hinder the movement of the slide 6 in the guide section 8.

[0017] The implementation example of the invention, according to the drawing, refers to a window regulator with one guide section, and it is obvious that it is also possible to provide the device with two guide sections and two slides driven by the same geared motor which may be fastened, as said before, to either guide.

Claims

1. Cable operated window regulator for automotive vehicles consisting of a geared motor (3), a cable (5) operated by the geared motor, a slider (6) moved by the above cable (5) and a guide section (8) of the slider (6), this slider (6) being fitted with a device (7) to hook up the window pane (4) and to move the pane according to shape of the guide section (8), this guide section (8) being fixed on the inside of the inner door plate (2) by means of U-bolts or anchor plates (9) suitably fastened by locking devices (10) which may be of various nature, characterized in

that a plate (13) is welded to the body or casing of the geared motor (3) and secured with suitable connecting devices (12) to a counter plate (11), welded in a suitable almost central position, to the guide sections (8) or the plate (13) being fastened directly by connecting devices (15) to the guide section (8) moving the glass pane (4) so as to reduce vibration noise propagation caused by the geared motor located inside the car door.

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2. Window regulator as described in claim 1, characterized in that the devices (10) blocking the U-bolts (9) of the guide (8) inside the inner door plate (2) are fitted with vibration dampers (14) in suitable soft and elastic material.
3. Window regulator as described in claim 1, characterized in that the connecting or blocking devices (10, 12, 15) are screws or bolts or any other known appropriate assembling device.
4. Window regulator as described in claim 1, characterized in that it may be equipped with two instead of one guide section (8), the sliders (6) being driven by one single geared motor (3) which is secured to either guide section (8).

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