

12 **EUROPEAN PATENT APPLICATION**

21 Application number: **86830274.6**

51 Int. Cl. 1: **H 01 H 13/12**

22 Date of filing: **01.10.86**

30 Priority: **03.10.85 IT 2332085 U**

71 Applicant: **CAVIS CAVETTI ISOLATI S.p.A., Via Roma, 31, I-15023 Felizzano (Alessandria) (IT)**

43 Date of publication of application: **06.05.87**
Bulletin 87/19

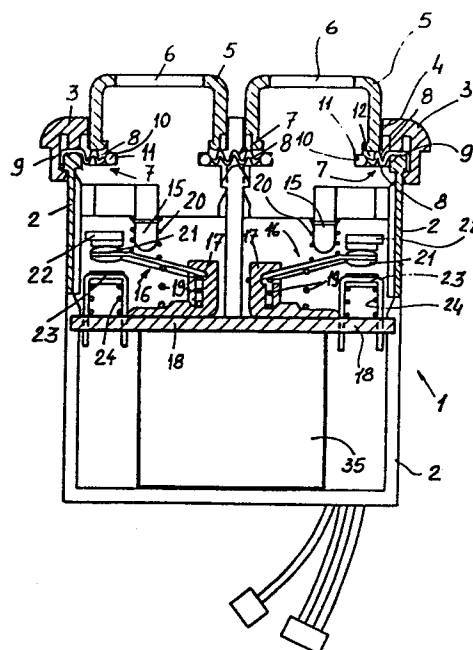
72 Inventor: **Codrino, Giuseppe, Via Stazione, 2, I-15028 Quattordio (Alessandria) (IT)**

84 Designated Contracting States: **DE ES FR GB**

74 Representative: **Cicogna, Franco, Ufficio Internazionale Brevetti Dott. Prof. Franco Cicogna Via Visconti di Modrone, 14/A, I-20122 Milano (IT)**

54 **A switch structure, particularly for motor vehicle electric window winders.**

57 A switch structure for motor vehicle electric window winders comprises a box-shape body closed at the top by a frame which defines seatings for housing a plurality of push buttons acting by contact on a rigid, electrically conductive movable blade, pivoted at one end to a fixed contact, provided on a printed circuit and connected to a motor, and, at the other end, movable between a fixed negative contact and a movable positive contact.



- 1 -

"A switch structure, particularly for motor vehicle electric window winders"

The present invention relates to a switch structure,
5 particularly for motor vehicle electric window winders.

As is known, electric window winders currently used on motor vehicles and the like have an actuating motor which is controlled by means of switches which are
10 provided within the motor vehicle.

Actuation can be either manual or automatic according to the fact that the complete raising, or closure, of the window may be effected by maintaining the switch
15 actuated, or possibly by means of a single pulse, exerted on the switch itself.

With switches of the known art, currently available on the market, there are encountered considerable problems
20 both as far as their constructional complexity is concerned and as far as their operating reliability is concerned, and in particular, there are encountered difficulties because of the inevitable infiltration of dust and water which, with the passage of time, can
25 create defects in making contacts.

Another disadvantage, attributable to the solutions of

- 2 -

the known art, is moreover, constituted by the fact that the known switches are generally very complicated and, consequently, expensive as far as their assembly is concerned.

5

The object of the invention is that of eliminating the aforementioned disadvantages by providing a switch structure particularly for motor vehicle electrical window winders, which will allow a simplified structure to be obtained with a limited number of component elements whilst having an operation which is always correct and precise.

15

Within the scope of the above explained object, a particular object of the invention is that of providing a switch structure particularly designed for electrical window winders, in which there will be the possibility of having a perfect sealed isolation between the interior of the body of the switch and the exterior, thus preventing damage to the contacts because of infiltrations of any type.

25

Another object of the invention is that of providing a switch which, because of its constructional simplicity, can be utilised both for automatic control and for manual control of the windows, thus being extremely practical and versatile in use.

30

A further object of the present invention is that of providing a switch structure, particularly for electrical window winders, which because of its constructional characteristics, is able to offer the widest guarantees of reliability and security in use.

35

The above explained object, as well as the objects

listed and others which³ will become more clearly
apparent hereinbelow, are achieved, according to the
invention by a switch structure, particularly for motor
vehicle electrical window winders, characterised by the
5 fact that it comprises a box-like body closed at the top
by a frame which defines seatings for housing a
plurality of push buttons contacting respective rigid
movable electrically conductive blade pivoted at one end
to a fixed contact provided on a printed circuit and
10 connected to the motor, and at the other end movable
between a negative fixed contact and a positive movable
contact.

Further characteristics and advantages of the subject of
15 the present utility model will become more clearly
apparent from a study of the detailed description of a
switch structure particularly for motor vehicle
electrical window winders illustrated by way of
indicative, but non-limitative, example, with the aid of
20 the attached drawings, in which:

Figure 1 schematically represents, in section and
in elevation, the structure of the switch according to
the invention;

25 Figure 2 represents the switch seen in plan;

Figure 3 represents a detail of the illumination
lamp within the box-like body.

With particular reference to the numerical symbols of
30 the said Figures, the switch structure particularly for
electrical window winders, which is indicated generally
with the reference numeral 1 comprises a box-like body
2, preferably, but not necessarily, of rectangular
shape, which is closed at the top by a small frame 3
35 which, advantageously, is snap engaged thereon.

-4-

The small frame 3 defines a plurality of seatings 4 for housing a plurality of push buttons 5 for the actuation of the windows.

- 5 The push buttons 5 preferably, but not necessarily, have in their upper part a small plate 6 where there are provided illuminated ideograms which can be made either with polycarbonate or by co-moulding.
- 10 An important peculiarity of the invention is constituted by the fact that the said push buttons 5 are connected to the box-like body 2 with the interposition of sealing means constituted by a seal generally indicated with the reference numeral 7.
- 15 The seal 7 has a central portion 8 shaped like a bellows with a perimetral outer border 9 which is clamped between the frame 3 and the box-like body 2.

- 5 -

Within the interior portions, facing the keys, the rubber seal 7 has an annular enlargement 10 which is lodged in seatings 11 correspondingly provided on the keys 5 in such a way as to create a fixed connection to each key.

The rubber seal 7 thus defines a membrane which connects together the push buttons and the box-like casing, forming a diaphragm to prevent the passage of impurities of any type.

Internally the key 5 has a tail 15 which acts on the median portion of a rigid movable blade, generally indicated with the reference numeral 16, which at its end is pivoted to a fixed contact 17 which is supported by a rigid printed circuit 18 and which is connected to the motor.

On the blade 16 acts a first spring 19, acting at the other end against the printed circuit, and a second spring 20 which interacts between the blade and the push button 5 in the region of the tail 15, thus creating a resilient thrust element for return movements of the push button itself.

At its free end the movable rigid blade 16 which is made of conductive material has a contact body 21 which is movable between a fixed negative contact 22 and a movable positive contact 23 constituted by a resiliently yieldable bridge which opposes the action of a spring 24 which acts between the bridge 23 and the printed circuit.

The bridge, which in practice constitutes an end stop for the descent of the rigid movable blade, is connected

- 6 -

to the window winder motor.

Under the printed circuit 18 there is housed an electro
magnet 35 if the switch is utilised for automatic
5 actuation.

For completeness of the description, within the box-like
body 1 there is advantageously provided an electric lamp
40 which creates an internal illumination within the
10 switch, which makes it easier to see the ideograms
provided on the push buttons.

The presence of the seal 7, as well as preventing the
infiltration of water and dust, also prevents outward
15 escape of light, thus eliminating the unaesthetic frame
of light which is encountered with switches in the prior
art.

From what has been described it will be seen how the
20 invention achieves the proposed objects.

In particular, it is desired to emphasise the extreme
structural simplicity of the switch described herein-
above, together with its great functionality and
25 precision of operation.

In practice, any materials may be used and likewise, any
dimensions and contingent forms according to require-
ments as long as they are compatible with the specific
30 use.

- 7 -

CLAIMS

1. A switch structure particularly for motor vehicle electric window winders, characterised by the fact that
5 it comprises a box-like body closed at the top by a frame which defines seatings for housing a plurality of push buttons contacting respective rigid movable electrically conductive blade pivoted, at one end, to a fixed contact provided on a printed circuit and
10 connected to the motor and, at the other end, movable between a negative fixed contact and a positive movable contact.
2. A switch structure according to the preceding
15 Claim, characterised by the fact that the said frame is snap engaged to the box-like body.
3. A switch structure according to the preceding Claims, characterised by the fact that it includes
20 sealing means acting between the push buttons and the said seatings.
4. A switch structure according to one or more of the preceding Claims, characterised by the fact that the
25 said sealing means are constituted by a rubber seal having a central bellows portion surrounded by a rim clamped between the frame and the said box-like body, around the said push buttons there being provided an annular enlargement which can be housed in annular
30 grooves defined by the push buttons.
5. A switch structure according to one or more of the preceding Claims, characterised by the fact that the rigid movable blade is pivoted to a fixed contact,
35 securely fixed to a printed circuit, whilst a tail,

- 8 -

extending from a lower part of each of the push buttons acts on a median portion of this blade.

5 6. A switch structure according to one or more of the preceding Claims, characterised by the fact that it includes a first spring acting between the printed circuit and the rigid movable blade and a second spring acting between the said push button and the said rigid movable blade.

10

7. A switch structure according to one or more of the preceding Claims, characterised by the fact that the said positive movable contact is constituted by a guide bridge slidably supported by a printed circuit and
15 resiliently yieldable with respect to a spring.

8. A switch structure according to one or more of the preceding Claims, characterised by the fact that it includes an illumination lamp provided within the
20 box-like body and operable to illuminate ideograms provided on the push buttons.

Fig. 1

1/2 0221030

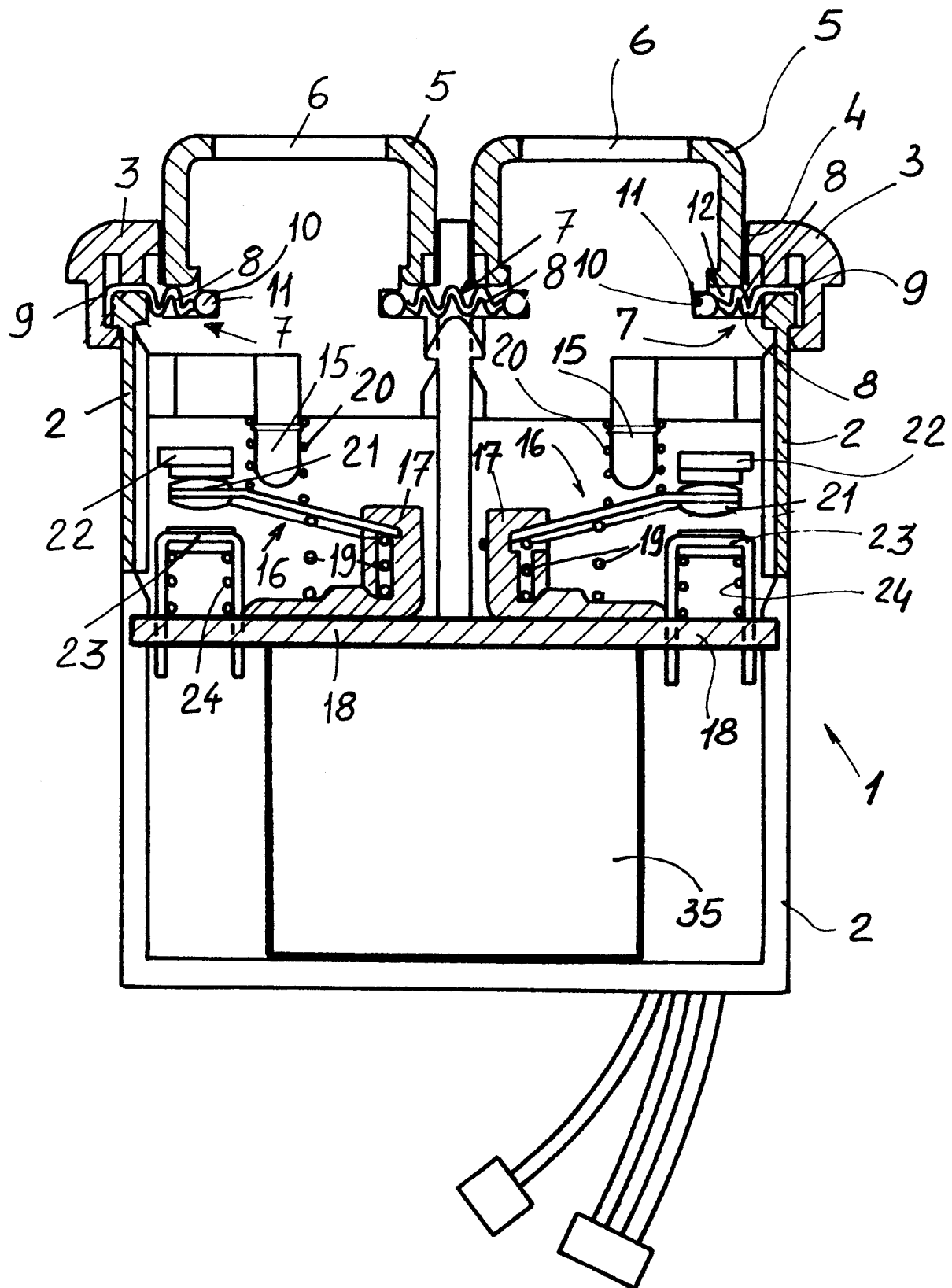


Fig. 2

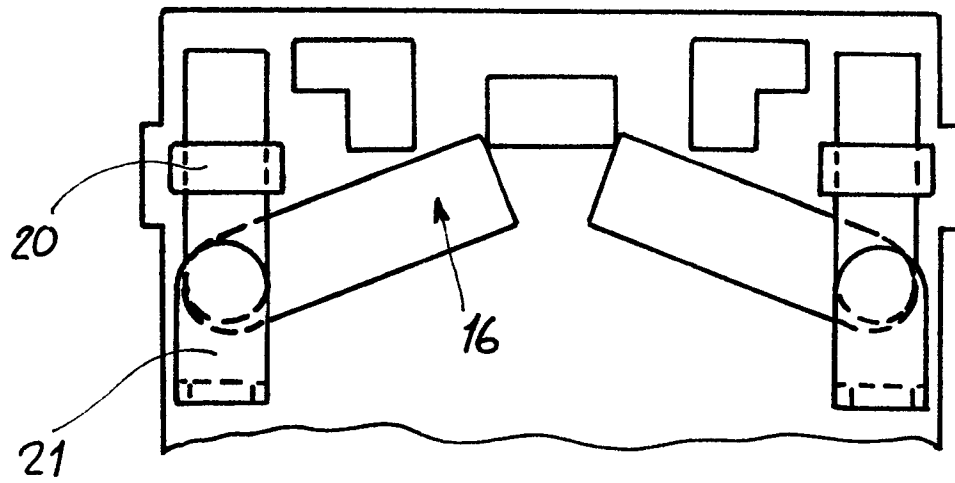


Fig. 3

