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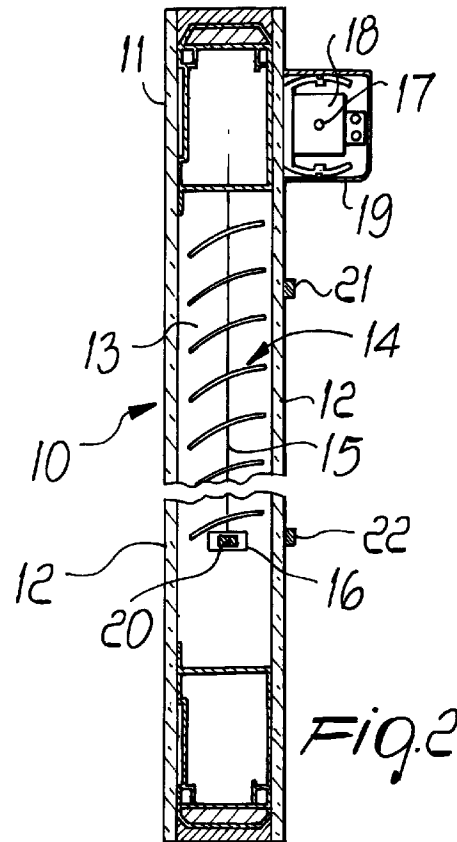
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(54) Device for controlling and actuating the stroke of light-blocking means in a double-glazing unit

(57) A device for controlling and actuating light-blocking means in double-glazing units (10) of the type constituted by a rectangular frame (11) which supports at least two transparent or translucent panes (12) which are mutually parallel and spaced so as to form a chamber (13) isolated from the outside and inside which the light-blocking means (14) are accommodated and moved, by actuator means (15), from an extended configuration for blocking the light to a gathered or rolled-up configuration which allows light to pass freely, and vice-versa. The device comprises at least one permanent magnet (20) which is associated with the light-blocking means (14) and at least one sensor (21,22) which is fixed to the frame (11) in order to signal that the light-blocking means (14) have passed and/or have reached their position.



EP 0 845 572 A1

Description

The present invention relates to a device for controlling and actuating the stroke of light-blocking means in double-glazing units.

Conventional casements commonly known as double-glazing units are particularly appreciated thanks to their heat insulation characteristics.

A double-glazing unit is usually constituted by a rectangular frame which supports at least two transparent or translucent panes which are mutually parallel and spaced so as to form a chamber which is isolated from the outside and inside which light-blocking means are accommodated.

Said blocking means are currently usually constituted by shutters or Venetian blinds or other equivalent devices which are moved in any manner from an extended light-blocking configuration to a gathered or rolled-up configuration which allows said light to pass freely, and viceversa, by means of actuator means.

The actuator means, if they are of the automatic type, are usually constituted by motor means which are accommodated outside the double-glazing unit in suitable containment casings and move the light-blocking means by means of kinematic systems which are partially internal and partially external.

Since in double-glazing units the user cannot intervene in any case inside the chamber, which is indeed isolated, all adjustments inside said chamber must be actuated appropriately from outside through one of the glass panes.

More specifically, in commercially available double-glazing units the necessary stroke limit adjustments are usually performed by means of devices known as programmable encoders which are connected to a microprocessor.

The encoder has the purpose of counting the turns made by the shaft for rolling up the gathering cables or the light-blocking means themselves, and the microprocessor has the purpose of comparing the data transmitted by the encoder with the data stored inside the microprocessor.

When a preset number of turns are reached, the microprocessor actuates the motor means.

It is absolutely necessary to have an electrical connection which allows to transmit the measurement signals of the encoder from the inside to the outside.

Moreover, the means for controlling and actuating the movement of the light-blocking means of the above described type burden, in terms of components, the overall structure of the double-glazing unit and constitute a significant cost.

In other cases, fixed stroke limits are used which are located between two preset positions of a female thread coupled to a worm screw and are part of means for reducing the rotation rate of the motor.

Nonetheless, even in this case the problem of transmitting the command through the glazing arises.

The aim of the present invention is to provide a device for controlling and actuating the stroke of light-blocking means in double-glazing units, which solves the above-described drawbacks of conventional models, particularly by providing precise and safe movement of the light-blocking means without however entailing the provision of holes or openings on the panes that form the double-glazing unit for the passage of measurement signals.

Within the scope of this aim, an object of the present invention is to provide a device whose precision in moving and stopping light-blocking means in preset positions is combined with a reduced number of components, consequently improving production and assembly costs.

Another object of the present invention is to provide a device which is particularly reliable and can be applied to various kinds of light-blocking means.

Another object of the present invention is to provide a device which can be integrated in a double-glazing unit without altering its aesthetic and styling levels.

Another object of the present invention is to provide a device which can be manufactured at low cost with conventional equipment.

This aim, these objects and others which will become apparent hereinafter are achieved by a device for controlling and actuating light-blocking means in double-glazing units of the type constituted by a rectangular frame which supports at least two transparent or translucent panes which are mutually parallel and spaced so as to form a chamber which is isolated from the outside and inside which light-blocking means are accommodated and moved, by actuator means, from an extended configuration for blocking the light to a gathered or rolled-up configuration which allows light to pass freely, and viceversa, said device being characterized in that it comprises at least one permanent magnet which is associated with said light-blocking means and at least one sensor which is energized by said at least one magnet and is fixed to said frame in order to signal that said light-blocking means have passed and/or have reached their position.

Further characteristics and advantages of the present invention will become apparent from the following detailed description of embodiments illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a perspective view of a double-glazing unit with the device according to a first embodiment of the present invention;
figure 2 is a partially sectional view of the double-glazing unit of figure 1;
figure 3 is a view of a second embodiment of the double-glazing unit of figure 1.

With particular reference to figures 1 and 2, a double-glazing unit, to which a device according to the

present invention described in detail hereinafter is applied, is generally designated by the reference numeral 10.

The double-glazing unit 10 is of the type constituted by a rectangular frame 11 which supports, in this case, two transparent panes 12 which are mutually parallel and spaced so as to form a chamber 13 isolated from the outside and inside which light-blocking means are accommodated; in this case, the light-blocking means are constituted by a device known as "Venetian blind" and generally designated by the reference numeral 14.

The Venetian blind 14, in particular, is constituted by a plurality of laminar elements which lie longitudinally and have a slightly curved cross-section; those elements are arranged substantially parallel to each other and are connected, at their end, by a cord 15 which is moved as described hereinafter so as to gather them in a pack or spread them out in a configuration which is adapted to block the light.

At the bottom of the Venetian blind 14 there is provided an element 16 which has the same extension as the laminar elements and which, by means of its weight, guides the arrangement of the Venetian blind 14 during transitions from the gathered condition to the extended configuration and viceversa.

More specifically, the movement of the Venetian blind 14 occurs by connecting the cord 15 to a shaft 17 by means of pulleys, not shown; the shaft is in turn connected to external motor means 18 contained in a casing 19 which hides them from sight from outside.

In a first embodiment, a device for controlling and actuating the stroke of the light-blocking means is associated with the double-glazing unit 10 which comprises a permanent magnet 20, which is fixed to the element 16, and two sensors 21 and 22, which are respectively fixed outside the frame 11 in positions which correspond to the stroke limits of the gathered and extended configurations.

The sensors 21 and 22 are, for example, the Hall or reed types, which are commonly commercially available and are energized in the presence of a magnetic field.

These sensors are also connected so as to activate or not activate the motor means 18.

In practice, operation is as follows: when the Venetian blind 14 is moved, by means of the permanent magnet 20 associated therewith it energizes, as it passes, one of the two sensors 21 or 22, which act as stroke limits which transmit the power-off signal to the motor means 18.

With particular reference to figure 3, in a second embodiment of the double-glazing unit 10 the motor means are associated with the head of the frame 11.

In practice, it has been observed that the present invention has achieved its intended aim and objects.

In particular, it should be noted that the adjustment of the internal state of the light-blocking means in the double-glazing unit provided with the device according to the present invention is particularly precise and does

not require in any way the provision of holes or other openings in the panes, which would cause difficulties in providing tightness in the passage regions.

The device according to the present invention in fact provides passage through the panes, in order to indicate the state and position of the light-blocking means, by means of an electromagnetic field generated by the magnet or magnets fixed to said light-blocking means; the external sensors then detect the presence of said magnetic field, performing the appropriate adjustments and actuations on the motor means.

It should also be noted that in the double-glazing unit with the device according to the present invention the number of components is drastically reduced, improving both costs and production simplicity as well as aesthetic execution options, eliminating cumbersome and usually unaesthetic devices located outside the double-glazing unit.

The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may also be replaced with other technically equivalent elements.

The materials and the dimensions may be any according to requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device for controlling and actuating light-blocking means in double-glazing units of the type constituted by a rectangular frame which supports at least two transparent or translucent panes which are mutually parallel and spaced so as to form a chamber isolated from the outside and inside which light-blocking means are accommodated and moved, by actuator means, from an extended configuration for blocking the light to a gathered or rolled-up configuration which allows light to pass freely, and viceversa, said device being characterized in that it comprises at least one permanent magnet which is associated with said light-blocking means and at least one sensor which is energized by said at least one magnet and is fixed to said frame in order to signal that said light-blocking means have passed and/or have reached their position.
2. A device according to claim 1, characterized in that it comprises two sensors arranged on the frame, a first sensor being in a position adapted to indicate that the correct packing or rolled-up state of said light-blocking means has been reached, a second

sensor being arranged on the frame so as to detect the extended state of said light-blocking means.

- 3. A device according to claim 1, characterized in that said at least one sensor is energized in the presence of a magnetic field. 5
- 4. A device according to claim 1, characterized in that it is associated with motor means which are located outside the double-glazing unit and are in turn associated with reduction-unit mechanisms for moving said light-blocking means. 10

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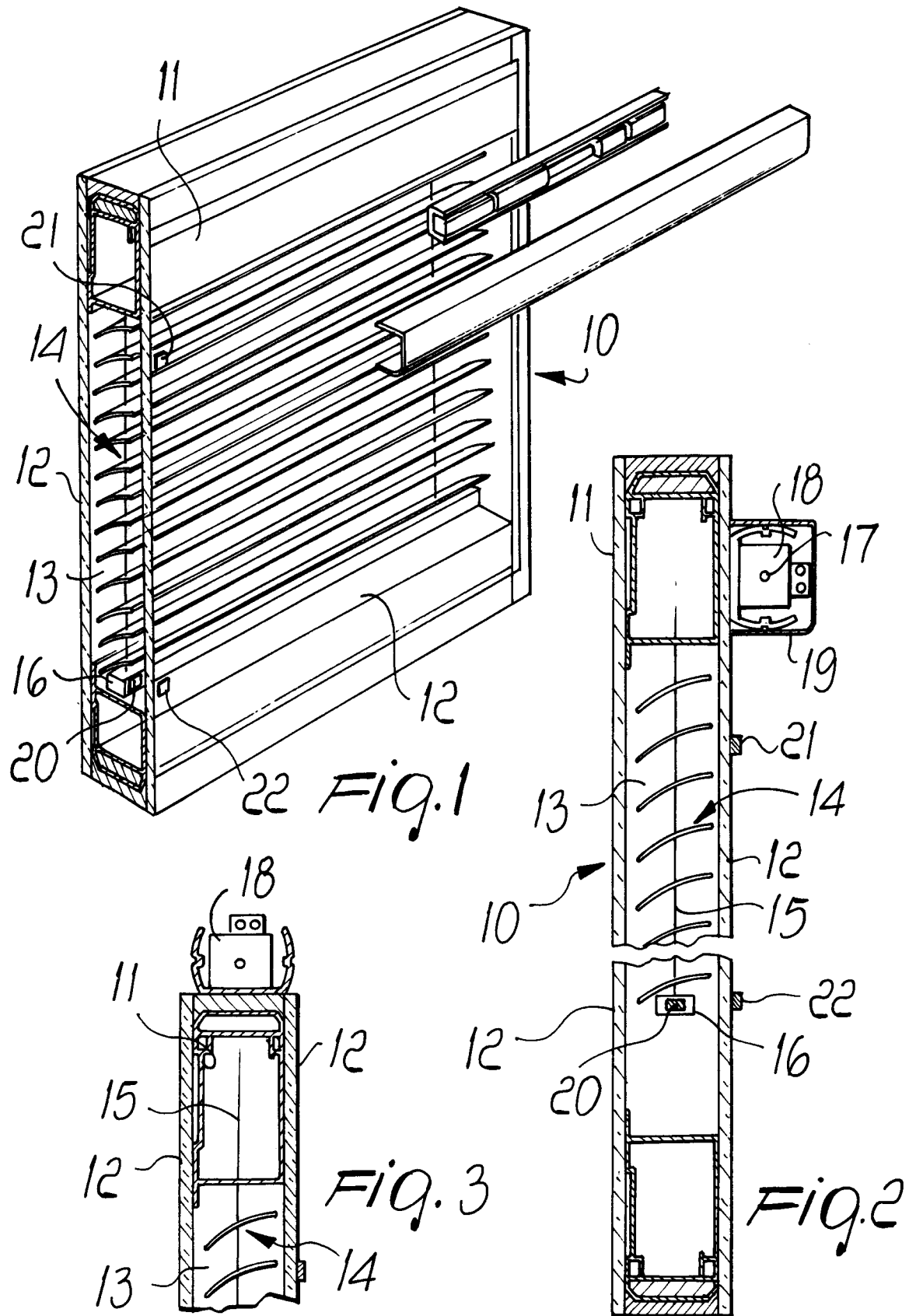
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EUROPEAN SEARCH REPORT

Application Number
EP 97 11 9237

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
P,X P,Y	DE 196 05 273 A (GOLDNER HORST) * column 1, line 45 - line 49 * * column 2, line 21 - line 23 * * column 2, line 38 - column 3, line 48; figures * ---	1-3 4	E06B9/264 E06B9/88
Y	US 4 664 169 A (OSAKA SUSUMU ET AL) * column 5, line 66 - column 6, line 21; figure 3 * ---	4	
X	US 5 540 269 A (PLUMER LOUIS) * column 5, line 66 - column 6, line 28; figures * ---	1-3	
A	FR 2 659 109 A (GOYAL JEAN GUY) -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6) E06B
Place of search THE HAGUE		Date of completion of the search 27 February 1998	Examiner Fordham, A
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (P04/C01)