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(54) Elevator cab door drive system with integrated controller

(57) Integrated control set for lift doors, being useful for installation in all types of lifts, in such a way that the set comprises a frame (6) wherein a system drive motor (17), an encoder and an electronic control device, as well as a series of potentiometers and pushbuttons that adapt the control set to the type of door of the lift installed, are integrated. There is direct transmission from the shaft (7) of the motor (17) transmitting movement to the conveyance drive mechanism of the carriages (3) and (4) fastening the leaves forming the door. The set integrated in the frame (6) has a pair of lighted indicators (13) and (14) that indicate when the control system is in a test position and the presence of power in the system.

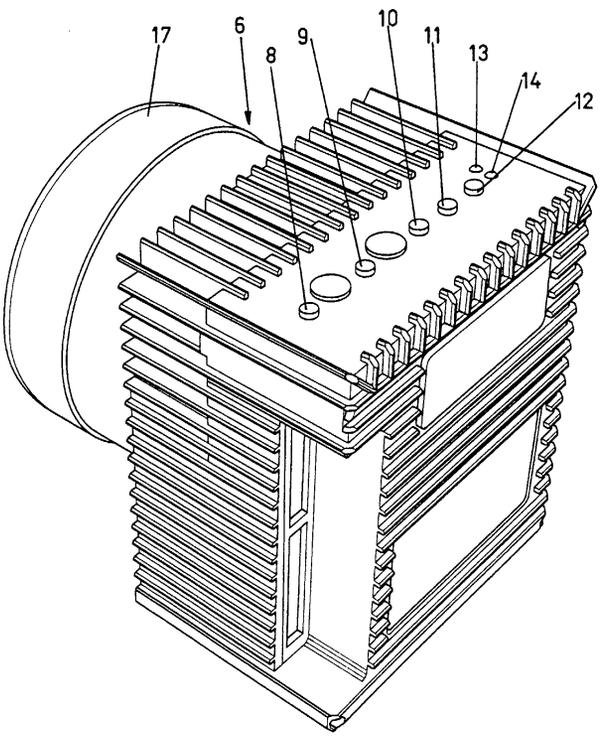

Fig. 3

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Description

OBJECT OF THE INVENTION

[0001] The following patent, as expressed in the title of the present specification, refers to an integrated control set for lift doors, by means of which all the operations of the door of a lift are controlled, in such a way that the set integrates all the operating and control components, and, thus, the set includes a motor, an encoder and an electronic control device.

[0002] In this way, the installation is made easier, since the installer only needs to install the set in a single operation, reducing labor and consequently economic costs.

[0003] Besides, the set includes a series of potentiometers, operable by hand that allow different characteristics to be adapted rapidly and simply in accordance with the type of door and required needs.

FIELD OF THE INVENTION

[0004] The present specification describes an integrated control set for lift doors, which is applicable for installation in all types of lift doors.

BACKGROUND OF THE INVENTION

[0005] Conventionally, in the installation of the lift door for operation thereof the corresponding system drive motor for the purpose of closing and opening the door, an encoder by means of which different parameters are detected and the respective signal is sent to the electronic control device by means of which the entire system is governed, are mounted.

[0006] Hence, the motor, the encoder and the electronic control device are mounted independently from each other. Each one of them should be installed in the desired place and adequately intercommunicated.

[0007] With this design, once the door has been installed, the personnel in charge of it should adjust the system in order to adapt it to the characteristics of the door, an adjustment which should be thorough and this operation takes up a lot of time.

DESCRIPTION OF THE INVENTION

[0008] The present specification describes an integrated control set for lift doors, being applicable for installation in all types of lifts, in such a way that the set comprises a frame in which a system drive motor, an encoder and an electronic control system, as well as a series of potentiometers that adapt the set to the type of lift installed are integrated. There is a direct transmission from the shaft of the motor transmitting movement to the conveyance drive mechanism of the carriages fastening the leaves forming the door.

[0009] Hence, when a lift is installed the set that integrates all the operating and control components will be incorporated, permitting the adaptation thereof to the different types and characteristics of the door of the corresponding lift, simply and rapidly, since the personnel in charge of doing so need only directly position the different potentiometers in the appropriate positions in accordance with the characteristics of the lift door.

[0010] Likewise, the set integrated in the frame has a position in one of the potentiometers that places the set in a test mode or in a normal operating mode, in such a way that in the test mode, it will permit the adaptation and introduction of the appropriate characteristics to the type of door of the lift installed and in the normal position it will adapt for normal operating of the lift.

[0011] Hence, with the potentiometer in the test mode, which is verified by means of a lighted indication, the opening speed of the door is adjusted and with a second potentiometer the closing speed of the door is adjusted, and, likewise, with a third potentiometer, it is adapted to the type of door and with a fourth potentiometer the time between reopenings is adjusted.

[0012] Furthermore, with the potentiometer in the test mode, by means of a pair of pushbuttons connected to the potentiometers adjusting the opening and closing speed of the lift door, respectively, the opening and closing of the door is caused.

[0013] On the other hand, the frame of the motor can be totally integrated in the frame of the set, or else it can be connected thereto in relation to a part thereof, leaving the rest free, so that in one case or the other suitable dissipation of heat will be caused.

[0014] In order to complete the description that is going to be made hereinafter and in order to provide a better understanding of the invention, a set of drawings whose figures in an illustrative and non-restrictive manner represent the most characteristics details of the invention is attached to the present specification.

BRIEF DESCRIPTION OF THE DESIGNS

[0015] Figure 1 shows a front view of the support plate regarding a practical embodiment in which the lift door is defined by a pair of telescopic leaves, having a pair of carriages to which the corresponding door leaf is fastened, showing how the movement is transmitted.

[0016] Figure 2 shows a plan view of the support plate regarding the preceding figure, showing how the transmission of movement to the carriages which the leaves of the double leaf telescopic door are fastened to, is carried out.

[0017] Figure 3 shows a perspective view, according to a varied embodiment of the invention, of the set that integrates the system drive motor, the encoder and the electronic control device, showing part of the frame of the motor fastened to the frame of the set.

[0018] Figure 4 shows a perspective view, according to a varied embodiment of the invention, of the set that integrates the system drive motor, the encoder and the

electronic control device, the motor being totally integrated in the frame of the set.

[0019] Figure 5 shows a perspective view of the frame of the set, showing a series of potentiometers, pushbuttons and lighted indicators, for example of the LED type, that function in order to adapt the characteristics of the different types of lift doors.

DESCRIPTION OF A PREFERRED EMBODIMENT

[0020] In view of the commented figures and in accordance with the numbering used, we can see, for example, and in accordance with a known embodiment, how movement is transmitted to a double leaf telescopic lift door. It is possible to see how the motor transmits movement to a pinion (1) wherein a belt (2) to which the rapid carriage (3) has been fastened gears, transmitting the movement to the slow carriage (4) in such a way that the corresponding leaf comprising the lift door is fastened to the respective carriages, and likewise, the rapid carriage (3) includes a conveyance pin (5) of the door of the corresponding floor, whereas regarding another one of the surfaces of the frame (6), the shaft (7) of the movement transmitting motor projects.

[0021] Hence, for the normal operating and control of the operating system of lift doors, an integrated set defined by a frame (6) in which a motor, encoder and an electronic control device are integrated, is described in the present specification, the frame (6) having in one of its surfaces a series of potentiometers and pushbuttons that permit adaptation of the operating characteristics to the type of door installed.

[0022] In this way, in the installation operation of the corresponding lift door the set that integrates all the operating components thereof will be mounted and it will adapt to the type and characteristics of the door by means of the positioning of the adjustment potentiometers.

[0023] Hence, upon mounting the set the motor shaft (7) is fastened to the pinion (1) transmitting movement to the system, and the potentiometers will adjust adapting to the type and characteristics of the door, and, hence, the opening speed of the door is adjusted by means of the potentiometer (8) and the closing speed of the door is adjusted by means of the potentiometer (9).

[0024] Furthermore, the integrated control set for lift doors includes a potentiometer (10) to adjust it in accordance with the type of door, in such a way that by means thereof it will adapt to a center door of two or four leaves, or to a telescopic door of two or three leaves.

[0025] Likewise, the integrated control set for lift doors includes a potentiometer (11) to adjust the closing force and a potentiometer (12) to adjust the time between reopenings.

[0026] On the other hand, the integrated control set for lift doors includes a pair of lighted indicators (13) and (14), in such a way that the lighted indicator (13) indicates that the system has power and the indicator (14) indicates that the system is in the test mode. With the potentiometer (12) in the test mode, the adjustment of all the functions can be carried out, as well as any type of verification of the operating state can be carried out, whereas when the potentiometer (12) is in a position that is not the test mode, the system will be in a normal mode where the potentiometer indicates the time between reopenings and the lift is ready to operate normally.

[0027] Likewise, the integrated control set for lift doors includes a pair of pushbuttons (15) and (16), which are connected to potentiometers (8) and (9), respectively, which permit adjustment of the opening and closing speed of the door, and by means of which the opening and closing of the door is permitted when the integrated control set is in the test mode position.

[0028] In short, the inclusion of the integrated control set in the assembly of lift doors, which integrates the system drive motor, an encoder and an electronic control device, has the great advantage of facilitating adaptation thereof to all types of lift doors. It is simply and rapidly adaptable and formable and this represents an important timesaver.

[0029] Figures 3 and 4 show two practical embodiments of the invention, wherein the motor (17) can be fastened to the structure of the frame (6) with its structure partially visible, or else it can be totally integrated therein, both embodiments having a perfect dissipation of heat.

Claims

1. Integrated control set for lift doors, being applicable for installation in all types of lifts, **characterized in that** the set comprises a frame (6) wherein a system drive motor (17), an encoder and an electronic control device, as well as a series of potentiometers and pushbuttons that adapt the control set to the type of door of the installed lift are integrated, having direct transmission from the shaft (7) of the motor (17) transmitting movement to the conveyance drive mechanism of the carriages (3) and (4) fastening the leaves forming the door.

2. Integrated control set for lift doors, according to claim 1, **characterized in that** the set integrated in the frame (6) has a pair of lighted indicators (13) and (14) that indicate when the control system is in a test position and when there is a presence of power in the system.

3. Integrated control set for lift doors, according to claims 1 and 2, **characterized in that** when the lighted indicator (13) is in the lit up test mode, the opening speed is adjusted with the potentiometer (8) and the closing speed of the door is adjusted with the potentiometer (9), and, likewise, with the

potentiometer (10) it adapts to the type of door, the potentiometer (12) adjusts the time between reopenings and the potentiometer (11) adjusts the closing force.

4. Integrated control set for lift doors, according to claims 1 and 2, **characterized in that** with the indicator (13) in the lit up test mode, the opening and closing of the door is caused by some pushbuttons (15) and (16) connected to the potentiometers (8) and (9), respectively.

5. Integrated control set for lift doors, according to claim 1, **characterized in that** the motor (17) transmitting movement to the system can be totally or partially integrated in the frame (6) of the control set.

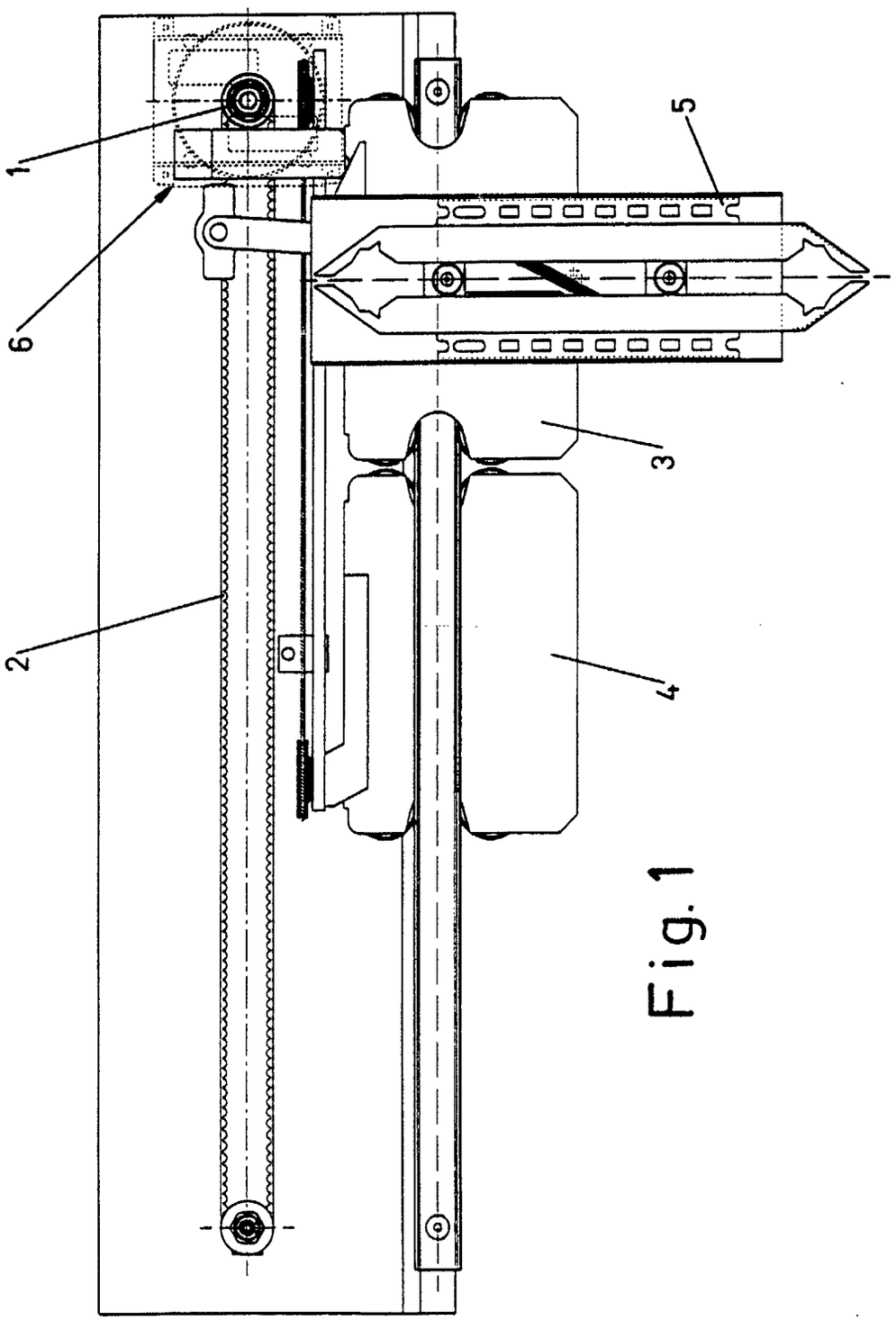

Fig. 1

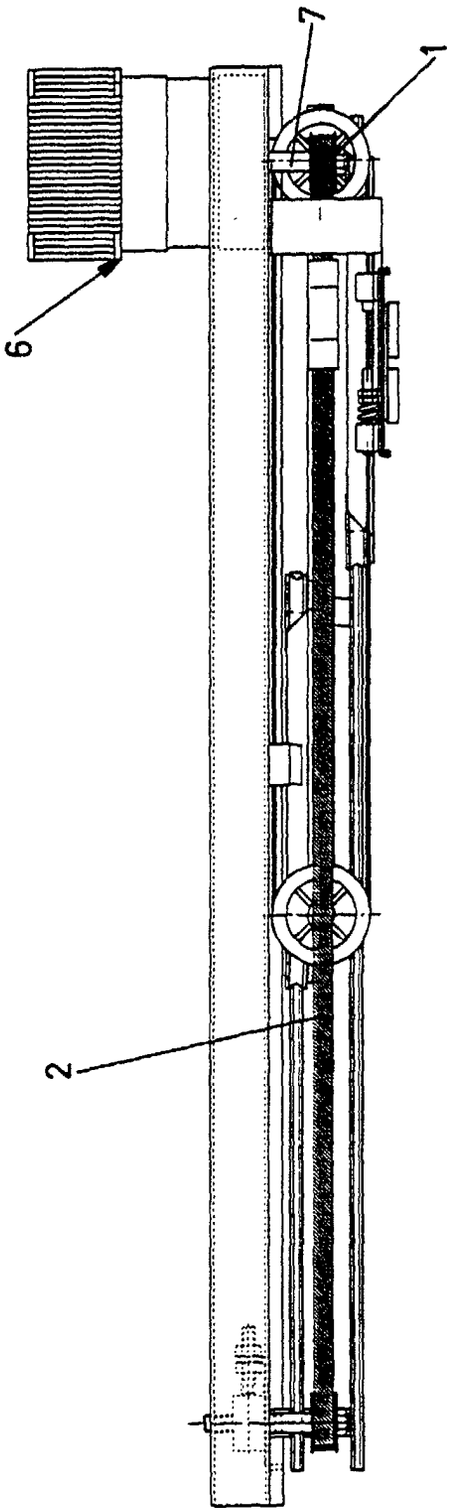

Fig. 2

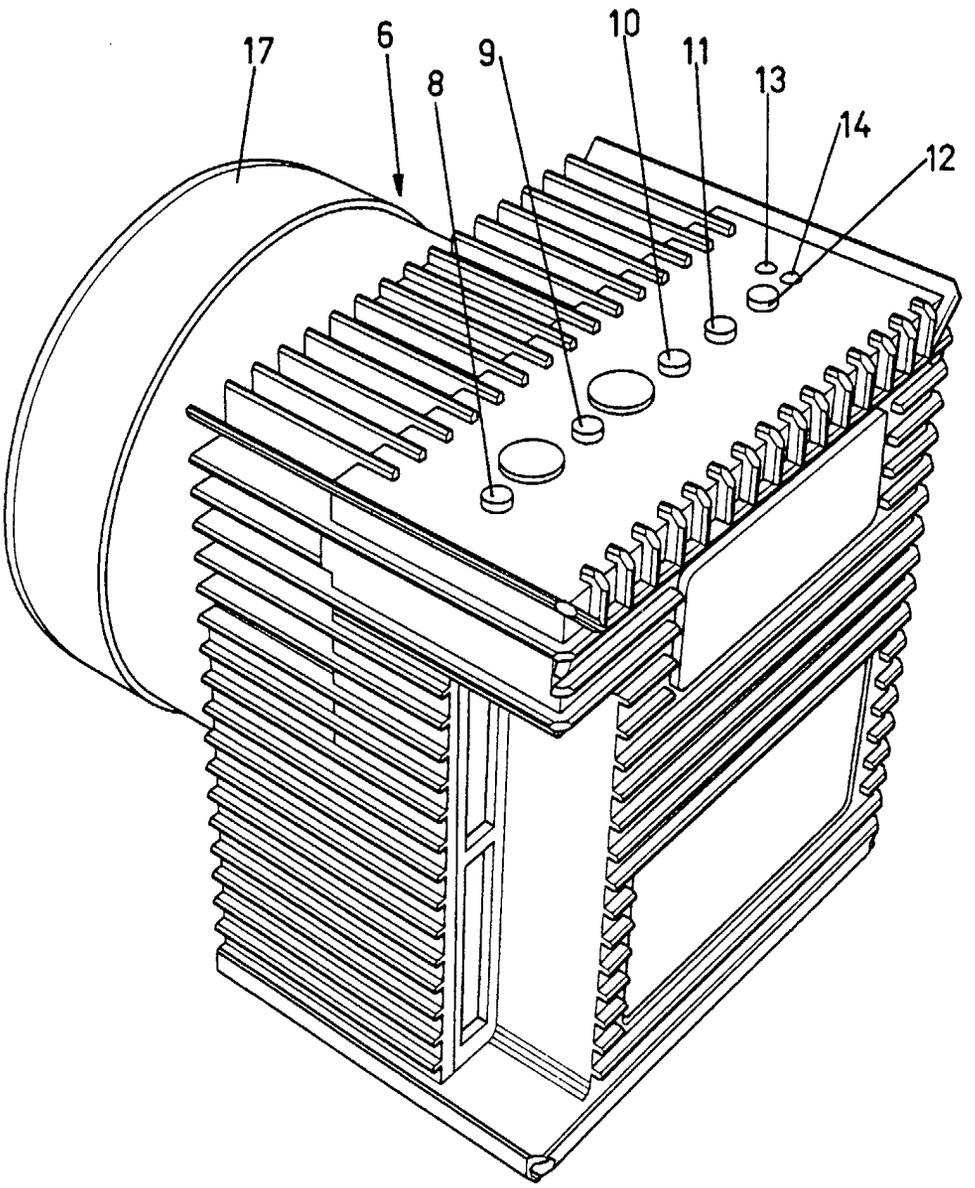

Fig. 3

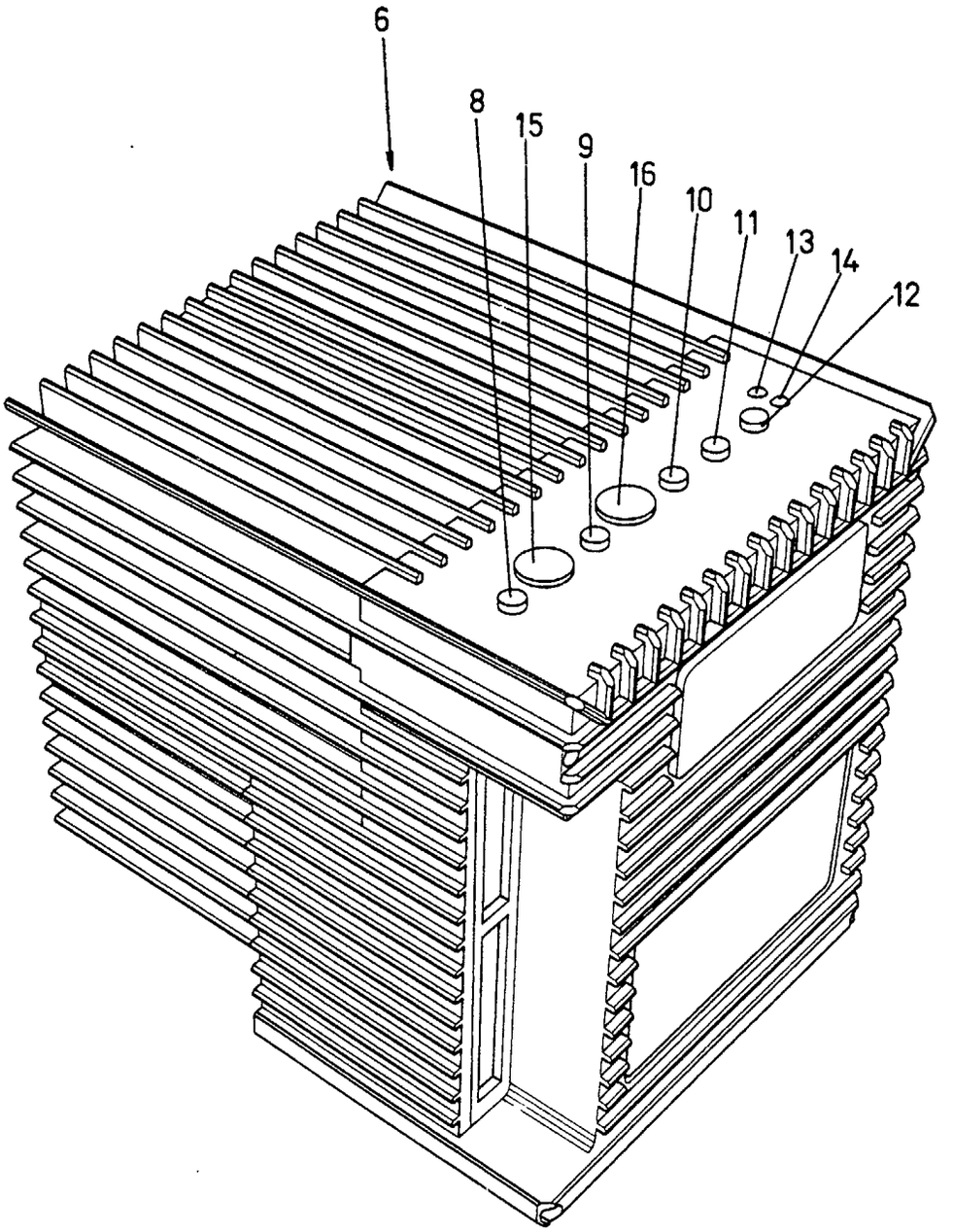

Fig. 4

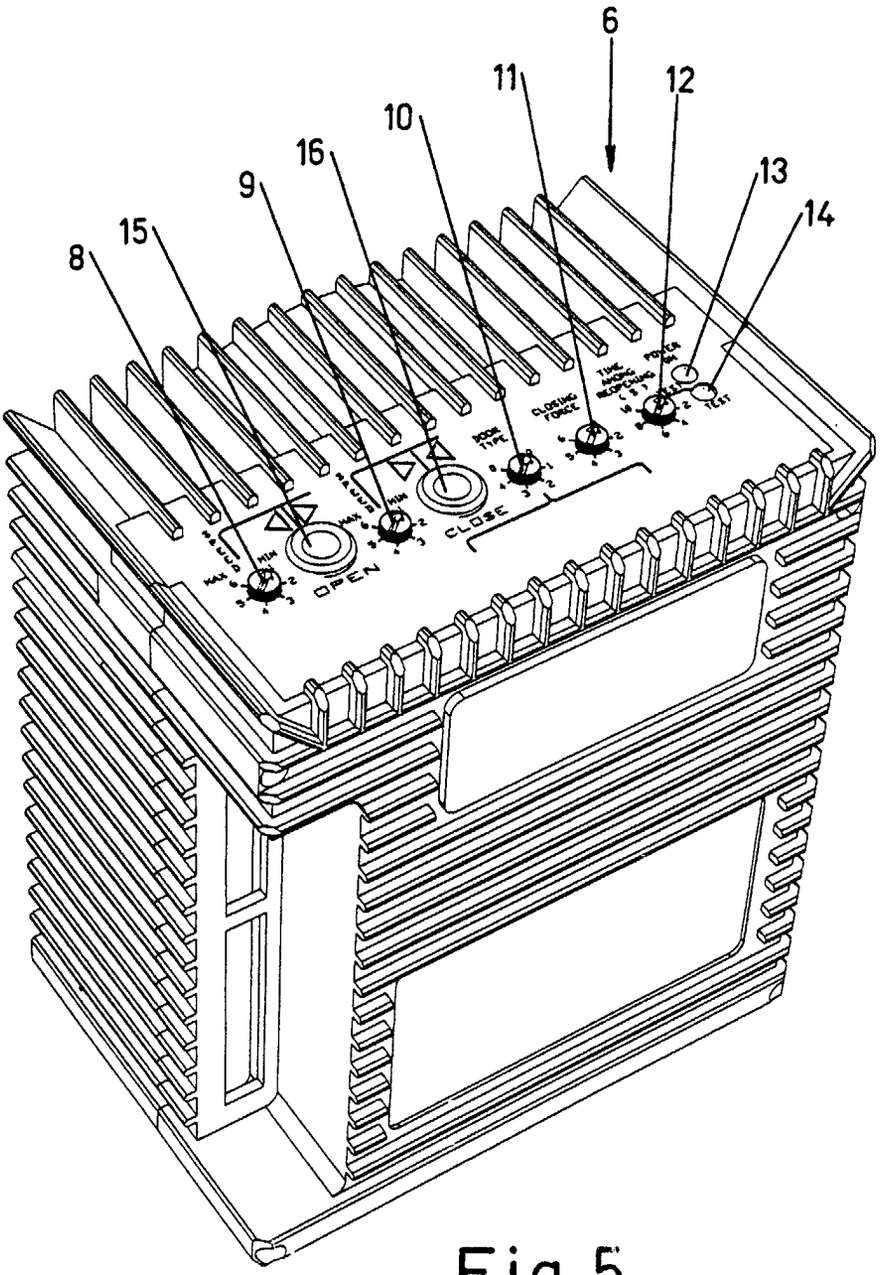

Fig. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 38 0141

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.7)
X	DE 44 19 290 A (FOERDER WEBER & SYSTEMTECHNIK) 21 December 1995 (1995-12-21) * the whole document *	1-5	B66B13/14
X	EP 0 624 541 A (SIEMENS AG) 17 November 1994 (1994-11-17) * page 4, column 6, line 42 - page 5, column 7, line 30; figure 2 *	1-5	
X	US 4 563 625 A (BOIUCANER LEON ET AL) 7 January 1986 (1986-01-07) * abstract; figure 1 *	1-5	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B66B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 October 2002	Nelis, Y

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 02 38 0141

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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