(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 529 916 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
11.05.2005 Bulletin 2005/19

(51) Int Cl.[7]: **E05F 15/12**, E05F 15/10

(21) Application number: **04078066.0**

(22) Date of filing: **09.11.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL HR LT LV MK YU

(30) Priority: **10.11.2003 IT MI20032160**

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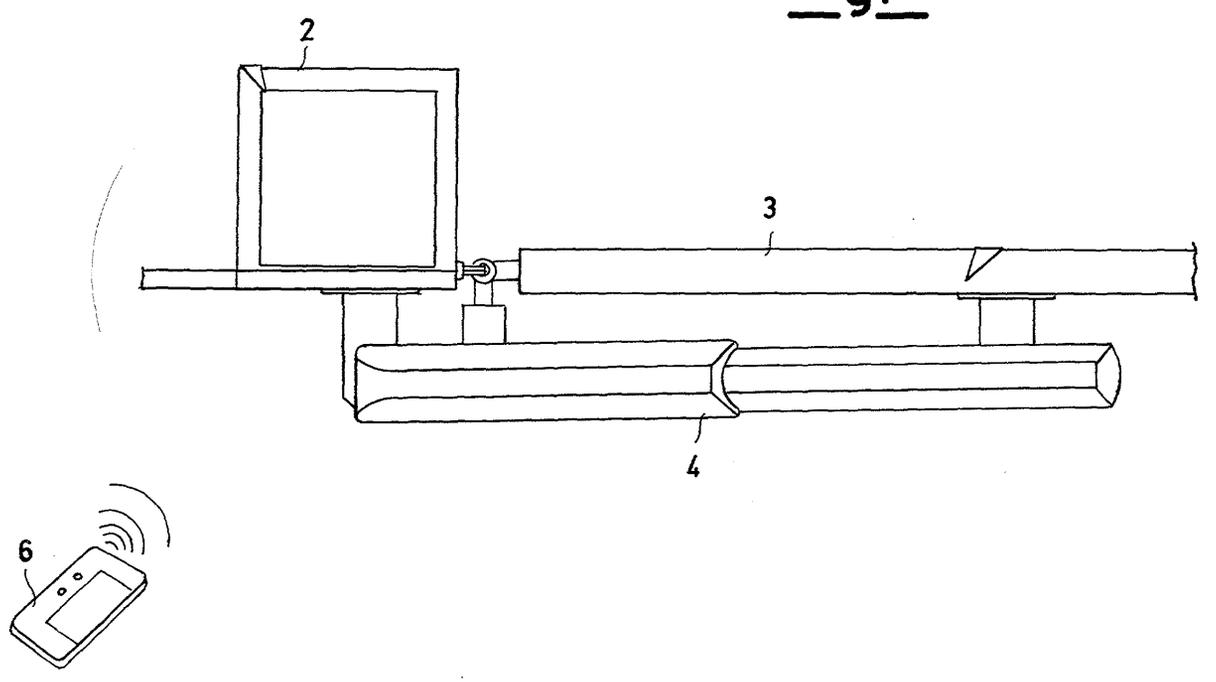
(54) Unlocking mechanism for an automatic gate

(57) Unlocking mechanism for an automatic gate, said gate comprising a mobile door, suitable for covering an access space defined at the ends by fixed parts of said gate, the movement of which is commanded by an electric motor. The mechanism can be activated in an emergency situation that involves said electric motor being shut down.

Fig.1



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Description

[0001] The present invention refers to an unlocking mechanism for automatic gates actuated by an electric motor, in which the unlocking mechanism is activated in an emergency situation that involves the shutting down of said electric motor.

[0002] Automatic gates for gaining access to private areas are usually actuated by the users, at fixed control points, through buttons or keys for opening and closing or by means of remote controls, which send a radio impulse to an electronic control station, which takes care of actuating the gate in the desired direction.

[0003] Moreover, generally, in the case of remote radio transmissions, after having commanded the gate to open, its subsequent closing takes place through the sending of another command by the user or else it takes place automatically after a certain predetermined period of time.

[0004] Such automatic gates are moved through electric motors connected to the normal electrical mains.

[0005] An emergency condition, which occurs, for example, due to a lack of current or due to an electrical failure, implies the shutting down of said electric motor, and the gate must be able to be moved manually, with the prior unlocking of the automatic moving mechanism, in particular the unlocking of the electric motor.

[0006] Normally, such an operation takes place through a conventional key, which allows the electric motor to be decoupled from the door of the gate in such a way allowing the manual movement of the doors themselves.

[0007] Such a system for unlocking a gate in the case of an emergency can at times be troublesome, since it can require difficult manual operations, perhaps to be carried out in uncomfortable positions, or they may have to be carried out during a storm, which has caused the interruption of the electric energy that has blocked the gate.

[0008] The Applicant has tackled the problem of making the way to unlock a gate moved by an electric motor during an interruption in an emergency situation simple and quick.

[0009] The Applicant has made a safety mechanism for unlocking an automatic gate that is based upon the use of an electromagnetic brake supplied by a battery and applied to the electric motor that moves the gate, which can be unlocked by deactivating such a brake, manually or through the remote control in an emergency situation.

[0010] An aspect of the present invention concerns an unlocking mechanism for an automatic gate, said gate comprising a mobile door, suitable for covering an access space defined at the ends by fixed parts of said gate, the movement of which is commanded by an electric motor, said mechanism being able to be activated in an emergency situation that involves said electric motor being shut down, characterised in that it comprises an electromagnetic brake applied onto the rotation shaft of the motor and that can be deactivated during the rotation of said motor and in said emergency situation through an unlocking command, allowing the free movement of the door of the gate.

[0011] The characteristics and the advantages of the unlocking mechanism for automatic gates according to the present invention shall become clearer from the following description, given as an example and not for limiting purposes, referring to the attached schematic drawings, in which:

- figure 1 is a view from above of a moving mechanism of an automatic gate, with which the unlocking mechanism according to the present invention is associated.
- figure 2 is a schematic view of the unlocking mechanism according to the present invention, inserted in a piston of the moving mechanism of figure 1.

[0012] With reference to the quoted figures, the gate to which the mechanism of the present invention can be applied can be a sliding gate, a swing gate and, more generally the mechanism of the present invention can be applied to barriers in which the access point is opened and closed by at least one door moved automatically through an electric motor, such as front doors, gates, etc.

[0013] In particular, figure 1 illustrates, as an example, a moving mechanism of an automatic gate comprising a post 2 of said gate on which a door 3 of such a gate is rotatably associated. The movement of such a door is carried out through a piston 4, which is connected at one end to such a post and at the opposite end to the rotatable door of the gate.

[0014] The stroke of the piston is regulated by an electric motor arranged inside it; the lengthening and shortening of such a piston allow the rotation of the mobile door of the gate and therefore the opening and closing of the space.

[0015] The unlocking mechanism according to the present invention is associated with the electric motor and intervenes on the motor itself, allowing the free rotation of the door of the gate following an unlock command.

[0016] The unlock command can be sent to the unlocking mechanism through a radio control 6, for example through the same radio control that commands the opening of the gate, or else through a key selector that, suitably inserted in a suitable seat in the gate, determines such unlocking.

[0017] The unlocking mechanism comprises an electromagnetic brake 5 that can be supplied with power by a battery, and at the same time connected to the power supply of the electric motor. Said brake is preferably associated with the rotation shaft of the electric motor and comprises a braking means on the rotation shaft, for example made through a first annular disc 51 integral with

such a shaft that can be electromagnetically coupled with a second brake disc 52. The electromagnet allows the discs to couple and decouple with/from each other. In particular, when the motor is supplied with power to allow the gate to open and close, such an electromagnet is also supplied with power, which automatically deactivates the brake.

[0018] In the case in which there is one of the aforementioned emergency situations, the lack of electrical voltage or a breakdown in the control station results in the activation of such an electromagnetic brake, which does not allow the manual movement of the gate. The mechanism of the present invention allows intervention by commanding the closing of an emergency electric circuit between the electromagnetic gate and the buffer battery that supplies it from the outside, ensuring that it is deactivated and that the piston allows the mobile door of the gate to move if manually stressed.

[0019] The intervention can be carried out through a radio control, for example through the same radio control that commands the opening of the gate, or else through a key selector that, suitably inserted in a suitable seat in the gate, determines such unlocking. The unlocking mechanism for such a purpose comprises a radio receiver suitable for capturing the unlocking signal and for closing a switch to connect said battery to the electromagnet of the brake. Such a switch can also be actuated through the quoted key.

[0020] Preferably, the power supply circuit of such an electromagnetic brake is placed in series with the power supply circuit of the electric motor, so that when the electric motor is supplied with power to move the mobile door of the gate, the electromagnetic brake is also supplied with power and therefore is deactivated.

[0021] By deactivated brake we mean that the two discs of the brake are not in contact and allow the rotation of the motor; such a condition is obtained by supplying the electromagnet of the brake with power.

[0022] On the other hand, by activated brake we mean that the two discs are in contact.

[0023] The mechanism of the present invention connects in parallel with such a power supply circuit of the motor that also supplies the brake with power, said emergency electric circuit, which, through the battery, can supply the electromagnetic brake, following an external command, even when the power supply circuit of the electric motor is not active. This allows such a brake to be deactivated, and makes the manual rotation of the electric motor and the manual movement of the mobile door of the gate possible.

[0024] Therefore, the mechanism of the present invention allows a mobile door of the gate to be unlocked, through a signal sent by the radio command for opening the gate, allowing, in an emergency situation, a user to open and/or close the entry space manually.

[0025] The radio control can, by the way, have a specific unlocking button, for example arranged on the base of the radio control, or else it is possible to use the same button used to open the gate.

Claims

1. Unlocking mechanism for an automatic gate, said gate comprising a mobile door, suitable for covering an access space defined at the ends by fixed parts of said gate, the movement of which is controlled by an electric motor, said mechanism being able to be activated in an emergency situation that involves said electric motor being shut down,
characterised in that it comprises
an electromagnetic brake, applied onto the rotation shaft of the motor, that can be deactivated during the rotation of the motor and in said emergency situation through an unlocking command, so as to allow the free movement of the door of the gate.

2. Mechanism according to claim 1, comprising an emergency electric circuit comprising a power supply battery for said electromagnetic brake, a radio receiver to receive said unlocking command, a switch suitable for connecting said battery to said brake according to said unlocking command.

3. Mechanism according to claim 1, wherein said unlocking command is generated by a radio control.

4. Mechanism according to claim 1, wherein said radio control determines the opening and closing of the gate in operating conditions.

5. Mechanism according to claim 1, wherein said electromagnetic brake is arranged on the rotation shaft of the electric motor.

6. Mechanism according to claim 5, wherein said electromagnetic brake comprises a braking means on the rotation shaft of the motor made through a disc integral with such a shaft that can be coupled, through an electromagnet, with a further annular brake disc, so that the electromagnet allows the discs to couple and decouple with/from each other according to said unlocking command and the power supply of said motor.

7. Mechanism according to claim 3, wherein said radio control comprises a specific button suitable for sending such an unlocking signal and a button for the opening and closing of the gate.

8. Mechanism according to claim 3, wherein said radio control comprises a button that can be used both to send the unlocking command and to send an open and close signal of the gate.

9. Mechanism according to claim 2, wherein said un-

locking signal can be sent to the emergency circuit through the insertion of a key selector in a suitable seat formed in the gate.

Fig.1

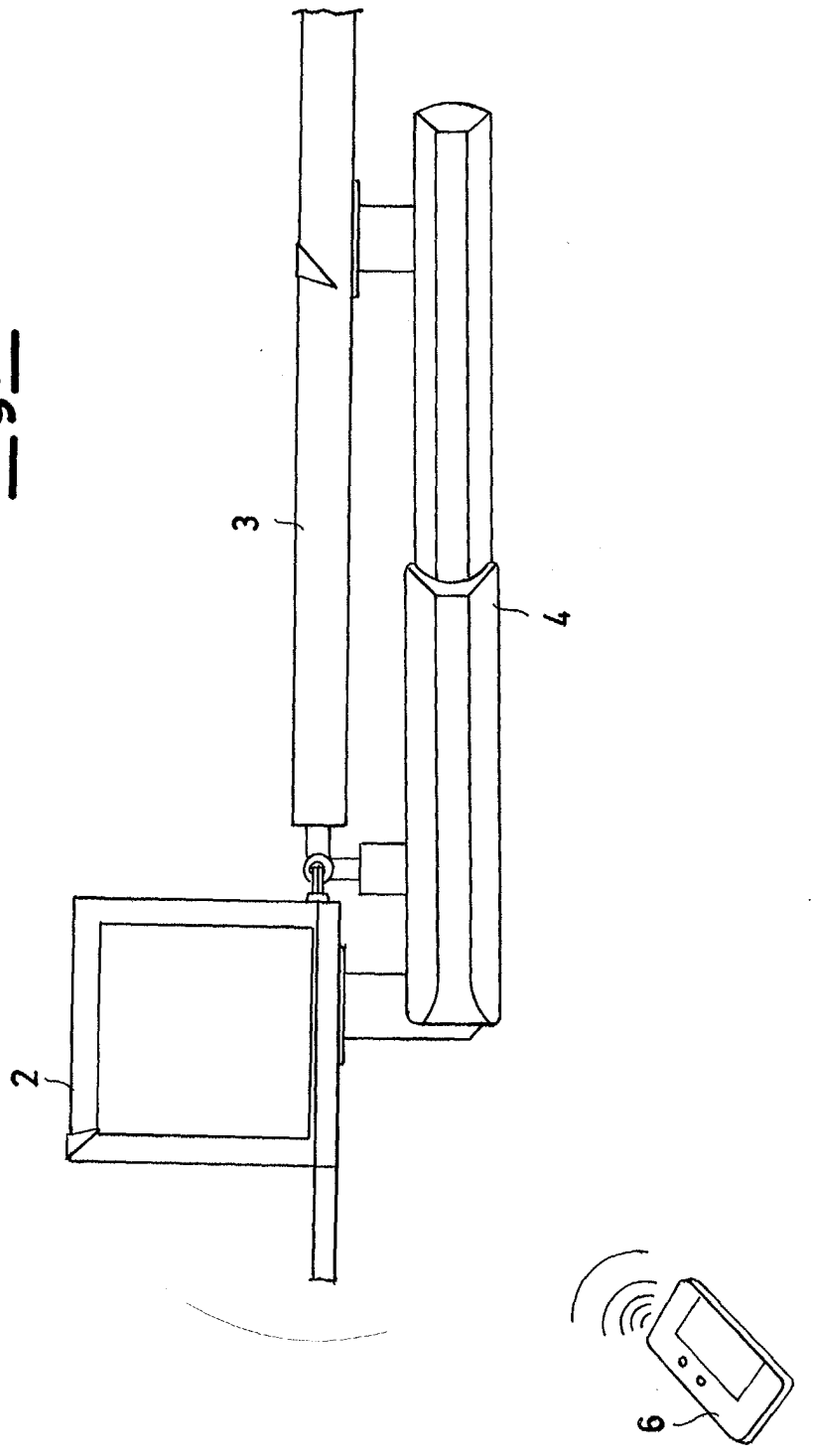

Fig.2