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(54) **Unlocking device for a door opener**

for a predetermined period of time in response to said release command so that the latch stop (5) is kept unlocked for said period of time even if it has been ceased. The energy storage means (12) may comprise a capacitor (14) or a rechargeable battery (15). A DC-AC converter circuit (17) may be further provided.

FIG. 2

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Description

Field of the invention

[0001] The present invention relates to an unlocking device for an electric door opener of the type which are used, for example, in the so-called entry phones to allow automatic remote opening of a door or the like.

[0002] The unlocking device of the invention is adapted to act, through an electromagnet, on a locking member of the latch stop of the door opener allowing the door to be opened. Actuation on the unlocking device is carried out when a release command is sent by the user, usually remotely, which involves sending electric current to said electromagnet, when a door release button is pressed down.

BACKGROUND ART

[0003] Typical configuration of an electric door opener includes a retaining arm that is rotatably fitted around a shaft in a housing (mechanism box), and associated with the movement of a movable latch stop. The retaining arm is usually associated with an elastic means that urges it into a direction of rotation.

[0004] Known door openers further include a locking member for preventing the retaining arm from being rotated and an elastic means associated with the locking member. Two positions can be assumed by said locking member: a locked position in which rotation of the retaining arm is prevented and consequently the movement of the latch stop (such that the door can not be opened), and an unlocking position, in which said locking member remains detached from the retaining arm, allowing the door to be opened.

[0005] Actuator means of the locking element are further provided for moving it in a direction away from the retaining arm against the action of said elastic means for unlocking the latch stop and enabling it to be moved (and thus the door to be opened). Said actuator means typically comprise an electromagnet that, upon receiving electric current (when the release button is pressed down by the user), is driven with the latter acting on the locking member causing it to be rotated for unlocking the latch stop.

[0006] There are door openers commonly referred to as normal actuation door openers in which a constant flow of electric current is required to such electromagnet to open the door until the door has been opened.

[0007] The disadvantage of this type of normal actuation door openers is that it is necessary that release button is continuously pressed down by the user while the door has not been opened. Once the door has been opened, it gets locked when closed again.

[0008] There are other door openers commonly referred to as of the automatic type, in which the door is opened with an electric pulse to the electromagnet, that is, with a single button pressing.

[0009] Automatic door openers used so far employ mechanical means for unlocking the latch stop allowing the door to be opened with a single electric pulse received by the electromagnet.

5 [0010] One example of this type of automatic door opener is the Spanish patent P0480860, which discloses a door opener comprising a housing in which a retaining arm is received. This arm is capable of being retained by a locking member which can rotate around one of its ends by the action of an electromagnetic actuation means. On 10 both members respective springs act which tend to keep the assembly in the locked position and the retaining arm is associated with a leaf spring attached by one end either at an intermediate portion of the retaining arm through 15 two rivets or in the inside of a wall of said housing.

[0011] A further example is U200600936 which employs only a conveniently shaped rod as a flexible member.

20 [0012] As stated above, this type of door opener has the advantage of allowing the door to be opened with a single electric pulse to the electromagnet, without requiring the release button to be continuously pressed down for unlocking the door. Once the door has been opened, it gets locked when closed again.

25 [0013] However, the need for the door to be opened and closed for it to get locked again is a disadvantage that it would be desirable to overcome. Particularly, when the user stops pushing down the door release button, the electric current stops flowing through the electromagnet 30 and the retaining arm remains unlocked until the door is opened and closed again. This is not desirable since if a visitor, for whatever reason, fails to open the door, leaving it, it is unlocked at the mercy of just a shove to cross it.

35 [0014] Another disadvantage associated with this type of door opener is that unintentional remote pressings or by children who leave the door unlocked often occur allowing access to be gained at any time by a stranger to the building, housing, office or any other premises secured with the door opener.

SUMMARY OF THE INVENTION

40 [0015] The present invention provides an unlocking device for door openers that allows the time the door remains in the unlocked position can be set, so that thereafter, whether the door has been open or not, it becomes locked again thus ensuring the safety of the precinct.

45 [0016] For this purpose, the unlocking device of the invention comprises an electromagnet suitable to act on the locking member of the latch stop in the electric door opener in the presence of a release command from the user, which command involves sending electric current to said electromagnet.

50 [0017] A special feature of the device of the present invention is the fact that it includes energy storage means arranged to continue sending electric current to the electromagnet for a predetermined period of time in response to the release command by the user even if it has been

ceased.

[0018] The advantage provided by this unlocking device is that it allows the latch stop to be kept unlocked for a predetermined period of time, so that the system for opening and closing the door is much safer for the user.

[0019] This predetermined period of time the latch stop is unlocked may depend, among other factors, upon the storage capacity of the energy storage means, which may include, according to different embodiments of the invention, a capacitor or a rechargeable battery.

[0020] The device of the invention may also include a DC-AC converter circuit.

[0021] The invention further refers to an automatic type electric door opener including a rotatably fitted retaining arm that is associated with the movement of a movable latch stop, a locking member for preventing said retaining arm from being rotated, which can assume a locking position preventing the retaining arm from being rotated and the latch stop from being moved, and an unlocking position in which it is detached from the retaining arm allowing the door to be opened, and an unlocking device that includes an electromagnet suitable for acting on said member in the presence of a release command by the user that involves sending electric current to said electromagnet.

[0022] The unlocking device carried by the automatic electric door opener of the invention is of the above mentioned type, that is, provided with energy storage means arranged to continue sending electric current autonomously to the electromagnet for a predetermined period of time in response to a release command by the user so that the latch stop is kept unlocked for said period of time even if it has been ceased.

[0023] With the above described configuration an unlocking device for an automatic electric door opener is obtained which provides greater security to users through a simple system.

[0024] Further objects, advantages and features of the door opener and the unlocking device thereof according to the invention will be apparent from the description of a preferred embodiment of the invention. This description is given by way of a non-limiting example and it is depicted in the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] In said drawings,

Fig. 1 is an elevational view of a door opener according to the invention, where it is shown in a locked position and showing all the elements that are part of it; and

Figs. 2 and 3 diagrammatically show two embodiments of the unlocking device of the door opener in Fig. 1, respectively.

DETAILED DESCRIPTION OF PARTICULAR EMBODIMENTS

[0026] An automatic type electric door opener is diagrammatically shown in Fig. 1, which has been denoted as a whole by reference numeral 1. This door opener 1 is the type of which are fitted in remotely opening doors.

[0027] The door opener 1 which is shown by way of an example includes a retaining arm 2 that is rotatably fitted around a shaft 3 arranged in a housing or mechanism box 4.

[0028] The retaining arm 2 is associated with the movement of a latch stop 5 fitted in said housing 4 so that it is allowed to slide therein.

[0029] The door opener 1 further includes a locking member 6 that is rotatably fitted around a shaft 9 arranged in the housing 4. The locking member 6 can assume a locking position (shown in Fig. 1) in which rotation of said retaining arm 2 is prevented, and therefore the movement of the latch stop 5, and an unlocking position in which said locking member 6 is separated from the retaining arm 2, allowing the door (not shown) to be opened.

[0030] The retaining arm 2 and the locking member 6 are provided with respective spring means 7, 8 associated therewith, as can be seen from Fig. 1.

[0031] An unlocking device is also provided in the door opener 1. This unlocking device is shown in Figs. 2 and 3 and it has been denoted as a whole by reference numeral 10.

[0032] The unlocking device 10 is provided with energy storage means 12 allowing electric current to flow, with the help of an electronic circuit 13, to the coil of an electromagnet 11 for a predetermined period of time in response to the release command from the user, which is performed by means of a push button 16. Once the electric pulse has been received, energy storage means 12 store sufficient energy to continue independently supplying the necessary electric current to the electromagnet 11 once the push button 16 is no longer actuated.

[0033] As electric current is being sent to the electromagnet, it acts on the locking member 6 keeping it in an unlocking position (away from the end of the retaining arm 2) thus allowing the door (not shown) to be opened for a predetermined period of time. After that time and regardless of whether the door is open or not, the locking member 6 returns back to its locking position. In this locking position, the door is prevented from being opened since the latch stop 5 is locked, that is, with the door opener 1 in the position shown in Fig. 1, thus ensuring the safety of the precinct.

[0034] In the embodiment of the unlocking device 10 in Fig. 2, the energy storage means 12 include a capacitor 14, while in the embodiment of the unlocking device 10 in Fig. 3, the energy storage means 12 include a rechargeable battery 15.

[0035] A single pressing on the remote switch or push button 16 by the user causes a amount of electric current to flow sufficient to keep the unlocking position of the

door opener 1 for a period of time enough for the door to be opened and for the user to easily pass therethrough with no hurry. However, in the embodiments of Figs. 2 and 3, the parts related to the electronic circuit 13, whether they are the condenser 14 or, in its case, the rechargeable battery 15 can be selected to adjust (extending or reducing) the door unlocking time.

[0036] In some cases it is provided that the electromagnet coil 11 is provided with tripolar or quadripolar connections.

[0037] The operation of the automatic electric door opener 1 provided with an unlocking device 10 according to the present invention is described below.

[0038] When a user wants to open the door, for example from a remote location for allowing a visitor to enter, the push button 16 is momentarily actuated. The actuation of the push button 16 causes the electrical circuit to close allowing the electric current to flow through a DC-AC converter circuit 17 to the energy storage means 12 charging the capacitor 14 or the rechargeable battery 15, depending on the embodiment. Current stored by the energy storage means 12 is sent through the electronic circuit 13 to the electromagnet coil 11 driving it even the user has stopped pressing down the push button 16. This means that the door is kept unlocked for a predetermined period of time. For each new actuation of the push button 16, this process is repeated again with the charging and discharging of the capacitor 14 or the rechargeable battery 15, accordingly.

[0039] In order to drive the electromagnet 11 there is no need for the capacitor 14 or the battery 15 to be previously charged. The mere fact of sending electric current makes first driving of the electromagnet 11 to be simultaneous with charging of the energy storage means 12.

[0040] While the present invention has been described in the specification and illustrated in the accompanying drawings with reference to a preferred embodiment thereof, various changes can be made in the unlocking device and the electric door opener of the invention without departing from the scope of protection defined by the following claims.

Claims

1. Unlocking device (10) for door openers comprising an electromagnet (11) suitable for acting on a locking member (6) of a latch stop (5) in an electric door opener (1) in the presence of a release command from a user, which command involves sending electric current to said electromagnet (11), **characterized in that** it includes energy storage means (12) arranged to continue sending electric current to the electromagnet (11) for a predetermined period of time in response to the release command by the user so that the latch stop (5) is kept unlocked for said period of time even if it has been ceased.

2. Device as claimed in claim 1, wherein said energy storage means (12) comprise a capacitor (14).
3. Device as claimed in claim 1, wherein said energy storage means comprise (12) a rechargeable battery (15).
4. Device as claimed in any of the preceding claims, wherein it comprises a DC-AC converter circuit (17).

FIG.1

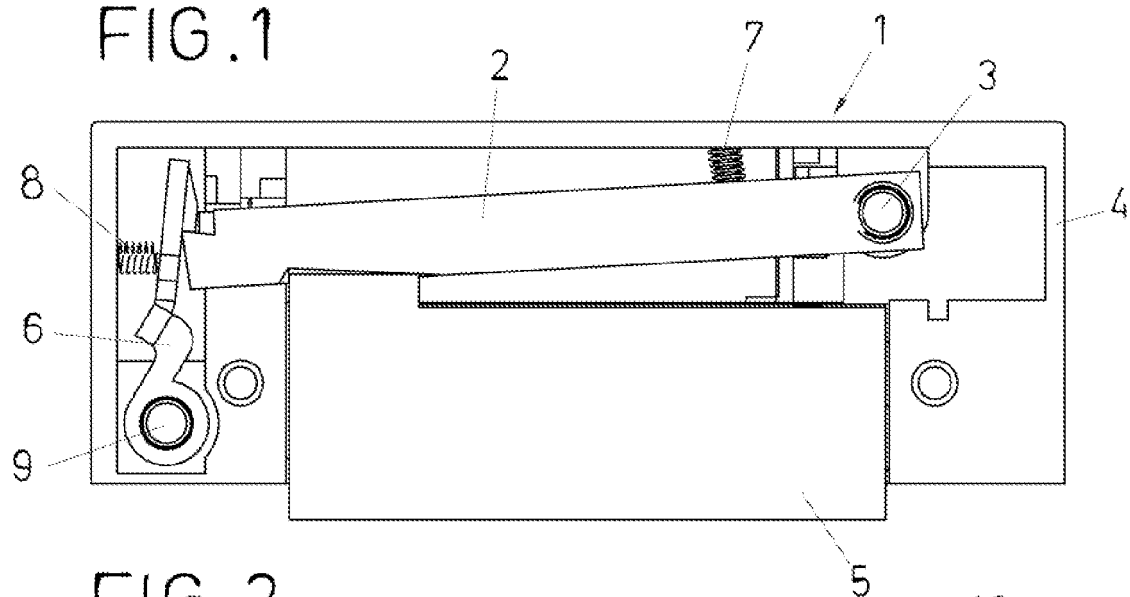


FIG.2

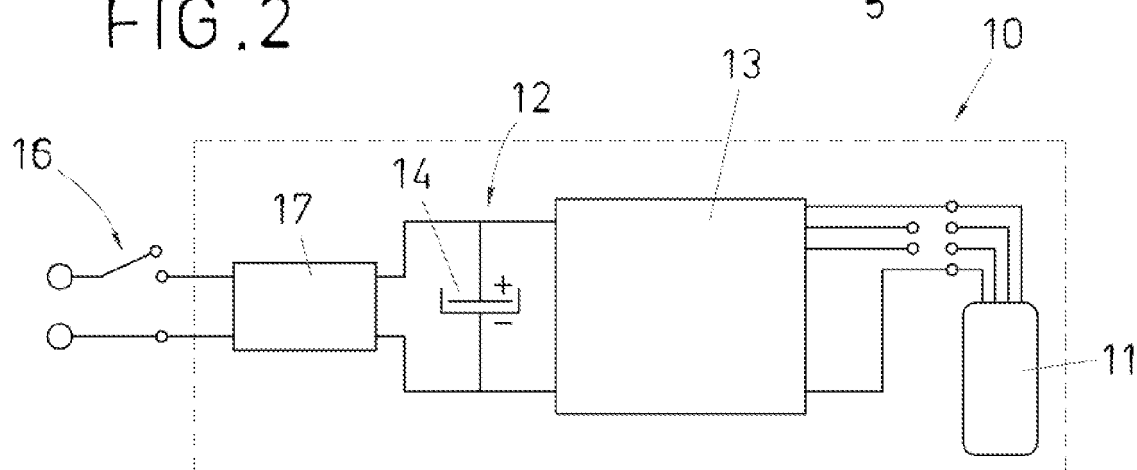
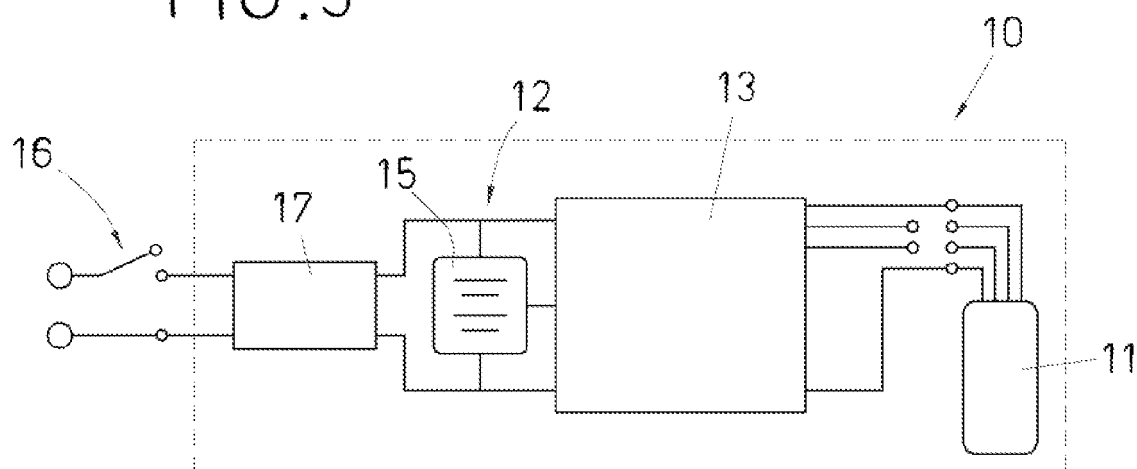


FIG.3



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES P0480860 [0010]