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(71) Applicant: **Industrias Galtés S.A.**
08755 Castellbisbal (ES)

(72) Inventors:
- **GALTÉS VALLÉS, Josep**
  08755 CASTELLBISBAL (ES)
- **GALTÉS CASTELLS, Miquel**
  08755 CASTELLBISBAL (ES)

(74) Representative: **Manresa Val, Manuel et al**
Manresa & De Rafael, S.L.
Roger de Llúria, 113, 4a planta
08037 Barcelona (ES)

(54) Device for driving strike boxes

(57) It comprises a housing or container holding the various device elements, a power supply module (1) with batteries and operating module (3) of a latch.

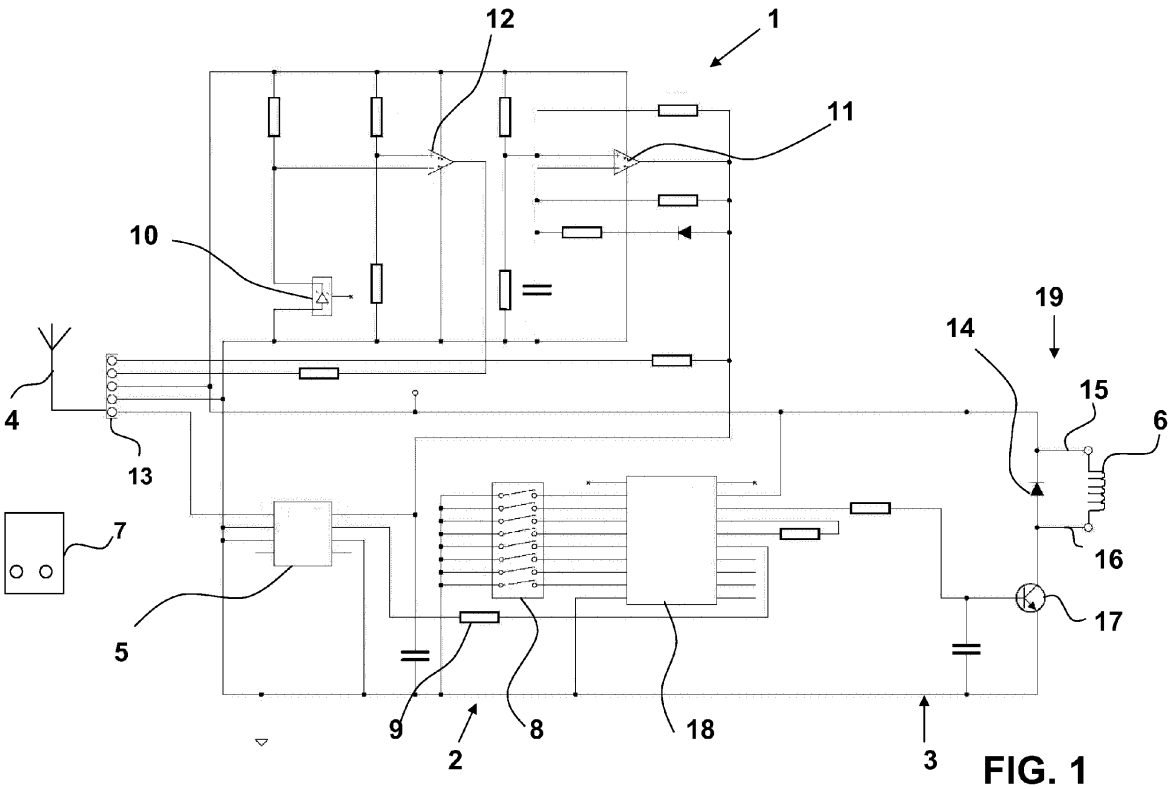

FIG. 1

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Description

DEVICE FOR DRIVING STRIKE BOXES

[0001] This device is for driving strike boxes, of the type that comprises a housing or container holding the various device elements, a power supply module with batteries, an actuation module with latch, **characterised in that** the power supply modules comprises a first integrated circuit that maintains a complete receiver power supply cycle by means of a low-frequency oscillation, with said operating cycle having a predetermined period, with said operating cycle equal to or less than the referred predetermined period, a signal reception module with at least one antenna and at least one receiver and because when a remote-control device sends a signal to the antenna it is taken to the receiver which applies it to a decoder and, if the signal is accepted, a command is sent to the drive module that comprises an electro-magnetic device that acting on the latch.

BACKGROUND TO THE INVENTION

[0002] Various mechanisms are known in the state of the art, which allow doors to be opened based on remote lock operation.

[0003] Thus, European Patent No 1764460 is known "CONDITIONALLY OPERATED", from 2006, in the name of DENY FONTAINE, which refers to an electromagnetic lock comprising a lock mechanism and a corresponding strike plate, said lock mechanism being fitted with a bolt adapted to come into engagement in said strike plate when said lock mechanism is brought to face said strike plate so as to keep said lock mechanism in a fixed position with respect to said strike plate, said electromagnetic lock comprising an electromagnetic transmitter and an electromagnetic receiver, one of which being housed in said lock mechanism whilst the other is housed in said strike plate, said lock comprising supply means for supplying said transmitter such that said transmitter transmits an encoded signal to said receiver, when said lock mechanism is brought to face said strike plate, the reception of said encoded signal by said receiver authorising the engagement of said bolt in said strike plate; **characterized in that** said electromagnetic transmitter is formed by a directional infrared transmitter housed in said strike plate and directed towards said receiver which is housed in said lock mechanism, said electromagnetic receiver being an infrared receiver; and in that said supply means comprise a radiofrequency electromagnetic generator housed in said lock mechanism, said radiofrequency electromagnetic generator being intended to remotely supply said transmitter.

[0004] Also known is Utility Model No 200800892, "PASADOR DE SEGURIDAD CON ACCIONAMIENTO A DISTANCIA", from 2008, in the name of Mr Vicente VERDET BENLLOCH, which refers to a security pin with remote control, **characterised in that** it comprises a male part and a female part, with the male part fitted with a remote actuating mechanism, whereas the female part comprises a securing mechanism into which the pin can couple and remote control associated with the remote control mechanism.

[0005] Another document from the state of the art is Utility Model No 8800308 "CERRADURA AUTOMATICA DE SEGURIDAD CON ALARMA INCORPORADA ACCIONADA A DISTANCIA MEDIANTE INFRARROJOS", from 1988, in the name of CAR PROTECTOR, S.A., which refers to an automatic security lock with alarm incorporated with infrared remote control, which comprises a mechanical anchor lock, operated by a remote-control infrared transmitter system, the assembly is powered by a battery and includes a code. The lock is coupled to a receiver with its diode connected to a serial converter that converts the infrared beam into the parallel code, a comparator which, if the code is correct, operates a trip circuit that drives the geared motor, the pinion of which, at the same time, drives the gear wheels to turn the anchors, with the assembly being fitted with a magnet alarm warning, **characterised in that** it comprises a mechanical strike lock slide with various anchor points that is activated by means of an infrared transmitter system, fitted with an automatic battery power supply and a key code connected to an amplifier that operates the infrared emitter diode. The lock contains a battery-operated receiver that receives the infrared via a diode connected in parallel with a serial converter, which codes the received beam transmitting to a bit comparator that checks if the code is correct and if it is, operates a trip circuit to drive the geared motor, the shaft of which is fitted with a pinion to turn the anchor drive gearwheels.

[0006] The Utility Model No 200001767 "MOTORISED LOCK" is worthy of mention, and derives from Spanish Patent No 9801932, from 1998, in the name of Mr Fermín USUBIAGA MUGUERZA et al, which refers to a motorised lock, of the type comprising a box housing the mechanisms and from the front of which leaves at least one main locking pin, **characterised in that** the box houses an electric motor that is connected to an electronic module that can be operated by remote or similar control means, with said motor coupled by transmission means to the main pin in relation to action that establishes movement of said main pin and the other lock operating elements between the closed and open positions when operated by the electric motor.

[0007] European Patent No 0737789 "CERRADURA MOTORIZADA", is known from 1996, in the name of Mr Antonio SOLARI et al, which refers to an electric safety-lock consisting of a motor (3) which by means of movement reduction gears (4, 5) drives a worm screw (6) axially mounted on the driven wheel (5). A slider (8) is keyed onto the worm screw (6) on which the mobile lock studs (9) entering the holes (10) in the locking box (1) are fastened. A mobile rack (13) is mounted on the slider (8); the rack (13) may be operated in case of emergency by a gear wheel (14) meshing with a cylinder or sprocket

latch (17) and functioning when using a key (15) or knob. An electric circuit provided with sensors (24, 25, 26) provides for remote control (34) of the door lock by means of opening (A) and closing push-buttons (C) The safety-lock may also be equipped with an alarm system.

[0008] Lastly, Utility Model No 201230383 "CERRADURA PARA PUERTAS Y VENTANAS DE ACCIONAMIENTO ELECTROMECÁNICO", is also known from 2012, in the name of GRUPO GESCASI, S.L., which refers to a lock for electromechanically operated doors and windows that comprises at least one actuator; an assembly of mechanisms housed inside a body or support for the actuator operation; a strike box that receives the actuator; at least one electromechanical drive device, which consists of a motor that is activated via the control unit; connection means between the actuator and the electromechanical drive device; self-contained electric power supply means, consisting of at least one battery; remote-control operating means; and suitable securing means to door or window, **characterised in that** it is fitted battery power level monitoring means and visual and/or acoustic means of warning the user that said battery requires changing.

BRIEF DISCLOSURE OF THE INVENTION

[0009] This application is framed within the invention sector relating to security locks that are operated by remote control.

[0010] There is currently a certain rejection of glass doors with respect to the use of electric locks because the required power cables makes them visually unacceptable to many buyers.

[0011] One solution for these problems is that described in the background to the invention and which is mentioned in, for example, European Patent No 0737789 (cited in the IET of Patent 9801932) and Utility Model No 201230383, which employs batteries to power the lock and the remote control.

[0012] In other words, these solutions affect the lock mechanism and not the strike box.

[0013] Although these documents resolve the above-mentioned problem, they have a serious drawback.

[0014] Thus, it is well-known that batteries regularly lose power because actuation of a lock mechanism requires a lot of electric power and so the same European Patent No 0737789 proposes the possibility of manually opening the lock.

[0015] This invention is an improvement over the previous documents because it resolves the stated problem because if affects the strike box and not the lock mechanism.

[0016] It should also be mentioned that the solutions that are currently employed for remote strike box opening require the wiring to be hidden, especially with glass doors. Thus, a market has developed that offers profiles, covers and adornments etc, for the sole purpose of dissimulating the wiring required to active the latches in said electric strike boxes, especially with glass doors.

[0017] Thus, the inventor has developed a device that reduces device consumption while it is not being used, so that battery lifetime is very significantly lengthened, so that no longer needs worrying for monitoring.

[0018] In this way, the invention remains in standby, but at predetermined intervals, it activates to check whether there is a valid instruction sent by the decoder, if not, it returns to standby mode to again save battery power.

[0019] Battery power is saved while the device is in standby, so that, depending on where it is installed, said time interval can be regulated which will reduce or increase useful battery lifetime.

[0020] One objective of this invention is a device for driving strike boxes, of the type that comprises a housing or container holding the various device elements, a power supply module with batteries, an actuation module with latch, **characterised in that** the power supply modules comprises a first integrated circuit that maintains a complete receiver power supply cycle by means of a low-frequency oscillation, with said operating cycle having a predetermined period, with said operating cycle equal to or less than the referred predetermined period, a signal reception module with at least one antenna and at least one receiver and because when a remote-control device sends a signal to the antenna it is taken to the receiver which applies it to a decoder and, if the signal is accepted, a command is sent to the drive module that comprises an electro-magnetic device that acting on the latch.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] In order to facilitate the explanation, this report is accompanied by two sheets of drawings that show a practical exemplary embodiment, which is cited as a non-limiting example of the scope of this invention:

Figure 1 is a view of a functional schematic of the device.

Figure 2 is a view of a functional schematic of the remote control.

SPECIFIC EXEMPLARY EMBODIMENT OF THIS INVENTION

[0022] Thus, Figure 1 illustrates power supply module 1 with batteries, signal reception module 2 with antenna 4 and receiver 5, actuation module 3 for a latch, remote-control device 7, decoder 8, electromagnetic device 19, solenoid 6, first integrated circuit 11, reference diode 10, second integrated circuit 12, first connector 13, third integrated circuit 18, transistor 14, terminals 15, 16 and diode 17.

[0023] Figure 2 represents remote-control device 7 with fourth integrated circuit 20, antenna 21 and power supplies 22 for the remote-control device.

[0024] Thus, a specific exemplary embodiment of the

device for driving strike boxes of this invention would operate in the following manner.

[0025] The device basically comprises three modules, power supply 1 with batteries that provides the device with the power required for operation.

[0026] Similarly, power supply 1 comprises first integrated circuit 11 that maintains a complete receiver 5 power supply cycle by means of a low-frequency oscillation and second integrated circuit 12 that controls the power supply voltage and reference diode 10. This reference diode 10 detects the power supply voltage.

[0027] There is also signal reception module 2. In this embodiment, module 2 comprises one antenna 4, although it can be fitted with more. This module also comprises at least one receiver 5, in this embodiment it is one receiver that receives the signal from antenna 4.

[0028] Lastly, third module is the actuation module 3 that operates the latch that is activated by a command sent by remote control device 7 and subsequently accepted by the decoder 8 that authorises to act on latch (not shown) that open or close the door.

[0029] One of the greatest advantages of this invention is the fact it saves battery power.

[0030] This is achieved because the operating cycle is established for a predetermined period, for example, 1/3 of a second, in other words, the first integrated circuit 11 is activated every 1/3 of a second so that there is a first battery saving of 2/3.

[0031] Moreover, the active time of said operating cycle is equal to or less than the referred predetermined time, which means that the activation time per cycle can also be programmed to be less, so that, for example, if this were less by 1/8 of a second per cycle, this reduction would have to be applied to the 1/3 of a second duration of the cycle.

[0032] The approximate saving would be in the order of at least doubling the useful battery lifetime in the case of large communities of neighbours with a great deal of transit. In the case of individual dwellings, a level of saving could be attained so that batteries last several years.

[0033] When remote-control device 7 sends a signal to antenna 4, this transfers the signal to receiver 5, via first connector 13.

[0034] In this embodiment, this signal is sent to third integrated circuit 18 via resister 9, and then to decoder 8 which interprets the signal, sending said information to third integrated circuit 18, which will authorise the signal or not.

[0035] If the signal is accepted, a command is sent to actuation module 3 which drives electromagnetic device 19, for example, a solenoid, which then acting on the latch.

[0036] Electromagnetic device 19 comprises first transistor 14 that receives the command from third integrated circuit 18, which drives solenoid 6 connected to terminals 15, 16 and diode 17 connected in parallel with the outer coil to protect transistor 14 against reverse voltage pulses produced by solenoid 6 activation.

[0037] Optionally, the device could comprise a second transistor (not shown on the drawings) that when decoder 8 detects a valid signal, said second transistor produces dc to stop the oscillation.

[0038] In order to enhance antenna performance, especially if the device is on a glass door, antenna 5 is installed on one of the container sides so that any effect preventing radiofrequency propagation, such as a Faraday cage are avoided.

[0039] Remote-control device 7 (Figure 2) was designed so that any power supply 22 could be applied to it. This enables it to be installed, for example, on a wall and connected to the mains power, or to be a battery-powered control. In other words, remote-control device 7 can be both versatile and adaptable.

[0040] This requires fourth integrated circuit 20 with a stabiliser, so that when its voltage is increased, the radiated power from the stationary devices is increased and thus, remote-control device 7 range can be calibrated.

[0041] Moreover, in this embodiment, antenna 21 of remote-control device 7 is configured as a spiral because it has been demonstrated that this provide greater range and with low manufacturing costs. This obviously does not limit the use of a different type of antenna 21 that might be employed for specific requirements.

[0042] It should be fully understood that that illustrated circuits are manufactured examples of same which, while maintaining the technical specifications given in the claims, others can be configured by changing resisters, capacitors and diodes etc, changing the schematic, but with the same performance as previously described.

[0043] This invention describes a new device for driving strike boxes. The embodiments mentioned here do not limit this invention and it may have different applications and/or adaptations, all of which are within the scope of the following claims.

Claims

1. A device for driving strike boxes, of the type that comprises a housing or container holding the various device elements, power supply module (1) with batteries, actuation module (3) with latch, **characterised in that** power supply module (1) comprises:

   - first integrated circuit (11) that maintains a complete receiver (5) power supply cycle by means of a low-frequency oscillation, with said operating cycle having a predetermined period, with said operating cycle equal to or less than the referred predetermined period,
   - signal reception module (2) with at least one antenna (4) and at least one receiver (5),

   and **in that** when remote-control device (7) sends a signal to the antenna (4) it is taken to receiver (5) which applies it to a decoder (8) and, if the signal is accepted, a command is sent to

the drive module (3) that comprises an electromagnetic device (19) that acting on the latch.

2. A device in accordance with claim 1, **characterised in that** it comprises reference diode (10) that detects the power supply voltage value, with the power supply voltage and reference diode (10) controlled by a second integrated circuit (12).

3. A device in accordance with claim 1, **characterised in that** it comprises first connector (13) which connects antenna (4) to receiver (5).

4. A device in accordance with claim 3, **characterised in that** receiver (5) sends a signal to third integrated circuit (18), which interprets the signal an, depending on its validity, sends the command to drive module (3) or not.

5. A device in accordance with claim 1 or 4, **characterised in that** electromagnetic device (19) comprises first transistor (17), which receives the command from third integrated circuit (18), which drives solenoid (6) connected to terminals (15, 16) and diode (14) connected in parallel.

6. A device in accordance with claim 5, **characterised in that** it comprises a second transistor which, when decoder (8) detects a valid instruction, said second transistor produces a dc voltage to stop the oscillation.

7. A device in accordance with claim 1, **characterised in that** antenna (5) is installed on one side of the container.

8. A device in accordance with claim 1, **characterised in that** remote-control device (7) comprises fourth integrated circuit (20) with a stabiliser so that when its voltage is increased, the radiated power from the stationary devices is increased.

9. A device in accordance with claim 8, **characterised in that** antenna (21) for remote-control device (7) is a spiral.

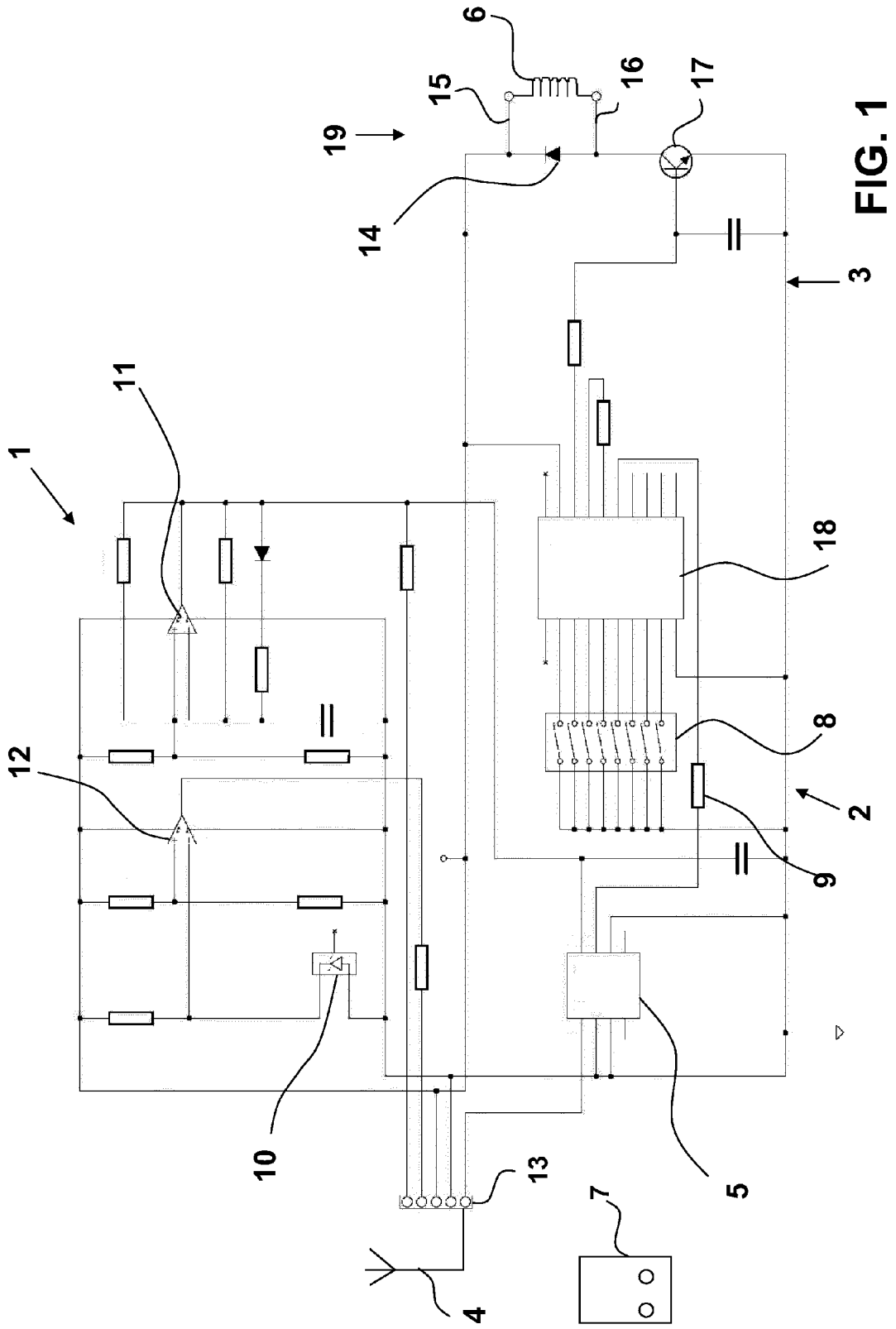

FIG. 1

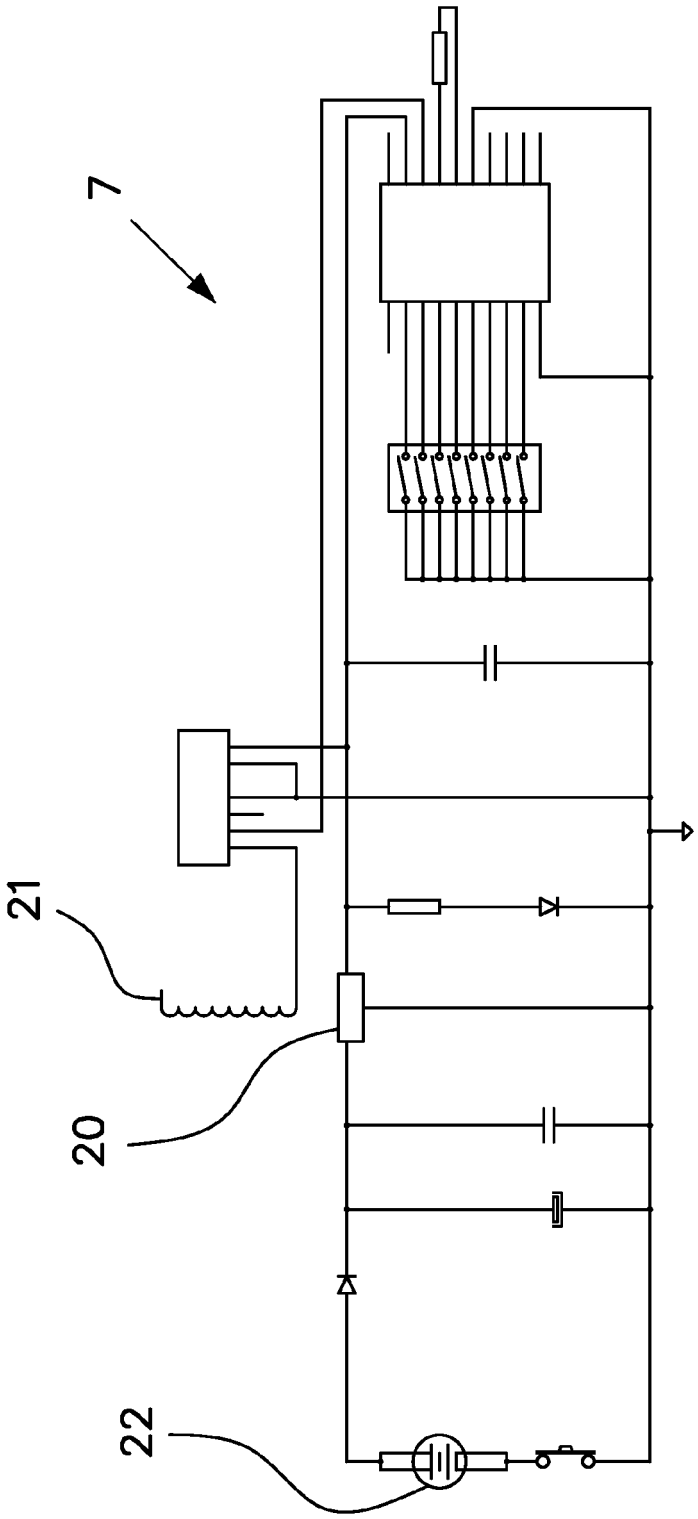

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 12 38 2231

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 99/53161 A1 (EMHART INC [US]) 21 October 1999 (1999-10-21) * page 3, line 1 - line 30 * * page 4, line 30 - page 5, line 30 * * page 7, line 5 - page 9, line 26 * * page 10, line 15 - line 30 * * figures 1,3,4,6 * -----	1-9	INV. G07C9/00 E05B47/00

TECHNICAL FIELDS SEARCHED (IPC)

G07C
E05B

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 December 2012	Miltgen, Eric

CATEGORY OF CITED DOCUMENTS

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
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 38 2231

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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04-12-2012

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WO 9953161 A1	21-10-1999	AU 3647899 A	01-11-1999
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- WO 8800308 A **[0005]**
- WO 9801932 A, Mr Fermín USUBIAGA MUGUERZA **[0006]**
- WO 0737789 A **[0007]**
- WO 201230383 A **[0008]**
- EP 0737789 A **[0011] [0014]**
- EP 9801932 A **[0011]**
- EP 201230383 A **[0011]**