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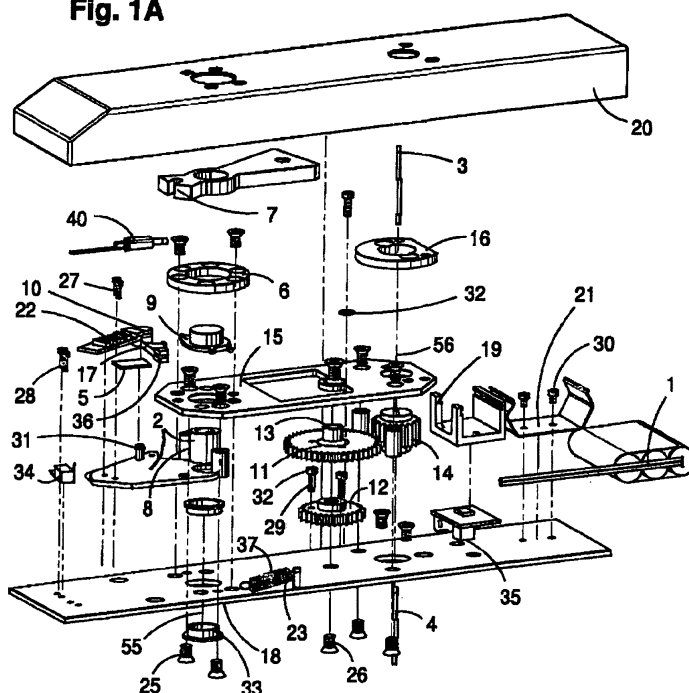
(54) **Control device for adjustment of a lock, lock provided with the control device, door provided with the lock, window provided with the lock and method of using the lock**

(57) The present invention relates to a control device for the adjustment of a lock from a first state that requires a key for unlocking the lock into a second state that does not require a key for unlocking the lock, and/or from a first state that requires a key for locking the lock into a second state that does not require a key for locking the lock. The control device comprises at least one source of power (1, 326), at least one electronic circuit, at least

one switch (34), at least one means (35, 349, 350) for the receipt and evaluation of a wireless signal and for possible actuation of at least one device (40) for the conversion of electric energy into mechanical motion.

The present invention also relates to a lock provided with the control device, a door provided with the lock, a window provided with the lock, and a method of using the lock.

Fig. 1A



Description

[0001] The present invention relates to a control device for the adjustment of a lock from a first state that requires a key for unlocking the lock into a second state that does not require a key for unlocking the lock, and/or from a first state that requires a key for locking the lock into a second state that does not require a key for locking the lock. The present invention also relates to a lock provided with the control device, a door provided with the lock, a window provided with the lock, and a method of using the lock.

Prior Art

[0002] SE, C2, 530 279 discloses a method for unlocking a lock as well as an appurtenant locking device. The locking device comprises members for unlocking said lock if a positive evaluation result is generated, i.e., the locking device itself unlocks the lock at the expense of an electric energy consumption. A disadvantage of this procedure and this device is a great electric energy demand.

Summary of the Invention

[0003] A first object of the present invention is to provide a control device that has a less demand for electric energy than existing known designs. A second object of the present invention is to provide a lock provided with the control device according to the invention. A third object of the present invention is to provide a door provided with the lock according to the invention. A fourth object of the present invention is to provide a window provided with the lock according to the invention. A fifth object of the present invention is to provide a method of using the lock according to the invention.

[0004] Accordingly, the invention embraces a control device for the adjustment of a lock from a first state that requires a key for unlocking the lock into a second state that does not require a key for unlocking the lock, and/or from a first state that requires a key for locking the lock into a second state that does not require a key for locking the lock. The control device comprises at least one source of power, at least one electronic circuit, at least one switch, and at least one means for the receipt and evaluation of a wireless signal and for possible actuation of at least one device for the conversion of electric energy into mechanical motion.

[0005] Said at least one switch may consist of at least one micro switch. Said at least one switch may consist of at least one IR cell. Said at least one switch may consist of at least one IR cell in combination with at least one accelerometer. Said at least one switch may, at least upon switching, be in mechanical connection with at least one lock plate that in turn is rotatable around a first axis of rotation that extends essentially perpendicularly to the principal extension plane of the lock plate.

[0006] Said at least one means may be at least one printed circuit card. At least one of said at least one printed circuit card may be of the PCB type. Said at least one printed circuit card may comprise at least one first card part adapted to wireless communication with a mobile telephone or the like, and at least one second card part adapted to - in the event of a wireless signal evaluated and approved by said first card part - open an electric connection between said source of power and said mechanism. Said at least one means may be at least two printed circuit cards, wherein at least one first card may be adapted to wireless communication with a mobile telephone or the like, and at least one second card may be adapted to - in the event of a wireless signal evaluated and approved by said first card - open an electric connection between said source of power and said device. Said wireless communication may be of the Bluetooth type.

[0007] Said at least one device may consist of at least one piezo motor. Said at least one device may consist of at least one solenoid. Said at least one device may be in mechanical connection with at least one first link. Said at least one first link may be provided with at least one first mechanical engagement member that in the engaged state co-operates with at least one second mechanical engagement member of at least one second link for direct or indirect transfer of rotary motion from said first axis of rotation to a second axis of rotation. Said second link may consist of at least one gear segment that in the engaged state is rotatable around said first axis of rotation.

[0008] Accordingly, the invention also embraces a lock, which is provided with at least one control device according to the above. The lock may comprise at least one first lock rotation axis and at least one second lock rotation axis. Said first lock rotation axis may coincide with said first axis of rotation and said second lock rotation axis may coincide with said second axis of rotation. The lock may comprise at least one first shaft having at least one hand grip or handle, and at least one second shaft, wherein the hand grip or handle, among other things, may be intended for actuating said at least one switch so that it opens an electric connection between said at least one source of power and said at least one means so that said at least one means can receive and evaluate a wireless signal. Said second shaft may be provided with at least one knob. Said first shaft may turn around said first lock rotation axis and said second shaft may turn around said second lock rotation axis.

[0009] Accordingly, the invention also embraces a door, which is provided with at least one lock according to the above.

[0010] Accordingly, the invention also embraces a window, which is provided with at least one lock according to the above.

[0011] Accordingly, the invention also embraces a method for, without a key, unlocking the lock according to the above and comprising the steps of

- pressing and/or turning a hand grip or a handle so that it turns a predetermined distance around a first axis of rotation and keeping it in this position for a predetermined time, at least one switch being brought to open an electric connection between at least one source of power and at least one means for the receipt and evaluation of a wireless signal,
- releasing the hand grip or handle so that it turns back to the initial position,
- transmitting a wireless signal from a mobile telephone or the like to the means, this examining the authority of the signal and, upon approved authority, opening an electric connection between the source of power and at least one device for the conversion of electric energy into mechanical motion, the device interconnecting at least one first link provided with at least one first mechanical engagement member with at least one second link provided with at least one second mechanical engagement member for enabling direct or indirect transfer of rotary motion from said first axis of rotation to a second axis of rotation,
- again pressing and/or turning the hand grip or handle so that it turns said predetermined distance, the turning transferred to said second axis of rotation directly or indirectly actuating the lock plunger so that the lock is unlocked.

[0012] The method may comprise the concluding step of

- releasing the hand grip or handle so that it turns back to the initial position, the turning transferred to said second axis of rotation directly or indirectly actuating the lock plunger so that the lock is locked, and said at least one switch, within a predetermined space of time, being brought to shut off the electric connection between said at least one source of power and said at least one means for the receipt and evaluation of a wireless signal.

[0013] Accordingly, the invention also embraces a method for, without a key, locking the lock according to the above and comprising the steps of

- pressing and/or turning a hand grip or a handle so that it turns a predetermined distance around a first axis of rotation and keeping it in this position for a predetermined time, at least one switch being brought to open an electric connection between at least one source of power and at least one means for the receipt and evaluation of a wireless signal,
- releasing the hand grip or handle so that it turns back to the initial position,
- transmitting a wireless signal from a mobile telephone or the like to the means, this examining the authority of the signal and, upon approved authority, opening an electric connection between the source

of power and at least one device for the conversion of electric energy into mechanical motion, the device interconnecting at least one first link provided with at least one first mechanical engagement member with at least one second link provided with at least one second mechanical engagement member for enabling direct or indirect transfer of rotary motion from said first axis of rotation to a second axis of rotation,

- again pressing and/or turning the hand grip or handle so that it turns said predetermined distance, and
- releasing the hand grip or handle so that it turns back to the initial position, the turning transferred to said second axis of rotation directly or indirectly actuating the lock plunger so that the lock is locked, and said at least one switch, within a predetermined space of time, being brought to shut off the electric connection between said at least one source of power and said at least one means for the receipt and evaluation of a wireless signal.

[0014] Accordingly, the invention also embraces a method for, without a key, locking the lock according to the above and comprising the steps of

- pressing and/or turning a hand grip or a handle so that it turns a predetermined distance around a first axis of rotation and keeping it in this position for a predetermined time, at least one switch being brought to open an electric connection between at least one source of power and at least one means for the receipt and evaluation of a wireless signal,
- releasing the hand grip or handle so that it turns back to the initial position,
- transmitting a wireless signal from a mobile telephone or the like to the means, this examining the authority of the signal and, upon approved authority, enabling the opening of an electric connection between the source of power and at least one device for the conversion of electric energy into mechanical motion,
- again pressing and/or turning the hand grip or handle so that it turns said predetermined distance, said electric connection being opened between the source of power and said at least one device for the conversion of electric energy into mechanical motion, the device interconnecting at least one first link provided with at least one first mechanical engagement member with at least one second link provided with at least one second mechanical engagement member for enabling direct or indirect transfer of rotary motion from said first axis of rotation to a second axis of rotation, and
- releasing the hand grip or handle so that it turns back to the initial position, the turning transferred to said second axis of rotation directly or indirectly actuating a lock plunger so that the lock is locked, and said at least one switch, within a predetermined space of

time, being brought to shut off the electric connection between said at least one source of power and said at least one means for the receipt and evaluation of a wireless signal.

List of Figures

[0015]

Figure 1a shows, in an exploded perspective view, a first embodiment of the control device according to the invention.

Figure 1b shows, in a perspective view, the control device according to Figure 1a.

Figure 2a shows, in an exploded perspective view, a second embodiment of the control device according to the invention.

Figure 2b shows, in a perspective view, the control device according to Figure 2a.

Figure 3 shows, in a front view, a part of the control device according to Figure 1 a mounted on the inside of a door and in a first position.

Figure 4 shows, in a front view, the part according to Figure 3 in a second position.

Figure 5 shows, in a front view, the part according to Figure 3 in a third position.

Figure 6 shows, in a front view, the part according to Figure 3 in a fourth position.

Figure 7 shows, in a front view, the part according to Figure 3 in a fifth position.

Figure 8 shows, in a front view, the part according to Figure 3 in a sixth position.

Figure 9 shows, in a front view, the part according to Figure 3 in a seventh position.

Figure 10 shows, in a front view, the part according to Figure 3 in an eighth position.

Figure 11 shows, in a front view, the part according to Figure 3 in a ninth position.

Figure 12 shows, in a front view, the part according to Figure 3 in a tenth position.

Figure 13a shows, in an exploded perspective view, a third embodiment of the control device according to the invention.

Figure 13b shows, in a perspective view, the control device according to Figure 13a.

Figure 14 shows, in a perspective view, a part of the control device according to Figure 13a.

Description of Embodiments

[0016] A first embodiment of the control device according to the invention for the adjustment of a lock is seen in Figure 1 a. The control device is intended to be mounted on the inside of a door or a window or in another comparable suitable application, and accordingly be provided with a suitable handle 51 and knob 52, see Figure 1 b. Included details are formed in such a way that the control device can be mounted in already existing holes

in a door that is equipped with module locks (mechanical lock housings) of the type ASSA 565 (ASSA is a trademark). After such a mounting of the control device, the door will externally - with an occurring external handle and lock cylinder in an external cylinder protection - look exactly the same as before the mounting of the control device, which is a great advantage that applies to all embodiments of the control device. Accordingly, it will not be possible to externally distinguish a door having the control device from a door that lacks such equipment.

[0017] In the control device, a source of power 1 in the form of three batteries is found, but the number of batteries may naturally vary. The source of power 1 is included in an electronic circuit together with a switch 34, at least one means 35 for the receipt and evaluation of a wireless signal and for possible actuation of at least one device 40 for the conversion of electric energy into mechanical motion. The switch 34 is a micro switch 34, but the type of switch may naturally vary. The means 35 in the embodiment illustrated consists of two printed circuit cards 35 of the PCB type mounted in a printed circuit card holder 19, but the number of printed circuit cards and the type of the same may naturally vary. The device 40 in the embodiment illustrated is one piezo motor 40, but the number of mechanisms and the type of the same may naturally vary.

[0018] The micro switch 34 may be actuated mechanically by a lock plate 2 that in turn is rotatable around a first axis of rotation 55 that extends essentially perpendicularly to the principal extension plane of the lock plate 2. The axis of rotation 55 coincides with an axis of rotation of the handle 51 - here denominated first lock rotation axis - and the lock plate 2 is connected to the handle 51.

[0019] At least one first card 35 of the printed circuit cards 35 is adapted to wireless communication with a mobile telephone or the like, and at least one second card of the printed circuit cards 35 is adapted to - in the event of a wireless signal evaluated and approved by said first card - open an electric connection between the batteries 1 and the piezo motor 40, alternatively enable such an opening. The piezo motor 40 is mechanically connected with at least one first link 17 in the form of a catch 17 provided with at least one first mechanical engagement member in the form of a bulging that, in the engaged state, co-operates with at least one second mechanical engagement member in the form of a corresponding indentation of at least one second link 7 in the form of a gear segment 7 for direct or indirect transfer of rotary motion from said first axis of rotation 55 to a second axis of rotation 56. In the engaged state, the gear segment 7 is rotatable around said first axis of rotation 55. According to the present embodiment, the transfer of rotary motion from the first axis of rotation 55 to the second axis of rotation 56 is effected indirectly in such a way that the gear segment 7 actuates an intermediate gearwheel that in turn actuates a gearwheel that turns around the axis of rotation 56. The axis of rotation 56 coincides with an axis of rotation of the knob 52 - here denominated

second lock rotation axis.

[0020] According to a second embodiment of the control device according to the invention, included details are instead formed in such a way that the control device can be mounted in already existing holes in a door that is equipped with module locks (mechanical lock housings) of the type ASSA 2000 (ASSA is a trademark), see Figures 2a and 2b. In this case, on the inside of the door, in addition to a handle 51 and a knob 52, there is also found a lock cylinder 54 in a cylinder protection. Please observe that the reference designations in Figure 2a regarding the second embodiment do not entirely correspond with those in Figure 1a regarding the first embodiment, see pages 11-13.

[0021] According to a third embodiment of the control device according to the invention, included details are formed in such a way that the control device can be mounted in already existing holes in a door that is equipped with module locks (mechanical lock housings) of the type ASSA 565 (ASSA is a trademark), see Figures 13a and 13b. A part of the construction in the mounted state is seen in Figure 14. A first printed circuit card 349 of the PCB type for the wireless communication is present and accordingly corresponds to said first card of the printed circuit cards 35 according to the first embodiment. Together, corresponding to the switch 34 according to the first embodiment - and, accordingly, instead of micro switches - there is found, according to the third embodiment, an IR cell (infrared cell) in combination with an accelerometer, both of which are mounted on a second printed circuit card 350 of the PCB type corresponding to said second card of the printed circuit cards 35 according to the first embodiment. The IR cell has the ability to transmit a light beam for the detection of whether an occurring lock catch of an occurring first link is in an initial position or in an upper active position, i.e., whether an occurring first mechanical engagement member is in a disconnected initial position or in a connected active position in relation to occurring other engagement members of an occurring second link. The accelerometer has the ability to sense the motions of a handle. The second printed circuit card 350 is in turn mounted on a lock plate 303 corresponding to the lock plate 2 according to the first embodiment. The first printed circuit card 349 and the second printed circuit card 350 may - instead of constituting two separate printed circuit cards - be combined in one and the same printed circuit card, and accordingly constitute two card parts in a single printed circuit card. Instead of an IR cell in combination with an accelerometer, only an IR cell may be used, i.e., it is feasible to spare the accelerometer and still obtain an acceptable function in the use of the control device. Please observe that the reference designations in Figure 13a regarding the third embodiment do not entirely correspond with those in Figure 1a regarding the first embodiment or Figure 2a regarding the second embodiment. Of course, additional embodiments of a control device according to the invention are also feasible without deviating from the gen-

eral idea of the invention. The designs according to all embodiments can be mirror-inverted for other types of doors and/or windows.

[0022] Figures 3-7 intend to illustrate how to use a lock according to the invention provided with the control device according to the invention and when it is desired to unlock the lock without using a key. A method comprises the steps of

- pressing and/or turning a hand grip or handle 51 so that it turns a predetermined distance around the first axis of rotation 55 and keeping it in this position for a predetermined time, the switch 34 being brought to open an electric connection between the batteries 1 and the means 35 for the receipt and evaluation of a wireless signal,
- releasing the hand grip or handle 51 so that it turns back to the initial position, see Figure 3, under the influence of at least one return spring,
- transmitting a wireless signal from a mobile telephone or the like to the means 35, this examining the authority of the signal and, upon approved authority, opening an electric connection between the source of power 1 and the device 40 for the conversion of electric energy into mechanical motion, the device 40 interconnecting the first link 17 provided with the first mechanical engagement member with the second link 7 provided with the second mechanical engagement member for enabling direct or indirect transfer of rotary motion from the first axis of rotation 55 to the second axis of rotation 56, see Figure 4,
- again pressing and/or turning the hand grip or handle 51 so that it turns said predetermined distance, the turning transferred to the second axis of rotation 56 directly or indirectly actuating a lock plunger so that the lock is unlocked, see Figure 5.

[0023] The method may comprise the concluding step of

- releasing the hand grip or handle 51 so that it turns back to the initial position under the influence of the at least one return spring, the turning transferred to the second axis of rotation directly or indirectly actuating the lock plunger so that the lock is locked, see Figure 6, and the switch 34, within a predetermined space of time, being brought to shut off the electric connection between the batteries 1 and the means 35 for the receipt and evaluation of a wireless signal, see Figure 7

[0024] Figures 8-12 intend to illustrate how to use a lock according to the invention provided with the control device according to the invention and when it is desired to lock the lock without using a key. A method comprises the steps of

- pressing and/or turning a hand grip or handle 51 so that it turns a predetermined distance around the first axis of rotation 55 and keeping it in this position for a predetermined time, the switch 34 being brought to open an electric connection between the batteries 1 and the means 35 for the receipt and evaluation of a wireless signal, 5
- releasing the hand grip or handle 51 so that it turns back to the initial position under the influence of the at least one return spring, see Figure 8, 10
- transmitting a wireless signal from a mobile telephone or the like to the means 35, this examining the authority of the signal and, upon approved authority, enabling the opening of an electric connection between the batteries 1 and the device 40 for the conversion of electric energy into mechanical motion, 15
- again pressing and/or turning the hand grip or handle 51 so that it turns said predetermined distance, see Figure 9, said electric connection being opened between the batteries 1 and the device 40 for the conversion of electric energy into mechanical motion, the device 40 interconnecting the first link 17 provided with the first mechanical engagement member with the second link 7 provided with the second mechanical engagement member for enabling direct or indirect transfer of rotary motion from the first axis of rotation 55 to the second axis of rotation 56, see Figure 10, and 20
- releasing the hand grip or handle 51 so that it turns back to the initial position under the influence of the at least one return spring, the turning transferred to the second axis of rotation 56 directly or indirectly actuating a lock plunger so that the lock is locked, see Figure 11, and the switch 34, within a predetermined space of time, being brought to shut off the electric connection between the batteries 1 and the means 35 for the receipt and evaluation of a wireless signal, see Figure 12. 25

[0025] Used wireless communication standard is preferably Bluetooth but also, for instance, WLAN or ZigBee are feasible.

[0026] The invention is not limited to the embodiments shown herein, but may be varied within the scope of the subsequent claims. 30

Reference signs in Figs. 1a and 1b

[0027]

Designation	Denomination
1	Battery
2	Lock plate
3	Driving pin

(continued)

Designation	Denomination
4	Carrier
5	Shim
6	Spacer ring
7	Gear segment
8	Spacer shaft
9	Flange sleeve
10	Shaft journal
11	Gearwheel
12	Gearwheel
13	Spacer shaft
14	Gearwheel
15	Base plate
16	Spacer ring
17	Catch
18	Base plate
19	Printed circuit card holder
20	Protecting cover
21	Battery support
22	Chip
23	Spring retainer
24	Handle
25	ISO 10642 - M4 × 8
26	ISO 10642 - M5 × 8
27	ISO 1207 - M1,6 × 8
28	ISO 1207 - M2 × 8
29	ISO 1207 - M3 × 10
30	ISO 1207 - M3 × 4
31	ISO 7046-1- M3 × 10-4,8
32	ISO 7092 - ST 3 - 140 HV
33	Slide bush
34	Micro switch
35	PCB-1
36	Tubular pin
37	Tension spring
38	Cover plate
39	Knob
40	WAVE

Reference signs in Figs. 2a and 2b

[0028]

Designation	Denomination
1	Battery
2	Printed circuit card holder
3	Battery support
4	Hub
5	Gear section
6	Gearwheel
7	Gearwheel
8	Shaft journal
9	Flange sleeve
10	Lock plate
11	Spacer shaft
12	Head plate
13	Spacer ring
14	Catch
15	Shim
16	Shaft journal
17	Bottom plate
18	Cover
19	Chip
20	Cylinder casing
21	DIN 7985 (H) - M3 × 4-H
22	DIN 923 - M2 × 4
23	DIN 934- M2
24	Decorative ring
25	Door leaf
26	Lifting ring
27	GFM-08104_1
28	Handle
29	Handle
30	ISO 10642 - M4 × 8
31	ISO 10642 - M3 × 10
32	ISO 1207 - M1,6 × 6
33	ISO 1207 - M2 × 4
34	ISO 1207 - M2 × 8
35	ISO 1207 - M3 × 6
36	ISO 7050 - ST4,2 × 16 - C - H

(continued)

Designation	Denomination
37	ISO 7092 - ST 3 - 140 HV
38	Case
39	Square bar
40	Square bar
41	Lock cylinder
42	Lock cylinder
43	MCM-10-03
44	MCM-14-03
45	Micro switch
46	PCB-1
47	Tubular pin
48	Pushbutton
49	Knob
50	WAVE

Claims

- Control device for the adjustment of a lock from a first state that requires a key for unlocking the lock into a second state that does not require a key for unlocking the lock, and/or from a first state that requires a key for locking the lock into a second state that does not require a key for locking the lock, **characterized by** at least one source of power (1, 326), at least one electronic circuit, at least one switch (34), at least one means (35, 349, 350) for the receipt and evaluation of a wireless signal and for possible actuation of at least one device (40) for the conversion of electric energy into mechanical motion.
- Control device according to claim 1, wherein said at least one switch (34) is at least one micro switch (34).
- Control device according to claim 1, wherein said at least one switch (34) is at least one IR cell.
- Control device according to claim 1, wherein said at least one switch (34) is at least one IR cell in combination with at least one accelerometer.
- Control device according to claim 1, wherein said at least one switch (34), at least upon switching, is mechanically connected with at least one lock plate (2, 303) that in turn is rotatable around a first axis of rotation (55) that extends essentially perpendicularly to the principal extension plane of the lock plate (2).

6. Control device according to claim 1, wherein said at least one means (35) is at least one printed circuit card (35).
7. Control device according to claim 6, wherein at least one of said at least one printed circuit card (35) is of the PCB type.
8. Control device according to claim 6, wherein said at least one printed circuit card (35) comprises at least one first card part (35) adapted to wireless communication with a mobile telephone or the like, and at least one second card part (35) adapted to - in the event of a wireless signal evaluated and approved by said first card part (35) - open an electric connection between said source of power (1) and said device (40).
9. Control device according to claim 6, wherein said at least one means (35) is at least two printed circuit cards (35), at least one first card (35) being adapted to wireless communication with a mobile telephone or the like, and at least one second card (35) being adapted to - in the event of a wireless signal evaluated and approved by said first card (35) - open an electric connection between said source of power (1) and said device (40).
10. Control device according to claim 1, wherein said wireless communication is of the Bluetooth type.
11. Control device according to claim 1, wherein said at least one device (40) is at least one piezo motor (40).
12. Control device according to claim 1, wherein said at least one device (40) is at least one solenoid (40).
13. Control device according to claim 1, wherein said at least one device (40) is mechanically connected with at least one first link (17).
14. Control device according to claim 13, wherein said at least one first link (17) is provided with at least one first mechanical engagement member that, in the engaged state, co-operates with at least one second mechanical engagement member of at least one second link (7) for direct or indirect transfer of rotary motion from said first axis of rotation (55) to a second axis of rotation (56).
15. Control device according to claim 14, wherein said second link (7) is at least one gear segment (7) that, in the engaged state, is rotatable around said first axis of rotation (55).
16. Lock, **characterized in that** it is provided with at least one control device according to any one of the preceding claims.
17. Lock according to claim 16, comprising at least one first lock rotation axis and at least one second lock rotation axis.
18. Lock according to claim 17, wherein said first lock rotation axis coincides with said first axis of rotation (55) and said second lock rotation axis coincides with said second axis of rotation (56).
19. Lock according to claim 16, comprising at least one first shaft having at least one hand grip or handle (51), and at least one second shaft, the hand grip or handle (51), among other things, being intended for actuating said at least one switch (34) so that it opens an electric connection between said at least one source of power (1) and said at least one means (35) so that said at least one means (35) can receive and evaluate a wireless signal.
20. Lock according to claim 19, wherein said second shaft is provided with at least one knob (52).
21. Lock according to claim 19, wherein said first shaft can turn around said first lock rotation axis and said second shaft can turn around said second lock rotation axis.
22. Door, **characterized in that** it is provided with at least one lock according to any one of claims 16-21.
23. Window, **characterized in that** it is provided with at least one lock according to any one of claims 16-21.
24. Method for, without a key, unlocking the lock according to any one of claims 16-21, **characterized by** the steps of
- pressing and/or turning a hand grip or a handle (51) so that it turns a predetermined distance around a first axis of rotation (55) and keeping it in this position for a predetermined time, at least one switch (34) being brought to open an electric connection between at least one source of power (1) and at least one means (35) for the receipt and evaluation of a wireless signal,
 - releasing the hand grip or handle (51) so that it turns back to the initial position,
 - transmitting a wireless signal from a mobile telephone or the like to the means, this examining the authority of the signal and, upon approved authority, opening an electric connection between the source of power (1) and at least one device (40) for the conversion of electric energy into mechanical motion, the device (40) interconnecting at least one first link (17) provided with at least one first mechanical engagement member with at least one second link (7) provided with at least one second mechanical engagement

ment member for enabling direct or indirect transfer of rotary motion from said first axis of rotation (55) to a second axis of rotation (56),
 - again pressing and/or turning the hand grip or handle (51) so that it turns said predetermined distance, the turning transferred to said second axis of rotation (56) directly or indirectly actuating a lock plunger so that the lock is unlocked.

25. Method according to claim 24, comprising the concluding step of

- releasing the hand grip or handle (51) so that it turns back to the initial position, the turning transferred to said second axis of rotation (56) directly or indirectly actuating the lock plunger so that the lock is locked, and said at least one switch (34), within a predetermined space of time, being brought to shut off the electric connection between said at least one source of power (1) and said at least one means (35) for the receipt and evaluation of a wireless signal.

26. Method for, without a key, locking the lock according to any one of claims 16-21, **characterized by** the steps of

- pressing and/or turning a hand grip or a handle (51) so that it turns a predetermined distance around a first axis of rotation (55) and keeping it in this position for a predetermined time, at least one switch (34) being brought to open an electric connection between at least one source of power (1) and at least one means (35) for the receipt and evaluation of a wireless signal,
 - releasing the hand grip or handle (51) so that it turns back to the initial position,
 - transmitting a wireless signal from a mobile telephone or the like to the means (35), this examining the authority of the signal and, upon approved authority, opening an electric connection between the source of power (1) and at least one device (40) for the conversion of electric energy into mechanical motion, the device (40) interconnecting at least one first link (17) provided with at least one first mechanical engagement member with at least one second link (7) provided with at least one second mechanical engagement member for enabling direct or indirect transfer of rotary motion from said first axis of rotation (55) to a second axis of rotation (56),
 - again pressing and/or turning the hand grip or handle (51) so that it turns said predetermined distance, and
 - releasing the hand grip or handle (51) so that it turns back to the initial position, the turning transferred to said second axis of rotation (56) directly or indirectly actuating a lock plunger so

that the lock is locked, and said at least one switch (34), within a predetermined space of time, being brought to shut off the electric connection between said at least one source of power (1) and said at least one means (35) for the receipt and evaluation of a wireless signal.

27. Method for, without a key, locking the lock according to any one of claims 16-21, **characterized by** the steps of

- pressing and/or turning a hand grip or a handle (51) so that it turns a predetermined distance around a first axis of rotation (55) and keeping it in this position for a predetermined time, at least one switch (34) being brought to open an electric connection between at least one source of power (1) and at least one means (40) for the receipt and evaluation of a wireless signal,
 - releasing the hand grip or handle (51) so that it turns back to the initial position,
 - transmitting a wireless signal from a mobile telephone or the like to the means (35), this examining the authority of the signal and, upon approved authority, enabling the opening of an electric connection between the source of power (1) and at least one device (40) for the conversion of electric energy into mechanical motion,
 - again pressing and/or turning the hand grip or handle (51) so that it turns said predetermined distance, said electric connection being opened between the source of power (1) and said at least one device (40) for the conversion of electric energy into mechanical motion, the device (40) interconnecting at least one first link (17) provided with at least one first mechanical engagement member with at least one second link (7) provided with at least one second mechanical engagement member for enabling direct or indirect transfer of rotary motion from said first axis of rotation (55) to a second axis of rotation (56), and
 - releasing the hand grip or handle (51) so that it turns back to the initial position, the turning transferred to said second axis of rotation (56) directly or indirectly actuating a lock plunger so that the lock is locked, and said at least one switch (34), within a predetermined space of time, being brought to shut off the electric connection between said at least one source of power (1) and said at least one means (35) for the receipt and evaluation of a wireless signal.

Fig. 1A

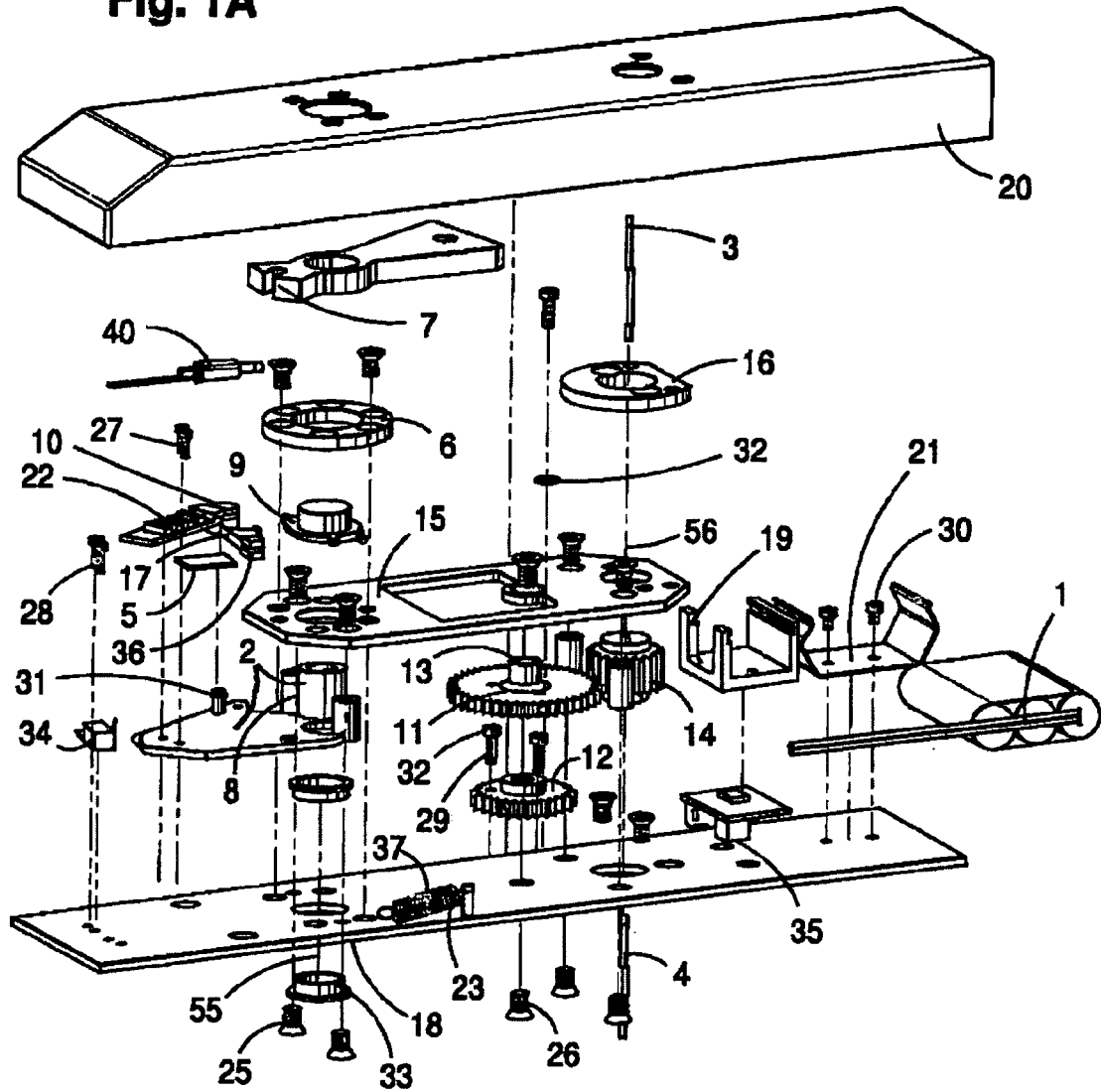


Fig. 1B

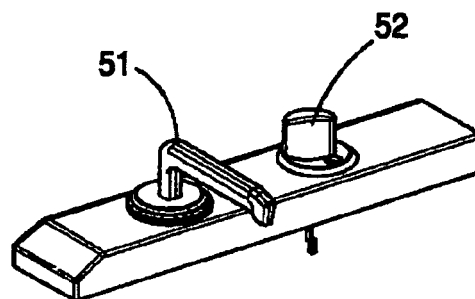


Fig. 2A

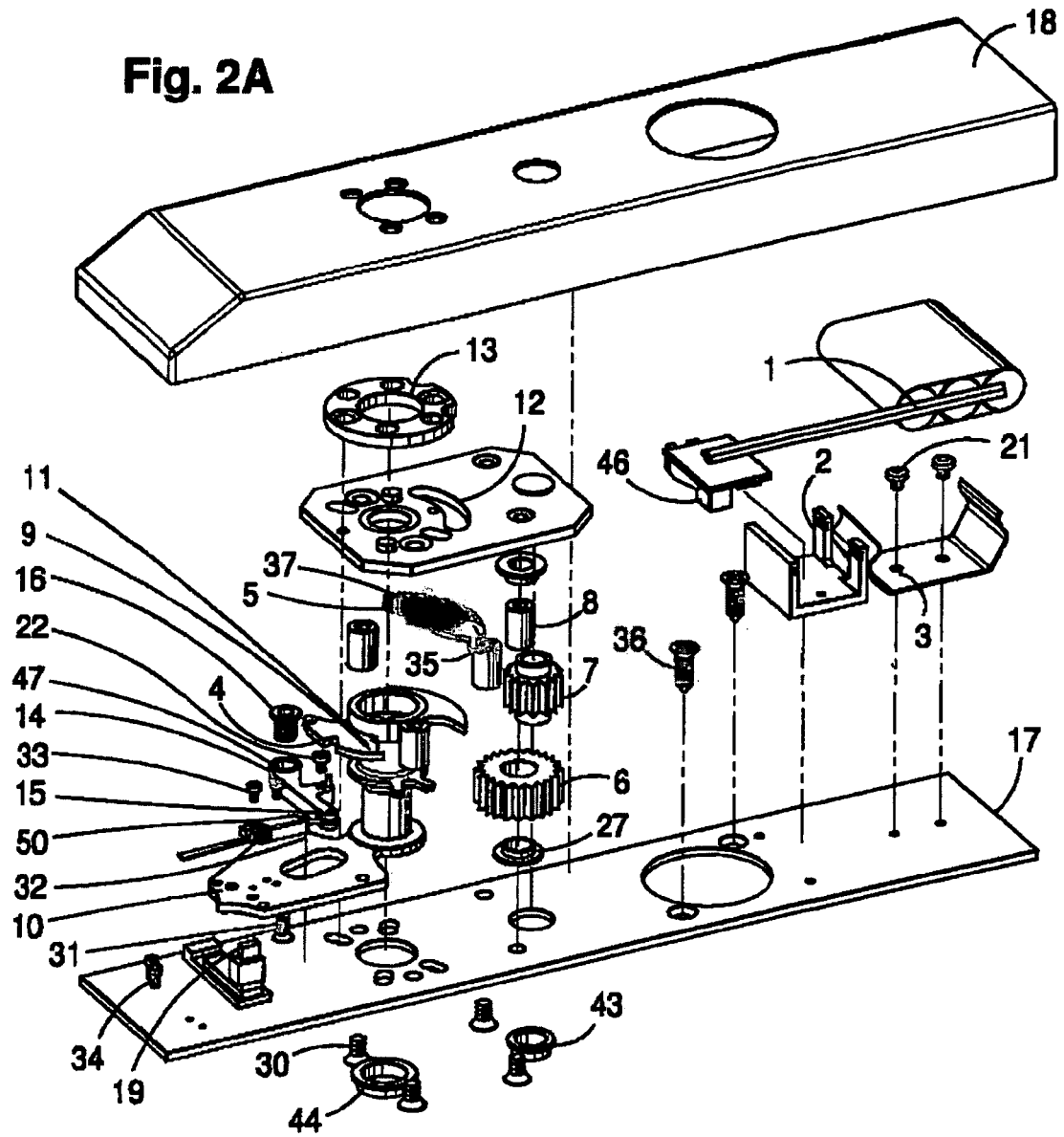


Fig. 2B

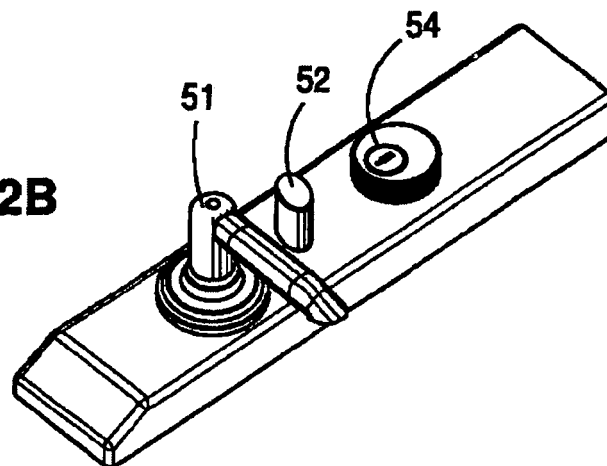


Fig. 3

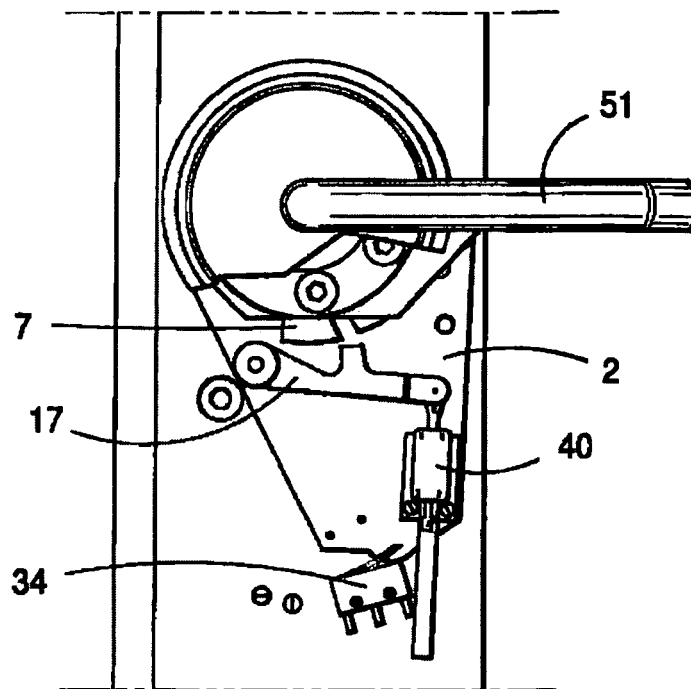


Fig. 4

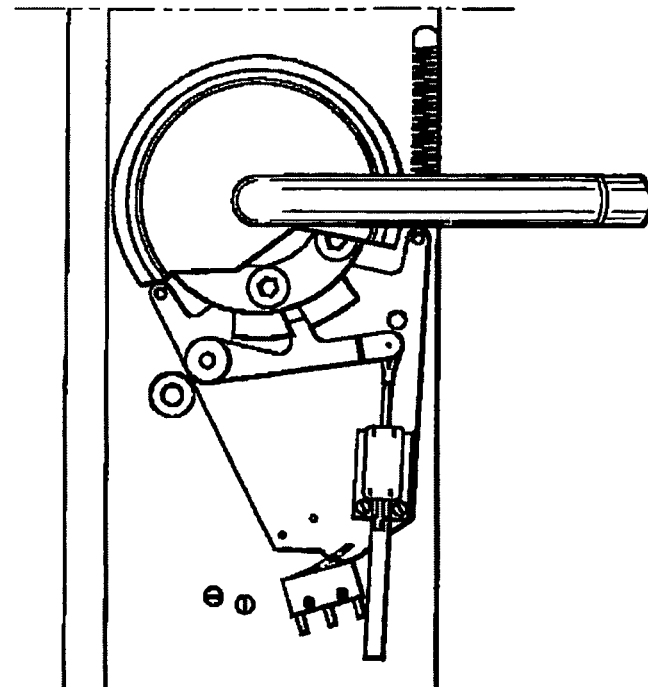


Fig. 5

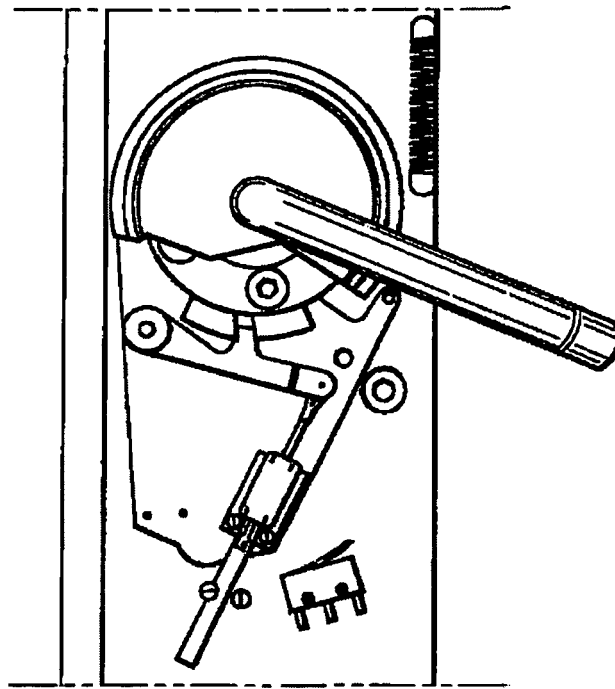


Fig. 6

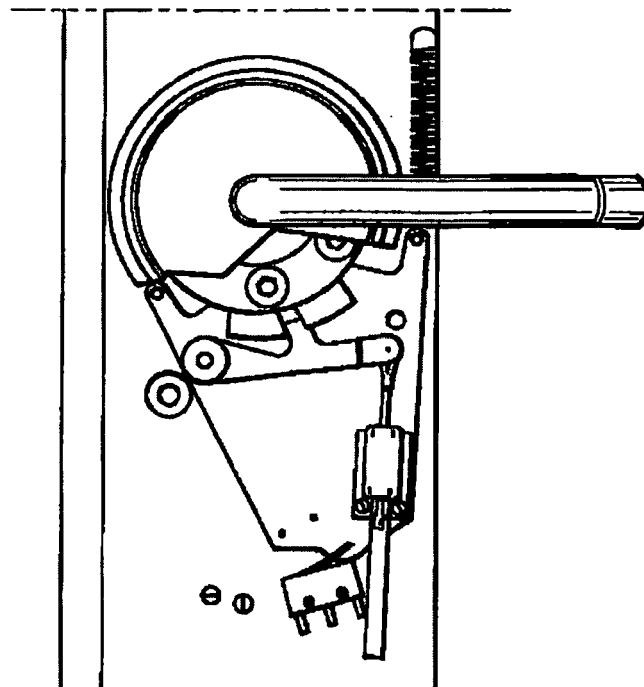


Fig. 7

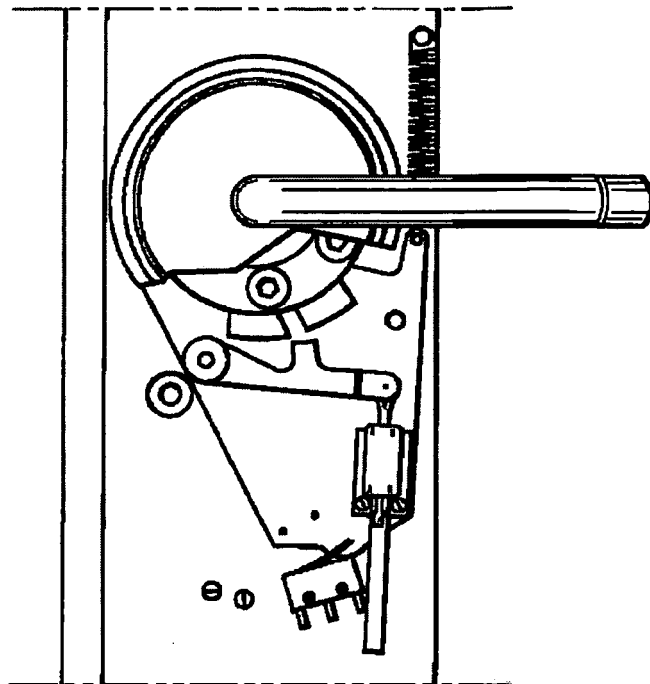
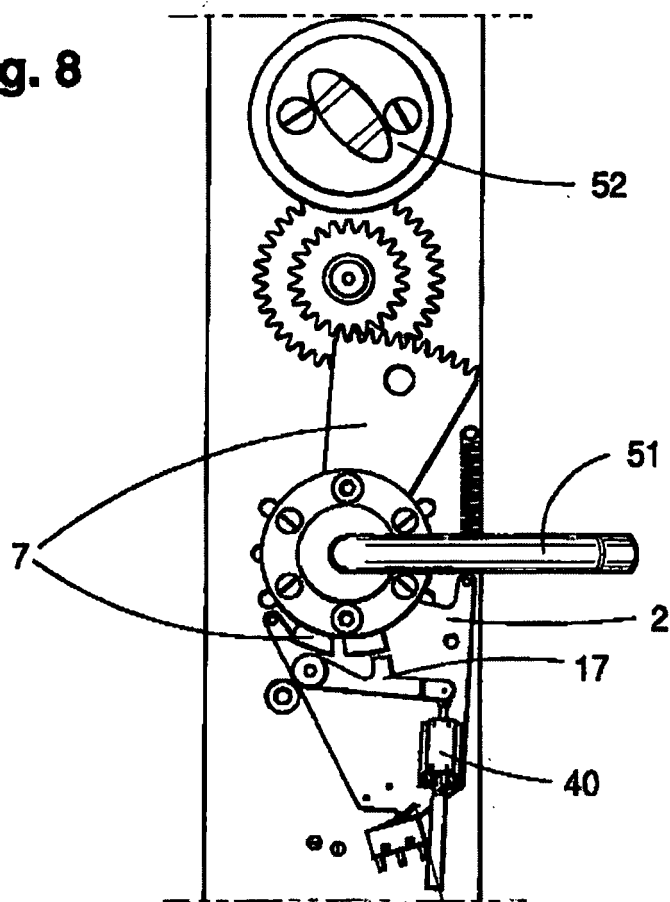


Fig. 8



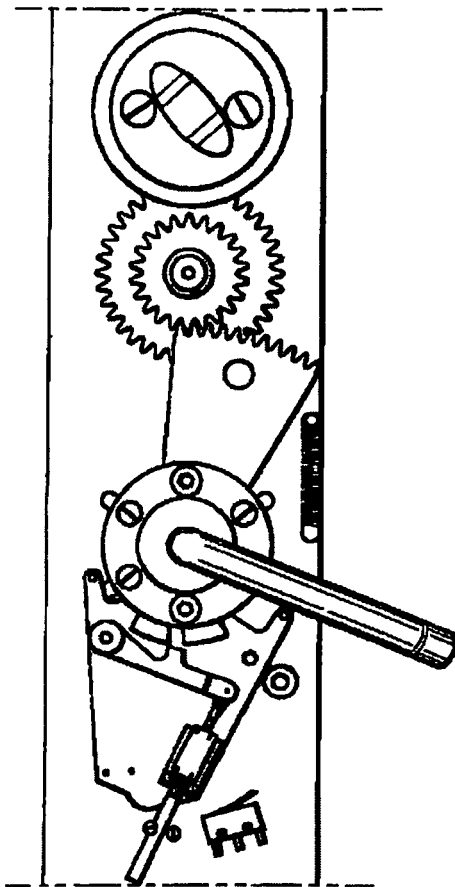


Fig. 9

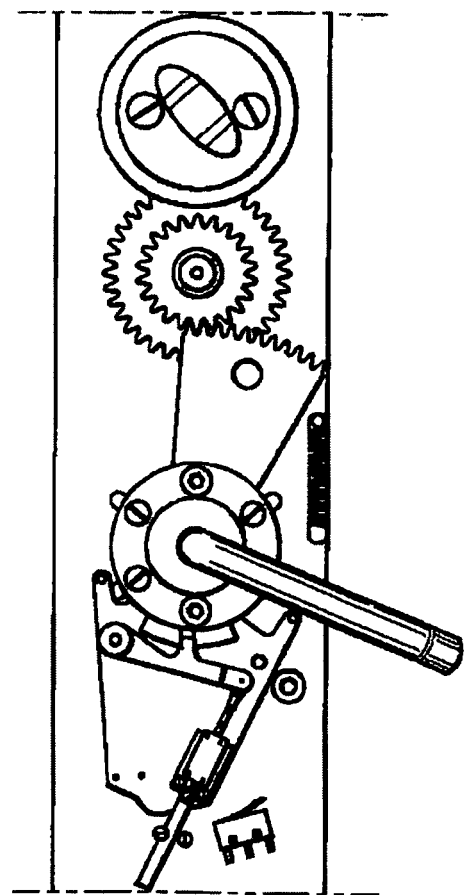


Fig. 10

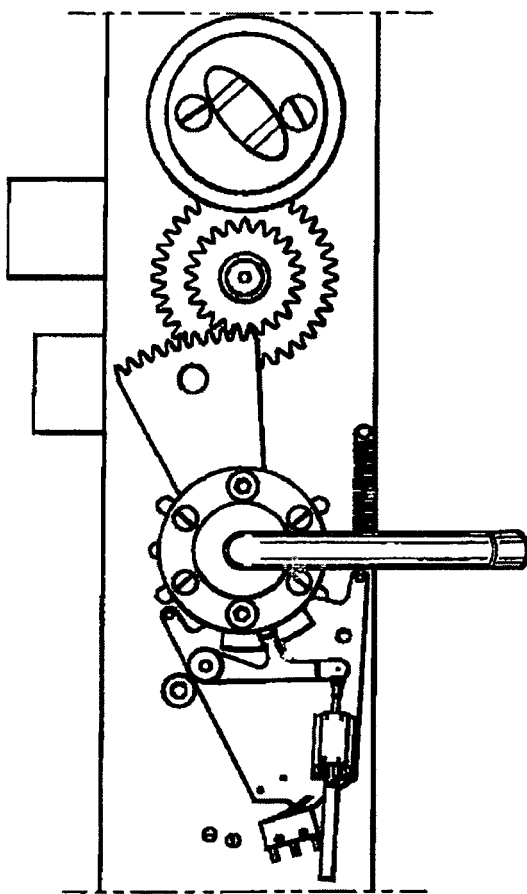


Fig. 11

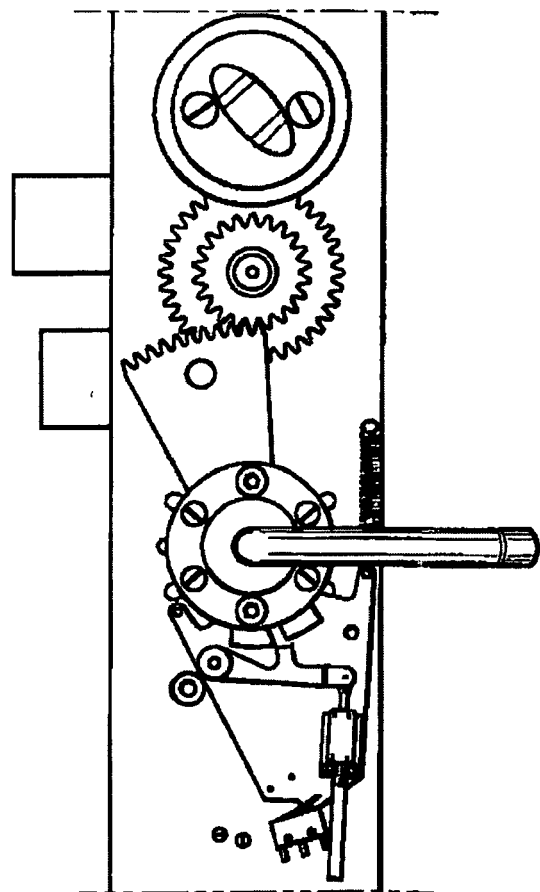


Fig. 12

Fig. 13A

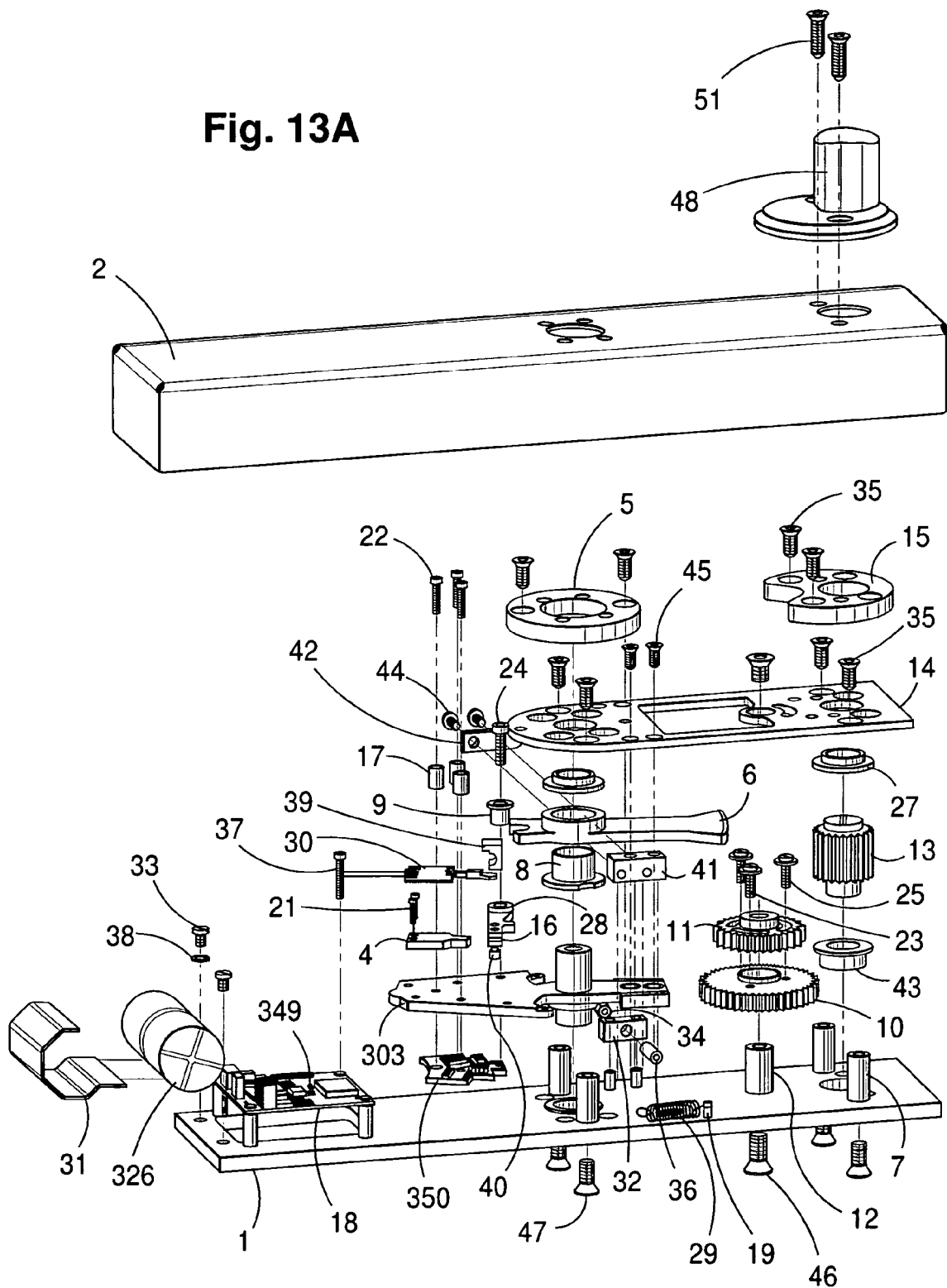


Fig. 13B

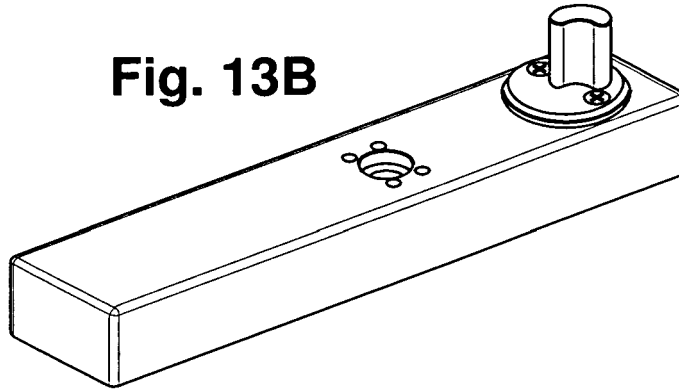
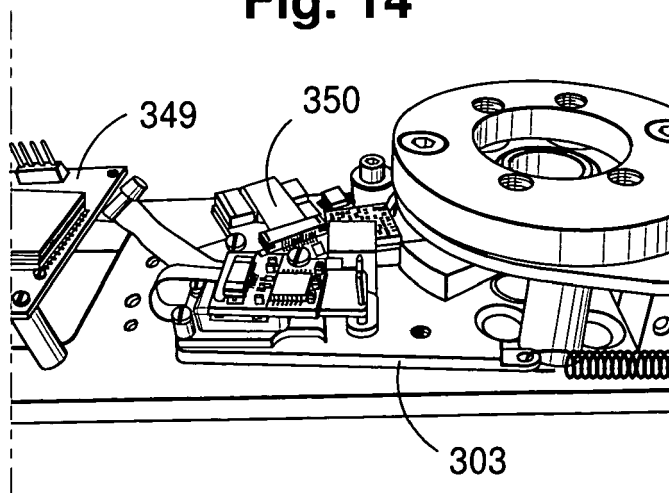


Fig. 14



Reference signs in Figs. 13a and 13b

Designation	Denomination
1	Base plate
2	Protecting cover
303	Lock plate
4	Insert
5	Spacer ring
6	Gear section
7	Spacer shaft
8	Flange sleeve
9	Shaft journal
10	Gearwheel
11	Gearwheel
12	Spacer shaft
13	Gearwheel
14	Base plate
15	Spacer ring
16	Catch
17	Spacer
18	Spacer
19	Spring socket
20	ISO 10642 - M5 x 8
21	ISO 1207 - M1,6 x 8
22	ISO 1207 - M2 x 12
23	ISO 1207 - M3 x 10
24	ISO 4762 - M3 x 12
25	ISO 7092 - ST 4 - 140 HV
326	LSH14
27	Slide bush
28	Tubular pin 1,0-5
29	Tension spring
30	WAVE
31	Battery support
32	Lip
33	ISO 1207 - M3 x 4
34	ISO 4032 - M4
35	ISO 10642 - M4 x 10
36	DIN 915 - M4 x 16
37	ISO 1207 - M2 x 16
38	ISO 7092 - ST 3 - 140 HV
39	Flag
40	ISO 1207 - M2 x 5
41	Lip
42	Plate spring

43	Slide bush
44	ISO 1207 - M3 x 6
45	ISO 10642 - M3 x 8
46	ISO 10642 - M5 x 12
47	ISO 10642 - M4 x 12
48	Knob
349	Pc card
350; 51	Piezo card; ISO 10642 - M4 x 16



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 4345

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Place of search		Date of completion of the search	Examiner
The Hague		23 January 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 P : intermediate document 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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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