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(54) **An electrically actuated lock and control system for application to vehicles.**

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Description

The present invention relates to an electrically actuated lock and to a control system for application to vehicles, in particular motor vehicles.

As is known, locks, particularly those fitted to the personal access doors, the baggage boot lid, and the engine compartment of a vehicle, comprise locking means and release means, the latter acting on the locking means to effect opening of the lock. Such release means are generally manually operable from outside the vehicle and, for locking the door, also from the interior.

The action of opening the vehicle from the outside, by acting manually on such means for releasing the locking means, has various associated disadvantages such as a force required from the user which is variable in dependence on the constructional arrangement of the lock and the handle mechanisms, the reaction load applied by the perimetral door seals or bonnet seals, the type of force exerted on the handle (press, pull, rotation etc.) such that actuation of the lock involves a more or less unpleasant sensation of force and reaction on the hand of the user, also influenced by the environmental conditions. Therefore, as it is shown in FR—A—1581402 it has been provided an electrically actuated lock which should overcome the above disadvantages.

The object of the present invention is that of providing an electrically actuated lock with a control system which ensures a correct operation of the lock in various conditions, and which allows a mechanical simplified realization of the lock itself.

According to the present invention there is provided a lock comprising a first locking group and a second release lever operating on the said first locking group for effecting opening of the said lock, the said second release lever being actuated by an electrically controlled mechanical actuator, characterised by the fact that the said electromechanical actuator is controlled and monitored by monitoring and control blocks, which include push-buttons operable to provide an electrical signal for controlling the operation of the said electromechanical actuator, circuits for monitoring the validity from the said push-buttons of electrical signals for controlling the operation of the said electromechanical actuator, and switches and blocks operable to provide an electrical signal for enabling or inhibiting the operation of the said electromechanical actuator.

Further advantageous embodiments of the invention are characterised in the dependent claims 2 to 20.

For a better understanding of the present invention a particular embodiment is now described. With reference to the attached drawings, in which:

Figure 1 is a partial and partially sectioned side view of a lock formed according to the present invention;

Figure 2 is a schematic side view of a motor vehicle on which are fitted a plurality of locks of the type illustrated in Figure 1; and

Figure 3 is a block schematic diagram of a control system for a plurality of locks formed according to the present invention and fitted to the vehicle of Figure 2.

With reference to Figure 1, there is shown a lock formed according to the present invention, indicated with the reference numeral 1, and mounted for example on a section of metal sheet 2 of a motor vehicle door. This lock 1 includes locking means 3 of known type, disposed on the outside of the metal sheet 2, and shown partially; the release actuation of such locking means 3 is obtained, in a known way, by means of a peg 4 which passes through an aperture 5 formed in the metal sheet 2 and a folded portion 6 fixed onto the inner part of the metal sheet 2 and belonging to a support frame 7 of the lock 1. To displace the peg 4 in the aperture 5, one end 8 of a release lever 9 can act on the end of the peg, which release lever is pivoted on the frame 7 by means of a pin 10, and which at the other end carries a hook 11 connected to one end 12 of a rod 13 which projects linearly from a geared motor unit 14 which is fixed on the support frame 7. To the end of the release lever 9 to which the hook 11 is connected there is also connected, on the opposite side, the first end of a tension spring 15 the other end of which is fixed on a support (not illustrated). On the pin 10 there is pivoted another release lever 16 which has a first end 17 which is able to act on the peg 4 to displace it in the aperture 5, and a second end 18 with a hole 19 to which is connected in a known way, a mechanical actuating element (not illustrated).

The locking means 3, in their opening movement, cause an angular displacement of a small lever 21 which projects inwardly of the metal sheet 2 and the folded portion 6 of the support frame 7, and is able to actuate a terminal 22 of a microswitch 23 which is fixed by means of a body 24 on the frame 7.

In Figure 2 there is shown a motor vehicle 26 having two front doors 27 and two rear doors 28 as well as a boot lid 29 on which are mounted locks 1 according to the present invention, which are monitored and controlled by means of a central control unit 83 according to the diagram illustrated in Figure 3. With reference to Figure 3, the reference numerals 31 and 31', 32 and 32', 33 and 33', 34 and 34' identify four two-position switches which are disposed respectively in correspondence with the two front doors 27, the boot lid 29 and within the passenger compartment of the motor vehicle 26, conveniently on the dashboard. The actuation of such switches 31 and 31', 32 and 32', 33 and 33', can take place by rotation of a block in two senses by means of keys, whilst the actuation of the switches 34 and 34' on the dashboard can take place by means of a two-position push-button. The switches 31, 32, 33 and 34 are connected at one side to earth, and at the other side to a first input 36 of a block 37 which at another input 38 receives terminal connections of the switches 31', 32', 33' and 34' which at the other side are connected to earth. The activation of any one of the switches 31, 32, 33 and 34 causes a

consensus signal to open the locks 1 as will be described better below, and causes an output signal 39 from the block 37 which, by means of a block 40, controls an operational consensus condition for four blocks 41, 42, 43, and 44 which each control the electrical supply to a respective geared motor unit 14 of each block 1 fitted respectively to the two front doors 27 and to the two rear doors 28. These blocks 41, 42, 43 and 44 which receive a supply voltage for the geared motor units 14, conveniently at 12 volts, conveniently include a timer relay with an activation logic circuit which receives a signal from a respective push-button switch 45, 46, 47 and 48 the other side of which is connected to earth; these push-buttons are conveniently disposed on the four doors 27 and 28 next to the door handles 49 (Figure 2); the push-button switch 45 for the front door 27 and the push button switch 46 for the other front door 27 are made with blocks which have slots for the introduction of an actuating key for the respective two-position switches 31 and 31' and 32 and 32'. In the blocks 41, 42, 43, and 44, upstream of the activation logic circuits for the timer relays there are positioned detector circuit blocks for detecting the correctness of the pulse signal generated by the push-button switches 45, 46, 47 and 48, and conveniently comprising circuits which detect a signal duration greater than a minimum predetermined time period, for example several tens of milli-seconds, to ignore disturbing signals.

In the case, on the other hand, in which the signal to the unit 37 comes from the input 38 corresponding to the activation of one of the switches 31', 32', 33' or 34' and causing an inhibition of the activation for the geared motor units 14 as will be described in more detail below, there is produced from the block 37 an output signal 51 which is passed to a block 52 which evaluates whether or not an earth signal has been received via the series of four microswitches 23, 23', 23'' and 23''' actuated by the locking means 3 of the locks 1 fitted to the four doors 27 and 28 of the motor vehicle 26. In the positive case (switches 23, 23', 23'', 23''' all closed) it is passed to a block 54 which causes an operating inhibition condition for the blocks, 41, 42, 43 and 44, whilst in the negative case (at least one of the switches 23, 23', 23'' and 23''' open) it passes to the block 40 which causes the operating enablement condition for the blocks, 41, 42, 43 and 44.

To the negative output of this block 52 there is connected an indicator lamp 55 connected to earth, whilst an indicator lamp 56 is connected to the input of the control circuit 40 and then connected to earth.

In the position of locked closure, within the passenger compartment of the motor vehicle 26, for example within a box in the dashboard, there is disposed a two-position switch 58 and 58' one side of which is connected to earth and the other of which is connected to the two inputs of a block 59 which, in dependence on the signal from one or the other of the inputs, provides a respective output signal 60 or 61. The output signal 60 is passed to a block 62 similar to the block 37 and which, in the presence of the signal 51, provides an output signal 63 which is passed to a block 64 similar to the block 52 and which likewise receives a connection to the switches 23, 23', 23'' and 23'''. If these four switches are all closed, from the block 64 it passes to a block 65 (at which also arrives the output signal 61 directly from the block 59) which causes an inhibition condition for a control block 66 (similar to the blocks 41, 42, 43 and 44) for a lock 1 fitted to the boot lid 29; this block 66 further receives an actuation signal from a pushbutton switch 67 similar to the switches 45 and 46 and formed with a respective key block for the switches 33 and 33'. This block 65 further controls a block 68 which on the leading edge of the control signal produced by the block 65, causes actuation of a geared motor 70 which actuates a latch 71 for locking the closure of a small cover 72 which closes access to the fuel filler inlet. On the other hand, if at least one of the switches 23, 23', 23'' and 23''' is open, from the block 64 it passes to a block 75 which controls enabling of the actuation by the block 66, and further controls, on the leading edge of this enabling signal, the operation of the geared motor 70 which causes the withdrawal of the latch 71 which allows opening of the cover 72. From the block 62 it also passes to the control block 75 in the event of loss of the signal 51.

The various blocks 37, 52, 40, 54, 59, 62, 64, 65 and 75 described above can be functional blocks formed by means of a microprocessor, or else can be circuit blocks, and in this case the blocks 37, 59 and 62 can conveniently be formed by multivibrators, the blocks 64 and 52 can be formed by logic gates, and blocks 40, 54, 65 and 75 can be made by circuit components for controlling the various signals described.

The operation of the described electrically actuated lock of the present invention and the control system for application to vehicles, is as follows. With reference to Figures 2 and 3, supposing that all the occupants of the vehicle 26 are outside and all the front doors 27 and rear doors 28 are closed, the operation of all the various locks 1 fitted to the motor vehicle 26 can be locked by actuation of one of the switches 31', 32', or 33' by rotation of a key inserted into a block in an associated push-button 45 or 46 for the front doors 27, or 67 for the boot lid 29. In this way there is caused a signal at the input 38 of the block 37, which causes the signal 51 which is passed to the block 52, which latter, detecting the closure condition of all the switches 23, 23', 23'' and 23''', determines, via the block 54, the operational inhibition condition of the blocks 41, 42, 43 and 44 such that an actuation of any of the push-buttons 45, 46, 47 or 48 does not cause opening of the doors 27 or 28. The signal 51 from the block 37 acts, moreover, on the block 62 which thus generates the signal 63 which is passed to the block 64 which, also receiving the closure signal from all of the microswitches 23, 23', 23'' and 23''', controls the block

65 to determine the operational inhibition of the block 66 (such that operation of the push-buttons 67 becomes ineffective) and further triggers the block 68 for a predetermined time, for example 0.6 seconds, which causes actuation of the geared motor 70 such as to cause displacement of the latch 71 for locking the cover 72 and thus prevent access to the fuel tank filler inlet.

When the driver wishes to re-enter the passenger compartment of the motor vehicle 26, he inserts the key into any of the push-buttons 45, 46 or 67 so as to cause closure of any of the switches 31, 32 or 33. In this way a signal arrives at the input 36 of the block 37, which thus provides the output signal 39 which is passed to the circuit 40 which determines in actuation enablement condition of the various blocks 41, 42, 43 and 44. When the signal 51 from the block 37 ceases, the block 62 no longer provides the signal 63 but controls, via the block 75, the operating enablement of the block 66 and, moreover, controls via the block 68, again for a time of about 0.6 seconds, the actuation of the geared motor 70 in an opposite sense such as to withdraw the latch 71 and allow opening of the cover 72. The actuation of any of the push-button switches 45, 46, 47, 48 and 67 therefore causes an operating control to the associated geared motor unit 14 for opening of the associated lock 1 and therefore of one of the front doors 27 or rear doors 28, or of the boot lid 29. The blocks 41, 42, 43, 44 or 66 in fact cause a supply to the associated geared motor units 14 for a predetermined time, for example 0.6 seconds, and, with reference to Figure 1, this displaces the rod 13 which, by means of the hook 11, causes an anti-clockwise rotation of the release lever 9 the end 8 of which displaces the peg 4 within the aperture 5 moving it to the position indicated in broken outline such that the locking means 3 is released, thus obtaining opening of the lock; by the reaction force exerted by the perimetral closure seals there is therefore an automatic opening, by an initial movement of the front doors 27 or rear doors 28, or of the boot lid 29, depending on which of the push-button switches has been actuated. At the end of the phase of displacement of the rod 13 the tension spring 15 moves the release lever 9 back to the rest position in which it does not act on the peg 4, as illustrated in Figure 1, such that the corresponding door 27 or 28, or the boot lid 29 can be reclosed.

Supposing now that the passengers are all in the passenger compartment of the motor vehicle 26, the opening of the doors 27 or 28 can be prevented by actuating the switch 34' disposed on the dashboard so that there is provided a signal to the input 38 of the block 37 which sends the signal 51 to the block 52 which, if the closure condition of all the switches 23, 23', 23'' and 23''' is detected (indicative of the closure of all the doors 27 and 28) controls the block 54 which determines the actuation inhibition condition of the blocks 41, 42, 43 and 44 and, moreover, as already described above, the signal 51 also acts on the block 62 which, by means of the block 64 determines the inhibition of the block 66 and, via the block 68, the actuation of the geared motor 70 for closure with the latch 71 of the cover 72. On the other hand, if one of the doors 27 or 28 is open, the corresponding micro-switch 23, 23', 23'' or 23''' will be open so that from the block 52 there is provided a signal not for the block 54 but for the block 40, which determines the operating enablement condition of the blocks 41, 42, 43 and 44 and similarly the block 64, via the block 75, determines the operating enablement of the block 66 and does not activate the block 68 for closure of the cover 72. This condition with at least one of the doors 27 or 28 open is moreover indicated by illumination of the lamp 55 fed with the signal from the output of the block 52, and thus the lamp 56 is also illuminated, which indicates the operating consensus condition of the blocks 41, 42, 43 and 44 for controls to open the doors 27 and 28; the lamp 56 is, moreover, also illuminated in the operating enablement condition of the blocks 41, 42, 43 and 44 determined directly by the block 37 by means of the signal 39 following actuation of one of the switches 31, 32, 33 or 34.

When the doors 27 and 28 are locked, and with the passengers within the passenger compartment of the motor vehicle 26, these doors can be opened directly from the interior in a mechanical manner with the normal interior mechanical actuating levers, which act on the end 18 of the lever 16 (Figure 1) the other end 17 of which acts on the peg 4 in a manner similar to the lever 9 (opening of the rear doors 28 from the interior of the passenger compartment can be prevented by means of a safety lever 80, indicated in broken outline in Figure 1, of known type, pivoted to the support frame 7 and having an end 81 which can act on a portion of the lever 16 to lock it). Such opening of one of the doors 27 or 28, by mechanical actuation from the interior of the passenger compartment, thus causes the opening of the corresponding switch 23, 23', 23'', or 23''', so that even if the central control unit 83 causes an operating inhibition condition of the blocks 41, 42, 43, 44 and 66, the blocks 52 and 64 cause, via the control circuits 40 and 75, operating enablement of the control blocks of the respective geared motor units 14. In this way, the preceding operating inhibition condition of the blocks 41, 42, 43, 44 and 66 being cancelled following opening of any of the doors 27 or 28, it is avoided that the driver cannot get back into the interior of the motor vehicle 26 if he had left without taking with him the key for actuation of the switches 31 and 31', 32 and 32', 33 and 33'.

The switches 58 and 58', disposed in a space access to which can be locked, serves to provide the so-called "garage" function in which the operation of the blocks 41, 42, 43 and 44 remain enabled for opening the doors 27 or 28 by means of the control push-buttons 45, 46, 47 or 48, whilst the block 66 remains disabled (so that actuation of the push-button 67 does not cause opening of the boot lid 29) as does the block 68 which maintains

the geared motor 70 in the closure condition of the cover 72. In fact, the actuation of the switch 58' causes a signal for the block 59 which provides the signal 61 which directly controls the block 65 which disables the block 66 and, via the block 68, causes closure of the latch 71. On the other hand, actuation of the switch 58, causes, via the block 59, the output signal 60 for the block 62, which can therefore evaluate, in dependence on the presence or otherwise of the signal 51, the general inhibition conditions determined by any of the switches 31', 32', 33' or 34' as already described above.

In the case of failure of the electricity supply to the system of the present invention described above for the control of the various locks 1 fitted on the motor vehicle 26, and to avoid the situation that the user cannot gain access to the interior of the motor vehicle 26, one of the locks 1 is also made actuable mechanically by means of a key; conveniently this can be the lock for the boot lid 29 which, as well as having the key block which controls the two-position switches 33 and 33', and having the push-button switch 67, can also have a further section of rotation of this block which acts in a mechanical manner to open the associated lock (conveniently by acting on the peg 4). In this way the user can open the boot lid 29 and gain access manually to an interior region in which there may be disposed two electrical connection terminals for an external battery, or else there may be disposed one end of a lever which acts in a mechanical manner on one of the locks 1 fitted to the doors 27 or 28 to open it from the inside.

The advantages obtained with an electrically operated lock described according to the present invention, and with the control system for application to vehicles are apparent from what has been described; in fact, the user requires only a constant and light manual force to open such locks in that he must exercise only pressure on the push-button switches 45, 46, 47, 48 or 67; the mechanical force necessary to open the lock 1, even though variable, is exercised by the geared motor 14; therefore a greater load on the perimetral closure seals of the doors 27 or 28, or the boot lid 29 can be employed, with advantages in water tightness, insulation from noise etc.

Moreover the push-buttons 45, 46, 47, 48 or 67 for controlling opening, no longer having to act directly and mechanically on lock opening mechanisms for the lock 1, can be disposed where most convenient without limitations of position, thereby allowing wide possibilities of design variants to the stylists.

The various operative functions of the control system for the various locks 1 fitted to the motor vehicle 26, such as simultaneous total or partial locking functions, indication of opening, etc., are obtained in an extremely simple manner with the electrical and electronic control unit 83 such that a significant constructional simplification of the mechanical parts of the lock 1 can be obtained.

The circuits disposed in the blocks 41, 42, 43, 44 and 66 which filter possible perturbation signals and allow operation determined only by signals originating from actuation of the push-button switches 45, 46, 47, 48 and 67 ensure that unwanted opening of the locks 1 cannot occur.

Finally, it is clear that the described embodiments of the lock of the present invention and the control system for application to vehicles, may have modifications and variants introduced thereto which do not depart from the scope of the invention itself.

For example the push-button switches, 45, 46, 47, 48 and 67 for controlling opening, and the two-position switches 31 and 31', 32 and 32', 33 and 33', 34 and 34' and 58 and 58' can be made in a very different constructional manner and, moreover, can be replaced by circuits activated by control signals transmitted through the air, for example by ultrasonics.

The motor vehicle 26 can, moreover, include a number of locks 1 different from those described, and may, for example include also a lock 1 for opening the engine compartment bonnet, and can for example include a single pair of front doors 27 without the rear doors 28.

The mechanism which makes the release lever 9 return to its rest position at the end of the actuation of the geared motor 14, rather than being made by means of the spring 15 can be replaced by a device of the crank and link type which is actuated by a rotatory movement of the geared motor unit 14 always in the same sense, for a predetermined time determined by the timer circuit of such blocks as 41, 42, 43, 44 and 66. Alternatively these blocks may include two relays and two timer circuits which determine, for predetermined times, for example 0.6 seconds, 0.4 seconds, and in opposite senses, the electrical supply to the associated geared motor units 14.

Claims

1. A lock (1) comprising a first locking group (3) and a second release lever (9) operating on the said first locking group (3) for effecting opening of the said lock (1), the said second release lever (9) being actuated by an electrically controlled mechanical actuator (14), characterised by the fact that the said electromechanical actuator (14) is controlled and monitored by monitoring and control blocks (83), which include push-buttons (45) operable to provide an electrical signal for controlling the operation of the said electromechanical actuator (14), circuits for monitoring the validity from the said push-buttons (45) of electrical signals for controlling the operation of the said electromechanical actuator (14), and switches and blocks (31, 31'; 37, 40, 54) operable to provide an electrical signal for enabling or inhibiting the operation of the said electromechanical actuator.

2. A lock according to Claim 1, characterised by the fact that the said switches and blocks (31, 31', 37, 40, 54) operable to provide an electrical signal for enabling or inhibiting the operation of the said electromechanical actuator (14) are electrically

controlled by a microswitch (52, 23) which detects the open or closure condition of the said lock (1).

3. A lock according to Claim 2, characterised by the fact that said microswitch (23) is controlled by the said first locking group (3).

4. A lock according to any preceding Claim, characterised by the fact that it includes a biasing spring (15) for returning the said electromechanical actuator (14) to the initial position after the operating phase on the said second release lever (9).

5. A lock according to Claim 4, characterised by the fact that the said biasing spring (15) acts in a sense opposite the action of the said electromechanical actuator (14).

6. A lock according to any Claims 1 to 3, characterised by the fact that it includes mechanical devices of the crank and link type for returning the said electromechanical actuator (14) to the initial position after the operating phase on the said second release lever (9).

7. A lock according to any Claims 1 to 3, characterised by the fact that it includes a relay and a timer operable to control the actuation of the said electromechanical actuator (14) in opposite senses and for predetermined times for returning it (14) to the initial position after the operating phase on the said second release lever (9).

8. A lock according to any of the preceding Claims, characterised by the fact that the said electromechanical actuator (14) comprises an electric motor.

9. A lock according to any preceding Claims, characterised by that the fact that it is fitted to at least one of the passenger doors (27, 28), boot lid (29), engine compartment bonnet (72) and fuel tank filler inlet cover (26).

10. A control system for a plurality of locks (1) according to any of Claims from 1 to 9, and fitted at least to some of passenger doors (27, 28), boot lid (29), engine compartment bonnet and fuel filler inlet cover (72) of a vehicle (26).

11. A control system according to Claim 10, characterised by the fact that the said monitoring and control blocks, switches and electrical circuits for the said plurality of locks belonging to a central electronic monitoring and control unit (83).

12. A control system according to Claim 11, characterised by the fact that it includes a plurality of the said push-buttons (45, 46, 47, 48, 76) for controlling the operation of each of the said locks (1).

13. A control system according to Claim 12, characterised by the fact that it includes a plurality of the said switches (31, 31', 32, 32', 33, 33', 34, 34') each of which is able to act on enablement or otherwise of the operating state of the said electromechanical actuator (14) for all of the said locks (1).

14. A control system according to Claim 13, characterised by the fact that the said switches (31, 31', 32, 32', 33, 33', 34, 34') are disposed in correspondence with front passenger doors (27) and/or boot lid (29) and on the interior of the passenger compartment of the said vehicle (26).

15. A control system according to any of Claims from 11 to 14, characterised by the fact that it includes switches (58, 58') disposed within the passenger compartment and accessible by means of a key, and operable to provide an electrical signal for the enablement or inhibition of enablement of the said electromechanical actuator (14) relating to the single lock (1) for the said boot lid (29) and the said fuel filler inlet cover (72).

16. A control system according to any of Claims from 11 to 15, characterised by the fact that the said lock for the said fuel filler inlet cover (72) is activated to the open or closure position respectively by enablement or inhibition signals at least for the said lock (1) of the said boot lid (29).

17. A control system according to any of Claims from 11 to 15, characterised by the fact that it includes optical indicator elements (55, 46) disposed within the passenger compartment and indicative respectively of the condition of enablement or otherwise to opening of the said locks (1) and the open or otherwise condition of at least some of the said locks (1).

18. A control system according to any of Claims from 11 to 17 characterised by the fact that it includes a mechanical device actuable from outside and operating on the said locking group (3) for releasing at least one of the said locks (1).

19. A control system according to Claim 18, characterised by the fact that the said mechanical device is actuable by means of a key and is disposed in correspondence with the lock for the said rear boot lid (29).

20. A control system according to Claim 19, characterised by the fact that within the rear space of the said vehicle (26) it is positioned a connection device for external electrical supply to the said central control unit (83) and to the said motor unit (14), or a mechanical actuation device operating on the said locking group (3) for releasing at least one lock (1) of the said passenger compartment doors (27, 28).

Patentansprüche

1. Schloß (1) bestehend aus einer ersten Sperrvorrichtung (3) und einem zweiten Auslösehebel (9), der auf die erste Sperrvorrichtung (3) einwirkt, um das Schloß (1) zu öffnen, wobei der zweite Auslösehebel (9) durch einen elektrisch kontrollierten mechanischen Antrieb (14) betätigt wird, dadurch gekennzeichnet, daß der elektromechanische Antrieb (14) durch Überwachungs- und Kontrollblöcke (83) überwacht und kontrolliert wird, bestehend aus Tastschaltern (45), die ein elektrisches Signal liefern, um den elektromechanischen Antrieb (14) zu kontrollieren; aus Schaltkreisen zur Überwachung der richtigen Funktion der Tastschalter (45) und der Abgabe des elektrischen Signals, das den Betrieb des elektromechanischen Antriebs (14) kontrolliert; und aus Schaltern und Blöcken (31, 31'; 37, 40, 54), die durch Lieferung eines elektrischen Signals den Betrieb

des elektromechanischen Antriebs in Gang setzen oder blockieren.

2. Schloß nach Anspruch 1, dadurch gekennzeichnet, daß die Schalter und Blöcke (31, 31'; 37, 40, 54), die durch Lieferung eines elektrischen Signals den Betrieb des elektromechanischen Antriebs (14) in Gang setzen oder blockieren, durch einen Mikroschalter (52, 23) elektrisch kontrolliert werden, der die Öffnungs- oder Sperrstellung des Schlosses (1) feststellt.

3. Schloß nach Anspruch 2, dadurch gekennzeichnet, daß der Mikroschalter (23) von der ersten Sperrvorrichtung (3) kontrolliert wird.

4. Schloß nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß es eine vorspannende Feder (15) aufweist, die den elektromechanischen Antrieb (14) nach der Betriebsphase wieder in die Ausgangsposition auf dem Auslösehebel (9) zurückbringt.

5. Schloß nach Anspruch 4, dadurch gekennzeichnet, daß die vorspannende Feder (15) in einer der Bewegung des elektromechanischen Antriebs (14) entgegengesetzten Richtung wirkt.

6. Schloß nach einem der Ansprüche 1—3, dadurch gekennzeichnet, daß es mechanische Vorrichtungen in der Art von Kurbeln und Gelenken besitzt, um den elektromechanischen Antrieb (14) nach der Betriebsphase wieder in die Ausgangsposition auf dem Auslösehebel (9) zurückzubringen.

7. Schloß nach einem der Ansprüche 1—3, dadurch gekennzeichnet, daß es ein Relais und einen Zeitgeber besitzt, die die Inbetriebnahme des elektromechanischen Antriebs (14) in beidem Richtungen für einen vorgegebenen Zeitabschnitt kontrollieren, um ihn (14) nach der Betriebsphase wieder zur Ausgangsposition am Auslösehebel (9) zurückzubringen.

8. Schloß nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der elektromechanische Antrieb (14) einen Elektromotor besitzt.

9. Schloß nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, . daß es zumindest an einer der Einstiegstüren (27, 28), am Kofferraumdeckel (29), an der Motorhaube und am Tankverschlußdeckel (72) angebracht ist.

10. Kontrollsystem für mehrere Schlösser (1) nach einem der Ansprüche 1—9, das zumindest an einer der Einstiegstüren (27, 28), am Kofferraumdeckel (29), an der Motorhaube und am Tankverschlußdeckel (72) eines Fahrzeuges (26) angebracht ist.

11. Kontrollsystem nach Anspruch 10, dadurch gekennzeichnet, daß die genannten Überwachungs- und Kontrollblöcke, Schalter und elektrischen Schaltkreise für die genannten Mehrzahl von Schlössern zu einer zentralen elektronischen Überwachungs- und Kontrolleinheit (83) gehören.

12. Kontrollsystem nach Anspruch 11, dadurch gekennzeichnet, daß es eine Mehrzahl der Tastschalter (45, 46, 47, 48, 76) besitzt, die den Betrieb jedes einzelnen der Schlösser (1) kontrollieren.

13. Kontrollsystem nach Anspruch 12, dadurch gekennzeichnet, daß es eine Mehrzahl der Schalter (31, 31', 32, 32', 33, 33', 34, 34') besitzt, von denen jeder einzelne nach Betätigung oder auf andere Art auf den Betriebszustand des elektromechanischen Antriebs (14) für alle Schlösser (1) einwirken kann.

14. Kontrollsystem nach Anspruch 13, dadurch gekennzeichnet, daß die Schalter (31, 31', 32, 32', 33, 33', 34, 34') in Ent sprechung zu den beiden vorderen Türen (27) und/oder dem Kofferraumdeckel (29) und im Inneren des Fahrgastraumes (26) angebracht sind.

15. Kontrollsystem nach einem der Ansprüche 11—14, dadurch gekennzeichnet, daß es Schalter (58, 58') besitzt, die innerhalb des Fahrgastraumes angebracht sind und mit einem Schlüssel betätigt werden können, und die durch Lieferung eines elektrischen Signals den Betrieb des elektromechanischen Antriebs (14) für ein einzelnes Schloß (1) am Kofferraumdeckel (29) und dem Tankverschlußdeckel (72) in Gang setzen oder blockieren können.

16. Kontrollsystem nach einem der Ansprüche 11—15, dadurch gekennzeichnet, daß das Schloß für den Tankverschlußdeckel (72) durch Auslöse- oder Blockiersignale zumindest für das Schloß (1) des Kofferraumdeckels (29) in Öffungs bzw. Sperrposition gebracht wird.

17. Kontrollsystem nach einem der Ansprüche 11—15, dadurch gekennzeichnet, daß es optische Anzeigeelemente (55, 46) enthält, die innerhalb des Fahrgastraumes angebracht sind und die den Betriebszustand der Schlösser (1) bzw. die Öffnungs- oder Sperrstellung von zumindest einigen Schlössern (1) anzeigen.

18. Kontrollsystem nach einem der Ansprüche 11—17, dadurch gekennzeichnet, daß es über eine mechanische Vorrichtung verfügt, die von außen zu betätigen ist und auf die Sperrvorrichtung (3) einwirkt, um zumindest eines der Schlösser (1) zu öffnen.

19. Kontrollsystem nach Anspruch 18, dadurch gekennzeichnet, daß die genannte mechanische Vorrichtung mit einem Schlüssel betätigt werden kann und in Entsprechung zu dem Schloß für den hinteren Kofferraumdeckel (29) angebracht ist.

20. Kontrollystem nach Anspruch 19, dadurch gekennzeichnet, daß innerhalb des Heckraumes des Fahrzeuges (26) eine Anschlußvorrichtung für externe elektrische Stromzufuhr für die zentrale Kontrolleinheit (83) und die Motoreinheit (14), oder eine mechanische Antriebsvorrichtung angebracht ist, die auf die Sperrvorrichtung (3) einwirkt, um zumindest ein Schloß (1) der Einstiegstüren (27, 28) zu öffnen.

Revendications

1. Serrure (1) comprenant un premier groupe de verrouillage (3) et un deuxième levier de déverrouillage (9) agissant sur le premier groupe de verrouillage (3) pour provoquer l'ouverture de la serrure (1), le deuxième levier de verrouillage (9) étant actionné par un élément d'actionnement mécanique à commande électrique (14), caractérisée par le fait que cet élément d'actionnement

électromécanique (14) est commandé et contrôlé par des blocs de contrôle et de commande (83) qui comportent des boutons-poussoirs (45) servant à procurer un signal électrique pour commander le fonctionnement de l'élément d'actionnement électromécanique (14), des circuits pour contrôler la validité des signaux électriques en provenance de ces boutons-poussoirs (45) pour commander le fonctionnement de cet élément d'actionnement électromécanique (14), et des interrupteurs et des blocs (31, 31'; 37 40, 54) servant à procurer un signal électrique pour permettre ou empêcher le fonctionnement de cet élément d'actionnement électromécanique.

2. Serrure selon la revendication 1, caractérisée par le fait que ces interrupteurs et ces blocs (31, 31'; 37, 40, 54) servant à procurer un signal électrique pour permettre ou empêcher le fonctionnement de cet élément d'actionnement électromécanique (14) sont électriquement commandés par un micro-interrupteur (52, 23) qui détecte la condition d'ouverture ou de fermeture de la serrure (1).

3. Serrure selon la revendication 2, caractérisée par le fait que ce micro-interrupteur (23) est commandé par le premier groupe de verrouillage (3).

4. Serrure selon l'une quelconque des revendications précédentes, caractérisée par le fait qu'elle comporte un ressort de rappel (15) pour ramener l'élément d'actionnement électromécanique (14) à son position initiale après la phase d'actionnement du deuxième levier de déverrouillage (9).

5. Serrure selon la revendication 4, caractérisée par le fait que le ressort de rappel (15) agit dans un sens opposé à l'action de l'élément d'actionnement électromagnétique (14).

6. Serrure selon l'une quelconque des revendications 1 à 3, caractérisée par le fait qu'elle comporte des dispositifs mécaniques du type bielle-manivelle pour ramener l'élément d'actionnement électromagnétique (14) à sa position initiale après la phase d'actionnement sur le deuxième levier de déverrouillage (9).

7. Serrure selon l'une quelconque des revendications 1 à 3, caractérisée par le fait qu'elle comporte un relais et un dispositif temporisé servant à commander l'actionnement de l'élément d'actionnement électromagnétique (14) dans des sens opposés et pour des durées prédéterminées pour le ramener à sa position initiale après la phase d'actionnement sur le deuxième levier de déverrouillage (9).

8. Serrure selon l'une quelconque des revendications précédentes, caractérisée par le fait que l'élément d'actionnement électromagnétique (14) est un moteur électrique.

9. Serrure selon l'une quelconque des revendications précédentes, caractérisée par le fait qu'elle est montée sur au moins l'un des composants suivants: portes passagers (27, 28), couvercle de coffre (29), capot du compartiment moteur et couvercle de l'embouchure de remplissage du réservoir de combustible (72).

10. Système de commande pour une multiplicité de serrures (1) selon l'une des revendications 1 à 9, montées sur au moins certains des composants suivants: portes passagers (27, 28), couvercle de coffre (29), capot du compartiment moteur et couvercle de l'embouchure de remplissage de combustible (72) d'un véhicule (26).

11. Système de commande selon la revendication 10, caractérisé par le fait que les blocs, interrupteurs et circuits électriques de contrôle et de commande pour cette multiplicité de serrures font partie d'une unité électronique centrale de contrôle et de commande (83).

12. Système de commande selon la revendication 11, caractérisé par le fait qu'il comporte une multiplicité d'interrupteurs à poussoir (45, 46, 47, 48, 76) pour commander le fonctionnement de chacune de ces serrures (1).

13. Système de commande selon la revendication 12, caractérisé par le fait qu'il comporte une multiplicité de ces interrupteurs (31, 31', 32, 32', 33, 33', 34, 34') dont chacun peut agir pour valide ou non l'état de fonctionnement de l'élément d'actionnement électromécanique (14) pour toutes ces serrures (1).

14. Système de commande selon la revendication 13, caractérisé par le fait que les interrupteurs (31, 31', 32, 32', 33, 33', 34, 34') sont disposés en correspondance avec les portes passagers avant (27) et/ou le couvercle de coffre (29) ou dans l'intérieur du compartiment passagers du véhicule (26).

15. Système de commande selon l'une des revendications 11 à 14, caractérisé par le fait qu'il comporte des interrupteurs (58, 58') disposées à l'intérieur du compartiment passagers et accessibles au moyen d'une clé, et pouvant être mis en oeuvre pour procurer un signal électrique pour permettre ou empêcher le fonctionnement de l'élément d'actionnement électromécanique (14) correspondant à la serrure unique (1) du couvercle de coffre (29) et du couvercle de l'embouchure de remplissage de combustible (72).

16. Système de commande selon l'une des revendications 11 à 15, caractérisé par le fait que la serrure pour le couvercle de l'embouchure de remplissage de combustible (72) est amenée respectivement en position d'ouverture ou de fermeture par des signaux de validation ou d'inhibition au moins pour la serrure (1) du couvercle de coffre (29).

17. Système de commande selon l'une des revendications 11 à 15, caractérisé par le fait qu'il comporte des éléments indicateurs optiques (55, 56) disposés à l'intérieur du compartiment passagers et indicatifs respectivement de la condition de validation ou non pour l'ouverture des serrures (1) et pour la condition ouverte ou non d'au moins certaines des serrures (1).

18. Système de commande selon l'une des revendications 11 à 17, caractérisé par le fait qu'il comporte un dispositif mécanique pouvant être actionné de l'extérieur et agissant sur le groupe de verrouillage (3) pour déverrouiller au moins l'une des serrures (1).

19. Système de commande selon la revendication 18, caractérisé par le fait que ce dispositif mécanique peut être actionné au moyen d'une clé et est disposé en correspondance avec la serrure pour le couvercle de coffre arrière (29).

20. Système de commande selon la revendication 19, caractérisé par le fait que, à l'intérieur de l'espace arrière du véhicule (26) est disposé un dispositif de raccordement pour une source de courant extérieur à fournir à l'unité de commande centrale (83) et au moto-réducteur (14), ou un dispositif d'actionnement mécanique agissant sur le groupe de verrouillage (3) pour déverrouiller au moins une serrure (1) des portes du compartiment passagers (27, 28).

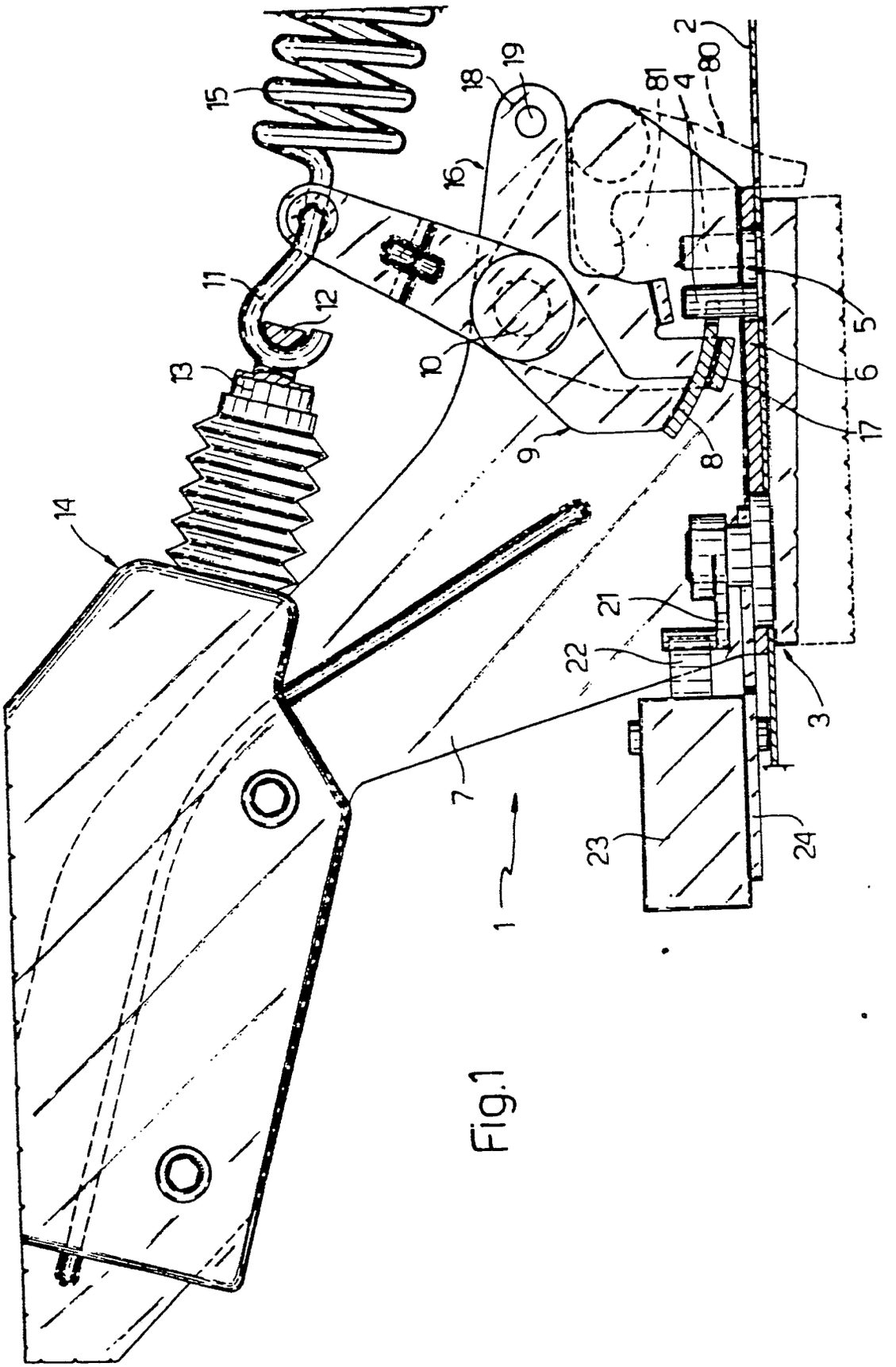

Fig.1

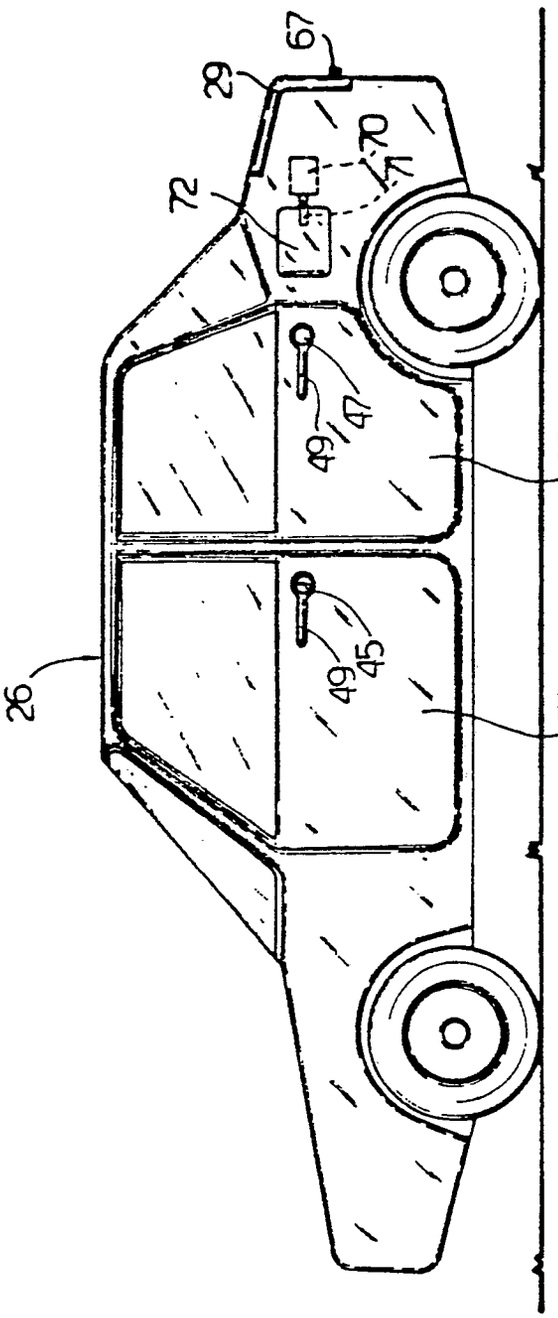

Fig.2

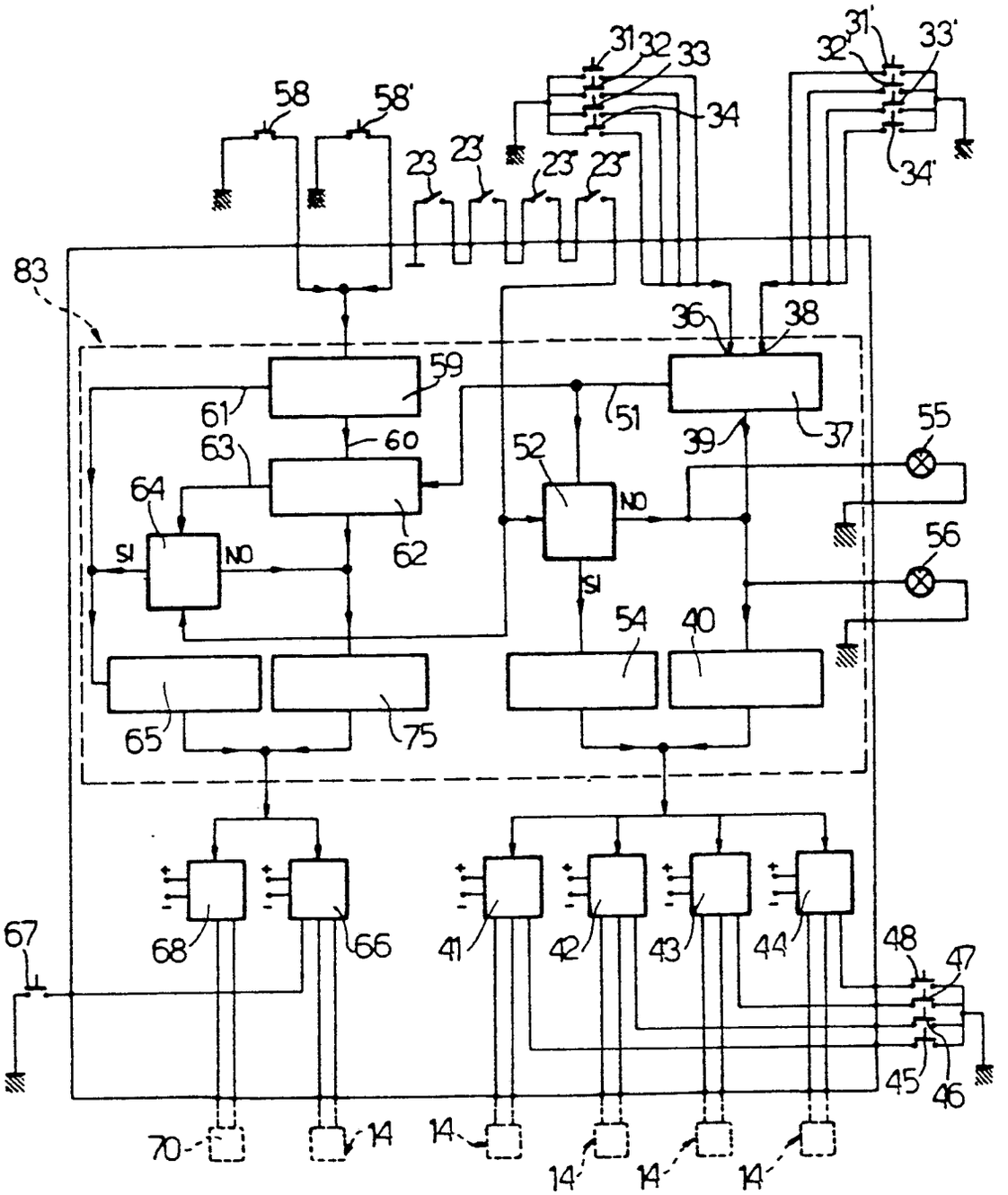
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Fig.3