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(54) **SAFETY LOCK**

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(73) Proprietor: **Kone Corporation**
00330 Helsinki (FI)

(72) Inventors:
• **KETONEN, Ari**
FI-05840 Hyvinkää (FI)

• **KETOVIITA, Seppo**
FI-05840 Hyvinkää (FI)

(74) Representative: **K & H Bonapat**
Patentanwälte
Eduard-Schmid-Strasse 2
81541 München (DE)

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Description

[0001] The object of this invention is a safety lock as defined in the preamble of claim 1, a method for fitting the safety lock into the safety arrangement of an elevator as defined in the preamble of claim 12, and also an elevator as defined in the preamble of claim 15.

[0002] Safety locks are used as a part of the safety arrangements of a building, e.g. in connection with the landing doors of an elevator. In this case monitoring appliances, with which the safety of the locking is verified, are needed in addition to the locking appliance in order to ensure safety. For example, elevator regulators require that the locking system of the landing doors of an elevator must be monitored both by measuring the status of the locking and by measuring the position of the landing door to be locked. The position of the landing door is conventionally measured with a separate safety switch, which is fitted to open under forced control when the landing door opens. The aforementioned safety switch is installed separately to the landing door.

[0003] Publication EP1441091 describes a safety lock, in which the operation of the manually-operated emergency release appliance is measured with a first safety switch and the locking is measured with a second safety switch.

[0004] Publication EP1473511 describes a measuring arrangement implemented with Hall sensors e.g. for monitoring the position of a landing door.

[0005] Publication EP1110900 describes a safety arrangement of the service spaces of an elevator shaft, wherein the safety device monitoring the position of the landing door is mechanically in connection with the door operator.

[0006] Further, document US1,896,541 relates to an electromechanical interlock for an elevator door having a bar which moves with the door upon a manually opening and closing thereof. Within the housing of the interlock installed on the wall side there is an electromagnet which when energized moves a catch lock which in turn releases a detent. In case the detent is released, the bar then can be manually moved to open the door.

[0007] The purpose of this invention is to disclose a new type of safety lock, in which both the monitoring of the locking and the measurement of the position of the landing door is done with a safety switch fitted inside the frame section of the safety lock. Another purpose of the invention is to present the fitting of a safety lock to the safety system of an elevator, more particularly in connection with the landing doors of the elevator.

[0008] The safety lock according to the invention is characterized by what is disclosed in the characterization part of claim 1, the method according to the invention for fitting the safety lock into the safety arrangement of an elevator is characterized by what is disclosed in the characterization part of claim 12, and the elevator according to the invention is characterized by what is disclosed in the characterization part of claim 15. Other embodiments

of the invention are characterized by what is disclosed in the other claims. Some inventive embodiments are also discussed in the descriptive section of the present application.

[0009] The safety lock according to the invention comprises a frame section, and also a lock latch in connection with the frame section; additionally the safety lock comprises a catch lever guided via a guide interface, as well as a safety switch fitted inside the frame section. A beak part is made in connection with the guide groove of the lock latch, and the guide of the catch lever is fitted to move in the guide groove in relation to the lock latch in essentially the first position of the catch lever, and the guide of the catch lever is fitted to lock to the beak part in essentially the second position of the catch lever. A guide force, by means of which the catch lever can be moved to a second position, can be exerted on the catch lever via the guide interface. The guide interface can comprise e.g. a guide magnet fixed to the catch lever, which guide magnet exerts a force on the catch lever between the guide magnet and a countermagnet that is in the vicinity. The countermagnet can be e.g. in the door jamb of the landing door, in which case the guide magnet is fitted immediately facing the countermagnet when the door is closed, and when the door opens the aforementioned guide force ceases to be exerted. Similarly, the guide force can be achieved with e.g. a spring instead of a magnet. A safety switch in this context refers to a switch that opens under forced control, which can comprise one or more switch elements.

[0010] In one embodiment of the invention the lock latch comprises a guide part, which guide part comprises a guide surface and also a guide groove.

[0011] In one embodiment of the invention the safety switch comprises an operating lever of the safety switch, which operating lever of the safety switch is supported via a roller on the guide surface of the lock latch.

[0012] In one embodiment of the invention the catch lever is fitted to turn around its hinge point and the catch lever comprises a guide, which is fitted into a guide groove.

[0013] In one embodiment of the invention the catch lever comprises an arrester spring and also a closing magnet.

[0014] In one embodiment of the invention the safety lock comprises a countermagnet of the closing magnet fitted into the door jamb, the polarity of which countermagnet is repellent to the closing magnet.

[0015] In one embodiment of the invention the safety lock comprises a closing spring, which closing spring is fitted between the frame section and the lock latch.

[0016] In one embodiment of the invention the safety lock comprises an operating lever of the lock latch, which operating lever is fitted to transmit a force effect exerted on itself to turn the lock latch in relation to the hinge point.

[0017] In one embodiment of the invention the safety lock comprises a position switch (25), which is fitted to change its state on the basis of the position of the lock

latch.

[0018] In one embodiment of the invention the lock latch comprises a separate guide part, which guide part is fixed elsewhere on the lock latch.

[0019] In one embodiment of the invention the safety lock comprises an electrical interface in the frame section.

[0020] In one embodiment of the invention the safety switch comprises a protective casing, as well as a first and a second switch element fitted inside the protective casing.

[0021] In the method according to the invention for fitting a safety lock in the safety arrangement of an elevator, a frame section is fitted to the safety lock, and also a lock latch in connection with the frame section; a catch lever guided via the guide interface is fitted to the safety lock; and also a safety switch is fitted inside the frame section of the safety lock; a beak part is made in connection with the guide groove of the lock latch; the guide of the catch lever is fitted to move in the guide groove in relation to the lock latch in essentially the first position of the catch lever; and the guide of the catch lever is fitted to lock to the beak part in essentially the second position of the catch lever; the safety lock is fitted to the landing door of the elevator; and also a signal comprising the position data of the first switch element of the safety switch is taken to the safety circuit of the landing doors of the elevator via the electrical interface of the frame section. The aforementioned signal comprising the position data of the first switch element can be any prior-art signal whatsoever that indicates the position of the switch. The signal can be an analog signal or a digital signal, in parallel or serial form, and it can be transmitted with a signal conductor or e.g. wirelessly, in which case the electrical interface of the safety lock also comprises a transmitter. The aforementioned first switch element can also be fitted into the serial circuit together with the first switch elements of the safety switches of the other landing doors, in which case the aforementioned switch elements together comprise the safety circuit of the landing doors.

[0022] In one method according to the invention the safety arrangement of the elevator is fitted to prevent, if necessary, movement of the elevator car by disconnecting the power supply to the elevator motor as well as by controlling the mechanical braking appliance of the elevator car on the basis of the position data of at least the first switch element of the safety switch; and the safety arrangement of the elevator is fitted to limit movement of the elevator car in the elevator shaft to outside the service spaces of the elevator shaft on the basis of the position data of at least the second switch element of the safety switch.

[0023] In one method according to the invention the signal comprising the status data of the position switch of the lock is taken to the control of the door operator of the elevator car via the electrical interface of the frame section; and the door operator of the elevator car is fitted to be controlled on the basis of the signal comprising at

least the aforementioned status data of the position switch of the lock.

[0024] The elevator according to the invention comprises a safety lock fitted to a landing door of the elevator. The safety lock comprises: a frame section, and also a lock latch in connection with the frame section; a catch lever guided via a guide interface; and also a safety switch fitted inside the frame section. A beak part is made in connection with the guide groove of the lock latch, and the guide of the catch lever is fitted to move in the guide groove in relation to the lock latch in essentially the first position of the catch lever, and the guide of the catch lever is fitted to lock to the beak part in essentially the second position of the catch lever. The signal comprising the position data of the first switch element of the safety switch is taken to the safety circuit of the landing doors of the elevator via the electrical interface of the frame section of the safety switch.

[0025] In one embodiment of the invention the aforementioned safety lock comprises two safety switches, of which the first safety switch comprises the aforementioned first switch element and the second safety switch comprises the aforementioned second switch element. In this case both the first and the second switch element are fitted to change their switch status on the basis of the movement of the guide part of the lock latch.

[0026] With the invention at least one of the following advantages is achieved:

- Since it is possible by means of the safety lock to monitor both the locking and the position of the door to be locked, it is not necessary to install in the door a separate measuring arrangement of the position of the door required by the safety regulations.
- Since the safety switch can be enclosed as presented in the invention in a separate protective enclosure inside the frame section, the protection of the safety switch e.g. against dirt and moisture improves, in which case the reliability of the safety switch also improves.
- The safety lock according to the invention is structurally compact in all its dimensions, so that it is easy to fit in the door, also e.g. when modernizing existing doors to make them compliant with new safety regulations. In this case the mechanical interface of the lock can also be designed such that the lock fits into the existing fixing. The material of the frame section of the lock can also be selected freely, and it can be of steel, in which case the lock will be durable.
- The cover of the frame section of the lock can be made e.g. from transparent plastic, in which case the structure of the lock can be inspected visually without opening the frame section.
- The electrical interface of the frame section of the lock can be designed such that the lock can be fitted into the electrical control systems and the safety systems of the building, such as into the safety system

of the elevator system as well as into the control system of the door operator of the elevator.

- Since the safety lock comprises a closing spring instead of a conventional closing weight, the position of the lock does not affect the closing force, in which case the position of the lock can be freely selected.
- Since the safety lock comprises a measurement of the position of a door, such as the landing door of the elevator shaft, from the safety switch fitted inside the frame section, it is possible by means of the safety lock to form monitoring information about a fitter moving into the elevator shaft, and then movement of the elevator car in the elevator shaft can be limited to outside the service spaces of the elevator shaft on the basis of the monitoring information.

[0027] In the following, the invention will be described in more detail by the aid of an embodiment with reference to the attached drawings, wherein

Fig. 1 presents a safety lock according to the invention.

Fig. 2 presents a safety lock according to the invention.

Fig. 3 presents the guide part of the lock latch according to the invention.

Fig. 4 presents a safety arrangement of an elevator according to the invention, in which is a safety lock according to the invention.

[0028] Fig. 1 presents a safety lock 1 according to the invention in the closed position. Fig. 2 presents a safety lock according to the invention in the open position. Fig. 3 presents a guide part 9 of the lock latch according to the invention. The safety lock is here fitted to the landing door of the elevator. The safety lock 1 comprises a frame section 2 and also a lock latch 4 in connection with the frame section. The lock latch is fitted to turn around its hinge point 5. The lock latch comprises a stem part 6, a beak part 7 and also a separate guide part 9, which is fixed elsewhere on the lock latch. The guide part 9 is here a separate plastic part to the rest of the lock latch 4 to facilitate manufacture, but it can also be integrated into the rest of the lock latch. The guide part 9 comprises a guide surface 10 and also a guide groove 11. A beak part 20 is made in connection with the guide groove 11. The safety lock also comprises an operating lever 24, of the lock latch, which operating lever is fitted to transmit the force effect exerted on itself to turn the lock latch in relation to the hinge point 5. This force effect can, e.g. in an elevator system, be achieved with the door motor of the elevator, in which case the operating lever 24 of the lock latch is in connection elsewhere to the door operator of the elevator. On the other hand the force effect can also be achieved e.g. manually with the emergency re-

lease appliance of the door.

[0029] The safety lock also comprises a catch lever 3, by means of which the lock latch 4 can be latched into the open position when the door is open. The safety lock comprises a guide interface in which is a closing magnet 17 fixed to the catch lever. When the door is closed the pushing force from the counter magnet 19, which is fitted into the door jamb 18 at the position of the closing magnet, is exerted on the closing magnet 17. An arrester spring is fitted around the hinge point of the catch lever, which arrester spring in turn exerts a latching force on the catch lever 3 that opposes the pushing force of the closing magnet. When the pushing force of the closing magnet starts to be exerted on the catch lever 3, the catch lever turns to essentially its first position 21, in which case the guide 15 of the catch lever is able to move in relation to the lock latch 4 in the guide groove 11. In the case the lock latch can turn freely and the lock can be opened and closed.

[0030] When the lock is turned into the open position and the door is opened, the pushing force of the counter magnet 19 of the closing magnet fitted into the door jamb 18 ceases to be exerted. In this case the opposing latching force exerted on the catch lever by the arrester spring turns the catch lever essentially into its second position 22. Now the guide 15 of the catch lever moves to the beak part 20 in connection with the guide groove, and the catch lever 3 locks the lock latch 4 in the open position. The locking can be cancelled by closing the door and thus bringing the closing magnet 17 and the counter magnet 19 into the vicinity of each other, in which case the pushing force turns the catch lever into its first position 21, the guide 15 of the catch lever moves into the guide groove and the locking of the catch lever ceases.

[0031] The safety switch 8 comprises a first and a second switch element, that open under forced control, and in connection with these an operating lever 12 of the safety switch, which operating lever is supported via a roller 13 on the guide surface 10 of the lock latch. The operating lever 12 moves as the roller 13 moves along the guide surface when the lock latch is turned. When the lock latch 4 is in the closed position the lock beak 7 is out, locking the door. In this case the first and the second switch element of the safety switch 8 are closed. When the lock latch turns to the open position, the operating lever 12 of the safety switch moves according to the movement of the guide surface 10, and the change in position of the operating lever forces the switch elements of the safety switch open. In this case the opened switch elements inform that the lock latch is in the open position. This information is transmitted to the safety arrangement of the elevator, in which the information is compared to at least the control command of the car door of the elevator, and if the information does not match, the safety arrangement deduces that the landing door has opened to the elevator shaft. In this case movement of the elevator car in the elevator shaft is limited. One of the two switch elements of the safety switch 8 is also in the safety circuit of the landing doors, so that opening of the switch ele-

ment disconnects the safety circuit of the landing doors. In this case driving with the elevator is prevented by disconnecting the power supply to both the brake control circuit 29, 31 of the mechanical brake and to the elevator motor 27.

[0032] Since the catch lever 3 locks the lock latch in the open position when the landing door is open, also the open switch elements of the safety switch 8 indicate the position of the landing door. The switch elements of the safety switch can change their state only after the landing door has closed, in which case locking of the lock latch is cancelled and the lock latch can be moved to the closed position.

[0033] The safety lock 1 also comprises a closing spring 23, which is fitted between the frame section 2 and the lock latch 4. The closing spring exerts a force on the lock latch 4, which force endeavors to keep the lock latch in the closed position. The position switch 25 presented in Fig. 1 is disposed in the safety lock such that when the lock latch 4 moves to the open position, the guide part 9 presses against the position switch, in which case the position switch 25 changes its state on the basis of the position of the lock latch 4.

[0034] Fig. 4 presents a safety arrangement of an elevator according to the invention. Here the elevator car 30 is moved in the elevator shaft 33 with an elevator motor 27 via elevator ropes. The power supply of the motor 27' is controlled with a frequency converter 28. In the safety arrangement safety locks according to the invention are fitted to the landing doors 26. The safety locks comprise safety switches 8 according to the invention, and the signal comprising the position data of the first switch element of each safety switch 8 is taken to the safety circuit 27 of the landing doors of the elevator via the electrical interface of the frame section 2. The safety circuit 27 in this embodiment of the invention comprises a safety circuit of first switch elements connected in series, and the first switch elements are connected to the safety circuit with conductors led through the electrical interface of the frame section of the safety lock. The signal comprising the position data of the second switch element of each safety switch 8 is taken by a conductor to the measuring circuit of the landing doors of the elevator via the electrical interface of the frame section 2 of the safety lock 1. The measuring circuit comprises a resistor 29 connected in parallel with each second switch element. The parallel connections of the resistors and the second switch elements are connected in series and connected to each other with conductors, and the position of the landing doors is determined by measuring the impedance of the serial circuit. The signal comprising the status data of the position switch element 25 of each safety lock 1 is taken, via the electrical interface of the frame section 2 of the lock, by a signal conductor to the control 32 of the door operator of the elevator car, and the control of the door operator receives information about the position of the landing door from the status data of the position switch 25.

[0035] The safety arrangement of the elevator is fitted to prevent, if necessary, movement of the elevator car 30 by disconnecting the power supply to the elevator motor 27' as well as by controlling the mechanical braking appliance of the elevator car, such as a machinery brake 29' or a wedge brake 31 of the elevator car, on the basis of the position data of at least the first switch element of the safety switch 8. The safety arrangement of the elevator is also fitted to limit movement of the elevator car in the elevator shaft 33 to outside the service spaces of the elevator shaft on the basis of the position data of at least the second switch element of the safety switch 8.

[0036] The safety lock according to the invention can be used generally for locking the doors in any building whatsoever, especially in situations in which the safety regulations require locking and monitoring of the position of the door to be locked.

[0037] It is obvious to the person skilled in the art that the different embodiments of the invention are not limited solely to the example described above, but that they may be varied within the scope of the claims presented below.

Claims

1. Safety lock (1), which comprises:

- a frame section (2), and in connection with the frame section:
- a lock latch (4),
- a catch lever (3) controlled via a guide interface, and
- a safety switch (8) fitted inside the frame section (2)

wherein a beak part (20) is made in connection with a guide groove (11) of the lock latch (4), and a guide (15) of the catch lever is fitted to move in the guide groove (11) in relation to the lock latch in essentially a first position of the catch lever, meaning a closed position of the catch lever (3) in which a locking of the lock latch (4) is cancelled, **characterized in that** the guide (15) of the catch lever is fitted to lock to the beak part (20) in essentially a second position (22) in which the catch lever (3) locks the lock latch (4) in an open position.

2. Safety lock according to claim 1, **characterized in that** the lock latch (4) comprises a guide part (9), which guide part comprises a guide surface (10) as well as a guide groove (11).

3. Safety lock according to claim 1 or 2, **characterized in that** the safety switch (8) comprises an operating lever (12) of the safety switch, which operating lever of the safety switch is supported via a roller (13) on the guide surface (10) of the lock latch.

4. Safety lock according to any of the preceding claims, **characterized in that** the aforementioned catch lever (3) is fitted to turn around its hinge point, and **in that** the catch lever comprises a guide (15), which is fitted into the guide groove (11). 5
5. Safety lock according to claim 4, **characterized in that** the catch lever comprises an arrester spring as well as a closing magnet (17). 10
6. Safety lock according to any of the preceding claims, **characterized in that** the safety lock comprises a counter magnet (19) of the closing magnet fitted inside the door jamb (18), the polarity of which counter magnet is repellent to the closing magnet (17). 15
7. Safety lock according to any of the preceding claims, **characterized in that** the safety lock comprises an operating lever (24) of the lock latch, which is fitted to transmit the force effect exerted on itself to turn the lock latch (4) in relation to a hinge point (5). 20
8. Safety lock according to any of the preceding claims, **characterized in that** the safety lock comprises a position switch (25), which is fitted to change its state on the basis of the position of the lock latch (4). 25
9. Safety lock according to any of the preceding claims, **characterized in that** the lock latch (4) comprises a separate guide part (9), which guide part is fixed elsewhere on the lock latch. 30
10. Safety lock according to any of the preceding claims, **characterized in that** the safety lock comprises an electrical interface inside the frame section (2). 35
11. Safety lock according to any of the preceding claims, **characterized in that** the aforementioned safety switch (8) comprises a protective casing, as well as a first and a second switch element fitted inside the protective casing. 40
12. Method for fitting a safety lock (1) into the safety arrangement of an elevator, wherein: 45
 - a frame section (2) is fitted to the safety lock (1), and also a lock latch (4) in connection with the frame section,
 - a catch lever (3) guided via a guide interface (17, 19) is fitted to the safety lock (1), and 50
 - a safety switch (8) is fitted inside the frame section (2) of the safety lock,
 - a beak part (20) is made in connection with a guide groove (11) of the lock latch (4),
 - a guide (15) of the catch lever (3) is fitted to move in the guide groove (11) in relation to the lock latch (4) in essentially a first position (21) of the catch lever, meaning a closed position of

the catch lever (3) in which a locking of the lock latch (4) is cancelled, and

- the guide (15) of the catch lever is fitted to lock to the beak part (20) in essentially a second position (22) of the catch lever, meaning that the catch lever (3) locks the lock latch (4) in an open position,
- the safety lock is fitted to a landing door (26) of the elevator,
- a signal comprising position data of a first switch element of the safety switch (8) is taken to a safety circuit (27) of landing doors of the elevator via the electrical interface of the frame section.

13. Method according to claim 12, characterized in that:

- the signal comprising the position data of a second switch element of the safety switch (8) is taken to the measuring circuit of the landing doors of the elevator via the electrical interface of the frame section.

14. Method according to claim 12 or 13, characterized in that:

- the safety arrangement of an elevator is fitted to prevent, if necessary, movement of the elevator car (30) by disconnecting power supply to an elevator motor (27) as well as by controlling a mechanical braking appliance (29, 31) of an elevator car on the basis of the position data of at least the first switch element of the safety switch (8).
- the safety arrangement of an elevator is fitted to limit movement of the elevator car in an elevator shaft (33) to outside the service spaces of the elevator shaft on the basis of the position data of at least the second switch element of the safety switch (8).

15. Elevator, which comprises a safety lock (1) according to claim 1, fitted to a landing door (26) of the elevator, characterized in that a signal comprising position data of a first switch element of a safety switch (8) is taken to a safety circuit (27) of landing doors of the elevator via an electrical interface of the frame section of the safety switch.

Patentansprüche

1. Sicherheitsschloss (1), aufweisend:

- eine Rahmensektion (2) und in Verbindung mit der Rahmensektion:
- eine Schloss-Falle (4),

- einen Fanghebel (3), der über eine Führungs-
verbindung gesteuert wird, und
- einen Sicherheitsschalter (8), der innerhalb der
Rahmensektion (2) eingepasst ist,

wobei eine Nase (20) in Verbindung mit einer Füh-
rungsnut (11) der Schlossfalle (4) gefertigt ist und
eine Führung (15) des Fanghebels eingepasst ist,
um in der Führungsnut (11) in Relation zu der
Schloss-Falle in im Wesentlichen eine erste Position
des Fanghebels bewegbar zu sein, die eine
Schließposition des Fanghebels (3) bedeutet, in der
ein Schließen der Schloss-Falle (4) aufgehoben ist,
dadurch gekennzeichnet, dass die Führung (15)
des Fanghebels eingepasst ist, um die Nase (20) in
im Wesentlichen einer zweiten Position (22) zu sper-
ren, in der der Fanghebel (3) die Schloss-Falle (4)
in einer Offen-Position sperrt.

2. Sicherheitsschloss nach Anspruch 1, **dadurch ge-
kennzeichnet, dass** die Schloss-Falle (4) ein Füh-
rungsteil (9) aufweist, welches Führungsteil eine
Führungsfläche (10) wie auch eine Führungsnut (11)
aufweist.
3. Sicherheitsschloss nach Anspruch 1 oder 2, **da-
durch gekennzeichnet, dass** der Sicherheitsschal-
ter (8) einen Betätigungshebel (12) des Sicherheits-
schalters aufweist, welcher Betätigungshebel des
Sicherheitsschalters über eine Rolle (13) auf der
Führungsfläche (10) der Schloss-Falle unterstützt
ist.
4. Sicherheitsschloss nach einem der vorangehenden
Ansprüche, **dadurch gekennzeichnet, dass** der
zuvor erwähnte Fanghebel (3) eingepasst ist, um um
dessen Aufhängungspunkt zu drehen, und dass der
Fanghebel eine Führung (15) aufweist, die in die
Führungsnut (11) eingepasst ist.
5. Sicherheitsschloss nach Anspruch 4, **dadurch ge-
kennzeichnet, dass** der Fanghebel eine Haltefeder
wie auch ein Schließmagnet (17) aufweist.
6. Sicherheitsschloss nach einem der vorangehenden
Ansprüche, **dadurch gekennzeichnet, dass** das
Sicherheitsschloss ein Gegenmagnet (19) zum
Schließmagnet aufweist, das innerhalb der Türilai-
bung (18) eingepasst ist, wobei die Polarität des Ge-
genmagnetes abstoßend auf das Schließmagnet
(17) gewählt ist.
7. Sicherheitsschloss nach einem der vorangehenden
Ansprüche, **dadurch gekennzeichnet, dass** das
Sicherheitsschloss einen Betätigungshebel (24) der
Schlossfalle aufweist, der eingepasst ist, um die
Kraftwirkung zu übertragen, die auf ihn selbst aus-
geübt wird, um die Schloss-Falle (4) in Relation auf

einen Aufhängungspunkt (5) zu drehen.

8. Sicherheitsschloss nach einem der vorangehenden
Ansprüche, **dadurch gekennzeichnet, dass** das
Sicherheitsschloss einen Positionsschalter (25) auf-
weist, der eingepasst ist, um seinen Zustand auf der
Grundlage der Position der Schloss-Falle (4) zu än-
dern.
9. Sicherheitsschloss nach einem der vorangehenden
Ansprüche, **dadurch gekennzeichnet, dass** die
Schloss-Falle (4) ein separates Führungsteil (9) auf-
weist, welches Führungsteil irgendwo an der
Schloss-Falle festgelegt ist.
10. Sicherheitsschloss nach einem der vorangehenden
Ansprüche, **dadurch gekennzeichnet, dass** das
Sicherheitsschloss eine elektrische Schnittstelle in-
nerhalb der Rahmensektion (2) aufweist.
11. Sicherheitsschloss nach einem der vorangehenden
Ansprüche, **dadurch gekennzeichnet, dass** der
zuvor erwähnte Sicherheitsschalter (8) ein Schutz-
gehäuse aufweist, wie auch ein erstes und ein zwei-
tes Schaltelement, die innerhalb des Schutzgehäu-
ses eingepasst sind.
12. Verfahren zum Einpassen eines Sicherheitsschlos-
ses (1) in die Sicherheitsanlage eines Aufzuges, wo-
bei:
 - eine Rahmensektion (2) für das Sicherheits-
schloss (1) vorgesehen wird, und ebenso eine
Schloss-Falle (4) in Verbindung mit der Rah-
mensektion,
 - ein über eine Führungs-Verbindung (17, 19)
geführter Fanghebel (3) in dem Sicherheits-
schloss (1) eingepasst wird, und
 - ein Sicherheitsschalter (8) innerhalb der Rah-
mensektion (2) des Sicherheitsschlusses einge-
passt wird,
 - eine Nase (20) in Verbindung mit einer Füh-
rungsnut (11) der Schloss-Falle (4) gefertigt
wird,
 - eine Führung (15) des Fanghebels (3) einge-
passt wird, um in der Führungsnut (11) in Rela-
tion zu der Schloss-Falle (4) in im Wesentlichen
einer ersten Position (21) des Fanghebels be-
wegbar zu sein, was einer Schließposition des
Fanghebels (3) entspricht, in der ein Schließen
der Schloss-Falle (4) aufgehoben ist, und
 - die Führung (15) des Fanghebels eingepasst
ist, um die Nase (20) in im Wesentlichen einer
zweiten Position (22) des Fanghebels zu schlie-
ßen, gleichbedeutend damit, dass der Fanghe-
bel (3) die Schloss-Falle (4) in einer Offen-Po-
sition sperrt,
 - das Sicherheitsschloss für eine Geschosstür

(26) des Aufzuges eingepasst wird,
 - ein Signal entnommen wird, dass die Positions-
 Daten eines ersten Schaltelements des Sicher-
 heitsschalters (8) aufweist, um dieses einem Si-
 cherheitskreis (27) für Geschosstüren des Auf-
 zuges über die elektrische Schnittstelle der Rah-
 mensektion zuzuführen.

**13. Verfahren nach Anspruch 12, dadurch gekenn-
 zeichnet, dass:**

- das die Positionsdaten eines zweiten Schalt-
 elements des Sicherheitsschalters (8) aufwei-
 sende Signal wird dem Messkreis der Geschos-
 stüren des Aufzuges über die elektrische
 Schnittstelle der Rahmensektion zugeführt.

**14. Verfahren nach Anspruch 12 oder 13, dadurch ge-
 kennzeichnet, dass:**

- die Sicherheitsanlage des Aufzuges dazu ein-
 gepasst ist, um bei Bedarf eine Bewegung der
 Aufzugskabine (30) zu verhindern, indem eine
 Stromzufuhr an einen Aufzugsmotor (27) unter-
 brochen wird, wie auch durch Steuern einer me-
 chanischen Bremsvorrichtung (29, 31) einer
 Aufzugskabine auf der Grundlage der Positions-
 daten von zumindest dem ersten Schaltelement
 des Sicherheitsschalters (8),
 - die Sicherheitsanlage eines Aufzuges eingepa-
 passt ist, um die Bewegung der Aufzugskabine
 in einem Aufzugsschacht (33) nach außerhalb
 der Serviceräume des Aufzugsschachtes zu be-
 grenzen, und zwar auf der Grundlage der Posi-
 tionsdaten von zumindest dem zweiten Schalt-
 element des Sicherheitsschalters (8).

**15. Aufzug, der ein Sicherheitsschloss (1) nach An-
 spruch 1 aufweist, eingepasst für eine Geschosstür
 (26) des Aufzuges, dadurch gekennzeichnet, dass**
 ein die Positionsdaten eines ersten Schaltelementes
 eines Sicherheitsschalters (8) aufweisende Signal
 an einen Sicherheitskreis (27) von Geschosstüren
 des Aufzuges über eine elektrische Schnittstelle der
 Rahmensektion des Sicherheitsschalters geführt
 wird.

Revendications

1. Serrure de sécurité (1), qui comprend :

une partie cadre (2), et en liaison avec la partie
 cadre :

un pêne de serrure (4),
 un levier d'encliquetage (3) commandé par
 l'intermédiaire d'une interface de guidage,

et

un interrupteur de sécurité (8) monté à l'in-
 térieur de la partie cadre (2) cependant une
 partie bec (20) est réalisée en liaison avec
 une rainure de guidage (11) du pêne de ver-
 rouillage (4), et un guide (15) du levier d'en-
 cliquetage est adapté pour se déplacer
 dans la rainure de guidage (11) par rapport
 au pêne de verrouillage essentiellement
 dans une première position du levier d'en-
 cliquetage, c'est-à-dire une position fermée
 du levier d'encliquetage (3) dans laquelle
 un verrouillage du pêne de serrure (4) est
 annulé, **caractérisée par le fait que** le gui-
 de (15) du levier d'encliquetage est adapté
 pour être verrouillé sur la partie bec (20) es-
 sentiellement dans une seconde position
 (22) dans laquelle le levier d'encliquetage
 (3) verrouille le pêne de serrure (4) dans
 une position ouverte.

**2. Serrure de sécurité selon la revendication 1, caracté-
 risée par le fait que** le pêne de serrure (4) com-
 prend un élément de guidage (9), laquelle partie de
 guidage comprend une surface de guidage (10) ainsi
 qu'une rainure de guidage (11).

**3. Serrure de sécurité selon la revendication 1 ou 2, caracté-
 risée par le fait que** l'interrupteur de sécu-
 rité (8) comprend un levier de service (12) de l'inter-
 rupteur de sécurité, lequel levier de service de l'in-
 terrupteur de sécurité est supporté par l'intermédiaire
 d'un galet (13) sur la surface de guidage (10) du
 pêne de serrure.

**4. Serrure de sécurité selon l'une quelconque des re-
 vendications précédentes, caractérisée par le fait
 que** ledit levier d'encliquetage (3) est adapté pour
 tourner autour de son point d'articulation, et **par le
 fait que** le levier d'encliquetage comprend un guide
 (15), qui est monté dans la rainure de guidage (11).

**5. Serrure de sécurité selon la revendication 4, caracté-
 risée par le fait que** le levier d'encliquetage com-
 prend un ressort d'arrêt ainsi qu'un aimant de fer-
 meture (17).

**6. Serrure de sécurité selon l'une quelconque des re-
 vendications précédentes, caractérisée par le fait
 que** la serrure de sécurité comprend un aimant con-
 traire (19) de l'aimant de fermeture monté à l'intérieur
 du montant de porte (18), la polarité duquel aimant
 contraire repoussant l'aimant de fermeture (17).

**7. Serrure de sécurité selon l'une quelconque des re-
 vendications précédentes, caractérisée par le fait
 que** la serrure de sécurité comprend un levier de
 service (24) du pêne de serrure, qui est adapté pour

transmettre l'effet de force exercé sur lui-même pour tourner le pêne de serrure (4) par rapport à un point d'articulation (5).

8. Serrure de sécurité selon l'une quelconque des revendications précédentes, **caractérisée par le fait que** la serrure de sécurité comprend un commutateur de position (25), qui est adapté pour modifier son état sur la base de la position du pêne de serrure (4). 5
9. Serrure de sécurité selon l'une quelconque des revendications précédentes, **caractérisée par le fait que** le pêne de serrure (4) comprend un élément de guidage (9) séparé, lequel élément de guidage est fixé ailleurs sur le pêne de serrure. 10
10. Serrure de sécurité selon l'une quelconque des revendications précédentes, **caractérisée par le fait que** la serrure de sécurité comprend une interface électrique à l'intérieur de la partie cadre (2). 15
11. Serrure de sécurité selon l'une quelconque des revendications précédentes, **caractérisée par le fait que** ledit interrupteur de sécurité (8) comprend une enveloppe de protection, ainsi qu'un premier et qu'un second élément de commutation montés à l'intérieur de l'enveloppe de protection. 20
12. Procédé pour monter une serrure de sécurité (1) dans le système de sécurité d'un ascenseur, dans lequel : 25
 - une partie cadre (2) est adaptée à la serrure de verrouillage (1), ainsi qu'un pêne de serrure (4) en liaison avec la partie cadre, 30
 - un levier d'enclenchement (3) guidé par l'intermédiaire de l'interface de guidage (17, 19) est adapté à la serrure de verrouillage (1), et
 - un interrupteur de sécurité (8) est monté à l'intérieur de la partie cadre (2) de la serrure de verrouillage, 35
 - une partie bec (20) est réalisée en liaison avec une rainure de guidage (11) du pêne de serrure (4), 40
 - un guide (15) du levier d'enclenchement (3) est adapté pour se déplacer dans la rainure de guidage (11) en liaison avec le pêne de serrure (4) essentiellement dans une première position (21) du pêne de serrure, c'est-à-dire une position fermée du levier d'encliquetage (3) dans laquelle un verrouillage du pêne de serrure (4) est annulé, et 45
 - le guide (15) du levier d'encliquetage est adapté pour être verrouillé sur la partie bec (20) essentiellement dans une seconde position (22) du levier d'encliquetage, c'est-à-dire que le levier d'encliquetage (3) verrouille le pêne de serrure 50

(4) dans une position ouverte, la serrure de sécurité est montée sur une porte palière (26) de l'ascenseur, un signal comprenant des données de position d'un premier élément de commutation de l'interrupteur de sécurité (8) est transmis à un circuit de sécurité (27) de portes palières de l'ascenseur par l'intermédiaire de l'interface électrique de la partie cadre.

13. Procédé selon la revendication 12, **caractérisé par le fait que** le signal comprenant les données de position d'un second élément de commutation de l'interrupteur de sécurité (8) est transmis au circuit de mesure des portes palières de l'ascenseur par l'intermédiaire de l'interface électrique de la partie cadre. 15
14. Procédé selon la revendication 12 ou 13, **caractérisé par le fait que** le système de sécurité d'un ascenseur est adapté pour empêcher, si nécessaire, le déplacement de la cabine d'ascenseur (30) en désactivant l'alimentation en courant d'un moteur d'ascenseur (27) ainsi qu'en commandant un système de freinage mécanique (29, 31) d'une cabine d'ascenseur sur la base des données de position au moins du premier élément de commutation de l'interrupteur de sécurité (8), 20

le système de sécurité d'un ascenseur est adapté pour limiter le déplacement de la cabine d'ascenseur dans une cage d'ascenseur (33) vers l'extérieur des espaces de service de la cage d'ascenseur sur la base des données de position d'au moins le second élément de commutation de l'interrupteur de sécurité (8). 25
15. Ascenseur, qui comprend une serrure de sécurité (1) selon la revendication 1, montée sur une porte palière (26) de l'ascenseur, **caractérisé par le fait qu'un** signal comprenant des données de position d'un premier élément de commutation d'un interrupteur de sécurité (8) est transmis à un circuit de sécurité (27) de portes palières de l'ascenseur par l'intermédiaire d'une interface électrique de la partie cadre de la serrure de sécurité. 30

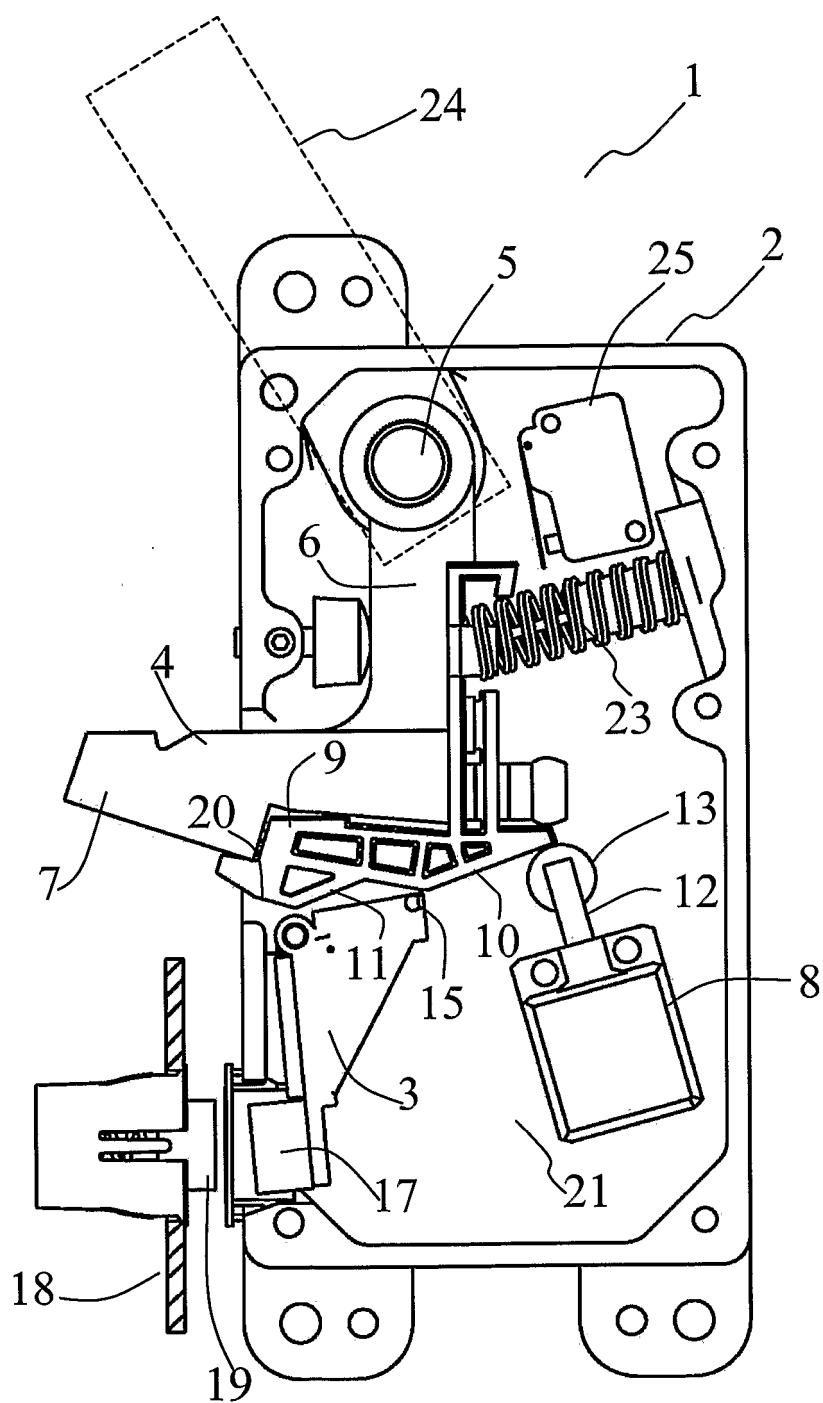


FIG. 1

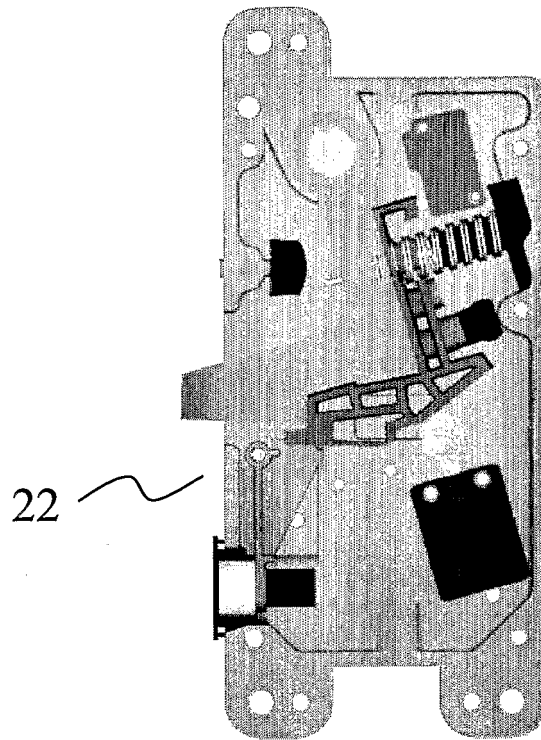


FIG. 2

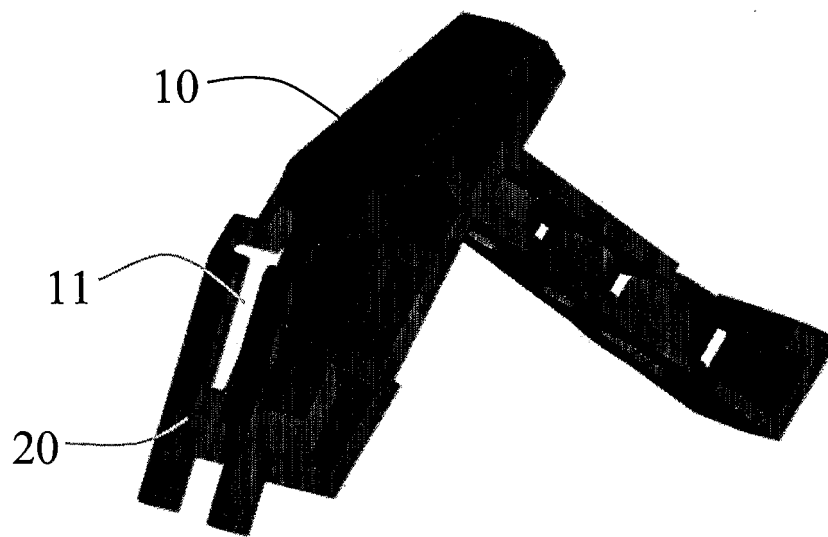


FIG. 3

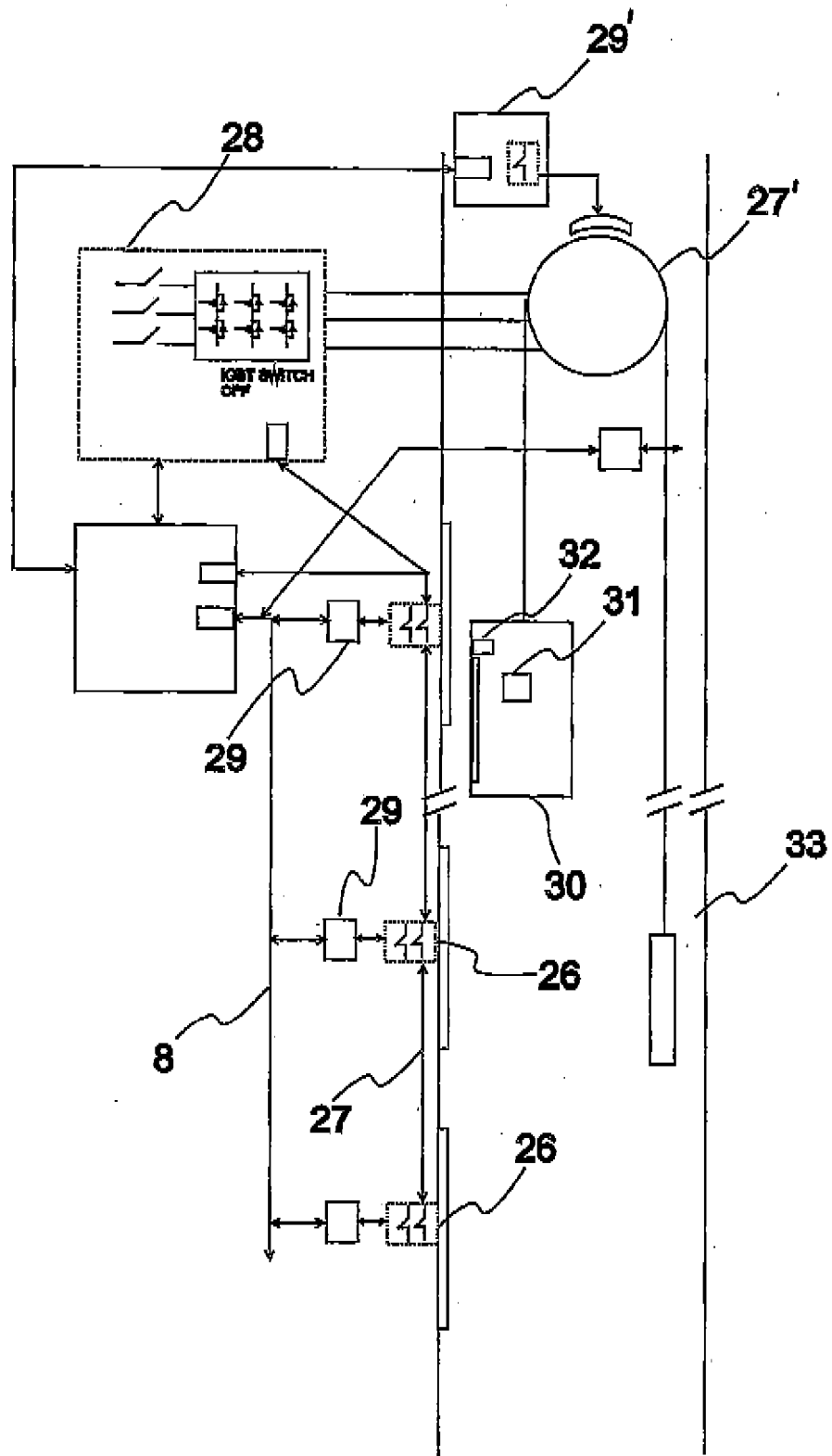


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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