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(54) System to control the entrance to a lockable room

(57) Systems for controlling the entrance into a lockable room (3), which may be movable or immovable, are known, for example in cars, whereby a first unit (5) is mounted inside the car and a second unit (7) is mounted in or on the car key, and for example in connection with the opening and closing of garage doors.

A drawback is that one unit may change the code without the other unit being made aware of this (being out of range and the like).

These problems are avoided by not carrying through the change until an OK signal (A) is received from the other unit.

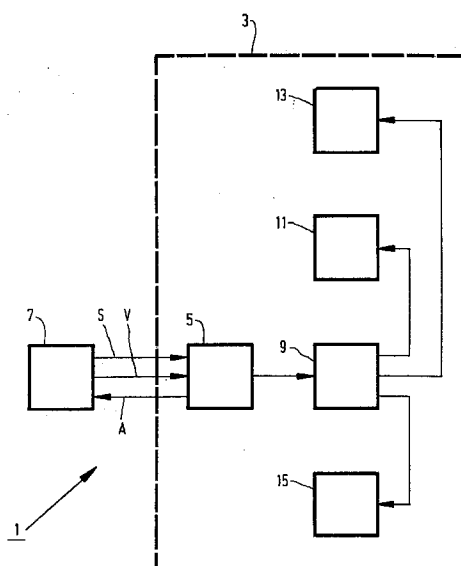


FIG.

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Description

The invention relates to a system for controlling the entrance into a lockable room, for example a car, a building and the like, comprising a first unit, which is mounted inside said room, and a second unit, which during operation remotely controls said first unit with a control signal for opening or closing said room, which control signal is changed by either one of said two units.

A control system of this type is inter alia known with (passenger) cars, whereby the first unit is mounted inside the car and the second unit is mounted in or on the car key, and for example in connection with the opening and closing of garage doors.

A drawback of this known control system is that with this system there is a possibility that unauthorized persons, who should not have entrance to the car in question, pick up the control signal which is being emitted by the second unit (for example a hand-held device/key) by means of a receiver, for example a scanner, and process said signal, for example by using a computer programme, after which they transmit said signal to the car with a transmitter, as a result of which the lock of the car is opened and an alarm that may be connected thereto is turned off.

Another drawback is that this may lead to the car being stolen or the house in question being burglarized.

The object of the invention is to provide a control system which does not have the above drawbacks. In order to accomplish that objective a control system according to the invention is characterized in that the one unit transmits a proposal to change said control signal to the other unit and changes said control signal after receiving an OK-signal from said other unit.

The invention is based on the principle that since the control signal is not changed until an OK-signal has been received, the one unit (in/on the key) is prevented from changing the code (the control signal) without the other unit (car, building) receiving said change signal. This might lead to the control signal getting outside the (frequency) range of the (receiving) unit after a number of changes.

Furthermore the control system according to the invention allows much more freedom to change the control system than has been possible with the known control systems.

One embodiment of a control system according to the invention is characterized in that said control system includes a processing unit, which is controlled by said first unit.

The invention will be explained hereafter by way of illustration with reference to the accompanying Figure.

The Figure shows a schematic embodiment of a control system according to the invention.

The Figure shows a schematic embodiment of a control system 1 according to the invention, which is mounted inside a car. The control system includes a first unit 5, which is mounted in a lockable room 3 (for example a car or a house or the like). Said first unit is controlled

by a second unit 7, which is located outside said room, for example in a key/hand-held device. Said second unit emits a control signal S to the first signal for opening or closing the room 3. After receiving the control signal S, the first unit will emit a signal to a processing unit 9. In the present embodiment the signal is converted by said processing unit into signals to a central door locking unit 11, an alarm unit 11 and a starter interrupter 15. In the present embodiment the central door locking unit 11 will emit a close or open signal for all doors upon receipt of a signal from the processing unit 9. Furthermore the alarm unit 13 may also be controlled by a signal from the processing unit for activating or deactivating the alarm, as the case may be. Finally the processing unit 9 may also control a starter interrupter 15 so as to disable or enable the starting of the car.

The unit 7 may for example be mounted in or on a car key, if the lockable room is a car. The above-described system makes it possible to control the door locking system as well as the alarm and the like with one control signal S. Furthermore the second unit 7 periodically emits a signal V to the first unit 5 to change the control signal S. If the first unit 5 agrees to the proposed change, said first unit 5 will in turn emit a signal A to the second unit 7, whereupon the control signal S is changed.

As a result of this the second unit 7 is prevented from changing the control system without the first unit 5 being aware of this, as is the case with the systems known so far, for example if the key containing the second unit is operated outside the range of reception of the first unit 5, whereby the control system is periodically changed, with the risk that the frequency of the control signal will get outside the frequency band of the first unit after some time.

The control system according to the invention enables the control signal S of the second unit 7 to be changed in various random ways (after an OK-signal from the first unit), without the control signal S having to remain within a certain frequency band, for example.

Persons wanting to gain unauthorized access to the car, for example, are thus no longer able to pick up the control signal with a receiver and subsequently transmit said signal to the car with their own transmitter in order to open the car and deactivate the alarm in this manner.

It will be apparent that several modifications to the control system according to the invention are possible without departing from the essence of the invention.

Thus it is not essential for the control system according to the invention by which one of the two units 5 and 7 the proposal to change the control signal S is initiated.

The change of the control signal may be any random change, and it is not limited to a certain frequency band or to a limited number of changes, as is the case with the systems known so far.

Additional security may be provided by transmitting a number (for example n) along with the proposal to change and also providing the OK signal A with said

number n . The next change number will then be $n + 1$, etc.

The proposed change may for example be a random number, which is added to the frequency of the control signal.

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If the unit which initiated the proposal to change the control signal does not receive an OK-signal, said unit may repeat the proposal (for example with the same change number).

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Claims

1. A system for controlling the entrance into a lockable room, for example a car, a building, and the like, comprising a first unit, which is mounted inside said room, and a second unit, which during operation remotely controls said first unit with a control signal for opening or closing said room, which control signal is changed by either one of said two units, characterized in that the one unit transmits a proposal to change said control signal to the other unit and changes said control signal after receiving an OK-signal from said other unit.
2. A control system according to claim 1, characterized in that said control system includes a processing unit, which processing unit is controlled by said first unit.
3. A control system according to claim 2, characterized in that said processing unit controls an alarm unit.

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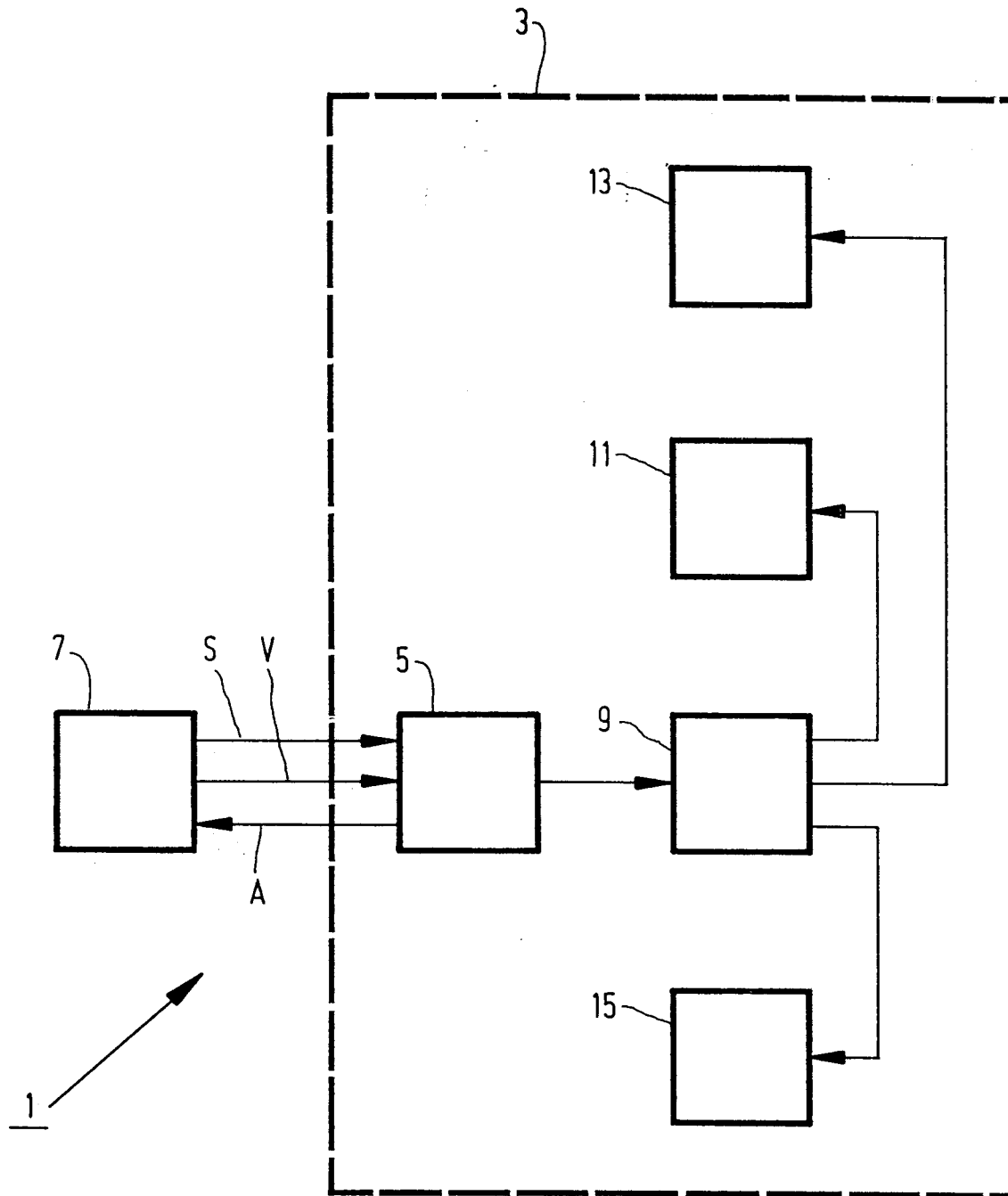


FIG.



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EUROPEAN SEARCH REPORT

Application Number
EP 95 20 3065

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y A	EP-A-0 268 902 (NEIMAN) 1 June 1988 * column 1, line 1 - column 3, line 25 * ---	1 2,3	E05B49/00
Y A	WO-A-91 15645 (WOLFRAM) 17 October 1991 * page 2, line 5 - page 3, line 26 * ---	1 2	
A	US-A-5 049 867 (STOUFFER) 17 September 1991 * column 11, line 33 - line 57; figure 6 * -----	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E05B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		28 February 1996	Herbelet, J.C.
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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