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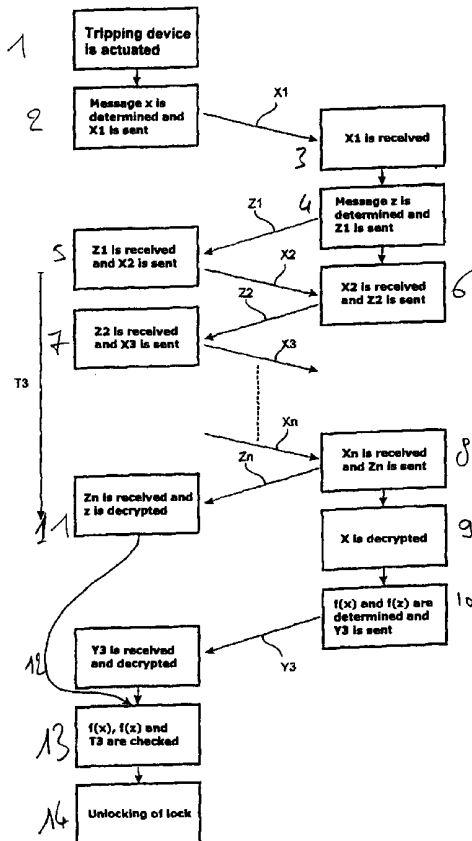
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(54) Title: A METHOD FOR CONTROLLING AUTHORIZATION TO AN OBJECT AND A COMPUTER PROGRAM PRODUCT FOR THE AUTHORIZATION CONTROL



(57) Abstract: The invention relates to a method for controlling authorization for access to an object, in which a signal communication via electromagnetic waves is established between the object and a wireless portable unit when a tripping device on the object is actuated. The signal communication comprises at least one first signal (X1...Xn) that is sent from the object to the portable unit, and at least one second signal (Y3, Z1...Zn) that is sent from the portable unit to the object in response to said first signal(s). Said second signal(s) comprise sufficient information for verifying that the portable unit has an approved identity. The verification information is checked, a distance is measured between the object and the portable unit and the authorization is confirmed if both the checked verification information is approved and the measured distance is less than a predetermined value. For the distance measurement, a time (T3) is measured for the transmission of at least one of said first signals and at least one of said second signals with verification information.



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A method for controlling authorization to an object and a computer program product for the authorization control

FIELD OF THE INVENTION

5 The present invention relates to a method for controlling authorization for access to an object, in which a signal communication via electromagnetic waves is established between the object and a wireless portable unit when a tripping device on the object is actuated, the signal communication comprising at least one first signal that is sent from the object to the portable unit and at least one second signal that is sent from the portable unit to the object in response to said first signal(s), in which said second signal(s) comprise sufficient information for verifying that the portable unit has an approved identity, in which the verification information is checked, in which a distance is measured between the object and the portable unit and in which the authorization is confirmed if both the checked verification information is approved and the measured distance is less than a predetermined value. The predetermined value corresponds to a maximal permitted distance between the portable unit and the object.

In addition, the invention concerns a method for controlling authorization for access to an object according to the preamble to claims 8 and 11. The invention also concerns computer program products for such authorization control.

The invention will be described below for authorization control for a vehicle, such as a car or truck. This is a preferred, but in no way limiting, application of the invention. In such a case, the tripping device normally consists of a door handle on the vehicle.

More specifically, the field of the invention is aimed at a so-called passive access control, which means that the person who is authorized to access the object does not need actively to use any key or remote control in order to unlock the object's door. Instead, the authorization is checked automatically via the abovementioned signal communication using electromagnetic waves between the vehicle and the

wireless unit carried by the person, when the vehicle's door handle is actuated. The door is unlocked automatically in the event of approved authorization.

PRIOR ART

5 Patent US 5,723,911 relates to a device for controlling access to a motor vehicle. This control is designed to be carried out without the user needing to actuate any key. A distance detection device on a transceiver carried by the user is designed to detect the distance between the transceiver and the vehicle with the aim of reducing the risk of unauthorized access to the vehicle. The authorization control is carried
10 out by a transmitter in the vehicle sending a call signal to a receiver in the transceiver when the vehicle's door handle is actuated. The transmitted signal has a short range. The transceiver's receiver receives the signal and sends a coded response signal back to the vehicle only if the vehicle is in the immediate vicinity of the transceiver. In other words, no response signal is sent back to the vehicle if this
15 is not located in the vicinity of the transceiver. A receiving unit in the vehicle receives the response signal, checks it and sends an unlocking signal to the lock if the response signal is correct. The distance detection is carried out, for example, via transmission of a distance detection signal from the transceiver and reflection of this by the vehicle.

20 The distance detection is carried out as mentioned above with the aim of reducing the risk of unauthorized access to the vehicle. Such unauthorized access to the vehicle has previously been possible by the use of a pair of receiver-transmitters in the following way: a first person with a first transmitter-receiver is in the vicinity of the
25 vehicle while a second person with a second transmitter-receiver stands in the vicinity of the authorized user of the vehicle. The first person actuates the door handle of the vehicle, which initiates the signal communication. The signal (with a short range) from the vehicle's transmitter is received by the first person's receiver and forwarded with a long range to the transmitter-receiver of the second person
30 and thereafter to the rightful user of the vehicle. In the same way, the coded signal is thereafter sent back from the portable unit to the vehicle via the two pairs of transmitters-receivers and authorization is confirmed.

Using the distance detection device according to US 5,723,911, the time it takes for the electromagnetic waves or ultrasound waves to go from the portable unit to the object and back again is measured. If the rightful user is located at a great distance
5 from the vehicle, the transmission of the ultrasound waves takes a long time. This is detected and a signal is not sent back to the vehicle from the portable unit.

A problem with said distance detection device is that it is not possible to know for certain that it is the correct (authorized) portable unit that is in the vicinity of the right
10 vehicle. In addition, known methods for distance detection, such as ultrasound echoes and metal detection, are relatively easy to deceive and thereby not secure.

SUMMARY OF THE INVENTION

A first aim of the invention is to achieve a method for controlling authorization to an
15 object with increased security in relation to previous technology.

This aim is achieved by measuring for the distance measurement a time for the transmission of at least one of said first signals and at least one of said second signals with verification information. In other words, the distance is determined
20 between the object and the portable unit by measuring the time for at least part of the signal communication for the identity verification and it is ascertained that it really is the time between the correct portable unit and the object that has been measured. The signals for the identity control are thus used to determine whether the portable unit and the object are located sufficiently close to each other. This results in
25 increased security.

Because the time is measured for the signals that are used for the identity control, the distance detection method that is separate to the identity control method according to previous technology is eliminated. In other words, according to the
30 invention, the distance detection method is integrated in the identity control method.

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