Claims

1. A smart door lock comprising:

a signal receiving circuit for receiving an unlocking cipher transmitted by smart unlocking device in a short distance communication way;

a central processor for outputting an unlocking instruction upon determining that the unlocking cipher received by the signal receiving circuit satisfies a predetermined unlocking condition;

and an executing part for receiving the unlocking instruction outputted by the central processor and executing unlocking accordingly;

wherein the central processor comprises:

a first comparator for judging whether the unlocking cipher received by the signal receiving circuit is the sole predetermined unlocking cipher or one of multiple predetermined unlocking ciphers;

a second comparator for judging whether the left unlocking times corresponding to the unlocking cipher received by the signal receiving circuit is zero and/or whether the present time is in the unlocking time period corresponding to the unlocking cipher received by the signal receiving circuit, when the first comparator determines the unlocking cipher received by the signal receiving circuit is the sole predetermined unlocking cipher or one of multiple predetermined unlocking ciphers;

and an output interface for outputting ~~an~~the unlocking instruction when the second comparator determines that the left unlocking times corresponding to the unlocking cipher received by the signal receiving circuit is not zero and/or the present time is in the unlocking time period corresponding to the unlocking cipher received by the signal receiving circuit.

2. The smart door lock in accordance with Claim 1, wherein the signal receiving circuit could be a NFC signal receiving circuit, a Bluetooth receiving circuit or an infrared signal receiving circuit;

or the executing part comprises a lock-tongue-driven circuit, an electric machine and a metal lock tongue with rack, wherein the electric machine comprises a spindle and upon it a gear which engages with the rack of the metal lock tongue, and the lock-tongue-driven circuit is used for making the electrical machine rotate in forward direction upon the unlocking instruction received from the central processor.

3. The smart door lock in accordance with Claim 1 or Claim 2 further comprising

a serial communication circuit and a back-up power source electrically connected with the signal receiving circuit, the central processor and the executing part, wherein the serial communication circuit, connected with ~~the~~a smart unlocking device through wire and mounted inside ~~the~~a house after the smart door lock is mounted on a security door, is used for receiving setting signals of the smart unlocking device for setting the unlocking cipher, its left unlocking times and its unlocking time period.

4. An unlocking system comprising

a smart unlocking device and

a smart door lock,

wherein the smart unlocking device is used for transmitting an unlocking cipher to the smart door lock in a short distance communication way;

and the smart door lock is any one of smart door lock in accordance with Claim 1 to Claim 3.

5. The unlocking system in accordance with Claim 4 wherein

the smart unlocking device comprises

a signal transmitting circuit which could be a NFC signal transmitting circuit, a Bluetooth transmitting circuit or an infrared signal transmitting circuit,

and a processor for transmitting the unlocking cipher received to the smart door lock through the signal transmitting circuit.

6. An unlocking method including following steps:

a. receiving an unlocking cipher from a smart unlocking device in a short distance communication way;

b. outputting an unlocking instruction once determining that the unlocking cipher received satisfies the predetermined unlocking condition;

c. executing unlocking in accordance with the unlocking instruction outputted;

wherein the step b includes:

b1. judging whether the unlocking cipher received is the sole predetermined unlocking cipher or one of multiple predetermined unlocking ciphers;

b2. judging whether the left unlocking times corresponding to the unlocking cipher received is zero and/or whether the present time is in the unlocking time period corresponding to the unlocking cipher received, when the step b1 determines the unlocking cipher received is the sole

predetermined unlocking cipher or one of multiple predetermined unlocking ciphers;

b3. outputting the unlocking instruction when the step b2 determines that the left unlocking times corresponding to the unlocking cipher received is not zero and/or the present time is in the unlocking time period corresponding to the unlocking cipher received.

7. The unlocking method in accordance with Claim 6 wherein

the short distance communication way means any one or multiple ways of the near field communication, the Bluetooth communication and the infrared communication.

8. The method in accordance with Claim 6 or Claim 7 further comprising:

d. receiving setting signals of the smart unlocking device for setting the unlocking cipher, its left unlocking times or its unlocking time period;

e. setting the unlocking cipher, its left unlocking times or its unlocking time period of the smart door lock according to the setting signals.