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(54) **A SMART LOCK FOR WALL HUNG BOILER DEVICES**

(57) The present invention relates to a smart lock (100) which can be locked and unlocked via Bluetooth connection, allowing only authorized service personnel to interfere, instead of the screw connection structure

that allows access by everyone, for the purpose of authorized serviceability of wall hung boilers through disassembling the front panel.

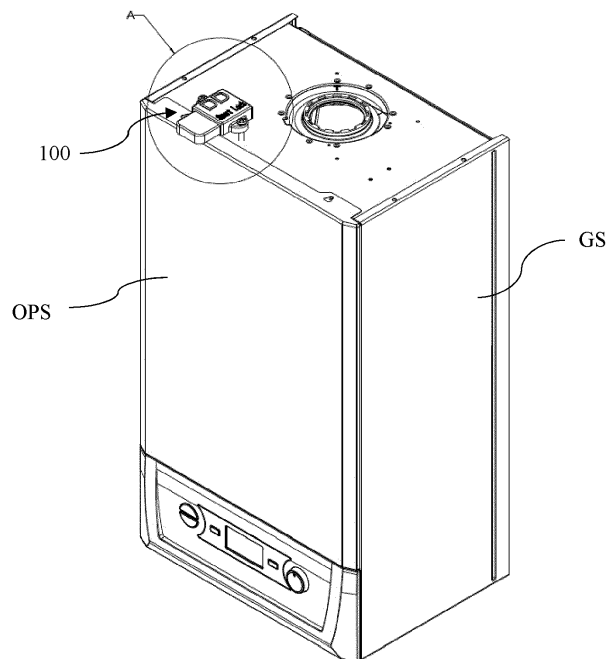


Figure 1

Description

Field of the Invention

[0001] The present invention relates to a smart lock which can be locked and unlocked via Bluetooth connection, allowing only authorized service personnel to interfere, instead of the screw connection structure that allows access by everyone, for the purpose of authorized serviceability of wall hung boilers through disassembling the front panel.

Background of the Invention

[0002] A boiler is a heating device which used to meet the heating and hot water needs required in closed areas such as small-volume houses and offices. Unlike the previous heating devices, in addition to having advantageous features such as being small in size and being hung on the wall, it also provides various benefits such as being lightweight, easy to install, silent operation, and the user being able to use it independently and as much as they want. Models can vary according to chimney type, combustion type and heat exchanger type.

[0003] In wall hung devices, the mounting of the front panel sheets can be achieved with screw connection in traditional applications. Therefore, it allows both the user and unauthorized technical service personnel to remove these sheets and interfere with the internal installation of the boiler. This may cause the device to undergo an improper repair or it may even cause malfunction.

[0004] Improper interference by unauthorized persons is frequently encountered in conventional wall hung devices wherein screw connections are used. Users deceived by unauthorized service personnel encounter problems which lead to device malfunctions. The use of non-original spare parts by unauthorized service personnel causes shortening of the life span of the device. Preventing unauthorized service personnel from interfering with the products and ensuring that the proper services are provided to the users by the authorized service personnel both enable the devices to have long life and protect human life.

[0005] Chinese patent document no CN209353900, an application known in the state of the art, discloses a Bluetooth lock. Lock structure according to the invention comprises a lock body having a lock tongue and a clamping groove matching with each other. The lock tongue is connected to a transmission mechanism, the said transmission mechanism is electrically connected to a control main board, and the control main board is electrically connected to a Bluetooth chip. According to the Bluetooth lock of the invention, the Bluetooth chip on the control mainboard is matched with unlocking software on a mobile phone, and unlocking is realized.

[0006] United States patent document no US2018283051, an application known in the state of the art, discloses a wireless controlled smart lock structure.

The smart lock according to the invention can be configured to be operable using Internet signals, Bluetooth signals, and/or direct physical contact of an identification verification mechanism or method.

[0007] Chinese utility model document no CN205717880, an application known in the state of the art, discloses a wall hanging boiler of intelligence. The structure according to the invention comprises a Bluetooth module and a signal processing module that are associated with a control chip in PCB board, and the operation of the boiler can be controlled when the Bluetooth module is associated with a Bluetooth equipment.

[0008] Turkish patent application document no TR 2014/13276, one of the applications known in the state of the art, discloses door unlocking method realized by using Bluetooth 4.0 Protocol and a system which enables this method to be realized. The invention is a door lock system and, in particular, it comprises a server which hosts the virtual key that is received by the mobile device and sent to the receiver module to create a command for unlocking the lock and which sends the key to the required mobile device; and Bluetooth 4.0 protocol is used as the communication protocol.

Summary of the Invention

[0009] The objective of the present invention is to prevent unauthorized service personnel from interfering with the products and to ensure that the proper services are provided to the users by the authorized service personnel, thereby enabling the devices to have a long life span and protecting human life.

[0010] Another objective of the present invention is to design an apparatus which allows only authorized service personnel to interfere by means of Bluetooth control.

[0011] A further objective of the present invention is to block unauthorized technical services and to allow authorized service personnel to interfere with the devices, thereby protecting human life and raising the awareness in the users to receive service from authorized service personnel not only during the warranty period but also outside the scope of the warranty.

Detailed Description of the Invention

[0012] "A smart lock for wall hung boiler devices" developed to fulfill the objectives of the present invention is illustrated in the accompanying figures, wherein:

Figure 1 is the perspective view of the place where the smart lock structure of the invention is located on the boiler.

Figure 2 is the close view of region A shown in Figure 1.

Figure 3 is the front view of the place where the smart lock structure of the invention is located on the boiler.

Figure 4 is the top view of the place where the smart

lock structure of the invention is located on the boiler.

Figure 5 is the side view of the place where the smart lock structure of the invention is located on the boiler.

Figure 6 is the view of the A-A section in Figure 3.

Figure 7 is the schematic view the B-B section in Figure 3.

[0013] The components shown in the figures are each given reference numbers as follows:

100. Smart lock

1. Lock body

11. Extension

2. Latch

3. Electronic circuit

4. Step motor

5. Cogwheel

6. Fixing member

GS. Boiler body sheet

OPS. Front panel sheet

[0014] The smart lock (100) for wall hung boiler devices of the present invention, which allows the front panel sheet (OPS) of wall hung boiler devices to be opened only by Bluetooth connection, comprises

- At least one lock body (1) which is located on a position of the body sheet (GS) of the boiler that is close to the front panel sheet (OPS),
- At least one latch (2) which is positioned in the inner volume of the lock body (1) and which acts as a lock by means of limiting the movement of the front panel sheet (OPS) mounted to the boiler body sheet (GS) by extending towards the front panel sheet (OPS) through an opening located close to the front panel sheet (OPS),
- At least one electronic circuit (3) which enables the front sheet to be locked by means of pulling the latch (2) out of the lock body (1) or the front sheet to be unlocked by means of pulling the latch (2) inside the lock body (1), and which, by means of a Bluetooth connection, enables the operation of a step motor that enables the rotation of a cogwheel (5) located inside the lock body (1) and contacting the teeth on the latch (2) in order to convert the rotational movement into linear movement.

[0015] In one embodiment of the invention, the lock body (1) comprises at least one extension (11) extending from the side of the lock body (1) parallel to the boiler body sheet (GS), and these extensions (11) provide a connection when it is fixed to the body sheet (GS). When fixing the lock body (1) to the body sheet (GS), a connection can be made via these extensions (11), as well

as connection can be made directly via the lock body (1). Accordingly, while a fixing member (6) which can be used to fix the lock body (1) to the body sheet (GS) can be positioned on the extension (11), it can also be located directly on the lock body (1). In the preferred embodiment of the invention, the fixing member (6) used for the connection of the lock body (1) to the boiler body sheet (GS) is a Tox connection or a riveted connection in order that it is a non-removable connection. Additionally, in another embodiment, the fixing member (6) can be a screw connection.

[0016] In one embodiment of the invention, the lock body (1) is positioned outside the boiler body sheet (GS). Alternatively, in a different embodiment, the lock body (1) is positioned inside the boiler body sheet (GS) in order to prevent the lock body (1) from being completely removed.

[0017] Within the scope of the smart lock (100) of the invention, there is no physical pulling or pushing with the intervention of the service personnel. It is entirely achieved by pushing and pulling the latch (2), preferably made of a metal material, by the electronic circuit (3) provided therein. This process is carried out when the electronic circuit (3) transmits the signal which will move the latch (2) upon pairing via Bluetooth by means of an application (DD smart lock app)/an interface on the phone of the service personnel.

[0018] In the state of the art wall hung devices, mounting the front panel sheet (OPS) to the device with a standard screw connection causes anyone to be able to interfere with the installation in the internal volume of the device. On the other hand, thanks to the inventive smart lock (100) for wall hung boiler devices, which is positioned on the upper part of the front panel sheet (OPS) of the wall hung device, only the Bluetooth connection that is available to the authorized service personnel will allow the front panel sheet (OPS) to be opened and only the authorized service personnel to interfere with the device. Thus, unauthorized pirate service centers will be prevented from interfering with the devices and user satisfaction will be increased.

[0019] The smart lock (100) of the present invention, which is positioned close to the front panel sheet (OPS) on the boiler body sheet (GS), is activated via a Bluetooth signal provider device like a mobile phone of the service personnel. The Bluetooth signal of the device is paired via an application (DD smart lock app)/an interface on the phone of the service personnel. Therefore, the service personnel can transmit a signal for unlocking or locking of the lock via the application/interface. After the signal is transmitted, the electronic circuit (3) positioned within the lock body (1) enables the latch (2) to move forwards and move out of the lock body (1) such that the latch (2) prevents the movement of the front panel sheet (OPS) or enables the latch (2) to move backwards into the lock body (1) such that it allows the front panel sheet (OPS) to be moved.

[0020] The boiler front panel sheet (OPS) is the sheet

metal panel surrounding the boiler, and removing this panel allows the internal structure of the boiler to be seen and interfered. After the screws on the lower part thereof are removed, the front panel sheet (OPS) is removed by being pushed upwards. However, by means of the smart lock (100) of the present invention, movement of the front panel sheet (OPS) is prevented by the latch (2) which extends out of the lock body (1) and creates an obstacle in the movement path of the front panel sheet (OPS).

[0021] Since the boiler, on which the smart lock (100) of the present invention is located, is delivered to the customer in locked position after it has been checked during production in the unlocked position at the factory, the customer will not be able to remove the front panel as they cannot unlock the lock.

[0022] Thanks to the fact that the smart lock (100) of the present invention operates in accordance with the locking and unlocking methods explained above in detail, only authorized service personnel can lock and unlock the lock, which is the objective of the invention. The smart lock (100) of the present invention, which can only be associated via a Bluetooth connection, makes it possible to control the opening and closing of the front panel sheet (OPS) with the Bluetooth connection established via the Bluetooth signal provider device, such as a phone belonging to the authorized service personnel. By means of this selective control mechanism, the interventions of unauthorized service personnel and the use of non-original spare parts are prevented, thereby extending the life of the device, avoiding negative consequences that may affect human health, and consequently increasing user satisfaction.

Claims

1. A wall hung boiler device comprising a boiler which has at least one body sheet (GS) and at least one front panel sheet (OPS) that allows to see and interfere with the internal structure of the body sheet (GS), and **characterized by** a smart lock (100) which allows the front panel sheet (OPS) of boiler devices to be opened only via Bluetooth connection and is located on the upper part of the front panel sheet (OPS) and comprises

- At least one lock body (1) which is located on a position of the body sheet (GS) of the boiler that is close to the front panel sheet (OPS),
- At least one latch (2) which is positioned in the inner volume of the lock body (1) and which acts as a lock by means of limiting the movement of the front panel sheet (OPS) mounted to the boiler body sheet (GS) by extending towards the front panel sheet (OPS) through an opening located close to the front panel sheet (OPS),
- At least one electronic circuit (3) which enables the front sheet to be locked by means of pulling

the latch (2) out of the lock body (1) or the front sheet to be unlocked by means of pulling the latch (2) inside the lock body (1), and which, by means of a Bluetooth connection, enables the operation of a step motor that enables the rotation of a cogwheel (5) located inside the lock body (1) and contacting the teeth on the latch (2) in order to convert the rotational movement into linear movement.

2. A smart lock (100) for wall hung boiler devices according to claim 1, comprising lock body (1) having at least one extension (11) which extends parallel to the boiler body sheet (GS) from its side surface and which is used in fixing it to the body sheet (GS).
3. A smart lock (100) for wall hung boiler devices according to claim 1 or 2, comprising lock body (1) which is fixed to the boiler body sheet (GS) from the outside by using a non-removable connection such as Tox connection or riveted connection.

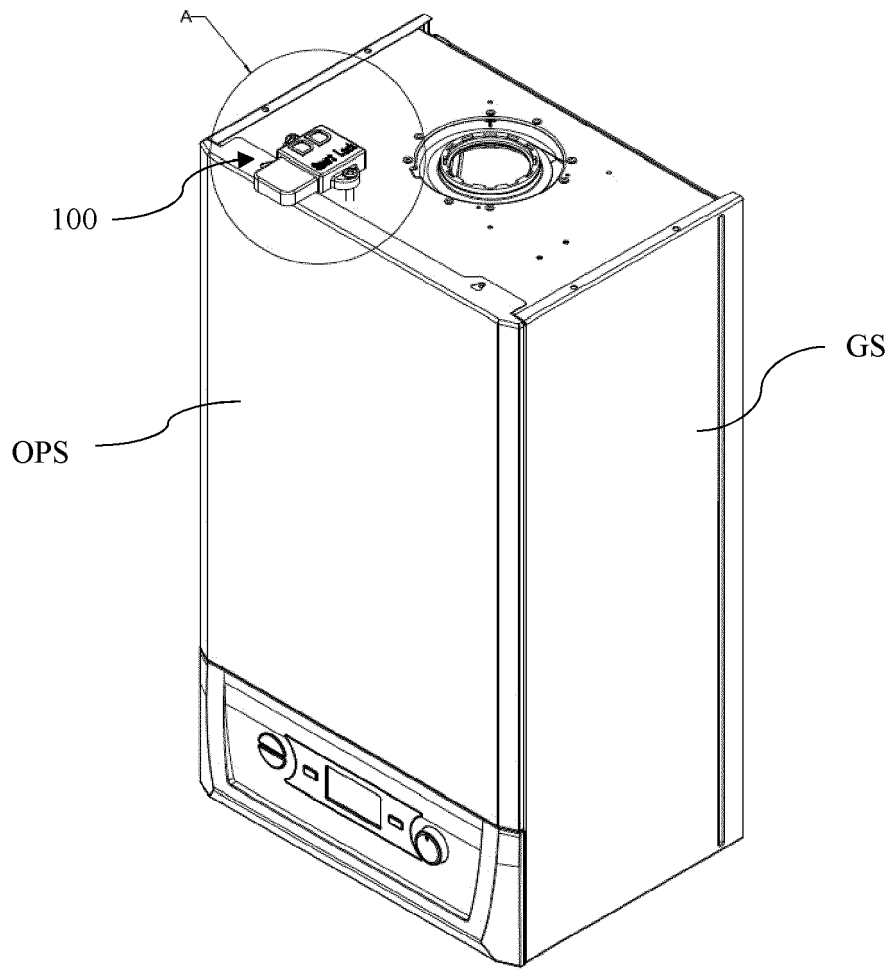


Figure 1

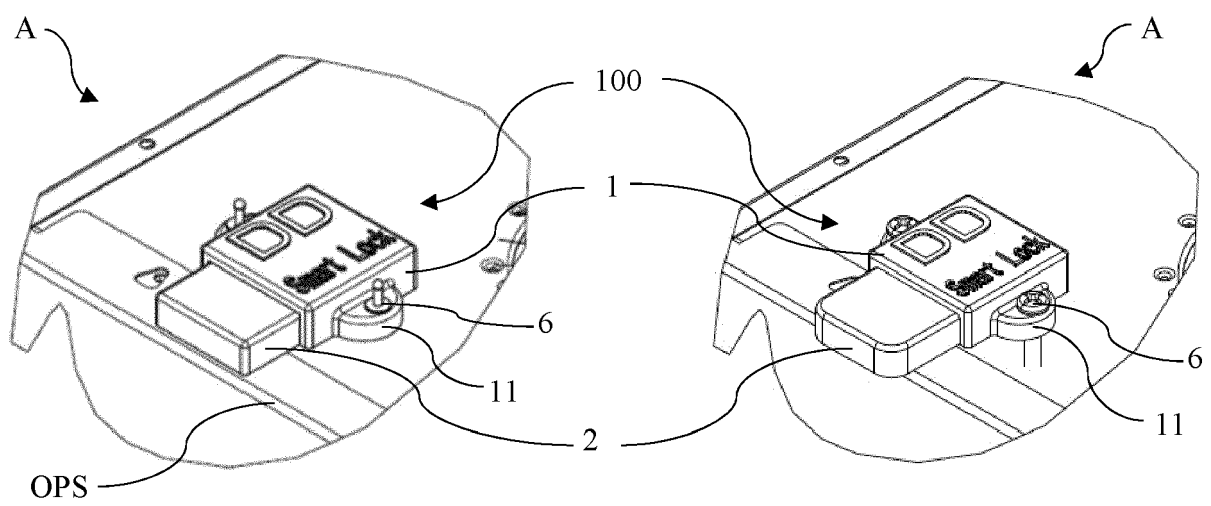


Figure 2-a

Figure 2-b

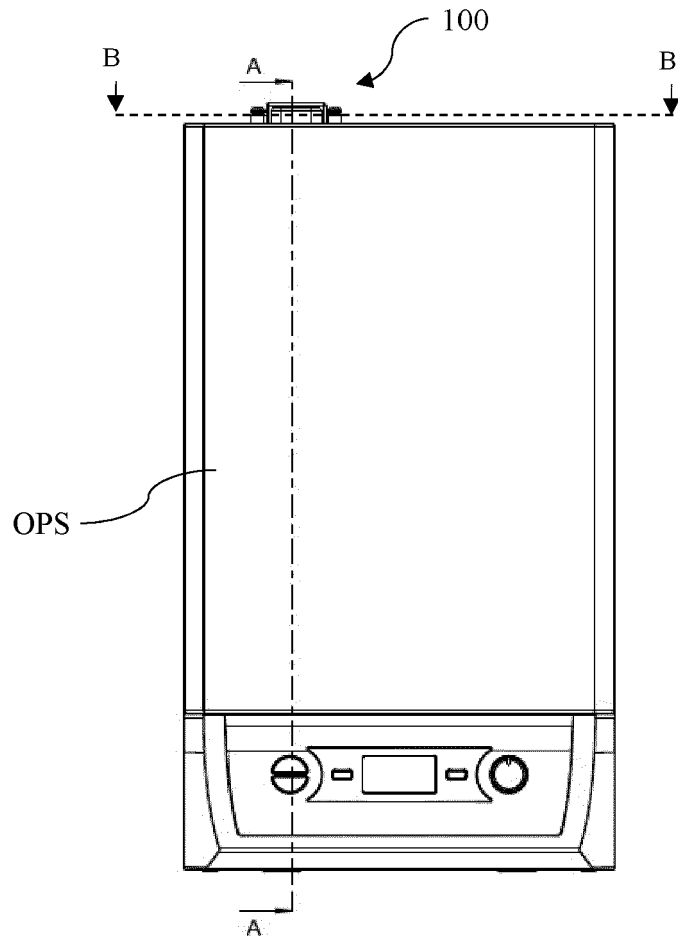


Figure 3

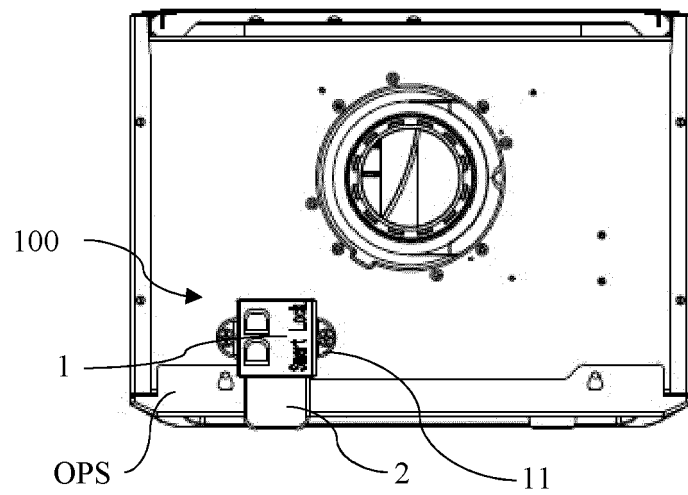


Figure 4

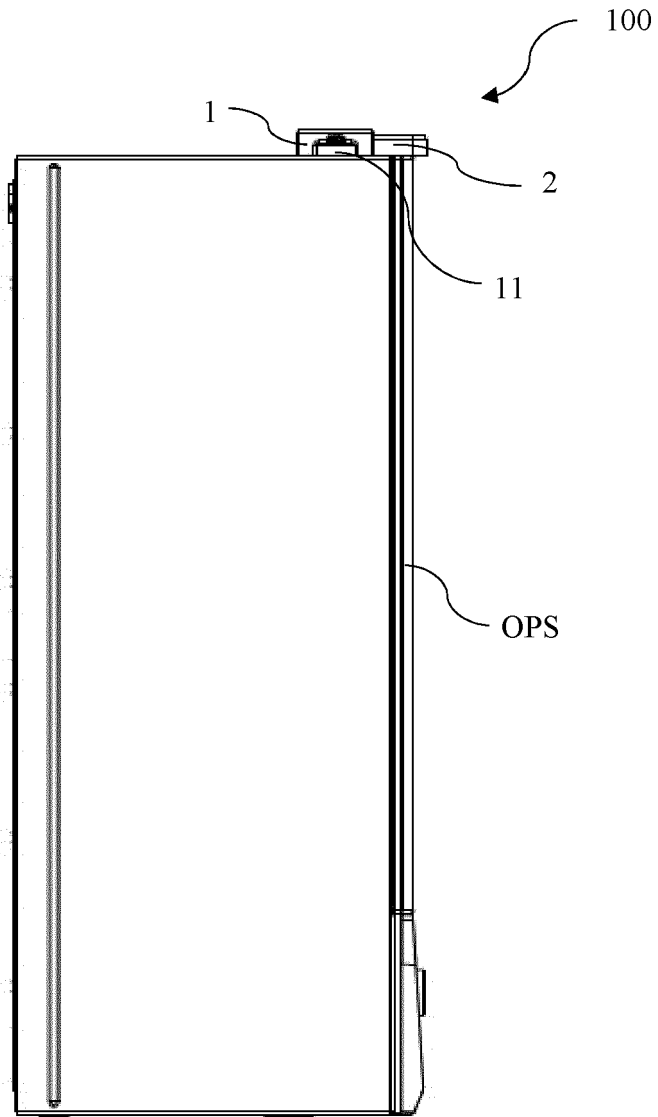


Figure 5

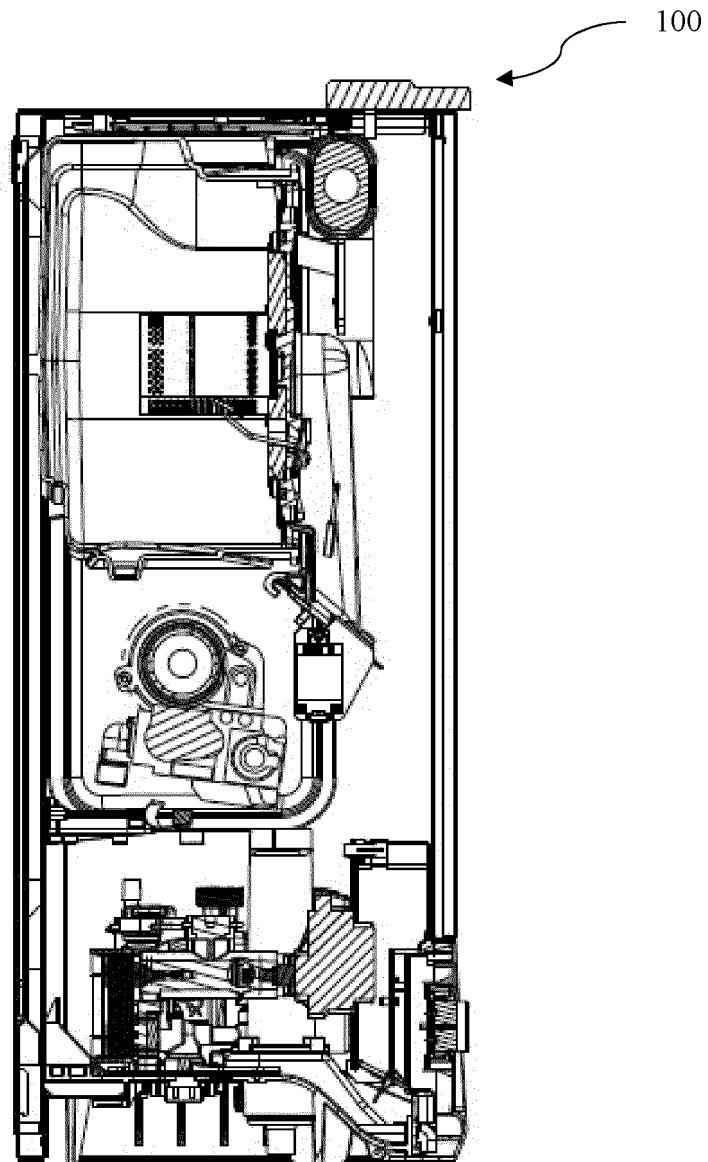


Figure 6

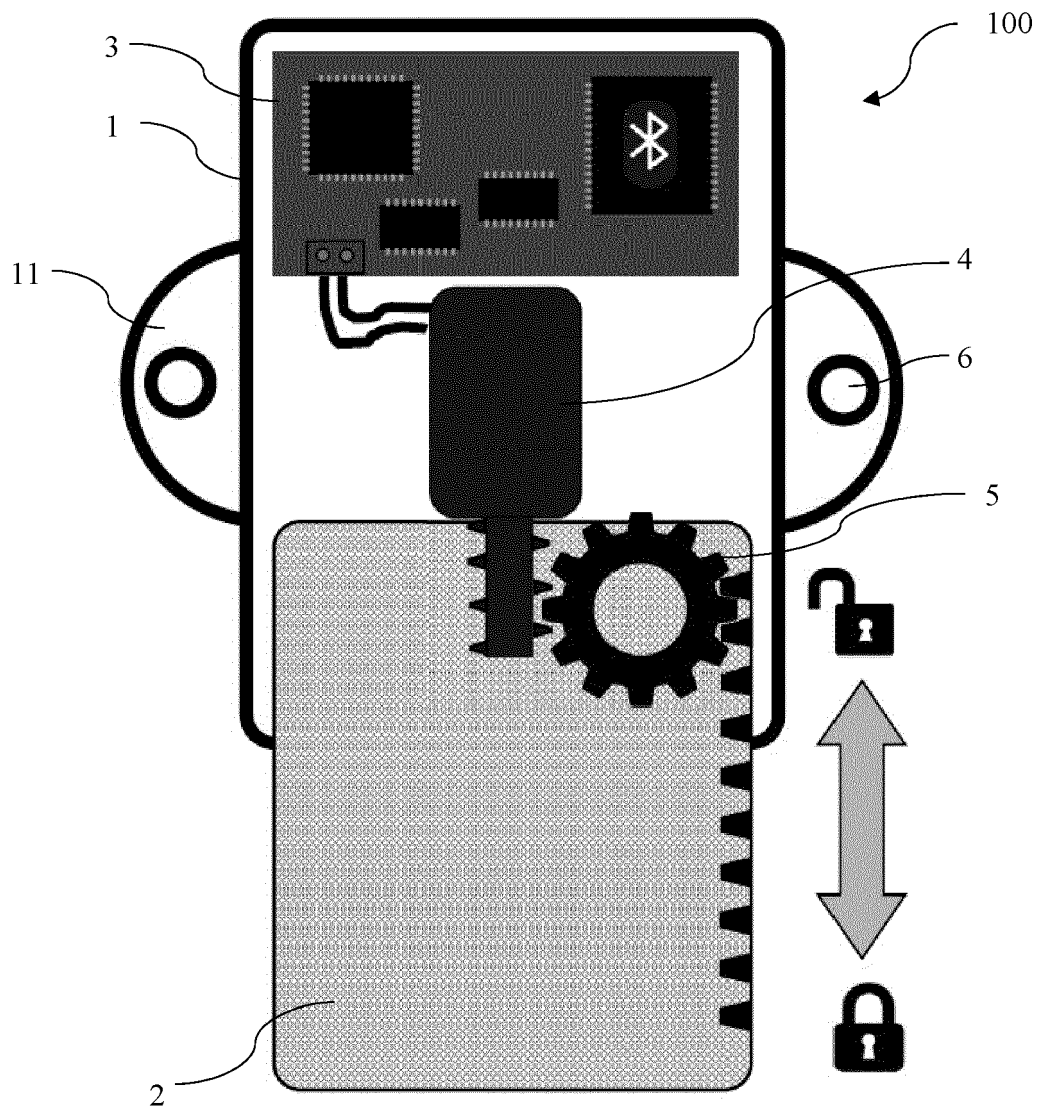


Figure 7



EUROPEAN SEARCH REPORT

Application Number

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 15 December 2021	Examiner Ast, Gabor
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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