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(71) Applicant: **Arcas Olle, S.L.**
08787 La Pobla de Claramunt (Barcelona) (ES)

(72) Inventor: **Olle Mas, Joan**
08785 Vallbona D'Anoia (Barcelona) (ES)

(74) Representative: **Durán-Corretjer, S.L.P.**
Còrsega, 329
(Paseo de Gracia/Diagonal)
08037 Barcelona (ES)

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(54) **Safety box and security system comprising said safe**

(57) Safety box of the type comprising an electronic safe-opening device, characterised in that said safety box further comprises a communication chip of the IEEE

802.15 type intended for receiving commands and having a power of less than 4 dBm, said chip being connected to said electronic safe-opening device.

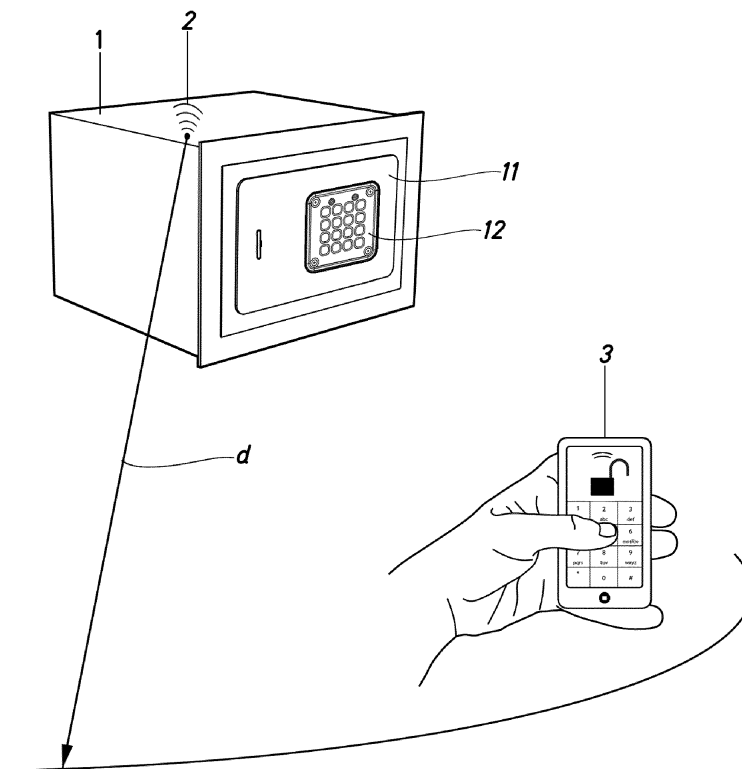


Fig.1

Description

[0001] The present invention relates to a safety box, also known as a safe, a strongbox, a vault, a strongroom, a security closet, etc.

[0002] In recent years, the forms of attack on private property have evolved to become much more aggressive. In some cases, the safety of the owners is even put at risk by the use of force, intimidation and/or duress. Injuries are sometimes caused and, in some exceptional cases, death.

[0003] The known prior art attempts to reduce the severity of this type of attacks by means of new safety boxes which have an integrated second code, known as the duress code, which opens the chamber and also causes the safe itself to transmit an alarm to a central system. For this purpose, the control unit of the safe has to be provided with the duress code, its own telephone connection for the safety box and an electrical connection to power the safety box. These requirements are not only expensive, but also cannot be applied to safes of a certain age. In addition, it can be sometimes difficult to obtain the telephone or electrical connection, and so said solution is neither universal nor desirable for all cases. Furthermore, by increasing the programming variables, the usual safety box interfaces become cumbersome and not very user-friendly.

[0004] In this regard, systems for remotely opening safety boxes are known. For example, the German patent DE102010049241 discloses a safe comprising a mobile modem which can receive a call to unlock the door of said safe. Also known are systems for opening doors (for example, garage doors) by using electromagnetic waves, i.e. radio frequency, generated by a mobile communication terminal (such as an electronic remote control). Said system requires a port or module for detecting electromagnetic waves that allows the door opening mechanism to be unlocked.

[0005] These two prior art examples require a communication port to be installed (either a telephone modem or a wireless communication port) which has to be powered electrically from the mains, which can be problematic. In addition, in the case of long-distance communication systems, the range thereof can be used to hack the opening codes, resulting in a reduction in the level of security of the safe. Lastly, this system does not provide an arrangement that reduces the severity of a violent robbery, in the case of safety boxes that do not have a duress code.

[0006] An object of the present invention is to disclose means for producing safes having increased levels of security, which means can be used in both new safes and existing safes and which do not necessitate expensive fixed installations.

[0007] More particularly, the present invention comprises a safety box of the type comprising an electronic safe-opening device, characterised in that it also comprises a communication chip of the IEEE 802.15 type,

preferably Bluetooth, intended for receiving commands having a power of less than 4 dBm and preferably of 0 dBm, said chip being connected to said electronic safe-opening device. The provision of a Bluetooth chip allows the safe to be controlled from a smartphone with the advantages described below. Furthermore, the power of the chip should be limited, whereby a double effect is achieved: firstly, power consumption is reduced, which means that, if desired, said safe can be powered by an internal battery with no mains connection. Secondly, the range of the chip is limited, and this is crucial to prevent hacking. The power levels mean that, when there is no interference, the range is always less than 15 metres, the typical range being approximately 5 metres and even less, and this prevents sabotage from outside a dwelling. The IEEE 802.15 technology allows batteries to be used for powering, whereas others (WIFI, RF, etc.) have higher consumption levels, and this necessitates at least a periodic mains connection.

[0008] The present invention also provides a safety box system, characterised in that it comprises:

- a safety box having an electronic safe-opening device, and a communication chip of the IEEE 802.15 type, preferably Bluetooth, intended for receiving commands and having a power of less than 4 dBm and preferably of 0 dBm, said chip being connected to the aforementioned electronic safe-opening device.
- a smartphone connected to said safe;

wherein the smartphone is configured to transmit a safe opening code which is received by said chip. Said opening code will preferably be encrypted.

[0009] Preferably, the smartphone will be configured to modify the operating parameters of the safe.

[0010] Preferably, the smartphone is configured to modify the usage parameters which can be modified by the user of the safety box.

[0011] The smartphone has as an advantage that it is able to provide a user interface which is easier to use than the electronic keypads of standard (and older) safes. In this way, the user interface of the safe is replaced in a simple manner by adding an IEEE 802.15 chip (e.g. a Bluetooth chip) and connecting said chip to the control unit of the safe.

[0012] A further advantage of the smartphone is that it also provides an external connection to safes that do not have said external connection. For example, the smartphone app can send a command to open the safe in response to the user entering two different codes. However, in one of these cases ("duress code"), the smartphone sends an alarm via the wireless data connection of the phone. This is of course also applicable if the safety box has an alarm interface kit connected to the alarm of the dwelling.

[0013] To better understand the invention, attached is

a set of drawings showing an embodiment of the subject matter of the present invention by way of an illustrative yet nonlimiting example.

Fig. 1 is a schematic view of a system comprising a safety box and a smartphone according to the present invention.

Fig. 2 is a functional diagram showing the different system elements.

Fig. 3 shows a smartphone having an illustrative example of an interface for entering the safe opening code according to the present invention.

Fig. 4 shows a smartphone having an illustrative example of an interface for modifying the values of the operating parameters and for configuring the duress code.

Fig. 1 is a schematic view of an embodiment of the system according to the present invention, which comprises an embodiment of a safety box -1- according to the present invention.

[0014] The safety box -1- shown in the example is a safety box designed to be built-in, although for clarity reasons the safety box -1- has been shown alone. The safe comprises a door -11- having a closure system which can be operable electronically by means of a keypad -12- arranged in the door -11-. This basic safe has been supplemented by a Bluetooth 4.0 chip -2-, having a power of 0 dBm that, in ideal conditions and with no obstacles, has a range of more than 10 metres. However, since the location of the chip is not ideal, located in the safety box and possibly, in turn, in a piece of furniture or a wall, the range is substantially reduced, in particular at locations where there is no "almost visual line of sight" between devices. In any case, to ensure proper operation, it is expedient for the actual range -d- to be, at least, 3 metres so that the user is not inconvenienced when the communication device and the safety box are communicating (for example, to prevent the need for an unnatural posture in order to ensure communication). On the other hand, it is not expedient for the actual range -d- to be significantly higher than approximately 10 metres for security reasons.

[0015] The keypad can be, for example, a membrane keyboard, without a screen. The lock can be a lever tumbler lock having an emergency key and a 19 Ohm solenoid.

[0016] Said safe can also have LEDs for indicating the proper functioning thereof and/or for indicating low battery.

[0017] All the elements of the safety box -1- in the example can be powered by batteries, for example, by means of 4 LR06 1.5 V batteries.

[0018] The safety box -1- can optionally have different

functions which can be activated or modified by the user: programming the user code, duress code, administration code, delayed opening, scheduled locking, events audit, user management, etc.

[0019] The system is supplemented by a communication device, which in this case is a smartphone having a specific app which turns the smartphone -3- into the interface for opening and for programming the safety box -1-, provided that said smartphone is within the actual range -d- of the Bluetooth chip -2-.

[0020] Fig. 2 shows the diagram of communication of the system. The smartphone -3- sends an encrypted command via Bluetooth to the Bluetooth 4.0 chip -2-, which is capable of decoding and sending the command either directly to the lock of the door -11- or to the electronic device associated with the keypad -12- interface of the safety box.

[0021] Basically, the smartphone sends an opening command, although it can also send commands for modifying the operating parameters or functions of the safety box -1-, such as those stated above.

[0022] Fig. 3 shows how the smartphone -3- provides an interface -31- on screen for entering the code, said interface consisting of a keypad. The smartphone -3- then sends the code to the safety box -1- in order to open said box.

[0023] The fact that the smartphone -3- has its own communication channels, independent of the Bluetooth by which said smartphone is connected to the chip -2-, allows a code to be introduced, even when the safe does not have a connection with an alarm system. Indeed, the smartphone -3- can be programmed so as to send one or more messages (for example, emails) to predetermined addresses in response to the entry of a code in addition to, for example, opening the safe as if the correct opening code had been entered.

[0024] Fig. 4 shows an example interface -41- on the smartphone for configuring the functions of the safety box. Within said interface, operable graphic elements are shown which allow for greater ease of use, for example scrollbars -411- and -412- for programming opening delays and a text entry window and text entry regions for entering various email addresses -413- and a message -414-, which will be used if the code is entered in the smartphone -3-. In particular, the smartphone -3- will send the text entered in the window -414- to the addresses entered in -413-. The interface elements shown are only exemplary and can be different. For example, the scrollbars -411- and -412- could be virtual scroll wheels.

[0025] As can be seen, the smartphone is able to provide interfaces for programming and using the safety box -1- that are much more user-friendly, and is able to provide the safety box -1- with new functions that increase the security thereof.

[0026] Although the invention has been described with respect to examples of preferred embodiments, said examples should not be considered to limit the invention, which will be defined by the broader interpretation of the

following claims.

Claims

1. Safety box of the type comprising an electronic safe-opening device, **characterised in that** said safety box further comprises a communication chip of the IEEE 802.15 type intended for receiving commands and having a power of less than 4 dBm, said chip being connected to said electronic safe-opening device.

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2. Safety box according to claim 1, **characterised in that** the chip is a chip of the Bluetooth type.

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3. Safety box according to either claim 1 or claim 2, **characterised in that** the power of the chip is equal to, or less than, 0 dBm.

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4. Security system of the type comprising a safety box and a mobile communication device, **characterised in that** the safety box comprises a safe opening device and a communications chip of the IEEE 802.15 type intended for receiving commands and having a power of less than 4 dBm for receiving commands from the mobile communication device, said chip being connected to said electronic safe-opening device, and **in that** the mobile communication device is a smartphone configured to provide, on the smartphone screen, an interface for entering a door opening code, and to transmit a safe opening code that is received by said chip.

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5. System according to claim 4, **characterised in that** the chip is a chip of the Bluetooth type.

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6. System according to either claim 4 or claim 5, **characterised in that** the power of the chip is equal to, or less than, 0 dBm.

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7. System according to any one of claims 4 to 6, **characterised in that** the smartphone also has an interface for modifying the operating variables of the safe.

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8. System according to any one of claims 4 to 7, **characterised in that** the smartphone is configured to send, in response to the entry of a duress code, an alarm notification to a predetermined destination by means of the smartphone.

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9. System according to any one of claims 4 to 8, **characterised in that** the communications between the smartphone and the safe are encrypted.

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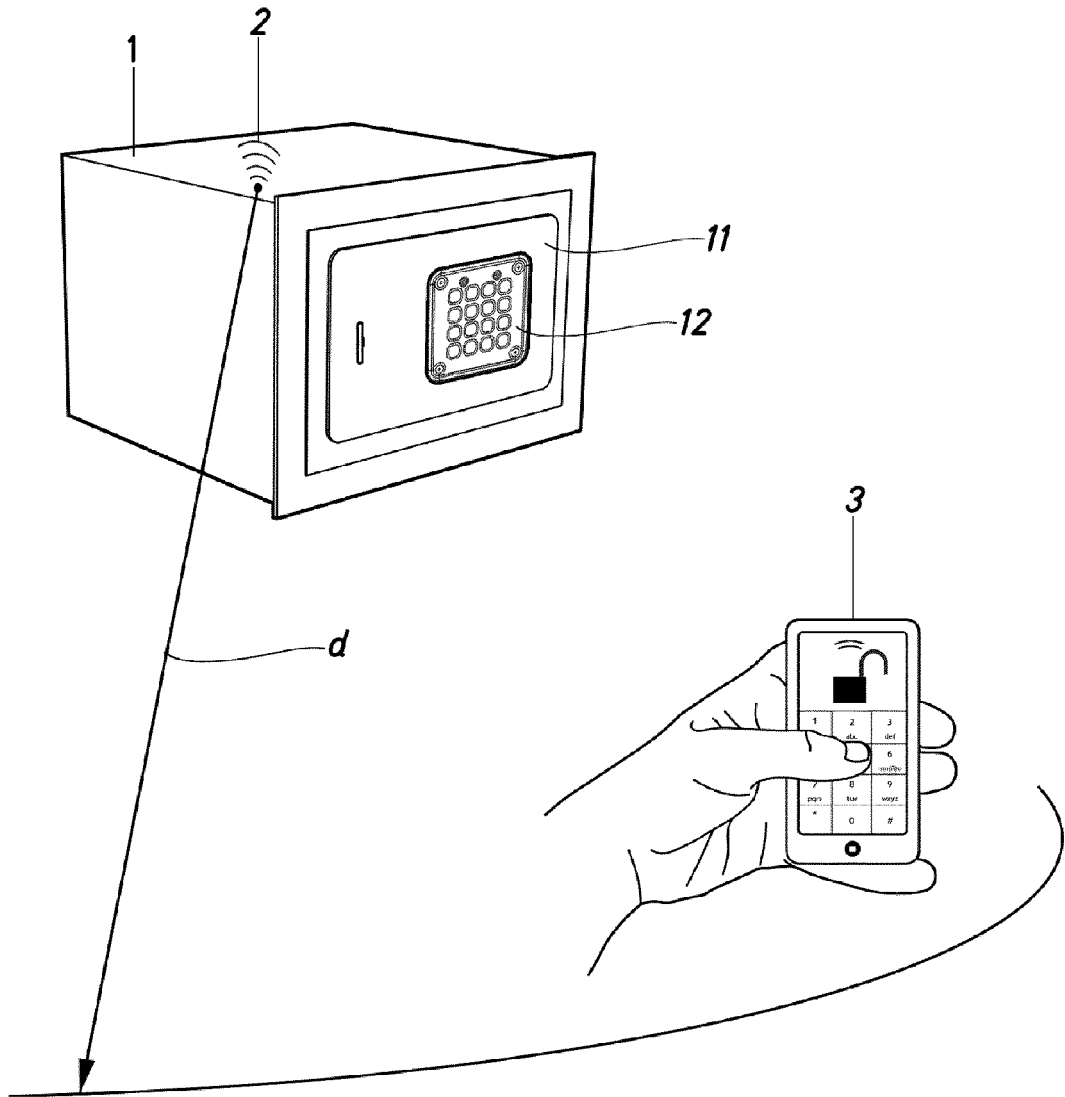


Fig.1

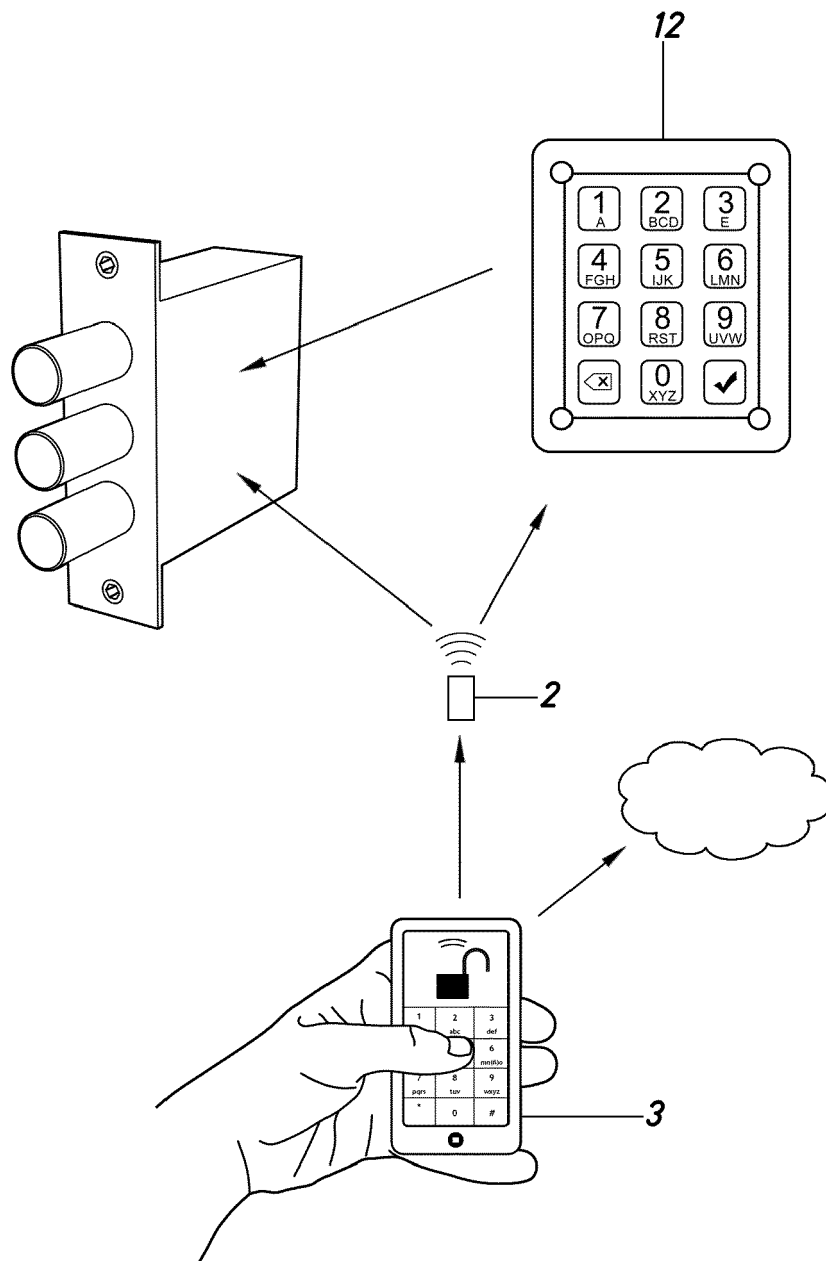


Fig.2

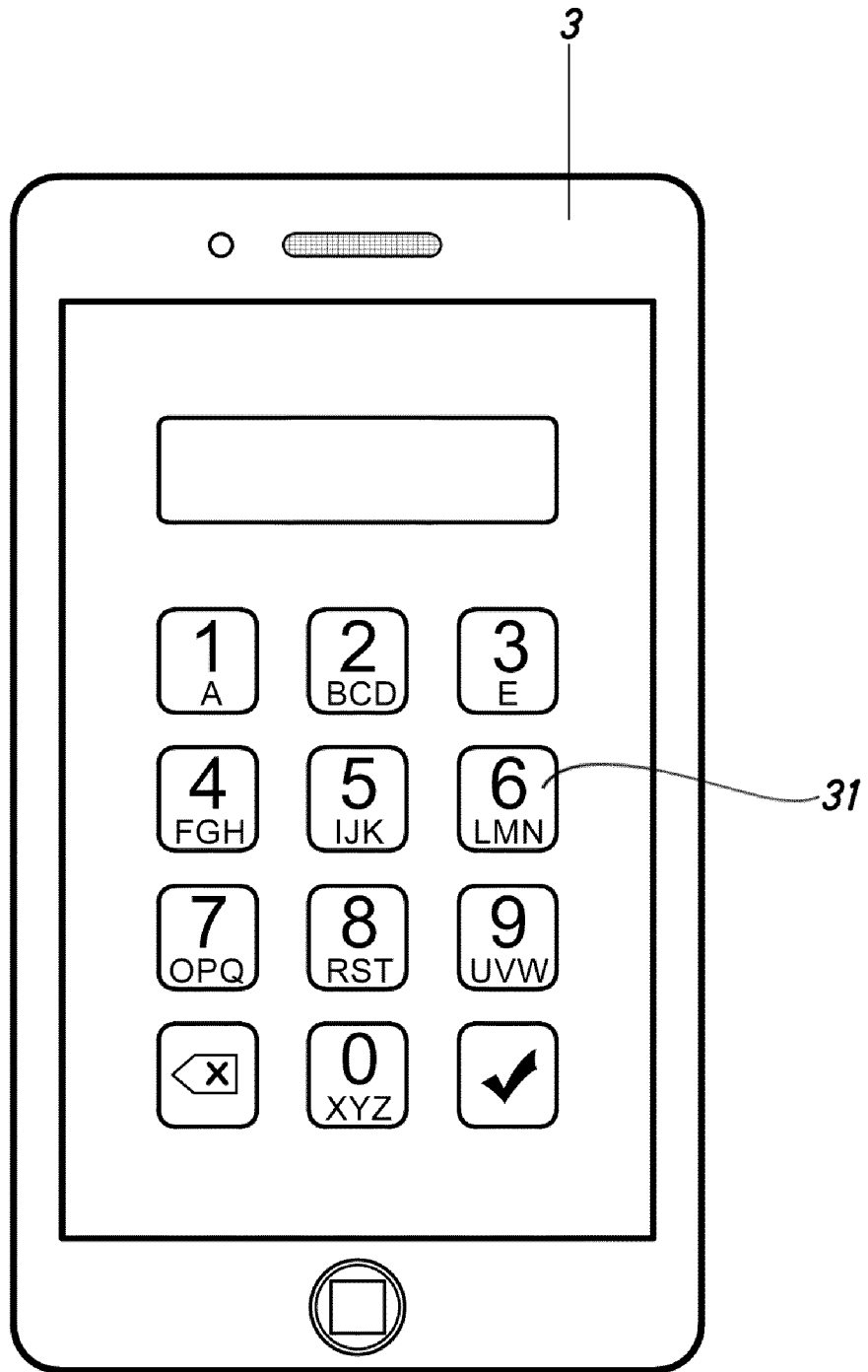


Fig. 3

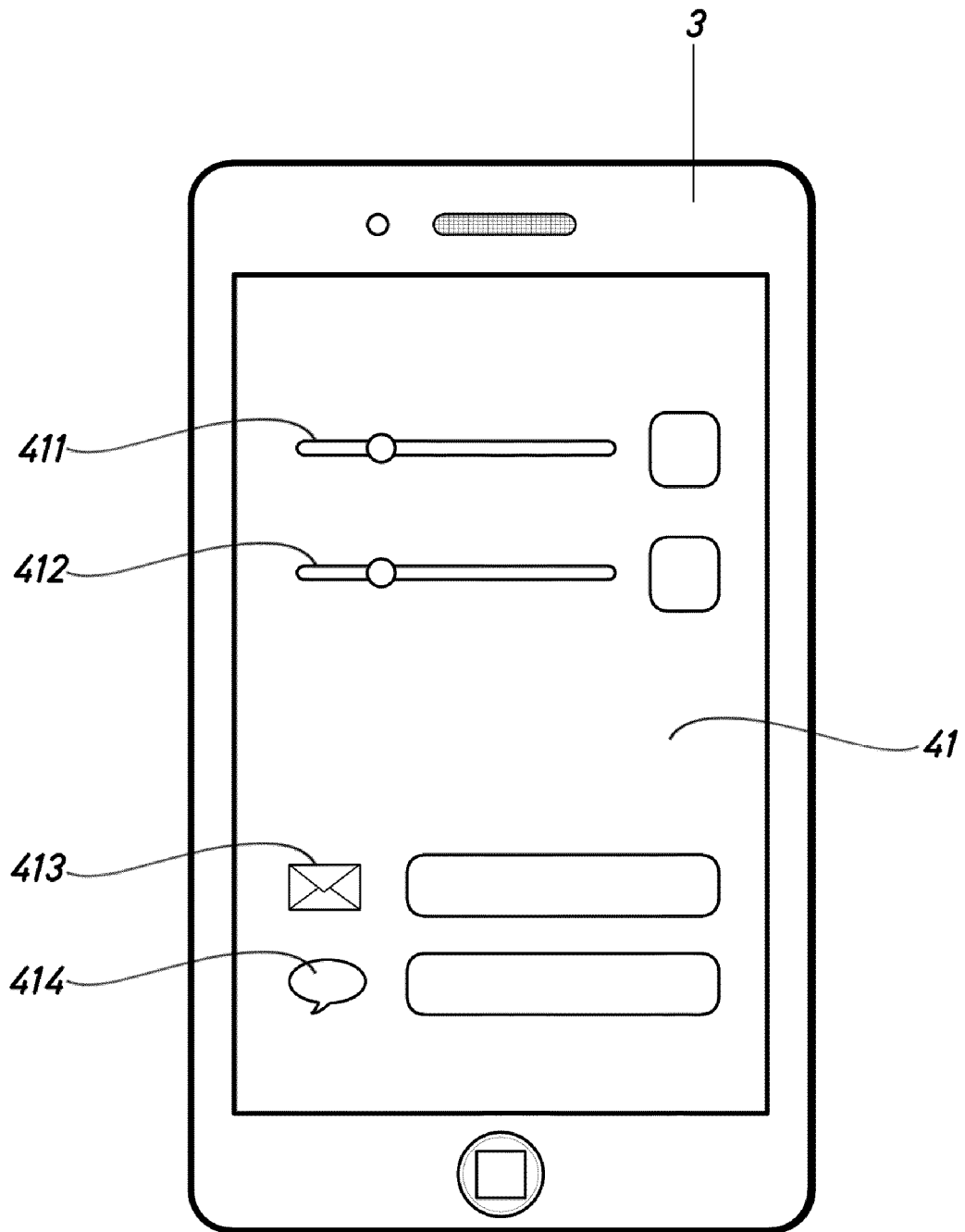


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 14 38 2397

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 February 2015	Examiner Van der Haegen, D
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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ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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