



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
04.01.2023 Bulletin 2023/01

(51) International Patent Classification (IPC):
G08C 17/02 (2006.01)

(21) Application number: **22182338.8**

(52) Cooperative Patent Classification (CPC):
G08C 17/02; G08C 2201/91; G08C 2201/93

(22) Date of filing: **30.06.2022**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **BORSOI, Luigi**
31012 CAPPELLA MAGGIORE (TV) (IT)
• **COLLOVINI, Roberto**
31100 TREVISO (IT)

(74) Representative: **Braidotti, Andrea**
Praxi Intellectual Property S.p.A.
Via F. Baracca, 5/A
30173 Venezia (IT)

(30) Priority: **01.07.2021 IT 202100017372**

(71) Applicant: **Teleco Automation S.R.L.**
31100 Treviso (IT)

(54) **INTERFACE DEVICE FOR A MOTORIZED COVER INSTALLATION**

(57) Interface device (10) for a motorized cover installation (1), such as for example of the type comprising a movable cover structure (3) for a swimming pool (2), said interface device (10) comprising:

- a wireless communication module of the radio type (11) configured to receive radio signals sent by corresponding radio communication means (21) of a smartphone (20),
- a control and / or processing unit which is connected and / or integrated in said radio communication module (11),

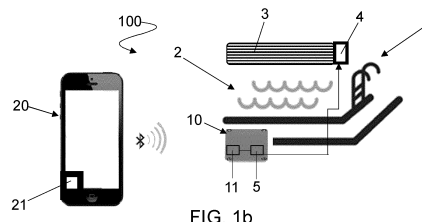
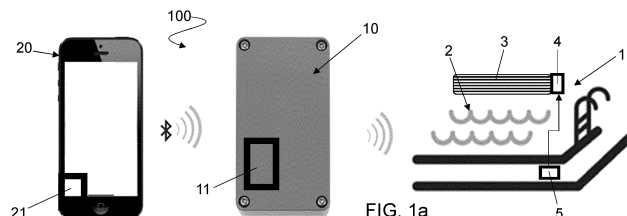
and characterized in that:

- said control and / or processing unit is configured so as to modify and set the reception or transceiving range of the radio communication module (11) on the basis of at least one setting signal which is sent by said radio com-

munication means (21) of said smartphone (20), and which is received by said radio communication module (11) of the interface device (10),

- the radio communication module (11) is configured to receive command signals, which are sent by corresponding radio communication means (21) of a smartphone (20), only if the distance between said smartphone (20) and the interface device (10) is less than the previously set range of action,

and also characterized by the fact that it comprises electrical connection means for making the command signals received by the radio communication module (11) reach at least one actuation device (4) of said motorized cover installation (1), to thus correspondingly control said at least one actuation device (4).



Description

FIELD OF THE TECHNIQUE

[0001] The present invention relates to an interface device for a motorized cover installation, such as for example a motorized cover for a swimming pool or the like. The present invention also relates to a system for controlling a motorized cover structure, in particular for a swimming pool. The present invention also relates to a motorized cover installation, preferably for a swimming pool, in particular of the type comprising a movable cover structure for a swimming pool.

STATE OF THE ART

[0002] For reasons of comfort, protection, but also aesthetic, the use of cover installations for swimming pools is known. In particular, these covers can be of various types and heights, for example they can be flat (ie substantially at water level), low or high.

[0003] The current market need for swimming pools, especially outdoors, is to have a cover installation that is motorized, in which the cover structure - which for example can be defined by a roll-up sheet or shutter, or it can be defined by a plurality of sliding modules - is moved automatically.

[0004] At present, for safety reasons, it is required that the automatic movement of the cover structure be carried out only when the user who commands / activates this movement is in proximity to the cover structure itself in order to be able to see and control it during handling or before activating it.

[0005] For this purpose, dedicated remote controls / radio controls are generally used, configured to operate only in the vicinity of the cover installation, or a fixed control console can be provided which is mounted in the vicinity of the cover installation.

[0006] These known solutions are not optimal as it may happen that the remote control / radio control is not found or, in the case of a fixed control console, this may have an impact from an aesthetic point of view. Furthermore, the known solutions are not safe as anyone (ie even unauthorized persons or children), once they have the remote control / radio control or are positioned at the fixed control console, can activate the automatic movement of the control structure. installation coverage.

[0007] US2020 / 0012274 describes a system for the remote control of an industrial vehicle, and in particular a lifting carriage. In particular, the system comprises a control device for remotely controlling a lifting carriage and also from the control device the intensity threshold of the radio waves that can be received by said communication means of the lifting carriage, thus allowing to vary the distance within which the control device is able to control the lifting carriage.

OBJECTIVES OF THE INVENTION

[0008] The purpose of the invention is to propose an interface device for a motorized user, and a system for controlling a motorized user, preferably a motorized cover installation, in particular for a swimming pool, which allows to solve, at least in part, the drawbacks of the known solutions.

[0009] Another object of the invention is to propose a device and a system which ensure that the automatic movement of the installation cover structure is carried out when the user is near the installation itself in order to be able to visually control said movement.

[0010] Another object of the invention is to propose a device and a system that allow to modify the distance within which the movement control of the installation cover structure can be activated.

[0011] Another object of the invention is to propose a device and a system that are safer.

[0012] Another object of the invention is to propose a device and a system that are simple and quick to install, even by unskilled personnel.

[0013] Another object of the invention is to propose a device and a system which are easy to program and manage.

[0014] Another object of the invention is to propose a device and a system which can be obtained and implemented in a simple, rapid and low-cost manner.

[0015] Another object of the invention is to provide a device that can be mass-produced quickly and efficiently.

[0016] Another object of the invention is to propose a device which can also be remotely controlled by a smartphone-type mobile phone, both for setting the device itself and for controlling the operation of other devices connected to the device itself.

[0017] Another object of the invention is to propose a device and a system which are improvements and / or alternatives to the traditional ones.

[0018] Another object of the invention is to provide a device and a system which have an alternative characterization, both in constructive and functional terms, with respect to the traditional ones.

[0019] Another object of the invention is to propose a device and a system which allow to remotely and safely control the automatic movement of the mobile cover structure of a cover installation, in particular of a swimming pool roof.

[0020] Another object of the invention is to propose a device that can be completely integrated on the cover installation to be controlled.

[0021] Another purpose of the invention is to propose a motorized cover installation, in particular for swimming pools, which is equipped with a device that ensures that the automatic movement of the mobile cover structure of the installation can only be carried out when the user is in proximity of the installation itself and this in order to be able to visually control said movement, and that it is simple to install, easy to program and manage, as well as

obtainable in a simple, quick and low-cost way.

SUMMARY OF THE INVENTION

[0022] All these objects, considered individually or in any combination thereof, and others which will result from the following description are achieved, according to the invention with a device as defined in claim 1 and with a system as defined in claim 6, as well as with a cover installation according to claim 10.

DESCRIPTION OF THE FIGURES

[0023] The present invention is further clarified hereinafter in some of its preferred embodiments reported for purely illustrative and non-limiting purposes with reference to the attached table of drawings, in which:

Figure 1a	schematically shows the system according to the invention,
Figure 1b	shows a schematic view of the system according to the invention in a different embodiment,
Figure 2	shows a screen of the APP loaded and executed on the smartphone to carry out the connection of the smartphone to the interface device,
Figure 3a	shows a photo of a face of the casing of the interface device,
Figure 3b	shows a photo of the inside of the interface device,
Figures 4a - 4d	show, in sequence, the screens of the APP loaded and executed on the smartphone and of the operations to match the interface device, controlled by the smartphone, to the receiver mounted on the cover installation,
Figures 5a - 5c	show, in sequence, the screens of the APP, loaded and executed on the smartphone, to control the opening movement of the mobile cover structure, and
Figures 6a - 6e	show, in sequence, the screens of the APP, loaded and executed on the smartphone, to control the closing movement of the mobile cover structure.

DETAILED DESCRIPTION OF THE INVENTION AND OF SOME PREFERRED EMBODIMENTS

[0024] As can be seen from the figures, the system according to the invention, indicated as a whole with the reference number 100, is applied and used to a motorized type cover installation 1, in particular for a swimming pool 2.

[0025] Preferably, the installation of the motorized cover 1 for the swimming pool 2 is of the traditional type. In

particular, the cover installation 1 comprises a cover structure 3 which is movable with respect to the swimming pool 2 (and in particular with respect to a fixed support and guide structure) and which is moved in opening or closing by at least one motorization device 4 equipped with one or more motors. Conveniently, the mobile cover structure 3 can be of any type, for example it can be rigid or flexible, roll-up or packet, and / or of any height with respect to the water level of the pool 2, for example it can be substantially flush, or it can be lower or higher.

[0026] Conveniently, the installation of the motorized cover 1 can comprise, or be associated with, a receiver 5 which is connected (via cable or wireless) or is incorporated in the motorization device 4. In particular, the receiver 5 can be integrated in the control unit (not shown) of the motorization device 4 or can be connected to said control unit.

[0027] Preferably, the receiver 5 is configured to receive radiofrequency signals transmitted by a traditional radio control / remote control. Preferably, the receiver 5 is configured to receive command signals for the motorization device 4 directly from a traditional radio control / remote control for moving the mobile cover structure 3; preferably, these signals are received by the receiver 5 only when the radio control / remote control is within a predefined range of action with respect to the receiver 5, in particular in the vicinity of the latter. Preferably, the receiver 5 is configured to receive radiofrequency signals, preferably of the VHF or UHF type and can advantageously operate in analog and / or digital modulation and with protocols such as, for example, of the FSK, GFSK, MSK, GMSK, LoRa type, etc. Conveniently, the receiver 5 can be configured to receive signals at a fixed frequency, for example about 433/868/916 MHz.

[0028] Preferably, the receiver 5 can also be configured to transmit radio frequency signals, thus operating as a transceiver. Conveniently, the receiver 5 can transmit signals to the outside relating to the status of the covering installation 1 or of the control unit of the latter.

[0029] The system 100 also comprises an interface device 10 which comprises a wireless communication module 11 of the radio type configured to communicate with corresponding radio communication means 21 of a smartphone 20, or in any case of another portable device such as a tablet. Conveniently, for the purposes of the present patent application, the smartphone 20 is considered equivalent to a tablet or other portable electronic device, preferably of the touchscreen type.

[0030] Conveniently, the radio communication module 11 is configured to receive radio signals transmitted by the radio communication means 21 of the smartphone 20. Preferably, the radio communication module 11 can be configured to transmit radio signals to the radio communication means 21 of the smartphone 20 or to other devices.

[0031] Conveniently, the radio communication module 11 is configured to define a bidirectional communication, i.e. in transceiving, with the radio communication means

21 of the smartphone 20.

[0032] Advantageously, in a possible embodiment, the radio communication module 11 is also configured for transmit radio signals, for example to the smartphone 20 or to the receiver 5 or to other devices. Conveniently, in a possible embodiment, the radio communication module 11 can transmit radio signals in the same communication technology and / or standard used for receiving the radio signals transmitted by the smartphone 20. Conveniently, in another possible embodiment, the radio communication module 11 can transmit radio signals with a different technology than that used for receiving the signals transmitted by the smartphone 20.

[0033] Conveniently, the interface device 10 can be connected via wireless (see fig. 1a) or via cable with the receiver 5.

[0034] Conveniently, in a possible embodiment (see Fig. 1b), the interface device 10 and the receiver 5 are integrated in a single unit which, preferably, is mounted on or at the cover installation 1 for swimming pool 2. Preferably, said unit can be positioned in correspondence with the motorization device 4. Appropriately, in a possible embodiment, the receiver module of the interface device 10 and the receiver 5 are mounted on the same electronic board.

[0035] Conveniently, the interface device 10 comprises a containment casing 12 inside which the radio communication module 11 is housed.

[0036] Conveniently, the interface device 10 can be configured to be powered from the outside, preferably it is powered directly through a connected cable to an external electrical source (preferably to the mains), and / or it can be powered by one or more batteries, preferably rechargeable, which are housed inside the containment casing 12.

[0037] Conveniently, the interface device 10 can comprise at least one electronic card 13 which is housed inside the containment casing 12.

[0038] The interface device 10 also comprises a control and / or processing unit (not shown) which is connected and / or integrated in said radio communication module 11. Preferably said control and / or processing unit comprises a microcontroller or a microprocessor which, preferably, is mounted on said electronic board. Advantageously, said interface device 10 can also comprise a memory unit.

[0039] Conveniently, the radio communication module 11 (which is configured to act in reception or in transceiving) of the interface device 10 can be mounted on the same electronic board on which the microcontroller / microprocessor of the device itself is mounted. Conveniently, the radio communication module 11 is connected via cable or via at least one track of the electronic card to the control and / or processing unit.

[0040] Conveniently, the radio communication module 11 is of the type suitable for receiving and / or transmitting radio signals. Conveniently, the radio communication module 11 can be configured for wireless data reception

or transmission using Wi-Fi technology or on the basis of traditional standards, such as Bluetooth® or ZigBee®. In a possible and preferred embodiment, said radio communication module is a communication module with Bluetooth technology, preferably with "Bluetooth Low Energy" technology, also known as "BLE". Preferably, the Bluetooth communication module can be mounted on the same printed circuit as the control and / or processing unit, or it can be mounted on a separate circuit, electrically connected to the control and / or processing unit.

[0041] The control and / or processing unit of the interface device 10 is configured, ie it is programmed, in such a way as to modify the range of action in reception or in transceiving of the radio communication module 11 on the basis of at least one setting signal coming from the outside (in particular it is sent by said communication means of the smartphone 20 or other portable device), and which is received by the same radio communication module 11 of the interface device 10.

[0042] Preferably, said signal is sent to the communication module radio 11 of the interface device 10 from the smartphone 20, and in particular from corresponding radio communication means with which the smartphone 20 is provided. Conveniently, the radio communication means of the smartphone 20 and the radio communication module 11 of the interface device 10 use the same radio communication technology, which can preferably be Bluetooth technology, and even more preferably it can be "Bluetooth Low Energy" technology, also called "BLE".

[0043] Preferably, the radio communication means 21 of the smartphone 20 and the radio communication module 11 of the interface device 10 are configured to communicate bidirectionally with each other by means of Bluetooth technology, and even more preferably by means of "Bluetooth Low Energy" technology, also called "BLE".

[0044] In particular, "range of action" means the maximum coverage distance within which the communication of signals and / or data via radio can take place between the radio communication means of the smartphone 20 and the radio communication module 11 of the interface device 10.

[0045] Preferably, the control and / or processing unit of the interface device 10 varies, on the basis of the signal received by the smartphone 20, the sensitivity in radio reception and / or transmission of said radio communication module 11.

[0046] Preferably, the control and / or processing unit of the interface device 10 varies, on the basis of the signal received by the smartphone 20, the gain and / or the power of the radio frequency (RF) part - for example the antenna - with which the radio communication module 11. Advantageously, this allows greater reliability and safety that the radio communication between the smartphone 20 and the interface device 10 takes place only if they are at a distance equal to or less than a certain range of action.

[0047] For example, considering a radio communication module 11 with Bluetooth technology, the control and/or processing unit of the interface device 10 varies, on the basis of the signal received by the smartphone 20, the reception power and / or the class of said module 11, thus varying the distance and range of action with respect to the radio communication means 21 of the smartphone 20. In particular, for example, for this purpose, the radio frequency (RF) parameters of the radio communication module 11 can be modified and, in more detail, the gain and / or the power of the radio frequency (RF) part - for example of the antenna - of which the radio communication module 11 is equipped, which uses the "Bluetooth Low Energy" technology, also called "BLE".

[0048] The radio communication module 11 of the interface device 10 is configured to receive command signals which are sent by corresponding communication means of a smartphone 20, or of another portable device, only if the distance between said smartphone 20 and the interface 10 is less than the previously set range of action.

[0049] Conveniently, according to the invention, the smartphone 20 is configured - and in particular it is programmed - both to command the sending of the setting signal and to set the range of action in reception or in transceiving of the radio communication module 11 of the interface device 10 and to act, within the smartphone itself, so as to correspondingly set the range of action in reception and / or transmission of the radio communication means 21 of the same smartphone.

[0050] Preferably, the smartphone 20 is configured so as to also vary the sensitivity in reception and / or transmission of the radio communication means 21 of the smartphone itself. Conveniently, the variation of the sensitivity in reception and / or transmission of the radio communication means 21 of the smartphone 20 can be carried out before, after or simultaneously with the sending of the setting signal to the radio communication module 11. The interface device 10 also comprises electrical connection means for sending the command signals that have been received by the radio communication module 11 to a receiver 5 or to a control unit, to thus command at least one actuation device 4 for moving the mobile cover structure 3 of the installation 1. Conveniently, said electrical connection means for sending the command signals that have been received by the radio communication module 11 to a receiver 5 or to a control unit comprise wireless transmission means, and / or cable connection means, and / or conductive tracks within the same printed circuit.

[0051] Conveniently, in a possible embodiment (see fig. 1b), the receiver 5 can be part of the interface device 10. In particular, in this case, the receiver 5 is housed inside said containment casing 12, it is electronically connected to said control and / or processing unit, and is configured to receive from the outside radio frequency command signals transmitted by a radio control / remote control.

[0052] Advantageously, a suitable software module

can be loaded and executed in the smartphone 20, and in particular in its processor, which preferably can be a native mobile software application, also known as APP. Preferably, the software module comprises at least one firmware acting on the radio communication means 21 of the smartphone 20.

[0053] Conveniently, said software module (which is loaded and / or executed in the smartphone) can be configured to generate at least one suitable screen on the display of the smartphone 20. in order to allow the user to easily and intuitively select a setting signal to be sent to the interface device 10 in order to set the range of action of the radio communication module 11 of the interface device itself and / or a command signal to be sent to the receiver 5 through said interface device 10, to then control the motorization device 4 for moving the mobile cover structure 3.

[0054] In particular, said software module (which is loaded and / or executed in the smartphone) is configured so that, on the basis of inputs entered by the user by acting on said smartphone 20, it generates at least one setting signal to be transmitted to the radio communication module 11 of said interface device 10 so that the command and control unit of said device 10 thus modifies, as a function of said setting signal, the range of action in reception or in transceiving of the module radio communication module 11.

[0055] Preferably, the radio communication module 11 of the interface device 10 and the radio communication means 21 of the smartphone 20 are configured to define a bidirectional communication between them.

[0056] Conveniently, said software module (which is loaded and / or executed in the smartphone 20) is configured to generate at least one setting signal to be transmitted to the radio communication module 11 of said interface device 10 so that the command and control unit of said device 10 thus modifies, as a function of said setting signal, the transceiving range of the radio communication module 11 and also to intervene on the radio communication means 21 of the smartphone 20 so as to correspondingly set the range of action in transceiving of the radio communication means 21 of the smartphone itself. Advantageously, therefore, the range of action in transceiving is changed by intervening both on the interface device 10 and also on the smartphone 20 and this allows greater security on the fact that the communication between smartphone and interface device then actually takes place and only when the smartphone and the interface device are at a distance from each other equal to or less than the range of action thus set.

[0057] Conveniently, said software module (which is loaded and / or executed on the smartphone 20) is configured to generate at least one setting signal to be transmitted to the radio communication module 11 of said interface device 10 in order to modify the sensitivity in reception and / or or transceiving of the same communication module 11. Conveniently, said software module (which is loaded and / or executed in the smartphone 20)

is configured to also vary the sensitivity in reception and / or transmission of the radio communication means 21 of the smartphone itself. Conveniently, said software module (which is loaded and / or executed in the smartphone 20) is configured to vary the sensitivity in receiving and / or transmitting the radio communication means 21 of the smartphone 20 previously, subsequently or simultaneously with the transmission and / or generation of the setting signal to the radio communication module 11.

[0058] Furthermore, said software module (which is loaded and / or executed in the smartphone) is configured so that, on the basis of inputs entered by the user by acting on said smartphone 20, it generates at least one command signal to be transmitted to the radio communication module 11 of said interface device 10 so that it then sends - directly or through the receiver 5 by means of a cable or wireless connection or through the card track (in the case in which the interface device 10 and receiver 5 are integrated with each other) - a corresponding command to the motorization device 4, and thus cause the opening or closing movement of the mobile cover structure 3.

[0059] Preferably, both the command signals for the motorization device 4 and the signal for setting / deciding the range of action of the communication between the interface device 10 and the smartphone 20 (and in particular between the radio communication module 11 of the device 10 and the corresponding radio communication means 21 of the smartphone 20) are both sent to the same communication module 11 of the interface device 10 by the same communication means of the smartphone 20.

[0060] Conveniently, the same software module which is loaded and / or executed in the smartphone 20 is configured so that the smartphone itself acts both as a setting device in varying the range of action of the radio communication module 11 of the interface device 10 and as a command device in sending the command signals for the motorization device 4.

[0061] Basically, by using the smartphone 20, the user can vary the range of action of the radio communication module 11 of the interface device 10 and can also send to the interface device 10 command signals for the motorization device 4 of the mobile cover structure 3. In particular, the command signals for the motorization device 4 which are sent by the smartphone 20 managed by the operator always pass through the interface device 10 and, in particular, are always received by the radio communication module 11 of said device 10 and then from here they pass to the receiver 5 connected and / or integrated in the motorization device 4 and / or from the device 10 they can pass directly to the motorization device 4 and / or to the control unit of the motorization device 4.

[0062] Conveniently, in a possible embodiment in which the interface device 10 is integrated in the motorization device 4 or in the control unit of the motorization device 4, the receiver 5 may not be provided and, therefore, the command signals - sent from the smartphone

20 and which are received by the communication module 11 of the device 10 - are decoded directly on the device 10 and from the latter then pass to the motorization device 4 or to the control unit of the motorization device 4.

[0063] Advantageously, therefore, considering that the smartphone 20 is managed by a specific user and considering that the interface device 10, containing the radio communication module 11, is installed in correspondence with or on the cover installation 1 for the swimming pool 2, we have that, by acting on the smartphone itself, you can easily and quickly set the range of action of the communication between the means of radio communication means 21 of the smartphone 20 and the radio communication module 11 interface device 10, and in particular can be set so that the transmission of the command signals from the smartphone 20 to the interface device 10 occurs at close distances, thus ensuring that the user who manages the smartphone 20 - when he has to control the movement of the mobile cover structure 3 of the installation 1 - is in the vicinity of the installation itself to thus visually oversee said movement.

[0064] Furthermore, the software module loaded and executed on the smartphone 20 can conveniently be configured to display information relating to the interface device 10 and / or the cover installation 1 to which the device is connected. Conveniently, the information thus displayed derives from data or signals sent by the radio communication module 11 of the interface device 10 to the communication means 21 of the smartphone 20.

[0065] For example, the software module can be configured to display an indication of the distance between the smartphone 20 and the interface device 10 and / or the state of the installation, for example if the cover structure of the installation is open or closed, or if there are any malfunctions, or other.

[0066] Conveniently, the software module loaded and executed on the smartphone 20 can comprise a screen 80 (see Fig. 2a) for setting the range of action of the communication between the communication means 21 of the smartphone itself and the radio communication module 11 of the interface device 10. In particular, said screen 80 is configured in such a way that, for a given interface device 10, the setting signal to be sent to the communication module 11 is defined by means of inputs entered by the user acting on said smartphone 20 of the interface device 10, to thus set the range of action in reception and / or transmission of the communication module 11 of the interface device 10 and, preferably, the range of action in transceiver for the radio communication means 21 of the smartphone itself. More in detail, the screen 80 is configured in such a way as to present a field 81 in which to enter the code of the interface device 10 - which, for example, can be provided on the back of the casing of said device (see fig. 3a) or on the inside the casing itself (see fig.3b) - and by input means 82 (for example a cursor sliding on the touch-screen) to define the setting signal to be sent to the communication module 11 of the interface device 10, and preferably also to be

set on the radio communication means 21 of the smartphone itself, to thus set the range of action in reception and / or transmission between the smartphone 20 and the interface device 10.

[0067] Conveniently, the software module loaded and executed on the smartphone 20 can be configured to receive a plurality of inputs from a user in order to control the installation of the cover 1 from the smartphone 20 through the interface device 10, and in particular to control the activation or deactivation of the motorization device 4 which moves the mobile cover structure 3 of the installation 1 in opening and closing. Preferably, said inputs can be associated with appropriate actions of the user on the touch -screen of the smartphone 20, or they can be linked to the pressure of one or more physical keys present on the smartphone 20. Advantageously, said inputs can be transmitted from the smartphone 20 to the radio communication module 11 of the interface device 10, and from this they are then transmitted to the receiver 5 associated or incorporated in the control unit of the motorization device 4 of the mobile movement structure 3.

[0068] Preferably, the software module loaded and executed on the smartphone 20 can be configured in such a way as to require the insertion of a password in order to be able to match the interface device 10 to the receiver 5 associated or incorporated therein 1 the control unit of the motorization device 4 of the handling structure 3. In particular, once the smartphone 20 has been connected to the interface device 10 (cf. fig. 2), the user can use the smartphone 20 to control the interface device 10 in order to pair the latter with the receiver 5 (see fig. 4a - 4d). Conveniently, therefore, the software module (which is loaded and / or executed in the smartphone) can be configured to act to control the interface device 10 in order to pair the latter via wireless to the receiver 5.

[0069] Preferably, the software module loaded and executed on the smartphone 20, can be configured in such a way as to require the insertion of a password in order to be able to control the opening movement of the cover structure 3 of the installation 1 (see fig. 5a - 5c). Preferably, the software module loaded and executed on the smartphone 20 can be configured in such a way as to require the insertion of a password in order to be able to control the closing movement of the cover structure of the installation. Preferably, the software module loaded and executed on the smartphone 20 can be configured in such a way as to require, in addition to the insertion of the password or a first command, the insertion of at least one further confirmation input (see fig. 6d) in order to be able to control the closing movement of the installation cover structure, thus essentially configuring a safety "double check" for the activation of said closing movement.

[0070] The operation of the solution according to the invention is clear from what has been said previously.

[0071] If it is necessary to move the cover structure installation when opening or closing, a user in possession

of the smartphone 20, to which the interface device 10 is coupled, can act on the smartphone itself - which thus acts as a remote control - in order to control the desired movement. Furthermore, the user can access the APP in order for example to view the status of the control unit of the covering installation 1 and / or of the mobile cover structure 3 and to verify that they are operational and / or functioning. Furthermore, it can check, again via the APP, if the interface device 10 is within the range of action of the smartphone 20 and in particular if the radio communication means 21 of the latter and the radio communication module 11 of the interface device 10 are at a distance suitable for allowing communication.

[0072] Furthermore, by means of an appropriate action on the smartphone 20 (see screenshot of fig. 2), the user can send, via the communication means with which the smartphone is provided, a setting signal from the smartphone 20 to the interface device 10 in order to set the reception or transceiver range of action of the communication module 11 of the interface device itself. Therefore, in this way, the interface device 10 is able to receive and / or transmit signals from / to the smartphone only when the latter is at a distance with respect to the interface device 10 which is equal to or less than the range of action previously set.

[0073] Conveniently, therefore, when the smartphone 20 is at a distance with respect to the interface device 10 which is equal to or less than the previously set range of action, then the signal sent by the smartphone 20 is received by the communication module 11 of the interface device 10. Subsequently, the interface device 10, and in particular its command and control unit, can be configured to process said first command signal and generate a corresponding second command signal. Furthermore, the interface device 10 is configured to send, by means of second radio or cable communication means or by track connections, this second command signal (or other signal generated starting from or on the basis of said first signal) to the receiver 5 associated with the control unit of the cover installation 1, and this in order to control the activation of the motorization device 4 and thus cause the movement of the mobile cover structure 3.

[0074] Advantageously, if the smartphone 20 is not located within the range of action of reception or transmission of the interface device 10 (and in particular of the communication module), the command sent by the smartphone 20 is not received by the interface device 10 and, suitably in this case a notification can be displayed on the smartphone 20 to warn the user accordingly. For example, when the communication between the smartphone 20 and the interface device 10 fails, a warning appears on the smartphone 20 indicating that the installation 1, or other user, connected to the interface device 10 cannot be reached.

[0075] Conveniently, it is understood that a new signal for setting the range of action in reception or transmission of the communication module 11 of the interface device 10 can be sent only when the smartphone 20 is at a dis-

tance from the interface device 10, which is shorter than the last set / decided range of action.

[0076] The system 100 according to the invention for the remote control of a user, and in particular of a covering installation 1, comprises an interface device 10 as described above and a smartphone 20 - in which it is loaded and / or executed a module as described above - which is configured to set said device 10 so that it can communicate with said smartphone 20 only if it is, with respect to the interface device 10, at a distance less than the range of action thus set. Conveniently, the smartphone 20 is also configured to send corresponding command signals to the interface device 10 which - only when these are at a distance less than the previously set range of action - are received by the interface device 10 to be then transferred to the receiver 5 associated with the control unit of the handling device 4.

[0077] Advantageously, in a possible embodiment, the receiver 5 can be connected to a centralized or distributed home automation unit which is configured to receive and send information from the receiver 5, preferably via Wi-Fi and via Internet protocols, to the smartphone 20 and / or to another external portable device and / or to a cloud archive accessible from the external portable device, in order to allow monitoring of the operation of the installation to which the receiver 5 is associated. Conveniently, the connection between the receiver 5 and the home automation unit can take place via cable or wireless, in particular via radio waves (for example Wi-Fi or according to the Bluetooth protocol).

[0078] Conveniently, the system 100 also comprises a software module, preferably an APP - as described above - loaded and / or executed in the smartphone 20.

[0079] Conveniently, the present invention also relates to a motorized cover installation 1, preferably of the type comprising a cover structure 3 cabinet for a 2 pool, which includes:

- a system 100 as described above,
- at least one motorization device 4 for the opening and closing movement of said mobile cover structure 3,
- a control unit configured to control said at least one motorization device 4 on the basis of a command signal sent by said interface device 10 on the basis of a command signal that the same interface device receives from said smartphone 20 only when these are a distance shorter than the range of action that has been preset on the interface device via the smartphone itself.

[0080] As it clearly appears from what has been said, the device and the system according to the invention are quite advantageous in that they allow to achieve all the purposes set out and in particular:

- involve the use of a widely used device such as a smartphone, thus transforming the latter into a re-

mote control,

- allow you to use your smartphone as a remote control in addition to the traditional remote control that communicates directly with the receiver,
- require the user to go near the installation in order to send an opening or closing movement command, thus ensuring that the user is actually in the vicinity of the cover installation so as to be able to see and check the mobile cover structure during its handling or before its activation.

[0081] The device according to the present invention has been described here in particular with reference to its application in a swimming pool cover installation, however it is understood that it can be applied in any other cover installation or other utility, in particular in cases where which is required that the movement command of the mobile cover structure or of the user takes place only when the user is in proximity to the installation or to the user itself in order to be able to visually control said movement or user.

[0082] The present invention has been illustrated and described in some of its preferred embodiments, but it is understood that executive variations may apply thereto in practice, without however departing from the scope of protection of the present patent for industrial invention.

Claims

1. Interface device (10) for a motorized cover installation (1), such as for example of the type comprising a movable cover structure (3) for a swimming pool (2), said interface device (10) comprising:

- a wireless communication module of the radio type (11) configured to receive radio signals sent by corresponding radio communication means (21) of a smartphone (20),
- a control and / or processing unit which is connected and / or integrated in said radio communication module (11),

and characterized in that:

- said control and / or processing unit is configured so as to modify and set the reception or transceiving range of the radio communication module (11) on the basis of at least one setting signal which is sent by said radio communication means (21) of said smartphone (20), and which is received by said radio communication module (11) of the interface device (10),
- the radio communication module (11) is configured to receive command signals, which are sent by corresponding radio communication means (21) of a smartphone (20), only if the distance between said smartphone (20) and the

interface device (10) is less than the previously set range of action,

and also **characterized by** the fact that it comprises electrical connection means for making the command signals received by the radio communication module (11) reach at least one actuation device (4) of said motorized cover installation (1), to thus correspondingly control said at least one actuation device (4).

2. Device according to claim 1, **characterized in that** said radio communication module (11) comprises a communication module with Bluetooth technology, preferably with "Bluetooth Low Energy" (BLE) technology.

3. Device according to one or more of the preceding claims, **characterized in that** said electrical connection means are configured to send the command signals, which have been received by the radio communication module (11), directly to said at least one motorization device (4) and / or to a receiver (5) and / or to a control unit associated with said at least one motorization device (4), said electrical connection means comprising:

- wireless transmission media, and / or
- means of connection via cable,
- conductive tracks within the same printed circuit.

4. Device according to one or more of the preceding claims, **characterized in that** it comprises a receiver (5) which:

- is housed inside the same containment casing (12) in which said radio communication module (11) and said control and / or processing unit are housed,
- is electronically connected with or integrated in said control and / or processing unit, and
- is configured to receive radio frequency command signals transmitted by a radio control / remote control from the outside.

5. Device according to one or more of the preceding claims, **characterized in that** it comprises a containment casing (12) in which an electronic card (13) is housed on which said radio communication module (11), said control unit and / or processing and, if provided, said receiver (5).

6. Device according to one or more of the preceding claims, **characterized in that**, in order to modify and set the range of action in reception or transmission of the radio communication module (11) on the basis of at least one setting signal which is sent by said

radio communication means (21) of said smartphone (20), said control and / or processing unit is configured in such a way as to vary the sensitivity in radio reception and / or trans-transmission of said radio communication module (11).

7. Device according to one or more of the preceding claims, **characterized in that**, to modify and set the range of action in reception or transmission of the radio communication module (11) on the basis of at least one setting signal which is sent by said radio communication means (21) of said smartphone (20), said control and / or processing unit is configured in such a way as to vary the gain and / or the power of the antenna with which the radio communication module is provided (11).

8. System for controlling a motorized cover installation (1), in particular a movable cover structure (3) for a swimming pool (2), comprising:

- an interface device (10) according to one or more of the preceding claims, and
- a smartphone (20) comprising radio communication means (21) configured to communicate with the radio communication module (11) of said interface device (10) and to send said setting signal to said radio communication module (11) and said command signals.

9. System according to the preceding claim, **characterized in that** it comprises a receiver (5) which is electronically connected to said interface device (10) to thus receive from said interface device (10) the command signals which the communication module radio (11) of the interface device (10) has received from said smartphone (20), said receiver (5) being also configured to receive from the outside radio frequency command signals transmitted directly by a radio control / remote control.

10. System according to one or more of claims 8 or 9, **characterized in that** said radio communication module (11) of said interface device (10) and said radio communication means (21) are configured to define a bidirectional communication.

11. System according to one or more of claims 8 - 10, **characterized in that** it comprises a software module, loaded and / or executed in the smartphone (20), which is configured for:

- generate said at least one setting signal to be transmitted to the radio communication module (11) of said interface device (10) so that the command and control unit of said device (10) thus modifies, as a function of said setting signal, the transceiver range of the radio communication

module (11), and

- to also intervene on the radio communication means (21) of the smartphone itself (20) so as to correspondingly set the transceiving range of the radio communication means (21) of said smartphone. 5

12. System according to one or more of claims 8 - 11, **characterized in that** it comprises a software module, loaded and / or executed in the smartphone (20), which is configured so that, on the basis of inputs entered by the user by acting on said smartphone (20), generates at least one corresponding setting signal to be transmitted to the radio communication module (11) of the interface device (10) and at least one command signal to be transmitted, through said radio communication module (11) of the device interface (10), to said at least one motorization device (4). 10 15 20

13. System according to one or more of claims 8 - 12, **characterized in that** a software module is loaded and executed on said smartphone (20) which is configured so as to comprise a screen (80) in which, for a given interface (10), the setting signal to be sent to the radio communication module (11) of the interface device (10) is defined by means of inputs entered by the user acting on said smartphone (20), to set the range of action in reception or transmission of the radio communication module (11) of the interface device (10). 25 30

14. System according to one or more of claims 8 - 13, **characterized in that** said software module loaded and executed on the smartphone (20) is also configured to display information deriving from data or signals sent by the communication module (11) of the control device interface (10) to the communication means (21) of the smartphone (20) and relating to the interface device (10) and / or the cover installation (1) to which the device is connected. 35 40

15. Installation of motorized cover (1) of the type comprising a movable cover structure (3) for a swimming pool (2), **characterized in that** it comprises: 45

- a system (100) according to one or more of claims 6 to 9,
 - at least one motorization device (4) for the opening and closing movement of said mobile cover structure (3), 50
 - a control unit which is connected to or integrated in said at least one motorization device (4) and which is configured to control said at least one motorization device (4) on the basis of a command signal sent by said interface device (10) on the base of a command signal that the same interface device (10) receives from said 55

smartphone (20) only when these are at a distance less than the range of action that has been preset, by sending a setting signal through the smartphone itself, on the communication module (11) of the interface device (10) and / or by intervening on the radio communication means (21) of the smartphone (20).

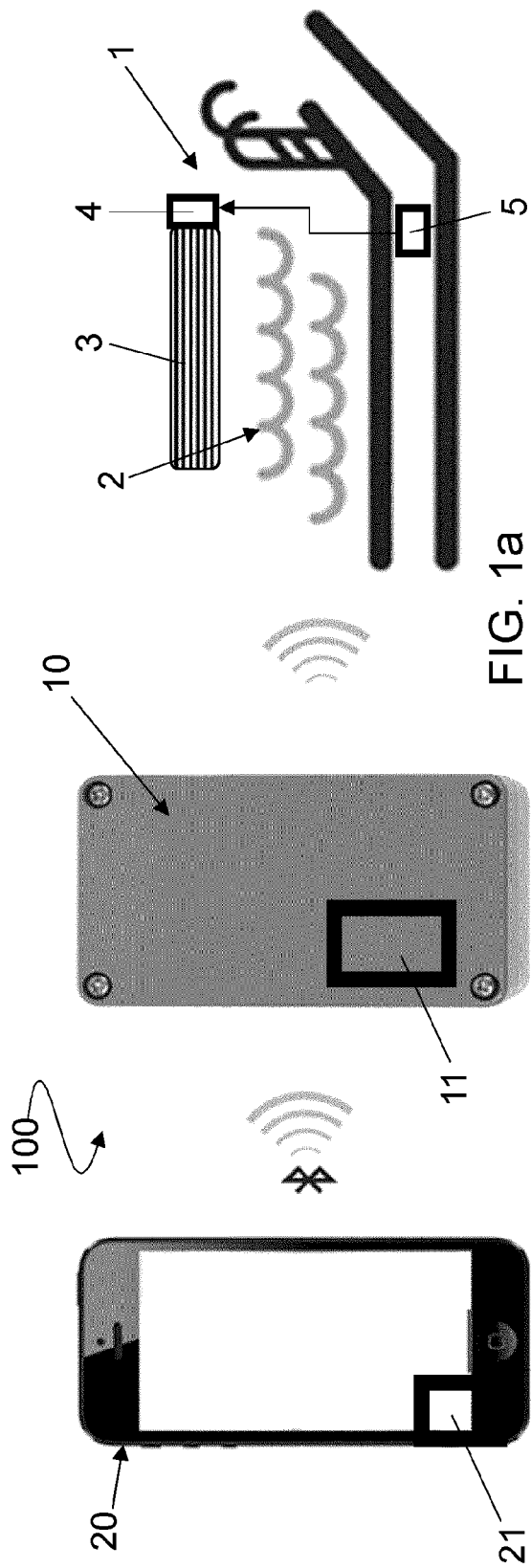


FIG. 1a

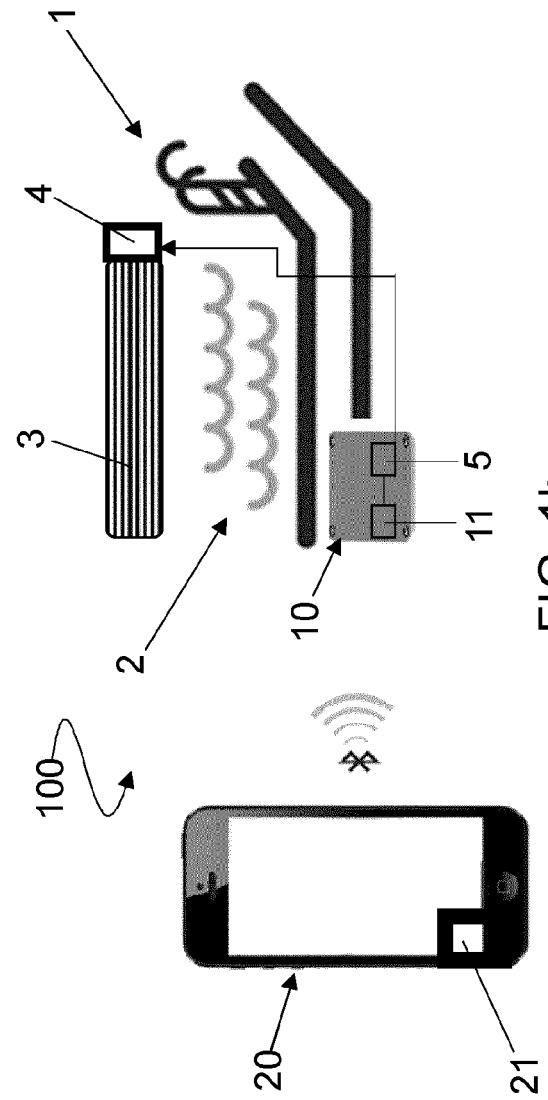
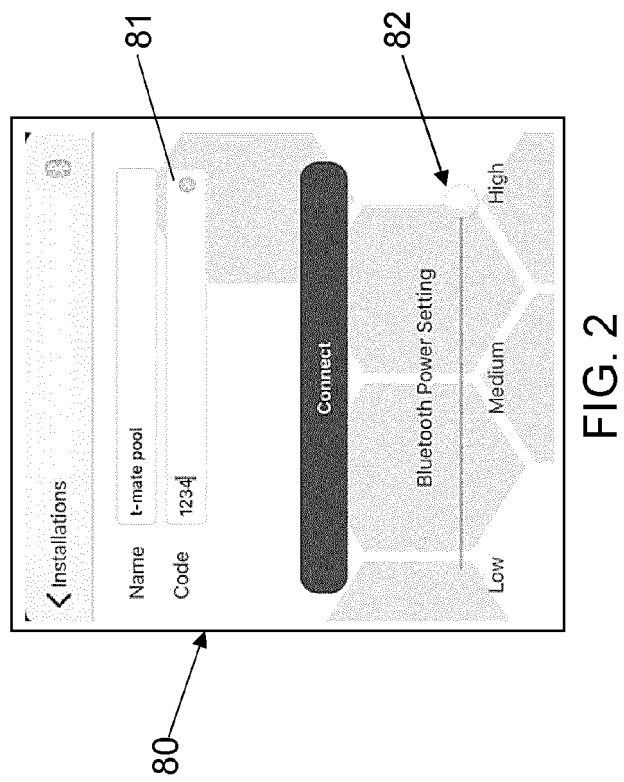
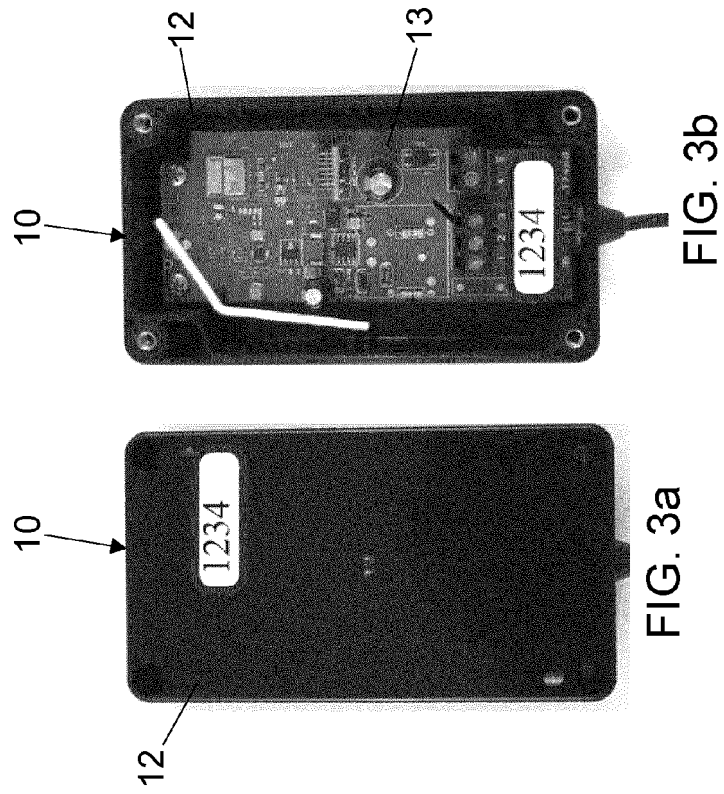


FIG. 1b



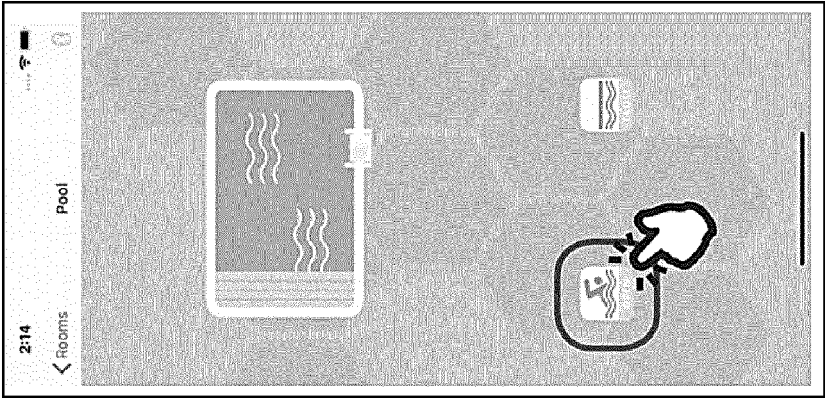


FIG. 4d

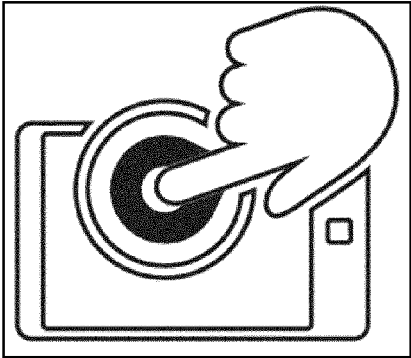


FIG. 4c

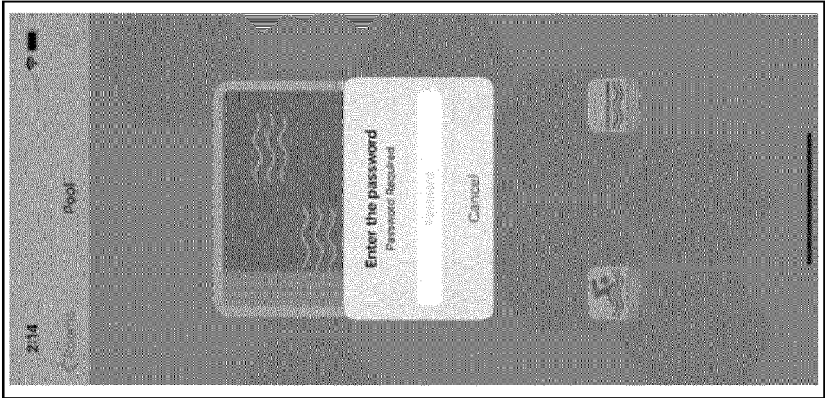


FIG. 4b

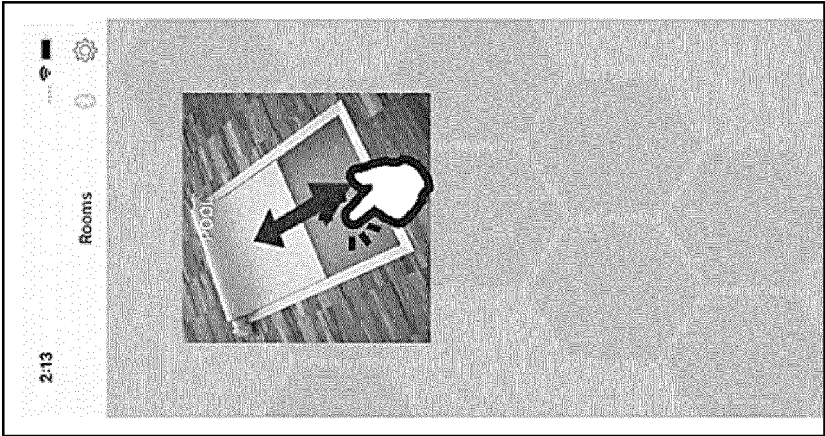


FIG. 4a

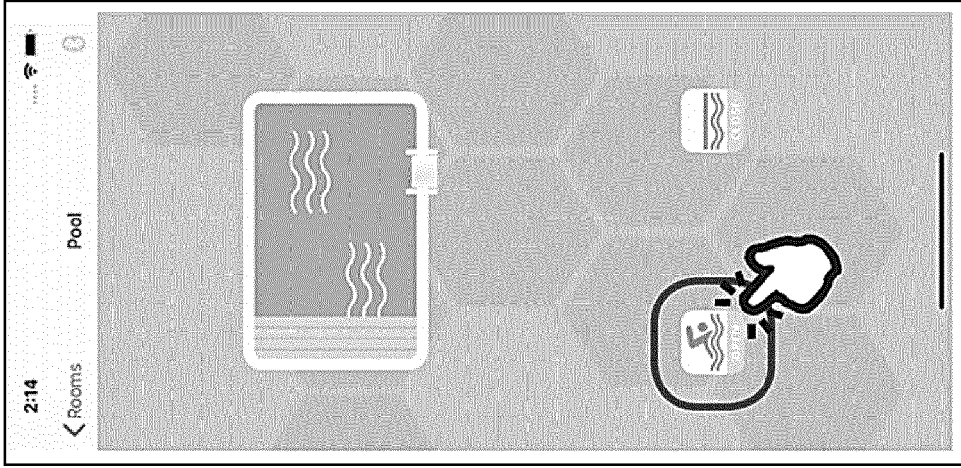


FIG. 5c

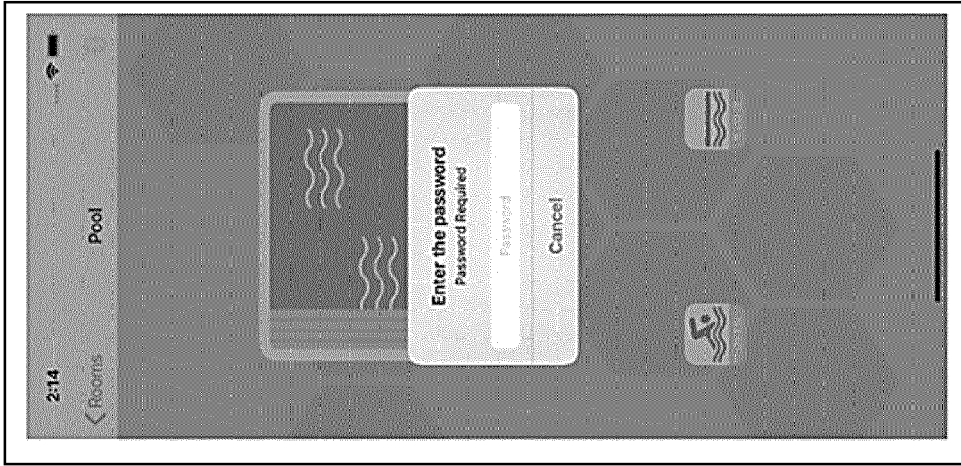


FIG. 5b

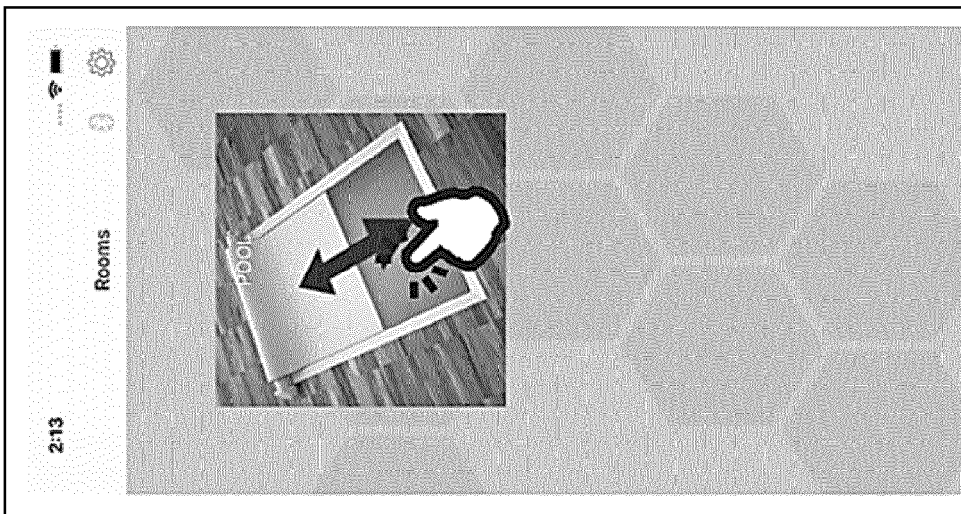


FIG. 5a

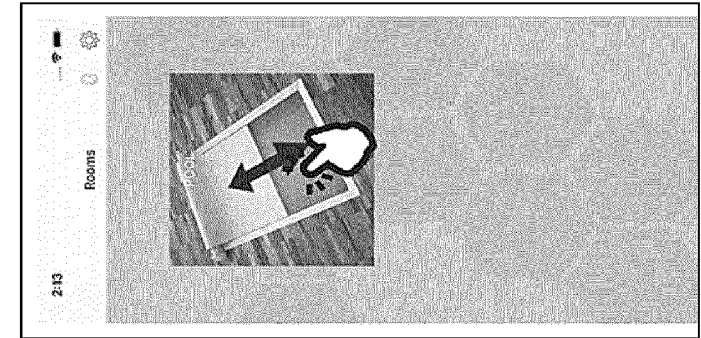


FIG. 6a

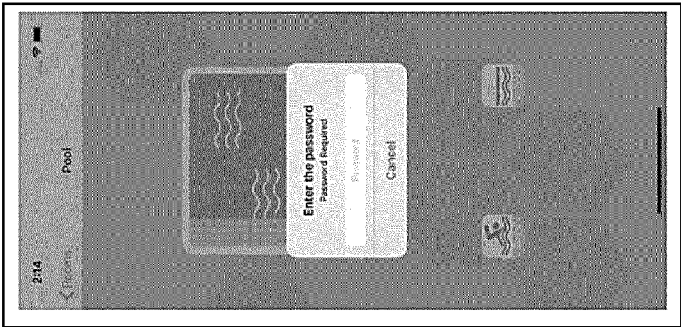


FIG. 6b

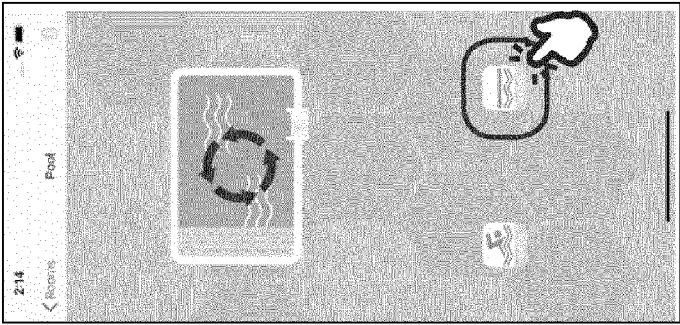


FIG. 6c

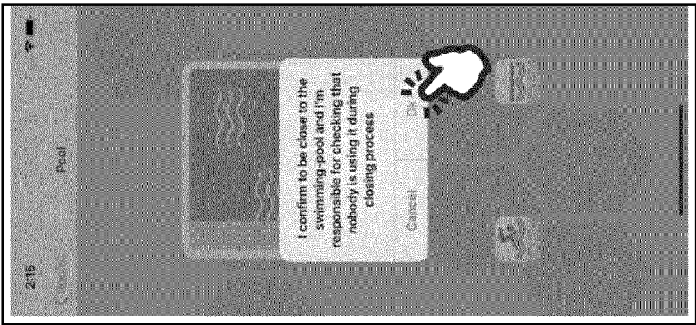


FIG. 6d

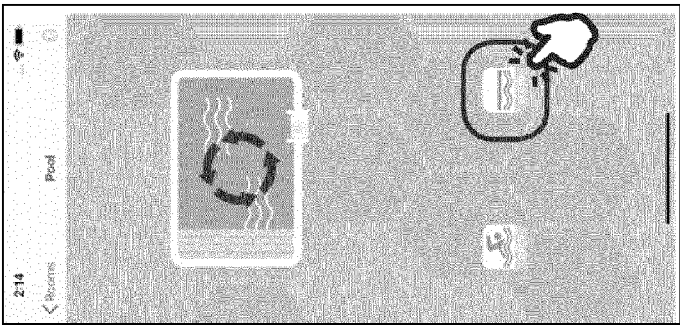


FIG. 6e



EUROPEAN SEARCH REPORT

Application Number

EP 22 18 2338

5

10

15

20

25

30

35

40

45

50

55

1

EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X, D	US 2020/012274 A1 (KAMIYA TOMONORI [JP] ET AL) 9 January 2020 (2020-01-09)	1-3, 5-8, 10-14	INV. G08C17/02
Y	* paragraph [0072] - paragraph [0075] * * paragraph [0265] - paragraph [0266] * * paragraph [0271] - paragraph [0291]; figures 18-21 * * paragraph [0349] *	4, 9, 15	
Y	WO 2014/189757 A1 (UNIVERSAL ELECTRONICS INC [US]) 27 November 2014 (2014-11-27) * page 6, line 16 - page 9, line 22; figures 3-6 *	4, 9	
Y	US 2020/311227 A1 (BENNETT JAMES DUANE [CZ] ET AL) 1 October 2020 (2020-10-01) * paragraph [0135] *	15	
			TECHNICAL FIELDS SEARCHED (IPC)
			G08C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		25 October 2022	Baas, Gert-Jan
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	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 22 18 2338

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-10-2022

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
15	US 2020012274 A1	09-01-2020	EP 3578501 A1 JP 6819490 B2 JP 2018123000 A US 2020012274 A1	11-12-2019 27-01-2021 09-08-2018 09-01-2020
20	WO 2014189757 A1	27-11-2014	BR 112015028858 A2 CN 105378578 A EP 3000007 A1 ES 2810299 T3 PL 3000007 T3 WO 2014189757 A1	25-07-2017 02-03-2016 30-03-2016 08-03-2021 02-11-2020 27-11-2014
25	US 2020311227 A1	01-10-2020	NONE	
30				
35				
40				
45				
50				
55				

ORM P0459

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 20200012274 A [0007]