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(54) **RETROFIT CONTACT TO CONTACTLESS ELEVATOR BUTTONS**

(57) This is an invention that refers to a method of transforming the usually touchable elevator buttons to contactless. Several viruses are spread by coughing and sneezing, and pass by hand-to-mouth contact. For this reason, it is imperative to reduce the exposure on these microorganisms, even more on everyday used products as elevators, where a plethora of people enter in and touch several surfaces in the elevator cabin. The invention consists of an application for smart devices, an IR sensor and the procedure of transforming the position of the user's finger, in front of the elevator operating panel, into a call for the desirable floor travel.

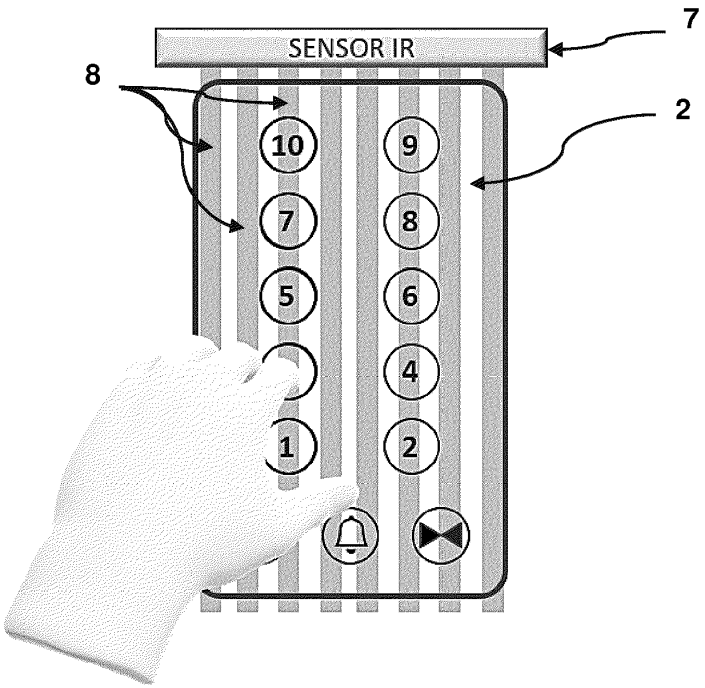

Figure 5.

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Description

[0001] Present invention refers to a method of transforming the usually touchable elevator buttons to contactless. Following are described further details about the invention and are presented figures that illustrate it better.

[0002] According to the state of the art, an elevator is equipped with the Landing Operating Panel (LOP) which gives the command of landing calls and the Cabin Operating Panel (COP) which is the control panel inside the elevator that houses the floor buttons, the light switch, the alarm button, the emergency stop switch and optional key lock. There are various designs of Elevator LOPs and COPs, but the majority of them consist of buttons that have to be pressed by the user.

[0003] The growth and spread of resistant strains of harmful microorganisms over every day use products, that may cause several infections that threat the human health, causes considerable concern. For example, several viruses are spread by coughing and sneezing or are transmitted by the oral route, passed by hand-to-mouth contact. For this reason, it is imperative to reduce the exposure on these microorganisms, even more on everyday used products as elevators, where a plethora of people enter in and touch several surfaces in the elevator cabin.

[0004] The presented invention is the solution to the abovementioned issue. The invention refers to a method of renovating an old elevator cabin, which has conventional COP and LOP with push buttons, by transforming them to contactless. The invention is not limited to renovations, but is also applicable in case of a new elevator installation. Following figures presents the example of a COP, but the invention is not restricted to this and the procedure is exactly the same for the case of any LOP. Any installer or worker could easily follow the instructions and transform a normal COP or LOP to touchless/contactless.

[0005] The first step is downloading the corresponding application to a smart phone or a tablet (1). The interface of the application is presented in Figure 1. The worker has to place the device in front of the COP (2) or the LOP and target it. They should be as stable as is possible in order to be steady the horizontal and vertical rulers (3).

[0006] The next step is selecting the first button (4), as is shown in Figure 2. The worker only has to touch the screen. Then it has to be registered as is presented in Figure 3. The corresponding floor is declared in box (5) and finally press the enter button (6). By this way, with the help of the vertical and the horizontal rulers, the coordinates of the COP (or LOP) button, relative to a reference point, are recorded, and the actual floor number is assigned. The procedure is repeated for the next button and continues until all the buttons are registered. Except for the floor numbers the same procedure is used for other symbols, as the symbols for "up" and "down" on a LOP or the symbols for "opening" and "closing" doors on a COP or any other symbol than may be present on a COP or a LOP.

[0007] Afterwards, the registered data have to uploaded to the sensor (7). The sensor is an optical device, as an active infrared (IR) sensor, that both emits and detects infrared radiation. Active IR sensors have two parts: a light emitting diode (LED) and a receiver. When an object -as a finger- comes in the path of IR light (8) the sensor detects intensity shifts in the received light. This information is used to track the position of the object.

[0008] Lastly, the sensor is connected to the elevator controller. The final state is a COP or LOP with an optical sensor on top or side of that, which transforms the exact position of user's finger to coordinates and coordinates to a registered floor number, which is transmitted to the controller. Finally, the controller with its conventional operation sends the elevator cabin to the requested floor.

[0009] To sum up, the installer/worker downloads the corresponding application to a smart device, as tablet or mobile phone. Then using the camera of the abovementioned device scans the COP or the LOP of the elevator and enters one-by-one the numbers of each floor in the application environment. After that the data are transferred to an optical sensor which is connected to the elevator controller. Finally, the user is able just by approaching his or her finger close to the position of the desirable floor number on the panel, and not by pushing the button, to send the elevator cabin to the corresponding floor.

Claims

1. The "Retrofit Contact to Contactless Elevator Buttons" is a method that consists of an application for smart devices, one calibration, an IR sensor and its connection to the elevator controller and is **characterized in that** it transforms, through coordinates registration, conventional elevator panel with buttons that the user has to push or touch, to contactless elevator call panel.

2. The invention according to Claim 1, is **characterized in that** the corresponding application is downloaded to a smart phone or a tablet and a worker places the device front of the Cabin Operating Panel (COP) or the Landing Operating Panel (LOP) and targets it in order to scan it on the vertical and the horizontal dimensions. The scanning process, with the help of the vertical and the horizontal rulers registers the coordinates of the COP or LOP button relative to a reference point.

3. The invention according to Claim 1-2, is **characterized in that** according to the indications of the vertical and the horizontal coordinates in the application are indicated the floor numbers of the COP and this procedure is the first and only calibration.

4. The invention according to Claim 1-3, is **characterized in that** according to the indications of the vertical and the horizontal coordinates in the application are indicated the symbols and their function of the COP or LOP and this procedure is the first and only calibration.

5. The invention according to Claim 1-4, is **characterized in that** the registered data are uploaded to an active optical sensor, which is connected to the elevator controller.

6. The invention according to Claim 1-5, is **characterized in that** the detected intensity shifts in the received light of the sensor is used to track the position of the user's finger and the controller receives the signal to move the cabin to the corresponding floor.

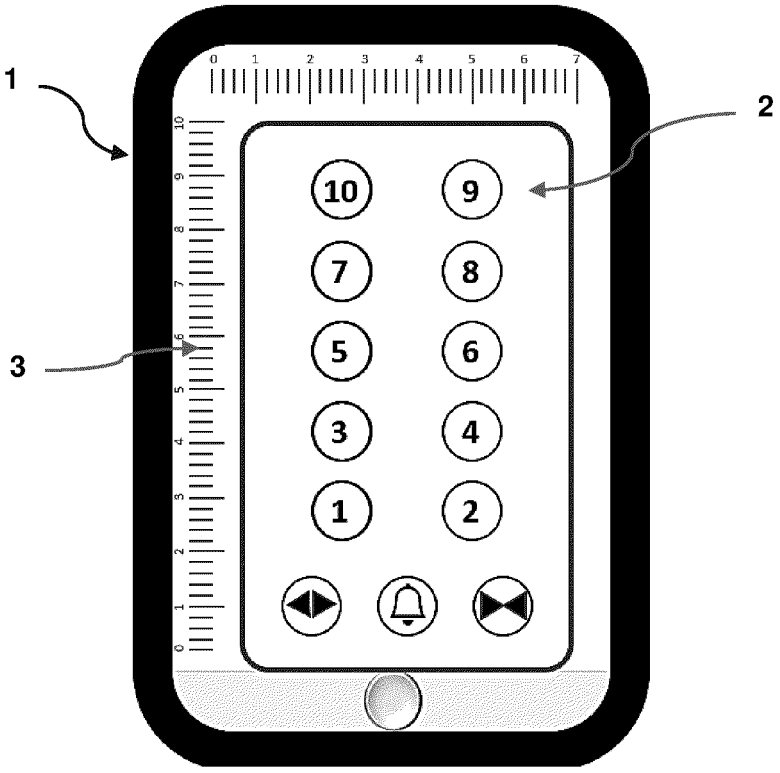

Figure 1.

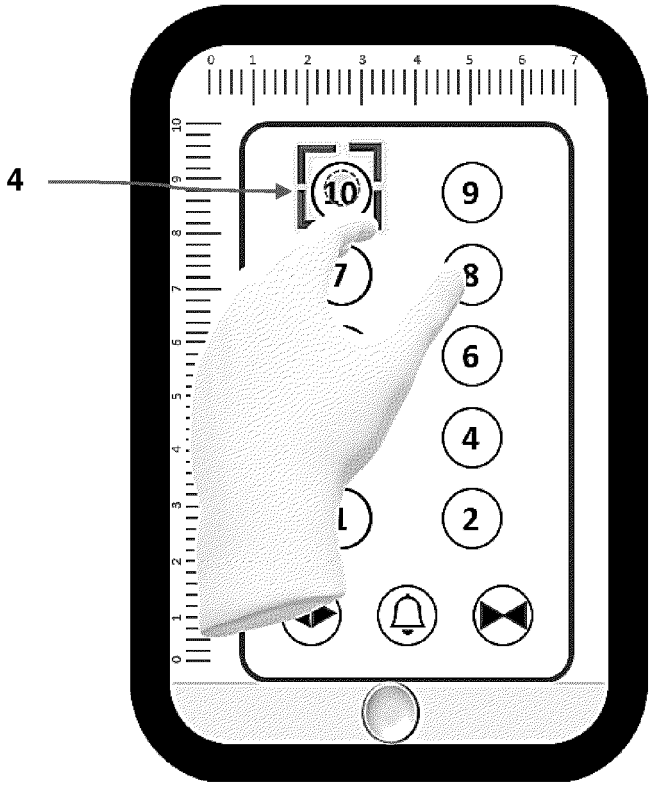

Figure 2.

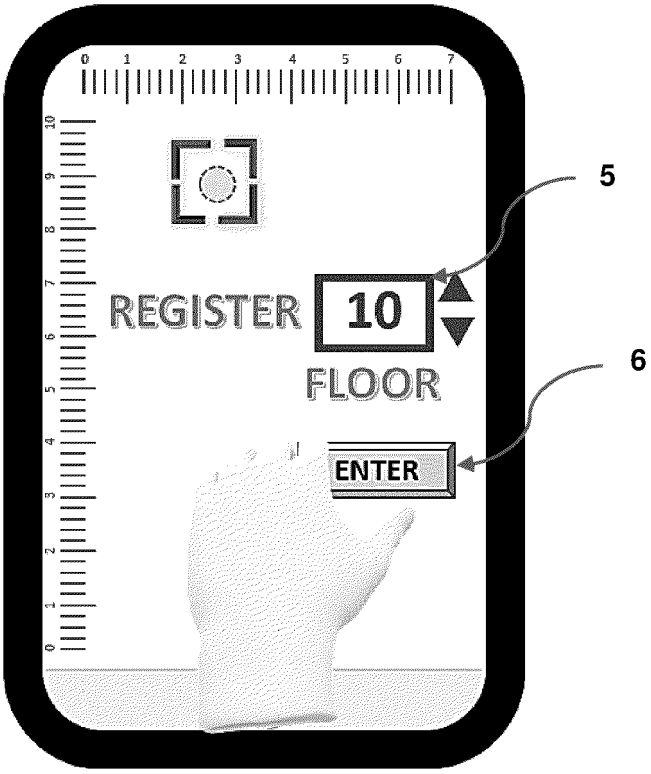

Figure 3.

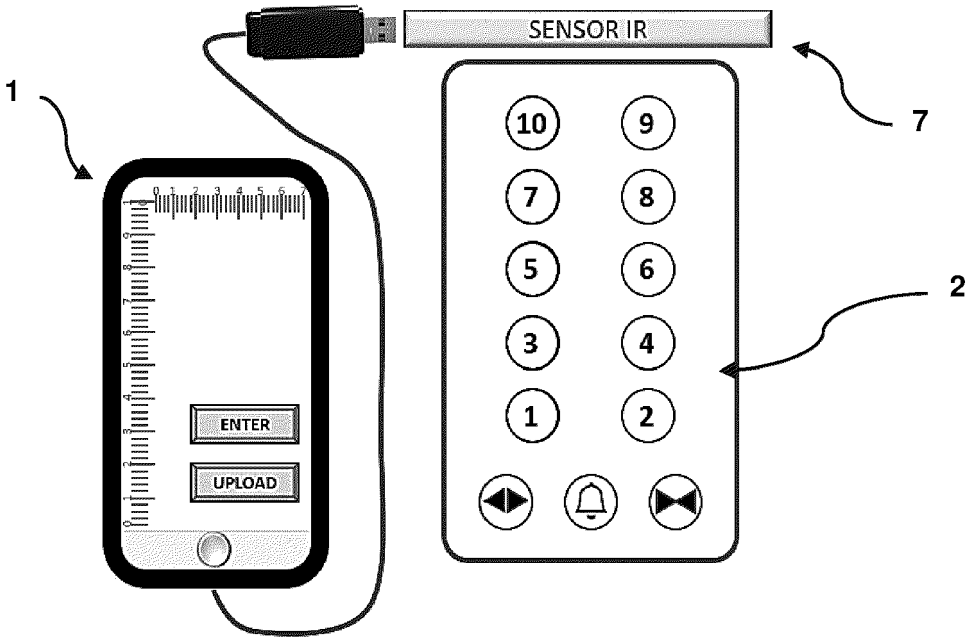

Figure 4.

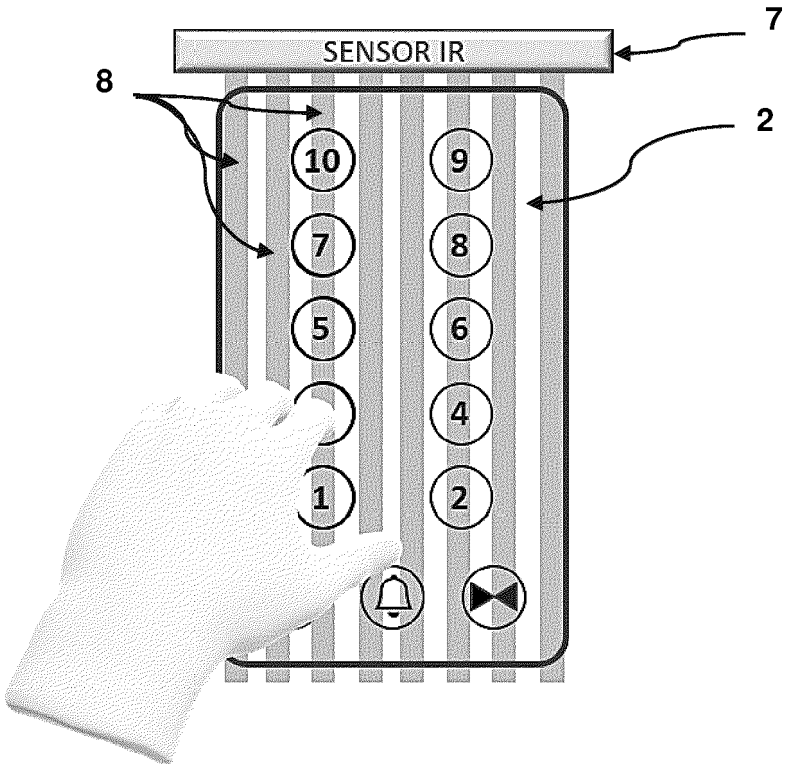

Figure 5.

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EUROPEAN SEARCH REPORT

Application Number
EP 21 02 0338

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	US 2018/354746 A1 (BLANCHARD ARNAUD [FR]) 13 December 2018 (2018-12-13) * paragraph [0027] - paragraph [0037]; figures 4,5 *	1-6	INV. B66B1/46
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X	CN 212 024 456 U (LIU ZHANGPING) 27 November 2020 (2020-11-27) * abstract; figure 2 *	1-6	

TECHNICAL FIELDS SEARCHED (IPC)

B66B

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 December 2021	Nelis, Yves

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 02 0338

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
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82