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(54) **STEREO CAMERA, OPERATION PANEL AND METHOD FOR OPERATING AN ELEVATOR**

(57) The present invention relates particularly to a stereo camera (5), an operation panel (1) and a method for operating an elevator as well as an elevator equipped with such a stereo camera (5) or an operation panel (1). There is a plurality of buttons (3) is positioned in an input area (4) on the front surface of the operation panel (1). The stereo camera (5) is constructed to be able to be positioned below this input area (4) for tracking a three-dimensional motion of an object (7) approaching one of the buttons (3) and/or detecting an object (7) adjacent to the respective buttons (3). The stereo camera (5) comprises a storage unit (8) for storing a distance threshold and a time threshold and a processor (6) for evaluating the tracking data collected by the stereo camera (5) if the processor (6) acknowledges the object (7) as a human finger or a human hand or the like, and wherein the processor (6) may actuate the button (3) to which the object (7) is adjacent, when the distance between the object (7) and this button (3) is within the distance threshold for a time duration longer than the time threshold.

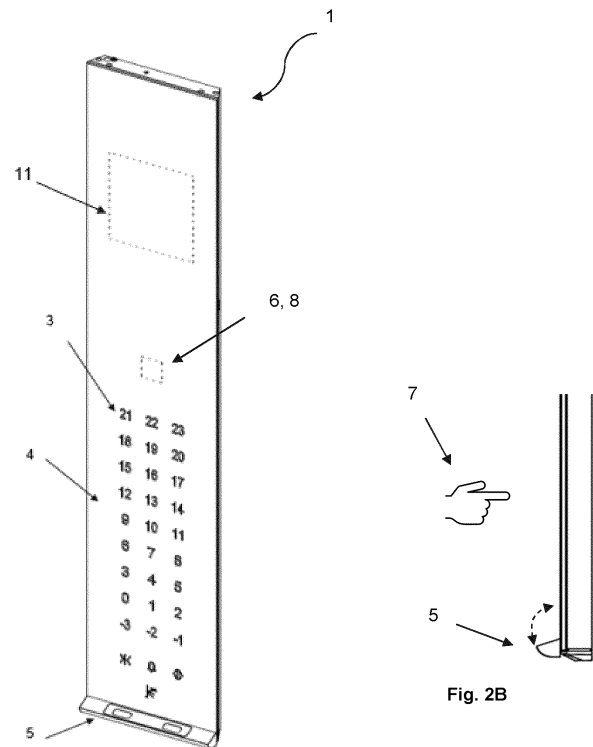


Fig. 2A

Fig. 2B

Description

[0001] The present invention relates particularly to a stereo camera, an operation panel and a method for operating an elevator as well as an elevator equipped with such a stereo camera or an operation panel.

[0002] An elevator is usually operated by an operation panel, such as a car operation panel (COP). This kind of operation panel generally comprises a plurality of buttons, which are assigned to register different floors or special functions respectively. For selecting a destination floor, these buttons can be actuated contacted or contactless with different technologies. For instance, these buttons may be a mechanical push button, which may be pressed down mechanically to actuate. Alternatively, these buttons can be constructed as a capacitive sensor, an inductive sensor, or other type of sensor, which may be actuated only by touching or approaching them.

[0003] During the COVID-19 pandemic, the touchless interfaces are even more critical. Passengers are more alert to touch than ever before, an aversion likely to persist for a long time. Reducing or eliminating touch points is essential for safely reopening businesses and daily socializing. However, there are still a lot of elevator operation panels that are not yet touch-/contactless. If the operation panel is to be improved into a non-contact operation panels, many parts or components of the panels must be modified in software and hardware. This will be technically difficult and complicated, so the cost is very high.

[0004] Accordingly, there may be a need for modifying or modernizing a touch operation panel of an elevator in a simple way so that this panel can be used for contactless input, in order to improve passenger's comfort.

[0005] Such a need may be met with the subject-matter of the independent claims. Advantageous embodiments are defined in the dependent claims as well as in the following specification.

[0006] According to the first aspect of the present invention, there is provided a stereo camera for an operation panel of an elevator, wherein a plurality of buttons is located in an input area on the front surface of the operation panel. A so-called stereo camera is a kind of camera with two or more lenses, each with a separate image sensor. This enables the camera to simulate human binocular vision, so that it can capture three-dimensional (3D) images. The stereo camera is configured to be able to be positioned below the input area for tracking a three-dimensional motion/movement of an object approaching/approximating one of the buttons and/or detecting an object adjacent to the respective buttons. The stereo camera comprises a storage unit for storing a distance threshold and a time threshold. Such a storage unit can be an integrated part of the stereo camera. If the storage unit is not a part of the stereo camera, it may also be a separate unit such as a USB flash drive or SD-card, etc. The stereo camera further comprises a processor for evaluating the tracking data collected by the

stereo camera if the processor acknowledges the object as a human finger or a human hand or the like. Any other object else will not be detected or tracked. The processor may actuate the button to which the object is adjacent, when the distance between the object and this button is within the distance threshold for a time duration longer than the time threshold.

[0007] According to an embodiment of the present invention, the stereo camera can be positioned on the bottom edge or at the bottom portion of the operation panel. Therefore, the operation panel can be easily modified or modernized by such a stereo camera, wherein it does not need to split or divide the operation panel. Compared with mounting the stereo camera on the top of an operation panel, the camera at on the bottom edge or at the bottom portion of an operation panel has advantages, because the operation panel often has a monitor or a broad free area above the buttons. The stereo camera positioned below the buttons can avoid being influenced by the monitor or ambient light.

[0008] According to a further embodiment of the present invention, the stereo camera is an infrared stereo camera (also called as thermographic camera) which includes at least two separate lenses, each equipped with an infrared light source. Each lens and light source operate independently. Infrared waves are waves of heat - also known as thermal radiation - that are emitted by all living things. Therefore, it is possible to detect and track a human finger/hand close to the input area or buttons. This can avoid detection errors if an object is shaped like a human finger but not really a finger. Since the stereo camera positioned below the input area is facing upwards, this arrangement could cause a problem due to the interference of ceiling lights or sunlight. Optical interference can be reduced by using the infrared camera with an infrared light source. In order to further reduce the amount of ambient light reaching the camera sensor, the camera lens can be covered by an infrared filter glass.

[0009] According to a further embodiment of the present invention, the stereo camera comprises body housing which is detachable or replaceable mounted on the operation panel. For mounting the body housing, any known means may be used such as the housing can be glued, attached, or fixed on the operation panel. The stereo camera has a flat cable extending from the rear wall of the body housing, which is used for connecting to a processing unit placed inside the operation panel. Therefore, there is no need to change the design, shape, structure or size of the operation panel. The flat cable is utilized to transmit data from the stereo camera to the processing unit, for example, to register a destination call of the elevator. After the call is registered, the operation panel may provide feedback to passengers by illuminating the selected button.

[0010] According to a further embodiment of the present invention, the body housing can be manually or automatically moved along and/or rotated around a transverse axis parallel to the front surface of the operation

panel to adjust the viewing angle of the stereo camera or switching the stereo camera in its off/closed position. Usually, the camera lenses should face upwards or towards the ceiling of an elevator car. The movement or the rotation may depend on the distance to the input area to be monitored or the requirement of the size of this input area. This movement or the rotation may also depend on a need of focusing the camera lens.

[0011] With this kind of stereo camera, an operation panel of an elevator can be easily improved into a panel that can be operated with or without contacted, regardless of the type or kind of the buttons of the operation panel. Therefore, it does not matter whether the operation panel is a contact operation or a contactless operation. For example, the operation panel can be a touch-screen with capacitive touch buttons. Even if a button is defective, the button can be actuated when the stereo camera recognizes the intention to actuate the button. Even if the internal structure of the operation panel is very complicated, it is very easy to install such a stereo camera outside the operation panel.

[0012] According to the second aspect of the present invention, an operation panel is provided for an elevator is provided. The operation panel includes a plurality of buttons located in an input area on the front surface of the operation panel, wherein the buttons are configured to be actuated contacted and/or contactless. The operation panel further comprises a stereo camera for monitoring the input area, which is positioned below the input area, wherein the stereo camera may track a three-dimensional motion/movement of an object approaching/approximating one of the buttons and/or detect an object adjacent to the buttons, a storage unit for storing a distance threshold and a time threshold, and a processor for evaluating the tracking data collected by the stereo camera if the processor acknowledges the object as a human finger or a human hand or the like. Any other object will not be detected or tracked. The processor may actuate the button to which the object is adjacent, when the distance between the object and this button is within the distance threshold for a time duration longer than the time threshold.

[0013] According to the second aspect of the present invention, the stereo camera can be simplified, because the stereo camera no longer needs a processor and a storage unit. And the processor and the storage may be placed into the operation panel or functionally combined with the existing components of the operation panel. In this case, the stereo camera only needs to monitor the input area and track an object adjacent to the buttons, without evaluating the tracking data collected. For example, if a button for a destination floor is actuated, the processor of the operation panel or another processing unit of the operation panel capable of communicating with the processor may register a destination call of an elevator. After the call is registered, the operation panel may also provide feedback to passengers by illuminating the selected button.

[0014] However, an operation panel according to the second aspect of the present invention is also compatible with a stereo camera according to the first aspect of the present invention. That means that the said processor and the said storage unit of the operation panel and of the stereo camera can be selected when configuring the stereo camera arranged to the operation panel.

[0015] According to embodiments of the second aspect of the present invention, the stereo camera is positioned on the bottom edge or at the bottom portion of the operation panel. The stereo camera is an infrared stereo camera comprising at least two separate lenses, each equipped with an infrared light source. The stereo camera is detachable or replaceable mounted on the operation panel. The stereo camera is detachable mounted on the operation panel. The stereo camera can be manually or automatically moved along and/or rotated around a transverse axis parallel to the front surface of the operation panel for adjusting the viewing angle of the stereo camera or switching the stereo camera in its off/closed position.

[0016] According to the third aspect of the present invention, a method for operating an operation panel of an elevator is proposed, wherein the operation panel comprises a plurality of buttons located in an input area on the front surface of the operation panel, wherein the buttons are configured to be actuated contacted and/or contactless, with steps:

- monitoring the input area with a stereo camera positioned below the input area, wherein the stereo camera may track the motion of an object approaching/approximating one of the buttons or detect an object adjacent to the respective buttons,
- evaluating the tracking data collected by the stereo camera if the object is acknowledged as a human finger or a human hand or the like, and
- actuating one of the buttons when the distance between the object and this button is within a distance threshold for a time duration longer than a time threshold.

[0017] According to embodiments of the third aspect of the present invention, the object is acknowledged as a human finger or a human hand or a human hand or the like by identifying the appearance and/or the temperature of the object. By moving and/or rotating the stereo camera manually or automatically along and/or around a transverse axis parallel to the front surface of the operation panel the viewing angle of the stereo camera is adjusted, or the stereo camera can be turned in its off/closed position.

[0018] According to the fourth aspect of the present invention, an elevator system is equipped with an aforementioned operation panel or is controllable through a method mentioned above.

[0019] It shall be noted that the possible features and advantages of embodiments of the present invention are

described herein concerning a mobile device, a method, and an elevator system mentioned above. One skilled in the art will recognize that the features may be suitably transferred from one embodiment to another and features may be modified, adapted, combined, and/or replaced, etc., in order to come to further embodiments of the present invention. Ideas underlying embodiments of the present invention may be interpreted as being based, inter alia, and without restricting the scope of the present invention, on the following observations and recognitions.

[0020] In the following, advantageous embodiments of the present invention will be described regarding the enclosed drawings. However, neither the drawings nor the description shall be interpreted as limiting the invention.

Fig. 1 shows a stereo camera according to the present invention,

Fig. 2 shows an exemplary embodiment of an operation panel according to the present invention,

Fig. 3 shows another exemplary embodiment of an operation panel according to the present invention.

[0021] Fig. 1 shows a stereo camera 5, for example, an infrared stereo camera used for elevator operation panel. The stereo camera comprises two separate lenses 5a, 5b, each equipped with an infrared light source 5c, 5d. Each lens and light source may operate independently. Infrared waves are waves of heat - also known as thermal radiation - that are emitted by all living things. Therefore, it is possible to detect and track a human finger or a human hand adjacent to the input area or buttons there. This can avoid detection errors, if the object is shaped like a human finger but not really a finger. On the other hand, light interference can be reduced by using the infrared camera with an infrared light source.

[0022] The stereo camera 5 comprises body housing 2 detachably mounted on an operation panel. The lenses 5a, 5b and the infrared light sources 5c, 5d are arranged in the body housing 2 so that they can be protected from light interference from the external environment. The body housing 2 has a cover 5e that can be closed and opened. There are two windows 5f in the cover 5e, whose positions correspond to those of the lenses 5a, 5b. In order to further reduce the interference of ambient light, the camera lenses 5a and 5b can be covered with an infrared filter glass. The lenses 5a and 5b and the light sources 5c and 5d may detect or contact the external environment through these windows 5f. Therein, Fig. 1A shows a stereo camera whose body housing 2 has a closed cover 5e, while Fig. 1B shows that the cover 5e is opened.

[0023] As shown in Fig. 1B, the stereo camera 5 comprises a storage unit 8 for storing a distance threshold and a time threshold. This storage unit 8 can be an inte-

grated part of the stereo camera, or it can be a separate unit that can be inserted in the stereo camera, such as a USB flash drive or SD-card. The stereo camera 5 also includes a processor 6, which may evaluate tracking data collected by the stereo camera 5 if the processor 6 acknowledges the object 7 as a human finger/hand or the like. The processor 6 may also actuate the button that the object is approaching, when the distance between the object and this button is within the distance threshold for a time duration longer than the time threshold.

[0024] Fig. 2 shows an operation panel 1 according to the present invention, which comprises an input area 4 on the front surface. In Fig. 2A, a perspective view of such an operation panel 1 is illustrated, and a side view of this operation panel 1 is shown in Fig. 2B. A plurality of buttons 3 is located within the input area 4, and these buttons will be actuated, for example, for registering a destination call. The operation panel 1 comprises an above-mentioned stereo camera 5 for monitoring the input area 4 located below it, wherein the stereo camera 5 may track a three-dimensional movement of an object 7 approaching one of the buttons 3 and/or detect an object adjacent to the respective buttons 3. The buttons 3 in the input area 4 can be constructed in different mechanism, such as mechanical, electrical, capacitive, magnetic, or etc., so that the buttons 3 can be actuated with contacted or without contact. According this invention, the buttons 3 may be just a sign or a graphic symbol printed or projected on the front surface of the operation panel 1. In order to detect each of the buttons in this way, the stereo camera 5 may define a grid layout of the buttons 3 and detect where the button 3 is located and which one of the buttons 3 is there.

[0025] Since the operation panel 1 has a display 11 above the input area, it is advantageous to mount the stereo camera 5 detachable or replaceable on the operation panel 1, for example, on the bottom edge or at the bottom portion of the operation panel 1. The stereo camera 5 positioned below the buttons can avoid getting affected by lighting from the display or environment. Furthermore, to setup the stereo camera 5 it may require an angle adjustment or lateral adjustment. So as shown in Fig. 2B, the stereo camera 5 can be manually or automatically moved along and/or rotated around a transverse axis for adjusting the viewing angle of the stereo camera 5 or switching the stereo camera 5 in its off/closed position. In the closing position, the stereo camera 5 is shut off. Thus, it can save energy when the operation panel 1 or the stereo camera 5 is in standby.

[0026] To ensure the movement or rotation of the stereo camera 5 relative to the operation panel 1, the vertical distance between the transverse axis and the front surface of the operation panel 1 should be greater than 10 mm.

[0027] Regardless of whether the stereo camera 5 comprises a processor 6 capable of evaluating tracking data and actuating a button, or whether the stereo camera 5 comprises a storage unit 8, the operation panel 1

in this embodiment may have its own processor 6 or storage unit 8 which may have the same functions and accomplish the same task as the stereo camera 5. If both the stereo camera 5 and the operation panel 1 have a said processor and a said storage unit, when configuring the stereo camera 5 or the operation panel 1, a user may determine which processor 6 is to be used for evaluating the tracking data collected, and for actuating the button 3, to which the object 7 is adjacent, when the distance between the object 7 and this button 3 is within the distance threshold for a time duration longer than the time threshold. The threshold value can be stored in any one or both of the storage units 8. The processor 6 of the operation panel 1 or another processing unit (not shown) of the operation panel 1 which can communicate with the processor 6, may activate a function corresponding to the actuation of a button 3. For example, a destination call can be registered, if a button 3 for a destination floor is actuated.

[0028] Fig. 3 illustrates another exemplary embodiment of an operation panel 1 according to the present invention. For this embodiment, the operation panel 1 comprises one or more inserts or key-operated switches in the form of a cylinder 10 at the bottom of the panel, wherein the cylinder 10 extends along the said transverse axis. In this case, the stereo camera 5 can be located above the cylinder 10 and below the input area 4.

[0029] Finally, it should be noted that the term "comprising" does not exclude other elements or steps, and the "a" or "an" does not exclude a plurality. Also, elements described in association with different embodiments may be combined. It should also be noted that reference signs in the claims should not be construed as limiting the scope of the claims.

Claims

1. Stereo camera (5) for an operation panel (1) of an elevator, wherein a plurality of buttons (3) is located in an input area (4) on the front surface of the operation panel (1), the stereo camera (5) is constructed to be able to be positioned below this input area (4) for tracking a three-dimensional motion of an object (7) approaching one of the buttons (3) and/or detecting an object (7) adjacent to the respective buttons (3), the stereo camera (5) comprises a storage unit (8) for storing a distance threshold and a time threshold and a processor (6) for evaluating the tracking data collected by the stereo camera (5) if the processor (6) acknowledges the object (7) as a human finger or a human hand or the like, and wherein the processor (6) may actuate the button (3) to which the object (7) is adjacent, when the distance between the object (7) and this button (3) is within the distance threshold for a time duration longer than the time threshold.
2. Stereo camera (5) according to claim 1, wherein the stereo camera (5) is able to be positioned on the bottom edge or at the bottom portion of the operation panel (1).
3. Stereo camera (5) according to claim 1 or 2, wherein the stereo camera (5) is an infrared stereo camera comprising at least two separate lenses (5a, 5b), each of them is equipped with an infrared light source (5c, 5d).
4. Stereo camera (5) according to any one of claims 1 to 3, wherein the stereo camera (5) comprises body housing (2) which is detachable mounted on the operation panel (1).
5. Stereo camera (5) according to any one of claims 1 to 4, wherein the body housing (2) is manually or automatically moveable along and/or rotatable around a transverse axis parallel to the front surface of the operation panel (1) for adjusting the view angle of the stereo camera (5) or switching the stereo camera (5) in its off position.
6. Operation panel (1) for an elevator, comprising:
 - a plurality of buttons (3) located in an input area (4) on the front surface of the operation panel (1), wherein the buttons (3) are configured to be actuated contacted and/or contactless,
 - a stereo camera (5) for monitoring the input area (4) is positioned below the input area (4), wherein the stereo camera (5) may track a three-dimensional motion of an object (7) approaching one of the buttons (3) and/or detect an object adjacent to the respective buttons (3),
 - a storage unit (8) for storing a distance threshold and a time threshold,
 - a processor (6) for evaluating the tracking data collected by the stereo camera (5) if the processor (6) acknowledges the object (7) as a human finger or a human hand or the like, wherein the processor (6) may actuate the button (3) to which the object (7) is adjacent, when the distance between the object (7) and this button (3) is within the distance threshold for a time duration longer than the time threshold.
7. Operation panel (1) according to claim 6, wherein the stereo camera (5) is positioned on the bottom edge or at the bottom portion of the operation panel (1).
8. Operation panel (1) according to claim 1 or 2, wherein the stereo camera (5) is an infrared stereo camera

comprising at least two separate lenses (5a, 5b), each of them (5a, 5b) is equipped with an infrared light source (5c, 5d).

9. Operation panel (1) according to any one of claims 1 to 3, wherein the stereo camera (5) is detachable mounted on the operation panel (1). 5
10. Operation panel (1) according to any one of claims 1 to 4, wherein the stereo camera (5) is manually or automatically moveable along and/or rotatable around a transverse axis parallel to the front surface of the operation panel (1) for adjusting the viewing angle of the stereo camera (5) or switching the stereo camera (5) in its off position. 10
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11. Method for operating an operation panel (1) of an elevator, wherein the operation panel (1) comprises a plurality of buttons (3) located in an input area (4) on the front surface of the operation panel (1), wherein the buttons (3) are configured to be actuated contacted and/or contactless, with steps: 20
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 - monitoring the input area (4) with a stereo camera (5) positioned below the input area (4), wherein the stereo camera (5) may track the motion of an object (7) approaching one of the buttons (3) and/or detect an object (7) adjacent to the respective buttons (3), 30
 - evaluating the tracking data collected by the stereo camera (5) if the object (7) is acknowledged as a human finger or a human hand or the like, and 35
 - actuating one of the buttons (3) when the distance between the object (7) and this button (3) is within a distance threshold for a time duration longer than a time threshold. 40
12. Method according to claim 11, wherein the stereo camera (5) is an infrared stereo camera comprising at least two separate lenses (5a, 5b) which are equipped with an infrared light source (5c, 5d) respectively. 45
13. Method according to claim 11 or 12, wherein the object (7) is acknowledged as a human finger or a human hand or the like by identifying the appearance and/or the temperature of the object (7). 50
14. Method according to any one of claim 11 to 14, wherein by moving and/or rotating the stereo camera (5) manually or automatically along and/or around a transverse axis parallel to the front surface of the operation panel (1) the viewing angle of the stereo camera (5) is adjustable or the stereo camera (5) 55

can be turned in its off position.

15. Elevator system (2) equipped with an operation panel (1) according to any of the claims 6 to 10 or being controllable through a method according to any of the claims 11 to 14.

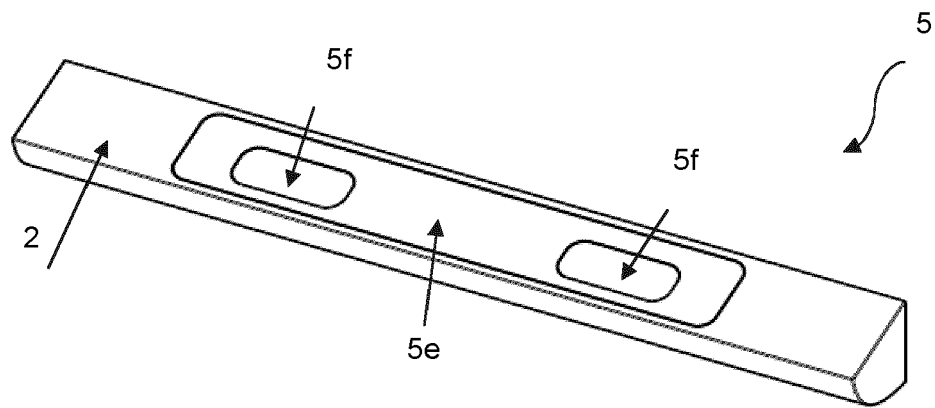


Fig. 1A

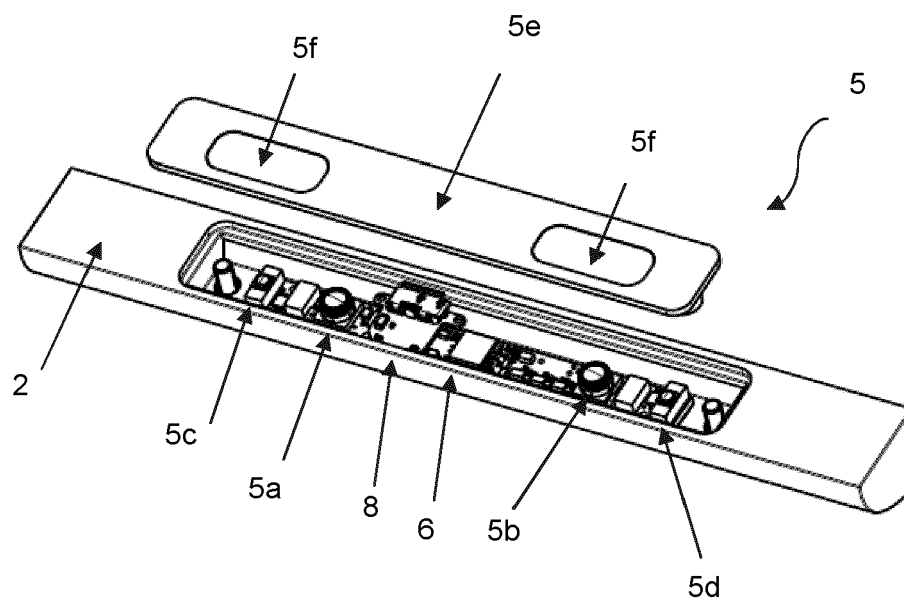


Fig. 1B

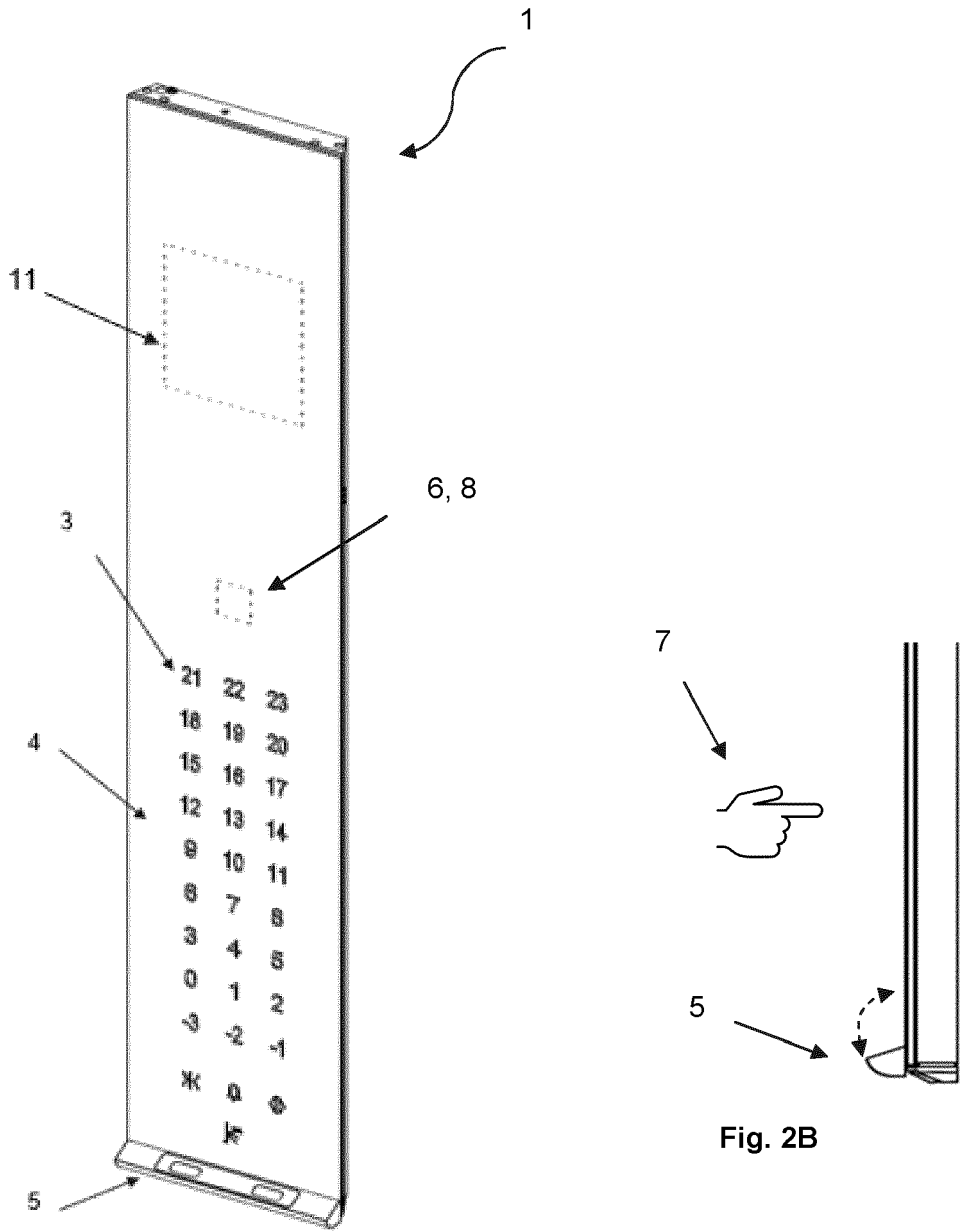


Fig. 2A

Fig. 2B

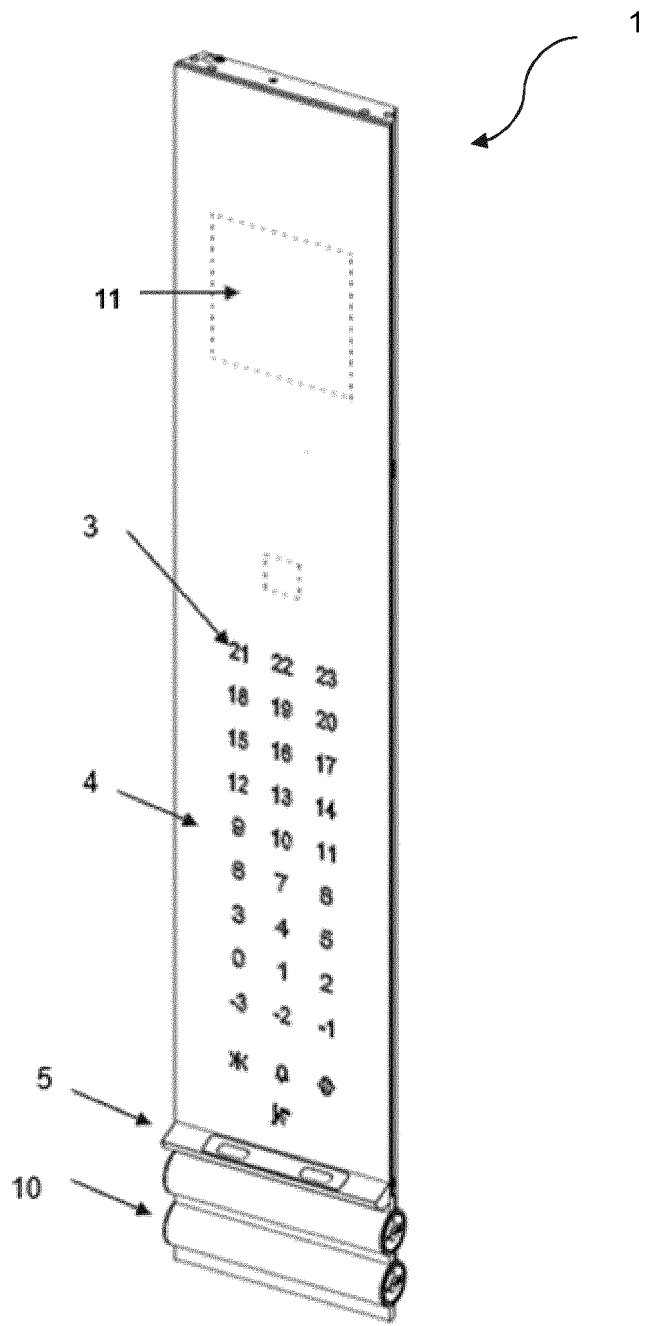


Fig.3A

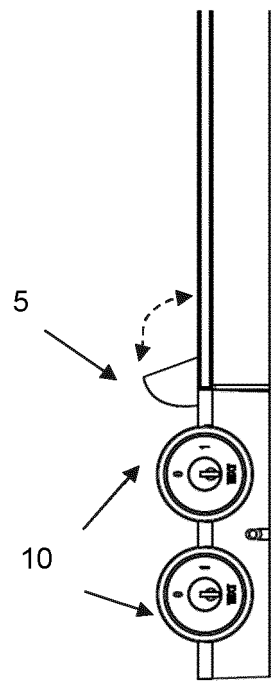


Fig. 3B



EUROPEAN SEARCH REPORT

Application Number

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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	Ultraleap: "Touchless Elevator Powered by Ultraleap", / 4 August 2020 (2020-08-04), XP055940248, Retrieved from the Internet: URL:https://www.youtube.com/watch?v=7OhO33eEIus [retrieved on 2022-07-08] * the whole document * -----	1-15	INV. B66B1/46
X	Ultraleap: "Touchless Elevators: Rethinking the Way We Ride", / 16 October 2020 (2020-10-16), XP055940250, Retrieved from the Internet: URL:https://www.ultraleap.com/company/news/blog/touchless-elevator/ [retrieved on 2022-07-08] * pages 1-5 * -----	1-15	
A	US 2019/344998 A1 (YOON IL SHIK [KR]) 14 November 2019 (2019-11-14) * abstract; figures 1-13 * * paragraphs [0028] - [0063] * -----	1-15	TECHNICAL FIELDS SEARCHED (IPC) B66B
A	US 2015/185857 A1 (JUNG MOONJIN [KR]) 2 July 2015 (2015-07-02) * abstract; figures 1-4 * -----	1-15	
A	JP 2011 162307 A (MITSUBISHI ELECTRIC CORP) 25 August 2011 (2011-08-25) * abstract; figures 1-9 * -----	1-15	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 July 2022	Examiner Bleys, Philip
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 15 2745

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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08-07-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2019344998 A1	14-11-2019	CN 109843769 A	04-06-2019
		EP 3524558 A1	14-08-2019
		JP 6671546 B2	25-03-2020
		JP 2019531239 A	31-10-2019
		KR 101821522 B1	08-03-2018
		SG 11201903118X A	30-05-2019
		US 2019344998 A1	14-11-2019
US 2015185857 A1	02-07-2015	WO 2018147576 A1	16-08-2018
		CN 104335145 A	04-02-2015
		EP 2860611 A1	15-04-2015
		US 2015185857 A1	02-07-2015
JP 2011162307 A	25-08-2011	WO 2013183938 A1	12-12-2013
		NONE	