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(54) **ELEVATOR INFORMATION SYSTEM FOR SAFE CABIN ENVIRONMENT**

(57) This is an invention that refers to an elevator information system, that informs the passengers before they enter in the cabin about the environment, the air quality and mobility inside the cabin. The passenger is

able to check several information while waiting the cabin's landing and make a choice, of entering or not, depending on these pieces of information.

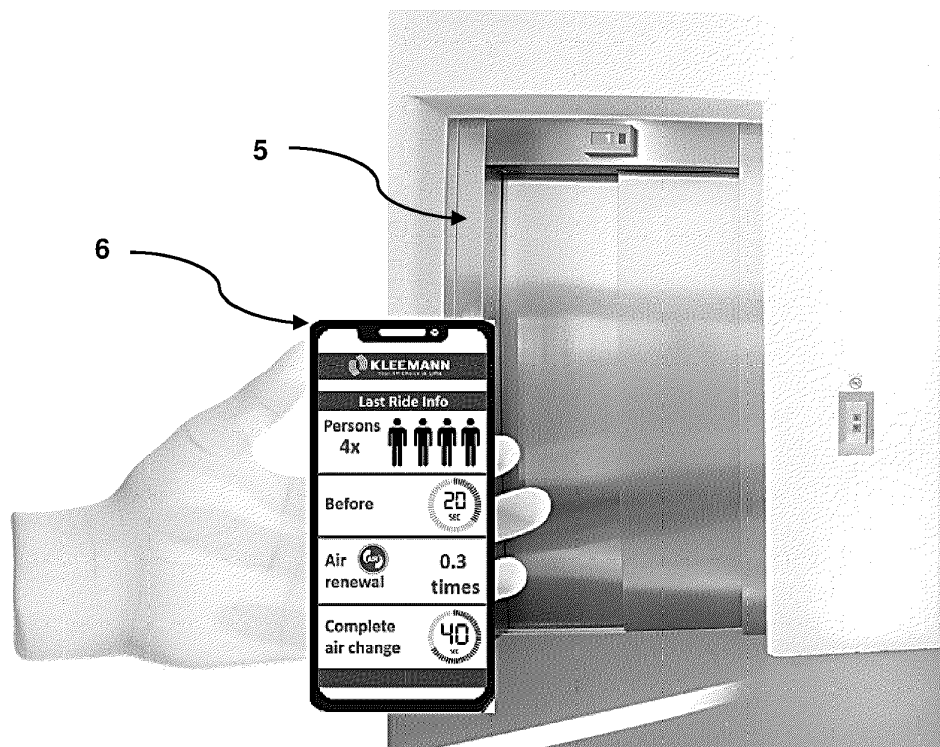


Figure 2.

Description

[0001] Present invention refers to an elevator information system, that informs the passengers before they enter in the cabin about the environment, the air quality and mobility inside the cabin. The passenger is able to check several information while waiting the cabin's landing and make a choice, of entering or not, depending on these pieces of information. Following are described further details about the invention.

[0002] The daily use of elevators, and the range of people who use them, makes it essential to protect the users due to airborne microorganisms, such as viruses, that may be transferred between people. These airborne microorganisms may be blamed for the spread of a disease over a number of people. It is estimated that almost 5.9 million elevators are in use, according to statistics of ELA (European Lifts Association), while the elevators and the escalators, are used 1 billion times per day.

[0003] Although passengers can choose when the cabin door is opening, if they will board or not, based on the people who are already in the elevator cabin, they do not have any clue of passenger previous load when nobody is present at the moment of opening the door. It could be however the case that elevator was traveling with full passenger capacity few seconds before entry. The indoor environment of the cabin is loaded with airborne microorganisms and odors. While the odors are just unpleasant, the airborne microorganisms, which are transferred via human breath, cough or sneeze, may spread contagious diseases. Even if there is an air filter, an air purifier or a fan system, it would take several seconds to completely clean the indoor cabin air.

[0004] The abovementioned situation reveals the need of an information system about the previous use of the elevator. The present invention is an information system that briefly informs someone about the last use of the elevator. The details that it holds are the number of users in the last ride, the time elapsed since the elevator was last used and the air quality level according to the ability of the air purifier or filter, that is installed in the cabin, to fully recycle the indoor cabin air.

[0005] First of all, Figure 1 describes further the details of the present invention. Specifically, Figure 1 presents the given information about the last ride, which are the number of persons who used the elevator (1), the time elapsed since they all get out of the cabin (2), the number of times that has the indoor cabin air been renewed (3), according to the characteristics of the fan and/or the air purifier that are installed in the cabin, and finally an estimation of the time remaining until the indoor cabin air is completely refreshed (4). After checking the status, the users are able to choose if they are willing to enter the cabin or choose another elevator of the building, if there is one, or even wait a small amount of time before using the elevator, until the indoor cabin air is completely renewed. It should be mentioned that the number of persons who were in the elevator cabin are detected through

a camera and this information is recorded by the elevator controller, which transfers all the information to the presented invention, the elevator information system for safe cabin environment.

[0006] Furthermore, Figures 2 and 3 present two different versions of the invention. In Figure 2 is presented the case that a user is approaching an elevator (5). The data, which are collected by the elevator controller, are transferred via means of wireless communication technology, Bluetooth or Wi-Fi, to the mobile phone (6) of the user. Then, the user is able to check the information just by opening the corresponding application and make their choice.

[0007] On the other hand, Figure 3 presents the second version of the invention. In case of a group of elevators, such as (5a) and (5b), is usual installing a destination selection control terminal in the entrance (6). The destination selection control is enhanced for the building traffic situation in order to increase the handling capacity with high traffic and/or to generate as few runs as possible with low traffic volume. The screen on the terminal is showing also the information (1), (2), (3) and (4). The passenger enters their destination at a terminal in the landing, in response to which the most favourable elevator is calculated, by also taking into account the information about the indoor cabin air quality, and assigned. The assigned elevator is immediately displayed to the passenger. The passenger waits in front of the elevator assigned to them. The same idea is able to be used even if the destination selection control is not applicable. There could be a terminal (6) only with the information (1), (2), (3) and (4), and the system would recommend to passengers which cabin to be used based on level of clean air, as it is presented if Figure 4.

[0008] The invention is useful for any kind of public building, such as buildings with professional offices, educational buildings and shopping centres. Especially, the invention is even more appropriate for places with high microbial and virus load, as hospitals, medical centres and generally health related services and research centres.

Claims

1. The "Elevator information system for safe cabin environment" is **characterized in that** it is a system that informs a passenger on parameters affecting cabin air quality prior to his entrance in the elevator, as the number of persons who used the elevator (1), the time elapsed since the cabin emptied (2), how many times has the indoor cabin air been renewed (3), according to the characteristics of the fan and/or the air purifier that are installed in the cabin, and finally an estimation of the time remaining until the indoor cabin air is completely refreshed (4).
2. The invention according to Claim 1, is **characterized**

in that the information is displayed to any mobile device of passenger, such as mobile phone, by means of wireless communication technology, Bluetooth or Wi-Fi.

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3. The invention according to Claim 1-2, is **characterized in that** in case of group of elevators the system recommends to passenger which cabin to be used based on level of clean air, through a terminal (7) placed out of the entrance or any mobile device of passenger. 10
4. The invention according to Claim 1-3, is **characterized in that** a camera is provided in the cabin to detect number of passengers. 15
5. The invention according to Claim 1-4, is **characterized in that** the elevator controller records time elapsed since the last ride. 20
6. The invention according to Claim 1-5 is **characterized in that** the elevator controller calculates or correlates operation time of air circulation fan and/or air purifier/filter. 25
7. The invention according to Claim 1-6, is **characterized in that** the elevator controller incorporates positive compensation factor in time needed for complete cabin volumetric air recirculation in correlation with number of passengers in the ride and air cleaning efficiency of fan system. 30

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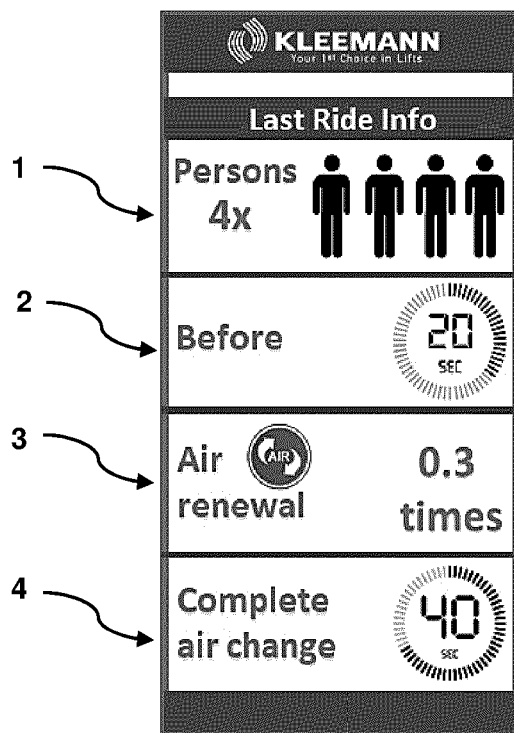


Figure 1.

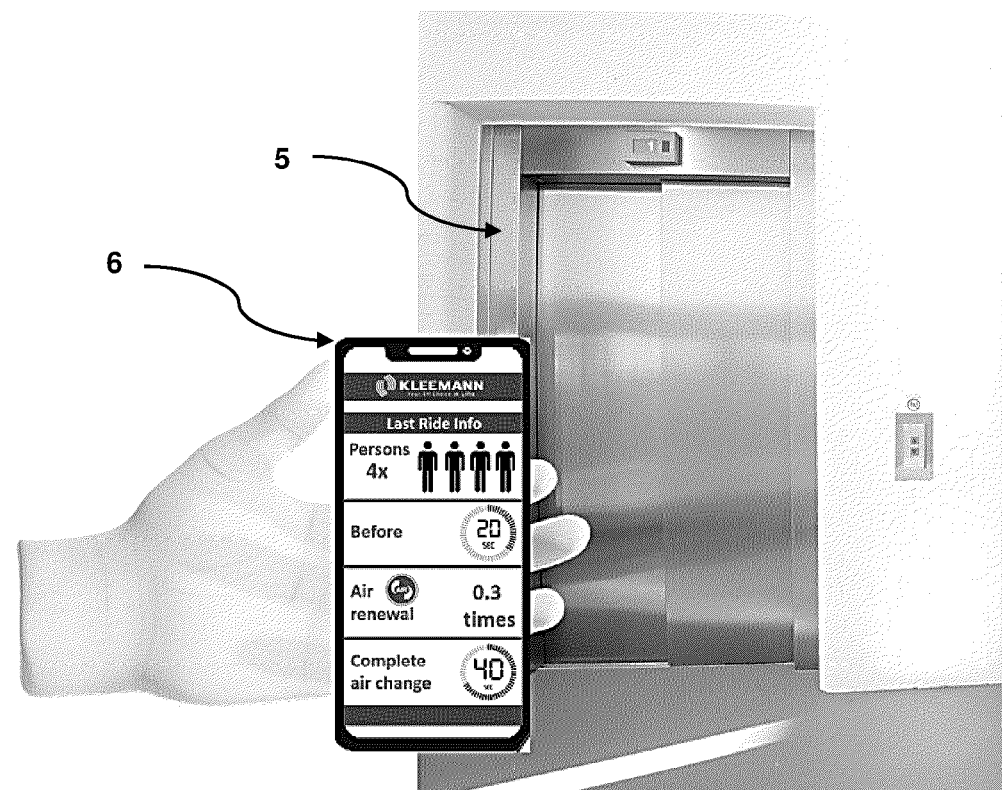


Figure 2.

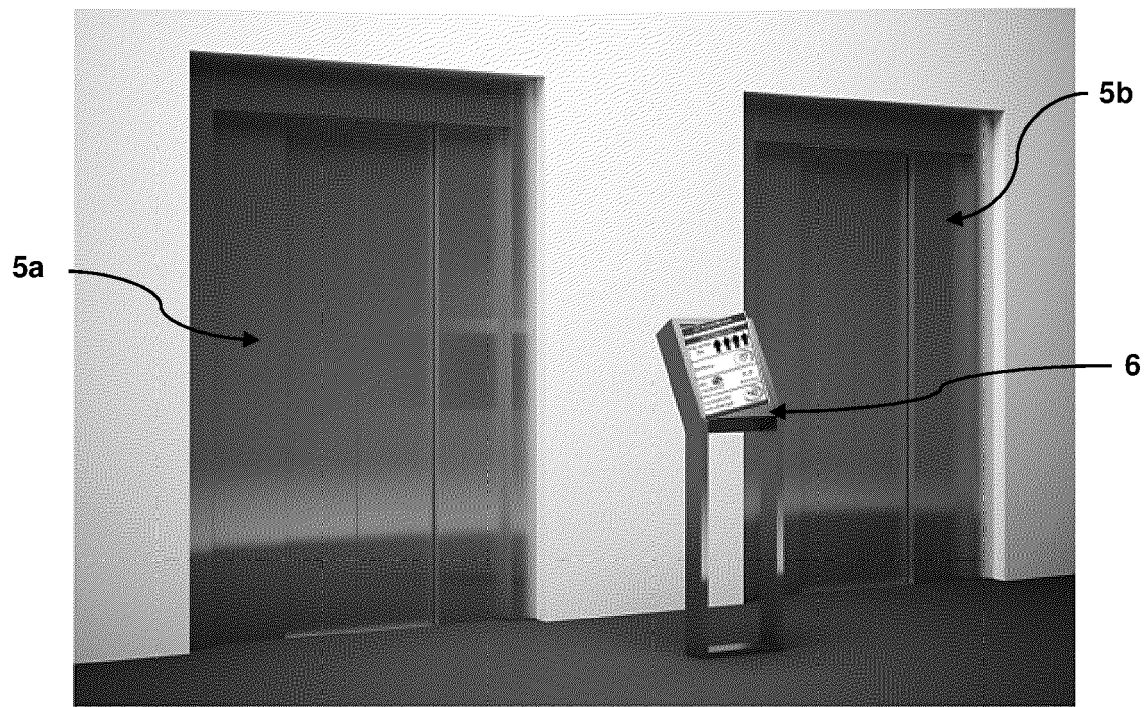


Figure 3.

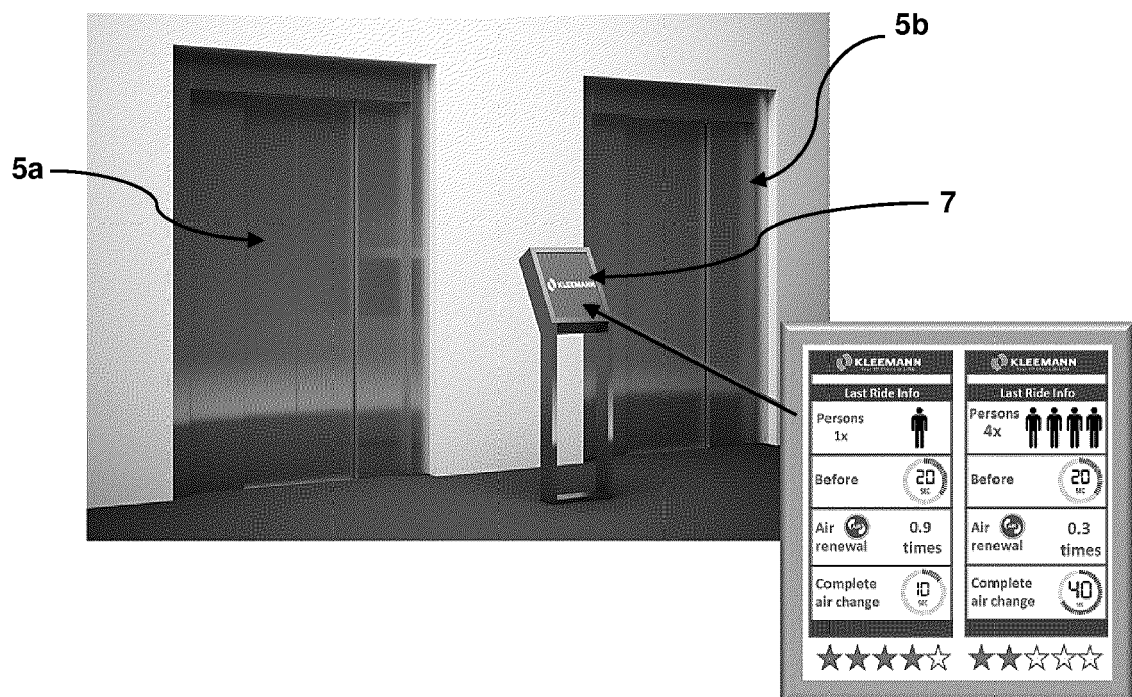


Figure 4.



EUROPEAN SEARCH REPORT

 Application Number
 EP 21 02 0181

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	CN 209 038 824 U (OTIS ELEVATOR CO) 28 June 2019 (2019-06-28) * abstract * * paragraph [0046] * * figures 1, 2 *	1-7	INV. B66B3/00
A	----- CN 205 739 932 U (SHANGHAI STEP ELECTRIC CORP) 30 November 2016 (2016-11-30) * abstract * * paragraph [0033] * * figure 2 *	1-7	
A	----- CN 205 802 725 U (XUZHOU COLLEGE IND TECHNOLOGY) 14 December 2016 (2016-12-14) * abstract * * paragraph [0023] * * figure 2 *	1-7	
A	----- CN 210 594 778 U (LIU XIANGYONG) 22 May 2020 (2020-05-22) * abstract * * paragraph [0026] *	1-7	TECHNICAL FIELDS SEARCHED (IPC)
A	----- EP 3 216 737 A1 (OTIS ELEVATOR CO [US]) 13 September 2017 (2017-09-13) * abstract * * paragraph [0065] * * figures 3,4 *	1	B66B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 July 2021	Examiner Oosterom, Marcel
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	

EPO FORM 1503 03.82 (P04C01)

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

EP 21 02 0181

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
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