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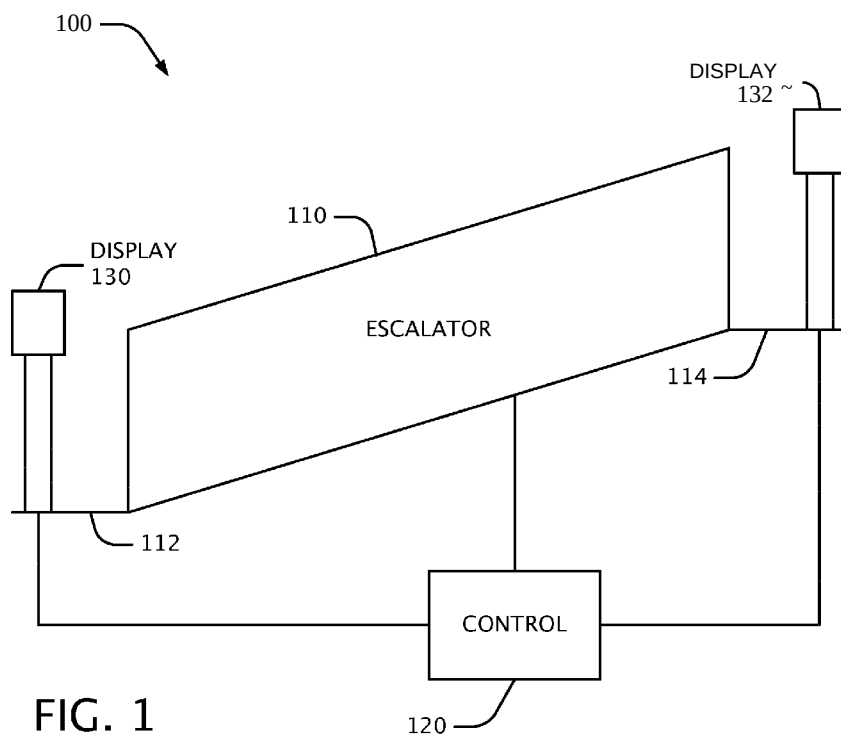


FIG. 1

(57) **Abstract:** Information about up-coming changes in an operating direction of a person-conveying device (110, 210) is communicated to approaching passengers. The approaching passengers can be advised to not board a person-conveying device (110, 210) whose direction will soon switch to the opposite direction in which the passengers are traveling. Passengers approaching the opposite end of the person-conveying device (110, 210) are advised that the device (110, 210) will soon switch to operating in the direction in which the passengers are traveling.

Informing Passengers of Person-Conveying Device Operation

Description

This disclosure relates to operation of escalator installations and to operation of moving walkway installations.

It is sometimes useful to change the operating direction of an escalator or the operating direction of a moving walkway. For example, the operating directions of these devices can be switched to accommodate actual or expected changes in traffic levels.

KR2001056078 describes a system with multiple escalators. The system changes the operating direction of an escalator according to a time schedule or traffic monitoring. When the direction of an escalator is to be changed, an acoustic alarm is sounded, and the escalator is gradually stopped.

Further options for managing escalator installations and/or moving walkway installations could be useful. This is addressed herein by at least some embodiments covered by the claims.

In various embodiments, information about upcoming changes in escalator operating direction or moving walkway operating direction is communicated to approaching passengers. The approaching passengers can be advised to not board an escalator or a moving walkway whose direction will soon switch to the opposite direction in which the passengers are traveling. Passengers approaching the opposite end of the escalator or moving walkway are advised that the device will soon switch to operating in the direction in which the passengers are traveling.

In some embodiments, an operation method for a person-conveying device comprises: communicating, to one or more passengers approaching the person-conveying device, information about a change of an operating direction of the person-conveying device; and changing the operating direction of the person-conveying device before the one or more passengers board the person-conveying device. The changing the operation direction can be performed based at least in part on a time schedule or based at least in part on a traffic measurement. The information about the change of the operating direction can comprise an amount of time before the change of the operating direction. The information about the change of the operating direction can comprise an indication that the person-

conveying device can be boarded after the change of the operating direction. The information about the change of the operating direction can comprise an indication that the person-conveying device should not be boarded after the change of the operating direction. The communicating can comprise displaying the information about the change of the operating direction on a display. The display can show a current operating direction of the person-conveying device after the changing of the operating direction of the person-conveying device. The communicating can also comprise audibly announcing the information about the change of the operating direction. In some cases, the person-conveying device is one of a plurality of person-conveying devices. The person-conveying device can comprise an escalator and/or a moving walkway.

Some embodiments of a person-conveying device installation comprise: a person-conveying device; at least one display or at least one speaker positioned at the person-conveying device; and a control computer, the control computer being coupled to the person-conveying device and the at least one display or the at least one speaker, the control computer being configured to, communicate, to one or more passengers approaching the person-conveying device and through the at least one display or the at least one speaker, information about a change of an operating direction of the person-conveying device, and to change the operating direction of the person-conveying device before the one or more passengers board the person-conveying device. The at least one display or the at least one speaker can be positioned at an entrance to the person-conveying device.

In additional embodiments for an operation method for an installation, the installation comprising first, second and third person-conveying devices, the method comprises: operating the first and second person-conveying devices in a first direction; operating the third person-conveying device in a second direction during the operating of the first and second person-conveying devices in the first direction; communicating, to a passenger approaching the first person-conveying device, that the first person-conveying device is operating in the first direction; communicating, to the passenger approaching the first person-conveying device, information about a change of an operating direction of the first person-conveying device; changing the operating direction of the first person-conveying device to the second direction before the passenger boards the first person-conveying device; and communicating, to the passenger approaching the first person-conveying device, that the first person-conveying device is operating in the second direction.

Further embodiments comprise a computer-based device configured to perform one or more of the disclosed methods.

At least some embodiments of the disclosed methods can be implemented using a computer or computer-based device that performs one or more method acts, the computer or computer-based device having read instructions for performing the method acts from one or more computer-readable storage media. The computer-readable storage media can comprise, for example, one or more optical disks, volatile memory components (such as DRAM or SRAM), and/or nonvolatile memory components (such as hard drives, Flash RAM or ROM). The computer-readable storage media do not cover pure transitory signals. The methods disclosed herein are not performed solely in the human mind.

The disclosure refers to the following figures, in which:

FIG. 1 shows a block diagram of an exemplary embodiment of an escalator installation.

FIG. 2 shows a block diagram of an exemplary embodiment of a moving-walkway installation.

FIG. 3 shows a block diagram of an embodiment of a system for use with escalator installations or moving-walkway installations.

FIG. 4 shows a block diagram of an exemplary embodiment of a method for operating a person-conveying device.

FIGS. 5A-5D show exemplary embodiments of information that can be displayed.

FIG. 6 shows a signal diagram depicting exemplary interactions between system components.

FIG. 7 shows a block diagram of an exemplary embodiment of a computer.

Disclosed herein are various exemplary embodiments of systems, methods and apparatus for use with escalators and moving walkways. Examples of escalators can include straight escalators and spiral escalators. Examples of moving walkways include flat moving walkways and inclined moving walkways. Moving walkways are also known by

names such as "moving sidewalk," "travelator" and "horizontal escalator." Although portions of this disclosure sometimes refer to "escalator" or "moving walkway," the various embodiments disclosed herein can be used with either escalators or moving walkways unless explicitly stated otherwise. The term "person-conveying device" refers collectively to escalators and moving walkways. Unless explicitly stated otherwise, the disclosed technologies can be applied to installations having a single person-conveying device or multiple person-conveying devices (of the same type or of various types).

FIG. 1 shows a block diagram of an exemplary embodiment of an escalator installation 100. The installation 100 comprises an escalator 110 configured to convey passengers between two floors 112, 114. The escalator 110 can run in an upward direction (for moving passengers from floor 112 to floor 114) or in a downward direction (for moving passengers from floor 114 to floor 112). The escalator 110 is coupled to and controlled by a control unit 120. The control unit 120 is, for example, a computer-based device that reads software instructions and performs one or more of the method acts disclosed herein. For the sake of clarity, many of the possible components of the escalator 110 are not shown, for example, steps, motors, and handrails.

The installation 100 further comprises a display 130. The display 130 is positioned such that it can be seen by passengers approaching the escalator 110 from the floor 112. In particular embodiments, the display 130 is positioned at the floor 112 directly before the escalator 110, namely at an entrance to the escalator 110, as shown in FIG. 1. (In the context of this application, the "entrance" of a person-conveying device is the area where a passenger boards the moving portions of the person-conveying device.) The installation 100 also includes a display 132, which is positioned such that it can be seen by passengers approaching the escalator 110 from the floor 114. In particular embodiments, the display 132 is positioned at the floor 114 directly before the escalator 110 (at an entrance to the escalator 110), as shown in FIG. 1. In further embodiments, the displays 130, 132 are positioned elsewhere. Generally, the displays 130, 132 should be positioned such that approaching passengers can see and react to information appearing on the displays before boarding the escalator 110. For example, the displays can be positioned before the respective entrances to the escalator (e.g., 1 m before, 2 m before, or another distance before). In other cases, the displays 130, 132 can be in the floor in areas near the respective escalator entrances. In further cases, the displays 130, 132 comprise projectors that project images onto one or more surfaces (e.g., floor surfaces) near the respective

escalator entrances. The displays 130, 132 are coupled to the control unit 120 and can display information sent by the control unit 120.

In further embodiments, the displays 130, 132 can also send input information to the control unit 120. The information can include, for example, operating instructions for the control unit 120 and/or the escalator 110 (e.g., turn the escalator on or off), or information for placing elevator calls for one or more elevator installations. The information can also include traffic flow information (e.g., traffic flow information based on passengers who use the escalator 110). In particular embodiments, the display 130, 132 is equipped with a tag reader. The tag can include, for example: radio-frequency identification (RFID) devices, including near-field communication (NFC) devices and far-field communication devices; magnetic storage devices (e.g., magnetic strip cards); and/or optical code devices. In such embodiments, a passenger can present a tag to the display 130, 132 to receive a car allocation for an elevator installation that can be reached using the escalator 110. The car allocation can be made based on the time needed by the passenger to travel on the escalator 110. In other embodiments, the display 130, 132 can tell a passenger not to use the escalator 110, can tell a passenger to go to a different person-conveying device or to an elevator, can show directions to guide the passenger to his destination, and/or can confirm the passenger's trip on the escalator 110.

Although the control unit 120 is depicted as being a single, computer-based device, in some cases the unit 120 comprises a plurality of computer-based units that are communicatively coupled to each other. In particular embodiments, a first computer-based unit is coupled to and controls the escalator 110, while a second computer-based unit (coupled to the first) is coupled to and exchanges information with the displays 130, 132. The control unit 120 can also comprise a computer-based device that is coupled to a non-computer-based device (not shown) that directly controls the operations of one or more parts of the escalator 110.

FIG. 2 shows a block diagram of an exemplary embodiment of a moving walkway installation 200. The installation 200 comprises a moving walkway 210 configured to convey passengers between two locations 212, 214. The locations 212, 214 can be on the same horizontal level or on different horizontal levels. The moving walkway 210 can move passengers in the direction from the location 212 to the location 214 or in the direction from the location 214 to the location 212. The moving walkway 210 is coupled to and controlled by a control unit 220. The control unit 220 is, for example, a computer-

based device that reads software instructions and performs one or more of the method acts disclosed herein. For the sake of clarity, many of the possible components of the moving walkway 210 are not shown, for example, belts, motors, and handrails.

5 The installation 200 further comprises a display 230. The display 230 is positioned such that it can be seen by passengers approaching the moving walkway 210 from the location 212. In particular embodiments, the display 230 is positioned at the location 212 directly before the moving walkway 210 (at an entrance to the moving walkway 210), as shown in FIG. 2. The installation 200 also includes a display 232, which is positioned such that it can be seen by passengers approaching the moving walkway 210 from the floor 214. In
10 particular embodiments, the display 232 is positioned at the location 214 directly before the moving walkway 210 (at an entrance to the moving walkway 210), as shown in FIG. 2. The displays 230, 232 are coupled to the control unit 220 and can display information sent by the control unit 220. In further embodiments, the displays 230, 232 are positioned elsewhere. Generally, the displays 130, 132 should be positioned such that approaching
15 passengers can see and react to information appearing on the displays before boarding the escalator 110. For example, the displays can be positioned before the respective entrances to the moving walkway (e.g., 1 m before, 2 m before, or another distance before). In other cases, the displays 230, 232 can be in the floor in areas near the respective moving-walkway entrances. In further cases, the displays 230, 232 comprise
20 projectors that project images onto one or more surfaces near the respective moving-walkway entrances (e.g., floor surfaces).

In further embodiments, the displays can also send input information to the control unit 220. The information can include, for example, operating instructions for the control unit 220 and/or the moving walkway 210 (e.g., turn the moving walkway on or off), or
25 information for placing elevator calls for one or more elevator installations. The information can also include traffic flow information (e.g., traffic flow information based on passengers who use the moving walkway 210). In particular embodiments, the display 230, 232 is equipped with a tag reader. The tag can include, for example: RFID devices, including NFC devices and far-field communication devices; magnetic storage devices
30 (e.g., magnetic strip cards); and/or optical code devices. In such embodiments, a passenger can present a tag to the display 230, 232 to receive a car allocation for an elevator installation that can be reached using the moving walkway 210. The car allocation can be made based on the time needed by the passenger to travel on the moving

walkway 210. In other embodiments, the display 230, 232 can tell a passenger not to use the moving walkway 210, can tell a passenger to go to a different person-conveying device or to an elevator, can show directions to guide the passenger to his destination, and/or can confirm the passenger's trip on the moving walkway 210.

5 Although the control unit 220 is depicted as being a single, computer-based device, in some cases the unit 220 comprises a plurality of computer-based units that are communicatively coupled to each other. In particular embodiments, a first computer-based unit is coupled to and controls the moving walkway 210, while a second computer-based unit (coupled to the first) is coupled to and exchanges information with the displays
10 230, 232. The control unit 220 can also comprise a computer-based device that is coupled to a non-computer-based device (not shown) that directly controls the operations of one or more parts of the moving walkway 210.

In various embodiments, any of the displays 130, 132, 230, 232 comprises, for example, a screen, a touch screen, or another type of digital display. Non-digital displays can also be
15 used. For example, some embodiments comprise electromechanical displays, such as split-flap or flip-dot displays.

FIG. 3 shows a block diagram of an embodiment of a system 300 for use with embodiments of the installations 100, 200. The system 300 comprises a control computer 310, which can be similar to the control computers 120, 220, for example. In particular
20 embodiments, the control computer 310 comprises a PORT Technology Gateway, available from the Schindler Group. The control computer 310 is coupled to an input/output (I/O) interface 320. The interface 320 allows the computer 310 to be communicatively coupled to one or more components 330 of an escalator or of a moving walkway. The interface 320 can be configured according to a variety of I/O interface
25 types, for example, a serial interface (e.g., RS-232, RS-485), an Ethernet interface (using, e.g., TCP (Transmission Control Protocol) or another protocol), and/or another interface. In some cases, the interface 320 allows for communication between devices that use different protocols (e.g., between devices that use RS-232 or RS-485 and devices that use Ethernet).

30 The control computer 310 can be further coupled to a display 340. The display 340 can, for example, be similar to the displays 130, 132, 230, 232. In particular embodiments, the display 340 comprises a PORT display, available from the Schindler Group. In some

cases, the control computer 310 is coupled to a monitoring computer 350. The monitoring computer 350 can be located locally to or remotely from the control computer 310. The monitoring computer 350 can receive from the control computer 310 information related to performance of an escalator or a moving walkway. Such information can include, for example, status information, error codes and statistic data availability. In further embodiments, the system 300 can transmit this information to a remote monitoring station (not shown).

In additional embodiments, information about the operation of the installations 100, 200 is audibly communicated to passengers through one or more speakers 360, which are coupled to the control computer 310. In some cases, the speakers 360 are incorporated into the display 340, while in other cases the speakers 360 are not incorporated into the display 340. In various embodiments, information is communicated by the control computer 310 to the passengers only in an audible manner, only in a visual manner, or through a mixture of audible and visual manners.

FIG. 4 shows a block diagram of an exemplary embodiment of a method 400 for controlling a person-conveying device. The method 400 can be used with various embodiments of the installations 100, 200. In a method act 410, information about a change of operating direction for the person-conveying device is communicated to one or more approaching passengers. As used herein, "operating direction" refers to the direction in which a person-conveying device is currently operating for moving passengers. The information can be communicated to passengers approaching from one direction or from two directions. In embodiments where the information is displayed, it can be shown using one or more of the displays 130, 132, 230, 232. In embodiments where the information is audibly announced, it can be announced using a speaker. The information about the change of operating direction generally comprises an indication that the operating direction of the person-conveying device will change in the near future. If the information is displayed, it can be shown using, for example, symbols, letters, words, numbers and/or pictures. In some cases, the operating information can comprise a message such as, "ESCALATOR WILL CHANGE DIRECTION SOON." In further embodiments, the information about the change of operating direction can comprise an indication of when the operating direction will change, whether a passenger should board the person-conveying device and/or that a passenger should prepare to board the person-conveying device. To determine how far in advance approaching passengers should be

notified of a direction change, a standard amount of time can be used (e.g., 30 seconds, 45 seconds, 60 seconds). This standard amount of time can be based on the time needed for a passenger to complete a one-way trip on the person-conveying device, possibly including a buffer time. Additional examples of information about the change of operating direction are described below.

In some embodiments, the person-conveying device comes to a full stop for a period of time (e.g., a predetermined period of time) before changing its operating direction. The full stop can be maintained for 1 second, 2 seconds, 5 seconds, or for another period of time. This can further help make passengers aware of the change in operating direction. This can also help ensure the safety of the passengers.

Particular embodiments of the method 400 further comprise a method act 430, in which information for the new operating direction is communicated. This information can be displayed using one or more of the displays 130, 132, 230, 232 and/or announced using a speaker. The information for the new operating direction can be displayed using, for example, symbols, letters, words, numbers and/or pictures.

FIGS. 5A-5D show exemplary embodiments of information that can be displayed on one or more displays for one or more of the disclosed escalator embodiments.

The display 510 of FIG. 5A shows information advising passengers approaching an escalator that the operating direction of the escalator is about to change, and so passengers should not board that escalator. That is, for passengers who are approaching the escalator from the direction that allows them to see the display, the escalator is operating in the same direction in which those passengers are moving. However, the escalator will soon start operating in the "wrong" direction for those passengers. Some embodiments show an amount of time before the direction change will occur (e.g., 34 seconds in the case of FIG. 5A). The display 510 also shows an image 512 (in this case, a do-not-enter sign) to help convey its message.

The display 520 of FIG. 5B shows information advising passengers approaching an escalator that the operating direction of the escalator is about to change, and so passengers can prepare to board the escalator after the change occurs. That is, the escalator is currently operating in the opposite direction in which passengers who are approaching the escalator and who can see the display are moving. However, the

escalator will soon be operating in the "correct" direction for those passengers. Some embodiments show an amount of time before the direction change will occur (e.g., 34 seconds in the case of FIG. 5A). The display 520 also shows an image 522 to help convey its message. In the depicted embodiment, the image 522 comprises alternating green lights. Other images can also be used.

The display 530 of FIG. 5C shows information advising passengers approaching an escalator from a given direction that they should not board the escalator from that direction. In the embodiment of FIG. 5C, the display 530 also indicates that the escalator is operating in the wrong direction for the approaching passengers (e.g., "DOWN DIRECTION"). In further embodiments, the display 530 can instead indicate that, for example, the escalator is out of order, the escalator is stopped to conserve energy, and/or other information.

The display 540 of FIG. 5D shows information advising passengers approaching an escalator from a given direction that they can board the escalator from that direction. In the embodiment of FIG. 5D, the display 540 also indicates that the escalator is operating in the proper direction for the approaching passengers (e.g., "UP DIRECTION").

FIGS. 5A-5D depict displays using both text and graphics to communicate information. Further embodiments use only text or only graphics. Although the embodiments of FIGS. 5A-5D refer to escalators, further embodiments can be used with moving walkways. Instead of referring to "UP" and "DOWN," the displays can refer to "FORWARD" and "BACKWARD," or to other terms.

In further embodiments, the displays can depict additional information, for example: building information; emergency information; traffic guidance for passengers; and/or event announcements (e.g., "Fire alarm training at 9 AM").

FIG. 6 shows a signal diagram depicting exemplary interactions between components of at least some of the disclosed embodiments. A control computer (such as the control computer 310) sends a signal 610 to a display (such as the display 340) and/or a speaker (such as the speaker 360) instructing the display and/or the speaker to communicate information about a change of operating direction for an escalator or a moving walkway. The control computer sends a signal 620 to an escalator component or a moving walkway component to cause the direction change at the escalator or moving walkway. The

control computer then sends a signal 630 to the display and/or to the speaker to cause these components to communicate information about the new operating direction (e.g., the display will stop indicating that the escalator or moving walkway is about to change direction, and the display will indicate what the current direction is). In some cases, the display sends input information to the control computer in a signal 640. In further
5 embodiments, in a signal 650, the control computer sends performance information for the escalator or moving walkway to a monitoring computer.

In various embodiments, any of the disclosed methods can be performed according to a time schedule. The time schedule can be based on, for example, known or expected
10 passenger traffic patterns. For example, passenger traffic can be estimated according to a schedule of another transportation device and/or vehicle (e.g., arrival of an airplane), or according to a schedule of a facility (e.g., opening times and/or closing times of service counters, offices, and/or other facilities). A schedule can be stored in a database accessible by a control unit 120, 220. The disclosed methods can also be performed
15 based on traffic information describing a detected number of passengers (detected using, for example, motion detectors, crowd detectors, radar detectors, RFID readers, infrared sensors, load measurement sensors, cameras and/or other devices). The traffic information can be detected, for example, in an area near the person-conveying device and/or in an area removed from the person-conveying device. Such information can be
20 used to determine not only when to change the direction of a person-conveying device, but also how many person-conveying devices should have their directions switched. In further embodiments, the measured passenger traffic data can be analyzed and/or provided to one or more parties (e.g., building managers, building owners). In some cases, the measured passenger traffic data is provided at least in part by the displays.

In additional cases, a maintenance company for the person-conveying device receives
25 passenger traffic data for use in planning maintenance activities (e.g., scheduling the activities during expected periods of low demand). Information about planned maintenance periods can be used for scheduling direction changes of the person-conveying devices. Direction changes of a person-conveying device can be controlled to
30 reduce wear-and-tear of the person-conveying device (e.g., avoid having too many and/or too few direction changes over a period of time).

Following is a non-limiting example of the use of at least some embodiments of the disclosed technologies. An escalator system comprises a group of three escalators that

run side-by-side and serve an upper floor and a lower floor. On the lower floor, each of the escalators has a respective display mounted in front of the escalator. On the upper floor, each of the escalators has a respective display mounted in front of the escalator. During morning rush hour, most escalator passengers move from the lower floor to the upper floor. Shortly before the beginning of the rush hour, two of the escalators are operating in a downward direction and one is operating in an upward direction. To prepare for the rush hour, a control computer causes the upper and lower displays for one of the downward-moving escalators to display information about a change of operation direction for the escalator. Specifically, the upper-floor display of the particular escalator informs passengers approaching the escalator on the upper floor, "DO NOT BOARD - ESCALATOR WILL CHANGE DIRECTION IN 45 SECONDS." An audio announcement of this information is also made. This can help inform passengers who, for example, are visually impaired. The information helps prevent passengers on the upper floor from boarding the particular escalator too close to the time when it changes direction. Thus, the passengers are not on the escalator when it changes direction. Simultaneously, the lower-floor display of the particular escalator informs passengers approaching the escalator on the lower floor, "PREPARE TO BOARD - ESCALATOR WILL CHANGE DIRECTION IN 45 SECONDS." An audio announcement of this information is also made. This can help inform passengers who, for example, are visually impaired. The information helps passengers wishing to travel in an upward direction to recognize that the particular escalator will soon be available for travel in that direction. After 45 seconds, the control computer causes the particular escalator to start moving in the upward direction. The control computer also instructs the upper-floor and lower-floor displays to display information about the current operating direction.

At least some embodiments of the disclosed technologies can allow for more automatic operation of escalator installations. For example, passengers can be better informed about upcoming changes in operating direction. Accordingly, this can help reduce the odds that passengers will be on an escalator when the escalator's operating direction changes. The change of operating direction can thus be performed automatically, without, for example, a human operator confirming that an escalator has no passengers before changing the direction.

FIG. 7 shows a block diagram of an exemplary embodiment of a computer 700 (e.g., part of a control computer, part of a display, part of a monitoring computer) that can be used

with one or more technologies disclosed herein. The computer 700 comprises one or more processors 710. The processor 710 is coupled to a memory 720, which comprises one or more computer-readable storage media storing software instructions 730. When executed by the processor 710, the software instructions 730 cause the processor 710 to perform one or more method acts disclosed herein. Further embodiments of the computer 700 can comprise one or more additional components. The computer 700 can be connected to one or more other computers or electronic devices through an input/output component (not shown). In at least some embodiments, the computer 700 can connect to other computers or electronic devices through a network 740. In particular embodiments, the computer 700 works with one or more other computers, which are located locally and/or remotely. One or more of the disclosed methods can thus be performed using a distributed computing system.

Although some embodiments of the various methods disclosed herein are described as comprising a certain number of method acts, further embodiments of a given method can comprise more or fewer method acts than are explicitly disclosed herein. In additional embodiments, method acts are performed in an order other than disclosed herein.

Having illustrated and described the principles of the disclosed technologies, it will be apparent to those skilled in the art that the disclosed embodiments can be modified in arrangement and detail without departing from such principles. In view of the many possible embodiments to which the principles of the disclosed technologies can be applied, it should be recognized that the illustrated embodiments are only examples of the technologies and should not be taken as limiting the scope of the invention. Rather, the scope of the invention is defined by the following claims and their equivalents. I therefore claim as my invention all that comes within the scope of these claims.

Claims

1. An operation method for an installation (100, 200), the installation comprising first, second and third person-conveying devices (110, 210), the method comprising:

operating the first and second person-conveying devices (110, 210) in a first direction;

operating the third person-conveying device (110, 210) in a second direction during the operating of the first and second person-conveying devices (110, 210) in the first direction;

communicating, to a passenger approaching the first person-conveying device (110, 210), that the first person-conveying device (110, 210) is operating in the first direction;

communicating, to the passenger approaching the first person-conveying device (110, 210), information about a change of an operating direction of the first person-conveying device (110, 210);

changing the operating direction of the first person-conveying device (110, 210) to the second direction before the passenger boards the first person-conveying device (110, 210); and

communicating, to the passenger approaching the first person-conveying device (110, 210), that the first person-conveying device (110, 210) is operating in the second direction.

2. The operation method of claim 1, the changing the operating direction being performed based at least in part on a time schedule for expected passenger traffic.

3. The operation method of any preceding claim, the changing the operating direction being performed based at least in part on a traffic measurement.

4. The operation method of claim 3, the traffic measurement being based on information from RFID readers.

5. The operation method of any preceding claim, the information about the change of the operating direction comprising an amount of time before the change of the operating direction.

5 6. The operation method of any preceding claim, the information about the change of the operating direction comprising an indication that the first person-conveying device (110, 210) can be boarded after the change of the operating direction.

7. The operation method of any of claims 1-5, the information about the
10 change of the operating direction comprising an indication that the first person-conveying device (110, 210) should not be boarded after the change of the operating direction.

8. The operation method of any preceding claim, the communicating
comprising displaying the information about the change of the operating direction on a
15 display (130, 132, 230, 232).

9. The operation method of claim 8, further comprising displaying on the
display (130, 132, 230, 232) a current operating direction of the first person-conveying
device (110, 210) after the changing the operating direction of the first person-conveying
20 device (110, 210).

10. The operation method of any preceding claim, the method further
comprising bringing the first person-conveying device (110, 210) to a full stop for a
predetermined amount of time before changing the operating direction.

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11. The operation method of any preceding claim, the first person-conveying
device (110, 210) comprising an escalator (110).

12. The operation method of any of claims 1-10, the first person-conveying
30 device (110, 210) comprising a moving walkway (210).

13. An installation (100, 200), comprising:

a first person-conveying device (110, 210);

a second person-conveying device (110, 210);

5 a third person-conveying device (110, 210);

a display (130, 132, 230, 232) or a speaker (360) positioned at the first person-conveying device (110, 210); and

a control computer (120, 220, 310), the control computer (120, 220, 310) being coupled to the first, second and third person-conveying devices (110, 210) and to the display (130, 132, 230, 232) or the speaker (360), the control computer (120, 220, 310) being programmed to perform a method, the method comprising,

operating the first and second person-conveying devices (110, 210) in a first direction,

operating the third person-conveying device (110, 210) in a second direction during the operating of the first and second person-conveying devices (110, 210) in the first direction,

communicating to a passenger approaching the first person-conveying device (110, 210), using the display (130, 132, 230, 232) or the speaker (360), that the first person-conveying device (110, 210) is operating in the first direction,

communicating to the passenger approaching the first person-conveying device (110, 210), using the display (130, 132, 230, 232) or the speaker (360), information about a change of an operating direction of the first person-conveying device (110, 210),

changing the operating direction of the first person-conveying device (110, 210) to the second direction before the passenger boards the first person-conveying device (110, 210), and

communicating to the passenger approaching the first person-conveying device (110, 210), using the display (130, 132, 230, 232) or the speaker (360), that the first person-conveying device (110, 210) is operating in the second direction.

14. The person-conveying device installation of claim 13, the display (130, 132, 230, 232) or the speaker (360) being positioned at an entrance to the first person-conveying device (110, 210).

15. One or more computer-readable storage media (720) having encoded thereon instructions that, when executed by a processor (710), cause the processor (710) to perform a method, the method comprising:

5 operating first and second person-conveying devices (110, 210) in a first direction;

 operating a third person-conveying device (110, 210) in a second direction during the operating of the first and second person-conveying devices (110, 210) in the first direction;

10 communicating, to a passenger approaching the first person-conveying device (110, 210), that the first person-conveying device (110, 210) is operating in the first direction;

 communicating to the passenger approaching the first person-conveying device (110, 210) information about a change of an operating direction of the first person-conveying device (110, 210);

15 changing the operating direction of the first person-conveying device (110, 210) to the second direction before the passenger boards the first person-conveying device (110, 210); and

20 communicating to the passenger approaching the first person-conveying device (110, 210) that the first person-conveying device (110, 210) is operating in the second direction.

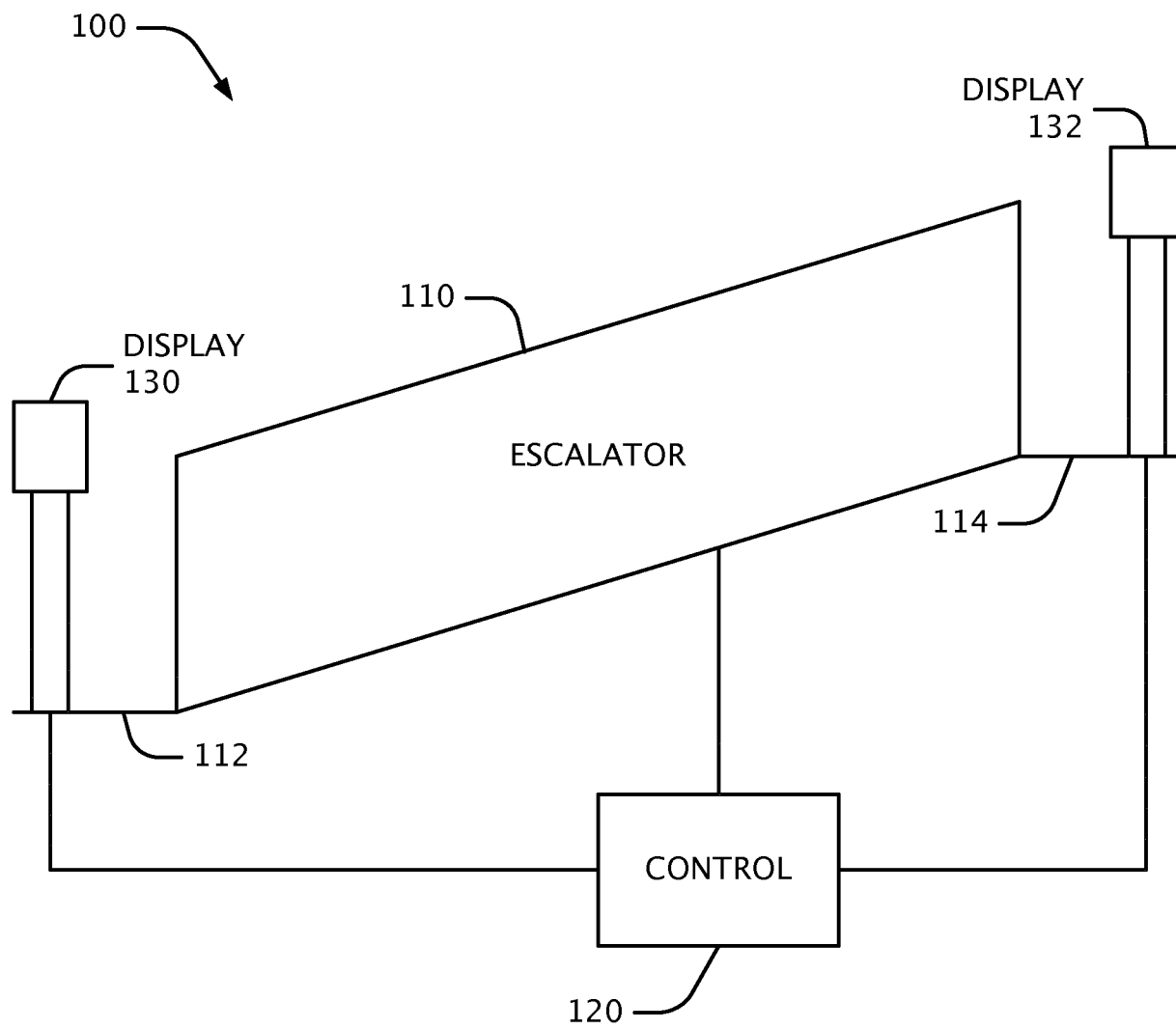


FIG. 1

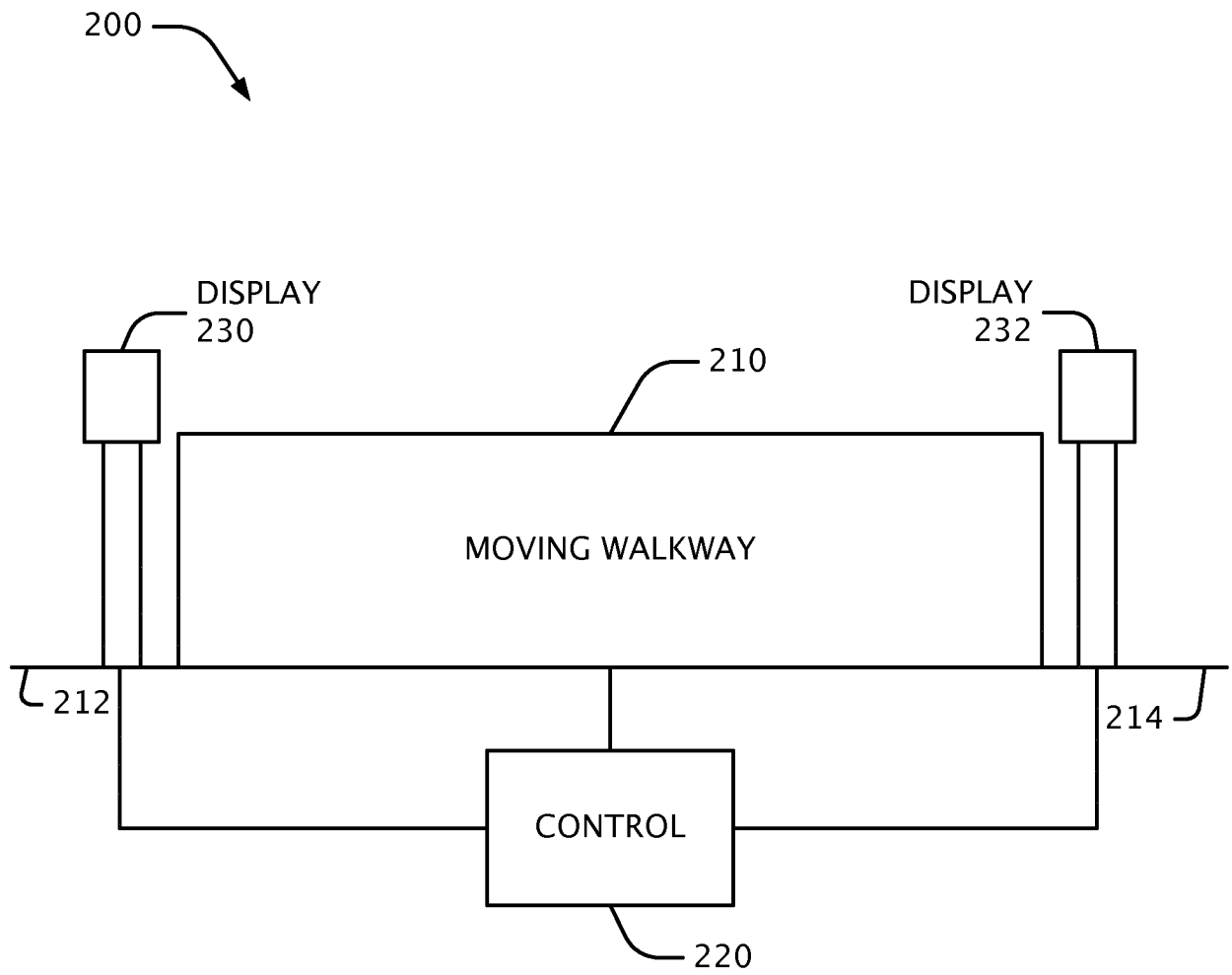


FIG. 2

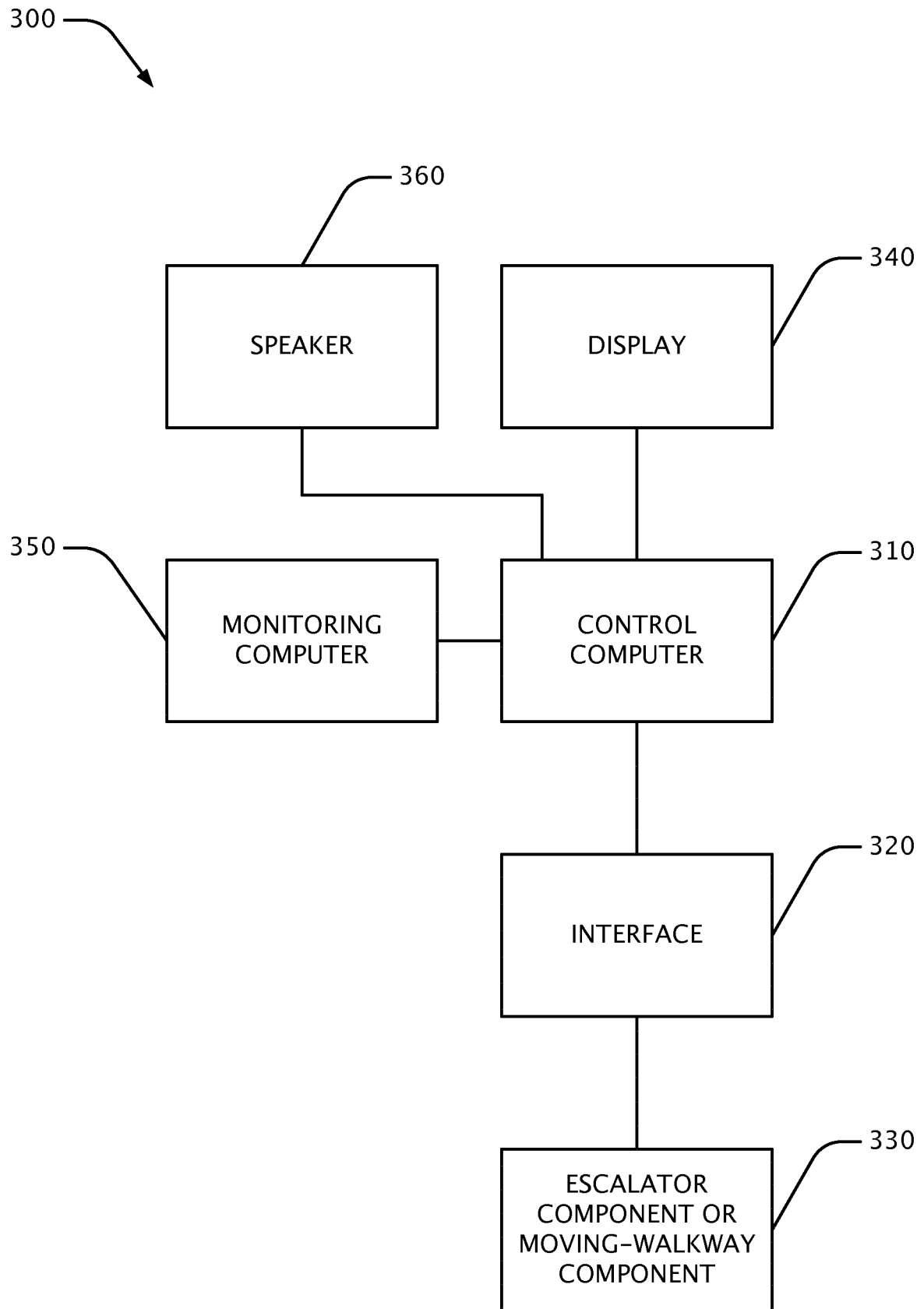


FIG. 3

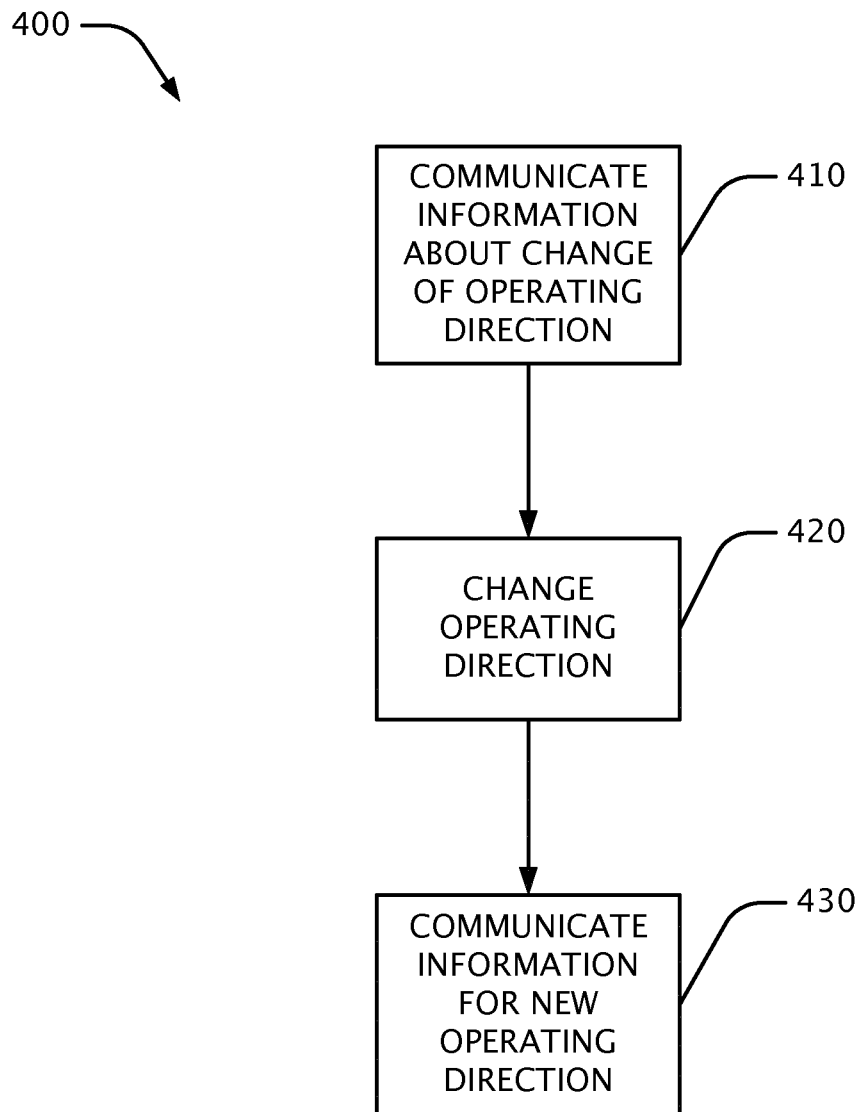


FIG. 4

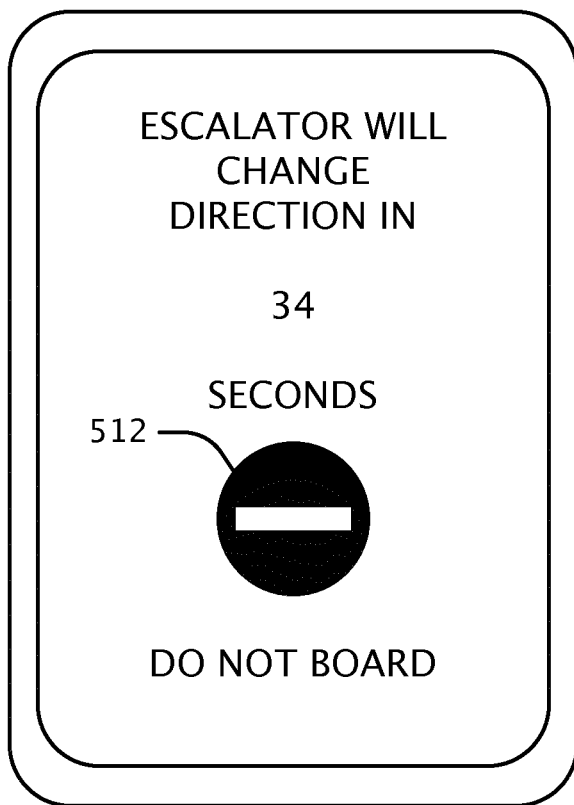


FIG. 5A

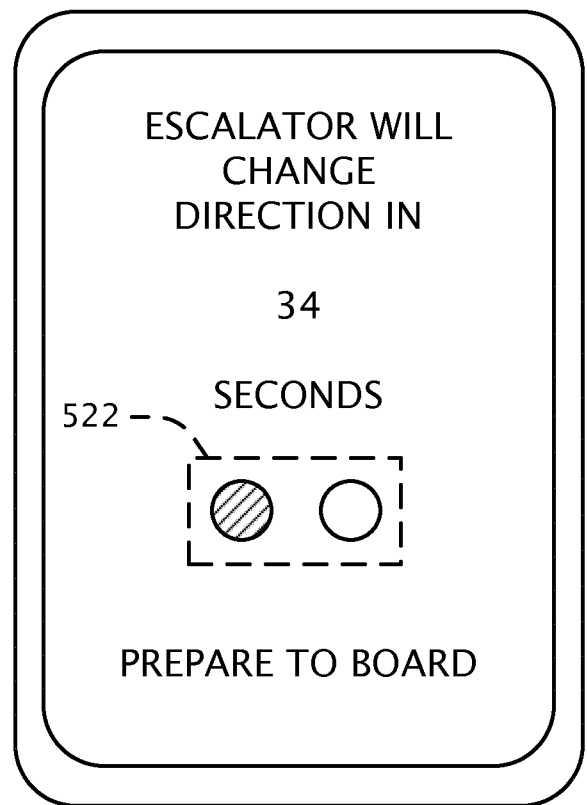


FIG. 5B

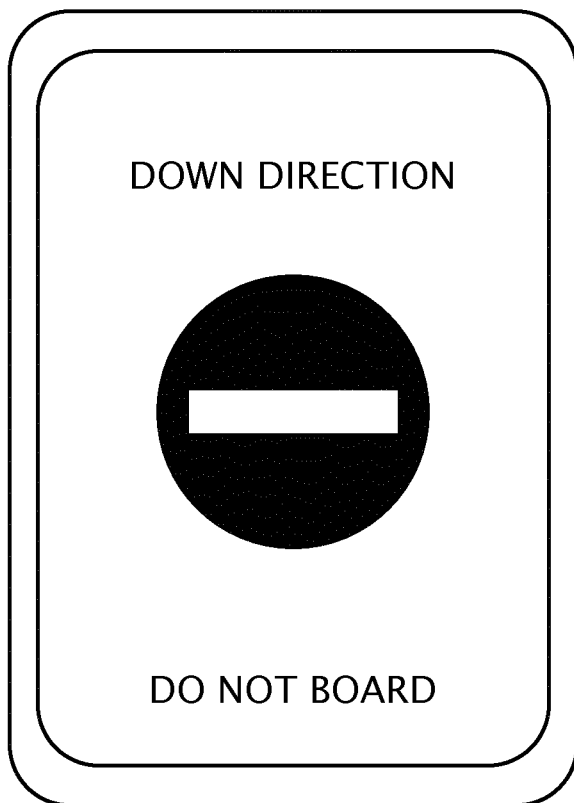


FIG. 5C

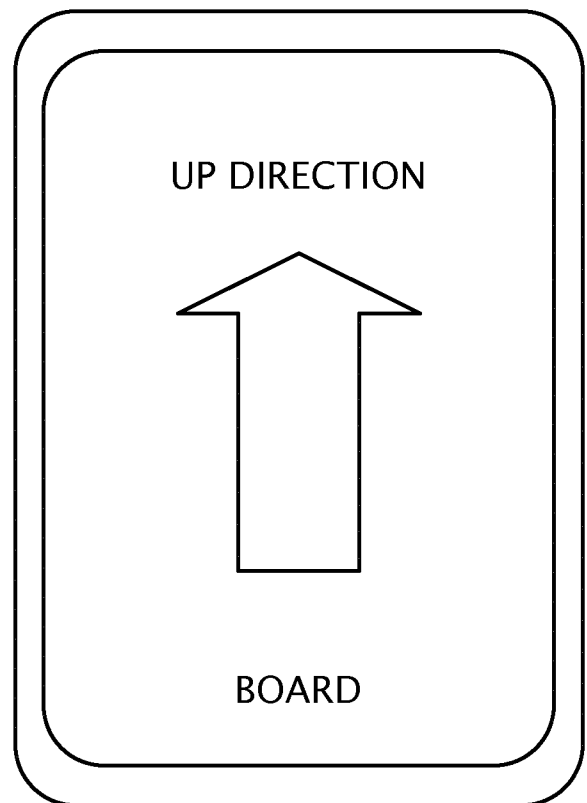


FIG. 5D

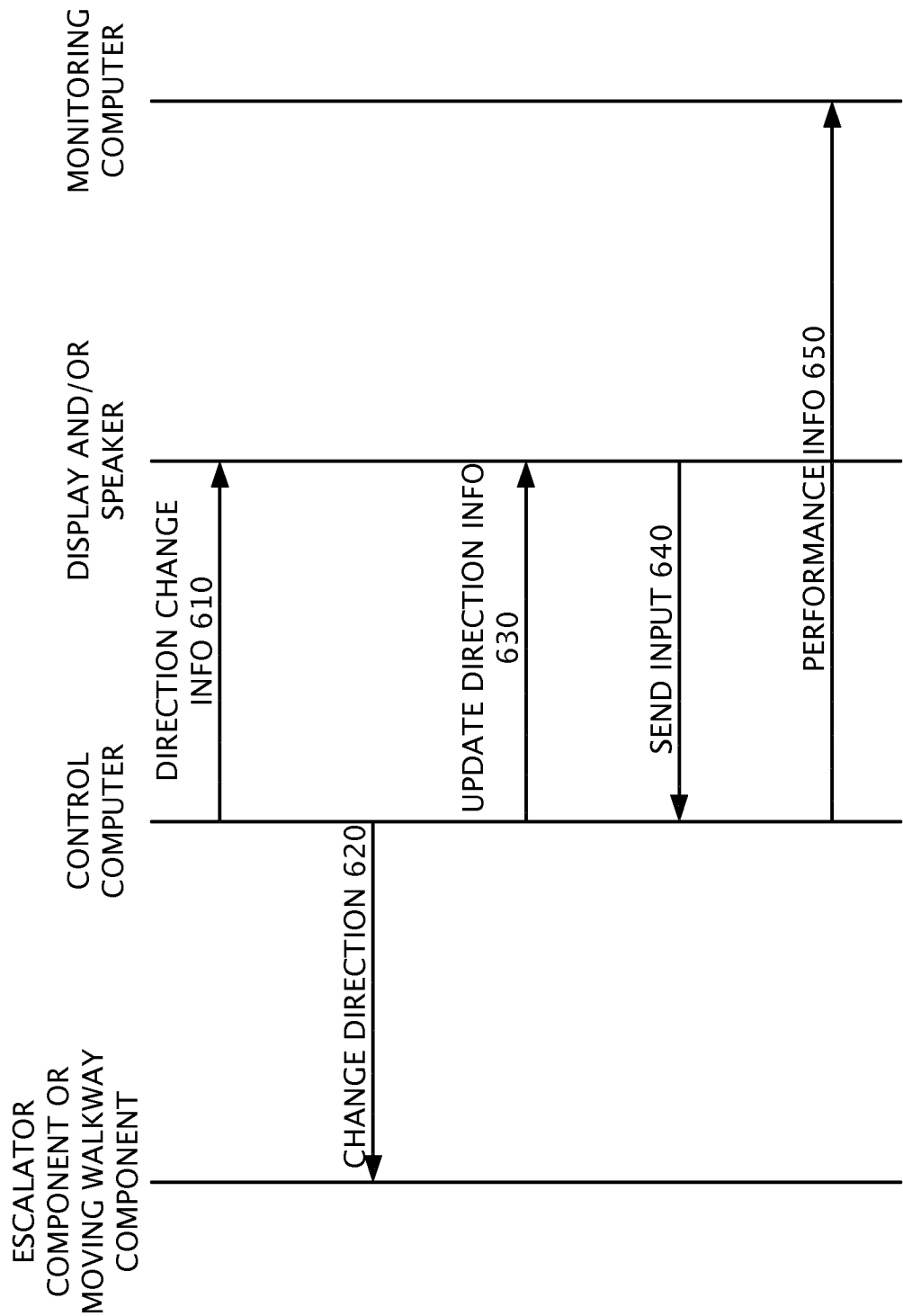


FIG. 6

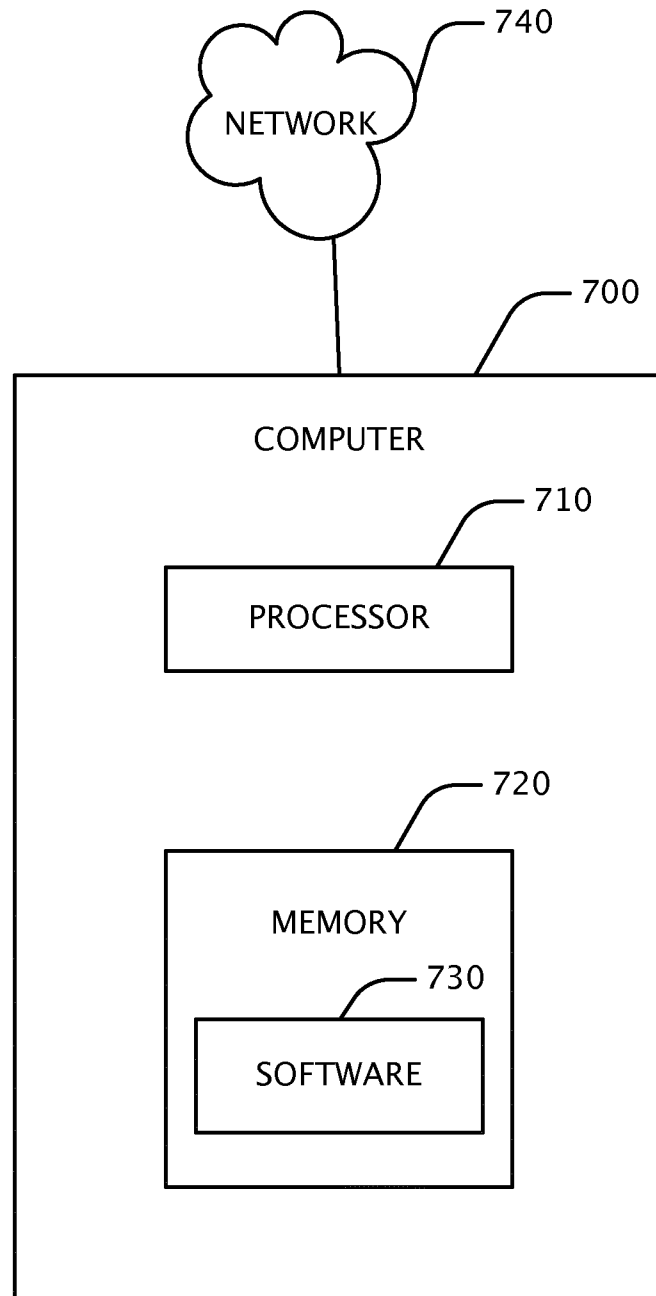


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/075384A. CLASSIFICATION OF SUBJECT MATTER
INV. B66B27/00 B66B25/00
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B66B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	DE 10 2010 021727 Al (SI EMENS AG [DE]) 1 December 2011 (2011-12-01) paragraphs [0001] , [0009] , [0010] , [0023] , [0024] , [0027] , [0032] ; figures 1,2 ----- -/- .	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

28 February 2013

Date of mailing of the international search report

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/075384

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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International application No
PCT/EP2012/075384

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

International application No

PCT/EP2012/075384

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