(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 876 610 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.05.2015 Bulletin 2015/22

(51) Int Cl.:
G07C 9/00 *(2006.01)* ***B66B 25/00*** *(2006.01)*

(21) Application number: **13194277.3**

(22) Date of filing: **25.11.2013**

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

(71) Applicant: **Inventio AG**
6052 Hergiswil NW (CH)

(72) Inventors:
- **Friedli, Paul**
  5453 Remetschwil (CH)
- **Finschi, Lukas**
  6030 Ebikon (CH)

(54) Controlling passenger traffic

(57) Passenger traffic between a first area and a second area can be controlled using a system with a transportation device, such as an elevator, an escalator, or a moving walkway. Depending on which mode the system is operating in, the transportation device allows passenger traffic in only one direction between the two areas. Thus in a first mode, for example, passengers can move from the first area to the second area, but passengers may not move from the second area to the first area. In a second mode, the direction of the permitted passenger traffic is reversed.

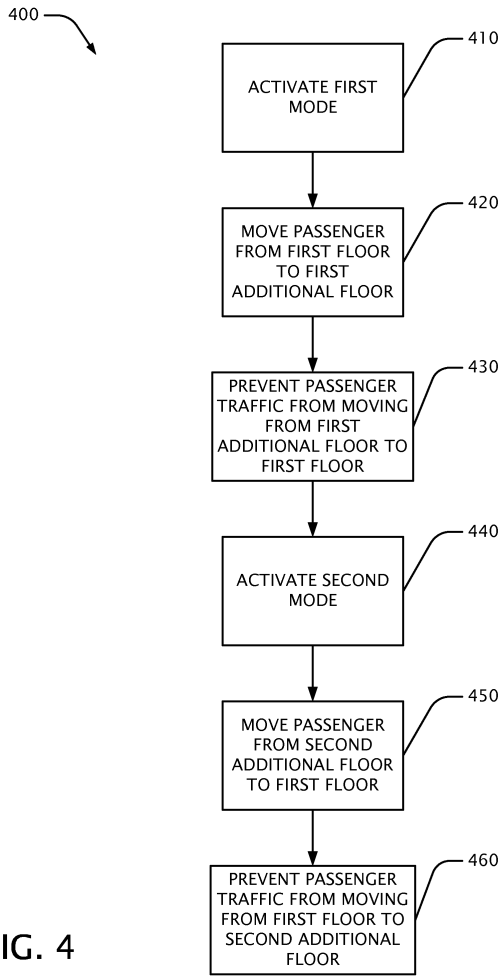

FIG. 4

EP 2 876 610 A1

Description

[0001] This application relates to controlling passenger traffic in areas such as, for example, an airport.

[0002] It is sometimes desirable to control the flow of passengers within a given area. For example, passenger traffic at or near an airport gate can be controlled or guided.

[0003] US 2010/0039259A1 describes a system and method for boarding area security. Passengers entering a transportation terminal may be issued a boarding pass having an attached radio-frequency identification (RFID) tag. The RFID tag allows the passenger's location to be measured.

[0004] Further options for controlling passenger traffic could be advantageous. This is addressed by at least some of the embodiments covered by the claims.

[0005] Passenger traffic between a first area and a second area can be controlled using a system with a transportation device, such as an elevator, an escalator, or a moving walkway. Depending on which mode the system is operating in, the transportation device allows passenger traffic in only one direction between the two areas. Thus in a first mode, for example, passengers can move from the first area to the second area, but passengers may not move from the second area to the first area. In a second mode, the direction of the permitted passenger traffic is reversed.

[0006] Some embodiments of a passenger-traffic control method comprise: activating a first mode of a passenger transportation system, the passenger transportation system comprising a transportation device; while the first mode is active, moving a first passenger from a first area to a second area using the passenger transportation system; while the first mode is active, preventing passenger traffic from moving from the second area to the first area using the passenger transportation system; activating a second mode of the passenger transportation system; while the second mode is active, moving a second passenger from a third area to the first area using the passenger transportation system; and while the second mode is active, preventing passenger traffic from moving from the first area to the third area using the passenger transportation system. The first area comprises, for example, an airport gate area or an observation platform area. The method can further comprise: activating a third mode of the passenger transportation system; and while the third mode is active, preventing passenger traffic from entering or leaving the first area through the passenger transportation system.

[0007] The transportation device can comprise an elevator, the first area comprising a first floor, the second area comprising a second floor, the third area comprising a third floor, the elevator being configured to prevent passenger traffic in a given direction by not transporting passengers in the given direction. The elevator can be configured to detect when a person enters the elevator to travel in the given direction. In some embodiments, the elevator comprises a cabin with a first set of doors and a second set of doors, the elevator being configured to open the first set of doors at the second area and to open the second set of doors at the third area.

[0008] In further embodiments, the transportation device comprises an escalator, the first area comprising a first floor, the second area comprising a second floor, the third area comprising a third floor, the escalator being configured to prevent passenger traffic in a given direction by detecting movement of a person on the escalator in the given direction.

[0009] In additional embodiments, the transportation device comprises a moving walkway, the first area and the second area being on a common floor.

[0010] In some embodiments, the activating of the first mode or the activating of the second mode is performed by a person at the first area, or by a person remote from the first area.

[0011] The first mode of the passenger transportation system can be an arriving-passenger mode, and the second mode of the passenger transportation system can be a departing-passenger mode.

[0012] Additionally, the method can further comprise permitting an authorized person to move from the second area to the first area using the passenger transportation system while the first mode is active, or further comprising permitting the authorized person to move from the first area to the third area using the passenger transportation system while the second mode is active.

[0013] Some embodiments of a passenger transportation system comprise: a control panel; a transportation device; and a computer-based control unit comprising a processor and a computer-readable storage medium, the computer-readable storage medium having encoded thereon instructions that, when executed by the processor, cause the processor to perform a method, the method comprising, activating a first mode of the passenger transportation system based on input from the control panel, while the first mode is active, moving a first passenger from a first area to a second area using the transportation device, while the first mode is active, preventing passenger traffic from moving from the second area to the first area using the transportation device, activating a second mode of the passenger transportation system based on input from the control panel, while the second mode is active, moving a second passenger from a third area to the first area using the transportation device, and while the second mode is active, preventing passenger traffic from moving from the first area to the third area using the transportation device. The second and third areas can be the same areas or different areas.

[0014] Further embodiments comprise a computer-based device configured to perform one or more of the disclosed methods.

[0015] 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 of optical disks, volatile memory components (such as DRAM or SRAM), 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.

[0016] In this application and in the claims, the term "transportation device" refers to any of an elevator, an escalator, and a moving walkway (inclined or horizontal). In this application and in the claims, the term "vertical transportation device" refers to at least one of: an elevator, an escalator, or an inclined moving walkway. A transportation device serves as part of a passenger transportation system.

[0017] The disclosure refers to the following figures, in which:

FIG. 1 shows a block diagram of an exemplary embodiment of an area for handling passenger traffic.

FIG. 2 shows a block diagram of an exemplary embodiment of a system for controlling passenger traffic.

FIG. 3 shows a block diagram of an exemplary embodiment of a method for controlling passenger traffic.

FIG. 4 shows a block diagram of an exemplary embodiment of another method for controlling passenger traffic.

FIG. 5 shows an exemplary graphical user interface.

FIG. 6 shows an exemplary symbol for a graphical user interface.

FIG. 7 shows examples of symbols for guiding or informing passengers.

FIG. 8 shows an example configuration for an observation tower.

FIG. 9 shows a block diagram of an exemplary embodiment of a method for controlling passenger traffic in an observation tower.

FIG. 10 shows a block diagram of an exemplary embodiment of a computer.

[0018] The disclosed technologies can be generally used to control the flow of passenger traffic in an area. Although many of the disclosed embodiments are described in the context of passenger traffic in an airport, any of the embodiments can be adapted for use in contexts other than an airport.

[0019] FIG. 1 shows a block diagram of an exemplary embodiment of an area 100 for handling passenger traffic, such as an airport area. The area 100 comprises a first floor 110. In an airport context, the first floor 110 includes a gate area from which a passenger can access an airport gate (not shown). The area 100 further comprises an additional floor 120. Although the additional floor 120 is shown in FIG. 1 as being one floor immediately above the first floor 110, any of the disclosed technologies can also be used in situations where the additional floor 120 is below the first floor 110, and also in situations where the floors 110, 120 are separated by one or more intervening floors. In FIG. 1 the floors 110, 120 are connected by an elevator 130 and by an escalator 140. In further embodiments, the floors 110, 120 are connected by one or more elevators, or by one or more escalators, but not by both an elevator and an escalator. A control panel 150 allows for controlling operation of the elevator 130 or the escalator 140, as described in more detail herein. Although FIG. 1 depicts the control panel 150 as being next to the elevator 130, in various embodiments the control panel 150 can be located elsewhere (e.g., near the escalator 140, near an airport gate, or at another location). Additional control panels 152, 154, 156 can also be present.

[0020] Although not shown in FIG. 1, various embodiments of the area 100 can further comprise additional passages between the gate floor and the additional floor, such as a stairwell, a service elevator, or both. However, use of such additional passages is typically limited to particular persons (e.g., authorized employees), to unusual situations (e.g., emergency situations, such as require an evacuation), or both. Generally, passenger traffic in the airport area is handled exclusively by the elevator 130, the escalator 140, or both.

[0021] In this application and in the claims, the term "passenger" refers to a person located on a given floor or traveling between any two floors. A passenger is not necessarily someone who has recently traveled on an airplane or who intends to travel on an airplane.

[0022] In this application and in the claims, the term "passenger traffic" refers generally to one or more persons moving in a given direction.

[0023] FIG. 2 shows a block diagram of an exemplary embodiment of a system 200 for controlling passenger traffic at an area, such as the area 100 of FIG. 1. The system 200 comprises a computer-based control unit 210. The control unit 210 comprises at least one processor and at least one computer-readable storage medium, which stores instructions for the processor. When the processor executes the instructions, the control unit 210 performs one or more of the method acts described in this application. The control unit 210 is communicatively coupled to additional components through a network 220. The system 200 also comprises an elevator control system 230, an escalator or moving walkway control system 240, or both, depending on the particular components

present in the area. The control systems 230, 240 are respectively coupled to an elevator 232 and an escalator or moving walkway 242. A control panel 250 (possibly similar to the control panel 150, 152, 154, 156 of FIG. 1) is also coupled to the network 220. The control panel 250 comprises a computer-based unit having at least one input-output device. For example, the control panel 250 can comprise a touch-sensitive display. Of course, other input-output devices can also be used. The control panel 250 can be a stationary device (e.g., mounted to a stationary object); it can also be a portable device (e.g., a smartphone, a tablet computer, a laptop computer, a personal digital assistant, or another portable electronic device).

[0024] A security system 260 can also be coupled to the network 220. Additionally, an intrusion detection unit 270 can be coupled to the network 220. Generally, the intrusion detection unit 270 determines when a person is attempting to use an escalator, a moving walkway, or an elevator to travel between two areas in a direction that is not currently allowed. In some embodiments, the security system 260 and the intrusion detection 270 unit are integrated into a single component.

[0025] Various versions of the system 200 can be used with methods for controlling passenger traffic. FIG. 3 shows a block diagram of an exemplary embodiment of such a method 300. The method 300 is performed in the context of an airport area or another area, possibly the area 100 of FIG. 1.

[0026] In a method act 310, the system 200 is placed in a first mode. The first mode allows passengers to travel from the first floor 110 to the additional floor 120. However, passengers are not allowed to travel in the opposite direction, that is, from the additional floor 120 to the first floor 110. In some embodiments, the first mode is called an "arrival mode," since it can be used in a scenario where passengers are entering the first floor 110 from an airplane that has arrived at a gate on the floor. Additional embodiments of the method are used in situations not related to passengers deboarding an airplane.

[0027] When the system 200 operates in the first mode, the elevator 130 acts as a one-way shuttle to move passengers from the first floor 110 to the additional floor 120. In particular embodiments, the elevator car waits for passengers with open doors at the first floor 110. When the elevator car is loaded, the doors close and the car brings the passengers to the additional floor 120.

[0028] In embodiments with the escalator 140, when the system 200 operates in arrival mode, the escalator steps move from the first floor 110 toward the additional floor 120. The escalator 140 thus provides one-way transportation of passengers from the first floor 110 to the additional floor 120.

[0029] In a method act 320, the system 200 is placed in a second mode, which is sometimes called an "idle mode." The idle mode prevents passengers from traveling between the first floor 110 and the additional floor 120. The escalator 140 and the elevator 130 are generally not operated in this mode.

[0030] In a method act 330, the system 200 is placed in a third mode. The third mode allows passengers to travel from the additional floor 120 to the first floor 110. However, passengers are not allowed to travel from the first floor 110 to the additional floor 120. In some embodiments, the third mode is called a "departure mode," since in can be used in a scenario where passengers are entering the first floor 110 in preparation for boarding an airplane at the gate. Additional embodiments of the method are used in situations not related to passengers boarding an airplane.

[0031] When the system 200 operates in the third mode, the elevator 130 acts as a one-way shuttle to move passengers from the additional floor 120 to the first floor 110. In some embodiments, the elevator 130 waits for passengers with open doors at the additional floor 120. When the elevator car is loaded, the doors close and the car brings the passengers to the first floor 110.

[0032] In embodiments with the escalator 140, when the system 200 operates in the third mode, the escalator steps move from the additional floor 120 toward the first floor 110. The escalator 140 thus provides one-way transportation of passengers from the additional floor 120 to the first floor 110.

[0033] Although FIG. 3 shows the system being placed in the various modes in a particular order, other embodiments can use other orders. For example, the system could be switched between the first mode and the third mode without first being placed in idle mode.

[0034] In the first, second, and third modes the direction and rate of the passenger traffic is controlled by appropriate operation of the elevator 130, of the escalator 140, or of both of these devices.

[0035] In an example configuration, an elevator operating in the first mode detects when a passenger is attempting to travel from the additional floor to the first floor (i.e., the opposite of the currently permitted direction). In some cases, the elevator can detect the passenger's presence in the elevator car at the additional floor. In other cases, the elevator can detect the passenger's attempt to enter the elevator car at the additional floor. The elevator can detect the passenger using one or more sensors, for example, a weight sensor, an infrared sensor, a time-of-flight sensor, an image sensor coupled with computer-vision technology, or another type of sensor. One or more of these sensors can be used in the intrusion detection unit 270 of FIG. 2.

[0036] In another example configuration, an escalator operating in the third mode detects when a passenger is attempting to travel from the first floor to the additional floor (i.e., opposite of the currently permitted direction). The escalator can detect the passenger using one or more sensors, for example a time-of-flight sensor, an image sensor coupled with computer-vision technology, or another type of sensor. One or more of these sensors can be used in the intrusion detection unit 270 of FIG. 2.

[0037] In some cases, the mode of operation for the

system 100 can be selected using the control panel 150, 152, 154, 156, 250. Use of the control panel can require user authentication in the form of, for example, a PIN (personal identification number), an RFID card, a biometric feature, an optical code, a magnetic stripe card, or another device. Such authentication can help prevent unauthorized use of one or more modes. In particular embodiments, the mode of operation is selected automatically by the system based on a time, a transportation schedule, or another factor.

[0038] In the embodiment shown in FIG. 1, the first floor 110 is connected to only a single additional floor 120 by the elevator 130 and the escalator 140. In further embodiments, the first floor 110 is connected to multiple additional floors by the elevator 130, the escalator 140, or both. Using multiple additional floors can allow for arrangements where, for example, passenger traffic flowing toward the first floor comes from a first additional floor (or a first set of additional floors), while passenger traffic flowing away from the first floor goes to a second additional floor (or a second set of additional floors).

[0039] FIG. 4 shows a block diagram of a further embodiment of a method 400 for controlling passenger traffic. The method 400 is performed in the context of an airport area or other areas. In some cases, the method is performed in the context of the airport area 100 of FIG. 1. The method 400 is also performed using an embodiment of the system 200 of FIG. 2.

[0040] In a method act 410, a first mode of the system is activated. While the system is operating in this first mode, one or more passengers are moved from the first floor to a first additional floor in a method act 420. Also while the system is operating in the first mode, passenger traffic is prevented from moving from the first additional floor to the first floor in a method act 430. Such unauthorized passenger traffic is detected using the intrusion detection unit 270. In some embodiments, if an unauthorized person is detected, operation of the escalator or elevator is inhibited, the security system 260 is notified, or both.

[0041] In a method act 440, a second mode of the system is activated. Correspondingly, the first mode of the system is deactivated. While the system is operating in this second mode, one or more passengers are moved from a second additional floor to the first floor in a method act 450. (In some embodiments, the first additional floor is different than the second additional floor, while in other embodiments these two floors are the same.) Also while the system is operating in the second mode, passenger traffic is prevented from moving from the first floor to the second additional floor in a method act 460. Such unauthorized passenger traffic is detected using the intrusion detection unit 270. In some embodiments, if an unauthorized person is detected, operation of the escalator or elevator is inhibited, the security system 260 is notified, or both.

[0042] In further embodiments, the method 400 further comprises a method act (not shown) in which an idle mode is activated. When the system is in idle mode, passengers cannot use an elevator or escalator to move between floors. Attempts to use the elevator or escalator during idle mode can be reported to the security system.

[0043] In some cases, an elevator car has multiple sets of doors. For example, the car has a set of doors on each of two sides of the cabin (e.g., front doors and back doors). In such embodiments, particular doors can be opened or closed to help in directing passenger traffic. For example, in an airport context, the front doors of an elevator cabin can be used by departing passengers, and the rear doors of an elevator cabin can be used by arriving passengers. This arrangement can allow for separating and controlling passenger traffic even on a single floor.

[0044] As mentioned above, a control panel (such as the control panel 150, 152, 154, 156, 250) can be used to select a mode of operation for the system. FIG. 5 shows an example of a graphical user interface 500 that can be used to place the system 200 into different modes in an airport context. The interface 500 comprises: a button 510 for placing the system 200 into departure mode; a button 520 for placing the system 200 into arrival mode; and a button 530 for placing the system 200 into idle mode.

[0045] Particular embodiments also comprise a button 540 to allow an authorized user to request an exception to the current operating mode. For example, a staff member could use the exception button to cause the elevator or the escalator to allow a trip in a given direction between the first floor and the additional floor. The trip would be permitted, even if the trip were against the flow of currently allowed passenger traffic, or if the system were currently operating in idle mode.

[0046] In the embodiment of FIG. 5, the buttons 510-540 comprise graphical symbols. In other embodiments, the buttons comprise graphical symbols and text, or they comprise only text. Additional embodiments employ user interface elements other than buttons.

[0047] In some embodiments, information is provided by the system 200 to guide or inform passengers. Such information can be displayed (e.g., on a control panel 150, 152, 154, 156, 250, or on another display), audibly announced, or both. FIG. 6 shows an example of a symbol 600 that indicates that an elevator or an escalator is currently unavailable for use by passengers. The elevator or escalator may be unavailable because, for example, the system is in idle mode, or because the elevator or escalator is not currently transporting passengers away from that particular floor.

[0048] FIG. 7 shows additional examples of symbols 700 for guiding or informing passengers. The symbols can indicate destinations which may be of interest to arriving passengers, departing passengers, or both. Examples include: baggage claim (symbol 710); immigration (symbol 720); transfer gates (symbol 730); and restrooms (symbol 740). Further examples include customs, shopping, eating areas, and visitor information. Indicators like the symbol 750 can tell a passenger which

elevator or escalator to use. For example, the symbol 750 shows passengers that the elevator or escalator to the left of the display leads to the other destinations shown on the display.

[0049] As mentioned above, the disclosed technologies are not limited to use in airport environments, and any of the disclosed embodiments can be modified for use in non-airport environments. Generally, the disclosed technologies can be used in any scenario where it is needed or desirable to control passenger traffic. For example, any of the disclosed embodiments can be adapted for use in a venue (e.g., an entertainment venue or other venue) in which passenger traffic is generally divided between "incoming" and "outgoing" traffic.

[0050] One possible entertainment venue is an observation area on a tower. FIG. 8 depicts an example of a configuration for an observation tower 800. In the tower 800, an elevator 802 moves passengers between various levels using a car 804. The observation tower 800 comprises a start level 810, an exit level 820, a first attraction level 840, and a second attraction level 830. The level 840 comprises an attraction such as an observation deck. The level 830 comprises, for example, a retail outlet, a restaurant, or another attraction. The level 820 comprises an exit from the tower 800, but can also include additional attractions.

[0051] FIG. 9 shows a block diagram of an exemplary embodiment of a method 900 for controlling passenger traffic in the context of the observation tower 800. In a method act 910, the elevator 802 operates in a first mode in which the car 804 brings passengers from the start level 810 to the first attraction level 840. In this mode, the elevator 802 does not allow passengers to ride the car 804 down to the lower levels 810, 820. The car 804 may make multiple consecutive trips from the level 810 to the level 840 while in the first mode.

[0052] In a method act 920, the elevator 802 switches to a second mode, in which the car moves from the level 840 to a second attraction level 830. From the level 830, the car 804 shuttles passengers to the exit level 820. In the second mode, the elevator 802 does not allow passengers to ride the car 804 from the level 820 to the upper levels 830, 840. The car 804 may make multiple consecutive trips from the level 830 to the level 820 while in the second mode.

[0053] In a method act 930, the car is moved from the exit level 820 to the start level 810. Passengers are not allowed to ride in the car 804 from level 820 to level 810. Thus, when the car 804 returns to the level 810, it is empty and ready for additional passengers.

[0054] How passengers move from the level 840 to the level 830 can vary depending on the embodiment. In some embodiments, passengers may travel in the car 804 from the level 840 to the level 830. In other variations, passengers move between the levels 830, 840 using a staircase or a ramp.

[0055] Other embodiments of the method 900 can be used with other arrangements of buildings, including other versions of the tower 800. For example, the positions of the start level 810 and the exit level 820 can be reversed. Particular versions of the tower 800 include an elevator having a double-deck car.

[0056] At least some of the embodiments that use an escalator can be adapted for use with a moving walkway. In some cases, the moving walkway is inclined and transports passengers between two floors, like an escalator. Generally, inclined moving walkways can be used in place of escalators in the disclosed embodiments. In other cases, the moving walkway is horizontal and transports passengers between areas on a single floor. For example, in a first mode, a passenger travels on the moving walkway from a first area on the floor to a second area on the floor. Passengers are prevented from using the moving walkway to travel in the opposite direction for the first mode, as was similarly described above for the escalator embodiments. In a second mode, a passenger travels on the moving walkway from a third area on the floor to the first area on the floor. As was also similarly described above for escalator embodiments, passengers are prevented from traveling in the incorrect direction on the moving walkway in the second mode.

[0057] FIG. 10 shows a block diagram of an exemplary embodiment of a computer 1000 (e.g., part of a system control unit, part of an elevator system control unit, part of an escalator or moving walkway system control unit, part of a control panel, part of a security system, part of an intrusion detection unit) that can be used with one or more technologies disclosed herein. The computer 1000 comprises one or more processors 1010. The processor 1010 is coupled to a memory 1020, which comprises one or more computer-readable storage media storing software instructions 1030. When executed by the processor 1010, the software instructions 1030 cause the processor 1010 to perform one or more of the method acts described in this application. Further embodiments of the computer 1000 can comprise one or more additional components. The computer 1000 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 1000 can connect to other computers or electronic devices through a network 1040. In particular embodiments, the computer 1000 works with one or more other computers, which are located locally, remotely, or both. One or more of the disclosed methods can thus be performed using a distributed computing system.

[0058] At least some of the disclosed embodiments can allow for improved passenger traffic flow in an area (e.g., in an airport). For example, when a system like that of FIG. 2 is operating in arrival mode, passengers can leave the first floor without being hindered by other passengers who are trying to enter the first floor from another floor. Conversely, when the system of FIG. 2 is operating in departure mode, passengers can enter the first floor without being hindered by other passengers who are leaving the first floor. When the system is operating in

idle mode, passengers may not travel between the first floor and other floors.

[0059] Particular embodiments can improve security at or around an airport gate area or another area. For example, when newly arrived passengers are leaving the gate area floor, other passengers can be prevented from entering the gate area floor until a certain time (e.g., when all of the newly arrived passengers have left the gate area floor). Thus security can be improved, possibly reducing the need for the presence of human security personnel.

[0060] At least some of the embodiments that allow an authorized user to request an exception to the current operating mode can improve the flexibility of the system without substantially hindering passenger traffic flow or security.

[0061] In one non-limiting airport example, a system for controlling passenger traffic (such as the system 200) is switched from idle mode to departure mode by an authorized person. In this case, the authorized person is a gate agent working on the gate area floor. The gate agent switches the system between modes using a control panel positioned next to the elevator. Operating in departure mode, the system uses an elevator and an escalator to bring passengers from an upper additional floor to the gate area floor. Later, the passengers board an airplane through a gate on the gate area floor. Once the passengers have boarded, the gate agent returns the system to idle mode, thus preventing use of the elevator and of the escalator. While the system is in idle mode, the gate agent uses the control panel to request an exception to the idle mode so that another airport worker can use the elevator to leave the gate area floor. When another airplane parks at the gate, the gate agent switches the system to arrival mode in preparation for the passengers that will soon disembark from the plane. The newly arrived passengers use the escalator and the elevator to leave the gate area floor. They are guided to their destinations by images on control panels next to the elevator and the escalator. While the system is in arrival mode, a person attempts to enter the gate area floor by boarding the elevator from the upper additional floor. The elevator system detects this unauthorized attempt and halts operation of the elevator car until the person exits the car.

[0062] 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 as disclosed herein. In some cases, two or more method acts can be combined into one method act or performed simultaneously. In some cases, one method act can be divided into two or more method acts.

[0063] Unless stated otherwise, a phrase referring to "at least one of" a list of items refers to any combination of those items, including single members. As an example, "at least one of: a, b, or c" is intended to cover: a; b; c; a and b; a and c; b and c; and a, b and c. As another example, "at least one of: a, b, and c" is intended to cover: a; b; c; a and b; a and c; b and c; and a, b and c.

[0064] 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. We therefore claim as our invention all that comes within the scope of these claims.

Claims

1. A passenger-traffic control method, comprising:

   activating a first mode of a passenger transportation system, the passenger transportation system comprising a transportation device (130, 140);
   while the first mode is active, moving a first passenger from a first area (110) to a second area (120) using the passenger transportation system;
   while the first mode is active, preventing passenger traffic from moving from the second area (120) to the first area (110) using the passenger transportation system;
   activating a second mode of the passenger transportation system;
   while the second mode is active, moving a second passenger from a third area to the first area (110) using the passenger transportation system; and
   while the second mode is active, preventing passenger traffic from moving from the first area (110) to the third area using the passenger transportation system.

2. The passenger-traffic control method of claim 1, the first area comprising an airport gate area.

3. The passenger-traffic control method of claim 1, the first area comprising an observation platform area (840).

4. The passenger-traffic control method of any preceding claim, further comprising:

   activating a third mode of the passenger transportation system; and
   while the third mode is active, preventing pas-

senger traffic from entering or leaving the first area (110) through the passenger transportation system.

5. The passenger-traffic control method of any preceding claim, the transportation device comprising an elevator (130), the first area comprising a first floor (110), the second area comprising a second floor (120), the third area comprising a third floor, the elevator (130) being configured to prevent passenger traffic in a given direction by not transporting passengers in the given direction.

6. The passenger-traffic control method of claim 5, the elevator (130) being configured to detect when a person enters the elevator (130) to travel in the given direction.

7. The passenger traffic control method of claim 1, the transportation device comprising an elevator, the elevator (130) comprising a cabin (804) with a first set of doors and a second set of doors, the elevator being configured to open the first set of doors at the second area (120) and to open the second set of doors at the third area.

8. The passenger-traffic control method of any of claims 1-4, the transportation device comprising an escalator (140) or an inclined moving walkway, the first area comprising a first floor (110), the second area comprising a second floor (120), the third area comprising a third floor, the escalator (140) or the inclined moving walkway being configured to prevent passenger traffic in a given direction by detecting movement of a person on the escalator (140) or on the inclined moving walkway in the given direction.

9. The passenger-traffic control method of any of claims 1-4, the transportation device comprising a moving walkway, the first area and the second area being on a common floor.

10. The passenger-traffic control method of any preceding claim, the activating of the first mode or the activating of the second mode being performed by a person at the first area (110) or by a person remote from the first area (110).

11. The passenger-traffic control method of any preceding claim, the first mode of the passenger transportation system being an arriving-passenger mode, and the second mode of the passenger transportation system being a departing-passenger mode.

12. The passenger-traffic control method of any preceding claim, further comprising permitting an authorized person to move from the second area (120) to the first area (110) using the passenger transportation system while the first mode is active, or further comprising permitting the authorized person to move from the first area (110) to the third area using the passenger transportation system while the second mode is active.

13. A passenger transportation system, comprising:

a control panel (150);
a transportation device (130, 140); and
a computer-based control unit (210) comprising a processor (1010) and a computer-readable storage medium (1020), the computer-readable storage medium (1020) having encoded thereon instructions (1030) that, when executed by the processor (1010), cause the processor (1010) to perform a method, the method comprising,
activating a first mode of the passenger transportation system based on input from the control panel (150),
while the first mode is active, moving a first passenger from a first area (110) to a second area (120) using the transportation device (130, 140),
while the first mode is active, preventing passenger traffic from moving from the second area (120) to the first area (110) using the transportation device (130, 140),
activating a second mode of the passenger transportation system based on input from the control panel (150),
while the second mode is active, moving a second passenger from a third area to the first area (110) using the transportation device (130, 140), and
while the second mode is active, preventing passenger traffic from moving from the first area (110) to the third area using the transportation device (130, 140).

14. The passenger transportation system of claim 13, the second and third areas being different areas.

15. A computer-readable storage medium (1020) having encoded thereon instructions (1030) that, when executed by a processor (1010), cause the processor (1010) to perform a method, the method comprising:

activating a first mode of a passenger transportation system, the passenger transportation system comprising a transportation device (130, 140);
while the first mode is active, moving a first passenger from a first area (110) to a second area (120) using the passenger transportation system;
while the first mode is active, preventing passenger traffic from moving from the second area (120) to the first area (110) using the passenger

transportation system;
activating a second mode of the passenger transportation system;
while the second mode is active, moving a second passenger from a third area to the first area (110) using the passenger transportation system; and
while the second mode is active, preventing passenger traffic from moving from the first area (110) to the third area using the passenger transportation system.

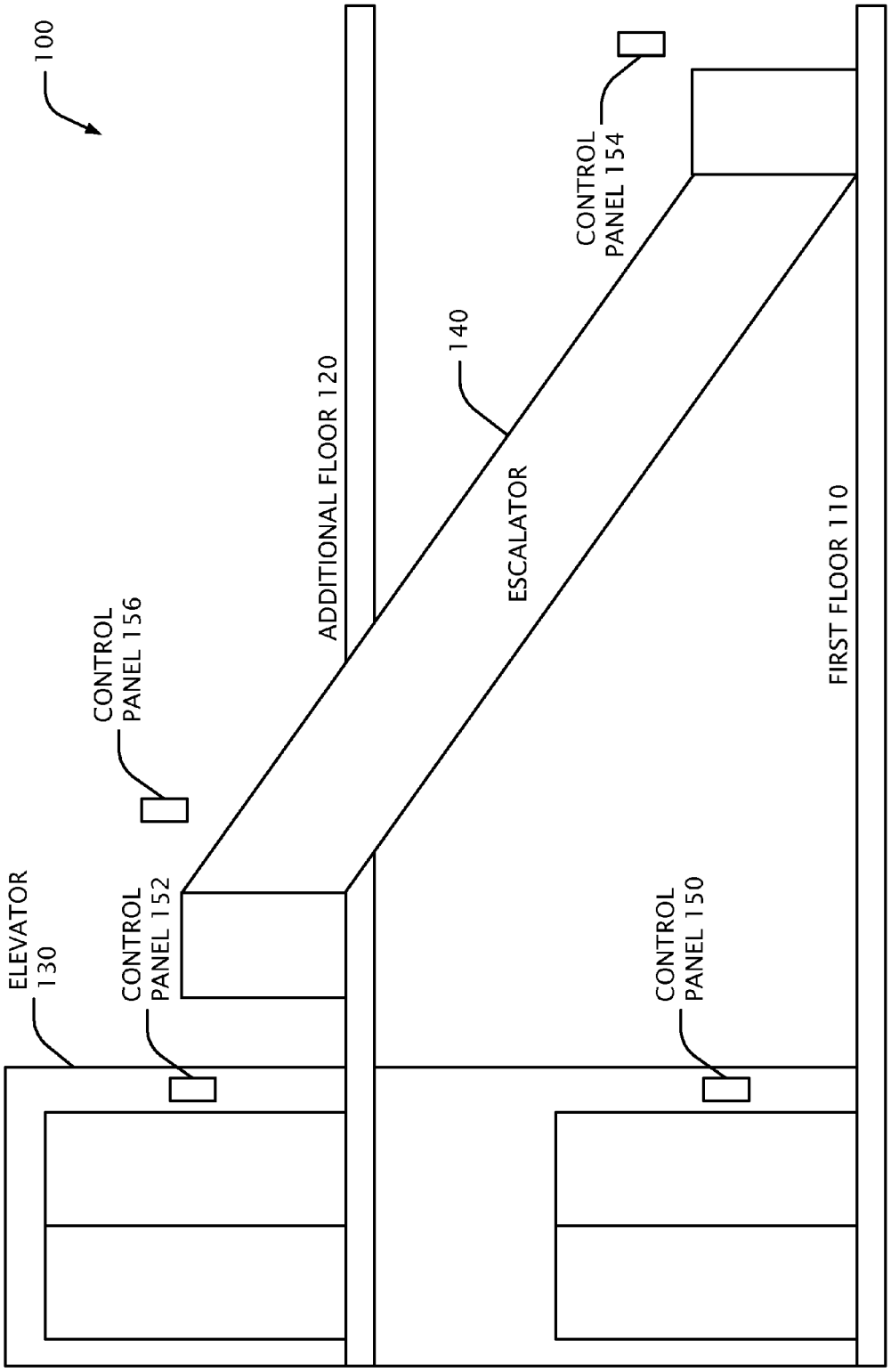
100
CONTROL PANEL 154
140
ADDITIONAL FLOOR 120
ESCALATOR
FIRST FLOOR 110
CONTROL PANEL 156
ELEVATOR 130
CONTROL PANEL 152
CONTROL PANEL 150

FIG. 1

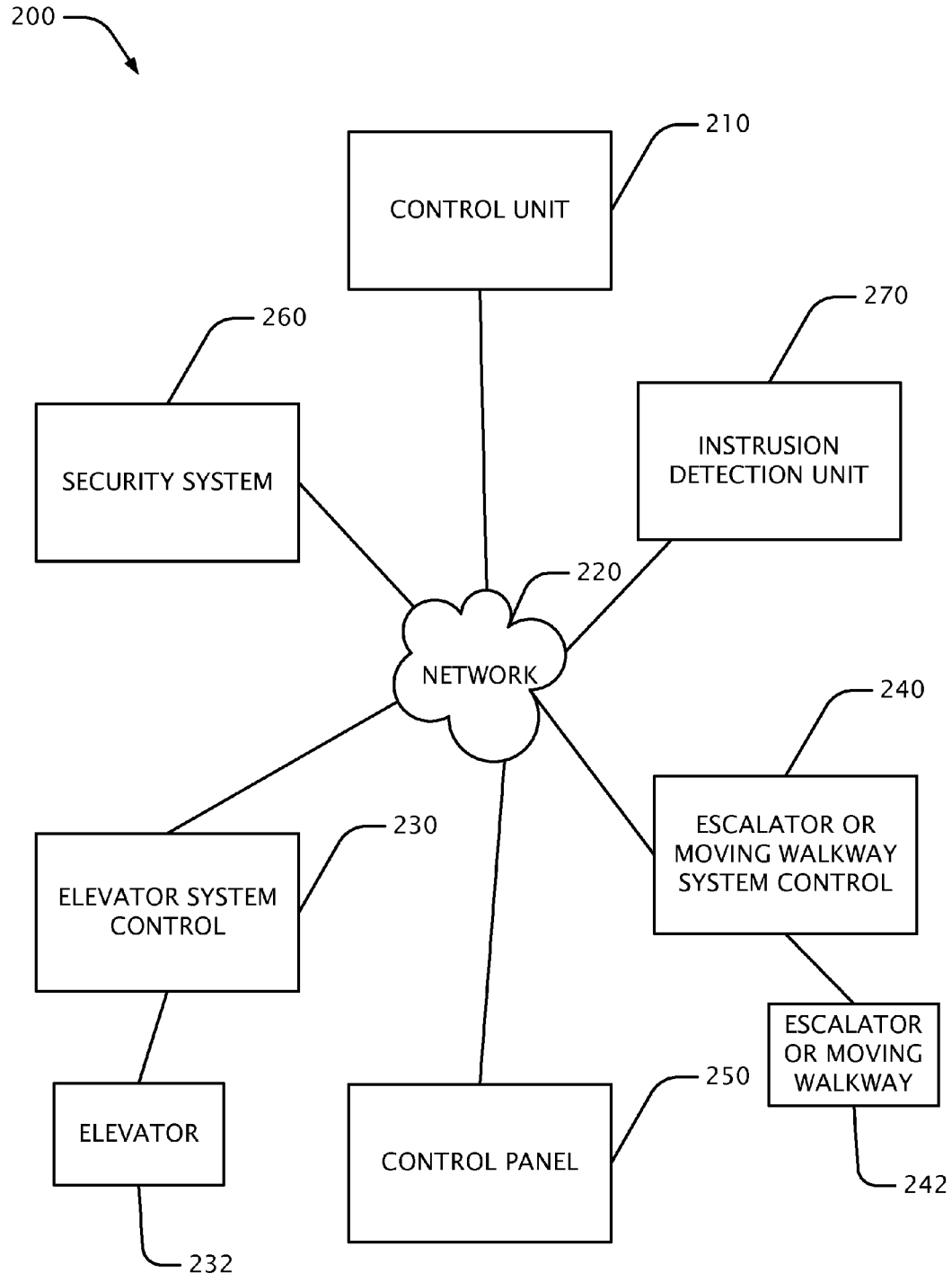
200
CONTROL UNIT
210
SECURITY SYSTEM
260
INSTRUSION DETECTION UNIT
270
NETWORK
220
ELEVATOR SYSTEM CONTROL
230
ESCALATOR OR MOVING WALKWAY SYSTEM CONTROL
240
ELEVATOR
232
CONTROL PANEL
250
ESCALATOR OR MOVING WALKWAY
242

FIG. 2

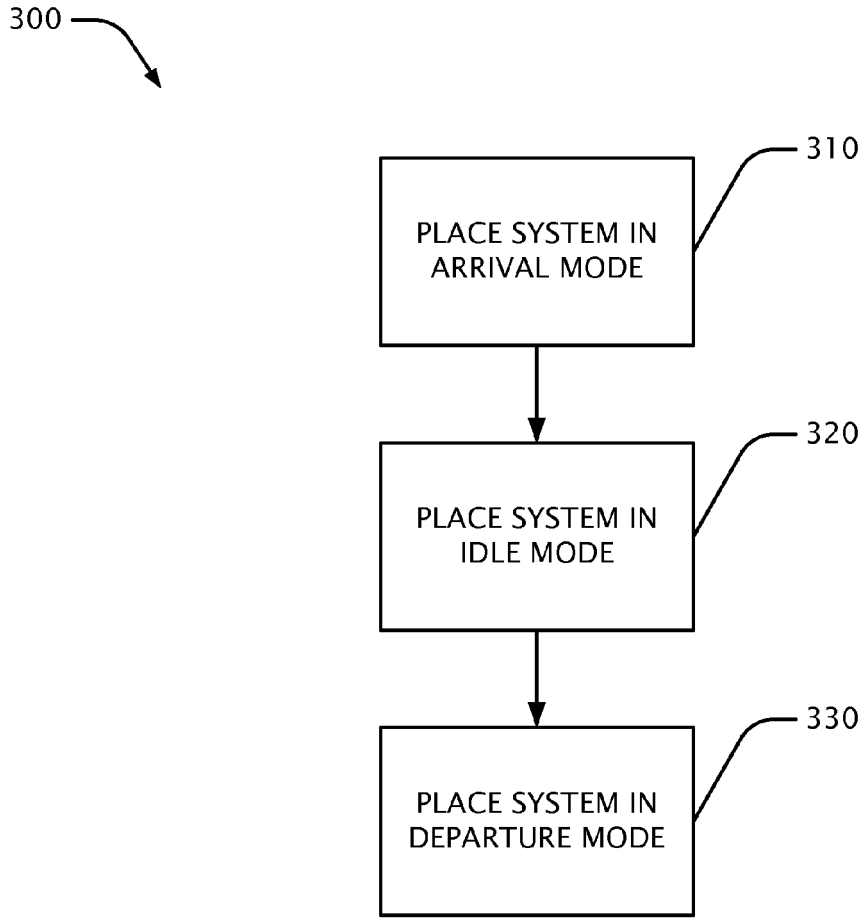
300
310
PLACE SYSTEM IN ARRIVAL MODE
320
PLACE SYSTEM IN IDLE MODE
330
PLACE SYSTEM IN DEPARTURE MODE

FIG. 3

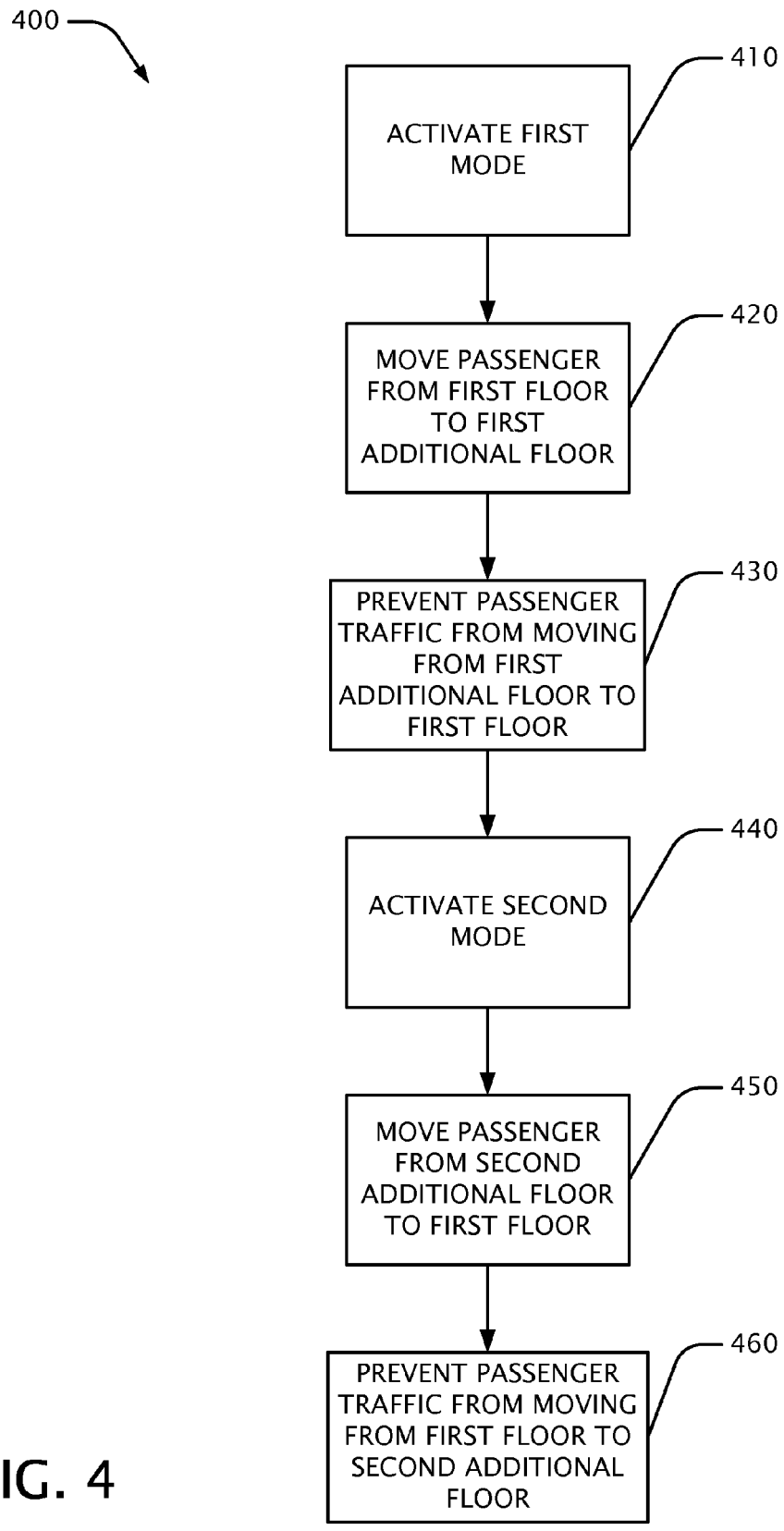
400
410
ACTIVATE FIRST MODE
420
MOVE PASSENGER FROM FIRST FLOOR TO FIRST ADDITIONAL FLOOR
430
PREVENT PASSENGER TRAFFIC FROM MOVING FROM FIRST ADDITIONAL FLOOR TO FIRST FLOOR
440
ACTIVATE SECOND MODE
450
MOVE PASSENGER FROM SECOND ADDITIONAL FLOOR TO FIRST FLOOR
460
PREVENT PASSENGER TRAFFIC FROM MOVING FROM FIRST FLOOR TO SECOND ADDITIONAL FLOOR

FIG. 4

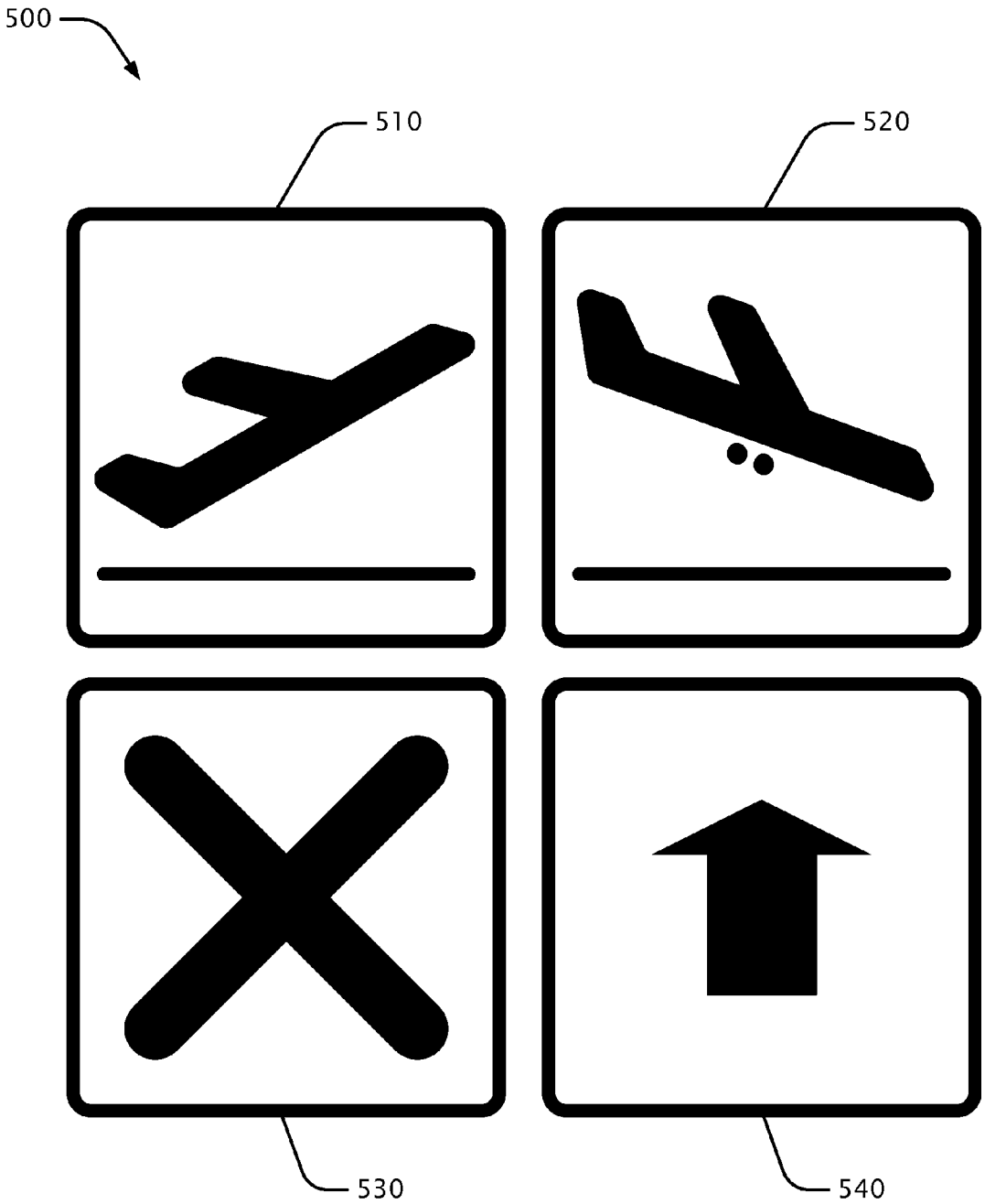

FIG. 5

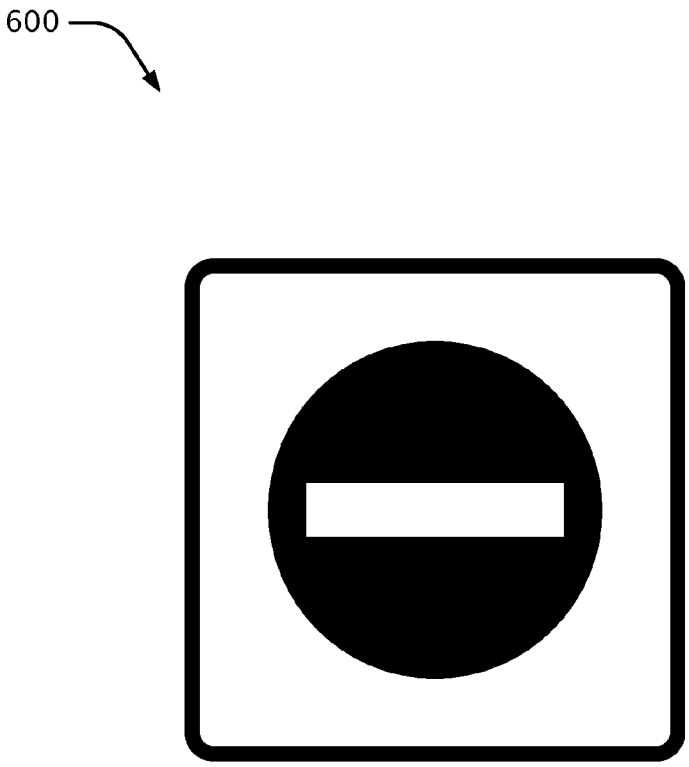

FIG. 6

FIG. 7

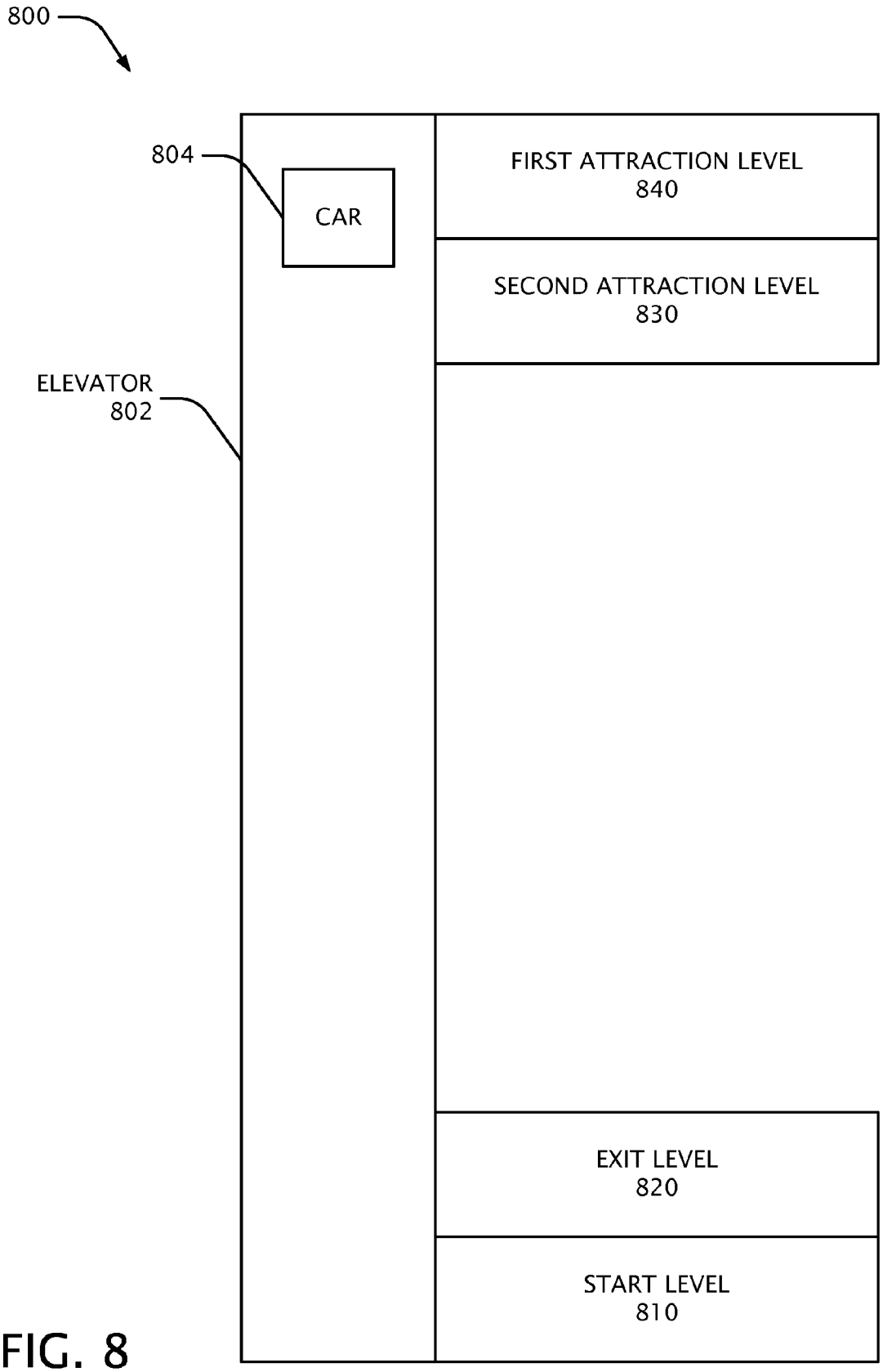
800
804
CAR
FIRST ATTRACTION LEVEL
840
SECOND ATTRACTION LEVEL
830
ELEVATOR
802
EXIT LEVEL
820
START LEVEL
810

FIG. 8

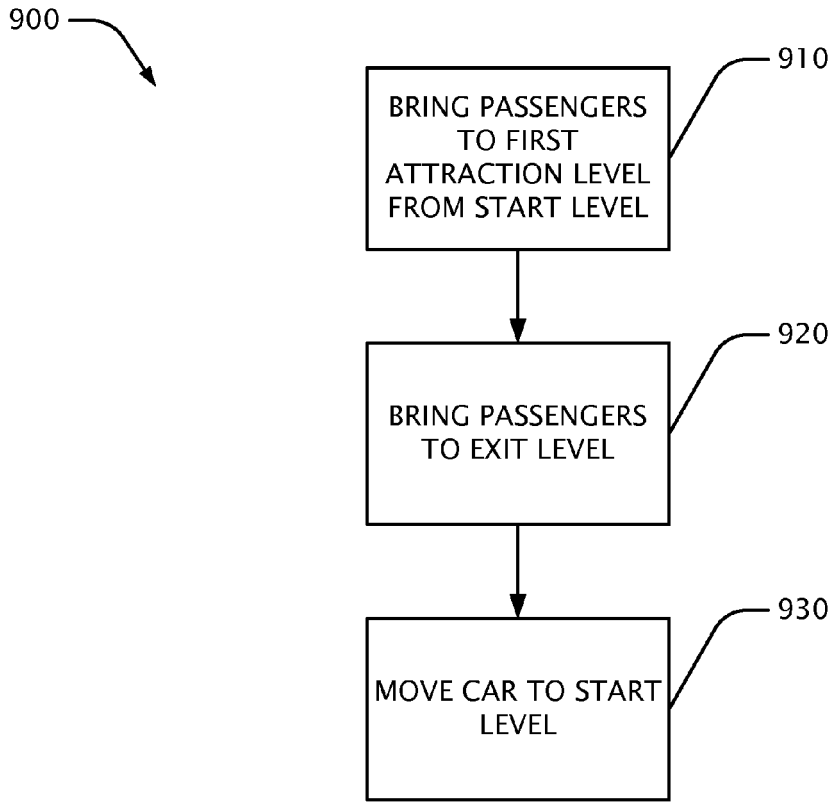
900
910
BRING PASSENGERS TO FIRST ATTRACTION LEVEL FROM START LEVEL
920
BRING PASSENGERS TO EXIT LEVEL
930
MOVE CAR TO START LEVEL

FIG. 9

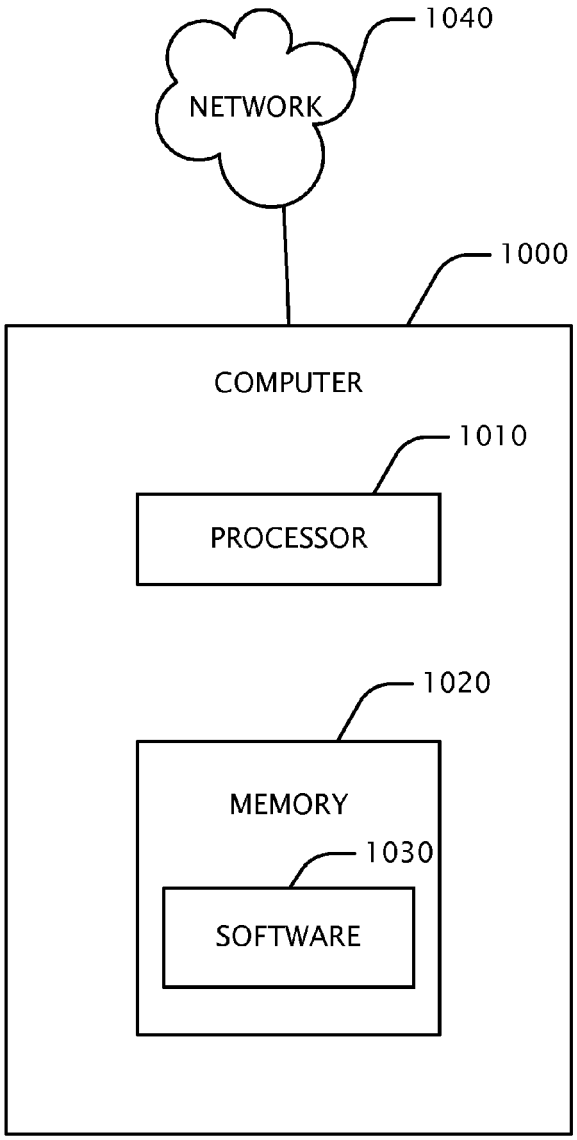
1040
NETWORK
1000
COMPUTER
1010
PROCESSOR
1020
MEMORY
1030
SOFTWARE

FIG. 10

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 13 19 4277

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 2 867 293 A (JOHN BAILEY WILLIAM) 6 January 1959 (1959-01-06) * column 1, line 15 - column 3, line 55 * * column 5, line 41 - line 49 * * column 7, line 15 - line 30 *	1-7,9-15	INV. G07C9/00 B66B25/00
X Y	WO 2006/018304 A2 (RAUCH JUERGEN [DE]) 23 February 2006 (2006-02-23) * page 25, line 14 - page 27, line 4 * * page 28, line 1 - page 31, line 23 * * page 41, line 12 - line 17 * * page 48, line 17 - line 31 * * figures 1-3,5 *	1-5,9-15 8	
X	US 2 775 312 A (THURSTON ERNEST B) 25 December 1956 (1956-12-25) * column 1, line 46 - column 2, line 66 * * column 3, line 50 - column 4, line 67 *	1-7, 10-15	
X	WO 2013/036225 A1 (OTIS ELEVATOR CO [US]; FLYNN MICHAEL P [US]; HANVEY DENNIS [US]; PATEN) 14 March 2013 (2013-03-14) * abstract * * paragraph [0001] - paragraph [0005] * * paragraph [0010] - paragraph [0014] * * paragraph [0017] - paragraph [0018] * * paragraph [0021] *	1-7, 10-15	TECHNICAL FIELDS SEARCHED (IPC) B66B G07C
Y	WO 03/088157 A1 (NEWTON SECURITY INC [US]; BRAMBLET JOHN WESTLEY [US]; WITTY CARL ROGER) 23 October 2003 (2003-10-23) * page 1, line 30 - page 2, line 5 * * page 14, line 6 - line 7 * * claim 41 *	8	
A	CN 103 030 051 A (THYSSENKRUPP ELEVATORS CO LTD SHANGHAI BRANCH) 10 April 2013 (2013-04-10) * figure 2 *	7	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 April 2014	Van der Haegen, D

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 13 19 4277

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

01-04-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2867293 A	06-01-1959	NONE	
WO 2006018304 A2	23-02-2006	AT 474304 T	15-07-2010
		CA 2577491 A1	23-02-2006
		DE 102004040057 A1	09-03-2006
		EP 1779354 A2	02-05-2007
		ES 2348856 T3	03-12-2010
		HK 1103256 A1	05-11-2010
		JP 4938664 B2	23-05-2012
		JP 2008510237 A	03-04-2008
		US 2008195257 A1	14-08-2008
		WO 2006018304 A2	23-02-2006
US 2775312 A	25-12-1956	NONE	
WO 2013036225 A1	14-03-2013	NONE	
WO 03088157 A1	23-10-2003	AU 2003221893 A1	27-10-2003
		CA 2481250 A1	23-10-2003
		EP 1493130 A1	05-01-2005
		US 2004017929 A1	29-01-2004
		US 2008285802 A1	20-11-2008
		WO 03088157 A1	23-10-2003
CN 103030051 A	10-04-2013	NONE	

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- US 20100039259 A1 **[0003]**