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(54) **Platform door control apparatus**

Vorrichtung zur Steuerung von Bahnsteigtüren

Dispositif de commande de portes d'un quai

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(73) Proprietor: **Hitachi Power Solutions Co., Ltd.**
Hitachi-shi, Ibaraki 317-0073 (JP)

(72) Inventors:
• **Kawabata, Iko**
Tokyo 100-8220 (JP)

- **Amazawa, Toshiharu**
Tokyo 100-8220 (JP)
- **Kasai, Syoji**
Tokyo 100-8220 (JP)
- **Inoue, Tomomi**
Tokyo 100-8220 (JP)

(74) Representative: **Addiss, John William et al**
Mewburn Ellis LLP
City Tower
40 Basinghall Street
London EC2V 5DE (GB)

(56) References cited:
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US-B1- 6 360 668

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Description

[0001] The present invention relates to a platform door control apparatus, and more particularly to technology for controlling platform doors installed on a platform for an underground train or the like.

[0002] In recent years, the trend towards the use of one-man operated trains has been increasing. Accompanying this, platform doors are being installed on platforms to secure passenger safety. After a train arrives at a platform, an "OPEN" command is transmitted from the train and the gates of the platform doors open. After passengers have gotten off and on, a "CLOSE" command is transmitted from the train and the gates of the platform doors close and the train departs.

[0003] Closest prior art US6360668 discloses a plurality of barrier elements which can be aligned along a track and are displaceable such that predetermined openings are created along the track.

[0004] However, on train lines on which a large number of trains of different forms operate, or on lines on which one train company shares the tracks with another, the number, locations and width dimensions of the train doors differ according to the specifications of each train. Thus, since the locations of train doors and platform doors do not correspond, it constitutes an obstacle to the introduction of platform doors.

[0005] The present invention aims to provide a platform door control apparatus that enables the installment of platform doors even if trains differ in the number, locations and width dimensions of their train doors.

[0006] Accordingly, the platform door control apparatus of the present invention comprises a plurality of platform doors provided on a platform and fixed in relation to the platform, wherein the plurality of platform doors are provided at intervals such that the gate of each platform door is located at a position corresponding to a different train door of a train having any of a plurality of formations, the gates being movable parts, the platform door control apparatus being characterized by comprising: a receiving means for receiving formation information of a train from the train; a storing means for storing information about a distance of moving for opening and closing of a gate of each of the platform doors corresponding to the formation information of each train; and a control apparatus capable of controlling openings of the platform doors in accordance with train doors of the trains of a plurality of formations by controlling the distance of moving for opening and closing of a gate of each of the platform doors based on the formation information of the train received by the receiving means and on the information about the distance of moving for opening and closing of a gate of each of the platform doors stored in the storing means.

[0007] Preferably, in accordance with the formation information of the train, when train doors of a train are not positioned at the gates of a relevant platform door, the gates do not open and close.

[0008] Preferably, a means is provided to inform passengers that it is not possible to get off or on at a platform door.

Fig. 1 is a schematic diagram illustrating the positional relationship between opening parts of platform doors and train doors of a train of formation information 1 in the present invention.

Fig. 2 is a schematic diagram illustrating the positional relationship between the opening parts of platform doors and the train doors of a train of formation information 2 in the present invention.

Fig. 3 is a schematic diagram illustrating the positional relationship between the opening parts of platform doors and the train doors of a train of formation information 3 in the present invention.

Fig. 4 is a schematic diagram illustrating the positional relationship between the opening parts of platform doors and the train doors of a train of formation information 4 in the present invention.

Fig. 5 is a schematic diagram showing a processing flow of individual control apparatus a4001 of platform door a3001 with respect to formation information of a train in the present invention.

Fig. 6 is a schematic diagram showing a processing flow of individual control apparatus b4002 of platform door b3002 with respect to formation information of a train in the present invention.

Fig. 7 is a schematic diagram showing a processing flow of individual control apparatus c4003 of platform door c3003 with respect to formation information of a train in the present invention.

Fig. 8 is a schematic diagram showing a processing flow of individual control apparatus d4004 of platform door d3004 with respect to formation information of a train in the present invention.

Fig. 9 is a schematic diagram showing a processing flow of individual control apparatus e4005 of platform door e3005 with respect to formation information of a train in the present invention.

Fig. 10 is a schematic diagram showing the system configuration of the platform doors of the present invention.

[0009] Hereafter, an embodiment of the present invention will be described referring to the figures.

[0010] A platform door control apparatus according to one embodiment of the present invention will be described using Figs. 1 to 4 and Figs. 5 to 9.

[0011] Fig. 1 illustrates the positional relationship between the opening part of platform doors and the train doors of a train 101 of formation information 1. Fig. 2 illustrates the positional relationship between the opening part of platform doors and the train doors of a train 201 of formation information 2. Fig. 3 illustrates the positional relationship between the opening part of platform doors and the train doors of a train 301 of formation information 3. Fig. 4 illustrates the positional relationship

between the opening part of platform doors and the train doors of a train 401 of formation information 4.

[0012] Herein, the term "formation information of a train" refers to information concerning the number, locations and width dimensions of train doors of a train. Formation information 1 indicates a case where the number of train doors of train 101 is five, the five train doors are located at regular intervals, and the width dimensions of the train doors are wide. Formation information 2 indicates a case where the number of train doors of train 201 is three, the three train doors are located at regular intervals, and the width dimensions of the train doors are wide. Formation information 3 indicates a case where the number of train doors of train 301 is five, the five train doors are located at regular intervals, and the width dimensions of the train doors are narrow. Formation information 4 indicates a case where the number of train doors of train 401 is two, the two train doors are positioned at the front and rear of the train, respectively, and the width dimensions of the train doors are narrow.

[0013] The moving distance for opening and closing of gates Ra and La, gates Rb and Lb, gates Rc and Lc, gates Rd and Ld, and gates Re and Le of the corresponding platform doors a to e, that corresponds to formation information 1-4 of the respective trains, is previously determined.

[0014] Fig. 1 shows a train 101 has arrived at a platform, and at a platform door a3001 an opening part a2001 is in a fully open state, at a platform door b3002 an opening part b2002 is in a fully open state, at a platform door c3003 an opening part c2003 is in a fully open state, at a platform door d3004 an opening part d2004 is in a fully open state, and at a platform door e3005 an opening part e2005 is in a fully open state. These data are previously registered as command values in an individual control apparatus a4001, an individual control apparatus b4002, an individual control apparatus c4003, an individual control apparatus d4004, and an individual control apparatus e4005, respectively.

[0015] Fig. 2 shows a train 201 has arrived at a platform, and at platform door a3001 the opening part a2001 is in a fully open state; at platform door b3002 a gate Rb and a gate Lb of opening part b2002 are in a fully closed state; at platform door c3003 the opening part c2003 is in a fully open state; at platform door d3004, a gate Rd and a gate Ld of opening part d2004 are in a fully closed state; and at platform door e3005 the opening part e2005 is in a fully open state. These data are previously registered as command values in individual control apparatus a4001, individual control apparatus b4002, individual control apparatus c4003, individual control apparatus d4004, and individual control apparatus e4005, respectively.

[0016] Fig. 3 shows a train 301 has arrived at a platform, and at platform door a3001, a gate Ra and a gate La of opening part a2001 are in a closed state and an open state, respectively; at platform door b3002, a gate Rb and a gate Lb of opening part b2002 are in an open

state and a closed state, respectively; at platform door c3003, a gate Rc and a gate Lc of opening part c2003 are in a closed state and an open state, respectively; at platform door d3004, a gate Rd and a gate Ld of opening part d2004 are in an open state and a closed state, respectively; and at platform door e3005, a gate Re and a gate Le of opening part e2005 are in a closed state and an open state, respectively. These data are previously registered as command values in individual control apparatus a4001, individual control apparatus b4002, individual control apparatus c4003, individual control apparatus d4004, and individual control apparatus e4005, respectively.

[0017] Fig. 4 shows a train 401 has arrived at a platform, and at platform door a3001, a gate Ra and a gate La of opening part a2001 are each in a semi-open state; at platform door b3002, opening part b2002 is in a fully closed state; at platform door c3003, opening part c2003 is in a fully closed state; at platform door d3004, opening part d2004 is in a fully closed state; and at platform door e3005, a gate Re and a gate Le of opening part e2005 are each in a semi-open state. These data are previously registered as command values in individual control apparatus a4001, individual control apparatus b4002, individual control apparatus c4003, individual control apparatus d4004, and individual control apparatus e4005, respectively.

[0018] Fig. 5 illustrates a processing flow of individual control apparatus a4001 of platform door a3001 with respect to formation information of a train.

[0019] When a train arrives at the platform, formation information is received from the control platform of the train (501). When the formation information is determined to be formation information 1 (502), a "FULL OPEN" command is sent to gate La and a "FULL OPEN" command is sent to gate Ra (503). When the formation information is determined to be formation information 2 (504), a "FULL OPEN" command is sent to gate La and a "FULL OPEN" command is sent to gate Ra (505). When the formation information is determined to be formation information 3 (506), a "FULL OPEN" command is sent to gate La and no command is sent to gate Ra and it remains in a "CLOSE" state (507). When the formation information is formation information 4, a "HALF OPEN" command is sent to gate La and a "HALF OPEN" command is sent to gate Ra (508).

[0020] Therefore, since platform door a3001 opens and closes to a distance corresponding to train door a102, a202, a302 and a402 of train 101, 201, 301, and 401, passengers are able to get off and on the trains without any hindrance, irrespective of differences in the forms of the trains.

[0021] Fig. 6 shows a processing flow of individual control apparatus b4002 of platform door b3002 with respect to formation information of a train.

[0022] When a train arrives at the platform, formation information is received from the control platform of the train (601). When the formation information is determined

to be formation information 1 (602), a "FULL OPEN" command is sent to gate Lb and a "FULL OPEN" command is sent to gate Rb (603). When the formation information is determined to be formation information 2 (604), no command is sent to gate Lb and it remains in a "CLOSE" state and no command is sent to gate Rb and it remains in a "CLOSE" state, and passengers are informed that it is not possible to get on or off the train at this platform door (605). When the formation information is determined to be formation information 3 (606), no command is sent to gate Lb and it remains in a "CLOSE" state, and a "FULL OPEN" command is sent to gate Rb (607). When the formation information is formation information 4, no command is sent to gate Lb and it remains in a "CLOSE" state and no command is sent to gate Rb and it remains in a "CLOSE" state, and passengers are informed that it is not possible to get on or off the train at this platform door (608).

[0023] Therefore, since platform door b3002 opens and closes to a distance corresponding to train door b103, b203, b303 and b403 of train 101, 201, 301, and 401, passengers are able to get off and on the trains without any hindrance, irrespective of differences in the forms of the trains.

[0024] Fig. 7 shows a processing flow of individual control apparatus c4003 of platform door c3003 with respect to formation information of a train.

[0025] When a train arrives at the platform, formation information is received from the control platform of the train (701). When the formation information is determined to be formation information 1 (702), a "FULL OPEN" command is sent to gate Lc and a "FULL OPEN" command is sent to gate Rc (703). When the formation information is determined to be formation information 2 (704), a "FULL OPEN" command is sent to gate Lc and a "FULL OPEN" command is sent to gate Rc (705). When the formation information is determined to be formation information 3 (706), a "FULL OPEN" command is sent to gate Lc and no command is sent to gate Rc and it remains in a "CLOSE" state (707). When the formation information is formation information 4, no command is sent to gate Lc and it remains in a "CLOSE" state and no command is sent to gate Rc and it remains in a "CLOSE" state, and passengers are informed that it is not possible to get on or off the train at this platform door (708).

[0026] Therefore, since platform door c3003 opens and closes to a distance corresponding to train door c104, c204, c304 and c404 of train 101, 201, 301, and 401, passengers are able to get off and on the trains without any hindrance, irrespective of differences in the forms of the trains.

[0027] Fig. 8 shows a processing flow of individual control apparatus d4004 of platform door d3004 with respect to formation information of a train.

[0028] When a train arrives at the platform, formation information is received from the control platform of the train (801). When the formation information is determined to be formation information 1 (802), a "FULL OPEN" com-

mand is sent to gate Ld and a "FULL OPEN" command is sent to gate Rd (803). When the formation information is determined to be formation information 2 (804), no command is sent to gate Ld and it remains in a "CLOSE" state and no command is sent to gate Rd and it remains in a "CLOSE" state, and passengers are informed that it is not possible to get on or off the train at this platform door (805). When the formation information is determined to be formation information 3 (806), no command is sent to gate Ld and it remains in a "CLOSE" state and a "FULL OPEN" command is sent to gate Rd (807). When the formation information is formation information 4, no command is sent to gate Ld and it remains in a "CLOSE" state and no command is sent to gate Rd and it remains in a "CLOSE" state, and passengers are informed that it is not possible to get on or off the train at this platform door (808).

[0029] Therefore, since platform door d3004 opens and closes to a distance corresponding to train door d105, d205, d305 and d405 of train 101, 201, 301, and 401, passengers are able to get off and on the trains without any hindrance, irrespective of differences in the forms of the trains.

[0030] Fig. 9 shows a processing flow of individual control apparatus e4005 of platform door e3005 with respect to formation information of a train.

[0031] When a train arrives at the platform, formation information is received from the control platform of the train (901). When the formation information is determined to be formation information 1 (902), a "FULL OPEN" command is sent to gate Le and a "FULL OPEN" command is sent to gate Re (903). When the formation information is determined to be formation information 2 (904), a "FULL OPEN" command is sent to gate Le and a "FULL OPEN" command is sent to gate Re (905). When the formation information is determined to be formation information 3 (906), a "FULL OPEN" command is sent to gate Le and no command is sent to gate Re and it remains in a "CLOSE" state (907). When the formation information is formation information 4, a "HALF OPEN" command is sent to gate Le and a "HALF OPEN" command is sent to gate Re (908).

[0032] Therefore, since platform door e3005 opens and closes to a distance corresponding to train door e106, e206, e306 and e406 of train 101, 201, 301, and 401, passengers are able to get off and on the trains without any hindrance, irrespective of differences in the forms of the trains.

[0033] In the above, formation information of the trains illustrated in Fig. 1 to Fig. 4 was described as one embodiment of the present invention. However, the present invention is not limited to this formation information, and it is clear that it can be suitably applied to the formation information of other trains.

[0034] Fig. 10 illustrates the system configuration of the platform doors.

[0035] When a train arrives at the platform and stops within a permitted range of stopping positions, a signal

indicating doors can be opened is transmitted by a communication means 1019 from a way-side apparatus 1008 installed on the rail track to an on-board apparatus 1007 and a transceiver 1006, and is displayed in the control platform of the train (not shown in the figure). The operator of the train then operates a door control panel 1005 to press the "Open" switch.

[0036] At this time, an "OPEN" command and "Formation Information" are transmitted to communication means 1019 and way-side apparatus 1008 via transceiver 1006 and on-board apparatus 1007, to be transmitted to a repeater 1009 and an information transmission device 1010. The information transmission device 1010 transmits the "OPEN" command and "Formation Information" to a station control device 1011 of the platform in question. Upon receiving these signals, station control device 1011 transmits the "OPEN" command and "Formation Information" simultaneously via a line 1000 to individual control apparatus a4001, individual control apparatus b4002, individual control apparatus c4003, individual control apparatus d4004, and individual control apparatus e4005 that control the platform doors.

[0037] Upon receiving the "OPEN" command and "Formation Information," individual control apparatus a4001 controls the moving distance for gate La1023 and gate Ra1024 according to the processing flow shown in Fig. 5. When the moving distance for gate La1023 and gate Ra1024 is "0," platform door a3001 does not perform any opening operation. At that time, passengers are informed by a display means a1022 that it is not possible to get on or off the train at this platform door.

[0038] Upon receiving the "OPEN" command and "Formation Information," individual control apparatus b4002 controls the moving distance for gate Lb1033 and gate Rb1034 according to the processing flow shown in Fig. 6. When the moving distance for gate Lb1033 and gate Rb1034 is "0," platform door b3002 does not perform any opening operation. At that time, passengers are informed by a display means b1032 that it is not possible to get on or off the train at this platform door.

[0039] Upon receiving the "OPEN" command and "Formation Information," individual control apparatus c4003 controls the moving distance for gate Lc1043 and gate Rc1044 according to the processing flow shown in Fig. 7. When the moving distance for gate Lc1043 and gate Rc1044 is "0," platform door c3003 does not perform any opening operation. At that time, passengers are informed by a display means c1042 that it is not possible to get on or off the train at this platform door.

[0040] Upon receiving the "OPEN" command and "Formation Information," individual control apparatus d4004 controls the moving distance for gate Ld1053 and gate Rd1054 according to the processing flow shown in Fig. 8. When the moving distance for gate Ld1053 and gate Rd1054 is "0," platform door d3004 does not perform any opening operation. At that time, passengers are informed by a display means d1052 that it is not possible to get on or off the train at this platform door.

[0041] Upon receiving the "OPEN" command and "Formation Information," individual control apparatus e4005 controls the moving distance for gate Le1063 and gate Re1064 according to the processing flow shown in Fig. 9. When the moving distance for gate Le1063 and gate Re1064 is "0," platform door e3005 does not perform any opening operation. At that time, passengers are informed by a display means e1062 that it is not possible to get on or off the train at this platform door.

[0042] Meanwhile, station control device 1011 returns an "OPEN ACK" signal to information transmission device 1010 to indicate that it has received the "OPEN" command and "Formation Information."

[0043] Information transmission device 1010 transmits this "OPEN ACK" signal to the train side via repeater 1009, way-side apparatus 1008, on-board apparatus 1007, and transceiver 1006. A train door device 1003 receives the "OPEN ACK" signal via a door operation relay panel 1004 and commences operation to open the train doors.

[0044] When the platform doors start opening operations, individual control apparatus a4001, individual control apparatus b4002, individual control apparatus c4003, individual control apparatus d4004; and individual control apparatus e4005 each output an "OPEN START" signal to station control device 1011. When station control device 1011 receives any "OPEN START" signal, it starts output of an "ALL CLOSE OFF" (not all platform doors are closed) signal to information transmission device 1010. Thereby, an "ALL CLOSE OFF" signal is transmitted to the train side via repeater 1009, way-side apparatus 1008, on-board apparatus 1007, and transceiver 1006 to show the status display in the control platform of the train. The operator of the train thus knows by means of the status display that a platform door is "OPEN."

[0045] The operator of the train checks the passenger getting on or off situation by means of a device to monitor getting on or off of passengers or the like (not shown in the figure), and operates door control panel 1005 of the control platform to press the "CLOSE" switch. Thereby, train door device 1003 commences "CLOSE" operation, and at the same time, a "CLOSE" command is transmitted to communication means 1019 and way-side apparatus 1008 via transceiver 1006 and on-board apparatus 1007, to be transmitted to repeater 1009 and information transmission device 1010. Information transmission device 1010 then transmits a "CLOSE" signal to station control device 1011 of the platform doors in question. Upon receiving this signal, station control device 1011 transmits a "CLOSE" command simultaneously via line 1000 to individual control apparatus a4001, individual control apparatus b4002, individual control apparatus c4003, individual control apparatus d4004, and individual control apparatus e4005 that control the platform doors. Upon receiving the "CLOSE" command signal, individual control apparatus a4001, individual control apparatus b4002, individual control apparatus c4003, individual control apparatus d4004, and individual control apparatus e4005

commence closing operations of platform door a3001, platform door b3002, platform door c3003, platform door d3004, and platform door e3005, respectively.

[0046] When the respective gates have moved to a fully closed position, individual control apparatus a4001, individual control apparatus b4002, individual control apparatus c4003, individual control apparatus d4004, and individual control apparatus e4005 each output a "CLOSE COMPLETED" signal to station control device 1011.

[0047] Upon receiving the "CLOSE COMPLETED" signal of all of the platform doors of the track where the passengers got off and on, station control device 1011 starts output of a "CLOSE CONFIRMED" signal to information transmission device 1010. Thereby, a "CLOSE CONFIRMED" signal is transmitted to the train side via repeater 1009, way-side apparatus 1008, on-board apparatus 1007 and transceiver 1006, and the status is displayed in the control platform of the train.

[0048] Having obtained a "CLOSE CONFIRMED" signal from train door device 1003 and the platform doors, train 1001 departs.

[0049] Further, in Fig. 10, each of the platform doors comprises door pockets La1021 and Ra1025, door pockets Lb1031 and Rb1035, door pockets Lc1041 and Rc1045, door pockets Ld1051 and Rd1055, and door pockets Le1061 and Re 1065, respectively.

[0050] As described above, according to the present invention, formation information of trains is registered beforehand so that opening and closing of a gate of platform doors as well as the moving distance for opening and closing of the gate can be changed corresponding to each train. Therefore a plurality of trains of different forms can be introduced onto a train line, providing an advantage when the number, location and width dimensions of train doors vary among trains. Further, the invention also makes it unnecessary to modify the train doors of existing trains to conform to platform doors.

[0051] Further, when newly introducing trains to a line after adopting platform doors, it is not necessary to make the doors of the trains absolutely uniform, thus it is possible to simply support the new forms of trains.

[0052] In addition, on lines on which one train company shares the tracks with another, because the present invention makes it possible to cover some differences in the specifications of the trains it is possible to go ahead with introduction of platform doors.

[0053] Furthermore, on lines on which trains with different numbers of carriages are operating, a moving distance for opening and closing of gates of platform doors can be made "0" in accordance with formation information to make the setting "0" at platform doors at parts where doors of the train are not situated so that the platform doors remain closed, providing an easy solution to the problem.

Claims

1. A platform door control apparatus having a plurality of platform doors (a3001, b3002, c3003) provided on a platform and fixed in relation to the platform, wherein the plurality of platform doors (a3001, b3002, c3003) are provided at intervals such that the gate (La, Ra, Lb, Rb, Lc, Rc) of each platform door (a3001, b3002, c3003) is located at a position corresponding to a different train door (a102, b103, c104) of a train having any of a plurality of formations, the gates (La, Ra, Lb, Rb, Lc, Rc) being movable parts, the platform door control apparatus being **characterized by** comprising:

a receiving means for receiving formation information of a train from the train;

a storing means for storing information about a distance of moving for opening and closing of a gate (La, Ra, Lb, Rb, Lc, Rc) of each of the platform doors (a3001, b3002, c3003) corresponding to the formation information of each train; and

a control apparatus (a4001, b4002, c4003, d4004, e4005) capable of controlling openings of the platform doors (a3001, b3002, c3003) in accordance with train doors (a102, b103, c104) of the trains of a plurality of formations by controlling the distance of moving for opening and closing of a gate (La, Ra, Lb, Rb, Lc, Rc) of each of the platform doors (a3001, b3002, c3003) based on the formation information of the train received by the receiving means and on the information about the distance of moving for opening and closing of a gate (La, Ra, Lb, Rb, Lc, Rc) of each of the platform doors (a3001, b3002, c3003) stored in the storing means.

2. The platform door control apparatus of claim 1, wherein the control apparatus (a4001, b4002, c4003, d4004, e4005) and the storing means are individually installed at each of the platform doors (a3001, b3002, c3003).
3. The platform door control apparatus of claim 1, wherein a platform door (a3001, b3002, c3003) whose gate's (La, Ra, Lb, Rb, Lc, Rc) distance of moving becomes "0" has a means (a1022, b1032, c1042, d1052, e1062) informing passengers that it is not possible to get on or off at the platform door.
4. The platform door control apparatus of claim 1, wherein the receiving means is way-side apparatus (1008) installed on a rail track.

Patentansprüche

1. Bahnsteigtüren-Steuergerät mit mehreren Bahnsteigtüren (a3001, b3002, c3003), die auf einem Bahnsteig angebracht und bezüglich des Bahnsteigs fixiert sind, wobei die mehreren Bahnsteigtüren (a3001, b3002, c3003) in solchen Abständen angeordnet sind, dass das Tor (La, Ra, Lb, Rb, Lc, Rc) jeder Bahnsteigtür (a3001, b3002, c3003) sich an einer Position befindet, die einer verschiedenen Zugtüre (a102, b103, c104) eines Zugs mit einer beliebigen von mehreren Ausführungsformen entspricht, wobei die Tore (La, Ra, Lb, Rb, Lc, Rc) bewegliche Bestandteile sind, und das Bahnsteigtüren-Steuergerät **dadurch gekennzeichnet ist, dass** es aufweist:

eine Empfangseinrichtung zum Empfangen von Ausgestaltungsforminformation eines Zugs von dem Zug,

eine Speichereinrichtung zum Speichern von Information über einen Bewegungsabstand zum Öffnen und Schließen eines Tors (La, Ra, Lb, Rb, Lc, Rc) von jeder der Bahnsteigtüren (a3001, b3002, c3003) entsprechend der Ausgestaltungsforminformation jedes Zugs und ein Steuergerät (a4001, b4002, c4003, d4004, e4005), das dazu ausgelegt ist, das Öffnen der Bahnsteigtüren (a3001, b3002, c3003) gemäß Zugtüren (a102, b103, c104) der Züge mehrerer Ausgestaltungsformen zu steuern, indem der Bewegungsabstand zum Öffnen und Schließen eines Tors (La, Ra, Lb, Rb, Lc, Rc) von jeder der Bahnsteigtüren (a3001, b3002, c3003) basierend auf der durch die Empfangseinrichtung empfangenen Ausgestaltungsforminformation des Zugs und der in der Speichereinrichtung gespeicherten Information über den Bewegungsabstand zum Öffnen und Schließen eines Tors (La, Ra, Lb, Rb, Lc, Rc) jeder der Bahnsteigtüren (a3001, b3002, c3003) gesteuert wird.

2. Bahnsteigtüren-Steuergerät nach Anspruch 1, wobei das Steuergerät (a4001, b4002, c4003, d4004, e4005) und die Speichereinrichtung einzeln an jeder der Bahnsteigtüren (a3001, b3002, c3003) installiert sind.
3. Bahnsteigtüren-Steuergerät nach Anspruch 1, wobei eine Bahnsteigtür (a3001, b3002, c3003) deren Tor (La, Ra, Lb, Rb, Lc, Rc) einen Bewegungsabstand "0" erreicht, eine Einrichtung (a1022, b1032, c1042, d1052, e1062) aufweist, um Fahrgäste zu informieren, dass es nicht möglich ist, an der Bahnsteigtüre ein- oder auszusteigen.
4. Bahnsteigtüren-Steuergerät nach Anspruch 1, wobei die Empfangseinrichtung ein auf einem Zuggleis

installiertes streckenseitiges Gerät (1008) ist.

Revendications

1. Dispositif de commande de portes de quai ayant une pluralité de portes de quai (a3001, b3002, c3003) agencées sur un quai et fixes par rapport au quai, dans lequel la pluralité de portes de quai (a3001, b3002, c3003) est agencée à des intervalles tels que le portillon (La, Ra, Lb, Rb, Lc, Rc) de chaque porte de quai (a3001, b3002, c3003) est situé dans une position correspondant à une porte de train différente (a102, b103, c104) d'un train ayant une composition quelconque parmi une pluralité de compositions, les portillons (La, Ra, Lb, Rb, Lc, Rc) étant des parties mobiles, le dispositif de commande de portes de quai étant **caractérisé en ce qu'il** comporte :

des moyens de réception pour recevoir d'un train des informations concernant la composition du train,

des moyens de stockage pour stocker des informations concernant une distance de déplacement pour l'ouverture et la fermeture d'un portillon (La, Ra, Lb, Rb, Lc, Rc) de chacune des portes de quai (a3001, b3002, c3003) correspondant aux informations de composition de chaque train, et

un dispositif de commande (a4001, b4002, c4003, d4004, e4005) pouvant commander des ouvertures des portes de quai (a3001, b3002, c3003) en fonction des portes de train (a102, b103, c104) des trains d'une pluralité de formations en commandant la distance de déplacement pour l'ouverture et la fermeture d'un portillon (La, Ra, Lb, Rb, Lc, Rc) de chacune des portes de quai (a3001, b3002, c3003) sur la base des informations de composition du train reçues par les moyens de réception et des informations concernant la distance de déplacement pour l'ouverture et la fermeture d'un portillon (La, Ra, Lb, Rb, Lc, Rc) de chacune des portes de quai (a3001, b3002, c3003) stockées dans les moyens de stockage.

2. Dispositif de commande de portes de quai selon la revendication 1, dans lequel le dispositif de commande (a4001, b4002, c4003, d4004, e4005) et les moyens de stockage sont individuellement installés sur chacune des portes de quai (a3001, b3002, c3003).
3. Dispositif de commande de portes de quai selon la revendication 1, dans lequel une porte de quai (a3001, b3002, c3003) dont la distance de déplacement du portillon (La, Ra, Lb, Rb, Lc, Rc) devient égale à "0" a des moyens (a1022, b1032, c1042,

d1052, e1062) informant les passagers qu'il n'est pas possible de monter ou de descendre au niveau de la porte de quai.

4. Dispositif de commande de portes de quai selon la revendication 1, dans lequel les moyens de réception sont un dispositif de voie (1008) installé sur une voie ferrée.

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FIG.1

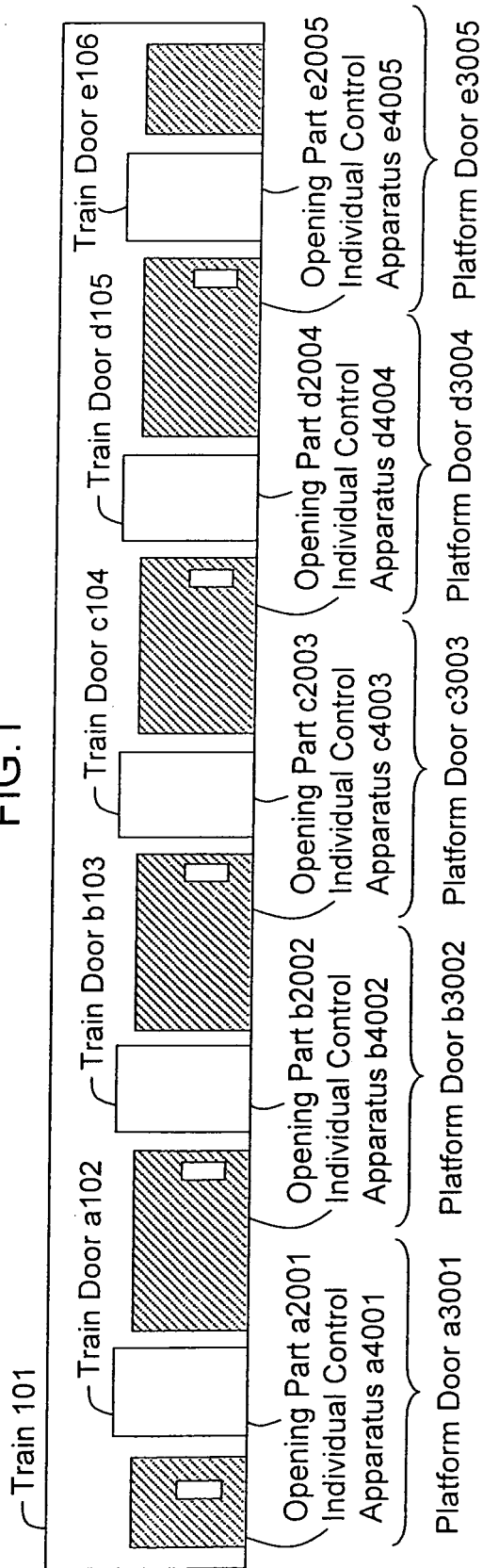


FIG.2

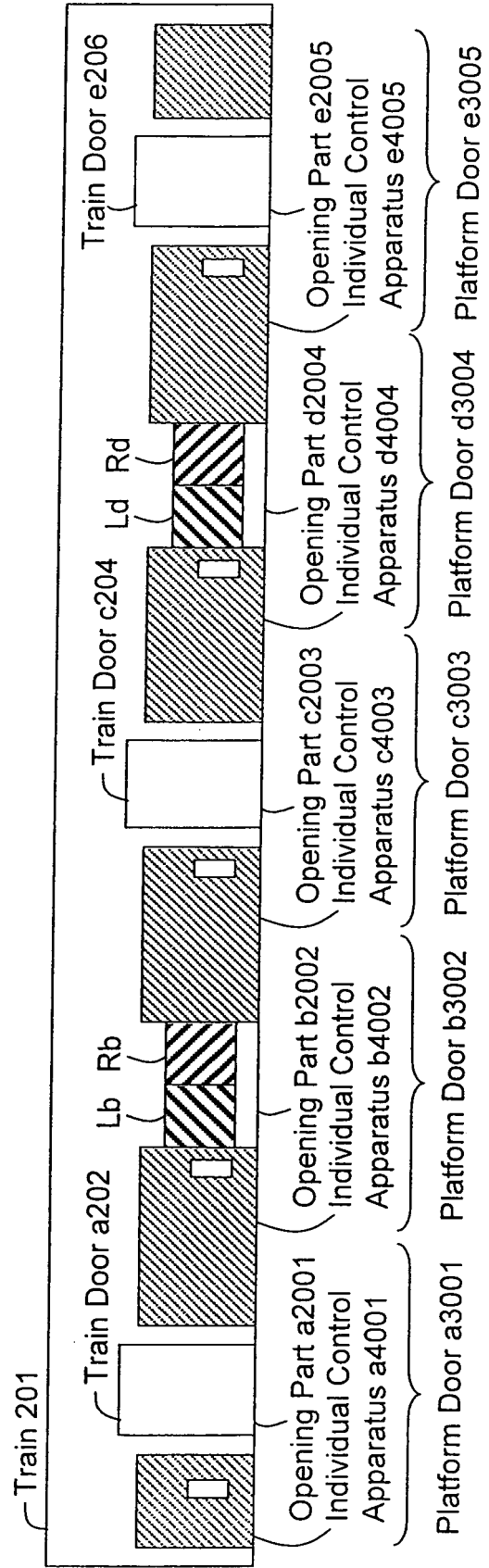


FIG.3

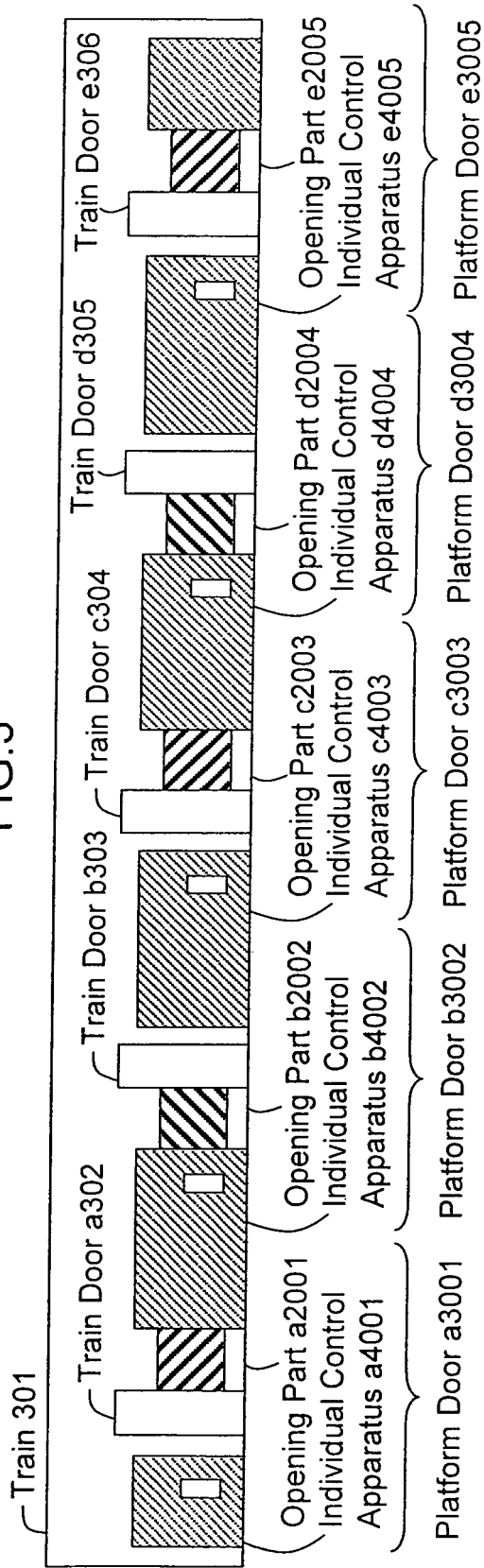


FIG.4

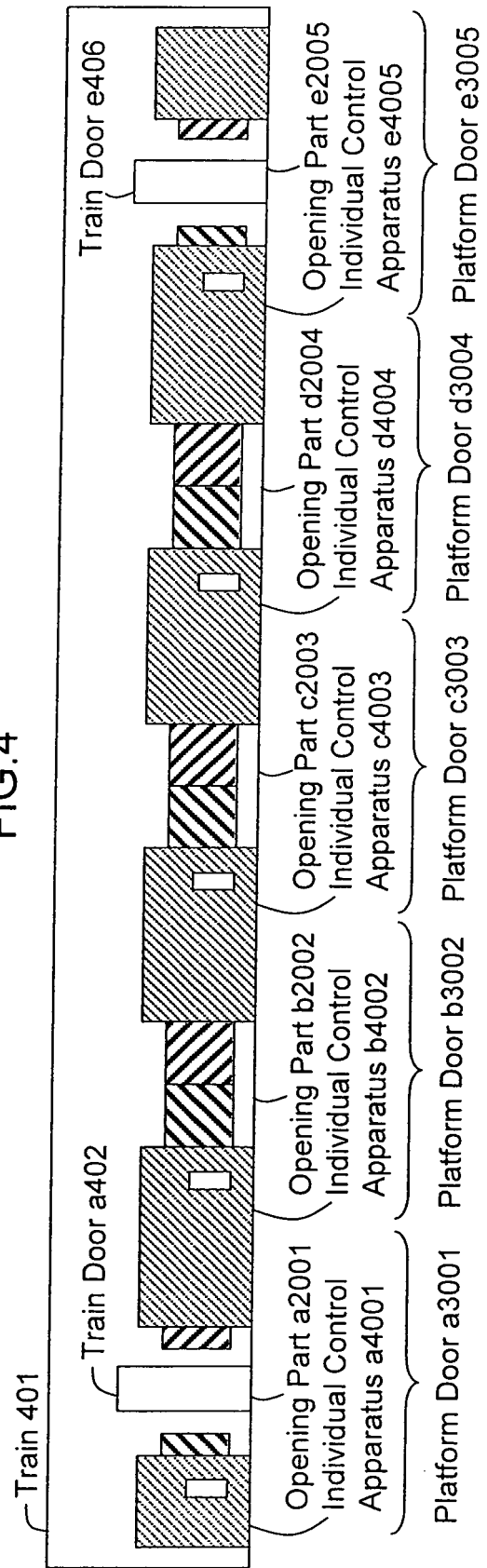


FIG.5

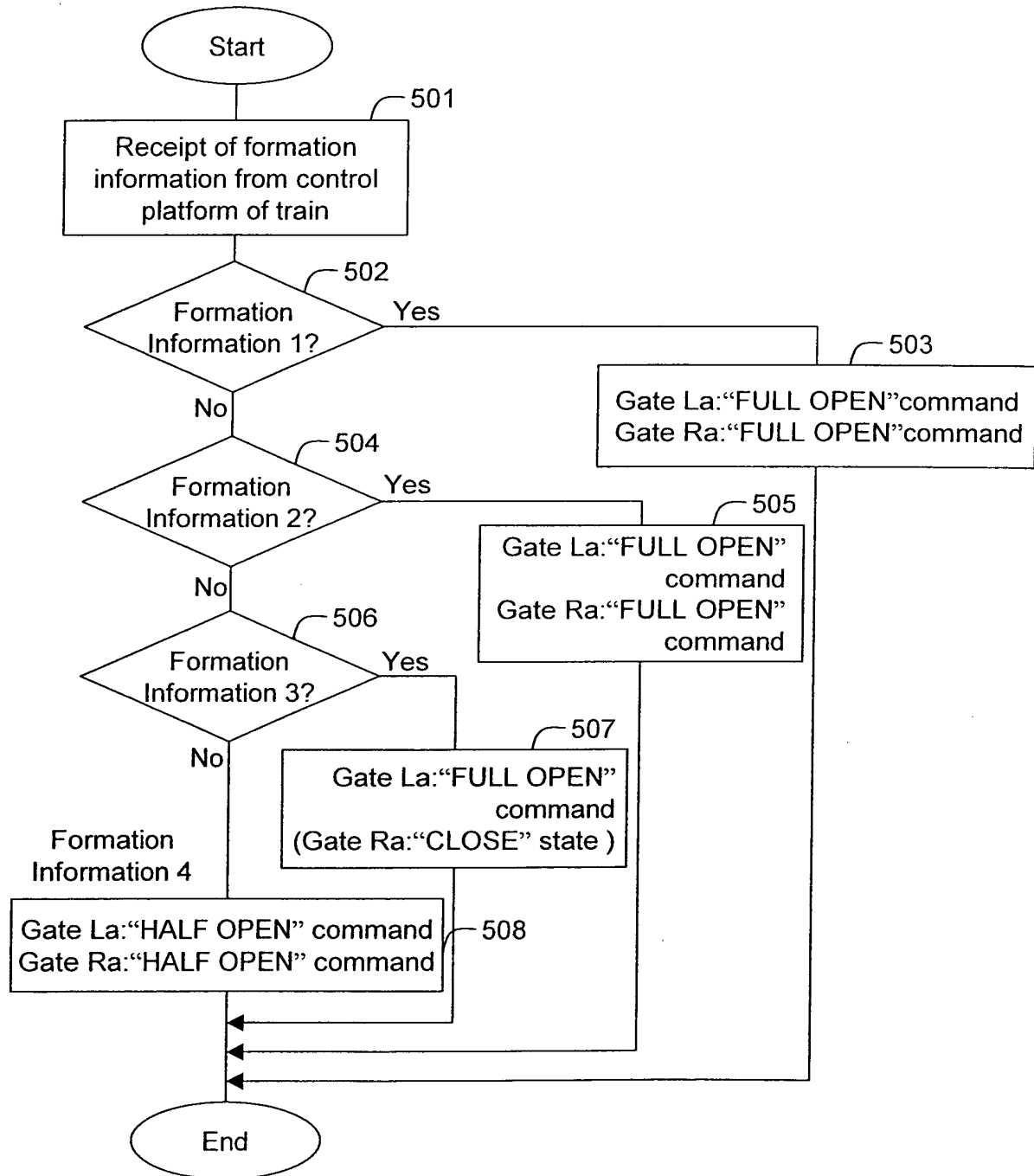


FIG.6

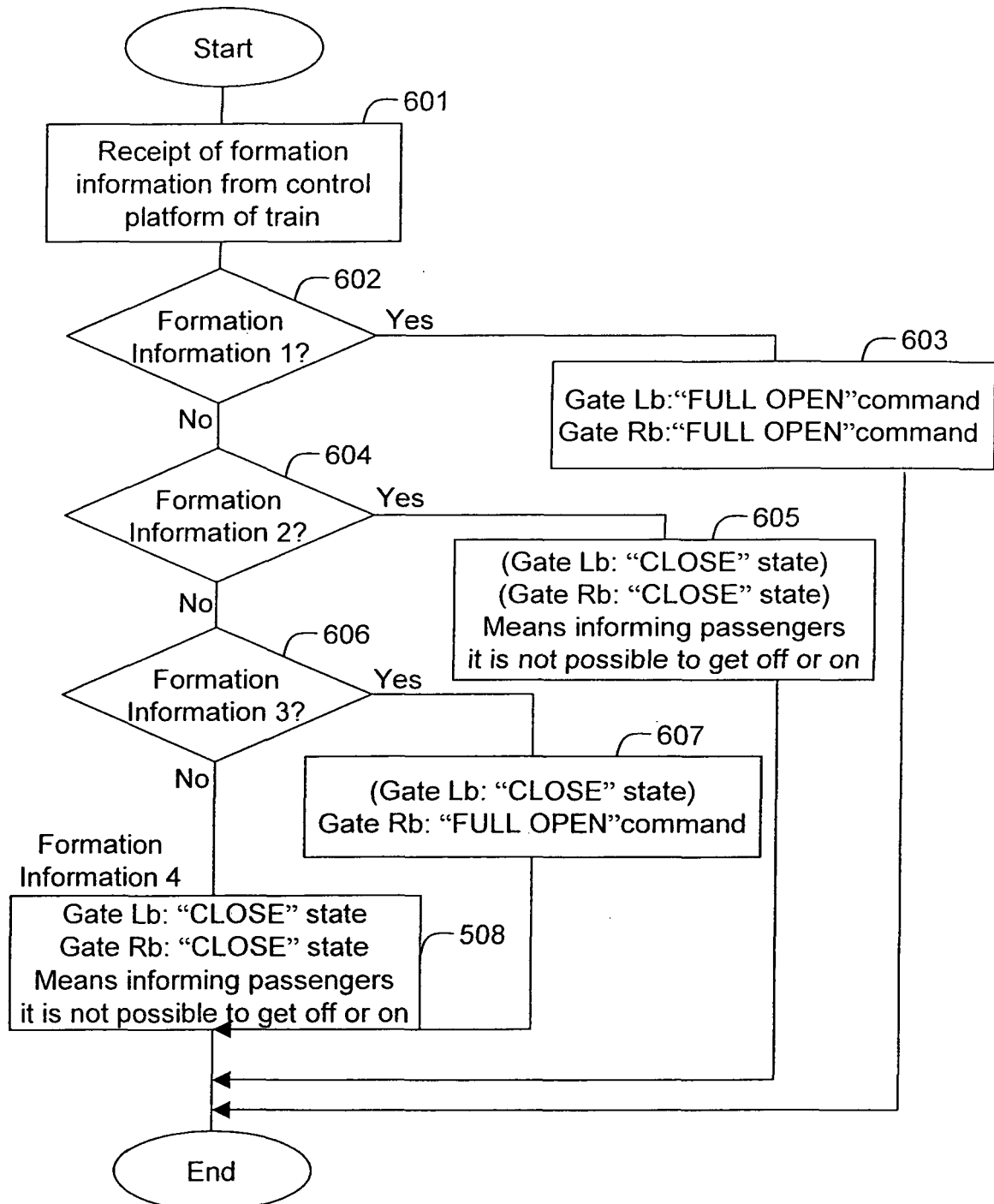


FIG.7

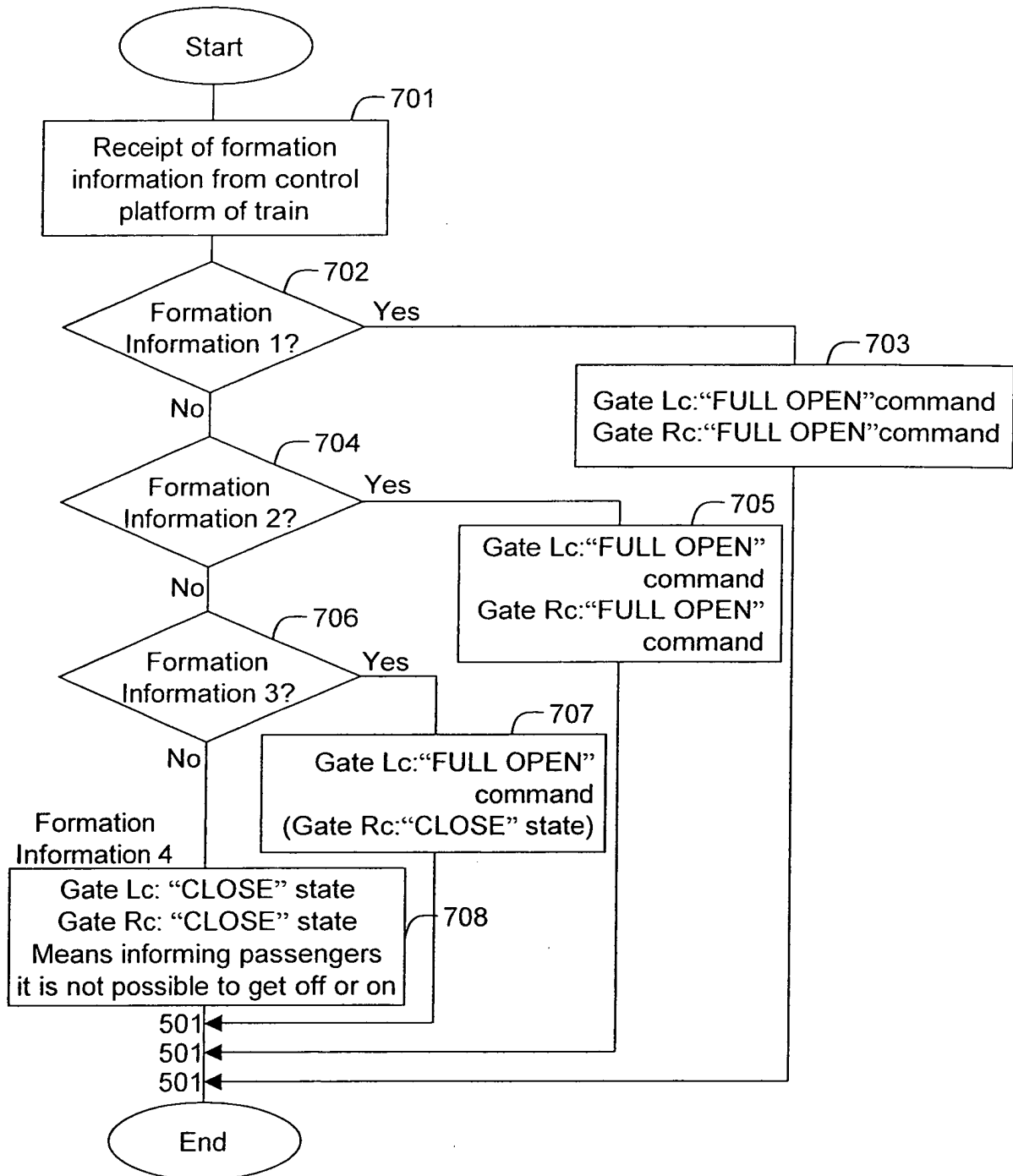


FIG.8

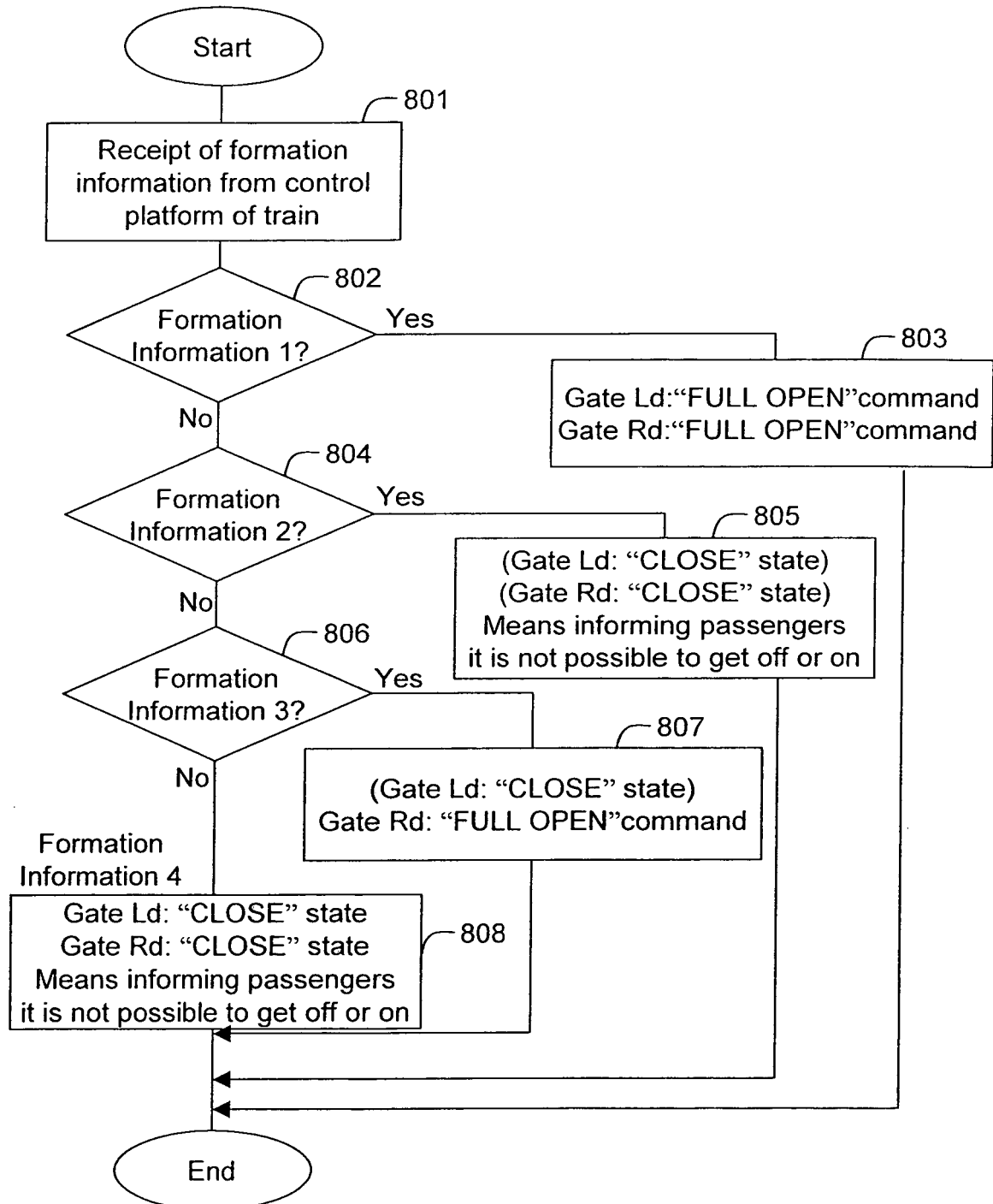


FIG.9

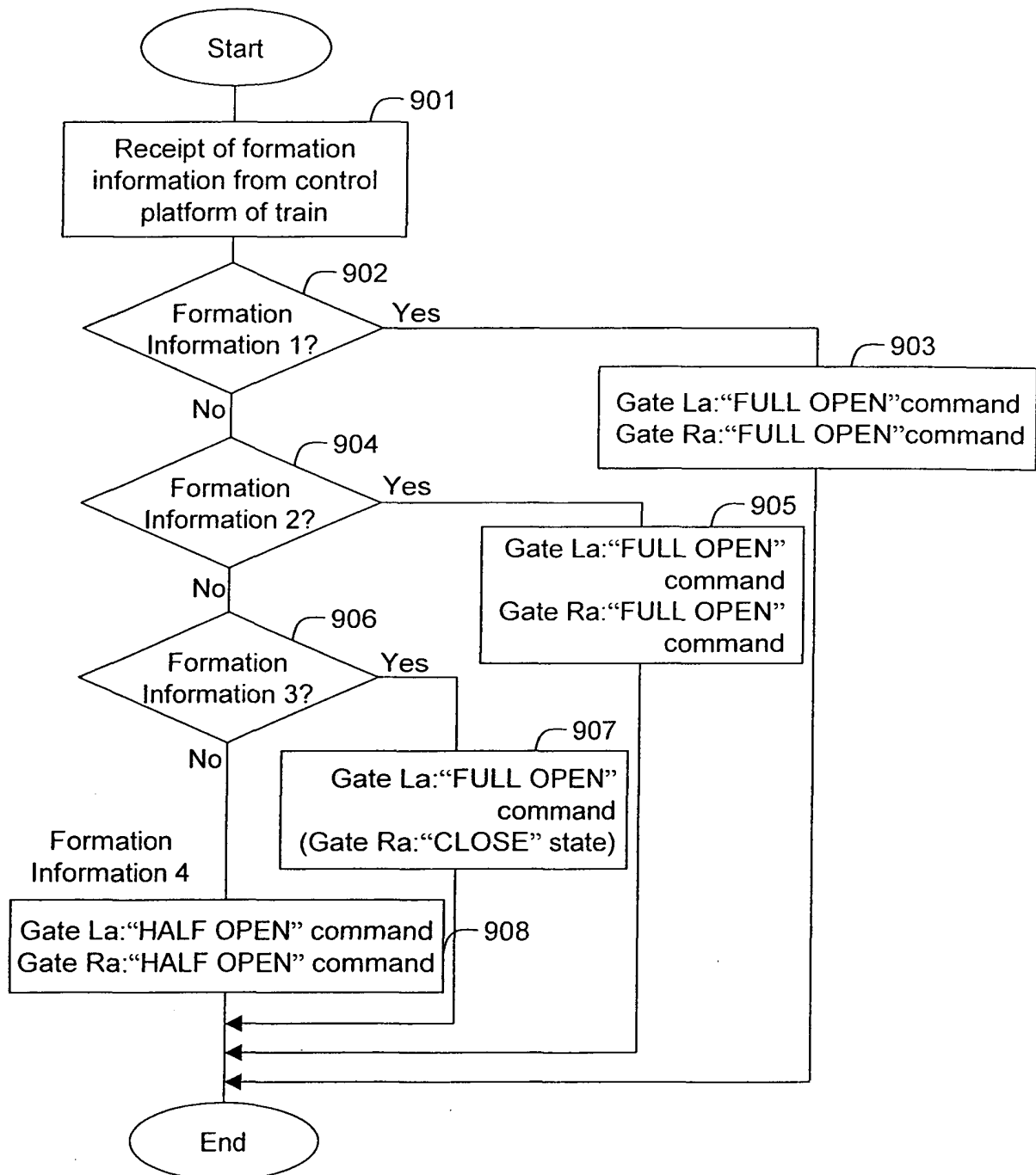
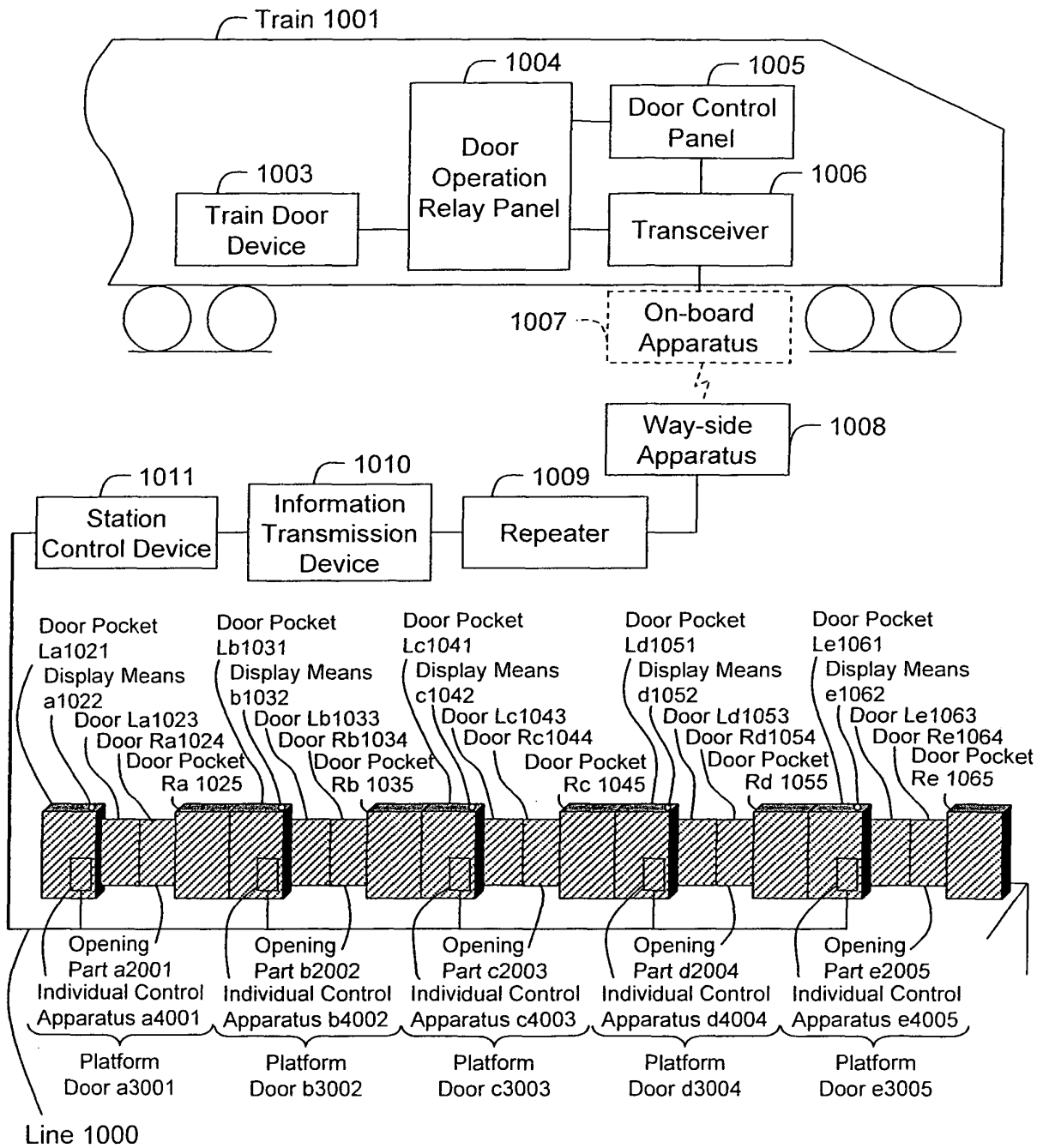


FIG. 10



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 6360668 B [0003]