GROUP MANAGEMENT CONTROL SYSTEM AND GROUP MANAGEMENT CONTROLLER

FIELD

Embodiments described herein relate generally to a group management control system and a group management controller.

BACKGROUND

In skyscrapers, etc., an elevator which comprises two cars stacked vertically and enables mass transport is used as a vertical transportation means inside such buildings. This type of elevator is called a double-deck elevator.

The double-deck elevator allows the mass transport of passengers. However, even if a passenger finished getting into one of the cars, and the doors of the car were closed, the closed car cannot depart for the destination floor unless another passenger finishes getting into the other car.

Thus, the passenger in the closed car has to wait in the car until another passenger finishes getting into the other car. If this waiting time is long, the passenger who is waiting in the closed car is stressed out.

SUMMARY

According to an aspect, there is provided a group management control system which includes a plurality of double-deck elevators each including upper and lower cars vertically connected to each other, and applies group management control to operation of each of the elevators, the system characterized by comprising: a call acquisition means which obtains a destination call registered by a hall destination controller installed at each floor; an additional assignment permission determination means which determines, when an assigned elevator responding to a different destination call

registered in a registration floor of the destination call is present, whether additional assignment of the destination call to the assigned elevator is permitted; and an extension controller which extends a door opening period of a door of the assigned elevator to an estimated arrival time as the additional assignment of the destination call is permitted, characterized in that the additional assignment permission determination means calculates a time at which a person who registers the destination call is expected to get into the assigned elevator as the estimated arrival time, sets an additional assignment permission period for permitting additional assignment of a destination call in each of the upper and lower cars vertically connected to each other, and determines whether the estimated arrival time is within the additional assignment permission periods set for the assigned elevator, and permits the additional assignment of the destination call to the assigned elevator when the estimated arrival time is within the additional assignment permission periods as a result of the determination, and does not permit the additional assignment of the destination call to the assigned elevator when the estimated arrival time is outside the additional assignment permission periods as a result of the determination.

According to another aspect, there is provided a group management controller which applies group management control to operation of a plurality of double-deck elevators each including upper and lower cars connected to each other, the controller characterized by comprising: a call acquisition means which obtains a destination call registered by a hall destination controller installed at each floor; an additional assignment permission determination means

which determines, when an assigned elevator responding to a different destination call registered at a registration floor of the destination call is present, whether additional assignment of the destination call to the assigned elevator is permitted; and an extension controller which extends a door opening period of a door of the assigned elevator to an estimated arrival time as the additional assignment of the destination call is permitted, characterized in that the additional assignment permission determination means calculates a time at which a person who registers the destination call is expected to get into the assigned elevator as the estimated arrival time, sets an additional assignment permission period for permitting additional assignment of a destination call in each of the upper and lower cars vertically connected to each other, and determines whether the estimated arrival time is within the additional assignment permission periods set for the assigned elevator, and permits the additional assignment of the destination call to the assigned elevator when the estimated arrival time is within the additional assignment permission periods as a result of the determination, and does not permit the additional assignment of the destination call to the assigned elevator when the estimated arrival time is outside the additional assignment permission periods as a result of the determination.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a schematic configuration example of a group management control system according to one embodiment.

FIG. 2 shows an example of the data structure of call information according to the embodiment.

FIG. 3 is a flowchart showing an example of the operation of a group management controller according to

the embodiment.

FIG. 4 is a timing chart shown for explaining the

CLAIMS

1. A group management control system which includes a plurality of double-deck elevators each including upper and lower cars vertically connected to each other, and applies group management control to operation of each of the elevators, the system characterized by comprising:

a call acquisition means which obtains a destination call registered by a hall destination controller installed at each floor;

an additional assignment permission determination means which determines, when an assigned elevator responding to a different destination call registered in a registration floor of the destination call is present, whether additional assignment of the destination call to the assigned elevator is permitted; and

an extension controller which extends a door opening period of a door of the assigned elevator to an estimated arrival time as the additional assignment of the destination call is permitted, characterized in that

the additional assignment permission determination means

calculates a time at which a person who registers the destination call is expected to get into the assigned elevator as the estimated arrival time,

sets an additional assignment permission period for permitting additional assignment of a destination call in each of the upper and lower cars vertically connected to each other, and determines whether the estimated arrival time is within the additional assignment permission periods set for the assigned elevator, and

permits the additional assignment of the destination call to the assigned elevator when the estimated arrival time is within the additional assignment permission periods as a result of the determination, and does not permit the additional assignment of the destination call to the assigned elevator when the estimated arrival time is outside the additional assignment permission periods as a result of the determination.

2. The system of Claim 1, characterized by further comprising

an assignment controller which selects a preferred elevator for the destination call from the elevators other than the assigned elevator as the additional assignment of the destination call is not permitted.

3. The system of Claim 2, characterized in that

the additional assignment permission determination means sets a period starting from the calculated estimated arrival time related to the destination call and ending a predetermined period after as the additional assignment permission periods when no assigned elevator responding to a different destination call registered at the registration floor of the destination call is present, and

the assignment controller causes the preferred elevator for the destination call to respond to the destination call when the additional assignment permission periods of the assigned elevator are set.

4. The system of Claim 1, characterized in that

the additional assignment permission determination means calculates the estimated arrival time based on a distance between the hall destination controller by which the destination call is registered and the assigned elevator.

5. The system of Claim 4, characterized in that

the additional assignment permission determination means calculates the estimated arrival time by adding a moving period set based on the distance between the hall destination controller and the assigned elevator to a registration time of the destination call.

6. The system of Claim 1, characterized in that

the additional assignment permission means does not permit, after one of the upper and lower cars starts to close, additional assignment to the other car.

7. The system of Claim 1, characterized in that

the additional assignment permission determination means does not permit, after, of the additional assignment permission periods set for the upper and lower cars, the additional assignment permission period of one of the upper and lower cars ends, additional assignment to the other car.

8. The system of Claim 1, characterized in that

the additional assignment permission determination means updates the additional assignment permission periods based on the calculated estimated arrival time related to the destination call every time additional assignment of a destination call to the assigned elevator is permitted.

9. The system of Claim 1, characterized in that

the additional assignment permission determination means sets, when one of the upper and lower cars starts to close, a period starting from a time the car starts to close and ending a predetermined period after as a second additional assignment permission period, and subsequently does not permit additional assignment to the other car when the estimated arrival time is outside the second additional assignment permission period.

10. A group management controller which applies group management control to operation of a plurality of double-deck elevators each including upper and lower cars connected to each other, the controller characterized by comprising:

a call acquisition means which obtains a destination call registered by a hall destination controller installed at each floor;

an additional assignment permission determination means which determines, when an assigned elevator responding to a different destination call registered at a registration floor of the destination call is present, whether additional assignment of the destination call to the assigned elevator is permitted; and

an extension controller which extends a door opening period of a door of the assigned elevator to an estimated arrival time as the additional assignment of the destination call is permitted, characterized in that

the additional assignment permission determination means

calculates a time at which a person who registers the destination call is expected to get into the assigned elevator as the estimated arrival time,

sets an additional assignment permission period for permitting additional assignment of a destination call in each of the

upper and lower cars vertically connected to each other, and determines whether the estimated arrival time is within the additional assignment permission periods set for the assigned elevator, and

permits the additional assignment of the destination call to the assigned elevator when the estimated arrival time is within the additional assignment permission periods as a result of the determination, and does not permit the additional assignment of the destination call to the assigned elevator when the estimated arrival time is outside the additional assignment permission periods as a result of the determination.