door-opening time detection means for detecting a state of a passenger or passengers waiting at a hall within a first range from a door of the car toward the hall, and a state of a passenger or passengers present in the vicinity of the door in the car within a second range from the door of the car toward a back side of the car, when the selected car arrives at the floor and the door of the car is opened; occupancy detection means for detecting an occupancy ratio of the car; ridable/unridable-state determination means for determining, when the door-opening time detection means detects the state of the passenger or passengers waiting at the hall, whether or not the passenger or passengers waiting at the hall are allowed to get into the car, based on the occupancy ratio of the car at a point of time at which the car arrives at the floor, which is detected by the occupancy detection means; notification control means for issuing, when the ridable/unridable-state determination means determines that the passenger or passengers are allowed to get into the car, a notification prompting the passenger or passengers to get into the car in consideration of the state of the passenger or passengers present in the vicinity of the door of the car, which is detected by the door-opening time detection means; and operation control means for closing the door of the car and causing the car to move to a next destination floor, when the occupancy ratio of the car is increased by the notification issued by the notification control means so that the occupancy ratio of the car is higher than that at the point of time at which the car arrives at the floor.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram showing a configuration of a group management system of elevators, according to a first embodiment.

FIG. 2 is a view for explaining an imaging range of a camera installed in a car of an elevator and a function configuration of a car controller in the first

CLAIMS

1. An elevator group management system which includes plural cars, and causes, in response to a hall call registered at an arbitrary floor, a selected one of the cars to move to the floor at which the hall call is registered, the elevator group management system comprising:

door-opening time detection means for detecting a state of a passenger or passengers waiting at a hall within a first range from a door of the car toward the hall, and a state of a passenger or passengers present in the vicinity of the door in the car within a second range from the door of the car toward a back side of the car, when the selected car arrives at the floor and the door of the car is opened;

occupancy detection means for detecting an occupancy ratio of the car;

ridable/unridable-state determination means for determining, when the door-opening time detection means detects the state of the passenger or passengers waiting at the hall, whether or not the passenger or passengers waiting at the hall are allowed to get into the car, based on the occupancy ratio of the car at a point of time at which the car arrives at the floor, which is detected by the occupancy detection means;

notification control means for issuing, when the ridable/unridable-state determination means determines that the passenger or passengers are allowed to get into the car, a notification prompting the passenger or passengers to get into the car in consideration of the state of the passenger or

passengers present in the vicinity of the door of the car, which is detected by the door-opening time detection means; and

operation control means for closing the door of the car and causing the car to move to a next destination floor, when the occupancy ratio of the car is increased by the notification issued by the notification control means so that the occupancy ratio of the car is higher than that at the point of time at which the car arrives at the floor.

2. The elevator group management system of Claim 1, further comprising dummy-call registration means for registering a dummy call before departure of the car, when the ridable/unridable-state determination means determines that the passenger or passengers are not allowed to get into the car, or when the number of passengers waiting at the hall after the notification issued by the notification control means does not become smaller than that at the point of time at which the car arrives at the hall, the dummy call being registered as a call for causing another one of the cars to move to the floor at which the hall call is registered.

3. The elevator group management system of Claim 2, wherein the dummy-call registration means further delays timing at which the dummy call is registered, as the number of persons allowed to get into the car increases.

4. The elevator group management system of Claim 1, wherein

when the occupancy ratio of the car before departure thereof exceeds a predetermined occupancy ratio, the operation control means controls the car to pass through a floor for which no car call is registered.

5. The elevator group management system of Claim 4, further comprising dummy-call registration means for registering a dummy call for causing another one of the cars to move to a floor determined by the operation control means as a floor through which the selected car will pass.

6. The elevator group management system of Claim 1, further comprising a load detector installed in the car,

wherein the occupancy detection means detects the occupancy ratio of the car based on relationship between a rated load of the car and a live load detected by the load detector.

7. The elevator group management system of Claim 1, further comprising a monitoring camera installed in the vicinity of the door in the car to image a state of the hall and a state of the vicinity of the door in the car,

wherein the door-opening time detection means performs an analytical processing on an image obtained by imaging performed by the camera to detect the state of the passenger or passengers waiting in the hall, and detects the state of the passenger or passengers present in the vicinity of the door of the car based on a result of the analytical processing performed on the image.