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(54) **ELEVATOR SYSTEM AND METHOD FOR CONTROLLING AN ELEVATOR SYSTEM**
AUFZUGSSYSTEM UND VERFAHREN ZUR STEUERUNG EINES AUFZUGSSYSTEMS
SYSTÈME D'ASCENSEURS ET PROCÉDÉ DE COMMANDE D'UN SYSTÈME D'ASCENSEURS

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to elevator systems. In particular the present invention relates to an elevator system, in which passenger elevators and freight elevators have a common control system but separate call pushbuttons. The invention further relates to a method for controlling an elevator system.

BACKGROUND OF THE INVENTION

[0002] In an elevator system the operation of the elevators is controlled on the basis of calls given by the user. The control system of the elevator receives a landing call given from the up/down pushbuttons situated in the lobby and endeavors to decide which of the elevators of the elevator group is best able to serve the person giving the call. Defining an elevator suitable for the user is designated call allocation. Often an elevator near the user that is driving in the direction of the call is selected for the call, but other attributes can also be used as allocation criteria. In a conventional elevator system landing calls are given with the up/down pushbuttons situated on each floor of the building, by means of which an elevator user arriving at the floor indicates his/her desired direction of travel as well as his/her own departure floor. The control system can give a call acknowledgement signal such as an indication light as a response to the signal given with the call pushbuttons, which illuminates the background of the call pushbutton.

[0003] Generally a signal light is situated outside the elevator car near the call pushbuttons, i.e. the up/down pushbuttons, which can be e.g. in the shape of a direction arrow. The indication light that illuminates this type of direction arrow indicates the direction of travel of the elevator arriving at the floor. The indication light can also be digital and show at which floor each elevator, is in addition to the direction of travel of the elevator arriving at the floor. Additionally, a control panel is needed in the elevator car, on which the elevator passenger presses the pushbutton according to his/her desired destination floor.

[0004] Often a conventional passenger elevator system in addition to e.g. a freight elevator is needed in buildings to serve users, especially for moving and transporting goods to the different floors. The freight elevator can be separate from the passenger elevators and separate call pushbuttons can be placed on each floor level for it, in which case the freight elevator also has its own control system. If the user needs the freight elevator, he/she can go to the freight elevator and press the call pushbutton. Since the freight elevator is generally needed less frequently than the passenger elevators, the freight elevator can also be utilized in passenger transportation when users do not need freight transportation. Sometimes the freight elevator and the conventional passenger elevator

or passenger elevators are next to each other. In this case the elevator system can be misused such that both the freight elevator button and the passenger elevator button are pressed. As a consequence of this two elevators are directed to the call-issuing floor although the actual need is for only one elevator.

[0005] Control of the freight elevator can thus be combined as a part of the elevator system as is done in Fig. 1. When the user presses a call pushbutton common to all elevator cars, the control system allocates a suitable elevator to the user according to the call, irrespective of whether the elevator is a passenger elevator or a freight elevator. Fig. 1 presents the parts of a conventional elevator system, wherein the elevator group of the elevator system 1 comprises one or more passenger elevators 2, at least one freight elevator 3, an elevator control system 4, the call pushbuttons 5 of the elevator and an indication light 6, which can indicate at which floor the elevator is or in which direction the elevator arriving at the floor is traveling.

[0006] When the freight elevator is a part of the passenger elevator system according to Fig. 1, the passenger can give a call just by pressing the pushbutton 5 for the direction of travel he/she desires, and one of the elevator cars of the elevator system 1 is allocated to the user. A problem in this type of combined system is that the user cannot select a freight elevator, but instead a freight elevator is allocated to the user only if it is suitable according to the allocation criteria. If the freight elevator and the passenger elevators have separate control systems and therefore also separate call pushbuttons, this often results in users pressing the pushbuttons of both elevators simultaneously (for only a single journey), in which case one of the elevators is directed to the departure floor unnecessarily.

[0007] The US 2004/0055828 discloses an elevator group comprising a medical elevator car equipped with an external defibrillator. This elevator car is handled as a normal elevator. Anyway, the elevator group comprises on each floor a protected emergency call button which initiates the elevator control to override all existing calls for the medical elevator and this elevator car is directly driven to the floor from which the emergency call has been issued.

PURPOSE OF THE INVENTION

[0008] The purpose of the present invention is to eliminate or alleviate the aforementioned problems of prior art technology as well as to disclose a solution that is simple and easy to implement. The purpose of the present invention is to present a method for controlling an elevator system, and an elevator system in which the user has the possibility to select use of the freight elevator, but which nevertheless enables allocation of the freight elevator to passenger transportation.

[0009] With regard to the characteristic attributes of the present invention reference is made to the claims.

SUMMARY OF THE INVENTION

[0010] The system and the method according to the invention are characterized by what is disclosed in claims 1 and 4. Other embodiments of the invention are characterized by what is disclosed in the other claims. Some inventive embodiments are also discussed in the descriptive section and in the drawings of the present application. The inventive content may also consist of several separate inventions, especially if the invention is considered in the light of expressions or implicit subtasks or from the point of view of advantages or categories of advantages achieved. In this case, some of the attributes contained in the claims below may be superfluous from the point of view of separate inventive concepts. The features of the various embodiments can be applied within the scope of the basic inventive concept in conjunction with other embodiments.

[0011] The purpose of the invention is to present an elevator system, in which a freight elevator is a part of the passenger elevator system. In other words the control system of the elevator group controls both a special elevator and a passenger elevator group, but which elevator system enables the user if necessary to select with the call pushbuttons whether he/she wants to travel specifically in a special elevator or whether any elevator at all is acceptable. The invention also relates to a method for controlling the aforementioned elevator system.

[0012] The elevator system according to the invention comprises one or more passenger elevators and at least one special elevator, call pushbuttons for reserving an elevator for use by passengers. In the system according to the invention the control system is arranged to allocate a special elevator as a response to a call received from a call pushbutton of a special elevator and to allocate a passenger elevator or a special elevator to a user as a response to a call received from the call pushbutton of a passenger elevator.

[0013] The present invention also relates to a method for controlling an elevator system, which elevator system comprises one or more passenger elevators and at least one special elevator, call pushbuttons for reserving an elevator for use by passengers. In the system according to the invention a special elevator is allocated in the elevator control system as a response to a call received from a call pushbutton of a special elevator and a passenger elevator or a special elevator is allocated in the elevator control system to a user as a response to a call received from the call pushbutton of a passenger elevator.

[0014] One advantage of the solution presented is that a common control system can be arranged for the whole elevator group, which control system controls both the passenger elevators and the special elevator, e.g. the freight elevator. If the freight elevator is not needed, the control system also allocates the freight elevator to passenger transportation. Use of the freight elevator in passenger transportation increases the capacity and thereby

reduces congestion. When a separate up/down button is arranged for the freight elevator, the user can if necessary also reserve the freight elevator for his/her own use. Since the control system processes only one call at a time given from the same floor, pressing both pushbuttons is of no benefit, so misuse by pressing both pushbuttons or the sending of two elevators to the same departure floor does not occur. By means of the invention the service level of the elevator system can be further improved and the system can be made more user-friendly.

LIST OF FIGURES

[0015]

Fig. 1 presents an elevator system of the technical level, in which the freight elevator is a part of the passenger elevator system and the call-issuing pushbuttons of the elevators are common, and

Fig. 2 presents an embodiment of an elevator system according to the invention, in which the freight elevator is a part of the passenger elevator system but it has its own call-issuing pushbutton.

DETAILED DESCRIPTION OF THE INVENTION

[0016] Fig. 2 presents an elevator system 8 according to the invention, which system comprises one or more passenger elevators 2 and at least one freight elevator 3 (e.g. a freight elevator), an elevator control system 9 common to the passenger elevators and the freight elevator, as well as an indication light or indication board 6, which can indicate at which floor the elevator is or in which direction the elevator arriving at the floor is traveling. The system also comprises call pushbuttons 5 for reserving an elevator for use by a passenger and call pushbuttons 7 for reserving specifically the freight elevator for use by a passenger.

[0017] A user of the elevator system according to the invention presses the call pushbutton 5 of the passenger elevator if he/she does not need to use specifically the freight elevator. The call is transmitted to the control system 9, which allocates a suitable elevator (either a passenger elevator 2 or the freight elevator 3) to the user. If the user needs the freight elevator, he/she presses the call pushbutton 7 of the freight elevator, in which case the control system 9 allocates the freight elevator to the user according to the allocation criteria.

[0018] Thus the user can give a call either with the call pushbuttons 5 of the passenger elevators or with the call pushbuttons 7 of the freight elevator. The elevator control system 9 allocates a suitable elevator to the user depending on which elevator call pushbutton was pressed. If the user needs only the freight elevator and presses only the call pushbutton of the freight elevator, the elevator control system allocates the freight elevator to the

user and prevents calling of other elevators than the freight elevator to that floor. If the user does not need the freight elevator, any suitable elevator at all can be allocated to him/her (including the freight elevator). In allocating the call, allocation criteria can be defined for a call given with the call pushbutton of the freight elevator whereby the freight elevator is allocated e.g. immediately the freight elevator is free or just in sequential order at the time the freight elevator can be freely allocated. The call pushbuttons can be cross-connected such that the control system does not accept a second call before the "first-called" elevator has arrived. In other words, if the call pushbutton of the freight elevator has been pressed, a call coming from the call pushbutton of the passenger elevator is not accepted before the freight elevator has arrived at and left the location (or after a certain delay). Likewise, if the call pushbutton of the passenger elevator has been pressed, a call coming from the call pushbutton of the freight elevator is not accepted until the passenger elevator has arrived at the location (or it is accepted only after a certain delay).

[0019] Although in the embodiments presented above the elevator system contains a plurality of passenger elevators, the invention can also be applied in a simple system, in which there is only one passenger elevator and another freight elevator, which is larger than the passenger elevator. The freight elevator does not necessarily have to be an elevator specially intended for transporting goods, but instead it can also be a different type of elevator such as a scenic elevator, or an elevator with doors that are wider than a passenger elevator. It is also possible in the allocation of an elevator to define many types of allocation criteria for the sequencing and method of allocating the freight elevator.

[0020] Also the invention is not limited solely to the embodiments described above, but instead many variations are possible within the scope of the inventive concept defined by the claims below.

[0021] It is obvious to the person skilled in the art that the invention is not limited to the embodiments described above, in which the invention is described using examples, but that many adaptations and different embodiments of the invention are possible within the scope of the inventive concept defined by the claims presented below.

Claims

1. Elevator system, which comprises: one or more passenger elevators (2) and at least one freight elevator (3), call buttons (5, 7) for reserving an elevator car (2, 3) for use by passengers, which system further comprises: a control system (9), which is arranged to allocate the freight elevator (3) as a response to a call received from a call pushbutton (7) of the freight elevator and to allocate a passenger elevator (2) or the freight elevator (3) to a user as a response to a

call received from the call pushbutton (5) of a passenger elevator, and that the control system (9) is arranged to prevent the allocation of a new elevator (2, 3) to the same call-issuing floor for a pre-defined period of time or until the elevator first allocated arrives at the call-issuing floor.

2. Elevator system according to claim 1 wherein a separate up/down pushbutton is arranged for the freight elevator.
3. Elevator system according to claim 1 or 2, **characterized in that** the call buttons (5,7) are up/down pushbuttons.
4. Control method for controlling an elevator system according to claim 1 (8), which elevator system comprises: one or more passenger elevators (2) and at least one freight elevator (3), call buttons (5, 7) for reserving an elevator car (2, 3) for use by the passengers, whereby the freight elevator (3) is allocated in the elevator control system (9) as a response to a call received from the call pushbutton (7) of the freight elevator, and a passenger elevator (2) or the freight elevator (3) is allocated in the elevator control system (9) as a response to a call received from the call pushbutton (5) of a passenger elevator, and that an allocation of a new elevator (2, 3) to the same call-issuing floor is prevented for a pre-defined period of time or until the elevator first allocated arrives at the call-issuing floor.

Patentansprüche

1. Aufzugssystem, aufweisend: einen oder mehrere Personen-Aufzüge (2) und mindestens einen Frachtaufzug (3), Ruf-Knöpfe (5, 7) zum Anfordern einer Aufzugskabine (2, 3) zur Verwendung für Personen, welches System ferner aufweist: ein Steuerungssystem (9), das vorgesehen ist, um den Frachtaufzug (3) in Antwort einem von einem Ruf-Druckknopf (7) des Frachtaufzuges erhaltenen Ruf zuzuweisen, und um einen Personen-Aufzug (2) oder den Frachtaufzug (3) einer Bedienperson als Antwort auf einen von dem Ruf-Druckknopf (5) eines Personen-Aufzuges erhaltenen Ruf zuzuweisen, wobei das Steuerungssystem (9) vorsieht, die Zuweisung eines neuen Aufzugs (2, 3) für dasselbe rufabgebende Geschoss für eine vordefinierte Zeitdauer zu unterbinden, oder bis der zuerst reservierte Aufzug an dem rufabgebenden Geschoss ankommt.
2. Aufzugssystem nach Anspruch 1, wobei ein separater aufwärts/abwärts-Druckknopf für den Frachtaufzug angeordnet ist.
3. Aufzugssystem nach Anspruch 1 oder 2, **dadurch**

gekennzeichnet, dass die Ruf-Knöpfe (5, 7) aufwärts/abwärts-Druckknöpfe sind.

4. Steuerverfahren zum Steuern eines Aufzugsystems (8) nach Anspruch 1, welches Aufzugsystem aufweist: einen oder mehrere Personen-Aufzüge (2) und mindestens einen Frachtaufzug (3), Ruf-Knöpfe (5, 7) zum Anfordern einer Aufzugskabine (2, 3) zur Personenverwendung, wobei der Frachtaufzug (3) in dem Aufzugsteuersystem (9) als Antwort einem Ruf zugewiesen wird, der von einem Ruf-Druckknopf (7) des Frachtaufzuges angenommen wird, und ein Personen-Aufzug (2) oder der Frachtaufzug (3) wird in dem Aufzugsteuersystem (9) als Antwort einem Ruf zugewiesen, der von dem Ruf-Druckknopf (5) eines Personen-Aufzuges angenommen wird, wobei eine Zuweisung eines neuen Aufzuges (2, 3) zu demselben rufabgebenden Geschoss für eine vorbestimmte Zeit oder bis der zuerst reservierte Aufzug an dem rufabgebenden Geschoss ankommt unterbunden wird.

7) pour réserver une cabine d'ascenseur (2, 3) pour l'utilisation par les passagers, l'ascenseur pour marchandises (3) étant attribué dans le système de commande d'ascenseurs (9) en réponse à un appel reçu depuis le bouton-poussoir d'appel (7) de l'ascenseur pour marchandises, et un ascenseur pour passagers (2) ou un ascenseur pour marchandises (3) étant attribué dans le système de commande d'ascenseurs (9) en réponse à un appel reçu depuis le bouton-poussoir d'appel (5) d'un ascenseur pour passagers, et de plus une attribution d'un nouvel ascenseur (2, 3) au même étage émettant l'appel est évitée pour une période de temps prédéfinie ou jusqu'à ce que le premier ascenseur attribué en premier arrive à l'étage d'émission de l'appel.

Revendications

1. Système d'ascenseur comprenant : un ou plusieurs ascenseurs pour passagers (2) et au moins un ascenseur pour marchandises (3), des boutons d'appel (5, 7) pour réserver une cabine d'ascenseur (2, 3) pour l'utilisation par des passagers, lequel système comprend en outre : un système de commande (9), agencé pour attribuer l'ascenseur pour marchandises (3) en réponse à un appel reçu depuis un bouton-poussoir d'appel (7) de l'ascenseur pour marchandises et pour attribuer un ascenseur pour passagers (2) ou l'ascenseur pour marchandises (3) à un utilisateur en réponse à un appel reçu depuis le bouton poussoir d'appel (5) d'un ascenseur pour passagers, et de plus le système de commande (9) est agencé pour éviter l'attribution d'un nouvel ascenseur (2, 3) au même étage émettant l'appel pour une période de temps prédéfinie ou jusqu'à ce que le premier ascenseur attribué en premier arrive à l'étage d'émission de l'appel.
2. Système d'ascenseur selon la revendication 1, dans lequel un bouton-poussoir haut/bas individuel est agencé pour l'ascenseur pour marchandises.
3. Système d'ascenseur selon la revendication 1 ou 2, **caractérisé par le fait que** des boutons d'appel (5, 7) sont des boutons-poussoirs haut/bas.
4. Procédé de commande pour contrôler un système d'ascenseur (8) selon la revendication 1, lequel système d'ascenseur comprend : un ou plusieurs ascenseurs pour passagers (2) et au moins un ascenseur pour marchandises (3), des boutons d'appel (5,

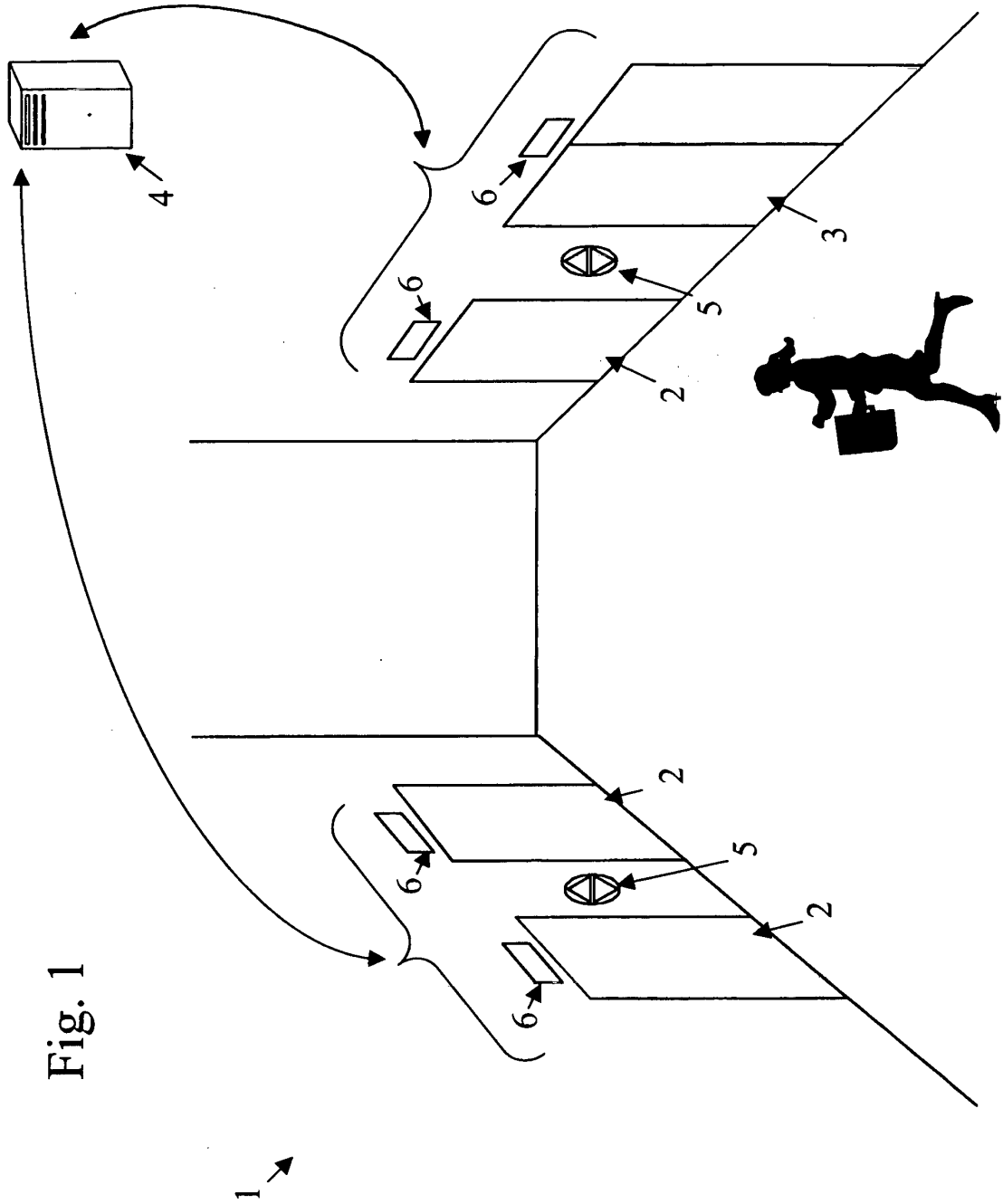
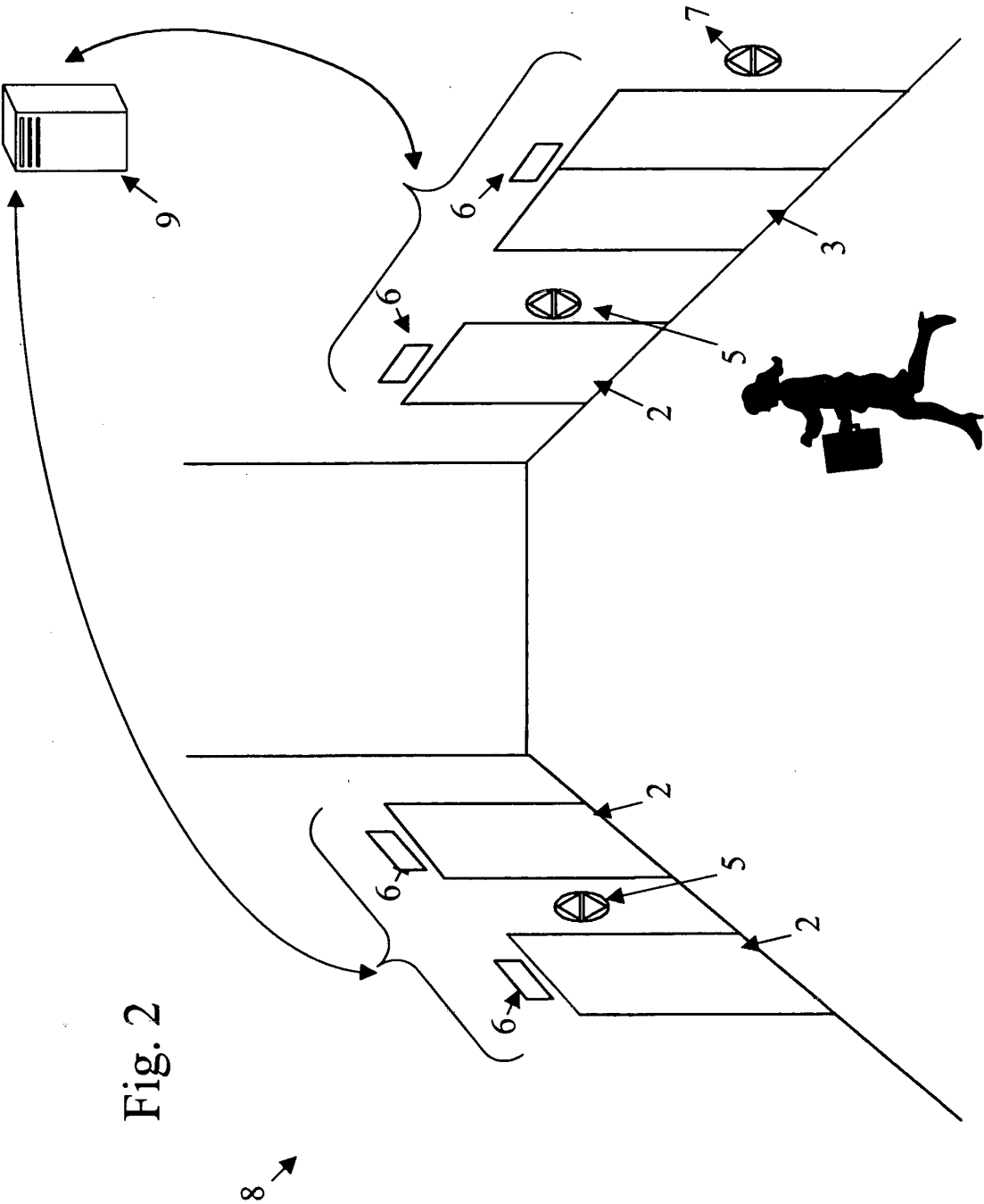


Fig. 1



REFERENCES CITED IN THE DESCRIPTION

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