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(54) **Environment control system, in particular for controlling access to premises**

Umgebungsüberwachungssystem insbesondere zur Zugangskontrolle für Grundstücke

Système de surveillance d'environnement, notamment pour contrôler l'accès à des locaux

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(56) References cited:
WO-A-97/40475
US-A- 5 585 614
US-A- 5 682 142
US-A- 6 052 068

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Description

[0001] The present invention relates to an environment control system which may be used, for example, in premises for public gatherings, entertainment or exhibitions (theatres, museums, stadiums, concert halls, cinemas, etc.) or in other types of structures (parking lots, etc.) or in premises with limited access subject to appointment (government offices, etc.), to control public access and traffic, and monitor ambient conditions of the premises.

[0002] As is known, a good deal of research has been, and is still being, done into improving control of public access and traffic at public gatherings, entertainment events or exhibitions in general.

[0003] For example, US-A-5 585 614 discloses an access control device including a local control device connected to a central control device and containing a local computer, an issuing station for control cards, and a lockable entry installation. At the issuing station portable control cards are issued with an electronic identity number stored at each issue. A transmitting device fitted at the entry installation transmits a continuous series of signals corresponding to identity numbers recognized by the local computer as valid. As soon as the comparator circuit finds a correspondence between transmitted and stored identity numbers, a transmission circuit of the control card is activated to send a release signal to open the entry installation, whereby the power to transmit the release signal is taken from the signals transmitted by the transmitting device.

[0004] WO 97/40475 discloses an electronically controlled access/monitoring system according to the preamble of claim 1.

[0005] Despite numerous efforts made over the past few years, however, there still remains considerable room for improvement.

[0006] In particular, foremost of the many drawbacks typically associated with known environment control systems is undoubtedly the high installation cost involved in terms of time and money, which makes known systems unfeasible for other than long-term, well attended events.

[0007] Another drawback of known environment control systems is their limited capacity to analyse and control so-called "risk factors", and so provide for adequate emergency action, in particular clearing of the premises in the event of fire.

[0008] It is an object of the present invention to provide an environment control system, which is highly flexible and can be transported easily for use on any premises.

[0009] According to the present invention, there is provided an environment control system as claimed in Claim 1.

[0010] A preferred, non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a block diagram of an environment control system in accordance with the present invention;

Figure 2 shows a manned pay station forming part of the Figure 1 environment control system;

Figure 3 shows a turnstile forming part of the Figure 1 environment control system;

Figure 4 shows an information and environment monitoring device forming part of the Figure 1 environment control system;

Figures 5-8 show operating flow charts of the Figure 1 environment control system.

[0011] Number 1 in Figure 1 indicates as a whole an environment control system in accordance with the present invention.

[0012] For the sake of simplicity, and purely by way of a non-limiting example, reference is made in the following description to controlling public access to and traffic within a museum. What is said relative to this application of the present invention, however, clearly also applies to public access and traffic control of premises of any type.

[0013] Environment control system 1 comprises a number of removable, easy-to-carry subsystems communicating with one another over a wireless connection.

[0014] More specifically, the wireless connection may conveniently be defined by a radio transmission, shown schematically in Figure 1 and indicated as a whole by 2, though other types of current or future wireless connections may obviously be employed equally well for the purpose.

[0015] Environment control system 1 substantially comprises:

- a central control unit 3;
- one or more manned pay stations 4;
- one or more automatic pay stations 5;
- one or more museum entrance/exit control devices 6 commonly known as "turnstiles".

[0016] The number of manned pay stations 4, automatic pay stations 5, and entrance/exit control devices 6 obviously depends on the type of premises in which environment control system 1 according to the invention is installed, and, in the example shown, on the number of access-controlled halls in the museum.

[0017] Central control unit 3 is defined by a central processing unit commonly known as a "server", which can be remote accessed over a wireless connection 2 to perform various, e.g. administration, control, booking, operations. Preferably, though not necessarily, central control unit 3 may be remote accessed over Internet - shown schematically in Figure 1 and indicated as a whole by 10 - which would also provide for performing any of what in computer language are known as "Web Attraction" activities.

[0018] More specifically, the central control unit may, for example, be remote accessed over Internet by museum administrators to real-time monitor attendance,

and by private users and travel agencies to book visits to the museum, e.g. by personal computer.

[0019] Each manned pay station 4, in addition to routine functions such as controlling admission to the museum, taking bookings, and issuing tickets, also provides audio/video assistance to the public inside the museum, as explained more clearly later on.

[0020] To do this, each manned pay station 4 is equipped with a personal computer with a booking and ticket printer, radio antenna, video screen, video camera, and microphone.

[0021] For easy transport and installation, each manned pay station comprises a foldable, 120 x 80 cm (standard pallet size) operator platform which can be transported by fork-lift truck. A manned pay station of the above type is shown in Figure 2 purely by way of a non-limiting example.

[0022] Each automatic pay station 5, in addition to routine functions such as receiving coins, banknotes or bank-cards, making change, and issuing tickets, also provides for video surveillance and full-duplex audio functions, as explained more clearly later on.

[0023] To do this, each automatic pay station 5 is equipped with a processing unit for processing user requests, a ticket printer, radio antenna, video camera, and microphone.

[0024] Control devices 6 are located at the entrances and exits to and from the access-controlled halls - both indoor and outdoor - of the museum, and, in addition to the routine function of permitting, or not, entry or exit to or from the halls in which they are installed, also provide for video surveillance and full-duplex audio functions, as explained more clearly later on.

[0025] To do this, each control device 6 comprises a ticket reader - preferably a bar code reader for reading the bar codes printed on the tickets when they are issued - a radio antenna, video camera, and microphone.

[0026] For easy transport and installation, each control device is at most 120 x 80 cm (standard pallet) size. A control device of the above type is shown in Figure 3 purely by way of a non-limiting example.

[0027] According to a further aspect of the present invention, environment control system 1 also comprises:

- one or more information and internal environment monitoring devices 7; and
- one or more information and external environment monitoring devices 8.

[0028] More specifically, information and internal environment monitoring devices 7 are installed at appropriately selected locations in the indoor halls of the museum, and each provide for measuring microclimatic parameters, such as air temperature and humidity, air speed, and atmospheric pressure, as well as for video surveillance and full-duplex audio functions as explained more clearly later on.

[0029] To do this, each information and internal environment monitoring device 7 comprises a temperature sensor, a humidity sensor, an anemometer, a pressure sensor, an information monitor connected to a personal computer, a radio antenna, video camera, and microphone.

[0030] Each information and internal monitoring device 7 also comprises volumetric sensors for security surveillance of the hall, and may be accessed externally over Internet, e.g. to permit central monitoring of the museum by special fire-fighting groups. For example, by constantly monitoring the temperature of the halls in the museum, a fire can be detected immediately on the basis of a rapid increase in temperature.

[0031] Information and external environment monitoring devices 8 are installed at appropriately selected locations in the outdoor halls of the museum, and each provide for measuring microclimatic parameters, such as air temperature and humidity, air speed, and atmospheric pressure, as well as for video surveillance and full-duplex audio functions as explained more clearly later on.

[0032] To do this, each information and external monitoring device 8 comprises a temperature sensor, a humidity sensor, an anemometer, a pressure sensor, an information monitor connected to a personal computer, a video camera, and microphone.

[0033] Each information and external environment monitoring device 8 is conveniently also equipped with solar panels for powering all the electronic devices with which it is equipped.

[0034] Each information and internal, external environment monitoring device 7, 8 also comprises an input/output interface for connection to other peripheral devices, and by which to control the peripheral devices both as a function of monitored microclimatic parameters and in response to operator commands.

[0035] More specifically, the input/output interface comprises:

- an analog input for local acquisition of any analog value supplied to the interface input (air temperature and humidity, air speed, and atmospheric pressure readings, etc.);
- a digital input for reading the status (On/Off) of any digital control;
- an analog output for driving any peripheral device connected to it via a controlled current or voltage output; and
- a digital output for driving any peripheral device connected to it by modifying the On/Off status of the peripheral device.

[0036] More specifically, according to a further aspect of the present invention, each information and internal, external environment monitoring device 7, 8 provides, via its input/output interface, for:

- on/off control of respective hall lights;
- on/off control of respective hall display case lights;

- on/off control of respective hall alarms;
- activating power relays to power electrical user devices in the respective hall;
- activating and powering electric motors via said power relays, e.g. the electric motors controlling respective hall window shutters and blinds, etc.; and
- visual and/or audio hall control by the video camera with which it is equipped.

[0037] The input/output interface of each information and internal, external environment monitoring device 7, 8 can be connected to the peripheral devices and above electrical/electronic devices over the same wireless connection connecting the various subsystems of environment control system 1, as shown in Figure 1, or, for cost reasons, by cable, in particular over an Ethernet/Intranet/Internet network.

[0038] An information and environment monitoring device of the above type - be it internal or external - is shown in Figure 4 purely by way of a non-limiting example.

[0039] Finally, environment control system 1 may conveniently also employ one or more area attendants 9, each equipped with a hand-held computer, and for performing various functions in addition to or instead of those performed by the above devices, e.g. supervising and opening or closing entrances/exits, validating tickets, and weather monitoring.

[0040] Figure 5 shows a flow chart of the operations performed by manned pay station 4 operators or automatic pay station 5 users to purchase entrance tickets to the museum, and the operations performed by central control unit 3 in response to operator or user action.

[0041] As shown in Figure 5, to begin with, the operator or user selects a ticket from those currently available as a function of day, time, and weather conditions (block 100) .

[0042] A check is then made to determine whether the selected ticket is for an access-controlled indoor or outdoor hall of the museum (block 110). If it is not (NO output of block 110), then this type of ticket is always available, and a check is made to determine whether the type of ticket selected calls for specification (block 120). If the type of ticket selected calls for specification or description for statistical purposes (YES output of block 120), the operator or user selects one of the available descriptions (block 130), and enters a print command to print the selected ticket (block 140). Conversely, if the type of ticket selected does not call for specification or description for statistical purposes (NO output of block 120), the operator or user enters the ticket print command directly (block 140).

[0043] Before the ticket is issued, a check is made to determine whether, since the start of the ticket purchase sequence, the ticket is still available, and, if applicable, weather conditions are still favourable (block 150). If they are (YES output of block 150), the ticket is issued (block 160) and the ticket purchase sequence terminated. Conversely (NO output of block 150), the ticket purchase sequence is terminated without issuing the ticket (block 170).

[0044] If the ticket selected is for an access-controlled hall, e.g. one in which a maximum number of visitors are allowed to enter at one time (YES output of block 110), then the first available time with at least one place is sought (block 180), and a check is made to determine the time exists (block 190) .

[0045] More specifically, visits may be of two types:

guided, i.e. organized groups of visitors; or unguided, i.e. visitors admitted individually. In the first case, availability depends on the number of tickets left for the time selected; in the second case, actual availability depends on the capacity of the hall minus the number of tickets sold and admitted, plus the number of tickets sold and not yet admitted, and minus the number of tickets that have gone in and out. In this case, control devices 6 do not merely validate the tickets for individual halls, but also count the number going in and out to keep an accurate count of the number of visitors.

[0046] If the time sought does not exist (NO output of block 190), the ticket purchase sequence is terminated without issuing the ticket (block 170).

[0047] Conversely, if the time exists (YES output of block 190), the operator or user is asked whether more than one ticket is required (block 200). If it is (YES output of block 200), the operator or user is asked to enter the number of tickets required (block 210), the first available time with the required number of tickets is sought (block 220), and a check is made to determine the time exists (block 230).

[0048] If the time does not exist (NO output of block 230), the ticket purchase sequence is terminated without issuing the tickets (block 170).

[0049] Conversely, if the time exists (YES output of block 230), the user is asked whether or not the proposed time is accepted (block 240). The same also applies in the event only one ticket is required (NO output of block 200) .

[0050] If the user accepts the proposed time (YES output of block 240), the sequence continues with the operations described above relative to block 120; conversely, if the user does not accept the proposed time (NO output of block 240), another time with the required number of tickets is sought (block 250), and a check is made to determine the time exists (block 260).

[0051] If the time does not exist (NO output of block 260), the ticket purchase sequence is terminated without issuing the ticket (block 170); conversely (YES output of block 260), the operator or user keys in the new time (block 270), and the sequence continues with the operations described above relative to block 120.

[0052] Figure 6 shows a flow chart of the operations performed by central control unit 3 on the basis of weather data supplied by information and external monitoring de-

vices 8.

[0053] As shown in Figure 6, to begin with, the various information and external monitoring devices 8 are interrogated (block 300), and the air temperature, humidity and speed values supplied by devices 8 are acquired cyclically (block 310).

[0054] An average air speed value is then calculated (block 320) and compared with a threshold set in central control unit 3 (block 330).

[0055] If the average air speed value is below or at most equal to the set threshold, a check is made of the operating status (disabled/enabled) of the ticket devices (manned pay stations 4 and automatic pay stations 5) and museum entrance/exit control devices 6 (block 340).

[0056] If disabled, control devices 6 are enabled (block 350); and, if they are not disabled, central control unit 3 goes into standby for a predetermined time interval (block 360), after which, the sequence continues with the operations described above with reference to block 300.

[0057] Conversely, if the average air speed value is above the set threshold, the at-risk outdoor halls of the museum are determined, e.g. those with strong wind and excessively high temperature or humidity (block 370), manned pay stations 4 and automatic pay stations 5 are disabled from issuing tickets for those particular halls (block 380), and control devices 6 controlling the entrances to those particular halls are disabled to prevent access by the public (block 390).

[0058] Central control unit 3 then goes into standby for a predetermined time interval (block 360), after which, the sequence continues with the operations described above with reference to block 300.

[0059] Figure 7 shows a flow chart of the operations performed by central control unit 3 to control museum entrance/exit control devices 6.

[0060] As shown in Figure 7, to begin with, the ticket inserted into the bar code reader of control device 6 is read (block 400), and control device 6 identified (block 410) .

[0061] A check is then made to determine whether the ticket inserted into the bar code reader is a public ticket or a museum operator pass (block 420).

[0062] If an operator pass is determined, the operator is identified (block 430). If the operator fails to be identified, control device 6 is disabled to prevent the operator using that particular museum entrance/exit (block 440), a picture of the operator is taken by the video surveillance system of control device 6 and recorded (block 450), and the operator's entry/exit attempt through that particular entrance/exit is also recorded (block 460).

[0063] Conversely, if identified, the operator's employment status - suspended/active duty - is checked (block 470).

[0064] If the operator is suspended, control device 6 is disabled to prevent the operator using that particular museum entrance/exit (block 480), and the sequence continues with the operations described above with reference to blocks 450 and 460. Conversely, if on active duty, the operator's access permits are checked (block 490).

[0065] If the operator is not authorized access to the hall controlled by the device, the device is disabled to prevent the operator using that particular museum entrance/exit (block 500), and the sequence continues with the operations described above with reference to blocks 450 and 460. Conversely, if the operator is authorized access to the hall, the disabled/enabled operating status of control device 6 is checked (block 510). If disabled previously for any reason, control device 6 is enabled (block 520), and entry/exit of the operator is recorded (block 530).

[0066] Conversely, if the ticket inserted into the bar code reader is a public ticket, a check is made to determine whether it relates to an indoor or outdoor hall of limited or unlimited capacity (block 540).

[0067] If the ticket relates to a hall of unlimited capacity, a check is made of the day to which the ticket relates (block 550).

[0068] If the ticket is not valid, i.e. the day on the ticket and the present day do not correspond, control device 6 is disabled to prevent the ticket holder using that particular museum entrance/exit (block 560), a picture of the ticket holder is taken by the video surveillance system of control device 6 and recorded (block 570), and the ticket holder's entry/exit attempt is also recorded (block 580).

[0069] Conversely, if the ticket is valid, i.e. the day on the ticket and the present day correspond, the used/unused status of the ticket is checked (block 590).

[0070] If the ticket has already been used, control device 6 is disabled to prevent the ticket holder using that particular museum entrance/exit (block 600), and the sequence continues with the operations described above with reference to blocks 570 and 580; whereas, if the ticket has not yet been used, the access covered by the ticket is checked (block 610).

[0071] If the ticket does not cover access to the hall controlled by device 6, the device is disabled to prevent the ticket holder using that particular museum entrance/exit (block 620), and the sequence continues with the operations described above with reference to blocks 570 and 580. Conversely, if the ticket covers access to the hall controlled by device 6, the disabled/enabled operating status of the device is checked (block 630). If disabled previously for any reason, control device 6 is enabled (block 640), and entry/exit of the ticket holder is recorded (block 650).

[0072] If the ticket relates to a hall of limited capacity, a check is made of the day to which the ticket relates (block 660).

[0073] If the ticket is not valid, i.e. the day on the ticket and the present day do not correspond, control device 6 is disabled to prevent the ticket holder using that particular museum entrance/exit (block 670), a picture of the ticket holder is taken by the video surveillance system of control device 6 and recorded (block 680), and the ticket holder's entry/exit attempt is also recorded (block 690).

[0074] Conversely, if the ticket is valid, i.e. the day on the ticket and the present day correspond, the time on the ticket is checked (block 700).

[0075] If the ticket is not valid, i.e. the time on the ticket and the present time do not correspond, control device 6 is disabled to prevent the ticket holder using that particular museum entrance/exit (block 710), and the sequence continues with the operations described above with reference to blocks 680 and 690; whereas, if the ticket is valid, i.e. the time on the ticket and the present time correspond, the used/unused status of the ticket is checked (block 720).

[0076] If the ticket has already been used, control device 6 is disabled to prevent the ticket holder using that particular museum entrance/exit (block 730), and the sequence continues with the operations described above with reference to blocks 680 and 690; whereas, if the ticket has not yet been used, the access covered by the ticket is checked (block 740).

[0077] If the ticket does not cover access to the hall controlled by device 6, the device is disabled to prevent the ticket holder using that particular museum entrance/exit (block 750), and the sequence continues with the operations described above with reference to blocks 680 and 690. Conversely, if the ticket covers access to the hall controlled by device 6, the disabled/enabled operating status of the device is checked (block 760). If disabled previously for any reason, control device 6 is enabled (block 770), and entry/exit of the ticket holder is recorded (block 780).

[0078] Figure 8 shows a flow chart of the operations performed by operators or users on museum entrance/exit control devices 6 and on information and internal, external monitoring devices 7, 8 to communicate with the operators of manned pay stations 4, and the operations performed by central control unit 3 in response to operator or user action to permit interaction between the above devices and the pay station operators.

[0079] As shown in Figure 8, to begin with, the operator or user calls a manned pay station 4 operator from a museum entrance/exit control device 6 or an information and internal, external monitoring device 7, 8 (block 800).

[0080] The peripheral device from which the call is made is then identified and engaged (block 810), and a free manned pay station 4 is sought (block 820).

[0081] If no free manned pay station 4 is found, no-available-operators is indicated (block 830), the calling peripheral device is disengaged (block 840), and the call is logged (block 850) .

[0082] Conversely, if at least one free manned pay station 4 is found, this is engaged (block 860), and full-duplex audio/video communication is enabled between the peripheral device and the manned pay station 4 (block 870) to enable the caller to communicate the engaged pay station operator (block 880).

[0083] At the end of the call, the manned pay station 4 operator cuts off communication with the calling peripheral device (block 890); the calling peripheral device and the manned pay station 4 are disengaged (blocks 900 and 910); and the call is logged (block 920).

[0084] The advantages of the present invention will be clear from the foregoing description.

[0085] In particular, using wireless communication between the various subsystems of the control system according to the present invention enables it to be used for controlling access to any premises. The system according to the present invention, in fact, is not only easy to transport, highly flexible, and adaptable to any premises, but can also be installed easily by requiring practically no wiring.

[0086] Clearly, changes may be made to the control system as described and illustrated herein without, however, departing from the scope of the present invention as defined in the accompanying Claims.

[0087] For example, given the rapid increase in electronic business Web sites, and those specifically designed to attract visitors and audiences to museums, theatres, concerts, etc., a "virtual" pay station defined by an Internet site may be set up alongside the manned and automatic pay stations at the museum, and accessed by users to book and purchase museum tickets by personal computer.

[0088] In which case, the museum ticket may be defined by a virtual ticket obtained telematically, thus enabling fully remote ticket purchase at any time and from any place, at the user's discretion.

[0089] More specifically, the virtual ticket may be defined substantially by a computer or electronic access permit (duly encrypted for obvious security reasons), which may be received over the same means used to purchase the ticket, e.g. a personal or hand-held computer, fixed or mobile telephone, or any other appropriate means.

[0090] Assuming payment is assured, the access permit to the museum may be generated and sent by the booking-office service, which may be an agency of the museum itself, or an authorized agency capable of providing general booking service, and which handles bookings, coverage checks, ticket payments, as well as generating and transmitting virtual tickets to purchasers using an appropriate protocol.

[0091] The access permit to the museum may be stored on a portable storage medium, and exhibited or presented at the museum entrance.

[0092] More specifically, the access permit storage medium may conveniently be defined by a contact or contactless "smart card" or cellular telephone.

[0093] The access permit stored on the storage medium may be presented in the same way as for fast access to high-traffic locations such as underground railways, ski-lifts, motorways (tele-pass), etc., i.e. by interaction between the storage medium and a reader or electronic access port set up at the museum entrance and/or various hall entrances, and by which the access permit is checked and cancelled, and access permitted by appropriate visual or audio communication.

[0094] Alternatively, the access permit may simply be defined by an access code, which is keyed in on a permit checking device at the museum entrance or various hall entrances, may be requested by an SMS (Short Message System) message and obtained automatically by a response SMS message, and may be either memorized mentally or written on a piece of paper, i.e. with no need for storage on a portable storage medium.

[0095] Moreover, the central control unit may even be connected to Internet over a normal fixed or mobile telephone network, and may be integrated directly in the pay stations, as opposed to being defined by a stand-along server.

Claims

1. An environment control system (1) comprising:

- access permit emitting means (4, 5) configured to emit access permits to the controlled environment, each access permit including access information;
- access permit reading means configured to read access information from said access permits;
- access control means (6) configured to control passage through entrances/exits of the controlled environment; and
- access management means (3) connected to said access permit emitting means (4, 5) and to said access control means (6);

said access control means including a plurality of access control devices (6) located, in use, at respective entrances to or exits from said controlled environment, the access control devices (6) located, in use, at respective entrances to said controlled environment comprising respective access permit readers configured to read access information from said access permits; and

said access management means including a central control unit (3) connected to said access control devices (6) and to said access permit emitting means (4, 5) and configured to control emission of said access permits;

characterized in that said central control unit (3) is connected to said access control devices (6) via respective wireless connections and is configured to be remotely accessed via the Internet;

and **in that** said central control unit (3) is further configured to identify the access control device (6) comprising the access permit reader that has read access information from an access permit, and to enable/deny the passage through the entrance controlled by the identified access control device (6) based on the read access information and on the identity of said access control device (6).

2. A system as claimed in Claim 1, wherein said access permit emitting means (4, 5) are connected to said central control unit (3) via a wireless connection (2).

3. A system as claimed in Claim 1 or 2, wherein said access permit emitting means (4, 5) are locate, in use, remotely from said controlled environment.

4. A system as claimed in Claim 3, **characterized in that** said access permit emitting means (4, 5) are an Internet site.

5. A system as claimed in Claim 1 or 2, wherein said access permit emitting means (4, 5) comprise pay means (4, 5) connected to said central control unit (3) via a wireless connection (2).

6. A system as claimed in Claim 5, wherein said pay means comprise at least one manned pay station (4).

7. A system as claimed in Claim 5 or 6, wherein said pay means comprise at least one automatic pay station (5).

8. A system as claimed in any one of the foregoing Claims, wherein said access control means comprise turnstile means (6).

9. A system as claimed in Claim 8, wherein said turnstile means comprise a turnstile (6) for each controlled entrance/exit of the controlled environment.

10. A system as claimed in any one of the foregoing Claims, further comprising:

- environment monitoring means (7, 8); and
- information means (7, 8) configured to supply information relative to said controlled environment and/or its contents.

11. A system as claimed in Claim 10, wherein said environment monitoring means (7, 8) are configured to modify a status of said controlled environment.

12. A system as claimed in Claim 11, wherein said environment monitoring means (7, 8) are further configured to visual and/or acoustic monitor said controlled environment.

13. A system as claimed in Claim 11 or 12, wherein said environment monitoring means (7, 8) are further configured to monitor microclimatic parameters of said controlled environment, comprising air temperature and humidity, air speed, and atmospheric pressure.

14. A system as claimed in Claims 11 and 13, wherein

said environment monitoring means (7, 8)are further configured to modify said status of said controlled environment based on the monitored microclimatic parameters or based on received commands.

15. A system as claimed in any one of the foregoing Claims 10 to 14, wherein said environment monitoring means (7, 8) and said information means (7, 8) are connected to said central control unit (3) via a wireless connection.

Patentansprüche

1. Umgebungskontrollsystem (1), umfassend:

- Zutrittsgenehmigungs-Ausgabeeinrichtungen (4, 5), die konfiguriert sind, um Zutrittsgenehmigungen zu der kontrollierten Umgebung auszugeben, wobei jede Zutrittsgenehmigung Zutrittsinformation enthält;
- Zutrittsgenehmigungs-Leseeinrichtungen, die konfiguriert sind, um Zutrittsinformation von den Zutrittsgenehmigungen zu lesen;
- Zutrittskontrolleinrichtungen (6), die konfiguriert sind, um einen Durchtritt durch Eingänge/Ausgänge der kontrollierten Umgebung zu kontrollieren; und
- Zutrittsmanagementeinrichtungen (3), die mit den Zutrittsgenehmigungs-Ausgabeeinrichtungen (4, 5) und mit den Zutrittskontrolleinrichtungen (6) verbunden sind;

wobei die Zutrittskontrolleinrichtungen eine Mehrzahl von Zutrittskontrollgeräten (6) umfassen, die sich im Gebrauch an jeweiligen Eingängen zu oder Ausgängen von der kontrollierten Umgebung befinden, wobei die Zutrittskontrollgeräte (6), die sich im Gebrauch an jeweiligen Eingängen zu der kontrollierten Umgebung befinden, jeweilige Zutrittsgenehmigungsleser umfassen, die konfiguriert sind, um Zutrittsinformation von den Zutrittsgenehmigungen zu lesen; und
wobei die Zutrittsmanagementeinrichtungen eine zentrale Steuereinheit (3) umfassen, die mit den Zutrittskontrollgeräten (6) und mit den Zutrittsgenehmigungs-Ausgabeeinrichtungen (4, 5) verbunden ist und konfiguriert ist, um eine Ausgabe der Zutrittsgenehmigungen zu steuern;
dadurch gekennzeichnet, dass die zentrale Steuereinheit (3) über jeweilige drahtlose Verbindungen mit den Zutrittskontrollgeräten (6) verbunden ist und konfiguriert ist, um über das Internet einen Fernzugriff zu erfahren;
und dadurch, dass die zentrale Steuereinheit (3) weiter konfiguriert ist, um das Zutrittskontrollgerät (6), das den Zutrittsgenehmigungsleser umfasst, der Zutrittsinformation von einer Zutrittsgenehmigung gelesen hat, zu identifizieren und um den Durchtritt durch den Eingang zu ermöglichen/verweigern, der auf Grundlage der gelesenen Zutrittsinformation und auf Grundlage der Identität des Zutrittskontrollgeräts (6) durch das identifizierte Zutrittskontrollgerät (6) kontrolliert wird.

2. System nach Anspruch 1, bei dem die Zutrittsgenehmigungs-Ausgabeeinrichtungen (4, 5) über eine drahtlose Verbindung (2) mit der zentralen Steuereinheit (3) verbunden sind.

3. System nach Anspruch 1 oder 2, bei dem die Zutrittsgenehmigungs-Ausgabeeinrichtungen (4, 5) im Gebrauch entfernt von der kontrollierten Umgebung angeordnet sind.

4. System nach Anspruch 3, **dadurch gekennzeichnet, dass** die Zutrittsgenehmigungs-Ausgabeeinrichtungen (4, 5) eine Internet-Web-Site sind.

5. System nach Anspruch 1 oder 2, bei dem die Zutrittsgenehmigungs-Ausgabeeinrichtungen (4, 5) Zahlungseinrichtungen (4, 5) umfassen, die über eine drahtlose Verbindung (2) mit der zentralen Steuereinheit (3) verbunden sind.

6. System nach Anspruch 5, bei dem die Zahlungseinrichtungen mindestens eine bemannte Zahlstation (4) umfassen.

7. System nach Anspruch 5 oder 6, bei dem die Zahlungseinrichtungen mindestens eine automatische Zahlstation (5) umfassen.

8. System nach einem der vorangehenden Ansprüche, bei dem die Zutrittskontrolleinrichtungen Drehkreuzeinrichtungen (6) umfassen.

9. System nach Anspruch 8, bei dem die Drehkreuzeinrichtungen ein Drehkreuz (6) für jeden kontrollierten Eingang/Ausgang der kontrollierten Umgebung umfassen.

10. System nach einem der vorangehenden Ansprüche, weiter umfassend:

- Umgebungsüberwachungseinrichtungen (7, 8); und
- Informationseinrichtungen (7, 8), die konfiguriert sind, um Information bezüglich der kontrollierten Umgebung und/oder ihrer Gehalte zur Verfügung zu stellen.

11. System nach Anspruch 10, bei dem die Umgebungsüberwachungseinrichtungen (7, 8) konfiguriert sind, um einen Status der kontrollierten Umgebung zu modifizieren.

12. System nach Anspruch 11, bei dem die Umgebungsüberwachungseinrichtungen (7, 8) weiter konfiguriert sind, um die kontrollierte Umgebung visuell und/oder akustisch zu überwachen.

13. System nach Anspruch 11 oder 12, bei dem die Umgebungsüberwachungseinrichtungen (7, 8) weiter konfiguriert sind, um mikroklimatische Parameter der kontrollierten Umgebung zu überwachen, die Lufttemperatur und Feuchtigkeit, Luftgeschwindigkeit und Atmosphärendruck umfassen.

14. System nach den Ansprüchen 11 und 13, bei dem die Umgebungsüberwachungseinrichtungen (7, 8) weiter konfiguriert sind, um den Status der kontrollierten Umgebung auf Grundlage der überwachten mikroklimatischen Parameter oder auf Grundlage von empfangenen Befehlen zu modifizieren.

15. System nach einem der vorangehenden Ansprüche 10 bis 14, bei dem die Umgebungsüberwachungseinrichtungen (7, 8) und die Informationseinrichtungen (7, 8) über eine drahtlose Verbindung mit der zentralen Steuereinheit (3) verbunden sind.

Revendications

1. Système de contrôle de l'environnement (1) comprenant :

- des moyens d'émission d'autorisations d'accès (4, 5) configurés pour émettre des autorisations d'accès pour l'environnement contrôlé, chaque autorisation d'accès comprenant des informations d'accès,
- des moyens de lecture d'autorisations d'accès configurés pour lire des informations d'accès à partir desdites autorisations d'accès,
- des moyens de contrôle d'accès (6) configurés pour contrôler le passage au travers d'entrées/sorties de l'environnement contrôlé, et
- des moyens de gestion d'accès (3) reliés auxdits moyens d'émission d'autorisations d'accès (4, 5) et auxdits moyens de contrôle d'accès (6),

lesdits moyens de contrôle d'accès comprenant une pluralité de dispositifs de contrôle d'accès (6) localisés, en utilisation, à des entrées ou à des sorties respectives vers ou depuis ledit environnement contrôlé, les dispositifs de contrôle d'accès (6) étant localisés, en utilisation, à des entrées respectives vers ledit environnement contrôlé comprenant des lecteurs d'autorisations d'accès respectifs configurés pour lire des informations d'accès à partir desdites autorisations d'accès, et

lesdits moyens de gestion d'accès comprenant une unité de commande centrale (3) reliée auxdits dispositifs de contrôle d'accès (6) et auxdits moyens d'émission d'autorisations d'accès (4, 5) et configurée pour commander l'émission desdites autorisations d'accès,

caractérisé en ce que ladite unité de commande centrale (3) est reliée auxdits dispositifs de contrôle d'accès (6) par l'intermédiaire de connexions sans fil respectives et est configurée pour faire l'objet d'un accès à distance par Le biais du système Internet, et **en ce que** ladite unité de commande centrale (3) est en outre configurée pour identifier le dispositif de contrôle d'accès (6) comprenant le lecteur d'autorisations d'accès qui a lu des informations d'accès à partir d'une autorisation d'accès, et pour permettre/refuser le passage à travers l'entrée contrôlée par le dispositif de contrôle d'accès (6) identifié sur la base des informations d'accès lues et de l'identité dudit dispositif de contrôle d'accès (6).

2. Système selon la revendication 1, dans lequel lesdits moyens d'émission d'autorisations d'accès (4, 5) sont connectés à ladite unité de commande centrale (3) par le biais d'une connexion sans fil (2).

3. Système selon la revendication 1 ou 2, dans lequel lesdits moyens d'émission d'autorisations d'accès (4, 5) sont localisés, en utilisation, à distance dudit environnement contrôlé.

4. Système selon la revendication 3, **caractérisé en ce que** lesdits moyens d'émission d'autorisations d'accès (4, 5) sont un site Internet.

5. Système selon la revendication 1 ou 2, dans lequel lesdits moyens d'émission d'autorisations d'accès (4, 5) comprennent des moyens de paiement (4, 5) connectés à ladite unité de commande centrale (3) par le biais d'une connexion sans fil (2).

6. Système selon la revendication 5, dans lequel lesdits moyens de paiement comprennent au moins un poste de paiement pourvu de personnel (4).

7. Système selon la revendication 5 ou 6, dans lequel lesdits moyens de paiement comprennent au moins un poste de paiement automatique (5).

8. Système selon l'une quelconque des revendications précédentes, dans lequel lesdits moyens de contrôle d'accès comprennent des moyens de tourniquets (6).

9. Système selon la revendication 8, dans lequel lesdits moyens de tourniquets comprennent un tourniquet (6) pour chaque entrée/sortie contrôlée de l'environnement contrôlé.

10. Système selon l'une quelconque des revendications précédentes, comprenant en outre :

- des moyens de surveillance de l'environnement (7, 8), et
- des moyens d'informations (7, 8) configurés pour fournir des informations relatives audit environnement contrôlé et/ou à ses contenus.

11. Système selon la revendication 10, dans lequel lesdits moyens de surveillance d'environnement (7, 8) sont configurés pour modifier un état dudit environnement contrôlé.

12. Système selon la revendication 11, dans lequel lesdits moyens de surveillance de l'environnement (7, 8) sont en outre configurés pour une surveillance visuelle et/ou acoustique dudit environnement contrôlé.

13. Système selon la revendication 11 ou 12, dans lequel lesdits moyens de surveillance de l'environnement (7, 8) sont en outre configurés pour surveiller des paramètres de microclimat dudit environnement contrôlé, comprenant la température et l'humidité de l'air, la vitesse de l'air et la pression atmosphérique.

14. Système selon les revendications 11 et 13, dans lequel lesdits moyens de surveillance de l'environnement (7, 8) sont en outre configurés pour modifier ledit état dudit environnement contrôlé sur la base des paramètres de microclimat surveillés ou sur la base d'ordres reçus.

15. Système selon l'une quelconque des revendications précédentes 10 à 14, dans lequel lesdits moyens de surveillance de l'environnement (7, 8) et lesdits moyens d'informations (7, 8) sont reliés à ladite unité de commande centrale (3) par l'intermédiaire d'une connexion sans fil.

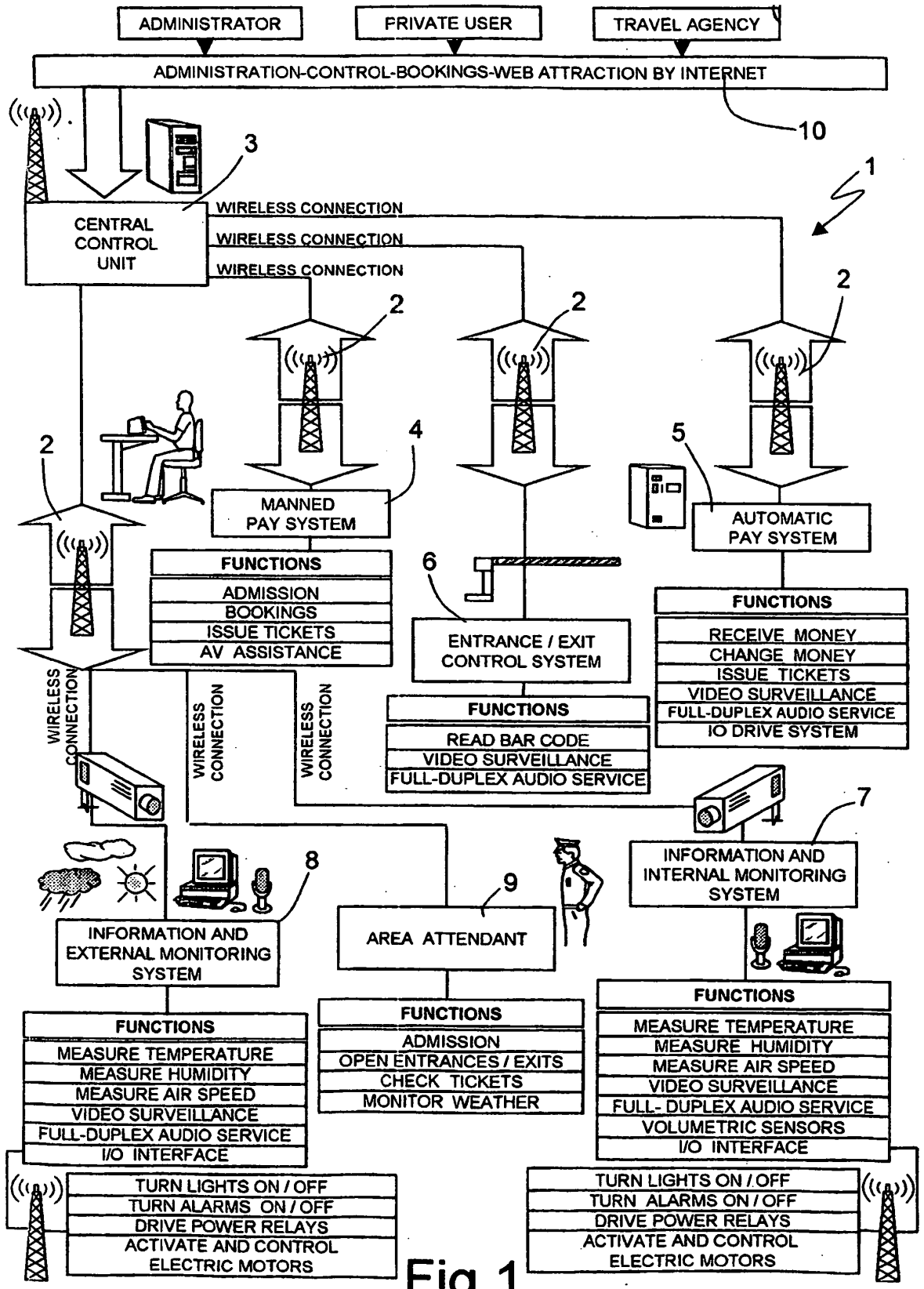

ADMINISTRATOR
PRIVATE USER
TRAVEL AGENCY
ADMINISTRATION-CONTROL-BOOKINGS-WEB ATTRACTION BY INTERNET
10
1
3
CENTRAL CONTROL UNIT
WIRELESS CONNECTION
WIRELESS CONNECTION
WIRELESS CONNECTION
2
2
2
2
4
5
MANNED PAY SYSTEM
AUTOMATIC PAY SYSTEM
FUNCTIONS
ADMISSION
BOOKINGS
ISSUE TICKETS
AV ASSISTANCE
6
ENTRANCE / EXIT CONTROL SYSTEM
FUNCTIONS
RECEIVE MONEY
CHANGE MONEY
ISSUE TICKETS
VIDEO SURVEILLANCE
FULL-DUPLEX AUDIO SERVICE
IO DRIVE SYSTEM
WIRELESS CONNECTION
WIRELESS CONNECTION
WIRELESS CONNECTION
FUNCTIONS
READ BAR CODE
VIDEO SURVEILLANCE
FULL-DUPLEX AUDIO SERVICE
7
INFORMATION AND INTERNAL MONITORING SYSTEM
8
9
INFORMATION AND EXTERNAL MONITORING SYSTEM
AREA ATTENDANT
FUNCTIONS
MEASURE TEMPERATURE
MEASURE HUMIDITY
MEASURE AIR SPEED
VIDEO SURVEILLANCE
FULL-DUPLEX AUDIO SERVICE
I/O INTERFACE
FUNCTIONS
ADMISSION
OPEN ENTRANCES / EXITS
CHECK TICKETS
MONITOR WEATHER
FUNCTIONS
MEASURE TEMPERATURE
MEASURE HUMIDITY
MEASURE AIR SPEED
VIDEO SURVEILLANCE
FULL- DUPLEX AUDIO SERVICE
VOLUMETRIC SENSORS
I/O INTERFACE
TURN LIGHTS ON / OFF
TURN ALARMS ON / OFF
DRIVE POWER RELAYS
ACTIVATE AND CONTROL ELECTRIC MOTORS
TURN LIGHTS ON / OFF
TURN ALARMS ON / OFF
DRIVE POWER RELAYS
ACTIVATE AND CONTROL ELECTRIC MOTORS

Fig.1

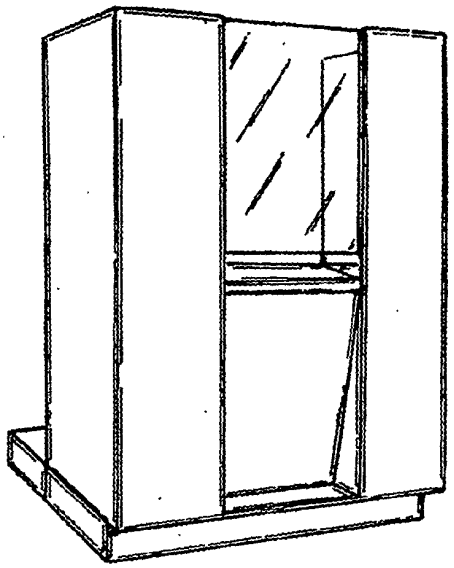


Fig. 2

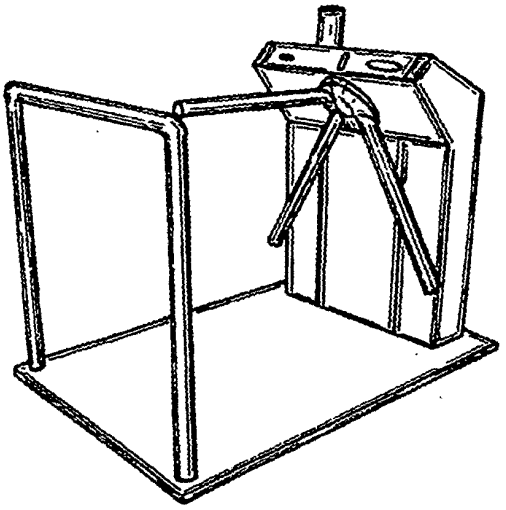


Fig. 3

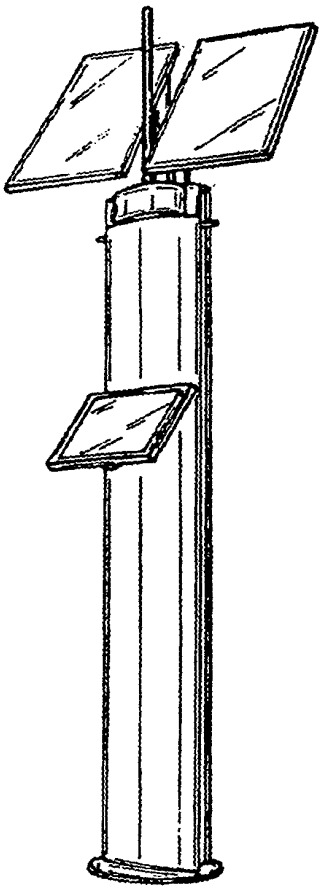


Fig. 4

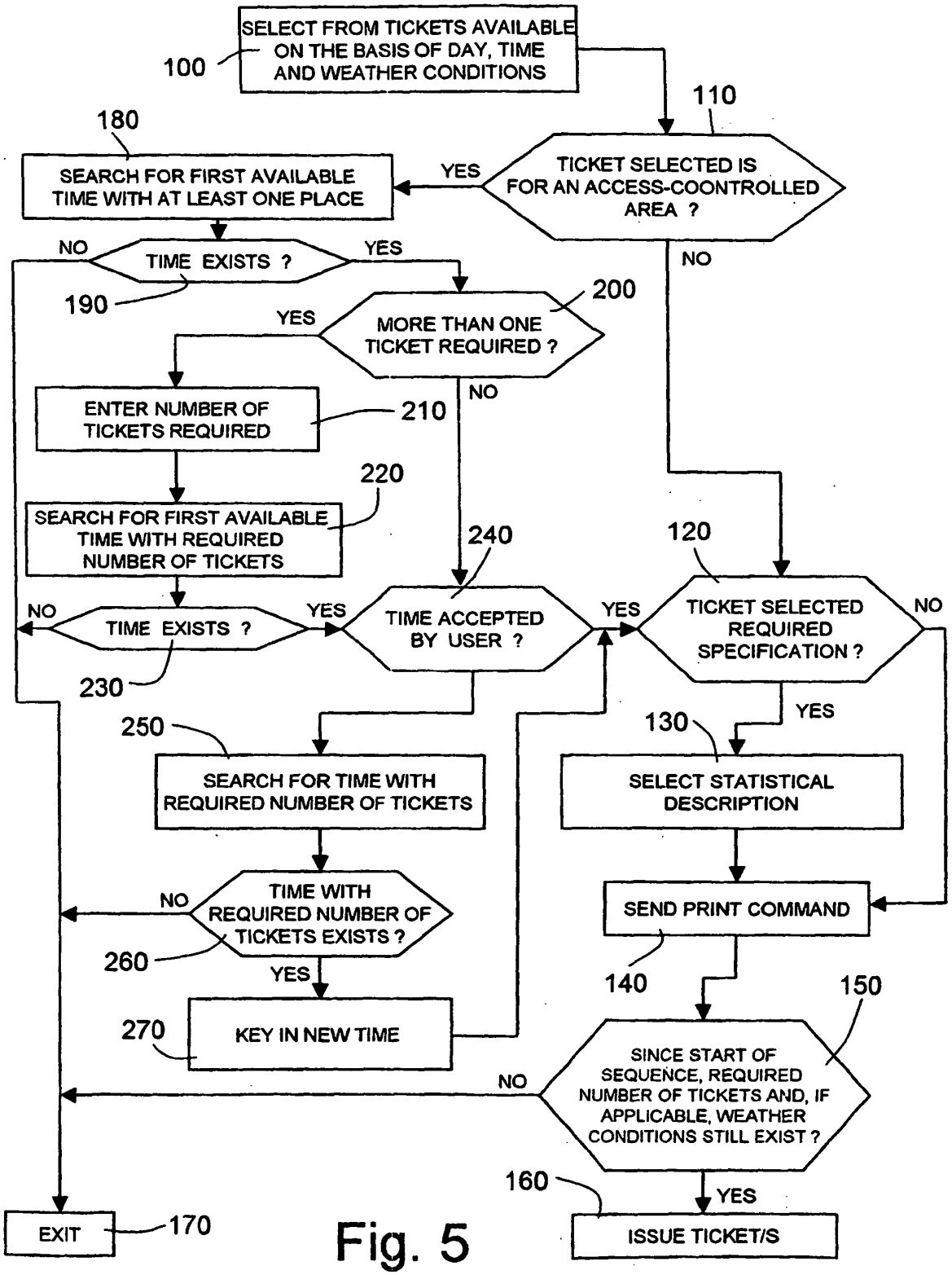

SELECT FROM TICKETS AVAILABLE ON THE BASIS OF DAY, TIME AND WEATHER CONDITIONS
100
110
TICKET SELECTED IS FOR AN ACCESS-COONTROLLED AREA ?
YES
NO
180
SEARCH FOR FIRST AVAILABLE TIME WITH AT LEAST ONE PLACE
NO
TIME EXISTS ?
YES
190
200
MORE THAN ONE TICKET REQUIRED ?
YES
NO
ENTER NUMBER OF TICKETS REQUIRED
210
220
SEARCH FOR FIRST AVAILABLE TIME WITH REQUIRED NUMBER OF TICKETS
240
120
NO
TIME EXISTS ?
YES
230
TIME ACCEPTED BY USER ?
YES
TICKET SELECTED REQUIRED SPECIFICATION ?
NO
YES
250
130
SEARCH FOR TIME WITH REQUIRED NUMBER OF TICKETS
SELECT STATISTICAL DESCRIPTION
NO
TIME WITH REQUIRED NUMBER OF TICKETS EXISTS ?
260
SEND PRINT COMMAND
YES
140
150
270
KEY IN NEW TIME
SINCE START OF SEQUENCE, REQUIRED NUMBER OF TICKETS AND, IF APPLICABLE, WEATHER CONDITIONS STILL EXIST ?
NO
160
YES
EXIT
170
ISSUE TICKET/S

Fig. 5

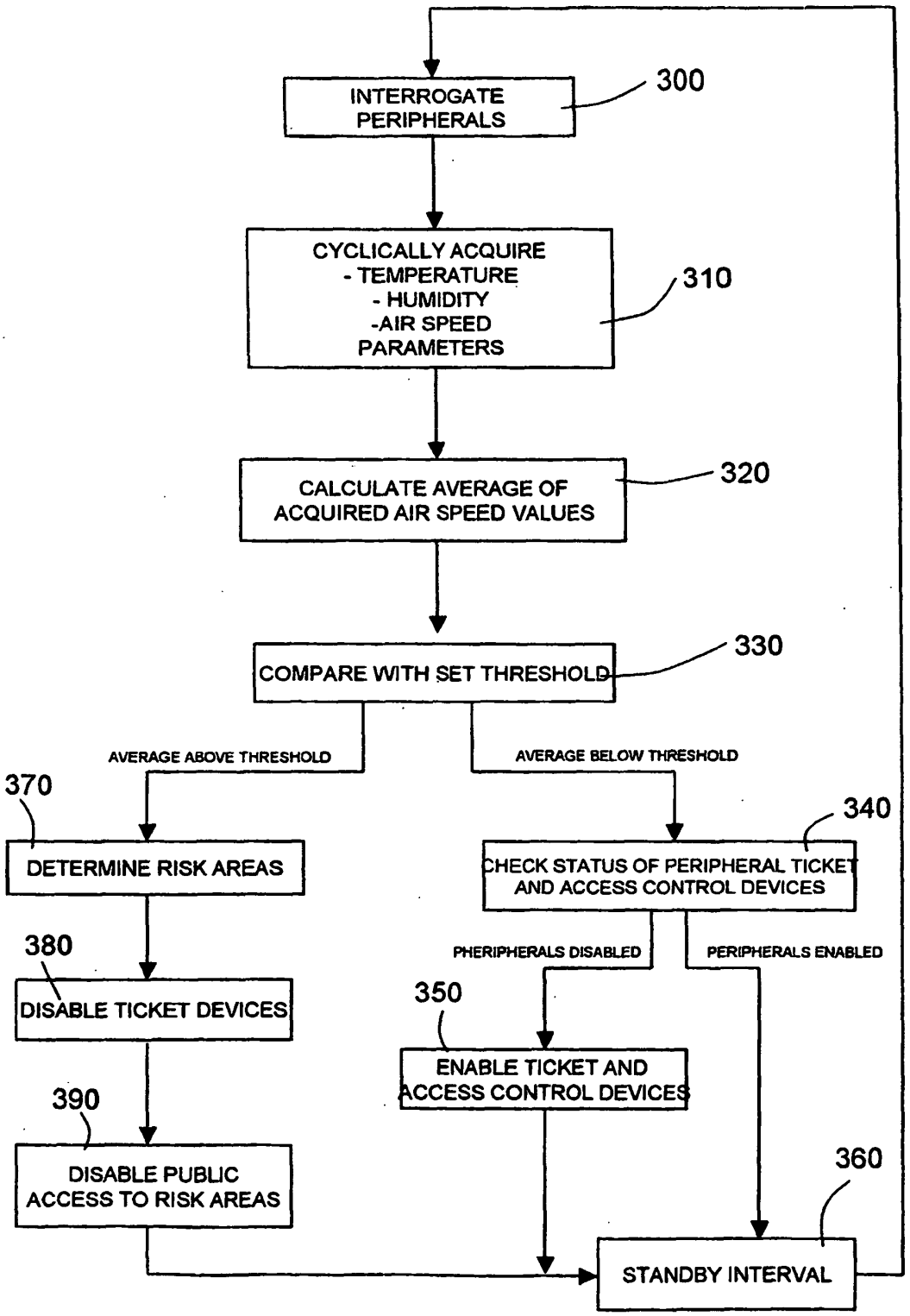
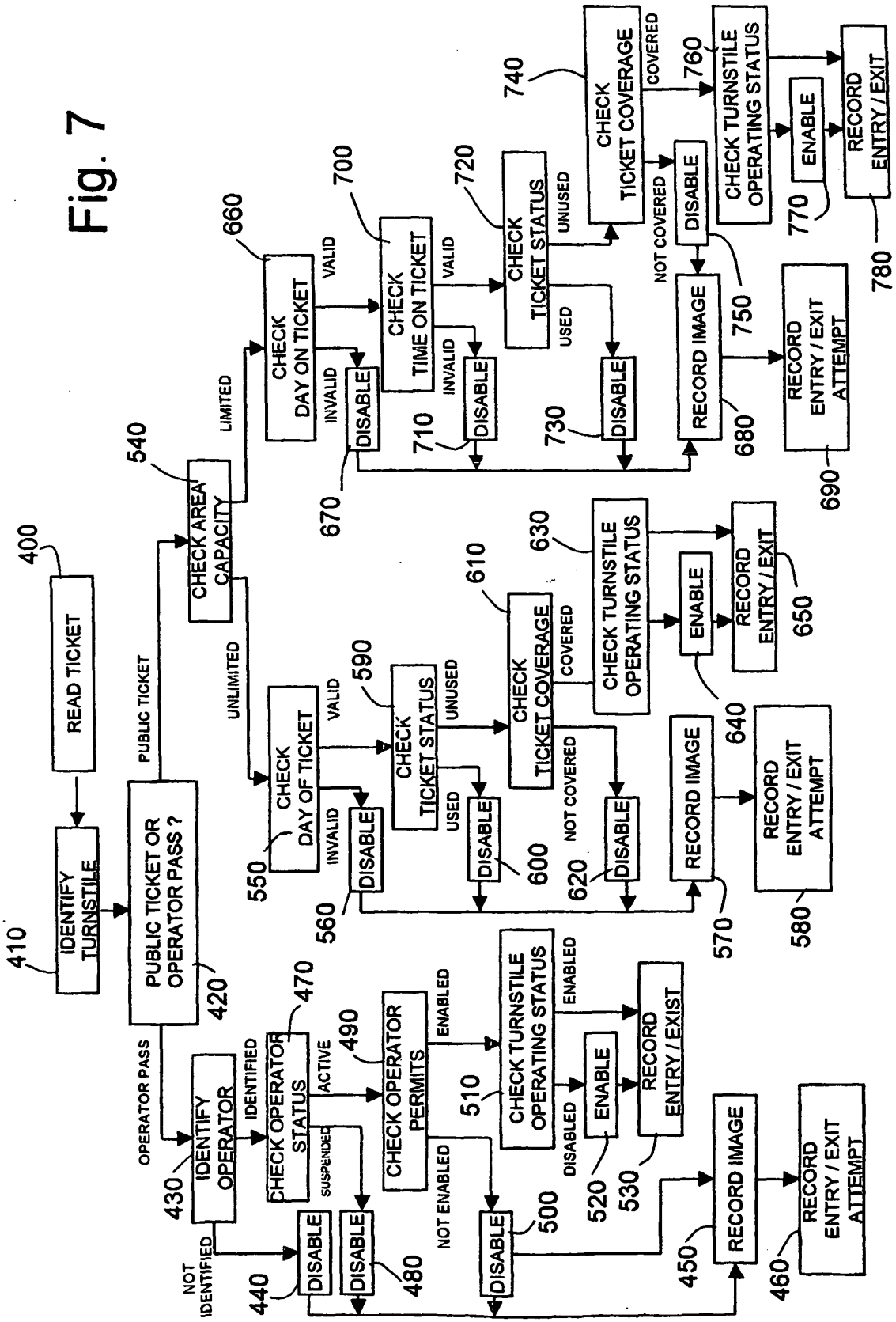

INTERROGATE PERIPHERALS
300
CYCLICALLY ACQUIRE
- TEMPERATURE
- HUMIDITY
-AIR SPEED
PARAMETERS
310
CALCULATE AVERAGE OF ACQUIRED AIR SPEED VALUES
320
COMPARE WITH SET THRESHOLD
330
AVERAGE ABOVE THRESHOLD
AVERAGE BELOW THRESHOLD
370
DETERMINE RISK AREAS
340
CHECK STATUS OF PERIPHERAL TICKET AND ACCESS CONTROL DEVICES
380
DISABLE TICKET DEVICES
PHERIPHERALS DISABLED
PERIPHERALS ENABLED
350
ENABLE TICKET AND ACCESS CONTROL DEVICES
390
DISABLE PUBLIC ACCESS TO RISK AREAS
360
STANDBY INTERVAL

Fig. 6

Fig. 7


400
READ TICKET
410
IDENTIFY TURNSTILE
PUBLIC TICKET OR OPERATOR PASS ?
420
PUBLIC TICKET
OPERATOR PASS
IDENTIFY OPERATOR
430
NOT IDENTIFIED
DISABLE
440
IDENTIFIED
CHECK OPERATOR STATUS
470
SUSPENDED
ACTIVE
490
CHECK OPERATOR PERMITS
480
NOT ENABLED
ENABLED
CHECK TURNSTILE OPERATING STATUS
510
DISABLED
ENABLE
520
RECORD ENTRY / EXIST
530
RECORD IMAGE
450
RECORD ENTRY / EXIT ATTEMPT
460
500
CHECK AREA CAPACITY
540
UNLIMITED
LIMITED
CHECK DAY OF TICKET
550
INVALID
DISABLE
560
VALID
CHECK TICKET STATUS
590
USED
DISABLE
600
UNUSED
CHECK TICKET COVERAGE
610
NOT COVERED
DISABLE
620
COVERED
CHECK TURNSTILE OPERATING STATUS
630
ENABLE
RECORD ENTRY / EXIT
650
RECORD IMAGE
640
RECORD ENTRY / EXIT ATTEMPT
580
570
CHECK DAY ON TICKET
660
INVALID
DISABLE
670
VALID
CHECK TIME ON TICKET
700
INVALID
DISABLE
710
VALID
CHECK TICKET STATUS
720
USED
DISABLE
730
UNUSED
CHECK TICKET COVERAGE
740
NOT COVERED
DISABLE
750
COVERED
CHECK TURNSTILE OPERATING STATUS
760
ENABLE
770
RECORD ENTRY / EXIT
780
RECORD IMAGE
680
RECORD ENTRY / EXIT ATTEMPT
690

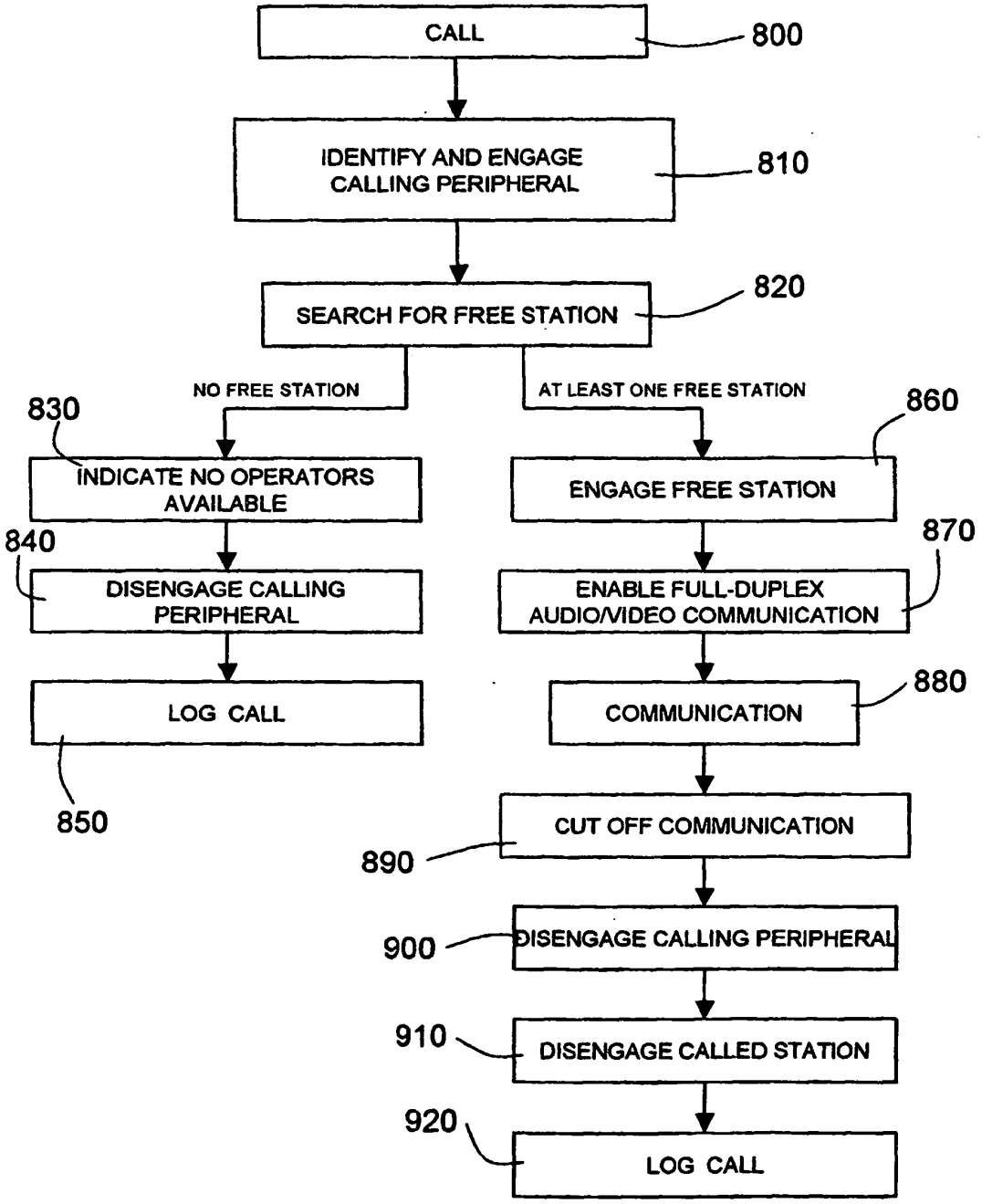

CALL
800
IDENTIFY AND ENGAGE CALLING PERIPHERAL
810
SEARCH FOR FREE STATION
820
NO FREE STATION
AT LEAST ONE FREE STATION
830
INDICATE NO OPERATORS AVAILABLE
840
DISENGAGE CALLING PERIPHERAL
LOG CALL
850
860
ENGAGE FREE STATION
870
ENABLE FULL-DUPLEX AUDIO/VIDEO COMMUNICATION
880
COMMUNICATION
CUT OFF COMMUNICATION
890
900
DISENGAGE CALLING PERIPHERAL
910
DISENGAGE CALLED STATION
920
LOG CALL

Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5585614 A **[0003]**
- WO 9740475 A **[0004]**