



(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
02.01.2004 Bulletin 2004/01

(51) Int Cl.7: G07C 9/00, G07C 9/02,
G07B 15/00

(21) Application number: 03013883.8

(22) Date of filing: 19.06.2003

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

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(30) Priority: 20.06.2002 IT TO20020533

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

(57) There is described an environment control system (1) for controlling access to premises. The environment control system (1) includes a number of removable, easy-to-transport subsystems communicating with one another over a wireless connection (2), in particular by radio transmission. More specifically, the environment control system (1) substantially includes a central

control unit (3); one or more manned pay stations (4); one or more automatic pay stations (5); one or more control devices (6) controlling entrances/exits of the premises and commonly known as turnstiles; one or more information and internal monitoring devices (7); and one or more information and external monitoring devices (8).

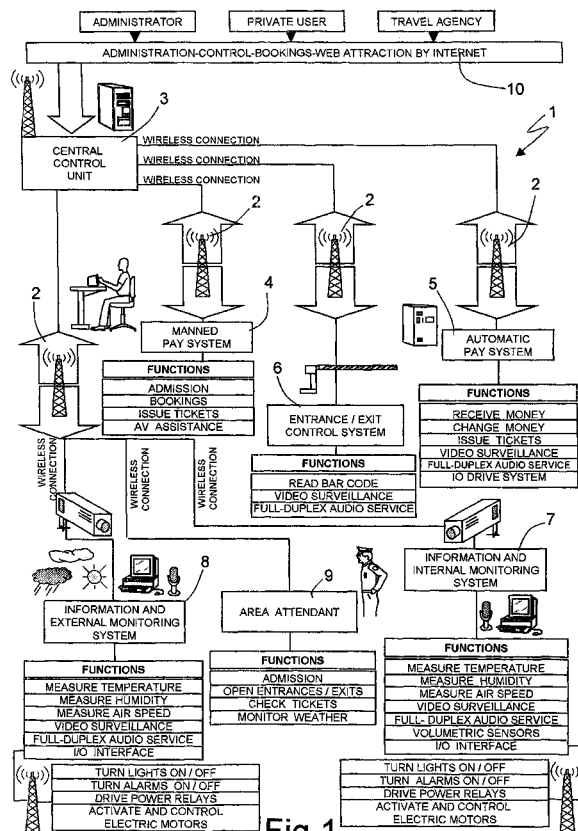


Fig. 1

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

[0004] 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.

[0005] 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.

[0006] 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.

[0007] According to the present invention, there is provided an environment control system as claimed in Claim 1.

[0008] 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.

[0009] Number 1 in Figure 1 indicates as a whole an environment control system in accordance with the present invention.

[0010] For the sake of simplicity, and purely by way of a non-limiting example, reference is made in the follow-

ing 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.

[0011] Environment control system 1 comprises a number of removable, easy-to-carry subsystems communicating with one another over a wireless connection.

[0012] 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.

[0013] 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".

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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.

[0029] 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.

[0030] 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.

[0031] 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.

[0032] 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.

[0033] 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.

[0034] 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.

[0035] 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.

[0036] 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.

[0037] 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.

[0038] 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.

[0039] 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).

[0040] 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).

[0041] 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).

[0042] 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).

[0043] 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.

[0044] If the time sought does not exist (NO output of block 190), the ticket purchase sequence is terminated without issuing the ticket (block 170).

[0045] 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).

[0046] If the time does not exist (NO output of block 230), the ticket purchase sequence is terminated without issuing the tickets (block 170).

[0047] 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).

[0048] 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).

[0049] 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.

[0050] 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 devices 8.

[0051] 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).

[0052] An average air speed value is then calculated (block 320) and compared with a threshold set in central control unit 3 (block 330).

[0053] 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).

[0054] 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.

[0055] 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).

[0056] 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.

[0057] Figure 7 shows a flow chart of the operations performed by central control unit 3 to control museum entrance/exit control devices 6.

[0058] 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).

[0059] 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).

[0060] 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).

[0061] Conversely, if identified, the operator's employment status - suspended/active duty - is checked (block 470).

[0062] 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).

[0063] 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).

[0064] Conversely, if the ticket inserted into the bar code reader is a public ticket, a check is made to deter-

mine whether it relates to an indoor or outdoor hall of limited or unlimited capacity (block 540).

[0065] If the ticket relates to a hall of unlimited capacity, a check is made of the day to which the ticket relates (block 550).

[0066] 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).

[0067] Conversely, if the ticket is valid, i.e. the day on the ticket and the present day correspond, the used/un-used status of the ticket is checked (block 590).

[0068] 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).

[0069] 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).

[0070] If the ticket relates to a hall of limited capacity, a check is made of the day to which the ticket relates (block 660).

[0071] 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).

[0072] 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).

[0073] 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).

[0074] If the ticket has already been used, control de-

vice 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).

[0075] 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).

[0076] 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.

[0077] 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).

[0078] 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).

[0079] 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).

[0080] 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).

[0081] 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).

[0082] The advantages of the present invention will be clear from the foregoing description.

[0083] 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.

[0084] 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.

[0085] 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.

[0086] 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.

[0087] 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.

[0088] 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.

[0089] The access permit to the museum may be stored on a portable storage medium, and exhibited or presented at the museum entrance.

[0090] More specifically, the access permit storage medium may conveniently be defined by a contact or contactless "smart card" or cellular telephone.

[0091] 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.

[0092] 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.

[0093] 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) for emitting access permits to the controlled environment;
- access control means (6) for controlling 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) to control emission of said access permits, and passage through the controlled environment entrances/exits controlled by said access control means (6), on the basis of said access permits;

characterized in that at least said access control means (6) are connected to said access management means (3) by a wireless connection (2).

2. A system as claimed in Claim 1, **characterized in that** said access permit emitting means (4, 5) are remote.

3. A system as claimed in Claim 1 or 2, **characterized in that** said access permit emitting means (4, 5) are defined by an Internet site.

4. A system as claimed in Claim 1, **characterized in that** said access permit emitting means (4, 5) comprise pay means (4, 5) located in the controlled environment.

5. A system as claimed in Claim 4, **characterized in that** said pay means (4, 5) are connected to said access management means (3) by a wireless connection (2).

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

7. A system as claimed in any one of Claims 4 to 6, **characterized in that** said pay means comprise at least one automatic pay station (5).

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

9. A system as claimed in Claim 8, **characterized in that** said turnstile means comprise a turnstile (6) for each controlled entrance/exit of the controlled en-

vironment.

10. A system as claimed in any one of the foregoing Claims, **characterized by** also comprising:

- environment monitoring means (7, 8); and
- information means (7, 8) for supplying information relative to the controlled environment and/or its contents.

11. A system as claimed in Claim 10, **characterized by** also comprising:

- environment interaction means (7, 8) for modifying the status of the controlled environment.

12. A system as claimed in Claim 10 or 11, **characterized in that** said environment monitoring means (7, 8) provide for visual and/or acoustic monitoring of the controlled environment.

13. A system as claimed in Claim 10 or 11, **characterized in that** said environment monitoring means (7, 8) monitor microclimatic parameters of the controlled environment, comprising air temperature and humidity, air speed, and atmospheric pressure.

14. A system as claimed in Claim 13, **characterized in that** said environment interaction means (7, 8) modify the status of the controlled environment on the basis of the microclimatic parameters monitored by said environment monitoring means (7, 8), or on the basis of received commands.

15. A system as claimed in any one of Claims 10 to 14, **characterized in that** said environment monitoring means (7, 8) and said information means (7, 8) are connected to said access management means (3) by a wireless connection.

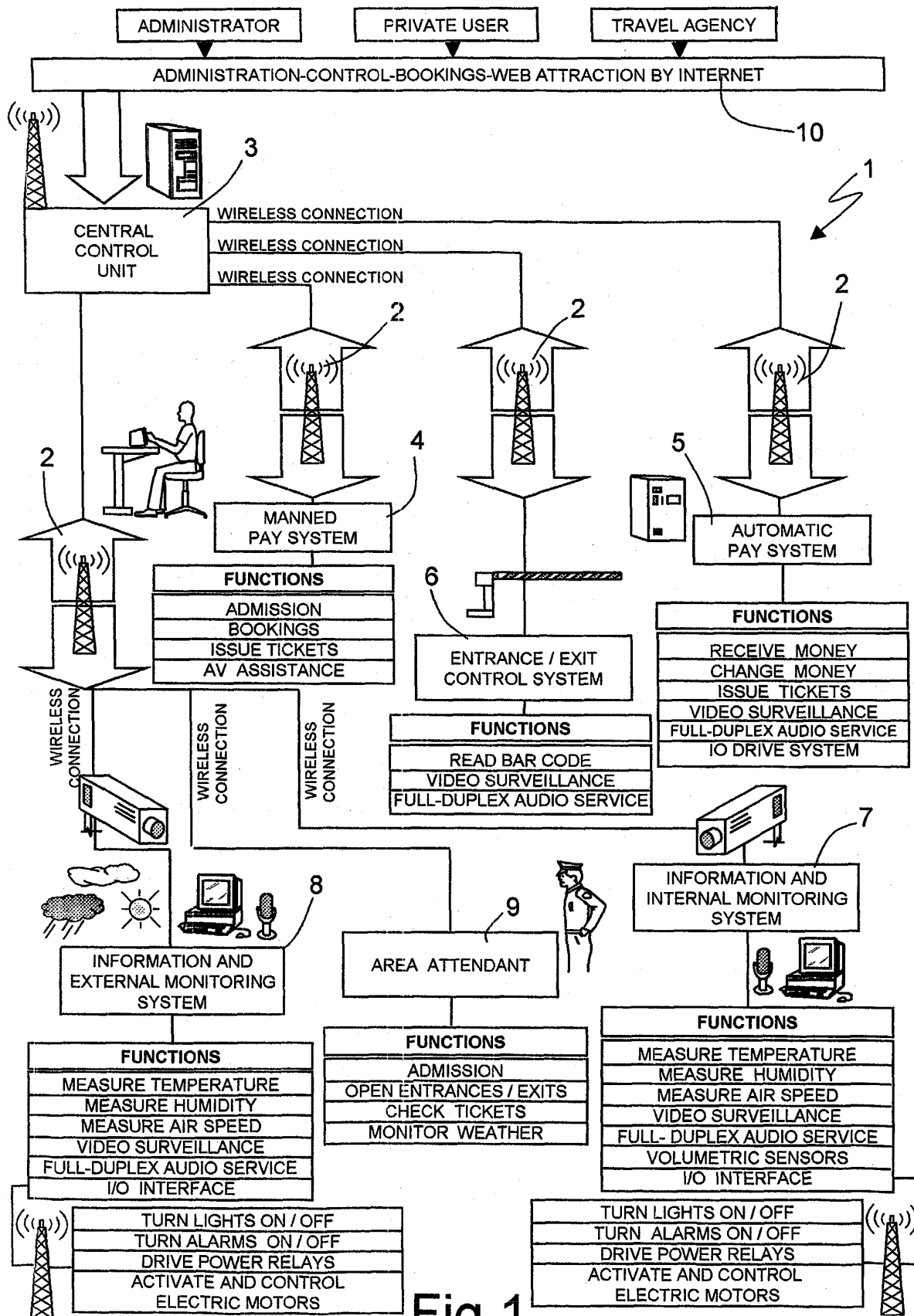


Fig.1

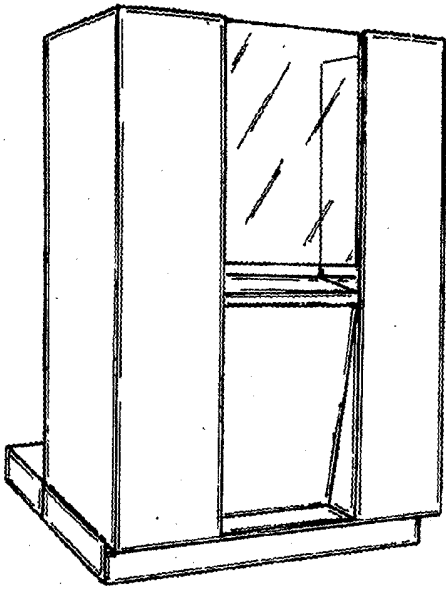


Fig. 2

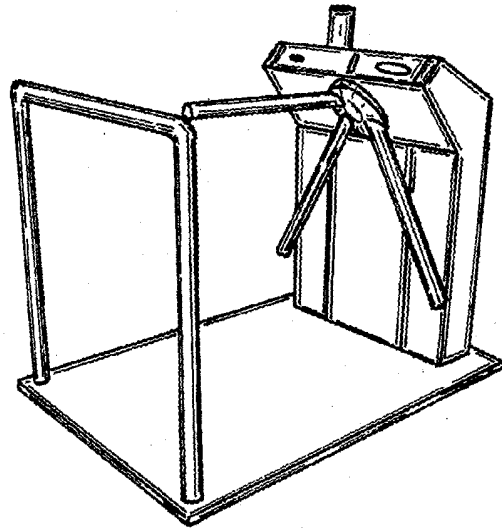


Fig. 3

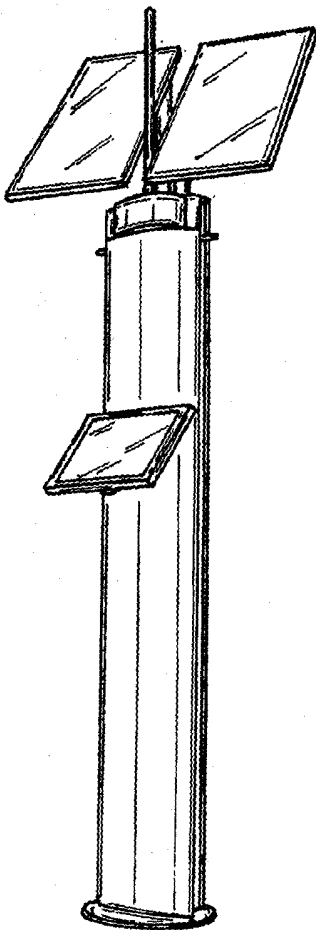


Fig. 4

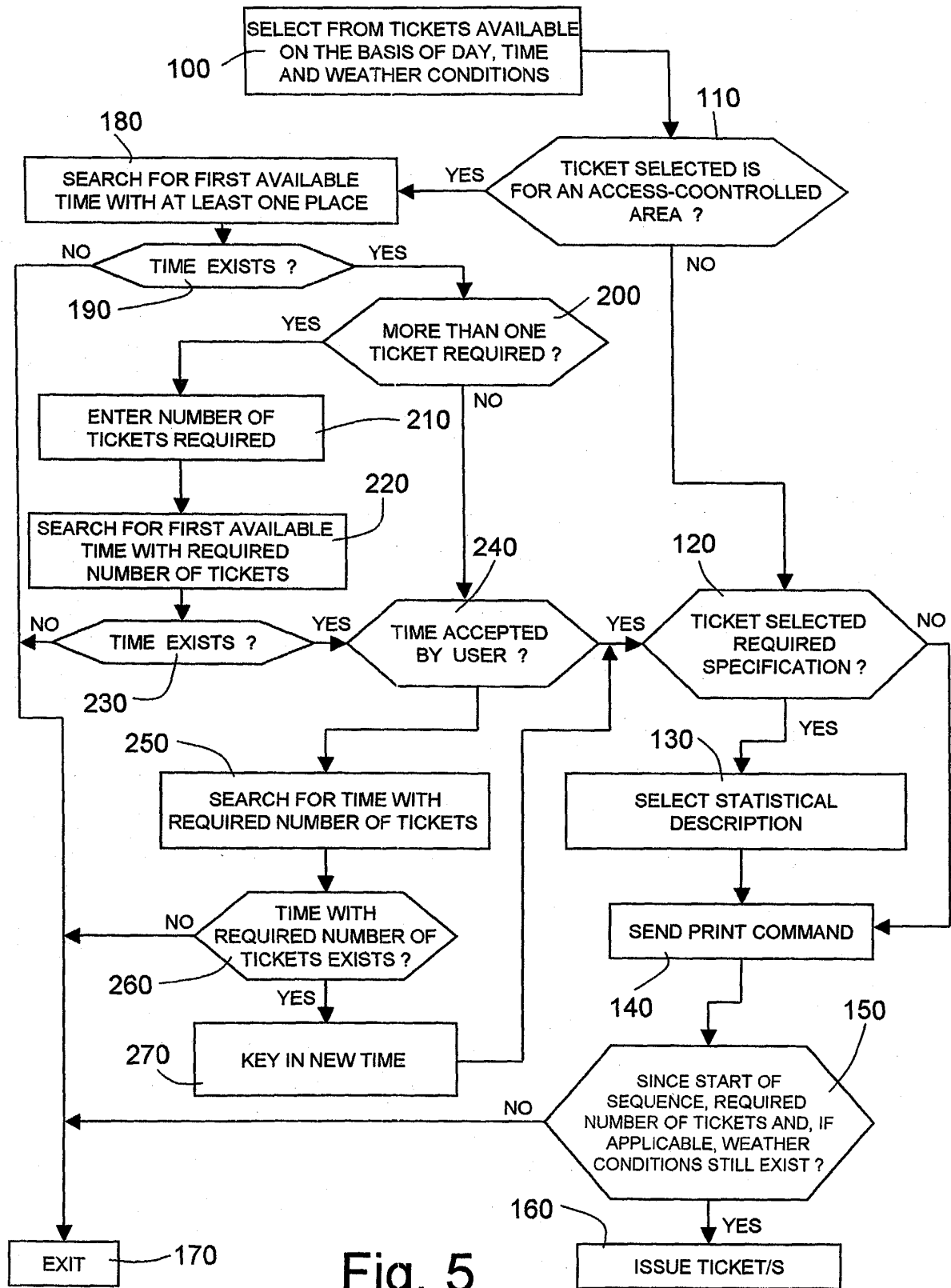


Fig. 5

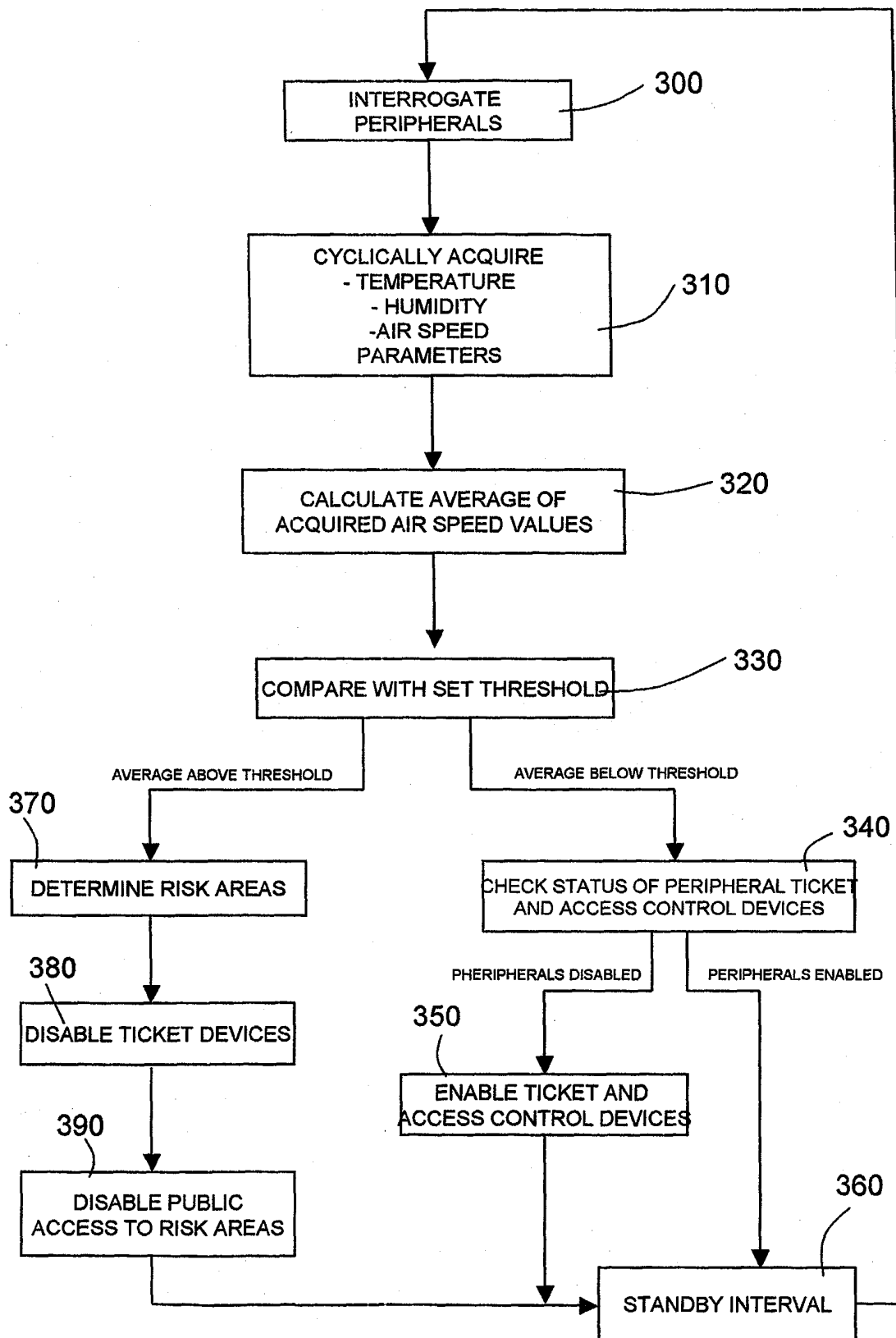
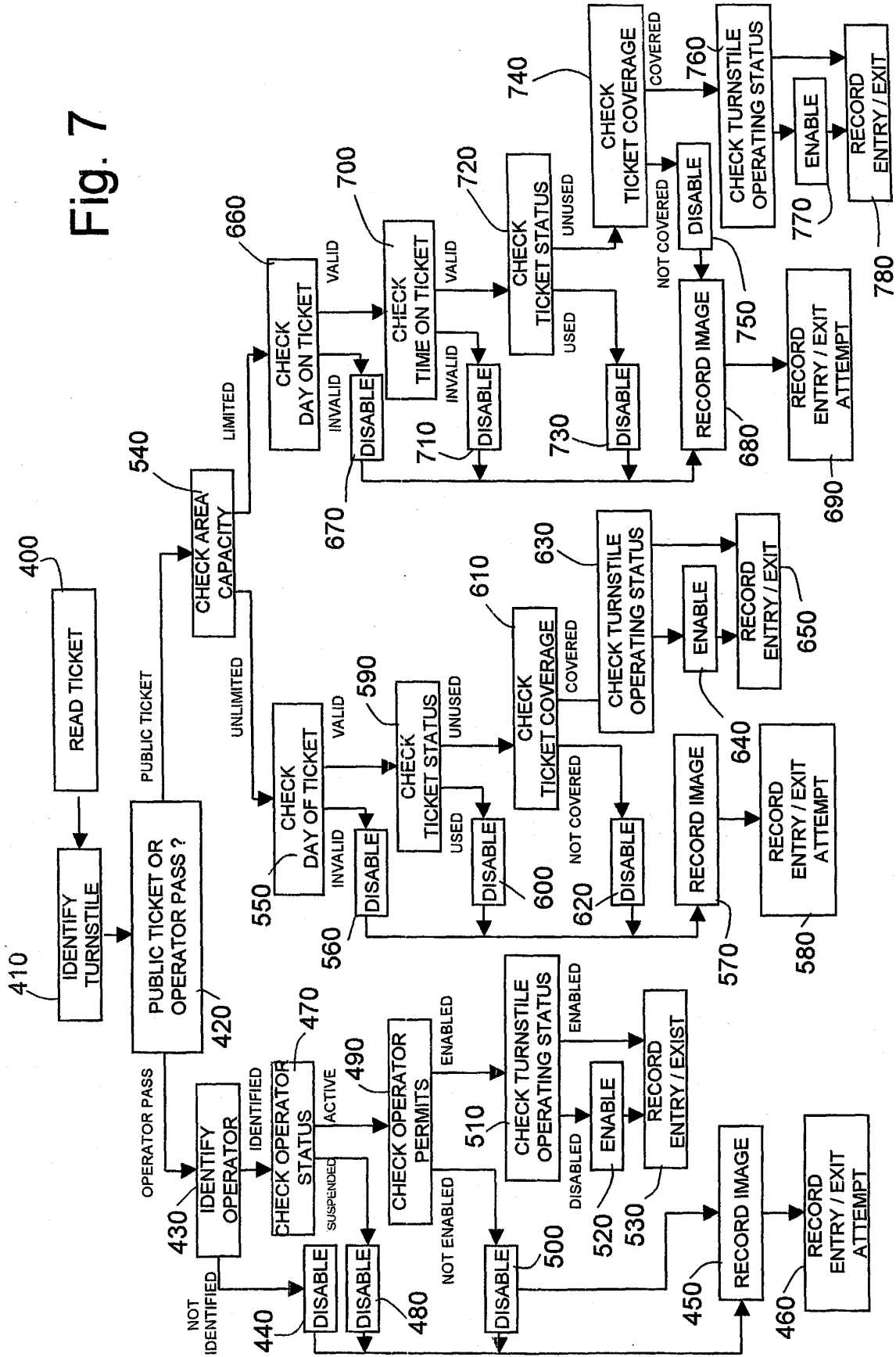


Fig. 6

Fig. 7



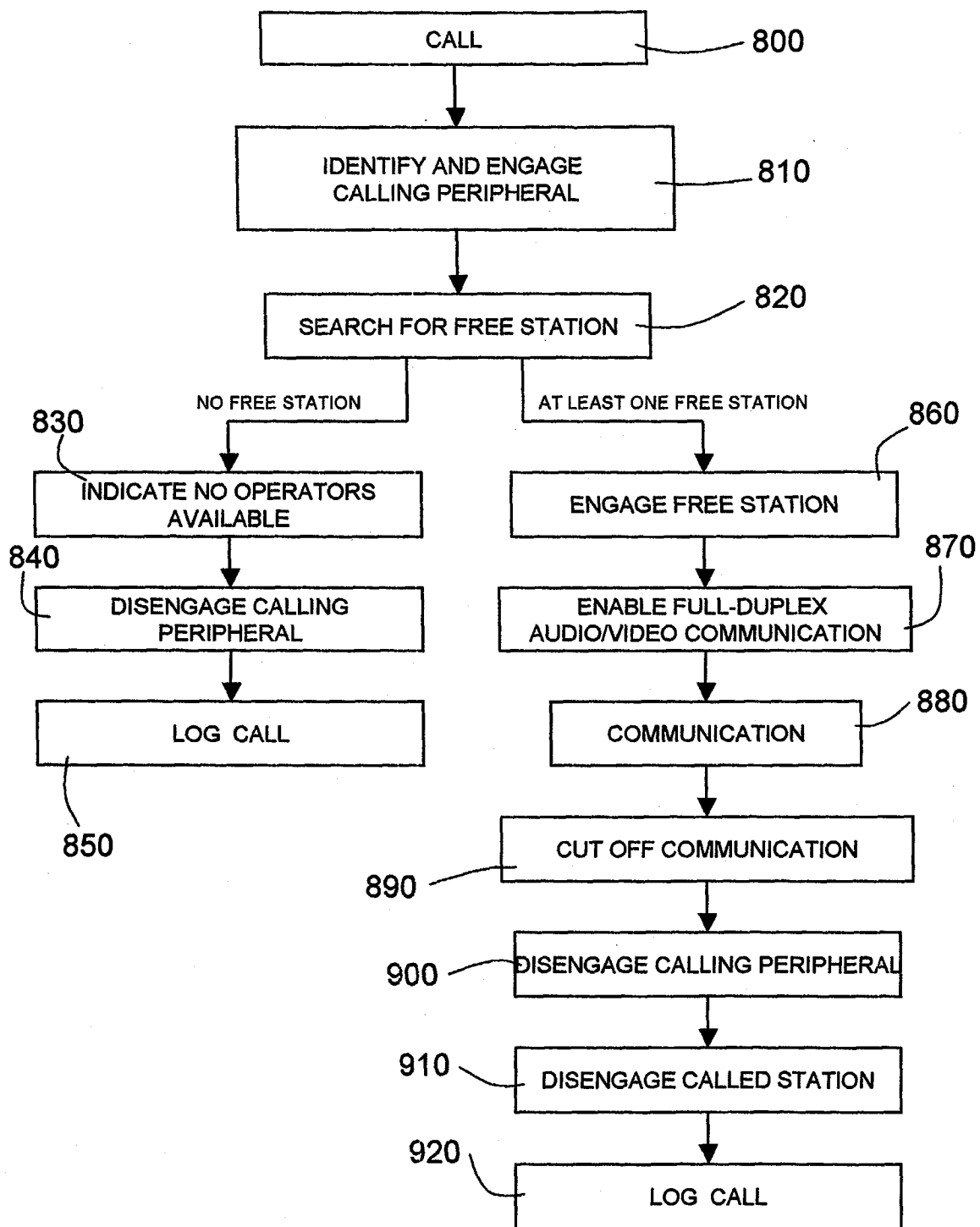


Fig. 8



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 01 3883

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 585 614 A (VONBALLMOOS FRITZ) 17 December 1996 (1996-12-17)	1,2,4-9	G07C9/00 G07C9/02 G07B15/00
Y	* column 2, line 39 - column 5, line 9; figures 1,2 *	3,10-15	

X	WO 97 40475 A (KOROLKIEWICZ EDWARD ;HUNTER GEOFFREY STRINGER (GB)) 30 October 1997 (1997-10-30) * page 1, line 1 - page 8, line 35; figures 1,4 *	1-4,6-9	

Y	US 5 682 142 A (JAGID BRUCE ET AL) 28 October 1997 (1997-10-28) * column 1, line 35 - column 2, line 67 *	10-15	

Y	US 6 052 068 A (CLEVELAND JOSEPH ROBERT ET AL) 18 April 2000 (2000-04-18) * column 4, line 12 - column 4, line 25; figure 1 *	3	

			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			G07C G07B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 30 September 2003	Examiner Burchielli, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 01 3883

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

30-09-2003

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5585614	A	17-12-1996	CH	678460 A5	13-09-1991
			AT	122165 T	15-05-1995
			CA	2033088 A1	19-11-1990
			WO	9014644 A1	29-11-1990
			DE	59009010 D1	08-06-1995
			EP	0427825 A1	22-05-1991

WO 9740475	A	30-10-1997	AU	2572997 A	12-11-1997
			EP	0960396 A1	01-12-1999
			WO	9740475 A1	30-10-1997

US 5682142	A	28-10-1997	NONE		

US 6052068	A	18-04-2000	WO	9843104 A2	01-10-1998
