

TITLE OF THE INVENTION

ELECTRONIC MAIL SYSTEM WITH PAGING SERVICE FUNCTION

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

5 The present invention relates to an electronic mail system with a paging service function, and in particular, to an electronic mail system with a paging service function, in which a customer can send out a service request even if the name and pager number of the service personnel are unknown to the
10 customer.

2. DESCRIPTION OF THE RELATED ART

 The electronic mail system which most people are aware of at the moment is the one available via the Internet. This Internet mail system, like a majority of the other electronic
15 mail systems known in the art, is not connected to pagers and is not suitable for handling urgent mails.

 Japanese Laid-Open Patent Publication No. 9-46369, entitled "Electronic Mail System", U.S. Patent No. 5,561,703, entitled "System and Method for Integration of a Paging Server
20 into a Private Branch Exchange Environment", U.S. Patent No. 5,487,100, entitled "Electronic Mail Message Delivery System", and International Application Publication No. WO 9415431, entitled "Mobile Telecommunications System", disclose electronic mail systems that incorporate a pager service
25 apparatus therein. However, only after the mail sender has

accurately identified the mail recipient or the code of the mail recipient, an electronic mail can be sent. The pager service apparatus of the electronic mail systems will page the mail recipient upon receipt of the electronic mail. The
5 aforementioned systems do not limit which mail senders can send emergency pager calls. The aforementioned systems further do not provide form designs and a database connection for deciding the mail recipient according to the contents of the electronic mail that was sent. Moreover, the aforementioned systems do not
10 permit setting of the paging time period, the number of paging actions, and the duration between paging actions.

The aforementioned electronic mail systems, that are capable of sending pager calls, require the mail sender to accurately identify the mail recipient or the code of the mail
15 recipient. This method is inadequate when the electronic mail system is used by a company specializing in field service. The following problems arise as follows when the aforementioned electronic mail systems are in use.

(1) The customer usually does not know the service
20 personnel employed by the service company, and the specialization of each service personnel. The customer also does not know whether or not a service personnel is out for business, and whether or not a service personnel is still working in the service company. There is thus a need to check beforehand
25 the personnel who will be tasked to handle the problem before

an electronic mail can be sent, thereby resulting in inconveniences.

(2) The customer pages the mail recipient directly, using a paging service. Screening of the mail sender and the contents of the electronic mail by a database are not performed, thereby easily resulting in harassment of the mail recipient or in the assignment of unsuitable personnel to handle the problem.

(3) The aforementioned systems do not permit the design of a paging form. Aside from inconveniencing the user since he is unable to fill up a formatted form, the aforementioned systems are unable to obtain the benefits of the form design in which the blanks of the form can be combined with search conditions of a database to determine the mail recipient according to the contents of the electronic mail.

(4) The flexibility of the aforementioned systems is insufficient since they do not permit setting of the paging time period, the number of paging actions, and the duration between paging actions.

SUMMARY OF THE INVENTION

Therefore, an essential object of the present invention is to provide an electronic mail system which is capable of overcoming the aforementioned drawbacks that are associated with the prior art, and which has a paging service function, in which a customer can send out a service request

even if the name and pager number of the service personnel are unknown to the customer

According to the present invention, there is provided an electronic mail system with a paging service function and
5 a database integrated therein, comprising:

a plurality of electronic mail client apparatuses, each being formed from a computer and being capable of linking with a main computer via a network link;

an electronic mail server apparatus formed in the main
10 computer;

a paging conditional search database apparatus formed in the main computer; and

a paging server apparatus formed in the main computer, wherein each of the electronic mail client
15 apparatuses includes a form input unit for filling in data in blanks of a form,

wherein the electronic mail server apparatus includes:

an address book storage unit for storing user
20 registration name and password data;

a form blank reading unit for retrieving form contents from an electronic mail;

a mail action decision unit for determining whether or not action has been taken for the mail by a specified paging
25 recipient;

a form storage unit for storing a plurality of previously established paging forms; and

a search informing unit for informing and sending the form blank content data retrieved by the form blank reading unit and sender data to a paging conditional search database apparatus,

wherein the paging conditional search database apparatus includes:

a paging search database storage unit for storing data that includes search conditions, paging recipients, pager numbers and paging identification codes;

a search decision unit for searching the paging search database storage unit according to the form blank content data and the sender data sent by the search informing unit of the electronic mail server apparatus; and

a paging informing unit for informing a paging server apparatus in case there is a paging service request that can be met, and

wherein the paging server apparatus includes:

a paging request decision unit for determining whether or not a pager call is to be sent out according to results of a query made to the mail action decision unit of the electronic mail server apparatus; and

a pager calling unit for sending the pager call to a pager.

In the above-mentioned electronic mail system, preferably, the data stored in the paging search database storage unit further includes paging time period, duration between paging actions, and number of paging actions. Further, the
5 paging request decision unit of the paging server apparatus determines an appropriate time for sending out the pager call based on the data stored in the paging search database storage unit.

In the above-mentioned electronic mail system,
10 preferably, the address book storage unit of the electronic mail server apparatus has user access level data stored therein.

Each of the electronic mail client apparatuses comprises an access level decision unit for checking whether or not the user has a valid access level every time one of the electronic mail
15 client apparatuses is used by the user to access one of the forms.

Then specified ones of the forms are accessible to the user for filling up the blanks of the specified one of the forms before being sent to a paging recipient only when the user has the valid access level thereto.

20 A service company utilizes the address book established in the address book storage unit of the electronic mail server apparatus of the present invention to verify the registration password of a customer and to give an access level to the customer. Paging forms are established in the form
25 storage unit and are provided for use by customers of specified

access levels. A database corresponding to the paging forms is established in the paging conditional search database apparatus of the main computer. Upon receipt by the electronic mail server apparatus of a specified form mail sent by the user via the electronic mail client apparatus, the paging conditional search database apparatus searches data previously established in the paging search database storage unit according to the mail sender and the contents of the mail. In the event of a successful search, data, such as the paging recipient, pager number, paging identification code, paging time period, duration between paging actions, and number of paging actions, is retrieved from the database, and the paging server apparatus is informed to send out the pager call. After the pager of the paging recipient receives the pager call, the paging recipient uses another electronic mail client apparatus to register for log into the system, to read the paging mail, and to respond to the customer's request according to the contents of the paging mail.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and features of the present invention will become clear from the following description taken in conjunction with the preferred embodiments thereof with reference to the accompanying drawings throughout which like parts are designated by like reference numerals, and in which:

Fig. 1 is a block diagram showing a constitution of an electronic mail system with a paging service function of a

preferred embodiment according to the present invention;

Fig. 2 is a flowchart showing a first part of operation processes which are executed by the electronic mail system of the preferred embodiment according to the present invention;

5 Fig. 3 is a flowchart showing a second part of operation processes which are executed by the electronic mail system of the preferred embodiment according to the present invention;

10 Fig. 4 is a table showing sample information found in an address book storage unit 220 of the preferred embodiment according to the present invention;

Fig. 5 is a schematic view showing sample contents of a form storage unit 280 of the preferred embodiment according to the present invention; and

15 Fig. 6 is table showing sample contents of a paging search database storage unit 430 of the preferred embodiment according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

20 Preferred embodiments according to the present invention will be described below with reference to the attached drawings.

Fig. 1 is a block diagram showing a constitution of an electronic mail system with a paging service function of a preferred embodiment according to the present invention. The
25 electronic mail system of the preferred embodiment comprises

the following four apparatuses in a computer system: electronic mail client unit 100-1 to 100-N (generically referred to as 100 hereinafter), an electric mail server unit 200, a paging server apparatus 300, and a paging conditional search database apparatus 400.

Referring to Fig. 1, each of the N electronic mail client apparatuses 100 is established in a personal computer.

In each of the electronic mail client apparatuses 100, there is provided the following four units 110, 120, 130 and 140. 110 denotes a mail sending unit for sending out the customer's mail.

120 denotes a mail receiving unit for retrieving mail stored at the server apparatus. 130 denotes a form input unit for retrieving forms stored in an electronic mail server apparatus 200 and for filling up blanks using input equipment of the computer. 140 denotes an access level decision unit for determining whether or not the access level of a customer is valid for accessing certain forms.

The electronic mail server apparatus 200 is established in a main computer. In the electronic mail server apparatus 200, there is provided the following eight units 210, 220, 230, 240, 250, 260, 270 and 280. 250 denotes an electronic mail storage unit for storing mail of the entire system. 210 denotes an electronic mail retrieving unit for retrieving mail stored in the electronic mail storage unit 250. 230 denotes an electronic mail receiving unit for receiving mail that was sent

by the mail sending unit 110 of each electronic mail client apparatus 100. 220 denotes an address book storage unit for storing contents of an address book, including data such as customer registration names, access levels and passwords. 280
5 denotes a form storage unit for storing paging forms. 260 denotes a form blank reading unit for reading mail in the electronic mail storage unit 250 and for retrieving contents of the blanks thereof. 240 denotes a search informing unit.

Upon receiving a paging mail, the search informing unit 240
10 will retrieve the blank contents from the form blank reading unit 260 and will inform a paging conditional search database apparatus 400. 270 denotes a mail action decision unit for determining whether or not a particular mail has already been read by a particular person.

15 The paging conditional search database apparatus 400 is established in the main computer. In the paging conditional search database apparatus 400, there is provided the following three units 410, 420 and 430. 430 denotes a paging search database storage unit for storing previously established
20 database contents. 410 denotes a search decision unit for determining whether or not a pager call is to be sent out in accordance with the contents of the paging search database storage unit 430. 420 denotes a paging informing unit for informing a paging server apparatus 300 to prepare to send out
25 the pager call.

The paging server apparatus 300 is established in the main computer. In the paging server apparatus 300, there is provided the following two units 310 and 320. 310 denotes a paging request decision unit for determining whether or not the
5 pager call is to be sent out according to paging time data from the paging informing unit 420 and to a query made to the mail action decision unit 270. 320 denotes a pager calling unit for sending out the pager call. 330-1 to 330-M denote M pagers carried by the paging recipients (or service personnel of a
10 service company). The M pagers 330-1 to 330-M (generically referred to as 330 hereinafter) are paged by the pager calling unit 320.

Figs. 2 and 3 flowcharts each showing an operation process which is executed by the electronic mail system of the
15 preferred embodiment according to the present invention. When the various apparatuses of the system have been established, the required computer systems are activated. The service company establishes the address book storage unit 220 in the electronic mail server apparatus 200, paging forms in the form
20 storage unit 280, and the database corresponding to the paging forms in the paging conditional search database apparatus 400 of the main computer. The operations flow of the system is as follows.

Referring to Fig. 2, the electronic mail client
25 apparatus 100 starts the paging operation, and the program flow

goes to step S200. In step S200, the user of the electronic mail client apparatus 100 registers for log into the mail system, and obtains an access level from the server apparatus. In step S100, upon receiving the registration of the customer, the
5 electronic mail server apparatus 200 inspects the passwords in the address book storage unit 220 to determine whether or not the customer can register, and assigns an access level to the customer. At this time, in step S210, the customer uses the access level decision unit 140 to determine whether or not a
10 certain form can be accessed using the assigned access level.

If possible, the desired form is read from the form storage unit 280. Thereafter, in step 220, the customer fills up the blanks of the form before the mail is sent to the electronic mail server apparatus 200, and then, the paging operation by
15 the electronic mail client apparatus 100 is completed.

When the electronic mail receiving unit 230 of the electronic mail server apparatus 200 receives the above mail, the mail is placed in the electronic mail storage unit 250.

Thereafter, in step S110, the form blank reading unit 260 reads
20 the blank contents, and the search informing unit 240 informs and sends the blank contents and the sender's account data to the paging conditional search database apparatus 400. Then the program flow goes to step S120 of Fig. 3.

Referring to Fig. 3, in step S120, the search decision
25 unit 410 of the paging conditional search database apparatus

400 searches the data previously defined in the paging search database storage unit 430. In case of a search failure (NO in step S120), the flow proceeds to step S170, where a failure message is sent back to the electronic mail client apparatus 5 100 of the customer, and then, the paging process for receiving and processing is completed. On the other hand, in case of a successful search (YES in step S120), data, such as the paging recipient, pager number, paging identification code, paging time period, duration between paging actions, number of paging 10 actions, etc., are retrieved from the database, and then, the program flow goes to step S130. In step S130, the paging informing unit 420 informs the paging server apparatus 300 and provides the specified paging recipient, pager number, paging identification code, paging time period, duration between 15 paging actions, and number of paging actions. Then the program flow goes to step S140.

Once the paging server apparatus 300 is informed, the paging request decision unit 310 decides whether or not a pager call is to be sent out in accordance with the data sent by the 20 paging informing unit 420 of the paging conditional search database apparatus 400 and in accordance with a query made to the mail action decision unit 270 of the electronic mail server apparatus 200 in steps S140 and S150. Namely, in step S140, it is judged whether or not the present time is the time for sending 25 pager call as determined by the paging server apparatus 300.

If YES in step S140, the program flow goes to step S150. On the other hand, if NO in step S140, the program flow goes back to step S140. In step S150, it is judged whether or not action to the mail has been taken by the paging recipient. If YES in
5 step S140 and NO in step S150, the pager calling unit 320 is informed to send out the pager call, and then, the program flow goes to step S160. In step S160, the pager calling unit 300 sends out pager call according to specified pager number and identification code, and then, the program flow goes back to
10 step S140.

In the process that the paging recipient receives paging operation, first of all, in step S300, after the pager 330 of the paging recipient has received the pager call, the paging recipient uses the electronic mail client apparatus 100
15 to register for log into the system. Using the mail receiving unit 120 of the electronic mail client apparatus 100, a request is sent to the electronic mail retrieving unit 210 of the electronic mail server apparatus 200 to read the mail, and based on the problem described in the problem description blank of
20 the mail, appropriate action is taken to respond to the customer's request.

After the electronic mail client apparatus 100 has retrieved the mail, the electronic mail storage unit 250 of the electronic mail server apparatus 200 will have a record that
25 the paging recipient has already read the mail. The paging

request decision unit 310 of the paging server apparatus 300 will, upon querying the mail action decision unit 270 of the electronic mail server apparatus 200 again in step S150, receive a response indicating that the mail has already been processed.

5 The entire receiving and processing of the paging operation is terminated at this time.

10 Fig. 4 is a table showing sample information found in an address book storage unit 220 of the preferred embodiment according to the present invention. The registered names of the users are established by the service company in the registered name blank. The access levels of the customers are established by the service company in the access level blank to restrict access to certain forms. The passwords used by the customers to log into the system are established in the password blank.

15 Fig. 5 is a schematic view showing sample contents of a form storage unit 280 of the preferred embodiment according to the present invention. As apparent from Fig. 5, the form contains different blanks, such as service type, machine type, location, etc., for checking by the paging conditional search database apparatus 400. The emergency contact person, emergency contact number, and problem description are information to be provided to the service personnel. The form of Fig. 5 is illustrative in nature, and the contents thereof may be modified to accommodate different requests.

25 Fig. 6 is table showing sample contents of a paging

search database storage unit 430 of the preferred embodiment according to the present invention.

As shown in Fig. 6, the columns of search conditions include mail sender, sender access level, service type, machine
5 type, and location. The search results include paging recipient, pager number, paging identification code, paging time period, duration between paging actions, and number of paging actions.

The columns and contents of the search conditions and results can be modified and are designed to meet the demands of the
10 intended application. For example, the search conditions can omit the mail sender or the sender access level. Moreover, the service type and the like can differ due to different form designs.

However, the search condition columns should always include the pager number and paging identification code. Other columns
15 may be added or omitted as desired. In other words, the service company can decide which service personnel in the service company should respond, if necessary, by adjusting or changing the search conditions and results which are stored in the paging search database storage unit 430. Namely, the service company can, if
20 needed, make arrangements or change the search contents and conditions in a computer database to decide which service personnel shall respond.

EXAMPLES

The followings are examples to illustrate the
25 operation of the preferred embodiment according to the present

invention in greater detail, with reference to Figs. 5 and 6.

Assuming that, because of the need to make an emergency call, an account named "Matsushita Generators" activates the electronic mail client apparatus 100 to register for log into the system. The electronic mail server apparatus 200 decides
5 whether or not the customer can register based on the passwords set in the address book storage unit 220, such as that shown in Fig. 4, and accords the customer with an access level of "2".

At this time, if the customer "Matsushita Generators" wishes
10 to access the "Customer Emergency Paging Contact Form" shown in Fig. 5, the access level decision unit 140 first of all determines whether or not the customer can have access to the paging form. Thereafter, with the use of the form input unit 130, the customer retrieves the desired form from the form
15 storage unit 280 of the electronic mail server apparatus 200 and, after filling up the "Emergency Contact Person", "Emergency Contact Number", "Service Type", "Machine Type", "Location", and "Problem Description" blanks of the form, sends the form as an electronic mail to the electronic mail server apparatus
20 200.

After the electronic mail receiving unit 230 of the electronic mail server apparatus 200 receives the mail, the mail is placed in the electronic mail storage unit 250, and then, after the form blank reading unit 260 has read the contents of
25 the blanks, the search informing unit 240 informs and provides

the blank contents, such as "Machine Out of Order", "Generator", and "Taipei", needed by the database, and account data of the mail sender, "Matsushita Generators", to the paging conditional search database apparatus 400.

5 The search decision unit 410 of the paging conditional search database apparatus 400 searches the data previously established in the paging search database storage unit 430, such as those shown in Fig. 6. The search will find a match in item 3 of the database.

10 At this time, data, such as the paging recipient "Mo-Wei Li", the pager number "2313756", the paging identification code "222", the paging time period "0-12", the duration between paging actions "10 min" (means 10 minutes), and the number of paging actions "1", are provided by the paging
15 informing unit 420 to the paging server apparatus 300.

 Once the paging server apparatus 300 has been informed, upon querying the mail action decision unit 270 of the electronic mail server apparatus 200 to verify that "Mo-Wei Li" has not yet read the mail, and that the current time meets the paging
20 time period conditions, the paging request decision unit 310 activates the pager calling unit 320 to send out a pager call according to the data transmitted by the paging informing unit 420 of the paging conditional search database apparatus 400.

 When the pager 330 of the paging recipient receives
25 the pager call, the paging recipient is able to know that a

customer needs his assistance in view of the paging identification code "222". The paging recipient then uses the electronic mail client apparatus 100 to register for log into the system. The mail receiving unit 120 of the electronic mail client apparatus 100 is used to send a request to the electronic mail retrieving unit 210 of the electronic mail server apparatus 200 to read the mail. Upon reading the contents of the "Problem Description", the paging recipient can then get in touch with the person (Yuan-Yi Lien) listed in the "Emergency Contact Person" via the telephone number listed in the "Emergency Contact Number" ((02)2345987) in response to the customer's request.

After the mail has been retrieved by the electronic mail client apparatus 100, the electronic mail storage unit 250 of the electronic mail server apparatus 200 will have a record of the same. Thereafter, when the paging request decision unit 310 of the paging server apparatus 300 determines that "Mo-Wei Li" has already responded to the request after querying the mail action decision unit 270 of the electronic mail server apparatus 200, further pager calls will not be sent out.

As such, the present invention is capable of overcoming the aforementioned problems associated with the prior art, and offers the following advantages:

(1) The client apparatus is able to access forms prepared by the service company, and is able to know what information must be provided. If any blank has not been filled.

up or has been filled up incorrectly, the system will send a warning after detecting the same. The format of the form guides the customer in filling data to minimize the possibility of incomplete or incorrect information. Thus, there is ease of use
5 on the part of the user, and ease of managing on the part of the service company.

(2) There is no need for the client to know and specify the paging recipient as this is determined by the database set by the service company. This results in convenience for the
10 customer, and the service company is able to decide on its own the best personnel to handle the service request, thereby enhancing the quality of service.

(3) The paging procedure and result are stored in the electronic mail server apparatus to facilitate follow-up
15 managing by the service company.

(4) There is no need for the service company to employ someone to hear and receive service telephone requests, thereby permitting 24 hour on-call service, even on holidays.

Although the present invention has been fully described
20 in connection with the preferred embodiments thereof with reference to the accompanying drawings, it is to be noted that various changes and modifications are apparent to those skilled in the art. Such changes and modifications are to be understood as included within the scope of the present invention as defined
25 by the appended claims unless they depart therefrom.



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WHAT IS CLAIMED IS:

1. An electronic mail system with a paging service function and a database integrated therein, comprising:

5 a plurality of electronic mail client apparatuses, each being formed from a computer and being capable of linking with a main computer via a network link;

an electronic mail server apparatus formed in said main computer;

10 a paging conditional search database apparatus formed in said main computer; and

a paging server apparatus formed in said main computer,

15 wherein each of said electronic mail client apparatuses includes a form input unit for filling in data in blanks of a form,

wherein said electronic mail server apparatus includes:

an address book storage unit for storing user registration name and password data;

20 a form blank reading unit for retrieving form contents from an electronic mail;

a mail action decision unit for determining whether or not action has been taken for the mail by a specified paging recipient;

25 a form storage unit for storing a plurality of



previously established paging forms; and

a search informing unit for informing and sending the
form blank content data retrieved by said form blank reading
unit and sender data to a paging conditional search database
5 apparatus,

wherein said paging conditional search database
apparatus includes:

a paging search database storage unit for storing data
that includes search conditions, paging recipients, pager
10 numbers and paging identification codes;

a search decision unit for searching said paging
search database storage unit according to the form blank content
data and the sender data sent by said search informing unit of
said electronic mail server apparatus; and

15 a paging informing unit for informing a paging server
apparatus in case there is a paging service request that can
be met, and

wherein said paging server apparatus includes:

a paging request decision unit for determining
20 whether or not a pager call is to be sent out according to results
of a query made to said mail action decision unit of said
electronic mail server apparatus; and

a pager calling unit for sending the pager call to
a pager.

25 2. The electronic mail system as claimed in claim 1,

wherein the data stored in said paging search database storage unit further includes paging time period, duration between paging actions, and number of paging actions, and

5 wherein said paging request decision unit of said paging server apparatus determines an appropriate time for sending out the pager call based on the data stored in said paging search database storage unit.

3. The electronic mail system as claimed in claim 1,
10 wherein said address book storage unit of said electronic mail server apparatus has user access level data stored therein, and

wherein each of said electronic mail client apparatuses comprises an access level decision unit for checking whether or not the user has a valid access level every time one
15 of said electronic mail client apparatuses is used by the user to access one of the forms,

whereby specified ones of the forms are accessible to the user for filling up the blanks of the specified one of the forms before being sent to a paging recipient only when the
20 user has the valid access level thereto.

4. The electronic mail system as claimed in claim 2,
wherein said address book storage unit of said electronic mail server apparatus has user access level data stored therein, and

25 wherein each of said electronic mail client



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apparatuses comprises an access level decision unit for checking whether or not the user has a valid access level every time one of said electronic mail client apparatuses is used by the user to access one of the forms,

- 5 whereby specified ones of the forms are accessible to the user for filling up the blanks of the specified one of the forms before being sent to a paging recipient only when the user has the valid access level thereto.

