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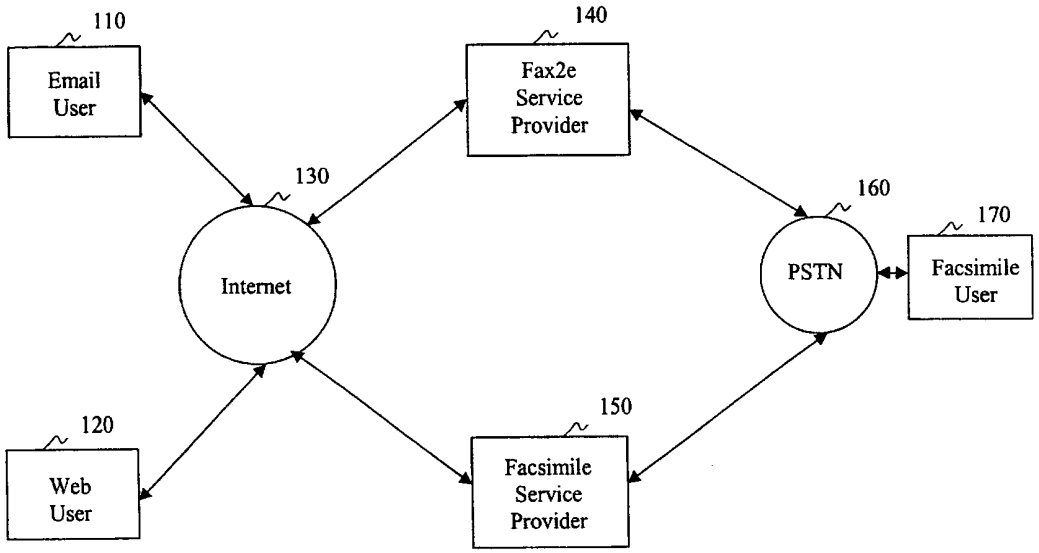
(54) Title: BI-DIRECTIONAL FACSIMILE-TO-EMAIL COMMUNICATION METHOD AND SYSTEM, AND METHOD AND SYSTEM OF ACQUIRING NEW SUBSCRIBERS THEREFOR



(57) Abstract: Bi-directional facsimile-to-email communications can be automatically routed through communications networks by means of a machine-readable message header including a coded reference to relevant routing information. The message header can be incorporated in a separate cover page that can be repeatedly used to route messages exclusively between specified entities including email and facsimile users, computer terminals, facsimile machines, communications networks and network-connected devices, etc. The method and system disclosed further provides for facsimile-to-facsimile communications over Internet Protocol and the acquisition of additional subscribers to a service provider offering the above communications facilities.

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BI-DIRECTIONAL FACSIMILE-TO-EMAIL COMMUNICATION METHOD AND SYSTEM, AND METHOD AND SYSTEM OF ACQUIRING NEW SUBSCRIBERS THEREFOR

FIELD OF THE INVENTION

The present invention is broadly concerned with a method and system enabling persons without Internet access to send and receive messages via the Internet and, more specifically with Internet-based communication by means of a conventional facsimile apparatus.

BACKGROUND

At present, communication by electronic mail is effectively only available to people having access to, or capable of using, an Internet-connected device. However, the vast majority of the world's population does not have such access. Consequently, the convenience, cost, efficiency and flexibility of communicating via the Internet remains somewhat restricted.

Whilst numerous methods and systems exist for delivering email messages to a facsimile apparatus, the reverse process is more difficult to achieve. Specifically, reliable automatic routing of facsimile messages to an email address (i.e. without human intervention) and reliable automatic routing of facsimile-to-facsimile messages via the Internet have not yet been satisfactorily achieved. An important additional requirement is that of a simple method of operation from the user's perspective.

SUMMARY

According to one aspect of the present invention, there is provided a method for transferring messages between email addresses and facsimile machines, by a service provider, including the steps of:

allocating, by said service provider, an email address to one or more facsimile subscribers and recording said subscribers' facsimile machine telephone numbers;

providing, by said service provider, each of said facsimile subscribers with one or more facsimile message headers, including a representative code in a machine-readable format;

upon receiving a facsimile message including a header from a subscriber, by said service provider, retrieving one or more email addresses represented by said code and

converting the message to an electronic file format and electronically mailing the converted message to said one or more retrieved email addresses;

upon detecting an incoming email message to any of said email addresses allocated to a facsimile subscriber, by said service provider, extracting a return email address from said incoming email message and generating a facsimile message header including a code representative of said return email address in a machine-readable format and transmitting said facsimile message header and said email message to said subscriber's facsimile machine.

According to another aspect of the present invention, there is provided a system for transferring messages between email addresses and facsimile machines including:

means for detecting incoming email messages to subscriber allocated email addresses;

means for producing a header associated with an incoming message, said header including a machine-readable code representative of the email address at which said incoming message originated;

a database associating said subscriber allocated email addresses with subscriber information;

means for transmitting said header and said message to a facsimile machine of a subscriber;

means for receiving facsimile messages from subscribers, said facsimile messages including a header, wherein said header includes a machine-readable code representative of one or more email addresses; and

means for converting a received facsimile message to an electronic format for electronically mailing to one or more email addresses.

According to another aspect of the present invention, there is provided a machine-readable message header for automatic routing of a message between two or more entities, including error correctable and coded data relating to the routing of said message, wherein said message header is for routing said message exclusively between said entities.

According to another aspect of the present invention, there is provided a cover page for automatic routing of a facsimile message between two or more entities, including at least one representation of a machine-readable message header, said message header

including error correctable and coded data relating to the routing of said message, wherein said cover page is insertable, independently of direction and in any page position of said facsimile message, and is for routing said message exclusively between said entities.

According to another aspect of the present invention, there is provided a method for delivery, by a service provider, of email messages to a facsimile apparatus of a subscriber to the delivery service, said method including the steps of:

assigning a unique email address to said subscriber, wherein said email address is associated with a facsimile number of said subscriber;

upon receipt of an email message at said unique email address:

retrieving and storing the email address of the sender of said email message;

converting the format of said email message to a facsimile message format;

generating a cover page for said facsimile message, wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page insertable independently of direction and in any page position of said facsimile message; and

forwarding said facsimile message together with said cover page to said facsimile apparatus of said subscriber.

According to another aspect of the present invention, there is provided a method for delivery of facsimile messages from a subscriber to one or more destination email addresses, by a service provider, said method including the steps of:

extracting data from a cover page of said facsimile message and retrieving said one or more destination email addresses;

converting the format of said facsimile message to an email message format; and

sending the converted format message to said one or more destination email addresses;

wherein said cover page includes one or more representations of a machine-readable message header, said message header including error correctable and coded data relating to the routing of said message and said cover page insertable independently of direction and in any page position of said facsimile message.

According to another aspect of the present invention, there is provided a method of acquiring new subscribers to a service whereby email can be sent and received by use of a facsimile apparatus, said method including the steps of:

receiving a request from an email user seeking to send email messages to a facsimile user;

assigning an email address to said requested facsimile user and associating said email address with a facsimile number of said facsimile user; and

sending a promotional message to said facsimile user.

According to another aspect of the present invention, there is provided a system for delivery, by a service provider, of email messages to a facsimile apparatus of a subscriber to the delivery service, including:

means for assigning a unique email address to said subscriber, wherein said email address is associated with a facsimile number of said subscriber;

means for retrieving and storing the email address of the sender of an email message;

means for converting the format of said email message to a facsimile message format;

means for generating a cover page for said facsimile message, wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message; and

means for forwarding said facsimile message together with said cover page to said facsimile apparatus of said subscriber.

According to another aspect of the present invention, there is provided a system for delivery of facsimile messages from a subscriber to one or more destination email addresses, by a service provider, including:

means for extracting data from a cover page of said facsimile message and retrieving the one or more destination email addresses;

means for converting the format of said facsimile message to an email message format; and

means for sending the converted format message to said one or more destination email addresses;

wherein said cover page includes one or more representations of a machine-readable message header, said message header including error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message.

According to another aspect of the present invention, there is provided a system for acquiring new subscribers to a service whereby email can be sent and received by use of a facsimile apparatus, including:

means for receiving a request from an email user seeking to send email messages to a facsimile user;

means for assigning an email address to said requested facsimile user and associating said email address with a facsimile number of said facsimile user; and

means for sending a promotional message to said facsimile user.

According to another aspect of the present invention, there is provided a computer program product incorporating a computer readable medium having a computer program recorded therein for delivery, by a service provider, of email messages to a facsimile apparatus of a subscriber to the delivery service, said computer program product including:

computer program code means for assigning a unique email address to said subscriber, wherein said email address is associated with a facsimile number of said subscriber;

computer program code means for retrieving and storing the email address of the sender of said email message;

computer program code means for converting the format of said email message to a facsimile message format;

computer program code means for generating a cover page for said facsimile message, wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message; and

computer program code means for forwarding said facsimile message together with said cover page to said facsimile number of said subscriber.

According to another aspect of the present invention, there is provided a computer program product incorporating a computer readable medium having a computer program recorded therein for delivery of facsimile messages from a subscriber to one or more destination email addresses, by a service provider, said computer program product including:

computer program code means for extracting data from said cover page and retrieving the one or more destination email addresses;

computer program code means for converting the format of said facsimile message to an email message format; and

computer program code means for sending the converted format message to said one or more destination email addresses;

wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile.

According to another aspect of the present invention, there is provided a computer program product incorporating a computer readable medium having a computer program recorded therein for acquiring new subscribers to a service whereby email can be sent and received by use of a facsimile apparatus, said computer program product including:

computer program code means for receiving a request from an email user seeking to send email messages to a facsimile user;

computer program code means for assigning an email address to a requested facsimile user and associating said email address with a facsimile number of said facsimile user; and

computer program code means for sending a promotional message to said facsimile user.

According to another aspect of the present invention, there is provided a method for delivery, by a service provider, of a facsimile message under cover of a cover page, said facsimile message from a first facsimile user to one or more additional facsimile users, said method including the steps of:

receiving, by said service provider, said facsimile message from said first facsimile user;

forwarding, by said service provider, said message via the Internet; and

delivering, by said service provider, said facsimile message to said one or more additional facsimile users;

wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message.

According to another aspect of the present invention, there is provided a system for delivery, by a service provider, of a facsimile message under cover of a cover page, said facsimile message from a first facsimile user to one or more additional facsimile users, said system including:

means for receiving, by said service provider, said facsimile message from said first facsimile user;

means for forwarding, by said service provider, said message via the Internet; and

means for delivering, by said service provider, said facsimile message to said one or more additional facsimile users;

wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable, independently of direction and in any page position of said facsimile message.

According to another aspect of the present invention, there is provided a computer program product incorporating a computer readable medium having a computer program recorded therein for delivery, by a service provider, of a facsimile message under cover of a cover page, said facsimile message from a first facsimile user to one or more additional facsimile users, said computer program product including:

computer program code means for receiving, by said service provider, said facsimile message from said first facsimile user;

computer program code means for forwarding,by said service provider, said message via the Internet; and

computer program code means for delivering, by said service provider, said facsimile message to said one or more additional facsimile users;

wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data

relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message.

According to a further aspect of the present invention, there is provided a method by which a subscriber to a service provider is able to utilise a facsimile machine to transmit a message to an email address, the method including the steps of:

a) the service provider providing a subscriber with facsimile message headers incorporating email addresses in a machine readable format;

b) the service provider upon receiving a faxed message including a header from the subscriber retrieving one or more email addresses stored in the header and converting the message to an electronic file format; and

c) electronically mailing the message to the retrieved email address or addresses.

Preferably the method further includes the steps of:

d) the service provider allocating an email address to said subscriber and recording said subscriber's facsimile machine telephone number;

e) the service provider upon detecting an incoming email message to said email address extracting the return email address from said message and generating a header incorporating said return email address in a machine readable format;

f) transmitting said header and email message to the subscriber's facsimile machine allowing the subscriber to transmit by facsimile a reply message which includes the header to the service provider for processing according to steps b) and c).

If desired the service provider may also host web pages for the subscribers, the web pages including the subscribers allocated email addresses so that browsers of the web page may transmit messages to the subscribers.

The method may further include the step of recording desired destination email addresses from the subscriber and providing the subscriber with a number of different header sheets each having a desired email address recorded in machine readable format upon it, whereby the subscriber may send messages to said email addresses by means of the service.

Alternatively a single header sheet may be provided including a number of different possible destination email addresses recorded in machine readable format and configured to allow selection of one or more of said addresses by a subscriber.

According to a further aspect of the present invention there is provided a facsimile response to email service provider system including:

incoming email monitoring means for monitoring email messages incoming to a plurality of subscriber allocated email addresses;

header production means operative to produce a header associated with an incoming message incorporating a machine readable version of the email address at which said message originated;

a database associating the subscriber allocated email addresses with subscriber facsimile machine telephone numbers and/or any other relevant information;

facsimile machine transmitting means for transmitting said header and said message to said subscriber at said number;

a facsimile machine receiving means for receiving faxes from subscribers to the service, said faxes including said header and a fax message; and

data conversion means for converting said machine readable email address to an electronic format and for converting said fax message to an electronic format for electronically mailing to said email address.

The facsimile machine transmitting means may comprise a software module operative to convert the email message to a file format suitable for reception by a subscriber's fax machine.

Alternatively the email message may be printed out and the facsimile machine transmitting means may simply comprise a fax machine operated in transmit mode.

The data conversion means may include a barcode reader or an optical character recognition device and software.

According to a further aspect of the invention there is provided a fax header incorporating at least one destination email address in a machine readable format.

BRIEF DESCRIPTION OF THE DRAWINGS

A small number of embodiments are described hereinafter with reference to the drawings, in which:

Fig. 1 shows a framework for bi-directional facsimile-to-email communications according to an embodiment of the present invention;

Fig. 2 shows an architectural block diagram of the Fax2e service provider of Fig. 1.

Fig. 3 shows the routing of a message from an email user to a facsimile user;

Fig. 4 shows the routing of a message from a web user to a facsimile user;

Fig. 5 shows the routing of a message from a facsimile user to an email user or a web user;

Fig. 6 shows a referral sequence whereby an email user requests that a facsimile user become a subscriber of the Fax2e service;

Fig. 7 shows an event sequence for email-to-facsimile communication using the Fax2e service;

Fig. 8 shows an event sequence for facsimile-to-email communication using the Fax2e service;

Fig. 9 shows an event sequence for facsimile-to-facsimile communication using the Fax2e service;

Fig 10 is a block diagram of an exemplary computer system wherewith the Fax2e service provider of the present invention can be practiced;

Fig. 11 shows an exemplary cover page in accordance with the present invention;

Fig. 12 is a high level system architecture diagram of a fax-to-email conversion system according to an embodiment of the present invention;

Fig. 13 is a medium level diagram of the features and processes included within Item A of Fig. 12;

Fig. 14 is a medium level diagram of the features and processes included within Item B of Fig. 12;

Fig. 15 is a medium level diagram of the features and processes included within Item C of Fig. 12;

Fig. 16 is a medium level diagram of the features and processes included within Item D of Fig 12; and

Fig. 17 is a block diagram of a fax-to-email conversion system according to a further embodiment of the invention.

DETAILED DESCRIPTION

A limited number of preferred embodiments of the present invention are described hereinafter with reference to the accompanying drawings. Embodiments of a bi-directional facsimile-to-email communication method and system are described, as well as an Internet-based facsimile-to-facsimile communication method and system. A method and system for acquiring new subscribers to the service is also described.

Fig. 1 shows a framework for bi-directional facsimile-to-email communications, according to an embodiment of the present invention.

An email user 110 sends an electronic mail (email) message to a facsimile user 170, who is a fax-to-email (Fax2e) subscriber with an email address allocated by the Fax2e service provider 140. The email message is transmitted, via the Internet 130, from a Net-connected device to the Fax2e service provider 140. The Net-connected device can be any Internet-enabled device including a Personal Computer, a Palm Computer, mobile phone, etc.

Upon receipt of the message, the Fax2e service provider 140 checks that the message is addressed to a valid subscriber email address. If so, the Fax2e service provider 140 stores the "Reply-to" email address and any other related email addresses from the message in a subscriber database (not shown) and then generates a fax header with a code for referencing the stored email addresses embedded therein, in a machine-readable format. The format of the fax header is hereinafter described and may be rendered as a cover page, electronically or in hardcopy as a separate cover sheet. The original message is converted to a file format suitable for reception by a fax machine (e.g. a TIFF file) and appended to the header or cover page.

The Fax2e service provider 140 either sends the message (with header or cover page) via the Fax2e service provider's own computer-based fax connection to the Public Switched Telephone Network (PSTN) 160, or via an Internet-based fax service provider 150 (e.g. JFax is one such commercially available service). Such services distribute messages via their own computer-based fax connection to the PSTN 160.

Either way, the message is delivered as a fax to the dial-up number of the facsimile user 170 that was stored in the subscriber database (not shown). Upon receipt, the facsimile user's fax machine prints out the message and cover page as a single multi-page fax document.

Another alternative is that the original message is generated by a web user 120 on a web-based form made available to web browsers of web users 120 via the Internet 130 by the Fax2e service provider 140. A header or cover page is then generated and attached to the message by the Fax2e service provider 140 and faxed as described above. Similar web forms may also be used by various classes of user in order to update or administer the subscriber database and service.

Once a facsimile user 170 has received a cover page, the original message sender (e.g. email user 110 or web user 120, if the reply email address was specified in the form) can be replied to by the facsimile user 170 simply attaching the received cover page to a reply message and faxing both to the Fax2e service provider 140 fax number, via the PSTN 160. The previously described process is then performed in reverse and the message is subsequently forwarded on to the email address or addresses embedded in the Fax2e header on the cover page.

Fig. 2 shows an architectural block diagram of the Fax2e service provider 140 of Fig. 1.

The Fax2e service provider 140 includes a Fax2e server 220, connected to a subscriber database 230. The subscriber database 230 is used to store information relating to subscribers and the parties the subscribers communicate with. The Fax2e service provider 140 further includes a mail server 210, a web server 240 and a facsimile server 250. The mail server 210 and the web server 240 are for performing Internet based communication with email and web users and are thus both connected to the Internet 130. The facsimile server 250 is for performing facsimile communications with facsimile users and is thus connected to the PSTN 160.

Fig. 3 shows the routing of a message from an email user to a facsimile user.

An email user 110 sends an email message to a facsimile user 170, who is a subscriber to the Fax2e service, using an email client (e.g. Netscape Messenger, Eudora, Hotmail, etc.). The Fax2e service provider 140 creates and maintains an email address for each facsimile user 170 who is a subscriber. The email message is transmitted via a Net-connected device 310 to the mail server 210 of the Fax2e service provider 140. The Net-connected device 310 can be any Internet-enabled device, including a Personal Computer, a palm Computer, mobile phone, etc.

Upon receipt of the message, the mail server 210 forwards the message to the Fax2e server 220 which checks whether the message is addressed to a valid subscriber email address. If the message is addressed to a valid subscriber, the Fax2e service provider 140 processes the email message by storing the "Reply-to" email address, and

any other related email addresses from the message, in the subscriber database (not shown) and then generates a fax header with a coded reference to the stored addresses. The coded reference is embedded in the header in a machine-readable format. The format of the fax header is hereinafter described and may be rendered electronically or as a hardcopy on a separate cover page. The original message is then converted to a suitable file format for facsimile transmission (e.g. TIFF) and appended to the header or cover page.

The Fax2e server 210 then extracts a fax number that corresponds to the destination email address, from the subscriber database (not shown), and proceeds to process and forward the converted fax message via the facsimile server 250 and PSTN 160.

The message is delivered as a fax to the fax machine 320 of the facsimile user 170, which prints out the message and cover page as a single multi-page fax document.

Alternatively, a message can be generated by a web user 120, as shown in Fig. 4. A web user 120 may be a Fax2e Customer Service Representative, a Fax2e Reseller or any person with access to the Internet 130. The web user 120 uses a web-based application made available to the web browser of web server 120 via the Internet 310 by the Fax2e service provider 140. Use of the application is as simple as filling out a form using any web client (e.g. Microsoft Internet Explorer or Nescape Navigator). The form, when submitted by the web user 120 via a Net-connected device 410 over the Internet 130, is received by a web server 240 of the Fax2e service provider 140 and forwarded to the Fax2e server 220.

Upon receipt of the message, the Fax2e server 220 checks whether the message is addressed to a valid subscriber email address. If the message is addressed to a valid subscriber, the Fax2e service provider 140 processes the email message by storing the "Reply-to" email address, and any other related email addresses from the message, in the subscriber database (not shown) and then generates a fax header with a coded reference to the stored addresses. The coded reference is embedded in the header in a machine-readable format. The format of the fax header is hereinafter described and may be rendered electronically or as a hardcopy on a separate cover page. The original message

is then converted to a suitable file format for facsimile transmission (e.g. TIFF) and appended to the header or cover page.

The Fax2e server 210 then extracts a fax number that corresponds to the destination email address, from the subscriber database (not shown), and proceeds to process and forward the converted fax message via the facsimile server 250 and PSTN 160.

The message is delivered as a fax to the fax machine 320 of the facsimile user 170, which prints out the message and cover page as a single multi-page fax document.

Once a facsimile user 170 has received a cover page, the original message sender can be replied to by the facsimile user 170 simply attaching the cover page to a reply message and faxing both to a fax number at the Fax2e service provider 140 via the PSTN 160 (providing a reply email address was specified in the web-based form).

The facsimile server 250 receives and forwards the fax message (inclusive of cover page) to the Fax2e server 220, which converts the message into an electronic file format (e.g. Adobe™ Acrobat PDF format). The message is then forwarded to the mail server (not shown) for transmission on to the email address or addresses referenced in the fax header on the cover page, via the Internet 130. The message is received by the addressee as an email message.

Conversion of the fax message involves extraction of a destination email address from the subscriber database, using the code embedded in the header. Alternatively, the destination email address may be directly embedded in the header, in which case the destination email address is extracted and converted to an electronic data format by Optical Character Recognition (OCR) apparatus and techniques. Other forms of coding may also be employed, such as barcodes.

Fig. 5 shows the routing of a message from a facsimile user to an email user or a web user.

Upon subscription to the Fax2e service, a facsimile user 170 is allocated a Fax2e email address which is linked to the fax number of the facsimile user 170. The facsimile

user 170 is then able to receive email messages as fax messages, together with a cover page, via a fax machine 320 of the fasimile user 170.

To fax back a response to a received email message, the facsimile user 170 faxes back the response message under cover of the cover page received. The message and cover page are sent from the fax machine 320 of the facsimile user 170 via the PSTN 160, to the Fax2e service provider 140.

The message and cover page are received by the facsimile server 250 of the Fax2e service provider 140 and forwarded to the Fax2e server 220 for processing. The Fax2e server 220 converts the message into electronic format (e.g. PDF), extracts the destination email address from the cover page or the subscriber database (not shown) and then forwards the converted message to the mail server 210. The mail server 210 sends the message via the Internet 130 to the recipient (i.e. either a email user 110 or a web user 120).

By filling out a fax-based order form, or even by telephoning an operator at the Fax2e service provider organisation, a user may register a number of pre-determined destination email addresses for communication with. Once those addresses have been registered, the subscriber is faxed a number of different header or cover sheets, each having the desired email addresses already associated with a particular header or cover sheet. This allows the subscriber to send messages to these pre-determined email addresses without having to receive an email from those addresses in the first place.

Alternatively, a number of numbered checkboxes might be provided and the subscriber given the option of registering an email address corresponding to each checkbox with the service. For each subscriber the email address to checkbox relationship is recorded in a database at the Fax2e service provider. Upon receiving a fax header or cover page, an OCR module determines the appropriate email addresses for the message by reference to the database. Such an arrangement provides a similar function to the address book or contacts list offered by most email applications.

It will be readily comprehended by persons skilled in the art that a substantial portion or even all of the functions of the Fax2e service provider 140 can be implemented

by means of software executed on a computer system. Thus, the Fax2e service provider 140 can operate with a high degree of automation and minimal human intervention.

A significant advantage of the described system is that users may send international email messages and faxes for the cost of a local call, as long as the service phone number of the Fax2e service provider is locally available. This is because interstate or international re-transmission is handled by the Fax2e service provider via the Internet. Accordingly, there is a substantial incentive for all fax machine owners and users to subscribe to the Fax2e service. A further benefit is that subscribers are able to maintain a website anywhere in the world and manage the website locally via a fax machine. This service could well include a website hosted in an international directory for small to medium size businesses previously unable to participate in the e-commerce revolution.

Implementation of the Facsimile Header and/or Cover Page

Automated routing of email messages, to and from a facsimile machine with a dial up connection to a public telephone network, can be facilitated by means of a unique facsimile header or separate cover page. A cover page is structured in such a manner, that it may be inserted by a facsimile user in any page position of a multiple page facsimile transmission and independently of orientation (i.e. the cover page may be fed or scanned from top-to-bottom or bottom-to top).

In producing a header or cover page, the Fax2e service provider generates a unique multiple line code as shown in Fig. 11 and reproduced below:

ECOMECOMECOMECOMECOMECOMECOM
X17A7747558X17A7747558X17A7747558X17A7747558X

As can be seen in the above example, the first line contains the four letter sequence 'ECOM', repeatedly. This sequence acts as a message identifier and indicates to the Fax2e server that the following one or more lines contain a unique code, also in a repeated fashion. As may be further seen, the second line contains a string of ten characters positioned between the delimiting letters 'X', in a repeated fashion. The characters may be numeric and/or alphanumeric, resulting in a vast number of potential combinations. The string of characters represent a unique identification code, unique to a particular facsimile user, and are used to extract relevant information from the database of

the Fax2e service provider. The information may include any of, but is not limited to, the following:

1. the facsimile user's name
2. the facsimile user's dial-up number
3. the Fax2e email address (fax number at Fax2e.com) and records pertaining to the facsimile user
4. records pertaining to the email user (e.g. the email user's email address)
5. the message subject line
6. the date sent
7. the date received by the Fax2e service provider
8. user profile information
9. billing information
10. special promotions
11. targeted advertising

It will be clear to persons skilled in the art that numerous different letters or characters may be used to delimit the repeating string of characters and that the number of characters in the string is not restricted to 10.

The Fax2e service provider generates a facsimile cover page that contains various information, sandwiched between two copies of the unique multiple line header previously described. (i.e. the two copies of the multiple line header are located near the top and bottom of the cover page). The information contained between the two copies of the unique multiple line header may include any of, but is not limited to, the information stored in the database, as described above.

The code in the multiple line header is generated using an algorithm that allows both error detection and correction. This ensures that the Fax2e server can read and translate the code, using known Optical Character Recognition (OCR) techniques and/or software, even in the event that the cover page is only partially received. Partial reception may, for example, result from poor transmission quality. As a result of the error correction incorporated, only one third of the code is necessary to be read for correct interpretation. Repetition of the code in the fax header provides additional assurance of correct interpretation. Furthermore, the OCR techniques employed enable the cover page

to be machine read, even if the header is upside down, as can be seen at the bottom of the exemplary cover page shown in Fig. 11.

As a consequence, the fax header is significantly more reliable than, for example, simply attempting to scan a textual email address or barcode at a location on the cover page.

Discount Internet Faxing

A variation of the previously described cover page can also be employed in a similar service provider system for delivering fax messages from one fax user to another fax user, via the Internet. In this instance, the destination email address is replaced with the destination fax number (including international and/or local area codes).

By way of an example, a fax user in Tokyo, Japan might have a fax cover page for communicating with a specific fax user in the USA. The fax user in Tokyo sends a fax message together with the appropriate cover page to a local Fax2e access number in Tokyo. The fax message is then forwarded via Fax2e's IP network to the USA and faxed to the destination fax number, without the cover page. The telecommunication carrier cost of delivering the fax message is thus reduced to the cost of a local call.

Communication Event Sequences

Figs. 6 to 9 show various event sequences as users of the Fax2e service communicate with one another and the Fax2e service provider. Each entity (e.g. the various users and elements that make up the Fax2e service provider) have a time line that flows down the page from top to bottom. Interactions between the different entities are shown as horizontal lines with arrowheads indicating the direction of flow of the interactions.

Fig. 6 shows a referral sequence, whereby an email user 610 requests that a facsimile user 620 becomes a subscriber to the Fax2e service 630. Such a request enables a free trial of the Fax2e service by a facsimile user 620 to be initiated by an email user 610.

When an email user 610 seeks to communicate with a facsimile user 620 who is not an existing subscriber to the Fax2e service, the email user 610 submits the facsimile

number of the facsimile user 620 to the Fax2e service provider 630, at step 651. The request for registration as a subscriber is typically submitted by means of a web browser, via the Internet, and is received by the web server 633 of the Fax2e service provider 630. Then, at step 652, information pertaining to the request is forwarded to the Fax2e server 631. The Fax2e server 631 creates an email address for the facsimile user 620 and logs this event in the subscriber database 632, at step 653. At step 654, the subscriber database 632 responds with a validation result and any necessary associated information. At step 655, a response is forwarded by the Fax2e server 631 to the web server 633 for transmission via the Internet to the email user 610, at step 656. The response is received on the web browser of the email user 610.

Then, at step 661, the Fax2e server generates a free trial offer fax message and forwards this message to the facsimile server 635. The message is sent by the facsimile server 635 to the fax number of the facsimile user 620 via the Public Switched Telephone Network (PSTN), at step 662. The Fax2e server 631 also generates a confirmation email message and forwards this message to the email server 634, at step 671. At step 672, the email server 634 sends the confirmation message to the email user 610 via the Internet. The confirmation message includes notification of the email address that was created for the facsimile user 620 by the Fax2e service provider 630.

Fig. 7 shows the sequence of events for an email-to-fax communication using the Fax2e service.

At step 751, an email user 710 sends an email message to a Fax2e service provider-created email address of a facsimile user 720. The email message is received by the email server 734 of the Fax2e service provider 730 and forwarded to the Fax2e server 731, at step 752. At step 753, the Fax2e server 731 validates and logs the event in the subscriber data base 732. At step 754, the subscriber database 732 responds with a validation result and any information necessary to forward the message. Such information typically includes the facsimile number of the facsimile user 720.

The Fax2e server 731 converts the email message into a format suitable for receipt by a facsimile machine and generates and appends a Fax2e coded cover sheet. The converted message and appended cover sheet are forwarded to the facsimile server 735.

The facsimile server 735 sends the fax message to the facsimile number of the facsimile user 720, at step 756.

The facsimile server 735 also sends a transmission receipt to the Fax2e server 731, at step 761. The transmission receipt is used to calculate the cost to be charged to the account of the facsimile user 720 and this information is transferred to the subscriber database 732, at step 762. The subscriber database 732 responds with a validation result at step 763.

Fig. 8 shows an event sequence for facsimile-to-email communication using the Fax2e service.

At step 851, a facsimile user 820 sends a facsimile message including a Fax2e cover sheet to a Fax2e service fax number, via the Public Switched Telephone Network (PSTN). The facsimile message is received by the facsimile server 835 of the Fax2e service provider 830. The facsimile message is forwarded to the Fax2e server 831 for processing, at step 852. At step 853, the Fax2e server 831 validates and logs the event in the subscriber database 832. At step 854, the subscriber database 632 responds with a validation result and any data necessary to forward the message to an email user 610. The Fax2e server 831 removes the Fax2e cover sheet from the message and uses the coded portion thereof to extract the destination email address of email user 610 from the subscriber database 832, as previously described. The Fax2e server 831 also converts the message into PDF format (Adobe™ Acrobat document). Then, at step 855, the converted document is forwarded to the email server 834 at step 855. At step 856, the email server 834 sends sends the message as an email to the email address of the email user 610.

If necessary, information can be forwarded to other services and/or gateways for processing (e.g. the JFAX commercial facsimile service, an EDI gateway, etc), at step 857.

The transmission receipt is used to calculate the cost to be charged to the account of the facsimile user 820 and this information is submitted to the subscriber database 832, at step 858. At step 859, the subscriber database 832 responds with a validation result to the Fax2e server 831.

Fig. 9 shows an event sequence for facsimile-to-facsimile communication using the Fax2e service.

At step 931, a facsimile user 910 sends a facsimile message, including a coded Fax2e cover sheet, to a Fax2e service fax number. The facsimile message is received by the facsimile server 925 of the Fax2e service provider 920 and forwarded to the Fax2e server 921 for processing, at step 932. At step 933, the Fax2e server 921 validates and logs this event in the subscriber database 922. The subscriber database 922 responds with a validation result and any information necessary to forward the facsimile message, at step 934.

At step 935, the Fax2e server 921 removes the Fax2e cover sheet and uses the coded information thereon to extract the destination fax number from the subscriber database 922. The message is then converted into PDF format and forwarded to the email server 924, at step 935.

The message is then sent by the email server 924 of the Fax2e service provider 920 to the email server 964 of another remote Fax2e service provider 960, via the Internet (not shown).

Once the message is received by the email server 964 of the Fax2e service provider 960, the message is forwarded to the Fax2e server 961 at step 971. At step 972, the message is converted into a format suitable for reception by a facsimile machine and sent to the facsimile server 965. The message is sent by the facsimile server 965 to the facsimile user 950 via the PSTN, at step 973. At step 974, the facsimile server 965 sends a transmission receipt to the Fax2e server 961. The transmission receipt is used to calculate the cost to be charged to the account of the facsimile user 950 and this information is submitted to the subscriber database 962, at step 975. At step 976, the subscriber database 962 responds with a validation result.

The individual Fax2e service providers 920 and 960 can communicate with one another, typically by the Internet, an Intranet, or a dedicated communications link, for the exchange of information (e.g. information relating to subscribers).

Additional Embodiments

The operation and arrangement of an embodiment of the present invention will now be described with reference to Fig. 12.

An email user (Item B) sends an electronic mail message to a fax response to email service provider (FR2E) subscriber (Fax User, Item D) which is transmitted via a Net-connected device to a Mail Server of the email user (Item B). The Net-connected device can be any Internet-enabled device including a Personal Computer, a Palm Computer, Mobile Phone etc. The message is then transmitted via the Internet to the FR2E Service (Item A).

When the FR2E Service (Item A) receives the message, the service (Item A) checks whether the message is addressed to a valid Subscriber email address. If that is the case, the FR2E service (Item A) then copies the "Reply-to" email address and any other related email addresses from the message and then generates a FR2E header with these addresses embedded in a machine readable format. The message is then converted to a file format which is suitable for a fax machine (e.g. a TIFF file).

The FR2E Service (Item A) then evaluates whether to directly send the message and the header via the FR2E Service's own computer-based fax connection to the phone network, or via an Internet-based fax service (e.g. JFax is one such commercially available service). If selected, this service would then distribute the message via the service's own computer-based fax connection to the standard phone network. Either way, the message and the FR2E header are then delivered as a fax to the fax user's phone number which was stored in the FR2E subscriber database. The fax user's facsimile machine then prints the message and the FR2E header out as one single multi-page fax document.

Another alternative is that the original message is generated by a web user (Item C) from a web-based form made available to web browsers via the World Wide Web. The message and FR2E header are then generated and faxed as described above. This type of web form may also be used by other classes of users in order to update or administer the FR2E Subscriber Database and Service.

Once a fax user (Item D) has received a FR2E header, the fax user can simply reply to the original message sender (e.g. email user or web user, if a reply email address

was specified in the form) by attaching the FR2E header to a reply message and faxing both to the FR2E Service Fax Number. The previously described process is then completed in reverse and the message is then forwarded on to the email address or addresses embedded in the FR2E header.

The operation and arrangement of an embodiment of the present invention will now be described with reference to Fig. 13.

An email user (Item B) sends an email message to a FR2E subscriber (item D). This message is received by the FR2E Mail Server which checks the FR2E database to see if the message is addressed to a valid Subscriber email address. If the message is addressed to a valid Subscriber, the FR2E Service processes the email by copying the "Reply-to" email address and any other related email addresses from the message and then generating a FR2E header with these addresses embedded in a machine readable format for example as a barcode. The message is then converted to a suitable file format (e.g. TIFF).

The FR2E Service (item A) then checks the Database for the fax number which corresponds to the email address. The FR2E Service then processes the fax and distributes the message via a fax gateway to the phone network. The message and the FR2E header are then delivered as a fax to the Fax User (Item D). A facsimile machine of the fax user (Item D) then prints the message and the FR2E header out as one single multi-page fax document.

Alternatively, the message can be generated by a web user (Item C). The web user fills out a web-based form made available to web browsers via the World Wide Web (WWW). The form, when submitted by the web user, is received and processed by the FR2E Web Server. The message and FR2E header are generated and faxed as described above.

Once a Fax User (Item D) has received a FR2E header, the fax user (Item D) can simply reply to the original message sender (e.g. email user or web user, if reply email address was specified in the form) by attaching the FR2E header to a reply message and faxing both to the FR2E Service Fax Number.

The FR2E Fax Gateway receives the fax message and header, processes the fax thereby converting the message into an electronic file format, and the message is then forwarded on to the email address or addresses embedded in the FR2E header via the FR2E Mail Server. The message is received by the addressee as an email.

The conversion of the fax message and header involves reading the destination email from the header. For example the destination email may be barcoded on the header in which case the destination email would be extracted and converted to an electronic data form by a barcode scanner. Alternatively, optical character recognition apparatus and techniques could also be used.

The operation and arrangement of an embodiment of the present invention from an email user's perspective will now be described with reference to Fig. 14.

An email user (Item B) sends an email message to a FR2E Subscriber using any email client (eg Netscape Messenger, Eudora, HotMail etc) which is transmitted via a Net-connected device to a Mail Server. The Net-connected device can be any Internet-enabled device including a Personal Computer, a Palm Computer, Mobile Phone etc. The message is then transmitted via the Internet to the FR2E Service (Item A).

Upon receiving the message the FR2E service (Item A) processes and converts the message into a fax and FR2E header and sends the converted message to the fax user (Item D). The message and the FR2E header are then delivered as a fax to the fax user's phone number which is stored in the FR2E Subscriber Database. A facsimile machine of the fax user (Item D) then prints the message and the FR2E header out as one single multi-page fax document.

The operation and arrangement of an embodiment of the present invention from a web user's perspective will now be described with reference to Fig. 15.

A web user (Item C) may be a FR2E Customer Service Representative, a FR2E Reseller or any person browsing the WWW. Each of these people can send a message to a FR2E subscriber (Item D) via a web-based Application. Using this Application is as simple as filling out a form using any Web Client (eg Microsoft Internet Explorer or

Nescape Navigator). The form, when submitted by the web user, is transmitted via a Net-connected device via the Internet to the FR2E Service (Item A).

Upon receiving the message, the FR2E service (Item A) processes and converts the message into fax and FR2E header sends the converted message to the fax user (Item D). The message and the FR2E header are then delivered as a fax to the fax user's phone number which is stored in the FR2E Subscriber Database. A facsimile machine of the fax user (Item D) then prints the message and the FR2E header out as one single multi-page fax document.

The operation and arrangement of an embodiment of the present invention from a Subscriber's perspective (fax user – Item D) will now be described with reference to Fig. 16.

Upon subscription to the FR2E Service, a fax user (Item D) is allocated an FR2E email address which is linked to a fax number of the fax user (Item D). The fax user (Item D) can then receive an email, which presents itself as a fax and a FR2E header, via the facsimile machine of the fax user (Item D).

To fax back a response to the email message, the fax user (Item D) creates the response and faxes back the response under cover of the same FR2E header. This message and header are sent from the fax user's (Item D) facsimile machine via the standard phone network to the FR2E Service (Item A). Upon receiving the message and header, the FR2E service (Item A) processes and converts the message into an electronic file and sends the converted message to the original message sender.

The operation and arrangement of a further embodiment of the present invention will now be described with reference to Fig. 17.

FR2E service 1 includes a database 8 of subscriber fax numbers and allocated email addresses. The FR2E service is connected to the Internet 4 and is able to receive email messages via the Internet at any of the allocated email addresses. Upon an email message being sent to an allocated address, by a remote computer 6, the allocated address is noted and the corresponding fax number is retrieved from the database 8.

Data from the incoming fax, such as the email address of the originating computer 6 and possibly other recipients of the message, is extracted and compiled into a predetermined message format or "header" by module 8. The header may include image registration marks, standard optical character recognition ready text and perhaps a high contrast set of symbols similar to a bar code. The contents of the email message and the header are then transmitted as a facsimile message by fax transmission module 10. The fax transmission module could simply comprise a conventional fax machine or alternatively the facsimile could be transmitted using known computer software. Alternatively the electronic files containing the header and message may be forwarded to a further service which converts the message and file to facsimile format and transmits to the appropriate fax number. In any event the message and header are transmitted via the standard telephony network 12 to the subscriber's fax machine where the header 16 and message 18 are finally printed out.

Upon receiving the header and message the subscriber reads the message and if a response is required writes out a response message 20. The response message is faxed under cover of the same header by the subscriber to fax machine 22 of the FR2E provider. Fax machine 22 reproduces the header 16A and the message 20A. The message is scanned by scanner 24 and an image file 26 of the message, for example a TIFF format file, is produced. The header is processed by optical character recognition module 28 in order to extract the data contained in the header. Alternatively, depending on the format chosen to store the data module 28 may comprise a bar code reader or some other apparatus arranged to extract the header data. As previously mentioned, the header data includes the email address of originating PC 6.

E-mail message compiler 30 produces an email from the data provided by OCR module 28. An attachment to the email is the TIFF message file. The email is then transmitted over the internet to personal computer 6 by conventional means.

It will be readily comprehended by those skilled in the art that most of the FR2E service 1 may be implemented by means of software executed on a computer.

By filling out a fax based order form, or even by telephoning an operator at the FR2E service, a user may register a number of pre-defined destination email addresses that they wish to be able to transmit messages to. Once those addresses have been

registered the subscriber is then faxed a number of different header sheets each having the desired email addresses already embedded within them. This allows the subscriber to send messages to these predefined email addresses without having to receive an email from those addresses in the first place.

Alternatively a number of numbered checkboxes might be provided and the subscriber be given the option of registering an email address corresponding to each checkbox with the conversion service. For each subscriber the email address to checkbox relationship would be recorded in a database at the bureau. Upon receiving a fax header OCR module 28 would then determine the appropriate email addresses for the message by reference to the database. Such an arrangement provides a similar function to the address book or contacts list offered by most email applications.

A significant advantage of the described system is that its users may send international email messages and faxes for only the cost of a local call as long as the service phone number of the FR2E provider is available locally. This is because the interstate or international re-transmission will be handled by the conversion service via the internet. Accordingly, there is a substantial incentive for all fax machine owners and users to subscribe to the conversion service. A further benefit is that subscribers are able to maintain a website anywhere in the world and manage it locally via a fax machine. This service could well include a website hosted in an international directory for small to medium size businesses previously unable to participate in the e-commerce revolution.

Computer Implementation

The Fax2e service provider can be implemented using a computer program product in conjunction with a computer system 1000 as shown in Fig. 10. In particular, the Fax2e service provider can be implemented as software, or computer readable program code, executing on the computer system 1000.

The computer system 1000 includes a computer 1050, a video display 1010, and input devices 1030, 1032. In addition, the computer system 1000 can have any of a number of other output devices including line printers, laser printers, plotters, and other reproduction devices connected to the computer 1050. The computer system 1000 can be connected to one or more other computers via a communication interface 1064 using an appropriate communication channel 1040 such as a modem communications path, an

electronic network, or the like. The network may include a local area network (LAN), a wide area network (WAN), an Intranet, and/or the Internet 1020.

The computer 1050 includes the control module 1066, a memory 1070 that may include random access memory (RAM) and read-only memory (ROM), input/output (I/O) interfaces 1064, 1072, a video interface 1060, and one or more storage devices generally represented by the storage device 1062. The control module 1066 is implemented using a central processing unit (CPU) that executes or runs a computer readable program code that performs a particular function or related set of functions.

The video interface 1060 is connected to the video display 1010 and provides video signals from the computer 1050 for display on the video display 1010. User input to operate the computer 1050 can be provided by one or more of the input devices 1030, 1032 via the I/O interface 1072. For example, a user of the computer 1050 can use a keyboard as I/O interface 1030 and/or a pointing device such as a mouse as I/O interface 1032. The keyboard and the mouse provide input to the computer 1050. The storage device 1062 can consist of one or more of the following: a floppy disk, a hard disk drive, a magneto-optical disk drive, CD-ROM, magnetic tape or any other of a number of non-volatile storage devices well known to those skilled in the art. Each of the elements in the computer system 1050 is typically connected to other devices via a bus 1080 that in turn can consist of data, address, and control buses.

The process of converting and automatically delivering messages between email and facsimile users and the process of creating message headers and facsimile cover pages can be effected by instructions in the software that are carried out by the computer system 1000. Again, the software may be implemented as one or more modules for implementing the method steps.

In particular, the software may be stored in a computer readable medium, including the storage device 1062 or that is downloaded from a remote location via the communications interface 1064 and communications channel 1040 from the Internet 1020 or another network location or site. The computer system 1000 includes the computer readable medium having such software or program code recorded such that instructions of the software or the program code can be carried out.

The computer system 1000 is provided for illustrative purposes and other configurations can be employed without departing from the scope and spirit of the invention. The foregoing is merely an example of the types of computers or computer systems with which the embodiments of the invention may be practised. Typically, the processes of the embodiments are resident as software or a computer readable program code recorded on a hard disk drive as the computer readable medium, and read and controlled using the control module 1066. Intermediate storage of the program code and any data including entities, tickets, and the like may be accomplished using the memory 1070, possibly in concert with the storage device 1062.

In some instances, the program may be supplied to the user encoded on a CD-ROM or a floppy disk (both generally depicted by the storage device 1062), or alternatively could be read by the user from the network via a modem device connected to the computer 1050. Still further, the computer system 1000 can load the software from other computer readable media. This may include magnetic tape, a ROM or integrated circuit, a magneto-optical disk, a radio or infra-red transmission channel between the computer and another device, a computer readable card such as a PCMCIA card, and the Internet 1020 and Intranets including email transmissions and information recorded on Internet sites and the like. The foregoing are merely examples of relevant computer readable media. Other computer readable media may be practised without departing from the scope and spirit of the invention.

The Fax2e service provider can be realised in a centralised fashion in one computer system 1000, or in a distributed fashion where different elements are spread across several interconnected computer systems.

Computer program means or computer program in the present context mean any expression, in any language, code or notation, of a set of instructions intended to cause a system having an information processing capability to perform a particular function either directly or after either or both of the following: a) conversion to another language, code or notation or b) reproduction in a different material form.

The forgoing describes only a few arrangements and/or embodiments of the present invention, and modifications and/or changes can be made thereto without

departing from the scope and spirit of the invention, the arrangements and/or embodiments being illustrative and not restrictive.

The claims defining the invention are as follows:

1. A method for transferring messages between email addresses and facsimile machines, by a service provider, including the steps of:

allocating, by said service provider, an email address to one or more facsimile subscribers and recording said subscribers' facsimile machine telephone numbers;

providing, by said service provider, each of said facsimile subscribers with one or more facsimile message headers, including a representative code in a machine-readable format;

upon receiving a facsimile message including a header from a subscriber, by said service provider, retrieving one or more email addresses represented by said code and converting the message to an electronic file format and electronically mailing the converted message to said one or more retrieved email addresses; and

upon detecting an incoming email message to any of said email addresses allocated to a facsimile subscriber, by said service provider, extracting a return email address from said incoming email message and generating a facsimile message header including a code representative of said return email address in a machine-readable format and transmitting said facsimile message header and said email message to said subscriber's facsimile machine.

2. The method of claim 1, further including the steps of:

hosting, by said service provider, a web page for each facsimile subscriber, wherein said web page includes said facsimile subscriber's allocated email address; and

transmitting a message to a facsimile subscriber using a browser to access said web page.

3. The method of claim 1, further including the steps of:

recording desired destination email addresses from a facsimile subscriber; and

providing said subscriber with one or more different facsimile cover sheets, wherein each facsimile cover sheet includes a code representative of one or more email addresses in a machine-readable format, whereby said facsimile subscriber can send messages to said destination email addresses.

4. The method of of claim 1, further including the steps of:

recording desired destination email addresses from a facsimile subscriber; and

providing said subscriber with a single facsimile cover sheet, including a machine readable code representative of one or more email addresses, wherein said cover sheet is configured to allow selection of one or more of said email addresses by said subscriber.

5. A system for transferring messages between email addresses and facsimile machines including:

means for detecting incoming email messages to subscriber allocated email addresses;

means for producing a header associated with an incoming message, said header including a machine-readable code representative of the email address at which said incoming message originated;

a database associating said subscriber allocated email addresses with subscriber information;

means for transmitting said header and said message to a facsimile machine of a subscriber;

means for receiving facsimile messages from subscribers, said facsimile messages including a header, wherein said header includes a machine-readable code representative of one or more email addresses; and

means for converting a received facsimile message to an electronic format for electronically mailing to one or more email addresses.

6. The system of claim 5, wherein said means for transmitting comprises a software program operative to convert an email message to a format suitable for reception by a facsimile machine.

7. The system of claim 5, wherein said means for transmitting comprises a facsimile machine operated in transmit mode.

8. The system of claim 5, wherein said means for converting includes at least one of a barcode reader and an optical character recognition device.

9. The system of claim 5, wherein said machine-readable code in said header is further representative of the email address at which said incoming message originated.

10. A machine-readable message header for automatic routing of a message between two or more entities, including error correctable and coded data relating to the routing of said message, wherein said message header is for routing said message exclusively between said entities.

11. The machine-readable message header of claim 10, wherein said entities are each selected from the group consisting of:

a user;
a database;
a machine;
a network; and
a network-connected device.

12. The machine-readable message header of claim 10, wherein said coded data is rendered repeatedly.

13. The machine-readable message header of claim 10, wherein said header is repeatedly useable for routing messages exclusively between said entities.

14. The message header of claim 10, wherein said entities comprise a facsimile user and an email user.

15. The message header of claim 14, further including data selected from the group consisting of:

the sender's name;
the sender's facsimile number;
the senders's email address;
the service provider's facsimile number;
the recipient's email address;
a subject line;
the date sent;
the date received;
user profile information;
billing information;
special promotional information; and

targeted advertising.

16. A cover page for automatic routing of a facsimile message between two or more entities, including at least one representation of a machine-readable message header, said message header including error correctable and coded data relating to the routing of said message, wherein said cover page is insertable, independently of direction and in any page position of said facsimile message, and is for routing said message exclusively between said entities.

17. The cover page of claim 16, wherein said entities are each selected from the group consisting of:

a user;

a machine;

a database;

a network; and

a network-connected device.

18. The cover page of claim 16, wherein said coded data is rendered repeatedly on said cover page.

19. The cover page of claim 16, wherein said header is repeatedly useable for routing messages exclusively between said entities.

20. The cover page of claim 16, wherein said cover page comprises a cover sheet.

21. A method for delivery, by a service provider, of email messages to a facsimile apparatus of a subscriber to the delivery service, said method including the steps of:

assigning a unique email address to said subscriber, wherein said email address is associated with a facsimile number of said subscriber;

upon receipt of an email message at said unique email address:

retrieving and storing the email address of the sender of said email message;

converting the format of said email message to a facsimile message format;

generating a cover page for said facsimile message, wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said

message and said cover page insertable independently of direction and in any page position of said facsimile message; and

forwarding said facsimile message together with said cover page to said facsimile apparatus of said subscriber.

22. The method of claim 21, wherein said coded data is rendered repeatedly on said cover page.

23. The method of claim 21, wherein said cover page is repeatedly useable for routing messages exclusively between said sender of said email message and said subscriber.

24. A method for delivery of facsimile messages from a subscriber to one or more destination email addresses, by a service provider, said method including the steps of:

extracting data from a cover page of said facsimile message and retrieving said one or more destination email addresses;

converting the format of said facsimile message to an email message format; and

sending the converted format message to said one or more destination email addresses;

wherein said cover page includes one or more representations of a machine-readable message header, said message header including error correctable and coded data relating to the routing of said message and said cover page insertable independently of direction and in any page position of said facsimile message.

25. The method of claim 24, wherein said coded data is rendered repeatedly on said cover page.

26. The method of claim 24, wherein said cover page is repeatedly useable for routing messages exclusively between said subscriber and said one or more destination email addresses.

27. A method of acquiring new subscribers to a service whereby email can be sent and received by use of a facsimile apparatus, said method including the steps of:

receiving a request from an email user seeking to send email messages to a facsimile user;

assigning an email address to said requested facsimile user and associating said email address with a facsimile number of said facsimile user; and

sending a promotional message to said facsimile user.

28. The method of claim 27, wherein said promotional message is sent in the name of said email user.

29. The method of claim 27, wherein said promotional message includes notification of a limited period free trial of said service.

30. The method of claim 27, including the further step of sending a promotional message to said email user, wherein said message includes notification of said email address assigned to said facsimile user.

31. A system for delivery, by a service provider, of email messages to a facsimile apparatus of a subscriber to the delivery service, including:

means for assigning a unique email address to said subscriber, wherein said email address is associated with a facsimile number of said subscriber;

means for retrieving and storing the email address of the sender of an email message;

means for converting the format of said email message to a facsimile message format;

means for generating a cover page for said facsimile message, wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message; and

means for forwarding said facsimile message together with said cover page to said facsimile apparatus of said subscriber.

32. The system of claim 31, wherein said coded data is rendered repeatedly on said cover page.

33. The system of claim 31, wherein said cover page is repeatedly useable for routing messages exclusively between said sender of said email message and said subscriber.

34. A system for delivery of facsimile messages from a subscriber to one or more destination email addresses, by a service provider, including:

means for extracting data from a cover page of said facsimile message and retrieving the one or more destination email addresses;

means for converting the format of said facsimile message to an email message format; and

means for sending the converted format message to said one or more destination email addresses;

wherein said cover page includes one or more representations of a machine-readable message header, said message header including error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message.

35. The system of claim 34, wherein said coded data is rendered repeatedly on said cover page.

36. The system of claim 34, wherein said cover page is repeatedly useable for routing messages exclusively between said subscriber and said destination email addresses.

37. A system for acquiring new subscribers to a service whereby email can be sent and received by use of a facsimile apparatus, including:

means for receiving a request from an email user seeking to send email messages to a facsimile user;

means for assigning an email address to said requested facsimile user and associating said email address with a facsimile number of said facsimile user; and

means for sending a promotional message to said facsimile user.

38. The system of claim 37, wherein said promotional message is sent in the name of said email user.

39. The system of claim 37, wherein said promotional message includes notification of a limited period free trial of said service.

40. The system of claim 37 further including means for sending a promotional message to said email user, wherein said message includes notification of said email address assigned to said facsimile user.

41. A computer program product incorporating a computer readable medium having a computer program recorded therein for delivery, by a service provider, of email messages to a facsimile apparatus of a subscriber to the delivery service, said computer program product including:

computer program code means for assigning a unique email address to said subscriber, wherein said email address is associated with a facsimile number of said subscriber;

computer program code means for retrieving and storing the email address of the sender of said email message;

computer program code means for converting the format of said email message to a facsimile message format;

computer program code means for generating a cover page for said facsimile message, wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message; and

computer program code means for forwarding said facsimile message together with said cover page to said facsimile number of said subscriber.

42. The computer program product of claim 41, wherein said coded data is rendered repeatedly on said cover page.

43. The computer program product of claim 41, wherein said cover page is repeatedly useable for routing messages exclusively between said sender of said email message and said subscriber.

44. A computer program product incorporating a computer readable medium having a computer program recorded therein for delivery of facsimile messages from a subscriber to one or more destination email addresses, by a service provider, said computer program product including:

computer program code means for extracting data from said cover page and retrieving the one or more destination email addresses;

computer program code means for converting the format of said facsimile message to an email message format; and

computer program code means for sending the converted format message to said one or more destination email addresses;

wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile.

45. The computer program product of claim 44, wherein said coded data is rendered repeatedly on said cover page.

46. The computer program product of claim 44, wherein said cover page is repeatedly useable for routing messages exclusively between said subscriber and said one or more destination email addresses.

47. A computer program product incorporating a computer readable medium having a computer program recorded therein for acquiring new subscribers to a service whereby email can be sent and received by use of a facsimile apparatus, said computer program product including:

computer program code means for receiving a request from an email user seeking to send email messages to a facsimile user;

computer program code means for assigning an email address to a requested facsimile user and associating said email address with a facsimile number of said facsimile user; and

computer program code means for sending a promotional message to said facsimile user.

48. The computer program product of claim 47, wherein said promotional message is sent in the name of said email user.

49. The computer program product of claim 47, wherein said promotional message includes notification of a limited period free trial of said service.

50. The computer program product of claim 47, further including computer program code means for sending a promotional message to said email user, wherein said message includes notification of said email address assigned to said facsimile user.

51. A method for delivery, by a service provider, of a facsimile message under cover of a cover page, said facsimile message from a first facsimile user to one or more additional facsimile users, said method including the steps of:

receiving, by said service provider, said facsimile message from said first facsimile user;

forwarding, by said service provider, said message via the Internet; and

delivering, by said service provider, said facsimile message to said one or more additional facsimile users;

wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message.

52. The method of claim 51, wherein said coded data is rendered repeatedly on said cover page.

53. The method of claim 51, wherein said cover page is repeatedly useable for routing messages exclusively between said first facsimile user and said additional facsimile users.

54. A system for delivery, by a service provider, of a facsimile message under cover of a cover page, said facsimile message from a first facsimile user to one or more additional facsimile users, said system including:

means for receiving, by said service provider, said facsimile message from said first facsimile user;

means for forwarding, by said service provider, said message via the Internet; and

means for delivering, by said service provider, said facsimile message to said one or more additional facsimile users;

wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data

relating to the routing of said message and said cover page is insertable, independently of direction and in any page position of said facsimile message.

55. The system of claim 54, wherein said coded data is rendered repeatedly on said cover page.

56. The system of claim 54, wherein said cover page is repeatedly useable for routing messages exclusively between said first facsimile user and said additional facsimile users.

57. A computer program product incorporating a computer readable medium having a computer program recorded therein for delivery, by a service provider, of a facsimile message under cover of a cover page, said facsimile message from a first facsimile user to one or more additional facsimile users, said computer program product including:

computer program code means for receiving, by said service provider, said facsimile message from said first facsimile user;

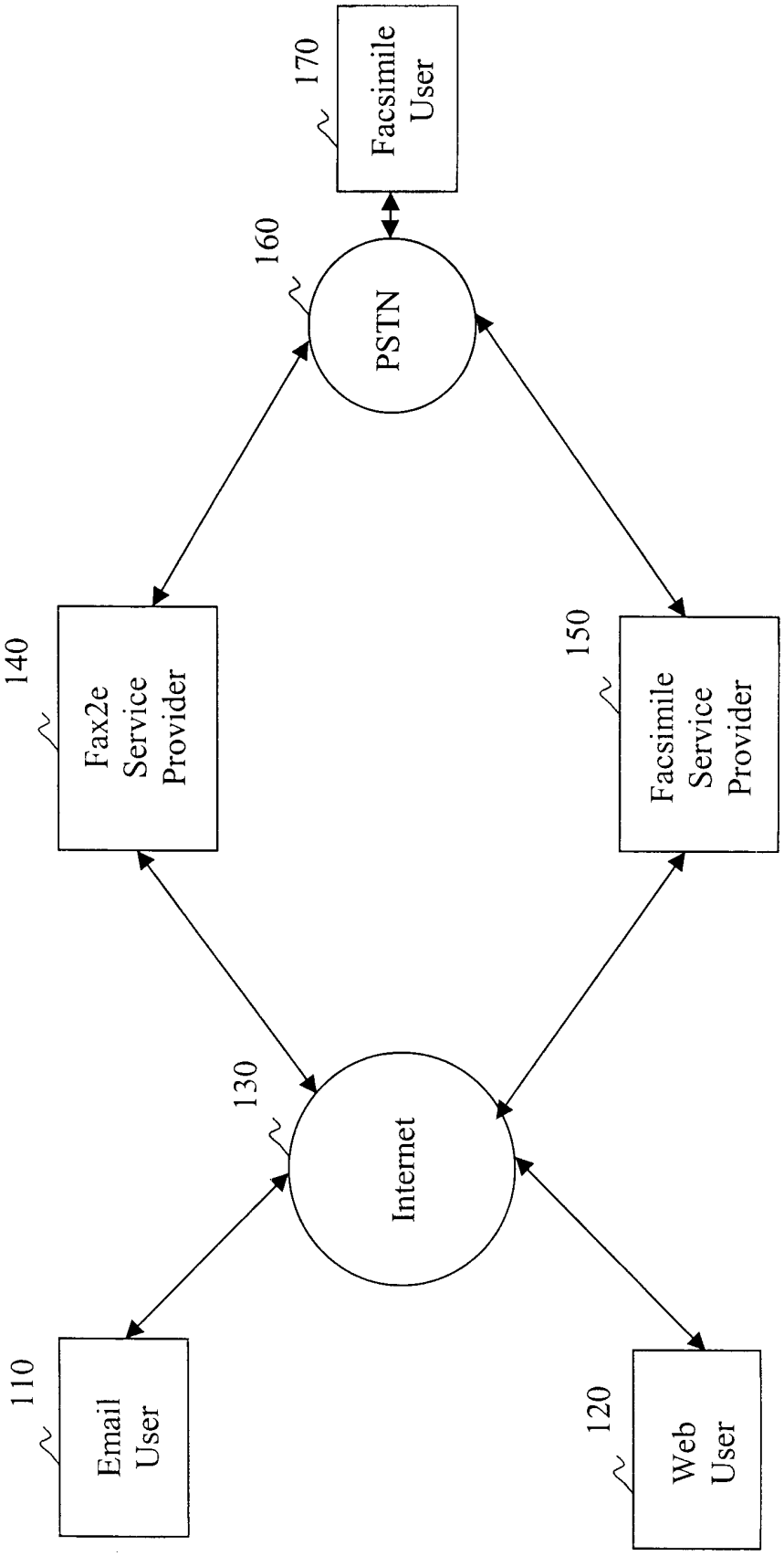
computer program code means for forwarding,by said service provider, said message via the Internet; and

computer program code means for delivering, by said service provider, said facsimile message to said one or more additional facsimile users;

wherein said cover page includes one or more representations of a machine-readable message header, said message header includes error correctable and coded data relating to the routing of said message and said cover page is insertable independently of direction and in any page position of said facsimile message.

58. The computer program product of claim 57, wherein said coded data is rendered repeatedly on said cover page.

59. The computer program product of claim 57, wherein said cover page is repeatedly useable for routing messages exclusively between said said first facsimile user and said additional facsimile users.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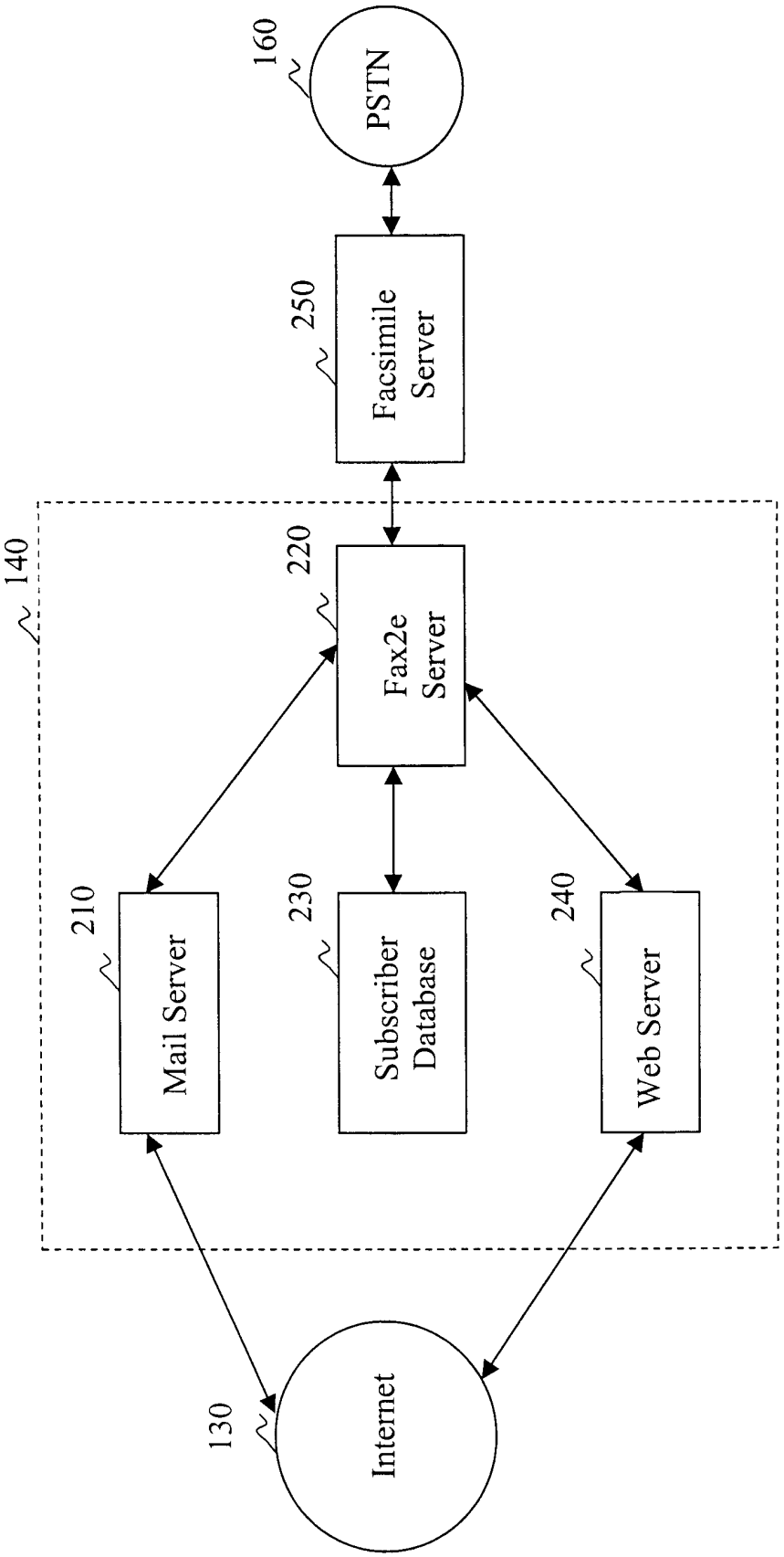
Facsimile User
160
PSTN
140
Fax2e Service Provider
150
Facsimile Service Provider
130
Internet
110
Email User
120
Web User

Fig. 1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PSTN
250
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220
Fax2e Server
210
Mail Server
230
Subscriber Database
240
Web Server
130
Internet

Fig. 2

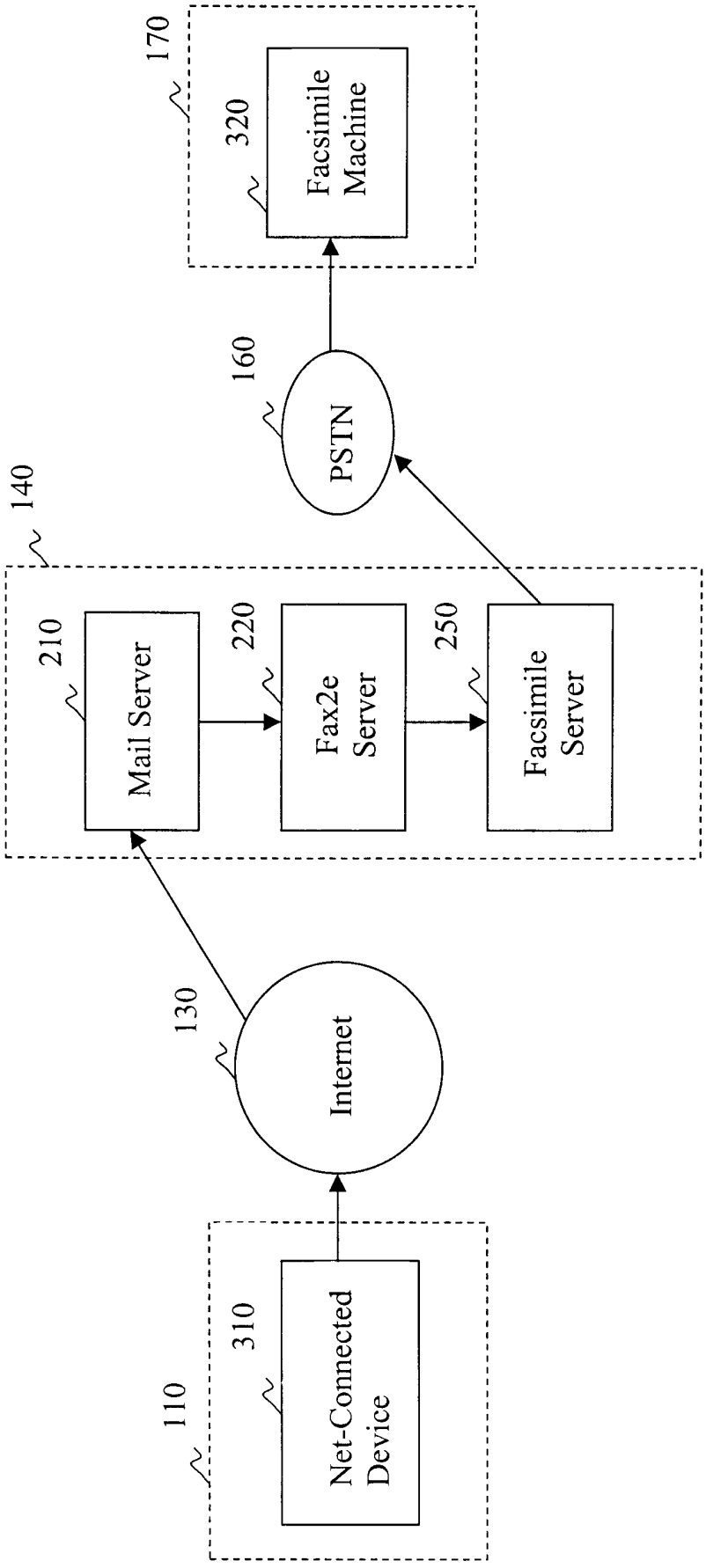

170
320
Facsimile Machine
160
PSTN
140
210
Mail Server
220
Fax2e Server
250
Facsimile Server
130
Internet
110
310
Net-Connected Device

Fig. 3

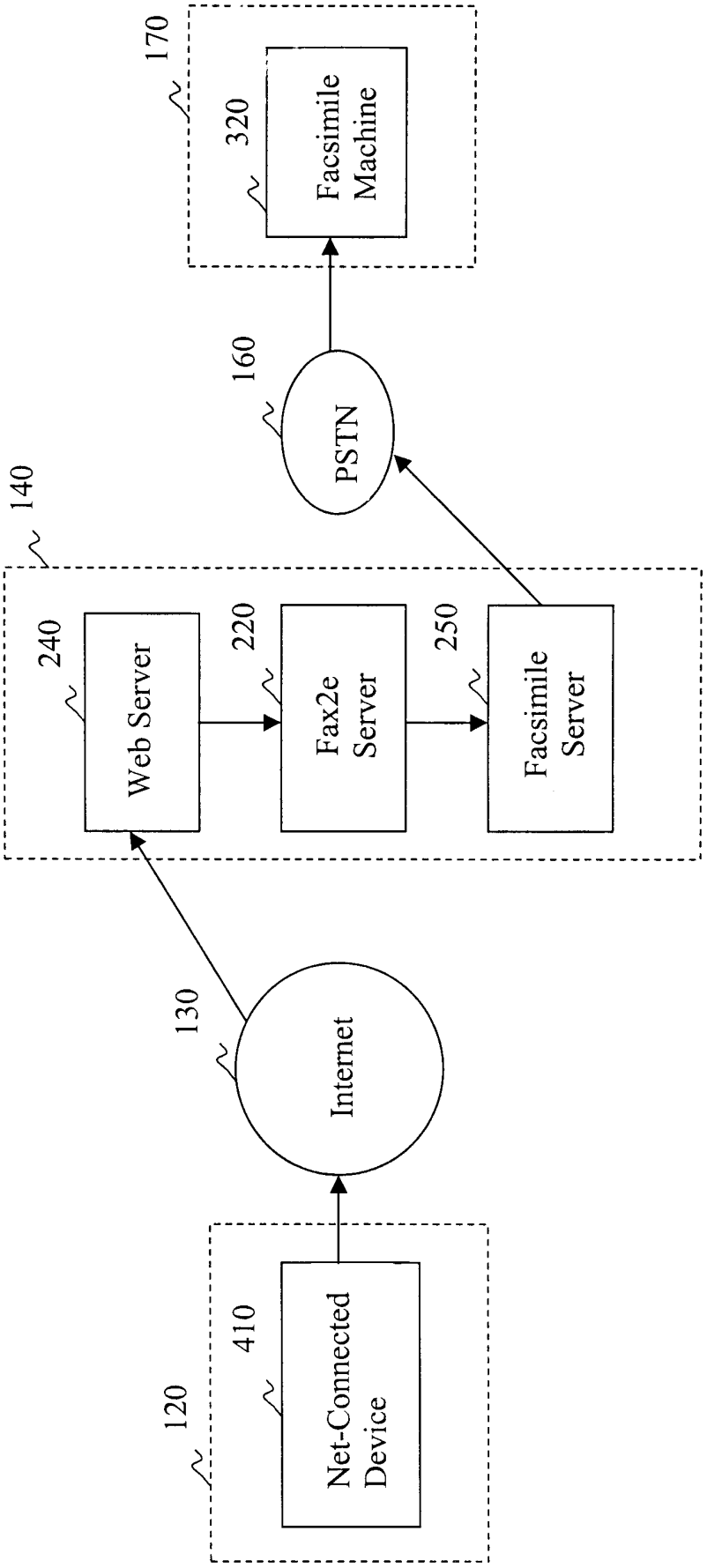

170
320
Facsimile Machine
160
PSTN
140
240
Web Server
220
Fax2e Server
250
Facsimile Server
130
Internet
120
410
Net-Connected Device

Fig. 4

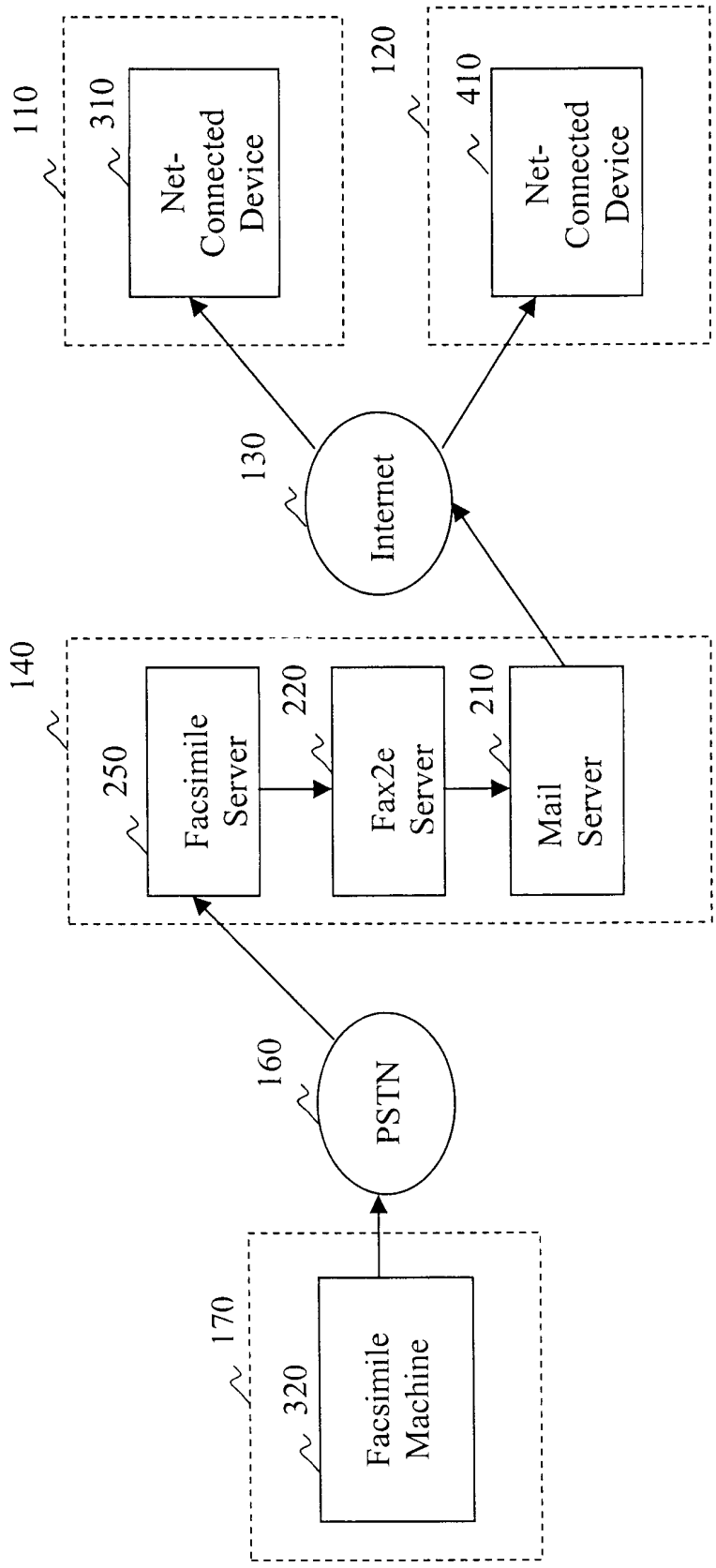
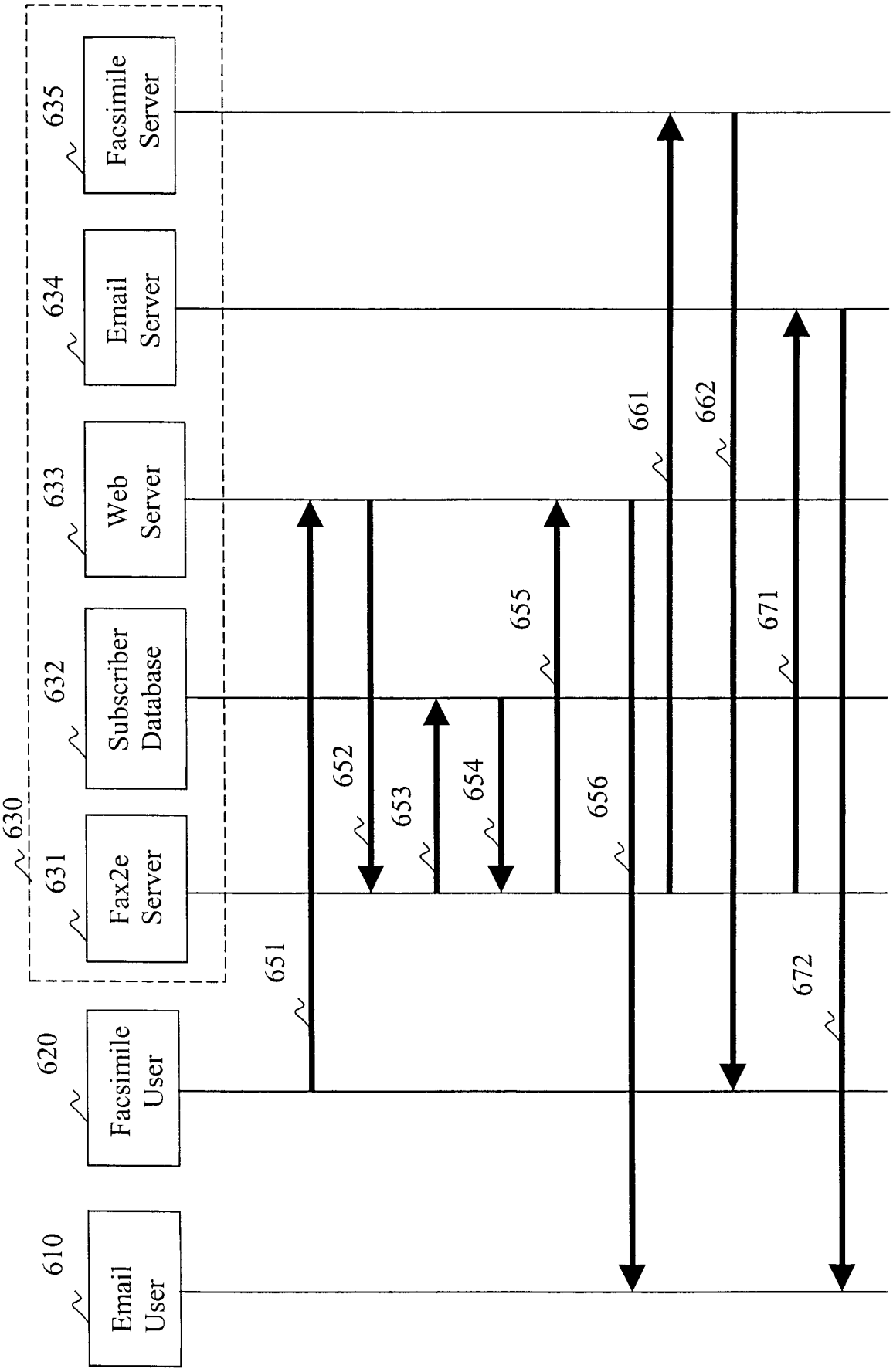

110
310
Net-Connected Device
120
410
Net-Connected Device
130
Internet
140
250
Facsimile Server
220
Fax2e Server
210
Mail Server
160
PSTN
170
320
Facsimile Machine

Fig. 5


610
Email User
620
Facsimile User
630
631
Fax2e Server
632
Subscriber Database
633
Web Server
634
Email Server
635
Facsimile Server
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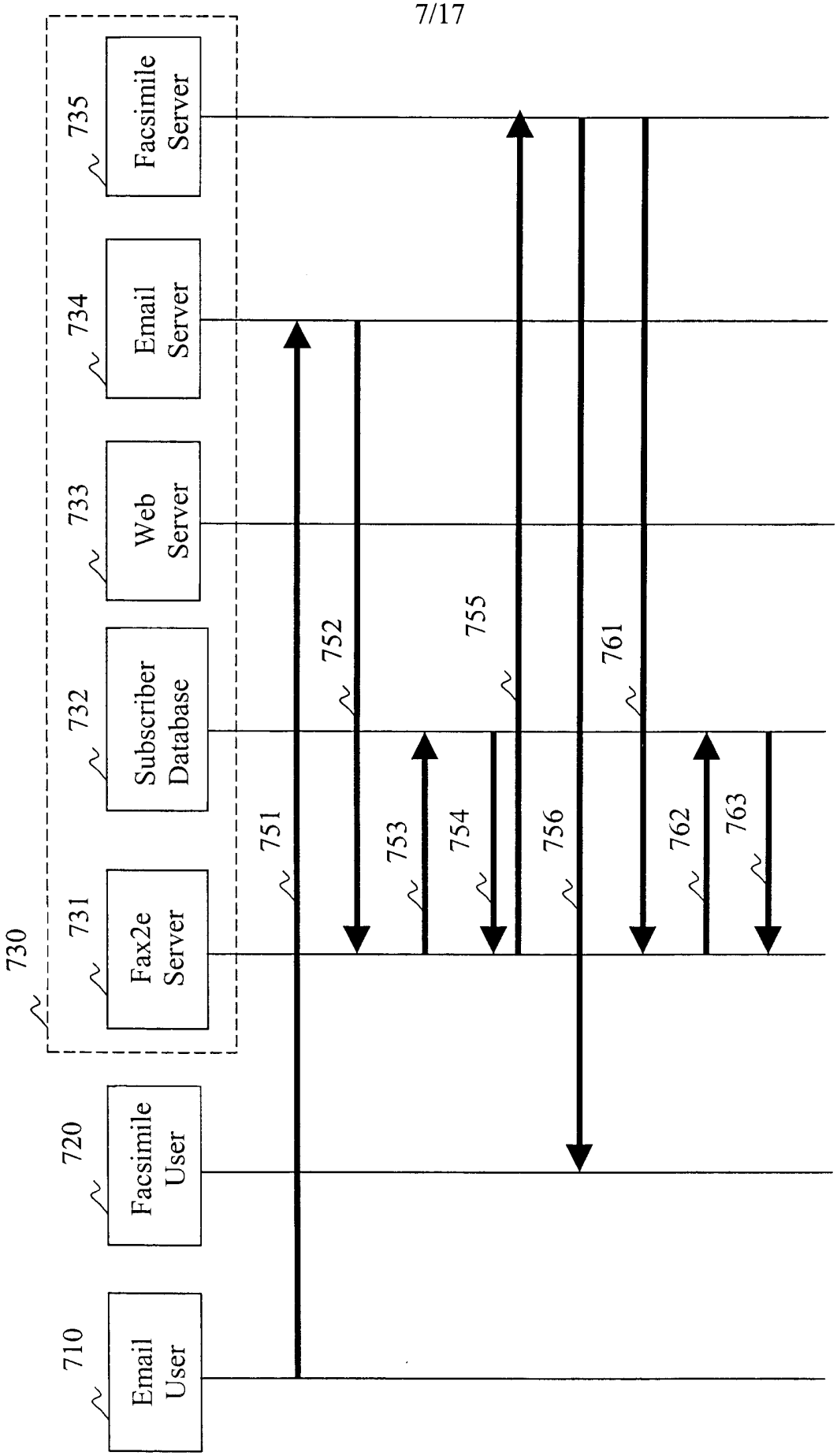
653
654
655
656
661
662
671
672

Fig. 6


730
731
Fax2e Server
732
Subscriber Database
733
Web Server
734
Email Server
735
Facsimile Server
710
Email User
720
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752
753
754
755
756
761
762
763

Fig. 7

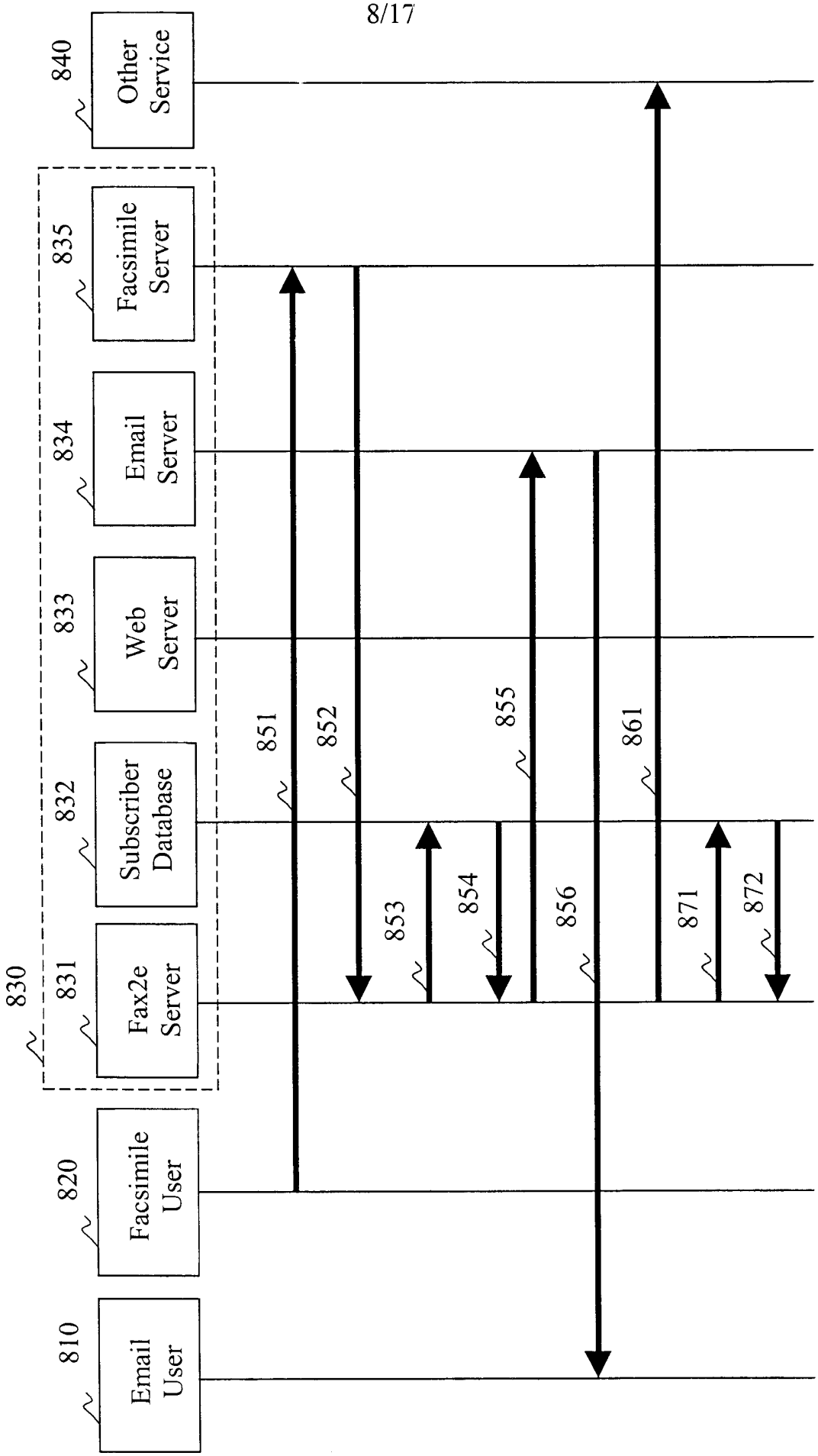
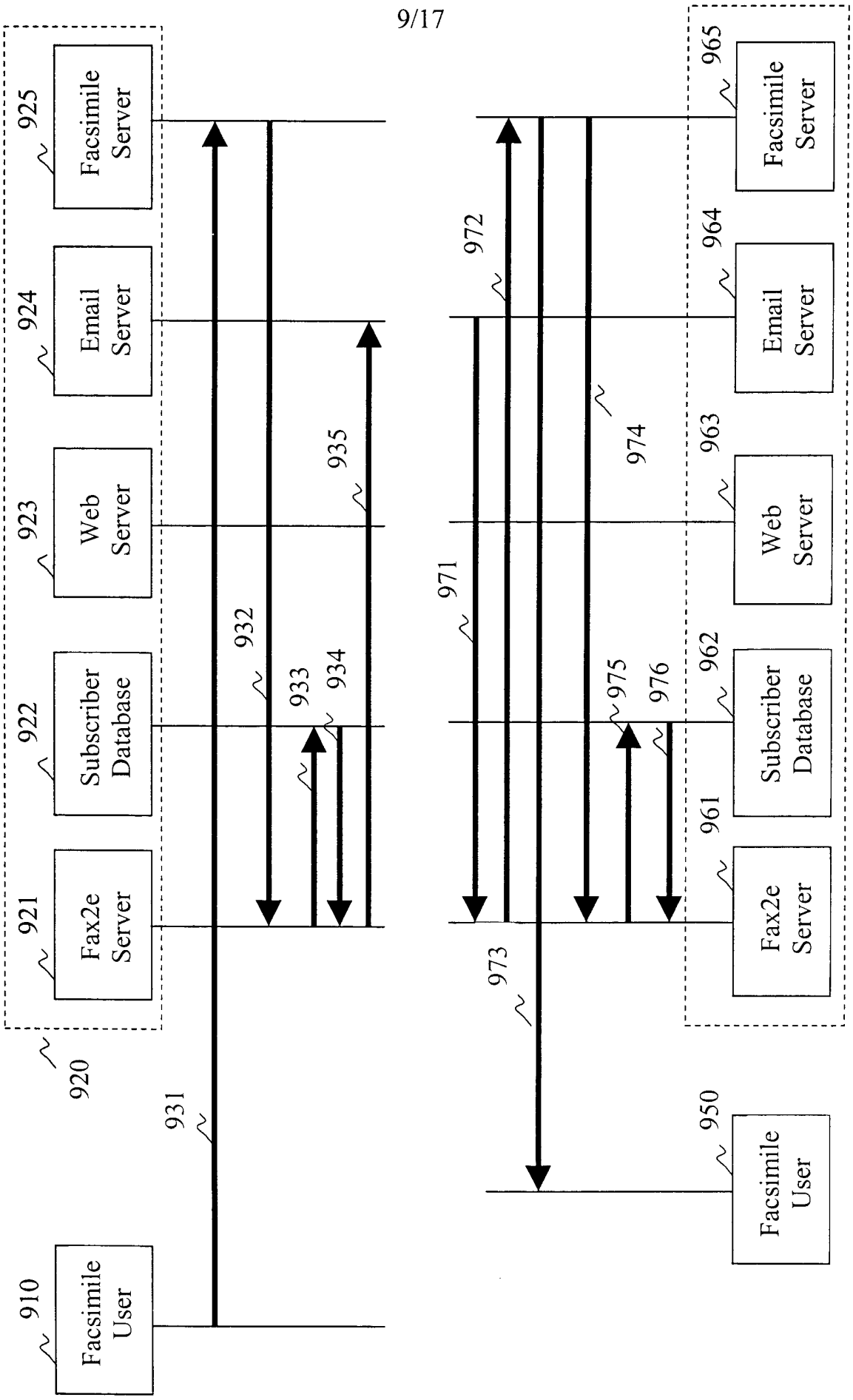

Email User
810
Facsimile User
820
830
Fax2e Server
831
Subscriber Database
832
Web Server
833
Email Server
834
Facsimile Server
835
Other Service
840
851
852
853
854
855
856
861
871
872

Fig. 8


910
Facsimile User
920
921
Fax2e Server
922
Subscriber Database
923
Web Server
924
Email Server
925
Facsimile Server
931
932
933
934
935
950
961
Fax2e Server
962
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975
976

Fig. 9

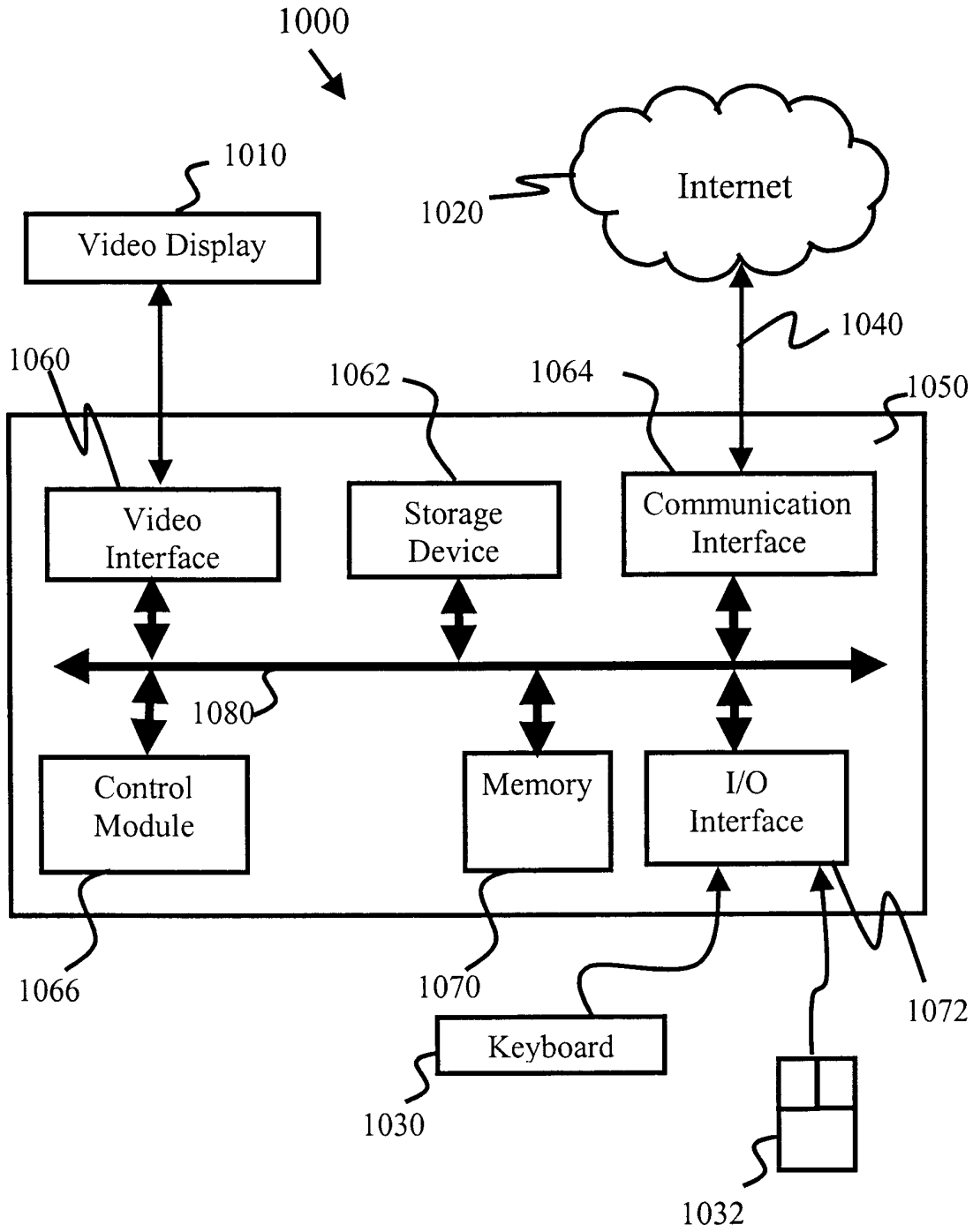

1000
1010
Video Display
1020
Internet
1040
1060
1062
1064
1050
Video Interface
Storage Device
Communication Interface
1080
Control Module
Memory
I/O Interface
1066
1070
1072
Keyboard
1030
1032

Fig. 10

From NothingSetup Mon 22 Jan 2001 04:05:59 PM EST Page 1 of 1

ECOMECOMECOMECOMECOMECOMECOMECOMECOMEC(
K17A7747558X17A7747558X17A7747558X17A7747558X17A7747558)

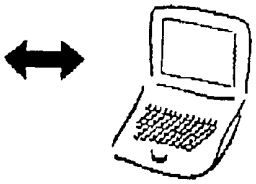
To: Rob Manson-Pollard fax2e

From: R M UT

This fax machine is now email ready!

Fax Machine

Computer



Now you won't be left behind by all the people who prefer email.

Dear Rob

I've set up a 30 day FREE trial for you with this great new service.

The email address they have assigned for your Fax Machine is:

61293574293@fax2e.com

To take advantage of this 30 Day FREE trial, follow the 3 easy steps below:

Step 1 Write me a note on a separate sheet of paper

Step 2 Fax this Fax2e Page along with your note to 1300 13 60 11

Step 3 Fax2e will automatically turn your note into an email & send it back to me.

FAX BACK THIS PAGE TO ACTIVATE YOUR 30 DAY FREE TRIAL RIGHT NOW!

REMEMBER: Anything you can fax, you can now email using Fax2e.

Any questions? Call fax2e on 1300 13 60 22

Powered by Unified [tele.com] A division of e.COM Global Limited

X17A7747558X17A7747558X17A7747558X17A7747558X17A7747558
ECOMECOMECOMECOMECOMECOMECOMECOMECOMEC

Fig. 11

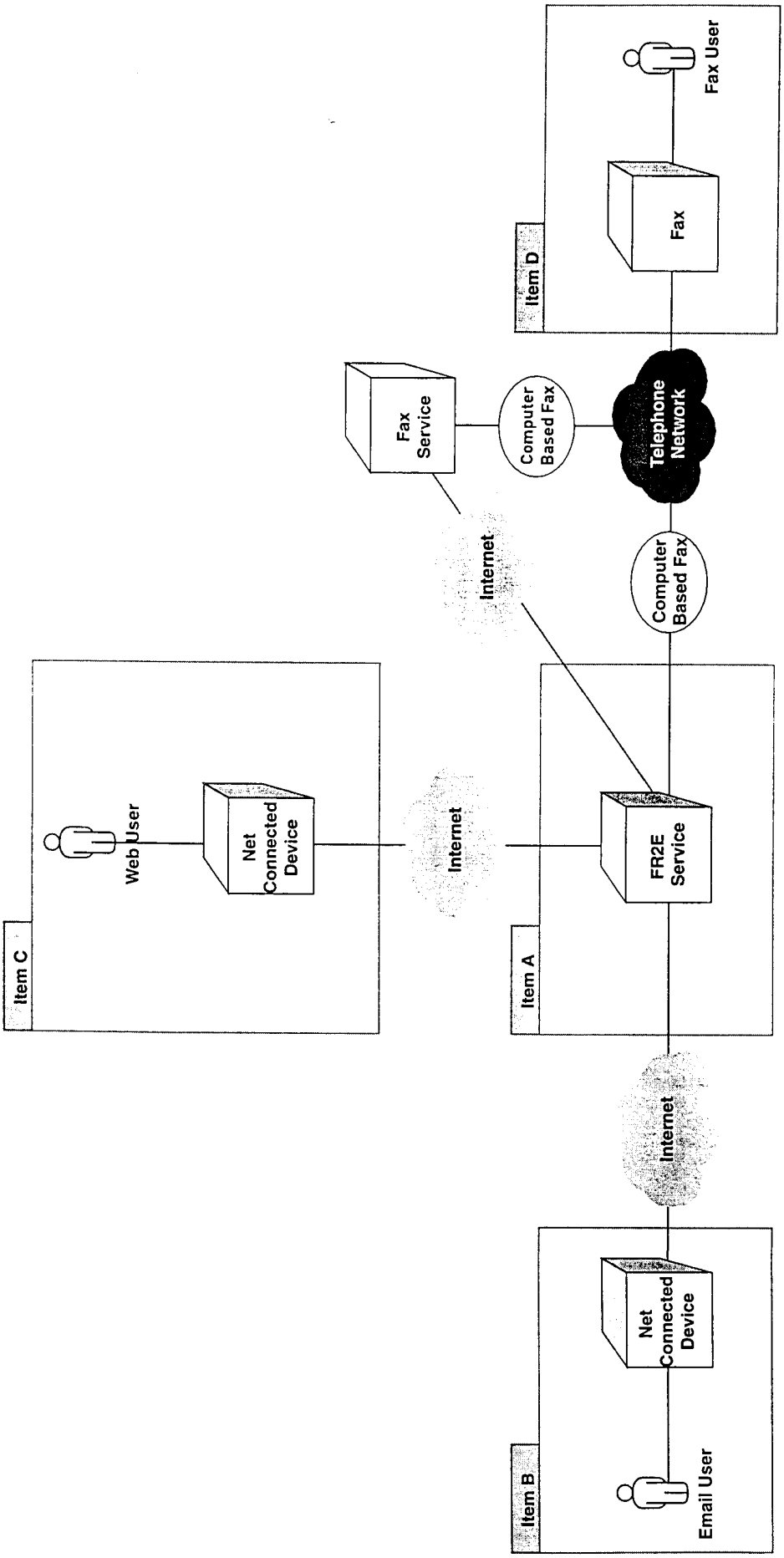

Item C
Web User
Net Connected Device
Internet
Item A
FR2E Service
Computer Based Fax
Internet
Fax Service
Computer Based Fax
Telephone Network
Item D
Fax User
Fax
Internet
Item B
Net Connected Device
Email User

Fig. 12

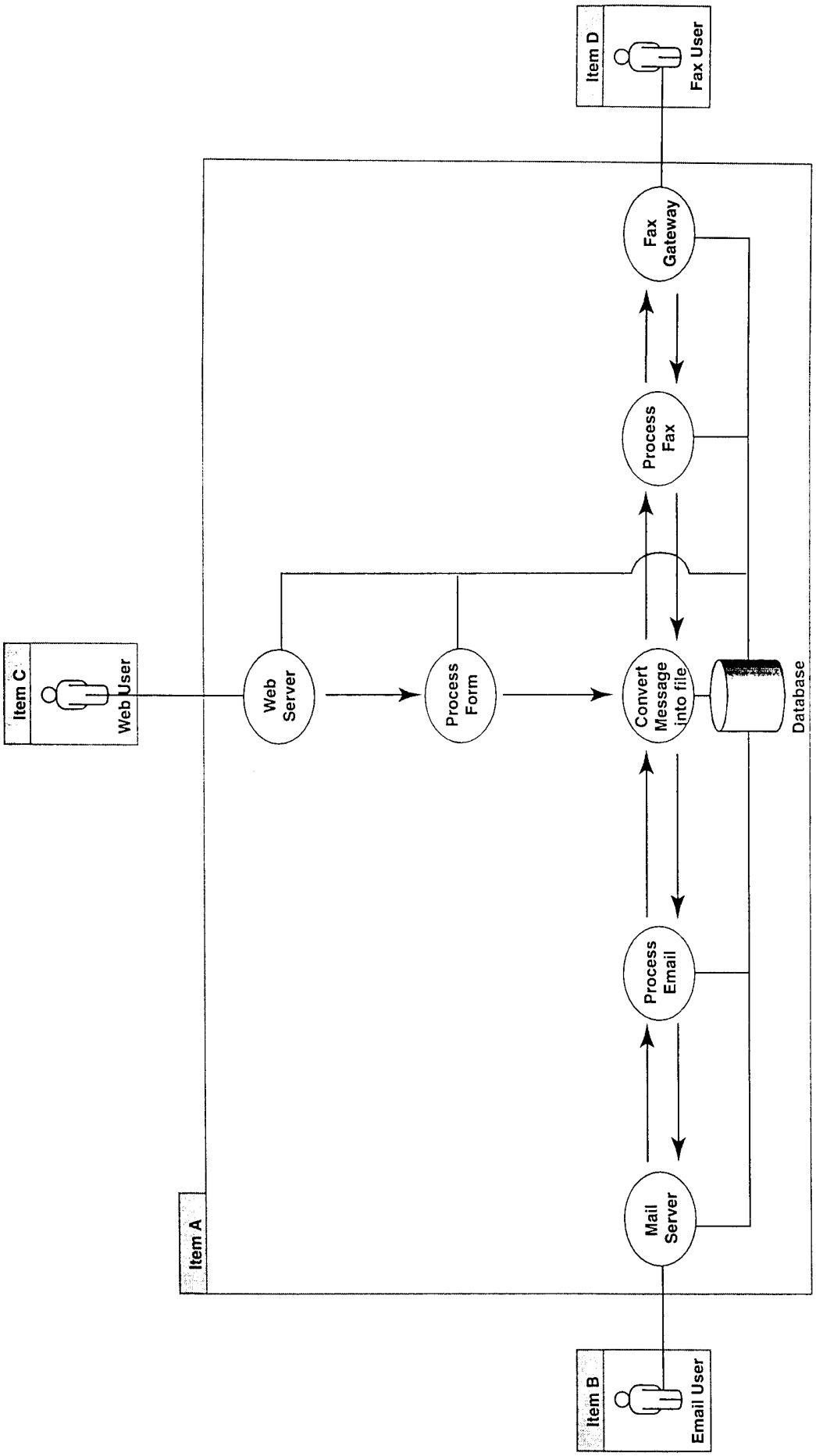

Item D
Fax User
Fax Gateway
Process Fax
Item C
Web User
Web Server
Process Form
Convert Message into file
Database
Process Email
Item A
Mail Server
Item B
Email User

Fig. 13

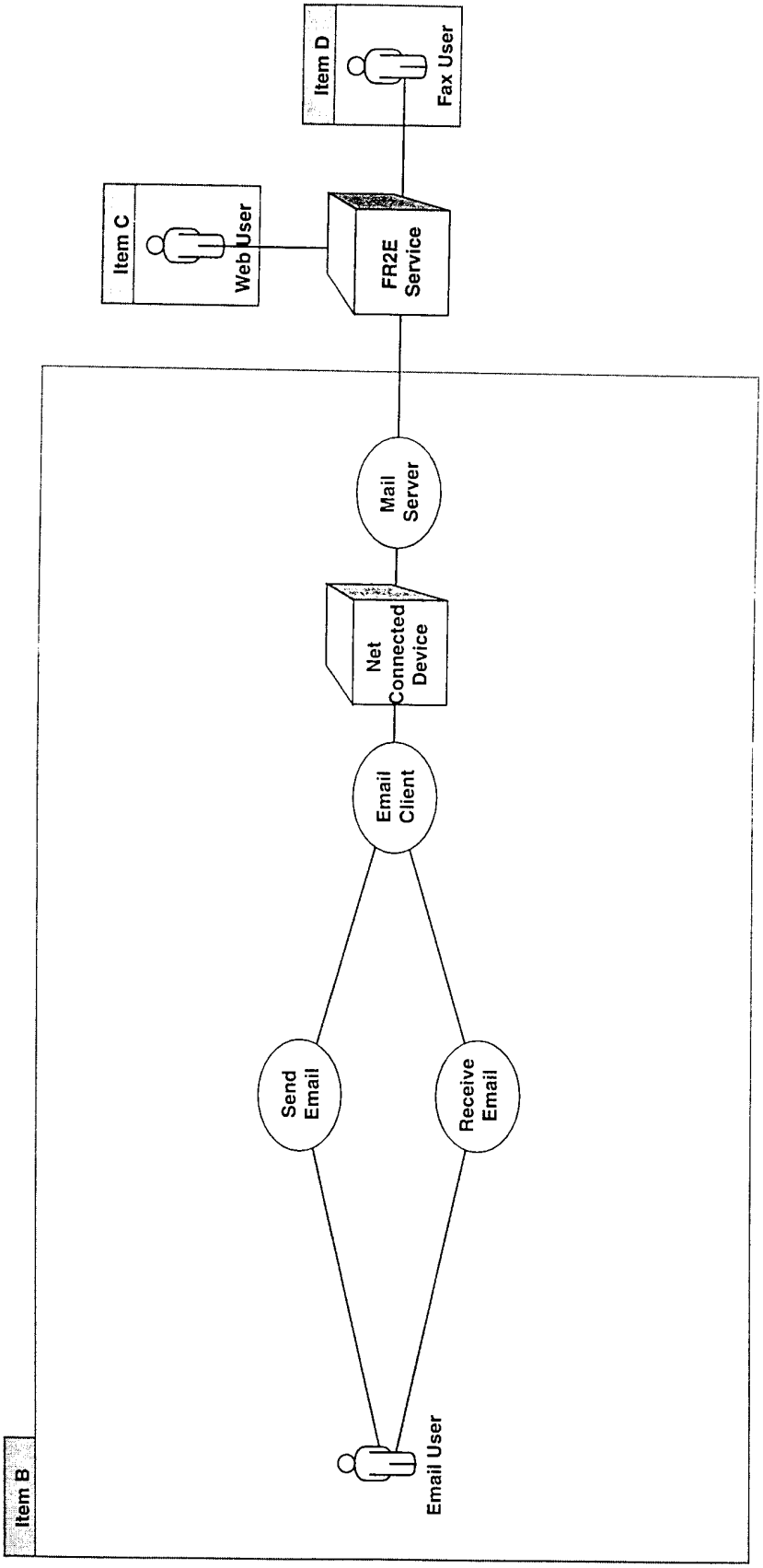

Item D
Fax User
Item C
Web User
FR2E Service
Mail Server
Net Connected Device
Email Client
Send Email
Receive Email
Email User
Item B

Fig. 14

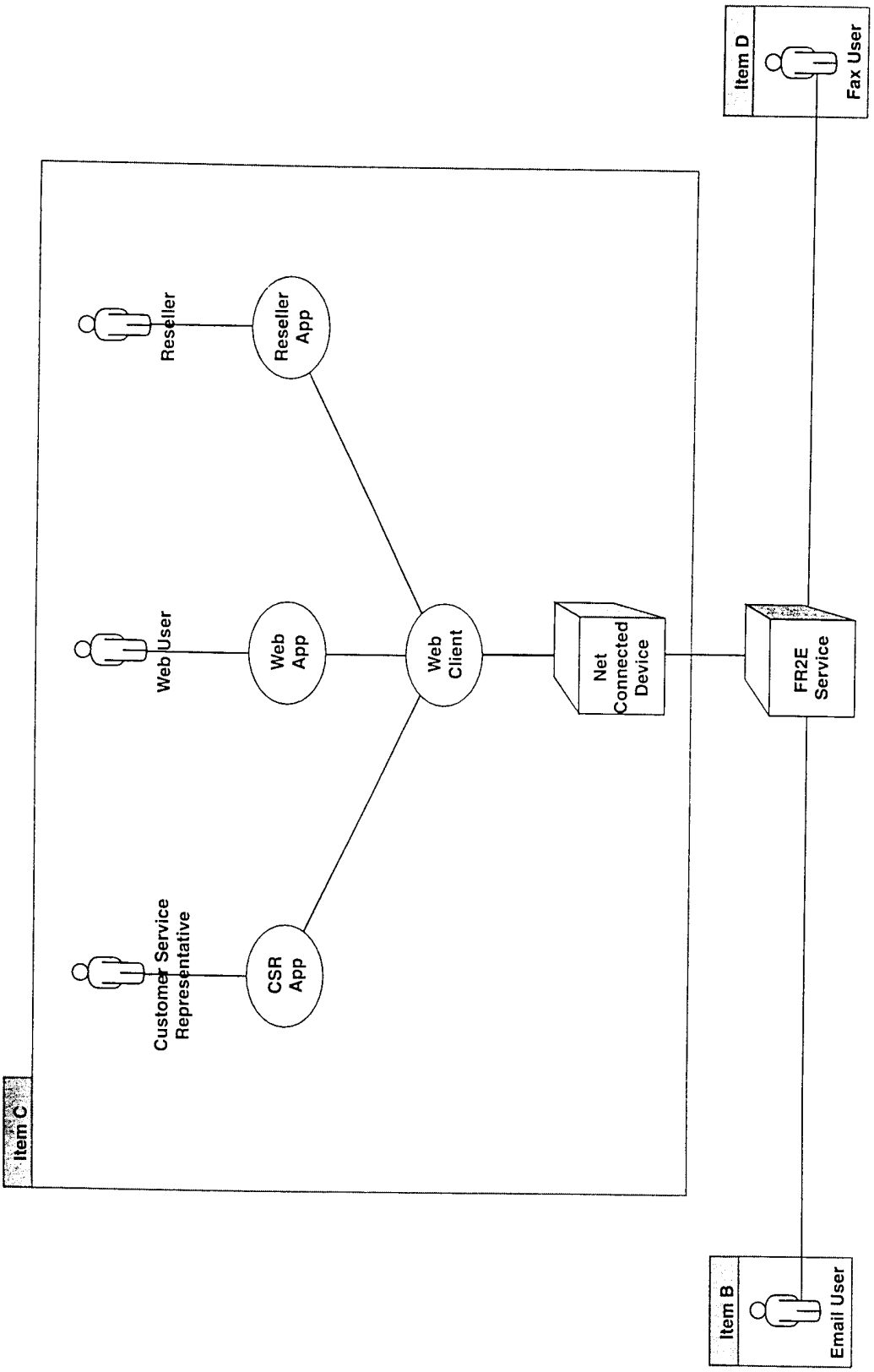

Item D
Fax User
Item C
Reseller
Reseller App
Web User
Web App
Web Client
Net Connected Device
FR2E Service
Customer Service Representative
CSR App
Item B
Email User

Fig. 15

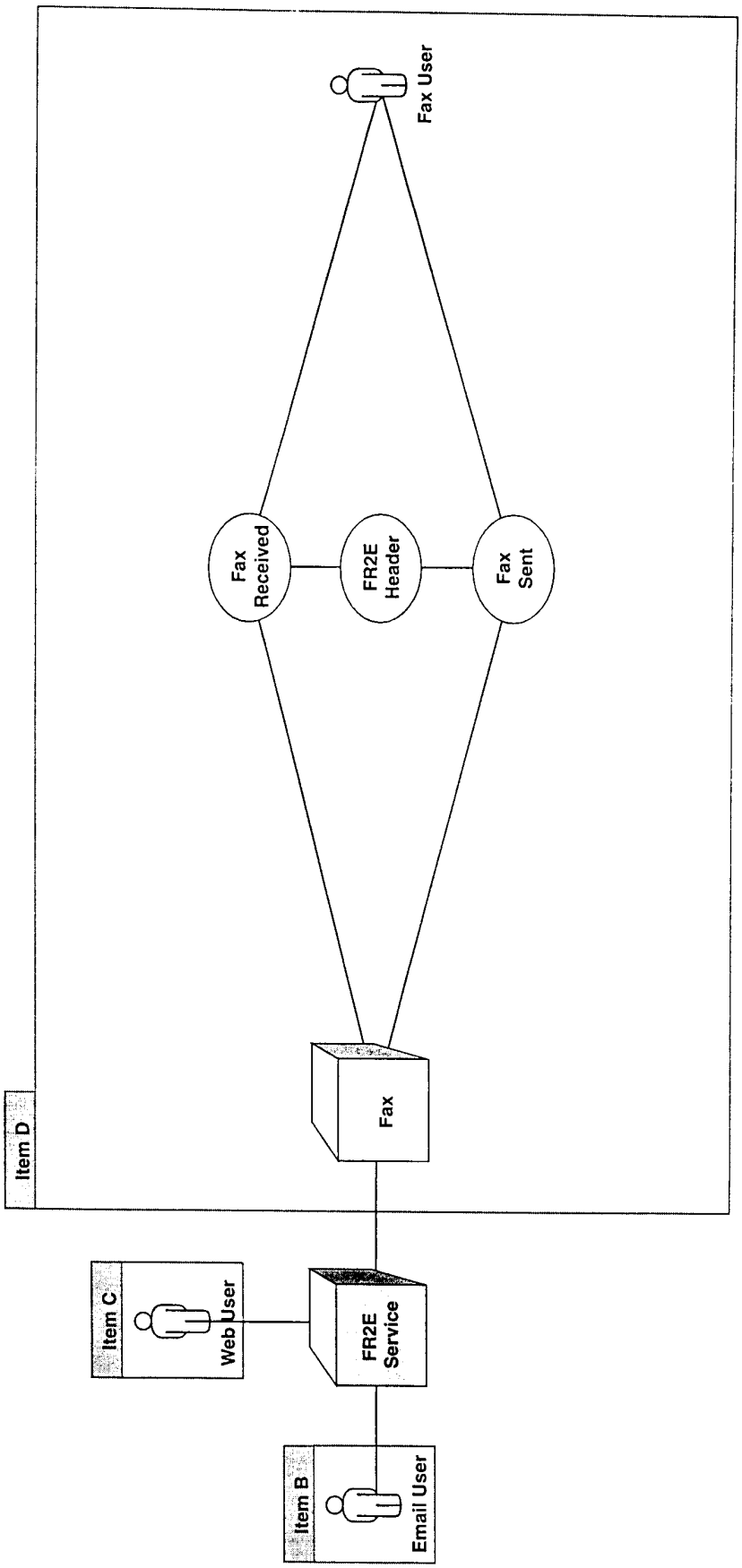
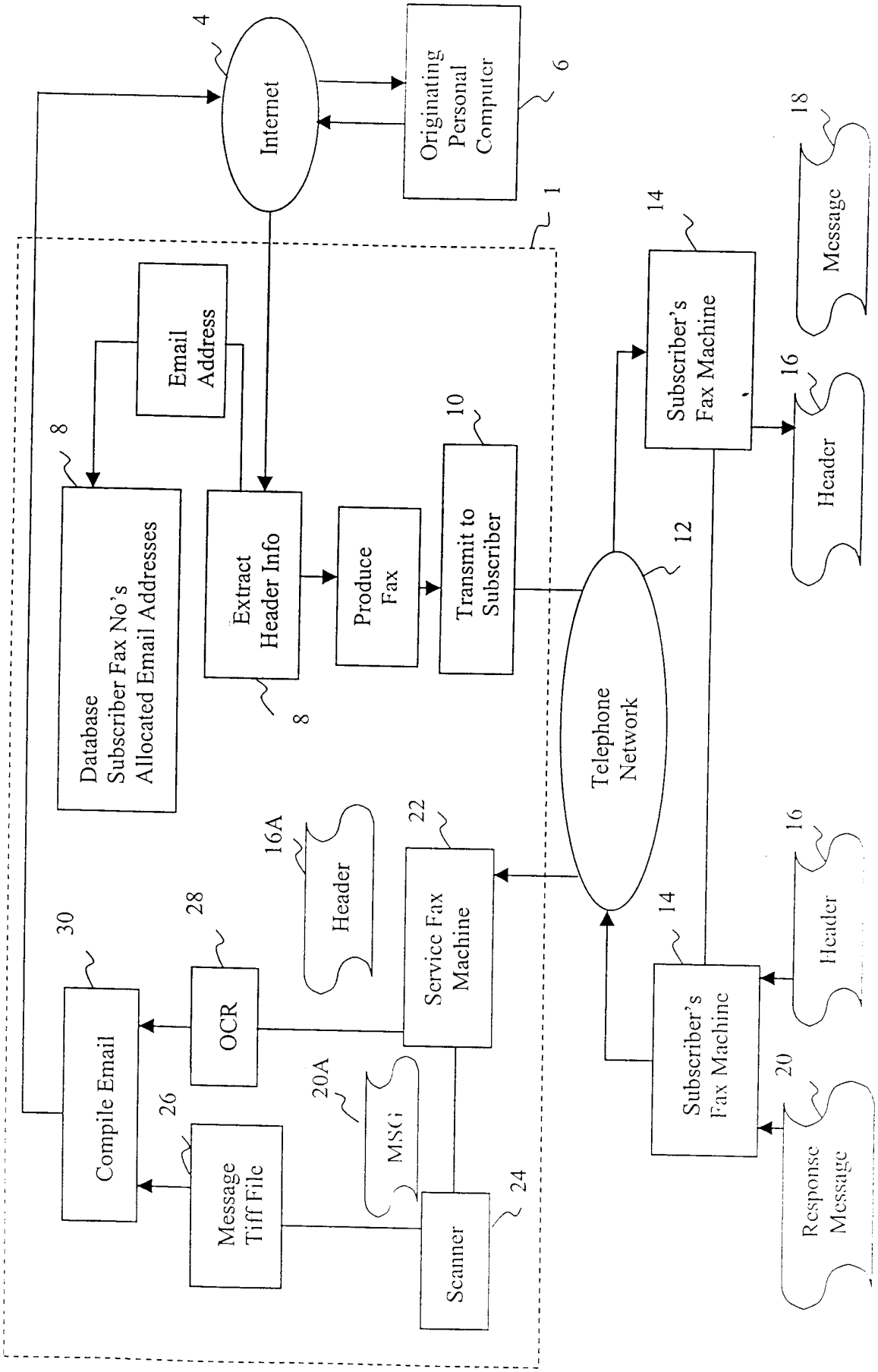

Fax User
Fax Received
FR2E Header
Fax Sent
Item D
Fax
Item C
Web User
FR2E Service
Item B
Email User

Fig. 16


Internet
4
Originating Personal Computer
6
1
Email Address
8
Database Subscriber Fax No's Allocated Email Addresses
Extract Header Info
8
Produce Fax
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10
Telephone Network
12
Subscriber's Fax Machine
14
Header
16
Message
18
16A
Header
Service Fax Machine
22
28
OCR
30
Compile Email
26
Message Tiff File
20A
MSG
Scanner
24
Subscriber's Fax Machine
14
Header
16
20
Response Message

Fig. 17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU01/00133

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7] H04N 1/32, 1/42, G06F 17/60

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC : H04N 1/32, 1/42, G06F 17/60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPAT, USPTO, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6020980 A (Freeman) 1 February 2000 Whole Document	1-59
X	US 6005677 A (Suzuki) 21 December 1999 Whole Document	1-59
X	US 5940478 A (Vaudreuil et al) 17 August 1999 Whole Document	1-50

[X] Further documents are listed in the continuation of Box C [X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 May 2001	1 June 2001
Name and mailing address of the ISA/AU	Authorized officer
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	**R.H. STOPFORD** Telephone No (02) 6283 2177

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU01/00133

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5920404 A (Weiser) 6 July 1999 Whole Document	1-59
X	US 5881233 A (Toyoda et al) 9 March 1999 Whole Document	1-9, 21-50
X	US 5872845 A (Feder) 16 February 1999 Whole Document	1-59
X	US 5862202 A (Bashoura et al) 19 January 1999 Whole Document	1-9, 21-26, 31-36, 41-46, 51-59
X	US 5812278 A (Toyoda et al) 22 September 1998 Whole Document	1-9, 21-59
X	US 5793972 A (Shane) 11 August 1998 Whole Document	27-30, 37-40, 47-50
X	US 5530806 A (Condon et al) 25 June 1996 Whole Document	10-20
X	US 5115326 A (Burgess et al) 19 May 1992 Whole Document	1-9, 21-50
X	US 4314367 A (Bakka et al) 2 February 1982 Whole Document	10-20
X	US 4058838 A (Crager et al) 15 November 1977 Whole Document	10-20, 51-59
X	WO 99/21351 A1 (Adobe Systems Incorporated) 29 April 1999 Whole Document	1-59
X	WO 98/53603 A2 (E-Centric, Incorporated) 26 November 1998 Whole Document	1-9, 21-59

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU01/00133

C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/48568 A1 (Zebra Communications, Incorporated) 29 October 1998 Whole Document	1-9, 21-59
X	WO 98/13996 A1 (JS Data & Teleteknik) 2 April 1998 Whole Document	1-9, 21-50
X	WO 96/41463 A1 (David M Geshwind) 19 December 1996 Whole Document	1-59
X	EP 971527 A2 (Matsushita Graphic Communication Systems, Inc.) 12 January 2000 Whole Document	1-9, 21-59
X	EP 967779 A2 (Lucent Technologies Inc.) 29 December 1999 Whole Document	1-9, 21-59
X	EP 918413 A1 (Samsung Electronics CO., Ltd.) 26 May 1999 Whole Document	1-59
X	EP 836315 A2 (Ricoh Company, Ltd.) 15 April 1998 Whole Document	1-9, 21-59
X	"Real-Time IP Facsimile: Protocol and Gateway Requirements", Robert G. Tebbs, Bell Labs Technical Journal, Volume 4, Number 2, April-June 1999, pp 128-145. Whole Document	51-59

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU01/00133

Box I **Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :

because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos :

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos :

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II **Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

Continued on an extra sheet.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

Supplemental Box
(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: III

4. Claims 51-59 are directed to a method of delivery of facsimiles between facsimile machines over the Internet, wherein a cover page includes error correctable and coded data relating to the routing of the message.

It is considered that the delivery of facsimiles between facsimile machines over the Internet is the fourth special technical feature.

Since the above mentioned groups of claims do not share any of the special technical features identified, a "technical relationship" between the inventions, as defined in PCT rule 13.2 does not exist. Accordingly the international application does not relate to one invention or to a single inventive concept.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU01/00133

Supplemental Box
(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: III

The International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are **four** inventions:

1. Claims **1-9** are directed to a method of transferring messages between a facsimile machine and email address and vice versa. A service provider allocates an email address to a facsimile machine telephone number and provides facsimile message headers which include a representative email code in machine readable format.

The service provider upon receiving a facsimile message including a message header with representative email code, the email address is retrieved, the message is converted to an electronic file format and the converted message is electronically mailed to the retrieved email address.

The service provider upon receiving an email message directed to an email address which is allocated to a facsimile machine, extracts the return email address, generates a facsimile message header including representative email code and transmits the facsimile message header and email message to the facsimile machine.

Claims **21-23, 31-33, 41-43** are directed to a method wherein upon receiving an email message directed to an email address which is allocated to a facsimile machine, the return email address is extracted, a facsimile message header including representative email code is generated, and the facsimile message header (cover page) and email message is transmitted to the facsimile machine.

Claims **24-26, 34-36, 44-46** are directed to a method wherein upon receiving a facsimile message including a message header (cover page) with representative email code, the email address is retrieved, the message is converted to an electronic file format and the converted message is electronically mailed to the retrieved email address.

It is considered that the use of a machine readable representative email code in the transmitted messages between facsimile machines and email addresses is the first special technical feature.

2. Claims **10-20** are directed to a machine readable message header for automatic exclusive routing of a message between entities, wherein the message includes error correctable and coded data relating to the routing of the message.

It is considered that the provision of a machine readable message header for automatic exclusive routing of a message between entities is the second special technical feature.

3. Claims **27-30, 37-40, 47-50** are directed to a method wherein an email user requests the ability to send an email to a facsimile user, an email address is assigned to the facsimile user, and a promotional message is sent to the facsimile user.

It is considered that the association of an email address to a fac simile user is the third special technical feature.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU01/00133

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	6020980	NONE					
US	6005677	JP	10065866				
US	5940478	AU	33101/97	CA	2255933	EP	897632
		WO	9745991				
US	5920404	NONE					
US	5881233	JP	8242326	US	6124939		
US	5872845	AU	31544/97	EP	938791	WO	9747107
US	5862202	AU	69693/98	EP	988745	WO	9846001
		US	6052445				
US	5812278	JP	9116728	US	6028982	JP	9121274
US	5793972	NONE					
US	5530806	CA	2160820	EP	717535	JP	8223182
US	5115326	EP	465011	JP	5199388		
US	4314367	NONE					
US	4058838	AR	224611	BE	860677	BR	7707476
		CA	1117205	CA	1131740	DE	2750066
		FI	773380	FR	2371098	IN	150610
		IT	1087476	JP	53089303	MX	143304
		NL	7712316	ES	463987	SE	7712572
		US	4058672				
WO	9921351	NONE					
WO	9853603	US	6157706				
WO	9848568	AU	71188/98	EP	986892		
WO	9813996	AU	44080/97	SE	9603558		
WO	9641463	EP	880848				
EP	971527	JP	2000032202				
EP	967779	JP	2000041131				
EP	918413	AU	21828/97	WO	9827690		
EP	836315	JP	10117210	JP	10126551		

END OF ANNEX