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Jones

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[54] **UNIVERSAL MESSAGE DELIVERY SYSTEM FOR HANDLES IDENTIFYING NETWORK PRESENCES**

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[57] **ABSTRACT**

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[52] **U.S. Cl.** 395/200.3; 395/683; 364/DIG. 1

[58] **Field of Search** 348/12; 37/389; 395/200.09, 672, 200.01

A message delivery system, for use with a communication network and in which a network presence is provided for an entity having attributes, delivers a message from a sender to the network presence. In some cases, information identifying the sender is omitted from the message. The delivery system can append non-repudiable sender information to the message. The sender can provide selected attributes as an address, and the delivery system replaces the selected attributes with an address of the network presence without disclosing the address to the sender. A software agent processes the delivered message in accordance with a processing preference included in the entity attributes.

[56] **References Cited**

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6 Claims, 2 Drawing Sheets

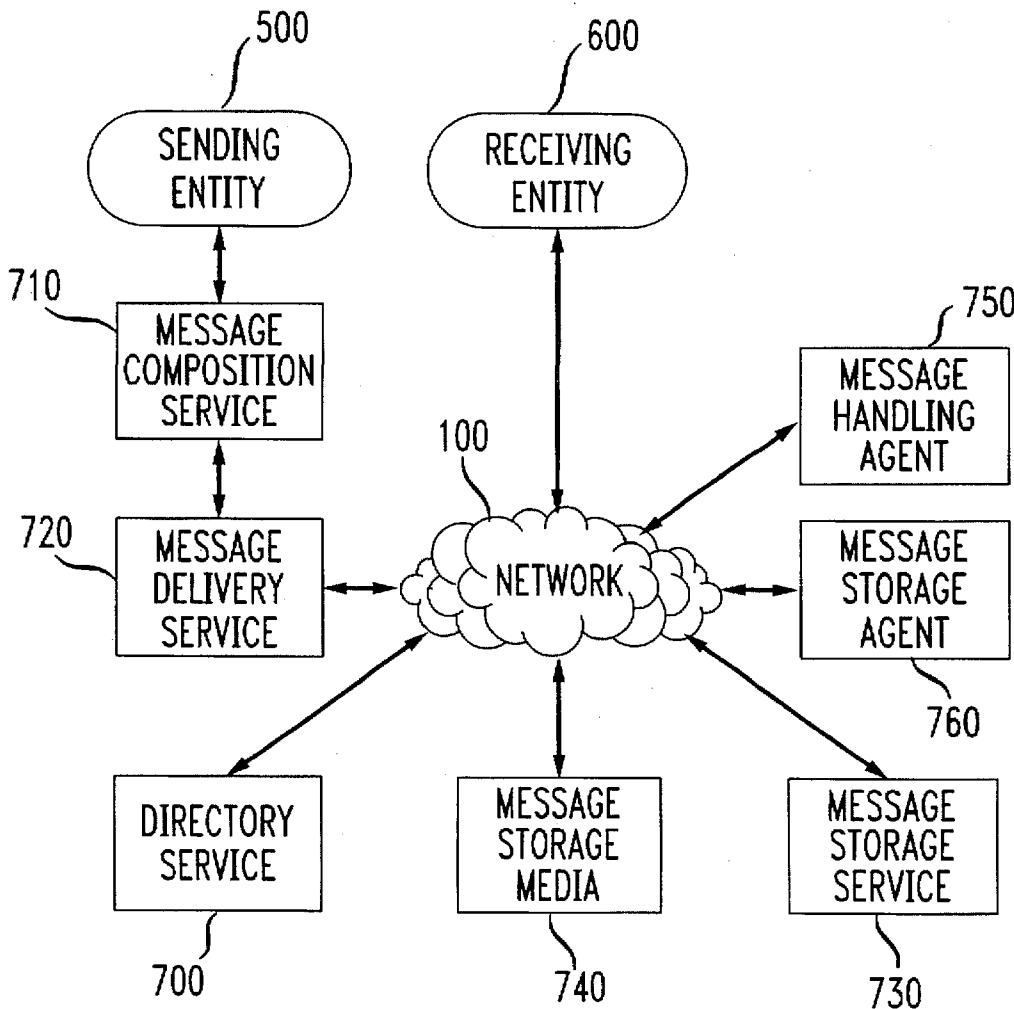


FIG. 1

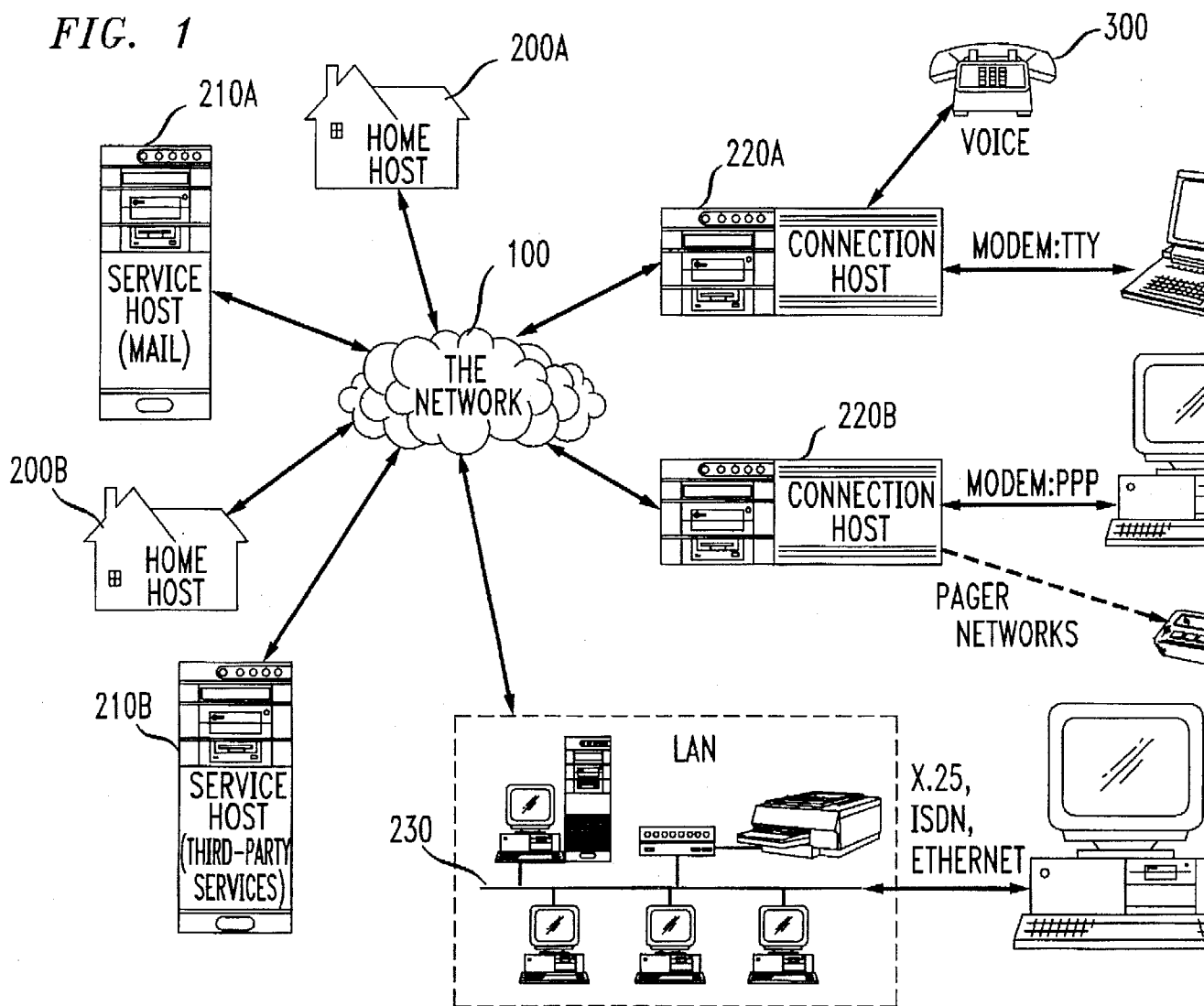
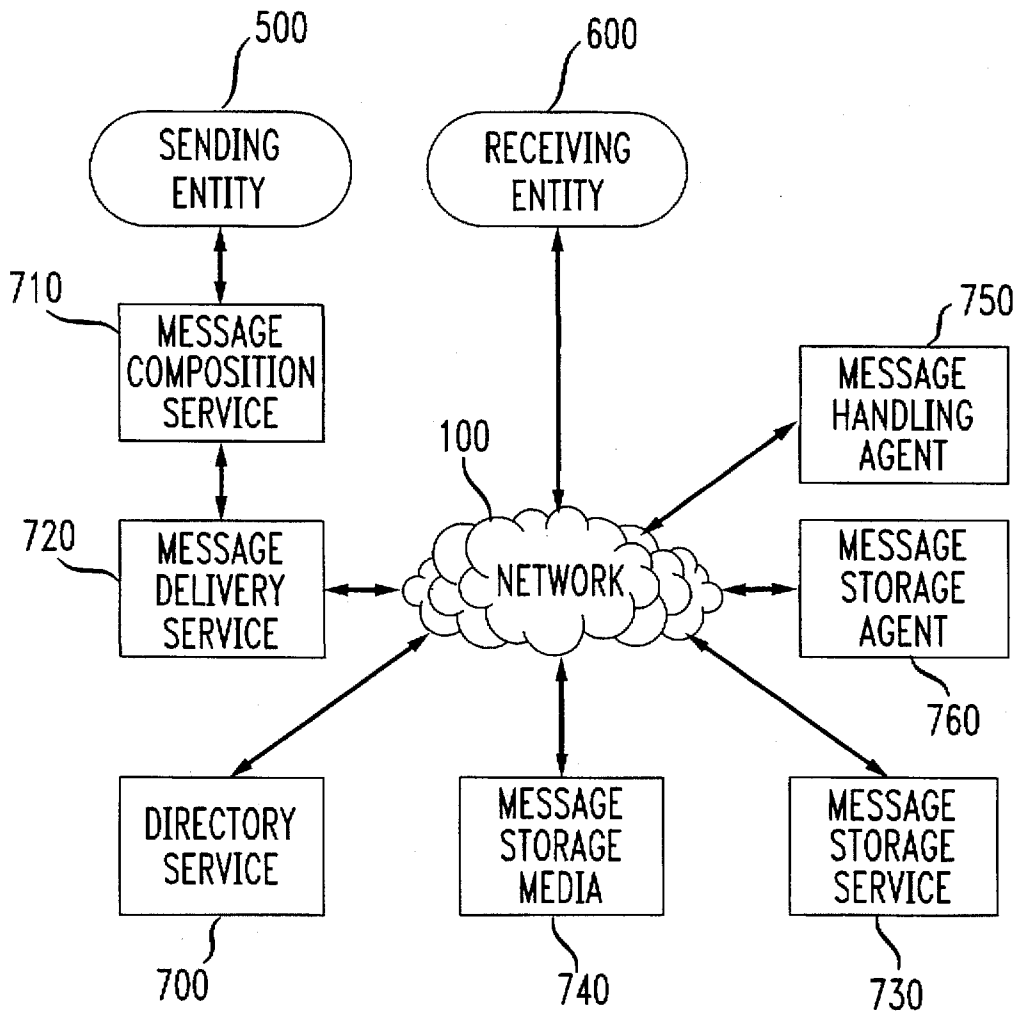


FIG. 2



UNIVERSAL MESSAGE DELIVERY SYSTEM FOR HANDLES IDENTIFYING NETWORK PRESENCES

BACKGROUND OF THE INVENTION

The present invention relates to a computer-based communication network service, and, more particularly, is directed to a system in which entities are represented by network presences associated with handle identifiers used as addresses.

Communication by messaging is becoming steadily more popular. Advantages of messaging relative to a personal conversation include more efficient use of communication capacity, that is, text based electronic mail requires far less channel capacity than an equivalent voice message; more time efficient due to less need for time consuming ritual social inquiries; opportunity for more careful composition; and capability of including various types of communication, that is, the message can be in a multimedia format including audio, video and/or text. Furthermore, if the message is broadcast, its composition effort is amortized across the recipients. Also, the message can be buffered when a recipient is unavailable or unwilling to receive the message immediately; the recipient has more time to plan their response; an electronic message is easy to capture and place in long term storage; and software can be used to assist in composing and organizing messages.

One problem with presently available forms of messaging is that it is necessary to determine and remember addressing information which is substantially unrelated to the identity of the recipient. Voice and facsimile messages require a telephone number. Electronic mail messages require an address usually comprising an assigned user name and electronic domain name, and possibly information indicating a communication service provider. Also, the format of an electronic mail address can differ depending on the communication provider.

Telephone numbers are difficult to remember, usually change when a person moves or switches jobs, can be obtained through a directory having only a very limited number of search fields and may lack privacy as it is fairly easy to associate address information with a telephone number.

Personal telephone numbers, such as the proposed AT&T 500/700 personal number services, assign a telephone number to a subscriber, and associate the assigned telephone number with a destination telephone number and, optionally, a backup telephone number having a voice recording and storage device. Callers call the assigned telephone number, and calls are automatically routed to the destination telephone number. If the destination telephone number does not accept the call, then the call is automatically routed to the backup telephone number. The destination telephone number may be changed frequently by the subscriber. These personal number services mask changes in the subscriber's telephone number, that is, allow a subscriber to have a single telephone number even while travelling or moving frequently, and provide increased privacy. However, the personal numbers are still difficult to remember, can be obtained through a directory having only a very limited number of search fields, are accessible through only one medium, and, due to reliance on a telephone number, are tied into a particular addressing infrastructure which has limited call management options.

Electronic mail addresses are often difficult to remember, usually change when a person switches jobs or communi-

cation carriers, and are difficult to obtain due to lack of universal directory services.

Another problem with presently available forms of messaging is that if someone is reachable by a variety of message types, e.g., voice mail, facsimile and electronic mail on several networks, a sender is not sure which type of message will be most effective at reaching the intended recipient.

A further problem with presently available forms of messaging is that there may be a conversion problem between an available sending device, such as a twelve-key telephone, and a preferred receiving device, such as a facsimile machine. Also, there may be a conversion problem between the form of the originating message, e.g., voice mail, and the preferred form of received message, e.g., electronic mail. Products for converting the form of the message, such as the AT&T INTUITY product for a PBX/LAN environment, have been introduced, but have not yet achieved widespread usage. A proposed Multipurpose Internet Multimedia Extension (MIME) specification for Internet electronic mail allows senders to provide content in multiple, alternative formats but conversion issues have not been resolved.

SUMMARY OF THE INVENTION

A message delivery system, for use with a communication network and in which a network presence is provided for an entity having attributes, delivers a message from a sender to the network presence.

In an aspect of the invention, information identifying the sender is omitted from the message. In another aspect of the invention, the delivery system appends non-repudiable sender information to the message.

When the sender provides selected attributes as an address, the delivery system replaces the selected attributes with an address of the network presence without disclosing the address to the sender. In another aspect of the invention, a software agent processes the delivered message in accordance with a processing preference included in the entity attributes.

It is not intended that the invention be summarized here in its entirety. Rather, further features, aspects and advantages of the invention are set forth in or are apparent from the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a communications network according to the present invention; and

FIG. 2 is a block diagram showing the logical relationship of various services according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An entity is represented by at least one handle, described in detail below. Generally, a handle is a more abstract representation of the entity than is found in the prior art, and avoids the problems of prior art entity representations associated with their insufficiently abstract (i.e., too physical) nature. Each handle provides a distinct cyberpresence identifier for an entity.

Directory services, as described in the present disclosure, provide more flexibility than prior art directory services. When used with handles according to the present disclosure, directory services provide further enhanced flexibility. Generally, a network directory service provides information

about entities and finds entities based on descriptive queries. Some of the directory information is publicly available, whereas other of the directory information is not publicly available but is usable by the directory service for dereferencing addresses. Entities specify the desired privacy level (s) of their directory information. The service provides one or more global and specialized network directories, which may be physically distributed across multiple hosts in the network.

Message composition and delivery services, as described in the present disclosure, provide more flexibility than prior art message composition and delivery services. When used with handles according to the present disclosure, message composition and delivery services provide further enhanced flexibility. Generally, message delivery services provide for specification of policies by entities as to the forwarding of messages to specific endpoints or to a universal message storage facility, notification of message receipt and retrieval of messages. Message notification and retrieval may be according to entity specified criteria, such as priority to particular senders or to particular subjects.

Message storage services, as described in the present disclosure, provide more flexibility than prior art message storage services. When used with handles according to the present disclosure, message storage services provide further enhanced flexibility.

An important feature of the present disclosure is the application to objects such as messages and cyberpresences of information retrieval techniques, such as vector space models, which have heretofore been applied only to documents. Generally, flexibility is accomplished by applying information retrieval techniques to objects, rather than by relying primarily on more structured database query techniques.

Network Environment

Referring now to the drawings, and in particular to FIG. 1, there is illustrated a network which is generally assumed as the environment in the present disclosure. The network shown in FIG. 1 comprises a communication network 100, home host computers 200, service host computers 210, connection host computers 220, gateways to other networks such as a local area network (LAN) 230, software executed on the various computers, and customer premises equipment such as twelve-key telephone sets 300, personal computers 310, terminals, and pager networks 400. Although not specifically shown in FIG. 1, internet connections and wireless transmission may be used in a network contemplated in the present disclosure.

As will be apparent to those of ordinary skill in the art, many different communication protocols may be employed in communicating between the various parts of the network, such as TCP/IP, X.25, ISDN, Ethernet, asynchronous line protocols and analog and/or digital voice transmission. Communication for transactional services are implemented in a secure, flexible remote procedure call (RPC). Also, as appropriate, authentication and encryption protocols are employed, for example, hypertext transfer protocol (HTTP) or secure socket layer (SSL) protocol.

Various divisions of communications capability between customer equipment and network equipment are encompassed by the network of FIG. 1. The network is assumed to provide processing capability for customer equipment which lacks sufficient processing capability to provide the functions described below. The specific type of software programming used to provide these functions is not critical.

In one case, the customer equipment comprises only a twelve-button telephone set. A user dials a connection host which is part of the network, such as the nearest connection host or a toll-free number providing access to a connection host. Using one or more of voice input and touch-tone input, the user establishes network access authority, such as by entering an identification code and password. The connection host verifies access authority with the user's home host, then makes appropriate network resources available to the user by, for example, presenting menus of choices to the user.

In another case, the customer equipment comprises a private host such as a personal computer and a modem. The user instructs the private host to establish a connection to a connection host. In this case, the connection host functions in a more limited manner than in the previously described situation where the customer premises equipment is a telephone set.

In yet another case, the customer equipment comprises a receive only pager network. A connection host somewhere in the network executes software on behalf of the pager network.

Handles

An entity may be a person, organization, corporation, department within a corporation, use (interest) group, or a set of entities. Alternatively, the entity may be a functional role, such as president of an organization.

An electronic presence is established for every entity which requires a public identity. The electronic presence is also referred to herein as a network presence or "cyberpresence". The electronic presence is identified by a handle. The network presence for an entity serves as a locus of publicly available information about the entity, as a point of connection to the entity, and as a centralized set of resources available to the entity. Physically, a network presence comprises an account on a home host computer, such as the home host computer shown in FIG. 1, the actual network resource usage associated with the account, the capability of using additional network resources and identification of the account in network directories. Typically, an account resides on a home host, but some accounts may reside on multiple hosts due to their resource usage.

An entity may have multiple network presences each of which is associated with a distinct handle. For example, an entity which is a person may have one network presence for activities related to their job, another network presence for activities related to their primary hobby, and yet another network presence for activities related to their other personal uses.

As used herein and in the claims, "handle" refers to a unique identifier registered with a universal directory network service for use by the entity. A handle represents an abstract entity, and does not correspond to a physical endpoint although it may be associated with one or more physical endpoints for various purposes, as described below. The handle functions as the network name of the entity, and also functions as the network address of the entity, but is not a physical end point address. An entity may have one or more handles each of which is associated with a network presence. Primarily for billing purposes, each handle is associated with a sponsor that is not necessarily the entity using the handle.

Handles permit decoupling of physical endpoints and delivery systems from the network presence for an entity. That is, a handle is not merely an address, it is a represen-

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