IN THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF TEXAS AUSTIN DIVISION

FUNDSXPRESS FINANCIAL NETWORKS, INC., and OPTRIA, LLC Plaintiff, v. TURN IP, LLC, Defendants.	§ § § § § § § § § §	Civil Action No. 1:15-cv-1023

COMPLAINT FOR DECLARATORY JUDGMENT OF INVALIDITY, PATENT INELIGIBILITY AND NON-INFRINGEMENT

TO THE HONORABLE UNITED STATES DISTRICT COURT JUDGE:

COMES NOW, FundsXpress Financial Networks, Inc. and Optria LLC, Plaintiffs herein ("Plaintiffs"), and file this Complaint for Declaratory Judgment against Turn IP, LLC, Defendant herein.

Introduction and Nature of the Action

1. Plaintiff FundsXpress Financial Networks, Inc. ("FundsXpress") is an Austin-based company in the business of developing, marketing, and supporting an integrated system that permits customer financial institutions to provide internet and mobile banking services to their customers. Plaintiff Optria LLC ("Optria") is a Florida company that provides customer communication solutions to banks and credit unions. One of Plaintiffs' customers is Prosperity Bank ("Prosperity"). Prosperity has at least ten branches in the Austin area. In July, 2015, Defendant Turn IP, LLC ("Turn IP") sued Prosperity in the Eastern District of Texas (along with at least 23 other financial institutions) claiming that Prosperity's internet and/or mobile banking solution infringed U.S. Patent #5,657,461 (the "'461 Patent"). *See* Turn IP v. Prosperity Bank,

No. 2:15-cv-01250-JRG. A true and correct copy of the '461 Patent is attached hereto as Exhibit A and incorporated herein by reference for all purposes. Between them, Plaintiffs provide to Prosperity the entire accused function. Prosperity uses the Plaintiffs' product to serve its own customers only and does not resell or remarket those products in any way.

2. Under a twenty-five-year long, unbroken line of Federal Circuit cases, Plaintiff has the right to litigate all its customers' alleged infringement of the '461 Patent in a single proceeding, rather than piece meal. A Georgia District Court recently summarized and applied the so-called "customer suit exception":

> In patent cases, there is a 'customer suit' exception that gives priority to actions against a manufacturer over patent actions against customers of the manufacturer. The exception 'exists to avoid, if possible, imposing the burdens of trial on the customer, for it is the manufacturer who is generally the 'true defendant' in the dispute.' *In re Nintendo of America, Inc.*, 756 F.3d 1363, 1365 (Fed. Cir. 2014); *see also Katz v. Lear Siegler, Inc.*, 909 F.2d 1459, 1464 (Fed. Cir. 1990) (citation omitted) ('[L]itigation against or brought by the manufacturer of infringing goods take precedence over a suit by the patent owner against customers of the manufacturer.'); *Spread Spectrum Screening LLC v. Eastman Kodak Co.*, 657 F.3d 1349, 1357 (Fed. Cir. 2011).

Capital Security Systems, Inc. v. Capital One NA, 2015 WL 3819336 (N.D. Georgia June 18, 2015). Accordingly, Plaintiffs bring this action and may soon move to stay the Eastern District action as to Prosperity. This action is filed the day after Prosperity's initial appearance in the Eastern District matter.

The Parties

3. FundsXpress is a Texas corporation founded in 1996 that is headquartered in, and substantially operated from, Austin, Texas. It provides internet-based financial services throughout the United States. Its products help financial institutions in the areas of retail banking, bill payment and presentment, business banking, lending, and aggregation.

4. Optria is a Florida limited liability company in the business of providing financial

institutions with solutions for print and online customer communications.

5. Turn IP is a Texas limited liability company formed on or about March 24, 2015, with its Registered Agent and Registered Office in Austin. Turn IP may be served by serving its Registered Agent, Incorp Services, Inc., at its Registered Office located at 815 Brazos Street, Suite 500, Austin, TX 78701. In its Complaint against Prosperity in the Eastern District, Turn IP claims that its principal place of business is 555 Republic Drive, Suite 278, Plano, Texas 75074, which appears to be no more than a virtual office that rents for $75 per month. Secretary of State records indicate that the Managing Member of Turn IP is Keith Marius. Internet research shows Mr. Marius has a day job designing and installing store displays and work place cubicles. Mr. Marius, again according to Secretary of State records, is the Managing Member of two other Texas limited liability companies—Venadium LLC and Batarga LLC. The three LLCs filed at least 65 patent infringement lawsuits during the months of July and August of 2015, including the one against Prosperity. In their respective 20-plus defendant lawsuits, Venadium and Batarga claimed principal places of business that appear to be individual boxes within private mail stores in Plano. All three companies were formed about six weeks before they began filing suits. On information and belief, each of Mr. Marius' three limited liability companies claim to own only one U.S. patent, but do not practice that single patent. On information and belief, to the extent any of the three companies conducts any business, they are in the business of enforcing and attempting to monetize patents.

Jurisdiction and Venue

6. This is a civil action seeking a declaration of non-infringement of a United States patent and therefore arises under the United States patent law, 35 U.S.C. § 271 *et seq.*, and is being further brought under the Declaratory Judgments Act, 28 U.S.C. §§ 2201-2202.

7. This Court has subject matter jurisdiction over this matter under 28 U.S.C. §§ 1331 and 1338(a).

8. The Court has personal jurisdiction over Turn IP as it is a limited liability company organized under the laws of the State of Texas with its Registered Agent and its Registered Office in Austin.

9. Venue is proper in this Court pursuant to 28 U.S.C. § 1391(b)(2) because a substantial part of the events or omissions giving rise to the claim occurred in this district. The accused FundsXpress product was developed and marketed in Austin, is currently administered and supported in Austin, and is hosted from Austin. Both Prosperity and FundsXpress have regular and established places of business in Austin, and Turn IP has alleged infringement has occurred in this District. Finally, Turn IP is a Texas entity with a claimed virtual principal place of business in Plano and a brick and mortar registered office and registered agent here in Austin, Texas.

The Substantial Controversy Between the Parties

10. This Court has subject matter jurisdiction over this action based on a real and immediate controversy between Plaintiffs and Turn IP regarding whether Plaintiffs' internet and mobile banking products provided to certain companies ("Plaintiffs' Customers") infringe the claims of the '461 Patent. Turn IP has actually sued at least one of Plaintiffs' Customers, Prosperity.

Facts

11. Each independent claim of the '461 Patent that Turn IP alleges has been infringed, in a fair and plain language translation, is: a system that allows persons to use a computer to designate how they want to receive information from a business and to change their delivery

preference.[1] A real world example of what Turn IP is trying to monopolize would be the use of basic computer hardware, software and the internet to speed up the decades-old process by which a dental office receptionist used a rotary dial telephone to call a patient and inquire if he wants to receive appointment reminder notices by telephone or post card. Such preferences have long been recorded in businesses records and changed periodically when the customer so requested.

12. The assertion of the '461 Patent against Plaintiffs' Customers purports to have the effect that, absent a license from Turn IP, no one in the United States can perform this core business function. Wrapping this decades-old process in rudimentary computer functions does not make the '461 Patent pass 35 U.S.C. § 101 muster under the two-step framework set forth in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. ___, 134 S. Ct. 2347 (2014). Applying that two-step framework, the claims of the '461 Patent (1) are directed to an abstract idea -- the long-standing practice of recording customer delivery preferences by hand, using a pen applied to paper by a receptionist when the delivery preference is recorded and then following the customer's recorded preference when contacting the customer -- and (2) do not contain an "inventive concept" beyond that abstract idea because their implementation consists entirely of the use of conventional computer hardware and software.

[1] In paragraph 10 of Turn IP's Complaint, Turn IP alleges infringement of the '461 Patent by reciting word-for-word independent claim 3 of the '461 Patent that provides, among other things:

> In a graphical user interface for communicating information between senders and receivers over a network having a plurality of network subscribers, the network providing a repository for storing a communication channel profile for each network subscriber to define preferences of data receipt for a receiver of data over the network, a method of sending information from a sender operating the graphical user interface to a selected receiver comprising the steps of: (1) selecting information at the graphical user interface for sending to the selected receiver; (2) querying the network repository for the communication channel profile of the selected receiver; and (3) sending said information to the selected receiver over a first communication channel in response to a firsts preference of data receipt specified in the communication channel profile of the selected receiver including the capability of altering the communication channel profile of said receiver at the graphical user interface.

The Supreme Court and the Federal Circuit have routinely invalidated computer-implemented patents covering algorithms that merely gather data and then take some action based on that data.[2] Turn IP's '461 Patent does not even rise to that level of sophistication. It merely allows persons to communicate how they want to receive their notices and to change that preference from time to time and then adds the most rudimentary computer components — workstations, communication network (*e.g.*, the internet), on screen displays and other entry-level computer devices to the way businesses have communicated with their customers since well before the computer era. Hence, the '461 Patent is an unpatentable, abstract idea. *Alice*, 134 S. Ct. at 2359. Further, that all limitations of all independent claims of the '461 Patent can be performed without a computer is graphically depicted in the below chart. On the left side depicting "'461 Patent Claim Language," the claimed "invention" is highlighted in pink, and the "computerization" is highlighted in yellow.

Representative Claim 1

'461 Patent Claim Language	Performance Without a Computer
Claim 1	
In an electronic workstation interconnected to a pretermined devices over a network, the workstation having a graphical user interface for operating the workstation and providing access to a communication channel profile for each subscriber on the network, the communication channel profile defining a priority scheme for identifying a preferred mode in which to transmit data to a said predetermined devices, the graphical user interface comprising:	A patient is provided with a paper form asking how she wants to receive appointment reminders from dentist. The form contains various options about how the patient could receive reminders, for example via a postcard or telephone call.

The other independent claims of the '461 patent are essentially the same as independent claim 3 asserted in Turn IP's Complaint.

[2] *See, e.g.*, *Parker v. Flook*, 437 U.S. 584, 585 (1978); *Intellectual Ventures I, LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1367-68 (Fed. Cir. 2015); *Cyberfone Sys., LLC v. CNN Interactive Group, Inc.*, 558 Fed. App'x 988, 991-92 (Fed. Cir. 2014).

means to select icons and menu options on the graphical user interface;	The patient has a pen and checks a box on a piece of paper indicating how she wishes to receive appointment reminders.
means to identify a given data file on the display using the means to select icons,	The patient uses the pen to indicate she wishes to receive appointment reminders by postcard.
means to specify a destination for said given data file,	The patient uses the pen to write her address on the paper form indicating the address to which the dentist should send appointment reminders.
means to access said communication channel profile for transmitting said given data file in a preferred mode, the means to access identifying a given device in response to the preferred mode set forth in said priority scheme, and	The dentist has access to patient's paper form and to the U.S. mail service. The form instructs the dentist to place an appointment reminder to the patient in the U.S. mail.
means for altering the priority scheme for identifying a preferred mode in which to transmit data to said predetermined devices.	If she wishes to do so, the patient, or the receptionists under direction of the patient, can use a pen at the next appointment to update the paper form and alter her preference on how to receive appointment reminders.

Representative Claim 3 (As Asserted in Turn IP's Complaint)

'461 Patent Claim Language	Performance Without a Computer
Claim 3	
In a graphical user interface for communicating information between senders and receivers over a network having a plurality of network subscribers, the network providing a repository for storing a communication channel profile for each network subscriber to define preferences of data receipt for a receiver of data over the network, a method of sending information from a sender operating the graphical user interface to a selected receiver comprising the steps of:	A patient is provided with a paper form asking how she wants to receive appointment reminders from dentist. The form contains various options about how the patient could receive reminders, for example via a postcard or phone call.
selecting information at the graphical user interface for sending to the selected receiver;	The patient has a pen and checks a box on a piece of paper how she wishes to receive appointment reminders. The patient uses the pen to indicate that she wishes to receive appointment reminders by postcard.

querying the network repository for the communication channel profile of the selected receiver;	The dentist has access to the patient's paper form and the selections made by the patient, or the receptionists on the patient's behalf. By querying, or examining, the paper form accessible to the dentist, the dentist can determine how the patient wishes to receive appointment reminders, *e.g.*, by postcard rather than a phone call.
sending said information to the selected receiver over a first communication channel in response to a firsts preference of data receipt specified in the communication channel profile of the selected receiver including the capability of altering the communication channel profile of said receiver at the graphical user interface	Based on the patient's delivery preference, the dentist sends the appointment reminder to the patient by postcard. If she wishes to do so, the patient, or the receptionists under the direction of the patient, can use a pen at the next appointment to update the paper form and alter her preference on how to receive appointment reminders

14. As noted in the so-called "invention" highlighted in pink, the '461 Patent claims are directed to: (1) a graphical user interface (or paper form to be filled-in by a patient/receptionist) (2) in which a subscriber (or patient/receptionist) (3) can enter preferences of data receipt (or delivery preference) (4) in order to form a communication channel profile (or filled-in paper form) (5) to send information to a receiver (or deliver an appointment reminder to the patient).

15. The graphical user interface used by a subscriber to enter preferences of data receipt to form a communication channel profile in which to send receiver information is contained in numerous prior art references and do not contain an "inventive concept" under the second step of the framework set forth in *Alice*. Among the prior art references[3] singularly and in combination, that render the '461 Patent invalid under 35 U.S.C. §§102 and/or 103, and well as rendering as the '461 Patent ineligible subject matter under 35 U.S.C. §101, and particularly

[3] As discovery progresses, additional prior art references will be brought forth depending on Turn IP's infringement contentions, or if additional patent claims are asserted by Turn IP beyond claim 3 alleged in their Eastern District Complaint. The Taylor '306 patent and the Oberlander '865 patent are provided only as examples of numerous other prior art references that will be supplied as discovery progresses and infringement contentions are provided.

the second step of *Alice* are:

U.S. Pat. No. 5,754,306 to Taylor (the "'Taylor '306 patent") – attached Exhibit B:

Taylor describes a graphical user interface of a communication address book depicted below in Fig. 4 with a menu bar 401, and other user interface areas 401-403, a portion of which contains buttons beneath the "Preference:" field to allow a user to enter his or her preferences of data receipt:

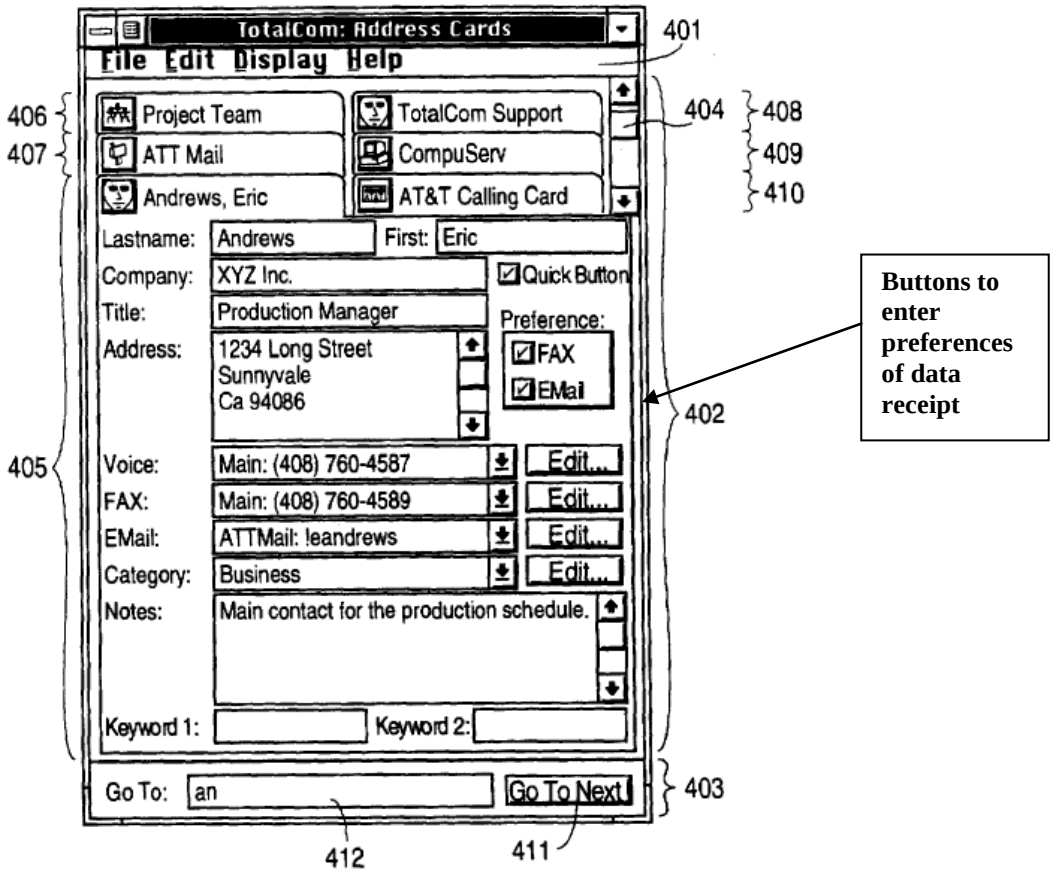


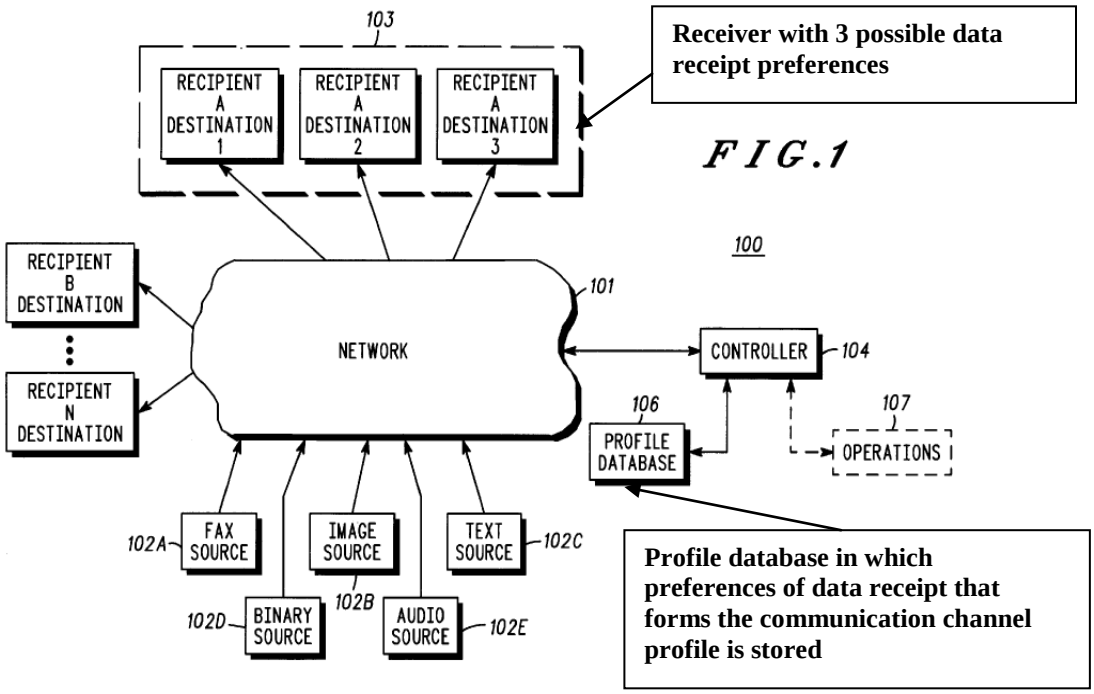
FIG. 4

Once the address book is filled in with the preferred data receipt checked on the above user interface, the communication channel profile for a recipient is formed and any information sent to, for example, Eric Andrews will be sent according to his preference --

either by Fax, Email, or both. Taylor '306 patent, 9:56-11:9; 15:5-12; and Figs. 4 and 9.

U.S. Pat. 5,825,865 to Oberlander (the "'Oberlander '865 patent") – attached Exhibit C:

Oberlander also describes a user interface in which the claimed communication channel profile of a user can be formed. Oberlander '865 patent, 2:20-22. "This information profile includes at least some user preferences regarding a plurality of different user destinations." Oberlander '865 patent 2:24-26. The information profile that contains the recipient's preferences of data receipt is stored in a profile database 106, and whenever information is sent over a network 101 from a sender to a receiver, the preferred destination 1, 2 or 3 is drawn from the profile database 106 and the information is sent to that destination:



An input 206 is a graphical user input having a keyboard" or "the like" that allows a user to specify at least certain aspects of the message descriptor." Oberlander '865 patent,

4:35-40; 9:43-44; Fig. 2.

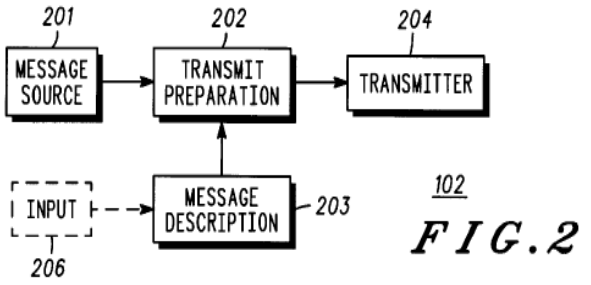


FIG. 2

The message descriptor can include many information fields, such as "a target address (TA) (301) (representing a physical address, such as a telephone number, of a particular recipient destination)…" Oberlander '865 patent Fig. 3; 4:46-48.

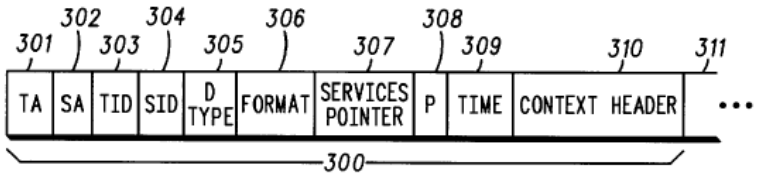


FIG. 3

In lieu of entering a telephone number preference, the user can just as easily enter a fax number preference, knowing that "many users have multiple reception platforms, such as landline telephones, cellular telephones, pagers, fax machines, computer modems, and so forth." Oberlander '865 patent 1:29-32.

Causes of Action

Count 1: Declaratory Judgment of Invalidity and/or Patent Ineligibility

1. Plaintiffs repeat, incorporate by reference, and re-allege paragraphs 1 – 15, above, as though fully set forth therein.

2. Plaintiffs hereby request a declaratory judgment that the '461 Patent and its

claims are invalid and/or that the '461 Patent fails to claim patent eligible subject matter, including, without limitation: (a) covering only an abstract idea (and, therefore, purporting to cover non-patentable subject matter pursuant to 35 U.S.C. § 101); (b) failing to claim any novel invention pursuant to 35 U.S.C. § 102; (c) failing to claim any unobvious invention pursuant to 35 U.S.C. § 103; and/or (d) failing to provide an enabling disclosure and/or definite claims in compliance with 35 U.S.C. § 112.

Count 2: Declaratory Judgment of Non-Infringement

3. Plaintiffs repeat, incorporate by reference, and re-allege paragraphs 1 – 15, above, as though fully set forth herein.

4. Plaintiffs hereby request a declaratory judgment that no product made, sold, provided to any third party, acquired or otherwise related in any manner to Plaintiffs infringes either literally or under any application of the doctrine of equivalents, any valid claim of the '461 Patent, nor supports any claim for inducement of infringement or any claim for contributory infringement of any claim of such patent.

5. Plaintiffs hereby request a declaratory judgment that no activity now or heretofore carried out by or on behalf of Plaintiffs infringes either literally or under any application of the doctrine of equivalents, any valid claims of the '461 Patent, nor supports any claim for inducement of infringement or any claim for contributory infringement of any claim of such patent.

Exceptional Case Finding

6. Because this matter constitutes and exceptional case under 35 USC § 285, Plaintiffs are entitled to an award of its reasonable and necessary attorney's fees.

Prayer for Relief

WHEREFORE, PREMISES CONSIDERED, Plaintiffs respectfully request that, upon final trial or hearing, it have judgment against the Turn IP for the following:

A. A declaration that the '461 Patent and its claims are invalid and/or unenforceable upon one or more bases, including but not limited to 35 §§ 101, 102, 103, 112, or by breach of the duty of candor to the Patent Office;

B. A declaration that Plaintiffs and their Customers have not infringed and do not infringe in any manner any claim of the '461 Patent;

C. A Permanent injunction enjoining Turn IP, its successors and assigns, and anyone acting in concert with it from attempting to enforce the '461 Patent against Plaintiffs, their parents, affiliates subsidiaries or any of their respective officers, agents, employees, successors, and assigns;

D. A permanent injunction enjoining Turn IP its successor and assigns, and anyone acting in concert with it or on its behalf from attempting to enforce the '461 Patent against any of Plaintiffs' Customers who use Plaintiffs' online banking or mobile banking products;

E. A finding that this case exceptional and an award to Plaintiffs of their costs and expenses, including reasonable attorney's fees in accordance with the provisions of 35 USC § 285 or otherwise;

F. An award to Plaintiffs for such other and further relief to which they may show themselves justly entitled, general or special, at law or in equity.

DATED: November 10, 2015

Respectfully submitted,

By: */s/ J. Stephen Ravel*

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US005657461A

United States Patent [19]

Harkins et al.

[11] Patent Number: 5,657,461

[45] Date of Patent: Aug. 12, 1997

[54] **USER INTERFACE FOR DEFINING AND AUTOMATICALLY TRANSMITTING DATA ACCORDING TO PREFERRED COMMUNICATION CHANNELS**

[75] Inventors: **Larry E. Harkins**, Rochester; **Ken Hayward**, Brockport; **Thomas J. Herceg**, Pittsford; **Jonathan D. Levine**, Rochester; **David M. Parsons**, Fairport, all of N.Y.

[73] Assignee: **Xerox Corporation**, Stamford, N.Y.

[21] Appl. No.: **130,929**

[22] Filed: **Oct. 4, 1993**

[51] **Int. Cl.**[6] **G06F 3/14**

[52] **U.S. Cl.** **395/333**; 395/326; 395/335

[58] **Field of Search** 395/500, 155, 395/156, 700, 326, 327, 328, 329, 330, 331; 345/149, 119, 156; 364/146, 514; 370/85.3, 85.15, 58.2, 60, 58.1

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,872,157	10/1989	Hemmady et al.	370/60
4,875,206	10/1989	Nichols et al.	370/85.15
4,893,302	1/1990	Hemmady et al.	370/60
4,896,319	1/1990	Lidinsky et al.	370/60
4,899,333	2/1990	Roediger	370/60
4,922,486	5/1990	Lidinsky et al.	370/60
5,303,343	4/1994	Ohya et al.	395/200
5,317,568	5/1994	Bixby et al.	370/85.6
5,488,686	1/1996	Murphy et al.	395/161

Primary Examiner—Thomas G. Black
Assistant Examiner—Ruay Lian Ho
Attorney, Agent, or Firm—Ronald F. Chapuran

[57] **ABSTRACT**

A user interface to automatically distribute information to a receiver on a network using devices (such as printers and facsimile machines) and communication channels (such as electronic mail) defined in a receiver profile. The receiver profile establishes the properties and mode for receipt of information for receivers on the network and the profile is published in a network repository for all network users or is accessible by selected groups or individuals on the network. Receivers have additional control over network senders by defining an information filter which further controls sender channel access (to a receiver) by defining some channels as having priority of access such as direct or delayed access, as well as selectively permitting senders to override the receiver profile. Consequently, receiver profiles provide a variable receiver definable link to senders using multiple forms of media as well as multiple hardware platforms and network configurations.

18 Claims, 11 Drawing Sheets

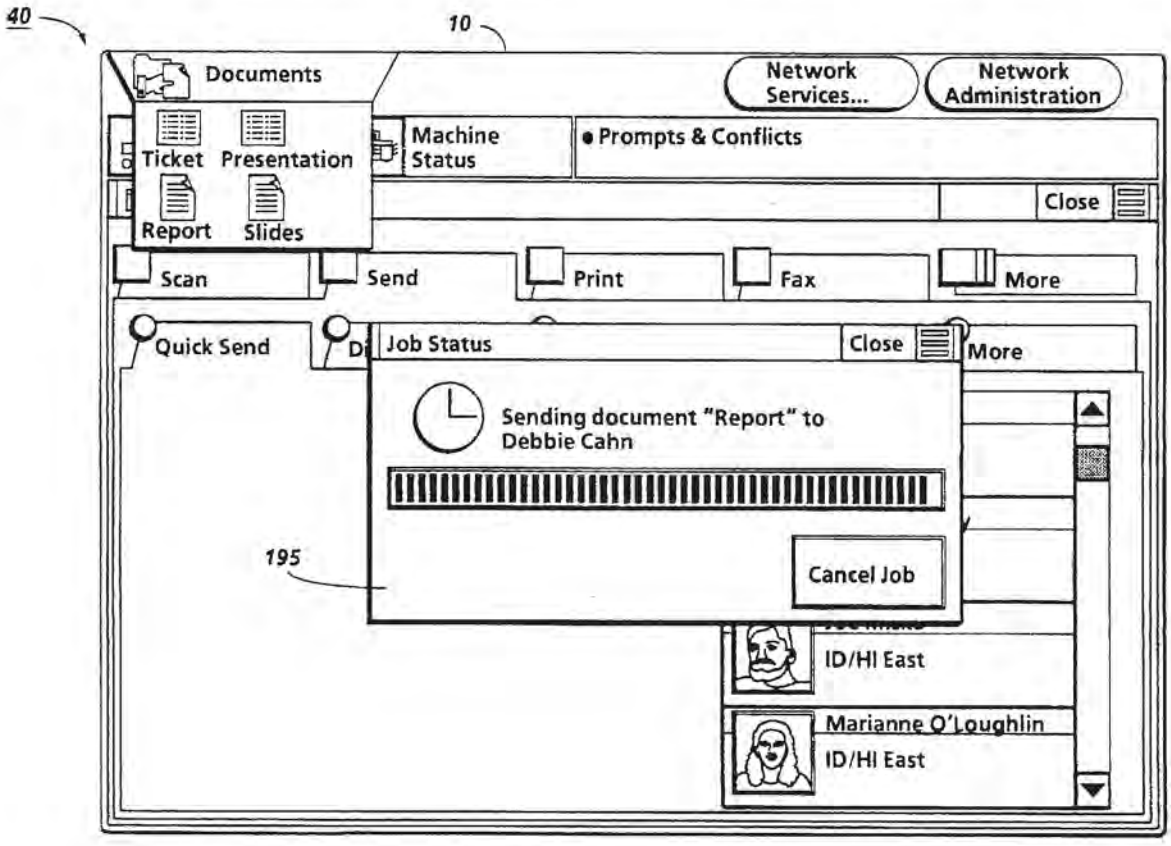
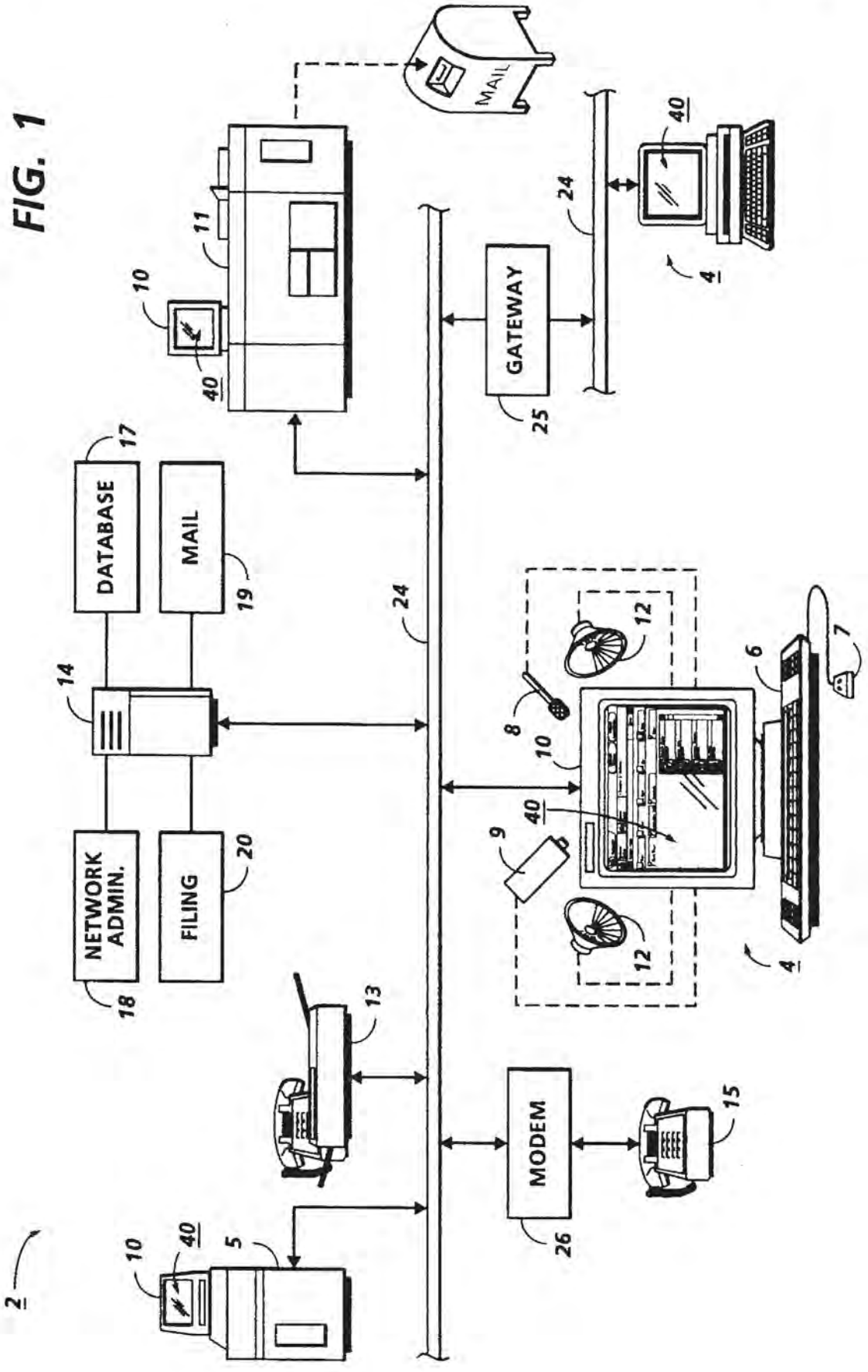


FIG. 1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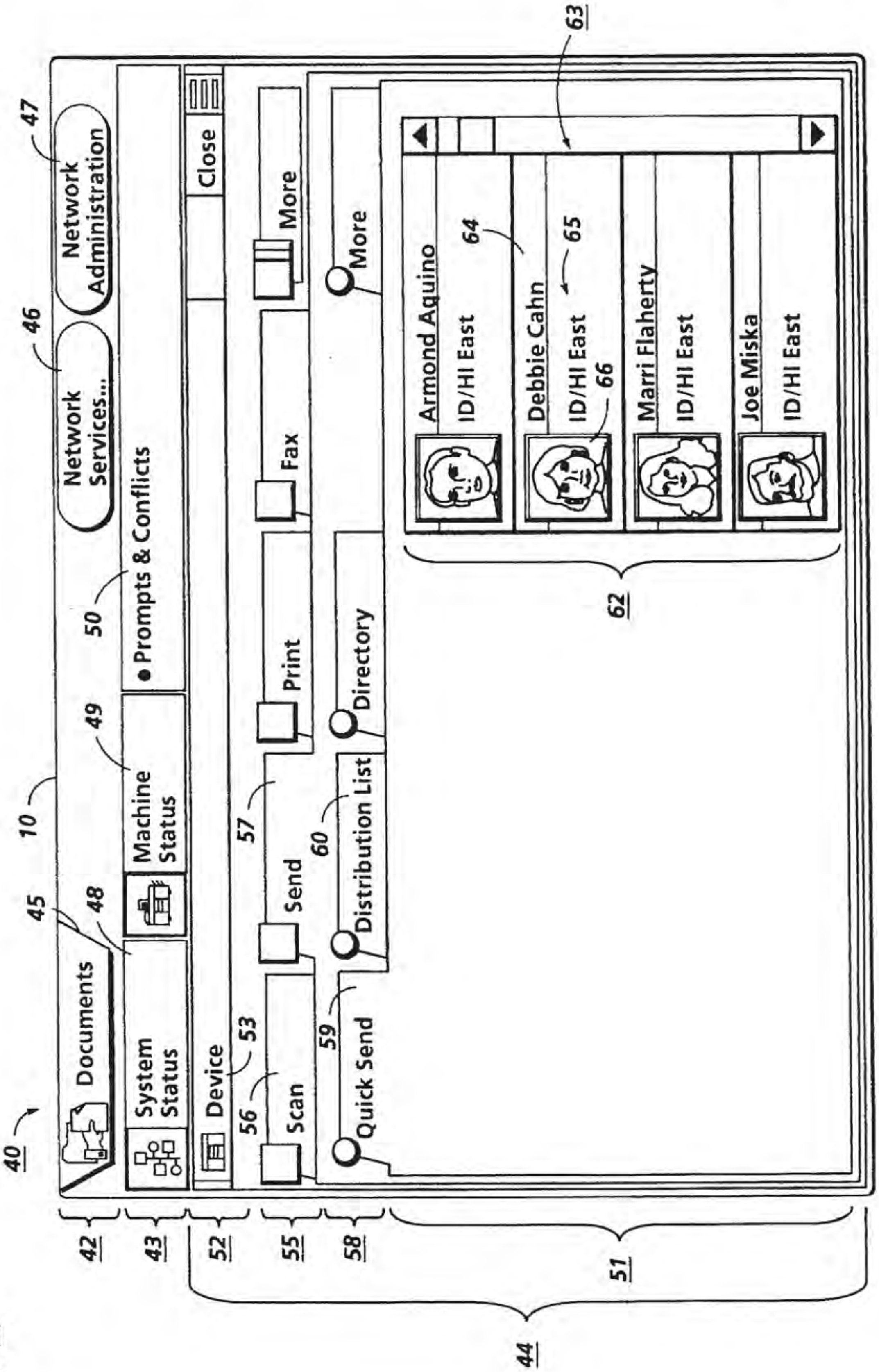

Documents
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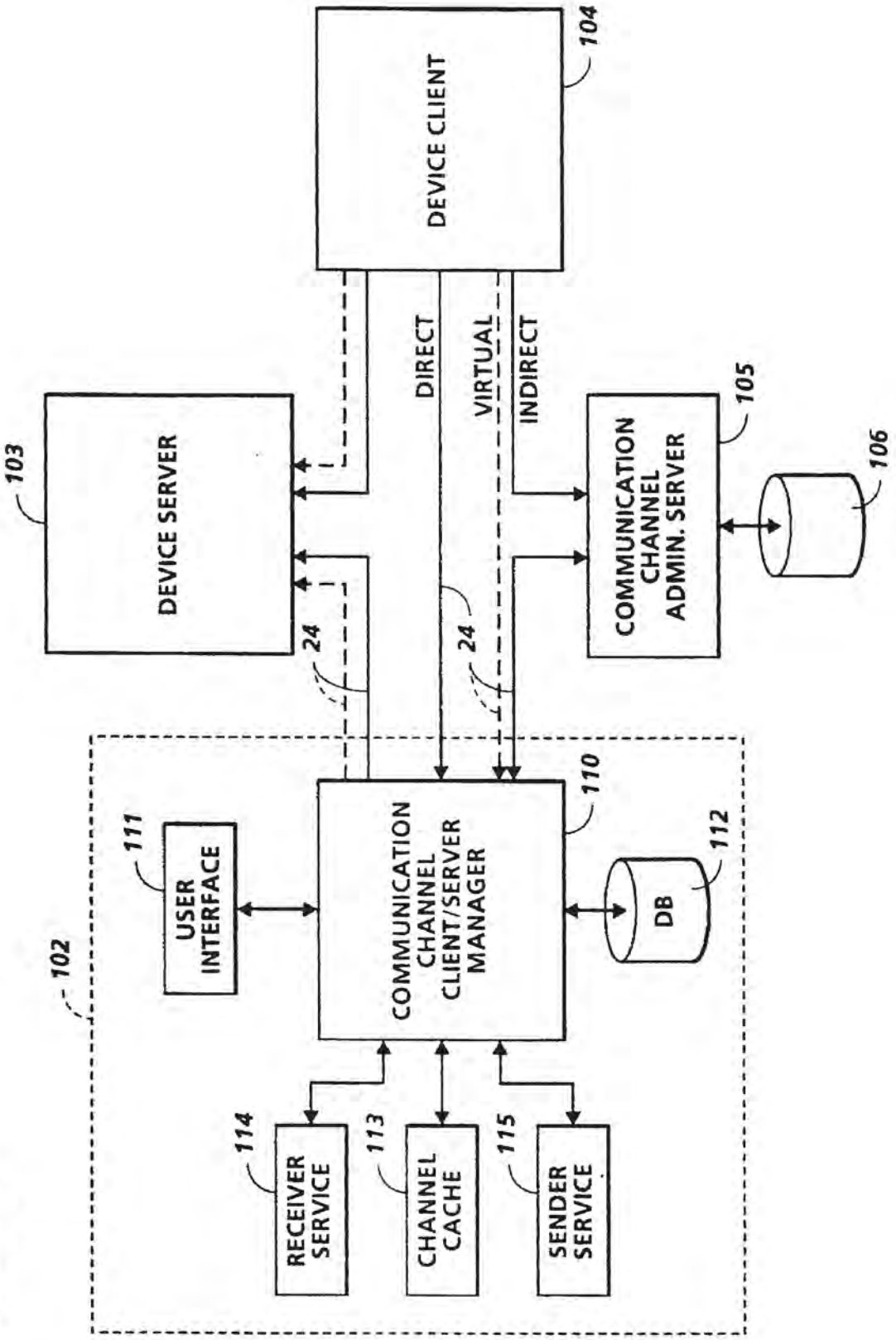
FIG. 2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103
DIRECT
VIRTUAL
INDIRECT
COMMUNICATION CHANNEL ADMIN. SERVER
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106
24
24
USER INTERFACE
111
COMMUNICATION CHANNEL CLIENT/SERVER MANAGER
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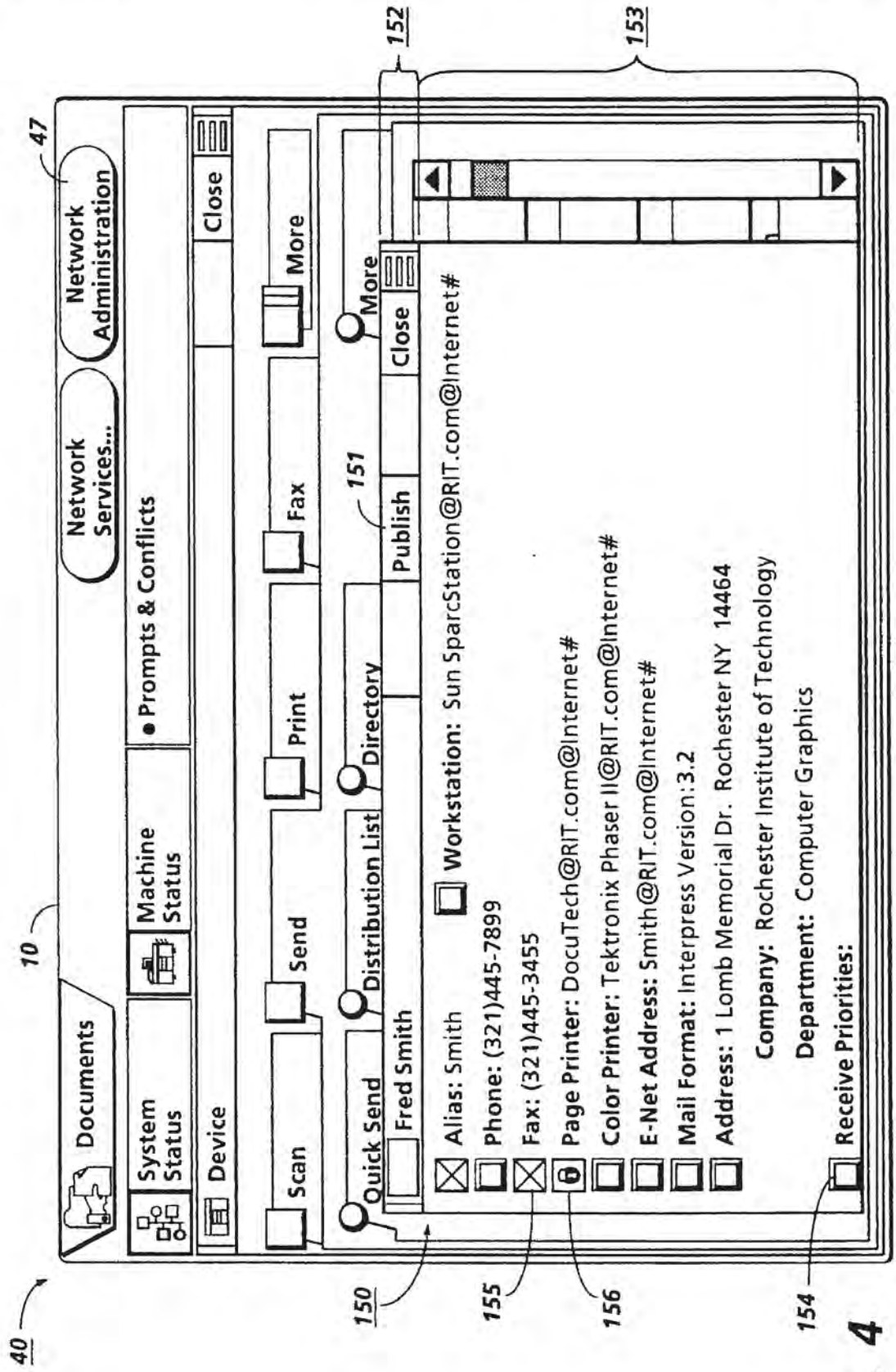
DB
112
102
RECEIVER SERVICE
114
CHANNEL CACHE
113
SENDER SERVICE
115

FIG. 3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Fax: (321)445-3455
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Color Printer: Tektronix Phaser II@RIT.com@Internet#
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Receive Priorities:
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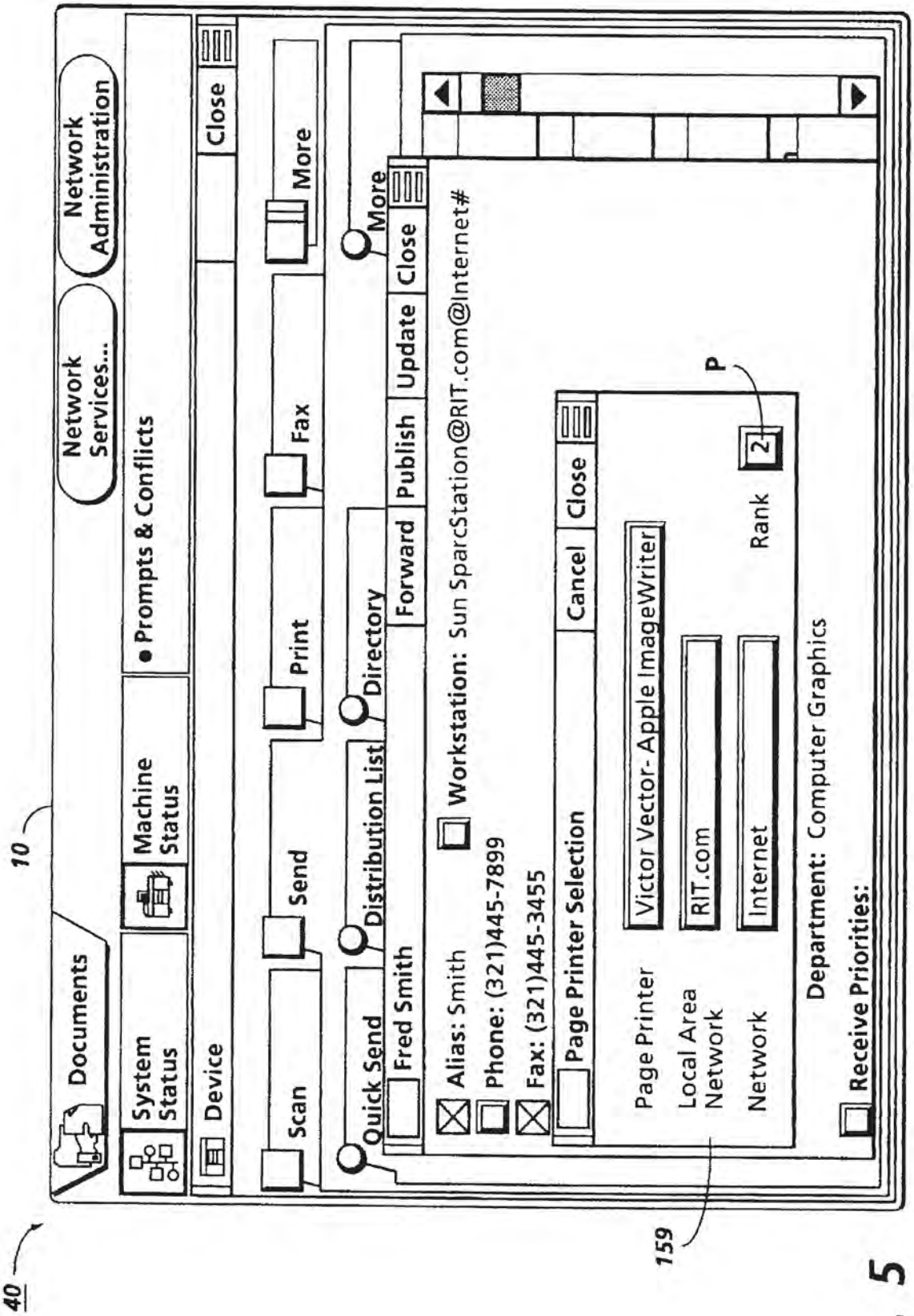
FIG. 4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Publish
Update
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Alias: Smith
Workstation: Sun SparcStation@RIT.com@Internet#
Phone: (321)445-7899
Fax: (321)445-3455
Page Printer Selection
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Page Printer
Victor Vector- Apple ImageWriter
Local Area Network
RIT.com
Network
Internet
Rank
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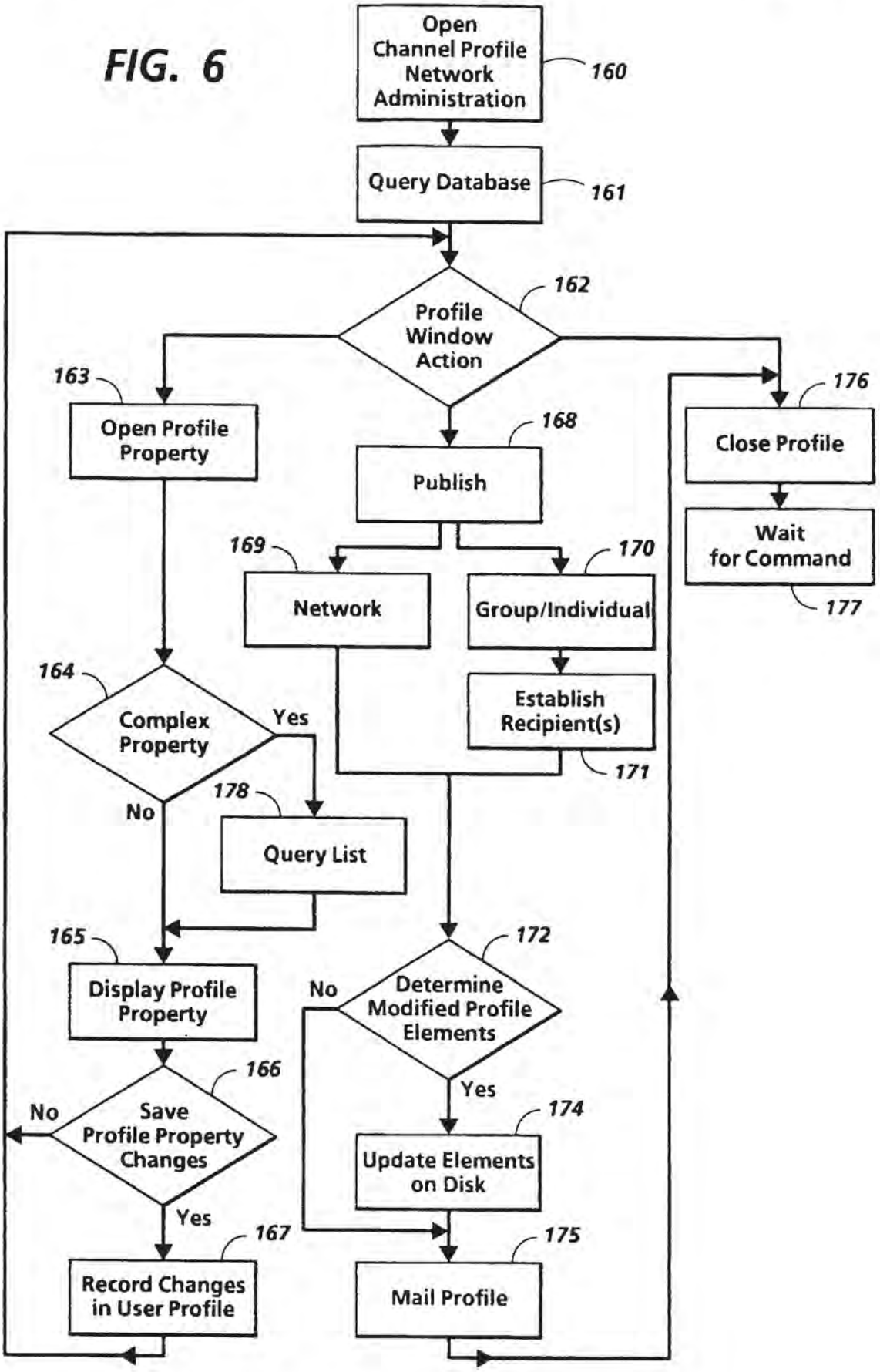
Department: Computer Graphics
Receive Priorities:

FIG. 5

FIG. 6


Open Channel Profile Network Administration
160
Query Database
161
162
Profile Window Action
163
Open Profile Property
168
Publish
176
Close Profile
Wait for Command
177
169
Network
170
Group/Individual
Establish Recipient(s)
171
164
Complex Property
Yes
No
178
Query List
165
Display Profile Property
172
Determine Modified Profile Elements
No
Yes
166
Save Profile Property Changes
No
Yes
174
Update Elements on Disk
167
Record Changes in User Profile
175
Mail Profile

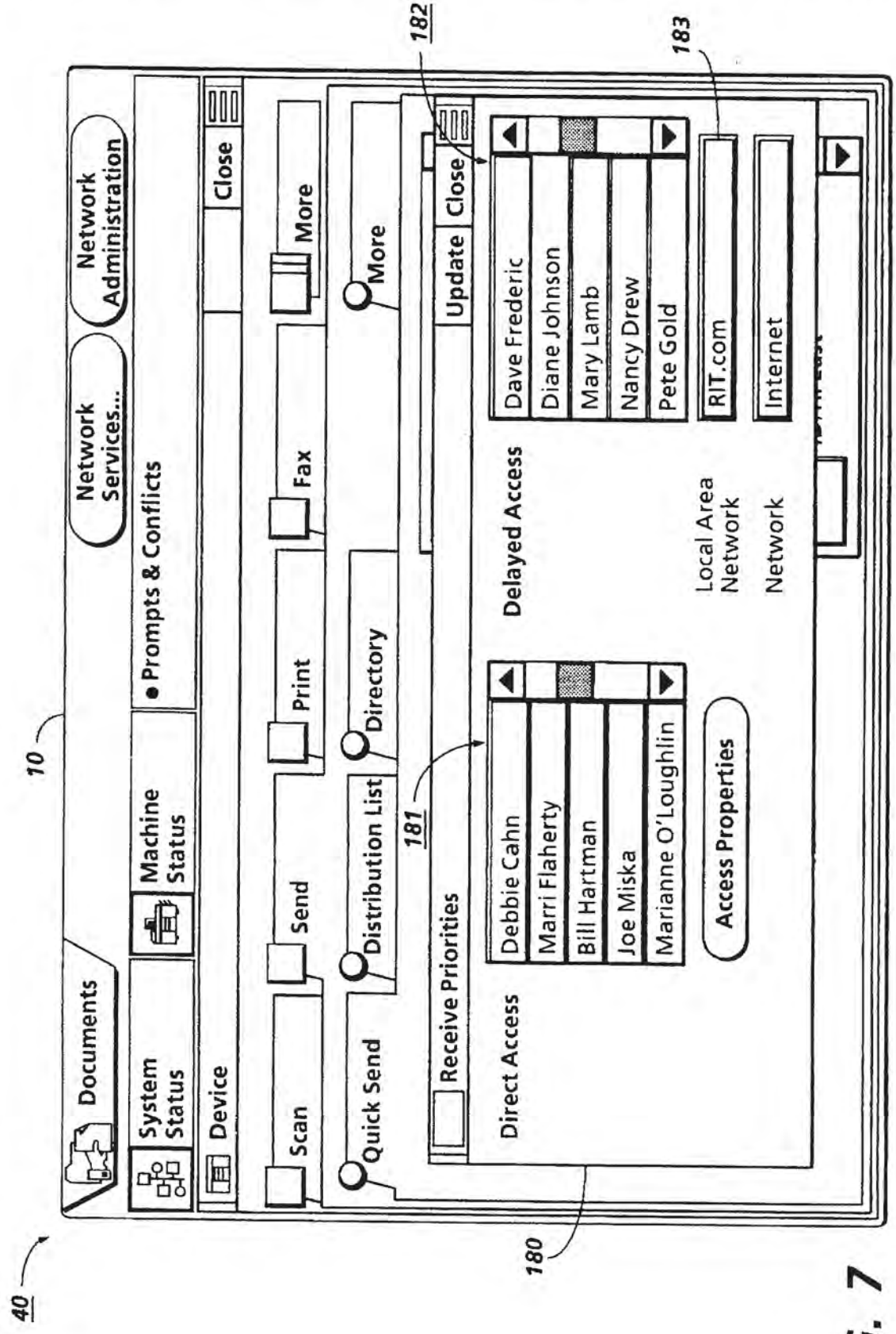

40
10
180
181
182
183
Documents
System Status
Machine Status
Network Services...
Network Administration
Prompts & Conflicts
Device
Close
Scan
Send
Print
Fax
More
Quick Send
Distribution List
Directory
More
Receive Priorities
Update
Close
Direct Access
Debbie Cahn
Marri Flaherty
Bill Hartman
Joe Miska
Marianne O'Loughlin
Delayed Access
Dave Frederic
Diane Johnson
Mary Lamb
Nancy Drew
Pete Gold
Access Properties
Local Area Network
RIT.com
Network
Internet

FIG. 7

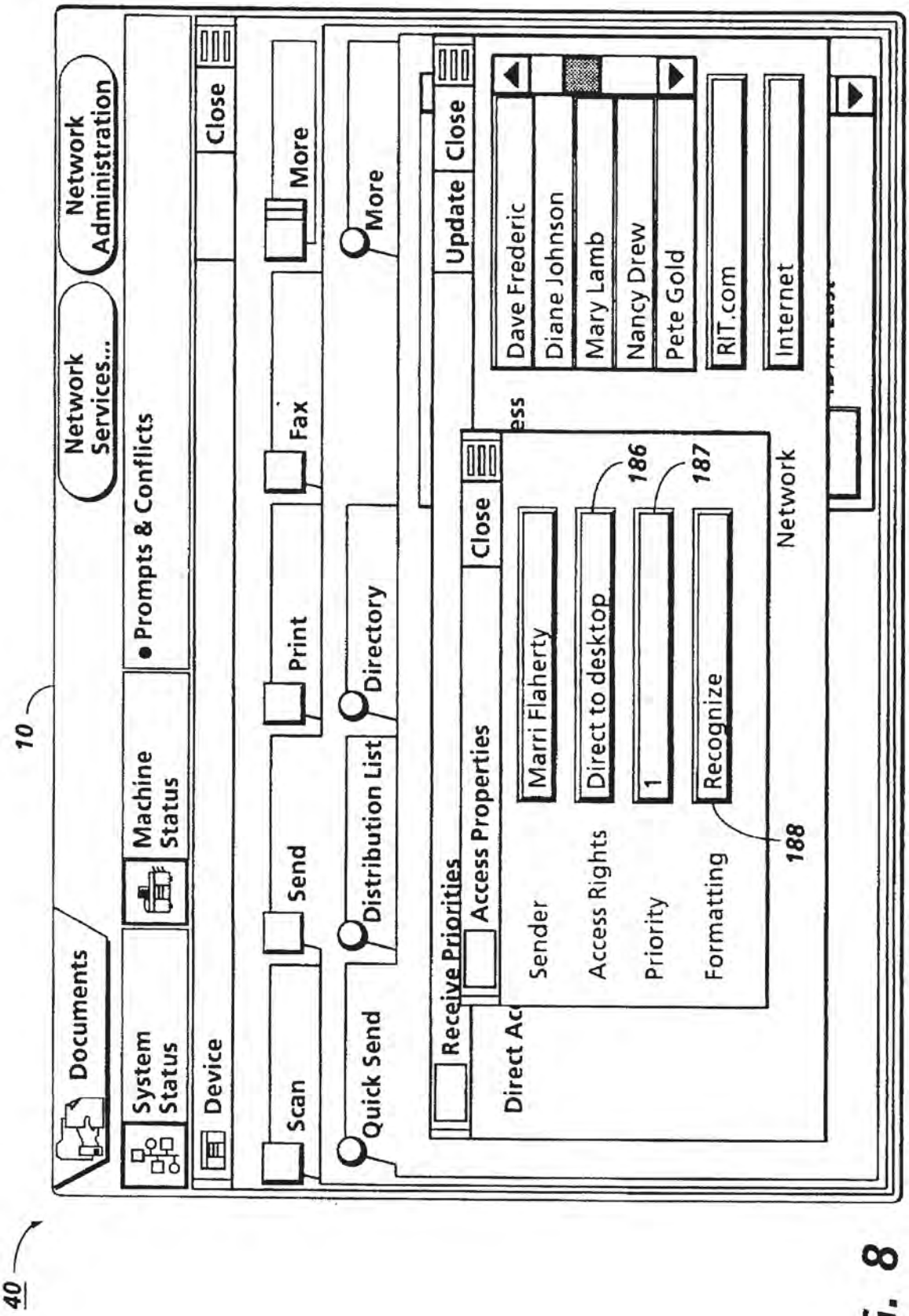

40
10
Documents
System Status
Device
Scan
Send
Print
Fax
More
Quick Send
Distribution List
Directory
More
Network Services...
Network Administration
Machine Status
Prompts & Conflicts
Close
Update
Close
Dave Frederic
Diane Johnson
Mary Lamb
Nancy Drew
Pete Gold
RIT.com
Internet
Receive Priorities
Access Properties
Close
Direct Ac
Sender
Access Rights
Priority
Formatting
Marri Flaherty
Direct to desktop
1
Recognize
186
187
188
Network

FIG. 8

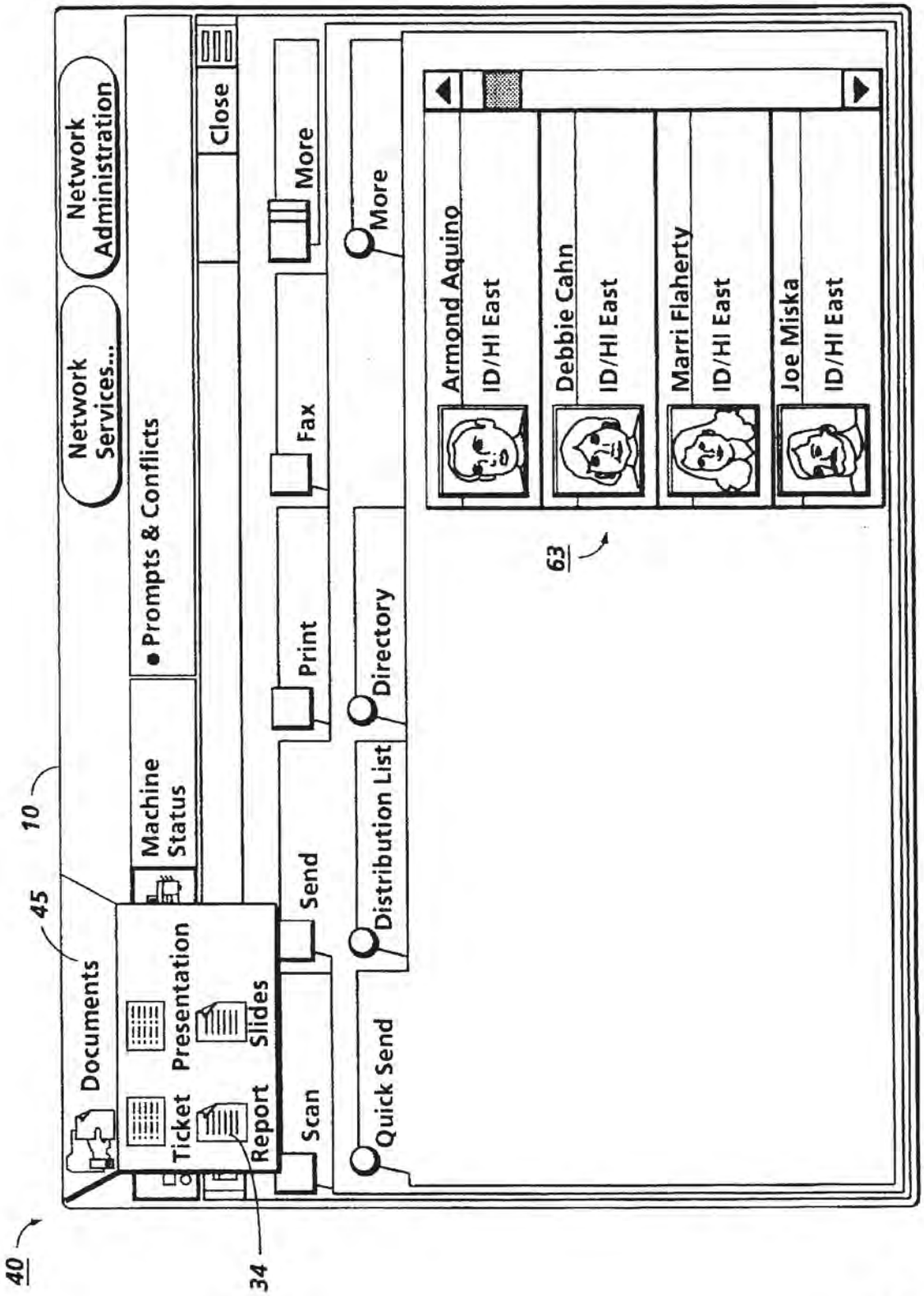

Network Administration
Network Services...
Prompts & Conflicts
Close
More
Fax
Print
Send
Directory
Distribution List
Quick Send
Machine Status
Documents
Presentation
Slides
Ticket
Report
Scan
Armond Aquino
ID/HI East
Debbie Cahn
ID/HI East
Marri Flaherty
ID/HI East
Joe Miska
ID/HI East
More
63
10
45
40
34

FIG. 9

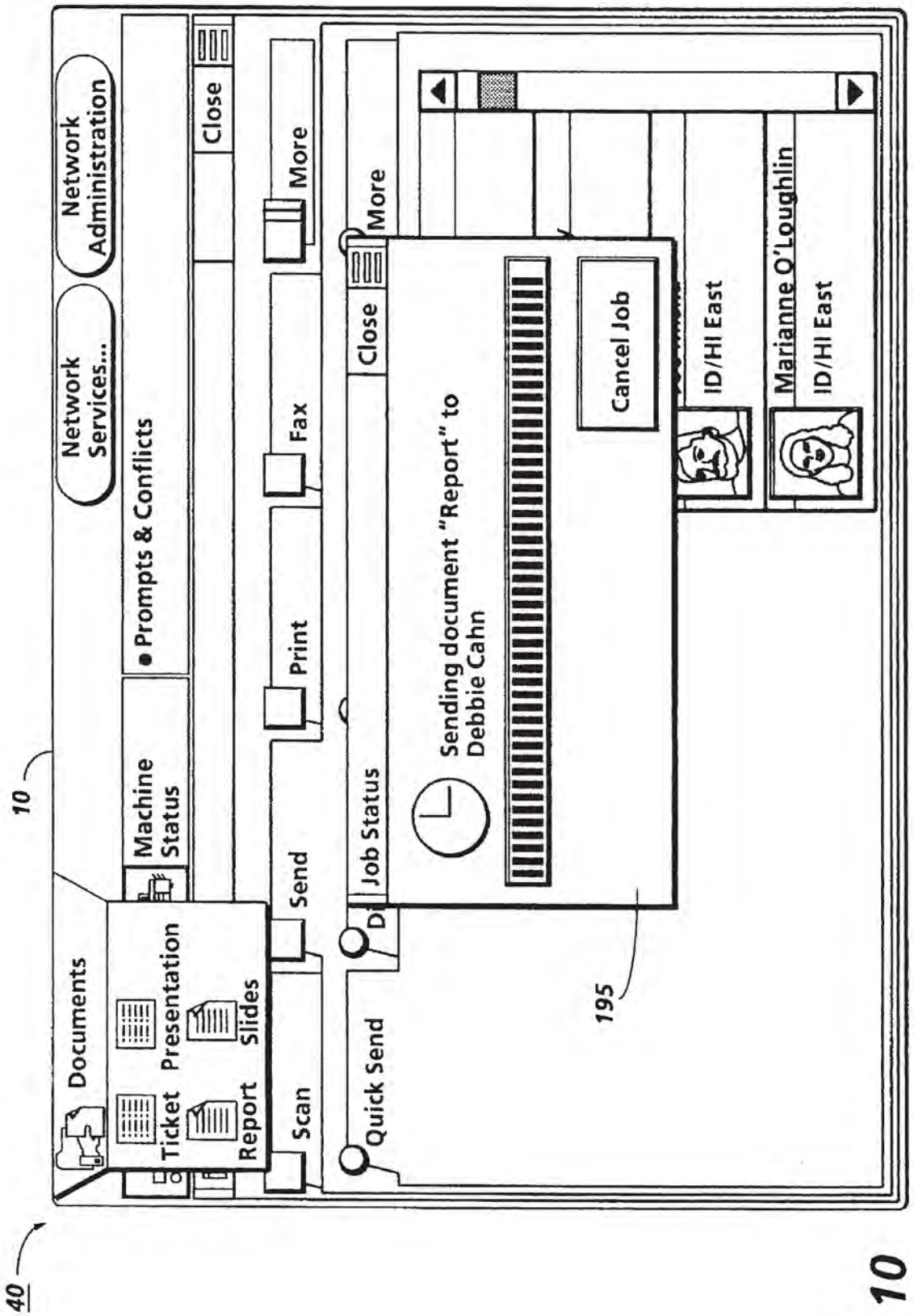

10
40
Network Services...
Network Administration
Prompts & Conflicts
Machine Status
Documents
Ticket
Presentation
Report
Slides
Scan
Send
Print
Fax
More
Close
Quick Send
Job Status
More
Close
Sending document "Report" to Debbie Cahn
195
Cancel Job
ID/HI East
Marianne O'Loughlin
ID/HI East

FIG. 10

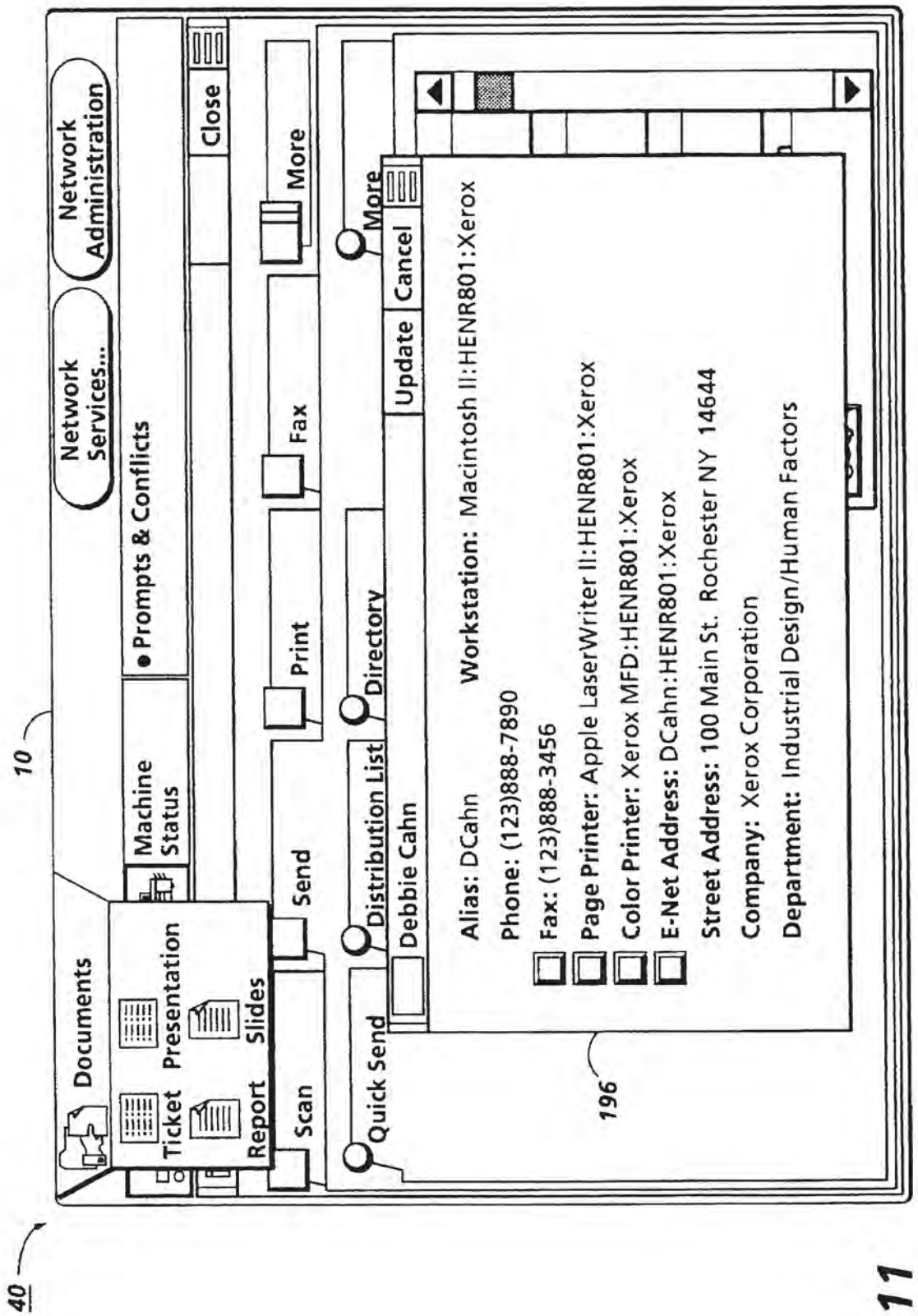

40
10
Network Administration
Network Services...
Prompts & Conflicts
Close
Machine Status
Documents
Presentation
Slides
Ticket
Report
Scan
Send
Print
Fax
More
Distribution List
Directory
More
Quick Send
Debbie Cahn
Update
Cancel
Alias: DCahn
Workstation: Macintosh II:HENR801:Xerox
Phone: (123)888-7890
Fax: (123)888-3456
Page Printer: Apple LaserWriter II:HENR801:Xerox
Color Printer: Xerox MFD:HENR801:Xerox
E-Net Address: DCahn:HENR801:Xerox
Street Address: 100 Main St. Rochester NY 14644
Company: Xerox Corporation
Department: Industrial Design/Human Factors
196

FIG. 11

USER INTERFACE FOR DEFINING AND AUTOMATICALLY TRANSMITTING DATA ACCORDING TO PREFERRED COMMUNICATION CHANNELS

BACKGROUND OF THE INVENTION

The present invention relates to a user interface for improving communication between devices or stations on a network. More specifically, the invention relates to a user interface having the option to define communication channels or virtual links between individual users or groups of users on the network and the capability to automatically send data to receivers based upon predetermined receiver defined communication channels.

As networks and systems become more integrated and more complex, the amount and speed of information flow between users creates a need for more versatile and more efficient control over the information flow process. Current systems do not enable receivers of information to define how they prefer their information received. Typically a sender controls the form information should take, forcing the receiver to accept information in the form defined by the sender.

Protocols defining integrated system behavior for devices such as printers, scanners, workstations and facsimiles, are well known. These protocols define how the systems should integrate across networks. Operational transparency across networks and device platforms, provide users with an increasingly integrated and transparent system environment. In this environment the manipulation of information (such as documents) is transparent to users as a result of the various network protocols that define the manner in which devices manipulate information. For example, "Office Systems Technology" Xerox Corporation, Palo Alto, Calif., 1984, OSD-R8203, is an overview of the Xerox Corporation "8000" series products, which include workstations, services, ethernet and software development. The "8000" series products are integrated using Ethernet and the Xerox Network Systems Communication Protocols which include: Intelnet Transport Protocols: Xerox System Integration Standard, Xerox Corp., Stamford, Conn., December 1981, XSIS-028112; Courier: The Remote Procedure Call Protocol, Xerox System Integration Standard, Xerox Corp., Stamford, Conn., December 1981, XSIS-038112; Clearinghouse Protocol, Xerox Corp., Stamford, Conn., April 1984, XSIS-078404; Authentication Protocol, Xerox Corp., Stamford, Conn., April 1984, XSIS-098404; Filing Protocol, Xerox Corp., Stamford, Conn., May 1986, XNSS-108605. Another example of an integrated system is the ISDN telephone network that provides services such as fax mail boxes and voice mail boxes.

The following Xerox Corporation U.S. patents include examples of systems indicating a network, server and printer usually having shared remote user terminals: U.S. Pat. No. 5,153,577; 5,113,517; 5,107,443; 5,072,412; 5,065,347; 5,008,853; 4,947,345; 4,939,507; 4,937,036; 4,899,136; 4,531,239; 3,958,088; 3,920,895, also, Fuji Xerox Co. U.S. Pat. No. 5,113,355. By way of background for system user interfaces, U.S. Pat. Nos. 5,072,412 and 5,107,443 disclose workspaces having an object-based user interface that appear to share windows and other display objects. A display system object can be linked to several workspaces giving workspaces the appearance of shared windows. These workspaces can be navigated through using metaphors such as moving from one room to another through doors. Additionally, these workspaces can be shared by groups of users over a network. Also of interest are U.S. Pat. No. 5,008,853 disclosing shared structured data by multiple users across a network, and U.S. Pat. No. 5,065,347 disclosing a method of presenting information hierarchically using a folder metaphor. Also noted is a print server disclosure by IBM Corp. U.S. Pat. No. 4,651,278 issued Mar. 17, 1987 to A. Herzog, et al. Also, noted for examples of printer controls are Xerox Corporation U.S. Pat. No. 5,133,048, and the October 1990 publication "The Xerox DocuTech® Production Publisher" from BIS CAP International, Newtonville, Mass., by Charles LeComte. Noted also are Xerox Corporation U.S. Pat. No. 5,170,340, and allowed U.S. Ser. No. 07/591,324 now U.S. Pat. No. 5,175,679, on networking thereof. Additionally, "Acrobat" products by "Adobe" will provide transparent document sharing. "Acrobat" can be viewed using a portable document format, through a "PostScript" file format that describes pages and their interrelation within a document.

Also noted are commercial network systems with printers is the 1992 Xerox Corporation "Network Publisher" version of the "DocuTech®" publishing system, including the "Network Server" to customer's Novell® 3.11 networks, supporting various different network protocols, such as "Ethernet™" and TCP/IP. Additionally noted is the Eastman Kodak "LionHeart™" system. A network publication noted is "Mastering Novell® Netware®", 1990, SYBEX, Inc., Alameda, Calif., by Cheryl E. Currid and Craig A. Gillett. Further noted are page description languages (PDL) for printers and systems as defined in "Interpress™: The Source Book", Simon & Schuster, Inc., New York, N.Y., 1988, by Harrington, S. J. and Buckley, R. R.; and Adobe Systems Incorporated "PostScript® Language Reference Manual", Addison-Wesley Co., 1990. Also noted is the Apple Corp. "Quickdraw™" software and its published materials.

Printers (and printer controllers or servers) are also sometimes referred to as "shared resources" in a networked environment. The server typically functions as a "spooler" to buffer the jobs that are sent to it, as well as a page description language (PDL) "decomposer", for converting the PDL files (e.g., "Interpress™" or "PostScript"®) to bitmapped files for application to the printer. Also of interest is Pennant Systems Co., Print Services Facility/2 (PFS/2), server-based software intended to act as a universal translator between various network protocols (LAN, TCP/IP and SNA) and printer document protocols (PCL and Postscript).

Another example of an established commercial integral system, with a shared printer and system server, comprises the Xerox Corporation "VP Local Laser Printing" software application package, which, together with the Xerox "4045" (or other) Laser Copier/Printer (CP), the "6085" "Professional Computer System" using Xerox Corporation "ViewPoint" or "GlobalView®" software and a "local printer [print service] Option" kit, comprises the "Documenter" system. The laser printer prints text and graphics with high quality resolution on a variety of paper sizes and special papers, including transparencies, labels, and envelopes. [When equipped with the optional copier feature, the "4045" CP also alternatively provides quick copies, functioning as a copier.] Printing occurs as a background process, enabling system users to continue with other desktop activities at their terminals. VP Local Laser Printing software can be loaded at a networked, remote, or standalone Xerox "6085" Professional Computer System (workstation).

Different workstations can access print services in different ways. To print a document, desirably the user can simply "copy" or "move" the document, with a mouse click or other command, to a printer icon on the workstation desktop, and

set the displayed printing options, as on Xerox Corporation workstations. From other workstations such as the IBM PC's, the user may need to select menu items or type in commands to obtain access. The workstation selectable print options can include the number of copies, selected pages to be printed, paper size, image orientation, a choice of printers, and phone numbers when sending to a facsimile device. In addition, the option sheet allows the user to specify whether to delete the "Interpress™" or other master, or retain it at the workstation desktop. Already print-formatted or master documents may be transmitted to the printer directly, eliminating the need to repeat the conversion or decomposition process if another copy of the document is desired. If saved, an "Interpress™" master can be stored at the file service or even mailed to one or more individuals via an electronic mail service. Utilizing an internetwork routing service, users can transmit "Interpress™" or other printing masters through a network and then across an intelnet, typically, via telephone lines, twisted pair wires, coaxial cables, microwaves, infrared, and/or other data links, allowing documents created in one location to be automatically routed to a print service and printer hundreds or even thousands of miles away, in seconds or minutes.

The recently announced Xerox Corporation developed "PaperWorks"™ product utilizes a special encoded fine pattern of special marks ("glyphs"), electronically recognized as such using PC computer software by the facsimile electronic image receiver. It was initially configured to operate on a conventional personal computer having a conventional internal fax card and a modem, electronic mail system or other network connection to telecommunications, and running "Windows"™ software. A "PaperWorks"™ fax form carries a coded identification region which, upon scanning, may be decoded by an appropriate processing system. This coded identification allows the system to determine which of several different pre-stored forms the received form is, and what its page layout is. From this, the system can also extract the necessary user-entered information from the form to facilitate processing. An important feature of the "PaperWorks"™ system is the use of data defining a control sheet image to provide information in accordance with which operations are performed on data defining a sequence of images [data defining images, not actual physical sheets of a medium]. For example, the control sheet image can include information indicating a destination to which the fax server then transmits data defining said sequence of images.

The "User Handbook, Version 3.01" ©1988, for the Xerox "FaxMaster 21" product, indicates that it can automatically load hours of multi-page, multi-destination, facsimile transmission documents, and send them all with a few simple keystrokes, and can retrieve document from multiple locations, print them at the hub, store them on disk for later printout, or forward them to other facsimile terminals [automated store and forward]. It provides electronic mail capability by storing documents for retrieval by remote network users. It provides confidential [electronic] mailboxes, enabling secure document reception for only authorized personnel. It utilizes a personal computer with software, and can use remote touch-tone telephone access to the hub unit. Of particular interest, especially re voice telephone notification to recipients of fax messages, is U.S. Pat. No. 4,654,718 to T. Sueyoshi, assigned to Fuji Photo Film Co. It refers to facsimile correspondence containing codes for telephone numbers and sensors in the receiving equipment for reading these telephone codes. An "Octel System 200" voice mail system is called "outcall notification" and may be as follows: when one receives a message on his voice mail system that telephone system dials your pager number to alert you that you have a message. One's voice mail box number and pager number are both dedicated. Also, of course, manually, for many years, a Western Union operator would call a person to let them know that their telegram came in.

The aforementioned systems, however, do not enable the sender of information on a network to identify the receiver's preferable form of receipt and respond accordingly. Nor do the aforementioned systems provide the receiver of information the capability of designating preferred forms of information receipt that can be automatically carried out by senders on the network. Given that hardware platforms and different software representations of identical information exist, more and more users require a system that establishes the preferred form with which their information should be received.

Accordingly it would be desirable to provide a user interface including a screen display for recipients of data to define the information flow and, particularly, a user interface enabling an operator at the interface to establish the format, communication channel, and disposition of information to be transmitted.

It is an object of the present invention, therefore, to provide a new and improved user interface with the capability to selectively define the properties and communication channels for information to be sent over a network. It is still another object of the present invention to provide a user interface to define the preferred form of receiving information such as physical properties (printed) or intermediate properties (electronic mail, digitally stored voice mail or facsimile mail) or services and devices such as printers, facsimiles, telephones and video terminals. Still another object of the present invention is to be able to access a screen display to identify preferred channels or preferred receipt status for data sent to a receiver. Other advantages of the present invention will become apparent as the following description proceeds, and the features characterizing the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

SUMMARY OF THE INVENTION

The present invention is a user interface to automatically distribute information to a receiver on a network using devices (such as printers and facsimile machines) and communication channels (such as electronic mail) defined in a receiver profile. The receiver profile establishes the properties and mode for receipt of information for receivers on the network and the profile is published in a network repository for all network users or is accessible by selected groups or individuals on the network. Receivers have additional control over network senders by defining an information filter which further controls sender channel access (to a receiver) by defining some channels as having priority of access such as direct or delayed access, as well as selectively permitting senders to override the receiver profile. Consequently, receiver profiles provide a variable receiver definable link to senders using multiple forms of media as well as multiple hardware platforms and network configurations.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, reference may be had to the accompanying drawings wherein the same reference numerals have been applied to like parts and wherein:

FIG. 1 is an illustration of a system environment incorporating the present invention;

FIG. 2 is an enlarged view of the multi-device user interface used on the display screens shown in FIG. 1, and which embody communication channels of the present invention.

FIG. 3 shows a schematic view of the system architecture used in the system environment of FIG. 1;

FIG. 4 shows a simulated screen image of a communication channel being published;

FIG. 5 shows a simulated screen image of a property of a communication channel being modified;

FIG. 6 is a flow chart showing the general steps involved with publishing a communication channel;

FIG. 7 shows a simulated screen image of receiver setable communication channel profiles;

FIG. 8 shows a simulated screen image of the access properties of a communication channel;

FIG. 9 shows a simulated screen image of information being sent using a communication channel;

FIG. 10 shows a simulated screen image of the status of the information being sent in FIG. 9;

FIG. 11 shows a simulated screen image of a communication channel of a receiver being optimized by a sender.

While the present invention will hereinafter be described in connection with a preferred embodiment thereof, it will be understood that it is not intended to limit the invention to that embodiment. On the contrary, it is intended to cover all alternatives, modifications, and equivalents, as may be included within the spirit and scope of the invention.

DESCRIPTION OF EMBODIMENT

In the description herein the term "hard copy" refers to a sheet of paper or other such conventional individual physical image substrate, and not to electronic images. The term "document" refers to either a single page or multiple pages that can be represented either as hard copy or in some intermediate electronically stored format for later rendering to a human understandable form such as hard copy or video display. A "job" refer to one or more documents or sets of documents being sent to or received by a particular addressee or designee. Additionally, the term "multimedia" is defined herein as documents that relay information using audio and/or video, where video includes documents in the form of text, graphics and/or images.

"Multimedia" can also encompass any information such as "electronic mail", "facsimile", "voice-mail" or any other media transferable through network having interconnected printers, scanners, facsimile devices or file servers. Multimedia can be encoded in a plurality of formats (i.e., glyphs, page description languages, ASCII, bar code, etc.) in order to optimize the quantity of data required for storage and transmission efficiency as well as the speed with which the media is rendered to users (e.g., electronic images displayed or printed). Plural mode or "multi-function" systems or "devices" combine printing, scanning, editing, facsimile and message receiver printing capability, where one such capability is defined as a "service". The term "printer" encompasses hard copy output from various input sources, including facsimile, scanners, keyboard entry, and electronic document images input.

The term "electronic mail" (email) also has various broad meanings, and can include multimedia transmission by either external telephone lines, and/or shared internal networks using optical fiber, twisted wire pairs, coaxial cable, wireless transmissions, or other networking media, or combinations thereof, of documents for electronic remote terminal displays and/or printer hardcopy printouts, to any of the numerous addresses designated by the sender.

A. System Architecture

Referring now to the drawings and in particular to FIG. 1, an exemplary multimedia device information system or network **2** including work station **4** enables users to communicate in a transparent and device independent manner. Multimedia system **2** can be implemented using a variety of hardware platforms and includes devices for input including scanner or digital copier **5**, keyboard **6**, pointing device or mouse **7**, microphone **8**, and video camera **9**. The system further has devices for output including display terminal **10**, printer **11**, and speakers **12**. Input/output (I/O) devices include facsimile **13**, file server **14**, and telephone **15**. Server **14** is configured central to or remote from work station **4** with public, shared and/or private data storage that is differentiated by user access rights. The server **14** includes relational database system **17**, network administration system **18**, mail system **19** (e.g. email, voice mail) and data storage and retrieval system **20**, and can be physically configured using optical drives, hard drives, floppy drives and/or tape drives. The relational database system **17** provides systems with fast query and retrieval of data.

Work station **4** operates in a collaborative environment, where users at different Work stations **4** can work together in real time to process and distribute public, shared or private information existing in different forms. (Public data is defined herein as data accessible by anyone, shared data is defined as data accessible by a limited number of users and private data is data uniquely accessible by a single user.) Work station **4** can exist in a distributed or centralized environment. In either environment Work station **4** is connected to other systems and devices through local area network (LAN) **24**, gateway **25**, and/or modem **26**. In distributed systems, a number of Work stations extend distributed processing and storage capabilities to each other, by providing for example redundant storage or a single mounting of a unique application. Work station **4** includes an object oriented user interface (UI) **40** that uses icons and windows to represent various data objects and user applications such as a display illustrating an office desktop metaphor employing various abstractions of a typical office environment. User interfaces using windows and icons having an object oriented methodology to present metaphors for maintaining data, navigating through various user spaces and presenting abstract computer concepts are well known, an example of which is Globalview TM ("GV") software available from Xerox Corporation, which uses abstractions such as a desktop, inbasket, outbasket and documents.

FIG. 2 shows an embodiment of a multi-function device user interface **40** which is displayed on screens **10** of Work station **4**, printer **11** and scanner **5**. User interface (UI) **40** can operate remotely from any system; it is extensible across network services using remote windowing protocols such as X windows ("X Window System", W. Scheifler and James Gettys, Digital Equipment Corporation, U.S., 1992, ISBN 1-55558-088-2). For example, the user interface **40** on printers **11** is available remotely from any Work station **4** or alternate service such as scanner **5**. Specifically, the user interface **40** is divided into three regions; resource bar **42**, status bar **43**, and service area **44**. Resource bar **42** is a menu bar that provides users access to high level services that are integrated on network **24**. Within the resource bar document

source or suitcase **45** provides the user with a temporary storage space for documents. Suitcase **45** stores active and editable documents for easy movement across network services, or it is a transitional space where documents are stored while a user navigates through network **24**.

Further, provided on resource bar **42** is network services menu **46** and network administration menu **47**. Network services menu **46** provides access to any networked service such as printer **11**, facsimile **13**, scanner **5**, file server **20** (private, shared and public file storage), database server **17**, mail servers (e.g. voice mail, email, etc.) **19**, ports (such as modem **26**, network gateway **25**), and other Work stations **4**. Also, available in services area **44** are published communications channels **63** available from network admin **18**. These are channels that have been provided to a utility (not shown) that manages network administration **18**. These channels included in a user profile are provided by a user who is to receive data from other users on network **24**. Other utilities available in network admin **18** are distribution lists, service access lists and other domain and area network services. Network administration **47** provides users with access to utilities for identification and location of profiles and services. For example, network administration **47** includes information concerning user access privileges as well as resource privileges to file server access.

Status bar **43** is divided into three dedicated message areas, system message area **48**, device message area **49**, programming conflicts message and prompt area **50**. Text is updated in the message area **50** as system status changes. The message area **50** can be selected to reveal more detailed messages. For example, when a printer is down, the message area gives a "Printer Down" message; further selection of the message area **50** provides more detail of causes for the printer to be down. Service area **44** groups and holds related services and features as well as provides user work space **51**. A selected device is identified on herald menu **52**, that is, cording on menu **52** provides utilities available to the device name **53**. For example, device **53** could be a network publishing system with scanning, printing or faxing facilities. Device **54** would be the physical network publisher exporting the services. Service bar **55** groups services available on service **53**. For example, a user could select a service module to access a specific document service (e.g. scan **56** or send **57**). Service sub bar **58** provides access to subservices within service modules. Workspace **51** provides a user area for preparing documents for distribution, which can include publication and archival.

In particular, the send service **57**, which is a service displayed on service bar **55**, is selected and opened on user interface **40** as shown in FIG. **2**. As shown in FIG. **2**, the send service **57** has sub service bar **58**, with sub-services, quick-send **59** and distribution lists **60**. The send service **57** provides virtual links or communication channels to other users on network **24**. Channels **62** are published to the network by a receiver in the form of a receiver profile to provide the receiver with the flexibility to define the mode (facsimile, hardcopy, email, voice mail, etc.) that the receiver's information should be received. In essence, the communication channels **62** are receiver setable information filters. A single communication channel **63** is identified using the user's name **64** as well as location **65** and illustrative identification **66** (e.g. a scanned-in picture, graphic, icon, etc.). Distribution list **60** is a sub-service that provides similar functionality as a quick-send sub-service except that distribution lists are communication channels that are directed to groups of individuals. It is a means for a user to build distinct distribution lists. Distribution list **60** subservice provides either distribution lists published to the network or be created by individual users.

B. Channel Architecture

The channel architecture is based on a client-server relationship, where client facilities are applications that are exported to the network **24**, and server facilities are imported from the network. In other words, clients access exported server functionality. Thus, some services (printer, scanners, and the like) may only export or provide server functionality while using no client functionality. As a result, both the channel client and channel server may operate on the same service as well as uniquely on different services. The architecture is shown in detail in FIG. **3**, where an integrated client/server system **102** is operating with stand-alone client **104**, server **103** and communication channel admin server **105** that provides network administrative facilities such as storing communication channel information on disk **106**.

Common to both the client and server architecture is communication channel manager **110**. Manager **110** interfaces user interface **111** with network **24**, local storage disk **112** and cache **113**, receiver service **114** and sender service **115**. Listed in Appendix A is an example of an interface for manager **110** between user interface **111** and receiver and sender service **114** and **115**. Local storage available to manager **110** is in the form of long-term storage **112** (e.g. disk, floppy or tape) and short-term fast access, or cache storage, **113**. Receiver service **114** provides server functionality while sender service **115** provides client functionality to manager **110**. Manager **110** establishes virtual links or communication channels **63** either directly to other servers such as server **103** or indirectly through admin server **105**.

C. Channel Control (Receiver Service)

1. Channel Profile Publication

Communication channel control begins with the receiver defining the preferred form(s) that documents should take when received. The user activates profile **150**, shown in FIG. **4**, by selecting display user profile command (not shown) from the network administration menu **47**. User profile **150** is completed by a user, for example Fred Smith, and published to network administration **105** using the publish command **151** or the profile herald bar **152**. Publication to other network users defines the preferred form with which the publisher, namely Fred Smith, desires his information to be received. Profile properties **153** are a number of different profile categories, each category can be either checked, locked, or unselected. If a category is unselected, then a category is neither locked nor checked. A checked category such as fax category box **155** identifies facsimile as the users established default receive preference. For example, given Fred Smith checked the fax box, then all facsimile documents sent to him are routed to the fax at the identified phone number in the profile properties **153**. In a similar manner, Fred Smith can set his preference for a particular page printer, color printer, or any other device to receive information. It should be noted that it is well within the scope of the present invention that multiple printers or devices can be listed or scrolled and the user or receiver can rank the devices or modes of communication in a priority of preference to receive information.

Also, the user or publisher can selectively lock choices or set-ups using a lock as shown in page printer box **156**. The lock function inhibits users from changing the published set up. The lock feature can be any hard or soft button or indicator to inhibit alteration of a specified mode or device.

In other words, both a check box and a lock identify receiver preference, where the lock disables the ability of the sender to deviate from the published receiver profile. For example, users sending documents may desire changing the preferred printer, if unlocked, to enable color printing rather than black and white printing.

Each profile property **153** is further selectable through each box category as indicated above. For example, the page printer selection window **159** shown in FIG. **5** depicts how users change the set-up of a particular category. Page printer window **159** opens as a result of double clicking on the page printer button **156**. Once the user, Fred Smith, has selected a preferred page printer by filling out the appropriate categories in window **159** including a privacy button P as shown, the user can either apply these selections or cancel them by selecting "Cancel." or "Close" on the herald bar of window **159**. The profile properties **153**, however, are not limited to those shown in user profile **150**. Any preferred form of receipt may be entered as a property in profile **150**, some examples include a video conferencing center and a voice mailbox.

The sequence of steps for publishing the user profile **150** (shown in FIGS. **4** and **5**) with network administration **47** is depicted in FIG. **6**. In box **160**, the user opens the user profile by invoking the "open user profile" command (not shown) in the network administration menu **47**. In box **161**, manager **110** (FIG. **3**) is activated with receipt of the open channel profile command identified as "Open Channel Profile" in Appendix A. To return the user profile, manager **110** queries channel profile database **112** for the logged on user's current profile. Alternatively, if the user profile is not available from local DB **112**, the admin server **105** is queried. Once the profile is returned to UI **111**, the user can invoke any profile property displayed on profile **150**. In box **162**, the UI **111** dispatches any commands received from open profile **150**.

At box **163**, a profile property **153** has been selected. If the property is determined not to be complex at box **164**, the property specifications are displayed, at box **165**, as shown for example in FIG. **5** for the page printer selection window **159**. If the property is complex, then as illustrated at box **178**, additional lists or sub properties are accessed for display as further described below with respect to FIG. **8**. At any time after changing or simply viewing a profile property, a determination is made at UI **111** if any changes required at box **166** should be recorded. At box **167**, profile changes that have been enumerated are recorded by manager **110**. In both cases, (whether or not the profile property specifications have been modified) the control returns to box **162** where subsequent commands from profile **150** can be dispatched.

After making profile changes or simply after opening profile **150**, at box **168**, the profile can be published, either to network admin server **105** at box **169** or to groups or individuals identifiable by network **24** at box **170**. If groups or recipients have been identified, their identity is verified at box **171**. Subsequently, at box **175**, the user profile is published to the network or to an individual or groups of individual network users. However, before publication, elements in the profile **150** are updated in local database **112**, if they have been modified, in order that local and published profiles remain consistent. This is shown at box **172** determining if there are modified profiles or properties and updating the modified profiles in local data base **112** as shown in box **174**. After publication, profile **150** is closed as shown at box **176**, followed by waiting for the next user command at box **177**. (If no publication is required, the user can select the close command in the herald of profile **150**.)

2. Channel Access Control

From profile **150**, receive priorities **154** can be selected to open receive priorities window shown in FIG. **7** to select additional priorities for receipt of information based upon factors such as the identity or status of the sender. Direct access priorities **181** and delayed access priorities **182** establish the access control of a user's communication channel **63**. In this case, priorities established by a user determine where information is to be received and what level of priority should be given to that information. Priorities **154** sorts network users into multiple directories such as directories **181** and **182**. Direct access places received information or data into a preferred location such as directly into the receiver's electronic mailbox whereas delayed access places received data in a remote or less accessible location. Delayed access group **182** is a directory of network users (e.g., a network directory). This directory is updated by manager **110** by querying admin server **105**. The user can move individuals from one directory to another simply by selecting the individual and moving its iconic representation to an alternate directory.

Additionally, access properties can be retrieved from any network supporting an admin server **105** by identifying the path **183** of the network. Access properties can be modified individually for each user listed in directories **181** and **182**, as shown, for example, for user Marri Flaherty in FIG. **8**. The sequence of steps required to establish channel access for different users is shown in FIG. **6**. At box **164**, receive priorities **154** has been selected. Since only necessary information is maintained locally to system **102**, remote admin server **105** is queried at box **178**. Displayed access properties **182** can be altered to the preference of the user. For example, the access rights property **186** specifies whether a sender's information is sent to a printer, to a queue or to a desktop. For instance, a receiver may provide an individual with "interrupt at desktop" privileges and another with a "reject" or busy return message. Priority property **187** ranks users as to their interrupt priority. Formatting property **188** provides the receiver with the ability to keep the senders finishing options (e.g. job ticket information). For example, a document sent may specify staple or bind for output specifications. Using formatting property **188**, a user can specify whether to ignore such document specifications.

To summarize, communication channel control includes channel profile publication, where a network user who is the receiver of a document has the capability to set forth either through publication to the network or in a more limited fashion to other network users (or groups of users through distribution lists) a profile describing the preferred form (facsimile, electronic mail, voice mail, hard copy, color or black, file server, etc.) and service (the specific printer, facsimile machine etc.) documents should take to be rendered. Thus, individuals always wanting their documents printed on a color printer can specify the printer and the appropriate format that document should take. As a result, users are provided with an ability to establish consistency in the form with which documents are to be received by each user on a network using a universal method (i.e. method which is easily accessible to everyone on the network).

D. Channel Operation

To operate a communication channel such as channel **63**, select a document from document source **45** (:e.g. report **34**) and move it to communication channel **63** as shown in FIG. **9**. Job status window **195** shown in FIG. **10** subsequently displays the document send progress. When sending a document through a communication channel without modifying its properties as shown in FIG. **11**, the channel takes on properties published by the receiver. Profile properties window **196**, open by a user sending information, displays

properties of the channel device from the receiver's channel profile. In the example shown in FIG. **11**, Debbie Cahn's communication channel allows the sender of information to select a document's disposition from either fax, page printer, color printer, or electronic mail. This option is enabled by the receiver at the time of channel publication. For example, this channel could have been forwarded to the current document sender by Debbie Cahn in order that this individual have adequate flexibility to send information. In this example, if the sender using system **4** had sent report **34** to Debbie Cahn without accessing Debbie's profile **196**, Debbie would have received report **34** over her Fax line (123-888-3456) since her Fax line is prioritized highest of the selected (checked) profile properties. It should be noted that it is well within the scope of the present invention to provide many alternate modes of identifying, listing, and accessing options, priorities, and defaults with respect to a receiver profile and making such options and priorities selectively accessible to potential individual senders as well as groups and categories of senders.

E. Summary Overview

Communication channels enable the recipients of documents in a network multimedia environment to define the form with which the document should take upon receipt. Initially, channel profiles are published to a defined network audience to establish a communication channel defined by the published profile. This enables a sender to distribute documents with a prior knowledge of the preferred disposition a document should have. An advantage derived from a receiver driven document distribution system is that information takes the form most desired by the document recipient. Communication channels help make systems more productive by enabling information receivers to have information in their desired format so that it does not need to be converted from multiple sender formats.

APPENDIX A

```
CommunicationChannel: DEFINITIONS =
    BEGIN
    -- TYPE DEFINITIONS
    StreetAddress: TYPE = RECORD [
        alias: AliasType,
        street: LONG STRING,
        town: LONG STRING,
        zipCode: LONG CARDINAL,
        company: LONG STRING,
        department: LONG STRING,
        mailStop: LONG STRING];
    AliasType: LONG POINTER TO ARRAY OF LONG STRING;
    ProfileOption: TYPE = RECORD [
        server: Address,
        preferredVersion: LONG CARDINAL,
        preferredFormat: LONG STRING,
        phoneNumber: LONG STRING,
        alternateProfile: ProfileOptionType]; -- e.g. fax goes direct to
        printer
    Command: TYPE = {update, ignore, publish, forward};
    Status: TYPE = {ok, errors};
    Address: TYPE = RECORD [address: LONG STRING, path: LONG
    STRING, alias: AliasType];
    SenderAccessRights: TYPE = {deskTop, secondaryStorage, queue,
    reject};
    PriorityType: TYPE = {interrupt(0), high(1), medium(2), low(3),
    background(4), ignore(5)};
    ReceivePriorityType: TYPE = {direct, delayed};
    AccessProperties: TYPE = RECORD [
        priority: PriorityType,
        accessRights: SenderAccessRights];
    ReceivePriorityRec: TYPE = RECORD [
        next: ReceivePriorities, -- link list of individual Receive-
```

APPENDIX A-continued

```
        Priorities
        type: ReceivePriorityType,
        modified: BOOLEAN,
        profileID: FileID,
        profile: ChannelProfile,
        accessProperties: AccessProperties];
    ReceivePriorities: TYPE = LONG POINTER TO ReceivePriority-
    Rec;
    SendProfilesRec: TYPE = RECORD [
        next: ReceivePriorities, -- link list of individual Receive-
        Priorities
        profile: ChannelProfile];
    SendProfiles: TYPE = LONG POINTER TO SendProfilesRec;
```

APPENDIX B

```
Profile: TYPE = RECORD [
    modified: BOOLEAN,
    enabled: BOOLEAN,
    cashed: BOOLEAN,
    locked: BOOLEAN, -- if locked by receiver then read only
    version: CARDINAL,
    priorityOfReciept: CARDINAL,
    profile: ProfileOption];
ProfileOptionType: TYPE = {workstation, phone, fax, pagePrinter,
colorPrinter, secondaryPrinter, email, audio, video, secondaryStorage};
    -- fax → use alternateProfile to establish incomming profile option
    -- phone → server implies vmax server and path box
ChannelProfilePtr: TYPE = LONG POINTER TO Profile;
ChannelProfileRec: TYPE = RECORD [
    preferredOption: ProfileOptionType,
    secondaryOption: ProfileOptionType,
    teriaryOption: ProfileOptionType,
    streetAddress: StreetAddress,
    profileArray: ARRAY ProfileOptionType OF ChannelProfilePtr];
        -- nil indicates the value is not specified
ChannelProfile: TYPE = LONG POINTER TO ChannelProfileRec;
-- PROCEDURE DEFINITIONS
OpenChannelProfile: PROCEDURE [ ]
    RETURNS[channelProfile: ChannelProfile];
CloseChannelProfile: PROCEDURE [command: Command, profile:
ChannelProfile, address: Address]
    RETURNS[status: Status, msg: LONG STRING];
OpenReceivePriorities: PROCEDURE [ ]
    RETURNS[receivePriorities: ReceivePriorities];
CloseReceivePriorities: PROCEDURE [command: Command, receive-
Priorities: ReceivePriorities]
    RETURNS[status: Status. msg: LONG STRING];
ForwardProfile: [channelProfile: ChannelProfile, address: Address];
PublishProfile: [channelProfile: ChannelProfile];
OpenQuickSend: PROCEDURE [ ]
    RETURNS[sendProfiles: SendProfiles];
Send: PROCEDURE [channelProfile: ChannelProfile, data: LONG
POINTER TO STREAM]
    RETURNS[status: Status, msg: LONG STRING];
END.
```

While the invention has been described with reference to the structure disclosed, it is not confined to the details set forth, but it is intended to cover such modifications or changes as may come within the scope of the following claims.

We claim:

1. In an electronic workstation interconnected to predetermined devices over a network, the workstation having a graphical user interface for operating the workstation and providing access to a communication channel profile for each subscriber on the network, the communication channel profile defining a priority scheme for identifying a preferred mode in which to transmit data to said predetermined devices, the graphical user interface comprising:

a display adapted for displaying the graphical user interface which includes icons and menu options, predetermined icons identifying data files,

means to select icons and menu options on the graphical user interface,

means to identify a given data file on the display using the means to select icons,

means to specify a destination for said given data file,

means to access said communication channel profile for transmitting said given data file in a preferred mode, the means to access identifying a given device in response to the preferred mode set forth in said priority scheme and

means for altering the priority scheme for identifying a preferred mode in which to transmit data to said predetermined devices.

2. The graphical user interface of claim **1** including means for preventing the altering of the priority scheme for identifying a preferred mode in which to transmit data to said predetermined devices.

3. In a graphical user interface for communicating information between senders and receivers over a network having a plurality of network subscribers, the network providing a repository for storing a communication channel profile for each network subscriber to define preferences of data receipt for a receiver of data over the network, a method of sending information from a sender operating the graphical user interface to a selected receiver comprising the steps of:

selecting information at the graphical user interface for sending to the selected receiver;

querying the network repository for the communication channel profile of the selected receiver; and

sending said information to the selected receiver over a first communication channel in response to a first preference of data receipt specified in the communication channel profile of the selected receiver including the capability of altering the communication channel profile of said receiver at the graphical user interface.

4. The method of claim **3** wherein said communication channel profile defines a second preference of data receipt including the step of sending said information to the selected receiver over the second communication channel in response to the second preference of data receipt.

5. The method of claim **4** wherein said first communication channel is unavailable.

6. The method of claim **3** wherein said communication channel profile defines a second preference of data receipt including the step of automatically sending said information to the selected receiver over the second communication channel in response to the failure of said first communication channel.

7. The method of claim **3** including a plurality of sources of information and wherein said preferences of data receipt for receivers over the network is a function of the source of the information to be sent.

8. A graphical user interface interconnected to a network and communicating with a plurality of network users subscribed to the network, comprising:

a display adapted for displaying primitives of the graphical user interface which include windows, icons and menu options, predetermined icons identifying data files,

means electrically connected to the display for selecting icons and menu options,

means to specify a data file icon on the display,

a quick send directory for quickly identifying a network user, the quick send directory including identifiers for identifying communication channel profiles of selected network users, and means to access the identifier for a selected network user, the means to access including a window specifying the preferred mode of receipt of a data file by said selected network user including means for a network user to allow alteration of the preferred mode of receipt of a data file,

means for automatically transmitting a data file to one of the selected network users by engaging the data file icon with the identifier of one of the selected network users in the quick send directory, the automatic transmitting means transmitting the data file in accordance with the communication channel profile of the selected network user so that the data file is received in a mode of data transmission preferable to the selected network users.

9. The graphical user interface of claim **8** including a window for displaying the progress of the transmitting of the data file to said one of the selected network users.

10. The graphical user interface of claim **8** wherein the window specifies preferred devices for receipt of a data file.

11. The graphical user interface of claim **10** wherein the window specifies a priority of modes for receipt of a data file.

12. The graphical user interface of claim **11** wherein the preferred mode for receipt of a data file include at least one from a set of printer, facsimile, and electronic mail devices.

13. The graphical user interface of claim **12** including means for a network user to set a preferred mode of receipt of a data file.

14. The graphical user interface of claim **13** wherein the means for a network user to set a preferred mode of receipt of a data file includes a displayed window for selecting predetermined devices.

15. The graphical user interface of claim **13** including means for a network user to bar alteration of the preferred mode of receipt of a data file.

16. The graphical user interface of claim **13** wherein the priority scheme is responsive to a data file type.

17. The graphical user interface of claim **13** including means for altering the priority scheme of modes of data receipt for a plurality of remote address profiles.

18. The graphical user interface of claim **13** wherein the remote system element is a printing system.

* * * * *

US005754306A

United States Patent [19]

Taylor et al.

[11] Patent Number: 5,754,306

[45] Date of Patent: May 19, 1998

[54] **SYSTEM AND METHOD FOR A COMMUNICATION SYSTEM**

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[73] Assignee: **Hewlett-Packard Company**, Palo Alto, Calif.

[21] Appl. No.: **523,565**

[22] Filed: **Sep. 5, 1995**

Related U.S. Application Data

[63] Continuation of Ser. No. 77,402, Jun. 15, 1993, abandoned.

[51] **Int. Cl.**[6] **H04N 1/00**

[52] **U.S. Cl.** **358/400**; 358/402; 358/407; 358/442; 395/200.06; 395/200.07

[58] **Field of Search** 358/400, 402, 358/403, 405, 407, 442; 379/88, 89, 67, 201, 142, 100; 395/153, 161, 200.06, 200.07, 200.02, 200.04, 200.1, 200.11, 200.12

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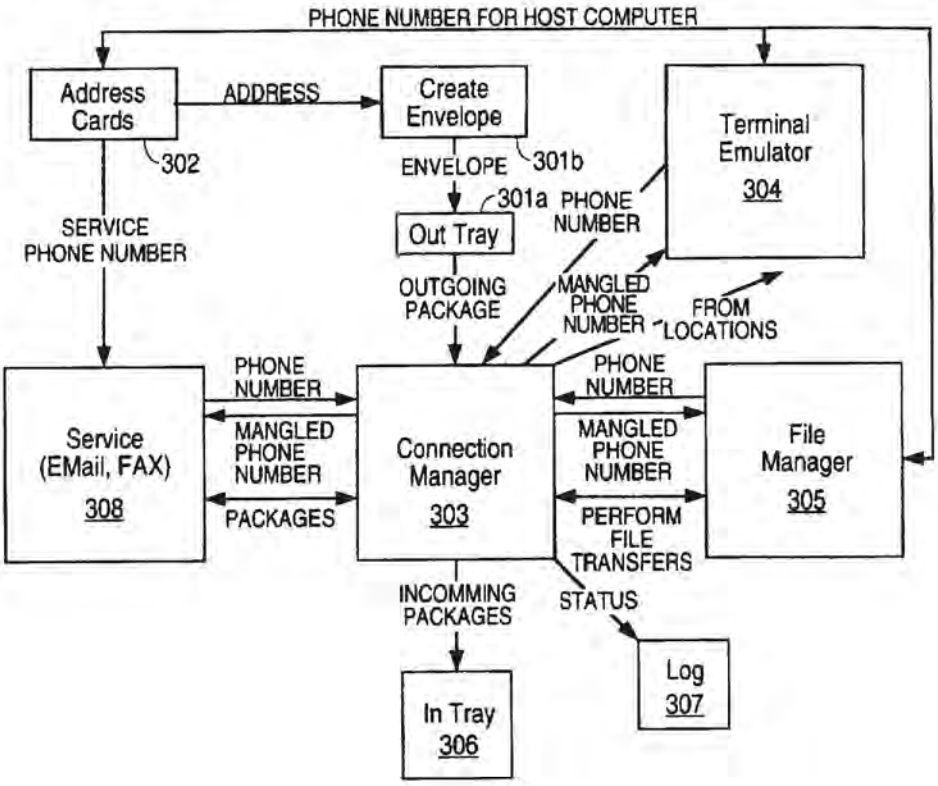
Primary Examiner—Thomas D. Lee
Assistant Examiner—Jerome Grant, II

[57] **ABSTRACT**

A method and a structure for providing electronic mail, facsimile transmission and file transfer maintain a data base in which the communication parameters of a local computer are maintained separately from the communication parameters of a remote computer which communicates the local computer. The data base includes an electronic address book in which a method and a structure are provided for specifying person, group, computer, calling card and service data. The person type data includes specification of a preference for data, or facsimile transmission. Service information are efficiently added because of modularly designed application programming interface. A method and a structure are also provided to allow synchronization between files residing on different computers.

8 Claims, 27 Drawing Sheets



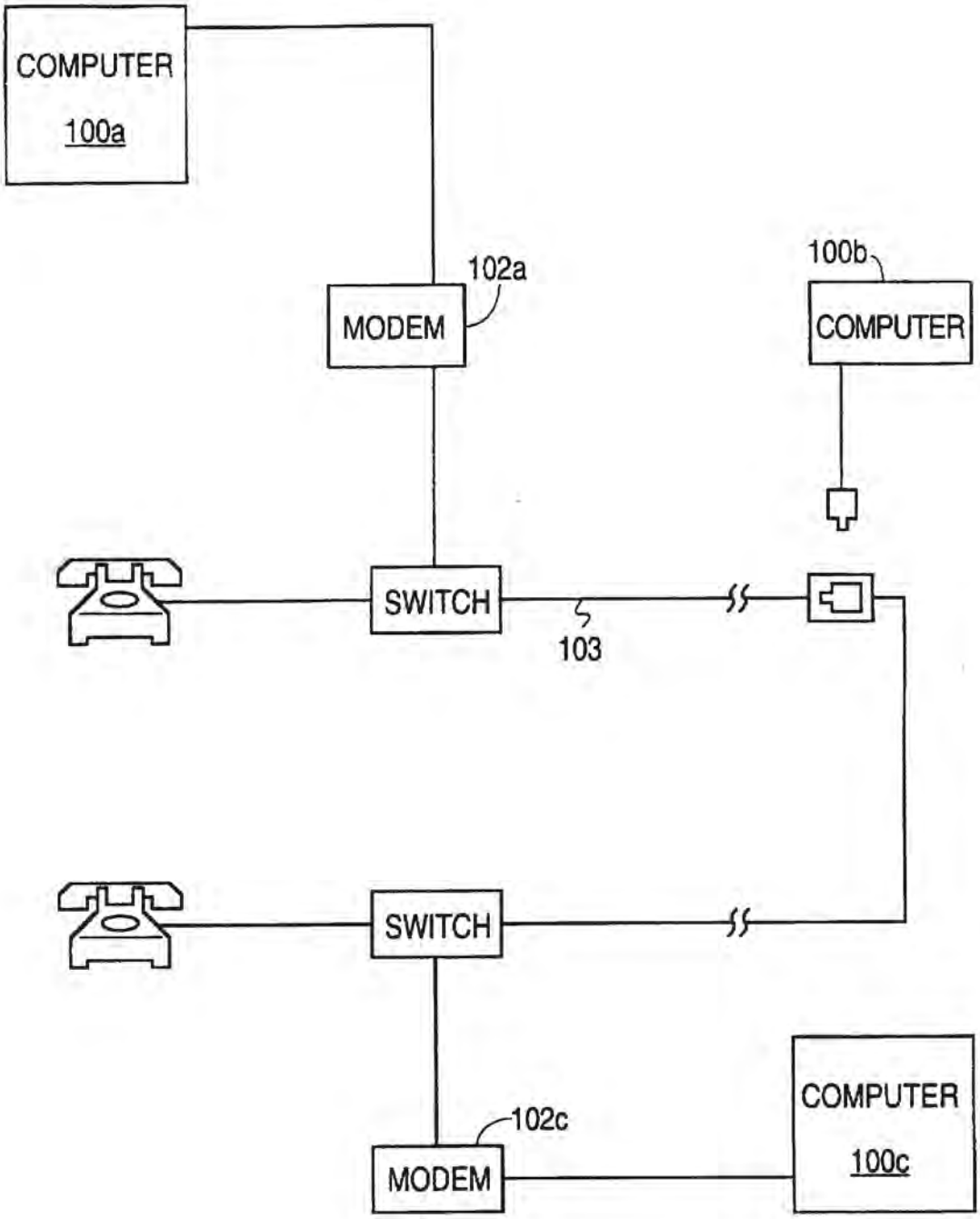

COMPUTER
100a
MODEM
102a
100b
COMPUTER
SWITCH
103
SWITCH
COMPUTER
100c
102c
MODEM

FIG. 1

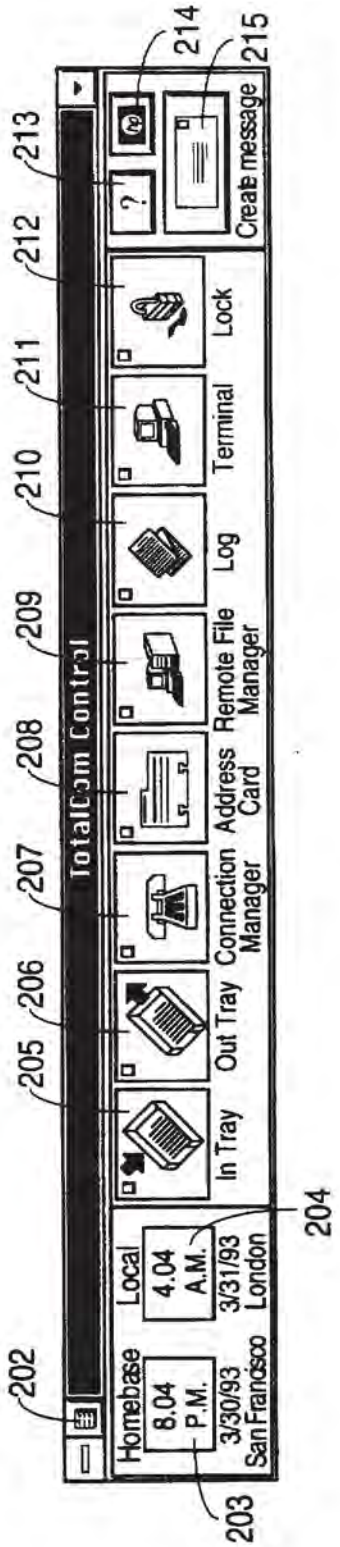

214
215
213
212
211
210
209
208
207
206
205
204
202
203
TotalCom Control
Create message
Lock
Terminal
Log
Remote File Manager
Address Card
Connection Manager
Out Tray
In Tray
Local
4.04 A.M.
3/31/93
London
Homebase
8.04 P.M.
3/30/93
San Francisco

FIG. 2

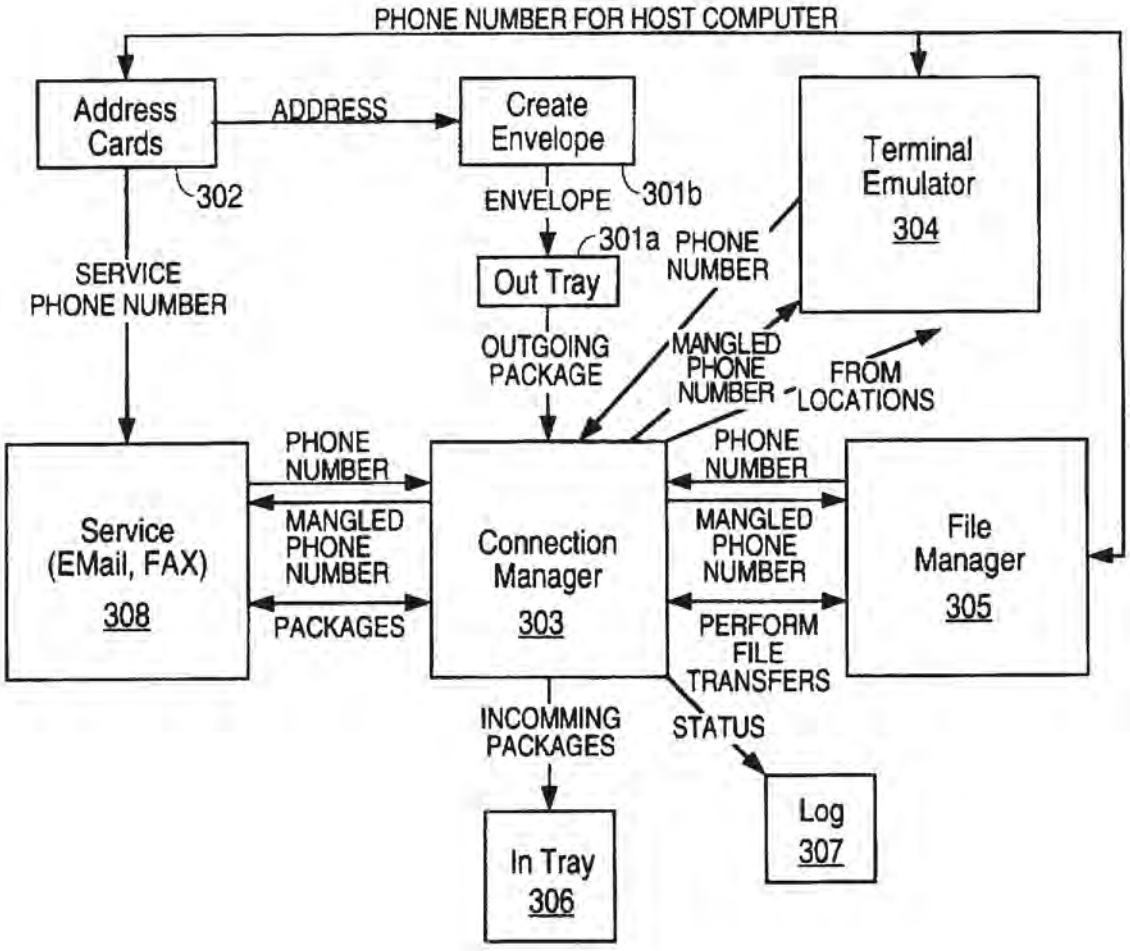

PHONE NUMBER FOR HOST COMPUTER
Address Cards
302
ADDRESS
Create Envelope
ENVELOPE
301b
301a
Out Tray
Terminal Emulator
304
PHONE NUMBER
SERVICE PHONE NUMBER
OUTGOING PACKAGE
MANGLED PHONE NUMBER
FROM LOCATIONS
PHONE NUMBER
MANGLED PHONE NUMBER
PACKAGES
Service (EMail, FAX)
308
Connection Manager
303
PHONE NUMBER
MANGLED PHONE NUMBER
PERFORM FILE TRANSFERS
File Manager
305
INCOMMING PACKAGES
STATUS
Log
307
In Tray
306

FIG. 3

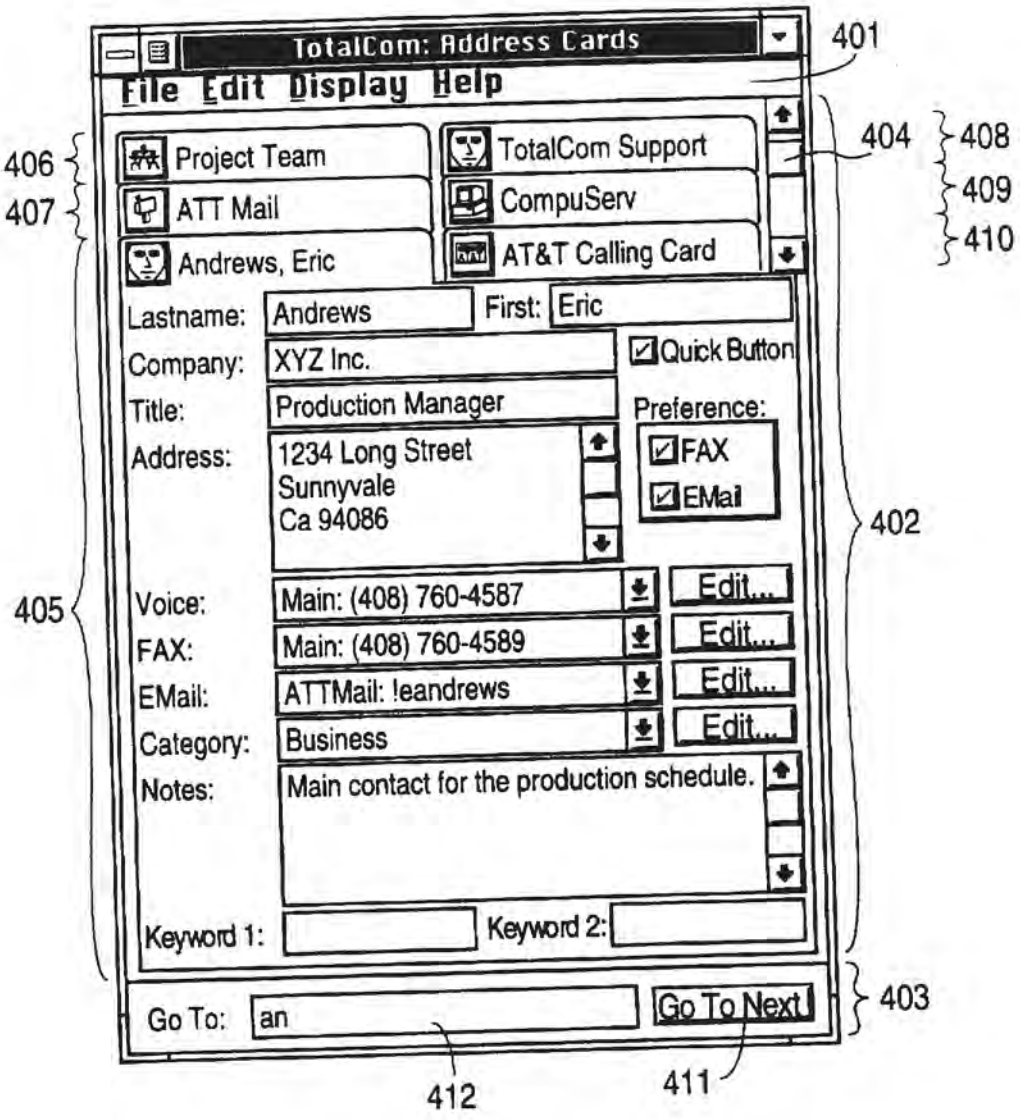

TotalCom: Address Cards
File Edit Display Help
Project Team
ATT Mail
Andrews, Eric
TotalCom Support
CompuServ
AT&T Calling Card
Lastname: Andrews
First: Eric
Company: XYZ Inc.
Quick Button
Title: Production Manager
Preference:
Address: 1234 Long Street
Sunnyvale
Ca 94086
FAX
EMail
Voice: Main: (408) 760-4587
FAX: Main: (408) 760-4589
EMail: ATTMail: !eandrews
Category: Business
Edit...
Notes: Main contact for the production schedule.
Keyword 1:
Keyword 2:
Go To: an
Go To Next
401
402
403
404
405
406
407
408
409
410
411
412

FIG. 4

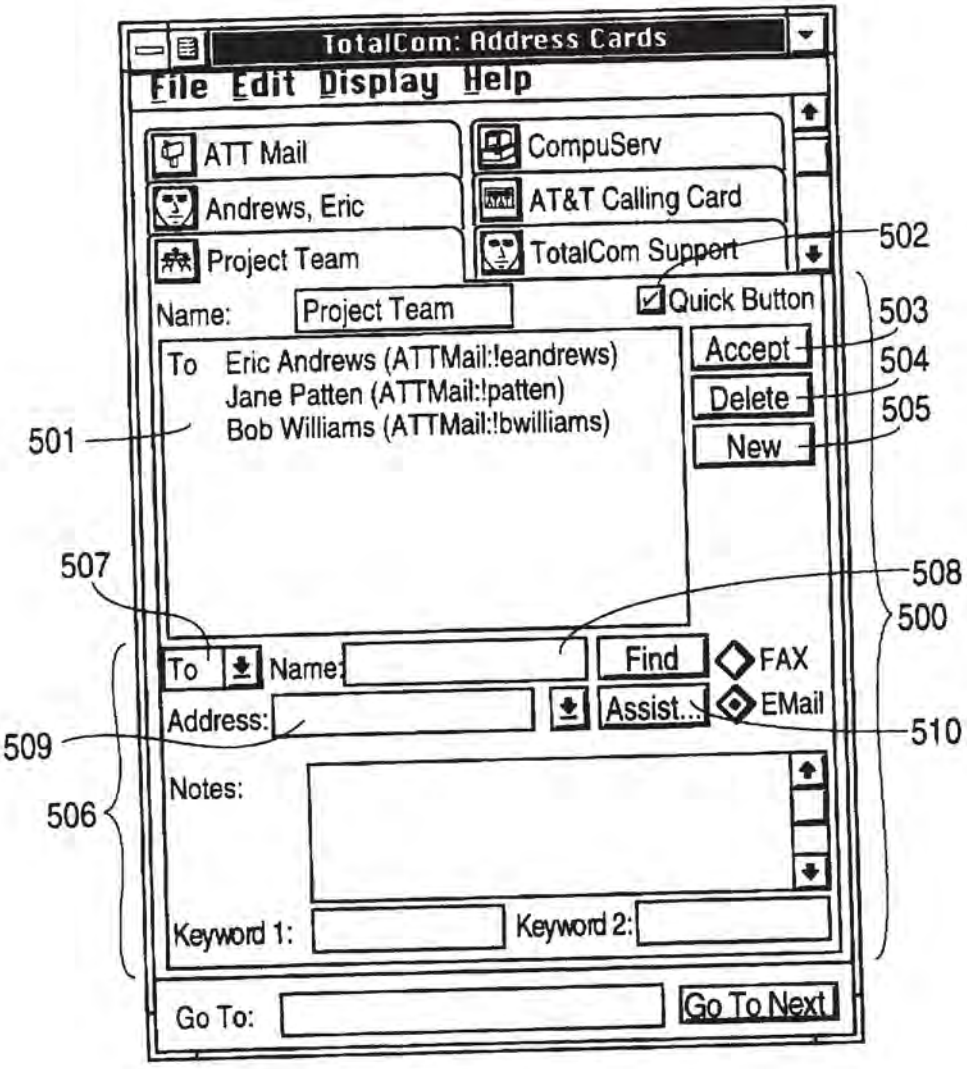

TotalCom: Address Cards
File Edit Display Help
ATT Mail
CompuServ
Andrews, Eric
AT&T Calling Card
Project Team
TotalCom Support
Name:
Project Team
Quick Button
To Eric Andrews (ATTMail:!eandrews)
Jane Patten (ATTMail:!patten)
Bob Williams (ATTMail:!bwilliams)
Accept
Delete
New
To
Name:
Find
FAX
Address:
Assist...
EMail
Notes:
Keyword 1:
Keyword 2:
Go To:
Go To Next
501
502
503
504
505
506
507
508
509
510
500

FIG. 5

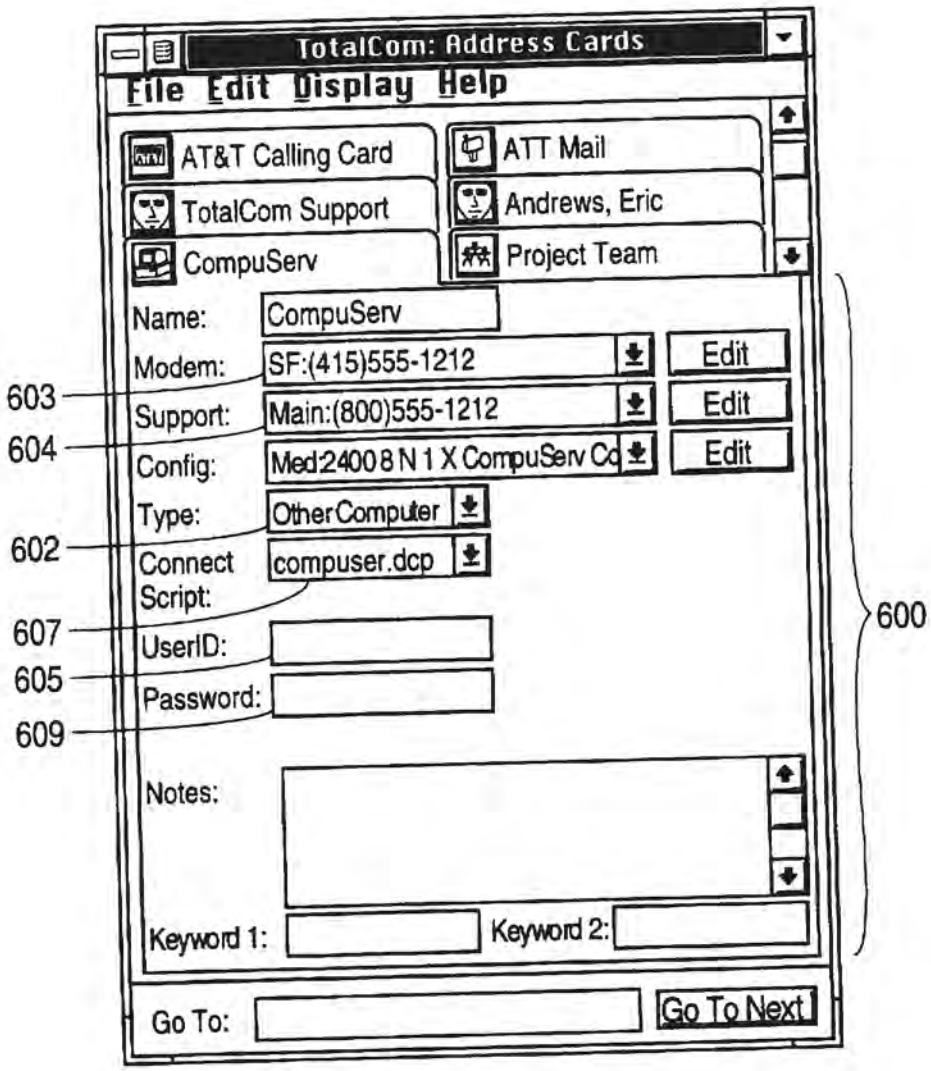

TotalCom: Address Cards
File Edit Display Help
AT&T Calling Card
ATT Mail
TotalCom Support
Andrews, Eric
CompuServ
Project Team
Name:
CompuServ
Modem:
SF:(415)555-1212
Edit
603
Support:
Main:(800)555-1212
Edit
604
Config:
Med:2400 8 N 1 X CompuServ Co
Edit
Type:
Other Computer
602
Connect Script:
compuser.dcp
607
UserID:
605
Password:
609
Notes:
Keyword 1:
Keyword 2:
600
Go To:
Go To Next

FIG. 6

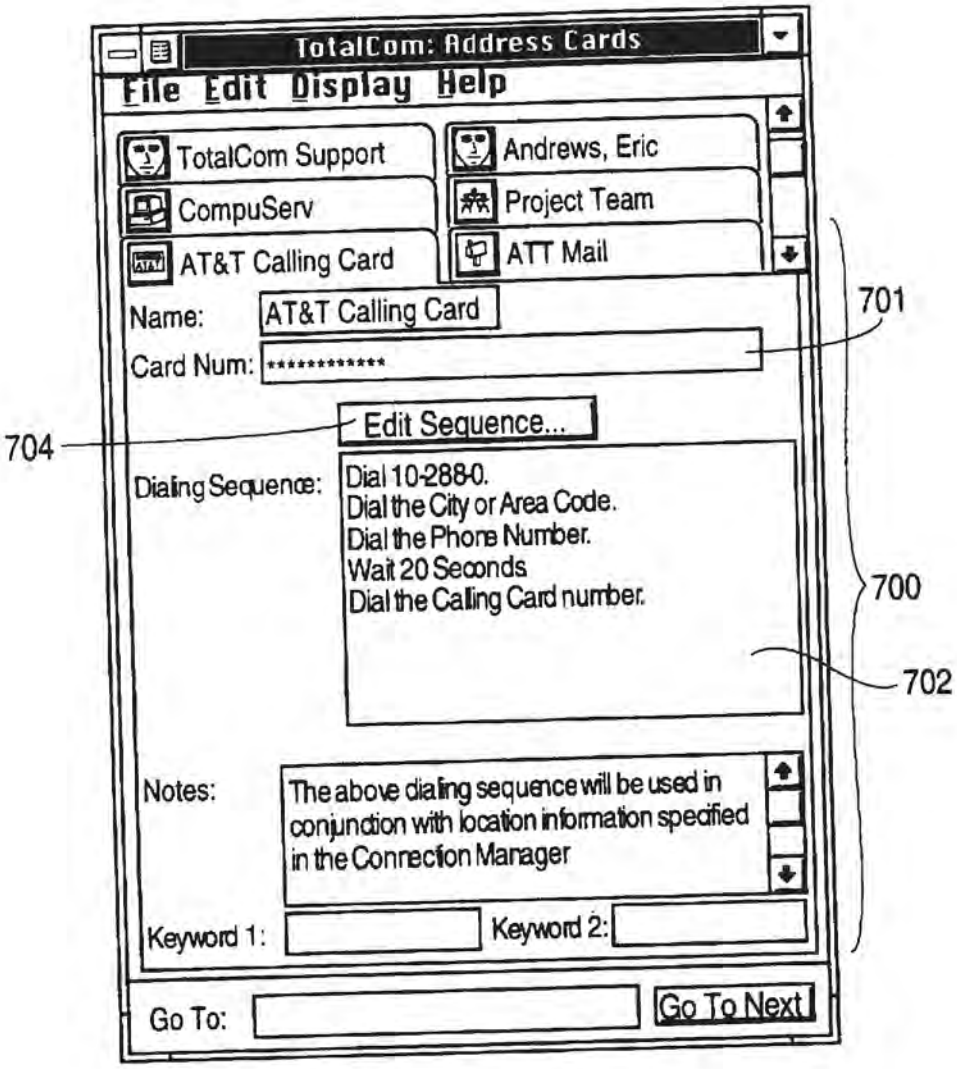

TotalCom: Address Cards
File Edit Display Help
TotalCom Support
Andrews, Eric
CompuServ
Project Team
AT&T Calling Card
ATT Mail
Name:
AT&T Calling Card
Card Num:
****
Edit Sequence...
Dialing Sequence:
Dial 10-288-0.
Dial the City or Area Code.
Dial the Phone Number.
Wait 20 Seconds
Dial the Calling Card number.
Notes:
The above dialing sequence will be used in conjunction with location information specified in the Connection Manager
Keyword 1:
Keyword 2:
Go To:
Go To Next
701
700
702
704

FIG. 7

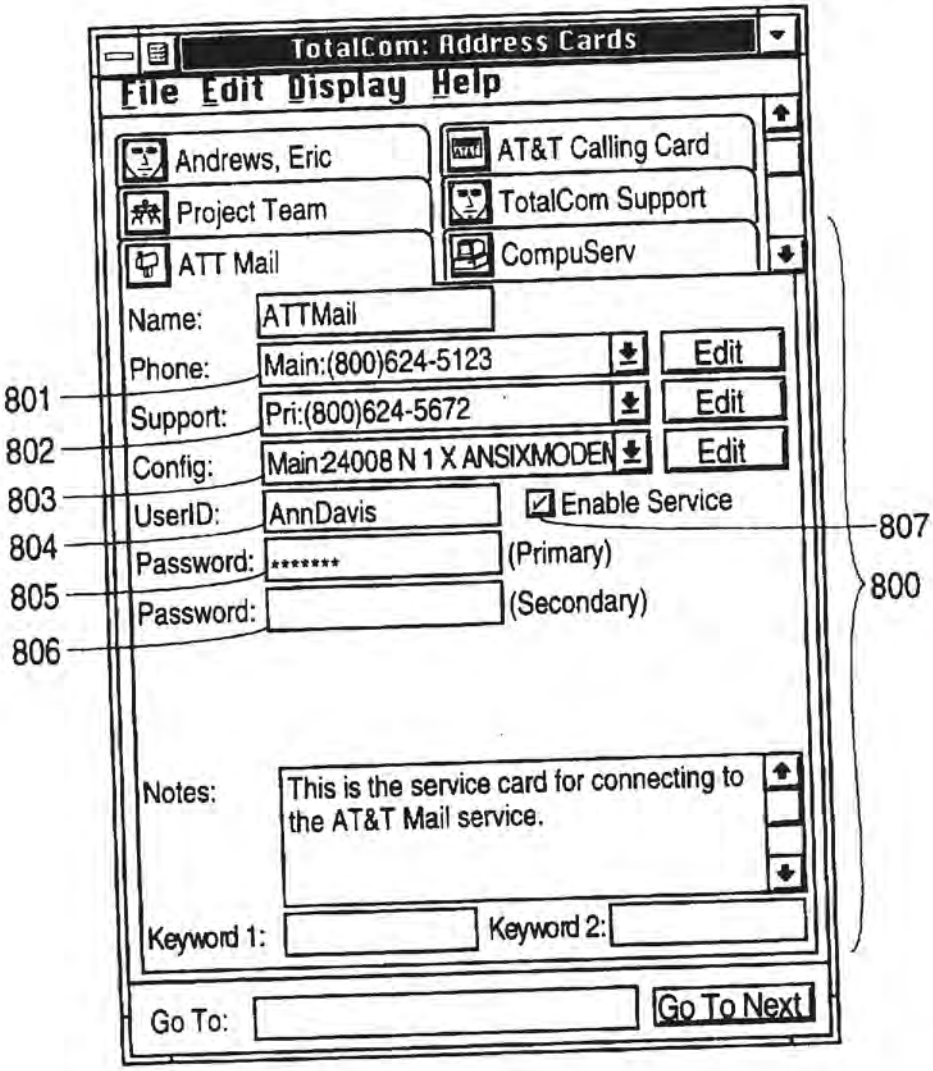

TotalCom: Address Cards
File Edit Display Help
Andrews, Eric
Project Team
ATT Mail
AT&T Calling Card
TotalCom Support
CompuServ
Name:
ATTMail
Phone:
Main:(800)624-5123
Edit
Support:
Pri:(800)624-5672
Edit
Config:
Main 24008 N 1 X ANSIXMODEM
Edit
UserID:
AnnDavis
Enable Service
Password:
****
(Primary)
Password:
(Secondary)
Notes:
This is the service card for connecting to the AT&T Mail service.
Keyword 1:
Keyword 2:
Go To:
Go To Next
801
802
803
804
805
806
807
800

FIG. 8

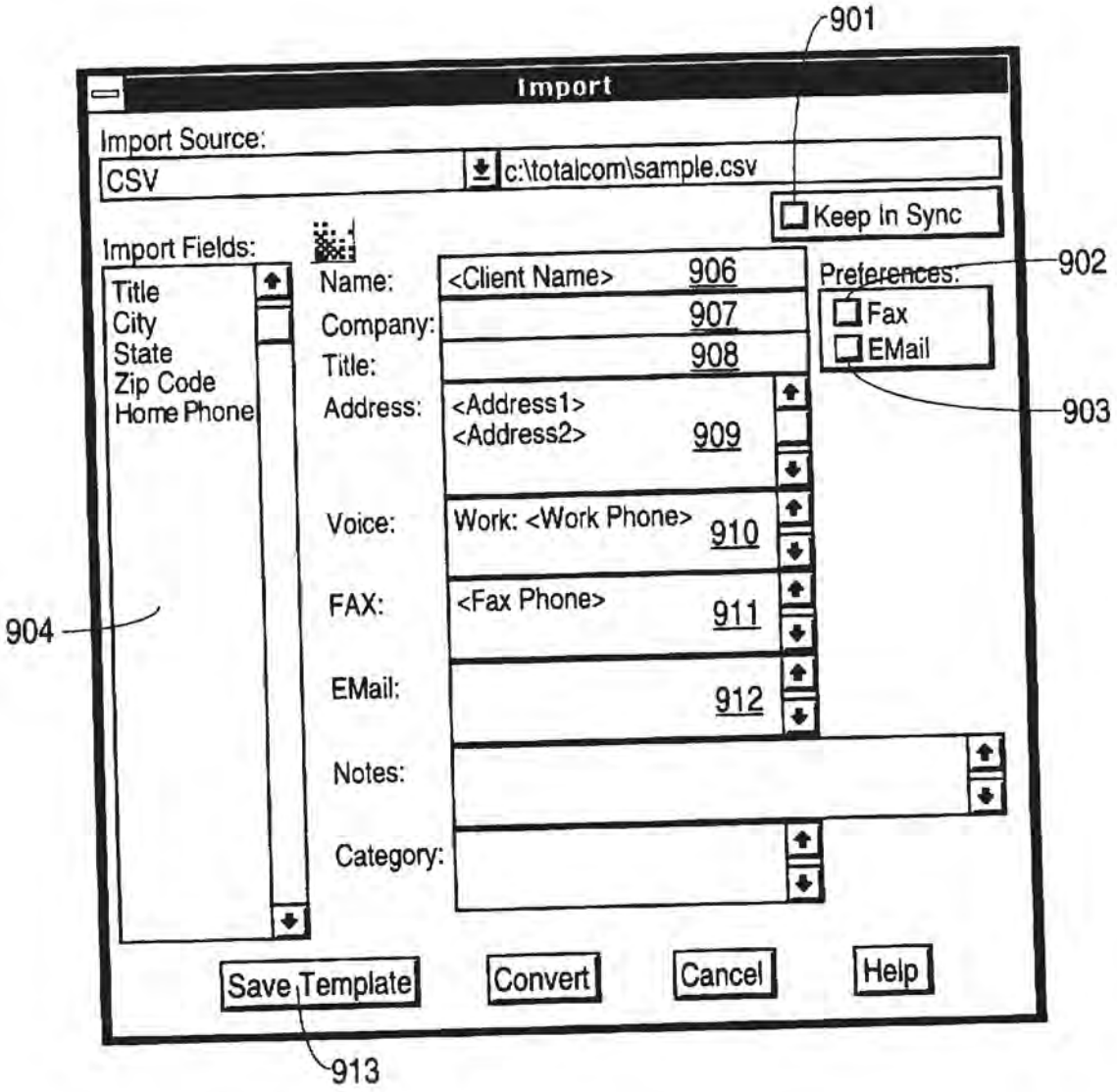

901
Import
Import Source:
CSV
c:\totalcom\sample.csv
Keep In Sync
Import Fields:
Title
City
State
Zip Code
Home Phone
Name:
<Client Name>
906
Company:
907
Title:
908
Address:
<Address1>
<Address2>
909
Voice:
Work: <Work Phone>
910
FAX:
<Fax Phone>
911
EMail:
912
Notes:
Category:
Preferences:
Fax
EMail
902
903
904
Save Template
Convert
Cancel
Help
913

FIG. 9

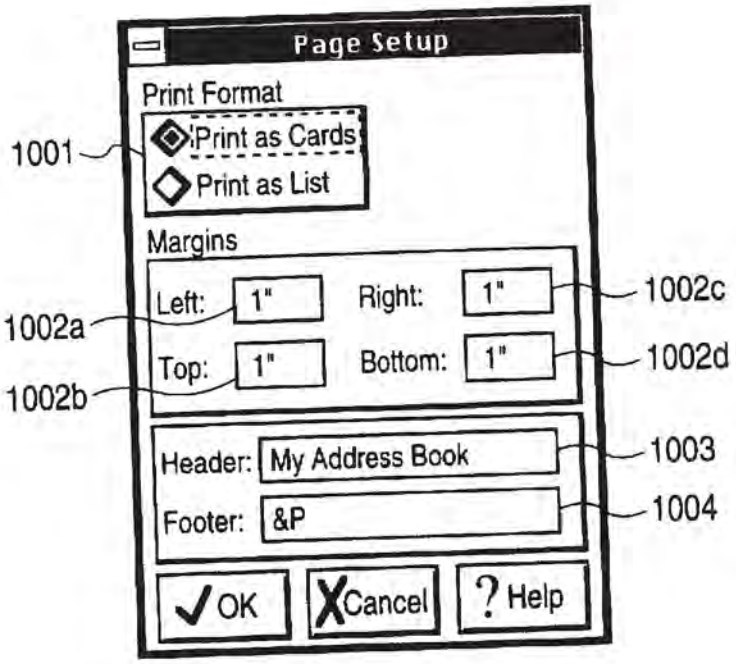


FIG. 10

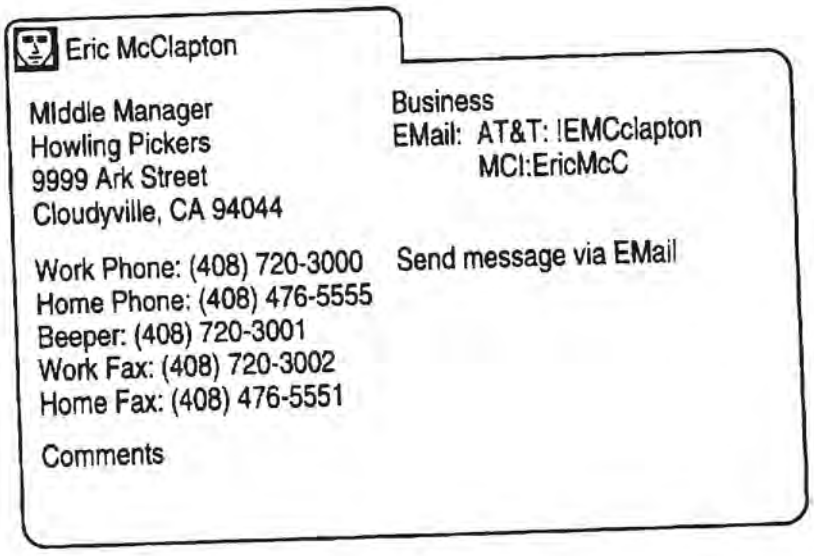


FIG. 11a

Eric McClapton

Middle Manager
Howling Pickers
9999 Ark Street
Cloudyville, CA 94044

Send message via EMail
Business

Work Phone: (408) 720-3000
Home Phone: (408) 476-5555
Beeper: (408) 720-3001
Work Fax: (408) 720-3002
Home Fax: (408) 476-5551
EMail: AT&T: !EMCclapton
MCI:EricMcC

Comments:

FIG. 11B

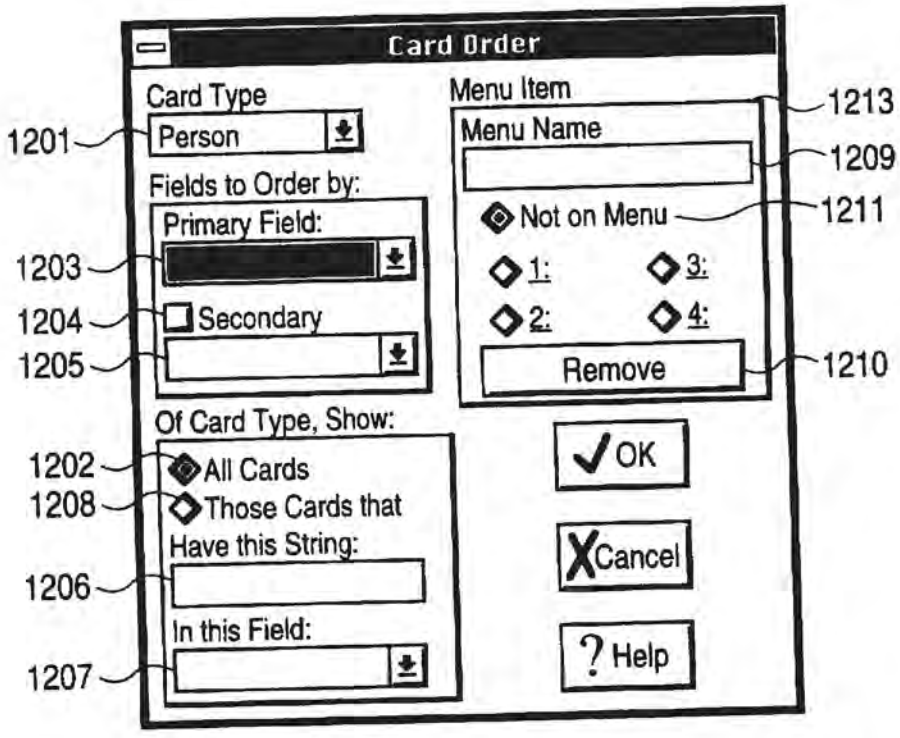


FIG. 12

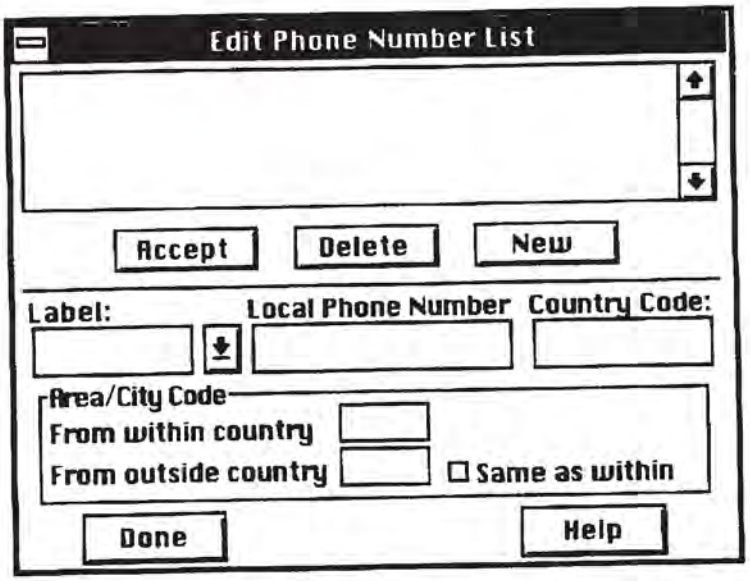

Edit Phone Number List
Accept
Delete
New
Label:
Local Phone Number
Country Code:
Area/City Code
From within country
From outside country
Same as within
Done
Help

FIG. 13

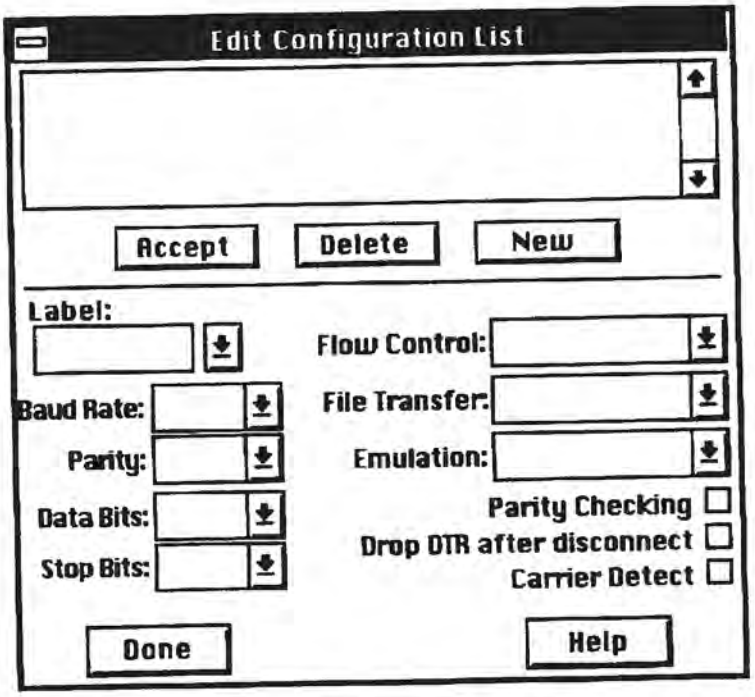

Edit Configuration List
Accept
Delete
New
Label:
Flow Control:
Baud Rate:
File Transfer:
Parity:
Emulation:
Data Bits:
Parity Checking
Drop DTR after disconnect
Stop Bits:
Carrier Detect
Done
Help

FIG. 14

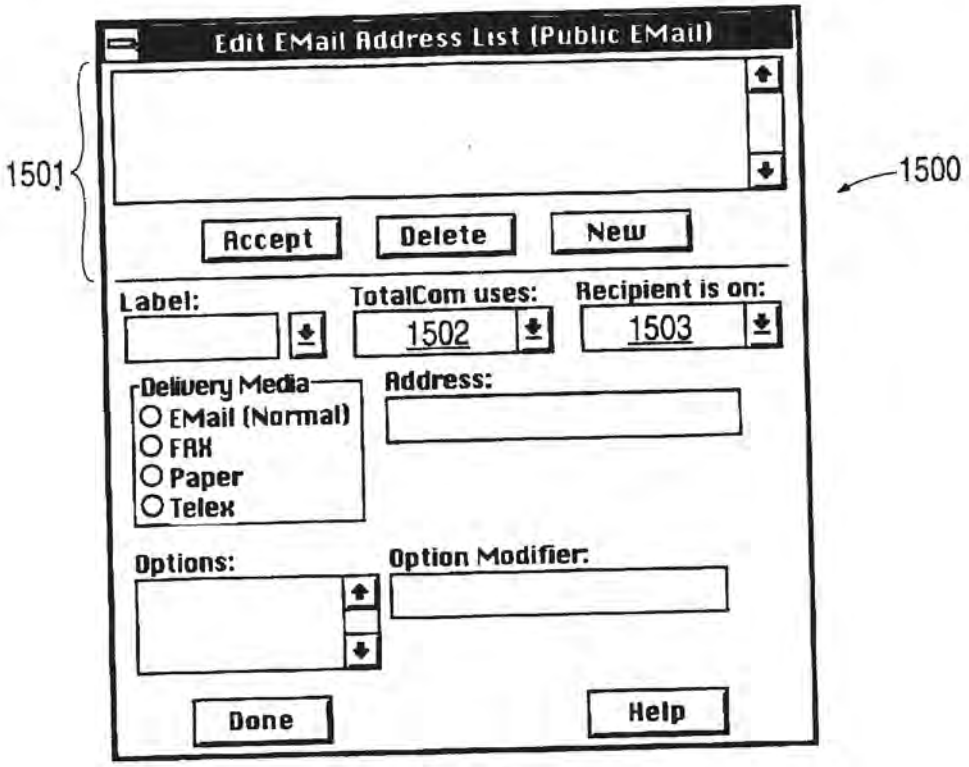


FIG. 15a

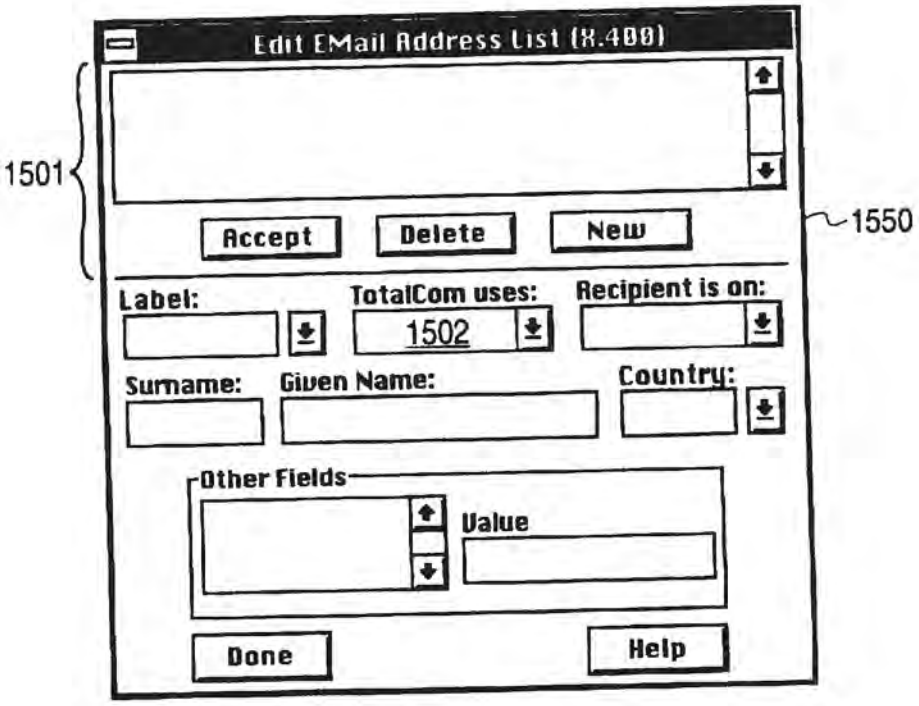


FIG. 15b

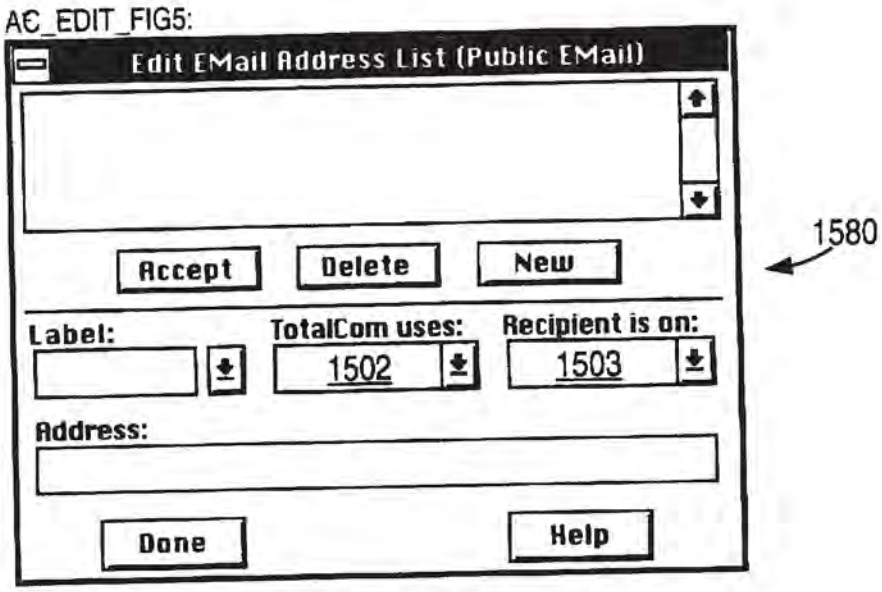

AE_EDIT_FIG5:
Edit EMail Address List (Public EMail)
Accept
Delete
New
1580
Label:
TotalCom uses:
1502
Recipient is on:
1503
Address:
Done
Help

FIG. 15C

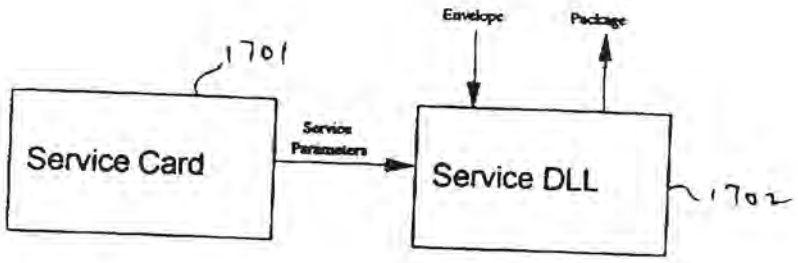

Envelope
Package
1701
Service Card
Service Parameters
Service DLL
1702

FIGURE 16

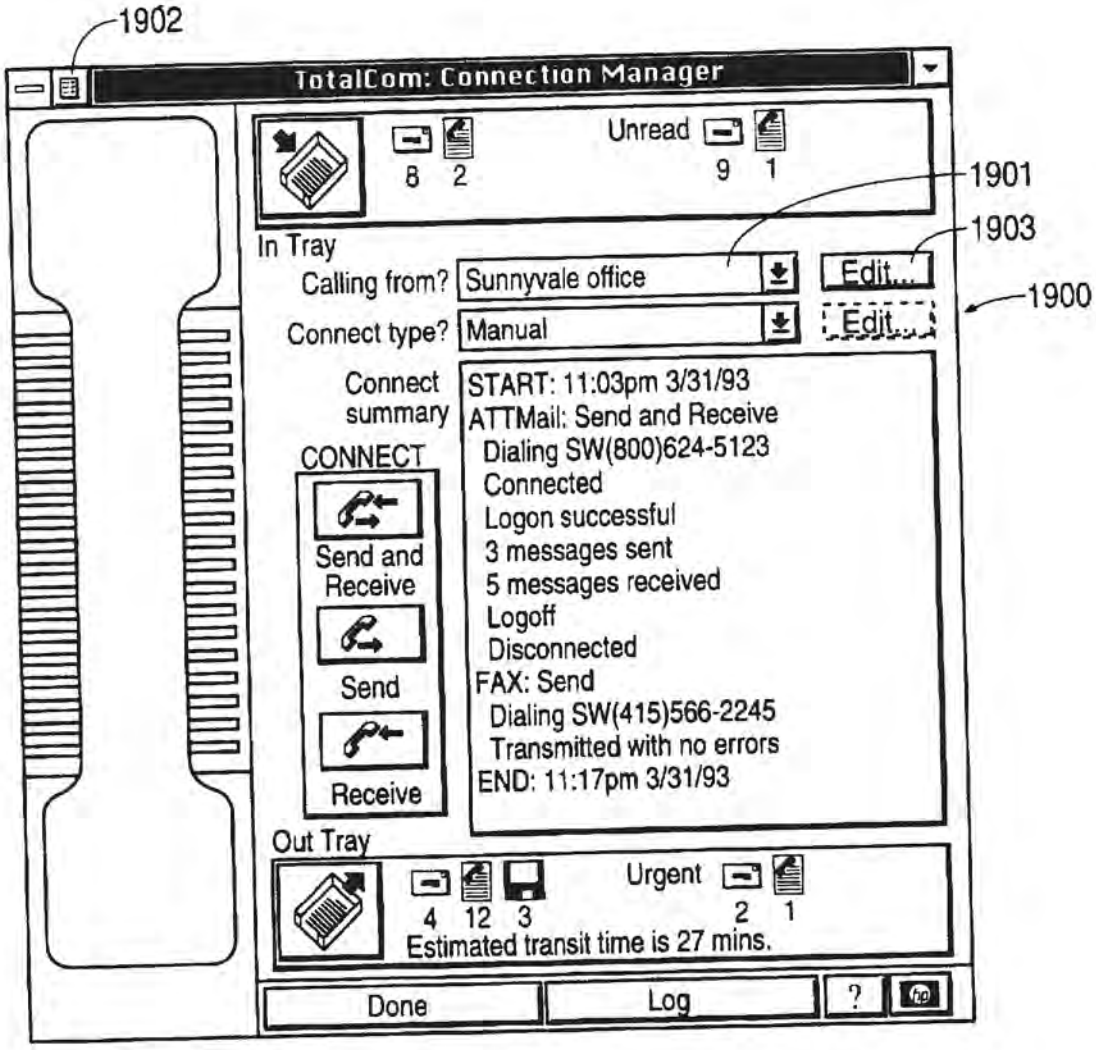
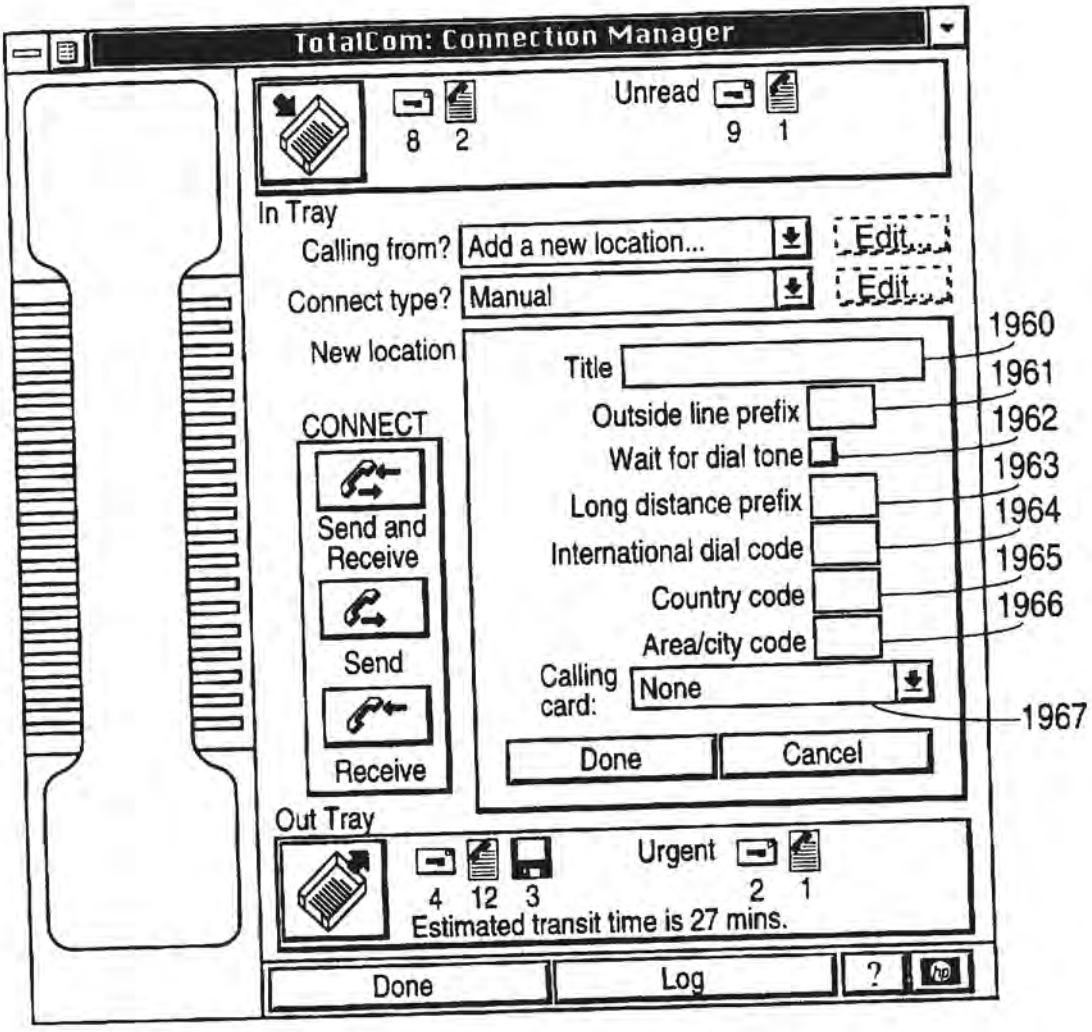
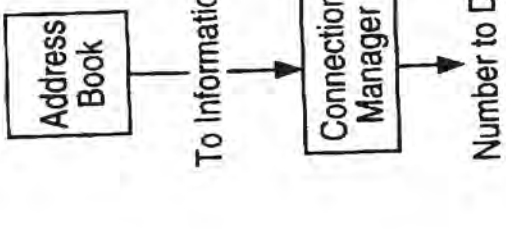

1902
TotalCom: Connection Manager
Unread
8 2
9 1
1901
1903
In Tray
Calling from?
Sunnyvale office
Edit...
1900
Connect type?
Manual
Edit...
Connect summary
START: 11:03pm 3/31/93
ATTMail: Send and Receive
Dialing SW(800)624-5123
Connected
Logon successful
3 messages sent
5 messages received
Logoff
Disconnected
FAX: Send
Dialing SW(415)566-2245
Transmitted with no errors
END: 11:17pm 3/31/93
CONNECT
Send and Receive
Send
Receive
Out Tray
Urgent
4 12 3
2 1
Estimated transit time is 27 mins.
Done
Log
?

FIG. 19A


TotalCom: Connection Manager
Unread
8 2
9 1
In Tray
Calling from?
Add a new location...
Edit...
Connect type?
Manual
Edit...
New location
Title
Outside line prefix
Wait for dial tone
Long distance prefix
International dial code
Country code
Area/city code
Calling card:
None
Done
Cancel
CONNECT
Send and Receive
Send
Receive
Out Tray
Urgent
4 12 3
2 1
Estimated transit time is 27 mins.
Done
Log
?
1960
1961
1962
1963
1964
1965
1966
1967

18

FIG. 19B



The actual data items used to represent the To and From locations is given in the following table.

Input	Supplied by Connection Manager	Output
Country Code City/Area Code from within Country City/Area Code fom outside Country Phone Number	Outside Line Prefix Wait for Dial Tone (y/n) International Dial Code From Country Code From City/Area Code Calling Card to Use (with Dialing Sequence)	Number to Dial

FIG. 20

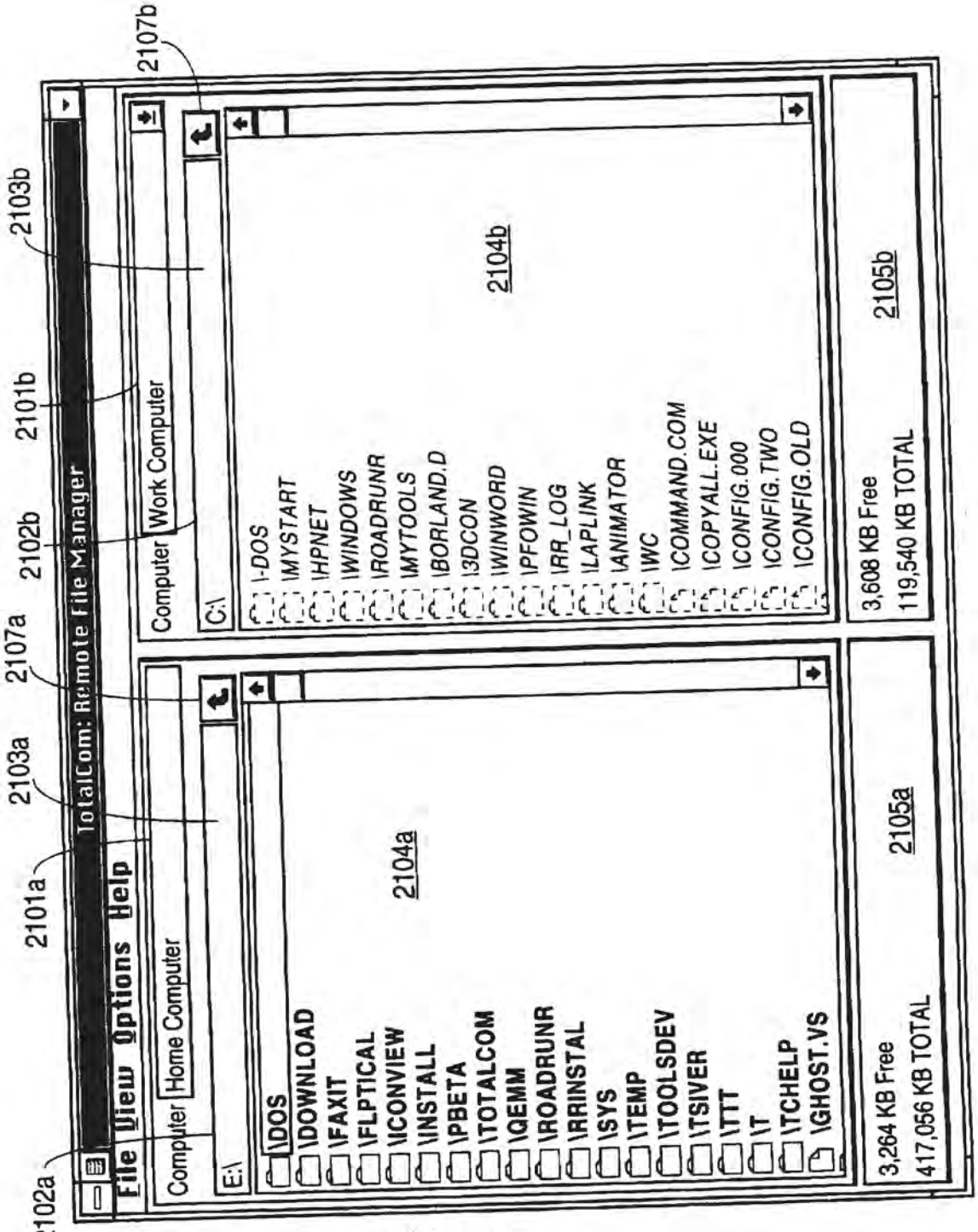

TotalCom: Remote File Manager
File View Options Help
Computer Home Computer
E:\
\DOS
\DOWNLOAD
\FAXIT
\FLPTICAL
\ICONVIEW
\INSTALL
\PBETA
\TOTALCOM
\QEMM
\ROADRUNR
\RRINSTAL
\SYS
\TEMP
\TOOLSDEV
\TSIVER
\TTT
\T
\TCHELP
\GHOST.VS
2104a
3,264 KB Free
417,056 KB TOTAL
2105a
Computer Work Computer
C:\
\-DOS
\MYSTART
\HPNET
\WINDOWS
\ROADRUNR
\MYTOOLS
\BORLAND.D
\3DCON
\WINWORD
\PFOWIN
\RR_LOG
\LAPLINK
\ANIMATOR
\WC
\COMMAND.COM
\COPYALL.EXE
\CONFIG.000
\CONFIG.TWO
\CONFIG.OLD
2104b
3,608 KB Free
119,540 KB TOTAL
2105b
2101a
2101b
2102a
2102b
2103a
2103b
2107a
2107b

FIG. 2A

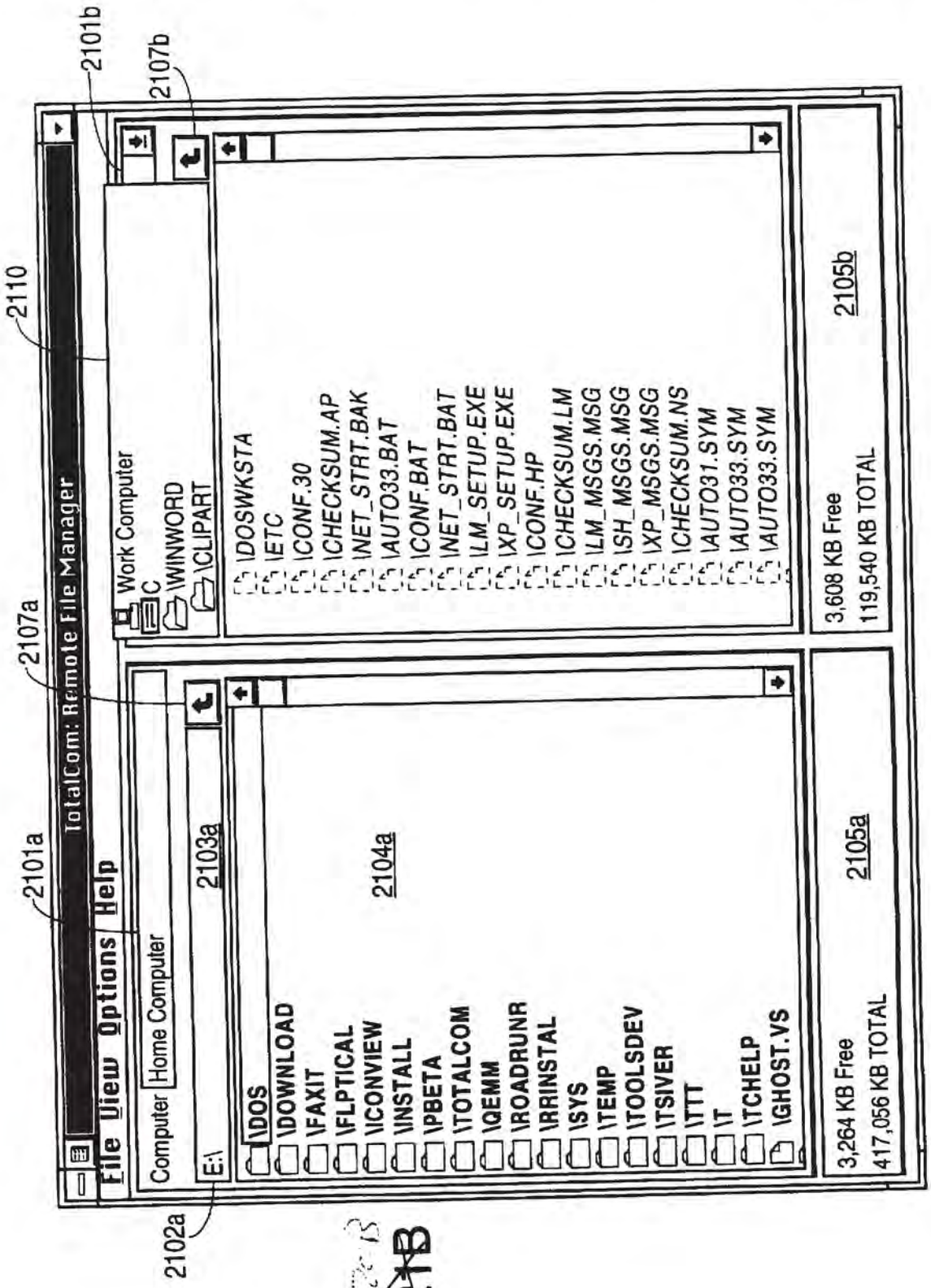

2101b
2107b
2110
2107a
2101a
TotalCom: Remote File Manager
File View Options Help
Work Computer
C
\WINWORD
\CLIPART
\DOSWKSTA
\ETC
\CONF.30
\CHECKSUM.AP
\NET_STRT.BAK
\AUTO33.BAT
\CONF.BAT
\NET_STRT.BAT
\LM_SETUP.EXE
\XP_SETUP.EXE
\CONF.HP
\CHECKSUM.LM
\LM_MSGS.MSG
\SH_MSGS.MSG
\XP_MSGS.MSG
\CHECKSUM.NS
\AUTO31.SYM
\AUTO33.SYM
\AUTO33.SYM
3,608 KB Free
119,540 KB TOTAL
2105b
Computer Home Computer
E:\
2103a
\DOS
\DOWNLOAD
\FAXIT
\FLPTICAL
\ICONVIEW
\INSTALL
\PBETA
\TOTALCOM
\QEMM
\ROADRUNR
\RRINSTAL
\SYS
\TEMP
\TOOLSDEV
\TSIVER
\TTT
\T
\TCHELP
\GHOST.VS
2104a
3,264 KB Free
417,056 KB TOTAL
2105a
2102a

FIG. 21B

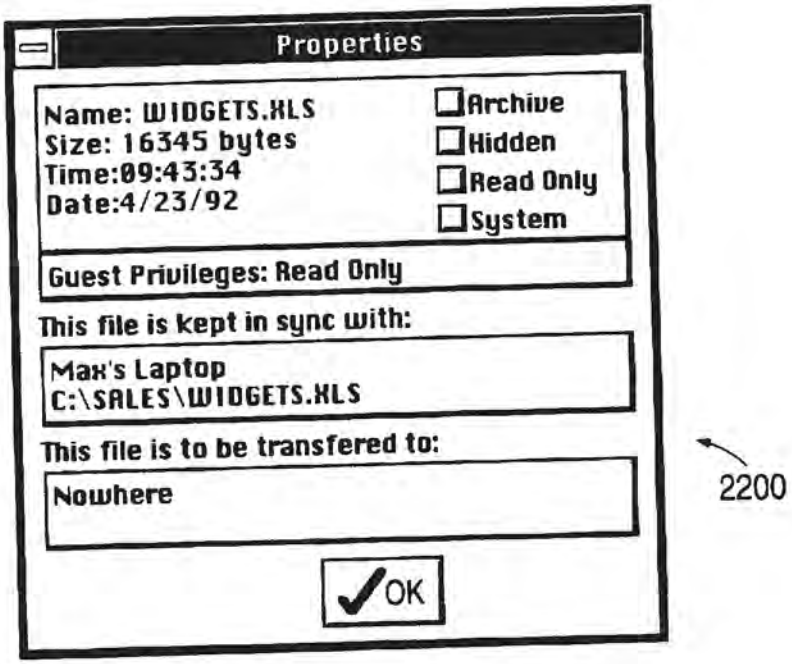

Properties
Name: WIDGETS.XLS
Size: 16345 bytes
Time:09:43:34
Date:4/23/92
Archive
Hidden
Read Only
System
Guest Privileges: Read Only
This file is kept in sync with:
Max's Laptop
C:\SALES\WIDGETS.XLS
This file is to be transfered to:
Nowhere
OK
2200

FIG. 22

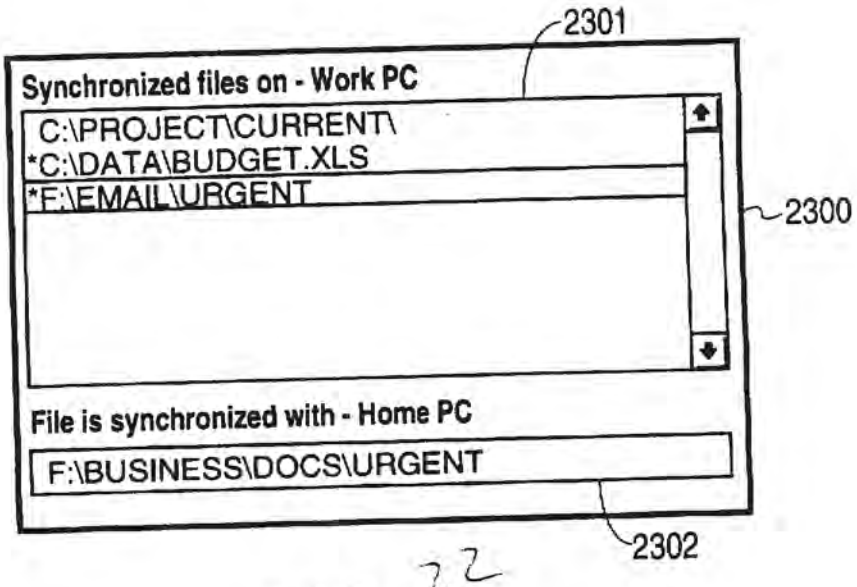

2301
Synchronized files on - Work PC
C:\PROJECT\CURRENT\
*C:\DATA\BUDGET.XLS
*F:\EMAIL\URGENT
2300
File is synchronized with - Home PC
F:\BUSINESS\DOCS\URGENT
2302

FIG. 22

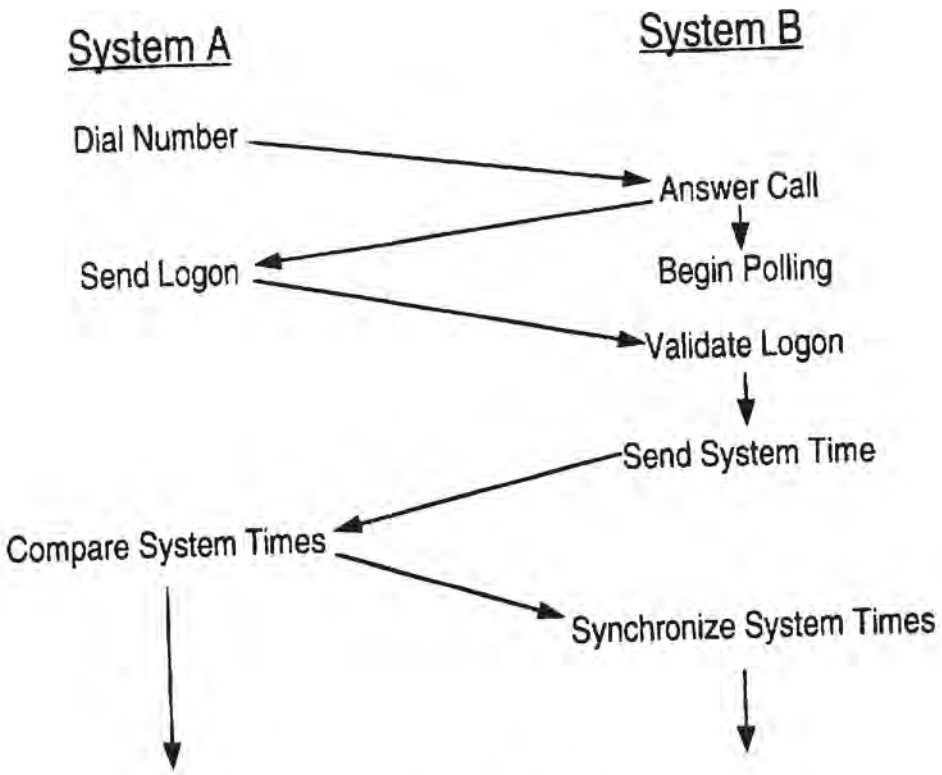

System A
System B
Dial Number
Answer Call
Send Logon
Begin Polling
Validate Logon
Send System Time
Compare System Times
Synchronize System Times

FIG. 24a

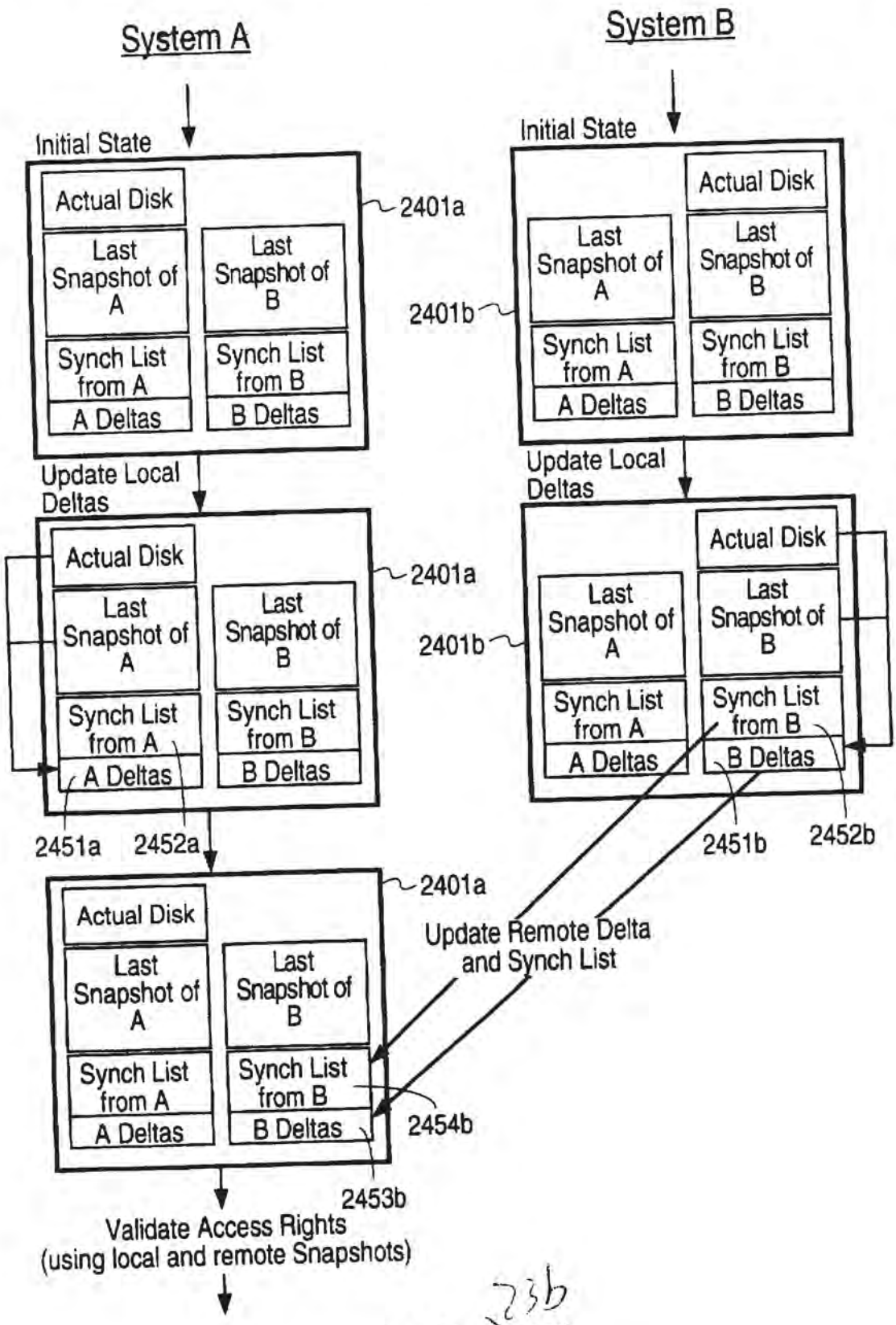

System A
System B
Initial State
Initial State
Actual Disk
Last Snapshot of A
Last Snapshot of B
Synch List from A
A Deltas
Synch List from B
B Deltas
2401a
2401b
Update Local Deltas
Update Local Deltas
2451a
2452a
2451b
2452b
Update Remote Delta and Synch List
2454b
2453b
Validate Access Rights
(using local and remote Snapshots)

FIG. 24b

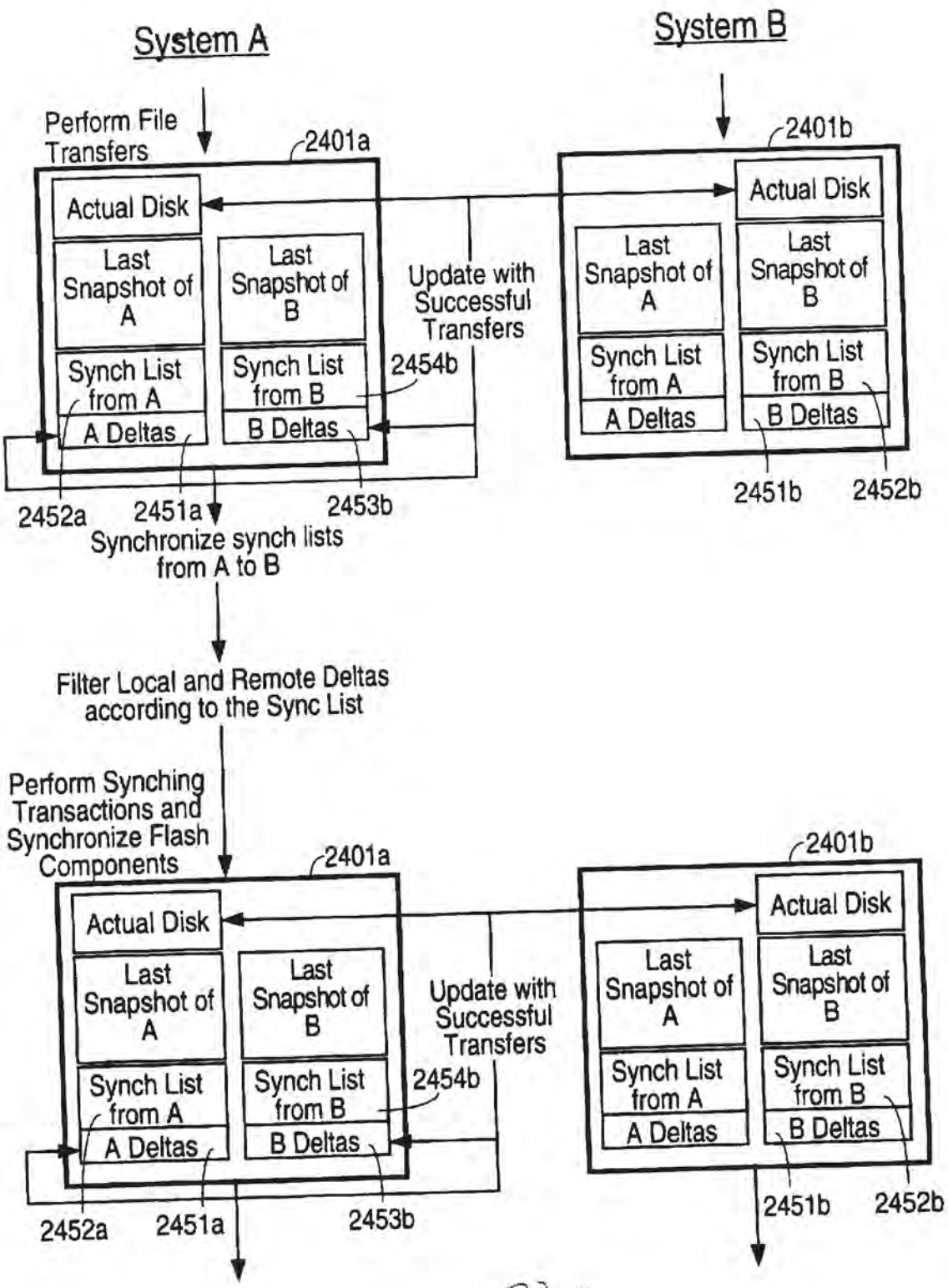

System A
System B
Perform File Transfers
2401a
2401b
Actual Disk
Last Snapshot of A
Last Snapshot of B
Synch List from A
Synch List from B
A Deltas
B Deltas
Update with Successful Transfers
2454b
2452a
2451a
2453b
2451b
2452b
Synchronize synch lists from A to B
Filter Local and Remote Deltas according to the Sync List
Perform Synching Transactions and Synchronize Flash Components

FIG. 24c

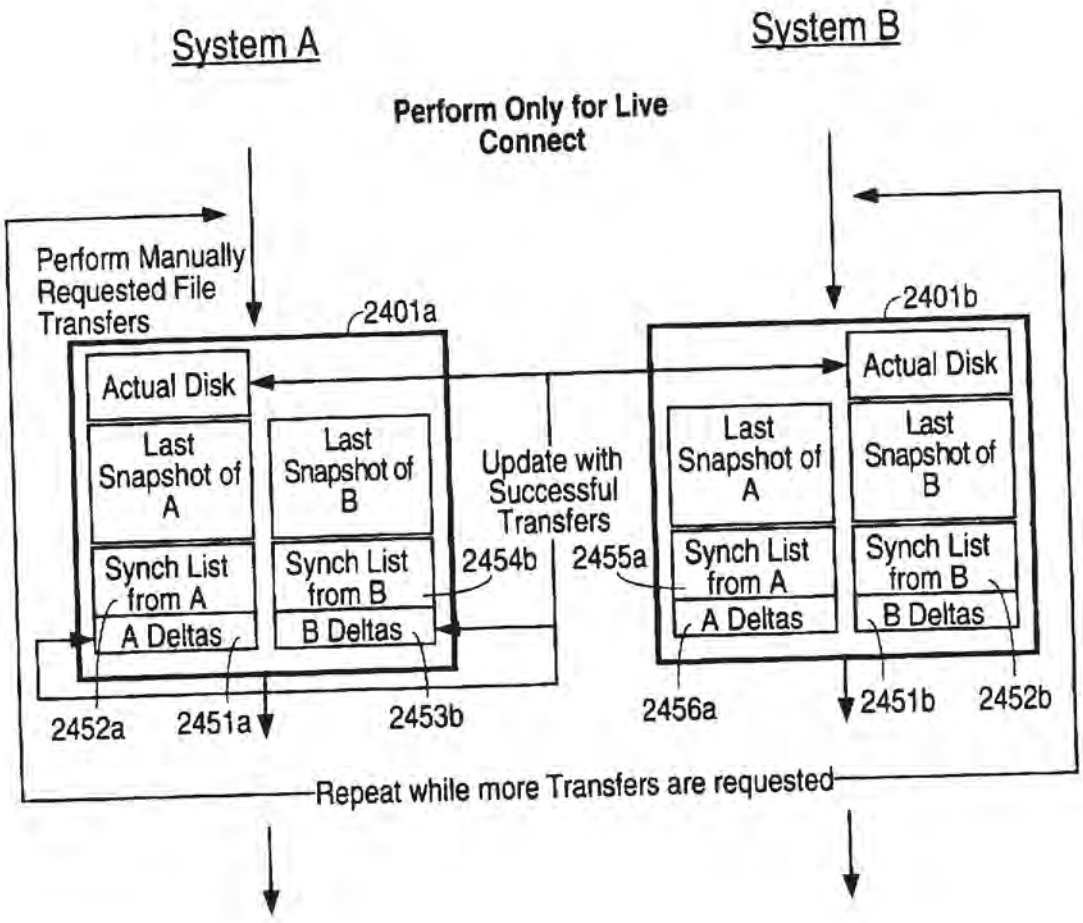

System A
System B
Perform Only for Live Connect
Perform Manually Requested File Transfers
2401a
2401b
Actual Disk
Last Snapshot of A
Last Snapshot of B
Synch List from A
A Deltas
Synch List from B
B Deltas
Update with Successful Transfers
2454b
2455a
2452a
2451a
2453b
2456a
2451b
2452b
Repeat while more Transfers are requested

FIG. 24d

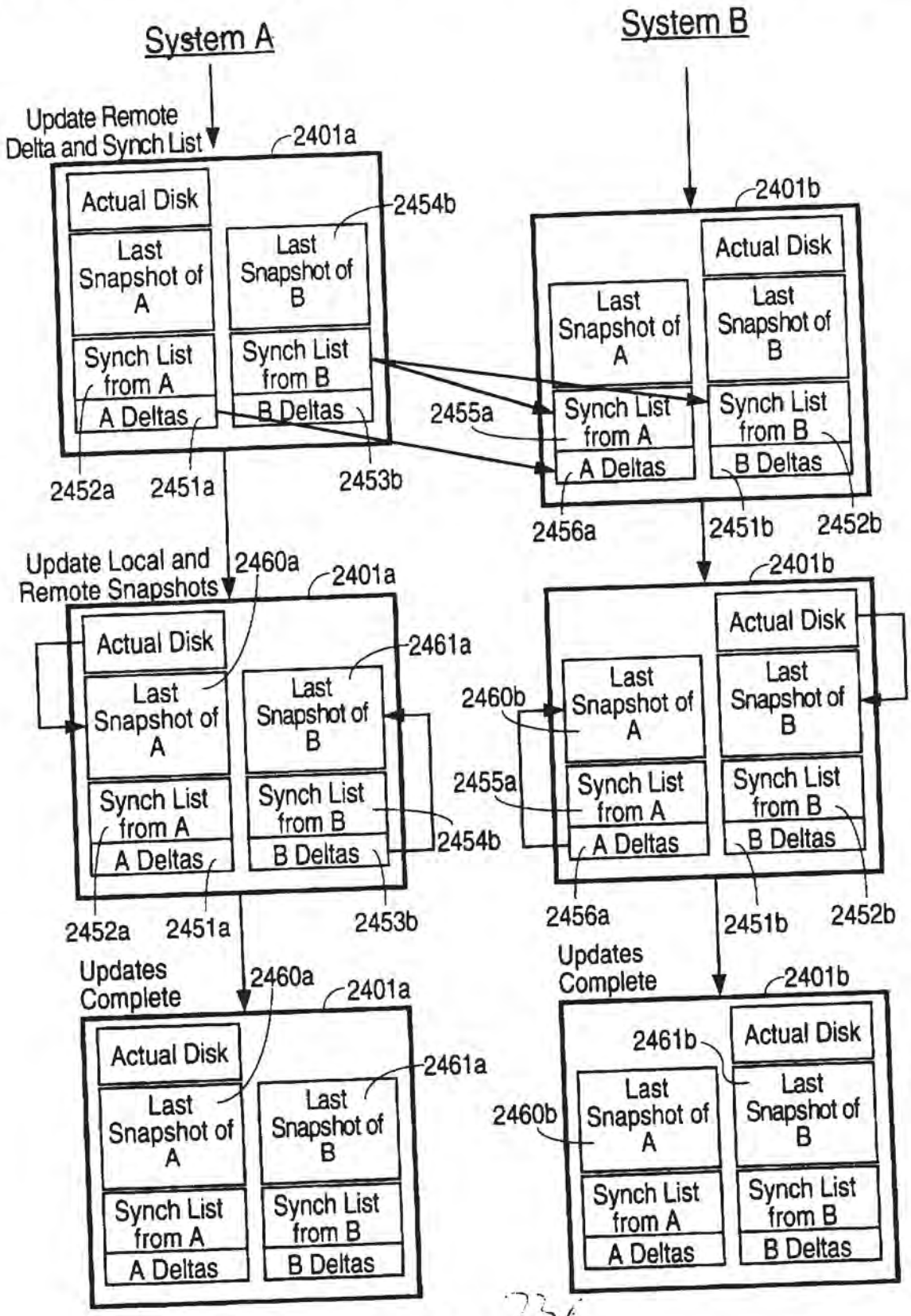

System A
System B
Update Remote Delta and Synch List
2401a
2401b
Actual Disk
Last Snapshot of A
Last Snapshot of B
Synch List from A
A Deltas
Synch List from B
B Deltas
2454b
2455a
2452a
2451a
2453b
2456a
2451b
2452b
Update Local and Remote Snapshots
2460a
2461a
2460b
Updates Complete

FIG. 24e

SYSTEM AND METHOD FOR A COMMUNICATION SYSTEM

CROSS REFERENCE TO RELATED APPLICATION

This is a continuation of application Ser. No. 08/077,402 filed on Jun. 15, 1993, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to the automation of electronic communication systems; and in particular, relates to an integrated system for electronic mail, facsimile transmission, terminal emulation and file synchronization among distributed computers.

2. Discussion of the Related Art

In addition to the telephone, electronic mail and facsimile transmission ("fax") have become indispensable communication tools in the information age. File transfers between computers are also frequently invoked communication functions. File transfers traditionally occur when information is shared among different computer users. More recently, as more users have multiple computers which are used, for example, at the work place, at home and during business travel, file transfers also occur when the same user maintains the same file in multiple machines. Further, portable computers have now made it possible for a computer user to send and receive electronic mail, a file or a fax at any time and anywhere. The frequency at which electronic mail, fax and file transfers occur has render manual management of each of these communication functions increasingly burdensome. Thus, an integrated system capable of both performing these communication tasks with minimal user intervention, and maintaining the necessary information for accomplishing each function is highly desired.

In the prior art, systems for generating and receiving electronic mail have at least two major weaknesses. First, these systems are incomplete. For example, facsimile transmission and electronic mail are not seen as satisfying the same communication need, but rather as two distinctly different applications. Consequently, the products available today typically address only one or two aspects of communications. For example, the prior art provides a program for sending and receiving facsimile transmission, and a program for providing both facsimile transmission and terminal emulation. No product to date provides, under a single user interface, and in a uniform manner, the ability to send and receive fax, file transfer, terminal emulation, and electronic mail.

The second weakness of prior art communication programs results from the designers' of such programs seeing communication as a function distinct from other functions carried out in the computer, and not as a supporting function to such other functions of the computer. For example, to send an electronic mail message today, the electronic mail application program would provide its own text processor for composing the message. This electronic mail application program may not necessarily be compatible with the other application programs the computer user uses, duplicates the functions performed by these other application programs, and demands both valuable memory space and screen "real estate."

Suitable management of communication data is also lacking in prior art communications products. For example, programs in the prior art do not automatically provide a different dialing sequence when a normally local call becomes a long distance call, or requires an access prefix to a private telephone exchange (PBX), such as when the computer user is away from his usual location during business travel or at a different office. In these situations, the user of the prior art program is required to manually edit the configuration, or even individual telephone numbers, stored in the data base of these programs.

Further, electronic address books of the prior art, such as those found in organizer programs, are generally suited only for maintaining databases designed for memorializing personal and business contacts. These programs, however, are not designed for creating an electronic communication environment. Specifically, electronic address books suffer at least two major weaknesses.

First, the type of information typically stored in such programs are insufficient for use in electronic communications. In general, these address book programs are not designed to handle electronic mail addresses, and usually provide little support for maintaining multiple fax and voice phone numbers. For example, none of these programs allows the user to specify a given recipient's preferred mode or method of receiving communication, e.g. facsimiles or electronic mail, so that an automatic procedure which sends a message to the recipient using the preferred mode or method of communication cannot be designed using databases of such programs.

Second, address book programs are structured to store information about individuals. Such programs do not provide support in maintaining information about other entities which may also be sources or destinations of communication. These entities, which include groups of people, bulletin board services, mainframe computers and desktop personal computers, all have attributes of communication different from such attributes of an individual. Thus, an environment for supporting electronic communication involving these entities cannot be created within the framework of these programs. Other deficiencies of prior art address book programs also include the absence of a flexible way to specify a communication medium, or to support telephone calling card usage, often necessary when the computer user is a traveller.

As to file transfers, prior art remote file transfer utilities are deficient in several areas. Firstly, these programs lack "user-friendliness." Typical prior art file transfer utilities are difficult to use. Often, to be able to properly set up these programs, the user is required to have detailed knowledge of data communications, such as the configuration of a modem. Further, these prior art file transfer programs do not support file management operations (e.g. marking a file for deletion, or updating a file when a new version of the file becomes available) when the communicating computers are not connected. These programs examine and operate on remote files only when the local and remote computers are connected. Thus, in these programs, file management operations are often manually performed in an interactive mode when the communicating computers are connected. Consequently, as such functions are often accomplished over a long distance telephone connection, substantial expense can be incurred.

Another deficiency in prior art file transfer utilities is the lack of support for file synchronization. The prior art file transfer utilities rest upon the human user the responsibility of remembering files or directories that need to be kept synchronized among the computers in which versions of these files or directories reside. While some products provide some support for performing such synchronization

manually, none of the prior art file transfer utilities supports persistent synchronization, i.e. automatic resynchronization of such files upon connection of the computers.

Finally, to add a new communication service, prior art software products generally require a complete update of many or all system components. Installing a new service would therefore require substantial cost and significant disruption of service due to the technical complexity of configuring and testing these software products.

SUMMARY OF THE INVENTION

In accordance with the present invention, a method and a structure provide an electronic address book which allows information to be efficiently sent to users of both electronic mail and facsimile transmission. In one embodiment of the present invention, a data base stores in a local computer information about a number of recipients, where each recipient is represented by a record holding (i) a telephone number at which the recipient receives facsimile transmissions; (ii) an electronic mail address at which the recipient receives electronic mail messages; and (iii) data elements indicating whether the recipient prefers to receive the communication in the form of electronic messages, facsimile transmissions or both.

In accordance with another aspects of the present invention, a structure and a method are provided to automatically generate correct dialing sequences, for use in sending electronic mail messages or facsimile, according to the physical location of the dialer. This aspect of the present invention is particular useful for users of portable computers who travels widely and frequently. In one embodiment, a data base stores a number of records each corresponding to a recipient of the information to sent by electronic messages or facsimile, each record specifying (i) the area or country code portion of said recipient's telephone number, and (ii) the local portion of said recipient's telephone number. Separate from the recipients' communication information, the data base stores connection information in a "Connection Manager" program. Such connection information includes (i) an access code to a long distance carrier, for use when the computer is in an out-of-state or out-of-the-country location and (ii) an access code to an outside line, for use when the computer is in a frequented location, such as the home base of the travelling user. Such access code to an outside line can be zero or more digits long, to accommodate, for example, access to a PBX. The present invention thus provides an automatic method for assembling the correct dialing sequence based on the location of the computer as indicated by the user. In addition, the data base also includes authorization information about the user's telephone credit card, which can also be automatically incorporated in the dialing sequence.

In accordance with another aspect of the present invention, a convenient method is provided for integrating into a communication package an automatic interface to an electronic mail service provider. The convenient method allows integrating the electronic service provider in an incremental manner, i.e. other components of the software package are unaffected by the integration. Consequently, additional service provider can be included without having to reinstall the other components of the communication package.

In one embodiment, the interface provides a method for retrieving from the data base an address template specifying data fields of an electronic mail address suitable for use with the electronic mail service provider. A second method receives (i) a distribution list specifying a number of recipients; and (ii) a message to be sent as electronic mail by the mail service provider. This second method then, for each recipient in the distribution list, retrieves from the data base values of the relevant data fields and uses these values to compose, according to the format specified in an address template, an electronic mail address suitable for use with the mail service provider. The message and the composed electronic mail address are then combined to form a package of a format acceptable for processing by the electronic mail provider.

In that embodiment, several methods are provided for receiving a package from the electronic mail provider. One method extracts the message from the package, another method extracts the distribution list, and a third method extracts any file attachments.

In accordance with another aspect of the present invention, a system and a method are provided for file synchronization between a local computer system and a remote computer system. In one embodiment, a communication link can be provided on demand between the local computer system and the remote computer system. In each computer system is kept a synchronization file which contains the list of files or directories to be synchronized. The synchronization file can be modified by each machine, even during a period of the time when no physical communication link exists between the local computer and the remote computer. In addition, each computer keeps a snapshot of its own file system and a snapshot of the other computer system's file system. These snapshots are taken when the local and remote computers are last physically connected. During the period when no physical connection exists between the computers, each computer can continue to modify both its own files and directories, as well as files and directories of the other computer system. When modifications are made to the other file system, while no physical communication link is in existence, the intended operations are queued. All changes to files or directories marked for synchronization, whether local or remote, are logged in each machine in the form of "delta files", which store information of the actual or intended changes. At the next physical connection of the computer systems, the remote computer system sends to the local computer system its delta files, which are then resolved in the local computer system against the local computer system's delta files. The changes resulting from resolving the delta files are the changes necessary, in each file system, to synchronize the files marked for synchronization in the synchronization file. Files are then exchanged to perform the synchronization. The resolved delta files are used to update both the snapshot files in the local computer system and the snapshot files in the remote computer system.

The file synchronization features are particular useful for users who use multiple computer systems, such as a user who uses a personal computer on a local area network at her home office, and works with a note book computer during her business travels.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows is a model of communication among a number of computers.

FIG. 2 shows an overall graphical interface of an integrated communication system (ICU) in accordance with the present invention.

FIG. 3 is a block diagram summarizing the interactions between the dynamically linked libraries (DLLs) corre-

sponding to Connection Manager, Address Cards, In Tray, Out Tray, Terminal Emulator, File Manager, Log and Service components of the ICU of the present invention.

FIG. **4** shows the window of the Communication Address Book (CAB) in accordance with one embodiment of the present invention.

FIG. **5** shows an example of a Group type address card **500** of the present invention.

FIG. **6** shows an example of a Computer type address card **600** of the present invention.

FIG. **7** shows an example of a Calling Card type address card **700** of the present invention.

FIG. **8** shows an example of a Service Type address card **800** of the present invention.

FIG. **9** shows a dialog box **900** used for associating the fields of a file containing information to be imported with the corresponding fields in the CAB.

FIG. **10** shows a dialog box **1000** for specifying the page format for printing address cards of the CAB.

FIGS. **11***a* and **11***b* show respectively an address card being printed as a card image and in a list format.

FIG. **12** shows the card order dialog box **1200** used to specify the order of address cards displayed in the card stack of the CAB, in accordance with the present invention.

FIG. **13** shows a dialog box **1300** which is used to edit a tagged list associated with one of the "Voice" or "Fax" fields in a Person type address card.

FIG. **14** shows a dialog box **1400** which is used to edit a tagged list associated with the "config" field in a Computer type address card.

FIGS. **15***a*, **15***b* and **15***c* show respectively a dialog box **1500**, a dialog box **1550** and a dialog box **1580**, which are used alternatively to edit a tagged list associated with the "Email" field in a Person type address card.

FIG. **16** shows a Service type address card **1901** providing service parameters to a service DLL **1902**, to assemble a package from an envelope.

FIG. **17** shows a dialog box **1900** of the Connect Manager component in an embodiment of the present invention.

FIG. **18** shows a dialog box **1950** of the Connect Manager component, which is invoked to receive input configuration information regarding the calling location, in accordance with the present invention.

FIG. **19** summarizes the portions of a telephone number contributed by the Connection Manager component and the Communication Address Book (CAB) component to build a telephone number to be used to reach an addressee, in accordance with the present invention.

FIG. **20**A shows a window of the File manager displaying the file systems of two computers, in accordance with the present invention.

FIG. **20**B shows the window of FIG. **21***a*, after sub-directories are selected in each of panels **2102***a* and **2102***b*.

FIG. **21** shows a dialog box **2200** illustrative of the "Properties" item under the File Menu, in accordance with the present invention.

FIG. **22** shows a dialog box **2300** showing the "Confirm" Menu under the "Options" Menu of the File Manager of the present invention.

FIGS. **23***a*–**23***e* shows the events under control of the File Manager of the present invention during a connection between a local computer and a remote computer.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. **1** is a model of communication among several computers. As shown in FIG. **1**, computer systems **100***a*–**100***c* are each a single-user computer system. Computer systems **100***a*, which can be a desktop computer either operating as a stand-alone machine, or as a node in a local area network, has access to a modem **102***a* which provides an interface to a telephone network **103**. Telephone network **103** provides access to other computers, such as computer **100***c*. Computer **100***b* is a portable computer which connects to telephone network **103** via a built-in modem **102***b* (not shown). A number of modems are available for mobile use, including those that couples through a cellular telephone link. Portable computer **100***b* can also send and receive facsimile transmission. Facsimile transmissions are typically stored as images (i.e. bitmaps).

1. The Control Panel

One embodiment of an integrated communication system or utility (ICU) provided by the present invention has an overall graphical user interface **200** shown in FIG. **2**. Provided in graphical interface **200** are square icon boxes representing the functions selectable by the user to be performed by the ICU. Graphical interface **200** acts as a top-level entry point for the various functional components of the ICU.

The present invention provides a control panel-based ICU. A control panel is an effective means to provide users with convenient and quick access to all necessary communications utilities, while incurring very little screen space. Using the control panel approach, the user can use the remaining screen space for other application programs. These application programs operate in conjunction with the ICU as if the ICU is part of the functionalities provided by application programs. The implementation of the ICU conforms to a common application program interface, so as to allow an application program, such as a word processor, to access the component functionalities of the ICU. As a result, existing application programs can be integrated with a wide range of communications facilities through the ICU.

Selection of icon boxes in the graphical user interface **200** can be accomplished either by a pointing device, e.g. a mouse, or by pressing on a keyboard a predetermined key or a predetermined combination of key strokes. For example, as shown in FIG. **2**, an "Out Tray" icon **206** represents the function which prepare an "envelope" for an electronic mail message or a facsimile transmission, for transfer out of the user's work space. An envelope comprises the recipient and destination information, configuration settings for the communication hardware involved, priority, and references to file attachments included in the communication.

To initiate the "out tray" function, the user "drags" the envelope, e.g. a text file and "drops" it on the "out tray" icon. Dragging and dropping are operations of the pointing device familiar to a computer user. One implementation of dragging is initiated when the user presses a button on a mouse device while the cursor on an associated display device is at an initial screen position. The pressing of the button indicates a selection. While holding the button down, the user moves the mouse to associate the selected item to another item displayed. Typically, when the mouse is moved, the computer generates a visual feedback to the user by generating on the display device a corresponding motion of the cursor. Also, while the button is held down, visual feedback, such as a dashed box resembling the outline of the item selected, can be generated to follow the cursor, so as to indicate to the user that a "dragging" manipulation is initiated. The user then selects the item to be associated by releasing the button on the mouse, i.e. "dropping" the item.

The other components accessible from graphical interface **200** are (a) "Configuration," represented by the configura-

tion icon **202**; (b) "Clock", represented by the "Homebase" and "Local" icons **203**; (c) "In Tray", represented by in-tray icon **205**; (d) "Connection Manager", represented by connection manager icon **204**; (e) "Address Cards" represented by address book icon **208**; (f) "Remote File Manager", represented by remote file manager icon **209**; (g) "Log", represented by log file icon **210**; (h) "Terminal Emulator" represented terminal icon **211**; (i) "Lock", represented by lock icon **212**; (j) "Help", represented by "?" icon **213**; (k) "About", represented by information icon **214**; and "Create Message", represented by "create message" icon **215**.

On selecting the "Configuration" icon **202**, a configuration dialog box appears. A dialog box is one of many methods in a graphical user interface for an application to receive input data. Normally, when displayed, a dialog box presents a form structure to solicit input data from the user. The user is expected to input information from the keyboard, or to select using a mouse appropriate input values from a displayed menu. In the configuration dialog box, the user specifies a the hardware configuration of the communication equipment, e.g. the modem type, communication port parameters and an identifier of the computer system.

The "Clock" component controls and shows the time of day and date. When traveling, time zone changes can be entered using the configuration tool associated with configuration icon **202**. In addition, the "Homebase" and the "Local" icons **203** and **204** display respectively the time and date of two selected locations. Typically, the user would enter identifying text, e.g. a city name, to associate each of "Homebase" and "Local" icons **203** and **204**. The time and date of "Local" icon **204** are used to timestamp communications handled by ICU.

The "In Tray" function manages messages received. The In Tray function allows the user to create folders to store incoming messages. Folders are logical file structures which allow the user to categorize and to separately manage incoming messages. In this embodiment, notifications of file transfer and file synchronizations are also managed by the In Tray component.

The "Connection Manager" component controls connections to fax machines, electronic mail services, and host computers. On invoking the Connection Manager via selection of the connection manager icon **207**, the Connection Manager manages the equipment of the computer system to effectuate sending and receiving envelopes.

The "Address Cards" component, also known as the "Address Book" component, manages a data base of names, addresses, phone numbers, and other information of individuals, groups of individual, electronic mail services, and host computers. In addition, the Address Book component also relates the user's communication parameters, such as access numbers, to long distance services and calling card information. The Address Book component is described in further detail below.

The File Manager allows the user to manipulate files on both the local machine and a host machine running the ICU of the present invention. Through the File Manager, the user can specify certain files included in both the local machine and the host machine to be automatically synchronized. The File Manager is also discussed in further detailed below.

The Log component maintains status information during a connection. When the log icon **209** is selected, information about previously made connections is displayed.

The Terminal Emulator is a terminal emulation program used to support a conventional interactive connection to a host computer or computer services, e.g. Compuserve™. Thus, the Terminal Emulator function can be provided by a conventional terminal emulation program.

The Lock component is a security program which prevents unauthorized use of the ICU. When the lock icon **212** is selected, further selection of the icons displayed in graphical user interface **200**, other than lock icon **212**, are disabled. Selection of the icons in graphical user interface **200** is reactivated when the user selects again lock icon **212** to provide a password matching a previously stored password.

The Help component, when selected via the "?" icon **213**, activates the ICU's on-line help facility. The Help component can be implemented using a conventional on-line facility.

The About component, when selected via about icon **214**, displays the logo of the assignee of the present invention, and displays information relating to the ICU's version number, part number, and other identifying information.

The Create Message component, when selected via create message icon **214**, provides a facility for the user to create a new message. In addition to creating the message body, the Create Message facility allows the user to specify the recipient's or recipients' address information, and also allows the user to specify files which are to be used as attachments to the message created. The new message thus created can be sent to its destination or destinations via fax, electronic mail, or both.

Using a widely accepted convention for graphical user interface, selection of an icon in this embodiment is signalled by the user moving the pointer device to cause a cursor on a display device to move to the position of the icon to be selected. Selection is achieved by pressing and releasing ("clicking") a button of the pointing device. In the ICU of the present invention, an individual component, e.g. any of components **212–215**, is activated by clicking on the associated icon once. A visual effect showing opening of a window corresponding to the component is provided to indicate activation of the component. In addition, an "indicator" located at the upper left corner of the icon is illuminated. Clicking on an icon whose indicator is illuminated causes the component's open window to be shown as the top window. The window of an activated component can be hidden by "minimizing", which is signalled by clicking at a predetermined position of the window in rapid succession twice. An activated component having a minimized window is indicated by an illuminated indicator at the upper right corner of the component's icon. When a component's window is closed, i.e. deactivated, the indicator light goes out. In the present embodiment, in lieu of the pointing device, the keyboard can also be used to activate components when a predetermined key or sequence of keys are pressed. For example, the tab key indicates deselection of one component's icon and simultaneous selection of the icon in next component immediately next to the icon which is deselected. An enter key indicates selection of the current icon.

One implementation of the ICU uses a set of dynamically linked libraries (DLL), such as those compatible with Microsoft Windows, which is available from Microsoft Corporation, Redmond, Wash. Under this implementation, each component of the ICU (see the discussion of components above) provides a corresponding DLL. Under the Microsoft Windows DLL convention, each DLL provides a predefined set of procedures, called "methods" and a predefined set of parameters, called "properties", to be accessed by programs external to the component. Thus, by limiting the interface between each component's DLL and the external program to these predefined parameters and procedures,

a component can be added or removed with predictability and minimal impact on the remainder components of the ICU.

The interactions among the DLLs corresponding to the Connection Manager component, the Address Cards component, the In Tray component, the Out Tray component, the Terminal Emulator, the File Manager component, the Log component and the Service component are summarized in FIG. **3**. The Service component, which provides the ICU interfaces to selected service providers, e.g. electronic mail services, will be discussed in further detail below.

As shown in FIG. **3**, the Create Envelope block of the Out Tray component (represented by block **301***b*) obtains from the Address Cards component (represented by block **302**) an address of a recipient, creates an envelope bearing the address, and passes the envelope to Out Tray block **301***a* (The Out Tray component comprises blocks **301***a* and **301***b*), which assembles the contents of communication item, and creates a "package." A package is the entirety of the electronic communication item, which includes, in addition to the envelope, also media-specific data. Such media-specific data includes, for example, the bitmap files of a fax image. The package is passed to the connection Manager component, represented by block **303**, to be queued for transmission.

The Connection Manager component, which manages the hardware configuration and has access to the information relating to the current communication parameters, e.g. access prefix to an outside line, manages for other components the physical operations of sending and receiving packages. The Connection Manager disassembles packages received at the Service component and forwards the extracted information to the In Tray component, which is represented by block **306**.

The Connection Manager component provides the physical file transfer facility for the File Manager component, which is represented by block **305**. In addition, the Connection Manager component provides information necessary to effectuate a physical connection to the designated communication medium. For example, the Terminal Emulator component, represented by block **304**, provides to the Connection Manager component a telephone number obtained from the Address Cards component, and receives in return a "mangled" telephone number, which is the suitably modified telephone number, including such information as the long distance telephone prefix, telephone credit card authorization codes and dialing instructions. Similar "mangled telephone number" service is provided by the Connection Manager component to the File Manager, the Terminal Emulator, and the Service components.

Status information of the physical connection is provided by the Connection Manager component to the Log component, represented by block **307**.

2. The Address Book

The present invention provides the Address Book component to optimize user efficiency in electronic communications. In addition to those typically found in computerized address books, the Address Book component, also known as the Communications Address Book (CAB), offers numerous features for use in electronic communications. Specifically, the CAB's novel features address the issues of: (a) how to prepare electronic mail and fax messages for transmission; (b) how to send the same message using both the fax and the electronic mail facilities and using addresses from the same distribution list; (c) how to handle in a uniform manner electronic mail addresses which are structurally different, according to the individual specifications of the numerous electronic mail services available; and (d) how to handle in a uniform manner the sending of an electronic message, regardless of the complexity of the path necessary to construct such a message.

One problem for which no solution existed prior to the present invention is the uniform handling of both electronic mail messages and faxes. In the prior art, the user has to decide, for each message, whether the message is to be sent by fax or by electronic mail. The choice of whether the message is to be sent by electronic mail or by fax determines which of two very distinct paths are to be taken.

To support multiple communication paths, each of the "address" fields in the CAB, regardless of whether it is field of holding a fax telephone number or an electronic mail address, is implemented as a "combo" box. A combo box is a mechanism adopted in a graphical user interface, such as that provided in the aforementioned Microsoft Windows program, for storing lists. A typical implementation of a combo box provides a window for showing the first element of a list. The full list can be viewed and manipulated when the single element window is expanded ("dropped down") by the user selecting a button icon, which is typically placed next to the single-element window. By allowing specification of address lists, the CAB allows storage of arbitrary lists of addresses.

The purpose of the CAB is to organize in a data base a collection of names, telephone numbers, and other relevant data on the electronic mail, fax, or host computer systems at the recipients (or "destinations") of communications. As illustrated in FIG. **3** above, the CAB supports other components of the ICU by supplying information to these components in a convenient manner.

The CAB consists of an ordered set of address cards (AC). In one implementation, the default ordering is alphabetical, according to the "name" field of each address card. Ordering can be changed by modifying the information in a dialog box, called the "card order dialog box". With respect to address cards, the functions supported by the CAB are card creation, deletion, modification, and transfer of card information between the CAB and other components of the ICU.

In general, many fields on an address card can be edited by bringing the address card to the top and typing directly to the edit field. Other fields in the address card are implemented as check boxes or radio buttons. A check box is a mechanism in a graphical user interface to indicate the value of a binary variable. Typically, when a predetermined value of the binary variable is selected, a "check mark" appears in the displayed box. A radio button, is a mechanism in a graphical interface to present mutually exclusive choices. Thus, radio buttons are typically presented as a group, and only one of the radio buttons can be set to the "ON" value at any given time. In a radio button, rather than a check mark, an illuminated dot is used to indicate the predetermined (i.e. "ON") value of the binary variable. Selections represented by check boxes or radio buttons can be changed by clicking on the icons of these check boxes or radio buttons.

As mentioned above, many fields are implemented by combo boxes, which accept tagged lists of items. (A discussion of 'tagged' lists is provided below). The 'preferred' selection may be made simply by selecting an item from the drop down list, which is displayed when the button associated with the combo box is selected. In the present embodiment, combo boxes are often accompanied by an

"Edit" button which is used to invoke the edit function that allows the tagged list to be edited.

FIG. **4** shows in detail the top-level window of the CAB. As shown in FIG. **4**, a menu bar **401**, from which a user can select one of the several menus "File", "Edit", "Display" and "Help," is displayed. Also shown in FIG. **4** is a portion **402** of the card stack, and a card finder window **403**. Each of areas **401–403** provides control of some portions of the CAB's functionalities.

The interactions between the user and card stack area **402**, and associated scroll bar **404**, allow address card navigation, and card editing. The card finder associated with area **403** provides a rapid means to locate a given card. As discussed above, cards in the CAB may be dragged and dropped to other ICU components, to indicate passing of parameters between such the ICU and such other components. Menu bar **401** controls all other functions of the CAB. The address cards in the CAB are automatically loaded whenever the CAB is selected from the control panel of the ICU, and saved whenever the CAB window is closed.

The card stack shown in card stack area **402** includes all cards currently being shown and ordered in accordance with information specified in the card order dialog box. As shown in FIG. **4**, card stack area **402** shows (a) the current card (AC), shown in its entirety ("on top"), and (b) the name and type icons of the several address cards **406–410** in the CAB. Scroll bar **404** is included to allow the user to select cards not immediately displayed. Thus, scroll bar **404** allows the user to navigate through the cards as if the card stack is maintained in a list box. Card stack area **404** shows the tab of each address card under the top card. The displayed portion of each address card, other than the top card, shows the value of the "name" field and an icon representing the card type. Currently, five card types are supported: a person card, a group card, a computer card, a calling card and a service card. The name field of a person card, for example, contains the name of the person referenced.

When the tab of another address card is "double clicked" on, i.e. selected by pressing and releasing a button on the mouse in rapid succession twice, the double-clicked or selected card is moved to the top, with several of the address cards following the selected card shown above the selected card. When a tab is single clicked on, it is selected but not moved to the top. When a card is selected, any other selected card then existing, and any fields within such other selected card are deselected. Disjoint selection is also supported. Selection is indicated by the tab inverting. Selected cards may be dragged from the card stack and dropped on other components of the ICU. The number of address cards with their tabs displayed in the card stack area **402** is determined by the size of the window.

All address cards in the database are shown in the card stack by default and ordered alphabetically by the value of the "Name" field. The Name field and the "Notes" field are the two text fields common to all address card types. Address cards can also be (i) ordered by type, and then alphabetically ordered by the value in the Name field, or (ii) ordered by type and within each type, ordered in accordance with up to two other fields (referred to as "primary" and "secondary" order fields) of that type. Custom fields, i.e. fields defined by the user, rather than by the ICU, can be created in an address card. Such custom fields can also be used for ordering address cards in the card stack.

The present embodiment also allows the user to restrict for display on the card stack only those address cards having a string or sub-string in a specified field. In this manner, a sub-set of the database can be selected. The card order dialog box is shown in FIG. **5**. The card order dialog box is discussed in further detail below.

The card finder area **403** is displayed below the card stack area **402**. As a text string is entered into the "Go to" text field **412**, the text string is matched to each of the address card following the top address card. The first address card which matches the field used in ordering the card stack is brought to the top. The card finder, which is not case sensitive, provides the user an incremental search capability. For example, starting with an empty field, with a default stack order, when an 'h' is pressed, the first card with a name starting with 'H' or 'h' is displayed. If an 'o' is then pressed, the card finder will cause to be displayed the first 'HO', 'Ho' or "ho" card. The incremental search continues as each character is entered until the desired card is displayed.

An icon button **411** is provided to find the next address card in the card stack matching the string specified in the "go to" field **412**. If there is no next match, the card finder returns to the first match.

Unless a field in the currently displayed address card, or a tab in the address cards underneath the currently displayed card, is clicked on, the card finder will have "input focus", i.e. any input data from the keyboard is assumed to be used as input data to the card finder. If backspace is pressed, indicated the cancellation of the most immediate character typed, the top card displayed is the last match of the previous card finder string before the cancelled character is typed.

Menu bar **401** provides menus "File", "Edit", "Display" and "Help". Each of these menus is further described below.

Under the File menu, the items "New Card", "Import", "Export", "Page Setup", "Print", "Print Setup" and "Exit" are available for selection. The New Card menu item is a "cascading" menu. A cascading menu is a menu which contains sub-menus. The New Card menu allows further selections of the various address card types: Person, Group, Computer, Calling Card and Service. As a address card type is selected, a blank address card of the specified type is displayed to allow the user to input the requisite information. In this embodiment, a Service type address card, which is used to define additional communication services, requires supporting files in addition to information appearing on its displayed face. At present, service cards are added in conjunction with a system upgrade; the present embodiment allows service cards to be provided only by the assignee of the present invention, when the ICU is shipped to the user, and cannot be added by the user.

As mentioned above, the Person type address card holds personal and destination information about a specific person or entity. The Computer type address card holds access telephone numbers and configuration data about a computer. The Group type address card holds a list which references Person type address cards, and/or other Group type address cards. The Calling Card type address card holds long-distance service calling card information. Finally, the Service type address card holds information on specific electronic mail services.

As previously discussed, the Name field, which is present in each of the various types of address cards, is displayed in the address card's tab area, next to the icon representing the type of the address card. While the Name field on a Person type address card is split into First Name and Last Name fields, for many purposes, e.g. the purpose of searching, the First Name and Last Name fields are concatenated as a single Name field.

A Person type address card has fields to hold the person's Company, Title, postal Address, Category, and a Note field.

The Person type address card also has a Preference field, for specifying whether the person prefers to receive communication in the form of electronic mail messages, faxes, or both.

Further, the Person type address card has three list fields "Voice", "Fax", and "Email", for holding respectively a list of voice telephone numbers, a list of fax telephone numbers and a list of electronic mail addresses. The elements of each of these lists can be "tagged", i.e. distinguished from other elements of the list, by a string preceding the telephone number. An expected use of the tags is, for example, to distinguish home and work telephone numbers. There is also a 'Preferred' item on each list. The preferred item is the item normally displayed.

Pre-designed tags are provided in the list of electronic mail addresses. These pre-designed tags are "AT&T Mail", "MC Mail", "Sprint Mail", and "Compuserve Mail". The data input by the user in these items are verified for proper format.

Like the lists for voice and fax telephone numbers, the Category field is a regular combo box, with edit capability, that can hold a list of multiple items. The Category field can be used to order the Person type address cards in the CAB. For example, the CAB can be selected to display only address cards that has "business" specified in their Category fields. A Person type address card can belong to one or more categories. The multiple categories are identified on the address card, with each category being separated from another category by a semicolon. The predesigned categories for a Person type address card are 'Business' and 'Personal'.

When the "Edit" button next to the Category edit field is clicked, a dialog box is displayed. The user may add a category by typing a name into the edit field and then clicking "Add" in the Edit Menu. When an item in the Category list is selected, the text of the category appears in the list box. Clicking "Delete" from the Edit Menu removes the category from both the category list and the edit field. The user may also change the contents of the edit field and click Change.

Next to each of the combo boxes "Voice", "Fax", and "Email", is a button labelled "Edit". Clicking on the "Edit" button activates an edit function which allows the user to modify each of these lists. A dialog box **1300**, which is shown in FIG. **13**, is displayed when the "Edit" button next to either the "Voice" or the "Fax" field is clicked. As shown in FIG. **13**, dialog box **1300** allows the user to specify, in addition to the local telephone number, an Area or City code, and a Country code. The user can optionally specify the Area or City code to be used from outside the specified country. Normally, but not always, the Area or City code is the same for both inside and outside the country. One notable exception is the United Kingdom.

Clicking the "Edit" button next to the "EMail" field displays one of dialog box **1500**, dialog box **1550**, and dialog box **1580**, shown respectively in FIGS. **15***a*, **15***b* and **15***c*, for editing the "Email" tagged list. The "TotalCom uses:" field, shown as field **1502** in FIGS. **15***a*, **15***b* and **15***c*, has as default value the name of the user's Primary electronic mail service, and the "Recipient is on" field (field **1503**) has as default value the recipient's primary electronic mail service. The lower portions of dialog box **1500**, dialog box **1550**, and dialog box **1580** are different, based on the contents of the "Recipient is On" and the "TotalCom uses" fields. Specifically, dialog box **1500** is used for public electronic mail services, e.g. ATT, MC, CompuServe, Sprint; dialog box **1550** is used for X.400; and dialog box **1580** is used for Internet and Others. The "Recipient is on" combo box is pre-loaded with all electronic mail services installed, X.400, Internet and others.

An additional check box field in the Person type address card is the "Quick Send" check box, which indicates whether on not the name in the Name field of the address card should appear in a "Quick Dial" radio button in a menu of the ICU used in preparing an envelope.

An example of a Group type address card **500** is shown in FIG. **5**. As shown in FIG. **5**, the Group type address card **500** has a field "To" (generally indicated by reference numeral **501**) holding a list of names of other address cards. Each of the names in the "To" list is also shown along with the 'Preferred' address. Each name on the "To" list corresponds to a Person type address card. The 'Preferred' address is the value provided in the "Preference" field of the referenced Person type address card. This preferred address can be an electronic mail address, if the preferred mode of communication is electronic mail, or a fax telephone number, if fax is the preferred mode of communication. If the Preference field of the referenced Person indicates both fax and electronic mail, two entries are shown, indicating respectively the preference for fax in one entry, and the preference for electronic mail in the other entry.

The "To" list of a Group type address card can reference names of Person type address cards, as well as other Group type address cards. In this embodiment, editing the Preference field in a Person type address card changes the indicated preferred address on any Group type address card referencing the Person type address card. Like a Person type address card, the Group type address card also has a check box field QuickDial, shown as check box **502**. Further, like its counterpart in the Person type address card, check box **502** is used to indicate that the Group type address card is to be included as a Quick Dial button in an envelope prepared by the ICU.

There are two combo boxes (fields **507** and **509**) and an edit field (field **508**) located below the list box (field **501**) in a Group type address card. When an item in list **501** is selected, combo box **507** lets the user select one of 'From', 'To', 'Cc', or 'Box'. In addition, edit field **508** provides the name of the item selected in field **501**, combo box **509** displays several addresses associated with the selected item from which the user can select the address to use. The user can select the "Delete" button from the Edit Menu to remove the selected item from the group list displayed in list **501**. The user can also select a different address from the address combo-box. Clicking on the "New" button clears combo box **509** and edit field **508**, and sets the selected item in combo box **507** to 'To', without affecting the selected item of list **501**. The user can type into edit field **508** a name and specify one or more addresses in the combo box **509**. Selecting "Add" in the Edit Menu adds the specified person to the group list displayed in list **501**. Instead of typing an address, the user may click the "Assist" button (button **510**), which displays a dialog box similar to one of the "Email" dialog boxes **1500**, **1550** or **1580** shown in FIGS. **15***a*, **15***b* or **15***c*. "Assist" button locates the "Email" information related to the address card specified in the "Name" field. To add address cards from the CAB to a Group type address card, the Group type address card is dragged out of the CAB and dropped anywhere except another ICU window. This drag and drop operation with the Group type address card creates a window containing the Group type address card. The user then navigates through the CAB to locate the address cards of persons or entities to be included in the group. The located

address cards are dragged to the newly opened window. Only Person and Group type address cards can be included in a group. The selected address cards' names are added to the group along with the Preferred electronic mail or fax address. If the Preference field of the address card is set to both fax and electronic mail, then two entries, specifying respectively the fax and electronic mail addresses, are added to the group. If a Person type address card of the list has only one preference specified, when selected, the address combo box **509** displays both fax and electronic mail addresses, allowing the user to switch between selecting electronic mail and fax easily. If a preexisting Group type address card is dropped into the open window containing a new Group type address card, the name of the preexisting Group type address card is added to the list in the new Group type address card. Address cards are added to the 'From', 'To', 'Cc', or 'Bbc' **507** lists independently.

An example of a Computer type address card **600** is shown in FIG. **6**. In this embodiment, two types of computers can be defined on a Computer type address card. These two types of computers are (a) ICU type computers and (b) non-ICU type computers.

A Computer type address card is required for each ICU type computer which the user connects. The ICU type computer to be included in the address card stack includes the local system (i.e. the machine including the instant card stack). At present, the present embodiment supports file transfer and file synchronization operations only on ICU type computers. The connection to a non-ICU type computer is made via the Terminal Emulator component. Typical non-ICU type computers include bulletin board systems (BBS), on-line information services, and mainframe computers.

Computer type address card **600** has the fields: (a) "Type", shown as field **602**, for specifying whether the computer is ICU or other type; (b) "modem", shown as field **603**, for specifying one or more dial-in telephone numbers of the computer; (c) "support", shown as field **604**, for specifying one or more telephone numbers of the support organization of the computer; (d) "Config", shown as field **605**, for specifying one or more modem configurations supported by the answering modems of the computer; (e) "UserID" and "Password" fields, shown as fields **605** and **606** respectively, for specifying access identification information to be supplied when initiating a session with the computer, and (f) "Connect Script" field, shown as field, for specifying a connect script for the Terminal Emulation component to use when initiating a session with the computer (Connect Script is only necessary for a non-ICU computer). A connect script is a procedure, typically written in a command level language, to provide the application program level protocol between the calling computer and the called computer.

Like the "Voice" and "Fax" fields of a Person type address card, the "modem", "support" and "config" fields of the Computer type address cards are tagged. The Script field is a combo box holding references to connect scripts currently defined. Clicking the "Edit" button next to the "config" field displays a dialog box **1400**, which is shown in FIG. **14**. As shown in FIG. **14**, dialog box **1400** allows the user to specify the modem configuration and the transfer protocols. There are no pre-defined tags for the "config" field.

The Calling Card type address card has information about the long distance carrier. An example of a Calling Card type address card **700** is shown in FIG. **7**. Calling Card **700** has the fields: (a) "Card Num", shown as field **701**, for holding multiple card numbers, and (b) "Dialing Sequence", shown as field **702**, for specifying dialing sequences to access the long distance carrier under different circumstances. The "Edit Sequence" button, shown as button **704**, is used to enable editing of a dialing sequence.

The Service type address card contains information for contacting an electronic mail service with which the ICU communicates. In this embodiment, the Service type address cards are special because the user can neither create nor delete them. When a new CAB is created, these Service type address cards are included. At present, new Service type address cards are added to the ICU only by an upgrade method provided by the assignee of the present invention. Service Cards can, however, be edited by the user to update such information as telephone numbers, or account identification information. As expected, the Name field of a Service type address card cannot be edited.

Service type address card **800** has the fields: (a) "phone" and "support", shown respectively as fields **801** and **802**, for specifying tagged lists of telephone numbers used for data and support connections; (c) "config", shown as field **803**, for specifying a tagged list of modem configurations; and (d) "User ID" and two "Password" fields, shown respectively as fields **804**, **805**, and **806**, for specifying the user identification, and the primary and the secondary passwords.

An "Enable Service" check box, shown as check box **807** is provided to allow the user to indicate whether the specified service is enabled. Any and all services of the Service type address cards in the CAB may be enabled by checking the corresponding "Enable Service" check boxes. When enabled, any electronic mail message sent by the ICU to a destination on an enabled electronic mail service causes the electronic mail message to be sent directly to that enabled service. In this embodiment, an enabled service is polled for messages for the ICU whenever a connection to the enabled service is made. Such a connection can be initiated through the Connection Manager, regardless of whether a message is at the Out Tray to be sent to a destination at the enabled service. When a connection is made, the enabled service is queried for any incoming mail envelopes for the calling machine.

In some Service type address cards, three Script fields can be provided for holding information of the login, the logoff and the modem usage procedures. In yet other Service type address cards, a number of other special fields peculiar to the specified service is provided.

To use an address card of any type, the user selects the address card by clicking on the address card's tab, dragging and dropping the address card to an application program represented in the ICU control panel. The ICU then passes the address card information to that application program. For example, dragging a Group type address card to an envelope will create a distribution list in the envelope. If the "quick send" field is checked in the Group type address card, the card's icon and name will appear in the envelopes as a "quick dial" button.

The ICU allows the user to drag an address card to any of the control panel's windows (i.e. an activated component of the ICU), except the window where the address card originates. Dragging and dropping to and from open windows allows the user to view more than one address cards at the same time and provides a simple mechanism for building Group type address cards.

As discussed above, the Person, Service, and Computer types of address cards each contain fields which are implemented as lists. For example, the "Voice" field of a Person type address card is a list of tagged telephone numbers.

where a tag provides a comment on the usage of the telephone number, such as "Home", "Work" or "Car". In each of these lists, a user can identify an item from the list as a default preference. For example, if the user wants to send electronic mail to a person, dropping the person's Person type address card envelope results in an envelope addressed to the person's preferred electronic mail service. The address used on the envelope is the default electronic mail address selected in the list of the "EMail" field.

As indicated above, the "Import" menu item under the File menu imports address information from several popular file formats and application programs. The CAB is capable of importing address card information from other application programs. Clearly, the data formats of other application programs must be converted. The imported information, provided it is in a supported file format, can be optionally updated by a subsequent file synchronization operation, whenever the original file has changed, or if a DDE (Dynamic Data Exchange) mechanism is used, whenever the CAB is opened. The DDE mechanism is an industry standard data exchange mechanism, which is defined by Microsoft Corporation, Redmond, Wash.

The present embodiment can import files in the following formats: (a) CSV[1] (comma separated field) format; (b) TSV[2] (tab separated field) format; (c) GDB[3] (Omnibook 300 PIM database) format; (d) PR1 or PR2[4] (the

[1]CSV is a text file format, in which adjacent fields are separated by a comma. In the CSV format, when a field contains a comma, the entire field is enclosed in double quotes. Records in a CSV file are terminated by a CR/LF combination. The first record in a CSV file provides the names of the field. The present embodiment does not support file synchronization for CSV files.

[2]The TSV format is very similar to the CSV format, except that the Tab character, rather than the comma, is used to separate fields. File synchronization is also not supported for TSV files.

[3]The GDB format is defined by the Omnibook 300 PIM Database. Explanation of the GDB format can be found in the Omnibook 300 PIM 'Database Documentation', available from Hewlett-Packard Company, Palo Alto, Calif. Unlike the CSV and TSV format files, a GDB format file is not an ASCII file. File synchronization between the CAB and a GDB file is provided by an application program interface supported by the Hewlett-Packard Company.

[4]PR1 and PR2 are the formats used by the Packrat Phone Book, available from Polaris Software, to store it's address book information. A PR1 or PR2 file can be kept in file synchronization with the CAB using the DDE mechanism. Packrat Phone book) format; (e) DBF[5] (the Act! address book) format; and (g) the Lotus Organizer[6] format.

[5]The DBF format used by the Act! address book, available from Contact Software, Inc. Since the DBF format is actually compatible with the well-known DBase III file format, which is supported by the DBase III program from Borland International, Scotts Valley, Calif., data from other application programs using the DBase III file format can also be imported by the CAB. A DBF format file can be kept in file synchronization with the CAB by parsing the DBase III files according to the above-mentioned DBase III format.

[6]The ICU imports address book information using an "application program interface" (API) provided by Lotus Corporation, which markets the Lotus Organizer.

When the "Import" item of the File Menu is selected, the CAB initiates a dialog box, e.g. the dialog box **900** shown in FIG. **9**, for creating a template which associates the fields in the files containing the information to be imported and the CAB fields. Dialog box **900** is used to specify the importation of a Person type address card. Other types of address card can also be imported. If the imported file is in a file format for which file synchronization is provided, a check box "keep in sync", shown in FIG. **9** as check box **901**, is provided for the user to specify whether file synchronization is desired.

Initially, the fields "FAX" or "EMail", which are provided radio buttons **902** and **903** respectively, are not selected. Also, the "keep in sync" check box **901** is initially grayed. (Graying is a representation in a graphical user interface to specify a "non-applicable" item. Typically, gray is the conventional color for indicating an item as deactivated or non-available.) Dialog box **900** is a template containing the fields defined in a Person type address card. To completely specify an import operation, the user first specifies the data format of the file to be imported using a file name. (In the cases of the Lotus Organizer and the Packrat Phone Book formats, no file name is necessary). Once the file format is specified, the CAB reads in the names of the defined fields of the imported file, and display the fields in display area **904**. The fields of the file to be imported and the corresponding field in the CAB are associated in a series of drag and drop operations between the fields in display area **904** and the edit boxes **906–912** in display area **905**. As shown in FIG. **9**, the names of fields of the address card are shown bracketed by angle brackets (<>). As shown in FIG. **9** also, tags may be added by typing them into a field in front of a field name, such as shown in edit box **910** of the "Voice" field, where the tag "work:" is added in front the <Work Phone> field. Where file synchronization is supported for the imported file format, the "keep in sync" check box **901** is ungrayed.

When the "Save Template" button **913** is selected, the template for the currently selected format is saved. Thus, the user can maintain a template for each file format for subsequent importation of files of the same format. When the "Convert" button is selected, file importation occurs. During the importation process, the Preference settings are obtained in the following manner: if an address card already exists for the name, the current preference settings in the address card are maintained; otherwise, the preference settings in the template are used in the address card created. Further, if the preference settings are in conflict, e.g. if the preference settings specify electronic mail, but no electronic mail address is provided, then the Preference field is modified to match the available address information.

The address cards of the CAB can be synchronized with their source databases either through DDE or by parsing the database file. As indicated above, file synchronization is supported only for certain formats. For the supported formats, any new address cards added to the source database are added to the CAB at connection time. The CAB does not erase any field not imported.

Whenever the CAB is activated, and while a file in an pplication program that supports DDE is specified to synchronize with the CAB, the user is queried to determine if the links are to be updated. If so, the source application program is loaded, and an update request is sent. To update the information in the CAB, the date and time of the last modification to the source database file are examined to determine if the such last modification occurs after the time the source database file was imported. If modification occurred more recently than the last date of importation, address information is updated in the CAB.

The "Export" item from the File Menu displays an "Export" dialog box, which is used for specifying informa-

tion necessary to convert the address cards in the CAB into a file format compatible with other application programs. Person, Group or Computer type address cards can be exported. In the present embodiment, an export operation exports all cards of the specified type. The file formats supported for export are: CSV, TSV, GDB, and DBF, which are described above with respect to the import operations.

The "Page Setup" item of the File menu, when selected, displays a dialog box **1000**, which is shown in FIG. **10**. Dialog box **1000** allows the user to specify a page format to be used for printing. As shown in FIG. **10**, a radio button group **1001**, labelled "Print Format" allows the user to select between printing an address card as a card image, or in a list format. These formats are shown respectively in FIGS. **11***a* and **11***b*.

In addition, four edit fields a–d under the label "Margins" are provided for specifying the page margins and edit fields "Header" and "Footer", shown as edit fields **1003** and **1004** are provided for specifying a text string to be printed in the top margin (Header) and bottom margin (Footer) of each page. The "Header" and "Footer" strings can include predefined variables, each variable being indicated by a '&' symbol preceding its one character name. For example, the variable "&P" represents the page number, the variable "&T" represents the time of day, and the variable "&D" represents the date. The values of these variables are supplied during printing.

The "Print" item in the File Menu allows the user to print one or more address cards. The configuration of the printer supporting the "Print" item is provided by a previous selection of the "Print Setup" item of the File Menu. When selected, the "Print Setup" item displays a printer selection dialog box for selecting a printer from a list of one or more printers, and for specifying the parameters of the printers on the list.

The "Exit" item from the File Menu prompts the user to save the current database prior to initiating a shut-down procedure for the CAB. At the minimal, the name of the current database, the ordering and the identity of the top card are saved.

The "Edit" menu holds the selections "Undo", "Cut", "Copy", "Paste", "Delete", "Select All" and "Find." The "Undo" item reverses the last action.

The "Cut" item copies the current selection, which can be a field in an address card, or the address card itself, to a work area called the "clipboard", and then deletes the selection. If a field in an address card, rather than a card, is selected, the selection is kept in the keyboard as a text string. When an address card is selected, the address card is kept in the clipboard in a text string under the CSV representation (see above regarding the CSV representation).

The "Copy" item in the Edit Menu copies the current selection, which is either a field in an address card, or the address card itself, to the clipboard.

The "Paste" item retrieves from the clipboard either an address card, or a field of an address card. A retrieved address card is placed onto the address card stack, and a retrieve field of an address card is provided to the field indicated by the cursor. If the field is pasted into a tagged list, the pasted text is checked for proper formatting before the field is added to the list. Cards may be pasted at any time, and will always appear on top of the card stack. The "Paste" item is grayed when there is no suitable data on the clipboard.

The "Delete" item in the Edit Menu deletes the current selection, which is either a field in an address card, or the address card itself. When the selection is an address card, the user is prompted to confirm the requested deletion.

The "Select all" item selects all address cards in the address card stack. The "Find" item, when selected, displays a dialog box into which the user can enter a search string. The search string is matched to all fields of the address cards following the top address card on the address card stack. The first address card having a field containing the search string is selected and brought to the top of the address card stack. When the search string is not matched, an error message is returned to the user. After the first match is found, selecting the Find item again finds the next match.

The "Display" menu includes items "Define Order", "Default Order" and "Columns". When selected, the "Define Order" item creates a "card order" dialog box, which is shown as dialog box **1200** in FIG. **12**. As initially displayed, the fields of card order dialog box **1200** are filled with the currently active values. By default, the values of the "Card Type" and "Of Card Type, Show" fields, shown in FIG. **12** as fields **1201** and **1202**, are set to 'All Types' and "All Cards" respectively. In addition, the default "Primary order" field, shown in FIG. **12** as field **1201**, is set to "Name". A "Secondary" field, which includes check box **1204** and combo box **1205** are grayed by default, as are the fields "Have this string:" (shown as field **1206**) and "In this Field:" (shown as field **1207**) below the "Those Cards that" radio button (shown as radio button **1208**). By default, also, the "Menu Name" edit field **1209** and the "Remove" button **1210** are grayed, and the "Not on Menu" radio button **1211** is selected. Since the default "Card Type" is set to 'All Types', the fields "Primary Field" and "In this Field", i.e. combo boxes **1203** and **1207**, are restricted to either 'Name' or 'Notes'. When a specific address card type is selected, combo boxes **1203** and **1207**, as well as "Secondary" field **1205**, can be filled with the field names specific to the specified address card type. The "Secondary" check box **1204** is ungrayed when a specific address card type is specified.

The dialog box **1200** allows the user to define in the "Menu Item" area **1213** up to four address card order specifications that can be selected and displayed under the Display menu. When one of these address card order is selected, the address card stack is re-displayed in the specified order. The undefined menu item positions are grayed. Defined menu items are shown as a number with the specified name after it. Specifications of address card orders are saved independent of the CAB database.

When any radio button associated with any of the items **1–4** within the "Menu item" area **1213**, other then "Not On Menu" (radio button **1211**), is selected, the "Menu Name" field **1209** is ungrayed, and filled by the text string associated with the selected radio button. If one or more of the items **1–4** are defined, the "Remove" button **1210** is ungrayed also. Selecting "Remove" button **1210** undefines the selected item or items. Changing the radio button selection will change the "Menu Name" in the Menu item area **1213**.

The "Default Order" item in the Display Menu causes the card stack to be ordered in the default card order, which is explained above.

The "Columns" item of the Display menu controls the number of columns of card tabs displayed by the CAB. By default, two columns of address card tabs are displayed. When two columns of address card tabs are displayed, the Columns item provides a selection "Display **1** Column of Cards". Selection of the Columns item would, naturally, causes a redraw to display only one column of address card tabs and toggles the Columns item to provide the selection "Display **2** Columns of Cards."

The Help Menu lists the items "Index", "Search", "Troubleshooting", "Using Help", and "About". Selecting any of these items provide an on-line help message concerning the selected item.

The CAB is implemented using an indexed database, which is viewed by the rest of the ICU as an object (the "CAB object") with numerous globally accessible methods, which are discussed in the following. (Although the following discussion uses terminology specific to the C++ programming language, one of ordinary skill will appreciate readily that the present invention can be implemented in other programming languages as well).

The "Methods Common to all Card Types" section, provided below shows the names and general description of the methods available in the CAB object applicable to all address cards (i.e. the properties of a "generic address card").

As shown in the "Methods Common to all Card Types" section below, each address card is constructed (i.e. created in memory) by a method "TRdxCard" which can directly invoked with or without a pointer to a window object. When invoked with a pointer to a window object, the address card can be edited. When invoked without a pointer to a window object, the address card is-read only. The address card is destroyed by the method "~TRdxCard", which releases the representation of the address card in memory.

Each address card has the string variables "pName", "pFirstName", "pNotes", "pUser1Data" and "pUser2Data" to store the name, the first name (only used in Person type address cards), a note, and two user-defined data strings.

A "DefineFields" method is provided to cast the generic address card constructed by the TRdxCard method into the specified type, using the definitions of the fields of each card type. In addition, a "WriteDefaultData" method provides to the address card, which is typed by the DefineFields method, the default values of the defined fields.

A "WriteFields" method is provided for writing field values from, for example, an edit function in a window, onto the address card.

An address card is written into the CAB, which is an indexed data base, by the method "SaveToDB". A number of methods are provided to retrieve information of the address card. The method "GetRecordSize" retrieves the size in bytes of the address card. The method GetRootRecord returns a pointer to the head of the master list of all address cards. The method "GetTypeRecord" returns the head of a list of address cards of a given type under the "root" record retrieved by the GetRootRecord method. A method "GetBitmapo" constructs the bit map, i.e. the image, of the address card for display on a video monitor. Another method "GetType" returns the type of the address card, if the address card is defined.

In this embodiment, a method, in the form of an operator, provides a convenient means of comparing two address cards to determine if they are identical. A "GetSize" method and a "SetSize" method are provided to get and to set the size of the address card, respectively, for such purpose as printing. To display an address card in memory, a method "AttachToWindow" associates the address card with a window in which the address card is to be displayed. Removal of the address card from the window is accomplished by the method "RemoveFromWindow".

Two methods, both known as "Display", in accordance with the convention of "overloading" in the C++ language, are provided to display the address card. By setting a boolean parameter "param" to true, the selected Display method displays the address card only as a tab, as when the address card is not the top address card on the stack.

The name and the icon, which are typically shown on the tab of a displayed address card, are drawn by the "DrawIconAndName" method.

The methods specific to the Person type address cards are shown in the "Person Card Methods" section, provided below. Methods "WriteFields", "DefineFields", "WriteDefaultData", "GetType", and "GetBitMap" are inherited from the generic address card described above.

A Person type address card is constructed by one of two "TPersonCard" methods for use respectively for by the constructor of the card stack, and for general use, other than by the card stack. The method "~TPersonCard" destroys a Person type address card. The strings "pCompany", "pTitle", "pAddress", and "pCat", tagged lists "pVoice", "pFax", "pEmail", boolean variables "pSpeedDial", "bFaxPref" and "bEmailPref" correspond respectively to the fields "Company", "Title", "Address", "Category", "Voice", "Fax", "Email", "quick send", and the "Fax" and "Email" fields within the Preference field.

A method "GetCat" is provided to retrieve the string value of the Category field. The "Load" and "unLoad" methods are used to initialize static data structures. In this instance, the bitmap of an icon specific to the Person type address card is created for display use.

The methods provided for a Computer type address card are shown in the "Computer Card Methods" section, provided below. Like the Person type address cards, two constructor methods, both named "THostCard", are provided to create a Computer type address card. One of the THostCard method is provided for general use and the other THostCard method is used by the card stack, respectively. A Computer type address card is destroyed by the destructor "~THostCard". Methods "WriteFields", "DefineFields", "WriteDefaultData", "GetType", and "GetBitMap" are inherited from the generic address card described above.

The tagged lists "pModem", "pSupport", "pConfig", type identifier "HostType", strings "password", "Connect", "pUserID" and "pSnapshotFile" are provided to support fields "Modem", "Support", "Config", "Type", "password", "Connect Script", and the file synchronization mechanism respectively. (In the file synchronization mechanism discussed below, a "snapshot" file containing the state of a file system in a remote storage devices, e.g. a hard disk, is kept.) In addition, two boolean functions "ToConfig" and "FromConfig" are provided to write onto, and to extract from, the Computer type address card configuration information. Like the Load and Unload methods of the Person type address cards, the Load and unLoad methods produce and destroy a bitmap image of the Computer type address card.

The methods for a Group type address card are shown in the "Group Card Methods" section, provided below. Three constructor methods, all named "TGroupCard", are provided to create a Group type address card. One of the three constructor methods is provided for general use. The second constructor method is used by the card stack. The third constructor method, which takes as an argument another address card, clones a new address card from an existing address card. A Computer type address card is destroyed by the destructor "~TGroupCard". Methods "WriteFields", "DefineFields", "WriteDefaultData", "GetType", and "GetBitMap" are inherited from the generic address card described above. The present embodiment provides the operator "=" to compare two Group type address cards for equality.

The arrays "To", "From", "CC", and "BBC" and boolean variable "bSpeedDial" are provided to support the "To", "From", "CC" and "BBC" lists specified in field **501** of FIG.

5, and the check box "Quick button" respectively. Like the Load and Unload methods of the Person type address cards, the Load and unLoad methods produces and destroys a bitmap image of the Group type address card.

The methods for the Group type address card also includes a method "build" for restoring local data and the methods "NewDestRef", "MoveDestRef", "DelDestRef", and "GetNextDest" for navigating through list of addresses associated with each entry of the Group list in a Group type address card.

The methods for a Calling Card type address card are shown in the "Calling Card Methods" section, provided below. Two constructor methods, both named "TCallCard", are provided to create a Calling Card type address card, for general use, and by the card stack. A Calling Card type address card is destroyed by the destructor "~TCallCard". Methods "WriteFields", "DefineFields", "WriteDefaultData", "GetType", and "GetBitMap" are inherited from the generic address card, as described above.

The string "CardNumber" and the object "pDialSeq" are provided to support the "Card Num" and "Dialing Sequence" fields respectively. Like the Load and Unload methods of the Person type address cards, the Load and unLoad methods produce and destroy a bitmap image of the Calling Card type address card.

The methods for a Service type address card are shown in the "Service Card Methods" section, provided below. Two constructor methods, both named "TServiceCard", are provided to create a Service type address card, for general use and for use by the card stack. A Service type address card is destroyed by the destructor "~TServiceCard". Methods "WriteFields", "DefineFields", "WriteDefaultData", "GetType", and "GetBitMap" are inherited from the generic address card described above.

The tagged lists "pPhone", "pSupport", "pConfig", the strings "pUserID", "pPassword" and "PAltPassword", and boolean variable "bEnabled" are provided to support the fields "Phone", "Support", "Config", "UserID", "Password (primary)", "Password (secondary)" and the check box "Enable Service" respectively. Like the Load and Unload methods of the Person type address cards, the Load and unLoad methods produce and destroy a bitmap image of the Service type address card. The boolean function "ToConfig" extracts from a Service type address card configuration data.

The remaining methods of a Service Type Address Card "GetAddressTemplate", "MakePackage", "GetNote", "GetDistList", "GetAttachments", "Open", "Close", "Abort" and "Queue" are used to call into a Service DLL for assembling an envelope into a package compatible with the conventions of the target communication service. These methods are discussed below in conjunction with the Serivce DLL.

3. Integration of Service Providers

The present invention allows automatic integration of new service providers, e.g. service providers for electronic mail services and fax connections, into an existing software product. The architecture of the ICU according to the present invention allows integration of a new communication service by simply adding a Dynamic Linked Library (DLL). Thus, the present invention allows incremental upgrade, i.e. without requiring new versions of the components of the ICU to be simultaneously upgraded at the time the upgrade is performed.

The present invention requires a uniform "object oriented" interface for each service DLL. Each service DLL has a corresponding Service type address card in the Address Book. The Service type address card supplies all the user-configurable parameters of the service. For example, for an electronic mail service, the Service type address card contains the user identification ("User ID"), the requisite password or passwords, and telephone numbers for accessing the service.

Generally, the principal task of a Service DLL is to assemble pieces of the message, which collectively form the envelope, and create a "package" which conform to the format requirements of the communication service to which the package is intended. The relationships among the Service DLL, the Service type address card, the envelope and the package are shown in FIG. **16**.

As shown in FIG. **16**, to prepare a package from an enveloped received, a Service DLL **1702** invokes the methods of Service type address card **1701** to retrieve service specific parameters. The methods provided in the Service cards are "GetAddressTemplate", "MakePackage", "GetNote", "GetDistList", "GetAttachments", "Open", "Close", "Abort" and "Queue".

The "GetAddressTemplate" method retrieves a template for an address compatible with the conventions of the service provider. This method is also used to verify that an address is in the correct format.

The "MakePackage" method receives (i) an array "PackList" indicating the items included in the package, (ii) an array "DistList" containing a list of recipients, (iii) a string "pSubject" for including a descriptive string, (iv) a string "pNote" for including the content of the message, (v) an array "arrAttachList" containing a list of attachment files, and (vi) a time stamp "tTime". The MakePackage method is used to prepare a package in a format which is conforming to the requirements of the target communication service.

When a package is received from a communication service, a method DestroyData strips from a package received Service Specific data. A method "GetNote" retreives from a package an included message. A method "GetDistList" retrieves from the package a list of recipients and casts the retrieved list of recipients into a Group type address card. Attachment files are retrieved from a package using the method "GetAttachments", which returns a list of strings containing the file names of the attachments.

A method "Open" is used by the Connection Manager component to initiate a session with the target service. While the connection is open, packages are queued for transmission, using the "queue" method. If an error occurs, service activity can be suspended using the "abort" method. When all packages are successfully queued, the method "close" is used to close the session. The session is actually closed when a "Service finished" status message is received from the communication service.

4. The Connection Manager

The present invention separates the "To" and "From" location information in its data base. Separating the "From" and "To" information allows great flexibility for the data base to adapt to mobile nature of an address book. For example, since an address book is frequently used by a travelling user, separating the "To" and "From" information results in a more powerful communication utility. Under the approach of the present invention, the details of access to a common carrier are handled by the software, rather than explicitly by the user. A separation is made in the present invention to separate addressee-specific information from the addressee non-specific information, e.g. information relating to a calling card, or a communication service.

The Connection Manager component of the ICU provides independent specification of the "To" and "From" information. FIG. **17** is a dialog box **1900** of the Connection Manager component. As shown in FIG. **17**, dialog box **1900**

comprises combo box **1901**, labelled "Calling From?". Combo box **1901** also includes a tagged list. Combo box **1901** provides a quick way for the user to specify the dialing information, e.g. the access code to a long distance carrier, specific to the location being dialed from. Each entry in combo box **1901**'s list includes a description and dialing information. Combo box **1901** has two fixed entries: "PROMPT ME" and "Add New Location". "PROMPT ME" is used when the user wishes to dial from a location, but does not want to define it as an entry in combo box **1900**. "Add New Location" adds a new entry to the combo box **1900**. "Calling From?" information can be edited by selecting "Config" button **1902**. A dialog box **1950** appears when the "Add New Location" of combo box **1900** is selected.

Dialog box **1950**, invoked by the "Add New Location" item, is displayed in FIG. **18**. As shown in FIG. **18**, a "Title" edit field **1960** receives a "title" string, which is used to identify a location, e.g. "Sunnyvale Sales Office". The other fields in dialog box **1950** are "Outside line prefix" (field **1961**), "Wait for dial tone" (field **1962**), "Long Distance Prefix" (field **1963**), "International Dial Code" (field **1964**), "Country code" (field **1965**), "Area/city code" (field **1966**) and combo box **1967**, labelled "Calling Card".

The "Outside line prefix" field is provided to specify the digit or digits used in a private business exchange (PBX) to request access to an outside telephone line. Field "Wait for dial tone" is a check box provided for specifying a pause requirement after dialing the outside line prefix. The "Long distance prefix" field specifies any access code necessary to reach the long distance carrier. The "International dial code" field specifies the prefix to make an international call. In the US, the international dial code is '011'. The "Country code" field specifies the country code of the location where the user is dialing from. If the country code field is blank, the default country code is assumed. The "Area/City code" field specifies the area code (or the city code, if used outside of the US) of the location where the user is dialing from. If the "Area/City Code" is blank, the default area/city code is assumed.

Combo box **1967** holds a list of calling card type address cards defined in the CAB. In addition, combo box **1967** can also contain a special entry "None", which indicates that the user does not wish to use a calling card. A "Delete" field deletes the entry specified in the "Calling From" field.

When "PROMPT ME" is selected from the "Calling From" field, and one of the Connect buttons (labelled "Send and Receive", "Send" and "Receive") is pressed, the "PROMPT ME" dialog box (not shown) is displayed. The "PROMPT ME" dialog box displays the "Calling From" settings from the last session during which "PROMPT ME" is invoked. The user can then edit the "Calling from" information displayed in the "PROMPT ME" dialog box.

The present embodiment separates the "From" and "To" information by placing all the "To" (i.e. address-specific) information in the CAB, and stores the "From" information in the Connection Manager component. FIG. **20** summarizes the portions of the dialing information provided by the CAB and the Connection Manager components in forming a telephone number to be dialed.

5. File Synchronization

The File Manager component provides novel ways of addressing file management issues which face users of multiple computer systems. Some issues which face a user of multiple computers include: (a) how to send and retrieve individual files between two systems in the most efficient and economical manner; (b) how to maintain synchronization between files existing simultaneously in multiple computer systems; and (c) how to perform file transfers without requiring the two computer systems to be connected.

To synchronize files on two machines, the ICU's File Manager component performs deferred file transfers. In a deferred file transfer, requested file transfer are noted and queued when the source and destination machines are not connected. The actual file transfers occur when the two machines are physically connected. A window of the File Manager, shown in FIG. **20**A, shows the file systems of two machines at a time. As shown in FIG. **20**A, "computer" fields **2101***a* and **2101***b* display the names of the file systems of the local and remote computers. The name of the local computer's file system is shown in computer field **2101***a*, and the name of the remote computer's file system is shown in field **2101***b*. "Computer" field **2101***b*, which can be edited, is implemented as a combo box which allows the user to select from a list of file systems of remote computer to be displayed in panel **2102***b*. In each panel, such as panel **2102***a*, there is a scrollable region, e.g. **2103***a*, which displays the name of a file location on the panel's machine. One example of such file location is the machine's root directory. Below the scrollable region is shown a "view", e.g. view **2104***a*, which displays the contents of the specified file location. As discussed below, files on the two machines displayed on panels **2102***a* and **2102***b* can be marked for synchronization. The files so marked are indicated, in views **2104***a* and **2104***b*, by an icon next to their names.

The items listed in views **2104***a* and **2104***b* can be selected. If the selected item is a directory, the name of the selected directory is displayed in the respective scrollable regions **2103***a* or **2103***b*, and the contents of the selected directory are displayed in the respective views **2103***a* or **2103***b*. FIG. **20**B shows panels **2102***a* and **2102***b* after subdirectories are selected in each of these panels. Once a subdirectory is entered, the area **2105***a* or **2105***b* displays status information of the sub-directory. Such status information includes: (i) when viewing a disk, total disk space and available disk space; (ii) when a file or a directory is slected, the size of the selected file or directory, and (iii) when the computers shown in panels **2102***a* and **2102***b* have a present physical connection ("live connection"), the elapsed connection time. When a live connection is established with a remote machine, the list of files on the remote machine are shown in the same manner as those on the current machine. However, when viewing files on a machine which is not currently connected to the remote machine, the files on the remote machine are grayed to indicate the files on the remote machine have not been updated.

Files in a file system are often provided a security rating, such that certain rights, such as the right to modify the files, are granted only to authorized users. For example, a common security level restricts "guest access" (i.e. not the owner of the file) to "Read Only", and thus prevents a guest from modifying a file. Other rights include "private", which prevents a guest from viewing a file, and "public", which grants the guest the right to modify the file.

Clicking on an entry in view **2104***a* or view **2104***b* (a file or directory) selects the entry, and at the same time deselects a previously selected entry in the same panel. In the present embodiment, disjoint selection is supported in one panel. Entries in a view can be dragged to the opposite panel and dropped to initiate or queue a file or directory for copy. Selecting a file or directory that is marked for synchronization with another causes the corresponding file or directory to appear in the opposite panel.

A button **2107***a* and a corresponding button **2107***b* are provided in panels **2102***a* and **2102***b*. When selected, button

2101*a* or **2101***b* displays a "pop-up" box, such as pop-up box **2110** shown in FIG. **20**B. As shown in FIG. **20**A, scrollable region **2102***b* displays, as the name of the current directory, a directory "C:\". If the current directory is a sub-directory, upon clicking on the button **2107***b*, a pop-up box **2110** is displayed (FIG. **20**B), showing the names of the directories in the path from the root directory to current directory. In FIG. **20**B, the current directory is "CLIPART", which has a path of "C:\WINWORD\CLIPART". Thus, the names "C:", "WINWORD", and "CLIPART" are displayed in the manner shown in pop-up box **2110** to illustrate the directory hierarchy.

In general, subject to security restrictions, the File Manager operates on files, directories, or disks of a remote machine. When a present connection does not exist between the current machine and the remote machine, such operations are applied to the most recent snapshots of the remote machine (see below). An operation performed on the most recent snapshots of the remote machine is queued as a request to be transmitted when a physical connection is achieved. Of course, when a physical connection exists, a request by the File Manager on the remote machine is dispatched immediately. Files or directories moved or copied from a remote machine that is not currently connected live are grayed, to indicate the tentative nature of the deferred file operations. Grayed files or directories will not be available for any manipulation, except delete, until actual file transfers take place at the next connection. Deleting a grayed file will cancel a transfer.

The File Manager components provide the menus "File", "View", and "Help". Under the File Menu are the commands "Open", "Copy", "Properties", "Synchronize", "Unsynchronize", "Connect", "Disconnect", "Guess access" and "Exit".

The "Open" menu item is grayed unless a directory in a view is selected. Selecting a directory causes the contents of the directory to be displayed in the view, and the name of the directory entered in the scrollable region, such as region **2102***a*. When the selected directory is in a machine which is not live-connected, the information displayed in the view is derived from the most recent "snapshot" of the remote machine. If a present connection exists, the displayed information is the current state of the remote machine.

The "Copy" item is grayed unless a file name or directory in a view is selected. When "Copy" is selected after a file or directory is selected, the user is prompted for a target file or directory name. The selected file or directory is then transferred to the directory/disk shown in the opposite panel.

The "Properties" item is grayed unless a file name or directory is selected. When "Properties" is selected, a simple dialog box is displayed showing the file's or the directory's size, its time and date stamps, and the values of the flags associated with the selected file or directory. If the selection is a file or directory marked for synchronization, an estimate of whether or not the synchronization will actually take place (based on time and date of last modification in relation to the timestamp of the last snapshot). If the selected file is queue to be transferred, the name of the target machine is shown. Guest privileges on the file or directory are also shown. FIG. **21** is an example of a dialog box **2200** illustrative of the "Properties" item under the File Menu.

The "Synchronize" item is grayed unless a file or directory selected is not currently marked for synchronization. The "Synchronize" item is also grayed when both panels under the File Manager refer to the current machine. The selected file or directory is marked for synchronization with a file or directory of the same name in the opposite panel. If the corresponding file or directory does not exist in the opposite panel, the selected file or directory is transferred to the opposite panel and marked for synchronization.

The "Unsynchronize" item is grayed unless a file name or directory, which is marked for synchronization, is selected from a view. The "Unsynchronize" item unmarks the file or directory for synchronization.

The "Connect" item is a menu in itself. The "Connect" menu is grayed when both panels are displaying information of the same machine, or the machine is currently connected with another machine different from the one referenced in the File Manager's panels. When selected, in addition to a "PROMPT ME" item, the "Connect" menu is displayed showing all the 'From' locations defined in the Connection Manager (CM).

When a 'From' item is selected from the "Connect" menu, the information on that 'From' location is combined with the dialing information on the Computer type address card corresponding to the remote machine specified in the "Computer" field. When a connection is established, all queue File Manager transaction would occur.

The "Prompt Me" menu item prompts the user for the dialing information.

The "Disconnect" item is grayed unless a present connection exists. When "Disconnect" is selected, the user is prompted for a confirmation, before the modem closes the connection between the computers. A connection between two computers can also be closed by the user selecting a different machine in the "Computer" field.

The "Guest Access" item is grayed when there is not a present connection, or when the live connection is established using a "Guest" password. "Guest Access" is also ungrayed when the selected file or directory is on the current machine. When selected, the user is prompted for the level of access granted on the selected file or directory to a guest user. The default guest access is "Read Only". Several Guest access rights are available, with "Private" being the highest priority and "Public" being the lowest. If a directory is marked public, but some files within the directory are marked private, then a guest can access all files in the directory except the private ones. If a directory is marked private, even though some files in the directory are marked public, a guest would still not be able to access any files in that directory.

The "Request Snapshot" item is normally grayed if a snapshot exists for the machine, the drive or the directory selected. When a connection between the local machine and the remote machine exists, "Request Snapshot" creates and adds to the current snapshots a snapshot of the desired area.

The "Exit" item, also invoked by a double-click on the system menu, closes the File Manager.

Under the "View" Menu are the following selections: "View Sync List", "View Name", "View All", "View Part", "Sort by Name", "Sort by Type", "Sort by Size" and "Sort by Date."

The "View Sync list" item displays the "Sync List" dialog box **2300** shown in FIG. **22**. Dialog box **2300** shows all the files on the current or local machine ("Work PC" in dialog box **2300**) that are being kept in synchronization with files on a remote machine ("Home PC" in dialog box **2300**). Dialog box **2300** can be used to cancel any synchronization settings, but otherwise read-only. A list of files on the local machine which are to be synchronized with files on the remote machine are shown in list box **2301**. One file in the list of listbox **2301** can be selected. The file in the remote machine corresponding to the selected file of listbox **2301** is shown in box **2302**.

The "View Name", "View All" and "View Part" items are mutually exclusive alternative selections. "View Name"

displays in each panel only the names and icons of the files, directories or disks displayed. "View All" displays in each panel the icon, name, size, time and date of the files or directories displayed. "View Part" prompts a user to choose from "Name", "Size", "Time" and "Date" the fields to display.

The "Sort By Name", "Sort by Type", "Sort by Size" and "Sort By Date" items, which are mutually exclusive selections, select the order in which the selected files and directories are sorted.

In the present embodiment, a snapshot is an inventory of a disk at a given point in time on a remote machine. The snapshot captures the names of files and directories, tags, times, dates, sizes, and synchronization settings. Snapshots are made or updated whenever a connection is established under ICU control. Snapshots are created by the ICU to provide file or directory information on a remote machine, when a present connection is not available.

When a file or a directory is marked for synchronization with another file or directory, synchronization replaces the relatively older version of the file or directory by the more recent one. The current implementation allows synchronization of files between two machines. It is, of course, possible for to mark a file for synchronization with files on more than one other machine. However, synchronization updates for the present embodiment occur only on two machines at a time. The ICU keeps tracks of the time zone in which a file or directory is created, so that, in order to prevent a later version of a file from being replaced by an earlier version in the synchronization process, synchronization occurs only after compensation for time differences.

A live connection is made whenever two machines each running an instance of the ICU are either directly connected via a serial or parallel cable, or by modems through the Connect Manager. A live connection is indicated in the File Manager by an altered PC icon next to the "Computer" field of the remote machine's panel. When a currently connected remote machine is selected, the whole directory structure is available to the local machine and all operations performed in the File Manager occur immediately. Modem connected machines are disconnected when the user selects the Disconnect menu item. A live connection to a host computer allows the drives on the host computer to be mapped into the local machine and made accessible by the File Manager. The File Manager maps the remote machine's drives mapped to unused drives on the local machine. When live connected, and the user performs an action such as Move or Copy that may take more then a second, a small dialog box is displayed to give the user feedback on time remaining and allow interruption or canceling of the operation.

When a modem connection is made to a host computer running an instance of an ICU, the passwords provided on the calling computer's Computer type address card are used to validate the connection. A guest and an owner are usually given different privileges. When connected as a guest, only files and directories that have not been marked private can be viewed by the guest's File Manager. Files marked "Read Only" are not modifiable by a guest.

The File Manager is implemented by three basic types of synchronization files. The three types are "Snapshot", "Synch Master", and "Delta Master" files.

A "Snapshot file" contains a full image all file directories, on all disk volumes, of a particular computer. The image includes all attributes of the files and directories on that computer. The attributes includes date and time of last modification, size and access protection. In addition, the image contains all of the relationships between files and directories (e.g. the parentage).

A "Synch Master file", which is included in each computer ("local") running an instance of the File Manager component, contains the records for all pending file transfers between the local computer and every computer with which the local computer communicates. In addition, the Synch Master file maintains a list of the files and directories that are to be synchronized between the local computer and every machine to which the local computer connects.

A "Delta Master" file contains a transaction list derived from comparing two snapshot files of the same computer. Essentially, a Delta Master file describes the operations needed to modify the earlier snapshot file to arrive at the later snapshot file. These operations are Add, Delete and Modify.

In the present embodiment, each computer ("local computer") maintains two sets of synchronization files for each computer ("remote computer") it communicates with. Each set of synchronization files include: (i) a snapshot file for each disk volume on the remote computer; and, (ii) created at the same time as (i), a snapshot file for each volume on the local computer.

Each set of synchronization files allow the local computer to display the file system of the remote computer even though a present connection does not exist with the remote computer. Additionally, the set of synchronization files allow the local computer to determine, since the last connection between the local computer and the remote computer, which files on the local computer have been changed, and hence require synchronization with the remote computer.

FIGS. **23**A–**23**D show the sequence of events under the control of the File Manager during a connection between the local computer and a remote computer. This connection can be initiated in the File Manager window by selecting the "Connect" item in the File Menu, or when a connection occurs outside of the File Manager, such as when electronic mail is sent. As shown in FIG. **23**A, the local computer "System A" calls a remote computer "System B". When System B answers, System A provides the "logon" information, which is validated by System B. System B then sends System A a current time stamp, which is used by System A to synchronize its clock. Clock synchronization eliminate any effects of time zone differences, or inaccurate clock settings.

FIG. **23**B shows events subsequent to those shown in FIG. **23**A. Boxes **2401***a* and **2401***b* shows the state of the synchronization files on System A and System B respectively immediately after the systems' clocks are synchronized. On each machine, both a snapshot file of System A and a snapshot file of System B, created at the end of the last connection, are stored. These snapshot files are referred to as "Last Snapshot of A" and "Last Snapshot of B" respectively. When a successful connection between System A and System B is established, each system compares the state of its own file system against the last snapshot file of itself. These operations in Systems A and B are shown in boxes **2401***a* and **2401***b*. The additions, deletions or modifications necessary to update the snapshot file to the current state of the disk volumes are provided in the "Delta Master" file of each system. In FIG. **23**B the "Delta Master" files for System A and System B are respectively labelled "A Deltas" and "B Deltas" and generally indicated by reference numerals **2451***a* and **2451***b*. In addition, each system maintains a synchronization list, labelled "Synch List from A" and "Synch List from B" respectively, generally indicated by reference numerals **2452***a* and **2452***b*. These synchronization lists list the files and directories for which file synchronization is performed. Upon connection, Systems A and B

each update the "Last Snapshot" of itself using respectively Delta master file **2451***a* and Delta master file **2451***b*.

System B's Delta Master file **2451***b* and synchronization list file **2452***b* are then transferred to System A to update System A's copy of "Delta Master" file and synchronization list file of system B, which are indicated by reference numerals **2453***b* and **2454***b* respectively. The next event, which is the transfer of the queued files, is shown in FIG. **23**C. As file are transferred between System A and System B, Delta Master files **2451***a* and **2453***b* are updated to reflect successful file transfers.

In addition to Delta Master file, System B also sends System A a copy of its most recent Synch Master file. This synchronization file is referenced as Sychronization list file **2454***b*. After the file transfers are completed, System A "synchronizes" its Synch Master file, i.e. Synchronization list file **2452***a*, with the copy of System B's Synch Master file it receives, i.e. Synchronization list file **2454***b*, by comparing and updating Synchronization list file **2454***b*, to include in the Synchronization list file **2452***a* any additional files marked for synchronization, and to remove from Synchronization list file **2452***a* any references to files which is no longer marked for synchronization.

After synchronization of the Synch Master files is completed, the Delta Master files **2451***a* and **2453***b* are filtered to remove any transaction that is not required to perform file synchronization under the synchronized Synchronization list files **2452***a* and **2454***b*. Synchronization transactions are then performed by actually copying, modifying and deleting files in both System A and System B, and updating the Delta Master files **2451***a* and **2453***b*.

If the connection is initiated by selecting the "Connect" item in the File Menu, control is then transferred to the user interface to allow the user to enter commands manually to request file transfers. As each file is successfully transferred, Delta Master files **2451***a* and **2453***b* are updated. These operations are illustrated by FIG. **23**D. The files to be transferred are indicated by the dragging and dropping operations between the displayed views discussed above.

The remaining sequence of events to complete file synchronization is shown in FIG. **23**E. As shown in FIG. **23**E, System A sends System B "Delta Master" file **2451***a*, so as to allow System B to update System B's snapshot files. In addition, System A also sends the updated Synchronization list file **2454***b* to inform System B of any changes in the synchronization list. Both System A and System B then apply, respectively, Delta Master files **2456***a* and **2453***b* to update snapshot files **2461***a* and **2460***b* each system maintains about the other system.

Finally, Systems A and B each update its "last snapshot" of itself, i.e. Snapshot files **2460***a* and **2461***b* respectively, to reflect the current states of themselves. The physical connection between Systems A and B can then be terminated to return to deferred file transfer mode.

The above detailed description is provided to illustrate the specific embodiments of the present invention and is not intended to be limiting of the present invention. Numerous modifications and variations within the scope of the present invention are possible. The invention is defined by the following claims.

We claim:

1. A method for efficiently sending a message to users of electronic mail and facsimile transmission, comprising the steps of:

providing, in a local computer system of an originator of said message, an integrated communication system having a control panel-based graphical user interface, said integrated communication system being capable of sending and receiving facsimile, transferring files, terminal emulation and electronic mail, said control panel-based graphical user interface capable of interfacing with an application program for creating said message and accessing a data base for storing information about a plurality of recipients;

providing in said data base, for each recipient, a recipient record for holding (i) a telephone number at which said recipient receives facsimile transmissions; (ii) an electronic mail address in a computer system at which said recipient receives electronic mail messages; and (iii) first and second data elements for indicating whether said recipient desires to receive said message in the form of an electronic mail and whether said recipient desires to receive said message in the form of a facsimile transmission, respectively;

preparing said message for sending to one or more of said recipients; and

sending said message to said one or more of said recipients using a process of said local computer system, said local computer system sending said message to each recipient by electronic mail and by facsimile transmission in accordance with said first and second data elements.

2. A method for efficiently sending a message to users of electronic mail and facsimile transmission, comprising the steps of:

providing, in a local computer system, a data base for storing information about a plurality of recipients;

providing in said data base, for each recipient, a recipient record for holding (i) a telephone number at which said recipient receives facsimile transmissions; (ii) an electronic mail address in a computer system at which said recipient receives electronic mail messages; and (iii) first and second data elements for indicating whether said recipient desires to receive said message in the form of an electronic mail message and whether said recipient desires to receive said message in the form of a facsimile transmission, respectively;

providing in said data base, independent of said recipient records, a plurality of computer records for holding information about a plurality of computer systems, each computer record associated with one of said computer systems;

storing in each computer record: (i) a telephone number of a modem by which the computer system associated with said computer record, acting as a host computer, connects with other computer systems; and (ii) a protocol specification to be used when connecting to said computer system;

preparing a message for sending to one or more of said recipients;

sending said message to said one or more of said recipients using a process of said local computer system, said local computer system sending said message to each recipient by electronic mail and by facsimile transmission in accordance with said first and second data elements;

and, when said message is sent to a recipient by electronic mail, (i) determining, from the electronic mail address of said recipient, the recipient's computer system;

(ii) obtaining the computer record corresponding to said recipient's computer system; and (iii) establishing a connection between said local computer system and

said recipient's computer system, using said telephone number and said protocol.

3. A method as in claim 1, further comprising the steps of:

providing in said data base, independent of said recipient records, a plurality of group records for holding information about said recipients and said plurality of group records; and

storing in each group record: (i) a list of said recipient records; and (ii) a list of said group records;

listing in a group record said one or more recipients; and

sending said message to said one or more recipients by providing said process with said group record listing said one or more recipients.

4. A method as in claim 1, further comprising the steps of:

providing in said data base, independent of said recipient records, a plurality of service records for holding protocol information about accessing each of said public electronic mail services; and

generating electronic mail messages in accordance with said service records for transmitting over said public electronic mail services.

5. A system for efficiently sending a message to users of electronic mail and facsimile transmission, comprising:

a control panel-based graphical user interface, said control panel-based graphical user interface capable of interfacing with an application program for creating said message;

a data base in a local computer system of an originator of said message for storing information aboaut a plurality of recipients;

a recipient record in said data base, for each recipient, for holding (i) a telephone number at which said recipient receives facsimile transmissions; (ii) an electronic mail address in a computer system at which said recipient receives electronic mail messages; and (iii) and second data elements for indicating whether said recipient desires to receive said message in the form of electronic mail message and whether said recipient desires to receive said message in the form of a facsimile transmission, respectively; and

means for sending said message to said one or more of said recipients using a process of said local computer system, said local computer system sending said message to each recipient by electronic mail and sending and receiving facsimile transmissions, transferring files, terminal emulation in accordance with said first and second data elements.

6. A system as in claim 5, further comprising:

a plurality of group records in said data base, independent of said recipient records, for holding information about said recipients and said plurality of group records; and

means for storing in each group record: (i) a list of said recipient records; and (ii) a list of said group records;

means for listing in a group record said one or more recipients; and

means for sending said message to said one or more recipients by providing said process with said group record listing said one or more recipients.

7. A system as in claim 5, further comprising:

a plurality of service records in said data base, independent of said recipient records, for holding protocol information about accessing each of said public electronic mail services; and

means for generating electronic mail messages in accordance with said service records for transmitting over said public electronic mail services.

8. A system for efficiently sending a message to users of electronic mail and facsimile transmission, comprising:

a data base in a local computer system for storing information about a plurality of recipients;

a recipient record in said data base, for each recipient, for holding (i) a telephone number at which said recipient receives facsimile transmissions; (ii) an electronic mail address in a computer system at which said recipient receives electronic mail messages; and (iii) first and second data elements for indicating whether said recipient desires to receive said message in the form of an electronic mail message and whether said recipient desires to receive said message in the form of a facsimile transmission, respectively;

means for preparing a message for sending to one or more of said recipients;

means for sending said message to said one or more of said recipients using a process of said local computer system, said local computer system sending said message to each recipient by electronic mail and by facsimile transmission in accordance with said first and second data elements;

a plurality of computer records in said data base, independent of said recipient records, for holding information about a plurality of computer systems, each computer record associated with one of said computer systems;

means for storing in each computer record: (i) a telephone number of a modem by which the computer system associated with said computer record, acting as a host computer, connects with other computer systems; and (ii) a protocol specification to be used when connecting to said computer system;

means for determining the recipient's computer system from the electronic mail address of said recipient, when said message is sent to a recipient by electronic mail;

means for obtaining the computer record corresponding to said recipient's computer system; and

means for establishing a connection between said local computer system and said recipient's computer system, using said telephone number and said protocol.

* * * * *

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[54] **TEMPORARY MESSAGE ROUTING AND DESTINATION SELECTION**

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[52] **U.S. Cl.** **379/211**

[58] **Field of Search** 395/600, 650, 395/700, 425, 725, 200; 379/201, 210, 211, 212

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[57] **ABSTRACT**

A profile is maintained, either in a central profile data base (**106**) or in a more distributed manner that includes local profile data bases (**706**). These profile data bases include preference information for particular users, which preference information is utilized by the system to direct various messages from various sources to various destinations for a particular user. By accessing the system through an appropriate input source (**708**), the user can provide temporary over-ride instructions that cause this preference information to be temporarily altered. When so altered, messages that would ordinarily be directed to a location in accordance with the original entries to the profile data base will be directed instead to a temporary destination (**707**) as identified by the user. This temporary destination can either be identified in particular at the time of entering the temporary over-ride instruction, or can be pre-identified in an over-ride plan (**709**). The over-ride instruction will be removed and the original conditions reset upon occurrence of a predetermined event. This predetermined event can be, for example, occurrence of a pre-established expiration time and/or reception of a reset instruction subsequent to reception of the temporary over-ride instruction.

20 Claims, 5 Drawing Sheets

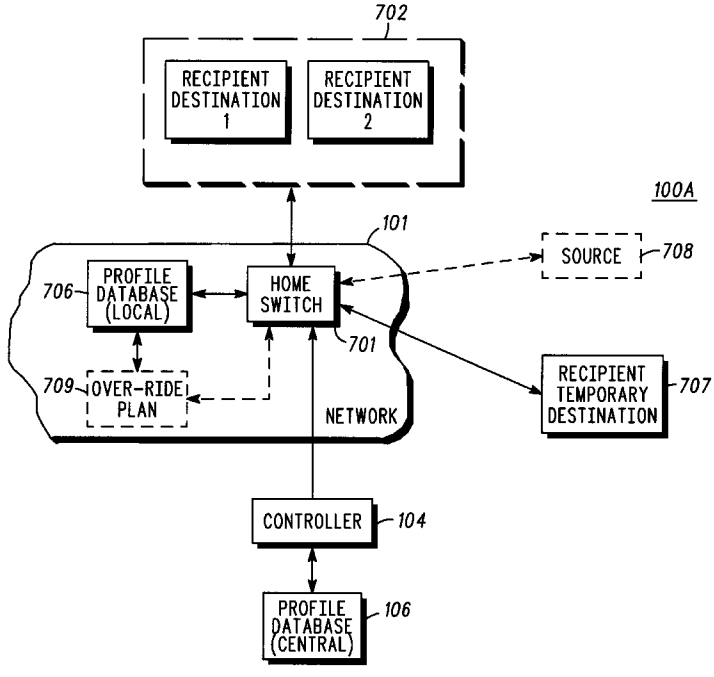
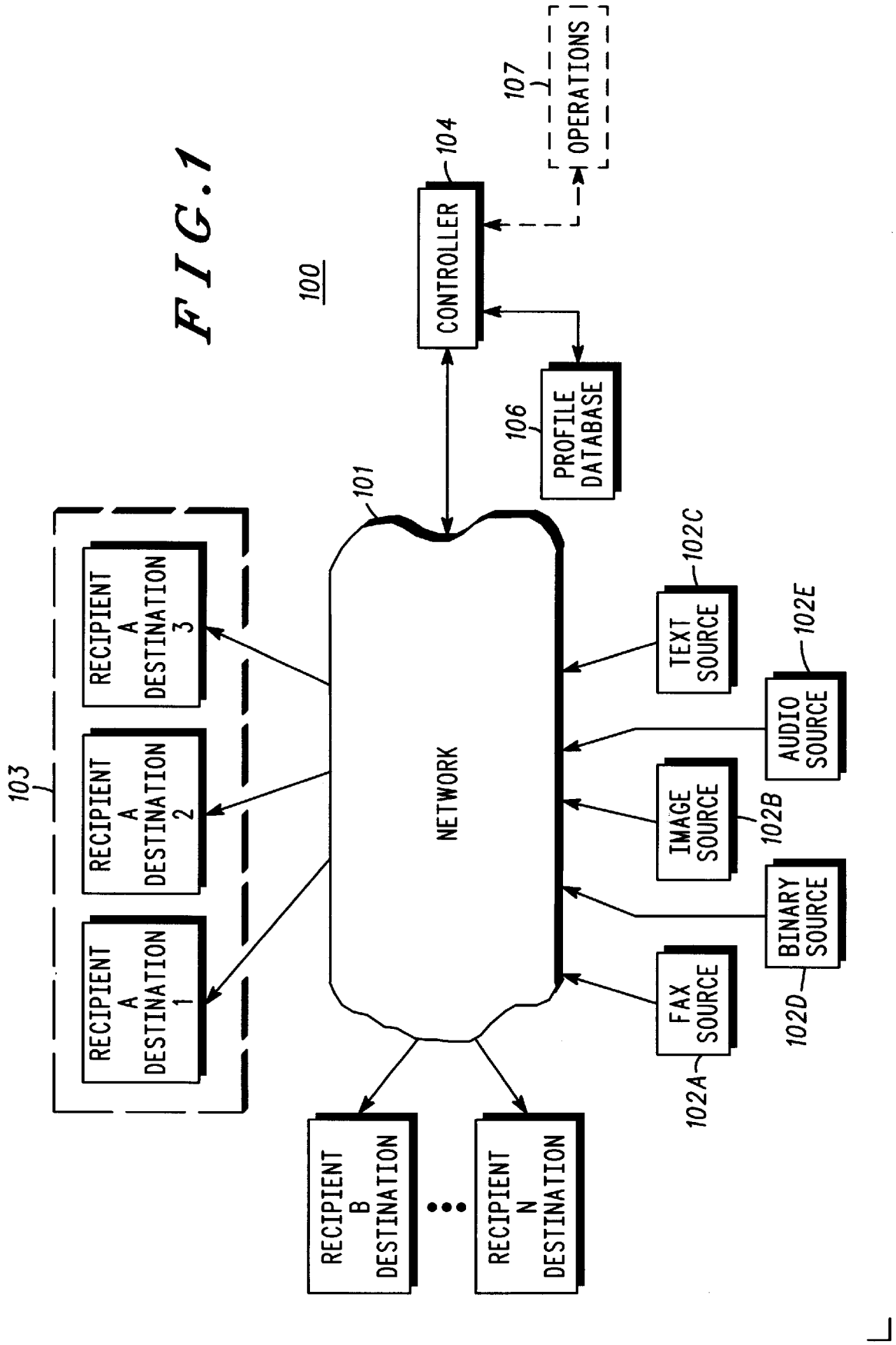


FIG. 1


100
CONTROLLER
104
OPERATIONS
107
PROFILE DATABASE
106
NETWORK
101
RECIPIENT A DESTINATION 3
RECIPIENT A DESTINATION 2
RECIPIENT A DESTINATION 1
103
RECIPIENT B DESTINATION
RECIPIENT N DESTINATION
TEXT SOURCE
102C
AUDIO SOURCE
102E
IMAGE SOURCE
102B
BINARY SOURCE
102D
FAX SOURCE
102A

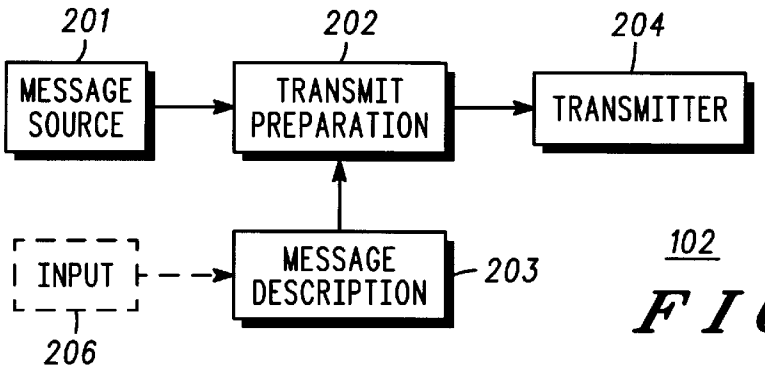


FIG. 2

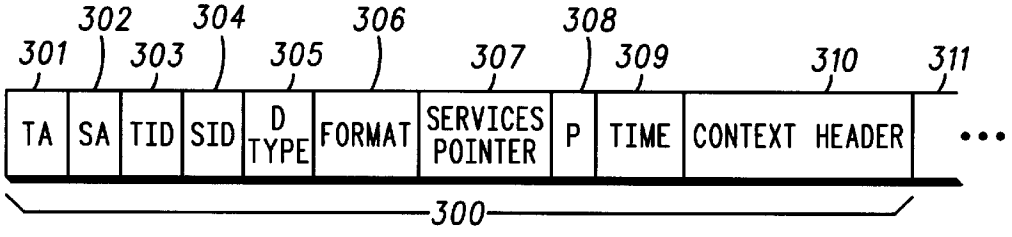


FIG. 3

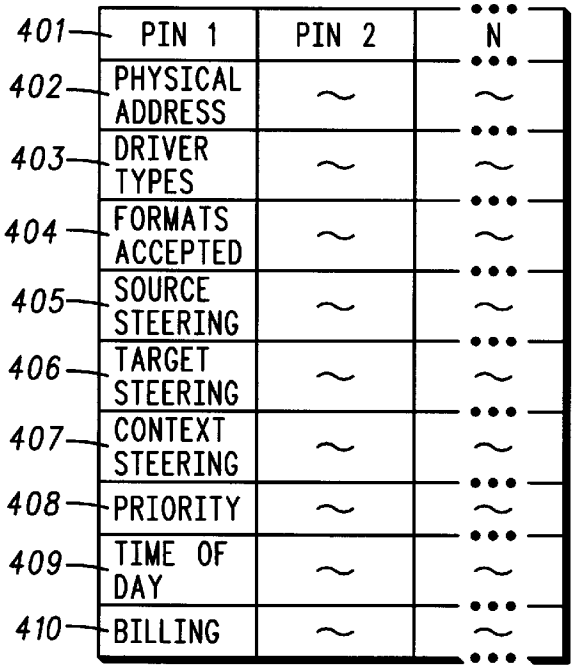


FIG. 4

400

FIG. 5

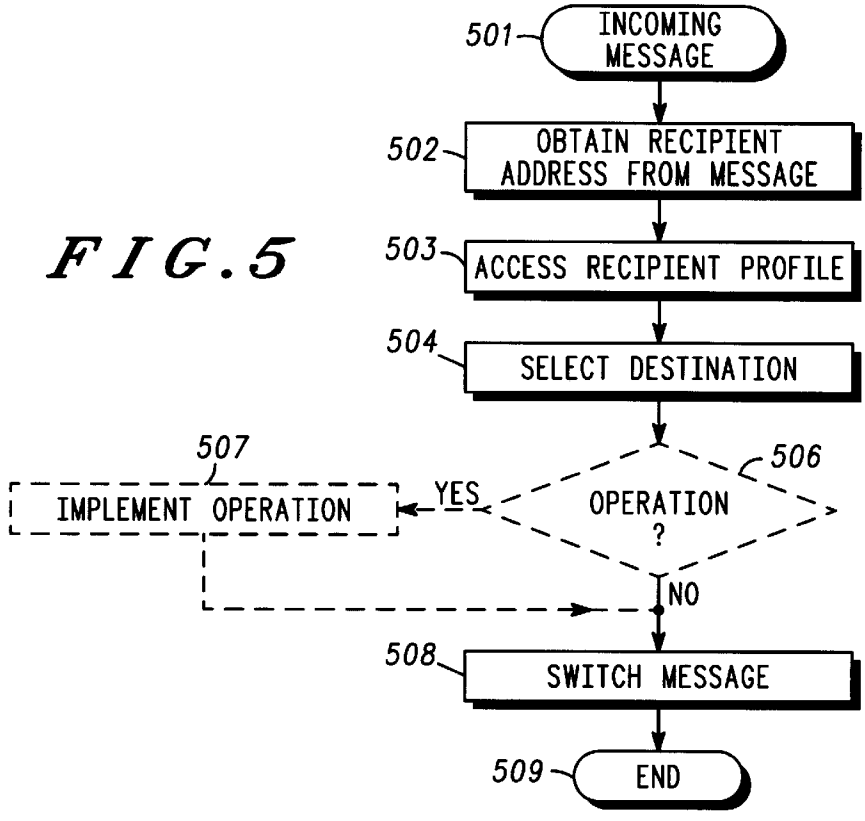

501
INCOMING MESSAGE
502
OBTAIN RECIPIENT ADDRESS FROM MESSAGE
503
ACCESS RECIPIENT PROFILE
504
SELECT DESTINATION
506
OPERATION ?
YES
507
IMPLEMENT OPERATION
NO
508
SWITCH MESSAGE
509
END

FIG. 6

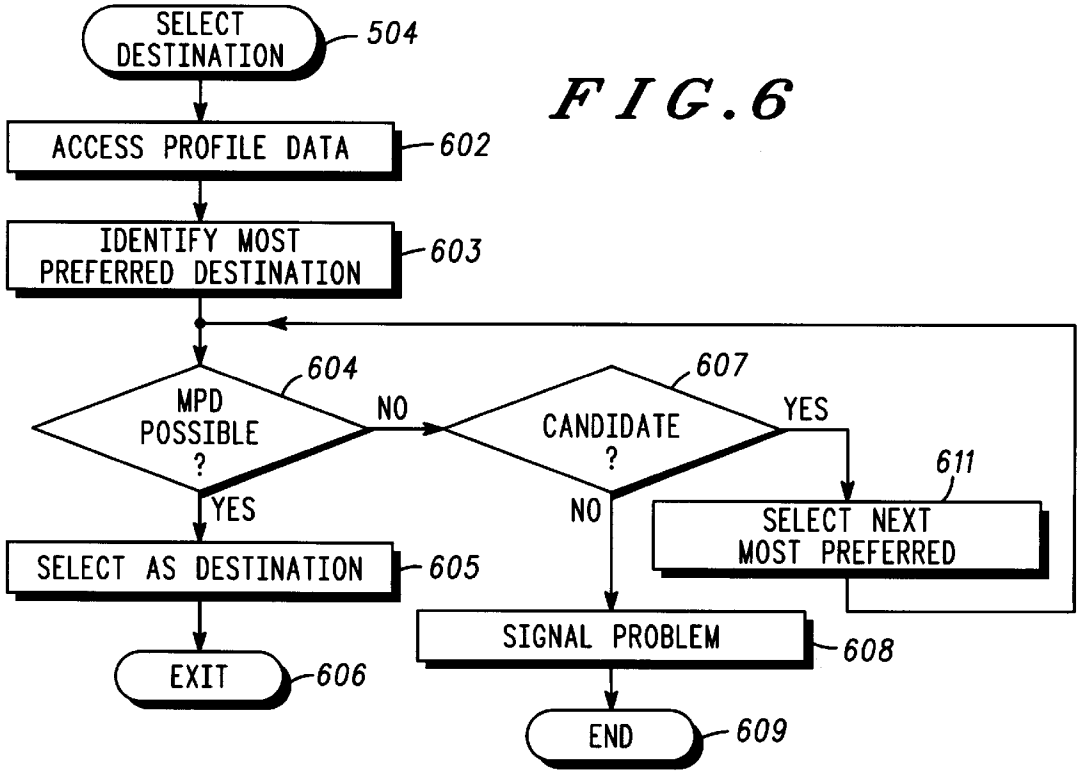

SELECT DESTINATION
504
ACCESS PROFILE DATA
602
IDENTIFY MOST PREFERRED DESTINATION
603
604
MPD POSSIBLE ?
NO
607
CANDIDATE ?
YES
611
SELECT NEXT MOST PREFERRED
YES
NO
SELECT AS DESTINATION
605
SIGNAL PROBLEM
608
EXIT
606
END
609

FIG. 7

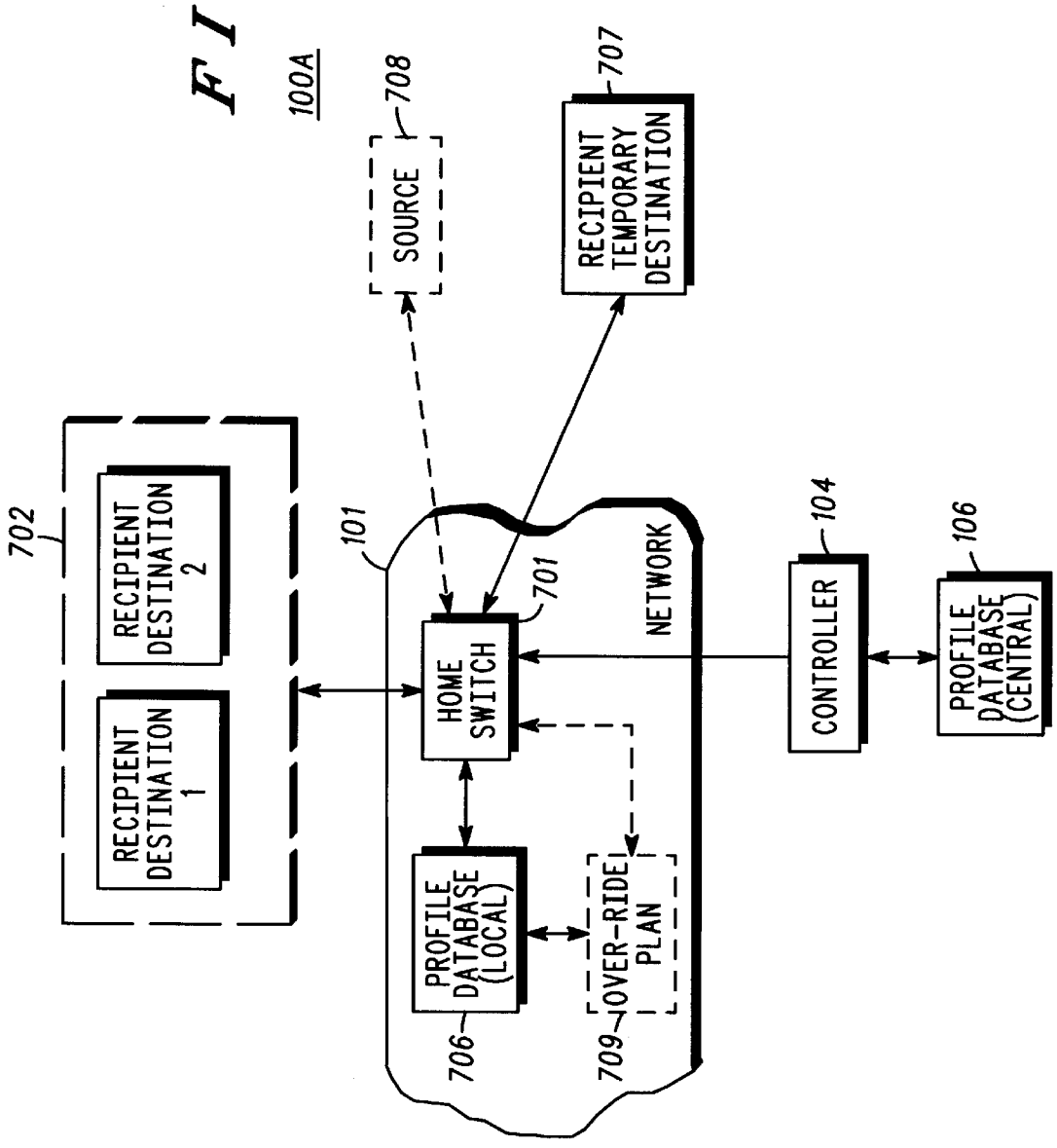

100A
SOURCE
708
RECIPIENT TEMPORARY DESTINATION
707
RECIPIENT DESTINATION 2
RECIPIENT DESTINATION 1
702
101
HOME SWITCH
701
NETWORK
CONTROLLER
104
PROFILE DATABASE (CENTRAL)
106
PROFILE DATABASE (LOCAL)
706
OVER-RIDE PLAN
709

FIG. 8

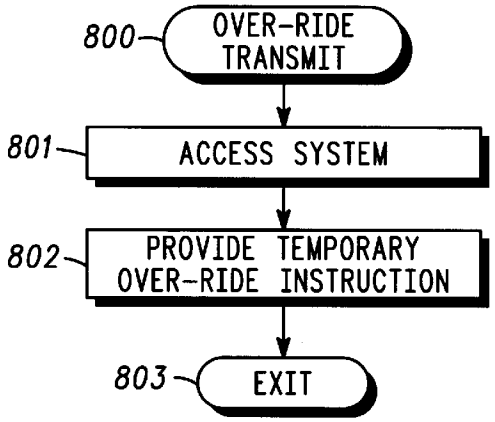
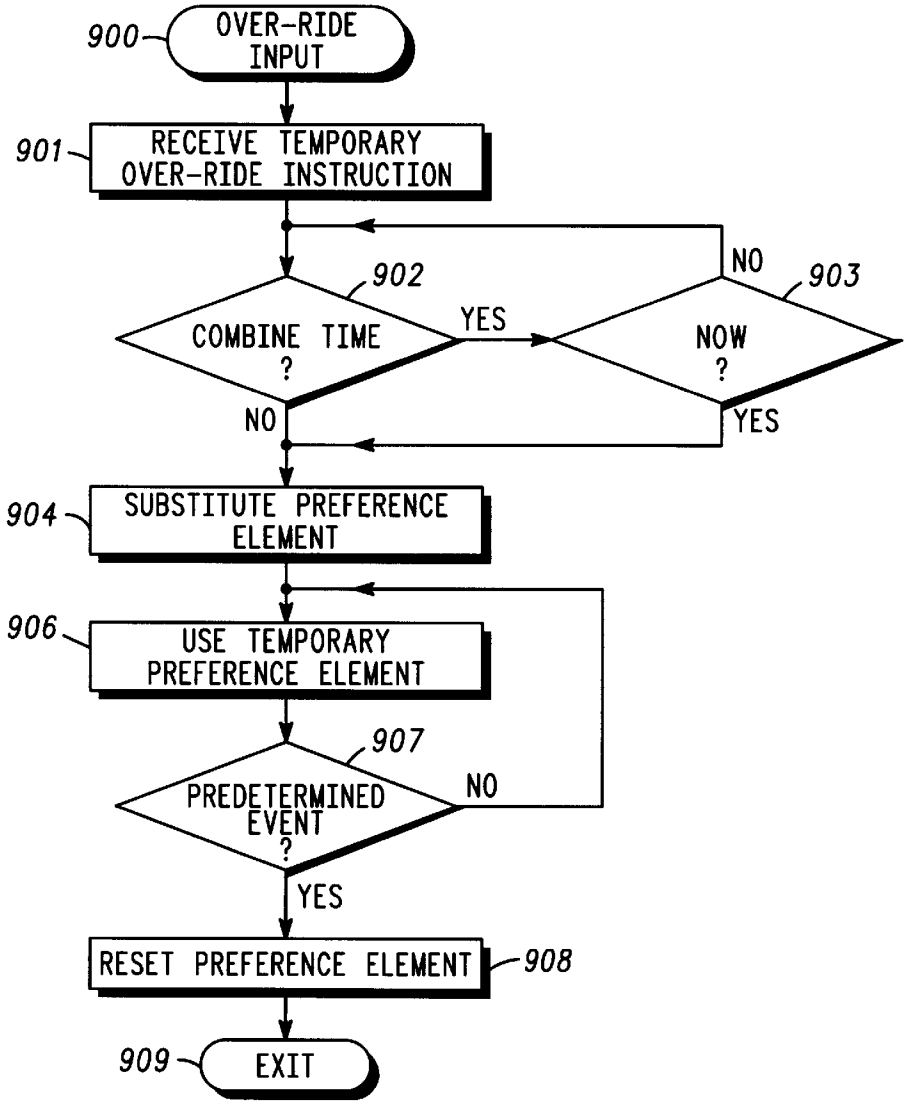

800
OVER-RIDE TRANSMIT
801
ACCESS SYSTEM
802
PROVIDE TEMPORARY OVER-RIDE INSTRUCTION
803
EXIT

FIG. 9


900
OVER-RIDE INPUT
901
RECEIVE TEMPORARY OVER-RIDE INSTRUCTION
902
COMBINE TIME ?
YES
903
NOW ?
NO
NO
YES
904
SUBSTITUTE PREFERENCE ELEMENT
906
USE TEMPORARY PREFERENCE ELEMENT
907
PREDETERMINED EVENT ?
NO
YES
908
RESET PREFERENCE ELEMENT
909
EXIT

TEMPORARY MESSAGE ROUTING AND DESTINATION SELECTION

FIELD OF THE INVENTION

This invention relates generally to communication networks, including but not limited to message routing methodology.

BACKGROUND OF THE INVENTION

Communication networks are known. In many such networks, message sources and destinations are selectively coupled to one another through appropriate switches. The switches ordinarily effectuate message routing by referring to a destination address provided by the message originator. For example, to establish a telephonic connection, the originator must enter a telephone number which comprises a destination address. With the destination so preidentified, the network appropriately switches the source and destination into a coupled mode.

Present communication capabilities greatly exceed the capabilities of prior telegraphic and simple telephonic networks. Today's systems accommodate a wide variety of message sources and destination platforms. For example, today's systems accommodate audio information (either in an analog or digital format), facsimile and other image information, binary information (as used to support computer communications), and other kinds of textual messages, to name a few. To accommodate these many kinds of message types, many users have multiple reception platforms, such as landline telephones, cellular telephones, pagers, fax machines, computer modems, and so forth.

Usually, each reception platform will have a different system address, such as a different telephone number. Such a configuration currently offers a high level of convenience and reliability. In the alternative, when a given reception address allows access to more than one kind of reception platform, the message must be directed by the user upon reception. For example, if upon answering a telephone ring the user hears an audible data stream, the user can presume that an incoming facsimile message is present, and the user can then redirect the call to a local fax machine. Though mechanisms are available to automate, at least to some extent, such message routing upon reception, these platforms allow only for limited routing possibilities, and furthermore are only implementable upon reception of a message at a particular address.

A number of problems are associated with the above. As the number of reception platforms increases, so too increases the number of reception addresses. This increasing proliferation of addresses is making more difficult the task of sending a message to an intended recipient. For example, an originator may inadvertently direct a facsimile transmission to an ordinary voice reception telephonic destination, or an important business call may be inadvertently directed to a home telephone number during business hours, as versus an office number. Many other similar examples abound, and will only increase as yet additional communication platforms and services are introduced. Such misdirected communications are particularly troublesome, as users are becoming more accustomed to expecting not only accurate, but timely routing of their messages.

All of the above problems are significantly worsened by yet another trend; the increasing mobility of communication system users. For both business and personal reasons, many users of such communication systems are conducting their affairs while on the move. As a consequence, in addition to

all of the above reception platforms that may ordinarily be associated with a particular user, yet other reception devices, in temporary proximity to a user on the move, may, under certain circumstances, be considered as available for use in contacting the user on the move, but which are, presently, unavailable for such use. This unavailability stems primarily from the fact that the communication system is unaware and unable to forward and/or direct incoming communications to such a reception device that is temporarily proximal to the user.

Accordingly, a need exists for a way to accommodate a wide variety of communication platforms while imposing only a minimal burden on originating parties and receiving parties, to allow the receiving parties to better control reception of their incoming messages to best suit their own particular needs, and particularly their mobility.

SUMMARY OF THE INVENTION

These needs and others are substantially met through provision of the method disclosed herein. The method functions in conduction with a communication system that supports an information profile for at least one user. This information profile includes at least some user preferences regarding a plurality of different user destinations, such that the communication system will automatically select a destination from amongst a plurality of candidate destinations for a message intended for the user as a function, at least in part, of the information profile. The method itself provides for accessing this communication system, and providing a temporary over-ride instruction to the communication system to temporarily over-ride at least one element in the information profile.

In one embodiment of the invention, this temporary over-ride instruction constitutes a revision to a user's ordinary destination preferences, thereby allowing the user to temporarily have at least certain messages directed to him or her at a temporary destination, such as another individual's vehicle, home, office, and the like.

In one embodiment of the invention, the temporary over-ride instruction includes an expiration time. The system utilizes the expiration time to automatically reset the information profile and remove the temporary over-ride element.

In another embodiment of the invention, the temporary over-ride instruction includes a commencement time. The communication system utilizes this information to determine when the temporary over-ride element becomes effective.

In yet another embodiment, the temporary over-ride instruction constitutes an instruction that implements a particular previously stored temporary over-ride plan. By previously storing one or more temporary over-ride elements in the system, and by arranging for substitution of those temporary elements in response to a simple temporary over-ride instruction (as versus an instruction that includes all required information, including destination address information for the temporary destination), user input requirements at the time of implementing an over-ride instruction are minimized.

In one embodiment of the invention, upon receiving the temporary over-ride instruction, the system temporarily replaces at least one element in the information profile with at least one temporary element. This temporary element is then used when selecting destinations, which destination selection decisions would previously been made using the replaced element. Upon occurrence of a predetermined event, the system automatically resets, and replaces the temporary element with the previously replaced element.

In one embodiment of the invention, the predetermined event comprises an expiration time as previously specified by the user.

In another embodiment of the invention, the predetermined event constitutes a specific reset instruction as provided by the user subsequent to providing the temporary over-ride instruction.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** comprises a block diagram depiction of a communication system in accordance with the invention;

FIG. **2** comprises a block diagram depiction of a message source in accordance with the invention;

FIG. **3** comprises a diagram depicting an exemplary message descriptor in accordance with the invention;

FIG. **4** comprises a tabular depiction of an exemplary information profile in accordance with the invention;

FIG. **5** comprises a flow diagram depicting overall message routing in accordance with the invention;

FIG. **6** comprises a flow diagram depicting destination selection in accordance with the invention;

FIG. **7** comprises a block diagram depiction of a revised communication system in accordance with the invention;

FIG. **8** comprises a flow diagram depicting transmission of temporary over-ride instructions; and

FIG. **9** comprises a flow diagram depicting use of the temporary over-ride instructions.

DESCRIPTION OF A PREFERRED EMBODIMENT

A communication system (**100**) (FIG. **1**) includes a switching network (**101**) in accordance with well understood prior art technique. The network (**101**) switches and routes messages from a variety of message sources (**102**A–E) to a variety of destinations. As an illustrative example, depicted are a facsimile source (**102**A), an image source (**102**B), a text source (**102**C), a binary source (**102**D), and an audio source (**102**E). Also depicted in FIG. **1** are A–N recipient destinations. In particular, and illustrative of the need for the invention, recipient A has three discrete addressable destinations **1**–**3** (**103**). One such destination could be, for example, a landline telephone, with another destination being a cellular telephone and the remaining destination being a facsimile terminal. Other combinations are of course possible, as are a significantly larger number of associated destinations.

When one of the sources (**102**) seeks to transmit a message to recipient A, the network (**101**) will be able to route that message to a most preferred destination (in this example, one of destinations 1, 2, or 3). To facilitate this, the network (**101**) interfaces with a controller (**104**), the latter comprising an appropriate data processing and communications capable platform, such as a computer having an operating speed and memory capacity suitable to meet the needs of a particular application. The controller (**104**) in turn couples to a profile data base (**106**) wherein destination preferences for various recipients are maintained. (In this particular embodiment, these records are compiled and stored in an initial data gathering activity, such as when a recipient first joins the system (**100**). The teachings contained herein are likewise applicable, however, to a system that would allow recipient (or system manager) originated initial information, alterations, and/or additions to the profile data base (**106**) to be made in a dynamic and ongoing manner.)

In one embodiment, the system (**100**) will also support exercising various operations with respect to a message to be routed. To accommodate this, the controller (**104**) also couples to an appropriate operations instruction base or platform (**107**), depending upon the needs of a particular application. For example, if, in order to accommodate routing of a message to a particular preferred destination, the message must first be subjected to a format change, the operations platform (**107**) would facilitate such a change in format, either by providing the format translation information to the controller (**104**) or by effectuating the transformation within itself (**107**).

With reference to FIG. **2**, a typical source (**102**) as used in the above system includes a message source (**201**) that sources the user's message itself (as noted above, these messages can assume any of a variety of types and/or substantive content). The message source (**201**) couples to a transmit preparation unit (**202**) that prepares the message for transmission. To accommodate some systems, such preparation may include modulation of a carrier frequency. This unit then couples to a transmitter (**204**) that transmits the message, using an appropriate transmission medium such as a landline or radio frequency channel, all of the above being in accordance with well understood prior art technique.

Pursuant to this embodiment, the source (**102**) also includes a message descriptor unit (**203**) that couples to the transmit preparation unit (**202**). The message descriptor unit (**203**) prepares a message descriptor for inclusion with the message. In this embodiment, the message descriptor comprises a data header that precedes transmission of the message itself. In other embodiments, the message descriptor could be interleaved with the message information, or can even include, at least in part, the contents of the message itself, such as a title or subject matter field.

If desired, an input unit (**206**) can also be optionally provided to allow a user to at least partially configure and determine the message descriptor. This input (**206**) could comprise, for example, a keyboard that would allow a user to specify at least certain aspects of the message descriptor. In other embodiments, the message descriptor would be automatically structured using predetermined or otherwise automatically determined information.

So configured, the source (**102**) will transmit a message in combination with a message descriptor. Referring now to FIG. **3**, the message descriptor (**300**) includes many information fields. In this particular embodiment, these fields include a target address (TA) (**301**) (representing a physical address, such as a telephone number, of a particular recipient destination), a source address (SA) (**302**) (this being the physical address for the source itself), a target logical ID (TID) (**303**) (this being a logical ID, such as a personal identification number, that identifies a particular recipient, as versus a particular recipient destination; this information will not always be known, and often this particular field may include a null indicator), a source logical ID (SID) (**304**) (the source counterpart to the target logical ID), a data type indicator (D TYPE) (**305**) (to identify the particular kind of message being sent, such as an analog voice message, a voice message that has been vocoded in accordance with a particular vocoding algorithm and method, a facsimile transmission, and so forth), and a format indicator (**306**) (to identify a particular data format as corresponds to the appended message). The message descriptor (**300**) further includes a services pointer (**307**) (to indicate one or more value-added operations to be performed prior to delivery of the message to the recipient; for example, storing and later forwarding the message, converting the message from one

format to another, using the message itself as input to the user's profile, defining an action item for subsequent messages, and so forth), a priority indicator (P) **(308)** (to indicate a particular user defined or automatically attributed priority level to categorize either the importance of the message and/or the sender), a time indicia **(309)** (to indicate, for example, desired reception time or a deadline by when transmission must be accomplished), and a context header **(310)** (to include user specified context information pertaining to the message, such as "emergency" or "your loan application").

The message **(311)** then follows the message descriptor **(300)**. Other categories of information could of course be included in the message descriptor to accommodate the needs of a particular application.

The profile information stored in the profile data base **(106)** as described above with respect to FIG. **1** is generally depicted in FIG. **4** by reference numeral **400**. In this embodiment, each recipient, which recipient may have a plurality of potential message destinations associated therewith, has a corresponding identifying personal identification number **(401)**. For example, one recipient may have personal identification number 1 associated therewith. The information profile next includes the physical addresses **(402)** associated with that particular recipient. For example, a particular user might have 9 different physical addresses associated with 9 different message destinations, as follows:

(Physical address)

Address 1: (555) 576-1302 (office telephone)
Address 2: (555) 332-9222 (residential telephone)
Address 3: (555) 112-1234 (automobile telephone)
Address 4: (555) 621-3339 (pager)
Address 5: (555) 576-3333 (office FAX)
Address 6: (555) 332-9223 (residential FAX)
Address 7: (555) 576-3334 (office computer modem)
Address 8: (555) 332-9224 (residential computer modem)
Address 9: (555) 332-9225 (answering service)

Next, the information profile **(400)** includes a driver types **(403)** entry to identify the types of reception platforms associated with each address. Continuing with the above example, these entries might appear as follows:

(Device types)

Address 1: Telephone
Address 2: Telephone
Address 3: Cellular telephone
Address 4: Pager terminal
Address 5: FAX
Address 6: FAX
Address 7: Modem
Address 8: Modem
Address 9: Telephone

Next, the kinds of data formats accepted at each address are specified **(404)**, and given the above example, might appear as follows:

Address 1: ISDN(B1) circuit switched voice
ISDN (B2) circuit switched data and video
ISDN (D) packet switched data
Address 2: analog voice
Address 3: analog (or U.S.D.C.) cellular voice and fax (G3)
Address 4: Pager with ASCII message (24 characters)
Address 5: FAX (G2, G3, G4)
Address 6: FAX (G2, G3)
Address 7: ISDN (B1) circuit switched data with V.120 TA
ISDN (B2) circuit switched data with OSI or DECnet
ISDN (D) packet switched data with X.400 E-Mail
Address 8: analog voice
Address 9: analog voice

Next, recipient specified source steering information **(405)** is maintained. For example, in the present example, the following information might appear:

(Source steering)

Address 1: All except (555) 321-9211; PIN-778654; PIN-690445
Address 2: (555) 112-1234; (555) 332-9222; PIN-332889 . . . only
Address 3: (555) 332-9222; PIN-332889 . . . only
Address 9: All/default

Given this example, all messages are accepted at address 1 (the recipients office telephone) with the exception of a particular specified source address (telephone number 555-321-9211) and 2 particular message sources as identified by their logical personal identification numbers. In effect, the recipient has stipulated that he will accept all messages at his office telephone with the exception of messages that are sourced from a particular physical address and messages that are sourced by two particular individuals or entities. At physical address 2 (the recipient's residential telephone), however, the recipient has identified a number of specific sources and individuals that constitute the only messages the recipient is willing to accept at home. At physical address 9 (the recipient's answering service), the recipient has indicated that he is willing to receive and/or have forwarded all calls to this destination by default.

Next, the information profile **(400)** includes recipient specified target steering preferences **(406)**. Continuing with the present example, such target steering information might appear as follows:

(Target steering)

Address 1: "Felix, Esq."; "Cat Enterprises"
Address 2: "Ignatz"; "9 Lives Insurance"*
Address 3:
Address 4:
Address 5: "Felix, Esq."; "Cat Enterprises"
Address 6: "Ignatz"; "9 Lives Insurance"*
Address 7:
Address 8: "Litterman"*
Address 9:

Accordingly, messages (and/or message descriptors) that include a particular recipient alias are directed to an appropriate recipient preferred corresponding destination. For example, messages intended for "Felix Esquire" or "Cat Enterprises" are particularly desired by this recipient for reception at either address 1 or address 5 (these being the recipient's office telephone and office facsimile machine, respectively). Messages directed, however, to "Ignatz" or "Nine Lives Insurance" are steered instead to either the recipient's home telephone or facsimile machine. It will further be noted that the alias "Nine Lives Insurance" as set forth for address 2 and address 6, and the alias "Litterman" as specified for address 8, have an asterisk associated therewith. The asterisk specifies an indicia of exclusivity. Accordingly, messages that specify "Nine Lives Insurance" can only be steered to either address 2 or 6. The recipient has indicated a particular sensitivity towards reception of such messages, and has accordingly indicated a refusal to receive such messages at any other destination.

Next, the information profile **(400)** includes context steering information **(407)**. In the present example, such information might appear as follows:

(Context Steering)

Address 1:
Address 2:

Address 3:
Address 4:
Address 5:
Address 6: "Life insurance"; "Boat?"; "Yacht?"
Address 7:
Address 8: "Life insurance"; "Boat?"; "Yacht?"
Address 9:

The controller **(104)** will consider the information in the context header **(310)** of the message descriptor **(300)** (and/or, in an appropriate embodiment, the contextual information in the message **(311)** itself) to look for the expressions "Life Insurance", "Boat", or "Yacht." Should any of these expressions be found, then the controller **(104)** will take into account the recipient's expressed preference that messages pertaining to a certain context be directed to particular destinations. (In the example given, the word "Boat" and "Yacht" appear in conjunction with a question mark. As per a not untypical data base search methodology, this question mark constitutes a universal suffix indicator, thereby indicating that the words "Boat," "Boats," and "Boating" are all contextual words of interest.)

Next, the information profile **(400)** sets forth recipient defined priority preferences **(408)**. In the present example, these entries might appear as follows:

(Priority)

Address 1:
Address 2: All if priority 1
Address 3: All if priority 2
Address 4:
Address 5:
Address 6:
Address 7:
Address 8:
Address 9:

Here, all messages, regardless of priority, that are otherwise directed to address 1 remain so directed. If a particular message specifies address 2, however, and that message source and/or sender is not otherwise allowed (as per, for example, the source steering or target steering preferences discussed above), then the messages will only be accepted at address 2 if they are of a high level of priority. Lower levels of priority will be redirected to other destinations notwithstanding initial designation of the recipient's residential telephone.

Next, the information profile **(400)** provides for time of day steering **(409)**. In the present example, certain entries might appear as follows:

(Time of day)

Address 1: Forward to Address 3 between 5:15–6:30 pm weekdays
Address 2:
Address 3:
Address 4:
Address 5: Forward to Address 6 between 5:15 pm–6:00 am weekdays; all weekend
Address 6:
Address 7:
Address 8:
Address 9:

So provided, communications originally addressed or otherwise directed to address 1 (the recipient's office telephone) between 5:15 and 6:30 PM on a weekday will instead be forwarded to address 3, i.e., to the recipient's automobile telephone. Such a time of day preference would be appropriate to reflect a recipient's preference of receiving office calls at the conclusion of the business day in his automobile when he is commuting home from the office.

Lastly, in this embodiment, the information profile includes billing information **(410)**. In the present example, certain entries might appear as follows:

Address 1: Use tariff, "ISDN 1"; bill to: "PDQ Corporation";
Address 2: Use tariff "res 1"; bill to: "Resident"
Address 3: Use tariff "cell 1"; bill to: "PDQ"
Address 4: Use tariff "pager 1"; bill to: "PDQ"
Address 5: Use tariff "fax 1"; bill to: "PDQ"
Address 6: Use tariff "fax res"; bill to: "PDQ"
Address 7: Use tariff "ISDN 2"; bill to: "PDQ"
Address 8: Use tariff "res 2"; bill to: "PDQ"
Address 9: Use tariff "ans 1"; bill to "PDQ"

With the above description in mind, general processing of a message will now be described with reference to FIG. **5**.

Upon receiving indicia of a need to transmit a message **(501)** (or, in a particular embodiment, presuming that sufficient buffer capacity exists, upon receiving a message intended for being forwarded to a final destination), the network obtains the recipient address from the message **(502)**. In this embodiment, that recipient address is easily extracted from the message descriptor **(300)** as described above. Using this information, the network then interfaces with the controller **(104)** to access the information profile for the designated recipient **(503)**. Based upon the information in the message descriptor, and further based upon the information in the information profile for the recipient, a particular destination is then selected **(504)**.

As described earlier, in an alternative embodiment, the message may be subjected to one or more operations prior to directing that message to the selected destination. If such operations are required **(506)**, those operations are implemented **(507)**. The type(s) of operation accommodated can of course be widely varied to suit a particular intended application. For example, to suit the needs of one system, format translation information would be utilized at this point to translate a message from a first format (as originally dictated by the source) into a second format that is compatible with the selected destination. By way of another example, the message itself could include some executable code (such as an encryption algorithm), and this self-included code would be executed during this operations step **(507)** when appropriate. Continuing this particular example, the encryption algorithm would be utilized to encrypt the message prior to providing the message to the selected destination. Following implementation of any such operations, the network **(101)** then switches the message **(508)** to the selected destination, in accordance with prior art technique and the process concludes **(509)**.

The destination selection process itself will be more particularly described with reference to FIG. **6**.

To select one or more particular destinations **(504)**, the controller **(104)** accesses the profile data **(602)** and identifies a most preferred destination **(603)**. For example, if the message includes context which the recipient has indicated a preference for receiving at a particular message destination, then that particular message destination will be identified as a most preferred destination, all other criteria being no more than equal. The controller **(104)** then determines whether that most preferred destination is possible **(604)**. For example, the most preferred destination may be a facsimile address, whereas the message comprises textual information in a noncompatible form, which form cannot be made compatible given the capabilities of the controller and network. Presuming that the most preferred destination is physically possible, that destination is selected as the actual

destination (**605**) and the process exits (**606**) to continue as described above in FIG. **5**.

If the most preferred destination is not possible (**604**), the process determines whether any other candidate destinations exist (**607**). If no other destinations are potentially available, a problem signal is sourced (**608**) (such as emission of a trouble tone to the message source or other appropriate data message indicating that a problem exists in completing the message transaction) and the process concludes (**609**). If other candidates do exist (**607**) then the controller (**104**) selects a next most preferred destination (**611**) and the process repeats until either a particular destination is ultimately selected or no suitable destinations exist.

So configured, the above system functions to direct a message to a recipient influenced destination, which destination may, or may not, coincide with a destination as originally selected by the originator of the message.

With the above description in mind, that aspect of the embodiment that particularly supports mobility of a user to locales not otherwise permitting (or warranting) permanent inclusion in such an information profile, will now be described.

Referring to FIG. **7**, and as noted earlier, the network (**101**) will typically include a plurality of switches. For at least a given user, one of the switches will constitute a home switch (**701**). This home switch (**701**) will typically couple to and service at least some destinations (**702**) usually associated with that particular user (in this case, recipient destination 1 (**703**) and recipient destination 2 (**704**)). The controller (**104**), acting upon information in the profile data base (**106**) as described above, controls both the home switch (**701**) and other routing apparatus as described above to route messages from a user to a particular recipient destination.

Also depicted in FIG. **7** is a temporary destination for this particular recipient (**107**). This temporary destination constitutes a destination that is not present in the profile data base (**106**). This temporary destination (**707**) could be, for example, a telephone at a business colleague's office, a cellular telephone in a friend's vehicle, a facsimile machine at a hotel, and so forth.

Pursuant to this embodiment, the user can contact the system (**100**A) through an appropriate input source (**708**) such as a telephone, computer keyboard, or the like. This source (**708**) may be at the locale of the temporary destination, or could be located elsewhere, depending simply upon the needs of the user. Through this input mechanism, the user provides a temporary over-ride instruction, compelling a temporary destination preference to be included in his information profile. With this information available, a particular message can then be routed to the user at the recipient temporary destination (**707**) by subsequent use of the information profile in accordance with the above description.

Before describing the over-ride process in more detail, two alternative embodiments relevant to that description will be set forth. In the first embodiment, in addition to the profile data base (**106**) described above, which profile data base (**106**) couples to the controller (**104**), a local profile data base (**706**) is maintained and coupled to the home switch (**701**). Pursuant to this embodiment, temporary over-ride instructions are directed to the local profile data base (**706**) via the home switch (**701**). Thereafter, temporary destination preferences as implemented through the temporary over-ride instruction are communicated for entry into the central profile data base (**106**) and subsequent use by the controller (**104**). Depending upon system configuration, size, and many other operating parameters, the use of such a local data base, in combination with a central data base, may better accommodate the operating characteristics and needs of the overall system.

In the second embodiment, an over-ride plan (**709**) can be stored in conjunction with the profile data base (in the embodiment depicted, the over-ride plan (**709**) is stored in conjunction with the local profile data base (**706**); if desired, this over-ride plan (**709**) could be alternatively stored in conjunction with the central profile data base (**106**)).

The over-ride plan (**709**) includes one or more pre-entered temporary over-ride preference elements. Each such temporary element, or predetermined set of such elements, is identified by a relatively simple code. For example, an individual about to begin a business trip would often know his or her itinerary. Consequently, address information for various hotels, including voice and data links, could be pre-entered into the over-ride plan (**709**). Upon arriving at a given hotel, the user, using the source (**708**) of his or her choice (such as a room telephone), could provide a simple code (such as a short prearranged series of DTMF tones) to the home switch (**701**), which prearranged series would be interpreted as a temporary over-ride instruction that would cause the corresponding prearranged destination preferences to be used in accordance with the method to be described below.

Referring now to FIG. **8**, transmission of temporary over-ride information (**800**) will be described.

Upon determining a need to arrange for temporary destination preferences, the user accesses the system (**801**) as described above, and provides one or more temporary over-ride instructions (**802**). The over-ride process then concludes from the user's standpoint (**803**). These instructions can be DTMF signals that include relevant action information, such as temporary destination addresses, commencement times, expiration times, and the identification of those particular preference elements in the user's profile that are to be temporarily over-riden. In the alternative, as noted above, if the above information has been pre-entered as a plan, the user would only need to enter a corresponding code that called up and utilized the prearranged temporary information.

System use of such over-ride instructions will now be described with reference to FIG. **9**.

Upon receiving temporary over-ride instructions (**901**) from the user as described above, the process determines whether a commencement time has been associated with the instruction (**902**). If so, the process determines whether the commencement time has yet occurred (**903**). If not, the process waits for the commencement time to occur.

Presuming either that no specific commencement time has been identified, or that the commencement time has occurred, the process causes one or more preference elements in the information profile of the user to be substituted by temporary preference elements (**904**), all as specifically identified by the user. These temporary preference elements are then used (**906**) as appropriate to make subsequent destination selections for the corresponding user.

When a predetermined event occurs (**907**), the process resets the preference element (**908**), thereby causing the temporary elements to be removed and the original elements to be reinstated for subsequent use.

As noted above, the predetermined event (**907**) can comprise any of a variety of events, including occurrence of the prearranged expiration time, and/or reception of a specific reset instruction from the user.

Following the above, the process concludes (**909**).

So configured, a user has great flexibility with respect to directing messages from various sources and of various types to various appropriate destinations. Of particular importance, the user can also temporarily alter those user preferences to accommodate directing messages to temporary destinations in accordance with the users needs and wishes.

What is claimed is:

1. A method for use with a communication system, which communication system includes an information profile for at least one user, which information profile includes at least some user preferences regarding a plurality of different user destinations for the user, such that the communication system will automatically select a destination from amongst a plurality of candidate destinations for a message intended for the user as a function, at least in part, of the information profile, the method comprising the steps of:

A) accessing the communication system via a communication link using a communication device;

B) transmitting from the communication device via the communication link a temporary over-ride instruction to the communication system to temporarily over-ride at least one element in the information profile while retaining the at least one element from the communication system, such that the temporary over-ride instruction can later be automatically replaced by the at least one element.

2. The method of claim **1**, wherein the step of transmitting from the communication device via the communication link to the communication system a temporary over-ride instruction to temporarily over-ride at least one element in the information profile includes the step of also providing to the communication system an expiration time related to the temporary over-ride instruction.

3. The method of claim **1**, wherein the step of transmitting from the communication device via the communication link to the communication system a temporary over-ride instruction to temporarily over-ride at least one element in the information profile includes the step of also providing to the communication system a commencement time related to the temporary over-ride instruction.

4. The method of claim **1**, wherein the temporary over-ride instruction comprises an instruction to implement a particular previously stored temporary over-ride plan.

5. The method of claim **4**, wherein the previously stored temporary over-ride plan is stored by the communication system in combination with the information profile.

6. The method of claim **1**, wherein the temporary over-ride instruction comprises an instruction to temporarily substitute, for a first destination contained in the information profile, a second destination identified by the temporary over-ride instruction.

7. The method of claim **6**, wherein the step of transmitting from the communication device via the communication link to the communication system a temporary over-ride instruction to temporarily over-ride at least one element in the information profile includes the step of also providing to the communication system a commencement time related to the temporary over-ride instruction, such that the second destination will be automatically substituted for the first destination upon occurrence of the commencement time.

8. The method of claim **7**, wherein the step of transmitting from the communication device via the communication link to the communication system a temporary over-ride instruction to temporarily over-ride at least one element in the information profile further includes the step of also providing to the communication system an expiration time related to the temporary over-ride instruction, such that substitution of the second destination for the first destination will be automatically discontinued upon occurrence of the expiration time.

9. The method of claim **1**, and further including the step of:

C) providing a reset instruction to the communication system to reset the information profile and to remove the temporary over-ride.

10. A method for use with a communication system, which communication system includes an information profile for at least one user, which information profile includes at least some user preferences regarding a plurality of different user destinations, such that the communication system will automatically select a destination from amongst a plurality of candidate destinations for a message intended for the user as a function, at least in part, of the information profile, the method comprising the steps of:

A) receiving a temporary over-ride instruction relating to the information profile;

B) in response to receiving the temporary over-ride instruction, temporarily replacing at least one element in the information profile with at least one temporary element;

C) using thereafter the at least one temporary element in place of the at least one element when selecting at least some destinations for messages intended for the user;

D) upon occurrence of a predetermined event, automatically replacing the at least one temporary element with the at least one element.

11. The method of claim **10**, and further including the step of:

E) thereafter, using the at least one element when selecting at least some destinations for messages intended for the user.

12. The method of claim **10**, wherein the step of temporarily replacing the at least one element with at least one temporary element includes the step of retaining the at least one element, such that the at least one element will be available when the predetermined event occurs.

13. The method of claim **10**, wherein the temporary over-ride instruction includes a commencement time, and wherein step B includes the step of:

B1) when the commencement time occurs, temporarily replacing the at least one element in the information profile with the at least one temporary element.

14. The method of claim **13**, wherein the temporary over-ride instruction includes an expiration time, and wherein the predetermined event includes occurrence of the expiration time.

15. The method of claim **10**, wherein the temporary over-ride instruction includes an expiration time, and wherein the predetermined event includes occurrence of the expiration time.

16. The method of claim **10**, wherein the predetermined event includes reception of a reset instruction that instructs the communication system to reset the information profile with respect at least to the temporary over-ride instruction.

17. The method of claim **10**, wherein the communication system maintains a temporary over-ride plan containing at least one temporary over-ride element, and wherein:

the temporary over-ride instruction relating to the information profile as received in step A includes an identification of at least one temporary over-ride element as contained in the temporary over-ride plan;

in response to receiving the temporary over-ride instruction, temporarily replacing at least one element

in the information profile with at least one temporary element as identified in the temporary over-ride instruction and as obtained from the temporary over-ride plan.

18. A method for use with a communication system, which communication system includes an information profile for at least one user, which information profile includes at least some user preferences regarding a plurality of different user destinations, such that the communication system will automatically select a destination from amongst a plurality of candidate destinations for a message intended for the user as a function, at least in part, of the information profile, the method comprising the steps of:

at a remote site:

A) accessing the communication system;

B) providing a temporary over-ride instruction to the communication system to temporarily over-ride at least one element in the information profile;

at a destination determining site:

C) receiving the temporary over-ride instruction;

D) in response to receiving the temporary over-ride instruction, temporarily replacing at least one element in the information profile with at least one temporary element;

E) using thereafter the at least one temporary element in place of the at least one element when selecting at least some destinations for messages intended for the user;

F) upon occurrence of a predetermined event, automatically replacing the at least one temporary element with the at least one element.

19. The method of claim **18**, wherein:

A) the step of instructing the communication system to temporarily over-ride at least one element in the information profile includes the step of also providing to the communication system a commencement time related to the temporary over-ride instruction; and

B) wherein step D includes the step of:

D1) when the commencement time occurs, temporarily replacing the at least one element in the information profile with the at least one temporary elements.

20. The method of claim **18**, wherein:

A) the step of instructing the communication system to temporarily over-ride at least one element in the information profile includes the step of also providing to the communication system an expiration time related to the temporary over-ride instruction;

B) wherein the predetermined event includes occurrence of the expiration time.

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