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Alexandria, Virginia 22313-1450  
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/821,690	04/09/2004	Alexander Kurganov	078616-1026

**CONFIRMATION NO. 1367**

**POWER OF ATTORNEY NOTICE**

27433  
FOLEY & LARDNER LLP  
3000 K STREET N.W.  
SUITE 600  
WASHINGTON, DC 20007-5109



Date Mailed: 12/03/2014

**NOTICE REGARDING CHANGE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 12/01/2014.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervned as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

*/rmtturner myles/*

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/821,690	04/09/2004	Alexander Kurganov	

93219  
Patent Law Works, LLP  
201 South Main Street, Suite 250  
Salt Lake City, UT 84111

**CONFIRMATION NO. 1367**  
**POA ACCEPTANCE LETTER**



Date Mailed: 12/03/2014

**NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 12/01/2014.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/rmtturner myles/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO**

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

Practitioners associated with Customer Number:

93219

**OR**

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

The address associated with Customer Number:

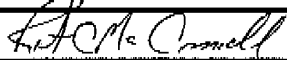
93219

**OR**

<input type="checkbox"/>	Firm or Individual Name			
<input type="checkbox"/>	Address			
<input type="checkbox"/>	City	State	Zip	
<input type="checkbox"/>	Country			
<input type="checkbox"/>	Telephone			Email

Assignee Name and Address: Parus Holdings, Inc.  
3000 Lakeside Drive, Suite 300N  
Bannockburn, IL 60015**A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.****SIGNATURE of Assignee of Record**

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	5/21/2013
Name	Robert C. McConnell	Telephone	888-387-3481
Title	Chief Financial Officer, Senior Vice President and General Counsel of Parus Holdings, Inc.		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	20821581
<b>Application Number:</b>	10821690
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	1367
<b>Title of Invention:</b>	ROBUST VOICE BROWSER SYSTEM AND VOICE ACTIVATED DEVICE CONTROLLER
<b>First Named Inventor/Applicant Name:</b>	Alexander Kurganov
<b>Customer Number:</b>	27433
<b>Filer:</b>	Reena Kuyper
<b>Filer Authorized By:</b>	
<b>Attorney Docket Number:</b>	078616-1026
<b>Receipt Date:</b>	01-DEC-2014
<b>Filing Date:</b>	09-APR-2004
<b>Time Stamp:</b>	02:44:20
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	no
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### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73.	04517US_Stmnt373.pdf	120064 <small>b618d1229f4045fae6075c8c4320113cd32cc ffc4</small>	no	3

### Warnings:

### Information:



2	Power of Attorney	Signed_Parus_POA.pdf	58299	no	1
			db136580173a245b145ea45cb364f8db8e9ae578		

**Warnings:**

**Information:**

<b>Total Files Size (in bytes):</b>	178363
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**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

**STATEMENT UNDER 37 CFR 3.73(c)**Applicant/Patent Owner: Alexander Kurganov, Valery ZhukoffApplication No./Patent No.: 10/821,690 Filed/Issue Date: April 9, 2004Titled: Robust Voice Browser System and Voice Activated Device Controller

Parus Holdings, Inc. \_\_\_\_\_, a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1.  The assignee of the entire right, title, and interest.
2.  An assignee of less than the entire right, title, and interest (check applicable box):
- The extent (by percentage) of its ownership interest is \_\_\_\_\_%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3.  The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4.  The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A.  An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

- B.  A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Alexander Kurganov, Valery Zhukoff To: Webley Systems, Inc.

The document was recorded in the United States Patent and Trademark Office at  
Reel 033922, Frame 0418, or for which a copy thereof is attached.

2. From: Webley Systems, Inc. To: Parus Holdings, Inc.

The document was recorded in the United States Patent and Trademark Office at  
Reel 033922, Frame 0431, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**STATEMENT UNDER 37 CFR 3.73(c)**

3. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

4. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

5. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

6. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

Additional documents in the chain of title are listed on a supplemental sheet(s).

As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Reena Kuyper/

December 1, 2014

Signature

Date

Reena Kuyper

33,830

Printed or Typed Name

Title or Registration Number

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/821,690	04/09/2004	Alexander Kurganov	078616-1026

CONFIRMATION NO. 1367

27433  
FOLEY & LARDNER LLP  
321 NORTH CLARK STREET  
SUITE 2800  
CHICAGO, IL 60610-4764



Date Mailed: 12/01/2006

**NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 11/13/2006.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

SHARON KUANG  
PTOSS (703) 305-3006

OFFICE COPY


**UNITED STATES PATENT AND TRADEMARK OFFICE**

UNITED STATES DEPARTMENT OF COMMERCE  
 United States Patent and Trademark Office  
 Address: COMMISSIONER FOR PATENTS  
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 Alexandria, Virginia 22313-1450  
 www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
10/821,690	04/09/2004	Alexander Kurganov	47242-00027USC1

**CONFIRMATION NO. 1367**

Steve Z Szczepanski-Kelley Drye & Warren LLP  
 Suite 2600  
 333 West Wacker Drive  
 Chicago, IL 60606



\*OC000000021442268\*

Date Mailed: 12/01/2006

**NOTICE REGARDING CHANGE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 11/13/2006.

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---

SHARON KUANG  
 PTOSS (703) 305-3006

OFFICE COPY

IFW



Atty. Dkt. No. 078616-1026

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Alex Kurganov

Title: Robust Voice Browser System and Voice Activated Device Controller

Appl. No.: 10/821,690

Filing Date: 4/9/2004

Examiner: Susan McFadden

Art Unit: 2644

Confirmation Number: 1367

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date below.

Sherry Cunningham-Page  
(Printed Name)

*Sherry Cunningham-Page*  
(Signature)

November 8, 2006  
(Date of Deposit)

**REVOCATION AND POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicant's attorney respectfully requests that the records of the United States Patent and Trademark Office in connection with the above-identified application be changed to show the following customer number for all future communications by virtue of the attached Power of Attorney to Prosecute Applications Before the U.S. Patent and Trademark Office (PTO/SB/80) and by the enclosed Statement under 3.73(b).

**Correspondence Customer Number: 27433**

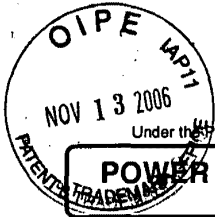
Respectfully submitted,

Date 11-8-06

By *SK*

FOLEY & LARDNER LLP  
Customer Number: 27433  
Telephone: (312) 832-5113  
Facsimile: (312) 832-4700

Scott R. Kaspar  
Attorney for Applicant  
Registration No. 54,583



**POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO**

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

Practitioners associated with the Customer Number:

**OR**

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

The address associated with Customer Number:

**OR**

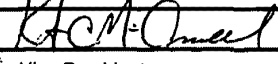
<input type="checkbox"/> Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Fax		

**Assignee Name and Address:**

Parus Interactive Holdings  
 3000 Lakeside Dr.  
 Suite 300N  
 Bannockburn, Illinois 60015

**A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.**

**SIGNATURE of Assignee of Record**  
 The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Company Name	PARUS INTERACTIVE HOLDINGS		
Name	Robert C. McConnell		
Signature		Date	
Title	Sr. Vice President	Telephone	888-387-3481

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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**STATEMENT UNDER 37 CFR 3.73(b)**

Applicant/Patent Owner: Alex Kurganov

Application No.: 10/821,690 Filed: 4/9/2004

Patent No.: 7,076,431 Issue Date: 7/11/2006

Docket Number: 078616-1026

Entitled: Robust Voice Browser System and Voice Activated Device Controller

Webley Systems, Inc. Corporation  
 (Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

- 1.  the assignee of the entire right, title, and interest; or
- 2.  an assignee of less than the entire right, title, and interest  
The extent (by percentage) of its ownership interest is %

in the patent application/patent identified above by virtue of either:

A.  An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel/Frame 011795/0293 or for which a copy thereof is attached.

OR

B.  A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

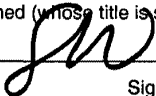
- 1. From: \_\_\_\_\_ To: \_\_\_\_\_  
The document was recorded in the United States Patent and Trademark Office at Reel \_\_\_, Frame \_\_\_, or for which a copy thereof is attached.
- 2. From: \_\_\_\_\_ To: \_\_\_\_\_  
The document was recorded in the United States Patent and Trademark Office at Reel \_\_\_, Frame \_\_\_, or for which a copy thereof is attached.
- 3. From: \_\_\_\_\_ To: \_\_\_\_\_  
The document was recorded in the United States Patent and Trademark Office at Reel \_\_\_, Frame \_\_\_, or for which a copy thereof is attached.

Additional documents in the chain of title are listed on a supplemental sheet.

Copies of assignments or other documents in the chain of title are attached.

[NOTE: A separate copy (i.e., a true copy of the original document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

 November 8, 2006  
 Signature Date

Scott R. Kaspar (312) 832-5113  
 Printed or Typed Name Telephone Number

Attorney for Applicant  
 Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PATENT  
47242-00027

## ASSIGNMENT

WHEREAS, We, Alexander Kurganov and Valery Zhukoff have invented certain new and useful improvements in the following: Robust Voice Browser System and Voice Activated Device Controller for which we have made application for United States Letters Patent; and,

WHEREAS, Assignee, Webley Systems, Inc., a corporation organized and existing under the laws of Illinois, having its principal place of business at 570 Lake Cook Road, Suite 406, Deerfield, IL 60015 (hereinafter referred to as "ASSIGNEE"), is desirous of acquiring our entire right, title and interest in and to the invention, and in and to the said application and any Letters Patent that may issue thereon;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, we do hereby sell, assign and transfer unto ASSIGNEE, its successors, assigns and legal representatives the entire right, title and interest in and to said invention and in and to said applications and all patents which may be granted therefore, and all provisionals, divisions, reissues, substitutions, continuations, continuation-in-part and extensions thereof, and we hereby authorize and request the Commissioner of Patents and Trademarks to issue all patents for said invention, or patents resulting therefrom, insofar as our interest is concerned, to the said ASSIGNEE of our entire right, title and interest.

We also hereby sell and assign to said ASSIGNEE, its successors, assigns and legal representatives the full and exclusive rights, title and interest to the invention disclosed in said applications throughout the world, including the right to file applications and obtain patents, utility models, industrial models and designs for said invention in its own name throughout the world including all rights of priority, all rights to publish cautionary notices reserving ownership of said invention and all rights to register said invention in appropriate registries; and

We further agree to execute any and all powers of attorney, applications, assignments, declarations, affidavits, and any other papers in connection therewith necessary to perfect such rights, title and interest in ASSIGNEE, its successors, assigns and legal representatives.

We hereby further agree that we will communicate to said ASSIGNEE, or its successors, assigns and legal representatives, any facts known to us respecting any improvements; and, at the expense of said ASSIGNEE, to testify in any legal proceedings, sign all lawful papers, execute all divisional, continuation, continuation-in-part, reissue and substitute applications, make all lawful oaths, and generally do everything possible to vest title in said ASSIGNEE and to aid said ASSIGNEE, its successors, assigns and legal representatives to obtain and enforce proper protection for said invention in all countries.

We further authorize and direct our attorneys to insert below\* the serial number and filing date of said application now identified as Case Docket No. 47242-00027 as soon as the same shall have been made known to them by the United States Patent Office.

\*Serial Number: 09/776,996  
Filing Date: February 5, 2001

BEST AVAILABLE COPY

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 4th day of

May 2001.

Alexander Kurganov  
Name: Alexander Kurganov  
Address: 2099 Sheridan Road  
Buffalo Grove, Illinois 60089

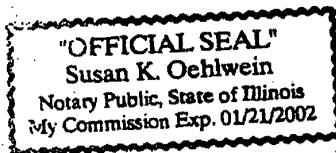
STATE OF Illinois )  
COUNTY OF Lake ) ss.

On this 4th day of May, 2001, before me, a Notary Public in and for the State and County aforesaid, personally appeared, known by me to be the person of the above name who signed and sealed the foregoing instrument, and acknowledged the same to be his own free act and deed.

Susan K. Oehlwein

Notary Public  
My Commission Expires:

[seal]



BEST AVAILABLE COPY

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 4<sup>th</sup> day of

May, 2001.

Valery Zhukoff

Name: Valery Zhukoff  
Address: 821 Rosemary Terrace  
Deerfield, IL 60015

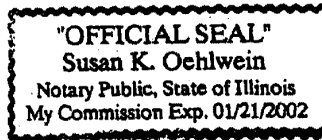
STATE OF Illinois )  
COUNTY OF Lake ) ss.

On this 4<sup>th</sup> day of May, 2001, before me, a Notary Public in and for the State and County aforesaid, personally appeared, known by me to be the person of the above name who signed and sealed the foregoing instrument, and acknowledged the same to be his own free act and deed.

Susan K. Oehlwein

Notary Public  
My Commission Expires:

[seal]



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Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (Use as many sheets as necessary)	<b>Complete if Known</b>	
	Application Number	10/821,690
	Filing Date	04-09-2004
	First Named Inventor	Kurganov
	Art Unit	TBA
	Examiner Name	TBA
Attorney Docket Number	47242-00027USC1	

Sheet 7 of 13

**U. S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number* Kind Code <sup>2</sup> (if known)			
DM		US- 5,812,796	09-22-1998	Broedner	
DM		US- 5,819,306	10-06-1998	Goldman	
DM		US- 5,822,727	10-13-1998	Garberg	
DM		US- 5,832,063	11-03-1998	Vysotsky	
DM		US- 5,835,570	11-10-1998	Wattenbarger	
DM		US- 5,867,494	02-02-1999	Krishnaswamy	
DM		US- 5,867,495	02-02-1999	Elliott	
DM		US- 5,873,080	02-16-2000	Coden	
DM		US- 5,881,134	03-01-1999	Foster	
DM		US- 5,884,262	03-16-1999	Wise	
DM		US- 5,890,123	03-30-1999	Brown	
DM		US- 5,915,001	06-22-1999	Uppaluru	
DM		US- 5,974,413	10-26-1999	Beauregard	
DM		US- 5,999,525	12-07-1999	Krishnaswamy	
DM		US- 6,012,088	01-04-2000	Li	
DM		US- 6,014,437	01-11-2000	Acker	
DM		US- 6,018,710	01-01-2000	Wynblatt	
DM		US- 6,021,181	02-01-2000	Miner	
DM		US- 6,031,904	02-01-2000	An	

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**FOREIGN PATENT DOCUMENTS**

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Examiner Signature	<i>[Signature]</i>	Date Considered	7-1-05
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Attorney Docket Number	47242-00027USC1												
Sheet <b>2</b> of <b>13</b>													

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U. S. PATENT DOCUMENTS					
Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
DM		US- 4,713,837	12-15-1987	Gordon	
DM		US- 4,748,656	05-31-1988	Gibbs	
DM		US- 4,757,525	07-12-1988	Mathews	
DM		US- 4,761,807	08-02-1988	Mathews	
DM		US- 4,763,317	08-09-1988	Lehman	
DM		US- 4,769,719	09-06-1988	Endo	
DM		US- 4,776,016	10-04-1988	Hansen	
DM		US- 4,809,321	02-28-1989	Morganstein	
DM		US- 4,837,798	06-06-1989	Cohen	
DM		US- 4,847,891	07-11-1989	Kotani	
DM		US- 4,850,012	07-18-1989	Mehta	
DM		US- 4,866,758	09-12-1989	Heinzelmann	
DM		US- 4,873,719	10-10-1989	Reese	
DM		US- 4,893,333	01-09-1990	Baran	
DM		US- 4,905,273	02-27-1990	Gordon	
DM		US- 4,907,079	03-01-1990	Turner	
DM		US- 4,918,722	04-17-1990	Buehren	
DM		US- 4,922,518	05-01-1990	Gordon	
DM		US- 4,922,526	05-01-1990	Morganstein	

FOREIGN PATENT DOCUMENTS						
Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	† <sup>4</sup>
		Country Code <sup>2</sup> Number <sup>3</sup> Kind Code <sup>5</sup> (if known)				
DM		WO 9609710	03-28-1996			
DM		WO 9823058	05-28-1998			

Examiner Signature: <i>[Signature]</i>	Date Considered:	7-1-08
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<sup>1</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>2</sup>Applicant's unique citation designation number (optional). <sup>3</sup>See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>4</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>5</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>6</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>7</sup>Applicant is to place a check mark here if English language translation is attached.

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PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0631-0031  
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**INFORMATION DISCLOSURE STATEMENT BY APPLICANT**  
*(Use as many sheets as necessary)*

Sheet 1 of 13

**Complete if Known**

Application Number	10/821,690
Filing Date	04-09-2004
First Named Inventor	Kurganov
Art Unit	TBA
Examiner Name	TBA
Attorney Docket Number	47242-00027USC1

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U. S. PATENT DOCUMENTS					
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		Number-Kind Code <sup>2</sup> (if known)			
JM		US-3,728,486	04-17-1973	Kraus	
JM		US-4,058,838	11-15-1997	Crager	
JM		US-4,313,035	01/26/1982	Jordan	
JM		US-4,327,251	04-27-1987	Fomenko	
JM		US-4,340,783	07-20-1982	Sugiyama	
JM		US-4,371,752	02-01-1983	Matthews	
JM		US-4,500,751	02-19-1985	Darland	
JM		US-4,513,390	04-23-1985	Walter	
JM		US-4,523,055	06-11-1985	Hohl	
JM		US-4,549,047	10-22-1985	Brian	
JM		US-4,584,434	04-22-1986	Hashimoto	
JM		US-4,585,906	04-29-1986	Matthews	
JM		US-4,596,900	06-24-1986	Jackson	
JM		US-4,596,900 B1	10-10-1995	Jackson	
JM		US-4,596,900 B2	08-26-1997	Jackson	
JM		US-4,602,129	07-32-1986	Matthews	
JM		US-4,635,253	01-06-1987	Urui	
JM		US-4,652,700	03-24-1987	Matthews	
JM		US-4,696,028	08-22-1987	Morganstein	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>3</sup>
		Country Code <sup>2</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)				
JM		GB 2211698	07-05-1989			
JM		GB 2240693	08-07-1991			
JM		JP 1-258526	10-16-1989			✓
JM		WO 9107838	05-30-1991			
JM		WO 9118466	11-28-1991			
JM		CA 1329852	05-24-94			

Examiner Signature	<i>[Signature]</i>	Date Considered	7-1-05
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Substitute for form 1449/PTO  <h2 style="text-align: center; margin: 0;">INFORMATION DISCLOSURE STATEMENT BY APPLICANT</h2> <p style="text-align: center; font-size: small;">(Use as many sheets as necessary)</p>	<h3 style="text-align: center; margin: 0;">Complete if Known</h3> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Application Number</td> <td>10/821,690</td> </tr> <tr> <td>Filing Date</td> <td>04-09-2004</td> </tr> <tr> <td>First Named Inventor</td> <td>Kurganov</td> </tr> <tr> <td>Art Unit</td> <td>TBA</td> </tr> <tr> <td>Examiner Name</td> <td>TBA</td> </tr> <tr> <td>Attorney Docket Number</td> <td>47242-00027USC1</td> </tr> </table>	Application Number	10/821,690	Filing Date	04-09-2004	First Named Inventor	Kurganov	Art Unit	TBA	Examiner Name	TBA	Attorney Docket Number	47242-00027USC1
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Sheet <b>3</b> of <b>13</b>													

U. S. PATENT DOCUMENTS					
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JM		US- 4,933,966	06-12-1990	Hird	
JM		US- 4,935,955	06-19-1990	Neudorker	
JM		US- 4,935,958	06-19-1990	Morganstein	
JM		US- 4,941,170	07-10-1990	Herbst	
JM		US- 4,953,204	08-28-1990	Cuschleg Jr.	
JM		US- 4,955,047	09-04-1990	Morganstein	
JM		US- 4,956,835	09-11-1990	Grover	
JM		US- 4,967,288	10-30-1990	Mizutori	
JM		US- 4,972,462	11-20-1990	Shibata	
JM		US- 4,974,254	11-27-1990	Perine	
JM		US- 4,975,941	12-04-1990	Morganstein	
JM		US- 4,994,926	02-01-1991	Gordon	
JM		US- 5,003,575	03-26-1991	Chamberlin	
JM		US- 5,008,926	04-16-1991	Misholi	
JM		US- 5,020,095	05-28-1991	Morganstein	
JM		US- 5,207,384 5027384	06-25-1991	Morganstein	
JM		US- 5,029,196	07-02-1991	Morganstein	
JM		US- 5,065,254	11-12-1991	Hishidi	
JM		US- 5,086,385	02-04-1991	Launey	

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Sheet <b>6</b> of <b>13</b>													

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DM		US-5,566,236	10-15-1996	MeLampby	
DM		US-5,603,031	02-11-1997	White	
DM		US-5,608,786	03-01-1997	Gordon	
DM		US-5,610,970	03-01-1997	Fuller	
DM		US-5,611,031	03-11-1997	Hertzfield	
DM		US-5,652,789	07-29-1997	Miner	
DM		US-5,659,597	08-01-1997	Bareis	
DM		US-5,666,401	09-09-1997	Morganstein	
DM		US-5,675,507	10-01-1997	Bobo II	
DM		US-5,675,811	10-07-1997	Broedner	
DM		US-5,689,669	11-18-1997	Lynch	
DM		US-5,692,187	11-25-1997	Goldman	
DM		US-5,719,921	02-01-1998	Vysotsky	
DM		US-5,724,408	03-03-1998	Morganstein	
DM		US-5,742,905	04-01-1998	Pepe	
DM		US-5,752,191	05-01-1998	Fuller	
DM		US-5,787,298	07-28-1998	Broedner	
DM		US-5,793,993	08-11-1998	Broedner	
DM		US-5,809,282	09-15-1998	Cooper	

UB  
Shu

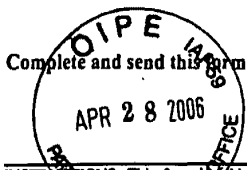
FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document <small>Country Code<sup>2</sup> Number<sup>3</sup> Kind Code<sup>4</sup> (if known)</small>	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>5</sup>

Examiner Signature <i>[Signature]</i>	Date Considered <b>7-1-05</b>
---------------------------------------	-------------------------------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 808. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

*If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.*



PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
(571) 273-2885

or Fax

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate...

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 01/23/2006

Steve Z Szczepanski-Kelley Drye & Warren LLP
Suite 2600
333 West Wacker Drive
Chicago, IL 60606

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers...

Certificate of Mailing or Transmittal

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above...

Form with fields: Depositor's name (SCOTT KASPAR), Signature (Handwritten), Date (APRIL 24, 2006)

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.

TITLE OF INVENTION: ROBUST VOICE BROWSER SYSTEM AND VOICE ACTIVATED DEVICE CONTROLLER

Table with 6 columns: APPLN. TYPE, SMALL ENTITY, ISSUE FEE, PUBLICATION FEE, TOTAL FEE(S) DUE, DATE DUE

Table with 3 columns: EXAMINER, ART UNIT, CLASS-SUBCLASS

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
"Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached...

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents...

1 KELLEY DRYE & WARREN LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

PARUS HOLDINGS, INC.

BANNOCKBURN, IL

Please check the appropriate assignee category or categories (will not be printed on the patent): Individual Corporation or other private group entity Government

4a. The following fee(s) are enclosed:

- Issue Fee
Publication Fee (No small entity discount permitted)
Advance Order - # of Copies

4b. Payment of Fee(s):

- A check in the amount of the fee(s) is enclosed. CHECK NO. 528138 For \$1000.
Payment by credit card. Form PTO-2038 is attached.
The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant...

Authorized Signature (Handwritten)
Typed or printed name SCOTT KASPAR

Date APRIL 24, 2006
Registration No. 54,583

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete...

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

05/01/2006 10821690
01 FC:2501
02 FC:1504



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590 01/23/2006
Steve Z Szczepanski-Kelley Drye & Warren LLP
Suite 2600
333 West Wacker Drive
Chicago, IL 60606

EXAMINER
MCFADDEN, SUSAN IRIS

ART UNIT 2655
PAPER NUMBER

DATE MAILED: 01/23/2006

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
10/821,690 04/09/2004 Alexander Kurganov 47242-00027USC1 1367

TITLE OF INVENTION: ROBUST VOICE BROWSER SYSTEM AND VOICE ACTIVATED DEVICE CONTROLLER

Table with 6 columns: APPLN. TYPE, SMALL ENTITY, ISSUE FEE, PUBLICATION FEE, TOTAL FEE(S) DUE, DATE DUE
nonprovisional YES \$700 \$300 \$1000 04/24/2006

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

**PART B - FEE(S) TRANSMITTAL**

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
 or **Fax** **(571) 273-2885**

**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590 01/23/2006

Steve Z Szczepanski-Kelley Drye & Warren LLP  
 Suite 2600  
 333 West Wacker Drive  
 Chicago, IL 60606

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**  
 I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)
_____ (Signature)
_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,690	04/09/2004	Alexander Kurganov	47242-00027USC1	1367

TITLE OF INVENTION: ROBUST VOICE BROWSER SYSTEM AND VOICE ACTIVATED DEVICE CONTROLLER

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$700	\$300	\$1000	04/24/2006

EXAMINER	ART UNIT	CLASS-SUBCLASS
MCFADDEN, SUSAN IRIS	2655	704-275000

<p>1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).</p> <p><input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.</p> <p><input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.</p>	<p>2. For printing on the patent front page, list</p> <p>(1) the names of up to 3 registered patent attorneys or agents OR, alternatively, _____ 1</p> <p>(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. _____ 2</p> <p>_____ 3</p>
--	---

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)  
 PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE \_\_\_\_\_ (B) RESIDENCE: (CITY and STATE OR COUNTRY) \_\_\_\_\_

Please check the appropriate assignee category or categories (will not be printed on the patent):  Individual  Corporation or other private group entity  Government

<p>4a. The following fee(s) are enclosed:</p> <p><input type="checkbox"/> Issue Fee</p> <p><input type="checkbox"/> Publication Fee (No small entity discount permitted)</p> <p><input type="checkbox"/> Advance Order - # of Copies _____</p>	<p>4b. Payment of Fee(s):</p> <p><input type="checkbox"/> A check in the amount of the fee(s) is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).</p>
--	---

5. Change in Entity Status (from status indicated above)

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.  b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_  
 Typed or printed name \_\_\_\_\_ Registration No. \_\_\_\_\_

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



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www.uspto.gov

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
10/821,690 04/09/2004 Alexander Kurganov 47242-00027USC1 1367

7590 01/23/2006
Steve Z Szczepanski-Kelley Drye & Warren LLP
Suite 2600
333 West Wacker Drive
Chicago, IL 60606

EXAMINER

MCFADDEN, SUSAN IRIS

ART UNIT PAPER NUMBER

2655

DATE MAILED: 01/23/2006

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571) 272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

**Notice of Allowability**

<b>Application No.</b> 10/821,690	<b>Applicant(s)</b> KURGANOV ET AL.	
<b>Examiner</b> Susan McFadden	<b>Art Unit</b> 2655	

-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

- 1.  This communication is responsive to Amendment filed 1-9-06.
- 2.  The allowed claim(s) is/are 1-32.
- 3.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a)  All   b)  Some\*   c)  None   of the:
    - 1.  Certified copies of the priority documents have been received.
    - 2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    - 3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**


- 4.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
- 5.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
- 6.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.



**Attachment(s)**

- 1.  Notice of References Cited (PTO-892)
- 2.  Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3.  Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
- 4.  Examiner's Comment Regarding Requirement for Deposit of Biological Material
- 5.  Notice of Informal Patent Application (PTO-152)
- 6.  Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
- 7.  Examiner's Amendment/Comment
- 8.  Examiner's Statement of Reasons for Allowance
- 9.  Other \_\_\_\_\_

  
Susan McFadden  
Primary Examiner  
Art Unit: 2655

<b>Issue Classification</b> 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/821,690	KURGANOV ET AL.	
	Examiner	Art Unit	
	Susan McFadden	2655	

ISSUE CLASSIFICATION										
ORIGINAL					CROSS REFERENCE(S)					
CLASS		SUBCLASS			CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
704		275								
INTERNATIONAL CLASSIFICATION										
G	1	0	L	21/06						
				/						
				/						
				/						
				/						

_____ (Assistant Examiner) (Date)	 Susan McFadden 1-18-06 (Primary Examiner) (Date)	<b>Total Claims Allowed: 32</b>				
 (Legal Instruments Examiner) (Date)		<table border="1" style="width: 100%;"> <tr> <th>O.G. Print Claim(s)</th> <th>O.G. Print Fig.</th> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> </table>	O.G. Print Claim(s)	O.G. Print Fig.	1	1
O.G. Print Claim(s)	O.G. Print Fig.					
1	1					

<input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant										<input type="checkbox"/> CPA		<input type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47	
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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	2		32		62		92		122		152		182		212
	3		33		63		93		123		153		183		213
	4		34		64		94		124		154		184		214
	5		35		65		95		125		155		185		215
	6		36		66		96		126		156		186		216
	7		37		67		97		127		157		187		217
	8		38		68		98		128		158		188		218
	9		39		69		99		129		159		189		219
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	11		41		71		101		131		161		191		221
	12		42		72		102		132		162		192		222
	13		43		73		103		133		163		193		223
	14		44		74		104		134		164		194		224
	15		45		75		105		135		165		195		225
	16		46		76		106		136		166		196		226
	17		47		77		107		137		167		197		227
	18		48		78		108		138		168		198		228
	19		49		79		109		139		169		199		229
	20		50		80		110		140		170		200		230
	21		51		81		111		141		171		201		231
	22		52		82		112		142		172		202		232
	23		53		83		113		143		173		203		233
	24		54		84		114		144		174		204		234
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	26		56		86		116		146		176		206		236
	27		57		87		117		147		177		207		237
	28		58		88		118		148		178		208		238
	29		59		89		119		149		179		209		239
	30		60		90		120		150		180		210		240







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\*BIBDATASHEET\*

CONFIRMATION NO. 1367

Bib Data Sheet

Table with 5 columns: SERIAL NUMBER (10/821,690), FILING OR 371(c) DATE (04/09/2004), CLASS (704), GROUP ART UNIT (2655), ATTORNEY DOCKET NO. (47242-00027USC1)

APPLICANTS
Alexander Kurganov, Buffalo Grove, IL;
Valery Zhukoff, Deerfield, IL;
\*\* CONTINUING DATA \*\*\*\*\*
This application is a CON of 09/776,996 02/05/2001 PAT 6,721,705
which claims benefit of 60/180,344 02/04/2000
and claims benefit of 60/233,068 09/15/2000
\*\* FOREIGN APPLICATIONS \*\*\*\*\*
IF REQUIRED, FOREIGN FILING LICENSE GRANTED\*\* SMALL ENTITY \*\*
\*\* 06/24/2004

Table with 6 columns: Foreign Priority claimed (no), 35 USC 119 (a-d) conditions (no), STATE OR COUNTRY (IL), SHEETS DRAWING (4), TOTAL CLAIMS (17), INDEPENDENT CLAIMS (1)

ADDRESS
Steve Z Szczepanski-Kelley Drye & Warren LLP
Suite 2600
333 West Wacker Drive
Chicago ,IL 60606

TITLE
Robust voice browser system and voice activated device controller

Table with 2 columns: FILING FEE RECEIVED (685), FEES: Authority has been given in Paper No. \_\_\_\_\_ to charge/credit DEPOSIT ACCOUNT No. \_\_\_\_\_ for following: (List of fee options: All Fees, 1.16 Fees ( Filing ), 1.17 Fees ( Processing Ext. of time ), 1.18 Fees ( Issue ), Other, Credit)

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		<b>Complete if Known</b>	
		Application Number	10/821,690
		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 11 of 13	Attorney Docket Number	47242-00027USC1	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.†	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T‡
DM		"GLOBECOM '85 IEEE Global Telecommunications Conference," New Orleans, La., December 2-5, 1985, pp. 1295-1300.	
DM		"Introducing PIC SuperFax, First PC/Fax System to Run Under Windows", Pacific Image Communications, Pasadena, CA, Date Unknown, (received at COMDEX show, Nov. 3, 1987), 4 pgs.	
DM		GARCIA, ET AL., "Issues in Multimedia Computer-Based Message Systems Design and Standardization," NATO ASI Series, Vol. 1-6, 1984, 18 pgs.	10/27/04
DM		DON HUNT & BRIAN EDWARDS, "Long-Distance Remote Control to the Rescue," Chicago Tribune, June 15, 2002, Section 4, page 15.	4/26/04
DM		SCHMANDT, ET AL., "Phone Slave: A Graphical Telecommunications Interface," Proceedings of the SID, 1985, Vol. 26/1, pp. 79-82.	10/27/04
DM		SCHMANDT, ET AL., "Phone Shell: The Telephone as Computer Terminal," ACM Multimedia, 1993, 11 pgs.	10/27/04
DM		Proceedings of the IFIP World Computer Congress, Dublin, Ireland, September 1-5, 1986.	10/27/04
DM		Shimamura, K., et al., "Review of the Electrical Communication Laboratories," Vol. 418 (33), No. 1, Tokyo, Japan, 1985, pp. 31-39.	10/27/04
DM		"Secretarial Branch Exchanged," IBM Technical Disclosure Bulletin, Vol. 26 (5), October 1983, pp. 2645-47.	10/27/04
DM		"Wildfire Communications, Inc.," Harvard Business School, March 21, 1996, Publ. No. 9-396-305, pp. 1-22.	10/27/04

Examiner Signature	<i>[Signature]</i>	Date Considered	7-1-05
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 † Applicant's unique citation designation number (optional). ‡ Applicant is to place a check mark here if English language Translation is attached.  
 This collection of information is required by 37 CFR 1.58. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Substitute for form 1449PTO		Complete if Known	
<b>INFORMATION DISCLOSURE                  STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		Application Number	10/821,690
		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 12 of 13	Attorney Docket Number	47242-00027USC1	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.†	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
DM		"WordPerfect: New Telephony Features Boost Office", WordPerfect Office TechBrief, 1994, Info-World Publg. Co., Vol. 10, Issue 2, pp. 2-3.	
DM		Internet web page, "Wildfire Communications, Inc.", November 5, 1997, including the following URL addresses:	
DM		http://www.wildfire.com (1 pg);	
DM		http://www.wildfire.com/consumerhome.html (2 pgs.);	
DM		http://www.wildfire.com/106.html (2pgs.);	
DM		http://www.wildfire.com/carrierhome.html (2pgs.);	
DM	1.	http://www.wildfire.com/sfandb.html (3 pgs.);	
DM		http://www.wildfire.com/about.html (1 pg.);	
DM		http://www.wildfire.com/abtmgmt.html (3 pgs.);	
DM		http://www.wildfire.com/scoop.html (2 pgs.); and	

Examiner Signature	<i>[Signature]</i>	Date Considered	7-1-06
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Substitute for form 1449PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		Application Number	10/821,690
		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 13 of 13	Attorney Docket Number	47242-00027USC1	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
JM		<a href="http://www.wildfire.com/intel.html">http://www.wildfire.com/intel.html</a> (1 pg.); and	
JM		<a href="http://www.wildfire.com/msft.html">http://www.wildfire.com/msft.html</a> (2 pgs.).	

No Citations

Examiner Signature	<i>[Signature]</i>	Date Considered	7-1-08
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 1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.  
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Substitute for form 1449PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		Application Number	10/821,690
		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 10 of 13	Attorney Docket Number	47242-00027USC1	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.†	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
DM		"A PABX that Listens and Talks." Speech Technology, January/February 1984, pp. 74-79.	✓
DM		MAEDA, ET AL., "An Intelligent Customer-Controlled Switching System," IEEE Global Telecommunications Conference, Hollywood, Florida, Nov. 28-Dec. 1 1988, pp. 1499-1503.	✓
DM		COLE, ET AL., "An Architecture for a Mobile OSI Mail Access System," IEEE Journal on Selected Areas in Communications, Vol. 7 (2), February 1989, pp. 249-256.	
DM		"Business Phone Systems for Advanced Offices," NTT Review, Vol. 2 (6), November 1990, pp. 52-54.	
DM		LY, "Chatter: A Conversational Telephone Agent," submitted to Program in Media Arts & Sciences, MIT, 1993, pp. 1-130.	
DM		SCHMANDT ET AL., "A Conversational Telephone Messaging Systems", IEEE Transactions on Consumer Electronics, 1984, Vol. CE-30, No. 3, pp. xxi-xxiv.	NO
DM		"Data Communications Networks: Message Handling Systems," Fascicle, VIII. 7- Recommendations X.400-X.430, 38 pages, date unknown.	NO
DM		Bellcore Technology Licensing, "The Electronic Receptionist -- A Knowledge-Based Approach to Personal Communications", 1994, pp. 1-8.	NO
DM		"Faxpak Store and Forward Facsimile Transmission Service," Electrical Communication, Vol. 54 (3), 1979, pp. 251-55.	1
DM		BRACHMAN, ET AL., "Fragmentation in Store-and-Forward Message Transfer," IEEE Communications Magazine, Vol. 26(7), July 1988, pp. 18-27.	

Examiner Signature	<i>Inson McFadden</i>	Date Considered	7-1-04
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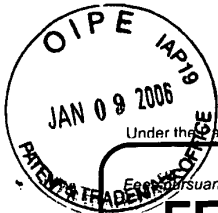
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# WEST Search History

DATE: Wednesday, January 18, 2006

<u>Hide?</u>	<u>Set Name</u>	<u>Query</u>	<u>Hit Count</u>
	<i>DB=USPT; PLUR=YES; OP=OR</i>		
<input type="checkbox"/>	L7	(list near web adj sites and speech adj recognition and voice adj browser and grammar).clm.	0
<input type="checkbox"/>	L6	(pre-selected adj web adj sites).clm.	0
<input type="checkbox"/>	L5	L3 and voice	1
<input type="checkbox"/>	L4	L3 and voice	1
<input type="checkbox"/>	L3	pre-selected adj web adj sites	4
<input type="checkbox"/>	L2	pre-selected adj web adj sites and voice and recognition and speech adj synthesis and grammar	0
<input type="checkbox"/>	L1	pre-selected adj web adj sites and voice adj enabled and speaker-independent and recognition and speech adj synthesis	0

END OF SEARCH HISTORY



IFW

PTO/SB/17 (12-04v2)

Approved for use through 07/31/2006. OMB 0651-0032  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Effective on 12/08/2004.  
Easements pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

## FEE TRANSMITTAL For FY 2005

Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT		(\$)	
		300	

Complete if Known	
Application Number	10/821,690
Filing Date	April 9, 2004
First Named Inventor	Kurganov
Examiner Name	McFadden, Susan
Art Unit	2644
Attorney Docket No.	015749-0015

### METHOD OF PAYMENT (check all that apply)

Check  
  Credit Card  
  Money Order  
  None  
  Other (please identify): \_\_\_\_\_

Deposit Account  
 Deposit Account Number: 11-0404  
 Deposit Account Name: Kelley Drye & Warren

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

Charge fee(s) indicated below  
  Charge fee(s) indicated below, except for the filing fee

Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17  
  Credit any overpayments

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

### FEE CALCULATION

#### 1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	_____
Design	200	100	100	50	130	65	_____
Plant	200	100	300	150	160	80	_____
Reissue	300	150	500	250	600	300	_____
Provisional	200	100	0	0	0	0	_____

#### 2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

**Total Claims**    **Extra Claims**    **Fee (\$)**    **Fee Paid (\$)**    **Multiple Dependent Claims**  
32 - 20 or HP = 12 x 25 = 300    **Fee (\$)**    **Fee Paid (\$)**  
 HP = highest number of total claims paid for, if greater than 20.

**Indep. Claims**    **Extra Claims**    **Fee (\$)**    **Fee Paid (\$)**  
 \_\_\_\_\_ - 3 or HP = \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_  
 HP = highest number of independent claims paid for, if greater than 3.

#### 3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
_____	_____	_____	_____	_____

\_\_\_\_\_ - 100 = \_\_\_\_\_ / 50 = \_\_\_\_\_ (round up to a whole number) x \_\_\_\_\_ = \_\_\_\_\_

#### 4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)    **Fees Paid (\$)** \_\_\_\_\_

Other (e.g., late filing surcharge): \_\_\_\_\_

SUBMITTED BY		
Signature		Registration No. (Attorney/Agent) 54,583
Name (Print/Type)	Scott R. Kaspar	Telephone 312-857-7088
		Date January 6, 2006

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PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/821,690 Confirmation No. : 1367  
Applicant : Kurganov et al.  
Filed : April 9, 2004  
Title : Robust Voice Browser System and Voice Activated Device Controller  
  
TC/A.U. : 2644  
Examiner : McFadden, Susan  
  
Docket No. : 015749-0015; old (47242-00027USC1)  
Customer No. : 47670

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

<b>CERTIFICATE OF MAILING</b> 37 C.F.R. 1.8	
I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below:	
06 JANUARY 2006 Date	 Signature

AMENDMENT

Sir:

In response to the Office Action mailed July 7, 2005 concerning the above application, please enter the following amendment and remarks:

Please update the record to reflect Applicant's new docket number, which is 015749-0015.

**Amendments to the Claims** are reflected in the Listing of Claims which begins on page 2 of this paper.

**Remarks** begin on page 11 of this paper.



**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended): A system for retrieving gathering information from pre-selected web sites information sources connected to a network by uttering using speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device indicating specific actions to be performed, said system comprising:
  - a computer, said computer operatively connected to the internet;
  - a voice enabled device operatively connected to said computer, said voice enabled device configured to receive employed by users to communicate speech commands indicating specific actions to be performed from users;
  - at least one speaker-independent speech recognition device, said speaker-independent speech recognition device operatively connected to said computer and to said voice enabled device;
  - at least one speech synthesis device, said speech synthesis device operatively connected to said computer and to said voice enabled device;
  - at least one instruction set for identifying said information to be retrieved, said instruction set being associated with said computer, said instruction set comprising:
    - a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved;
    - at least one recognition grammar associated with said computer, each said recognition grammar corresponding to each said instruction set and corresponding to a speech command;
    - said speech command commands comprising an information request requests-selectable by the user;
    - a database operatively connected with a computer said database containing stored digital form commands for operating said system;
    - said a speaker-independent speech recognition device configured to receive for receiving from users via said voice enabled device said speech command commands and to select the

~~corresponding recognition grammar upon receiving said speech command indicating specific actions to be performed, said speaker-independent speech recognition device configured to convert said speech commands to data messages;~~

~~said a computer configured to retrieve said instruction set corresponding to said recognition grammar selected by said speaker-independent speech recognition device operatively connected with said database and said speech recognition device and configured to match said data messages with said stored digital form commands and configured to carry out the specific actions indicated by said speech commands;~~

~~said computer further configured to search access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer configured to sequentially access said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed; information sources connected to a network to gather information from said information sources connected to said network in response to said information requests.~~

~~said speech synthesis device configured to produce an audio message containing any retrieved information from said pre-selected web sites, and said speech synthesis device further configured to transmit said audio message to said users via said voice enabled device.~~

2. (Currently Amended): The system of claim 1 wherein said internet network is the Internet.

3. (Currently Amended): The system of claim 1 wherein said internet is a local area network ~~information sources are web sites.~~

4. (Currently Amended): The system of claim 1 wherein ~~the~~ said voice enabled device is a standard telephone, an IP telephone, a cellular phone, a PDA, a personal computer, a DVD player, a television or other video display device, a CD player, a MP3 player, or any other device capable of transmitting said audio message ~~audio playing an audio signal.~~

5. (Currently Amended): The system of claim 1 wherein said speaker-independent speech recognition device is configured to analyze analyzes-phonemes to recognize said speech commands.

6. (Currently Amended): The system of claim 1 wherein said speaker-independent speech recognition device is configured to recognize recognizes-naturally spoken speech commands.

7. (Currently Amended): The system of claim 1 wherein said ~~database contains a stored list of said information sources connected to said network~~ instruction set further comprises a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved.

8. (Currently Amended): The system of claim 1 7 wherein said computer is further configured to periodically ~~search~~ poll each of said web sites without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site, said computer further configured to create a ranking of said plurality of web sites based on said periodic polling information sources contained in said stored list and also configured to assign ranks to said information sources to reflect the results of said periodic search.

9. (Currently Amended): The system of claim 1 7 wherein said computer is further configured to periodically search said ~~internet network~~ to identify new web sites information sources and to add said new web sites information sources to said plurality of web sites stored list.

10. (Currently Amended): The system of claim 1 9 wherein said ~~computer is further configured to periodically search said information sources contained in said stored list and also configured to assign ranks to said information sources to reflect the results of said periodic search~~

instruction set further comprises a ranking associated with each said web site address, said ranking indicating the order in which the plurality of pre-selected web sites are accessed.

11. (Currently Amended): The system of claim 10 & wherein said computer is configured to modify ranks are established or modified said rankings based upon utility considerations of said information sources at least one of a plurality of criteria, said plurality of criteria comprising:  
the availability of each said web site;  
the duration of time for each said web site to respond to a request from said computer;  
and  
changes to the location of said information to be retrieved from each said web site.

12. (Currently Amended): The system of claim 11 wherein ~~said utility considerations comprise one or more of the following list: functionality of said information sources, speed of said information sources, or changes to said information sources that lower its utility for a specific information request~~ computer is configured to weigh said criteria with respect to one another when modifications to said rankings are based on more than one of said plurality of criteria.

13. (Currently Amended): The system in claim 10 & wherein said computer is configured to access searches said plurality of web sites in order of ranking information sources with the highest rank in order to retrieve said information requested by said user, said computer further configured to first access said web site having the highest ranking.

14. (Currently Amended): The system of claim 1 further comprising a database operatively connected to said computer, wherein said database configured to store said information gathered by said system from said web sites information sources in response to said information requests is stored by said database and processed by said computer into a message, said system further configured to transmit said message to said voice enabled device or such other destination as designated by said user.

15. (Currently Amended): The system of claim ~~10~~ 14 wherein ~~said message is an audio message~~ computer is further configured to modify said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings.

16. (Currently Amended): The system of claim ~~14~~ 15 ~~further comprising a speech synthesis engine configured to create said audio message~~ wherein each said recognition grammar and each said instruction set are stored in said database.

17. (Currently Amended): The system of claim ~~9~~ 15 ~~further comprising a pre-recorded audio concatenation application configured to create said audio message~~ wherein said computer is configured to search each of said new web sites without being instructed by said user to determine the availability of each said new web site, the duration of time for each said new web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said new web site, said computer further configured to create a ranking of said plurality of new web sites based on said periodic searches.

18. (New): A method for retrieving information from pre-selected web sites by uttering speech commands into a voice enabled device and for providing to users retrieved information in an audio form via said voice enabled device, said method comprising the steps of:

providing a computer operatively connected to the internet, said computer further being operatively connected to at least one speaker-independent speech recognition engine and to at least one speech synthesis engine;

providing a voice enabled device operatively connected to said computer, said voice enabled device configured to receive speech commands from users;

providing at least one instruction set stored in a database operatively connected to said computer, said instruction set comprising:

a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved;

providing a speech command to said speaker-independent speech recognition engine, said speech command corresponding to said instruction set;

said speaker-independent speech recognition engine assigning said speech command to a recognition grammar, said speech command and said recognition grammar corresponding to said instruction set;

transmitting said speech command to said speaker-independent speech recognition engine;

said speaker-independent speech recognition engine receiving said speech command and selecting the corresponding recognition grammar upon receiving said speech command;

said computer retrieving said instruction set corresponding to said recognition grammar selected by said speaker-independent speech recognition engine;

said computer accessing at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer first accessing said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer sequentially accessing said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed;

said speech synthesis engine producing an audio message containing any retrieved information from said pre-selected web sites; and

said speech synthesis engine transmitting said audio message to said users via said voice enabled device.

19. (New): The method of claim 18 wherein said instruction set further comprises a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved.

20. (New): The method of claim 18 wherein said instruction set further comprises a ranking from highest to lowest associated with each said web site, said ranking indicating the order in which the plurality of pre-selected web sites are accessed.

21. (New): The method of claim 20 wherein said computer accesses said plurality of web sites based on said ranking, said computer first accessing said web site having the highest ranking.
22. (New): The method of claim 21 further comprising the step of adjusting said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings.
23. (New): The method of claim 18 further comprising the step of periodically polling each said web site to determine whether said web site contains said information to be retrieved.
24. (New): The method of claim 23 wherein the computer periodically polls each said web site without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site, said computer creating a ranking of said plurality of web sites based on said periodic polling.
25. (New): The method of claim 18 further comprising the step of periodically searching said internet to find new web sites containing said information to be retrieved, and adding said new web sites to said plurality of web sites.
26. (New): A system for retrieving information from pre-selected web sites by uttering speech commands into a phone and for providing to users retrieved information in an audio form via said phone, said system comprising:
- a computer, said computer operatively connected to the internet and to at least one phone;
  - at least one speaker-independent speech recognition engine, said speaker-independent speech recognition engine operatively connected to said computer;
  - at least one speech synthesis engine, said speech synthesis engine operatively connected to said computer;

a database, said database operatively connected to said computer;

at least one instruction set stored in said database for identifying said information to be retrieved, said instruction set comprising:

- a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved;
- a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved;
- a ranking from highest to lowest associated with each said web site address, said ranking indicating the order in which the plurality of pre-selected web sites are accessed;

at least one recognition grammar stored in said database, each said recognition grammar corresponding to each said instruction set and corresponding to a speech command;

said speaker-independent speech recognition engine configured to receive from users via said phone a speech command and to select the corresponding recognition grammar upon receiving said speech command;

said computer configured to retrieve said instruction set corresponding to said recognition grammar selected by said speaker-independent speech recognition device;

said computer further configured to access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said web site having the highest ranking and, if said information to be retrieved is not found at said web site having the highest ranking, said computer configured to subsequently access said plurality of web sites in order of rankings until said information to be retrieved is found or until said plurality of web sites has been accessed;

said computer further configured to establish or adjust said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings;

said speech synthesis engine configured to produce an audio message containing any retrieved information from said pre-selected web sites, and said speech synthesis engine further configured to transmit said audio message to said users via said phone.



27. (New): The system of claim 26 wherein said phone comprises a standard telephone, a cellular phone, or an IP phone.
28. (New): The system of claim 26 wherein said internet is a local area network.
29. (New): The system of claim 26 wherein said internet is a wide area network.
30. (New): The system of claim 26 wherein said internet is the Internet.
31. (New): The system of claim 26 wherein said computer is configured to establish or adjust said rankings associated with said plurality of web sites when instructed by said user to access said plurality of web sites to retrieve said information.
32. (New): The system of claim 26 wherein said computer is configured to establish or adjust said rankings associated with said plurality of web sites based on periodic polling of each of said web sites without being instructed by said user to determine the availability of each said web site, the duration of time for each said web site to respond to a request from said computer, and changes to the location of said information to be retrieved from each said web site.

### REMARKS

Before addressing the merits of the Office Action mailed July 7, 2005, Applicant wishes to point out some important features of the present invention. Applicant's invention allows for users to retrieve desired information from pre-selected web sites containing the desired information by uttering speech commands, and the retrieved information is provided to the users in an audio form. Applicant's invention allows users to retrieve the desired information using a voice enabled device, such as a standard telephone, cell phone, or IP phone, whereby users utter speech commands into the voice enabled device, and the retrieved information is provided to the users in audio form via the voice enabled device. Applicant's invention retrieves the desired information from one of a plurality of pre-selected web sites by accessing the web sites sequentially until the desired information is found or until all of the pre-selected web sites have been accessed. Once the desired information is found at one of the pre-selected web sites, the information is converted into audio form and transmitted via the voice enabled device to the user.

For example, Applicant's invention may be configured to provide financial information, such as current stock values for various publicly-traded companies. As such, the system may be set up with a plurality of pre-selected web sites containing current stock values for various companies. For instance, fifty web sites containing current stock values for various companies may be pre-selected for use by the system. A user desiring the current stock value for a company may utter a speech command relating to the particular company, and the system accesses the pre-selected web sites sequentially until the desired information is located. For example, a user desiring the current stock value of Southwest Airlines may utter the speech command "Southwest" into a voice enabled device, such as a standard telephone, cell phone, or IP phone, and the system accesses the pre-selected web sites beginning with the first web site and sequentially accessing each web site until the current stock value for Southwest Airlines is found or until all of the pre-selected web sites have been accessed. Once the information is found, the system converts the retrieved information into audio form, which may be transmitted via the voice enabled device to the user. For example, once the current stock value for Southwest Airlines is found, the system may transmit an audio message containing the retrieved

information, such as "\$16.65" or "The current stock value of Southwest Airlines is \$16.65," to the user over the voice enabled device.

These features of the present invention are important advancements over the prior art. In the system disclosed by U.S. Patent No. 6,157,705 to Perrone ("the Perrone Patent"), users cannot retrieve desired information from a plurality of pre-selected web sites by uttering speech commands. *See* Perrone Patent, col. 11, ll. 19-29. Rather, speech commands correspond to specific resources on specific web sites, and uttering speech commands allows users to retrieve the specific resources from the specific web sites. *Id.* The system disclosed by the Perrone Patent does not access a plurality of pre-selected web sites in a sequential manner until the desired information is found. *Id.*

Applicant has amended claims 1-17 to further emphasize these important features of the present invention. Additionally, claims 18-32 have been added to further protect Applicant's invention. Accordingly, the Examiner is requested to withdraw the rejections and enter a timely Notice of Allowance

Rejection Under Double Patenting:

The amendment is believed to obviate the rejection of claims 1-17 under non-statutory double patenting as being unpatentable over U.S. Patent No. 6,807,257 to Kurganov ("the Kurganov Patent"). Independent claim 1 as amended includes several patentable features not disclosed, suggested, or implied by the Kurganov Patent.

For example, claim 1 as amended includes "at least one instruction set for identifying said information to be retrieved, said instruction set being associated with said computer, said instruction set comprising: a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved." The Kurganov Patent does not disclose, suggest, or imply this feature.

As another example, claim 1 as amended includes "said computer further configured to access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site,

said computer configured to sequentially access said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed.”

The Kurganov Patent does not disclose, suggest, or imply “said computer further configured to access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer configured to sequentially access said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed.”

Rather, with the system disclosed by the Kurganov Patent, speech commands are used to carry out specific functions, such as make telephone calls or compose e-mail messages. *See* Kurganov Patent, col. 6, ll. 18-52. The system disclosed by the Kurganov Patent does not access a plurality of pre-selected web sites in a sequential manner until desired information is found. *Id.*

The Kurganov Patent does not disclose, suggest, or imply all of the elements of independent claim 1 as amended. As such, the rejection based on non-statutory double patenting should be withdrawn. *See In re Braat*, 937 F.2d 589, 592-93 (Fed. Cir. 1991) (stating that the Federal Circuit “has endorsed an obviousness determination similar to . . . that undertaken under 35 U.S.C. § 103 in determining the propriety of a rejection for double patenting”); *see also In re Vogel*, 422 F.2d 438, 441-42 (C.C.P.A. 1970) (stating that a rejection under double patenting cannot be sustained where the prior art does not disclose, suggest, or imply all of the elements of the claimed invention).

Accordingly, amended independent claim 1, and those claims depending therefrom, should be allowed.

Rejection Under 35 U.S.C. § 102:

The amendment is believed to obviate the rejection of claims 1-7 and 14-17 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,157,705 to Perrone (“the Perrone Patent”). Independent claim 1 as amended includes several patentable features not disclosed by the Perrone Patent.

For example, claim 1 as amended includes “at least one instruction set for identifying said information to be retrieved, said instruction set being associated with said computer, said

instruction set comprising: a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved.” The Perrone Patent does not disclose this feature.

As another example, claim 1 as amended includes “said computer further configured to access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer configured to sequentially access said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed.”

The Perrone Patent does not disclose “said computer further configured to access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer configured to sequentially access said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed.” Rather, speech commands correspond to specific resources on specific web sites, and uttering speech commands allows users to retrieve the specific resources from the specific web sites. *See* Perrone Patent, col. 11, ll. 19-29. The system disclosed by the Perrone Patent does not access a plurality of pre-selected web sites in a sequential manner until the desired information is found. *Id.*

The Perrone Patent does not disclose all of the elements of independent claim 1 as amended. As such, the rejection based on anticipation should be withdrawn. *See Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987) (“A claim is anticipated only if each and every element as set forth in the claim is found”).

Accordingly, amended independent claim 1, and those claims depending therefrom, should be allowed.

Rejection Under 35 U.S.C. § 103:

The amendment is believed to obviate the rejection of claims 8-13 under 35 U.S.C. § 103(a) as being unpatentable over the Perrone Patent. Independent claim 1 as amended includes several patentable features not disclosed, suggested, or implied by the Perrone Patent.

For example, claim 1 as amended includes “at least one instruction set for identifying said information to be retrieved, said instruction set being associated with said computer, said instruction set comprising: a plurality of pre-selected web site addresses, each said web site address identifying a web site containing said information to be retrieved.” The Perrone Patent does not disclose, suggest, or imply this feature.

As another example, claim 1 as amended includes “said computer further configured to access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer configured to sequentially access said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed.”

The Perrone Patent does not disclose, suggest, or imply “said computer further configured to access at least one of said plurality of web sites identified by said instruction set to obtain said information to be retrieved, said computer configured to first access said first web site of said plurality of web sites and, if said information to be retrieved is not found at said first web site, said computer configured to sequentially access said plurality of web sites until said information to be retrieved is found or until said plurality of web sites has been accessed.” Rather, speech commands correspond to specific resources on specific web sites, and uttering speech commands allows users to retrieve the specific resources from the specific web sites. *See* Perrone Patent, col. 11, ll. 19-29. The system disclosed by the Perrone Patent does not access a plurality of pre-selected web sites in a sequential manner until the desired information is found. *Id.*

The Perrone Patent does not disclose, suggest, or imply all of the elements of independent claim 1 as amended. As such, the rejection based on obviousness should be withdrawn. *See In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974) (stating that all elements of a claim must be disclosed by the prior art to support a *prima facie* case of obviousness).

Accordingly, amended independent claim 1, and those claims depending therefrom, should be allowed.

Additional Claims:

Applicant has added claims 18-32 to further protect Applicant's invention. New claims 18-32 have patentable elements not disclosed by the prior art applied by the Examiner. For example, claim 21 includes the step of "access[ing] said plurality of web sites based on said ranking, said computer first accessing said web site having the highest ranking." This feature is not disclosed by the prior art applied by the Examiner.

As another example, claim 22 includes the step of "adjusting said rankings associated with said plurality of web sites such that said web site having said information to be retrieved is assigned the highest ranking and any web sites not having said information to be retrieved are assigned lower rankings." This feature is not disclosed by the prior art applied by the Examiner.

As a further example, claim 23 includes the step of "periodically polling each said web site to determine whether said web site contains said information to be retrieved." This feature is not disclosed by the prior art applied by the Examiner.

As yet a further example, claim 26 includes an instruction set comprising "a content descriptor associated with each said web site address, said content descriptor pre-defining a portion of said web site containing said information to be retrieved." This feature is not disclosed by the prior art applied by the Examiner.

As still a further example, the instruction set of claim 26 further includes "a ranking associated with each said web site address, said ranking indicating the order in which the plurality of pre-selected web sites are accessed." This feature is not disclosed by the prior art applied by the Examiner.

**CONCLUSION**

In view of the above amendments and remarks, Applicant believes claims 1-32 are in position for allowance and respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant has enclosed a Petition for Extension of Time and a fee transmittal to cover the related fees. Should any additional fees be required (except for payment of the issue fee), the Commissioner is authorized to deduct the fees from Kelley Drye & Warren LLP Deposit Account No. 11-0404, Order No. 015749-0015.

Application Number 10/821,690  
Response to Office Action dated July 7, 2005

Respectfully submitted,

By \_\_\_\_\_



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PTO/SB/22 (12-04)

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<b>PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)</b>		Docket Number (Optional)
<b>FY 2005</b>		015749.0015
<i>(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)</i>		

Application Number <b>10/821,690</b>	Filed <b>April 9, 2004</b>
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For **Robust Voice Browser System and Voice Activated Device Controller**

Art Unit <b>2644</b>	Examiner <b>McFadden, Susan</b>
----------------------	---------------------------------

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$120	\$60	\$ _____
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$450	\$225	\$ _____
<input checked="" type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1020	\$510	\$ <u>510</u>
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$1590	\$795	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$2160	\$1080	\$ _____

- Applicant claims small entity status. See 37 CFR 1.27.
- A check in the amount of the fee is enclosed.
- Payment by credit card. Form PTO-2038 is attached.
- The Director has already been authorized to charge fees in this application to a Deposit Account.
- The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 11-0404. I have enclosed a duplicate copy of this sheet.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

- I am the
- applicant/inventor.
  - assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).
  - attorney or agent of record. Registration Number 54,583
  - attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 \_\_\_\_\_

Signature 1/6/06 Date

Scott R. Kaspar Typed or printed name 312-857-7088 Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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01/10/2006 YPOLITE1 00000057 110404 10821690

01/11/2006 YPOLITE1 00000002 110404 10821690

01 FC:2253- 5.00-BA

01 FC:2253 510.00 DA

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PATENT APPLICATION FEE DETERMINATION RECORD						Application or Docket Number <b>101821690</b>					
Substitute for Form PTO-875											
<b>CLAIMS AS FILED – PART I</b>											
(Column 1)		(Column 2)		SMALL ENTITY		OR		OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA		RATE	FEE			RATE	FEE		
BASIC FEE (37 CFR 1.16(a))					\$ _____				\$ _____		
TOTAL CLAIMS (37 CFR 1.16(c))	17	minus 20 =	*	X \$ _____ =				X \$ _____ =			
INDEPENDENT CLAIMS (37 CFR 1.16(b))	1	minus 3 =	*	X \$ _____ =				X \$ _____ =			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))				+ \$ _____ =				+ \$ _____ =			
				TOTAL				TOTAL			
* If the difference in column 1 is less than zero, enter "0" in column 2.											
<b>CLAIMS AS AMENDED – PART II</b>											
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR		OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDI-TIONAL FEE			RATE	ADDI-TIONAL FEE		
Total (37 CFR 1.16(c))	32	Minus	20	=	12	X \$ 25	300	X \$ 50	=		
Independent (37 CFR 1.16(b))	3	Minus	3	=	=	X \$ _____ =		X \$ _____ =			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ \$ _____ =				+ \$ _____ =			
				TOTAL ADD'L FEE	300			TOTAL ADD'L FEE			
(Column 1)		(Column 2)		(Column 3)							
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDI-TIONAL FEE			RATE	ADDI-TIONAL FEE		
Total (37 CFR 1.16(c))	*	Minus	**	=	=	X \$ _____ =		X \$ _____ =			
Independent (37 CFR 1.16(b))	*	Minus	***	=	=	X \$ _____ =		X \$ _____ =			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ \$ _____ =				+ \$ _____ =			
				TOTAL ADD'L FEE				TOTAL ADD'L FEE			
(Column 1)		(Column 2)		(Column 3)							
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDI-TIONAL FEE			RATE	ADDI-TIONAL FEE		
Total (37 CFR 1.16(c))	*	Minus	**	=	=	X \$ _____ =		X \$ _____ =			
Independent (37 CFR 1.16(b))	*	Minus	***	=	=	X \$ _____ =		X \$ _____ =			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))				+ \$ _____ =				+ \$ _____ =			
				TOTAL ADD'L FEE				TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,690	04/09/2004	Alexander Kurganov	47242-00027USC1	1367
	7590	07/07/2005	EXAMINER	
Steve Z Szczepanski-Kelley Drye & Warren LLP Suite 2600 333 West Wacker Drive Chicago, IL 60606			MCFADDEN, SUSAN IRIS	
			ART UNIT	PAPER NUMBER
			2655	

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/821,690	<b>Applicant(s)</b> KURGANOV ET AL.	
	<b>Examiner</b> Susan McFadden	<b>Art Unit</b> 2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1)  Responsive to communication(s) filed on 09 April 2004.
- 2a)  This action is **FINAL**.                      2b)  This action is non-final.
- 3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4)  Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5)  Claim(s) \_\_\_\_\_ is/are allowed.
- 6)  Claim(s) 1-17 is/are rejected.
- 7)  Claim(s) \_\_\_\_\_ is/are objected to.
- 8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9)  The specification is objected to by the Examiner.
- 10)  The drawing(s) filed on 09 April 2004 is/are: a)  accepted or b)  objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a)  All    b)  Some \*    c)  None of:
1.  Certified copies of the priority documents have been received.
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 9 of U.S. Patent No. 6,807,257. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both claim a computer, Internet and Telecommunications based network which comprises: a system for gathering information from information sources connected to a network by using speech commands indicating specific actions to be performed, said system comprising: a voice enabled device employed by users to communicate speech commands indicating specific actions to be performed, said speech commands comprising information requests selectable by the user; a database

operatively connected with a computer said database containing stored digital-form commands for operating said system, a speaker-independent speech recognition device for receiving from users said speech commands indicating specific actions to be performed, said speaker-independent speech recognition device configured to convert said speech commands to data messages, a computer operatively connected with said database and said speech recognition device and configured to match said data messages with said stored digital-form commands and configured to carry out the specific actions indicated by said speech commands, said computer further configured to search information sources connected to a network to gather information from said information sources connected to said network in response to said information requests. Claims 1 and 9 are similar to claim 9 of the US 6807257. Claim 2 is similar to claim 4. Claim 3 is similar to claim 10. Claim 5 is similar to claim 13. Claim 6 is similar to claim 12. Claim 7 is similar to claim 14. Claims 14-17 are similar to claim 15.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-7 and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Perrone (6,157,705).

In regard to claim 1, Perrone shows in Figure 1 B, a system for gathering information from information sources connected to a network by using speech commands indicating specific actions to be performed, said system comprising: a voice enabled device employed by users to communicate speech commands indicating specific actions to be performed (items 2,4), said speech commands comprising information requests selectable by the user; a database operatively connected with a computer said database containing stored digital-form commands for operating said system (col. 6), a speaker-independent speech recognition device for receiving from users said speech commands indicating specific actions to be performed (item 16), said speaker-independent speech recognition device configured to convert said speech commands to data messages (col. 5-6), a computer operatively connected with said database and said speech recognition device and configured to match said data messages with said stored digital-form commands and configured to carry out the specific actions indicated by said speech commands (item 8), said computer further configured to search information sources connected to a network to gather information from said information sources connected to said network in response to said information requests (col. 5-6).

In regard to claim 2, Perrone shows that an Internet network is used (claim 19).

In regard to claim 3, Perrone shows that the information sources can be web sites (col. 20, ln 1-3).

In regard to claim 4, Perrone shows that the voice-enabled device can be a standard telephone (col. 5, Fig 1A, item 10).



In regard to claims 5 and 6, Perrone shows that a speaker independent speech recognizer inherently analyzes phonemes to recognize naturally spoken speech commands (col. 8, ln 4-35).

In regard to claim 7, Perrone show a database that contains a list of information sources connected to the network that can be searched (col. 9, ln 53-60).

In regard to claims 14-17, Perrone shows that information gathered by said system from said information sources in response to said information requests is stored by said database and processed by said computer into a message, said system further configured to transmit said message to said voice enabled device or such other destination as designated by said user (col. 9, ln 1-10), which can be an audio message inherently output from a speech synthesis engine configured to create said audio message (Fig. 1B, item 14), which inherently comprises a pre-recorded audio concatenation application configured to create said audio message.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perrone (cited above).

In regard to claims 8-13, Perrone show the system discussed above. They do not specifically show that the database contains a list of information sources connected to


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the network that can be searched, ranked, and updated. The Examiner takes Official Notice that one of ordinary skill in the art at the time of the invention would know how to store and rank information sources in a database.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan McFadden whose telephone number is 571-272-7621. The examiner can normally be reached on Monday-Friday, 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Susan McFadden  
Primary Examiner  
Art Unit 2655

July 5, 2005

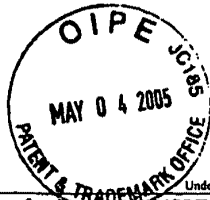


Sheet 1 of 1	Application Number	10/821,690
	Filing Date	April 9, 2004
	First Named Inventor	Kurganov
	Art Unit	2644
	Examiner Date	TBA
	Attorney Docket Number	015749-0015

**NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
JM		MATTHEW TALIN MARX, "Toward Effective Conversational Messaging" (Thesis). As indicated on the cover page, the thesis was presented to the Departmental Committee on Graduate Students, Program in Media Arts and Sciences, School of Architecture and Planning, Massachusetts Institute of Technology on May 12, 1995. According to the web site <a href="http://www.theses.mit.edu/Dienst/Repository/2.0/Body/0018.mit.theses/1995-314/rfc1807bib">http://www.theses.mit.edu/Dienst/Repository/2.0/Body/0018.mit.theses/1995-314/rfc1807bib</a> , attached hereto as Attachment 1, the thesis was indexed on March 21, 2000.	
JM		MATT MARX & CHRIS SCHMANDT, "Mail Call: Message Presentation and Navigation in a Nonvisual Environment," <i>SIGCHI Conference on Human Factors in Computing Systems</i> , Vancouver, B.C., Canada, April 13-18, 1996. As shown on Attachment 2, the web site <a href="http://www.usabilityviews.com/uv001673.html">http://www.usabilityviews.com/uv001673.html</a> shows a date of April 16, 1996. The distribution date is not presently known.	
JM		F. KUBALA, S. AUSTIN, C. BARRY, J. MAKHOUL, P. PLACEWAY & R. SCHWARTZ, "BYBLOS Speech Recognition Benchmark Results," <i>Workshop on Speech &amp; Natural Language</i> , February 19-22, 1991. According to the web site <a href="http://portal.acm.org/citation.cfm?id=112405.112415&amp;coll...">http://portal.acm.org/citation.cfm?id=112405.112415&amp;coll...</a> , attached hereto as Attachment 3, the reference was published in 1991, Morgan Kaufman Publishers, San Francisco, CA. The distribution date is not presently known.	
JM		CHARLES T. HEMPHILL, PHILIP R. THRIFT & JOHN C. LINN, "Speech-Aware Multimedia," <i>IEEE MultiMedia</i> , Spring 1996, Vol. 3, No. 1, pp. 74-78, IEEE. As indicated on the cover page of the journal, a copy of which is attached hereto as Attachment 4, the reference was received by Cornell University on March 25, 1996.	
Examiner Signature: <i>[Signature]</i>	Date Considered: <i>July 1, 2005</i>		

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.  
<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and use by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450  
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Substitute for form P-449/USPTO		<b>Complete if known</b>	
		Application Number	10/821,690
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (Use as many sheets as necessary)		Filing Date	April 9, 2004
		First Named Inventor	Kurganov
		Art Unit	2644
		Examiner Name	TBA
		Attorney Docket Number	015749-0015
Sheet	1 of 3		

**U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup>			
DM		US - 4,585,906	04/29/1986	Matthews	
DM		US - 4,926,462	05/15/1990	Ladd	
DM		US - 4,811,381	03/07/1989	Woo	
DM		US - 4,850,012	07/18/1989	Mehta	
DM		US - 4,481,574	11/06/1984	DeFind	
DM		US - 4,489,438	12/18/1984	Hughes	
DM		US - 4,792,968	12/20/1988	Katz	
DM		US - 4,748,656	05/31/1988	Gibbs	
DM		US - 4,893,335	01/09/1990	Fuller	
DM		US - 4,747,127	05/24/1988	Hansen	
DM		US - 4,755,932	07/05/1988	Diedrich	
DM		US - 4,782,517	11/01/1988	Bernardis	
DM		US - 4,922,520	05/01/1990	Bernard	
DM		US - 4,930,150	05/29/1990	Katz	
DM		US - 5,054,054	10/01/1991	Pessia	
DM		US - 5,133,004	07/21/1992	Heileman, Jr.	
DM		US - 4,799,144	01/17/1989	Parruch	
DM		US - 4,852,149	07/25/1989	Zurich	
DM		US - 4,879,743	11/07/1989	Burke	
DM		US - 4,903,289	02/20/1990	Hashimoto	
DM		US - 4,985,913	01/15/1991	Shalom	
DM		US - 4,996,704	02/26/1991	Brunsen	
DM		US - 5,003,577	03/26/1991	Ertz	

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Sheet 3 of 3	Application Number	10/821,690
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	Examiner Date	TBA
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JM		YANG, C., "INETPhone - Telephone Services and Servers on the Internet," April 1995, University of North Texas, pp. 1-6.	
JM		ROBERT J. PERDUE & EUGENE L. RISSANEN, "Conversant® 1 Voice System: Architecture and Applications," July 17, 1986, AT&T Technical Journal, pp. 1-14.	
Examiner Signature: JM		Date Considered: July 1, 2008	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609, Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and use by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

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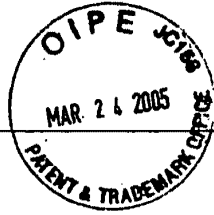
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DM		DAX Systems, Inc., Press Release, "Speech Recognition Success in DAX's Grasp," Nov. 22, 1995, pp. 1-2, Pine Brook, NJ.	
DM		AT&T, Press Release, "AT&T customers can teach systems to listen and respond to voice," Jan. 17, 1995, pp. 1-2, Basking Ridge, NJ., available at <a href="http://www.lucent.com/press/0195/950117.gbb.html">www.lucent.com/press/0195/950117.gbb.html</a> (accessed Mar. 15, 2005).	
DM		MARCO SARTORI, "Speech Recognition," April 1995, pp. 1-9, Mercury Communications, available at <a href="http://www.gare.co.uk/technology_watch/speech.htm">www.gare.co.uk/technology_watch/speech.htm</a> (accessed Mar. 15, 2005).	
DM		JUDITH MARKOWITZ, "The ultimate computer input device may be right under your nose," <i>Byte</i> , December 1995, pp. 1-13, available at <a href="http://www.byte.com/art/9512/sec8/art1.htm">www.byte.com/art/9512/sec8/art1.htm</a> (accessed Mar. 15, 2005).	
Examiner Signature:	DM	Date Considered:	7-1-05

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Sheet 1 of 1	Application Number	10/821,690
	Filing Date	April 9, 2004
	First Named Inventor	Kurganov
	Art Unit	2644
	Examiner Date	TBA
	Attorney Docket Number	47242-00027USC1 (015749-0015)

NON PATENT LITERATURE DOCUMENTS			
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DM		"Wildfire Communications, Inc.," Harvard Business School, March 21, 1996, Publ. No. 9-396-305, pp. 1-22.	
Examiner Signature:	DM	Date Considered:	7-1-08

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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (Use as many sheets as necessary)		Application Number	10/821,690
		Filing Date	April 9, 2004
		First Named Inventor	Kurganov
		Art Unit	2644
		Examiner Name	TBA
Sheet 1 of 1	Attorney Docket Number	47242-00027USC1	

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup>			
DM		US - 5,291,479	03-01-1994	Vaziri	
DM		US - 5,307,399	04-26-1994	Dai	
DM		US - 5,559,859	09-24-1996	Dai	

FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup>	Number <sup>4</sup> - Kind Code <sup>5</sup>				

Examiner Signature: <i>[Signature]</i>	Date Considered: <i>[Date]</i>
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Substitute for form 1449/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>		Application Number	10/821,690
		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
		Attorney Docket Number	47242-00027USC1
Sheet 1	of 13		

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
JM		US- 3,728,486	04-17-1973	Kraus	
JM		US- 4,058,838	11-15-1997	Crager	
JM		US- 4,313,035	01/26/1982	Jordan	
JM		US- 4,327,251	04-27-1987	Fomenko	
JM		US- 4,340,783	07-20-1982	Sugiyama	
JM		US- 4,371,752	02-01-1983	Matthews	
JM		US- 4,500,751	02-19-1985	Darland	
JM		US- 4,513,390	04-23-1985	Walter	
JM		US- 4,523,055	06-11-1985	Hohl	
JM		US- 4,549,047	10-22-1985	Brian	
JM		US- 4,584,434	04-22-1986	Hashimoto	
JM		US- 4,585,906	04-29-1986	Matthews	
JM		US- 4,596,900	06-24-1986	Jackson	
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JM		US- 4,602,129	07-32-1986	Matthews	
JM		US- 4,635,253	01-06-1987	Urui	
JM		US- 4,652,700	03-24-1987	Matthews	
JM		US- 4,696,028	09-22-1987	Morganstein	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> * Number <sup>4</sup> * Kind Code <sup>5</sup> (if known)				
JM		GB 2211698	07-05-1989			
JM		GB 2240693	08-07-1991			
JM		JP 1-258526	10-16-1989			✓
JM		WO 9107838	05-30-1991			
JM		WO 9118466	11-28-1991			
JM		CA 1329852	05-24-94			

Examiner Signature	<i>[Signature]</i>	Date Considered	7-1-04
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Substitute for form 1449/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>		Application Number	10/821,690
		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
		Attorney Docket Number	47242-00027USC1
Sheet <u>2</u>	of <u>13</u>		

U. S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code <sup>2</sup> (if known)			
DM		US-	4,713,837	12-15-1987	Gordon	
DM		US-	4,748,656	05-31-1988	Gibbs	
DM		US-	4,757,525	07-12-1988	Matthews	
DM		US-	4,761,807	08-02-1988	Matthews	
DM		US-	4,763,317	08-09-1988	Lehman	
DM		US-	4,769,719	09-06-1988	Endo	
DM		US-	4,776,016	10-04-1988	Hansen	
DM		US-	4,809,321	02-28-1989	Morganstein	
DM		US-	4,837,798	06-06-1989	Cohen	
DM		US-	4,847,891	07-11-1989	Kotani	
DM		US-	4,850,012	07-18-1989	Mehta	
DM		US-	4,866,758	09-12-1989	Heinzelmann	
DM		US-	4,873,719	10-10-1989	Reese	
DM		US-	4,893,333	01-09-1990	Baran	
DM		US-	4,905,273	02-27-1990	Gordon	
DM		US-	4,907,079	03-01-1990	Turner	
DM		US-	4,918,722	04-17-1990	Buehren	
DM		US-	4,922,518	05-01-1990	Gordon	
DM		US-	4,922,526	05-01-1990	Morganstein	

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Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>3</sup>
		Country Code <sup>4</sup>	Number <sup>4</sup> Kind Code <sup>5</sup> (if known)				
DM		WO	9609710	03-28-1996			
DM		WO	9823058	05-28-1998			

Examiner Signature	<i>James W. Janda</i>	Date Considered	7-1-08
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JM		US- 4,933,966	06-12-1990	Hird	
JM		US- 4,935,955	06-19-1990	Neudorker	
JM		US- 4,935,958	06-19-1990	Morganstein	
JM		US- 4,941,170	07-10-1990	Herbst	
JM		US- 4,953,204	08-28-1990	Cuschleg Jr.	
JM		US- 4,955,047	09-04-1990	Morganstein	
JM		US- 4,956,835	09-11-1990	Grover	
JM		US- 4,967,288	10-30-1990	Mizutori	
JM		US- 4,972,462	11-20-1990	Shibata	
JM		US- 4,974,254	11-27-1990	Perine	
JM		US- 4,975,941	12-04-1990	Morganstein	
JM		US- 4,994,926	02-01-1991	Gordon	
JM		US- 5,003,575	03-26-1991	Chamberlin	
JM		US- 5,008,926	04-16-1991	Misholi	
JM		US- 5,020,095	05-28-1991	Morganstein	
JM		US- 5,207,384	06-25-1991	Morganstein	
JM		US- 5,029,196	07-02-1991	Morganstein	
JM		US- 5,065,254	11-12-1991	Hishidi	
JM		US- 5,086,385	02-04-1991	Launey	

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Sheet <u>4</u> of <u>13</u>													

U. S. PATENT DOCUMENTS					
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		Number-Kind Code <sup>2</sup> (if known)	MM-DD-YYYY		
JM		US- 5,095,445	03-10-1992	Sekiguchi	
JM		US- 5,099,509	03-24-1992	Morganstein	
JM		US- 5,109,405	04-28-1992	Morganstein	
JM		US- 5,131,024	07-14-1992	Pugh	
JM		US- 5,145,452	09-08-1992	Pekarske	
JM		US- 5,166,974	11-24-1992	Morganstein	
JM		US- 5,193,110	03-09-1993	Jones	
JM		US- 5,195,086	03-16-1993	Baumgartner	
JM		US- 5,233,600	08-03-1993	Pekarske	
JM		US- 5,243,645	09-07-1993	Bissell	
JM		US- 5,249,219	09-28-1993	Morganstein	
JM		US- 5,263,084	11-16-1993	Chaput	
JM		US- 5,291,302	03-01-1994	Gordon	
JM		US- 5,303,298	04-12-1994	Morganstein	
JM		US- 5,309,504	05-03-1994	Morganstein	
JM		US- 5,325,421	06-01-1994	Hou	
JM		US- 5,327,486	07-05-1994	Wolff	
JM		US- 5,327,529	07-01-1994	Fults	
JM		US- 5,329,578	07-12-1994	Brennan	

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		Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)	MM-DD-YYYY			

Examiner Signature: <i>[Signature]</i>	Date Considered: <i>7-2-05</i>
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Sheet <u>5</u> of <u>13</u>													

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JM		US- 5,333,266	07-26-1994	Boaz	
JM		US- 5,347,574	09-13-1994	Morganstein	
JM		US- 5,355,403	10-11-1994	Richardson, Jr.	
JM		US- 5,365,524	11-15-1994	Hiller	
JM		US- 5,375,161	12-01-1994	Fuller	
JM		US- 5,384,771	01-24-1995	Isidoro	
JM		US- 5,404,231	04-01-1995	Bloomfield	
JM		US- 5,408,526	04-18-1995	McFarland	
JM		US- 5,414,754	05-09-1995	Pugh	
JM		US- 5,436,963	07-25-1995	Fitzpatrick	
JM		US- 5,459,584	10-17-1995	Gordon	
JM		US- 5,463,684	10-31-1995	Morduch	
JM		US- 5,475,791	12-01-1995	Schalk	
JM		US- 5,495,484	02-27-1996	Self	
JM		US- 5,497,373	03-05-1996	Hulen	
JM		US- 5,499,288	03-01-1996	Hunt	
JM		US- 5,517,558	05-01-1996	Schalk	
JM		US- 5,555,100	09-01-1996	Bloomfield	
JM		US- 5,559,611	09-11-1996	Bloomfield	

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Examiner Signature <i>James M. Fahl</i>	Date Considered 7-1-05
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Sheet 6 of 13		

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DM		US- 5,566,236	10-15-1996	MeLampby	
DM		US- 5,603,031	02-11-1997	White	
DM		US- 5,608,786	03-01-1997	Gordon	
DM		US- 5,610,970	03-01-1997	Fuller	
DM		US- 5,611,031	03-11-1997	Hertzfield	
DM		US- 5,652,789	07-29-1997	Miner	
DM		US- 5,659,597	08-01-1997	Bareis	
DM		US- 5,666,401	09-09-1997	Morganstein	
DM		US- 5,675,507	10-01-1997	Bobo II	
DM		US- 5,675,811	10-07-1997	Broedner	
DM		US- 5,689,669	11-18-1997	Lynch	
DM		US- 5,692,187	11-25-1997	Goldman	
DM		US- 5,719,921	02-01-1998	Vysotsky	
DM		US- 5,724,408	03-03-1998	Morganstein	
DM		US- 5,742,905	04-01-1998	Pepe	
DM		US- 5,752,191	05-01-1998	Fuller	
DM		US- 5,787,298	07-28-1998	Broedner	
DM		US- 5,793,993	03-11-1998	Broedner	
DM		US- 5,809,282	09-15-1998	Cooper	

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JM		US- 5,819,306	10-06-1998	Goldman	
JM		US- 5,822,727	10-13-1998	Garberg	
JM		US- 5,832,063	11-03-1998	Vysotsky	
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FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	†
		Country Code <sup>3</sup> *Number <sup>4</sup> *Kind Code <sup>5</sup> (if known)				

Examiner Signature		Date Considered	7-1-05
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Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE                  STATEMENT BY APPLICANT</b> (Use as many sheets as necessary)	<b>Complete if Known</b>	
	Application Number	10/821,690
	Filing Date	04-09-2004
	First Named Inventor	Kurganov
	Art Unit	TBA
	Examiner Name	TBA
Sheet <u>8</u> of <u>13</u>	Attorney Docket Number	47242-00027USC1

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
JM		US- 6,038,305	03-01-2000	McAllister	
JM		US- 6,047,053	04-01-2000	Miner	
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FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	* <sup>6</sup>
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		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 10	of 13	Attorney Docket Number	47242-00027USC1

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
DM		"A PABX that Listens and Talks," Speech Technology, January/February 1984, pp. 74-79.	
DM		MAEDA, ET AL., "An Intelligent Customer-Controlled Switching System," IEEE Global Telecommunications Conference, Hollywood, Florida, Nov. 28-Dec. 1 1988, pp. 1499-1503.	
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Examiner Signature	<i>Susan McFadden</i>	Date Considered	<i>7-1-04</i>
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		Filing Date	04-09-2004
		First Named Inventor	Kurganov
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		Examiner Name	TBA
		Attorney Docket Number	47242-00027USC1
Sheet	11	of	13

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JM		"GLOBECOM '85 IEEE Global Telecommunications Conference, " New Orleans, La., December 2-5, 1985, pp. 1295-1300.	
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Examiner Signature		Date Considered	7-1-05
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		Examiner Name	TBA
		Attorney Docket Number	47242-00027USC1
Sheet	12	of	13

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DM		"WordPerfect: New Telephony Features Boost Office", WordPerfect Office TechBrief, 1994, Info-World Publg. Co., Vol. 10, Issue 2, pp. 2-3.	
DM		Internet web page, "Wildfire Communications, Inc.", November 5, 1997, including the following URL addresses:	
DM	✓	<a href="http://www.wildfire.com">http://www.wildfire.com</a> (1 pg);	
DM	-	<a href="http://www.wildfire.com/consumerhome.html">http://www.wildfire.com/consumerhome.html</a> (2 pgs.);	
DM		<a href="http://www.wildfire.com/106.html">http://www.wildfire.com/106.html</a> (2pgs.);	
DM		<a href="http://www.wildfire.com/carrierhome.html">http://www.wildfire.com/carrierhome.html</a> (2pgs.);	
DM	1.	<a href="http://www.wildfire.com/sfandb.html">http://www.wildfire.com/sfandb.html</a> (3 pgs.);	
DM		<a href="http://www.wildfire.com/about.html">http://www.wildfire.com/about.html</a> (1 pg.);	
DM		<a href="http://www.wildfire.com/abtmgmt.html">http://www.wildfire.com/abtmgmt.html</a> (3 pgs.);	
DM		<a href="http://www.wildfire.com/scoop.html">http://www.wildfire.com/scoop.html</a> (2 pgs.); and	

Examiner Signature	<i>[Signature]</i>	Date Considered	7-1-05
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**Index of Claims**



Application No.

10/821,690

Examiner

Susan McFadden

Applicant(s)

KURGANOV ET AL.

Art Unit

2655

	Rejected
=	Allowed

-	(Through numeral) Cancelled
+	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claim		Date									
Final	Original	7/5/05									
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**\*BIBDATASHEET\***

**CONFIRMATION NO. 1367**

Bib Data Sheet

SERIAL NUMBER 10/821,690	FILING DATE 04/09/2004  RULE	CLASS 704	GROUP ART UNIT 2655	ATTORNEY DOCKET NO. 47242-00027USC1	
<p>APPLICANTS</p> <p>Alexander Kurganov, Buffalo Grove, IL;                  Valery Zhukoff, Deerfield, IL;</p> <p>** CONTINUING DATA *****                  This application is a CON of 09/776,996 02/05/2001 PAT 6,721,705 <i>LM</i>                  which claims benefit of 60/180,344 02/04/2000                  and claims benefit of 60/233,068 09/15/2000</p> <p>** FOREIGN APPLICATIONS *****</p> <p>IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY **                  ** 06/24/2004</p>					
Foreign Priority claimed <input type="checkbox"/> yes <input checked="" type="checkbox"/> no 35 USC 119 (a-d) conditions <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Met after met Verified and Acknowledged <i>Allowance</i> Examiner's Signature <i>[Signature]</i> Initials <i>[Initials]</i>		STATE OR COUNTRY IL	SHEETS DRAWING 4	TOTAL CLAIMS 17	INDEPENDENT CLAIMS 1
<p>ADDRESS</p> <p>Steve Z Szczepanski-Kelley Drye &amp; Warren LLP                  Suite 2600                  333 West Wacker Drive                  Chicago , IL                  60606</p>					
<p>TITLE</p> <p>Robust voice browser system and voice activated device controller</p>					
FILING-FEE	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees ( Filing ) <input type="checkbox"/> 1.17 Fees ( Processing Ext. of		



<b>Notice of References Cited</b>	Application/Control No. 10/821,690	Applicant(s)/Patent Under Reexamination KURGANOV ET AL.	
	Examiner Susan McFadden	Art Unit 2655	Page 1 of 1

**U.S. PATENT DOCUMENTS**

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
A	US-6,081,782	06-2000	Rabin, Michael D.	704/275
B	US-6,157,705	12-2000	Perrone, Jeffrey	379/88.01
C	US-6,185,535	02-2001	Hedin et al.	704/270
D	US-6,230,132	05-2001	Class et al.	704/270
E	US-6,501,966	12-2002	Bareis et al.	455/563
F	US-6,807,257	10-2004	Kurganov, Alex	379/88.22
G	US-			
H	US-			
I	US-			
J	US-			
K	US-			
L	US-			
M	US-			

**FOREIGN PATENT DOCUMENTS**

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
N					
O					
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**NON-PATENT DOCUMENTS**

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\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

## WEST Search History

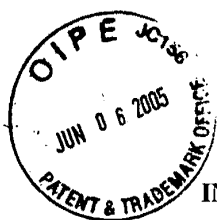




DATE: Tuesday, July 05, 2005

Hide?	<u>Set</u> <u>Name</u>	<u>Query</u>	<u>Hit</u> <u>Count</u>
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<input type="checkbox"/>	L5	L4 and (information adj sources or web adj site)	3
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<input type="checkbox"/>	L3	L1 and (request or search)	10
<input type="checkbox"/>	L2	L1 and browser	4
<input type="checkbox"/>	L1	(speech or voice) adj commands and speaker-independent adj speech adj recognition and database and (network or Internet)	10

END OF SEARCH HISTORY



*Handwritten initials*

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
Kurganov

Atty Docket: 47242-  
00027USC1;  
(015749-0015)

Serial No.: 10/821,690

Art Unit: 2644

Filed: April 9, 2004

Examiner: Unknown

Title: ROBUST VOICE BROWSER SYSTEM AND  
VOICE ACTIVATED DEVICE  
CONTROLLER

NINTH INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.97 and 1.98

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

<b>CERTIFICATE OF MAILING</b> 37 C.F.R. § 1.8	
I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below:	
Date <u>6/3/05</u>	<u><i>[Signature]</i></u> Signature

Dear Commissioner:

In compliance with the duty of disclosure under 37 C.F.R. § 1.56, it is respectfully requested that the present Information Disclosure Statement be entered and the references listed on attached Form PTO/SB/08B be considered by the Examiner and made of record.

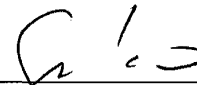
In accordance with 37 C.F.R. §§ 1.97(g) and (h), this Information Disclosure Statement is not to be construed as a representation that a search has been made, and is not to be construed to be an admission that the information disclosed is, or is considered to be, prior art with respect to the present application or material to patentability as defined in 37 C.F.R. § 1.56.

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Respectfully submitted,

6/3/05  
\_\_\_\_\_  
Date

  
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Scott R. Kaspar  
Reg. No. 54,583  
Kelley Drye & Warren LLP  
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Chicago, IL 60606  
(312) 857-7070  
(312) 857-7095 (Fax)  
Attorneys for Applicant



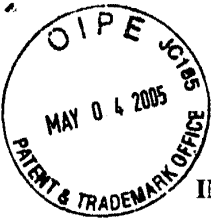


Application Number	10/821,690
Filing Date	April 9, 2004
First Named Inventor	Kurganov
Art Unit	2644
Examiner Date	TBA
Attorney Docket Number	015749-0015
Sheet 1 of 1	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		MATTHEW TALIN MARX, "Toward Effective Conversational Messaging" (Thesis). As indicated on the cover page, the thesis was presented to the Departmental Committee on Graduate Students, Program in Media Arts and Sciences, School of Architecture and Planning, Massachusetts Institute of Technology on May 12, 1995. According to the web site <a href="http://www.theses.mit.edu/Dienst/Repository/2.0/Body/0018.mit.theses/1995-314/rfc1807bib">http://www.theses.mit.edu/Dienst/Repository/2.0/Body/0018.mit.theses/1995-314/rfc1807bib</a> , attached hereto as Attachment 1, the thesis was indexed on March 21, 2000.	
		MATT MARX & CHRIS SCHMANDT, "Mail Call: Message Presentation and Navigation in a Nonvisual Environment," <i>SIGCHI Conference on Human Factors in Computing Systems</i> , Vancouver, B.C., Canada, April 13-18, 1996. As shown on Attachment 2, the web site <a href="http://www.usabilityviews.com/uv001673.html">http://www.usabilityviews.com/uv001673.html</a> shows a date of April 16, 1996. The distribution date is not presently known.	
		F. KUBALA, S. AUSTIN, C. BARRY, J. MAKHOUL, P. PLACEWAY & R. SCHWARTZ, "BYBLOS Speech Recognition Benchmark Results," <i>Workshop on Speech &amp; Natural Language</i> , February 19-22, 1991. According to the web site <a href="http://portal.acm.org/citation.cfm?id=112405.112415&amp;coll...">http://portal.acm.org/citation.cfm?id=112405.112415&amp;coll...</a> , attached hereto as Attachment 3, the reference was published in 1991, Morgan Kaufman Publishers, San Francisco, CA. The distribution date is not presently known.	
		CHARLES T. HEMPHILL, PHILIP R. THRIFT & JOHN C. LINN, "Speech-Aware Multimedia," <i>IEEE MultiMedia</i> , Spring 1996, Vol. 3, No. 1, pp. 74-78, IEEE. As indicated on the cover page of the journal, a copy of which is attached hereto as Attachment 4, the reference was received by Cornell University on March 25, 1996.	
Examiner Signature:		Date Considered:	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.  
<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and use by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450  
 If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

IFW



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
Kurganov

Atty Docket: 47242-  
00027USC1;  
(015749-0015)

Serial No.: 10/821,690

Art Unit: 2644


Filed: April 9, 2004

Examiner: Unknown

Title: ROBUST VOICE BROWSER SYSTEM AND  
VOICE ACTIVATED DEVICE  
CONTROLLER

EIGHTH INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.97 and 1.98

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

<b>CERTIFICATE OF MAILING</b> 37 C.F.R. § 1.8	
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<u>05-02-2005</u> Date	 Signature

Dear Commissioner:

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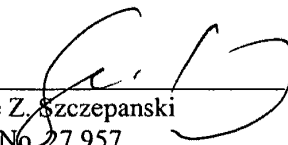
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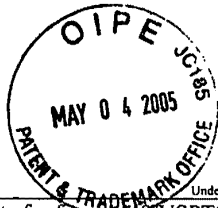
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Respectfully submitted,

05-02-2005  
Date

  
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Attorneys for Applicant



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Substitute for form 1449/USPTO		<b>Complete if known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (Use as many sheets as necessary)		Application Number	10/821,690
		Filing Date	April 9, 2004
		First Named Inventor	Kurganov
		Art Unit	2644
		Examiner Name	TBA
Sheet 1 of 3	Attorney Docket Number	015749-0015	

**U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup>			
		US - 4,585,906	04/29/1986	Matthews	
		US - 4,926,462	05/15/1990	Ladd	
		US - 4,811,381	03/07/1989	Woo	
		US - 4,850,012	07/18/1989	Mehta	
		US - 4,481,574	11/06/1984	DeFind	
		US - 4,489,438	12/18/1984	Hughes	
		US - 4,792,968	12/20/1988	Katz	
		US - 4,748,656	05/31/1988	Gibbs	
		US - 4,893,335	01/09/1990	Fuller	
		US - 4,747,127	05/24/1988	Hansen	
		US - 4,755,932	07/05/1988	Diedrich	
		US - 4,782,517	11/01/1988	Bernardis	
		US - 4,922,520	05/01/1990	Bernard	
		US - 4,930,150	05/29/1990	Katz	
		US - 5,054,054	10/01/1991	Pessia	
		US - 5,133,004	07/21/1992	Heileman, Jr.	
		US - 4,799,144	01/17/1989	Parruch	
		US - 4,852,149	07/25/1989	Zurich	
		US - 4,879,743	11/07/1989	Burke	
		US - 4,903,289	02/20/1990	Hashimoto	
		US - 4,985,913	01/15/1991	Shalom	
		US - 4,996,704	02/26/1991	Brunsen	
		US - 5,003,577	03/26/1991	Ertz	



		Application Number	10/821,690
		Filing Date	April 9, 2004
		First Named Inventor	Kurganov
		Art Unit	2644
		Examiner Date	TBA
Sheet	3 of 3	Attorney Docket Number	015749-0015

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Examiner Initials*	Cite No. <sup>1</sup>	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		YANG, C., "INETPhone – Telephone Services and Servers on the Internet," April 1995, University of North Texas, pp. 1-6.	
		ROBERT J. PERDUE & EUGENE L. RISSANEN, "Conversant® 1 Voice System: Architecture and Applications," July 17, 1986, AT&T Technical Journal, pp. 1-14.	
Examiner Signature:		Date Considered:	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and use by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.



IFW

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
Kurganov

Atty Docket: 47242-  
00027USC1;  
(015749-0015)

Serial No.: 10/821,690

Art Unit: 2644


Filed: April 9, 2004

Examiner: Unknown

Title: ROBUST VOICE BROWSER SYSTEM AND  
VOICE ACTIVATED DEVICE  
CONTROLLER

SEVENTH INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.97 and 1.98

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

<p>CERTIFICATE OF MAILING 37 C.F.R. § 1.8</p> <p>I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below:</p> <p style="text-align: center;"><u>4-5-05</u></p> <p>Date <span style="float: right;"></span></p>	
--	--

Dear Commissioner:

In compliance with the duty of disclosure under 37 C.F.R. § 1.56, it is respectfully requested that the present Information Disclosure Statement be entered and the references listed on attached Form PTO/SB/08A be considered by the Examiner and made of record.

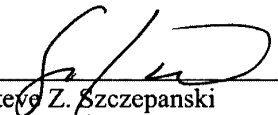
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Respectfully submitted,

4-5-05  
Date

  
Steve Z. Szczepanski  
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Attorneys for Applicant







JFW

PATENT

THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
Kurganov

Atty Docket: 47242-  
00027USC1;  
(015749-0015)

Serial No.: 10/821,690

Art Unit: 2644


Filed: April 9, 2004

Examiner: Unknown

Title: ROBUST VOICE BROWSER SYSTEM AND  
VOICE ACTIVATED DEVICE  
CONTROLLER

SIXTH INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.97 and 1.98

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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3-25-05 Date	 Signature

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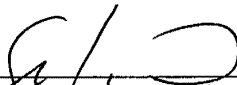
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Respectfully submitted,

3-25-05  
Date

  
\_\_\_\_\_  
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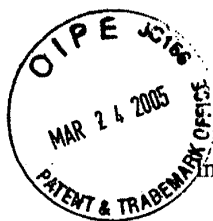
	Application Number	10/821,690
	Filing Date	April 9, 2004
	First Named Inventor	Kurganov
	Art Unit	2644
	Examiner Date	TBA
	Attorney Docket Number	015749-0015
Sheet	1	of 1

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
		DAX Systems, Inc., Press Release, "Speech Recognition Success in DAX's Grasp," Nov. 22, 1995, pp. 1-2, Pine Brook, NJ.	
		AT&T, Press Release, "AT&T customers can teach systems to listen and respond to voice," Jan. 17, 1995, pp. 1-2, Basking Ridge, NJ., available at <a href="http://www.lucent.com/press/0195/950117.gbb.html">www.lucent.com/press/0195/950117.gbb.html</a> (accessed Mar. 15, 2005).	
		MARCO SARTORI, "Speech Recognition," April 1995, pp. 1-9, Mercury Communications, available at <a href="http://www.gare.co.uk/technology_watch/speech.htm">www.gare.co.uk/technology_watch/speech.htm</a> (accessed Mar. 15, 2005).	
		JUDITH MARKOWITZ, "The ultimate computer input device may be right under your nose," <i>Byte</i> , December 1995, pp. 1-13, available at <a href="http://www.byte.com/art/9512/sec8/art1.htm">www.byte.com/art/9512/sec8/art1.htm</a> (accessed Mar. 15, 2005).	
Examiner Signature:		Date Considered:	

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PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
Kurganov

Atty Docket: 47242-  
00027USC1;  
(015749-0015)

Serial No.: 10/821,690

Art Unit: 2644

Filed: April 9, 2004

Examiner: Unknown

Title: COMPUTER, INTERNET AND  
TELECOMMUNICATIONS BASED  
NETWORK

FIFTH INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§ 1.97 and 1.98

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

<p>CERTIFICATE OF MAILING 37 C.F.R. § 1.8</p> <p>I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below:</p> <p><u>3-21-05</u> <u>M. Hammonds</u></p> <p>Date <span style="float: right;">Signature</span></p>	
--	--

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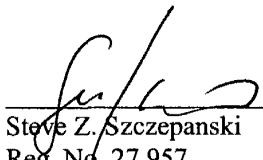
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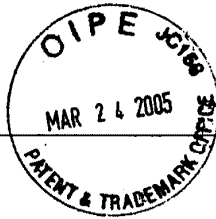
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Respectfully submitted,

3-21-2005  
Date

  
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Sheet   of	Application Number	10/821,690
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		"Wildfire Communications, Inc.," Harvard Business School, March 21, 1996, Publ. No. 9-396-305, pp. 1-22.	
Examiner Signature:		Date Considered:	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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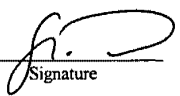
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Kurganov	Atty Docket:	47242-00027USC1
Serial No.:	10/821,690	Art Unit:	2644
Filed:	April 9, 2004	Examiner:	Unknown
Title:	ROBUST VOICE BROWSER AND VOICE ACTIVATED DEVICE CONTROLLER		

FOURTH INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §§1.97 and 1.98

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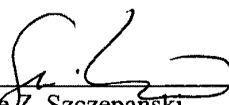


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Respectfully submitted,

3-16-2005  
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PATENT

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Serial No.:	10/821,690	Art Unit:	2644
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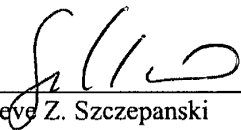
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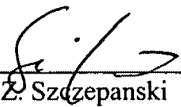


communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the present statement, as evidenced by the enclosed search report dated November 16, 2004 for European Patent Application No. 00905896.7.

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Respectfully submitted,

12-01-04  
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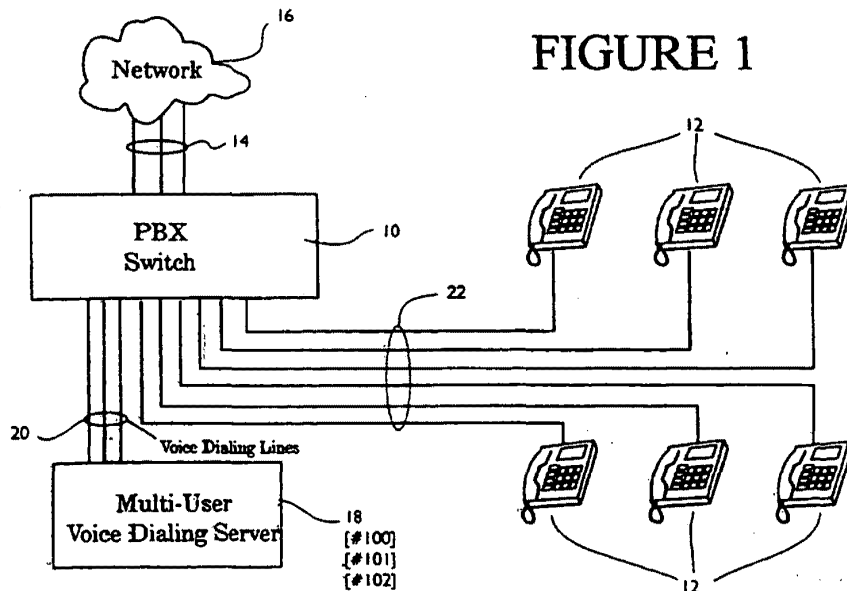
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(54) Voice dialling server for branch exchange telephone systems

(57) The voice dialling server plugs into one or more unused extensions of a branch exchange system to provide each of the users on the system with voice dialling services. To use the system a user simply dials the extension to which the server is attached. The server then prompts the user to supply the name of a party to be called. The name is then looked up in a telephone number dictionary unique to that user. The system then places the telephone call by sending commands to the branch exchange system that simulate the operations a user would perform to connect to an outside line or inside extension and then place the call. The server incorporates a speech processing module having a multistage word recognizer that represents speech in terms of high phoneme similarity values. This representation is highly compact, allowing the word recognizer to perform the recognizer and fine match stages with far less processor overhead than frame-by-frame speech recognizers.



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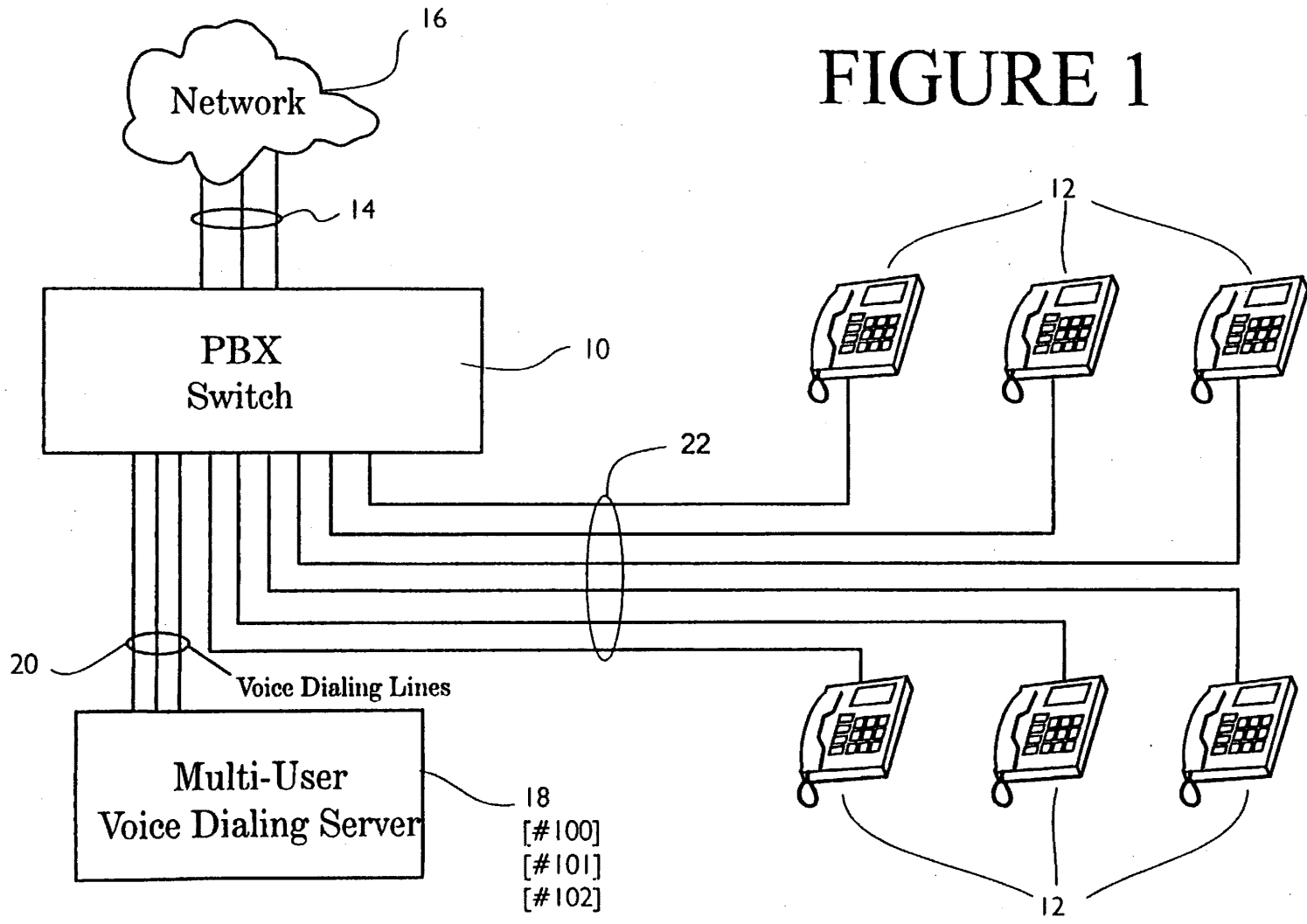


FIGURE 1

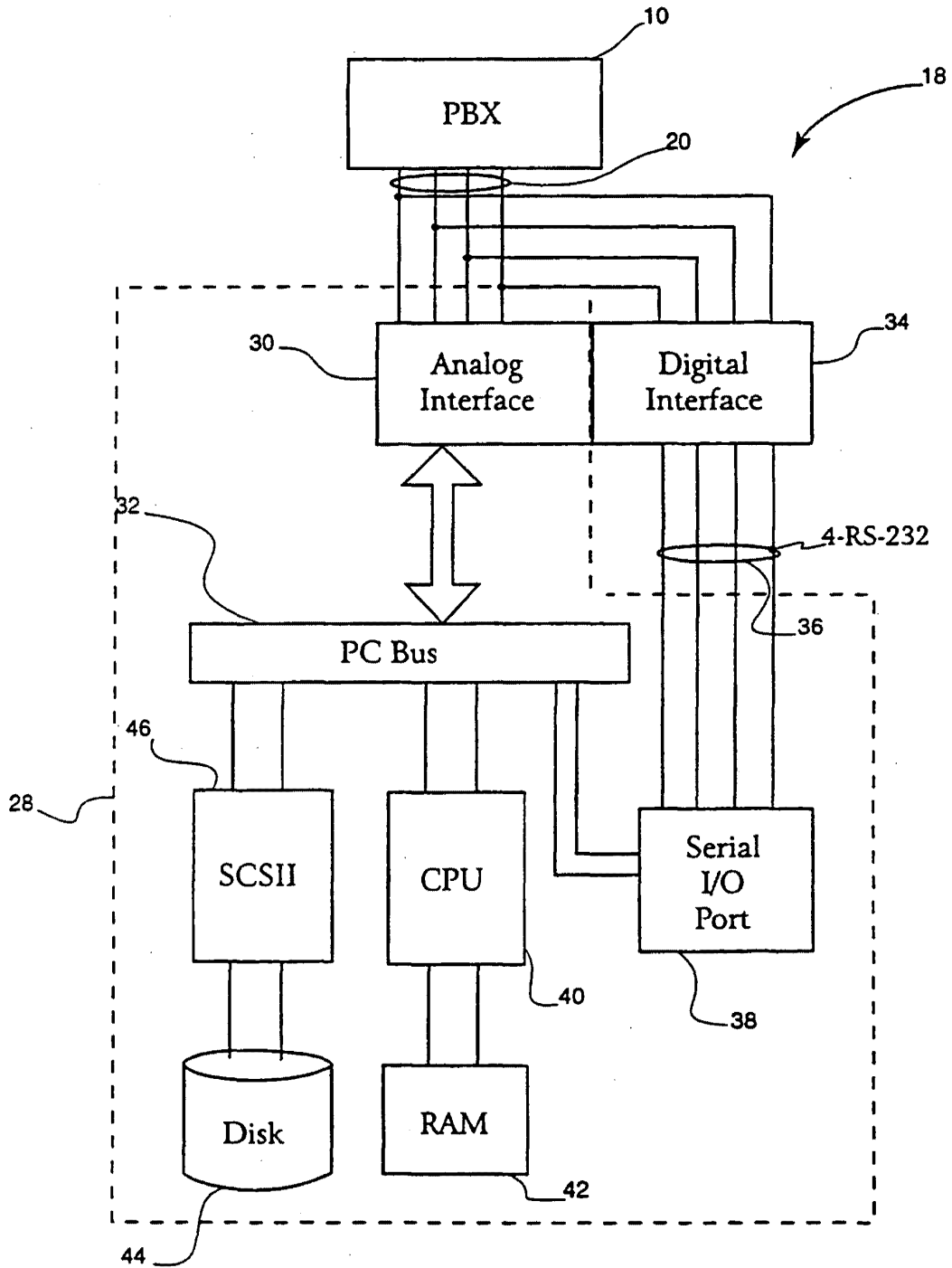


Figure 2

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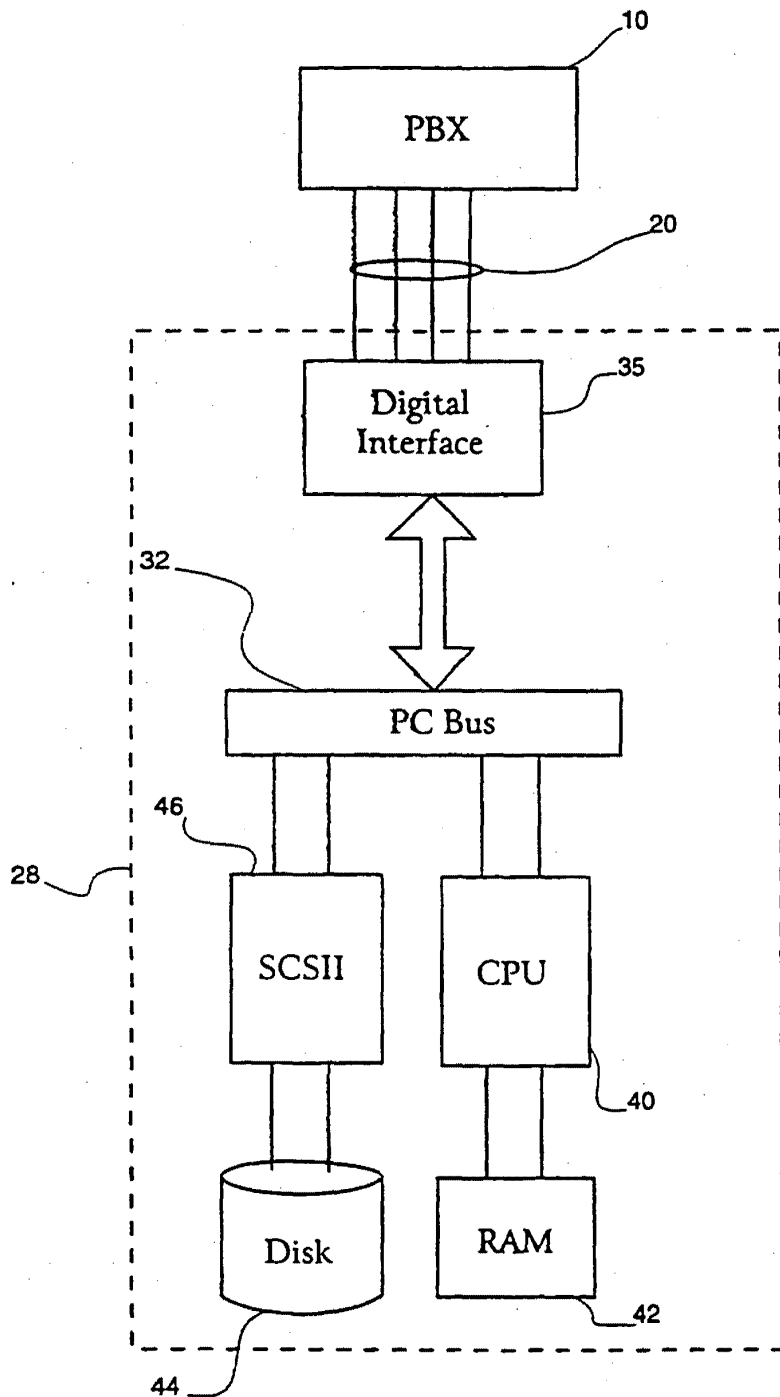


Figure 3

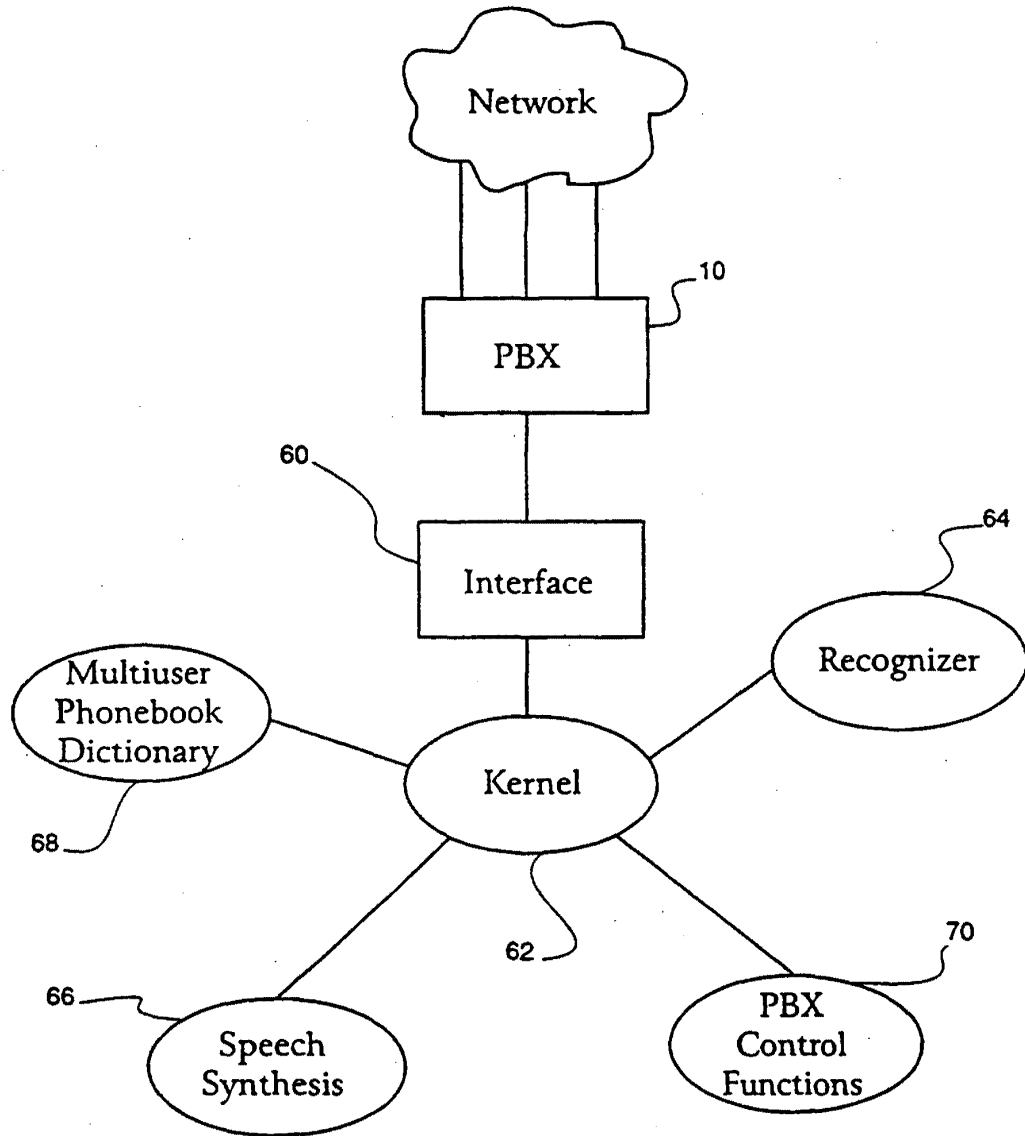
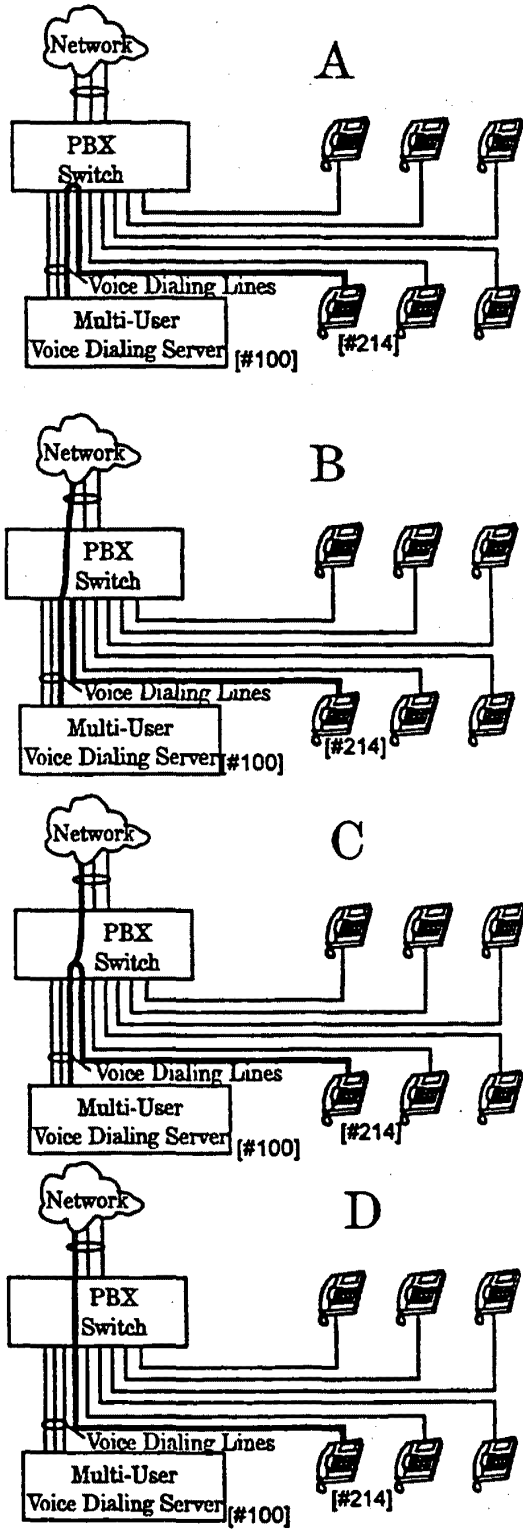
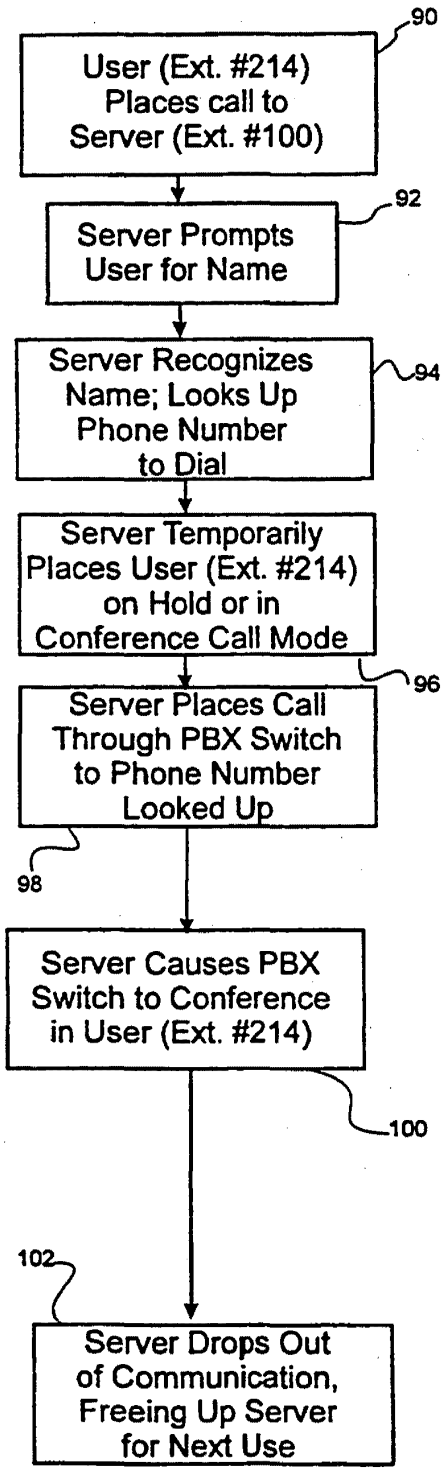


Figure 4

# FIGURE 5



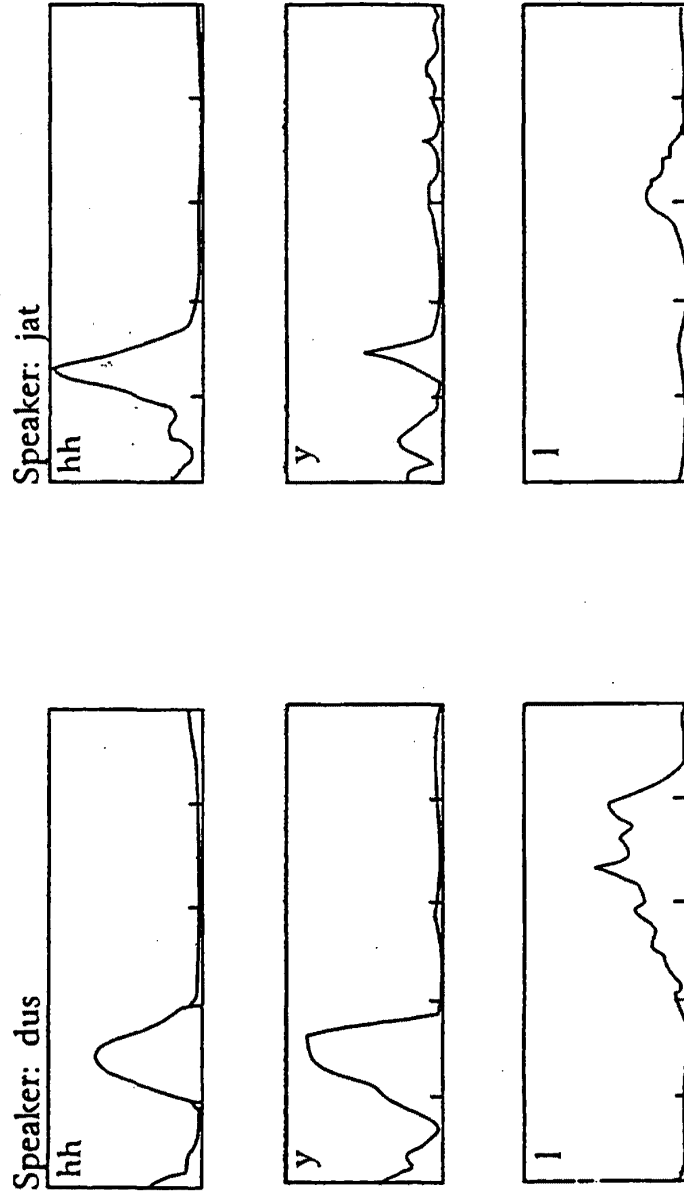


Figure 6

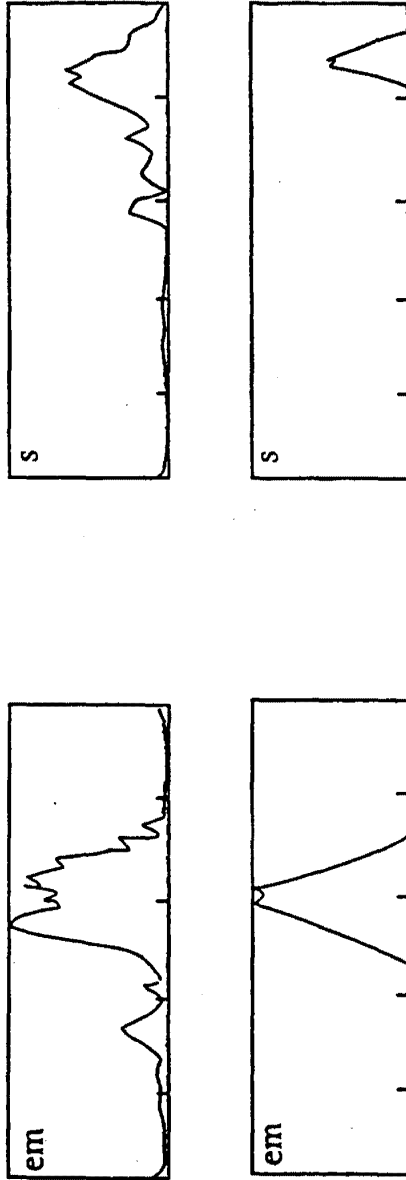
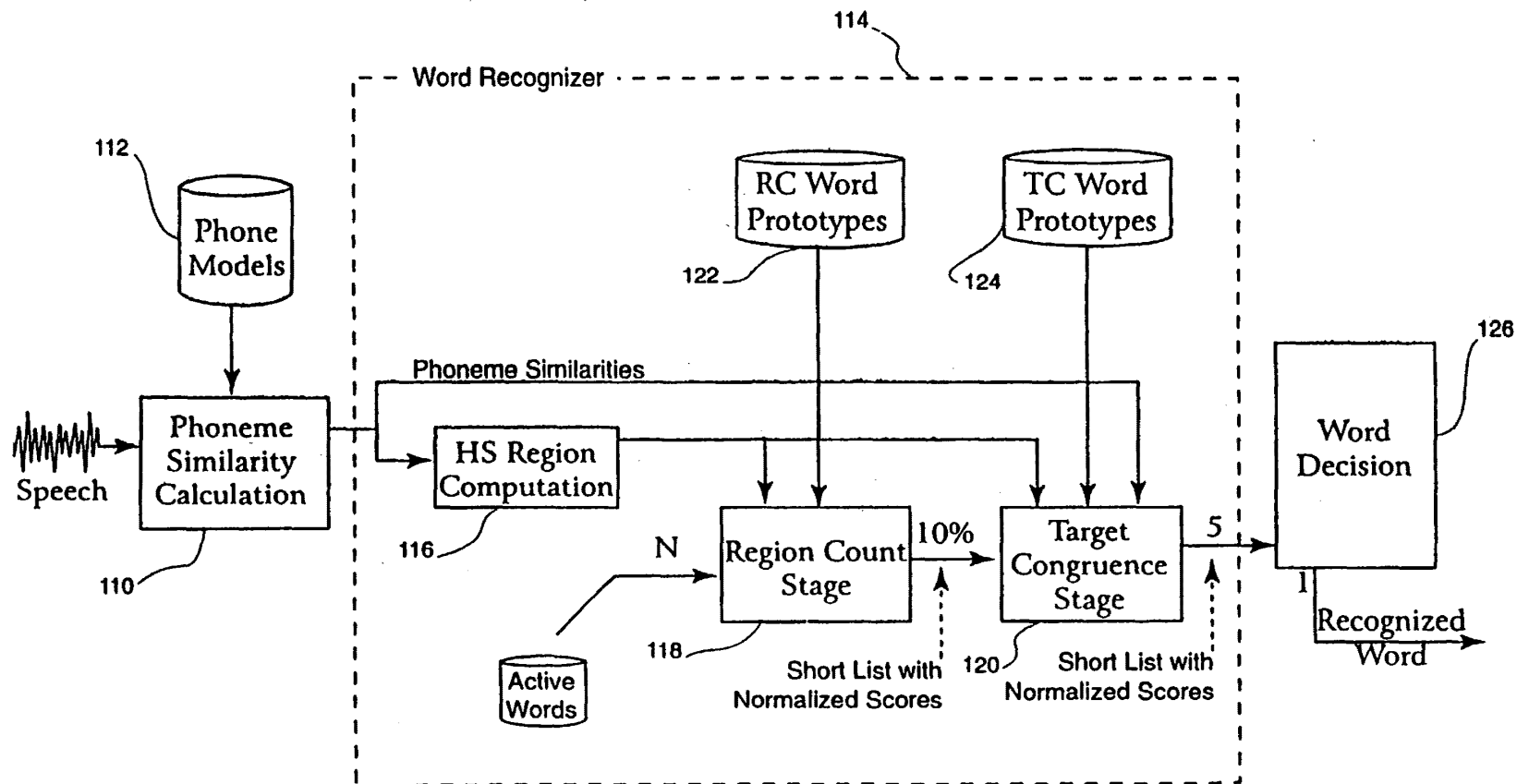


Figure 7

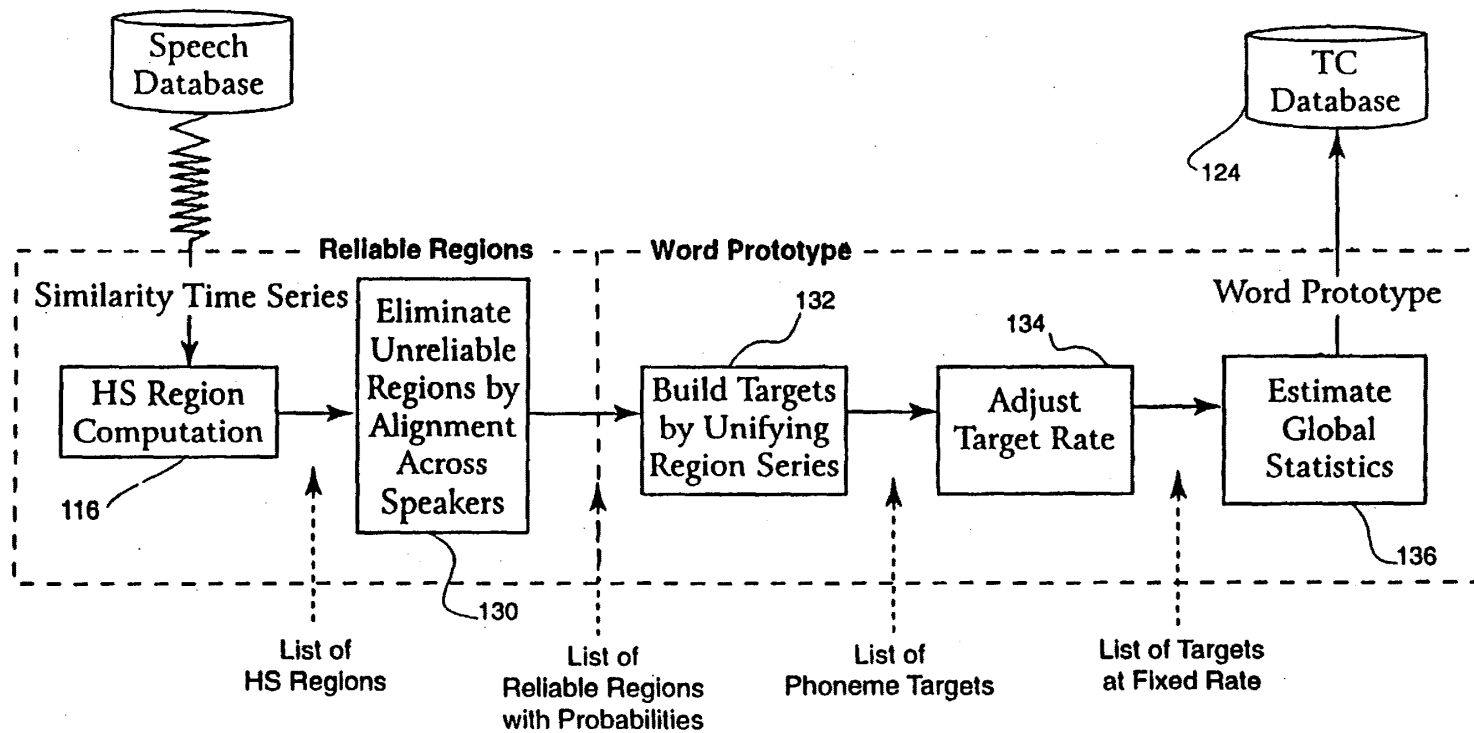
Similarity Values  
→  
High Similarity Regions





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Figure 8



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Figure 9

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VOICE DIALING SERVER FOR BRANCH EXCHANGE TELEPHONE SYSTEMS

The present invention relates generally to telephone switching equipment. More particularly the invention relates to a voice dialing server that attaches to the telephone branch exchange equipment to provide voice dialing services without the need to extensively modify the branch exchange equipment. The preferred system plugs into one or more unused extensions of the branch exchange system to provide voice dialing services for multiple users of the system. Each user may have his or her own dictionary of names and phone numbers. The system integrates with the existing branch exchange network, using the existing voice and control channels to cause the existing branch exchange system to perform the necessary switching operations.

Voice dialing promises to make telephones easier to use, by allowing the user to simply speak a name and then have the voice dialing system look up the telephone number of the named party and automatically place the call. In the cellular telephone market, rudimentary voice dialing systems have been experimented with to provide hands-free operation. The primary technological focus in the cellular telephone market has been on how to overcome the high ambient noise level present in the cellular telephone

environment, particularly in car phone applications. There has also been some work in developing voice dialing units for the home. These units typically connect between the telephone and the outside telephone line. A primary technological focus of those units has been on how to overcome the presence of the dial tone when the user lifts the handset to use the voice dialer.

While voice dialing has made some inroads, particularly in the applications discussed above, voice dialing has yet to be incorporated into more complex telephone systems such as private branch exchange switching systems (PBX systems). There are a number of reasons for this. First, voice recognition is a challenging problem and current technology does not provide suitable recognition accuracy in an economical configuration. For example, the complex Hidden Markov Model-based systems employed by state-of-the-art speech recognizers (as in dictation transcription systems) require lots of memory and computational power.

Second, in the voice dialing application, the voice recognition problem is compounded where the system must be adapted for use by a large number of users. The need to respond to the spoken commands of a large number of users makes the voice dialing problem far more difficult than it is for simple voice dialing systems designed for home use.

Third, it is not a simple matter to integrate voice dialing into a complex telephone switching network. Modern-day telephone switching networks employ an intricate labyrinth of digital control signals that effect various switching functions (e.g. placing a call on hold, transferring a call, initiating a conference call, reassigning an extension to a different location

and so forth). Simple voice dialing systems of the type employed in cellular phone applications or home dialing applications will not work in this more complex environment.

Finally, office PBX equipment is expensive and difficult to replace without disrupting day-to-day office functions. Thus many businesses that would benefit from voice dialing services, were such equipment available, simply cannot afford the cost and down-time required to replace that equipment with newer equipment providing voice dialing capabilities.

Thus, while the desirability of providing voice dialing in office systems is readily appreciated, current technology does not provide the means to accomplish it.

The present invention provides a voice dialing server for coupling to a branch exchange telephone system of the type that provides call switching among a plurality of telephone extension ports. The system is designed for plug-compatible connection to the existing telephone system without the need for modifying the system extensively. The voice dialing server has an interface for connection to at least one of the telephone extension ports of the existing telephone system. The interface supports transmission of voice signals and telephone system control information.

The voice dialing server also includes a speech processing module coupled to the interface for providing the following services. The speech processing module answers calls placed to the voice dialing server by users of the system. It processes speech input from the user, corresponding to a

selected party to be called; and it looks up the telephone number of the selected party.

The voice dialing system also includes a branch exchange control module that is coupled to the interface and to the speech processing module. The control module issues control information to the telephone system, causing the telephone system to connect the user's extension to an outside line while dialing the phone number of the selected party. The preferred embodiment causes the extension that has been assigned to the interface to be connected to a second telephone port on the system. The second port can be another extension or an outside line. Then the call is placed via the second port and the user's extension is then attached to the second port. In this way the user is placed in communication with the selected party.

The system integrates fully with the existing branch exchange telephone system. Thus the invention can be readily added to an existing telephone system, simply by plugging it into an unused extension port on the system. To use the system the user simply dials the extension assigned to the voice dialing server and follows the voice prompts issued by the server. The system is preferably implemented in a multitasking environment that allows multiple threads to run concurrently. Thus multiple users may use the system simultaneously. The system is capable of providing different phone directories for different users, and these may be automatically associated with the users' telephone extension. The system is able to determine the extension of the user. By determining the user's extension the voice dialing server automatically uses the phone number dictionary created by the user at

that extension. Alternatively, the user can override the determined extension by supplying a different extension, thereby causing a different phone number dictionary to be used.

Although well integrated into the existing telephone system architecture, the invention can also be used by callers outside the system to reach persons inside the system or to look up numbers from the telephone book. For example, a user calling from home may connect to the voice dialing server by specifying the server's extension. Then, the user may enter his or her office telephone extension number, thereby telling the voice dialing server that the phone number dictionary assigned to the office extension should be used. Thereafter, the user calling from home can use his or her office telephone number directory just as if the user were from the office.

The voice dialing server uses very fast and yet remarkably accurate voice recognition technology based on reliably detected phoneme similarity regions. The preferred embodiment uses a multistage word recognizer that compactly represents speech in terms of high phoneme similarity values. This is a departure from conventional techniques that determine similarity based on a frame-by-frame alignment. The preferred embodiment uses a word recognizer that preserves only the interesting regions of high phoneme similarity or features. A word recognizer is used to narrow the search so that the subsequent fine match stage is able to perform its task more quickly. The word recognizer and fine match stages share the initial representation of speech as a sequence of multiple phoneme similarity values. By representing speech as features at a lower data rate in the initial stage

of recognition, the complexity of the matching procedure is greatly reduced.

For a more complete understanding of the invention, its objects and advantages, reference may be had to the following specification and to the accompanying drawings.

Figure 1 is a system block diagram showing the multiuser voice dialing server connected to an existing public branch exchange (PBX) switch;

Figure 2 is a block diagram of a first embodiment of the invention;

Figure 3 is a block diagram of a second embodiment of the invention;

Figure 4 is a entity relationship diagram showing how the major software subsystems are interfaced with the existing PBX switch;

Figure 5 is a flowchart with accompanying signal flow diagrams, showing how the PBX control functions are performed;

Figure 6 is a phoneme similarity time series for the word "hill" spoken by two speakers;

Figure 7 is a series of graphs showing the output of the region picking procedure whereby similarity values are converted into high similarity regions;

Figure 8 is a block diagram of the presently preferred word recognizer system;



Figure 9 is a block diagram illustrating the target congruence word prototype training procedure.

The present voice dialing server is designed to connect to an existing telephone system of the type found in small, medium and large businesses, institutions, hotels, offices and the like. For purposes of illustrating the invention the existing telephone system will be illustrated and described as a private branch exchange system or PBX system. As will be appreciated from the following description, the invention is not limited to any particular type of telephone switching system. Hence the reference to private branch exchange or PBX systems in this written description is not intended to limit the invention.

With the foregoing in mind, Figure 1 depicts a conventional PBX switch 10 to which a plurality of telephone stations 12 are connected. PBX switch 10 is connected through a plurality of outside lines 14 to the telephone network infrastructure 16. Each of the individual stations 12 is connected to a separate extension or port, assigned a unique extension number. When calling internally from one station to another, the extension numbers may be dialed directly and the PBX switch connects the calling station to the designated receiving station. When placing calls to the telephone network 16 the full telephone number of the intended receiving station is dialed through the PBX switch.

The multiuser voice dialing server 18 of the invention is connected to one or more extension ports of the PBX switch 10, essentially in the same fashion as telephone stations 12 are connected. Preferably the voice dialing server is assigned an extension number different from the extension numbers assigned to the telephone stations 12. In this example the voice dialing server is assigned extension number #100. Although it is possible to implement the invention using only one extension line, the voice dialing server will handle more traffic from users if the server is connected through a plurality of lines to the PBX switch. In Figure 1 server 18 is connected through three separate lines 20 to three separate extension ports of the PBX switch 10. These lines may be referred to as the voice dialing lines, although it will be appreciated that these lines are physically the same as the telephone station lines 22 that connect the telephone stations 12 to the PBX switch.

When multiple voice dialing lines are used, as illustrated here, one line will be assigned the primary extension number (in this case #100). The remaining lines are assigned other extension numbers. To make the system easy to use, the PBX switch 10 is programmed so that the primary extension (#100) is used by all users. When this extension is busy (in use by an earlier user) subsequent calls to the primary extension are routed to one of the unused remaining lines. If all voice dialing lines are busy when a user attempts to employ the voice dialing server, a busy signal will be received. This does not ordinarily occur because the voice dialing server is designed

to drop out of the communication path once the desired number has been dialed. The system is designed to prompt the user for a name. It then looks up the telephone number associated with that name and dials it after receiving verbal confirmation from the user. The voice recognizer of the preferred embodiment is quite fast, hence each individual use of the system does not tie up a voice dialing extension for very long.

A first embodiment of the voice dialing server is illustrated in Figure 2. In Figure 2 PBX switch 10 and the voice dialing lines 20 have been illustrated. The remaining components of the telephone system, as shown in Figure 1, have been omitted from Figure 2 to simplify the illustration. The voice dialing server can be implemented using a conventional personal computer, depicted diagrammatically at 28, that has been equipped with the voice dialing server software described more fully below. The voice dialing server embodiment of Figure 2 uses an analog interface 30 that plugs into the PC bus 32 and has ports for connecting to voice dialing lines 20. An optional digital interface 34 may be connected through a plurality of RS-232 lines 36 to the serial ports 38 of computer 28. In this case there would be a digital line for each analog line. The digital interface is connected in parallel with the analog interface to the voice dialing lines 20. Computer 28 includes a central processing unit 40 and random access memory 42. These are coupled to PC bus 32 in conventional fashion. A disk drive 44 is used to store the multiuser phone number dictionaries, as well as the boot copy of the voice dialing server software. The voice dialing server software is loaded into

RAM 42, where it is accessed by the CPU 40 during execution. Disk drive 44 may be coupled through any suitable interface such as a SCSI interface 46 to the PC bus 32.

The analog interface of this embodiment may be a model D41E voice board available from Dialogic. Analog interface 30 includes a digital signal processor (DSP) and a general purpose microprocessor. The interface is capable of handling all telephony signal and it performs DTMF (touchtone) detection and generation as well as audio/voice signal processing tasks. The D41E voice board from Dialogic supports four independent voice channels.

The digital interface 34 is a protocol converter that converts the digital control signals from PBX switch 10 into serial signals conforming to the telephony application programming interface (TAPI) protocol established by Microsoft Corporation. The digital interface 34 is optional. Essentially, it is provided to allow the voice dialing server to determine the user's extension number automatically. The TAPI protocol is used to employ a caller ID function that will tell the voice dialing server what extension the user is calling from. Knowing this extension allows the voice dialing server to automatically use the phone number dictionary that is preassigned to that caller's extension. Without the caller ID information, the voice dialing server will need to prompt the user to enter his or her extension in order to activate the correct phone number dictionary.

An alternate embodiment of the invention is depicted in Figure 3. The embodiment of Figure 3 is similar to that of Figure 2 except that a

dedicated digital interface 35 is used in place of analog interface 30 and digital interface 34. The dedicated digital interface is designed to directly connect with a predetermined make and model of PBX switch. The availability of such a dedicated digital interface 35 depends on the make and model of the PBX system. One such system is a Norstar PBX switch using a D/42-NS voice board as digital interface 35. The D/42-NS voice board is available from Dialogic. It functions similar to the D41E analog voice board described above, with additional digital control features built-in to interface with the Norstar PBX switch.

As noted above, the presently preferred embodiments are implemented using a suitably programmed personal computer. Figure 4 is a software entity relationship diagram showing the preferred software architecture that may be used to program the computer. Essentially, the software performs two functions: a voice interaction function and a PBX control function. From a voice and control signal standpoint, all communication with the PBX switch 10 is through an interface 60. The interface 60 supports both bidirectional voice communication and digital control information. The software of the preferred embodiment assumes that the voice channel has been digitized, hence the voice information communicated through interface 60 is digital audio data. If analog voice signals are present in the PBX system, they may be converted into digital signals through the analog interface hardware 30 (Figure 2).

Connected to interface 60 is the kernel module 62 that oversees the operation of the server software. Attached to the kernel module 62 is the voice recognizer module 64 and speech synthesis module 66. The voice recognizer 64 works with a multiuser phone book dictionary 68 that contains all of the multiple users' personal phone book information, that is, the names and phone numbers that the users have entered by speaking the names and entering the numbers using DTMF tones entered through the touchtone keypad of the station handset. A subset of kernel module 62 are the PBX control functions 70. These are a stored set of digital control commands that cause the PBX 10 to execute certain control functions, in effect mimicking the control functions that a user of a telephone station handset might employ. The PBX control functions include the ability to place a call on hold and to request the PBX switch to set up a conference call. These commands are used during dialing of the selected phone number and thereafter to connect the user to the selected party. See pseudocode in the Appendix for details.

Figure 5 is a flowchart showing how a user (at extension #214) might use the voice dialing server (at extension #100) to place an outside call using the voice dialer dictionary. Alongside the numbered boxes of the flowchart several reproductions of Figure 1 have been illustrated, showing in bold lines how the switching actually occurs. The reader may wish to refer to these switching diagrams while reading the flowchart of Figure 5.

The procedure begins at Step 90. The user at extension #214 lifts the handset of the telephone station and dials the extension of the voice

dialing server (#100). The server answers the call and prompts the user for a name at Step 92. To effect this step the analog interface 30 (Figure 2) or the dedicated digital interface 35 (Figure 3) detects the ring signal and answers the incoming call. The extension number of the user's station is detected at this point for use in selecting the proper dictionary. The user may override by entering a different extension number. The incoming call event is transmitted through interface 60 (Figure 4) to the kernel module 62. In response, the kernel module 62 employs the speech synthesis module 66 to prompt the user for a name and then monitors the voice channel (through interface 60) while employing the recognizer module 64.

Returning to Figure 5, when the server recognizes the name spoken by the caller at Step 94, the server looks up the phone number to dial using the multiuser phone book dictionary 68 (Figure 4). If the voice recognizer does not identify a name in the dictionary, or if the recognized name is below a predetermined reliability threshold the kernel module 62 may employ the speech synthesis module 66 to prompt the user to try again.

After recognizing the name and looking up the phone number, the kernel module 62 of the server prompts the user by repeating the name and asking the user to verify that the name is correct. The user may then either answer yes or no. If the answer is yes, the server will proceed to place the call. If the answer is no, the server will prompt the user to try again.

During these first three steps (Steps 90-94) the user's extension is connected through the PBX switch to the voice dialing server. This is

shown in the switching diagram adjacent Steps 90-94. Bold lines are used to show the connection.

After obtaining the number to call and receiving the user's verification, the server then at Step 96 temporarily places the user on hold or in conference call mode. Then in Step 98 the server places a call through the PBX switch to the phone number that was determined during the lookup procedure. As illustrated at B the user's extension (#214) is temporarily placed on hold while the server is connected to an outside line via the PBX switch. Note that this technique allows the voice dialing server to connect to an outside line without the need to employ a separate inside extension. To effect this operation the kernel module 62 uses one of the PBX control functions 70 to send a request through interface 60 to the PBX. The request causes the PBX to place the user's extension on hold or in conference call mode and then causes the PBX switch to connect the server's extension (#100) to an outside line. This is done by mimicking the control signal commands that would be sent by a user of a telephone station handset to effect these same functions.

After establishing an outside line connection and receiving a dial tone, the server places the call by dialing the number that was looked up. The kernel 62 performs this operation by using the DTMF dialing capabilities of the analog interface 30 (Figure 2) or the digital interface 35 (Figure 3).

After dialing the desired number the server causes the PBX switch to conference in the user's extension at Step 100. As shown at C, the user's



extension (#214) and the voice dialing server's extension (#100) are now both connected through a conference call to the outside line. Finally, in Step 102 the server drops out of the communication as illustrated at D. This leaves the user's extension (#214) connected to the outside line and frees up the server for its next use by another user.

The present invention employs a unique compact speech representation based on regions of high phoneme similarity values. As shown in Figure 6, there is an overall consistency in the shape of the phoneme similarity time series for a given word. In Figure 6 phoneme similarity time series for the word "hill" spoken by two speakers are compared. Although the precise wave shapes differ between the two speakers, the phoneme similarity data nevertheless exhibit regions of similarity between the speakers. Similar behavior is observed in the phoneme plausibility time series that has been described by Gong and Haton in "Plausibility Functions in Continuous Speech Recognition: The VINICS System," *Speech Communication*, Vol. 13, Oct. 1993, pp. 187-196.

Conventional speech recognition systems match each input utterance to reference templates, such as templates composed on phoneme similarity vectors, as in the model speech method (MSM) of Hoshimi et al., "Speaker-Independent Speech Recognition Method Using Training Speech From a Small Number of Speakers," *ICASSP*, Vol. 1, pp. 469-472, 1992. In these conventional systems the reference speech representation is frame-based and requires a high data rate, typically 8 to 12 parameters every 10 to 20 milliseconds. The

frame-by-frame alignment that is required with these conventional systems is computationally costly and makes this approach unsuitable for larger vocabularies, especially when using small hardware.

The present system uses a multistage word recognizer that is applied prior to a frame-by-frame alignment, in order to reduce the search space and to achieve real time performance improvements. The number of stages in the recognizer, as well as the computational complexity of each stage and the number of word candidates preserved at each stage, can be adjusted to achieve desired goals of speed, memory size and recognition accuracy for a particular application. The word recognizer uses an initial representation of speech as a sequence of multiple phoneme similarity values. However, the word recognizer further refines this speech representation to preserve only the interesting regions of high phoneme similarity. Referring to Figure 7, the interesting regions of high phoneme similarity value are represented as high similarity regions. By representing the speech as features at a lower data rate in the initial stages of recognition, the complexity of the matching procedure is greatly reduced.

The multistage word recognizer also employs a unique scoring procedure for propagating and combining the scores obtained at each stage of the word recognizer in order to produce a final word decision. By combining the quasi-independent sources of information produced at each stage, a significant gain in accuracy is obtained.

The system's architecture features three distinct components that are applied in sequence on the incoming speech to compute the best word candidate.

Referring to Figure 8, an overview of the presently preferred system will be presented. The first component of the present system is a phoneme similarity front end 110 that converts speech signals into phoneme similarity time series. Speech is digitized at 8 kilohertz and processed by 10th order linear predictive coding (LPC) analysis to produce 10 cepstral coefficients every 100th of a second. Each block of 10 successive frames of cepstral coefficients is compared to 55 phoneme reference templates (a subset of the TIMIT phoneme units) to compute a vector of multiple phoneme similarity values. The block of analysis frames is then shifted by one frame at a time to produce a vector of phoneme similarity values each centisecond (each 100th of a second). As illustrated in Figure 8, the phoneme similarity front end works in conjunction with a phone model database 112 that supplies the phoneme reference templates. The output of the phoneme similarity front end may be stored in a suitable memory for conveying the set of phoneme similarity time series so generated to the word recognizer stages.

The word recognizer stages, depicted in Figure 8 generally at 114, comprise the second major component of the system. A peak driven procedure is first applied on the phoneme similarity time series supplied by front end 110. The peak driven procedure extracts High Similarity Regions (HS Regions). In this process, low peaks and local peaks of phoneme similarity values are

discarded, as illustrated in Figure 7. In the preferred embodiment regions are characterized by 4 parameters: phoneme symbol, height at the peak location and time locations of the left and right frames. Over our data corpus, an average of 60 regions per second of speech is observed. In Figure 8 the high similarity region extraction module 116 performs the peak driven procedure. The output of the HS region extraction module is supplied to two different word recognizer stages that operate using different recognizer techniques to provide a short list of word candidates for the fine match final recognizer stage 126.

The first of the two stages of word recognizer 114 is the Region Count stage or RC stage 118. This stage extracts a short list of word candidates that are then supplied to the next stage of the word recognizer 114, the Target Congruence stage or TC stage 120. The RC stage 118 has an RC word prototype database 122 that supplies compact word representations based on the novel compact speech representation (regions of high phoneme similarity values) of the invention. Similarly, the TC stage 120 also includes a TC word prototype database 124 that supplies a different compact word representation, also based on the compact speech representation of the invention. The TC stage provides a more selective short list of word candidates, essentially a further refinement of the list produced by the RC stage 118.

The word decision stage 126, the final major component of the present system, selects the word with the largest score from the short list supplied by TC stage 120.

### Region Count Modeling

The RC stage 118 of word recognizer 114 represents each reference word with statistical information on the number of HS regions over a predefined number of time intervals. The presently preferred embodiment divides words into three equal time intervals in which each phoneme interval is described by (1) the mean of the number of HS regions occurring in that interval and (2) a weight that is inversely proportional to the square of the variance, which indicates how reliable the region count is. Specifically for a score normalized between 0 and 100, the weight would be  $100/(\text{variance}^2 + 2)$ . These parameters are easily estimated from training data. In the currently preferred implementation, each word requires exactly 330 parameters, which corresponds to two statistics, each over three intervals each comprising 55 phoneme units (2 statistics x 3 intervals x 55 phoneme units).

Region count modeling was found to be very effective due to its fast alignment time (0.33 milliseconds per test word on a Sparc10 workstation) and its high top 10% accuracy.

The region count prototype is constructed as follows. A first utterance of a training word or phrase is represented as time-dependent phoneme similarity data. In the presently preferred embodiment each utterance

is divided into N time intervals. Presently each utterance is divided into three time intervals, with each time interval being represented by data corresponding to the 55 phonemes. Thus the presently preferred implementation represents each utterance as a 3 x 55 vector. In representing the utterance as a 3 x 55 vector, each vector element in a given interval stores the number of similarity regions that are detected for each given phoneme. Thus if three occurrences of the phoneme "ah" occur in the first interval, the number 3 is stored in the vector element corresponding to the "ah" phoneme.

An inductive or iterative process is then performed for each of the successive utterances of the training word or phrase. Specifically, each successive utterance is represented as a vector like that of the first utterance. The two vectors are then combined to generate the vector sum and the vector sum of the squares. In addition, a scalar count value is maintained to keep track of the current number of utterances that have been combined.

The process proceeds inductively or iteratively in this fashion, each new utterance being combined with the previous ones such that the sum and sum of squares vectors ultimately represent the accumulated data from all of the utterances.

Once all training utterances have been processed in this fashion the vector mean and vector variance are calculated. The mean vector is calculated as the sum vector divided by the number of utterances used in the training set. The vector variance is the mean of the squares minus the square of the means. The mean and variance vectors are then stored as the region

count prototype for the given word or phrase. The same procedure is followed to similarly produce a mean and variance vector for each of the remaining words or phrases in the lexicon.

When a test utterance is compared with the RC prototype, the test utterance is converted into the time dependent phoneme similarity vector, essentially in the same way as each of the training utterances were converted. The Euclidean distance between the test utterance and the prototype is computed by subtracting the test utterance RC data vector from the prototype mean vector and this difference is then squared. The Euclidean distance is then multiplied by a weighting factor, preferably the reciprocal of the prototype variance. The weighted Euclidean distance, so calculated, is then converted into a scalar number by adding each of the vector component elements. In a similar fashion the weighting factor (reciprocal of the variance) is converted into a scalar number by adding all of the vector elements. The final score is then computed by dividing the scalar distance by the scalar weight.

The above process may be repeated for each word in the prototype lexicon and the most probable word candidates are then selected based on the scalar score.

#### Target Congruence Modeling

The second stage of the word recognizer represents each reference word by (1) a prototype which consists of a series of phoneme targets and (2) by global statistics, namely the average word duration and the average "match

rate," which represents the degree of fit of the word prototype to its training data. In the presently preferred embodiment targets are generalized HS regions described by 5 parameters:

1. phoneme symbol;
2. target weight (percentage occurrence in training data);
3. average peak height (phoneme similarity value);
4. average left frame location;
5. average right frame location.

Word prototypes are automatically created from the training data as follows. First, HS regions are extracted from the phoneme similarity time series for a number of training speakers. The training data may be generated based on speech from a plurality of different speakers or it may be based on multiple utterances of the same training words by a single speaker. Then, for each training utterance of a word, reliable HS regions are computed by aligning the given training utterance with all other utterances of the same word in the training data. This achieves region-to-region alignment.

For each training utterance the number of occurrences (or probability) of a particular region is then obtained. At that time, regions with probabilities less than a pre-established Reliability Threshold (typically 0.25) are found unreliable and are eliminated. The word prototype is constructed by merging reliably detected, high similarity regions to form *targets*. At the end of that process a target rate constraint (i.e. desired number of targets per second) is then applied to obtain a uniform word description level for all the words in the lexicon. The desired number of



targets per second can be selected to meet system design constraints such as the ability of a given processor to handle data at a given rate. By controlling the target rate a reduction in the number of targets is achieved by keeping only the most reliable targets. Once the word prototype has been obtained in this fashion, the average match rate and average word duration are computed and stored as part of the word prototype data.

The number of parameters needed to represent a word depends on the average duration of the word and on the level of phonetic detail that is desired. For a typical 500 millisecond word at 50 targets per second, the speech representation used by the presently preferred embodiment employs 127 parameters, which correspond to 5 values per target x 50 targets per second x 0.5 seconds + 2 global statistics (average match rate and average word duration).

Figure 9 illustrates the word prototype training procedure by which the TC word prototype database 124 is constructed. The RC word prototype database 122 is constructed by similar, but far simpler process, in that only the presence or absence of an HS region occurring with each of the three equal time intervals must be detected.

Referring to Figure 9, the HS Region Computation Module 116 is used to convert the similarity time series from the speech database into a list of HS regions. The alignment module 130 operates on this list of HS regions to eliminate unreliable regions by alignment across speakers. Again,

the process can be performed across a plurality of different speakers or across a plurality of utterances by the same speaker.

Next the list of reliable regions, together with the associated probabilities of detecting those regions is passed to the target building module 132. This module builds targets by unifying the region series to produce a list of phoneme targets associated with each word in the database. This list of phoneme targets is then supplied to a module 134 that adjusts the target rate by applying the target rate constraint. The target rate constraint (the desired number of targets per second) may be set to a level that achieves the desired target rate. After adjusting the target rate a statistical analyzer module 136 estimates the global statistics (the average match rate and the average word duration) and these statistics along with the list of targets at the selected rate are then stored as the TC word prototype database 124.

### Word Recognition

Given an active lexicon of N words, the region count stage is first applied to produce a short list of word candidates with normalized scores. A weighted Euclidean distance is used to measure the degree of fit of a test word X to a reference word P (in RC format as supplied by the RC word prototype database). Specifically, in the current implementation the weighted Euclidean distance is defined as

$$D_{RC}(X, P) = \sum_{i=1}^3 \sum_{j=1}^{55} (x_{ij} - p_{ij})^2 w_{ij} / \sum_{i=1}^3 \sum_{j=1}^{55} w_{ij}$$

where  $x_{ij}$  is the number of HS regions in time interval  $I$  for phoneme  $j$ , where  $p_{ij}$  is the corresponding average number of HS regions estimated on training data, and where  $w_{ij}$  is the corresponding weight. The  $N/10$  highest scoring word prototypes are preserved as word candidates and their scores (weighted Euclidean distances) are normalized by dividing each individual score by the highest score. This defines a normalized score  $S_{RC}$  for each word. Normalized scores range from 0 to 1 and are dimensionless, making it possible to combine scores resulting from different scoring methods.

The target congruence stage is then applied on each word candidate selected by the RC stage. A region-to-target alignment procedure is used to produce a congruence score between the test word and a given word reference (in TC format as supplied by the TC word prototype database). The congruence score of a matched target  $CG_{match}$ , that is, the alignment found between target  $t$  of the prototype and region  $r$  of the test word, is defined as

$$CG_{match}(t,r) = \min(A_t / A_r, A_r / A_t)$$

where  $A_t$  and  $A_r$  respectively represent the target's area and the aligned region's area in the time similarity plane.

The congruence score of an unmatched target  $CG_{unmatch}$  is computed in the same way, using an estimate for the area  $A_r$  of the missing HS region. The estimated area  $A_r$  is computed as the area under the similarity curve for

the target's phoneme label, between the projected locations of the target's left and right frames.

The word congruence score is computed as the weighted sum of congruence scores for all the targets, divided by the sum of their weights. Normalized congruence scores  $S_{TC}$  are computed by dividing the individual congruence scores by the highest congruence score. The final score output by the word recognizer is a combination of the information obtained at each recognizer stage. In the presently preferred embodiment the final score output of the recognizer is:

$$S_{Hypo} = (S_{RC} + S_{TC}) / 2$$

The recognized word is the one with the highest  $S_{Hypo}$  value.

## APPENDIX

### Notes:

The function `TransferCallDeskLab(Number)` does the transfer to an inside extension by calling the PBX function "feature 7 0" followed by the extension number after a hookflash. Then the line is released.

The function `TransferExternalCallDeskLab(Number)` does the transfer outside. In the program a message is played, then the user is put on hold (by sending "feature 7 9", then the program gets an external line, then a conference call is established, the phone number is dialed, and the line is released.

### Pseudocode:

```
int TransferCallDeskLab(Number)
char *Number;
{
    int LastRet;
    int Ret;

    ghookflash((*DskLab).Desc,500);
    gdial((*DskLab).Desc,**70",1);
    gdial((*DskLab).Desc,Number,1);
    gphone_hookswitch((*DskLab).Desc,1);
    while (Ret=gphone_status((*DskLab).Desc,&LastRet)!=G_ONHOOK)
    {
        sleep(1);
    }
}

int TransferExternalCallDeskLab (phoneNumber)
    char *phoneNumber;
```

```

{
    int LastRet;
    int Ret;
    int laststatus=-199, rtnval;
    int thereIsProblem,
        state,
        new_state,    last_state;
extern char *G_PhoneStatus[];
    char msg[] = "Calling";

    /* Play message while transferring */
    ALIPlayMessage(msg);
    esleep(1,1000);

    printf("Putting calling line on hold ...");fflush(stdout);
    ghookflash((*DskLab).Desc,500);
    gdial((*DskLab).Desc,**79",1);
    printf("done!\n"); fflush(stdout);

    printf("Getting external line .. "); fflush(stdout);

    gdial((*DskLab).Desc,"9",0); /* obtain an external line */

    state = 0;
    do {
        esleep(0,1000);
        new_state = gphone_status((*DskLab).Desc,&last_state);
        if (state != new_state) {
            state = new_state;
            printf("state = %s\n",G_PhoneStatus[state]);
        }
        thereIsProblem = 0;

        switch (state) {
            case G_ONHOOK: /* call disconnected -- strangely */
            case G_BUSY: /* cannot get an outside line */
            case G_REORDER:
            case G_REORDER2: thereIsProblem = 1;
            default: break;
        }
    } while ( (state != G_DIALTONE ) && (state != G_CONNECTED)
        && !thereIsProblem );

    printf("done!\n"); fflush(stdout);
    printf("Establishing Conference Call ...");fflush(stdout);

    ghookflash((*DskLab).Desc,500);    gdial((*DskLab).Desc,**3",1);

```

```

ALIPlayMessage(msg);

printf("Dialing %s... ",phoneNumber); fflush(stdout);

gdial((*DskLab).Desc,phoneNumber,1);
printf("done!\n"); fflush(stdout);

state = 0;
do {
    esleep(0,10000);          /* 1/4 second sleep */
    new_state = gphone_status((*DskLab).Desc,&last_state);
    if (state != new_state) {
        state = new_state;
        printf("state = %s\n",G_PhoneStatus[state]);fflush(stdout);
    }
    thereIsProblem = 0;

    switch (state) {
        case G_ONHOOK: /* call disconnected -- strangely */
        case G_BUSY: /* cannot get an outside line */
        case G_REORDER:
        case G_REORDER2: thereIsProblem = 1;
        default: ;
    }
} while ((state !=G_CONNECTED ) && (state != G_BUSY) &&
!thereIsProblem);

printf("Putting phone ONHOOK ...");fflush(stdout);

gphone_hookswitch((*DskLab).Desc,G_ONHOOK);
while ((Ret=gphone_status((*DskLab).Desc,&LastRet))!=G_ONHOOK)
{
    sleep(1);
}
printf("done!\n"); fflush(stdout);
}

```

**CLAIMS**

---

1. A voice dialing server for coupling to a branch exchange telephone system of the type that provides call switching among a plurality telephone extension ports, comprising:

an interface for connection to at least a first one of said telephone extension ports to support transmission of voice signals and telephone system control information;

a speech processing module coupled to said interface for (a) answering a call placed to the voice dialing server by a user (b) processing speech input from the user corresponding to a selected party to be called and (c) looking up a phone number of a selected party;

branch exchange control module coupled to said interface and to said speech processing module for issuing control information to said telephone system (a) to cause the extension assigned to said interface to connect to second port (b) to establish communication via the second port and (c) to attach the user's extension to the second port, whereby the user is placed in communication with the selected party.

2. The server of Claim 1 wherein said speech processing module supports a plurality of user phone number dictionaries.



3. The server of Claim 2 wherein said branch exchange control module includes system for communicating with said telephone system to determine the identity of the user's extension and for using this identity to select one of said plurality of phone number dictionaries for use by said speech processing module.

4. The server of Claim 2 wherein said branch exchange control module includes system responsive to keyed user input for selecting one of said plurality of phone number dictionaries for use by said speech processing module.

5. The server of claim 1, 2, 3 and 4, wherein said branch exchange control module issues control information to said telephone system to place the user's call to the voice dialling server on hold while establishing communication via said second port.

6. The server of any one of claims 1 to 5, wherein said branch exchange control module issues control information to said telephone system to transfer the user's call to the voice dialling server to another extension on said telephone system.

7. The server of any one of claims 1 to 6, wherein said branch exchange control module is implemented on a computer having a bus and said interface comprises an analog interface coupled to the bus of said computer.

8. The server of any one of claims 1 to 6, wherein said branch exchange control module is implemented on a computer having at least one

serial port and said interface comprises an analog interface coupled to the serial port of said computer.

9. The server of any one of claims 1 to 6, wherein said branch exchange control module is implemented on a computer having a bus and said interface comprises an digital interface coupled to the bus of said computer.

10. The server of any one of claims 1 to 9, wherein said speech processing module includes a speech recognizer that represents speech as high phoneme similarity values.

11. The server of any one of claims 1 to 9, wherein said speech processing module includes a speech recognizer comprising a word recognizer that employs a region count stage that extracts a list of word candidates based on regions of high phoneme similarity values.

12. The server of any one of claims 1 to 9, wherein said speech processing module includes a speech recognizer comprising a word recognizer that employs:

a region count stage that extracts a first list of word candidates based on regions of high phoneme similarity values, and

a target congruence stage that extracts a second list of word candidates from said first list based on regions of high phoneme similarity values.

13. A server constructed and arranged to operate as hereinbefore described with reference to the accompanying drawings.



Application No: GB 9718126.7  
Claims searched: 1-13

Examiner: Peter Slater  
Date of search: 18 November 1997

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): H4K ( KFH , KF42 )

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**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0283120 A1 ( BRITISH TELECOM ) - see whole document	1 at least
X	EP 0166318 A2 ( STANDARD ELECTRIC ) - see fig.1 & US4763350	1 at least
X,P	WPI Abstract Accession No: 97-305198/199728 & JP 9116940A (MATSUSHITA) 02.05.97 (see abstract)	1 at least
X	Patent Abstracts of Japan, vol.94, No.10, & JP 6303320A (MATSUSHITA) 28.10.94 (see abstract)	1 at least
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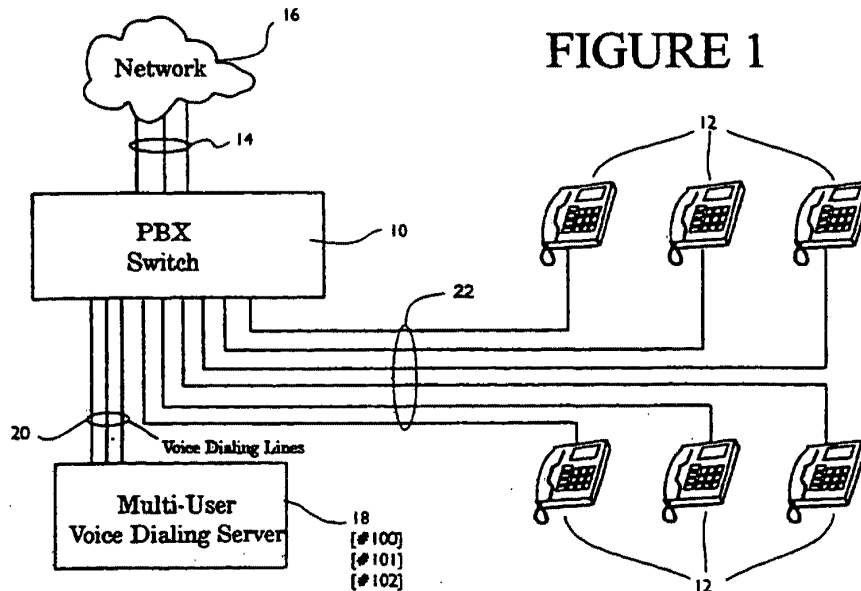
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(54) **Voice dialling server for branch exchange telephone systems**

(57) The voice dialling server plugs into one or more unused extensions of a branch exchange system to provide each of the users on the system with voice dialling services. To use the system a user simply dials the extension to which the server is attached. The server then prompts the user to supply the name of a party to be called. The name is then looked up in a telephone number dictionary unique to that user. The system then places the telephone call by sending commands to the branch exchange system that simulate the operations a user would perform to connect to an outside line or inside extension and then place the call. The server incorporates a speech processing module having a multistage word recognizer that represents speech in terms of high phoneme similarity values. This representation is highly compact, allowing the word recognizer to perform the recognizer and fine match stages with far less processor overhead than frame-by-frame speech recognizers.



**FIGURE 1**

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EP 22070 (3)



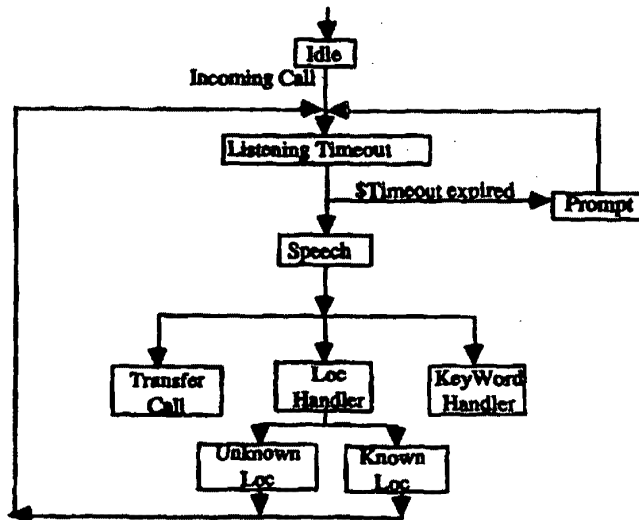
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(54) Title: APPARATUS AND METHOD FOR REDUCING SPEECH RECOGNITION VOCABULARY PERPLEXITY AND DYNAMICALLY SELECTING ACOUSTIC MODELS



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(57) Abstract

A method of reducing the perplexity of a speech recognition vocabulary and dynamically selecting speech recognition acoustic model sets used in a simulated telephone operator apparatus. The directory of users of the telephone network is subdivided into subsets wherein each subset contains the names of users within a certain location or exchange. A speech recognition vocabulary database is compiled for each subset and the appropriate database is loaded into the speech recognition apparatus in response to a requested call to the location covered by the subset. Furthermore, a site-specific acoustic model set is dynamically loaded according to the location of a calling party. An apparatus for carrying out the method is also discussed.

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APPARATUS AND METHOD FOR REDUCING SPEECH RECOGNITION  
VOCABULARY PERPLEXITY AND DYNAMICALLY SELECTING  
ACOUSTIC MODELS

5

Field of the Invention

This invention relates to automatic speech  
recognition in telecommunication systems and to the use of  
such systems to provide large scale voice activated dialing  
10 and information retrieval services.

Background to the Invention

In the early development of telephone systems it  
was commonplace for a telephone subscriber to converse  
15 directly with a telephone operator at a telephone central  
office. The telephone subscriber would verbally request the  
telephone operator to complete a connection to a called  
party. As telephone exchanges were small the telephone  
operator was aware of virtually all of the subscribers by  
20 name and manually completed the requested connection. With  
the advent of dial telephone services, calls within an  
exchange could be completed automatically, and only certain  
toll calls required operator assistance. Today, operator  
assisted calls have become the exception and are usually  
25 comparatively expensive. Machine-simulated operator  
functions, including limited speech recognition services,  
have recently been available for expediting some typical  
operator-assisted functions. This includes "collect" long  
distance calls wherein completion of the connection is  
30 contingent upon the called party agreeing to pay for the  
service. However, these functions are limited to the simple  
recognition of "yes" or "no" so there is little room for  
non-functionality due to uncertainty as to which word was  
spoken. There have also been advancements in voice  
35 recognition services relating to directory assistance but  
these too are directed to a very limited vocabulary.

Prior Art

The prior art contains several recent developments pertaining to voice recognition in general, and to voice recognition applicable to telecommunication systems in particular.

U.S. Patent No. 5,091,947, which issued February 25, 1992 to Ariyoshi et al, entitled "Speech Recognition Method and Apparatus", discloses a voice recognition system for comparing both speaker dependent and speaker independent utterances against stored voice patterns within a coefficient memory. The voice identification comparator selects the one voice pattern having the highest degree of similarity with the utterance in question.

15

In U.S. Patent No. 5,165,095, which issued on November 17, 1992, Borcharding discloses a voice recognition system to initiate dialog to determine the correct telephone number. According to the '095 patent, the calling party is first identified so that a database containing speaker templates can be accessed. These templates are then used to compare the dial command so that the dialing instructions can be recognized and executed. An example of a dialing directive in the patent is "call home", with "call" being the dial command and "home" being the destination identifier.

20

Gupta et al, in U.S. Patent No. 5,390,278 issued February 14, 1995, disclose a flexible vocabulary speech recognition for recognizing speech transmitted via the public switched telephone network. This voice recognition technique is a phoneme based system wherein the phonemes are modeled as hidden Markov models.

30

In spite of these ongoing developments, the functionality of automatic recognition of human speech by machine has not advanced to a degree wherein a calling party

35

can simply speak the called party's name and thereafter be connected as reliably as a human operator in situations where the database for a potential called party is very large (greater than 100 names).

5

#### Summary of the Invention

The present invention is in the field of human speech recognition performed by machines and more particularly relates to a reduction of the perplexity of the speech recognition task in the context of names spoken by a telephone user in a telephone system.

10

Individual users of telephone networks are divided into subsets to facilitate identification of the vast number of subscribers to the service. In the public network these subsets are local exchanges. Private switching networks such as the Nortel Electronic Switching Network (ESN) assigns individual ESN numbers to each location within the private network. The present invention relies on these subsets or location identifiers to reduce the perplexity of a speech recognition application.

15

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Therefore in accordance with a first aspect of the present invention, there is provided a telephone network including a plurality of telephone exchanges, each for serving a plurality of telephone terminals and each being interconnected with at least one other of the telephone exchanges for providing telephone communications between users of the telephone terminals. The network function includes a simulated telephone operator apparatus for receiving a speech request from a user for connection to another telephone user and to translate this request into a directory number for use by the appropriate one of the telephone exchanges. The translation is in accordance with a speech recognition algorithm and an active speech recognition vocabulary selected in accordance with the origin of the request.

30

35

In an ESN application the active speech recognition vocabulary is limited to the names of the individuals serviced by the ESN number. In a preferred embodiment the ESN number, which is also a location code, is contained in the first two or three digits of the directory number.

In accordance with a second aspect of the invention there is provided a simulated telephone operator server for a telephone network. The server has means for storing voice utterances of a calling party telephone user and means responsive to location information in association with the telephone user for selecting an active speech recognition vocabulary. Speech detection means are provided for processing the stored voice utterance in accordance with a speech recognition algorithm and the active speech recognition vocabulary. Directory lookup means identify a directory listing of a called party corresponding to a result of the processing by the speech detection means. The server also includes means for transmitting the directory listing to a telephone exchange serving the called party.

In accordance with a further aspect of the invention there is provided a telephone exchange comprising: a plurality of ports for serving a plurality of telephone users' telephone instruments via telephone lines; a trunk facility for connection to another telephone exchange; a switching network for connecting and disconnecting the telephone instruments; a controller means for causing a newly OFF HOOK telephone instrument to be coupled via the switching network with a solicitation signal, and subsequently for being responsive to a telephone number received in association with the newly OFF HOOK telephone instrument for completing a telephone call via the switching network. The exchange also includes an originating register means for storing voice band signals received from the newly OFF HOOK telephone instrument via the switching network.

Means are provided for detecting digits represented by frequency signals, within the stored voice band signals, in accordance with a standard for key pad dialed telephone numbers and for transmitting detected digits to the call controller. A simulated telephone operator apparatus receives and translates voice band signals in accordance with a speech recognition algorithm and an active speech recognition vocabulary selected in accordance with the origin of the voice band signals into a directory number for use by the controller means. An interface facility is provided for transmitting the stored voice band signals via the switching network to the simulated telephone operator server apparatus in an event wherein the voice band signals did not include a key pad dialed digit.

In accordance with yet a further aspect of the present invention there is provided a method of detecting a voiced speech request of a calling party for connection to another user of an automatic telephone exchange. The method comprises storing a plurality of speech recognition vocabularies in association with geographic location of users; receiving the voiced request and information as to the geographic location of the user having voiced the request from the automatic telephone exchange; selecting an active speech recognition vocabulary in accordance with the information as to the geographic location of the user and, in accordance with a speech recognition algorithm and the selected active speech recognition vocabulary, translating the received request into a directory number for use by the automatic telephone exchange in setting up a telephone connection between the calling telephone user and the other telephone user.

#### Brief Description of the Drawings

The invention will now be described in greater detail with reference to the attached drawings wherein:

FIGURE 1 is a block diagram illustrating trunk connections between private switch locations;

FIGURE 2 is a block diagram of the system hardware architecture;

5 FIGURE 3 is an overall system state diagram; and

FIGURE 4 is a state diagram of the key word handler.

#### Detailed Description of the Invention

10 The following description relates to an enterprise-wide speech directory calling service within a company or corporation having a number of locations. Each location is assigned a unique electronic switching network (ESN) location code or ESN number. As shown in the block  
15 diagram of FIGURE 1, the on-site PBX 20 at each location is connected to each other location via trunk connectors 22. In this discussion the ESN comprises a three-digit code to identify the location. It is to be understood, however, that it is not essential to use all three digits to identify  
20 the location as it may be sufficient to use the first two for example.

FIGURE 2 illustrates the hardware architecture in accordance with a preferred embodiment of the invention. As  
25 shown, PBX 20 is connected to trunk 22 and to a plurality of on site telephone sets as known in the art. The speech recognition system 30 of the invention is connected to the PBX 20 via T1 line 32 via T1 card 34 and via signal link 36 and signal link card 38. Speech recognition system 30  
30 includes a speech recognition processor operating on a speech recognition algorithm, central processor and control units as well as memory cards for storing active speech recognition vocabulary data bases.

35 Although FIGURE 1 refers to a private switching network using ESNs, it is to be understood that the

invention is not limited to such networks but can also be adapted to use in public switching systems.

One objective metric used to measure the accuracy of a speech recognition system is the Word Error Rate (WER). The WER is defined as the total number of incorrectly recognized words made by a speech recognition system divided by the total number of words spoken by a user of the system.

$$WER = \frac{\text{Number of Errors Made by Recognizer}}{\text{Number of Words Spoken by User}}$$

The present invention makes use of information as to the calling party's location for automatically assisting in improving the WER of a speech recognition system on a spoken called party's name for the purpose of connecting a telephone call.

It has been empirically shown that the WER of a speech recognition system will vary with the square root of the perplexity of the vocabulary of words being recognized. [Kimbal, O., et al., "Recognition Performance and Grammatical Constraints", Proceedings of a Workshop on Speech Recognition, Report Number SAIC-86/1546, Defense Advanced Research Projects Agency, Palo Alto, February 19-20, 1986.]

$$WER \propto \sqrt{\text{Perplexity}}$$

The perplexity of a vocabulary is defined as the measure of the constraint imposed by a grammar, or the level of uncertainty given the grammar of a population of users. Perplexity is mathematically modeled and quantified in the following way:

$$H = -\frac{1}{|V|} \sum_{w \in V} P(w) \cdot \log P(w)$$

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$$B = 2^H$$

where:  $H$  is entropy  
 $P(w)$  is the probability of  $w$  being spoken  
 5  $B$  is the perplexity of the application

The vocabulary of words in this implementation consists entirely of proper names, location names, and a small number of key words for command and control. For  
 10 large corporations with a large number of employees, the proper names become the determining factor in measuring the perplexity since the number of employees will overwhelm the number of location names and key words. Thus location names and key words can be ignored in this calculation. If we  
 15 make a simplifying assumption that every name is spoken with equal probability, then the equation above can be simplified to the following:

$$\text{Perplexity} = \sqrt[L]{|S|}$$

20

where:  $L$  is the average number of words in a sentence  
 $S$  is the number of sentences in the vocabulary  $V$

If we further make the simplification that proper  
 25 names contain two words -- first and last name -- and the number of sentences in the vocabulary is equivalent to the number of employee names, then we can further reduce the equation to the following:

$$\text{Perplexity} = \sqrt{|S|}$$

30

If we make the assumption that the amount of  
 confusability between names within a large database will be  
 similar between large databases, the accuracy of a speech  
 35 recognition system has the following relationship with the number of names in the vocabulary:



$$WER \propto \sqrt[4]{\text{Number of Active Directory Names}}$$

We can observe from the above equations that the WER increases with the perplexity and thus increases with the number of proper names in the vocabulary.

In the past, speech recognition scientists have used various methods to reduce the perplexity in an effort to improve the WER of a speech recognition system. To achieve this result, most of these efforts have been focused at the linguistic level. For example, scientists have used statistical language models and linguistics rules of phonology to reduce perplexity or uncertainty in recognizing a spoken word or phrase.

In this implementation the list of employee names for each location is stored in a separate speech recognition vocabulary. The employee name will normally be associated with the four digits of the telephone number following the three-digit ESN or location code. According to the system of the present invention a calling party wishing to speak to another employee at the same location will simply announce the first and last name of the employee to whom a connection is desired. The speech recognition system will assume that calling party and called party are at the same location and load the active speech recognition vocabulary database containing the names of all employees at that location. Using a conventional speech recognition algorithm the name spoken by the calling party is compared by the system against the names of all employees in the database and the closest match is selected. The name selected is announced to the calling party and the call is automatically connected to the line associated with the telephone number assigned to the called party unless the calling party interrupts the process by saying, "No." Thereafter the voice recognition system releases from the call.

If the called party is at a different location than the calling party, the calling party will first announce the location of the called party followed by the called party's name. The voice recognition system responds  
 5 by announcing the location and subsequently loading the active voice recognition vocabulary database including the names of all the employees at the announced location of the called party. The voice recognition system then selects the name in the loaded database that most closely matches the  
 10 name of the called party. The selected name is announced to the calling party and the call is automatically connected to the line associated with the telephone number assigned to the called party unless the calling party interrupts the process by saying, "No." Thereafter the voice recognition  
 15 system releases from the call.

Because the active voice recognition vocabulary set associated with each ESN or location contains only a portion of the total number of employees of the corporation  
 20 or company, the WER is much lower than it would be if the complete employee directory was loaded in the database.

The actual decrease in the corporate wide WER (C\_WER) is contingent upon how evenly the employees are  
 25 spread over the different sites. In the best case where the employees are evenly distributed in each site, C\_WER will decrease according to the following relation.

$$C\_WER = \frac{WER}{\sqrt[4]{n}}$$

30 where: n is the number of sites.

In the worst case, where there is only one employee in each site, except for one site which holds all of the remaining employees, there will be a negligible  
 35 decrease in the C\_WER.

$$C\_WER \propto \sqrt[4]{(m-n)}$$

where:  $m$  is the number of employees in the company.

$$C\_WER = WER$$

5

for:  $m \gg n$

In a similar way that ESN information is used by the speech recognition system to dynamically load the active vocabulary set, the ESN information can also be used by the speech recognition system to select the appropriate acoustic model set. Speech recognition systems use previously collected speech samples to serve as reference templates against which new spoken speech samples are matched for classification. Statistical pattern recognition techniques are used to match new speech samples against reference templates to determine the closest match. These reference templates are referred to as acoustic models in the speech recognition system. Acoustic models may vary according to the regional accent and subsequently according to ESN locations. The speech recognition system can use site-specific acoustic models that are dynamically loaded based on the ESN information presented at the time of the call. Having site-specific acoustic models will also decrease the WER of the system.

The following specification illustrates an example of the NORTEL Speech Directory Calling Service. The state diagram shown in FIGURES 3 and 4 describes the user interface that users of the service experience and is not meant as an implementation specification. Some parts of the system, such as error recovery and instructions have been omitted.

In the description that follows, the use of *italics* denotes system state and the use of a dollar sign symbol denotes a parameter.

Description of the States in Alphabetical Order:Cancel:

5 Play Who  
go to *Listening Timeout*

Idle:

10 /\* Go to *Idle* anytime a user hangs up \*/  
On an incoming call  
Get ESN information  
Set \$Location based on ESN information  
go to *Listening Timeout*

15

Keyword Handler:

Case  
    Service Locations: go to *Service Location*  
    Receptionist: go to *Transfer Receptionist*  
20 Cancel: go to *Cancel*  
End Case

Known Loc:

Set \$Location to \$RecognizedWord  
25 Play \$Location  
Play EmployeeName  
go to *Listening Timeout*

30 Listening Timeout:

Listen for \$Timeout  
If the user speaks  
    go to *Speech*  
Else  
35 go to *Prompt*

Loc Handler:

If \$Location is known location

    go to *Known Loc*

Else

5       go to *Unknown Loc*

Prompt:

Case (state before *Listening Timeout* )

10       Idle:

        Play Who

        go to *Listening Timeout*

        The rest of the states:

15           When \$Timeout expires on the first two times

            Play TimeoutHelp.\$Location

            \$Timeout = 4 sec

            go to *Listening Timeout*

        When \$Timeout expires on the third time

20           Play Difficulties

            go to *Transfer Receptionist*

End Case

Service Location:

25   Play ServiceAvailable

    Play \$Location list

    Play Who

    go to *Listening Timeout*

30   Speech:

    Load the active vocabulary set from \$Location

    Get \$RecognizedWord from Speech Recognizer

35

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Case (\$RecognizedWord)

Rejection: go to Rejection Handler

\$Name: go to Transfer Call

\$Location: go to Loc Handler

5 Key Word: go to KeyWord Handler

End Case

Transfer Call:

Database Lookup for Employee Phone Number

10 Transfer the call

go to Idle

Transfer Receptionist :

Play TransferReceptionist

15 Transfer the call to the receptionist

go to Idle

Unknown Loc:

Play NotServiced.\$Location

20 go to Listening Timeout

Index of the Prerecorded Prompts in Alphabetical Order :

Calling:

25 Calling \$Name?

Difficulties:

The system is having difficulties with your request.  
Transferring to a receptionist.

30

EmployeeName:

Employee name?

NotServiced:

35 This service is not available in \$Location. Choose  
another location or for a list of serviced ESN locations,  
say "Service Locations".

*ServiceAvailable:*

This service is available for the following Nortel/BNR locations: \$Location list.

5

*TransferReceptionist:*

Transferring to a receptionist.

*Who:*

10 Who would you like to call?

A specific embodiment of the invention has been disclosed and illustrated. It will be apparent to one skilled in the art that various changes in methodology and/or approach can be made without departing from the spirit and scope of this invention as defined in the appended claims.

15

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## I CLAIM:

1. A telephone network including:
  - a plurality of telephone exchanges each for
  - 5 serving a plurality of telephone instruments and each being interconnected with at least one other of the telephone exchanges, for providing telephone communications between telephone users associated with the telephone instruments; and
  - 10 a simulated telephone operator apparatus for receiving a voiced speech request from a user for connection to another of the telephone users and translating said request into a directory number for use by one of the telephone exchanges in accordance with a speech recognition
  - 15 algorithm and an active speech recognition vocabulary selected in accordance with the origin of the request.
  
2. A simulated telephone operator server for a telephone network comprising:
  - 20 means for storing voice utterances of a calling party telephone user;
  - means responsive to location information in association with the telephone user for selecting an active speech recognition vocabulary;
  - 25 speech detection means for processing the stored voice utterances in accordance with a speech recognition algorithm and said active speech recognition vocabulary;
  - directory lookup means for identifying a directory listing of a called party corresponding to a result of said
  - 30 processing by the speech detection means; and
  - means for transmitting the directory listing to a telephone exchange serving said called party.
  
3. A simulated telephone operator server as defined
- 35 in claim 2, wherein the directory lookup means defaults to identification by a telephone attendant directory listing in the event of there being no called party directory listing



corresponding to the result of said processing by the speech detection means.

4. A telephone exchange comprising:
- 5 a plurality of ports for serving a plurality of telephone users' telephone instruments via telephone lines;
- a trunk facility for connection to another telephone exchange;
- a switching network for connecting and
- 10 disconnecting the telephone instruments;
- a controller means for causing a newly OFF HOOK telephone instrument to be coupled via the switching network with a solicitation signal, and subsequently for being responsive to a telephone number received in association
- 15 with the newly OFF HOOK telephone instrument for completing a telephone call via the switching network;
- an originating register means for storing voice band signals received from the newly OFF HOOK telephone instrument via the switching network;
- 20 means for detecting digits represented by frequency signals, within the stored voice band signals, in accordance with a standard for key pad dialed telephone numbers, and for transmitting detecting digits to the call controller;
- 25 a simulated telephone operator apparatus for receiving and translating voice band signals in accordance with a speech recognition algorithm and an active speech recognition vocabulary selected in accordance with the origin of the voice band signals into a directory number for
- 30 use by the controller means; and
- an interface facility for transmitting the stored voice band signals via the switching network to the simulated telephone operator server apparatus in an event wherein the voice band signals did not include a key pad
- 35 dialed digit.

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5. A telephone exchange as defined in claim 4, wherein the call controller means is operative to cause the interface means to transmit said stored voice band signals via the switching network to the simulated telephone operator server apparatus in an event wherein the voice band signals included a key pad dialed digit designating the simulated telephone operator apparatus.

6. A simulated telephone operator apparatus for receiving a user voiced speech request for connection to another user of a telephone network and translating said request into a directory number for use by an automatic telephone exchange, in accordance with a speech recognition algorithm and an active speech recognition vocabulary selected in accordance with the origin of the request.

7. A method for detecting a calling telephone user voiced speech request for connection to another telephone user via an automatic telephone exchange comprising:

- 20 storing a plurality of speech recognition vocabularies in association with geographic locations of users;
- receiving the voiced speech request and information as to the geographic location of the user having
- 25 voiced the speech request from the automatic telephone exchange;
- selecting an active speech recognition vocabulary in accordance with the information as to the geographic location of the user; and
- 30 in accordance with a speech recognition algorithm and the selected active speech recognition vocabulary, translating the received request into a directory number for use by the automatic telephone exchange in setting up a telephone connection between the calling telephone user and
- 35 said another telephone user.

1/2

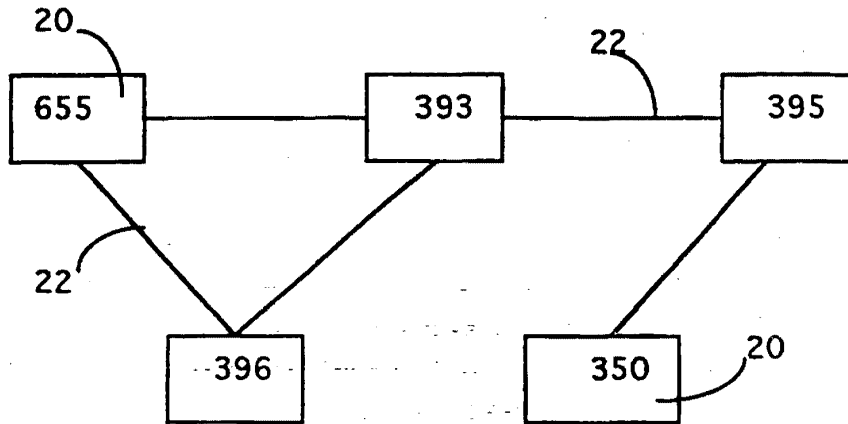


FIGURE 1

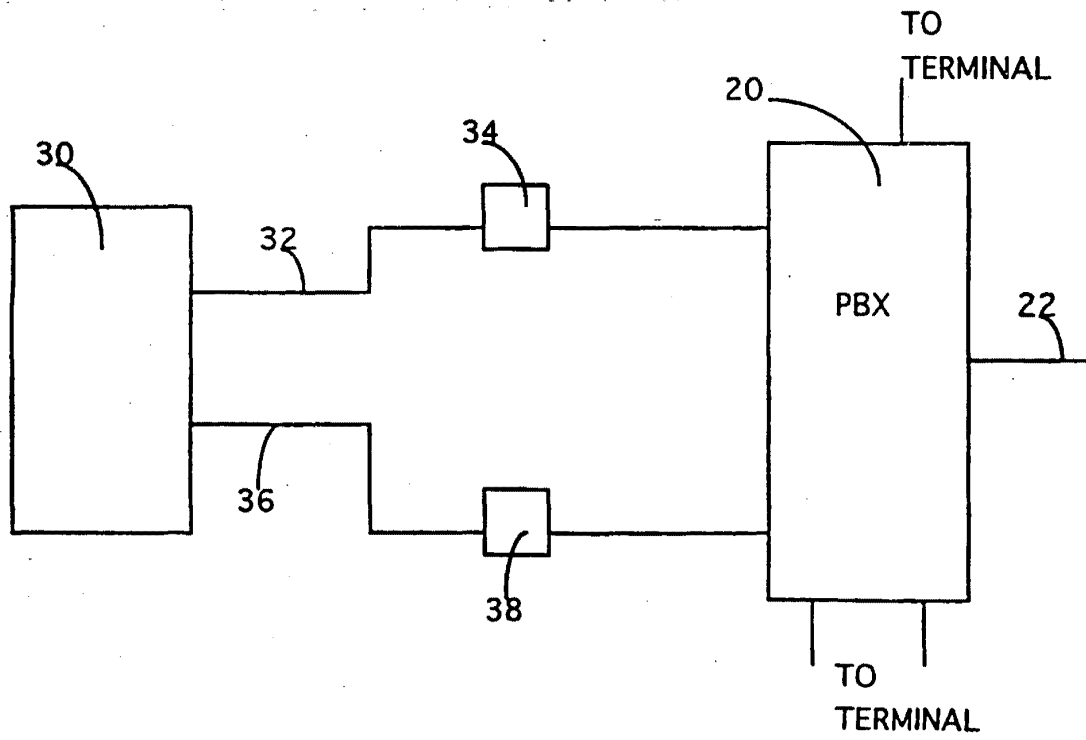


FIGURE 2

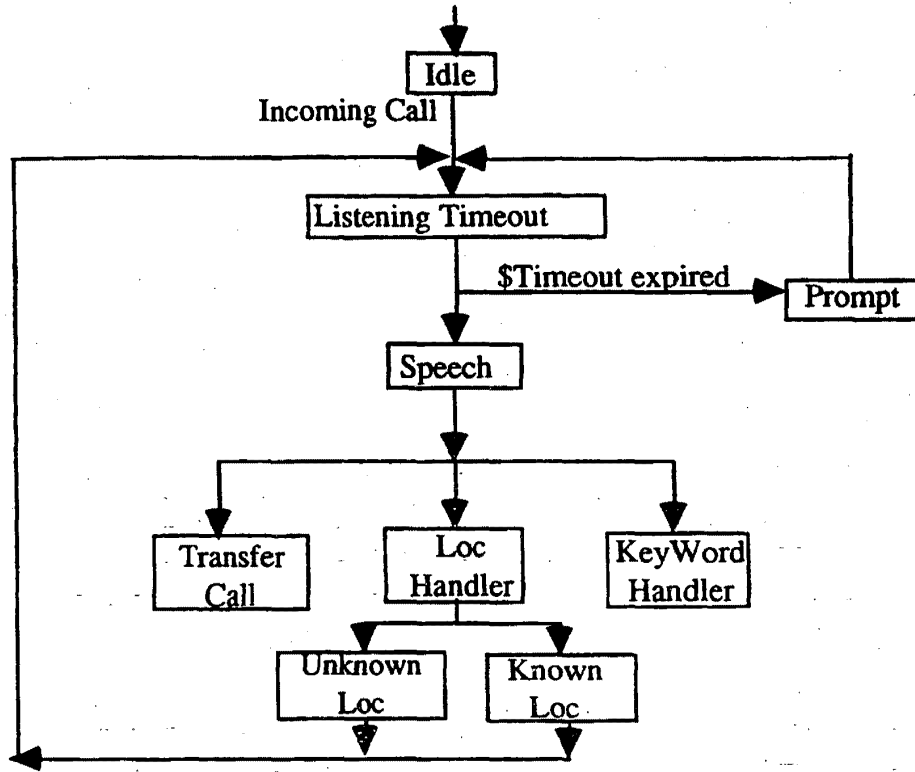


FIGURE 3

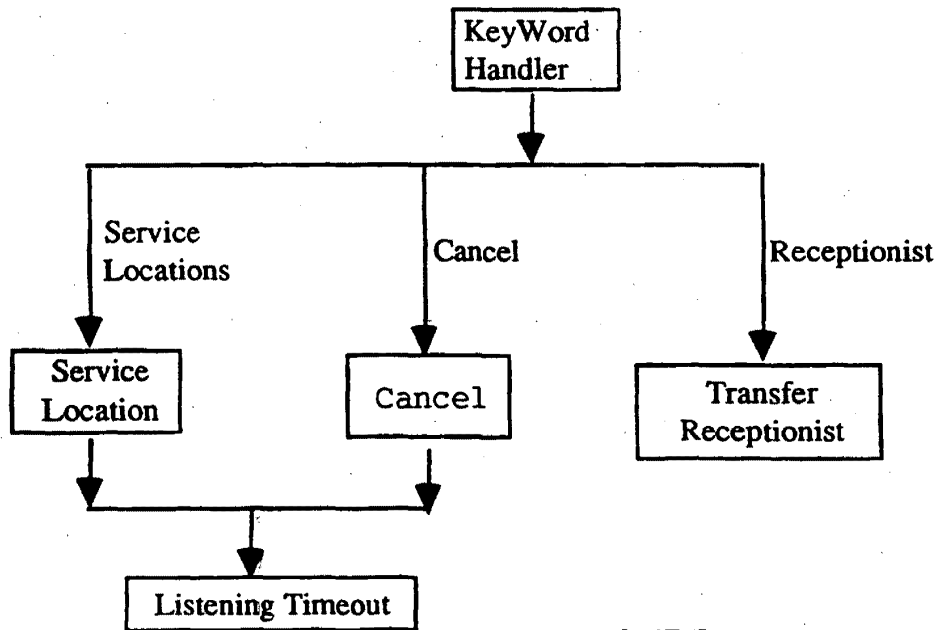


FIGURE 4

# INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/CA 97/00008

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> H 04 M 1/27, G 10 L 5/06		
According to International Patent Classification (IPC) or to both national classification and IPC <sup>6</sup>		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) H 04 M, G 10 L, H 04 Q		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP, A, 0 105 441 (SIEMENS) 18 April 1984 (18.04.84), page 1, line 1 - page 3, line 32; claim 1.	1, 2, 4, 6, 7
A	US, A, 5 165 095 (BORCHERDING) 17 November 1992 (11.11.92), abstract; column 1, line 6 - column 2, line 37; column 3, line 22 - column 6, line 27; fig. 1, 2 (cited in the application).	1, 2, 4, 6, 7
A	EP, A, 0 568 979 (SONY CORPORATION) 10 November 1993 (10.11.93), abstract; column 1, lines	1, 2, 4, 6, 7
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.		
<input type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents :		
*A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed		
*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family		
Date of the actual completion of the international search 21 March 1997		Date of mailing of the international search report 18.04.97
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016		Authorized officer HAJOS e.h.

## INTERNATIONAL SEARCH REPORT

-2-

International Application No  
PCT/CA 97/00008

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	43-50.	
A	<p>US, A, 5 390 278 (GUPTA et al.) 14 February 1995 (14.02.95), abstract (cited in the application).</p>	1,2,4, 6,7
A	<p>EP, A, 0 045 941 (SIEMENS) 17 February 1982 (17.02.82), page 1, line 7 - page 4, line 9; fig..</p>	1,2,4, 6,7
A	<p>US, A, 5 091 947 (ARIYOSHI et al.) 25 February 1992 (25.02.92), abstract; column 1, line 10 - column 3, line 17 (cited in the application).</p>	1,2,4, 6,7

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## ANHANG

zum internationalen Recherchen-  
bericht über die internationale  
Patentanmeldung Nr.

## ANNEX

to the International Search  
Report to the International Patent  
Application No.

## ANNEXE

au rapport de recherche inter-  
national relatif à la demande de brevet  
international n°

PCT/CA 97/00008 SAE 148639

In diesem Anhang sind die Mitglieder  
der Patentfamilien der im obenge-  
nannten internationalen Recherchenbericht  
angeführten Patentdokumente angegeben.  
Diese Angaben dienen nur zur Unter-  
richtung und erfolgen ohne Gewähr.

This Annex lists the patent family  
members relating to the patent documents  
cited in the above-mentioned inter-  
national search report. The Office is  
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La présente annexe indique les  
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In Recherchenbericht angeführtes Patentdokument Patent document cited in search report Document de brevet cité dans le rapport de recherche		Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membres(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
EP A1	105441	18-04-84	EP A1 105441 US A 5165098 CA A 2069675 EP A1 45941 US A 5091947	15-07-88 11-04-92 07-07-92 08-08-92 11-11-92
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US A	5091947	25-02-92	EP A1 105441 US A 5165098 CA A 2069675 EP A1 45941 US A 5091947	11-04-92 07-07-92 08-08-92 11-11-92

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JFu

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:  
Kurganov et al.

Atty Docket: 47242-  
00027USC1

Serial No.: 10/821,690

Group Art: Unknown

Filed: April 9, 2004

Examiner: Unknown

Title: ROBUST VOICE BROWSER SYSTEM AND  
VOICE ACTIVATED DEVICE  
CONTROLLER

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 C.F.R. §§1.97 and 1.98**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

<b>CERTIFICATE OF MAILING</b> 37 C.F.R. 1.8	
I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below:	
9-16-04 Date	 Signature

Dear Commissioner:

In compliance with the duty of disclosure under 37 C.F.R. §1.56, it is respectfully requested that this Information Disclosure Statement be entered and the reference(s) listed on attached Forms PTO/SB/08A and PTO/SB/08B be considered by the Examiner and made of record.

In accordance with 37 C.F.R. § 1.98(d), copies are enclosed only of those references not already of record or cited by the Examiner in a prior related application.

The applicant would like to make the Examiner aware of the following applications that are being pursued by the assignee of the present application:

Application No.	Date Filed	Title
10/877,366	06/25/04	Computer, Internet and Telecommunications Based Network
10/877,367	06/25/04	Computer, Internet and Telecommunications Based Network

Application No.	Date Filed	Title
09/260,279	03/02/99	Computer, Internet and Telecommunications Based Network
09/777,406	02/06/01	Personal Voice-Based Information Retrieval System

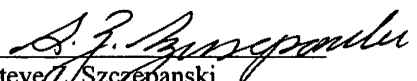
In accordance with 37 C.F.R. § 1.98(a)(2)(iii), copies of the specification and claims of the above-referenced U.S. Patent Application Serial Nos. 09/777,406, 10/877,366, 10/877,367, and 09/260,279 are enclosed. As Serial Nos. 10/877,366, 10/877,367, and 09/260,279 share a common specification, one copy of the specification related thereto is enclosed.

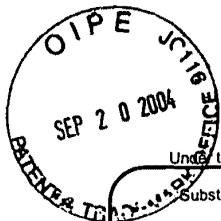
In accordance with 37 C.F.R. §§ 1.97(g),(h), this Information Disclosure Statement is not to be construed as a representation that a search has been made, and is not to be construed to be an admission that the information disclosed is, or is considered to be, prior art with respect to the present application or material to patentability as defined in 37 C.F.R. §§ 1.56.

The present Information Disclosure Statement is being filed prior to the receipt of a first Official Action reflecting an examination on the merits and hence is believed to be timely in accordance with 37 C.F.R. § 1.97(b). Accordingly, no fees are believed to be due in connection with the filing of this Information Disclosure Statement. However, should any fees be deemed necessary (except payment of the issue fee), the Commissioner is authorized to charge any deficiency or to credit any over payment to Kelley Drye & Warren Deposit Account No. 11-0404/015749.0015.

Respectfully submitted,

September 16, 2004  
Date

  
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Attorneys for Applicant



PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Substitute for form 1449/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

### Complete if Known

Application Number	10/821,690
Filing Date	04-09-2004
First Named Inventor	Kurganov
Art Unit	TBA
Examiner Name	TBA
Attorney Docket Number	47242-00027USC1

Sheet 1 of 13

### U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
		US- 3,728,486	04-17-1973	Kraus	
		US- 4,058,838	11-15-1997	Crager	
		US- 4,313,035	01/26/1982	Jordan	
		US- 4,327,251	04-27-1987	Fomenko	
		US- 4,340,783	07-20-1982	Sugiyama	
		US- 4,371,752	02-01-1983	Matthews	
		US- 4,500,751	02-19-1985	Darland	
		US- 4,513,390	04-23-1985	Walter	
		US- 4,523,055	06-11-1985	Hohl	
		US- 4,549,047	10-22-1985	Brian	
		US- 4,584,434	04-22-1986	Hashimoto	
		US- 4,585,906	04-29-1986	Matthews	
		US- 4,596,900	06-24-1986	Jackson	
		US- 4,596,900 B1	10-10-1995	Jackson	
		US- 4,596,900 B2	08-26-1997	Jackson	
		US- 4,602,129	07-32-1986	Matthews	
		US- 4,635,253	01-06-1987	Urui	
		US- 4,652,700	03-24-1987	Matthews	
		US- 4,696,028	09-22-1987	Morganstein	

### FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> * Number <sup>4</sup> * Kind Code <sup>5</sup> (if known)				
		GB 2211698	07-05-1989			
		GB 2240693	08-07-1991			
		JP 1-258526	10-16-1989			✓
		WO 9107838	05-30-1991			
		WO 9118466	11-28-1991			
		CA 1329852	05-24-94			

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This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Substitute for form 1449/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>		Application Number	10/821,690
		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 2 of 13	Attorney Docket Number	47242-00027USC1	

U. S. PATENT DOCUMENTS					
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		Number-Kind Code <sup>2</sup> (if known)			
		US- 4,713,837	12-15-1987	Gordon	
		US- 4,748,656	05-31-1988	Gibbs	
		US- 4,757,525	07-12-1988	Matthews	
		US- 4,761,807	08-02-1988	Matthews	
		US- 4,763,317	08-09-1988	Lehman	
		US- 4,769,719	09-06-1988	Endo	
		US- 4,776,016	10-04-1998	Hansen	
		US- 4,809,321	02-28-1989	Morganstein	
		US- 4,837,798	06-06-1989	Cohen	
		US- 4,847,891	07-11-1989	Kotani	
		US- 4,850,012	07-18-1989	Mehta	
		US- 4,866,758	09-12-1989	Heinzelmann	
		US- 4,873,719	10-10-1989	Reese	
		US- 4,893,333	01-09-1990	Baran	
		US- 4,905,273	02-27-1990	Gordon	
		US- 4,907,079	03-01-1990	Turner	
		US- 4,918,722	04-17-1990	Buehren	
		US- 4,922,518	05-01-1990	Gordon	
		US- 4,922,526	05-01-1990	Morganstein	

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		Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)				
		WO 9609710	03-28-1996			
		WO 9823058	05-28-1998			

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		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 3 of 13	Attorney Docket Number	47242-00027USC1	

U. S. PATENT DOCUMENTS					
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		Number-Kind Code <sup>2</sup> (if known)			
		US- 4,933,966	06-12-1990	Hird	
		US- 4,935,955	06-19-1990	Neudorker	
		US- 4,935,958	06-19-1990	Morganstein	
		US- 4,941,170	07-10-1990	Herbst	
		US- 4,953,204	08-28-1990	Cuschleg Jr.	
		US- 4,955,047	09-04-1990	Morganstein	
		US- 4,956,835	09-11-1990	Grover	
		US- 4,967,288	10-30-1990	Mizutori	
		US- 4,972,462	11-20-1990	Shibata	
		US- 4,974,254	11-27-1990	Perine	
		US- 4,975,941	12-04-1990	Morganstein	
		US- 4,994,926	02-01-1991	Gordon	
		US- 5,003,575	03-26-1991	Chamberlin	
		US- 5,008,926	04-16-1991	Misholi	
		US- 5,020,095	05-28-1991	Morganstein	
		US- 5,207,384	06-25-1991	Morganstein	
		US- 5,029,196	07-02-1991	Morganstein	
		US- 5,065,254	11-12-1991	Hishidi	
		US- 5,086,385	02-04-1991	Launey	

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		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 4	of 13	Attorney Docket Number	47242-00027USC1

U. S. PATENT DOCUMENTS					
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		US- 5,095,445	03-10-1992	Sekiguchi	
		US- 5,099,509	03-24-1992	Morganstein	
		US- 5,109,405	04-28-1992	Morganstein	
		US- 5,131,024	07-14-1992	Pugh	
		US- 5,145,452	09-08-1992	Pekarske	
		US- 5,166,974	11-24-1992	Morganstein	
		US- 5,193,110	03-09-1993	Jones	
		US- 5,195,086	03-16-1993	Baumgartner	
		US- 5,233,600	08-03-1993	Pekarske	
		US- 5,243,645	09-07-1993	Bissell	
		US- 5,249,219	09-28-1993	Morganstein	
		US- 5,263,084	11-16-1993	Chaput	
		US- 5,291,302	03-01-1994	Gordon	
		US- 5,303,298	04-12-1994	Morganstein	
		US- 5,309,504	05-03-1994	Morganstein	
		US- 5,325,421	06-01-1994	Hou	
		US- 5,327,486	07-05-1994	Wolff	
		US- 5,327,529	07-01-1994	Fults	
		US- 5,329,578	07-12-1994	Brennan	

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Sheet 5	of 13	Attorney Docket Number	47242-00027USC1

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		US- 5,333,266	07-26-1994	Boaz	
		US- 5,347,574	09-13-1994	Morganstein	
		US- 5,355,403	10-11-1994	Richardson, Jr.	
		US- 5,365,524	11-15-1994	Hiller	
		US- 5,375,161	12-01-1994	Fuller	
		US- 5,384,771	01-24-1995	Isidoro	
		US- 5,404,231	04-01-1995	Bloomfield	
		US- 5,408,526	04-18-1995	McFarland	
		US- 5,414,754	05-09-1995	Pugh	
		US- 5,436,963	07-25-1995	Fitzpatrick	
		US- 5,459,584	10-17-1995	Gordon	
		US- 5,463,684	10-31-1995	Morduch	
		US- 5,475,791	12-01-1995	Schalk	
		US- 5,495,484	02-27-1996	Self	
		US- 5,497,373	03-05-1996	Hulen	
		US- 5,499,288	03-01-1996	Hunt	
		US- 5,517,558	05-01-1996	Schalk	
		US- 5,555,100	09-01-1996	Bloomfield	
		US- 5,559,611	09-11-1996	Bloomfield	

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		US- 5,566,236	10-15-1996	MeLampby	
		US- 5,603,031	02-11-1997	White	
		US- 5,608,786	03-01-1997	Gordon	
		US- 5,610,970	03-01-1997	Fuller	
		US- 5,611,031	03-11-1997	Hertzfield	
		US- 5,652,789	07-29-1997	Miner	
		US- 5,659,597	08-01-1997	Bareis	
		US- 5,666,401	09-09-1997	Morganstein	
		US- 5,675,507	10-01-1997	Bobo II	
		US- 5,675,811	10-07-1997	Broedner	
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		Country Code <sup>3</sup> *Number <sup>4</sup> *Kind Code <sup>5</sup> (if known)				

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<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>		Application Number	10/821,690
		Filing Date	04-09-2004
		First Named Inventor	Kurganov
		Art Unit	TBA
		Examiner Name	TBA
Sheet 7 of 13	Attorney Docket Number	47242-00027USC1	

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		Number-Kind Code <sup>2</sup> (if known)			
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Sheet <b>8</b> of <b>13</b>													

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		<b>Art Unit</b>	TBA
		<b>Examiner Name</b>	TBA
		<b>Attorney Docket Number</b>	47242-00027USC1
Sheet	10	of	13

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		BRACHMAN, ET AL., "Fragmentation in Store-and-Forward Message Transfer," IEEE Communications Magazine, Vol. 26(7), July 1988, pp. 18-27.	

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		"Wildfire Communications, Inc.," Harvard Business School, March 21, 1996, Publ. No. 9-396-305, pp. 1-22.	

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Sheet 12 of 13	Attorney Docket Number	47242-00027USC1	

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		Internet web page, "Wildfire Communications, Inc.", November 5, 1997, including the following URL addresses:	
	✓	<a href="http://www.wildfire.com">http://www.wildfire.com</a> (1 pg);	
	-	<a href="http://www.wildfire.com/consumerhome.html">http://www.wildfire.com/consumerhome.html</a> (2 pgs.);	
		<a href="http://www.wildfire.com/106.html">http://www.wildfire.com/106.html</a> (2pgs.);	
		<a href="http://www.wildfire.com/carrierhome.html">http://www.wildfire.com/carrierhome.html</a> (2pgs.);	
	}	<a href="http://www.wildfire.com/sfandb.html">http://www.wildfire.com/sfandb.html</a> (3 pgs.);	
		<a href="http://www.wildfire.com/about.html">http://www.wildfire.com/about.html</a> (1 pg.);	
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(11) (C) 1,329,852  
(21) 612,217  
(22) 1989/09/21  
(45) 1994/05/24  
(52) 379-4  
C.L. CR. 350-11

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(51) INTL. CL. <sup>5</sup> H04N-001/32; H04N-001/44; H04N-001/21; H04M-011/00

(19) (CA) CANADIAN PATENT (12)

PATENTS  
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TOPOGRAPHY

(54) Facsimile Telecommunications System and Method

(72) Gordon, Richard J. , U.S.A.  
Kennedy, James R. , U.S.A.

(73) Audiofax, Inc. , U.S.A.

(30) (US) U.S.A. 248,798 1988/09/22

(57) 32 Claims

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Abstract of The Disclosure

A system and method for facilitating facsimile transmissions has one or more store and forward facilities, each associated with a plurality of subscriber facsimile machines, typically coupled over the switched telephone network. The store and forward facilities include a computer for controlling operations and mass data storage equipment. A subscriber to the system delivers an outgoing facsimile message to the store and forward facility with which it is associated, which records the fax message together with data as to originating facsimile machine and destination facsimile machine. The store and forward facility then delivers the facsimile message to the intended receiver facsimile machine, either directly or through another store and forward facility. If unsuccessful on an initial attempt, the store and forward facility periodically retries to send the facsimile message. The system also provides spooling of all facsimile messages for an intended receiver machine, which are all transmitted upon making connection with the receiver machine. Subscriber mailboxes are provided as part of the mass storage, which can be accessed by a subscriber to have his messages delivered to any facsimile machine he designates. Secure facsimile transmission is achieved through use of subscriber PIN numbers. Broadcasting, redirecting messages and cost accounting can also be achieved by the system and method.

## CLAIMS

1. A system for facilitating facsimile communications between a transmitting facsimile machine and at least one intended receiving facsimile machine, comprising at least one store and forward facility, means coupling the at least one store and forward facility to the switched telephone network for receiving transmissions from a transmitting facsimile machine, said store and forward facility including computer means for controlling its operation and including mass storage means for storing facsimile transmissions together with information identifying the transmitting facsimile machine and the at least one intended receiving facsimile machine under control of said computer means, said store and forward facility also including means coupling it to the switched telephone network for transmitting facsimile messages stored in the mass storage means to at least one intended receiving facsimile machine.
2. The system of claim 1 wherein said computer means is programmed such that if the at least one intended receiving facsimile machine is busy or otherwise unable to receive a transmission at the time the store and forward facility attempts to transmit a facsimile message stored in the mass storage means, the store and forward facility periodically retries transmitting the facsimile message to the at least one intended receiving facsimile machine.
3. The system of claim 2 wherein said computer means is additionally programmed to establish a linked queue in said mass storage means spooling all stored facsimile messages intended for a particular receiving facsimile machine, and transmitting all the spooled facsimile messages intended for that particular receiving facsimile machine upon successfully making contact with the intended receiving facsimile machine.
4. The system of claim 1 wherein said computer means of said at least one store and forward facility is programmed, upon successful completion of a facsimile transmission to an intended receiving facsimile machine, to transmit a message to the transmitting facsimile machine confirming delivery of the transmission to the intended receiving facsimile machine.
5. The system of claim 2 wherein said computer means of said at least one store and forward facility is programmed, upon being unsuccessful in making a transmission to an intended receiving facsimile machine, to transmit a message to the transmitting facsimile machine indicating that the message has been entered into the mass storage means at the store and forward facility, and at least also indicating the reason for

a delay in transmitting the message to the intended receiving facsimile machine.

6. The system of claim 1 wherein the at least one store and forward facility includes means for receiving broadcast instructions from a user at a transmitting facsimile machine and associating those broadcast instructions with a facsimile message received from the transmitting facsimile machine and stored in the mass storage means, and for transmitting the stored facsimile message to a plurality of receiving facsimile machines in accordance with the broadcast instructions.

7. A system in accordance with claim 1 wherein said mass storage means additionally includes mailboxes associated with particular system subscribers and wherein facsimile messages received and stored by the mass storage means and intended for receiving facsimile machines associated with those subscribers are stored in the respective mailboxes, said store and forward facility being responsive to instructions received from a subscriber to transmit the facsimile messages stored in that subscriber's mailbox to any particular facsimile machine designated in the instructions by the subscriber, whereby a subscriber who is traveling or otherwise away from the fixed location of his facsimile machine may have facsimile messages intended for receipt by his facsimile machine collected, and retrieve them from any location where any other facsimile machine is situated.

8. A system in accordance with claim 1 wherein said computer means of said at least one store and forward facility is programmed to retain a facsimile message in the mass storage means for a predetermined time period even after successful transmission of the facsimile message to an intended receiving facsimile machine, and wherein the store and forward facility is responsive to instructions received from either originating or receiving subscribers to retransmit the facsimile message to another intended receiving facsimile machine.

9. A system in accordance with claim 1 for use in system operation wherein individual subscribers may be provided with unique PIN numbers, wherein individual subscriber PIN numbers are stored in the mass storage means, and wherein the store and forward facility recognizes an incoming facsimile message that is security coded by a transmitting facsimile machine, and wherein the security coded facsimile message is sent to an intended receiving facsimile machine only upon receipt from the intended receiving facsimile machine of the appropriate subscriber PIN number.

10. A system in accordance with claim 9 where said computer means is programmed such that, upon receipt by the store

and forward facility of a security coded facsimile message from a transmitting facsimile machine, the store and forward facility sends a transmission to an intended receiving facsimile machine indicating that the store and forward facility is holding a security coded facsimile message, whereby a subscriber at the intended receiving facsimile machine is prompted to input to the store and forward facility his PIN in order to have the facsimile message transmitted to the intended receiving facsimile machine.

11. A method for facilitating facsimile communications between a transmitting facsimile machine and at least one intended receiving facsimile machine, comprising the steps of providing at least one store and forward facility having computer means for controlling its operation and having mass storage means for storing facsimile messages, coupling the at least one store and forward facility to the switched telephone network for receiving facsimile messages from transmitting facsimile machines, recording received facsimile messages in the mass storage means together with information indicating the transmitting facsimile machine and the intended receiving facsimile machine, and transmitting facsimile messages stored in the mass storage means to intended receiving facsimile machines.

12. A method in accordance with claim 11 including the step that if an intended receiving facsimile machine is busy or otherwise unavailable to receive at the time the at least one store and forward facility attempts contact to transmit a facsimile message, of periodically retrying to transmit the facsimile message to the intended receiving facsimile machine.

13. A method in accordance with claim 11 including the step of establishing a linked queue in the mass storage means spooling all stored facsimile messages intended for a particular receiving facsimile machine, and transmitting all the spooled facsimile messages intended for that particular receiving facsimile machine upon successfully making contact with the intended receiving facsimile machine.

14. A method in accordance with claim 11 including the step, upon successful completion of a facsimile transmission to an intended receiving facsimile machine, of transmitting a message to the transmitting facsimile machine confirming delivery of the transmission to the intended receiving facsimile machine.

15. A method in accordance with claim 11 including the step, upon being unsuccessful in making a transmission to an intended receiving facsimile machine, of transmitting a message to the transmitting facsimile machine indicating that the message has been entered into the mass storage means at the store and forward facility, and at least also indicating in the message the reason for a delay in successfully transmitting the message to the intended receiving facsimile machine.

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16. A method in accordance with claim 11 including the step of providing the at least one store and forward facility with means for receiving broadcast instructions from a user at a transmitting facsimile machine and associating those broadcast instructions with a facsimile message received from the transmitting facsimile machine and stored in the mass storage means, and including the step of transmitting the stored facsimile message to a plurality of receiving facsimile machines in accordance with the broadcast instructions.

17. A method in accordance with claim 11 including the step of defining mailboxes in the mass storage means associated with particular system subscribers, and including the step of storing facsimile messages intended for those particular system subscribers in their respective mailboxes, and further including the step, in response to instructions received from a system subscriber, of transmitting facsimile messages stored in that subscriber's mailbox to a facsimile machine designated by that subscriber in the instructions.

18. A method in accordance with claim 11 including the step of retaining facsimile messages in the mass storage means for a predetermined time period after successful delivery of the facsimile messages to intended receiving facsimile machines, and, in response to instructions received from either the transmitting or receiving facsimile machines with respect to a particular facsimile message, the step of retransmitting that particular facsimile message to additional intended receiving facsimile machines.

19. A method in accordance with claim 11 including the step of providing subscribers with unique individual PIN numbers, storing the individual PIN numbers in the mass storage means, recognizing an incoming facsimile message from a transmitting facsimile machine which has been security coded, transmitting to the intended receiving facsimile machine for the security coded message a message indicating that the store and forward facility is holding a security coded message, and transmitting to the intended receiving facsimile machine the security coded message only after receipt by the store and forward facility from the intended receiving facsimile machine of the unique PIN number of a subscriber associated with that intended receiving facsimile machine.

20. A method for facilitating facsimile communications between a transmitting facsimile machine and at least one intended receiving facsimile machine, comprising the steps of providing a plurality of store and forward facilities at geographically spaced locations each having computer means for controlling its operation and having mass storage means for storing facsimile messages, coupling each store and forward

facility to the switched telephone network for both receiving from and transmitting to a plurality of facsimile machines associated with each store and forward facility facsimile messages, recording in the mass storage means each facsimile message transmitted from an associated facsimile machine together with information indicating the transmitting facsimile machine and the intended receiving facsimile machine, and transmitting facsimile messages stored in the mass storage means to intended receiving facsimile machines if those intended receiving facsimile machines are associated with the store and forward facility which received the facsimile message from a transmitting facsimile machine, or to another of the plurality of store and forward facilities if the intended receiving facsimile machine is associated with the another store and forward facility.

21. A method in accordance with claim 20 including the step that if an intended receiving facsimile machine is busy or otherwise unavailable to receive at the time a store and forward facility attempts contact to transmit a facsimile message, or periodically retrying to transmit the facsimile message to the intended receiving facsimile machine.

22. A method in accordance with claim 21 including the step of establishing a linked queue in each mass storage means spooling all stored facsimile messages intended for a particular receiving facsimile machine, and transmitting all the spooled facsimile messages intended for that particular receiving facsimile machine upon successfully making contact with the intended receiving facsimile machine.

23. A method in accordance with claim 22 including the step, upon successful completion of a facsimile transmission to an intended receiving facsimile machine, of transmitting a message to the transmitting facsimile machine, either directly or through another store and forward facility associated with that particular transmitting facsimile machine, confirming delivery of the transmission to the intended receiving facsimile machine.

24. A method in accordance with claim 23 including the step, upon being unsuccessful in making a transmission to an intended receiving facsimile machine, of transmitting a message to the transmitting facsimile machine, either directly or through another store and forward facility associated with that particular transmitting facsimile machine, indicating that the message has been entered into the mass storage means at one of the store and forward facilities, and at least also indicating the reason for a delay in successfully transmitting the message to the intended receiving facsimile machine.

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25. A method in accordance with claim 24 including the step of providing the store and forward facilities with means for receiving broadcast instructions from a user at a transmitting facsimile machine and associating those broadcast instructions with a facsimile message received from the transmitting facsimile machine and stored in the mass storage means, and including the step of transmitting the stored facsimile message to a plurality of receiving facsimile machines in accordance with the broadcast instructions, either directly or through additional store and forward facilities associated with particular ones of the plurality of intended receiving facsimile machines.

26. A method in accordance with claim 25 including the step of defining mailboxes in the mass storage systems of each store and forward facility associated with particular system subscribers associated with particular store and forward facilities, and including the step of storing facsimile messages intended for those particular system subscribers in their respective mailboxes, and further including the step, in response to instructions received from a system subscriber, of transmitting facsimile messages stored in that subscriber's mailbox to a facsimile machine designated by that subscriber in the instructions.

27. A method in accordance with claim 26 including the step of retaining facsimile messages in the mass storage means for a predetermined time period after successful delivery of the facsimile messages to intended receiving facsimile machines, and, in response to instructions received from either the transmitting or receiving facsimile machines with respect to a particular facsimile message, the step of retransmitting that particular facsimile message to additional intended receiving facsimile machines.

28. A method in accordance with claim 27 including the step of providing subscribers with unique individual PIN numbers, storing the individual Pin number in the mass storage means of a store and forward facility associated with a particular subscriber, recognizing an incoming facsimile message from a transmitting facsimile machine which has been security coded, transmitting to the intended receiving facsimile machine for the security coded message a message indicating that the store and forward facility is holding a security coded message, and transmitting to the intended receiving facsimile machine the security coded message only after receipt by the store and forward facility from the intended receiving facsimile machine of the unique PIN number of a subscriber associated with that intended receiving facsimile machine.

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29. A system in accordance with claim 1 wherein said computer means is programmed to store in the mass storage means relevant charging parameters including number of pages, destination and special system feature options provided for each facsimile message sent by a subscriber and received by a subscriber from a non-subscriber, and to generate charging summaries for subscribers periodically from the stored charging parameters.

30. A method in accordance with claims 11 or 20 including the step of storing in the mass storage means relevant charging parameters including number of pages, destination and special system feature options provided for each facsimile message sent by a subscriber and received by a subscriber from a non-subscriber, and generating charging summaries for subscribers periodically from the stored charging parameters.

31. A method in accordance with claims 11 or 20 including the step, upon receipt of a facsimile message from a transmitting facsimile machine, of immediately attempting delivery of the facsimile message to an intended receiving machine at the same time the message is being recorded in the mass storage means.

32. A method in accordance with claims 11 or 20 including the step that when an additional facsimile message intended for a particular receiving facsimile machine is received by a store and forward facility while that facility is in communication with that particular facsimile machine, the additional facsimile message is immediately appended to a message queue for the particular facsimile machine and delivered as part of the communication with that particular facsimile machine.





## Facsimile Telecommunications System and Method

## Field of the Invention

The field of this invention is telecommunications systems used in connection with facsimile transmissions. More specifically, this invention relates to a system and method for enhancing ease of facsimile transmissions and providing features relative to facsimile transmissions not heretofore available.

## Background of the Invention

The electronic transmission of documents by way of facsimile (fax) systems employing public and private switched telephone networks has become both commonplace and, often, an essential component in many business activities. In such a setting, it is very common for the fax terminals (fax machines) to be kept quite busy during a major fraction of the business day. Moreover, where sender and recipient are in different time zones, the "business day" can approach 24 hours, particularly in international activities. It is common for fax users to "broadcast" documents to a number of different recipients, that is, send the same message to several different fax machines. It is also true that the contents of some faxed documents are of such a sensitive nature that the originator or addressee would like to have a measure of control over who might see those documents as they move from the receiving machine to the hands of the actual addressee.

These circumstances present a number of practical problems for a fax user. In order to make a successful fax transmission it is necessary that the receiving machine be available at the time that the transmitting machine attempts to contact it. If the receiving machine is already in use handling another message, the transmitter will receive a "busy" signal. The originator's only recourse is to continue initiating telephone calls until contact can be established. This is a "hit or miss" process at best and can be very wasteful of the originating operator's time.

Some, rather expensive, fax machines have digital memories which will allow them to memorize the document to be transmitted and to be programmed to make multiple redials in an effort to establish contact in an automatic way. However, this is limited to only one or two documents and, more importantly, it ties up the transmitting machine until the effort is successful or abandoned. This is hardly an acceptable solution if that machine has other documents to send or receive.

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There are other conditions which can result in a failure to transmit even though a telephone connection has been established. Perhaps the most common of these is the absence of paper in the receiving machine. In such situations, repeated attempts to "redial" will lead to repeated toll charges with each attempt, with no actual success until the receiving machine is serviced (which may be some time if the machine is operating unattended because it is nighttime half-way around the world).

Busy machines which are destined to receive messages are affected by the converse problem. Since they and the prospective transmitting machines must engage in (perhaps, automated) "telephone tag", they are used very inefficiently. When a transmitting machine gets a busy signal, even if it automatically redials, it can only guess at when the receiving machine will be available. Thus, the receiving machine will likely remain idle for some fraction of the time until such an attempt is made.

The practice of broadcasting documents to a number of addressees obviously compounds these problems and adds still others of its own. Even if one does not encounter busy signals or impaired machines, convenient broadcasting demands an expensive memory-type fax machine on the transmitting end. Such machines read in the document once and then proceed to automatically dial the various recipient machines. This process ties up the sending machine and its telephone line and makes them unavailable for incoming calls. This, of course, exacerbates the busy signal problem for those units trying to contact the sending machine.

The security of sensitive documents is still another problem. Once contact is established between two fax machines, the transmission of the document proceeds automatically, irrespective of who may be standing by the receiving machine at the time. In a busy office, the contents of these documents are accessible to the fax operator and anyone else who happens to be in the vicinity.

It is also common for individuals to wish to deliver fax documents to a recipient who is not currently available through a known machine (eg. a person on a business trip). This is a very inconvenient situation in that it requires that the paper documents be held until the traveler phones in from a remote machine. It further requires that there be someone available at that time who has knowledge of and access to the documents intended for the recipient.

Still another concern is adequate accounting control over the billing of calls. Typically, many businesses wish to be

able to track the costs of both fax machine use and the associated telephone charges. While telephone charges can be ascribed from telephone company records, in the present environment these must be related to records of the number of pages transmitted per call and so forth, separately maintained by the fax machine or its attendants.

#### Summary of the Invention

The objects of this invention are to address these many shortcomings of present fax systems and to provide an integrated system for their solution. Furthermore, the intention is to achieve this in a way which is fundamentally compatible with existing fax terminal machines. The basic approach is to provide special computer-based fax Store And Forward Facilities (SAFF's) as an integral part of a switched telephone network system. All fax transmissions entered into the network are routed to such a facility, typically geographically near the originating machine, where they are temporarily stored or "spooled" by the computer in a mass storage buffer, such as a magnetic disk.

The fax message from the originating machine is intended for a destination machine, which may or may not be in a position to immediately answer the call. If the destination machine is within the service region of that SAFF, the system then proceeds to attempt to call the destination fax machine. If the destination machine is within the service area of a different SAFF, the system forwards the fax document data to that facility by long-distance lines, in which case this second facility attempts to call the destination machine. In either case, if contact is established and the message is delivered immediately, the system directs a printed report back to the originating fax machine confirming delivery to the destination machine, and other pertinent data.

If, on the other hand, the delivery cannot be completed immediately due to a busy signal, a machine fault (eg, receiving machine out of paper) or any other reason, the spooled document is saved and the system makes periodic attempts to contact the destination machine and complete the transmission.

In the meantime, the system sends a printed report back to the originating machine acknowledging that the message has been entered into the system, indicating the reason the delivery is being delayed, stating the protocol the system will take to deliver the message, and providing a reference number or "Message Code" which identifies the message and may be used at a later time to trace the status of the document.

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Placing the delivering spooling system geographically near the destination machine has the advantage of more economical use of any long-distance lines that may be involved. These lines are used only to move the message from the originator to the spooling system in the vicinity of the destination, which is virtually certain to be successful on the first try. Subsequent attempts to contact the destination machine can be handled more or less locally and need not tie up the bulk of the long-distance facilities.

If the delayed delivery is ultimately successful, the system will send a printed delivery report to the originating machine. On the other hand, if the delivery attempt protocol has gone through its whole cycle without success, a report will be sent to the originator indicating that the delivery procedure has failed and requesting instructions as to how to proceed (eg. try again, redirect the message to an alternate number, or delete the message).

An important feature of the system is that it recognizes all of the documents that are spooled in the system at a given time for a given destination machine. These are identified and linked together to form a message queue for that machine. In this way, once contact is established, all of the waiting messages can be "dumped" to that machine in a continuous batch. Furthermore, if new messages arrive while that dump is occurring, they are simply appended to the end of the active queue and are transmitted when their turn comes. This has the advantage of greatly enhancing the utilization efficiency of a busy destination machine.

Since all outgoing fax documents are temporarily stored at the facility near the originating machine, it is also practical to provide for automatic broadcasting of documents to multiple destinations. Lists of "broadcast groups" of phone numbers can be programmed into the facility by users, or a list of destination phone numbers entered "by hand" at the time of a call. The SAFF can then broadcast the message to every machine of the selected list. This is a great advantage to broadcast users in that they need only tie up their machines for one outgoing transmission, the one to the SAFF. The SAFF copies the message to all of the destination machines as outlined above. In the meantime, the originating machine is available for receiving or transmitting other documents.

Similarly, since the documents are stored near the originator, the system can permit messages which have already been sent to be copied to other destinations after the fact, without the necessity of resending the message to the SAFF. Likewise, since the messages are also spooled in a facility near the destination, the system also provides the recipient with

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the option of forwarding or redirecting documents to still other destinations, as if the recipient were the originator. The system can also accept and store messages destined for a fictitious destination or "Mail Box". Thus, individuals who are traveling can, at their convenience, dial into the system and pick up any waiting documents.

Closely akin to these features is the ability to have the originator of a transmission include the requirement that the recipient provide a security code, such as a PIN number, in order to release the document from the spool to the destination machine. In this case, the SAFF sends a written report to the destination machine advising that a secure message is waiting for a particular recipient and the fax identification of the originating machine. The recipient must then call in to the SAFF and key in the security code to initiate the delivery of the document. Since the document is spooled, the delivery easily may be delayed until the recipient is available to supply the code.

Finally, since the documents and their delivery are both under the control of the telephone system, as a special service the telephone call accounting system can provide both time and charges for the telephone services rendered and fax information, such as pages transmitted, sorted according to the originator's clients. This can greatly facilitate the fax user who wishes to do cost accounting or to bill clients for costs incurred.

#### Brief Description of the Drawings

Other objects and advantages of the present invention will be apparent from the following Detailed Description of the preferred embodiments thereof and from the attached Drawings of which:

Fig. 1 illustrates the inter-relationships of the principal elements of a connection between two SAFFs.

Fig. 2 shows a more detailed view of the various systems within a single SAFF, such as those shown in Figure 1.

Fig. 3 illustrates the major components of the Originate Function in the SAFFs shown in Figures 1 and 2.

Fig. 4 illustrates the major components of the Answer Function in the SAFFs shown in Figures 1 and 2.

Figs. 5a and b show a flow chart describing the general processing steps required to handle a fax or voice message

incoming to the Originate Function of a SAFF, as described particularly in Figures 2 and 3.

Figs. 6a and b show a flow chart describing the general processing steps required to handle the delivery of a fax message incoming to the Answer Function of a SAFF, as described particularly in Figures 2 and 4.

Fig. 7 shows a flow chart of the general processing steps required to handle a service request in the General Service unit of a SAFF, as described particularly in Figure 2.

#### Detailed Description

##### Introduction

The preferred embodiment of this invention is a multi-function, interactive facsimile transmission system which is integrated into a switched telephone distribution network, where "network" is taken broadly to mean the entire system required to complete a communication from an originator to an answerer. This embodiment provides a comprehensive computerized fax message management system based on automated fax Store And Forward Facilities (SAFF) embedded in the network. This system requires no modifications to existing facsimile machines, but rather, relies on the network to provide the enhanced services.

The system contains several components which actually transmit the fax messages and related information, provide written fax reports to users about the status of messages within the system, allow user intervention in the sequence of automatic actions of the system, provide an accounting of services rendered for both the customer and the telephone company, and control and supervise all of these activities.

In the preferred embodiment, it is presumed that the SAFF's are placed at the interface between the local telephone delivery system and the long-distance delivery system, as indicated in Figures 1 and 2. In this setting, the SAFF system can be controlled and its services offered by either one. However, it is obvious that useful systems can be constructed where the SAFF exists as close to the user as a component of his or her own in-house telephone system (such as a PBX or Centrex) or as remotely as a single, independent, stand-alone SAFF serving a wide geographical area. It is also obvious that commercially viable systems can be constructed which provide subsets of the features of the preferred embodiment. The choice of site/control setting and service features might be driven by any number of economic, market, or legal

considerations, which would militate toward offering the system at an alternate location in the network, or in a "stripped down" form.

To more clearly understand the present invention, it is useful to consider the manner in which a fax transmission occurs in the traditional setting. Here the communication between two machines is initiated when the destination machine answers a telephone call directly from the originating machine. Typically, there is an exchange of digital data identifying the sending and receiving machines to each other and establishing the fax mode or format to be used. If this exchange is satisfactory, then the actual image transmission takes place. Otherwise, the call is terminated, usually with some form of written diagnostic to the respective users.

#### Message Interception

In the present invention, all fax transmissions initiated by a subscriber to the fax management system are first intercepted by an "originator" SAFF; that is, the SAFF which directly services the originating fax machine. Figure 1 shows two exemplary SAFFs 8 and 18, with interconnections between the SAFFs and with subscriber fax machines being diagrammatically indicated. Thus in Figure 1, the SAFF 8 includes an originate function 9 coupled over telephone lines 4 to originating fax machines 1. Likewise, the SAFF 18 includes an originate function 22 coupled over telephone lines 26 to originating fax machines 30. Each of the SAFFs 8 and 18 also includes respective answer function blocks 12 and 19 respectively connected over telephone lines 6, 24 to fax machines 3, 28. Each of the SAFFs 8, 18 also includes service interfaces 10, 21 coupled via telephone lines 5, 25 to telephones 2, 29. The function and purpose of the service interfaces is more fully explained hereafter, and they are under control of status and control blocks 11 and 21.

Access to the system of Figure 1 can be obtained much the same as access to a specific long-distance company's network. That is, subscribers such as 1 in Figure 1 can dial a unique access code at the time a call is initiated, or a telephone line dedicated to a fax terminal may be permanently routed to the SAFF system, in this case the SAFF 8 of Figure 1. Either way, one accesses SAFF Directed Lines 4 and the SAFF 8 itself in the process of dialing the destination fax machine.

The SAFF 8 then answers the phone in place of the destination machine, such as one of 28 shown in Figure 1 as serviced by SAFF 18. For the moment, this SAFF 8 near the originator becomes the proxy for the destination machine 28. While

noting the actual destination telephone number, the SAFF 8 engages the originating machine in the same digital dialogue that would have occurred if a direct connection to the destination machine had actually been made. Thus, it echoes back the destination telephone number, to identify the intended destination machine, and agrees to accept the fax format requested by the originating machine.

This causes the originating machine 1 to respond by transmitting the fax document image data. The originating machine's identification, the destination machine's telephone number, the fax format, and the document image data are all stored on a mass storage device 67 (in Figure 3), such as a computer magnetic disk unit. Furthermore, a unique alphanumeric Message Code is assigned to the block of data to identify it while it is resident in the SAFF system. This Message Code is related to the file name for the stored data.

### Delivery

At this point the SAFF 8 initiates two actions. The first is to generate an "Acceptance Record" of the transaction to this point. This record, in one form or another, will be returned to the originator as will be described below. The second step is to begin to deliver the fax message to the destination machine 28.

The details of the delivery process depend to some degree on the geographic location of the destination within the network. A single SAFF can, in principle, service a broad geographical area. However, in the preferred embodiment, communications beyond a certain limiting distance involve at least two SAFFs, one 8 near the originator 1 and the other, a "destination SAFF", 18 near the recipient 28 of the document. The choice of one, two, or more SAFFs is determined by network economics, or other considerations, and is not essential to the invention.

For the sake of this discussion, we will define a "local" message to imply that the originating and the destination machines are serviced by the same SAFF. (Although, this does not preclude the possibility that the two machines are some considerable distance apart and connected by a toll call.) On the other hand, we will define a "long-distance" message to mean that the originating and destination fax machines are serviced by different SAFFs and, thus, one SAFF must exchange data with the other, perhaps through intermediaries. Similarly, the term "near" used in connection with a SAFF refers to being within the service area of that SAFF.



Each SAFF 8, 18 has two clearly defined roles: the "Originate Function" 9, 22 for handling data with an originating machine, and the "Answer Function" 19, 12 for handling data with a destination machine. The details of these two subsystems are illustrated in Figures 3 and 4 respectively. In the local message mode, the connection between the Originate Function, such as 9, and the Answer Function, such as 12, is linked within the single SAFF 8 by way of a Local Call Loop-back connection 13, between the two Functions. In the long-distance mode, the Originate Function 9 of SAFF 8, near the originator, is linked to the Answer Function 19 of another SAFF 18, near the destination, by long-distance lines, such as 14, or 16 for SAFF 18. Thus, processing a long-distance message involves the same basic steps as a local message, except that the activity is shared interactively between at least two different SAFFs.

#### Originate Function

With this understanding of SAFF functions, the following detailed discussion will illustrate the operation of the system in the long-distance case, since it is the more complex, and therefore provides a more comprehensive example. Figures 1, 2, 3, and 4 all show elements of the SAFF system in varying degrees of detail and all will be referred to in the following. It will be noted that some critical elements are shown in more than one of the Figures.

As an example, it is assumed that one of the subscribers 1 attached to SAFF 8 wishes to send a fax message to one of the subscribers 28 attached to SAFF 18. The subscriber 1 places the call to the destination machine 28 which is routed over SAFF Directed Lines 4 to the Originate Function 9 of SAFF 8. These signals originate within the SAFF system and they are picked up by the On-net Interface 64 which is part of the Originate Function, as shown in Figure 3. This Interface signals the Originate Host Computer 70 of the incoming call and the Host responds by directing the incoming data to a Mass Storage Unit 67 where it is stored in a file 68.

During this storage process the Host directs two other activities. It creates a call status record file 69 (Figure 3) in mass storage, recording the time and date of the origination, the telephone number of the calling machine, the telephone number of the destination machine, any security or other special services requested, various housekeeping information, and it assigns the Message Code number which locates not only the status file but also the fax data file associated with it. The Host also passes the destination machine's telephone number to the Outbound Control unit 74 which proceeds to

connect the originating SAFF 8 with the nearest available SAFF 18 to the destination through a long-distance interface 75 over long-distance circuits 79 (14 in Figure 1). In the process of establishing this connection, the Outbound Control unit employs an algorithm which examines the number and kind of available trunk resources and chooses the most efficient combination of these lines for the task required.

#### Answer Function

The originating SAFF 8 then proceeds to transmit the originator and destination telephone numbers, the stored fax image, the Message Code, and other housekeeping data to the destination SAFF 18. These data are sent by the most expedient mechanism offered by the long-distance service. For example, if this service employs digital communications, the fax data may well be transmitted at a significantly higher rate than it was originally received into the system.

The fax data is received by the Long-distance Interface 95 (Figure 4) in the Answer Function 19 of the destination SAFF. This unit signals the Answer Host Computer 85 of the incoming data. The Host then routes these data to its Mass Storage facility 87. (It should be noted for later reference that the originator SAFF and the destination SAFF now both have a copy of these data.) The Host notes whether other messages are pending for the destination machine and either opens a Delivery Queue file 88, or appends the new message to the existing Queue File.

The Host also records the arrival time and other pertinent information about the fax message in a Call Status file 90 in Mass Storage unit 87, and sends a status update back to the originating SAFF 8 by way of the Status and Control Interface 84, and the System Status and Control Unit 11 via Long-distance Trunks 15.

It then signals the Local Interface 83 to dial the destination machine's (81 in Figure 4) telephone number on ordinary outgoing local lines 24, 82. If the destination fax's line is available, the destination SAFF now becomes the proxy for the originating fax machine and engages the destination machine in the necessary preliminary digital dialogue.

If this is successful, the document image, including the source and destination identification information, the Message Code, and the entry and delivery times, is played back from storage and delivered to the destination. A "Delivery Record" is then created by the Answer Host 85 which indicates the date and time of delivery, and any other pertinent data. The

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Delivery Record is sent back to the originating SAFF 8, again by way of the Status and Control Interface 84, and the System Status and Control Unit 11, via Long-distance Trunks 15. The originator SAFF 8 then appends this information to the Acceptance Record to form a complete "Transaction File". The originating SAFF 8 then sends this file, as a delivery receipt or report, back to the originating machine 1, 60, as a fax document.

If the destination machine's line is busy, or the contact fails for some other reason, the destination SAFF's Host Computer 85 will enter a sequence whereby it will attempt to contact the destination machine and transmit the document on a predetermined schedule for a specific period of time or number of tries. As this sequence is entered, a "Retry Record" is generated documenting the situation and the system's response to it. This record contains the reason that the delivery was delayed and it indicates which protocol the system will use to attempt to deliver the message. This is transmitted back to the originating SAFF 8, as described above, and appended to the previously described Acceptance Record to form a Transaction File which is then sent as a fax message back to the originator. The assigned Message Code is a part of every transaction report and may be used at any time to trace the status of undelivered documents, as will be described shortly.

If the retry effort is ultimately successful, a Delivery Record is appended to the Transaction File which is sent back to the originating machine. If the effort fails after reaching the predetermined limit, this is also recorded, appended, and sent back to the originator. In this case, the originator is given the option of dialing back into the system within a certain length of time (typically several hours) and instructing the destination SAFF as to how to dispose of the document (eg. repeat retry sequence, forward to a different telephone number, or delete the message).

This process is handled by using an ordinary touchtone phone to dial a multipurpose (perhaps, toll free) fax system "Service Number"; which will be referred to here and in later sections. This might be a unique number for every SAFF, or it might be a standardized number common to many localities, except perhaps for area code, such as is 555-1212 for calling "Information". This Service Number is answered by the General Service Control units (10 in Figure 1, 50 in Figure 2) of the SAFF to which the call is directed. This unit contains an automated voice response system that presents a menu of the available services and prompts the user to select the desired choices by pressing particular numbers on the touchtone keypad. In an advanced embodiment, a computer-based voice

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recognition system replaces the keypad and accepts verbal commands in a conversational way.

The General Service Control unit 50 can communicate with its own System Status and Control unit 11, and through that unit, any other such unit 11, 20 via Long-distance Trunks 15. Through these connections, both inquiries relating to messages in the system and instructions as to their disposition may be addressed to the entire SAFF system.

Having selected the "failed-connection message disposition" choice, the user is prompted to key in the Message Code. The system verbally repeats the code and the delivery discrepancy for verification, and then presents a menu of disposition options for the user to select with the keypad.

If the user does not take advantage of this "what to do now" opportunity within the time limit, the message is retransmitted back to the originator with a report. It is then erased from both the originator and destination SAFF files after a suitable delay (typically six hours). If the originator wishes to resend the message during this "grace" period, it may be recovered and resent to the original destination or forwarded to another destination(s), as will be described later.

In each of the various cases where the SAFFs automatically direct fax message status reports (such as, the Acceptance, Delivery, or Retry records above), the system can be programmed to accumulate records from all calls over a period of time (eg. an hour) at the originator SAFF and deliver them as a single fax document at the end of the period or upon request by the originator. This has the advantage of reducing the number of report calls and the subsequent burden on the originating fax machine. The originator SAFF will enter a retry sequence if it finds the originator's line busy or the machine unavailable when it attempts to deliver reports. This is a persistent sequence which it will continue trying for direct contact at intervals of an hour or so for a considerable length of time (eg. 72 hours). It also places a copy of the report in the originator's Mail Box (described below) so that the originator may recover it in between SAFF delivery attempts.

It should also be noted that the originator has the option of dialing the Service Number at any time and inquiring about the status of a given message. Here again, the voice response system prompts, presents menus, and uses the Message Code to locate and report on the current location and condition of the message. A written record can be directed to the originating or destination fax machine, if desired.

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Another feature of the system is that the act of accepting and storing an incoming message at the originator SAFF, and the act of dialing and forwarding that message to the destination by the destination SAFF, can overlap in time. That is, if the originator SAFF has lines available, once the initial connection dialogue between the originator and the SAFF is complete, the SAFF may immediately make its first attempt to contact the destination SAFF and, thus, the destination machine, while it is beginning to spool the document.

If this immediate contact is successful, then the message is passed from the originator SAFF 8 to the destination SAFF 18 to the destination machine 28 directly from the Originate Host Computer's memory 70 while the two SAFFs are still in the process of spooling the document to disk. This is facilitated by a "write-through pipeline" whereby the Originate Host 70 passes the incoming fax data through directly to the Outbound Control unit 74 at the same time it is being written to mass storage. It is held in a temporary memory buffer in the Outbound unit until it is clear whether or not an immediate connection to the destination machine is possible. At that point the temporary buffer fax data is either sent and then deleted, or merely deleted. The net effect is that the spooling process only adds a few seconds delay in the message delivery over the traditional direct machine-to-machine contact when the destination machine is readily available.

On the other hand, if lines are limited, the originating SAFF can choose to delay until suitable lines are available. This has the advantage of improving communications resource management and enhancing the efficiency of the telephone system's line usage over the direct contact scheme.

The foregoing describes the basic fax SAFF message handling system and from this discussion several advantages should be apparent. The originating machine always functions as if it makes contact and delivers documents on the first try, thus immediately freeing the machine and the attendant personnel for sending or receiving other transmissions. Likewise, the telephone system only handles one call across its local and long-distance lines from the originating machine to the destination SAFF, since the state of the destination machine has no impact on the call. This significantly improves the efficiency of line usage when messages are addressed to busy fax terminals.

Although some additional calls are needed to deliver the various reports, these require very little long-distance time, as they are transmitted over the circuits as highly compressed coded messages. It is the nearby originating SAFF that translates them into "plain language" for fax delivery as a local

message. As pointed out, additional savings in these local messages can be gained by compiling multiple reports and delivering them in bulk as a single call. It should be noted that the delivery of reports to an originator is a cooperative process between the Originate Function and the Answer Function of the originate SAFF. The Originate Function 9 actually generates these reports and passes them through the Local Call Loop-back 13 (76 in Figure 3) to the Answer Function 12 for delivery as an ordinary fax message.

In addition to these basic features, the design of the system also provides for a number of additional services and advantages which are described below.

#### Message Queuing

As pointed out, all fax messages directed to a particular telephone number are spooled by the Answer Function of the destination SAFF, as detailed in Figure 4. The Host Computer 85 controlling this function monitors the incoming messages and links all undelivered messages for a given telephone number into a message Delivery Queue file 88. The computer also compiles a constantly updated, ordered catalog of the file names of the messages waiting for each fax machine.

Consequently, when messages arrive at a rate faster than they can be delivered, for whatever reason, they are held in this queue for delivery. As soon as the destination SAFF establishes contact with the destination machine, it begins sending the entire queue of messages in a single, essentially uninterrupted transmission. Messages that arrive while the transmission is in progress are appended to the end of the queue.

This scheme eliminates the "trial and error" dial and redial attempts that result from a number of independent incoming calls competing in an uncoordinated way for the single destination line. It can significantly enhance the efficiency of the destination fax machine and the long-distance and local telephone circuits connected to a busy machine.

When the queue exceeds a certain limiting size, the destination SAFF will periodically insert and send a "Queue Report" (as a fax document) to the destination machine showing a list of the waiting messages. This list shows the originating machine identification, the time entered into the originator SAFF, the number of pages in the document, and the approximate time that the message will be delivered based on its position in the queue.

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The user can advance a particular message to the head of the queue by calling the fax Service Number and supplying the desired message number, by using the voice response menus. The General Service unit 50 directs these instructions to the System Status and Control Unit 11, which in turn directs them to the Answer Function Host 85 through its Status and Control Interface 84.

Alternately, the originator can designate a priority level to a given fax message at the time it is dialed in (eg. by using a different access code). In this case, the destination SAFF will insert higher priority messages ahead of lower priority messages in the queue as they are received. The originator would normally pay a premium price for this service.

Another originator option is the time of delivery. If desired, the originator can specify the time of day which the message should be delivered. In this case the message is forwarded to the destination SAFF directly, but is not entered into the queue until the specified time. This can be used in combination with an assigned high priority to insert the message at the head of the queue at the appointed time.

When messages are finally delivered to the destination machine they are not immediately erased from the spool file 88 at the destination SAFF. Rather, they are maintained in a "Delivered Message" directory 90 for a period of time (typically six hours). A feature offered by this action is the opportunity for the subscribing recipient of a message to make additional copies, redirect, or forward copies of selected messages to other destinations. This is accomplished by calling the Service Number and selecting the appropriate choices from the voice response menus.

#### Security and Mail Boxes

It is not uncommon for documents of a sensitive nature to be sent by facsimile from place to place. This is often a problem, especially in a busy office or where a machine is nominally unattended during the transmission, in that the originator has no control over who may be standing by the machine when the document prints out, or who may leaf through a stack of faxes piled up in a hopper right after lunch.

This is a problem which others have attempted to deal with in a variety of ways. For example, Bond, U.S. Pats. 3,594,495 and 3,641,432, discloses a "radio facsimile postal system" which features the direct delivery of documents to specific addressees by facsimile via communications

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satellites. In this system, intended as a replacement for or supplement to the ordinary "paper" postal system, fax messages were directed from special public fax terminals operated by the post office to a central satellite earth-station. Here the messages were sorted according to their geographical destination for concentration and uplinking to a satellite servicing that area. The satellite then broadcasts all of the uplinked messages back to Earth.

In principle, anyone with a radio receiver in the satellite's service area could access any of the messages, so Bond built in a "privacy code" which operated with the receiver to allow the message to print out only on the desired machine. In reality, this privacy code was nothing more than an addressing signal which enables the selected fax receiving system. Thus, Bond's system is merely a restricted version of the services presently provided to fax users by the telephone networks. His privacy code function is the same as a telephone number: it selects which of a plurality of fax machines will actually receive the message. Unfortunately, his approach leads to exactly the security dilemma facing telephone fax users.

Chapman, U.S. Pat. 4,106,060, has approached the problem in a somewhat different way. He too discloses a facsimile-based mail system. However, in his system, the messages are directed by whatever means to a "paper" post office near the addressee, rather than the addressee's home or place of business. This post office then makes a paper copy of the fax message, places it in an envelope, and delivers it to the addressee as ordinary mail. This is a reasonably effective solution to the security problem, but it can only be relied upon to provide "next day" delivery, and there are a number of other, competing alternatives for document delivery service on that time scale.

In the present invention the security problem is addressed by a control variation of the destination SAFF queuing system. Messages which the originator wishes to designate as secure are temporarily directed to a auxiliary storage file 54, 89 in the Answer Function of the destination SAFF called a "Mail Box". Instead of being delivered to the destination machine, a report is sent to that machine indicating that a secure message is waiting for a particular addressee. Optionally, a voice message may be directed to a designated telephone number by the General Service Control 50.

This feature works in the following way. Each individual SAFF is assigned its own unique telephone exchange code or codes (typically indicated by the first three digits of a seven digit local number). Thus, the SAFF appears to the



world as if it were a distinct telephone exchange(s), separate from all other exchanges in that area code region. All subscriber's to a given SAFF are assigned their fax telephone numbers with that exchange prefix. Subscribing individuals wishing Mail Boxes (typically associated with a "default" fax machine) are issued "fictitious" telephone numbers which actually terminate in fax Mail Boxes, rather than in an actual telephone line.

Mail Box numbers are published so that correspondents may use them. In addition, each individual is also given a secret security code or PIN number which will access his or her box. The host computer managing the SAFF maintains a list that relates each fictitious number with the individual's name, the security code, and the real telephone number of the default destination machine. This default machine is the one to which messages and reports will normally be sent, when appropriate.

An originator wishing to send a secure message merely dials the (fictitious) Mail Box telephone number at the time the document is sent. The system directs the message to the Mail Box file 89 in the destination SAFF associated with that number, and the Answer Host 85 sends a "Message Waiting" report to the default destination fax machine through the Local Interface 83. If more than one message is in the Mail Box queue, then this report lists them all.

In order to get the fax document actually sent to the destination, the security code must be sent back to the destination SAFF. Typically, this would be done by the addressee dialing his or her own Mail Box number. Since this call originates from a "normal" telephone 34 over Ordinary Local Lines 40, rather than the fax's SAFF Directed Lines 38, the call is directed to the Off-net Incoming Screener 48 in the (destination) SAFF which functions in conjunction with a mailbox service control 49. This unit recognizes that the call is not a fax transmission and thus treats it as a voice service request. A voice response system then prompts the caller to key in the security code. When the correct code is supplied, the SAFF system announces the number of messages waiting and, if desired, the message codes of each. Mail Box contents are maintained in a queue 89 just as are "regular" spool files. Thus, the user is also given the opportunity to reorder the messages within a Mail Box Delivery queue, through the System Status and Control units 11, 20 in the same way as other messages.

The system finally permits the addressee to make a selection of messages for immediate release, and provides an opportunity to "redirect" them to a fax machine 3 other than the default machine over ordinary local lines 39. The SAFF then

releases the selected documents and moves them to the head of the appropriate destination Delivery Queue 88 for immediate delivery.

When messages are accepted into the SAFF system and arrive at a mail box, The Answer Function of the destination SAFF issues a "Posting Report" which is directed back to the Originator in the manner described for other reports. The report is similar to a Delivery Report, except that it indicates that the message has been received by the mail box. When the Mail Box Queue is actually read by the addressee the Destination SAFF sends an actual Delivery Report to the originator indicating the date and time of delivery and so forth.

Another advantage of the Mail Box system is that it can provide a convenient way for individuals who are away from their "home" machine to still have access to their documents. Such individuals may call in to their Mail Box number to hear from the voice response unit whether they have any messages waiting. By use of the redirection feature, messages sent to a fax Mail Box can be accessed by an individual with the security code from any telephone with a fax machine.

For example, a person on a business trip can have all his or her fax documents directed to their Mail Box. Upon arriving at a hotel that has a fax machine, the traveler places a call to the Mail Box number and supplies the information outlined above, including the telephone number of the hotel fax machine. The SAFF then calls the hotel machine and dumps the queue of waiting documents.

#### Broadcasting

The queuing, Mail Boxes, and security codes are all derivative benefits of the spooling of messages at the destination SAFF. There is a counterpart advantage to the originator SAFF's spooling as well. Since the originator SAFF maintains a copy of each message, that copy can be used to broadcast messages to multiple destinations.

This can be initiated in a number of ways. For example, the user can dial in a code prefix indicating that a list of destination numbers is to follow. The numbers are then entered and finally another code is entered to signal "end of list". The Originate Host 70 recognizes these inputs and attaches them to the message which follows. As an alternative, the user can store different numbered broadcast telephone lists in the Originate SAFF mass storage files 69 (entered much as described above) and invoke them simply by dialing a two or three digit "short-cut" code. In either

case, from there the fax transmission to the originator SAFF proceeds normally.

Upon reception of the list and the document, the originator SAFF proceeds to open as many local loop-back or long-distance lines as it can to deliver the broadcast message to the various destinations, essentially simultaneously. Although the originator is billed for making a number of different calls, in fact the originating machine is only tied up for the time required to make one call. Furthermore, the full power of the delivery system is asserted for each destination machine, including reporting, redials, queuing, and so forth.

A feature related to broadcasting is the redirection of messages by the originator. Since fax messages are spooled at the originator SAFF and held for a period of time even after delivery (typically six hours), the originator can dial the Service Number any time during this period and direct a copy of the spooled message to be sent to other destination machines.

#### Communications With Non-subscribers

Thus far, the discussion has presumed that both the originator and answerer were subscribers to the SAFF system. It is quite reasonable to assume that subscribers will wish to send or receive fax messages with non-subscribers, as well. While the services provided by the SAFF are more limited in such cases, nevertheless, the system both anticipates and enhances communications with non-subscribers for the benefit of the subscribers.

When a subscriber originates a call to a non-subscriber the delivery process is almost identical to subscriber-to-subscriber calls. The fax data is forwarded to the Answer Function of the appropriate destination SAFF and delivery is pursued, all in the usual way. For the benefit of the subscribing originator, the message is stored in the usual way at the destination SAFF until delivery is completed. If multiple SAFF-processed messages arrive before the delivery is complete, a temporary Delivery Queue will be created and used as required. However, since the non-subscriber will have no account in the system, attempts to use the Service Number to manipulate the queue, forward messages, make multiple copies, and use the other special services available to a subscribing answerer, will be unsuccessful.

Calls originated by a non-subscriber directed to a subscribing answerer move by a somewhat different mechanism. As noted, each SAFF appears to the world as a distinct telephone

exchange and all subscriber's to a given SAFF are assigned their fax telephone numbers with that exchange prefix. Consequently, all calls directed to a SAFF subscriber eventually end up at the subscriber's SAFF, whether they originated from within the SAFF system network or not. Messages originating "off-network" can arrive by any route. For example, they may be truly local calls, or they may be long-distance calls which arrive over any available long-distance network.

In any case, messages originating from a non-subscriber 33 are delivered to the answering fax machine's SAFF by the local lines 39 provided by the local telephone company. They are answered by the SAFF's Off-net Incoming Screener 48, which, upon noting that they are fax transmissions, directs the calls to the Originate Function 9 of that SAFF. From that point, the call is treated as if it were a local fax call and it is passed over to the Answer Function 12 via the Local Call Loop-back 13 for delivery to the subscriber.

In this situation an Acceptance Record will be returned to the originating machine, but no further originator services are provided. On the other hand, the answering subscriber has the full range of Answer Function available.

#### Charges and Detailed Billing

Normally, the Originate Function of the originator SAFF has ultimate responsibility for the management of outgoing messages. It initiates all connections to the Answer Functions of the various SAFFs with which it must communicate. It is the node to which all reports concerning message status and disposition must flow. It interrogates Answer SAFFs when extraordinary updates are required. Consequently, the Originate Function is also the focus of charging data.

The telephone company presumably charges for all of the various services provided by this system. The method, algorithm, and rates are determined by actual costs and applicable regulations. Typically, the user would be billed for telephone connect time, toll charges, extraordinary services, such as those provided by calling the Service Number, the amount of mass storage space consumed as a function of time, and so forth.

One of the user services for which a special charge might be made is a subscriber's customer specific billing system. In this option the user can "flag" each fax transmission with a keyed-in prefix which contains a user customer, client, or project number. This number is stored as a key field in the

transaction File for that call. Thus, when the telephone bill is prepared, the billing computer can sort the subscriber's bill on this field and present the user with a list of all fax messages, total usage time, number of pages, and related charges, all grouped by the subscriber's own customers, clients, or projects. Furthermore, it can accept the subscriber's particular algorithm for billing calls to customers or clients and generate a column showing what the subscriber will bill for the service (as a separate matter from what the SAFF system and the telephone company have billed the subscriber). This can be of great assistance in attributing costs and billing customers for services rendered.

#### Software Control

In the preferred embodiment, each of the principal units of the SAFF such as described in Figures 2,3, and 4 is controlled by its own computer processing unit or units. These units are interrupt-driven computers which are connected together by the System Status and Control unit 11. This unit is an electronic switch yard for control communications between the Originate, Answer, and other units within a given SAFF, as well as the other SAFFs in the system through the control long-distance trunks 15. While there are many tasks which the various control processors must perform to handle fax operations, the primary ones are intercepting incoming calls, either for fax forwarding or service requests, and delivering the fax messages to their destinations. The general software organization of these principal activities is shown in Fig. 5, 6, and 7. It should be noted that these figures are simplified and intended to be generally descriptive. For example, some procedures illustrated here as sequential (for the sake of simplicity) can actually be performed concurrently. Likewise, not every function of the system is represented in detail. Generally speaking, similar results also can be obtained with a number of other obvious arrangements of the functional blocks.

Broadly speaking, fax messages addressed to the Originate Function of a SAFF arise either through the special SAFF Directed Local Lines 4 (Figures 2 and 3) as a result of direct connection or dialing a special access code, or they arise from Ordinary Local Lines (off-net lines) 39, 40, 63. Those which arrive via off-net lines are processed first by the Off-net Screener 48, which may direct them to either the Originate Function 9 or to Mail Box Service 49. Figure 5, therefore combines all three of these related functions.

At the outset one of the two incoming call interfaces 64 and 65 signals the Host Computer 70 that it is beginning to

process a call at 100 in Figure 5a. These units have their own buffer capability and can tolerate some delay before the Host responds. Ultimately the Host must decide whether it is responding to an on-net or off-net call 101. If it is an off-net call there are two possibilities (excluding wrong numbers) 102: it may either be a fax call, in which case it is from a non-subscriber to a subscriber, or it is a mail box service call. If it is a fax call then the billing for services must be directed to the subscribing destination addressee 112. From that point it is handled like an on-net call as will be described shortly.

If it is not a fax call then it is presumed to be a mail box service call 103, and the caller is presented with the voice response menu 104 for such service. The user responds to these prompts with a touchtone keypad, or verbally, 105 and a decision ladder, shown succinctly as 107 selects the desired implementation routine 108, 109, 110 (for brevity only three typical choices are shown, and this element is actually a loop which will permit multiple commands). The chosen routine passes parameters to a command parser 121 (Figure 5b) which prepares an command statement which is then sent 122 to the System Status and Control unit 11, through the interface 72. This command will be passed to the Answer Host 85 through its interface 84 for actual action on the Mail Box Queue 89. If the service requires a response to the caller the transmission path is reversed. When the operation is completed 123 the call is terminated.

If on the other hand, the original call is found at 101 to be an on-net call, billing is generally directed at the originator 113 and the Host 70 begins the opening digital dialogue 114 with the calling machine, acting in place of the destination machine. This dialogue includes gathering and storing the fax identifications, originating and destination telephone numbers and so forth 116. The Host opens a Transaction File and links it to a data file 117 for the expected data, and then stores all of the call and file information 118 keyed to the Message Code. The destination telephone number and other information are passed almost immediately 119 to the Outbound Controller 74, which then opens a temporary buffer to hold the fax message in case immediate contact can be established, and it attempts to establish that contact through the destination SAFF.

In pursuing this contact, the Outbound Controller 74 examines the status of available trunks. If trunks are available, it will immediately attempt to connect with the destination SAFF, otherwise it will defer the call until a trunk is available. In the event of a broadcast message, the Outbound Controller will select the number of trunks to use

simultaneously based on the percentage of the trunks already in use, in order to avoid tying up all of the SAFF's outgoing capacity with a single message task. Other considerations can affect these usage choices depending on the details of the setting of the system.

The Host then enters a loop which gets the incoming fax data 125 (Figure 5b) from the On-net 64 or Off-net 65 Interface's buffer and stores each byte in the fax data file 126 while sending another copy 127 to the Outbound controller 74 until the incoming data is complete 128. The Host then checks 129 with the Outbound controller to see if it was successful in making immediate connection with the destination machine. If it was successful and a satisfactory transfer occurred, then a Delivery Report is sent back 132 to the originating machine before it leaves the line. Otherwise, an Acceptance Report is sent 131, and in either case the outcome is reported 133 to the Transaction File and the call is terminated 134.

A complementary set of activities occurs in the Answer Function of the destination SAFF as described in Figure 6a and b. Here an incoming call is detected 136 by the Inbound Control 92 (Figure 4). The Answer Host Computer 85 then opens a new fax data and Transaction file for the message if there is no current queue for that destination machine, or it prepares to append the data to an existing queue 137. The various call and file parameters are linked and stored 138 and the call parameters are passed through 139 to the Local Interface 83, which then decides 141 whether the call is addressed to a "real" fax number, or a fictitious number terminating in a mail box. If the number is real the Local Interface attempts to contact the destination machine for immediate delivery.

The Host then enters a loop where it gets the incoming data 147, stores it 148 in the fax Delivery Queue, and passes it through 149 to the Local Interface buffer. When the Host determines that the fax transfer is complete 150, it then checks 152 (Figure 6b) to see if the Local Interface has been able to make immediate delivery. If it has, the Host initiates the transmission of the Delivery Report 167 back through its Status and Control Interface 84 to the System Control and Status unit 11, which in turn updates the Transaction File and sends it back to the originator SAFF over Trunk 15. It is this communication which ultimately results in the immediate Delivery Report described previously. The transaction is then terminated 169.

If immediate connect is not established a Retry Report is sent 153 back through the System Status and Control unit and the Retry sequence begins. The Retry criteria can be varied

154, both in place and with the SAFF setting. For example, if the SAFF is integrated into a local exchange, the SAFF can actually monitor the desired line and simply wait for it to become available. In other settings it will be necessary for the SAFF to actually redial at prescribed intervals. In any case attempts to connect are made 155 and if they are not successful 156 a counter or timer is checked 159 to see if the retry limit has been exceeded. If not, the process is repeated and if so, a Failed Delivery Report 160 is sent back through the system and the effort terminated 170.

If the retry effort is successful the Delivery Queue is retrieved 158 and message by message 162 the queue is dumped, with a pause 163 after each message to confirm receipt, send a Delivery Report 164 and to check for end of queue 165. If a message fails during the queue dump the retry sequence at 154 is resumed at the failure point and the process repeated to a conclusion. When the last message has been received satisfactorily, the transaction is terminated 168.

If it is determined at 141 (Figure 6a) that this is a mail box call, a loop is entered which gets the fax data 142 and stores it 143 in the appropriate Mail Box Queue. When the end of message is detected 144, a Posting Report 145 is sent back through the system and a Message Waiting Report 146 is sent forward through the system to the default destination machine.

General Service calls always arrive on Ordinary Local Lines 5. Upon detection and answering 172, the voice response menu is presented 173 to the user. As with the Mail Box Service, the user keys in responses or gives them orally 174 and a decision ladder 175 identifies the desired service routine such as 177, 178, or 179. Here again only a few of the possible choices have been shown for sake of illustration and looping for multiple service requests is provided. The selected service routine generates command parameters which are parsed 181 as system commands and sent 182 to the System Status and Control unit 11 for execution. Upon completion of all requests the call is terminated 183.

What has been described are the presently preferred embodiments of a system and method for providing a comprehensive interactive facsimile message management system embedded in a switched telephone network. It should be apparent that many modifications to the system and the method are possible without departing from the true spirit and scope of the invention.



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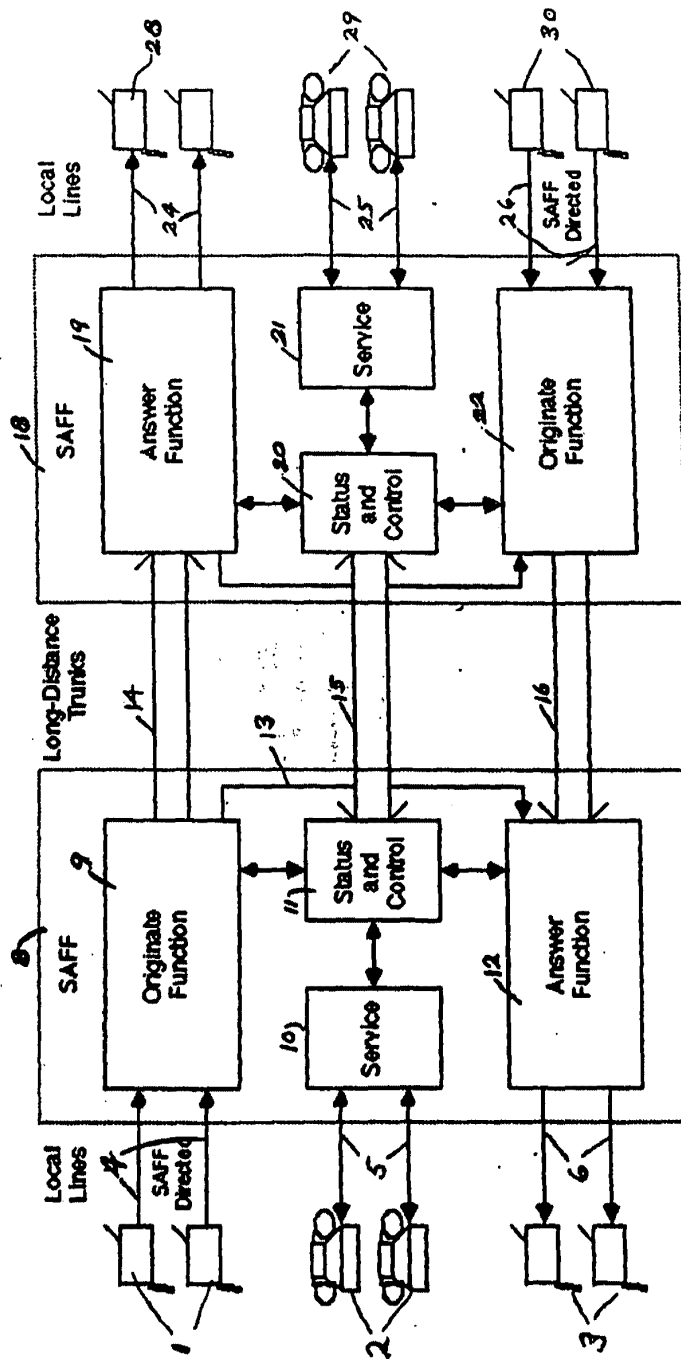


FIG. 1

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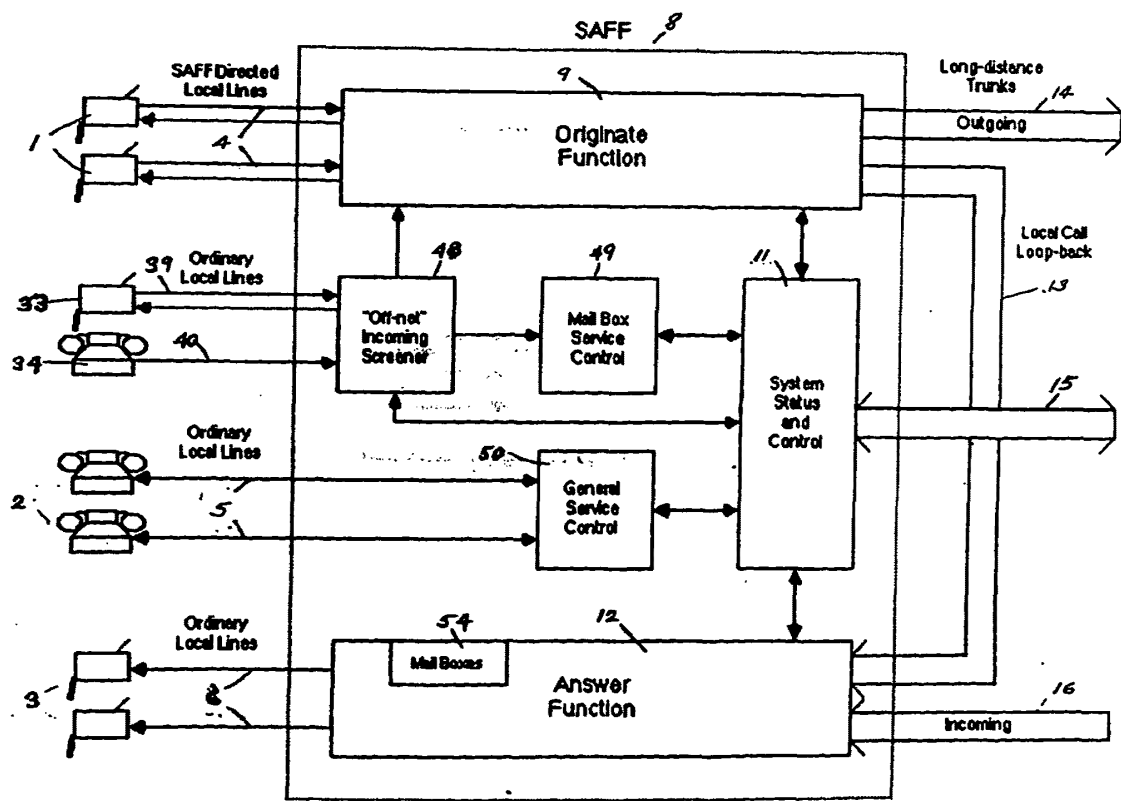


Fig. 2

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CANADA

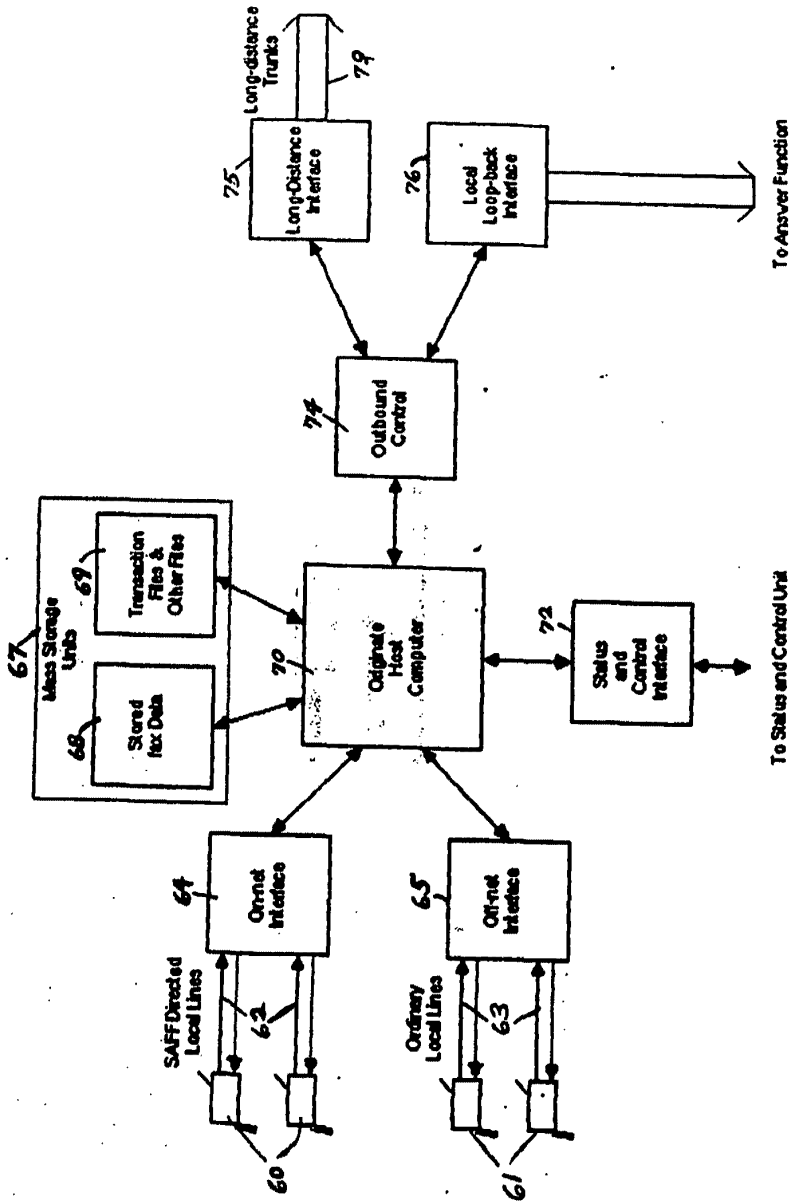


Fig 3

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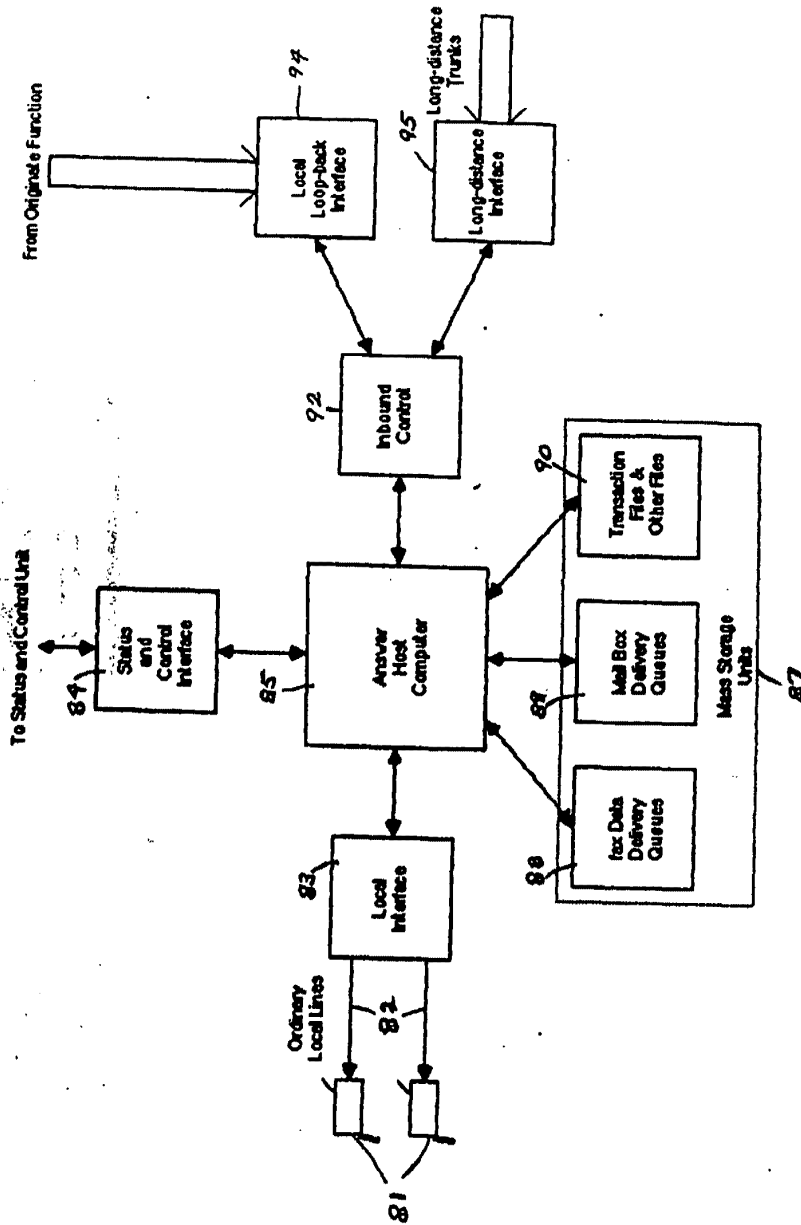


FIG 4

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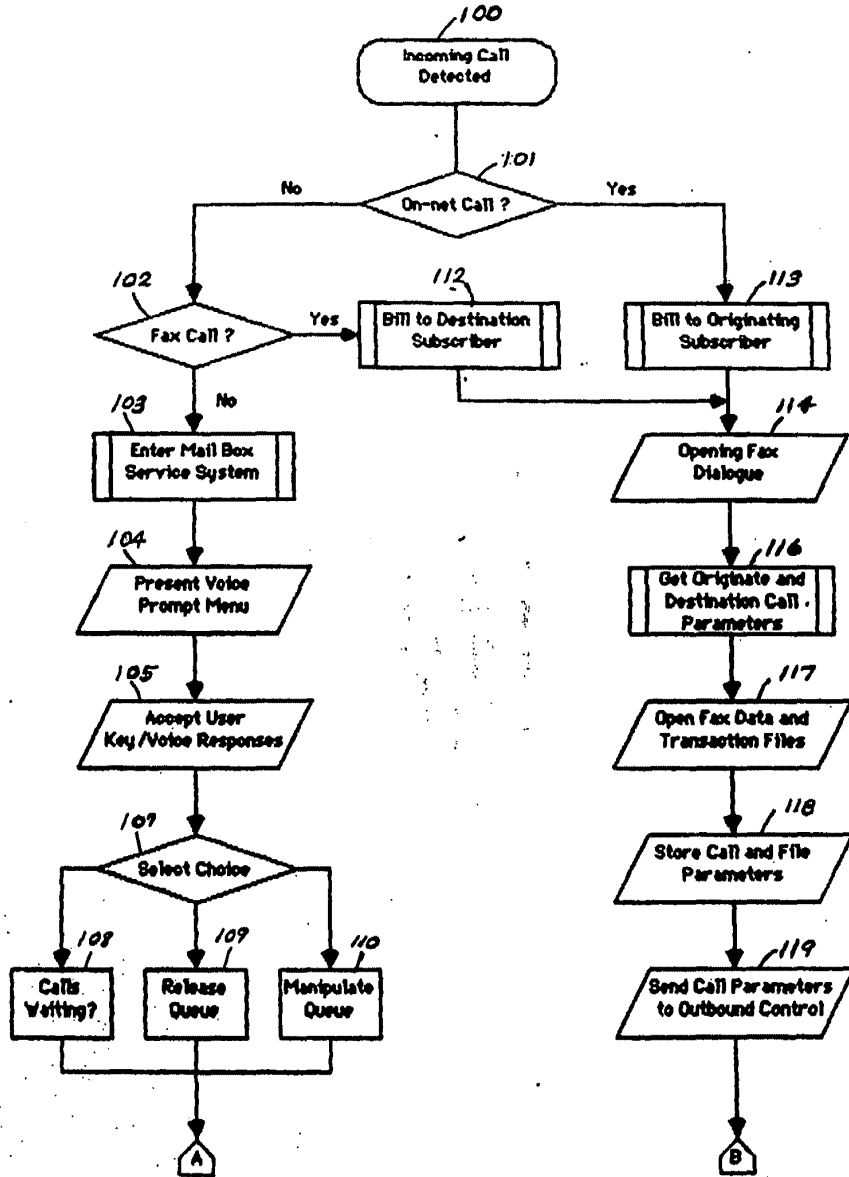


Fig. 5a

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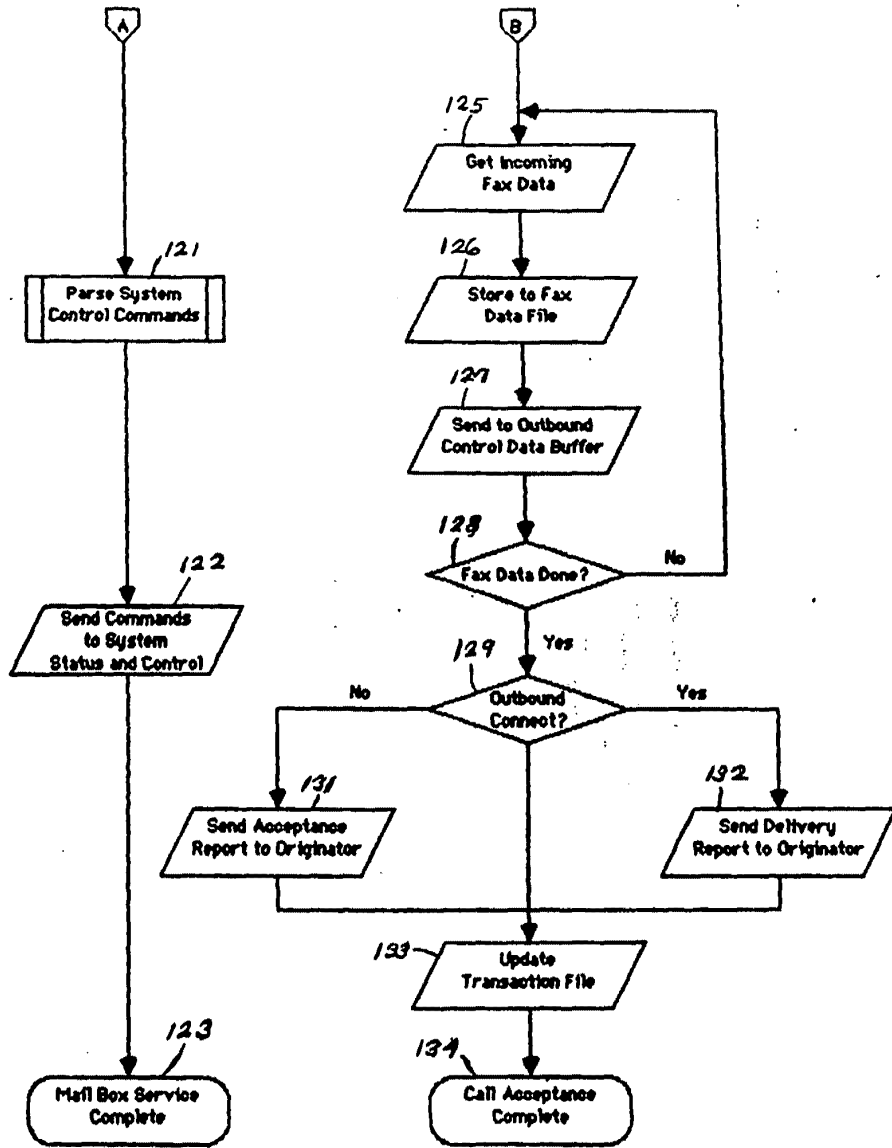


Fig. 5b

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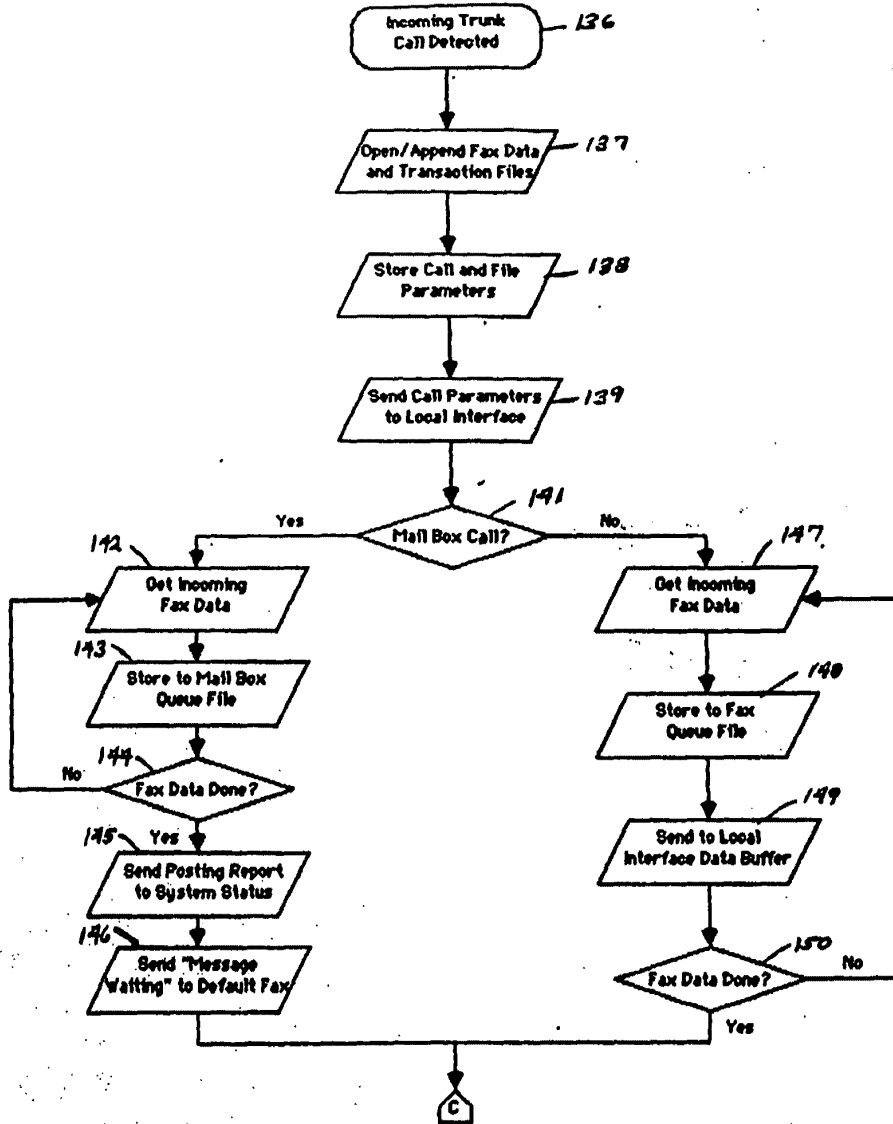


Fig. 6a

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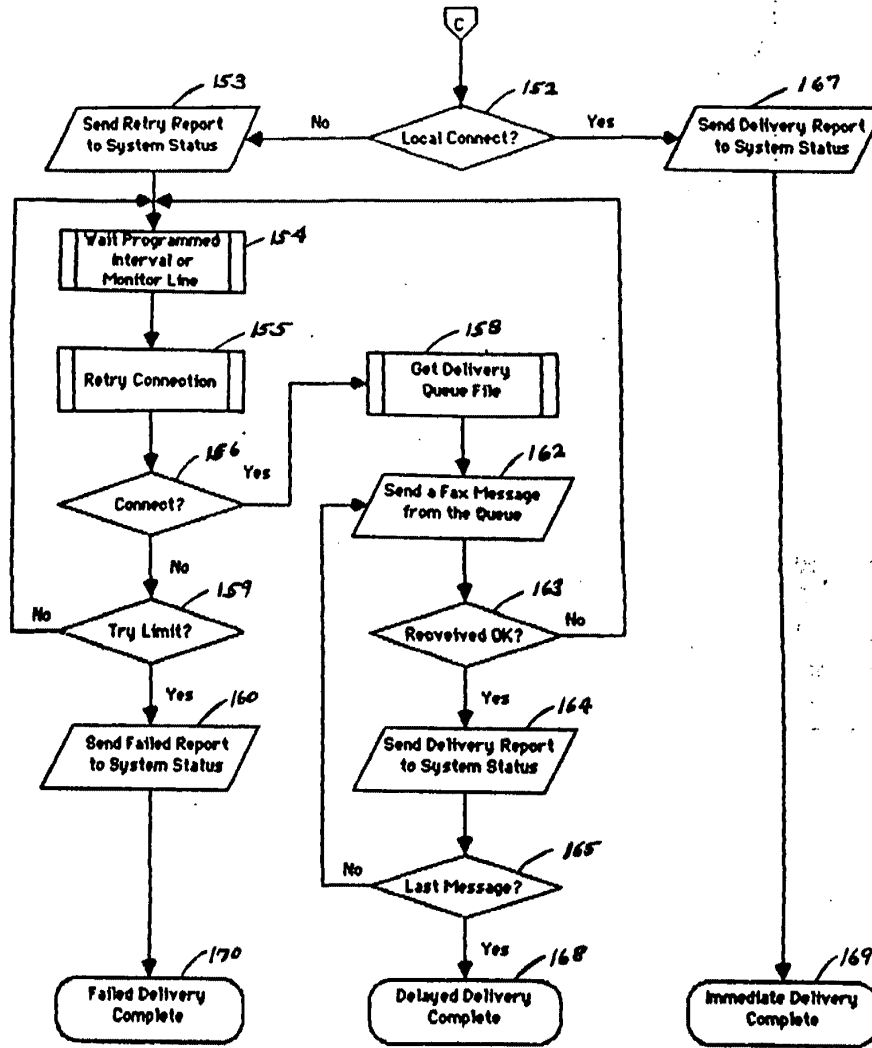


Fig. 6b

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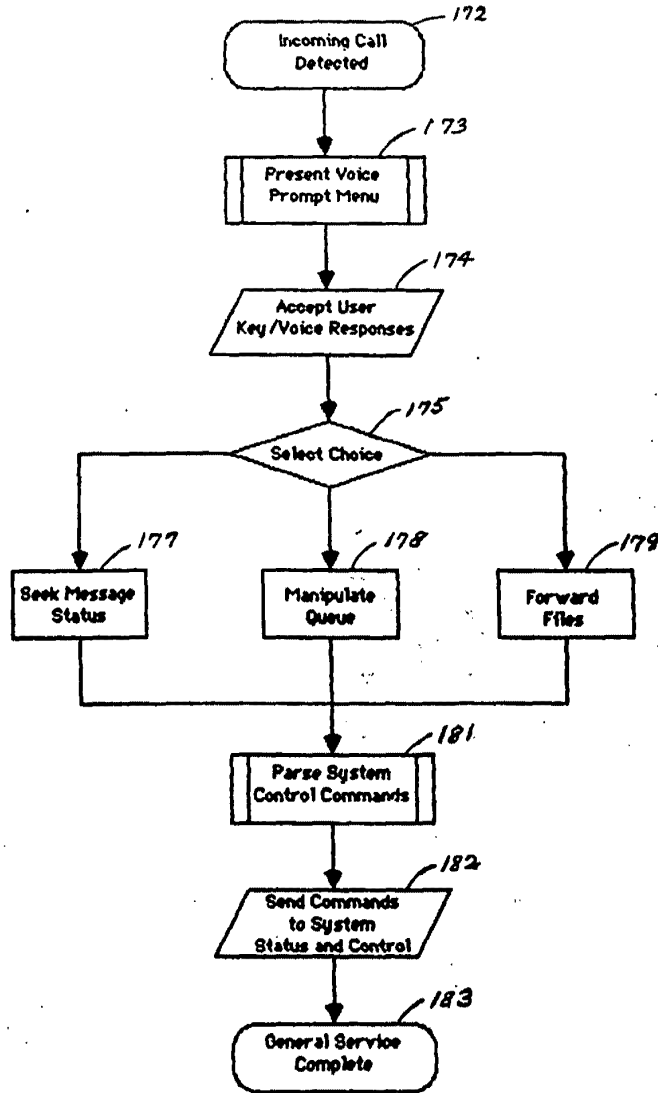


Fig. 7

Gouling, Strathy & Henderson

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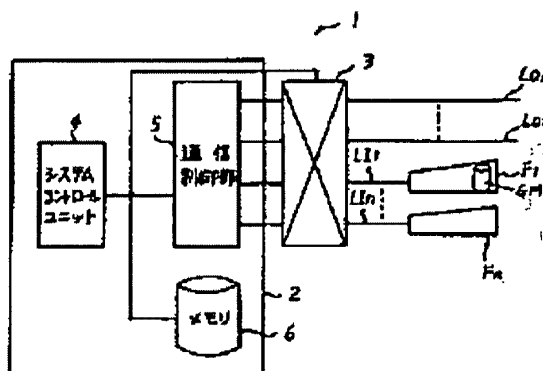
## FACSIMILE STORE AND FORWARD SWITCHING SYSTEM

**Patent number:** JP1258526  
**Publication date:** 1989-10-16  
**Inventor:** TSUNODA NAOKI  
**Applicant:** RICOH CO LTD  
**Classification:**  
 - international: H04L11/20  
 - european:  
**Application number:** JP19880086839 19880407  
**Priority number(s):**

### Abstract of JP1258526

**PURPOSE:** To execute the effective use of the memory of a Fax store and forward switching system by providing at least one terminal of the facsimile(Fax) terminal of an extension equipped with a picture memory and providing a means to accumulate prescribed picture information into the picture memory and transmit the transfer information of the effect to the related Fax terminal.

**CONSTITUTION:** In a Fax store and forward switching system 1, for example, when the time designation transmission is requested from extension Fax terminals F1-Fn, the system 1 accumulates temporary the picture information of an original from the extension Fax terminals F1-Fn to request the communication request to a memory 6 at the time of the designation time, the picture information is read and transmitted to a designed destination from the memory 6. When the confidential transmission service from the Fax terminal of line wires LO1-LOm to special extension Fax terminals F1-Fn is requested, the system 1 receives the picture information from a requester, accumulates the picture information into the memory 6, and thereafter, the prescribed identifier is designated from the extension Fax terminals F1-Fn, an in case of requesting reception, the system answers the reception request and transmits the picture information of the memory 6.



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⑪ 特許出願公開

⑫ 公開特許公報(A) 平1-258526

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審査請求 未請求 請求項の数 2 (全5頁)

⑮ 発明の名称 ファクシミリ蓄積交換装置

⑯ 特 願 昭63-86839

⑰ 出 願 昭63(1988)4月7日

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明 細 書

1. 発明の名称

ファクシミリ蓄積交換装置

2. 特許請求の範囲

(1) 複数の内線と外線を介して複数のファクシミリ端末に接続され、各ファクシミリ端末からの西情報を受信して一旦メモリに蓄積した後、所定の宛先に送信するファクシミリ蓄積交換装置において、内線のファクシミリ端末として西像メモリを備えたファクシミリ端末を少なくとも1端末設け、受信してメモリに蓄積した西情報を、所定の宛先に送信できないとき、該西情報を該西像メモリ付ファクシミリ端末に送信して該西像メモリに蓄積させ、当該宛先等にその旨の転送情報を送信することを特徴とするファクシミリ蓄積交換装置。

(2) 前記西像メモリ付ファクシミリ端末への西情報の送信をあらかじめ設定した所定の時間毎あるいはメモリに西情報が所定容量まで蓄積さ

れた時に行うことを特徴とする請求項1記載のファクシミリ蓄積交換装置。

3. 発明の詳細な説明

(産業上の利用分野)

本発明はファクシミリ蓄積交換装置に関し、西情報を蓄積するメモリの有効利用を図ったファクシミリ蓄積交換装置に関する。

(従来の技術)

近時、ファクシミリ装置が普及するにつれ、複数の内線および外線を介して複数のファクシミリ端末に接続され、各ファクシミリ端末からの西情報をメモリに蓄積した後、指定された宛先に送信するファクシミリ蓄積交換装置が出現している。

このようなファクシミリ蓄積交換装置においては、種々の通信サービスを行っており、例えば、内線ファクシミリ端末から発呼があると、通常のファクシミリ通信手順に従ってファクシミリ制御信号の交換を行った後、当該ファクシミリ端末の有している機能に応じた通信手順を設定し、西情報の受信を行っている。このとき、内線ファクシ

ミリ端末が時刻指定送信を要求すると、ファクシミリ蓄積交換装置は受信した西情報を一旦メモリに蓄積した後、指定の送信時刻に指定された宛先に通常のファクシミリ通信手順に従って送信する。

また、外線ファクシミリ端末から発呼があると、送信相手の内線ファクシミリ端末に接続したり、ファクシミリ蓄積交換装置が当該外線ファクシミリ端末からの西情報を受信してメモリに蓄積した後、内線ファクシミリ端末に送信している。また、外線ファクシミリ端末が観展サービスを要求すると、ファクシミリ蓄積交換装置は、受信した西情報をメモリに蓄積し、その後、内線ファクシミリ端末からの受取要求があると、メモリ内の西情報を送信する。

(発明が解決しようとする課題)

しかしながら、このような従来のファクシミリ蓄積交換装置にあっては、メモリに蓄積した西情報を相手ファクシミリ端末がビジー状態であるとか、紙切れである等の理由により送信できない場合、西情報が送信されずに不送原稿等としてメモ

とも1端末設け、不送原稿となった西情報や観展原稿の西情報を該ファクシミリ端末に送信してその西像メモリに蓄積し、その旨転送情報を該当するファクシミリ端末に送信することにより、ファクシミリ蓄積交換装置のメモリが不送原稿や観展原稿の西情報により占領されることを防止するとともに、不送原稿や観展原稿の西情報を内線ファクシミリ端末の西像メモリに利用可能な状態で蓄積して、ファクシミリ蓄積交換装置のメモリの有効利用を図るとともに、ファクシミリ蓄積交換装置を利用した通信サービスの利便性をより一層向上させることを目的としている。

(発明の構成)

本発明は、上記目的を達成するため、

(1) 複数の内線と外線を介して複数のファクシミリ端末に接続され、各ファクシミリ端末からの西情報を受信して一旦メモリに蓄積した後、所定の宛先に送信するファクシミリ蓄積交換装置において、内線のファクシミリ端末として西像メモリを備えたファクシミリ端末を少なくと

りにいつまでも蓄積される。したがって、メモリを有効に利用することができなかった。

そこで、従来、蓄積した西情報の送信先にあらかじめ設定した所定回数だけ再発呼処理を行っても送信できない場合や、観展サービスで所定の許容時間内に受取要求がない場合には、ファクシミリ蓄積交換装置のメモリに蓄積した不送原稿や観展原稿の西情報を消去するファクシミリ蓄積交換装置もある。

しかしながら、ファクシミリ蓄積交換装置のメモリに蓄積した不送原稿や観展原稿の西情報を消去してしまうと、ファクシミリ蓄積交換装置に通信サービスを依頼したファクシミリ端末のオペレータは同様の通信サービスを繰り返し要求する必要があり、ファクシミリ蓄積交換装置の利用性が低下し、また、不送原稿の西情報を有効に利用することができない。

(発明の目的)

そこで、本発明は、内線ファクシミリ端末として西像メモリを備えたファクシミリ端末を少なく

とも1端末設け、受信してメモリに蓄積した西情報を、所定の宛先に送信できないとき、該西情報を該西像メモリ付ファクシミリ端末に送信して該西像メモリに蓄積させ、当該宛先等にその旨の転送情報を送信することを特徴とするもの。および、

(2) 前記西像メモリ付ファクシミリ端末への西情報の送信をあらかじめ設定した所定の時間毎あるいはメモリに西情報が所定容量まで蓄積された時に行うことを特徴とするものである。

以下、本発明の実施例に基づいて具体的に説明する。

第1、2図は本発明の一実施例を示す図である。

第1図において、1はファクシミリ蓄積交換装置であり、ファクシミリ蓄積交換装置1は本体2と構内交換機(Private Branch Exchange: P B X) 3を備えている。

本体2は、システムコントロールユニット4、通信制御部5およびメモリ6を備えており、構内交換機3には内線L1、～L10を介して内線フ

ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>が接続されるとともに、外線L<sub>0</sub>～L<sub>0m</sub>が接続されている。構内交換機3はシステムコントロールユニット4からの指示に従い、発呼動作を行うとともに、内線L<sub>1</sub>～L<sub>1n</sub>相互および内線L<sub>1</sub>～L<sub>1n</sub>と外線L<sub>0</sub>～L<sub>0m</sub>との接続・交換を行う。

内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>のうち内線ファクシミリ端末F<sub>1</sub>は画像メモリGMを備えており、画像メモリGMは原稿複数ページ分の画情報を蓄積する容量を有している。

通信制御部5は変・復調器、圧縮・再生器、ダブルバッファメモリ等を備えている。通信制御部5はシステムコントロールユニット4からの指示に従い、相手ファクシミリ端末（内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>または外線に接続されたファクシミリ端末）とファクシミリ制御信号の交換を行うとともに、相手ファクシミリ端末より送信されてきた画情報の復調、冗長度抑圧符号化を行いながらダブルバッファメモリの片方に貯めこみ、一杯になると、メモリ6に転送するという入力動作、

シミリ端末F<sub>1</sub>～F<sub>n</sub>から時刻指定送信の要求があると、ファクシミリ蓄積交換装置1は通信要求を依頼してきた内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>からの原稿の画情報を受信して一旦メモリ6に蓄積し、指定時刻になると、メモリ6から当該画情報を読み出して指定された宛先に送信する。また、外線L<sub>0</sub>～L<sub>0m</sub>のファクシミリ端末から特定の内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>宛への観展送信サービスの要求があると、ファクシミリ蓄積交換装置1は依頼元からの画情報を受信してメモリ6に蓄積し、その後、内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>から所定のID(識別子)を指定して受取要求があると、その受取要求に答えてメモリ6の画情報を送信する。

このように、ファクシミリ蓄積交換装置1では通信サービスの内容によってはメモリ6に画情報を蓄積し、通信サービスが完了するまで、メモリ6に蓄積される。しかし、送信先がビジー状態や紙切れ状態等で、メモリ6内の画情報を送信できないときや、観展送信サービスで受取要求がない

およびメモリ6から転送されてきた画情報をダブルバッファメモリの片方に貯めた後、変調して相手ファクシミリ端末に送出するという出力動作を行う。

システムコントロールユニット4は内部ROMに格納するプログラムに従ってファクシミリ蓄積交換装置1の各部を制御してファクシミリ蓄積交換装置1としてのシーケンスを実行するとともに、本発明の不達原稿の画情報転送処理を実行する。

メモリ6は各ファクシミリ端末から送信されてきた画情報を蓄積し、メモリ6に蓄積された画情報は指定宛先毎にシステムコントロールユニット4によりファイル管理されている。

次に、作用を第2図に示すフローチャートに基づいて説明する。

ファクシミリ蓄積交換装置1は内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>あるいは外線L<sub>0</sub>～L<sub>0m</sub>に接続されたファクシミリ端末からの通信サービス要求があると、その通信サービス要求に応じて種々の通信サービスを提供する。例えば内線ファク

場合には不達原稿としていつまでもメモリ6に蓄積され、メモリ6の有効利用が図れない。

そこで、本実施例では、内線ファクシミリ端末として画像メモリGMを備えたファクシミリ端末F<sub>1</sub>を設置し、所定の転送時刻、あるいはメモリ6の蓄積容量等に基づいてメモリ6の不達原稿の画情報を内線ファクシミリ端末F<sub>1</sub>に転送してその画像メモリGMに蓄積させる。

すなわち、システムコントロールユニット4は、まず、不達原稿がメモリ6に有るか、すなわち、時刻指定送信要求に応じて受信した原稿の画情報で指定時刻に発呼したが受信できず、所定回数再発呼して送信できない画情報がメモリ6に有るかどうかがチェックし(ステップP<sub>1</sub>)、不達原稿が無いときには、受取要求の無い観展原稿の画情報がメモリ6に有るかどうかがチェックする(ステップP<sub>2</sub>)。観展原稿の画情報も無いときには、転送レポート要求の有るかチェックし(ステップP<sub>3</sub>)、転送レポート要求が無いときにはステップP<sub>1</sub>に戻る。

ステップP、あるいはステップP<sub>1</sub>で不送原稿あるいは受取要求の無い親展原稿が有るときには、あらかじめ設定された転送時刻かどうかチェックし(ステップP<sub>4</sub>)、転送時刻になっていないときには、メモリ6への蓄積量があらかじめ設定した蓄積量に達しているかどうかチェックする(ステップP<sub>5</sub>)。転送時刻としては、例えば、1日1回あるいは数回適当な時刻を転送時刻として設定してもよいし、また不送原稿では送信指定時刻から何時間か後を転送時刻とし、親展原稿では原稿受信時刻から何時間か後を転送時刻としてもよい。また、メモリ6の蓄積量としてはメモリ6の全メモリ容量から以降の通信サービスとの関係から適宜原稿のページ数等で設定する。

転送時刻になっておらず、メモリ6の蓄積量も所定量に達していないときには(ステップP<sub>6</sub>、P<sub>7</sub>)、ステップP<sub>8</sub>に移行して同様の処理を繰り返す。転送時刻になるか、メモリ6への蓄積量が所定量に達すると、画像メモリGMを備えた内線ファクシミリ端末F<sub>1</sub>を呼び出し(ステップP<sub>9</sub>、

画像メモリGMに不送原稿や親展原稿の画情報が蓄積されていることを知ることができる。次いで、ファクシミリ蓄積交換装置1は転送原稿が不送原稿のときは、時刻指定送信を依頼してきた内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>を呼び出し、転送レポートを出力する。したがって、時刻指定送信を依頼した内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>のオペレータは原稿が消去をされないで、内線ファクシミリ端末F<sub>1</sub>の画像メモリGMに蓄積されていることを知り、内線ファクシミリ端末F<sub>1</sub>の画像メモリGMに蓄積されている原稿の画情報を有効に利用することができる。

また、前記ステップP<sub>9</sub>で、即ち内線ファクシミリ端末F<sub>1</sub>に転送した不送原稿や親展原稿に対して送信要求や受取要求があると、ファクシミリ蓄積交換装置1は転送レポート要求と判断して、ステップP<sub>10</sub>に移行し、当該内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>に転送レポートを出力する(ステップP<sub>10</sub>～P<sub>11</sub>)。

このように、本実施例のファクシミリ蓄積交換

装置1は、不送原稿や親展原稿を内線ファクシミリ端末F<sub>1</sub>に転送する(ステップP<sub>9</sub>)。このとき、ファクシミリ蓄積交換装置1は、不送原稿についてはメモリ送信して内線ファクシミリ端末F<sub>1</sub>の画像メモリGMに蓄積させ、親展原稿については親展送信して内線ファクシミリ端末F<sub>1</sub>の画像メモリGMに蓄積させる。原稿の送信が終了すると、回線を切断する(ステップP<sub>12</sub>)。

次いで、ファクシミリ蓄積交換装置1は該当する内線ファクシミリ端末F<sub>1</sub>～F<sub>n</sub>を呼び出して転送レポートを出力する(ステップP<sub>10</sub>、P<sub>11</sub>、P<sub>12</sub>)。この転送レポートは不送原稿や親展原稿を内線ファクシミリ端末F<sub>1</sub>の画像メモリGMに転送した旨およびその原稿のリストを示すレポートであり、ファクシミリ装置のレポート機能を利用している。すなわち、ファクシミリ蓄積交換装置1は、まず、不送原稿や親展原稿を転送した内線ファクシミリ端末F<sub>1</sub>を呼び出し、転送レポートを出力する。したがって、内線ファクシミリ端末F<sub>1</sub>のオペレータは内線ファクシミリ端末F<sub>1</sub>の画

装置1においては、不送原稿や親展原稿を内線ファクシミリ端末F<sub>1</sub>の画像メモリGMに転送し、画像メモリGMに蓄積させることができるので、ファクシミリ蓄積交換装置1のメモリ6を有効に利用することができるとともに、内線ファクシミリ端末F<sub>1</sub>の画像メモリGMを有効に利用することができる。また、内線ファクシミリ端末F<sub>1</sub>の画像メモリGMに蓄積した不送原稿や親展原稿を有効に利用することができる。

なお、上記実施例においては、ファクシミリ蓄積交換装置1のメモリ6に蓄積した原稿を転送する条件として、転送時刻とメモリの蓄積量を取り上げたが、これに限るものではなく、また、その条件の設定方法も上記実施例のものに限るものではない。

#### (効果)

本考案によれば、ファクシミリ蓄積交換装置のメモリが不送原稿や親展原稿の画情報により占領されることを防止することができるとともに、不送原稿や親展原稿の画情報を内線ファクシミリ端末





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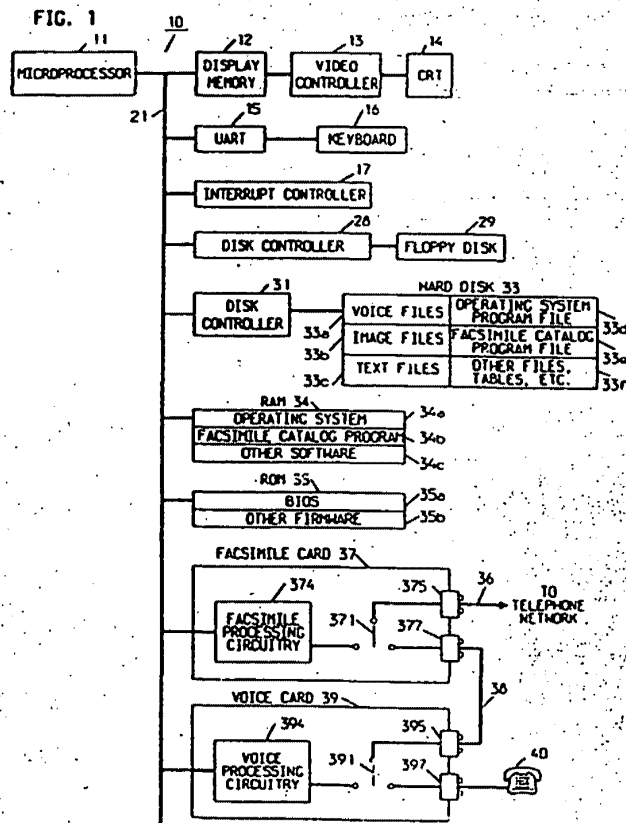
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 Derwent WPIL (online) INSPEC (RTM) online

(54) Document distribution system with voice generation and facsimile

(57) Printed or other pre-formed documents are delivered to requesters rapidly and at low cost by a microcomputer-based system which uses voice generation circuitry to invite a person calling in to the system to specify the document needed by pushing particular keys of his/her touch-tone telephone 40 or by spoken input. Upon ascertaining the identity of the document in question, the computer transmits the document to the caller in standard facsimile form, either over the telephone connection already established if the telephone call was initiated from a telephone connected with a facsimile machine, or to a different telephone number specified by the caller.



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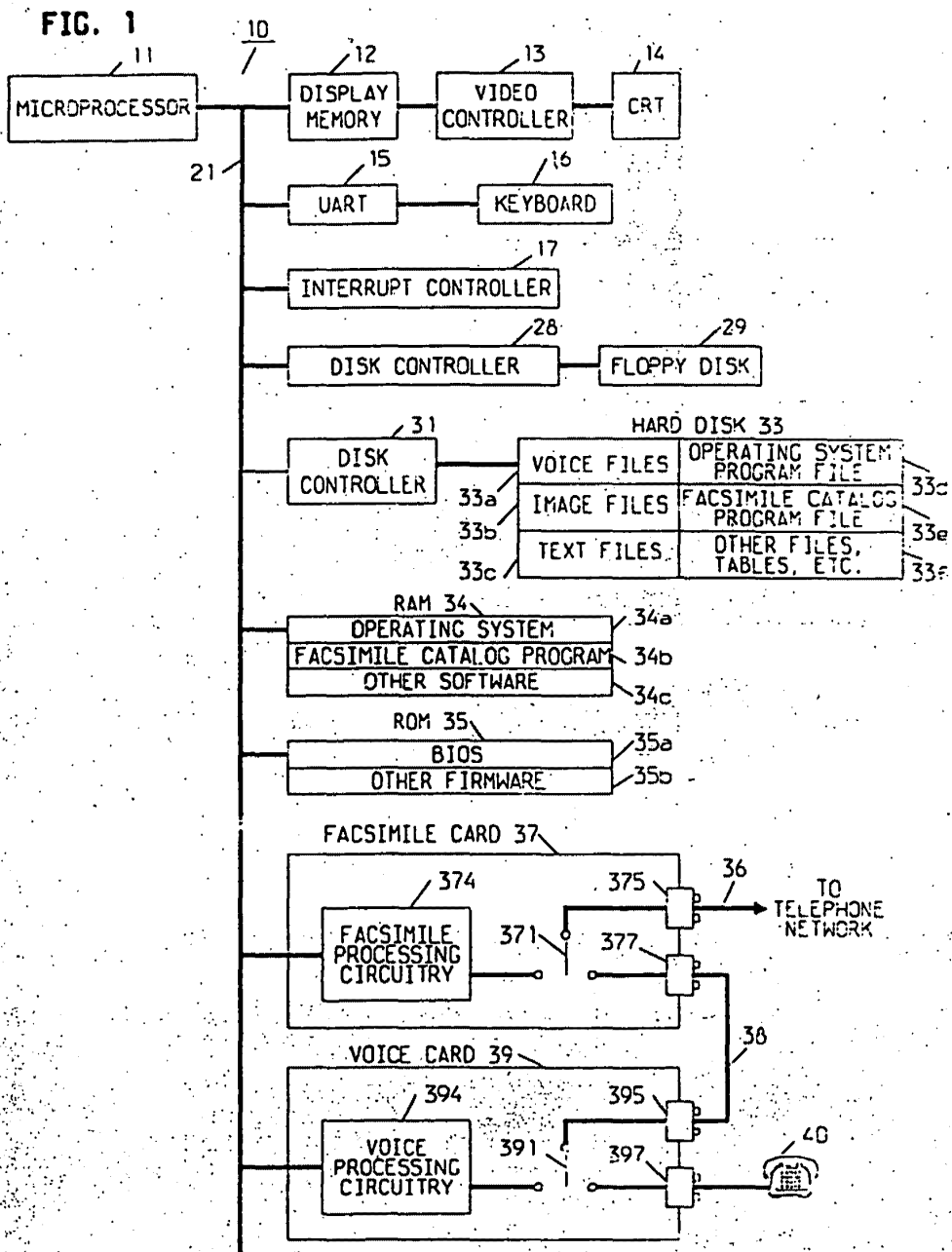


FIG. 2

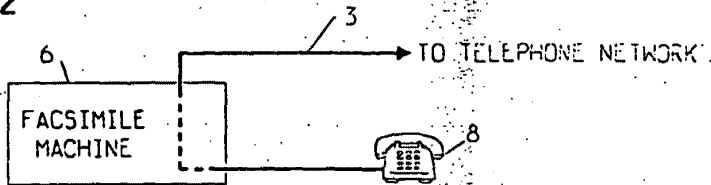


FIG. 4

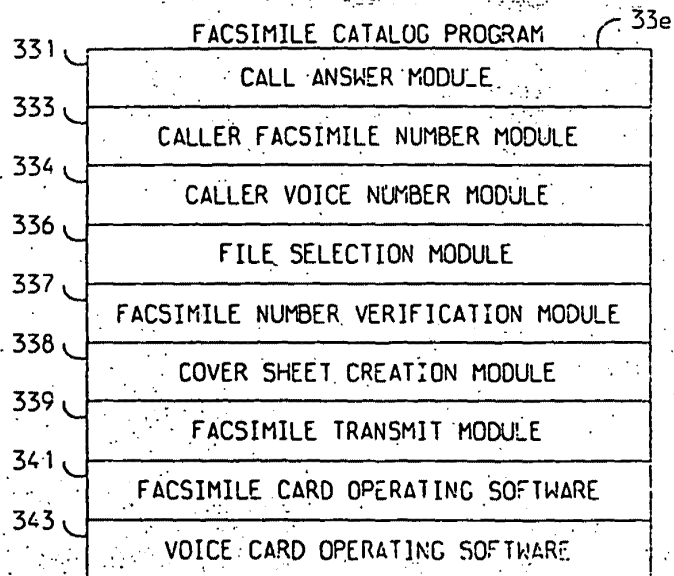
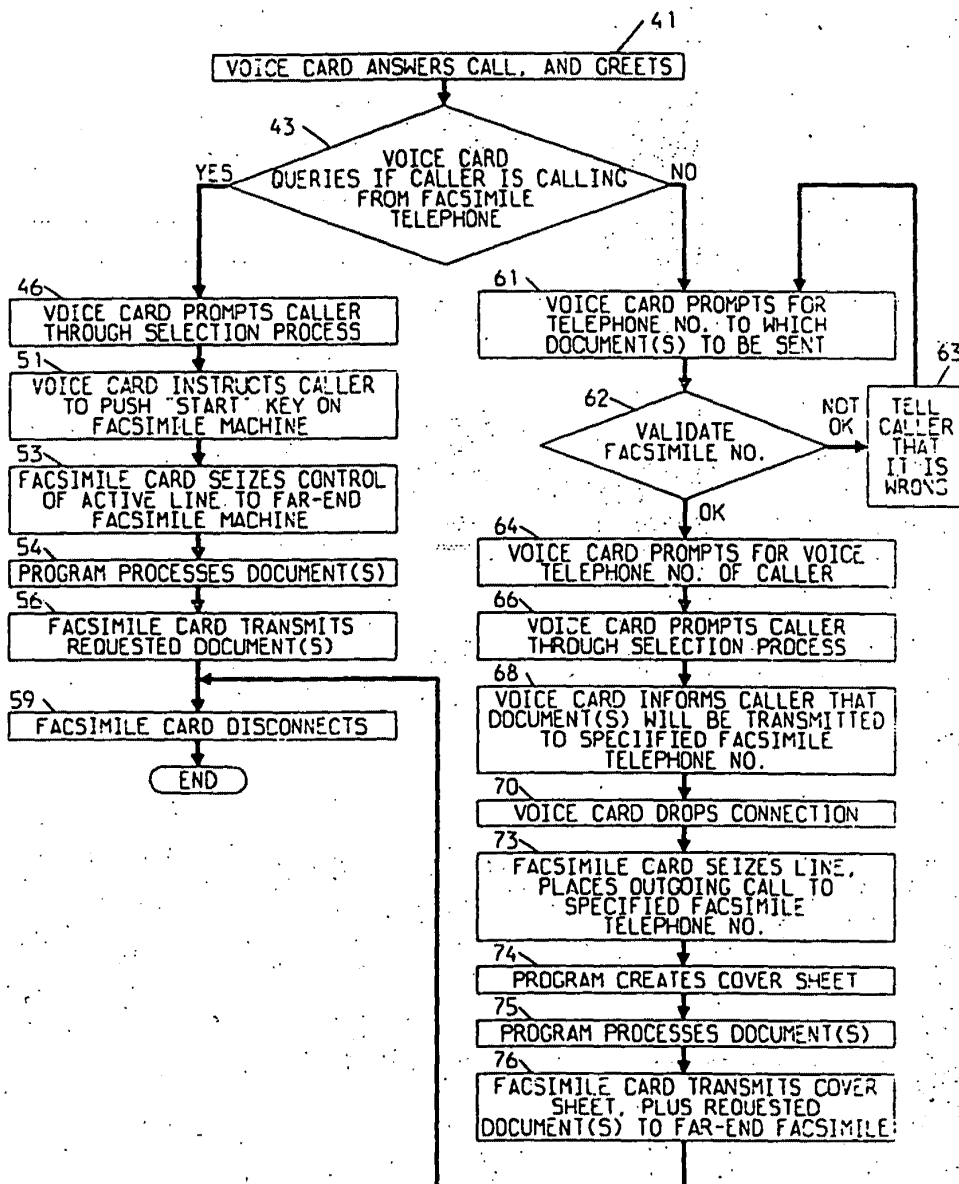


FIG. 3



METHOD AND APPARATUS FOR TRANSMITTING  
DOCUMENTS

This invention relates to methods of and apparatus for transmission of documents.

It is a common and oft-repeated circumstance of business and consumer life that one needs to obtain a printed document from a supplier of same. Such documents range from government forms to integrated circuit "specification" sheets to airline schedules. A typical such transaction begins when the person needing the documents telephones the business establishment or agency in question and, having been put in contact with an order clerk, salesman, etc, requests the needed document. Typically, the document is delivered to the requester in the mail. When the requester is in a hurry, however, an "overnight delivery" service or, perhaps, private messenger may be used. Such expedited delivery mechanisms are relatively expensive, however.

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The present invention is directed to a system, which is illustratively microcomputer-based, for delivering printed or other pre-formed documents to requesters rapidly and at low cost. In particular, the requester dials a telephone number associated with the system. The latter uses voice generation circuitry to invite the requester, hereinafter the "caller", to specify the document needed, such as by pushing particular keys of his/her touch tone telephone. Upon ascertaining the identity of the document in question, the computer transmits the document to the caller in standard facsimile form.

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Advantageously, if the telephone call was initiated from a telephone connected with a facsimile machine—a fact that the system may ascertain by querying the caller during the telephone transaction—the facsimile data is communicated over the telephone connection already established. If, on the other hand, the telephone call was initiated from a telephone that is not connected with a facsimile machine, then, in preferred embodiments of the invention and in accordance with a feature thereof, the caller is prompted to enter the telephone number of a facsimile machine to which the requested document can be sent and the document is then sent there.

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In accordance with a further feature of the invention, when the document is to be sent to a facsimile machine other than one connected with the callers telephone, the caller may also be prompted for caller-identifying data, such as his/her telephone number. This data is supplied by the system with the requested document--preferably on a separate cover sheet--thereby enabling an attendant at the receiving facsimile machine to identify the intended recipient.

The invention will now be described by way of example with reference to the accompanying drawings, in which:

FIG. 1 is a block diagram of a microcomputer system embodying the invention;

FIG. 2 is a block diagram of a standard facsimile machine station from which documents can be requested from the system of FIG. 1;

FIG. 3 is a flowchart of the processing performed by software within the system of FIG. 1; and

FIG. 4 is a memory map of a region of the hard disk used in the system of FIG. 1.

Referring now to FIG. 1 system 10 is based around a standard microcomputer and commercially available special-purpose circuit cards and provides individuals who call into the computer with a catalog service--specifically, in this example, the ability to request "specification" sheets for integrated circuits.

The system is illustratively based on an AT&T Model PC6300 personal computer, at the heart of which is a microprocessor 11 having address, data and control buses denoted generically as bus 21. Connected to bus 21 are a display memory 12 whose contents are used by a video controller 13 to generate video signals for a CRT 14; a universal asynchronous receiver transmitter (UART) 15, which serves as a serial interface between microprocessor 11 and a keyboard 16; an interrupt controller 17, to which hardware interrupt leads (not shown) extend, inter alia, from UART 15; a floppy disk controller 28, which serves as an interface between microprocessor 11 and a floppy disk memory 29, and a hard disk

controller 31, which serves as an interface between microprocessor 11 and hard disk memory 33. The latter holds, inter alia, voice, image and text files 33a, 33b and 33c, respectively, as discussed in further detail

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hereinbelow; a copy of the workstation's operating system 33d—illustratively the MS-DOS<sup>®</sup> operating system; a copy of an application module, herein referred to as "facsimile catalog program" 33e, which, when executing, controls the system hardware; and a

5 number of other files not here relevant indicated at 33f.

Also connected to bus 21 is random access memory (RAM) 34 and read-only memory (ROM) 35. When the system is in operation, RAM 34 holds the executed copies of a) the operating system, indicated as 34a, and b) facsimile catalog program, indicated as 34b, and c) other  
10 software not here relevant, indicated as 34c. ROM 35 contains the conventional Basic Input/Output System (BIOS) 35a as well as other firmware 35b.

Also connected to bus 21 are two circuit cards that play a central role in implementing the invention. One of these is voice card 39 which  
15 may be, for example, the card marketed by Natural Microsystems under the name WATSON. As called out in the drawing, voice card 39 includes input and output connectors 395 and 397, respectively, a switch 391 and voice processing circuitry 394, the latter comprising all the other circuitry on the card. When in one position, switch 391 simply interconnects connector 395  
20 and 397, thereby providing a direct path through the card. When in its other position, switch 391 connects input connector 395 to the voice processing circuitry.

Voice card 39 has a number of capabilities. Among the capabilities relevant here are the ability to a) recognize touch tone inputs  
25 and report the identity of the digit or symbol represented thereby onto bus 21 and b) to re-create human speech from digitally stored versions thereof supplied from the bus and to output that speech to connector 395.

The other of the aforementioned circuit cards is facsimile card 37, illustratively the FAXCON-20 facsimile communication board  
30 available from AT&T. Similar to voice card 39, facsimile card 37 includes input and output connectors 375 and 377, respectively, a switch 371 and facsimile processing circuitry 374, the latter comprising all the other circuitry on the card. Among the capabilities of facsimile card 37 relevant here is the ability to accept files containing text and/or image data, convert  
35 that data into facsimile images and supply it, when switch 371 is appropriately thrown, to connector 375 using standard facsimile formats



and protocols.

Circuit cards 37 and 39 are interconnected by way of a jumper cable 38 which connects facsimile card output connector 377 to voice card input connector 395. In addition, a telephone line 36 is connected to  
5 facsimile card input connector 375 and a standard telephone set 40 is connected to voice card output connector 397.

When the system is in an idle state, switch 371 within card 37 is set so as to interconnect facsimile card connectors 375 and 377 while switch 391 within card 39 is set so as to interconnect voice card  
10 connectors 395 and 397. Thus prior to the receipt of any telephone call, telephone line 36 is directly connected through both cards to telephone set 40.

Turning now to FIGS. 2 and 3, the facsimile station depicted in FIG. 2 is seen to comprise a standard facsimile machine 6 having connected  
15 thereto a standard touch-tone telephone 8 and a conventional telephone line 3 which extends into the public dialed network. When a person at telephone 8 wishes to be availed of the catalog service provided by system 10, he/she dials the telephone number associated with telephone 40. Having been instructed by facsimile catalog program 34b, which is now in  
20 control of the system, to be monitoring the incoming line, voice card 39 recognizes the ringing voltage and, as indicated at 41 of FIG. 3, answers the call. It does this, specifically, by causing its switch 391 to connect voice processing circuitry 394 to connector 395 and thence to the telephone line back through facsimile card 37. (Although not shown in the FIG., voice  
25 processing circuitry 394 has an internal connection to connector 395 that enables it to monitor the signals applied thereto, such as ringing voltage.)

Facsimile catalog program 34b at this point operates voice card 39 to deliver a sequence of messages to the caller. In each case, the message is delivered by instructing the operating system 34a to retrieve one  
30 of voice files 33a from hard disk 33 and route the file via bus 21 to voice processing circuitry 394 of voice card 39. The voice processing circuitry converts this file into audible speech which is thereupon transmitted to the caller via the telephone line.

System 10 illustratively provides to requesters "specification"  
35 sheets for integrated circuits manufactured by the (fictitious) XYZ Microchip Corporation, and, as further indicated at 41, the first message is a

greeting, illustratively the greeting "You have reached the XYZ Microchip Corporation automated facsimile catalog." This is immediately followed by a second message, again delivered to the voice card via the above-outlined mechanism. As indicated at 43, this second message queries as to whether  
5 the caller is calling from a facsimile telephone, i.e., a telephone associated with a facsimile machine, the message illustratively being, "Touch '1' on your touch-tone telephone if you are calling from a facsimile telephone; otherwise touch any other key." The program now instructs the voice card to be receptive to an answering touch-tone input from the caller. The voice  
10 card, being capable of recognizing touch tone inputs, provides facsimile catalog program 34b with an indication of the caller's response.

Since in the present example, telephone 8 is, in fact, associated with a facsimile machine, the caller will touch "1" at this time. The program thereupon proceeds to step 46 at which it prompts the caller  
15 through a selection process so to elicit from the caller what specific information the caller wishes to receive. This process may involve several queries and responses, allowing the caller to be increasingly specific with respect to the desired information.

A typical such interaction might be:

20 FAX CATALOG: Touch '1' for information on digital integrated circuits; touch '2' for information on analog integrated circuits.

USER: [Enters '1'].

25 FAX CATALOG: Touch '1' for 74LS series devices; touch '2' for 74LP series devices.

USER: [Enters '1'].

FAX CATALOG: Enter the 4-digit code of the device that you are interested in.

USER: [Enters '7522'].

(In some applications, the caller may make selections based on information previously disseminated by the supplier, such as a printed index of available documents.)

5 As indicated at 51, facsimile catalog program 34b now causes the voice card to instruct the caller to now operate the "START" key on the facsimile machine with which the caller's telephone is associated. To this point, facsimile machine 6 has been providing a signal path from telephone line 3 directly through to telephone 8. However, responsive to the operation of the "START" key, facsimile machine 6 now  
10 disconnects telephone 8 from the line and connects the line to the internal facsimile circuitry of the machine. There should not be any source documents in the input tray of the caller's facsimile machine. Accordingly, the latter assumes the role of recipient in the upcoming facsimile transaction.

15 After a preprogrammed delay to allow the caller to comply with the instruction to operate the "START" key, facsimile catalog program 34b instructs facsimile card 37 to now operate its switch 371, causing facsimile card 37 to seize control of the active, already established telephone connection to the far-end facsimile machine, as indicated at 53. At this  
20 point, there is a direct telephone connection between facsimile circuitry 374 in facsimile card 37 and the facsimile circuitry in the caller's facsimile machine.

As also indicated at 53, facsimile card 37 now negotiates with facsimile machine 8, in the standard way, such parameters as line speed,  
25 transmission protocols and transmitter/receiver identity. Upon successful completion of these negotiations, facsimile card 37 notifies facsimile catalog program 34b of this fact. Proceeding then to step 54, the program then processes the requested document(s)—in this case the "specification" sheet for the "7522" microchip—in preparation for transmission to facsimile  
30 machine 6. In particular, it instructs the operating system to retrieve from hard disk 33 one or more of either image files 33b or text files 33c. These files contain the text and/or graphic images which comprise the document(s) that the caller has requested. In particular, each image file contains a document, or portion thereof, in bit-mapped form and, as such, is  
35 directly transmittable by facsimile card 37. A text file, by contrast, contains standard ASCII characters and must be converted by facsimile

catalog program 34b to a bit-mapped form before being sent to the facsimile card. A particular document or package of documents may be stored as either an image file, a text file, or some combination of files to be assembled by the facsimile catalog program.

5           The various image files may be files that were, for example, created by scanning paper copies of documents through an electronic scanner (not shown) connected to the system; received from a remote location by facsimile transmission; or created on a frame creation system such as the AT&T PC Image Director system. The text files may be files  
10 that were, for example, created from keyboard 16 or received from a remote location via a data communications link.

          Having assembled the document(s) requested by the caller and, if necessary, converted them to bit-mapped form, facsimile catalog program 34b delivers them to facsimile card 37 via bus 21. Facsimile  
15 processing circuitry 374 converts these bit maps into facsimile images in accordance with the negotiated parameters. As indicated at 56, the resulting facsimile images are thereupon transmitted to the caller's facsimile machine 8 via the telephone network, using standard facsimile protocols such as CCITT Group III.

20           Having completed the facsimile transmissions, facsimile catalog program 34b then instructs facsimile card 37 to disconnect from the telephone line, as indicated at 59. The operation thus comes to an end, with the program now instructing facsimile and voice cards to assume their previous idle states.

25           Returning, now, to step 43, let us now assume that the caller is not at a telephone associated with a facsimile machine and therefore touches a key other than "1" in response to the step 43 prompt. Facsimile catalog program 34b thereupon proceeds to step 61 at which, in accordance with a feature of the invention, it prompts the caller for the telephone  
30 number of the facsimile machine to which the caller wishes to have the documents transmitted. As indicated at 62, the program validates the entered number, illustratively by verifying that it appears to be a valid telephone number; checking for the presence of an area code; stripping off the area code if it is the same as the area code of telephone line 36; and  
35 prepending an outside calling dialing code, such as "9", to the number in cases where telephone line 36 extends from a PBX. If any of these

validation checks fail, the program so informs the caller, as indicated at 63, and then returns to step 61 to re-prompt the caller for the desired number.

(Similar validation checks may be provided, as desired, at various stages of the call, such as during the eliciting of the identity of the desired document at step 46 described above.)

Once the caller has supplied an apparently valid number, the program proceeds to step 64, where, for a purpose discussed hereinbelow, it prompts the caller for caller-identifying data, illustratively his/her voice telephone number, i.e., the number at which the caller receives his/her normal telephone calls.

As indicated at 66, the system now prompts the caller through a selection process similar to that carried out a step 46 in order to elicit from the caller what specific information the caller wishes to receive. The program then causes the voice card to inform the caller, at step 68, that the requested document(s) will be transmitted to the previously supplied facsimile telephone number and causes voice card 39 to disconnect from telephone line 36 by operating switch 391, as indicated at step 70.

After waiting a brief period of time, illustratively 2-3 seconds, to assure that the previously established telephone connection has been dropped, facsimile catalog program 34b, at step 73, instructs facsimile card 37 to seize telephone line 36 and place a new, outgoing telephone call to the facsimile number just supplied by the caller. This is accomplished by first having the facsimile card operate switch 371 to connect telephone line 36 to facsimile processing circuitry 374, and then having the latter dial the number. If the called facsimile number is busy or does not answer, the facsimile catalog program will wait a predetermined period of time, illustratively five minutes, and then initiate one or more retries.

Facsimile catalog program 34b now creates, at step 74, a cover sheet for the document(s) about to be transmitted. It does this by instructing the operating system to retrieve a cover sheet template, stored as one of text files 33c in hard disk 33, and modifying it to include the facsimile telephone number and caller's voice telephone number both previously supplied by the caller. As in the prior case, the program, at step 75, a) instructs the operating system to retrieve one or more of either image files 33b or text files 33c from hard disk 33, b) processes them as needed and c) and supplies them along with the cover sheet via bus 21 to facsimile

card 37 for transmission. The facsimile card thereupon transmits them, as indicated at 76 and, once again at step 59, facsimile catalog program 34b instructs facsimile card 37 to disconnect from the telephone line and assume its previously idle state.

5           FIG. 4 is a memory map of that region of hard disk 33 that holds the "permanent" copy of the facsimile catalog program, denoted 33e, as previously discussed. As shown therein, the program includes a number of identifiable modules, copies of which comprise the executed copy of the program stored in RAM 34. The principal functions of these modules are as  
10 follows:

Module Name and Number	Principal Function and Corresponding Flowchart Steps
Call Answer 331	initial telephone call processing (steps 41,43)
Caller Facsimile Number 333	obtaining caller's facsimile number (61)
15 Caller Voice Number 334	obtaining caller's voice number (64)
File Selection 336	eliciting identity, and processing, of desired documents (46,51,66,68,70)
Facs. Num. Verification 337	validating facsimile number (62,63)
Cover Sheet Creation 338	creating cover sheet (74)
20 Facsimile Transmit 339	transmitting the requested document(s) (53,54, 56,59,73,75,76)

Two other modules within the facsimile card program are facsimile card operating software 341 and voice card operating software 343. These modules are supplied by the vendor(s) of the cards themselves and control  
25 the card hardware in response to commands from the above-listed software modules. And it will, of course, be appreciated that the executing copy of the facsimile catalog program in RAM 34 is comprised of copies of the modules shown in FIG. 4.

Variations will occur to those skilled in the art.  
30 For example, although the invention has been disclosed in the context of a particular hardware configuration, other hardware configurations providing the same functionality may be used. In addition, although the caller inputs are illustratively provided via the operation of the keys of a touch-tone

telephone, it may be desired to provide the system with, for example, voice-recognition circuitry which allows the caller to provide spoken inputs instead. In addition, although the presently disclosed system maintains the image and text files in local storage, it may be desired—particularly if there  
5 is a large volume of requestable information—to store that information on a larger system and have the local system, i.e., the system interacting with the caller, request and have downloaded the information when it is needed.

And in other straightforward variations, the system may be configured to handle multiple calls and document requests on a time-shared or parallel  
10 processing basis. It may also be arranged to provide the caller with the opportunity to make multiple document requests in the same transaction with the system. Additionally, it will be appreciated that the documents supplied by the system may be of the type that changes fairly frequently, such as real estate listings, as compared to documents which do not, such as  
15 government forms. Moreover, in some implementations, access to highly confidential documents may be restricted by requesting the caller to enter a security password or voice sample prior to providing the caller with the documents.

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CLAIMS

1. A method of transmitting, on request, copies of documents stored in machine-readable form, including the machine-implemented steps of answering a telephone call made over a telephone line to  
5 complete a first telephone connection from a caller at the far end of said connection, providing to said caller machine-stored voice signals instructing said caller relative to the ordering of copies of one or more of said documents, receiving from said caller responses to said voice signals and determining from said responses  
10 the identity of a specific one of said documents, retrieving the machine-readable document from storage, and transmitting the retrieved machine-readable document in facsimile form.

2. A method as claimed in claim 1 including the machine-implemented steps of determining whether a facsimile machine  
15 is connected to the far end of said first telephone connection, and, if so, transmitting the retrieved document in facsimile form over said telephone line during said telephone call, and, if not, providing to said caller machine-stored instructions relative to the specification of information identifying a facsimile machine to  
20 which the retrieved document is to be transmitted, receiving from said caller responses to those instructions, and initiating a telephone call to the identified facsimile machine to establish thereto a second telephone connection and transmitting the retrieved document in facsimile form over said second telephone connection.

3. A method as claimed in claim 2 including, in the case  
25 where a facsimile machine is not connected to the far end of said first telephone connection, the machine-implemented steps of determining the identity of said caller, and transmitting information identifying said caller along with the retrieved  
30 document.

4. Apparatus for transmitting documents, including  
(i) memory means for storing a plurality of documents in machine-readable form, and (ii) means for answering a telephone call made  
35 over a telephone line to complete a first telephone connection from a caller at the far end of said connection and for providing to said caller machine-stored voice signals instructing said caller relative



to the ordering of copies of one or more of said documents, for receiving from said caller responses to said instructions and for identifying from said responses a specific one of said documents, and for retrieving the identified document from said memory means  
5 and for transmitting it in facsimile form.

5. Apparatus as claimed in claim 4 wherein the means in (ii) serves for determining whether a facsimile machine is connected to the far end of said first telephone connection, and, when it has been determined that a facsimile machine is connected to the far end  
10 of said first telephone connection, for transmitting the retrieved document in facsimile form over said telephone line during said telephone call.

6. Apparatus as claimed in claim 5 wherein the means in (ii) serves, when it has been determined that a facsimile machine is not  
15 connected to the far end of said first telephone connection, for providing to said caller voice instructions relative to the specification of information identifying a facsimile machine to which the requested document is to be transmitted, for receiving from said caller responses to those instructions, for thereafter  
20 initiating a telephone call to the identified facsimile machine to establish thereto a second telephone connection, and for transmitting the retrieved document in facsimile form over said second telephone connection.

7. Apparatus as claimed in claim 6 wherein the means in (ii) serves, when it has been determined that a facsimile machine is not  
25 connected to the far end of said first telephone connection, for providing to said caller machine-stored voice signals instructing said caller relative to the specifying of data identifying said caller, for receiving said caller-identifying data from said caller,  
30 and for transmitting said caller-identifying data along with the requested document.

8. A computer-based document transmission system, including first circuit means operable under program control for providing audio messages over a telephone line and for interpreting  
35 information supplied over the telephone line, second circuit means operable under program control for providing facsimile messages

over the telephone line, storage means for storing machine-readable representations of a plurality of document files, program means

5 a) for operating said first circuit means to answer a telephone call made over a telephone line to complete a telephone connection  
10 between a caller at the far end of said connection and said system, to provide machine-stored voice signals instructing said caller relative to the ordering of copies of one or more of said documents, to receive from said caller responses to said voice signals identifying at least a specific one of said documents, and to  
15 determine whether a facsimile machine is connected to the far end of said telephone connection, b) for retrieving from said storage means at least a first one of said document files associated with said specific one of said documents, and c) for operating said second circuit means to transmit the retrieved document in facsimile form.

9. A method of transmitting documents substantially as herein described with reference to the accompanying drawings.

10. Apparatus for transmitting documents substantially as herein described with reference to the accompanying drawings.

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 8004001 22.02.1990

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 H04M 1/66 3/42

(52) UK CL (Edition K)  
 H4K KFB KFD

(56) Documents cited  
 None

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 United Kingdom

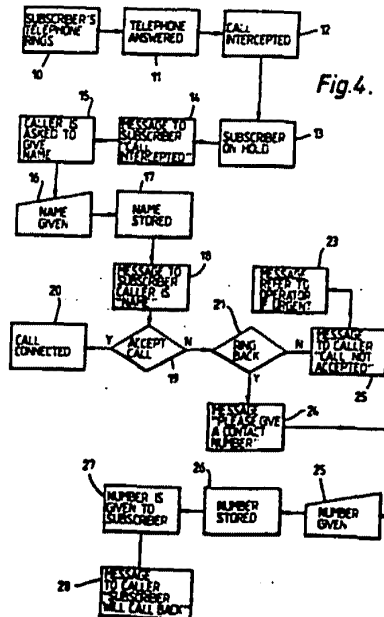
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 UK CL (Edition K) H4K KFB KFD  
 INT CL<sup>a</sup> H04M  
 Online database: WPI

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(54) Telephone call intercept system

(57) An automatic call interception apparatus (1) provides a barrier between the subscriber and the caller. The apparatus can ask the callers identity, without the subscriber having to speak to the caller personally. The reply is recorded and then played back to the subscriber who can then decide whether or not to accept the call. The call need be intercepted only if the subscriber answers thus minimising inconvenience to the caller.



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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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Fig.1a.

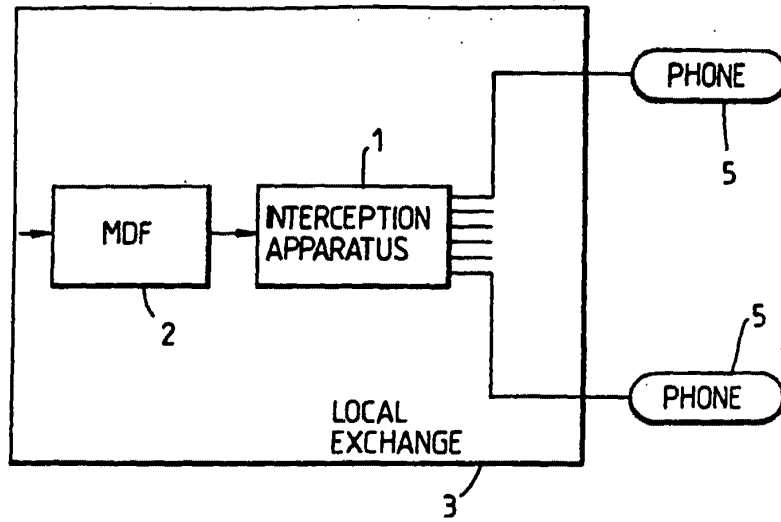


Fig.1b.

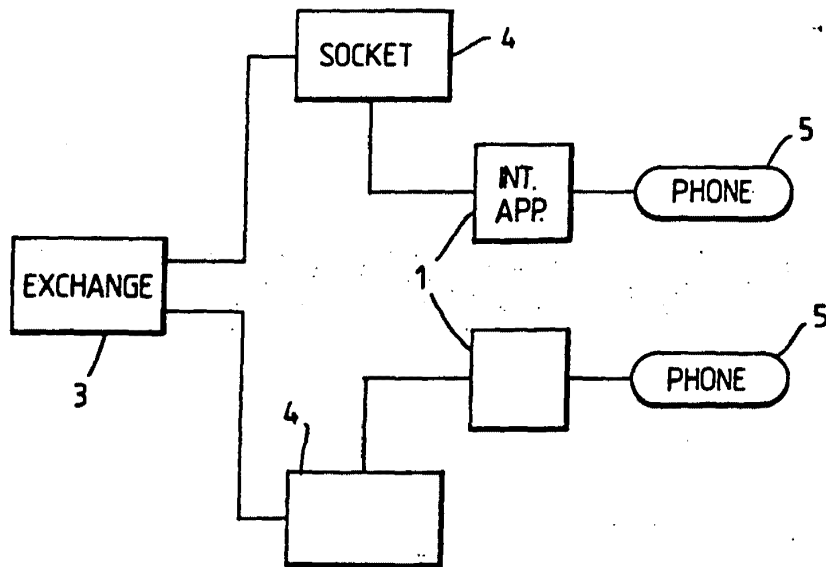
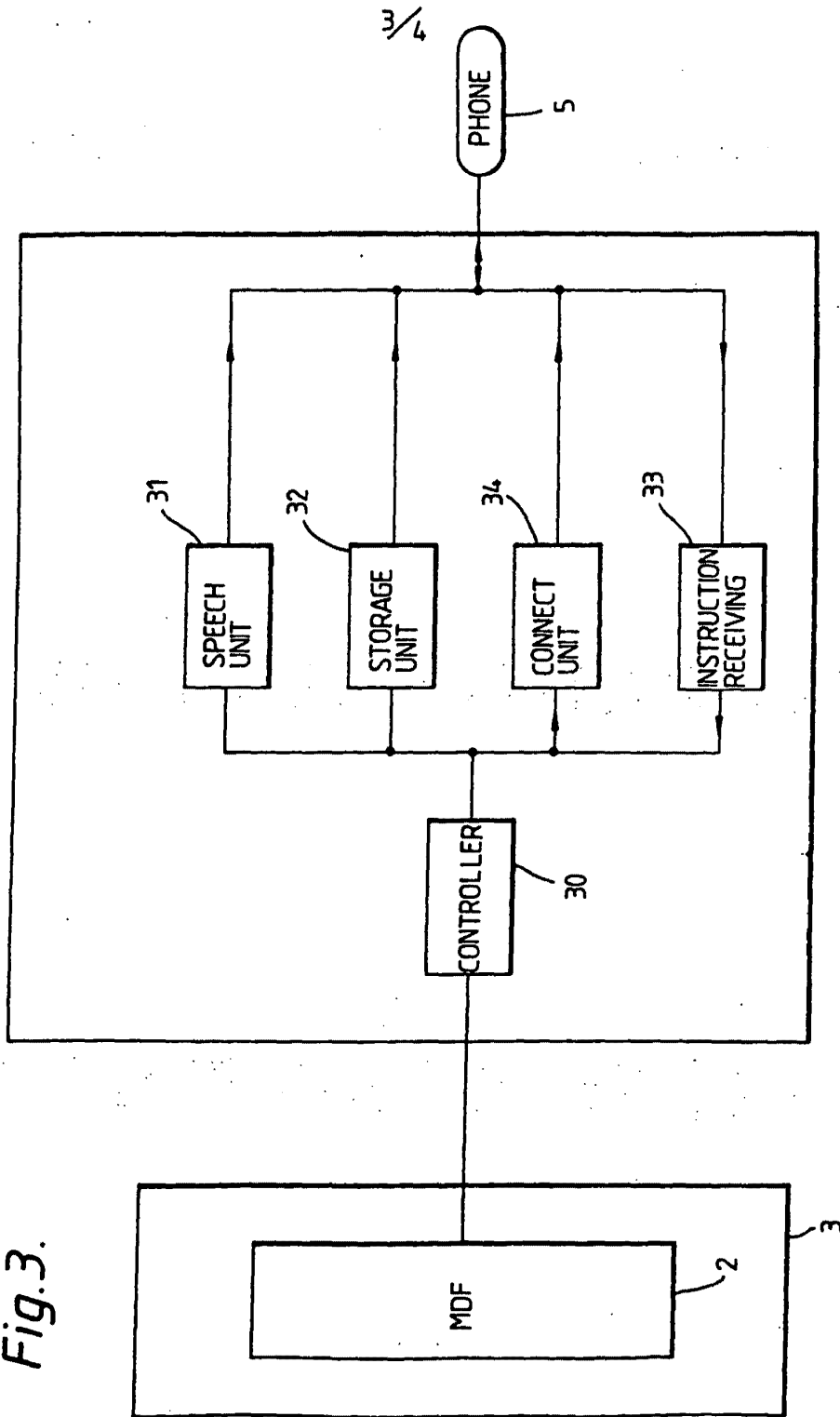
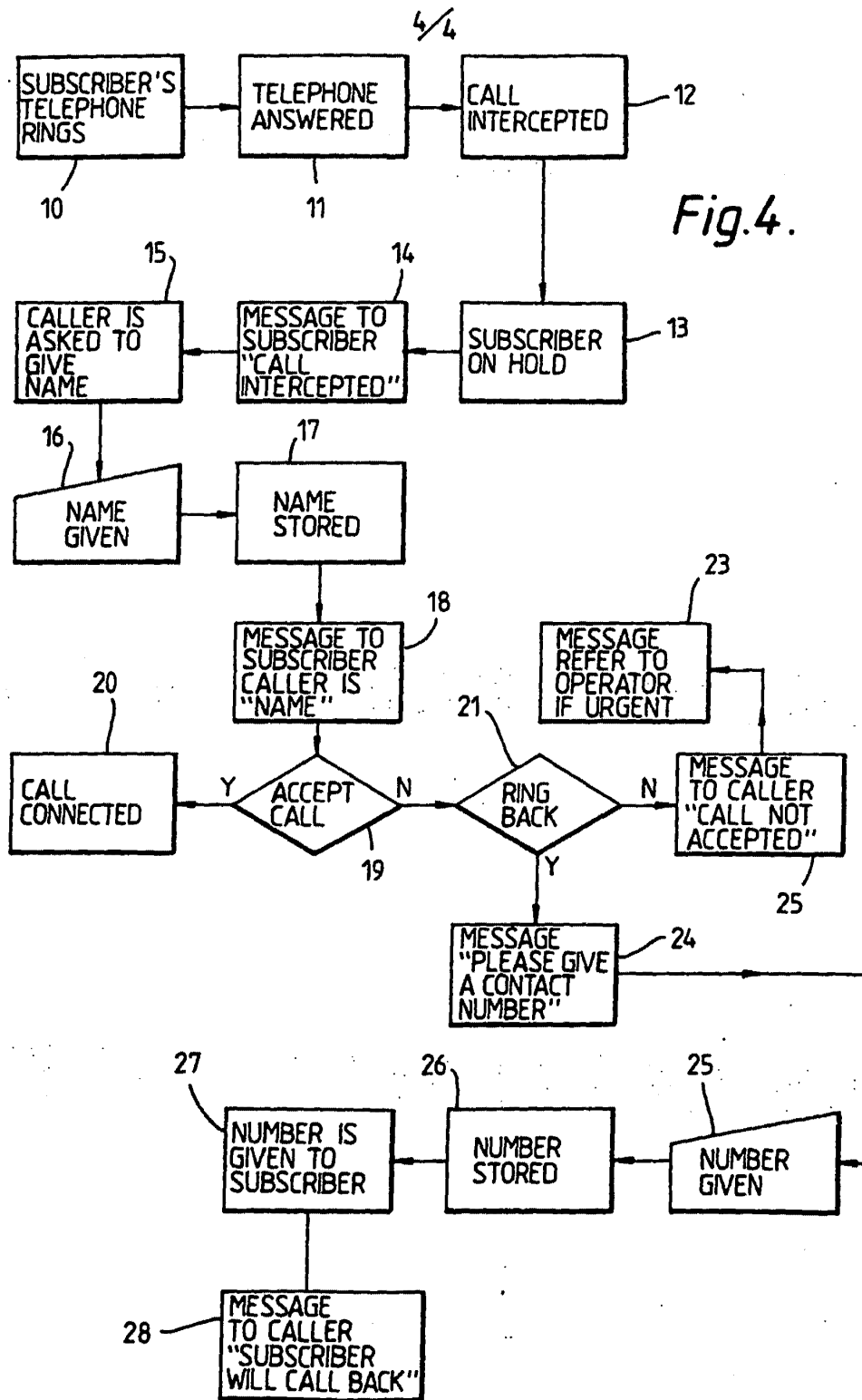




Fig. 3.







TELEPHONE CALL INTERCEPT SYSTEM

5 This invention relates to an automatic telephone call interception facility to allow screening of incoming calls. The invention has a particular use as a deterrent to malicious callers.

Subscribers are often bothered with unwelcome calls which may be malicious or just time consuming, eg from salespeople.

10 A call intercept facility is available to subscribers troubled by malicious callers. However, this facility has several disadvantages.

This facility involves all the subscriber's calls being diverted to an operator. The operator then asks:

- 15 1. the identity of the calling party,
2. the telephone number to which the calling party wishes to be connected,
3. the telephone number of the calling party,
4. who the calling party wishes to speak to.

20 Once the operator has asked the questions, the caller is then connected to the subscriber's line. There is no guarantee that the subscriber will answer. The operator does not check to see if the subscriber's phone will be answered before asking the questions or attempting to connect the call.

25 This is a very labour intensive and expensive service to provide. The calling party can get irritated at being asked a lot of seemingly pointless questions each time the subscriber is called. The operator is not able to give the subscriber the option of refusing the call. The service is uneconomical to use simply to  
30 screen out unwanted calls.

The object of this invention is to provide an inexpensive and easily implemented system of intercepting and screening incoming calls.

According to the invention there is provided a telephone call interception apparatus comprising first connection means for connecting the apparatus to a party calling a subscriber's telephone associated with the apparatus, interrogation means for interrogating the calling party, recording means for recording the responses given by the calling party to the interrogation, transfer means for transferring the recorded answers to the subscriber's telephone and second connection means for connecting the calling party to the subscriber's telephone, means for accepting signals from the called party to instruct the apparatus to connect the call and means for accepting a password from the operator allowing the apparatus to be bypassed in cases of emergency.

The apparatus preferably incorporates a speech synthesizer in the interrogation means.

The apparatus preferably also includes means for recording the responses given by the calling party to the interrogation. The recording means is preferably through a digital recording means. In a preferred embodiment the invention is a network system based at the local exchange capable of intercepting calls on a plurality of subscriber lines. Another preferred embodiment of the invention is a small portable unit based on the subscriber's premises.

Alternatively the apparatus uses pulse coded modulation (PCM) or linear predictive coding (LPC) to record the responses to the interrogation.

Conveniently the apparatus has means for disconnecting the calling party if the subscriber does not wish to accept the call.

Preferably the apparatus is such that the call is intercepted only if the called party answers.

Conveniently the apparatus incorporates a means for logging intercepted calls.

Advantageously the apparatus incorporates means such that the subscriber can switch the call intercept on or  
5 off from the telephone to be protected, or from any telephone using an identifying password or code.

The subscriber based apparatus may incorporate a plug means for plugging into a socket on the subscriber's premises.

10 The apparatus conveniently also incorporates an alarm means to allow the subscriber to alert the telephone company to the fact that assistance is required.

The apparatus may further comprise means to allow  
15 the subscriber to trigger a malicious call alarm.

Preferably the apparatus includes means for accepting a password to allow the apparatus to be overridden. This allows household members to get  
20 straight through and also allows an operator to bypass the system in case of emergency.

The apparatus conveniently incorporates a telephone answering apparatus obviating the need for two pieces of equipment attached to the same telephone.

The intercept system could either be at the local  
25 exchange connected to a main distribution frame (MDF) where the individual line pairs enter the local exchange, and be a chargeable service or it could take the form of a separate portable unit. The subscriber could buy or rent the unit and it could be plugged into the existing  
30 telephone socket.

The present invention will now be described by way of example only and with reference to the accompanying drawings in which:

35 Figure 1a) is a block diagram of an exchange based system;

Figure 1b) is a block diagram of a subscriber based system.

Figure 2 is a block diagram of a network based system constructed in accordance with the invention.

5 Figure 3 is a block diagram of a subscriber's premises based system constructed in accordance with the invention.

10 Figure 4 is a flow diagram showing the manner of operation of a system constructed in accordance with the invention.

Referring to the drawings, Figure 1a shows an intercept apparatus 1 connected to the main distribution frame 2 (MDF) at a local exchange 3. The intercept apparatus 1 is capable of intercepting calls on a plurality of lines (typically 100 or more lines per unit).

15 On compatible exchanges which allow customer controlled call diversion the subscriber would be able to switch the intercept apparatus on or off as required. Once activated all calls would be intercepted before the called party had answered.

20 Referring now to Figure 1b, the intercept apparatus 1 is connected to the local exchange 3 via the subscriber's telephone socket 4, the intercept apparatus being positioned between the socket and the subscriber's telephone 5.

30 Figure 2, shows in more detail the telephone intercept apparatus 1 situated at the local exchange 3. It has a controller 30 which controls the activities of the other parts of the apparatus. When a caller rings a subscriber and the subscriber picks up the receiver to answer the call the call is then intercepted. The controller 30 causes a speech unit 31 to tell both the caller and the subscriber that the call has been intercepted, and asks the caller to give a name. The

speech unit may be a speech synthesizer, or alternatively pre-recorded messages on magnetic tape or other media could be used.

5 Responses from the caller to questions asked by the speech unit 31, are stored in a storage unit 32, constituted by a digital storage unit eg a RAM. Alternatively, the storage unit 32 could be a simple magnetic storage means.

10 The controller 30 causes the responses to be transferred to the subscriber at the relevant times in the manner described below with reference to the flow chart of Figure 4.

15 After information has been transferred to the subscriber the controller 30 alerts an instructions receiving unit 33, to be on standby to receive instructions from the subscriber. The instruction receiving unit 33 could be a speech recognition system with a limited vocabulary or take the form of an MF tone decoder for people with speech or language difficulties.

20 When the subscriber indicates that the call is accepted the controller 30 signals a call connect unit 34 to connect the call if appropriate.

25 Where the subscriber does not wish to accept the call, the caller is referred back to the operator at the local exchange or played a suitable message.

30 The controller 30 and also has means (speech recogniser or an MF tone decoder) for recognising a password or other signal sent from the exchange so that the exchange operator can, upon giving the correct password or other code, override the interception mechanism and be routed directly to the subscribers telephone 5 via the call connect unit 34. Members of the subscriber's household could also have a second password allowing the system to be bypassed. The speech  
35 recognition system could be speaker dependent for added security.

The apparatus could incorporate means to allow the subscriber to instruct the apparatus not to connect any further calls from a caller. The apparatus could use a speaker dependent recognition system to recognise  
5 unwanted repeat callers.

Where the subscriber does not wish to accept the call and the caller does not hang up, thereby blocking the subscriber's line the apparatus is able to disconnect the call.

10 An alternative embodiment of the invention is the subscriber based unit shown in Figure 3. This is very similar to the MDF network based system, but as the subscriber based unit only intercepts calls on the subscriber line it is connected to it may be consequently  
15 much smaller and less expensive. The controller 30 controls the operation of the unit. The other parts of the unit are the same, a speech unit 31, a storage unit 32, an instruction receiving unit 33 and a call connect unit 34. In the subscriber based unit the call connect  
20 unit 34 is not able to disconnect the call if not accepted and the caller does not hang up because calls can only be disconnected by the caller or the local exchange.

Both the network based service and the subscriber's  
25 premises based service operate in substantially the same manner, which will now be described with reference to Figure 4.

The subscriber's telephone rings (at 10), and when the subscriber answers (at 11), the call is intercepted  
30 (at 12). At this point the subscriber is put on hold (at 13) and informed that the call has been intercepted (at 14). The caller is informed, either by a light on the subscriber based apparatus or a message that the call is being intercepted and logged and asked to give a name (at  
35 15). When the caller gives a name (at 16) this is stored

(at 17) and then transferred to the subscriber (at 18). The subscriber is then given the option of accepting the call or not (at 19). If the subscriber chooses to accept the call, this is indicated to the unit by pressing a  
5 dedicated button or by MF signalling, then the call is connected (at 20). Some lower cost models might not have call logging facilities but the caller will not be able to tell whether the apparatus in question can log calls or not.

10 If the subscriber chooses not accept the call, the apparatus offers the subscriber the possibility of returning a call (at 21). Again the subscriber's intentions can be indicated by dedicated "yes" or "no" buttons or by MF signalling. If the subscriber does not  
15 wish to return the call then the caller is informed that the call has not been accepted (at 22) and is referred to the operator in case of emergency (at 23).

If the subscriber does choose to ring the caller back, the operator asks the caller to provide a contact  
20 telephone number (at 24). The caller can then give the number (at 25) which is stored (at 26) for transmission to the subscriber (at 27) and the caller is informed that the subscriber will ring back (at 28).

Dedicated buttons with labels and lights would  
25 overcome problems experienced by people with speech or language difficulties.

The subscriber based system could intercept internal calls on PABX exchanges which do not go via the local exchange, and so could not be intercepted by the operator  
30 or an MDF based system.

The apparatus could incorporate means for allowing subscriber's to hear the information provided by the caller eg name and telephone number, replayed via a  
35 loudspeaker instead of through the earpiece from the handset.

CLAIMS

1. Telephone call interception apparatus comprising first connection means for connecting the apparatus to a party calling a subscriber's telephone associated with the apparatus, interrogation means for interrogating the calling party, recording means for recording the responses given by the calling party to the interrogation, transfer means for transferring the recorded answers to the subscriber's telephone and second connection means for connecting the calling party to the subscriber's telephone, means for accepting signals from the called party to instruct the apparatus to connect the call and means for recognising a password from the exchange operator and means responsive to said password causing the apparatus to be by-passed in cases of emergency. A
2. An apparatus as claimed in claim 1, wherein the password recognising means is able to recognise a second password and whereby a caller having a password can cause the apparatus to be by-passed.
3. Apparatus as claimed in claim 2, comprising a multitone frequency decoder system to accept instructions from the called party.
4. Apparatus as claimed in claim 3, further comprising a speech recognition system to accept instructions from the called party.
5. Apparatus as claimed in any one of the preceding claims, wherein a digital recording means constitutes the recording means for recording the responses given by the calling party to the interrogation.



6. An apparatus as claimed in claim 2, where the password accepting means constitutes an MF tone decoder.

5 7. An apparatus as claimed in claim 2, wherein the password accepting means constitutes a speech recognition system.

8. An apparatus as claimed in claim 2, wherein the password accepting means constitutes a speaker dependent speech recognition system.

10 9. An apparatus as claimed in any one of the preceding claims, wherein the interrogation means incorporates a speech synthesizer.

10. An apparatus as claimed in any one of the preceding claims, wherein the apparatus only intercepts the call if the called party answers.

15 11. An apparatus as claimed in any one of the preceding claims, further comprising means for connecting the apparatus to a distribution frame at a local exchange, the apparatus being capable of intercepting calls on a plurality of subscriber lines.

20 12. An apparatus as claimed in claim 11, further comprising means for disconnecting the calling party if the subscriber does not wish to accept the call.

25 13. An apparatus as claimed in one of the preceding claims, wherein the apparatus can be switched on or off from any telephone by the subscriber.

14. An apparatus as claimed in any one of the preceding claims, further comprising programmable call rejection means to always reject calls from a certain party.
- 5 15. An apparatus as claimed in claim 14, wherein the programmable call rejection means further comprises a speaker recognition system.
- 10 16. An apparatus as claimed in any one of claims 1 to 10, further comprising a plug means for plugging the apparatus into a telephone socket on the subscriber's premises.
17. An apparatus as claimed in any one of the preceding claims, further comprising an alarm means to allow the subscriber to alert the telephone company to the fact that assistance is required.
- 15 18. An apparatus as claimed in any one of the preceding claims, further comprising means to allow the subscriber to trigger a malicious call alarm.
- 20 19. A telephone call interception apparatus substantially as described herein with reference to and as illustrated by the accompanying drawings.

PCT

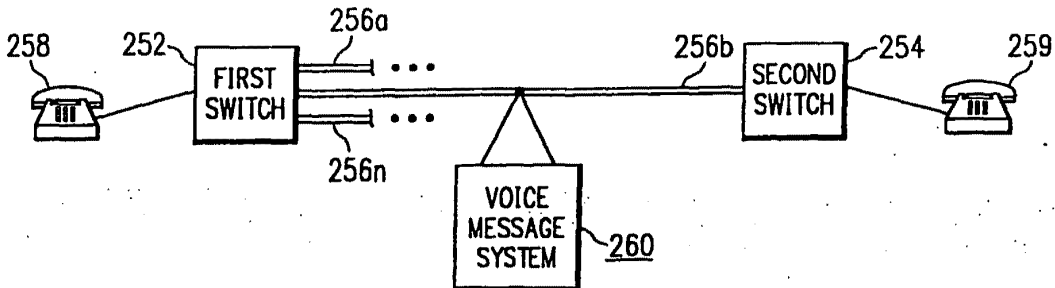
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(54) Title: METHOD AND APPARATUS FOR PROVIDING PROACTIVE CALL SERVICES FOLLOWING CALL COMPLETION



(57) Abstract

An apparatus for use in a telephone network (250) having a calling station connectable to a first switch (252) means and a called station connectable to a second switch (254) means, with the first and second switch means being connectable by a link (257). The apparatus comprises an interface having a passive in-line monitor connected in the link for detecting entry of a predetermined service access code by a user of the calling station (258) or a user of the called station (259) after call completion between the calling station and the called station and before either of said users goes on-hook. Upon entry of predetermined service access code, a speech circuit issues a predetermined prompt to the user of the calling station and/or the user of the called station. Processor control (266) circuitry is then responsive to entry of predetermined signaling by one of the users following the issuance of the prompt for providing a predetermined service controlled and paid for by the user requesting the predetermined service.

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**METHOD AND APPARATUS FOR PROVIDING  
PROACTIVE CALL SERVICES  
FOLLOWING CALL COMPLETION**

The present invention relates to telephone systems and more particularly to a method and apparatus for providing a variety of caller-controlled proactive services after a caller  
5 has been connected to a called station.

It is known in the prior art to carry telephone calls between local telephone operating companies through the AT&T network or through one or more independent inter-exchange carriers such as MCI or  
10 Sprint. The local telephone operating companies operate within a so-called local access and transport area (LATA). When a long distance call is dialed, the call is usually transmitted through an operating company central office to a point of  
15 termination in the originating LATA at which it is picked up by the inter-exchange carrier and passed by that carrier on to a termination point in a distant LATA. Upon reaching the destination LATA, the call is then transferred by the inter-exchange  
20 carrier to the local operating company central office within that LATA for ultimate connection to the original called station therein. Typically, the termination points of each LATA include suitable switching circuits, e.g., an access tandem, that are  
25 interconnected by a digital serial link. Such digital links are also presently used to interconnect virtually all central offices as well as to interconnect operating company switching networks to one or more cell site control switches  
30 of a mobile telephone network.

It is also known in the prior art to provide "automatic voice messaging" where, upon the occurrence of a busy/ring-no-answer condition at a called station, the user of the calling station can  
35 be connected to a voice message facility for recording a voice message for subsequent delivery to

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the called station. The decision to accept or reject the automatic voice messaging service is determined by the caller. Automatic voice messaging operates essentially after a call has been initiated  
5 but before the call can be completed to the called station.

It would be desirable to extend the advantages of caller-controlled automatic voice messaging to facilitate the providing of enhanced proactive  
10 services after call completion.

It is an object of the invention to provide caller-controlled proactive telephone services to a caller after call completion.

It is another object to provide a unique system  
15 architecture that facilitates the offer/acceptance of various ancillary user services to the original caller at the calling station and/or the original called party at the called station after call completion between the calling station and called  
20 station.

It is a further object of the invention to describe an apparatus that passively monitors a line between calling and called stations following call completion, detects a request for an ancillary user  
25 service, and then controls the providing of such service at the request of either the calling party or the called party.

It is yet another object of the present invention to provide an apparatus having on-line  
30 monitoring capabilities for the selective offering and providing of various ancillary services under the control of, and at the cost to, one of the parties to the completed call.

These and other objects of the invention are  
35 achieved in a preferred embodiment of the invention describing an apparatus for use in a telephone

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network having a calling station connectable to a first switch means and a called station connectable to a second switch means, with the first and second switch means being connectable by a link.

5 Generally, the apparatus comprises an interface having a passive in-line monitor connected in the link for detecting entry of a predetermined service access code by a user of the calling station or a user of the called station after call completion

10 between the calling station and the called station and before either of said users goes on-hook. Upon entry of the predetermined service access code, a speech circuit of the apparatus issues a predetermined prompt to the user of the calling

15 station and/or the user of the called station. Processor control circuitry of the apparatus is then responsive to entry of predetermined signaling by one of the users following the issuance of the prompt for providing a predetermined service

20 controlled and paid for by the user requesting the predetermined service. Alternatively, if the user(s) are aware of the service offering, the speech circuit is not required in order to offer the service. In such alternative embodiments, the

25 speech circuit can be used for a confirmation prompt.

For a more completed understanding of the present invention and the advantages thereof, reference is now made to the following Description taken in conjunction with the accompanying Drawings

30 in which:

FIGURES 1A, 1B and 1C are block diagrams of a digital telephone network in which a proactive call services system is preferably incorporated; and

35 FIGURE 2 is a detailed block diagram of the preferred embodiment of the proactive call services system of FIGURE 1.

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Referring now to FIGURE 1A, a block diagram is shown of a generic digital telephone network 250 in which an automatic voice message system is advantageously provided according to the teachings of copending application Serial No. 07/478,674. The telephone network generally includes a first switch 252, a second switch 254, and a plurality of digital communications links interconnecting the first and second switches 252 and 254 and designated by the reference numerals 256a-n. At least one digital link 256 is preferably a high speed (1.544 MHz) T-1 span over which conventional in-band signaling is provided in a serial fashion; of course, other higher speed links as DS/3 can be used. Link 256, alternatively, is a high speed digital serial link over which digital signals are provided using out-of-band signaling with other communications protocols, such as X.25 or common channel signaling (SS7).

For purposes of generalization, FIGURE 1A shows a calling station 258 connected (or connectable to via a central office or the like) to the first switch 252 and a called station 259 connected (or connectable) to the second switch 254. For the remainder of the discussion, it is assumed that a call to the called station 259 is initiated by a caller at the calling station 258. A proactive call services system 260 is placed across or in a digital link 256 for enabling the offering and acceptance of one or more predetermined call services under the control and at the expense of the caller at the calling station 258 or the caller at the called station.

Without limiting the foregoing, the first and second switches 252 and 254 are access tandems located at termination points between two LATAs.



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Alternatively, the first switch 252 is an access tandem and the second switch 254 is a cellular tandem or cell site controller for a mobile telephone system. In this configuration, the network 250 is a cellular telephone network. The first switch 252 may be an operating company central office while the second switch 254 is an access tandem. The first and second switches can interconnect two central offices. The system 260 is bridged across the link.

Referring briefly to FIGURE 1B, in an alternate embodiment the system 260 is placed in a self-contained loop 256C from the first switch 252 (or the second switch 254 (not shown)). A "self-contained" loop means that the system 260 is located internally to the switch or as an adjunct thereto.

Referring now to FIGURE 2, a detailed block diagram is shown of the preferred embodiment of a proactive call services 260 for use in a digital network environment. System 260 preferably includes an interface means including a plurality of interface circuits 262a-n each connected to a multiplexer 264. The multiplexer includes a control bus connected to a control means comprising a processor 266, storage interface 268, storage device 270 and input/output device 272. The processor is controlled in a conventional manner by suitable application programs stored in the storage device 270. Input/output device is used to modify the system operation by entering suitable program commands to the control means.

The system 260 further includes a number of circuits for facilitating various monitor intercept, prompting, conferencing and redirect functions as will be described in more detail below. A scanner

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circuit 274 is provided to identify Feature Group D supervision or other similar information depending on the type of signaling used. A service circuit 276 includes a passive line monitor circuit as well as all necessary call progress (e.g., busy/ring-no-answer) detection circuits, speech generation circuits, and service acceptance (e.g., DTMF) detection circuits. The service circuit 276 also preferably includes appropriate circuitry for capturing ANI, DNI and billing information. A first communication interface 278 is provided to receive, interpret, format and transmit SS7 messages as will be described in more detail below. The system preferably also includes a second communication interface 280 connected to a network applications platform 282. The platform 282 includes a billing computer and other appropriate devices such as a database for transaction processing and accounting purposes. The system 260 advantageously includes its own voice/data storage unit 284 for storing voice messages, data or other call conversations as will be described. A storage 286, preferably a disk storage, is connected to the voice/ data storage unit 284. The voice message or data storage may take place either in the voice/data storage unit or in the network applications platform, as is appropriate, to facilitate subsequent delivery.

Each of the circuits 274, 276, 278, 280 and 284 are connected to the processor 266 via the control bus 290. Input/output channel buses 292 and 294 also interconnect these circuits to the multiplexer of the interface means. Preferably, the interface means includes twenty-eight (28) T-1 interface circuits, each of which is connected to two digital links. Each T-1 interface circuit includes first and second T-1 interface circuits 295 and 297, with

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the first interface circuit 295 connected to one of the digital links and the second interface circuit 297 connected to the other digital link. The first and second digital links are thus connectable to  
5 bypass their respective interface circuit if the first and second T-1 interfaces are interconnected by means of the switch 298. Given this architecture, i.e., with 28 T-1 spans each carrying twenty-four (24) channels, the buses 292 and 294  
10 service 1344 channels.

To provide automatic voice messaging, the scanner 274, service circuit 276 and/or communications interface 278 monitor the received signaling to determine the state of the call  
15 progress. Of course, the actual circuit used depends on the type of signaling. If an SS7 protocol is used, communications interface 278 monitors the line. If Feature Group D signaling is used, the Feature Group D information is collected  
20 in and processed by service circuit 276; other types of signaling are collected and processed by scanner 274. When call processing is required due to a busy or ring/no answer condition, the processor 266 activates the service circuits 276 to thereby issue  
25 a prompt offering (e.g., "Your party is not available; if you would like to leave a message, please press the # key") and monitor the line for acceptance of the service. Processor 266 also controls the circuit 276 to capture ANI, DNI and  
30 billing information. If the service is accepted, the service circuit 276 notifies the processor 266, which then controls the service circuit to issue appropriate prompts to the caller to instruct the caller to begin recording the message. The message  
35 is then recorded by the voice storage unit 284, and the processor controls the service circuit 276 to

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transfer the ANI, DNI, and billing information to the network applications platform 282. Although not meant to be limiting, preferably voice messages are stored in the voice/data storage unit 284 or its associated disk storage, while ANI, billing and other management information resides in the network applications platform.

For message delivery, the network applications platform ships the message routing information (i.e., the ANI, etc.) back to the voice/data storage unit 284, and the processor 266 then locates an open channel on a link for outdialing to the original called station. The service circuit then dials the call. When the call is placed, the scanner 274 watches the call states for answer supervision or on-hook/off-hook detection. If off-hook is detected, the service circuit 276 issues a prompt announcing the message which is then delivered by the voice storage unit 284. When the message is delivered, the processor 266 notifies the network applications platform and the packet is deleted.

If desired, the system 260 is connectable to a remote host computer via a dedicated communications interface which in turn is connected to the remote host via an RS-232 link or the like. This enables messages to be transferred to another location for the subsequent outdial attempts. As an alternate embodiment, the network applications platform 282 is set up to control billing and delivery attempts while the remote host issues the prompt announcing the message and other voice functions. The remote host can alternatively retain all billing information with the voice messenger or other call information for a short time; and then passes off all such information to the platform 282 for further processing. It is also possible to have the

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voice/data storage unit 284 pass a "packet" (comprising the billing information) downstream to a platform 282, e.g., in a destination delivery area (a destination LATA).

5           The architecture of FIGURE 2 is quite useful in providing various ancillary "instant" services to the calling station user and/or the called station user after the call between these parties has been completed. As used herein, "call completion" means  
10 the calling station has been successfully connected to the called station, i.e., a busy/ring-no-answer has not been encountered by the calling station user upon call initiation to the called station. According to the present invention, one or more such  
15 ancillary services are provided after call completion but before either party goes back to an on-hook condition.

          One such ancillary service is conference calling. During the call, if either party  
20 determines that a conference is needed, that party can enter a predetermined access code (e.g., "2,2") which is detected by the passive on-line monitor circuit in the service circuit 276 of the system. Detection of the predetermined access code causes  
25 the processor 266 to control the service circuit to issue a prompt, e.g., "if you would like to add another party to this call, please dial that party's number now" or "if you would like to add a party to this call, please press # and follow the  
30 instructions" or the like. Depending on the prompt offering, one of the parties then enters the necessary signaling (dialed digits or the # sign, etc.) to accept the service offering. This signaling is detected by the service circuit 276 at  
35 which point the processor seizes an available line and places the call to the party sought to be

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conferenced. Such call initiation continues while the originally completed call remains in progress between the calling station and the called station. The system can either mute the ringing signals to the third party or allow such signals to be heard by the parties. Upon call completion to the third party, the processor 266 bridges the calls together to provide the conference. The database in the network applications platform 282 could then provide billing validity information as well as storing the billing information. Generally, the party who accepts the service is billed.

The system of FIGURE 2 thus facilitates call conferencing in a proactive or caller-controlled manner which has heretofore never been available. From the caller's perspective, such ancillary services are provided to the call-in-process unobtrusively. If the parties are familiar with the service offering, a prompt offering may not be necessary following entry of the predetermined access code. In this embodiment, detection of the predetermined access code by the monitor circuit will result in the generation by the service circuit of a "beep" tone or superimposed dialtone (over the existing talkpath) instead of the prompt offering. One of the parties then dials the third party's telephone number or enters the appropriate code for acceptance of the service as the case may be. Confirmation of follow-up prompts may then be provided if necessary.

Yet another ancillary service available through the system of FIGURE 2 is call recording. During the call, one or both of the parties may decide to record the call. Upon detection of a predetermined access code (e.g., a 2,7) by the on-line monitor of the service circuit 276, the circuit signals the

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processor 266. Processor 266 in turn connects the voice storage unit on line to immediately begin recording the call. Alternatively, the parties are provided the prompt offering to determine whether the continued conversations are to be recorded. The recording of the call, and the associated information packet containing the requesting party and billing information, is then transferred to the network applications platform 282 after the pathway to the platform is established as previously described. The party requesting the recording can then recall the recorded conversation from the platform 282 using dialup parameters such as an entry and verification of security codes. Other collateral services, such as transcription of the recorded call, can thus be arranged and billed to the requesting party.

Another ancillary service is silent call recording. In this embodiment, a predetermined service access code is detected by the passive on-line monitor but not sent down the line to the party at the called station. The recording of the call is then carried out privately without the other party's knowledge. With this service, there is no need to provide a prompt offering, however, a one-way confirmation (to either the calling party or the called party) superimposed over a muted line (to the other party) is provided if desired. Although not meant to be limiting, the silent recording feature alternatively can be invoked by using a second band of an ISDN telephone, by transmitting out-of-band information, or by transmitting a combination of in-band and out-of-band signaling to a special "notch" filter.

According to the present invention, either the calling party and/or the called party can invoke one

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or more of the above-identified services by entry of the appropriate code. Service may be offered at the destination either by subscription or as a basic service by the destination service provider.

5 Generalizing, and with reference to FIGURE 1C, conceptually the service offerings can be provided in numerous locations in and around the network. In particular, FIGURE 1C shows a public telephone network with alternative pickup points, alternative

10 central office switching points and alternate delivery processors. The system of FIGURE 2 can be implemented at the various positions indicated in FIGURE 1C.

Although not shown in detail, it should be

15 appreciated that the architecture of FIGURE 2 is quite powerful and enables the service provider to provide numerous ancillary call services that have heretofore been unavailable to users except in only limited ways behind a private branch exchange or the

20 like and without the capability of providing such services in a proactive, caller-controlled and billed manner as described herein.

It should be appreciated by those skilled in the art that the specific embodiments disclosed

25 above may be readily utilized as a basis for modifying or designed other structures for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent constructions do not depart

30 from the spirit and scope of the invention as set forth in the appended claims.

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**CLAIMS**

What is claimed is:

1. In a telephone network having a calling station connectable to a first switch means and a called station connectable to a second switch means, with the first and second switch means being connectable by a link, the improvement comprising:  
an interface connected in the link to monitor for entry of a predetermined service access code by a user of the calling station or a user of the called station after call completion between the calling station and the called station and before either of said users goes on-hook; and  
control means connected to the interface and responsive to entry of the predetermined access code for controlling offer and acceptance of one or more predetermined services controlled and paid for by the user requesting the service.
2. In the telephone network as described in Claim 1 wherein the service is call conferencing.
3. In the telephone network as described in Claim 1 wherein the service is call recording.
4. In the telephone network as described in Claim 1 wherein the service is silent call recording.
5. Apparatus for use in a telephone network having a calling station connectable to a first switch means and a called station connectable to a second switch means, with the first and second switch means being connectable by a link, comprising:  
an interface connected in the link to monitor for entry of a predetermined service access code by a user of the calling station or a user of the

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called station after call completion between the calling station and the called station and before either of said users goes on-hook; and

speech means responsive to entry of the predetermined service access code for issuing a predetermined prompt to the user of the calling station and/or the user of the called station; and

control means connected to the interface and responsive to entry of predetermined signaling by one of the users following the issuance of the prompt for providing a predetermined service controlled and paid for by the user requesting the predetermined service.

6. Apparatus for use in a telephone network having a calling station connectable to a first switch means and a called station connectable to a second switch means, with the first and second switch means being connectable by a link, comprising:

an interface connected in the link to monitor for entry of a predetermined service access code by a user of the calling station or a user of the called station after call completion between the calling station and the called station and before either of said users goes on-hook; and

control means connected to the interface and responsive to entry of predetermined signaling by one of the users for providing a predetermined service controlled and paid for by the user requesting the predetermined service.

7. Apparatus for use in a telephone network having a calling station connectable to a first switch means and a called station connectable to a second switch means, with the first and second switch means being connectable by a link, comprising:

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an interface in the first switch means to monitor for entry of a predetermined service access code by a user of the calling station or a user of the called station after call completion between the calling station and the called station and before either of said users goes on-hook; and

control means connected to the interface and responsive to entry of predetermined signaling by one of the users for providing a predetermined service controlled and paid for by the user requesting the predetermined service.

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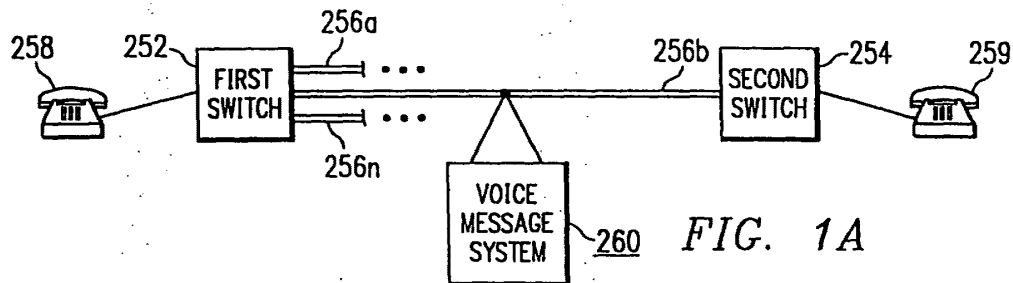


FIG. 1A

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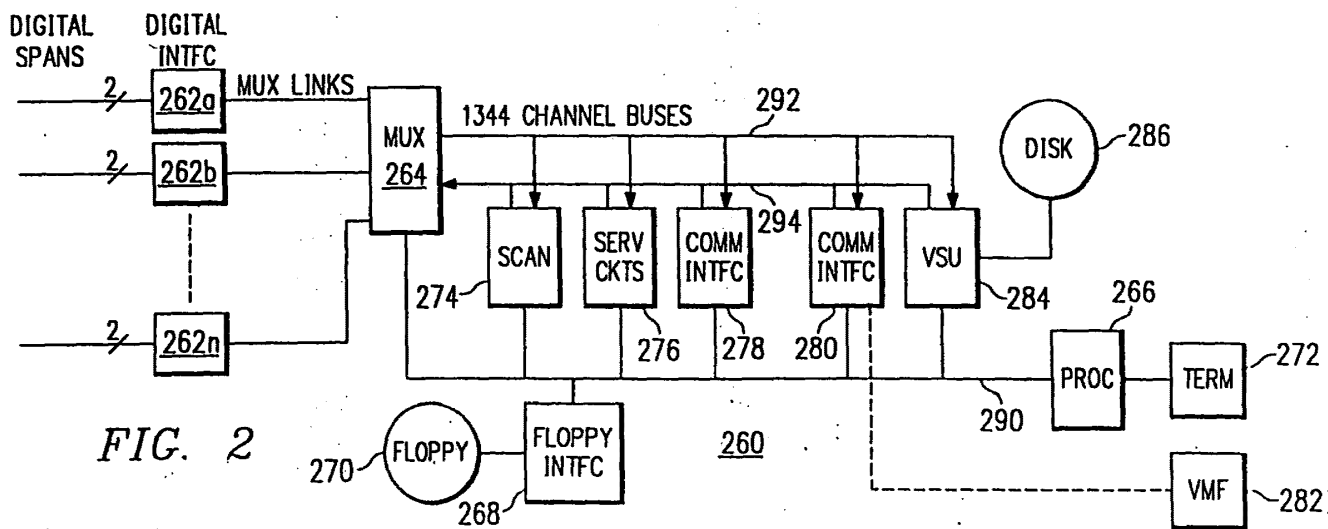
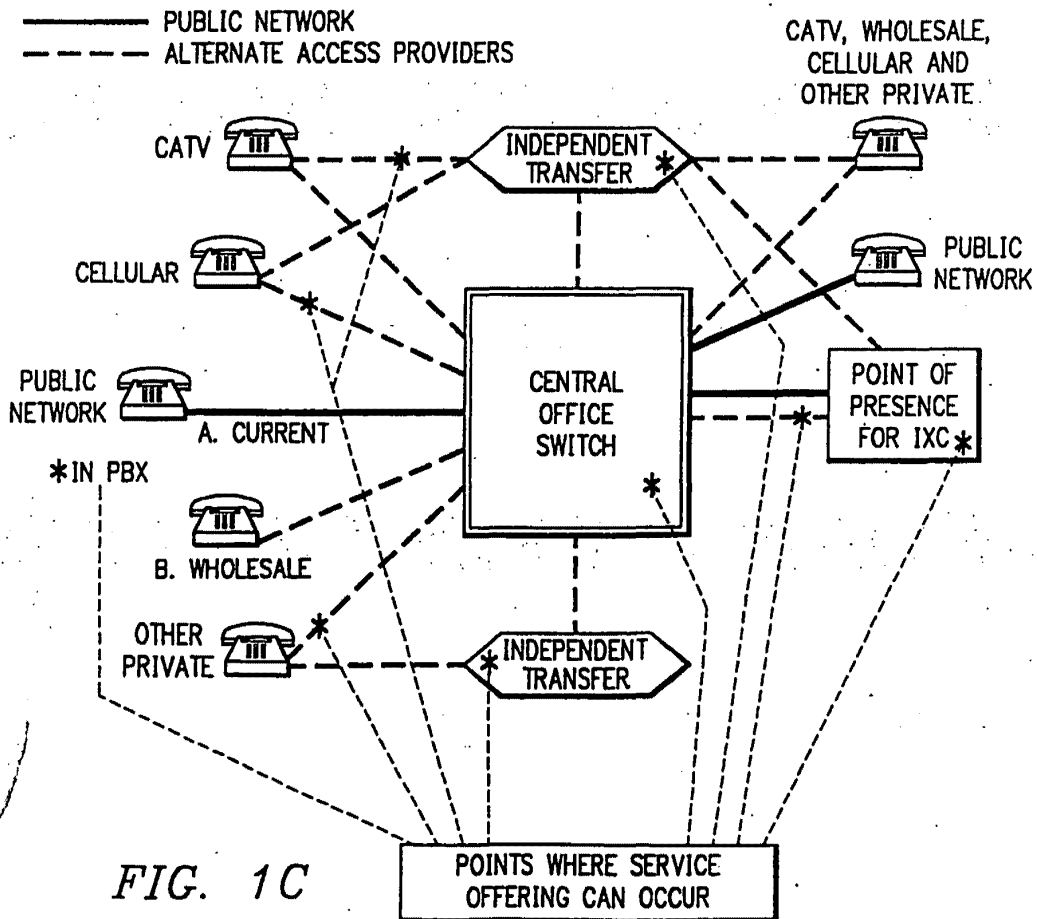
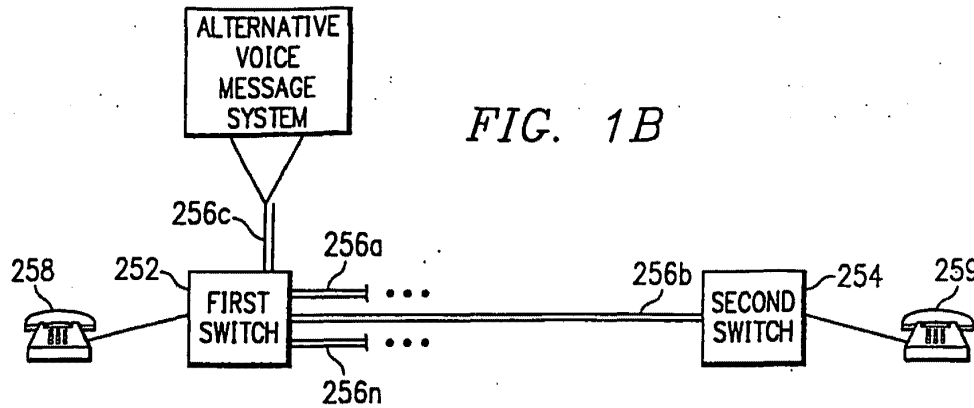


FIG. 2



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