



| APPLICATION NO. | ISSUE DATE | PATENT NO. | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|------------|------------|---------------------|------------------|
| 13/009,483 | 11/05/2013 | 8577003 | 18279-18190 | 1820 |

758 7590 10/16/2013
 FENWICK & WEST LLP
 SILICON VALLEY CENTER
 801 CALIFORNIA STREET
 MOUNTAIN VIEW, CA 94041

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 263 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

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 Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Robert L. Rae, Plano, TX;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

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

- Applicant certifying micro entity status. See 37 CFR 1.29
- Applicant asserting small entity status. See 37 CFR 1.27
- Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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 /Dohyun Ahn/

Date October 1, 2013

Typed or printed name Dohyun Ahn

Registration No. 63237

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.

Electronic Patent Application Fee Transmittal

| | |
|---|-----------------------------|
| Application Number: | 13009483 |
| Filing Date: | 19-Jan-2011 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Filer: | Dohyun Ahn/Larisa Burshteyn |
| Attorney Docket Number: | 18279-18190 |

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|--|-----------|----------|--------|----------------------|
| Basic Filing: | | | | |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Utility Appl Issue Fee | 1501 | 1 | 1780 | 1780 |
| Publ. Fee- Early, Voluntary, or Normal | 0004 1504 | 1 | 300 | 300 |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|---------------------------|----------|----------|--------|----------------------|
| Extension-of-Time: | | | | |
| Miscellaneous: | | | | |
| Total in USD (\$) | | | | 2080 |

Electronic Acknowledgement Receipt

| | |
|---|-----------------------------|
| EFS ID: | 17006613 |
| Application Number: | 13009483 |
| International Application Number: | |
| Confirmation Number: | 1820 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Customer Number: | 758 |
| Filer: | Dohyun Ahn |
| Filer Authorized By: | |
| Attorney Docket Number: | 18279-18190 |
| Receipt Date: | 01-OCT-2013 |
| Filing Date: | 19-JAN-2011 |
| Time Stamp: | 16:46:18 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|--|-----------------|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | \$2080 |
| RAM confirmation Number | 3851 |
| Deposit Account | 192555 |
| Authorized User | |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 0006 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|-----------------------------|------------------------------------|--|------------------|------------------|
| 1 | Issue Fee Payment (PTO-85B) | 18190_US_issue_fee_transmittal.pdf | 114398 741365e8802b8751ad056e91bf6498419ad d50d1 | no | 2 |

Warnings:

Information:

| | | | | | |
|---|----------------------|--------------|--|----|---|
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 31801 1c2cab434d88c2bcab0f803d427297d4ea d6eb3 | no | 2 |
|---|----------------------|--------------|--|----|---|

Warnings:

Information:

Total Files Size (in bytes): 146199

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.



NOTICE OF ALLOWANCE AND FEE(S) DUE

758 7590 09/18/2013
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

Table with 2 columns: EXAMINER (SHAH, ANTIM G), ART UNIT (2652), PAPER NUMBER

DATE MAILED: 09/18/2013

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

13/009,483 01/19/2011 Robert L. Rae 18279-18190 1820

TITLE OF INVENTION: CENTRALIZED CALL PROCESSING

Table with 7 columns: APPLN. TYPE, ENTITY STATUS, ISSUE FEE DUE, PUBLICATION FEE DUE, PREV. PAID ISSUE FEE, TOTAL FEE(S) DUE, DATE DUE

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 DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

- I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.
If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.
If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".
For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). 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. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

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)

758 7590 09/18/2013
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

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. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 13/009,483 | 01/19/2011 | Robert L. Rae | 18279-18190 | 1820 |

TITLE OF INVENTION: CENTRALIZED CALL PROCESSING

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | UNDISCOUNTED | \$1780 | \$300 | \$0 | \$2080 | 12/18/2013 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---------------|----------|----------------|
| SHAH, ANTIM G | 2652 | 370-261000 |

| | |
|---|---|
| <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 submitted:</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): (Please first reapply any previously paid issue fee shown above)</p> <p><input type="checkbox"/> A check 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 to charge the required fee(s), any deficiency, 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)

Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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.



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

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
13/009,483 01/19/2011 Robert L. Rae 18279-18190 1820

758 7590 09/18/2013
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

SHAH, ANTIM G

ART UNIT PAPER NUMBER

2652

DATE MAILED: 09/18/2013

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 263 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 263 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 1-(888)-786-0101 or (571)-272-4200.

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.

| | | | |
|-------------------------------|--------------------------------------|---------------------------------------|--|
| Notice of Allowability | Application No. 13/009,483 | Applicant(s) RAE, ROBERT L. | |
| | Examiner ANTIM SHAH | Art Unit 2652 | AIA (First Inventor to File) Status No |

-- 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 RCE filed on 8/29/2013.
 A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. The allowed claim(s) is/are 1-4, 6-12 and 14-16 (renumbered as 1-14). As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- 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.

5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 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. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Examiner's Amendment/Comment |
| 2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ | 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 7. <input type="checkbox"/> Other _____. |
| 4. <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date <u>9/9/2013</u> . | |

/ANTIM SHAH/
Primary Examiner, Art Unit 2652

DETAILED ACTION

Allowable Subject Matter

1. This communication is in response to the RCE filed on 8/29/2013 and telephonic interview conducted on 9/9/2013.
2. Claims 1-4, 6-12 and 14-16 (renumbered as 1-14) are allowed.
3. The following is an examiner's statement of reasons for allowance: Claims 1, 9 and their dependents thereof are allowed because the closest prior art either alone or in combination, fail to anticipate or render obvious, the claimed limitations of "a networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remotely from the centralized call processing system via a wide area network (WAN), the networking device configured to: receive outgoing Voice over Internet Protocol (VoIP) data packets from prison facilities; and send incoming VoIP data packets to the prison facilities; an unauthorized call activity detection system connected to the networking device for detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets via a local area network (LAN); a call application management system connected via the LAN to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the telephone carrier network into the incoming VoIP data packets; and a validation system connected via the LAN to the call application management system and configured to allow or disallow completion or continuing of a particular call of the plurality of prison facilities through the telephone carrier network based on the outgoing

Art Unit: 2652

VoIP data packets or the incoming VoIP data packets”, in combination with all other limitations in the claim(s) as defined by applicant.

Consequently, the disclosed independent claims are allowed on behalf of above-discussed reasons, and also presented via Applicants arguments and remarks filed on 8/29/2013 as well. Since the disclosed dependent claims are dependent on one of the above independent claims, therefore they are also patentable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTIM SHAH whose telephone number is (571)270-5214. The examiner can normally be reached on Monday to Friday 8:30 am-5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Ahmad Matar can be reached on (571)272-7488. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2652

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). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANTIM SHAH/
Primary Examiner, Art Unit 2652

| | | | |
|---|--------------------------------------|---------------------------------------|--|
| Examiner-Initiated Interview Summary | Application No. 13/009,483 | Applicant(s) RAE, ROBERT L. | |
| | Examiner ANTIM SHAH | Art Unit 2652 | |

All participants (applicant, applicant's representative, PTO personnel):

- (1) ANTIM SHAH. (3)_____.
- (2) DOHYUN AHN. (4)_____.

Date of Interview: 09 September 2013.

Type: Telephonic Video Conference
 Personal [copy given to: applicant applicant's representative]

Exhibit shown or demonstration conducted: Yes No.
If Yes, brief description: _____.

Issues Discussed 101 112 102 103 Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1-4,6-12 and 14-16.

Identification of prior art discussed: N/A.

Substance of Interview

(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)


To advance procecution, examiner discussed the invention with the applicant's representative. Examiner also suggested to file terminal disclaimer to overcome double patenting rejection. Applicant's representative agreed on filing terminal disclaimer to overcome double patenting rejection.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Attachment

/ANTIM SHAH/
Primary Examiner, Art Unit 2652

| | | |
|--|--|--|
| Search Notes  | Application/Control No. 13009483 | Applicant(s)/Patent Under Reexamination RAE, ROBERT L. |
| | Examiner ANTIM SHAH | Art Unit 2652 |

| CPC- SEARCHED | | |
|---------------|------|----------|
| Symbol | Date | Examiner |
| | | |


| CPC COMBINATION SETS - SEARCHED | | |
|---------------------------------|------|----------|
| Symbol | Date | Examiner |
| | | |

| US CLASSIFICATION SEARCHED | | | |
|----------------------------|-----------------------------|-----------|----------|
| Class | Subclass | Date | Examiner |
| 379 | 188, 189, 32.01, 35, 207.01 | 12/2/2012 | AS |
| 370 | 260, 261, 401, 352 | 12/2/2012 | AS |
| | Updated above search | 5/29/2013 | AS |
| | Updated above search | 9/10/2013 | AS |

| SEARCH NOTES | | |
|--------------------------------|-----------|----------|
| Search Notes | Date | Examiner |
| Inventor name searched in EAST | 12/2/2012 | AS |
| EAST search | 12/2/2012 | As |
| Updated EAST search | 5/29/2013 | AS |
| Updated EAST search | 9/10/2013 | AS |

| INTERFERENCE SEARCH | | | |
|-------------------------|-------------------------|-----------|----------|
| US Class/ CPC Symbol | US Subclass / CPC Group | Date | Examiner |
| 379 | 189 | 9/10/2013 | AS |

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|---|--|--|
| Issue Classification  | Application/Control No. 13009483 | Applicant(s)/Patent Under Reexamination RAE, ROBERT L. |
| | Examiner ANTIM SHAH | Art Unit 2652 |

| <input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant | | <input type="checkbox"/> CPA | | <input checked="" 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 |
| 1 | 1 | | | | | | | | | | | | | | |
| 2 | 2 | | | | | | | | | | | | | | |
| 3 | 3 | | | | | | | | | | | | | | |
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| 10 | 11 | | | | | | | | | | | | | | |
| 11 | 12 | | | | | | | | | | | | | | |
| 12 | 14 | | | | | | | | | | | | | | |
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| 14 | 16 | | | | | | | | | | | | | | |
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|--|-----------|------------------------------|-------------------|
| NONE | | Total Claims Allowed: | |
| | | 14 | |
| (Assistant Examiner) | (Date) | O.G. Print Claim(s) | O.G. Print Figure |
| /ANTIM SHAH/ Primary Examiner.Art Unit 2652 | 9/10/2013 | 1 | 1 |
| (Primary Examiner) | (Date) | | |

EAST Search History**EAST Search History (Interference)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|-------|------|--|-----------------------|------------------|---------|------------------|
| L1 | 3 | ((VOIP or voice\$1over\$1internet\$1protocol) and (prison or jail or inmate or (correction\$4 facili\$3)) and (plural\$5 or many or multiple) and ((un\$1authorized near2 activity) or (three\$1way call\$3)) and (validat\$4) and ((remote near3 location) or off\$site or central\$4)).clm. | US-PGPUB; USPAT; UPAD | ADJ | ON | 2013/09/10 10:59 |

9/ 10/ 2013 11:15:12 AM**C:\ Users\ ashah2\ Documents\ EAST\ Workspaces\ 13008483.wsp**

EAST Search History

EAST Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|-------|-------|--|--|------------------|---------|---------------------|
| L3 | 325 | (379/189).ccls. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:14 |
| L4 | 183 | ((ROBERT) near2 (RAE)).INV. | US-PGPUB; USPAT; DERWENT | ADJ | ON | 2013/09/10 11:15 |
| L5 | 468 | (ITS or inmate telephone system) same (VOIP or voice\$1over\$1i\$) and gateway | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:15 |
| L6 | 42 | L5 and (@ad<="20030815" or @rlad<="20030815") | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:15 |
| L7 | 1859 | (379/188,189,32.01,35,207.01).ccls. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:16 |
| L8 | 25881 | (370/260,261,401,352).ccls. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:16 |
| L9 | 3431 | (plural\$4 or multiple or many) same (inmate or jail or prison or (correction near2 facilit\$5)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:16 |
| L10 | 11525 | (central\$ with bill\$3) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:16 |
| L11 | 939 | (plural or multiple) same (inmate or jail or prison or (correction near2 facilit\$5)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; | ADJ | ON | 2013/09/10 11:16 |


| | | | | | | |
|-----|---------|--|--|-----|----|---------------------|
| | | | IBM_TDB | | | |
| L12 | 22 | L11 and L10 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:16 |
| L13 | 17444 | (inmate or jail or prison or (correction near2 facilit\$5)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:17 |
| L14 | 26 | L13 same L10 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:17 |
| L15 | 3528895 | (inmate or jail or prison or facilit\$5) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:18 |
| L16 | 855 | L15 with L10 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:18 |
| L17 | 585 | L16 and (@ad<="20030815" or @rlad<="20030815") | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:18 |
| L18 | 162 | ("3" near way) or three\$1way) near2 detection | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:18 |
| L19 | 90 | L18 and (@ad<="20030815" or @rlad<="20030815") | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:18 |
| L20 | 32 | L19 and (prison or inmate or (correction near2 facility)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:18 |
| L21 | 14429 | call near (record or monitor or unauthori\$5) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; | ADJ | ON | 2013/09/10 11:39 |

| | | | | | | |
|-----|---------|---|--|-----|----|---------------------|
| | | | IBM_TDB | | | |
| L22 | 3528895 | (inmate or jail or prison or facilit\$5) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:39 |
| L23 | 1063 | L21 same L22 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:39 |
| L24 | 76206 | voip or voice\$1over\$1ip or voice over ip or vop or voice\$1over\$1packet or voice over packet | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:39 |
| L25 | 217 | L23 and L24 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:39 |
| L26 | 11789 | (inmate or jail or prison or correction\$3 facilit\$5) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:40 |
| L27 | 124 | L21 same L26 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:40 |
| L28 | 51 | L24 and L27 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:40 |
| L29 | 301 | backbone same gateway same (voip or voice\$1over\$1i\$) | USPAT | ADJ | ON | 2013/09/10 11:40 |
| L30 | 180 | (multi\$5 or plural\$4 or many) near (prison or inmate or jail) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:41 |
| L31 | 107 | L30 and call | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/09/10 11:41 |

9/10/2013 11:42:04 AM

C:\Users\ashah2\Documents\EAST\Workspaces\13008483.wsp

0025

| | | |
|---|--|--|
| Index of Claims  | Application/Control No. 13009483 | Applicant(s)/Patent Under Reexamination RAE, ROBERT L. |
| | Examiner ANTIM SHAH | Art Unit 2652 |

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|---|-----------------|
| ✓ | Rejected |
| = | Allowed |

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|---|-------------------|
| - | Cancelled |
| ÷ | Restricted |

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|---|---------------------|
| N | Non-Elected |
| I | Interference |

| | |
|---|-----------------|
| A | Appeal |
| O | Objected |

Claims renumbered in the same order as presented by applicant
 CPA
 T.D.
 R.1.47

| CLAIM | | DATE | | | | | | | |
|-------|----------|------------|------------|------------|--|--|--|--|--|
| Final | Original | 12/02/2012 | 05/29/2013 | 09/10/2013 | | | | | |
| 1 | 1 | ✓ | ✓ | = | | | | | |
| 2 | 2 | ✓ | ✓ | = | | | | | |
| 3 | 3 | ✓ | ✓ | = | | | | | |
| 4 | 4 | ✓ | ✓ | = | | | | | |
| | 5 | ✓ | ✓ | - | | | | | |
| 5 | 6 | ✓ | ✓ | = | | | | | |
| 6 | 7 | ✓ | ✓ | = | | | | | |
| 7 | 8 | ✓ | ✓ | = | | | | | |
| 8 | 9 | ✓ | ✓ | = | | | | | |
| 9 | 10 | ✓ | ✓ | = | | | | | |
| 10 | 11 | ✓ | ✓ | = | | | | | |
| 11 | 12 | ✓ | ✓ | = | | | | | |
| | 13 | ✓ | ✓ | - | | | | | |
| 12 | 14 | ✓ | ✓ | = | | | | | |
| 13 | 15 | ✓ | ✓ | = | | | | | |
| 14 | 16 | ✓ | ✓ | = | | | | | |

| | |
|---|---|
| Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed | PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce |
|---|---|

| | |
|-----------------------------|---|
| Electronic Petition Request | TERMINAL DISCLAIMER TO OBIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT |
| Application Number | 13009483 |
| Filing Date | 19-Jan-2011 |
| First Named Inventor | Robert Rae |
| Attorney Docket Number | 18279-18190 |
| Title of Invention | CENTRALIZED CALL PROCESSING |

Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

| Owner | Percent Interest |
|----------------------------|------------------|
| SECURUS TECHNOLOGIES, INC. | 100% |

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

7899167

as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

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

Applicant(s) status remains as SMALL ENTITY.

Applicant(s) status remains as other than SMALL ENTITY.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 63237

A sole inventor

A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors

A joint inventor; all of whom are signing this request

The assignee of record of the entire interest that has properly made itself of record pursuant to 37 [CFR 3.71](#)

| | |
|-----------|--------------|
| Signature | /Dohyun Ahn/ |
| Name | Dohyun Ahn |

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

| | |
|---|-----------------------------|
| Application Number: | 13009483 |
| Filing Date: | 19-Jan-2011 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Filer: | Dohyun Ahn |
| Attorney Docket Number: | 18279-18190 |

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|----------------------------------|----------|----------|--------|----------------------|
| Basic Filing: | | | | |
| Statutory or Terminal Disclaimer | 1814 | 1 | 160 | 160 |

Pages:

Claims:

Miscellaneous-Filing:

Petition:

Patent-Appeals-and-Interference:

Post-Allowance-and-Post-Issuance:

Extension-of-Time:

0030

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|--------------------------|----------|----------|--------|----------------------|
| Miscellaneous: | | | | |
| Total in USD (\$) | | | | 160 |

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 13009483

Filing Date: 19-Jan-2011

Applicant/Patent under Reexamination: Rae et al.

Electronic Terminal Disclaimer filed on September 9, 2013

APPROVED

This patent is subject to a terminal disclaimer

DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

| | |
|---|-----------------------------|
| EFS ID: | 16804049 |
| Application Number: | 13009483 |
| International Application Number: | |
| Confirmation Number: | 1820 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Customer Number: | 758 |
| Filer: | Dohyun Ahn |
| Filer Authorized By: | |
| Attorney Docket Number: | 18279-18190 |
| Receipt Date: | 09-SEP-2013 |
| Filing Date: | 19-JAN-2011 |
| Time Stamp: | 18:53:04 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|--|-----------------|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | \$160 |
| RAM confirmation Number | 6926 |
| Deposit Account | 192555 |
| Authorized User | |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 0088 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|--------------------------------------|--------------------------|---|------------------|------------------|
| 1 | Electronic Terminal Disclaimer-Filed | eTerminal-Disclaimer.pdf | 33542 9d1742f395d0c1bc3d66972eaa32227b260417f9 | no | 2 |

Warnings:

Information:

| | | | | | |
|---|----------------------|--------------|---|----|---|
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 29923 c68c65daf38ed36d198fa0529379ac55e08e5e20 | no | 2 |
|---|----------------------|--------------|---|----|---|

Warnings:

Information:

Total Files Size (in bytes): 63465

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.

**REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)**

| | | | | | | | |
|----------------------|---------------|-------------|------------|-------------------------------|---------------|----------|------|
| Application Number | 13/009,483 | Filing Date | 2011-01-19 | Docket Number (if applicable) | 18279-18190 | Art Unit | 2652 |
| First Named Inventor | Robert L. Rae | | | Examiner Name | Antim G. Shah | | |

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

Other _____

Enclosed

Amendment/Reply

Information Disclosure Statement (IDS)

Affidavit(s)/ Declaration(s)

Other _____

MISCELLANEOUS

Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 192555

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Patent Practitioner Signature

Applicant Signature

| Signature of Registered U.S. Patent Practitioner | | | |
|--|--------------|---------------------|------------|
| Signature | /Dohyun Ahn/ | Date (YYYY-MM-DD) | 2013-08-29 |
| Name | Dohyun Ahn | Registration Number | 63273 |

This collection of information is required by 37 CFR 1.114. 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.

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

Privacy Act Statement

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

APPLICANT: Robert L. Rae
APPLICATION NO.: 13/009,483
FILING DATE: January 19, 2011
TITLE: Centralized Call Processing
EXAMINER: Antim G. Shah
GROUP ART UNIT: 2652
CONFIRMATION NO.: 1820
ATTY. DKT. NO.: 18279-18190

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the Pacific Time Zone of the United States on the local date shown below.

Dated: August 29, 2013

By: /Dohyun Ahn/
Dohyun Ahn, Reg. No.: 63,237

COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

AMENDMENT B AND REQUEST FOR CONTINUED EXAMINATION

Sir:

This is in response to the Office Action dated June 4, 2013, which set a shortened statutory period for response that expires on September 4, 2013.

Kindly amend this application as indicated herein.

IN THE CLAIMS:

Please amend claims 1-4, 6-12 and 14-16; and cancel claims 5 and 13, as set forth below:

1. (Currently amended) A centralized call processing system, comprising:
 - a networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remotely ~~remote~~ from the centralized call processing system via a wide area network (WAN), the networking device configured to:
 - receive outgoing Voice over Internet Protocol (VoIP) data packets from prison facilities; and
 - send incoming VoIP data packets to the prison facilities;
 - an unauthorized call activity detection system connected to the networking device for detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets via a local area network (LAN);
 - a call application management system connected via the LAN to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the ~~first~~ telephone carrier network into the incoming VoIP data packets; and
 - ~~a computing~~ validation system connected via the LAN to the call application management system and configured to ~~perform a function of permitting, establishing, continuing or terminating calls~~ allow or disallow completion or continuing of a particular call of the plurality of prison facilities

~~through the telephone carrier network of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls.~~

2. (Currently amended) The system of claim 1, further comprising a billing system connected to the LAN and configured to manage ~~wherein the function comprises managing~~ billing associated with the calls made through the system.

3. (Currently amended) The system of claim 1, further comprising a call recording system connected to the LAN and configured to record ~~wherein the function comprises recording~~ at least part of the calls made through the system.

4. (Currently amended) The system of claim 3, wherein the call application management system is configured to select calls to be recorded by the call recording system.

5. (Canceled)

6. (Currently amended) The system of claim 1, further comprising a justice application management system connected to the LAN and configured to manage ~~wherein the function comprises managing~~ information about inmates at the prison facilities.

7. (Currently amended) The system of claim 1, further comprising a commerce system connected to the LAN and configured to manage ~~wherein the function comprises managing~~ commissary orders placed by inmates at the prison facilities.

8. (Currently amended) The system of claim 1, further comprising a call treatment system connected to the LAN and configured to communicate wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with the calls made through the system.

9. (Currently amended) A method comprising:

receiving outgoing Voice over Internet Protocol (VoIP) data packets from a plurality of prison facilities by a networking device via a wide area network (WAN);

sending incoming VoIP data packets to the prison facilities via the WAN by the networking device;

routing the outgoing VoIP data packets or the incoming VoIP data packets in a local area network (LAN) in a centralized call processing system to detect three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets;

routing the outgoing VoIP data packets via the LAN to process the outgoing VoIP data packets for transmission to a telephone carrier network;

processing signals from the telephone carrier network into the incoming VoIP data;

routing the incoming VoIP data packets via the LAN for transmission to the plurality of prison facilities via the WAN; and

~~providing a function of permitting, establishing, continuing or terminating~~ allowing or disallowing completion or continuation of a particular

~~call calls~~ of the plurality of prison facilities through the telephone carrier network based on the outgoing VoIP data packets or the incoming VoIP data packets[[,]] by communicating data over the LAN ~~a computing device connected to the networking device via the LAN, the function excluding detecting of the three-way call activity in the calls.~~

10. (Currently amended) The method of claim 9, further comprising ~~wherein the function comprises~~ managing billing associated with the calls made through the networking device by communicating data over the LAN.

11. (Currently amended) The method of claim 9, further comprising ~~wherein the function comprises~~ recording at least part of the calls made through the networking device by communicating data over the LAN.

12. (Currently amended) The method of claim 11, further comprising selecting calls to be recorded by communicating data over the LAN.

13. (Canceled).

14. (Currently amended) The method of claim 9, further comprising ~~wherein the function comprises~~ managing information about inmates at the prison facilities by communicating data over the LAN.

15. (Currently amended) The method of claim 9, further comprising ~~wherein the function comprises~~ managing commissary orders placed by inmates at the prison facilities by communicating data over the LAN.

16. (Currently amended) The method of claim 9, further comprising ~~wherein the function comprises~~ communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with the calls made through the networking device.

REMARKS

Claims 1-16 were pending in this application. In an Office Action dated December 7, 2012, claims 1-16 were rejected.

Claims 1-4, 6-12 and 14-16 are hereby amended. Claims 5 and 13 are hereby canceled without prejudice or disclaimer.

Based on the above Amendment and the following Remarks, withdrawal of all outstanding rejections is respectfully requested.

Rejection under 35 U.S.C. § 112, First Paragraph, is Overcome

In the Office Action, claims 1-16 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claims 5 and 13 are canceled herein, and therefore, the rejection of these claims is now obviated. With respect to the rejection of claims 1-4, 6-12 and 14-16 under 35 U.S.C. § 112, first paragraph, Applicant respectfully disagree with the rejection. However, amendment is hereby made to claims 1 and 9 to expedite prosecution of the application. Claim 1, as amended, recites “configured to allow or disallow completion or continuing of a particular call of the plurality of prison facilities....” Claim 9, as amended, is similarly amended. Therefore, the rejection of claims 1-4, 6-12 and 14-16 is overcome in view of amendment.

Claims Are Not Obvious over Cited References

In the Office Action, claims 1-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over various combinations of U.S. Patent Application Publication No. 2007/0041545 (“Gainsboro”), U.S. Patent Application Publication No. 2003/0091028 (“Chang”), U.S. Patent No. 7,333,798 (“Hodge”) and U.S. Patent No. 7,505,406 (“Spadaro”). The rejections are overcome in view of amendment.

Independent claim 1, as amended, reads as follows:

A centralized call processing system, comprising:

a networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remotely from the centralized call processing system via a wide area network (WAN)...

a call application management system connected via the LAN to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the telephone carrier network into the incoming VoIP data packets; and

a validation system connected via the LAN to the call application management system and configured to allow or disallow completion or continuing of a particular call of the plurality of prison facilities through the telephone carrier network. (Emphasis added).

Per claim 1, a centralized call processing system includes, among other components, a networking device, a call application management system and a validation system. The networking device is connected to a plurality of call processing gateways of a plurality of prison facilities. Within the centralized call processing system, the networking device, the call application management system and the validation system are all connected via a LAN. The call management system processes outgoing VoIP packets to a telephone carrier network and also processes incoming VoIP data packets. The validation system allows or disallows completion or continuation of a particular call made through the telephone carrier network.

The feature of “a validation system connected via the LAN to the call application management system and configured to allow or disallow completion or continuing of a particular call of the plurality of prison facilities through the telephone carrier network” is advantageous among other reasons because validation determination responsive may be improved. (See paragraph [0043] of the specification). That is, by performing the validation

at the centralized call processing system, the need to establish connection with many clearing houses or other databases via WAN can be eliminated. The data for performing validation is performed transmitted locally via LAN, the validation can be performed faster.

None of the cited references disclose this feature. Although Gainsboro discloses using a wide area network for communication between FTS Central Offices 101 located at each correction facility 100 and Primary Central Operations Facility (PCOF) 104 (see paragraph [0073]), operations associated with the calls are performed predominantly at the FTS Central Offices 101. That is, an FMU 201 in the FTS Central Offices 101 performs the operations of call validation (see paragraphs [0135]-[0141]). The function of PCOF 104 appears to be limited to archiving data of the FTS Central Offices 101 in the PCOF 104. (See paragraph [0708]). In other words, the PCOF 104 does not appear to perform functions associated with validating calls. Further, the confusing role of two distinct FMUs (i.e., FMU 201 in a typical site, and FMU 231 in BOP Central Office) appears to be contributing to misunderstanding of disclosure in Gainsboro. Based on the reading of Gainsboro in its entirety, FMU 231 in BOP Central Office is connected to network monitoring and administrative workstation 232, and hence, the function of FMU 231 appears to be limited to network monitoring and performing of administrative tasks. (See paragraph [0084]; and FIG. 2). That is, FMU 231 in BOP Central Office does not appear to perform call validation by communicating with a call application management system via LAN. Therefore, Gainsboro fails to disclose “centralized call processing system comprising...a validation system connected via the LAN to the call application management system and configured to allow or disallow completion or continuing of a particular call of the plurality of prison facilities through the telephone carrier network,” as recited in claim 1, as amended.

Chang also fails to disclose this feature. Chang was cited in the Office Action merely for allegedly disclosing gateways to collect VoIP data packets associated with calls to multiple facilities. Nowhere in Chang does it disclose anything about performing functions of validating calls at a centralized system remote from prison facilities.

Hodge also fails to disclose this feature. Hodge was cited in the Office Action merely for allegedly disclosing a justice system and a commerce system. Nowhere in Hodge does it disclose anything about validating calls of a plurality of facilities at a centralized system remote from prison facilities.

Spadaro also fails to disclose this feature. Spadaro at best discloses performing routing function 22, billing function 24 and PIN checking 28 at a point beyond a VOIP network (i.e., a remote location) by communicating with a control computer 12 at a prison facility via WAN, which may involve “edge routing.” (See 4:4-35; 4:56-65; and FIG. 5). However, nowhere in Spadaro does it appear to disclose that call validation for multiple prison facilities is performed at a centralized location. Therefore, Spadaro also fails to disclose the feature of “centralized call processing system comprising...a validation system connected via the LAN to the call application management system and configured to allow or disallow completion or continuing of a particular call of the plurality of prison facilities through the telephone carrier network,” as recited in amended claim 1.

Therefore, none of the cited references disclose the feature of “centralized call processing system comprising...a validation system connected via the LAN to the call application management system and configured to allow or disallow completion or continuing of a particular call of the plurality of prison facilities through the telephone carrier network,” as recited in claim 1, as amended. Accordingly, claim 1 and its dependent claims

2-4 and 6-8, as amended, are patentably distinguishable over Gainsboro, Chang, Hodge and Spadaro.

Independent claim 9, as amended, recites the feature of “allowing or disallowing completion or continuation of a particular call of the plurality of prison facilities through the telephone carrier network based on the outgoing VoIP data packets or the incoming VoIP data packets by communicating data over the LAN.” Therefore, claim 9 and its dependent claims 10-12 and 14-16 are also patentably distinguishable over Gainsboro, Chang, Hodge and Spadaro, for similar reasons as set forth above for claim 1.

Therefore, withdrawal of these rejections is respectfully requested.

Double Patenting Rejection Should be Held in Abeyance

In the Office Action, claims 1-16 were rejected based on double patenting rejection over claims 1-21 of U.S. Patent No. 7,899,167. It is hereby requested that the double patenting rejection of claims 1-16 be held in abeyance until the claims are otherwise in condition for allowance, at which time a Terminal Disclaimer will be filed, if it is deemed necessary.

Conclusion

It is submitted that claims 1-4, 6-12, and 14-16, as presented herein, are patentable for the reasons set forth above.

The Examiner is invited to contact representative at the number provided below if the Examiner believes it will help expedite furtherance of this application.

Respectfully submitted,

Dated: August 29, 2013

/Dohyun Ahn/
Dohyun Ahn, Reg. No. 63,237
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Electronic Patent Application Fee Transmittal

| | |
|---|-----------------------------|
| Application Number: | 13009483 |
| Filing Date: | 19-Jan-2011 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Filer: | Dohyun Ahn/Larisa Burshteyn |
| Attorney Docket Number: | 18279-18190 |

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|--|----------|----------|--------|----------------------|
| Basic Filing: | | | | |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Extension-of-Time: | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|-----------------------------------|----------|----------|--------|----------------------|
| Miscellaneous: | | | | |
| Request for Continued Examination | 1801 | 1 | 1200 | 1200 |
| Total in USD (\$) | | | | 1200 |

Electronic Acknowledgement Receipt

| | |
|---|-----------------------------|
| EFS ID: | 16721447 |
| Application Number: | 13009483 |
| International Application Number: | |
| Confirmation Number: | 1820 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Customer Number: | 758 |
| Filer: | Dohyun Ahn |
| Filer Authorized By: | |
| Attorney Docket Number: | 18279-18190 |
| Receipt Date: | 29-AUG-2013 |
| Filing Date: | 19-JAN-2011 |
| Time Stamp: | 19:40:01 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
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| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | \$1200 |
| RAM confirmation Number | 6328 |
| Deposit Account | 192555 |
| Authorized User | |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 0052 (Patent application and reexamination processing fees)

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File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|---|------------------|---|------------------|------------------|
| 1 | Request for Continued Examination (RCE) | 18190_US_RCE.pdf | 697853 <small>35caec3925602dd15ab4acc5a937113746a74087</small> | no | 3 |

Warnings:

Information:

| | | | | | |
|---|--|--------------------------|---|-----|----|
| 2 | | 18190_US_Amendment_B.pdf | 111840 <small>3988469afb059c7bf20e07f7deabe37396745e8e</small> | yes | 12 |
|---|--|--------------------------|---|-----|----|

Multipart Description/PDF files in .zip description

| Document Description | Start | End |
|--|-------|-----|
| Amendment Submitted/Entered with Filing of CPA/RCE | 1 | 1 |
| Claims | 2 | 6 |
| Applicant Arguments/Remarks Made in an Amendment | 7 | 12 |

Warnings:

Information:

| | | | | | |
|---|----------------------|--------------|--|----|---|
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 30113 <small>43afc9d4cbbc94ad60e3324df2aad15d4e66058f</small> | no | 2 |
|---|----------------------|--------------|--|----|---|

Warnings:

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| Total Files Size (in bytes): | | | 839806 | | |
|-------------------------------------|--|--|--------|--|--|

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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.

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| | | | |
|---|---|----------------------------------|---------------------------------------|
| PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875 | Application or Docket Number 13/009,483 | Filing Date 01/19/2011 | <input type="checkbox"/> To be Mailed |
|---|---|----------------------------------|---------------------------------------|

ENTITY: LARGE SMALL MICRO

APPLICATION AS FILED – PART I

| FOR | NUMBER FILED | NUMBER EXTRA | RATE (\$) | FEE (\$) |
|--|---|--------------|-----------|----------|
| <input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | |
| <input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (l), or (m)) | N/A | N/A | N/A | |
| <input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | minus 20 = | * | X \$ = | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | minus 3 = | * | X \$ = | |
| <input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 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). | | | |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | |

APPLICATION AS AMENDED – PART II

| AMENDMENT | (Column 1) | (Column 2) | (Column 3) | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) |
|-----------|--|----------------------------------|------------------------------------|---------------|-----------------|---------------------|
| | 08/29/2013 | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | | | |
| | Total (37 CFR 1.16(i)) | * 14 | Minus ** 16 | = 0 | X \$80 = | 0 |
| | Independent (37 CFR 1.16(h)) | * 2 | Minus ***2 | = 0 | X \$420 = | 0 |
| | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s)) | | | | | |
| | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | |
| | | | | | TOTAL ADD'L FEE | 0 |

| AMENDMENT | (Column 1) | (Column 2) | (Column 3) | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) |
|-----------|--|----------------------------------|------------------------------------|---------------|-----------------|---------------------|
| | | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | | | |
| | Total (37 CFR 1.16(i)) | * | Minus ** | = | X \$ = | |
| | Independent (37 CFR 1.16(h)) | * | Minus *** | = | X \$ = | |
| | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s)) | | | | | |
| | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | |
| | | | | | 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.

LIE
/ANTHONY TYSON/

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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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
13/009,483 01/19/2011 Robert L. Rae 18279-18190 1820

758 7590 06/04/2013
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

EXAMINER

SHAH, ANTIM G

ART UNIT PAPER NUMBER

2652

NOTIFICATION DATE DELIVERY MODE

06/04/2013

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

The time period for reply, if any, is set in the attached communication.

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PTOC@Fenwick.com

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 13/009,483 | Applicant(s) RAE, ROBERT L. | |
| | Examiner ANTIM SHAH | Art Unit 2652 | AIA (First Inventor to File) Status No |

-- 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) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 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 5 March 2013.
 A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) 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

- 5) Claim(s) 1-16 is/are pending in the application.
5a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 6) Claim(s) _____ is/are allowed.
- 7) Claim(s) 1-16 is/are rejected.
- 8) Claim(s) _____ is/are objected to.
- 9) Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) The specification is objected to by the Examiner.
- 11) The drawing(s) filed on _____ 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).

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).

Certified copies:

- 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)).

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

Interim copies:

- a) All b) Some c) None of the: Interim copies of the priority documents have been received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 3) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 4) Other: _____

DETAILED ACTION

Response to Amendment

1. Applicants' amendment filed on 3/5/2013 has been entered. Claims 1-3, 9-11, 13 and 16 have been amended. No claims have been canceled. No new claims have been added. Claims 1-16 are still pending in this application, with claims 1 and 9 being independent.

Double Patenting

2. 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. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *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) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory

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double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

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).

3. **Claims 1-16** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 7,899,167 ("patent '167"). Although, the conflicting claims are not identical, they are not patentably distinct from each other.

Claims 1-16 of the instant application are identical with the exception of the narrower claim limitation of "billing system/billing operation" as claimed in patent '167 claims 1-21.

The claimed invention in the instant application is fully disclosed in the patent '167 and it is broader than the claimed invention in the patent '167. No new invention or new improvement is being claimed in the instant application. Applicant is now attempting to claim broadly that which had been previously described in more detail in the claims of the patent '167 (In re Van Ornum, 214 USPQ 761 CCPA 1982).

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Furthermore, there is no apparent reason why Applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent.

Claim Rejections - 35 USC § 112

1. The following is a quotation of 35 U.S.C. 112(a):
(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), first paragraph:
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-16 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recite following limitation: “a computing system connected via the LAN to the call application management system and configured to perform a function of **permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets**, the function excluding detecting of the three-way call activity in the calls”. The specification does not seem to support this limitation. Claim 9

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also recites similar limitation. Therefore, claim 9 is also rejected for the same reason.

Claims 2-8 and 10-16 depend on claims 1 and 9 respectively. Therefore, they have been also rejected for the same reason.

Claim Rejections - 35 USC § 103

4. 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.

5. **Claims 1-5, 8, 9-13 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2007/0041545 to *Gainsboro* ("*Gainsboro*") in view of U.S. Patent Publication No 2003/0091028 to *Chang et al.* ("*Chang*").

As to **claim 1**, *Gainsboro* discloses a centralized call processing system [paragraph 0067, Fig. 1], comprising:

a networking device connected to a plurality of call processing gateways of a plurality of prison facilities, located remote from the centralized call processing system [paragraphs 0067, 0073, Fig. 1-2, FTS central offices] via a wide area network (WAN) [paragraphs 0073, 0218, 307-344], the networking device configured to: receive outgoing Voice over Internet Protocol (VoIP) data packets from prison facilities; and send incoming VoIP data packets to the prison facilities [paragraphs 0067, 0073, Fig. 1-2];

an unauthorized call activity detection system connected to the networking device for detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets [paragraphs 0035, 0037, 0776-0788] via a local area network (LAN) [paragraphs 0075, 0179, 0216, 0218, 0317, 0336-337, 0339];

a call application management system connected via the LAN to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the first telephone carrier network into the incoming VoIP data [paragraphs 0034-0037, 0074, 0838, Fig. 2, FMU is integrated with ITS-II components which includes call processing, call monitoring, IVR equipment]; and

a computing system connected via the LAN to the call application management system and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls [*Gainsboro* paragraphs 0068-0069, 0075, 0082, 0179, 0216, 0306].

Gainsboro discloses the FMU 201 for call processing is installed at each prison facility [paragraphs 0034, 0074]. *Gainsboro* also discloses the FMU 231 at the central office to perform network monitoring and administrative tasks [paragraph 0084]. It would have been obvious to the person of ordinary skill in

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the art to have the functions of FMU 201 (such as call processing) at the FMU 231 which is located at the central office. The suggestion motivation would have been to have low cost system that will have centrally located call processing module. Also, it would be easy to upgrade and maintain the system.

Gainsboro does not expressly disclose gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the prison facilities. Even though, *Gainsboro* teaches internet technology and PCOF network [0315, 0690-0692]. It is extremely obvious and well known in the art to use VoIP to make voice calls over internet.

In the same or similar fields of endeavor, *Chang* discloses gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the multiple facilities [*Chang* Abstract, Fig. 3, 3A, 5, paragraphs 0085-0089, 0141].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Gainsboro* to have the gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the multiple facilities as taught by *Chang*. The suggestion/motivation would have been to provide a highly integrated voice gateway system for use within a company which

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can route a voice call between parties at two different locations over IP network [*Chang* paragraph 0016].

As to **claims 2 and 10**, *Gainsboro* discloses wherein the function comprises managing billing associated with calls made through the system [*Gainsboro* paragraphs 0068-0069, 0082, 0306].

As to **claims 3 and 11**, *Gainsboro* wherein the function comprises recording at least part of calls made through the system [*Gainsboro* paragraph 0002, 0036, 0054].

As to **claims 4 and 12**, *Gainsboro* wherein the call application management system is configured to select calls to be recorded [*Gainsboro* paragraph 0002, 0036, and 0054].

As to **claims 5 and 13**, *Gainsboro* discloses wherein the function comprises validating calls made through the system for authorizing connecting of calls to the telephone carrier network [*Gainsboro* paragraphs 0131, 0237].

As to **claims 8 and 16**, *Gainsboro* teaches wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the system [*Gainsboro* paragraphs 0037, 0135, 0777, 0782-0784].

As to **claim 9**, *Gainsboro* discloses a method for processing calls at a centralized call processing system [paragraph 0067, Fig. 1], the method comprising: receiving outgoing Voice over Internet Protocol (VoIP) data packets

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from a plurality of prison facilities by a networking device via wide area network (WAN) [paragraphs 0067, 0073, Fig. 1-2, FTS central offices, for WAN: paragraphs 0073, 0218, 307-344]; sending incoming VoIP data packets to the prison facilities [paragraphs 0067, 0073, Fig. 1-2, FTS central offices] via the WAN by the networking device [paragraphs 0073, 0218, 307-344]; routing the outgoing VoIP data packets or the incoming VoIP data packets in the local area network (LAN) [paragraphs 0075, 0179, 0216, 0218, 317, 336-337, 339] to detect three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets [paragraphs 0035, 0037, 0776-0788]; routing the outgoing VoIP data packets via the LAN to process the outgoing VoIP data packets for transmission to a telephone carrier network; processing signals from the telephone carrier network into the incoming VoIP data [paragraphs 0034-0037, 0074, 0838, Fig. 2, FMU is integrated with ITS-II components which includes call processing, call monitoring, IVR equipment]; routing the incoming VoIP data packets via the LAN for transmission to the plurality of prison facilities via the WAN [paragraphs 0216, 0218, 0317, 0336-0337]; and providing a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on associated with the outgoing VoIP data packets or the incoming VoIP data packets other than , by a computing device connected to the networking device via the LAN, the function excluding detecting of the three-way call activity [*Gainsboro* paragraphs 0068-0069, 0075, 0082, 0216, 0306].

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Gainsboro discloses the FMU 201 for call processing is installed at each prison facility [paragraphs 0034, 0074]. *Gainsboro* also discloses the FMU 231 at the central office to perform network monitoring and administrative tasks [paragraph 0084]. It would have been obvious to the person of ordinary skill in the art to have the functions of FMU 201 (such as call processing) at the FMU 231 which is located at the central office. The suggestion motivation would have been to have low cost system that will have centrally located call processing module. Also, it would be easy to upgrade and maintain the system.

Gainsboro does not expressly disclose gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the prison facilities. Even though, *Gainsboro* teaches internet technology and PCOF network [0315, 0690-0692]. It is extremely obvious and well known in the art to use VoIP to make voice calls over internet.

In the same or similar fields of endeavor, *Chang* discloses gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the multiple facilities [*Chang* Abstract, Fig. 3, 3A, 5, paragraphs 0085-0089, 0141].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Gainsboro* to have the gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls

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and to send incoming VoIP data packets associated with the calls to the multiple facilities as taught by *Chang*. The suggestion/motivation would have been to provide a highly integrated voice gateway system for use within a company which can route a voice call between parties at two different locations over IP network [*Chang* paragraph 0016].

6. **Claims 6-7 and 14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Gainsboro* and *Chang* (as applied above) in further view of U.S. Patent No. 7,333,798 to *Hodge* ("*Hodge*").

As to **claims 6-7 and 14-15**, *Gainsboro* and *Chang* teaches everything claimed, as applied to claim 1, with the exception of a justice application management system and a commerce system for managing commissary orders placed by the inmates.

In the same field of endeavor, *Hodge* teaches the justice application management system [*Hodge* col. 21 lines 48-60] and a commerce system for managing commissary orders placed by the inmates [*Hodge* column 6 lines 33-49].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Gainsboro* and *Chang* to have the justice application management system as taught by *Hodge*. The suggestion/motivation would have been to identifying and authenticating an institutional calling party [*Hodge* column 9 lines 54-61].

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7. **Claims 1-5 and 9-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,505,406 to *Spadaro et al* (“*Spadaro*”).

As to **claim 1**, *Spadaro* discloses a centralized call processing system [Fig. 3-6, column 3 line 50-column 5 line 2], comprising:

a networking device connected to a plurality of call processing gateways of a plurality of prison facilities, located remote from the centralized call processing system, via a wide area network (WAN) [column 3 lines 1-18, column 4 lines 4-13, 43-65], the networking device configured to: receive outgoing Voice over Internet Protocol (VoIP) data packets from prison facilities; and send incoming VoIP data packets to the prison facilities [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65];

an unauthorized call activity detection system connected to the networking device for detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets [column 4 lines 4-65, “three way call detection 30a] via a local area network (LAN) [column 3 lines 1-18, column 4 lines 4-13, 43-65];

a call application management system connected via the LAN to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the first telephone carrier network into the incoming VoIP data [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65]; and

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a computing system connected via the LAN to the call application management system and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls [Fig. 1, element 20 "switching", column 3 lines 28-50].

Spadaro discloses the plurality of Commander units at each site (column 8 lines 51-57). Commander is programmable computer that provides switching, accessing, routing, timing, billing and control functions (column 2 lines 45-43). *Spadaro* also discloses that the call processing and three-way call detect is connected to a WAN (Fig. 6, elements 30a and 12). *Spadaro* also discloses that the pluralities of sites are connected to the WAN. Multiple sites could share a common set of local access circuits. The edge routing negates the need for local access circuits at each facility (column 4 lines 56-65). It would have been obvious to the person of ordinary skill in the art to have the commander (which provides switching, accessing, routing, timing, billing and control functions) connected to the WAN and provides the centralize call processing to the different sites . The suggestion motivation would have been to have a low cost system that will have a centrally located call processing module. Also, it would be easy to upgrade and maintain the system.

As to **claims 2 and 10**, *Spadaro* discloses wherein the function comprises managing billing associated with calls made through the system [Fig. 1, element 24 “billing”, column 3 lines 28-50].

As to **claims 3 and 11**, *Spadaro* wherein the function comprises recording at least part of calls made through the system [column 4 lines 14-24].

As to **claims 4 and 12**, *Spadaro* wherein the call application management system is configured to select calls to be recorded [column 4 lines 14-24].

As to **claims 5 and 13**, *Spadaro* discloses wherein the function comprises validating calls made through the system for authorizing connecting of calls to the telephone carrier network [column 3 lines 28-42].

As to **claim 9**, *Spadaro* a method for processing calls at a centralized call processing system, the method comprising [Fig. 3-6, column 3 line 50-column 5 line 2]:

receiving outgoing Voice over Internet Protocol (VoIP) data packets from a plurality of prison facilities, the plurality of prison facilities by a networking device via wide area network (WAN) [Fig. 3-6, column 3 lines 1-18, 50-57, column 4 lines 4-65]; sending incoming VoIP data packets to the prison facilities [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65] via the WAN by the networking device;

routing the outgoing VoIP data packets or the incoming VoIP data packets in the local area network (LAN) to detect three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data

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packets [column 3 lines 1-18, column 4 lines 4-65, “three way call detection 30a];
and

routing the outgoing VoIP data packets via the LAN to process the outgoing VoIP data packets for transmission to a telephone carrier network; processing signals from the first telephone carrier network into the incoming VoIP data [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65]; and routing the incoming VoIP data packets via the LAN for transmission to the plurality of prison facilities via the WAN [column 3 lines 1-18, column 4 lines 4-13, 43-65]; and providing a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, by a computing device connected to the networking device via the LAN, the function excluding detecting of the three-way call activity [Fig. 1, element 20 “switching”, column 3 lines 28-50].

Spadaro discloses the plurality of Commander units at each site (column 8 lines 51-57). Commander is programmable computer that provides switching, accessing, routing, timing, billing and control functions (column 2 lines 45-43). *Spadaro* also discloses that the call processing and three-way call detect is connected to a WAN (Fig. 6, elements 30a and 12). *Spadaro* also discloses that the pluralities of sites are connected to the WAN. Multiple sites could share a common set of local access circuits. The edge routing negates the need for local access circuits at each facility (column 4 lines 56-65). It would have been obvious to the person of ordinary skill in the art to have the commander (which provides

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switching, accessing, routing, timing, billing and control functions) connected to the WAN and provides the centralized call processing to the different sites. The suggestion/motivation would have been to have a low cost system that will have a centrally located call processing module. Also, it would be easy to upgrade and maintain the system.

8. **Claims 6-7 and 14-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Spadaro* (as applied above) in further view of U.S. Patent No. 7,333,798 to *Hodge* ("*Hodge*").

As to **claims 6-7 and 14-15**, *Spadaro* teaches everything claimed, as applied to claim 1, with the exception of a justice application management system and a commerce system for managing commissary orders placed by the inmates.

In the same field of endeavor, *Hodge* teaches the justice application management system [*Hodge* col. 21 lines 48-60] and a commerce system for managing commissary orders placed by the inmates [*Hodge* column 6 lines 33-49].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Spadaro* to have the justice application management system as taught by *Hodge*. The suggestion/motivation would have been to identifying and authenticating an institutional calling party [*Hodge* column 9 lines 54-61].

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9. **Claims 8 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Spadaro* (as applied above) in further view of U.S. Patent Publication No. 2007/0041545 to *Gainsboro* (“*Gainsboro*”).

As to **claims 8 and 16**, *Spadaro* teaches everything claimed, as applied to claim 1, with the exception wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the system.

In the same field of endeavor, *Gainsboro* teaches wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the system [*Gainsboro* paragraphs 0037, 0135, 0777 and 0782-0784].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Spadaro* to have wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the system as taught by *Gainsboro*. The suggestion/motivation would have been to provide security and call monitoring function in prison environment [*Gainsboro* paragraph 0035, 0037].

Response to Arguments

10. The references from the parent application (U.S. Patent Application No. 10/642,532) have been considered.
11. Applicant's arguments filed on 3/5/2013 have been fully considered but they are not persuasive.
12. On pages 9-10 of applicant's remark, the applicant argues the following:
 - "Therefore, Gainsboro fails to disclose the feature of "networking device connected to a plurality of call processing gateways of a plurality of prison facilities, located remote from the centralized call processing system via a wide area network (WAN)...a computing system connected via the LAN...and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls," as recited in claim 1, as amended."
13. Examiner respectfully disagrees with Applicant's arguments for the following reasons: *Gainsboro* discloses the FMU 201 for call processing is installed at each prison facility [paragraphs 0034, 0074]. *Gainsboro* also discloses the FMU 231 at the central office to perform network monitoring and administrative tasks [paragraph 0084]. It would have been obvious to the person of ordinary skill in the art to have the functions of FMU 201 (such as call processing) at the FMU 231 which is located at the central office Further, *Gainsboro* discloses that the ITS-II system, which consists of local inmate

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phone systems located at each high security correctional facility and low-security facility, which interface over the FTS central offices to the Primary Central Operations Facility ("PCOF") via wide-area network. The PCOF contains central database server, backup storage, mail servers, routers, system maintenance etc. [paragraph 0073].

Gainsboro also teaches that each Central Operations Facility has a dedicated network management server responsible for monitoring all network activity over the wide area network as well as the local area network at each of the correctional facilities [paragraph 00216]. Gainsboro discloses that the connectivity among the ITS-II equipment at federal correctional facilities and support for system-wide ITS-II administrative operational and functional capability is achieved by a TCP/IP based wide area network [Paragraphs 0307-0344]. Further, *Chang* discloses gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the multiple facilities. Thus, Gainsboro in view of *Chang* discloses all the limitations of claims 1 and 9 including the feature of "networking device connected to a plurality of call processing gateways of a plurality of prison facilities, located remote from the centralized call processing system via a wide area network (WAN)...a computing system connected via the LAN...and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls".

14. On pages 9-10 of applicant's remark, the applicant argues the following:

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- “However, nowhere in Spadaro does it appear to disclose that the point beyond the VOIP network communicates with a plurality of prison facilities. Rather, the routing function 22, billing function 24, and PIN checking 28 appear to be conducted for a single prison facility. The Office Action also argues that 'Edge Routing' of Spadaro suggests the feature recited in claim 1. However, the common local access circuits for Edge Routing in Spadaro are located in one of the prison facilities, and are not located remotely in the prison facilities. Therefore, Spadaro also fails to disclose the feature of "networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remote from the centralized call processing system via a wide area (WAN)...a computing system connected via the LAN...and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls,” as recited in claim 1, as amended.”

15. Examiner respectfully disagrees with Applicant's arguments for the following reasons: *Spadaro* discloses the plurality of Commander units at each site (column 8 lines 51-57). Commander is programmable computer that provides switching, accessing, routing, timing, billing and control functions (column 2 lines 45-43). *Spadaro* also discloses that the call processing and three-way call detect is connected to a WAN (Fig. 6, elements 30a and 12). *Spadaro* also discloses that the pluralities of sites are

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connected to the WAN. Multiple sites could share a common set of local access circuits. The edge routing negates the need for local access circuits at each facility (column 4 lines 56-65). It would have been obvious to the person of ordinary skill in the art to have the commander (which provides switching, accessing, routing, timing, billing and control functions) connected to the WAN and provides the centralized call processing to the different sites. *Spadaro* further discloses that the programming of control functions may be distributed to remote locations over the Ethernet network. The switching function, billing function, PIN checking function are distributed to a remote location or locations by Ethernet network. The Ethernet network is a LAN or WAN [column 4 lines 4-24]. Thus, *Spadaro* discloses the feature of “networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remote from the centralized call processing system via a wide area (WAN)...a computing system connected via the LAN...and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls”, as claimed by claim 1 and 9. See prior art rejection for more detail.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTIM SHAH whose telephone number is (571)270-5214. The examiner can normally be reached on Monday to Friday 8:30 am-5:30 pm EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ahmad Matar can be reached on (571)272-7488. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 13/009,483
Art Unit: 2652

Page 23

/ANTIM SHAH/
Primary Examiner, Art Unit 2652

| | | |
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| Search Notes  | Application/Control No. 13009483 | Applicant(s)/Patent Under Reexamination RAE, ROBERT L. |
| | Examiner ANTIM SHAH | Art Unit 2652 |

| CPC- SEARCHED | | |
|---------------|------|----------|
| Symbol | Date | Examiner |
| | | |

| CPC COMBINATION SETS - SEARCHED | | |
|---------------------------------|------|----------|
| Symbol | Date | Examiner |
| | | |

| US CLASSIFICATION SEARCHED | | | |
|----------------------------|-----------------------------|-----------|----------|
| Class | Subclass | Date | Examiner |
| 379 | 188, 189, 32.01, 35, 207.01 | 12/2/2012 | AS |
| 370 | 260, 261, 401, 352 | 12/2/2012 | AS |
| | Updated above search | 5/29/2013 | AS |

| SEARCH NOTES | | |
|--------------------------------|-----------|----------|
| Search Notes | Date | Examiner |
| Inventor name searched in EAST | 12/2/2012 | AS |
| EAST search | 12/2/2012 | As |
| Updated EAST search | 5/29/2013 | AS |

| INTERFERENCE SEARCH | | | |
|-------------------------|-------------------------|------|----------|
| US Class/ CPC Symbol | US Subclass / CPC Group | Date | Examiner |
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| Substitute for form 1449A/PTO | | | | Complete if Known | |
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | | | Application No. | 13/009,483 |
| | | | | Filing Date | January 19, 2011 |
| | | | | First Named Inventor | Robert L. Rae |
| | | | | Art Unit | 2652 |
| | | | | Examiner Name | Antim G. Shah |
| Sheet | 1 | of | 2 | Attorney Docket Number | 18279-18190 |

| U.S. PATENT DOCUMENTS | | | | |
|-----------------------|-----------------------|--|--------------------------------|--|
| Examiner Initials* | Cite No. ¹ | Document No. Number – Kind Code ² (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
| | A1 | US-7,889,847 | 02-15-2011 | Gainsboro |
| | A2 | US-7,551,732 | 06-23-2009 | Anders |
| | A3 | US-7,443,963 | 10-28-2008 | Scherer |
| | A4 | US-7,158,621 | 01-02-2007 | Bayne |
| | A5 | US-7,106,843 | 09-12-2006 | Gainsboro et al. |
| | A6 | US-7,092,494 | 08-15-2006 | Anders et al. |
| | A7 | US-7,092,492 | 08-15-2006 | Marn |
| | A8 | US-7,085,359 | 08-01-2006 | Crites et al. |
| | A9 | US-7,010,110 | 03-07-2006 | Jorasch et al. |
| | A10 | US-6,934,530 | 08-23-2005 | Engelhart |
| | A11 | US-6,917,672 | 07-12-2005 | Brown et al. |
| | A12 | US-6,917,670 | 07-12-2005 | Isomura |
| | A13 | US-6,795,540 | 09-21-2004 | Mow |
| | A14 | US-6,760,420 | 07-06-2004 | Heilmann et al. |
| | A15 | US-6,665,380 | 12-16-2003 | Cree et al. |
| | A16 | US-6,647,096 | 11-11-2003 | Milliorn et al. |
| | A17 | US-6,614,781 | 09-02-2003 | Elliott et al. |
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| | A22 | US-5,655,013 | 08-05-1997 | Gainsboro |
| | A23 | US-2003/0174826 A1 | 09-18-2003 | Hesse |
| | A24 | US-2002/0168060 A1 | 11-14-2002 | Huie |

| | | | |
|--------------------|---------------------------|-----------------|------------|
| Examiner Signature | /Antim Shah/ (05/29/2013) | Date Considered | 05/29/2013 |
|--------------------|---------------------------|-----------------|------------|

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.

1Applicant's unique citation designation number (optional). 2See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04.
3Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.S./ (05/29/2013)

| Substitute for form 1449A/PTO | | | | Complete if Known | |
|--|---|----|---|--------------------------|------------------|
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | | | Application No. | 13/009,483 |
| | | | | Filing Date | January 19, 2011 |
| | | | | First Named Inventor | Robert L. Rae |
| | | | | Art Unit | 2652 |
| | | | | Examiner Name | Antim G. Shah |
| Sheet | 2 | of | 2 | Attorney Docket Number | 18279-18190 |

| FOREIGN PATENT DOCUMENTS | | | | | |
|--------------------------|-----------------------|---|--------------------------------|--|----------------|
| Examiner Initials* | Cite No. ¹ | Foreign Patent Document Country Code ³ - Number ⁴ Kind Code ⁵ (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | T ⁶ |
| | B1 | WO 98/54879 A1 | 12-03-1998 | T-Netix, Inc. | |
| | B2 | WO 96/14703 A1 | 05-17-1996 | T-Netix, Inc. | |

| OTHER REFERENCES - NON-PATENT LITERATURE DOCUMENTS | | | | | |
|--|-----------------------|--|--|--|----------------|
| Examiner Initials* | Cite No. ¹ | 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 ⁶ |
| | C1 | Defendants' First Amended Answer to Plaintiffs' Second Amended Complaint, C.A. NO. 2:09-cv-00333-DF, United States District Court, Eastern District of Texas, Marshall Division, October 13, 2011, 17 pages. | | | |
| | C2 | Defendants' Supplemental Invalidation Contentions, C.A. NO. 2:09-cv-00333-DF, United States District Court, Eastern District of Texas, Marshall Division, October 13, 2011, 19 pages. | | | |
| | C3 | SUNDSTROM, K., "Voice Over IP: An Engineering Analysis," Master of Science Thesis, September 1999, University of Manitoba, 137 pages. | | | |
| | C4 | United States Patent Application, United States Application No. 10/642,532 [Copy Not Enclosed]. | | | |

18279/18190/DOCS/2844624.3

| | | | |
|--------------------|---------------------------|-----------------|------------|
| Examiner Signature | /Antim Shah/ (05/29/2013) | Date Considered | 05/29/2013 |
|--------------------|---------------------------|-----------------|------------|

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.

1Applicant's unique citation designation number (optional). 2See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04.
3Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6Applicant is to place a check mark here if English language Translation is attached.

0082

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.S./ (05/29/2013)


EAST Search History

EAST Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|-------|---------|--|---|------------------|---------|---------------------|
| L1 | 2 | "US 20110110276" | US-PGPUB; USPAT; USOCR; DERWENT | ADJ | ON | 2013/05/28 23:54 |
| L2 | 11284 | (central\$ with bill\$3) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/05/29 00:02 |
| L3 | 3461511 | (inmate or jail or prison or facilit\$5) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/05/29 00:02 |
| L4 | 828 | L3 with L2 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/05/29 00:02 |
| L5 | 573 | L4 and (@ad<="20030815" or @rlad<="20030815") | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/05/29 00:02 |
| L6 | 1844 | (379/188,189,32.01,35,207.01).ccls. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/05/29 00:02 |
| L7 | 25164 | (370/260,261,401,352).ccls. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/05/29 00:02 |
| L8 | 445 | (ITS or inmate telephone system) same (VOIP or voice\$1over\$1i\$) and gateway | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/05/29 00:03 |
| L9 | 41 | L8 and (@ad<="20030815" or @rlad<="20030815") | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2013/05/29 00:03 |

5/ 29/ 2013 12:04:43 AM

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|---|--|--|
| Index of Claims  | Application/Control No. 13009483 | Applicant(s)/Patent Under Reexamination RAE, ROBERT L. |
| | Examiner ANTIM SHAH | Art Unit 2652 |

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| ✓ | Rejected |
| = | Allowed |

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| - | Cancelled |
| ÷ | Restricted |

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| N | Non-Elected |
| I | Interference |

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|---|-----------------|
| A | Appeal |
| O | Objected |

Claims renumbered in the same order as presented by applicant
 CPA
 T.D.
 R.1.47

| CLAIM | | DATE | | | | | | | |
|-------|----------|------------|------------|--|--|--|--|--|--|
| Final | Original | 12/02/2012 | 05/29/2013 | | | | | | |
| | 1 | ✓ | ✓ | | | | | | |
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| | 12 | ✓ | ✓ | | | | | | |
| | 13 | ✓ | ✓ | | | | | | |
| | 14 | ✓ | ✓ | | | | | | |
| | 15 | ✓ | ✓ | | | | | | |
| | 16 | ✓ | ✓ | | | | | | |

PATENT ASSIGNMENT

Electronic Version v1.1
 Stylesheet Version v1.1

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|------------------------------|--------------------|
| SUBMISSION TYPE: | NEW ASSIGNMENT |
| NATURE OF CONVEYANCE: | SECURITY AGREEMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|-------------------------------------|----------------|
| Securus Technologies, Inc. | 04/30/2013 |
| Securus Technologies Holdings, Inc. | 04/30/2013 |

RECEIVING PARTY DATA

| | |
|------------------------|---|
| Name: | Deutsche Bank Trust Company Americas, as Administrative Agent |
| Street Address: | 60 Wall Street |
| City: | New York |
| State/Country: | NEW YORK |
| Postal Code: | 10005 |

PROPERTY NUMBERS Total: 118

| Property Type | Number |
|---------------------|----------|
| Application Number: | 11480268 |
| Application Number: | 11125842 |
| Application Number: | 11516680 |
| Application Number: | 11338868 |
| Application Number: | 11842844 |
| Application Number: | 11810691 |
| Application Number: | 11751895 |
| Application Number: | 11603960 |
| Application Number: | 11931764 |
| Application Number: | 12042861 |
| Application Number: | 12766159 |
| Application Number: | 12975077 |
| Application Number: | 12981489 |
| Application Number: | 13009821 |
| | 0085 |

OP \$4720.00 11480268

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|---------------------|----------|
| Application Number: | 13009483 |
| Application Number: | 13006861 |
| Application Number: | 13253101 |
| Application Number: | 13341066 |
| Application Number: | 13213149 |
| Application Number: | 13244402 |
| Application Number: | 13086379 |
| Application Number: | 13213295 |
| Application Number: | 13452523 |
| Application Number: | 13273441 |
| Application Number: | 13290075 |
| Application Number: | 13452584 |
| Application Number: | 13441997 |
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| Application Number: | 13364212 |
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| Patent Number: | 7278028 |
| Patent Number: | 7492881 |

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| | 7496345 |
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| Patent Number: | 7158621 |
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| Patent Number: | 7106843 |
| Patent Number: | 6064963 |
| Patent Number: | 7248680 |
| Patent Number: | 5485507 |
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| Patent Number: | 6141406 |
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| Patent Number: | 6763099 |
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| Patent Number: | 7386448 |
| Patent Number: | 7542906 |
| Patent Number: | 5926533 |
| Patent Number: | 6560323 |
| Patent Number: | 6668045 |
| Patent Number: | 6647096 |

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| | 5796811 |
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| Patent Number: | 7899167 |
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| Patent Number: | 7961858 |
| Patent Number: | 7961860 |
| Patent Number: | 8098804 |
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| Patent Number: | 8180027 |
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| Patent Number: | 8135127 |
| Patent Number: | 8000269 |
| Patent Number: | 8340260 |
| Patent Number: | 7567658 |
| Patent Number: | 8190121 |
| Patent Number: | 8355492 |
| Patent Number: | 7860722 |

Fax Number: 2123548113
Correspondence will be sent via US Mail when the fax attempt is unsuccessful.
Phone: 212-819-2000
Email: iprecordations@whitecase.com
Correspondent Name: James Maewsky/White & Case LLP
Address Line 1: 1155 Avenue of the Americas
Address Line 2: Patent & Trademark Department
Address Line 4: New York, NEW YORK 10036

| | |
|-------------------------|--|
| ATTORNEY DOCKET NUMBER: | 111779-2369 |
| NAME OF SUBMITTER: | James Maewsky |
| Signature: | /jm/ |
| Date: | 05/07/2013 |
| | This document serves as an Oath/Declaration (37 CFR 1.63). |

Total Attachments: 11

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PATENT SECURITY AGREEMENT

This **PATENT SECURITY AGREEMENT**, dated as of April 30, 2013 (as amended, restated, supplemented or otherwise modified from time to time, this “**Agreement**”), is made by the entities identified as grantors on the signature pages hereto (collectively, the “**Grantors**”) in favor of Deutsche Bank Trust Company Americas, as Administrative Agent for the Secured Parties (in such capacity and together with its successors and permitted assigns, the “**Administrative Agent**”).

WHEREAS, the Grantors are party to a First Lien Security Agreement, dated as of April 30, 2013 (as amended, restated, supplemented or otherwise modified from time to time, the “**Security Agreement**”), between each of the Grantors and the other grantors party thereto and the Administrative Agent pursuant to which the Grantors granted a security interest to the Administrative Agent in the Patent Collateral (as defined below) and are required to execute and deliver this Agreement.

NOW, THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Grantors hereby agree with the Administrative Agent as follows:

SECTION. 1. DEFINED TERMS

Unless otherwise defined herein, terms defined in the Security Agreement and used herein have the meaning given to them in the Security Agreement.

SECTION 2. GRANT OF SECURITY INTEREST

As security for the payment or performance in full of the Secured Obligations, including the Guaranteed Obligations, each Grantor hereby pledges to the Administrative Agent, its successors and permitted assigns, for the benefit of the Secured Parties, and hereby grants to the Administrative Agent, its successors and permitted assigns, for the benefit of the Secured Parties, a security interest in all right, title or interest in or to any and all of the following assets and properties now owned or at any time hereafter acquired by such Grantor or in which such Grantor now has or at any time in the future may acquire any right, title or interest (collectively, the “**Patent Collateral**”); *provided*, that the Patent Collateral shall not include any Excluded Assets:

- (i) (a) all letters Patent of the United States in or to which any Grantor now or hereafter has any right, title or interest therein, all registrations and recordings thereof, and all applications for letters Patent of the United States, including registrations, recordings and pending applications in the United States Patent and Trademark Office (“**USPTO**”), including any of the foregoing listed in Schedule A hereto, and (b) all reissues, continuations, divisionals, continuations-in-part, improvements or extensions thereof, and the inventions disclosed or claimed therein, including the right to make, use and/or sell the inventions disclosed or claimed therein,

(ii) all Proceeds of the foregoing, including license fees, royalties, income, payments, claims, damages and proceeds of suit now or hereafter due and/or payable with respect thereto,

(iii) the right to sue or otherwise recover for any past, present and future infringement or other violation thereof, and

(iv) all other rights accruing thereunder or pertaining thereto throughout the world.

SECTION 3. SECURITY AGREEMENT

The security interest granted pursuant to this Agreement is granted in conjunction with the security interest granted to the Administrative Agent for the Secured Parties pursuant to the Security Agreement, and the Grantors hereby acknowledge and affirm that the rights and remedies of the Administrative Agent with respect to the security interest in the Patent Collateral made and granted hereby are more fully set forth in the Security Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein. In the event that any provision of this Agreement is deemed to conflict with the Security Agreement, the provisions of the Security Agreement shall control.

SECTION 4. RECORDATION

EACH GRANTOR HEREBY AUTHORIZES AND REQUESTS THAT THE USPTO RECORD THIS PATENT SECURITY AGREEMENT.

SECTION 5. TERMINATION

This Agreement shall terminate and the lien on and security interest in the Patent Collateral shall be released upon the payment and performance of the Secured Obligations (other than any outstanding indemnification obligations). Upon the termination of this Agreement, the Administrative Agent shall execute all documents, make all filings, take all other actions reasonably requested by the Grantors to evidence and record the release of the lien on and security interests in the Patent Collateral granted herein.

SECTION 6. Governing Law

THIS AGREEMENT SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAW OF THE STATE OF NEW YORK, WITHOUT GIVING EFFECT TO ANY CHOICE OF LAW PRINCIPLES THAT WOULD APPLY THE LAWS OF ANOTHER JURISDICTION.

SECTION 7. Counterparts

This Agreement may be executed in one or more counterparts and by different parties hereto in separate counterparts, each of which when so executed and delivered shall be deemed an original, but all such counterparts together shall constitute but one and the same instrument.


[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, each Grantor has caused this Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

SECURUS TECHNOLOGIES, INC.,
as Grantor

By: 
Name: Richard A. Smith
Title: Chief Executive Officer and President

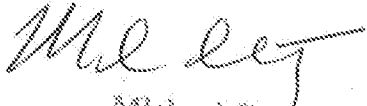
SECURUS TECHNOLOGIES HOLDINGS, INC.,
as Grantor

By: 
Name: Richard A. Smith
Title: Chief Executive Officer and President

DEUTSCHE BANK TRUST COMPANY
AMERICAS,
as Administrative Agent


By: 

Name: Anca Trifan
Title: Managing Director

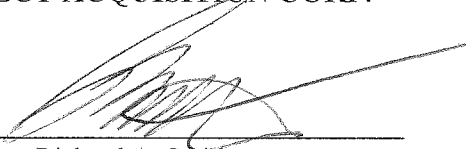

Michael Getz
Vice President

The foregoing Agreement is hereby ACKNOWLEDGED AND AGREED by:

**SECURUS TECHNOLOGIES HOLDINGS,
INC.**

By: 
Name: Richard A. Smith
Title: Chief Executive Officer and President

CONNECT ACQUISITION CORP.

By: 
Name: Richard A. Smith
Title: Chief Executive Officer and President

SCHEDULE A
to
PATENT SECURITY AGREEMENT

US Patent Issuances:

| Owner | Patent Title | Patent # |
|--|---|-----------------|
| Securus Technologies, Inc. | Three-Way Telephone Call Prevention System and Method | 7,079,636 |
| | System and Method for Call Redirect Detection and Treatment | 7,372,949 |
| | System and Methods for Offering a Service to a Party Associated with a Blocked Call | 6,836,540 |
| | System and Method for Reverse Billing of a Telephone Call | 6,639,977 |
| | Method for Determining an Entity Responsible for Billing a Called Party | 6,639,978 |
| | System and Method for Affecting Inmate Conduct with Good Behavior Discount Telephone Rates | 6,636,591 |
| | Systems and Methods for Account Establishment and Transaction Management Using Interrupt Messaging | 7,042,992 |
| | System and Method for Call Treatment | 7,203,301 |
| | Systems and Methods for Cross-Hatching Biometrics With Other Identifying Data | 7,278,028 |
| | Intelligent Queuing of Transaction Records | 7,492,881 |
| | System and Methods for Processing Calls Directed to Telephones Having a Portable Interface | 7,496,345 |
| | Public Telephone with Voice Over Internet Protocol Transmission | 7,505,406 |
| | Systems and Methods for Management and Dissemination of Information for Controlled Environment Facility | 7,519,169 |
| | Information Dissemination Systems and Methods For Use In a Controlled Environment Facility | 7,519,375 |
| | Called Party Controlled Message Delivery | 7,561,680 |
| | Systems and Methods for Transaction and Information Management | 7,640,190 |
| | Systems and Methods for Transaction and Information Management | 7,664,689 |
| | Optimizing Profitability in Business Transactions | 7,698,182 |
| | System and Method for Detecting Unauthorized Call Activities | 7,079,637 |
| | Systems and Methods for Identify Verification Using Continuous Biometric Monitoring | 7,494,061 |
| | Inmate Management System and Call Processing Systems and Method | 7,529,357 |
| | Resource Allocation System and Method | 7,324,637 |
| | Pre-paid Calling and Voice Messaging Services for Inmates | 7,158,621 |
| | Telecommunication Resource Allocation System and Method | 7,164,761 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 7,106,843 |
| Automatic Key Word or Phrase Speech Recognition for the Corrections Industry | 6,064,963 | |

| Owner | Patent Title | Patent # |
|-------|---|-----------|
| | Computer Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 7,248,680 |
| | Integrated Commissary Systems | 5,485,507 |
| | Inmate Messaging System and Method | 6,665,380 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access "GOTU" Original | 5,655,013 |
| | Improved Selectivity Activated Integrated Real-Time Recording of Telephone Conversations with Automated Documentation Consent to Call Recording | 6,665,376 |
| | Selectively Activated Integrated Real-Time Recording of Telephone Conversations | 5,535,261 |
| | Method and Apparatus for Detecting a Secondary Destination of a Telephone Call Based on Changes in the Telephone Signal Path ("Dolphin") | 6,141,406 |
| | Telecommunication Resource Allocation System and Method | 6,381,321 |
| | Telecommunication Resource Allocation System and Method | 6,560,325 |
| | Advanced Three-way Call Detection System and Method Using Spread Spectrum Techniques | 6,763,099 |
| | Telecommunication Resource Allocation System and Method | 6,904,139 |
| | System and Method for Ex Post Facto Preserving a Recorded Conversation | 7,058,163 |
| | Method and Apparatus for Detecting a Secondary Destination of a Telephone Call Based on Changes in Telephone Signal Path ("Dolphin") | 7,136,471 |
| | Biometric Voice Identification | 7,386,448 |
| | Off-Site Detention Monitoring System | 7,542,906 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 5,926,533 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 6,560,323 |
| | Message Screening, Delivery, and Billing System | 6,668,045 |
| | System and Method for Remotely Controlling Automated Call Placement Call Monitoring Functions | 6,647,096 |
| | Three-way Call Detection | 5,796,811 |
| | Three-way Call Detection By Counting Signal Characteristics | 5,805,685 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 6,611,583 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 6,920,209 |
| | System and Method for Message Delivery in a Controlled Environment Facility | 7,804,941 |
| | System and Method for Monitoring for identifying Members of a Gang or Security Threat Group | 7,805,457 |
| | System and Method for Account Establishment and Transaction Management | 7,860,222 |
| | System and Method for Account Establishment and Transaction Management using Interrupt Messaging | 7,860,226 |
| | Centralized Call Processing | 7,899,167 |
| | Computer-Based Method And Apparatus For Controlling, Monitoring, Recording And Reporting | 7,889,847 |

| Owner | Patent Title | Patent # |
|--------------|--|-----------------|
| | Telephone Access | |
| | Unauthorized Call Activity Detection and Prevention Systems and Methods for a Voice Over Internet Protocol Environment | 7,916,845 |
| | System and Method for Remote Call Forward Detection Using Signaling | 7,945,037 |
| | System and Method for Account Establishment and Transaction Management using Interrupt Messaging | 7,961,858 |
| | Systems and Methods for Graphically Demonstrating and Analyzing Case Treatment Operations | 7,961,860 |
| | Systems and Methods for Call Treatment Using a Third Party Database | 8,098,804 |
| | Optimizing Profitability In Business Transactions | 8,068,590 |
| | System and Method for Independently Authorizing Auxiliary Communication Services | 8,255,300 |
| | Systems and Methods For Transaction And Information Management | 8,065,213 |
| | Called Party Controlled Message Delivery | 8,180,028 |
| | Multiple Carriers in Secure Environment | 8,243,896 |
| | Wireless Communications Control in a Controlled Environment Facility | 8,019,354 |
| | Wireless Communications Control in a Controlled Environment Facility | 8,099,080 |
| | System and Methods for Visitation Terminal User Identification | 8,031,850 |
| | System and Method for Multi-Channel Recording | 8,135,115 |
| | Protected Data Container for Storing Data Relating to Recorded Calls in a Manner That Enables the Data to be Authenticated | 8,121,264 |
| | Score-Driven Management of Recordings | 8,180,027 |
| | Systems and Methods for Radio Frequency Identification | 8,031,052 |
| | Method and Apparatus for Detecting and Responding to Events Occurring on Remote Telephone | 8,135,127 |
| | Call Processing With Voice Over Internet Protocol Transmission | 8,000,269 |
| | Inmate Management And Call Processing Systems And Methods | 8,340,260 |
| | Method to Verify Designation of Pay Telephone with an Interexchange Carrier | 7,567,658 |
| | Systems and method for authorizing and monetizing collect cellular telephone calls | 8,190,121 |
| | Systems and Methods for Remote Call Redirection Detection and Treatment | 8,355,492 |
| | System and method for keyword detection in a controlled-environment facility using a hybrid application | 7,860,722 |

US Patent Applications:

| Owner | Patent Application Title | Application # |
|----------------------------|---|----------------------|
| Securus Technologies, Inc. | Systems and Methods for Acquiring, Accessing, and Analyzing Investigative Information | 11/480,268 |

| Owner | Patent Application Title | Application # |
|-------|---|---------------|
| | Processor-Based Self-Service Terminals Used with Respect to Controlled Environment Facilities | 11/125,842 |
| | System and Method for Call Treatment | 11/516,680 |
| | Systems and Methods for Transaction and Information Management | 11/338,868 |
| | Systems and Methods for Reducing Recidivism Among Former Inmates | 11/842,844 |
| | Systems and Methods for Management and Dissemination of Information from a Controlled Environment Facility | 11/810,691 |
| | Systems and Methods for Facilitating Booking, Bonding and Release | 11/751,895 |
| | Systems and Methods for Detecting A Call Anomaly Using Biometric Identification | 11/603,960 |
| | Controlled Environment Facility Calling Services Using Voice Over Internet Protocol Infrastructure | 11/931,764 |
| | System and Method for Proactively Establishing a Third-Party Payment Account for Services Rendered to a Resident of a Controlled-Environment Facility | 12/042,861 |
| | All Calls Completed Friends and Family Single Call Funding | 12/766,159 |
| | Call Center for Offering Goods and Services to an Inmate Population | 12/975,077 |
| | Advertisement-Funded Calling System with Audio and Video Messages | 12/981,489 |
| | Person-to-Person Calling Accounts | 13/009,821 |
| | Centralized Call Processing | 13/009,483 |
| | Unauthorized Call Activity Detection And Prevention Systems And Methods For A Voice Over Internet Protocol Environment | 13/006,861 |
| | Distribution of Satellite-Broadcast Content to Controlled-Environment Facilities | 13/253,101 |
| | Systems and Methods for Call Treatment Using a Third Party Database | 13/341,066 |
| | | 13/213,149 |
| | Discretionary Non-Trust Account for Residents of Controlled Environment Facilities | 13/244,402 |
| | Systems and Methods for Managing and Providing Investigative Services to Controlled Environment Facilities | 13/086,379 |
| | Crime Reporting in a Controlled-Environment Facility | 13/213,295 |
| | Visitation Services for Residents of Controlled Environment Facilities | 13/452,523 |
| | Healthcare Services for Residents of Correctional Facilities | 13/273,441 |
| | Emergency Communications within Controlled-Environment Facilities | 13/290,075 |
| | Virtual Mailboxes for Controlled-Environment Facilities | 13/452,584 |
| | Integrated Network Devices Utilizing Low-Power Technologies | 13/441,997 |
| | Virtual Communication Device Interface | 13/566,687 |
| | Location Based Services | 13/600,214 |
| | Session-triggered Lighting for Video Visitation Terminal | 13/605,713 |
| | PIN-less Biometrics | 13/364,212 |
| | Detecting Events Occurring On Remote Telephone | |

| Owner | Patent Application Title | Application # |
|-------|---|---------------|
| | Multiple Carriers in Secure Environment | 13/567,037 |
| | System and Method for Independently Authorizing Auxiliary Communication Services | 13/566,867 |
| | Community-Based Investigative Tools | 13/705,153 |
| | Voice-Based Investigative Services | 13/705,155 |
| | Rules-based Engine for Video Visitation Usage | 13/764,470 |
| | Multiple Carriers in Secure Environment | 13/567037 |
| | Inmate Cloud Storage | 13/769,764 |
| | System And Method For Authorizing And Monetizing Collect Cellular Telephone Calls | 13/449,308 |
| | Systems and methods for transaction and information management | 13/293,928 |

PATENT ASSIGNMENT

Electronic Version v1.1
 Stylesheet Version v1.1

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|------------------------------|--------------------|
| SUBMISSION TYPE: | NEW ASSIGNMENT |
| NATURE OF CONVEYANCE: | SECURITY AGREEMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|-------------------------------------|----------------|
| Securus Technologies, Inc. | 04/30/2013 |
| Securus Technologies Holdings, Inc. | 04/30/2013 |

RECEIVING PARTY DATA

| | |
|------------------------|---|
| Name: | Deutsche Bank Trust Company Americas, as Administrative Agent |
| Street Address: | 60 Wall Street |
| City: | New York |
| State/Country: | NEW YORK |
| Postal Code: | 10005 |

PROPERTY NUMBERS Total: 118

| Property Type | Number |
|---------------------|----------|
| Application Number: | 11480268 |
| Application Number: | 11125842 |
| Application Number: | 11516680 |
| Application Number: | 11338868 |
| Application Number: | 11842844 |
| Application Number: | 11810691 |
| Application Number: | 11751895 |
| Application Number: | 11603960 |
| Application Number: | 11931764 |
| Application Number: | 12042861 |
| Application Number: | 12766159 |
| Application Number: | 12975077 |
| Application Number: | 12981489 |
| Application Number: | 13009821 |

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| Application Number: | 13009483 |
| Application Number: | 13006861 |
| Application Number: | 13253101 |
| Application Number: | 13341066 |
| Application Number: | 13213149 |
| Application Number: | 13244402 |
| Application Number: | 13086379 |
| Application Number: | 13213295 |
| Application Number: | 13452523 |
| Application Number: | 13273441 |
| Application Number: | 13290075 |
| Application Number: | 13452584 |
| Application Number: | 13441997 |
| Application Number: | 13566687 |
| Application Number: | 13600214 |
| Application Number: | 13605713 |
| Application Number: | 13364212 |
| Application Number: | 13567037 |
| Application Number: | 13566867 |
| Application Number: | 13705153 |
| Application Number: | 13705155 |
| Application Number: | 13764470 |
| Application Number: | 13769764 |
| Application Number: | 13449308 |
| Application Number: | 13293928 |
| Patent Number: | 7079636 |
| Patent Number: | 7372949 |
| Patent Number: | 6836540 |
| Patent Number: | 6639977 |
| Patent Number: | 6639978 |
| Patent Number: | 6636591 |
| Patent Number: | 7042992 |
| Patent Number: | 7203301 |
| Patent Number: | 7278028 |
| Patent Number: | 7492881 |

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| | 7496345 |
| Patent Number: | 7505406 |
| Patent Number: | 7519169 |
| Patent Number: | 7519375 |
| Patent Number: | 7561680 |
| Patent Number: | 7640190 |
| Patent Number: | 7664689 |
| Patent Number: | 7698182 |
| Patent Number: | 7079637 |
| Patent Number: | 7494061 |
| Patent Number: | 7529357 |
| Patent Number: | 7324637 |
| Patent Number: | 7158621 |
| Patent Number: | 7164761 |
| Patent Number: | 7106843 |
| Patent Number: | 6064963 |
| Patent Number: | 7248680 |
| Patent Number: | 5485507 |
| Patent Number: | 6665380 |
| Patent Number: | 5655013 |
| Patent Number: | 6665376 |
| Patent Number: | 5535261 |
| Patent Number: | 6141406 |
| Patent Number: | 6381321 |
| Patent Number: | 6560325 |
| Patent Number: | 6763099 |
| Patent Number: | 6904139 |
| Patent Number: | 7058163 |
| Patent Number: | 7136471 |
| Patent Number: | 7386448 |
| Patent Number: | 7542906 |
| Patent Number: | 5926533 |
| Patent Number: | 6560323 |
| Patent Number: | 6668045 |
| Patent Number: | 6647096 |

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| | 5796811 |
| Patent Number: | 5805685 |
| Patent Number: | 6611583 |
| Patent Number: | 6920209 |
| Patent Number: | 7804941 |
| Patent Number: | 7805457 |
| Patent Number: | 7860222 |
| Patent Number: | 7860226 |
| Patent Number: | 7899167 |
| Patent Number: | 7889847 |
| Patent Number: | 7916845 |
| Patent Number: | 7945037 |
| Patent Number: | 7961858 |
| Patent Number: | 7961860 |
| Patent Number: | 8098804 |
| Patent Number: | 8068590 |
| Patent Number: | 8255300 |
| Patent Number: | 8065213 |
| Patent Number: | 8180028 |
| Patent Number: | 8243896 |
| Patent Number: | 8019354 |
| Patent Number: | 8099080 |
| Patent Number: | 8031850 |
| Patent Number: | 8135115 |
| Patent Number: | 8121264 |
| Patent Number: | 8180027 |
| Patent Number: | 8031052 |
| Patent Number: | 8135127 |
| Patent Number: | 8000269 |
| Patent Number: | 8340260 |
| Patent Number: | 7567658 |
| Patent Number: | 8190121 |
| Patent Number: | 8355492 |
| Patent Number: | 7860722 |

Fax Number: 2123548113
Correspondence will be sent via US Mail when the fax attempt is unsuccessful.
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Correspondent Name: James Maewsky/White & Case LLP
Address Line 1: 1155 Avenue of the Americas
Address Line 2: Patent & Trademark Department
Address Line 4: New York, NEW YORK 10036

| | |
|-------------------------|--|
| ATTORNEY DOCKET NUMBER: | 1111779-2369 |
| NAME OF SUBMITTER: | James Maewsky |
| Signature: | /jm/ |
| Date: | 05/07/2013 |
| | This document serves as an Oath/Declaration (37 CFR 1.63). |

Total Attachments: 11

source=Securus - Patent Security Agreement (Second Lien) EXECUTION VERSION#page1.tif
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This instrument and the rights and obligations evidenced hereby are subordinate in the manner and to the extent set forth in that certain Closing Date Intercreditor Agreement (the “Closing Date Intercreditor Agreement”) dated as of April 30, 2013 between Deutsche Bank Trust Company Americas as First Lien Credit Agreement Administrative Agent and Deutsche Bank Trust Company Americas as Second Lien Credit Agreement Administrative Agent, to the indebtedness (including interest) owed by the Borrower pursuant to that certain First Lien Credit Agreement dated as of April 30, 2013 among Connect Merger Sub, Inc., the other Guarantors party thereto from time to time, Deutsche Bank Trust Company Americas, as Administrative Agent, each lender from time to time party thereto, and Deutsche Bank Trust Company Americas, as L/C Issuer and Swing Line Lender and the other agents named therein, as such First Lien Credit Agreement has been and hereafter may be amended, supplemented or otherwise modified from time to time and to indebtedness refinancing the indebtedness under that agreement as contemplated by the Closing Date Intercreditor Agreement; and each holder of this instrument, by its acceptance hereof, irrevocably agrees to be bound by the provisions of the Closing Date Intercreditor Agreement.

PATENT SECURITY AGREEMENT

This **PATENT SECURITY AGREEMENT**, dated as of April 30, 2013 (as amended, restated, supplemented or otherwise modified from time to time, this “**Agreement**”), is made by the entities identified as grantors on the signature pages hereto (collectively, the “**Grantors**”) in favor of Deutsche Bank Trust Company Americas, as Administrative Agent for the Secured Parties (in such capacity and together with its successors and permitted assigns, the “**Administrative Agent**”).

WHEREAS, the Grantors are party to a Second Lien Security Agreement, dated as of April 30, 2013 (as amended, restated, supplemented or otherwise modified from time to time, the “**Security Agreement**”), between each of the Grantors and the other grantors party thereto and the Administrative Agent pursuant to which the Grantors granted a security interest to the Administrative Agent in the Patent Collateral (as defined below) and are required to execute and deliver this Agreement.

NOW, THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Grantors hereby agree with the Administrative Agent as follows:

SECTION. 1. DEFINED TERMS

Unless otherwise defined herein, terms defined in the Security Agreement and used herein have the meaning given to them in the Security Agreement.

SECTION 2. GRANT OF SECURITY INTEREST

As security for the payment or performance in full of the Secured Obligations, including the Guaranteed Obligations, each Grantor hereby pledges to the Administrative Agent, its successors and permitted assigns, for the benefit of the Secured Parties, and hereby grants to the Administrative Agent, its successors and permitted assigns, for the benefit of the Secured Parties, a security interest in all right, title or interest in or to any and all of the following assets and properties now owned or at any time hereafter acquired by such Grantor or in which such

Grantor now has or at any time in the future may acquire any right, title or interest (collectively, the “**Patent Collateral**”); *provided*, that the Patent Collateral shall not include any Excluded Assets:

(i) (a) all letters Patent of the United States in or to which any Grantor now or hereafter has any right, title or interest therein, all registrations and recordings thereof, and all applications for letters Patent of the United States, including registrations, recordings and pending applications in the United States Patent and Trademark Office (“**USPTO**”), including any of the foregoing listed in Schedule A hereto, and (b) all reissues, continuations, divisionals, continuations-in-part, improvements or extensions thereof, and the inventions disclosed or claimed therein, including the right to make, use and/or sell the inventions disclosed or claimed therein,

(ii) all Proceeds of the foregoing, including license fees, royalties, income, payments, claims, damages and proceeds of suit now or hereafter due and/or payable with respect thereto,

(iii) the right to sue or otherwise recover for any past, present and future infringement or other violation thereof, and

(iv) all other rights accruing thereunder or pertaining thereto throughout the world.

SECTION 3. SECURITY AGREEMENT

The security interest granted pursuant to this Agreement is granted in conjunction with the security interest granted to the Administrative Agent for the Secured Parties pursuant to the Security Agreement, and the Grantors hereby acknowledge and affirm that the rights and remedies of the Administrative Agent with respect to the security interest in the Patent Collateral made and granted hereby are more fully set forth in the Security Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein. In the event that any provision of this Agreement is deemed to conflict with the Security Agreement, the provisions of the Security Agreement shall control.

SECTION 4. RECORDATION

EACH GRANTOR HEREBY AUTHORIZES AND REQUESTS THAT THE USPTO RECORD THIS PATENT SECURITY AGREEMENT.

SECTION 5. TERMINATION

This Agreement shall terminate and the lien on and security interest in the Patent Collateral shall be released upon the payment and performance of the Secured Obligations (other than any outstanding indemnification obligations). Upon the termination of this Agreement, the Administrative Agent shall execute all documents, make all filings, take all other actions reasonably requested by the Grantors to evidence and record the release of the lien on and security interests in the Patent Collateral granted herein.

SECTION 6. Governing Law

THIS AGREEMENT SHALL BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAW OF THE STATE OF NEW YORK, WITHOUT GIVING EFFECT TO ANY CHOICE OF LAW PRINCIPLES THAT WOULD APPLY THE LAWS OF ANOTHER JURISDICTION.

SECTION 7. Counterparts

This Agreement may be executed in one or more counterparts and by different parties hereto in separate counterparts, each of which when so executed and delivered shall be deemed an original, but all such counterparts together shall constitute but one and the same instrument.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, each Grantor has caused this Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

SECURUS TECHNOLOGIES, INC.,

as Grantor

By: 

Name: Richard A. Smith

Title: Chief Executive Officer and President

SECURUS TECHNOLOGIES HOLDINGS, INC.,

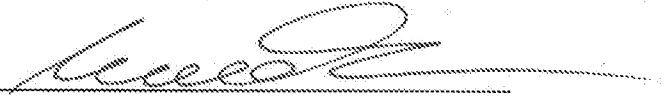
as Grantor

By: 

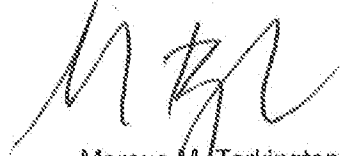
Name: Richard A. Smith

Title: Chief Executive Officer and President

**DEUTSCHE BANK TRUST COMPANY
AMERICAS,**
as Administrative Agent

By: 

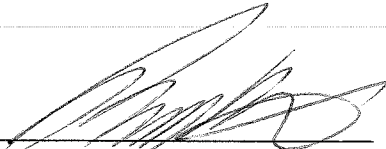
Name: Anca Trifan
Title: Managing Director




Marcus M. Tarkington
Director

The foregoing Agreement is hereby ACKNOWLEDGED AND AGREED by:

**SECURUS TECHNOLOGIES HOLDINGS,
INC.**

By: 
Name: Richard A. Smith
Title: Chief Executive Officer and President

CONNECT ACQUISITION CORP.

By: 
Name: Richard A. Smith
Title: Chief Executive Officer and President

[Signature Page to Securus Second Lien Patent Security Agreement]

SCHEDULE A
to
PATENT SECURITY AGREEMENT

US Patent Issuances:

| Owner | Patent Title | Patent # |
|----------------------------|---|-----------------|
| Securus Technologies, Inc. | Three-Way Telephone Call Prevention System and Method | 7,079,636 |
| | System and Method for Call Redirect Detection and Treatment | 7,372,949 |
| | System and Methods for Offering a Service to a Party Associated with a Blocked Call | 6,836,540 |
| | System and Method for Reverse Billing of a Telephone Call | 6,639,977 |
| | Method for Determining an Entity Responsible for Billing a Called Party | 6,639,978 |
| | System and Method for Affecting Inmate Conduct with Good Behavior Discount Telephone Rates | 6,636,591 |
| | Systems and Methods for Account Establishment and Transaction Management Using Interrupt Messaging | 7,042,992 |
| | System and Method for Call Treatment | 7,203,301 |
| | Systems and Methods for Cross-Hatching Biometrics With Other Identifying Data | 7,278,028 |
| | Intelligent Queuing of Transaction Records | 7,492,881 |
| | System and Methods for Processing Calls Directed to Telephones Having a Portable Interface | 7,496,345 |
| | Public Telephone with Voice Over Internet Protocol Transmission | 7,505,406 |
| | Systems and Methods for Management and Dissemination of Information for Controlled Environment Facility | 7,519,169 |
| | Information Dissemination Systems and Methods For Use In a Controlled Environment Facility | 7,519,375 |
| | Called Party Controlled Message Delivery | 7,561,680 |
| | Systems and Methods for Transaction and Information Management | 7,640,190 |
| | Systems and Methods for Transaction and Information Management | 7,664,689 |
| | Optimizing Profitability in Business Transactions | 7,698,182 |
| | System and Method for Detecting Unauthorized Call Activities | 7,079,637 |
| | Systems and Methods for Identify Verification Using Continuous Biometric Monitoring | 7,494,061 |
| | Inmate Management System and Call Processing Systems and Method | 7,529,357 |
| | Resource Allocation System and Method | 7,324,637 |
| | Pre-paid Calling and Voice Messaging Services for Inmates | 7,158,621 |
| | Telecommunication Resource Allocation System and Method | 7,164,761 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 7,106,843 |
| | Automatic Key Word or Phrase Speech Recognition for the Corrections Industry | 6,064,963 |

| Owner | Patent Title | Patent # |
|-------|---|-----------|
| | Computer Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 7,248,680 |
| | Integrated Commissary Systems | 5,485,507 |
| | Inmate Messaging System and Method | 6,665,380 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access "GOTU" Original | 5,655,013 |
| | Improved Selectivity Activated Integrated Real-Time Recording of Telephone Conversations with Automated Documentation Consent to Call Recording | 6,665,376 |
| | Selectively Activated Integrated Real-Time Recording of Telephone Conversations | 5,535,261 |
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| | Telecommunication Resource Allocation System and Method | 6,560,325 |
| | Advanced Three-way Call Detection System and Method Using Spread Spectrum Techniques | 6,763,099 |
| | Telecommunication Resource Allocation System and Method | 6,904,139 |
| | System and Method for Ex Post Facto Preserving a Recorded Conversation | 7,058,163 |
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| | Biometric Voice Identification | 7,386,448 |
| | Off-Site Detention Monitoring System | 7,542,906 |
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| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 6,560,323 |
| | Message Screening, Delivery, and Billing System | 6,668,045 |
| | System and Method for Remotely Controlling Automated Call Placement Call Monitoring Functions | 6,647,096 |
| | Three-way Call Detection | 5,796,811 |
| | Three-way Call Detection By Counting Signal Characteristics | 5,805,685 |
| | Computer-Based M&A for Controlling, Monitoring, Recording and Reporting Telephone Access | 6,611,583 |
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| | System and Method for Monitoring for identifying Members of a Gang or Security Threat Group | 7,805,457 |
| | System and Method for Account Establishment and Transaction Management | 7,860,222 |
| | System and Method for Account Establishment and Transaction Management using Interrupt Messaging | 7,860,226 |
| | Centralized Call Processing | 7,899,167 |
| | Computer-Based Method And Apparatus For Controlling, Monitoring, Recording And Reporting | 7,889,847 |

| Owner | Patent Title | Patent # |
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| | Telephone Access | |
| | Unauthorized Call Activity Detection and Prevention Systems and Methods for a Voice Over Internet Protocol Environment | 7,916,845 |
| | System and Method for Remote Call Forward Detection Using Signaling | 7,945,037 |
| | System and Method for Account Establishment and Transaction Management using Interrupt Messaging | 7,961,858 |
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| | Systems and Methods for Call Treatment Using a Third Party Database | 8,098,804 |
| | Optimizing Profitability In Business Transactions | 8,068,590 |
| | System and Method for Independently Authorizing Auxiliary Communication Services | 8,255,300 |
| | Systems and Methods For Transaction And Information Management | 8,065,213 |
| | Called Party Controlled Message Delivery | 8,180,028 |
| | Multiple Carriers in Secure Environment | 8,243,896 |
| | Wireless Communications Control in a Controlled Environment Facility | 8,019,354 |
| | Wireless Communications Control in a Controlled Environment Facility | 8,099,080 |
| | System and Methods for Visitation Terminal User Identification | 8,031,850 |
| | System and Method for Multi-Channel Recording | 8,135,115 |
| | Protected Data Container for Storing Data Relating to Recorded Calls in a Manner That Enables the Data to be Authenticated | 8,121,264 |
| | Score-Driven Management of Recordings | 8,180,027 |
| | Systems and Methods for Radio Frequency Identification | 8,031,052 |
| | Method and Apparatus for Detecting and Responding to Events Occurring on Remote Telephone | 8,135,127 |
| | Call Processing With Voice Over Internet Protocol Transmission | 8,000,269 |
| | Inmate Management And Call Processing Systems And Methods | 8,340,260 |
| | Method to Verify Designation of Pay Telephone with an Interexchange Carrier | 7,567,658 |
| | Systems and method for authorizing and monetizing collect cellular telephone calls | 8,190,121 |
| | Systems and Methods for Remote Call Redirection Detection and Treatment | 8,355,492 |
| | System and method for keyword detection in a controlled-environment facility using a hybrid application | 7,860,722 |

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| Owner | Patent Application Title | Application # |
|----------------------------|---|----------------------|
| Securus Technologies, Inc. | Systems and Methods for Acquiring, Accessing, and Analyzing Investigative Information | 11/480,268 |

| Owner | Patent Application Title | Application # |
|-------|---|---------------|
| | Processor-Based Self-Service Terminals Used with Respect to Controlled Environment Facilities | 11/125,842 |
| | System and Method for Call Treatment | 11/516,680 |
| | Systems and Methods for Transaction and Information Management | 11/338,868 |
| | Systems and Methods for Reducing Recidivism Among Former Inmates | 11/842,844 |
| | Systems and Methods for Management and Dissemination of Information from a Controlled Environment Facility | 11/810,691 |
| | Systems and Methods for Facilitating Booking, Bonding and Release | 11/751,895 |
| | Systems and Methods for Detecting A Call Anomaly Using Biometric Identification | 11/603,960 |
| | Controlled Environment Facility Calling Services Using Voice Over Internet Protocol Infrastructure | 11/931,764 |
| | System and Method for Proactively Establishing a Third-Party Payment Account for Services Rendered to a Resident of a Controlled-Environment Facility | 12/042,861 |
| | All Calls Completed Friends and Family Single Call Funding | 12/766,159 |
| | Call Center for Offering Goods and Services to an Inmate Population | 12/975,077 |
| | Advertisement-Funded Calling System with Audio and Video Messages | 12/981,489 |
| | Person-to-Person Calling Accounts | 13/009,821 |
| | Centralized Call Processing | 13/009,483 |
| | Unauthorized Call Activity Detection And Prevention Systems And Methods For A Voice Over Internet Protocol Environment | 13/006,861 |
| | Distribution of Satellite-Broadcast Content to Controlled-Environment Facilities | 13/253,101 |
| | Systems and Methods for Call Treatment Using a Third Party Database | 13/341,066 |
| | | 13/213,149 |
| | Discretionary Non-Trust Account for Residents of Controlled Environment Facilities | 13/244,402 |
| | Systems and Methods for Managing and Providing Investigative Services to Controlled Environment Facilities | 13/086,379 |
| | Crime Reporting in a Controlled-Environment Facility | 13/213,295 |
| | Visitation Services for Residents of Controlled Environment Facilities | 13/452,523 |
| | Healthcare Services for Residents of Correctional Facilities | 13/273,441 |
| | Emergency Communications within Controlled-Environment Facilities | 13/290,075 |
| | Virtual Mailboxes for Controlled-Environment Facilities | 13/452,584 |
| | Integrated Network Devices Utilizing Low-Power Technologies | 13/441,997 |
| | Virtual Communication Device Interface | 13/566,687 |
| | Location Based Services | 13/600,214 |
| | Session-triggered Lighting for Video Visitation Terminal | 13/605,713 |
| | PIN-less Biometrics | 13/364,212 |
| | Detecting Events Occurring On Remote Telephone | |

| Owner | Patent Application Title | Application # |
|-------|---|---------------|
| | Multiple Carriers in Secure Environment | 13/567,037 |
| | System and Method for Independently Authorizing Auxiliary Communication Services | 13/566,867 |
| | Community-Based Investigative Tools | 13/705,153 |
| | Voice-Based Investigative Services | 13/705,155 |
| | Rules-based Engine for Video Visitation Usage | 13/764,470 |
| | Multiple Carriers in Secure Environment | 13/567037 |
| | Inmate Cloud Storage | 13/769,764 |
| | System And Method For Authorizing And Monetizing Collect Cellular Telephone Calls | 13/449,308 |
| | Systems and methods for transaction and information management | 13/293,928 |

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

APPLICANT: Robert L. Rae
APPLICATION NO.: 13/009,483
FILING DATE: January 19, 2011
TITLE: Centralized Call Processing
EXAMINER: Antim G. Shah
GROUP ART UNIT: 2652
CONFIRMATION NO.: 1820
ATTY. DKT. NO.: 18279-18190

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the Pacific Time Zone of the United States on the local date shown below.

Dated: March 5, 2013

By: /Dohyun Ahn/

Dohyun Ahn, Reg. No.: 63,237

COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

AMENDMENT A

Sir:

This is in response to the Office Action dated December 7, 2012, which set a shortened statutory period for response that expires on March 7, 2013.

Kindly amend this application as indicated herein.

IN THE CLAIMS:

Please amend claims 1-3, 5, 8-11, 13 and 16, as set forth below:

1. (Currently amended) A centralized call processing system, comprising:
 - a networking device connected to a plurality of call processing gateways of a plurality of prison facilities, ~~each call processing gateway installed at a prison facility~~ located remote from the centralized call processing system via a wide area network (WAN), the networking device configured to:
 - receive outgoing Voice over Internet Protocol (VoIP) data packets from prison facilities; and
 - send incoming VoIP data packets to the prison facilities;
 - an unauthorized call activity detection system connected to the networking device for detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets via a local area network (LAN);
 - a call application management system connected via the LAN to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the first telephone carrier network into the incoming VoIP data; and
 - a computing system connected via the LAN to the call application management system ~~for providing and configured to perform~~ a function-
~~associated with~~ of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or

the incoming VoIP data packets ~~other than~~, the function excluding detecting of the three-way call activity in the calls.

2. (Currently amended) The system of claim 1, wherein the function comprises managing billing associated with the calls made through the system.

3. (Currently amended) The system of claim 1, wherein the function comprises recording at least part of the calls made through the system.

4. (Previously presented) The system of claim 3, wherein the call application management system is configured to select calls to be recorded.

5. (Currently amended) The system of claim 1, wherein the function comprises validating the calls made through the system for authorizing connecting of the calls to the telephone carrier network.

6. (Previously presented) The system of claim 1, wherein the function comprises managing information about inmates at the prison facilities.

7. (Previously presented) The system of claim 1, wherein the function comprises managing commissary orders placed by inmates at the prison facilities.

8. (Currently amended) The system of claim 1, wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with the calls made through the system.

9. (Currently amended) A method ~~for processing calls at a centralized call processing system~~, the method comprising:

receiving outgoing Voice over Internet Protocol (VoIP) data packets from a plurality of prison facilities by a networking device via a wide area network (WAN), ~~the plurality of prison facilities located remotely from the call processing gateways~~;

sending incoming VoIP data packets to the prison facilities via the WAN by the networking device;

routing the outgoing VoIP data packets or the incoming VoIP data packets in a local area network (LAN) to detect ~~detecting~~ three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets;

routing the outgoing VoIP data packets via the LAN to process ~~processing~~ the outgoing VoIP data packets for transmission to a telephone carrier network;

processing signals from the ~~first~~ telephone carrier network into the incoming VoIP data;

routing the incoming VoIP data packets via the LAN for transmission to the plurality of prison facilities via the WAN; and

providing a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on ~~associated with~~ the outgoing VoIP data packets or the incoming VoIP data packets ~~other than~~.

by a computing device connected to the networking device via the LAN, the function excluding detecting of the three-way call activity in the calls.

10. (Currently amended) The method of claim 9, wherein the function comprises managing billing associated with the calls made through the networking device ~~centralized-call processing system~~.

11. (Currently amended) The method of claim 9, wherein the function comprises recording at least part of the calls made through the networking device ~~centralized-call processing system~~.

12. (Previously presented) The method of claim 11, further comprising selecting calls to be recorded.

13. (Currently amended) The method of claim 9, wherein the function comprises validating the calls made through the networking device system ~~system~~ for authorizing connecting of calls to the telephone carrier network.

14. (Previously presented) The method of claim 9, wherein the function comprises managing information about inmates at the prison facilities.

15. (Previously presented) The method of claim 9, wherein the function comprises managing commissary orders placed by inmates at the prison facilities.

16. (Currently amended) The method of claim 9, wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with the calls made through the networking device ~~centralized call processing system~~.

REMARKS

Claims 1-16 were pending in this application. In an Office Action dated December 7, 2012, claims 1-16 were rejected.

Claims 1-3, 5, 8-11, 13 and 16 are hereby amended. No claim is added or canceled herein.

Based on the above Amendment and the following Remarks, withdrawal of all outstanding rejections is respectfully requested.

Request for Consideration of Information Disclosure Statements **Filed in Parent Application**

Applicant notes that this application is a continuation application of a parent application, U.S. Patent Application No. 10/642,532 (now issued as U.S. Patent No. 7,899,167).

Under MPEP § 609.02, the Examiner should consider information which has been considered by the Office in a parent application when examining such continuation applications. It is not necessary for Applicant to submit a duplicative information disclosure statement in the continuation application. See MPEP §§ 609.02 and 2001.06(b). In addition, the first Office Action should indicate whether references from the parent application have been reviewed. See MPEP § 2001.06(b).

However, there is no such indication in the first Office Action dated December 7, 2012, as to whether the references from the parent application (U.S. Patent Application No. 10/642,532) have been reviewed. The Examiner is hereby respectfully requested to consider the references from the parent application if he has not already done so, and indicate in the next Office Action that such references have been considered. In making this response,

Applicant presumes that the Examiner has considered such references and any other information in the parent application, pursuant to MPEP §§ 609.02 and 2001.06(b).

Supplemental Information Disclosure Statement

A Supplemental Information Disclosure Statement including additional references is submitted herewith. The Examiner is respectfully requested to indicate consideration of these references in the next communication.

Claims Are Not Obvious over Cited References

In the Office Action, claims 1-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over various combinations of U.S. Patent Application Publication No. 2007/0041545 (“Gainsboro”), U.S. Patent Application Publication No. 2003/0091028 (“Chang”), U.S. Patent No. 7,333,798 (“Hodge”) and U.S. Patent No. 7,505,406 (“Spadaro”). The rejections are overcome in view of amendment.

Independent claim 1, as amended, recites the feature of “networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remote from the centralized call processing system via a wide area network (WAN)...a computing system connected via the LAN...and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls....”

Per claim 1, a call processing system includes a network device that communicates via a plurality of call processing gateways via a WAN. The call processing system also includes an authorized call activity detection system, a call application management system and a computing system. The authorized call activity detection system and the call

application management system are connected to network device via a LAN. The computing system is connected to the call application management system via the LAN.

This feature is advantageous, among other reasons, because the need to provide equipments for various functions (e.g., unauthorized call detection, call application management and other functions) at each prison facility may be obviated. By removing duplicative deployment of equipments, the cost associated with providing functions associated with calls can be reduced.

None of the cited references disclose this feature. Although Gainsboro discloses using a wide area network for communication between FTS Central Offices 101 located at each correction facility 100 and Primary Central Operations Facility (PCOF) 104 (see paragraph [0073]), operations associated with the calls are performed predominantly at the FTS Central Offices 101. That is, an FMU 201 in the FTS Central Offices 101 performs the operations of inmate account validation (see paragraphs [0123]-[0130]), collect call processing (see paragraph [0131] -[0134]), collect call validation (see paragraphs [0135]-[0141]), and other functions. The function of PCOF 104 appears to be limited to archiving data of the FTS Central Offices 101 in the PCOF 104. (See paragraph [0708]). In other words, the PCOF 104 does not appear to perform functions associated with permitting, establishing, continuing or terminating calls. Therefore, Gainsboro fails to disclose the feature of “networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remote from the centralized call processing system via a wide area network (WAN)...a computing system connected via the LAN...and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data

packets, the function excluding detecting of the three-way call activity in the calls,” as recited in claim 1, as amended.

Chang also fails to disclose this feature. Chang was cited in the Office Action merely for allegedly disclosing gateways to collect VoIP data packets associated with calls to multiple facilities. Nowhere in Chang does it disclose anything about performing functions of establishing, continuing or terminating calls of a plurality of facilities at a centralized system remote from prison facilities.

Hodge also fails to disclose this feature. Hodge was cited in the Office Action merely for allegedly disclosing a justice system and a commerce system. Nowhere in Hodge does it disclose anything about performing functions of establishing, continuing or terminating calls of a plurality of facilities at a centralized system remote from prison facilities.

Spadaro also fails to disclose this feature. Spadaro at best discloses performing routing function 22, billing function 24 and PIN checking 28 at a point beyond a VOIP network (i.e., a remote location) by communicating with a control computer 12 at a prison facility via WAN. (See 4:4-35; and FIG. 5). However, nowhere in Spadaro does it appear to disclose that the point beyond the VOIP network communicates with a plurality of prison facilities. Rather, the routing function 22, billing function 24 and PIN checking 28 appear to be conducted for a single prison facility. The Office Action also argues that ‘Edge Routing’ of Spadaro suggests the feature recited in claim 1. However, the common local access circuits for Edge Routing in Spadaro are located in one of the prison facilities, and are not located remotely in the prison facilities. Therefore, Spadaro also fails to disclose the feature of “networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remote from the centralized call processing system via a wide area

network (WAN)...a computing system connected via the LAN...and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls,” as recited in amended claim 1.

Therefore, none of the cited references disclose the feature of “networking device connected to a plurality of call processing gateways of a plurality of prison facilities located remote from the centralized call processing system via a wide area network (WAN)...a computing system connected via the LAN...and configured to perform a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, the function excluding detecting of the three-way call activity in the calls,” as recited in claim 1, as amended. Accordingly, claim 1 and its dependent claims 2-8, as amended, are patentably distinguishable over Gainsboro, Chang, Hodge and Spadaro.

Independent claim 9, as amended, recites the feature of “receiving outgoing Voice over Internet Protocol (VoIP) data packets from a plurality of prison facilities by a networking device via a wide area network (WAN)...providing a function of permitting, establishing, continuing or terminating calls of the plurality of prison facilities based on the outgoing VoIP data packets or the incoming VoIP data packets, by a computing device connected to the networking device via the LAN, the function excluding detecting of the three-way call activity in the calls.” Therefore, claim 9 and its dependent claims 10-16 are also patentably distinguishable over Gainsboro, Chang, Hodge and Spadaro, for similar reasons as set forth above for claim 1.

Therefore, withdrawal of these rejections is respectfully requested.

Double Patenting Rejection Should be Held in Abeyance

In the Office Action, claims 1-16 were rejected based on double patenting rejection over claims 1-21 of U.S. Patent No. 7,899,167. It is hereby requested that the double patenting rejection of claims 1-16 be held in abeyance until the claims are otherwise in condition for allowance, at which time a Terminal Disclaimer will be filed, if it is deemed necessary.

Conclusion

It is submitted that claims 1-16, as presented herein, are patentable for the reasons set forth above.

The Examiner is invited to contact representative at the number provided below if the Examiner believes it will help expedite furtherance of this application.

Respectfully submitted,

Dated: March 5, 2013

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Robert L. Rae
APPLICATION NO.: 13/009,483
FILING DATE: January 19, 2011
TITLE: Centralized Call Processing
EXAMINER: Antim G. Shah
GROUP ART UNIT: 2652
CONFIRMATION NO.: 1820
ATTY. DKT. NO.: 18279-18190

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

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Dated: March 5, 2013

By: /Dohyun Ahn/

Dohyun Ahn, Reg. No. 63,237

**INFORMATION DISCLOSURE STATEMENT D
Under 37 CFR §§ 1.56 and 1.97-98**

Pursuant to the provisions of 37 CFR §§ 1.56 and 1.97-98, enclosed herewith is modified form PTO/SB/08A listing references for consideration by the Examiner.

The filing of this Information Disclosure Statement shall not be construed as a representation regarding the completeness of the list of references, or that inclusion of a reference in this list is an admission that it is prior art or is pertinent to this application, or that a search has been made, or as an admission that the information listed is, or may be considered to be, material to patentability, or that no other material information exists, and shall not be construed as an admission against interest in any manner.

This Information Disclosure Statement is being filed:

- within three months of the filing date of the application, or date of entry into the national stage of an international application, or before the mailing date of a first office action on the merits, whichever event last occurred;
- before the mailing of a first official action after the filing of a request for continued examination (RCE) under 37 CFR § 1.114;

- after three months of the filing date of this national application or the date of entry of the national stage in an international application, or after the mailing date of the first official action on the merits, whichever event last occurred, but before the mailing date of the first to occur of either: (1) a final action under 37 CFR §1.113; or (2) an action that otherwise closes prosecution in the application, and:
 - attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(c); OR
 - Applicant certifies pursuant to 37 CFR § 1.97(e) that:
 - each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement; OR
 - no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement;
- on or before the payment of the issue fee but after the mailing date of the first to occur of either: (1) a final action under 37 CFR § 1.113; (2) a notice of allowance under 37 CFR § 1.311; or (3) an action that otherwise closes prosecution in the application, and:
 - Applicant certifies pursuant to 37 CFR. § 1.97(e) that:
 - each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement; OR
 - no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application

and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement; AND

- attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(d); OR
- after the payment of the issue fee. Applicant requests that the information contained in this Information Disclosure Statement be placed in the file according to 37 CFR § 1.97(i), although the information may not be considered by the USPTO.
- This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior application No. _____, filed on _____, and the references cited therein are hereby referenced, but are not required to be provided in this application under 37 CFR § 1.98(d).
- Each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not received by any individual designated in 37 CFR § 1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement. 37 CFR § 1.704(d).

Respectfully submitted,

Dated: March 5, 2013 /Dohyun Ahn/
Dohyun Ahn, Reg. No.: 63,237
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801 California Street
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT****Complete if Known**

| | |
|------------------------|------------------|
| Application No. | 13/009,483 |
| Filing Date | January 19, 2011 |
| First Named Inventor | Robert L. Rae |
| Art Unit | 2652 |
| Examiner Name | Antim G. Shah |
| Attorney Docket Number | 18279-18190 |

Sheet 1 of 2

U.S. PATENT DOCUMENTS

| Examiner Initials* | Cite No. ¹ | Document No. Number – Kind Code ² (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
|--------------------|-----------------------|--|--------------------------------|--|
| | A1 | US-7,889,847 | 02-15-2011 | Gainsboro |
| | A2 | US-7,551,732 | 06-23-2009 | Anders |
| | A3 | US-7,443,963 | 10-28-2008 | Scherer |
| | A4 | US-7,158,621 | 01-02-2007 | Bayne |
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| | A18 | US-6,611,583 | 08-26-2003 | Gainsboro |
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| | A24 | US-2002/0168060 A1 | 11-14-2002 | Huie |

| | | | |
|--------------------|--|-----------------|--|
| 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.

1Applicant's unique citation designation number (optional). 2See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6Applicant is to place a check mark here if English language Translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT****Complete if Known**

| | | | |
|------------------------|------------------|----|---|
| Application No. | 13/009,483 | | |
| Filing Date | January 19, 2011 | | |
| First Named Inventor | Robert L. Rae | | |
| Art Unit | 2652 | | |
| Examiner Name | Antim G. Shah | | |
| Attorney Docket Number | 18279-18190 | | |
| Sheet | 2 | of | 2 |

FOREIGN PATENT DOCUMENTS

| Examiner Initials* | Cite No. ¹ | Foreign Patent Document Country Code ³ – Number ⁴ Kind Code ⁵ (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | T ⁶ |
|--------------------|-----------------------|---|--------------------------------|--|----------------|
| | B1 | WO 98/54879 A1 | 12-03-1998 | T-Netix, Inc. | |
| | B2 | WO 96/14703 A1 | 05-17-1996 | T-Netix, Inc. | |

OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS

| Examiner Initials* | Cite No. ¹ | 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 ⁶ |
|--------------------|-----------------------|--|----------------|
| | C1 | Defendants' First Amended Answer to Plaintiffs' Second Amended Complaint, C.A. NO. 2:09-cv-00333-DF, United States District Court, Eastern District of Texas, Marshall Division, October 13, 2011, 17 pages. | |
| | C2 | Defendants' Supplemental Invalidation Contentions, C.A. NO. 2:09-cv-00333-DF, United States District Court, Eastern District of Texas, Marshall Division, October 13, 2011, 19 pages. | |
| | C3 | SUNDSTROM, K., "Voice Over IP: An Engineering Analysis," Master of Science Thesis, September 1999, University of Manitoba, 137 pages. | |
| | C4 | United States Patent Application, United States Application No. 10/642,532 [Copy Not Enclosed]. | |

18279/18190/DOCS/2844624.3

| | | | |
|--------------------|--|-----------------|--|
| 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.

1Applicant's unique citation designation number (optional). 2See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6Applicant is to place a check mark here if English language Translation is attached.



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

| | | |
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| (54) Title: METHOD AND APPARATUS FOR DETECTING A SECONDARY DESTINATION OF A TELEPHONE CALL BASED ON SIGNAL PATH CHANGES | | |
| (57) Abstract A method and apparatus for detecting whether a remote party has added a secondary telephone destination to a telephone call, for example through the activation of three-way calling service, conference calling or two lining bridging, by identifying an echo characteristic to the telephone connection between the local and the remote telephone and monitoring the echo characteristic to determine whether there is a significant change. The addition of a secondary telephone destination can be verified by continuing to monitor the echo characteristic to determine whether it has returned to its original value. | | |

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**METHOD AND APPARATUS FOR DETECTING A SECONDARY DESTINATION
OF A TELEPHONE CALL BASED ON SIGNAL PATH CHANGES**

TECHNICAL FIELD OF THE INVENTION

The invention relates to a method and apparatus to detect events occurring on a telephone line based on changes in the telephone signal path during the course of the telephone transmission. In particular, the method and apparatus of the invention can detect when a call originally completed to a first telephone
5 destination has been transferred to or conferenced with a second telephone destination. Thus, the invention can be used to detect when a three-way or conference call has occurred to include a second telephone destination after a telephone connection has been established with a first telephone.

The invention is particularly useful to prevent the unauthorized use of
10 three-way calling or conference calling to circumvent the security features which typically restrict telephone calls emanating from institutions, such as prisons and other correctional facilities, to certain previously approved telephone numbers. The invention is typically employed so that the detection of the three-way or conference call results in an action, such as, termination of the initial two party
15 connection.

BACKGROUND OF THE INVENTION

Prior to a June, 1984, FCC decision, pay telephones were the exclusive province of local telephone companies. Others were precluded from the business of providing pay telephone services. Today, however, subject to state Public Utility
5 Commission regulations, Customer Owned Coin Operated Telephone ("COCOT") service is permitted. An outgrowth of COCOT service has been the private operation of institutional telephone services.

Calls placed through COCOT equipment are frequently handled by an automated operator service ("AOS"), i.e., call handling equipment and procedures
10 which can automatically route and complete local and long distance calls without the intervention of a live operator. Typically, an AOS has the ability to complete collect calls and to bill users of that service for both intra- and inter-LATA calls. However, the use of an AOS system opens the possibility of fraudulent activity in certain instances.

15 In many institutions, such as prisons, the phone calls placed by an inmate or patient are restricted to certain previously approved numbers, such as those of family, friends, defense lawyers, etc. To minimize the possibility of fraud or harassment, calls cannot be made to other numbers, such as judges, prosecutors, witnesses, commercial establishments and members of the public at large.
20 Nevertheless, these security measures can be circumvented if an accomplice answering a phone having an approved number uses features of the phone, such as

three-way or conference calling, to establish a connection with an unapproved third party telephone. To avoid these problems, it would be desirable if an AOS system utilized at a prison, for example, could be able to detect when the other, i.e., remote party, has commenced a three-way call (i.e., a three-party calling service initiated by
5 activation of the hook switch) or a conference call (such as that resulting from the bridging of two lines). It should do so reliably, in that it should detect as many of the three-way or conference calls as possible, and it should not be subject to "false detects." False detects are at least irritating, if not expensive, for one or more of the participants to the telephone call. In particular, the AOS should not be prone to
10 false detects resulting from certain other events, such as the announcement or activation of call waiting service which may occur during a normal telephone call.

Several methods of detecting and confirming the detection of an attempted three-way call are known in the prior art. Most of these are intended to recognize one or more changes in the electrical signal resulting from a party's flashing the
15 hook switch to activate a three-way calling feature. The flashing results in a temporary disconnect and reconnect, which can be observed as a momentary interruption of loop current in the immediate circuit associated with the telephone at which the hook flash occurred. Since the current is not interrupted further "down the line," this technique is not available to detect a hook flash at a remote
20 telephone, i.e., at the other telephone involved in a two-party call. In addition, it

cannot distinguish between a hook flash event used for activation of three-way calling service and other hook flash events.

In addition, a battery polarity reversal may be observed at the telephone company central office when the local party performs a hook flash. However, the polarity reversal is not observable down the line to the other party to the telephone call. Thus, this attribute of a hook-flash cannot be employed as a detection mechanism, except at the local central office.

U.S. Patents No. 5,319,702 and 5,539,812, which are commonly assigned to the assignee of the present invention, describe techniques to recognize certain characteristics of the signal received at a local telephone when a remote party flashes the hook switch. Although these techniques reliably detect the vast majority of hook flash signals performed by a remote party to a telephone call, they are not one hundred percent perfect under all conditions. Coupled with the "window analyzation" techniques described in the '702 Patent, these methods can also reliably differentiate an attempted three-way call from a call waiting signal. On the other hand, the techniques described in these patents do not consistently detect conference calls established by "bridging" two lines or by other techniques, such as PBX switching, which do not utilize flashing of the hook switch. In addition, the technology of the '702 and '812 Patents does not reliably detect whether a remote telephone has been forwarded.

Thus, it is desirable to provide a more infallible way of detecting attempts by a remote party to circumvent telephone security procedures, such as those typically employed with inmate telephone calls.

5

SUMMARY OF THE INVENTION

The present invention is based on the discovery that each telephone "connection" i.e., the establishment of an electronic path between a local and a remote party to a telephone call, has a characteristic reflection or "echo" idiosyncratic to that connection. The signal transmitted by the local party's microphone is reflected from a number of sources in the connection. The reflected signal at any other point in the path is different from the originally transmitted signal in a number of characteristics, such as, volume, (i.e., amplitude); phase; and frequency content. It has now been found that the reflection or echo usually does not change significantly once a particular telephone call is established, unless the connection, i.e., signal path, changes.

The echo characteristics of a particular telephone connection are altered, for example, when a three-way calling feature is activated by the remote party at the original destination thereby adding a third party at a secondary destination. The addition of the third party results in a change in the signal path. It has now been found that the change in signal path results in a new, characteristic reflection that can be distinguished from the old one. By continuing to monitor the echo or

reflection over time, it is possible to verify that the event that caused the change was the activation of a three-way calling feature or initiation of a conference call, rather than the use of a call waiting service.

5 The present invention includes means for "zeroing out" or canceling the characteristic echo once a connection has been established. Preferably this is done using an adaptive FIR filter. The coefficients or "tap values" required to cancel the echo are then monitored to determine if the echo changes significantly. Significant changes are analyzed to determine their origin.

10 The invention also includes response means for implementing a predetermined response when an undesirable event is detected. Examples of the responses which can be pre-programmed include call termination, playing a prerecorded message, generating a tone which may be heard by one or more parties to the call, muting the microphone of the local telephone and recording the date and time of the remote party's attempt to initiate the three-way call.

15 The invention is suitable for use in a computer controlled telephone. However, an advantage of the present invention is that the detection apparatus may be located at a site remote from the telephone.

20 Although the system of the present invention is highly reliable, it may be combined with other known techniques, such as the ones referenced previously, to enhance their respective overall reliability as well.

BRIEF DESCRIPTION OF THE DRAWINGS

For convenience, the drawings are briefly described as follows:

Figure 1A is a diagram showing a typical adaptive FIR filter with variable taps. Figure 1B shows an FIR filter arranged in accordance with one embodiment of the present invention to observe a characteristic echo.

Figure 2 shows the sum of the squares output from the adaptive FIR filter after the telephone call is established, and the filter output reaches steady state.

Figures 2A-D shows the sum of the squares output from the adaptive FIR filter over time after establishment of the connection and the happening of certain events on the line. Figure 2A shows the sum of the squares output from the filter after the telephone connection has been established and a three-way call has been initiated. Figure 2B shows the sum of the squares output from the filter when a call waiting notification occurs on the line, but the third party call is not answered. Figure 2C shows the sum of the squares output from the filter when a third party call is answered, and the answering party then returns to the original call. Figure 2D depicts the sum of the squares output of the adaptive FIR filter when a third party call is answered and the answering party continues to talk to the third party caller.

Figures 3A through 3D are block diagrams of the hardware in accordance with certain embodiments of the present invention as connected in several different telephone line situations. Figure 3A shows the apparatus as associated with a local telephone. Figure 3B is a block diagram of the equipment as deployed in a local loop

embodiment. Figure 3C is a block diagram of the equipment as deployed in a 4-wire E&M connection. Finally, Figure 3D is a block diagram of the equipment as deployed in an environment where the incoming signal is already in digital format. This would occur, for example, in many network configurations utilizing pulse code modulation ("PCM") or "DSØ" signals.

Figures 4A through 4D depict various options for locating the detection apparatus of the present invention relative to the local and remote telephones and the telephone network. As used herein, "local" telephone refers to the telephone whose transmitted and returned sound, i.e., "echo," are being monitored. In the applications of particular interest, the "local telephone" would typically be the telephone used by the inmate at the correctional facility. "Remote" telephone refers to the other telephone involved in the original telephone communication, for example, the called party if the inmate at the local telephone initiated the call. In Figure 4A, the detection device is located in connection with the local telephone. In Figure 4B, the detection device is located between two switches. In Figures 4C and 4D, the detection device is located as an "adjunct" to a switch. In the configuration shown in Figure 4C, the detection device is an adjunct to a local central office; in Figure 4D, it is an adjunct to an "IXC," i.e., an interexchange carrier, switch.

Figure 5 is a logic diagram for a preferred analytical technique to verify that an event of interest has occurred consistent with the addition of a secondary telephone designation.

A more complete understanding of the present invention may be derived by referring to the detailed description and claims which follow when considered in connection with the accompanying drawings.

DETAILED DESCRIPTION OF THE INVENTION

5 The following detailed description is provided in reference to the accompanying Figures 1 through 4, wherein like reference numbers indicate like features throughout the drawings.

Before describing the equipment in detail or its method of operation to detect specific events, it is helpful to understand the basic methodology. As previously
10 noted, the invention is based on the discovery that a given connection between a local party's telephone and a remote party's telephone evidences an echo which is characteristic of that connection. This is generally true for a telephone connection, except those involving certain cellular, microwave, or satellite transmissions. Signals emanating from the local party's microphone and echoed back to the local
15 party's receiver from the public switched telephone network ("PSTN") will be altered in one or more ways, i.e., characteristics, that are stable for the connection. The echo characteristics can be ascertained and monitored to determine whether the connection has been changed. If a significant enough change is detected, the echo characteristics can be further analyzed to determine the event which caused the
20 change.

Although several techniques are available, the preferred embodiment utilizes a standard adaptive FIR filter, i.e., an "adaptive filter," with variable taps to monitor the echo signal. An adaptive filter is shown in Figure 1. In lieu of an adaptive FIR filter, an adaptive IIR filter may be used.

5 The output of the adaptive FIR filter immediately after establishment of a telephone call is depicted schematically in Figure 2. When the connection is established, the line is monitored and the deviation between the echoed sound and that transmitted by the local party is minimized by the adaptive FIR filter to a baseline, by constantly making corrections until the deviation between the noise
10 observed and the previous baseline is so small that further corrections are not made. The baseline is shown on Figure 2 as the level period after the initial spike and the "zeroing out" of the echo. Typically, this occurs within one second after the "connection" between the local and remote telephones has been completed.

15 A. METHOD OF OPERATION:

 The present invention can be used to detect events, such as a three-way call, two line conference bridging, and PBX switching to add a third party. That process comprises two parts -- detecting an event of interest and then analyzing the event to confirm if it is one that warrants a response or not. Although the first part of the
20 process can be used alone, it will not be as discriminating as the two step process. In the preferred embodiment of the invention, these functions are performed by

processing digital representations of the appropriate signals. In the embodiment illustrated, these signals consist of the signal transmitted from a microphone, such as the signal on line 871 in Figure 3A at the local telephone and the echo received back, for example, the signal on line 132. As used herein, "echo" refers to the audio
5 signal returning from the direction of the terminating central office corresponding to the signal originating from the local phone source. The echo can be the signal as received back at the local telephone or as intercepted at any appropriate point on the trunk side of the terminating or remote central office.

The method of the present invention is described with respect to the
10 configuration of Figure 4A in which the detector is associated with the local telephone. The detector utilizes the signal emanating from the local party's microphone as the baseline for comparing the echoed or reflected signal received back from the remote party's telephone. The signal emanating from the local party's microphone will normally consist of the local party's speech and any background
15 noise.

It may also be desirable to introduce a known signal for transmission from the local telephone. For example, a broad spectrum, i.e., "white" noise, or a specific tone or frequency can be used. These signals can be generated by commonly known means, such as a white noise generator, or digital signal processing signal generation
20 means, such as available by use of "Matlab™" software. If a specific tone is used, preferably it is noninterfering, i.e., a frequency that doesn't interfere with the voice

transmissions and doesn't "roll off" or get severely affected by the PSTN. For example, a tone generator can be used with a frequency of approximately 20 Hz. Unfortunately, it is difficult to introduce such a signal of sufficient strength that some part of the signal will reliably pass through the PSTN echo cancellation and band limiting means yet not be a distracting nuisance to the parties to the call.

On the other hand, it may be desirable to introduce a known signal at least temporarily during a telephone communication. This may occur, for example, if the local party ceases to speak for an appreciable period of time and there is insufficient background noise to produce a signal at the local microphone of sufficient strength to ensure a viable echo. During such a period of "local silence," it may be desirable to transmit a known signal from the local party's telephone. This may be done by intermittently transmitting a known signal at known intervals or by monitoring the output of the local microphone and, if it falls below a predetermined level for a specified period of time, enabling signal generation means at the local telephone to provide a signal resulting in a viable echo. This is particularly useful to ensure that echo monitoring can occur during a period when the remote party has activated a call waiting feature and is talking to the third party caller. Normally, the local party is silent during that period and absent sufficient background noise, there will be insufficient signals generated at the local telephone to provide an adequate echo for monitoring.

The known signal may be added at the local telephone or at other points in the telecommunication known to one skilled in the art appropriate for the detector configurations shown in the accompanying figures.

In the presently preferred embodiment, the invention is implemented
5 without a specific, generated signal, but instead utilizes the normal communications themselves, i.e., the voice of the local party or other background noise received by the microphone of the local telephone. Typically, at least a portion of these sounds pass through the PSTN echo cancellation and band limiting means so that an
10 "echo" is received at the local party's telephone. These sounds are generally not noticed by persons involved in the telephone communication. However, the echo is of sufficient strength to be monitored for a deviation caused by a change or changes in the signal path.

The method of the present invention is employed after a connection has been established between the local and remote telephones. At that time, the echo
15 received at the local telephone is sent through an adaptive FIR filter as shown in Figure 1. The adaptive FIR filter compares the received signal to the signal transmitted from the local party's microphone and acts to "zero out" any differences. The output of this filter over time as the call is initially established is shown in Figure 2. The output reaches a stable condition shortly after the line
20 connection is established between the two telephones.

The present invention is premised on certain attributes of an adaptive FIR filter. Such a filter has a set of mathematical coefficients (sometimes referred to as "tap values") which exhibit characteristics inherent to the established communication channel. These taps can be examined and monitored to see if a significant enough change has occurred to the channel characteristics, due to a three-way call, bridging of two lines, or answer of a call waiting notification, to warrant call termination or any of the other predetermined actions. Once the filter reaches a steady state or baseline condition, the tap values change in only very small amounts -- barring a variation caused by a three-way call, conference call bridging, or call waiting events.

As mentioned previously, the present invention is based on the observation that the return signal from the remote party's telephone, i.e., the "echo" signal is defined by the signal path idiosyncratic to the particular telephone connection. The difference between the echo and the originally transmitted signal remains constant during the course of the communication, unless an event occurs that changes the path for the signals and, therefore, the echo.

As previously noted, the adaptive FIR filter acts to achieve a steady state characteristic between the baseline signal and the signal echoed back. Thus, as the call is initially established, there is a spike in the error output from the adaptive FIR filter. The error output from the filter diminishes to a small value, i.e., approximately zero, and remains there until an event occurs which changes the

echo. At that time, a change in the channel results in changes in the filter output due to the signal's traveling a different path from the local party's telephone to the other end of the connection and back.

The adaptive FIR filter can detect a change in the path caused by such an
5 event by: (1) comparing tap values; (2) examining frequency content; or
(3) examining the power in the filter.

Although there are numerous ways to look for variations in the tap values,
in the preferred embodiment of the invention, the pseudo-power of the frequency
spectrum is monitored. This could be accomplished by simply summing up the tap
10 values of the entire frequency spectrum. This would compress many numbers
which represent the frequency spectrum into a single value representative of the
entire spectrum. Due to the fact, however, that valid tap values can be both positive
and negative, more than just a simple sum should be performed. Alternatively,
filter tap values could be transformed into the frequency domain, but the
15 transformation would require time to perform. Rather than wasting time
performing the transform, an equivalent method of compressing many values into
one value can be performed on the filter tap values.

Accordingly, it was decided to perform a sum of squares on the filter tap
values. This method has several advantages. First no transform need be
20 performed, thus saving processor resources and time. In addition, the sum of the
squares of the tap values also avoids the problem of summing tap values having

valid positive and negative values. Further, the method gives a pseudo-power measurement of the tap values in a single numerical representation. This single value is a convenient and viable measurement to follow over time, and provides the insight necessary to make a decision concerning the events of interest (e.g. three way, bridging, and call waiting).

The preferred embodiment uses the well known Normalized LMS with tap leakage algorithm for the adaptive filter. This method uses the outgoing inmate's voice in conjunction with the echoed return signal to adapt the filter. The intended use for this algorithm is to characterize the echoed signal's channel characteristics and remove the echo from the returned signal. Once the filter has performed this function and reached a steady state condition the telephone channel is characterized. From this point on, during the course of normal telephone use, the telephone channel does not change significantly. If the remote party attempts a three way or a conference bridge between two lines, or answers a call waiting notification, the telephone channel characteristics change, thus changing the echo characteristics. This will cause the adaptive filter to change from its' previous steady state condition to a new steady state condition. This change can be monitored and a determination of an event of interest can be made.

1. **Logic for Detecting Significant Changes:**

In the preferred embodiment of the present invention, the filter is performed by software utilizing digital signal processing ("DSP") as described below. The

hardware and software are illustrated, for example, as block 880 on Figure 3A. In that regard, a processor should be chosen with enough precision to perform the Normalized LMS algorithm. Using today's standards as a measuring stick a processor which only utilizes 16 bits for its calculations would not be precise enough
5 to get the filter to adapt in the appropriate manner without significant mathematical manipulation. However, a processor which utilizes 32 bits of precision would be more than adequate to perform this operation.

The adaptive filter is in a period of transition from start-up, i.e., when the call is initiated, to steady state, shortly after the telephone connection with the initial
10 destination party has been established. This period is usually quite small depending on the adaption algorithm used by the filter. In the preferred embodiment of the invention the event detection means is disabled briefly during this transition. Once the filter has reached its steady state condition, the detection means is enabled.

Once steady state has been achieved and the event detection algorithm has
15 been activated, it begins to look for significant changes in the sum of the squares of the filter tap values. In the preferred embodiment of the invention, the appropriate electronic signals are sampled, i.e., digitized, at a rate of 8000 samples per second. Thus, the filter receives a new sample every 125 microseconds. Theoretically, it would be possible to determine a new pseudo-power measurement every 125
20 microseconds utilizing the latest tap values. However, it is not necessary to perform these calculations and comparisons that frequently, since the events of interest take

a number of seconds to occur. Instead, the filter tap values are checked and the sum of the squares calculated much less frequently. In the preferred embodiment of the invention, the calculation is performed every 0.25 second, i.e., 250 milliseconds.

The calculated sum of the squares value is then stored in a circular buffer, which keeps the latest values as a reference for determining whether an event of interest has occurred. In the preferred embodiment, the buffer contains five (5) values, i.e., the sum of the squares calculated from the tap values for the prior 1.25 seconds.

A number of protocols could be used for determining whether an event of interest has occurred using the calculated sum of the squares values. In the preferred embodiment, the value of the sum of squares calculated 1 second prior to the current sample is stored in a temporary position. The ratio of this temporary variable position and the most current value of the sum of the squares is computed by dividing the former by the latter. If the result of this division is less than a predetermined value, an event of interest is deemed to have occurred. The predetermined value used in the preferred embodiment is 0.6. It is anticipated that values ranging from approximately 0.8 to 0.5 could be used resulting in greater or lesser degrees of sensitivity and reliability in detecting the events of interest. In the preferred embodiment, a ratio of less than 0.6 indicates that the telephone channel characteristics have changed significantly enough from the steady state conditions to declare, at least initially, that an event of interest has occurred.

The preferred embodiment utilizes a 1 second reference period for determining whether a significant change has occurred in the echo characteristic. The burden of performing additional, more frequent comparisons of the ratio does not have a significant corresponding benefit. On the other hand, the use of larger reference time periods may result in missing certain events of interest. Thus, a typical time period is from one-half to a few, i.e., 2-3 seconds.

2. Analysis:

The detection of a significant variation in the tap values in the filter is a reliable indication that a new channel of communication has been effected. At that time, one of the responses noted below could be implemented. On the other hand, such an implementation could be premature, since the change in the communication channel could be only temporary. This may occur, for example, in a situation where the communication with the remote party is temporarily altered by the activation of a call waiting service.

Figures 2A through 2D show the change in the output from the adaptive FIR filter associated with certain events.

Figure 2A shows a typical change in output resulting from a completed three-way call. In this case the output of the filter after the call has been completed is substantially different from the baseline established prior to the initiation of the three-way call. It should be noted that when the remote party activates the hook switch, the local party is temporarily, put on hold. As a result, the line

characteristics are changed, due to the fact that the central office has switched the line to quiet termination. Following the initial hook flash, the channel changes again to include the third party, causing the line path to change again as indicated by further changes in the reflected signal. In the preferred embodiment of the present invention, the device ultimately determines that there is an event of interest based upon the fact that there is a significant change in the output of the FIR filter and that output did not return to the original baseline value.

Figure 2B shows the typical output from the FIR filter after a call waiting notification signal has been transmitted to one or more of the parties. Regardless of its dissemination, the call notification signal does not result in a change in the filter output.

On the other hand, if the party who has the call waiting service responds to the third party notification signal by answering that call and temporarily responding to it, the output of the filter would change over time as shown in Figure 2C. It should be noted, that in this case the output returns to its original baseline value when the answering party returns to the original conversation.

Finally, Figure 2D illustrates the situation in which the party who has call waiting service responds to the third party notification signal by answering that call and temporarily dropping the original connection or, in the case of some advanced call waiting services, has added the additional party to the original connection.

These situations can be distinguished by continuing to monitor the sum of the squares of the filter tap values after an event of interest has initially been detected. The monitoring is performed in order to see if the sum of the squares returns to original baseline condition. This would indicate that the remote party received a call waiting notification, "flashed out" to talk to the third party and then returned to the original conversation or that some other event may have occurred which did not result in the establishment of a three-way or conference call. If the channel characteristics return to their original value, then the original change in channel characteristics would be ignored, and an event of interest would not be declared.

Alternatively, the apparent "flash out" occurrence could be noted/recorded for reference. Indeed, repeated "flash out" events could be detected and, if appropriately designated as an undesirable activity which could trigger a response, such as a warning message or disconnection, as applicable. This might be particularly useful to detect and prevent the remote party's acting as a "relay" for messages between the local party and a party at a secondary telephone destination by switching between separate connections with each.

Figure 5 is a logic diagram for a preferred analytical technique to verify that an event of interest has occurred consistent with the addition of a secondary telephone designation. The time period utilized in that technique may be from approximately three seconds to several minutes. A typical time period would be from 1 to 60

seconds. Obviously, if longer time periods are used greater buffer or other storage must be available to hold the prior baseline value of interest in the comparison. It should also be noted that, while the channel characteristics may not return to precisely the same value as originally, the variation in characteristics resulting from a return to the original signal pathway should be well outside the criteria used for
5 determining whether a significant change initially occurred.

An event of interest can be declared after the initial change in channel characteristics or following confirmation that the characteristics have not returned to their original value. In either event, once an event of interest has been declared,
10 that decision can be used to implement one or more responses. Such response may include call termination, playing a prerecorded message, generating a tone which may be heard by one or more parties to the call, muting the microphone of the local telephone and recording the date and time of the remote party's attempt to initiate a conference call. Typically, these responses are implemented or activated via
15 conventional software and hardware. The response or responses which are employed can be selectively changed from time-to-time by the user.

3. Alternative Methods:

The invention has been described in an event detection implementation using an adaptive FIR filter as effected in a Normalized LMS algorithm. This
20 implementation is a preferred embodiment, because it works well with speech. As previously noted, it is also possible to use other techniques for identifying and

monitoring an echo characteristic that changes with the addition of a secondary telephone destination to the communication.

For example, it is possible to use an adaptive IIR filter. Although an adaptive IIR filter processes incoming signals differently from an adaptive FIR filter, the output is the same. Thus, it would be possible to implement the invention with an adaptive IIR filter using the sum of the squares of the coefficients to identify and monitor the echo characteristic.

Although not as easy to use as an FIR or IIR filter, a lattice filter may also be used. Preferably, this would be employed with a Kalman algorithm.

In general, differences in either the time domain or the frequency domain between an outgoing signal and its "echo" can be used to ascertain an appropriate echo characteristic for a given telecommunication. In the time domain, the delay or phase response may be used to define an echo characteristic, although the latter, may be somewhat difficult to implement because the echo may contain multiple reflections. Nevertheless, such a characteristic might be ascertained using an IIR filter looking for a group delay. An auto correlation function algorithm may be used to ascertain the characteristic time delay in receiving back a stream of information corresponding to the original signal. In the frequency domain, the magnitude of the signal being returned (e.g., the percentage of signal strength) may define an echo characteristic. The shape of the spectrum may also be employed.

A significant change in echo characteristics can be ascertained by any of these techniques. The event detection may be followed by continuing analysis of the signal to confirm the nature of the event.

4. **Advantages:**

5 An advantage of the present invention is that it can precisely distinguish the initiation of a three-way call from temporary activation of a call waiting service. In the case of a call waiting event, the channel path returns to its initial state and the echo returns to its original baseline. In contrast, the three-way call establishes a new channel path with new echo characteristics.

10 A further advantage of the present invention is that it can be utilized to detect conference calls which are initiated through means which do not involve activation of the hook switch. This can occur, for example, where two lines are "bridged" to create a call between three parties. When this occurs, it obviously results in a change in the communication path between the original remote and calling parties
15 whose line is being monitored, and can be detected as such.

Further, the present invention is not prone to "false detects" which might be encountered with other three-way or conference detection technology. For example, the present invention will not be affected by one or more of the various call waiting notification signals that are generated by telephone service providers.

5. Call Forwarding Detection:

The present invention can also be used to detect when a remote telephone has been forwarded to a third party. This is accomplished by electronically storing the echo characteristics of one or more calls previously made with the same remote
5 telephone. Every time the number is called, the characteristics, once the filter is zeroed out, are compared against the stored value(s). If there is a substantial difference, this is an indication that the call has been forwarded.

B. SYSTEM CONFIGURATIONS:

10 Having described the basic steps involved in detecting events occurring during the communication between the remote and local parties, it is now possible to explain the general organization of the architecture appropriate to implement the present invention as shown in Figures 3A through 3D. The system is described in the context of an AOS.

15 Figures 3A-3D disclose four likely implementations for use of the present invention in telephone or telephone equipment related applications. It will be clear to those skilled in the art that other combinations of input (controlled telephone equipment) connections and output (monitored or remote telephone equipment) connections are easily configured by appropriate use of the information provided.

20 Figure 3A pertains to telephone equipment wherein the apparatus of the present invention is included as a direct subsystem of the telephone equipment.

Figure 4A indicates the relative placement of the present invention in such an implementation.

As shown in Figure 3A, the present invention is incorporated with the controlled telephone equipment, in this example shown as a conventional
5 telephone user interface consisting of a listening point indicated as an earphone 750 and sound sources indicated as microphone and DTMF generating keypad both shown as 700. In addition, a user activation element is shown as hookswitch 770. An example of such an arrangement is a telephone handset, cradle hookswitch, and DTMF generating keypad. In such an application the circuit shown could be
10 powered by a power supply deriving its standby power requirements from a small wall-type transformer. The following discussion assumes such an application.

When the user of the controlled telephone equipment lifts the handset from the cradle the hookswitch 770 automatically sends user request signal 180 to the controller wherein the controller would send a command to the DSP subsystem via
15 command signal 881 to generate a user dial tone and to begin looking for sound or, perhaps more simply, for DTMF tones on signal 871. The DSP subsystem 880 then creates the proper sequence of digital patterns which are sent as the current signal 876 to DAC 877 which in turn translates the digital signal 876 into the appropriate voltage pattern as analog signal 699 which is heard by the telephone
20 equipment user on the earphone 750.

When the telephone equipment user presses a key on the keypad, a DTMF tone will be generated which will be presented on signal 871, which is digitized by ADC 872 and sent to the DSP subsystem 880 as the current signal 873. As the DSP subsystem is currently looking for, at least, DTMF tones it will detect and recognize
5 the first DTMF tone. The DSP subsystem could then automatically stop generating the user dial tone or wait for the controller 800 to so instruct but in any case would send the value or meaning of the detected DTMF tone to the controller 800 over the circuit for signal 659. If so designed, the controller 800 would instruct the DSP subsystem 880 to stop generating the user dial tone going to the user earphone 750
10 but to continue looking for additional DTMF tones on signal 871. Each key pressed by the telephone equipment user would similarly be detected and sent to the controller 800 until the controller 800 determines that a complete sequence of digits has been entered. At that point, the controller 800 may optionally send a command to the DSP subsystem via signal 881 to discontinue looking for additional sound
15 and/or DTMF digits.

At this point, the controller 800 might, for example, determine if the sequence of digits entered by the telephone equipment user corresponds to an "invalid" telephone number. A number may be deemed "invalid," for example, if the telephone equipment user were attempting to place a collect call to a public coin
20 telephone or if the telephone equipment user were a prison inmate attempting to call a witness whose telephone number was listed in an appropriate database. If the

controller determines that the number is invalid, it may take appropriate action, such as denying the attempted call to that number.

When ready to forward the call to the number requested by the telephone equipment user, controller 800 would seize the line 101, 102 by activating an
5 appropriate relay or switch indicated as relay 103. The loop current detector 100 completes the DC path for the LEC switch causing DC current to flow in through the TIP and RING wires from the serving central office. The indicated loop start circuits could easily be replaced by ground-start circuits by one skilled in the art. Controller 800 would also send a command to the DSP subsystem 880, via signal 881, to look for
10 sound or, more particularly network dial tone. Note that in this example the internal circuits of the present invention are isolated from the PSTN by transformer 108 and the loop current detector 100 which is commonly implemented using an optoisolator of sufficient voltage rating. Capacitor 112 is provided to complete the AC, or audio, path for the network TIP/RING pair. Note also that a two wire to four
15 wire hybrid function 130 is provided to isolate the "outgoing" analog signals 131 from the "incoming" analog signals 132. The hybrid function 130 can be any of a number of the passive or active implementations well known in the art.

When the serving central office is ready to receive dialing instructions, it will send the dial tone signal on the TIP/RING pair. This signal will be coupled through
20 transformer 108 to the hybrid function 130 where the dial tone signal is separated to the hybrid output signal 132. Signal 132, currently the network dial tone, is then

connected to ADC 874 where the dial tone is converted to digital form and passed to the DSP subsystem 880 as signal 875. The DSP subsystem then passes information about the signal 132, 875 to the controller 880 via the reporting circuit signal 659. At this point the controller 800 would send an appropriate command to the DSP
5 subsystem to prepare to generate DTMF tones via DAC 879 and a sequence of digits to the DSP subsystem to be sent to the PSTN. The DSP subsystem 880 accepts the command and digit sequence and proceeds to generate an appropriate digital pattern which is presented as signal 878 to the DAC 879 which in turn translates the digital pattern into an analog voltage 131. The hybrid function 130 takes the analog signal
10 131 and drives the transformer 108 and thus the PSTN TIP/RING pair with the requested DTMF tone. Clearly a pulse dial relay system could also be used to out pulse the requested digit sequence.

Two subsystems are available to send an audio, i.e., verbal, message to the telephone equipment user. First, the DSP subsystem can generate an appropriate
15 sequence as signal 876, preferably as described by an internally stored message pattern. Alternately another audio source such as a recorded message or live microphone system indicated as 710 would provide the analog message 711 that can be digitized by ADC 712 into the digital signal 713 which the DSP subsystem would send as signal 876 to DAC 877 recreating signal 699 to the telephone equipment user
20 earphone 750. A more direct, but perhaps more expensive, method would be to

provide a direct analog path from source 710 to a mixer amplifier driving the earphone 750.

After the requested digit sequence has been delivered to the PSTN, the controller 800 would use one or more of the methods known to those skilled in the art to determine when the called party has "answered" such that a connection exists
5 between the local and remote telephones. Controller 800 would next instruct the DSP subsystem 880 to neutralize the echo within signals 132, 878 due to current signals 871 and/or 711 at 131. At this point controller 800 would command the DSP subsystem 880 to look for a significant change in the characteristic echo indicating
10 the addition of a secondary telephone destination. When such an event is detected by the DSP subsystem 880, the DSP subsystem 880 will preferably interrupt the controller 800 by signal 472. The controller may or may not have previously commanded the DSP subsystem to pass the digital signal 873 to signal 878. If so, the direct signal 304 may be used to mute the microphone 700 circuit. Alternatively, the
15 DSP subsystem 880 could be commanded to pass only a portion of the microphone 700 signal such as through a high pass filter function perhaps with a low end pass frequency of 1500 Hz or so until the remote party answer has been confirmed. After the remote party answer has been confirmed controller 800 would proceed with an appropriate protocol and other command sequences not specifically concerned with
20 the present invention. For the purpose of the present invention, at some point the combined controller 800 and DSP subsystem 880 can be assumed to enter a secondary

destination detection mode. At that point, the DSP subsystem 880 will be looking for and reporting significant changes in the echo characteristics to the controller 800, and the controller 800 will be taking appropriate pre-programmed action. Each time the DSP subsystem 880 detects an event consistent with the addition of a secondary
5 destination, signal controller 800 will be notified via signal 472. Controller 800 can issue commands, for example, to stop passing audio from signal 871 to 131, i.e., mute the controlled sound source. In any case, all necessary circuits and components are provided to detect and respond to the attempted addition of a secondary telephone destination.

10 Figure 3B shows the apparatus of the present invention as connected to an otherwise independent loop-start telephone or piece of telephone equipment by being placed electrically between the serving central office and the independent telephone or piece of telephone equipment. The indicated loop start circuits could easily be replaced by ground-start circuits by one skilled in the art. Figure 4A
15 indicates the relative placement of the present invention in such a case.

Comparing Figure 3B with Figure 3A, it is apparent that the only change to the overall circuit is to provide the circuitry necessary to disassociate the present invention from the controlled telephone equipment. This is accomplished by providing a loop bias ("talk battery") voltage and external telephone equipment off-
20 hook detection circuits depicted as block 160. As the signals 871 and 699 are unidirectional, a second hybrid function 190 is provided to convert the

unidirectional, i.e., four wire, signals to the two wire bi-directional form. Isolation is provided by transformer 168. AC audio circuit completion is provided by capacitor 172. The DC bias voltage is provided by the loop bias block 160. Block 160 also contains appropriate loop current detection in a manner similar to block 100.

5 The resulting subscriber line interface circuit ("SLIC") looks exactly like a standard Telco central office TIP/RING pair and is designated by leads 161, 162. Any standard telephone interface equipment can be connected to the TIP/RING pair 161, 162 as shown by the telephone instrument 50 via telephone line 51.

When the telephone equipment 50 goes off hook, the loop current detector
10 160 will sense the occurrence and report to the controller via signal 180 exactly as in Figure 3A.

Figure 3C pertains to a stand alone piece of telephone equipment using industry standard four wire plus E&M ("4E&M") analog interconnections intended to be connected within the PSTN. In this case, the present invention would not be
15 connected directly to the telephone or telephone equipment receiving the control benefits of the present invention. Instead, it would be connected either between two switches (Figure 4B) or as an adjunct to a switch (Figures 4C and 4D).

In the case shown in Figure 3C, there are no loop current detectors or hybrid functions. In 4E&M circuits, the audio paths are always connected but not
20 necessarily active. The equivalent to the controlled telephone going off-hook is when the E-lead 663 from the PSTN circuit providing the E-lead signal is activated.

The equivalent signal is now a remote "service request" but is, in effect, the same as the controlled telephone equipment going off hook. The controlled telephone equipment E-lead is monitored by E-lead detector 664 and reported to the controller 800 as signal 180. Numerous circuits are known in the art, such as, isolation relays, transistor level shifters and, similar to loop current detectors, simple optoisolator
5 circuits.

The controller 800 has the additional task in this network application of responding to the requesting PSTN switch with appropriate "winks" and "off hook" conditions on the M-lead. This is accomplished via signal 185 connected to an
10 M-lead driver 668 which in turn commonly drives a mercury wetted relay as the actual M-lead signal. Other M-lead signal driving circuits are known in the art.

On the monitored telephone equipment side, a similar set of connections are disclosed. Instead of driving relay 103 as in Figure 3A the monitored telephone equipment network switch is notified that service is requested by asserting signal 125
15 to the monitored side M-lead driver 678 which in turn drives the monitored side M-lead 679. Instead of waiting for a dial tone as in Figure 3A and 3B, it is necessary to wait only for the monitored side switch to indicate service acceptance by the use of its E-lead signal 673. This is detected by the E-lead detector 674 and reported to the controller 800 via signal 120. In all other respects, the circuits described in Figure 3C
20 act in a manner similar to those in Figures 3A and 3B.

Figure 3D is a block diagram which shows the general organization of the equipment of the present invention where the signals transmitted and received on the line are already digitized. This occurs, for example, where the detection equipment is located in the network as part of the transmission of a call which has
5 already been digitized.

In this case, the present invention would not be connected directly to the telephone or telephone equipment receiving the control benefits of the present invention but rather either between two switches (Figure 4B) or as an adjunct to a switch (Figures 4C and 4D).

10 The standard practice is currently to digitize the telephone audio signals at the LEC end office before transmission in digital form to another intra-LATA end office or to an inter exchange carrier for transmission to an inter-LATA end office. Each audio path equivalent is referred to as a trunk and the digitized trunk is referred to as a "DSØ" level signal. Multiple DSØ signals may be multiplexed over a single
15 physical path, for example, DS1 and DS3 level paths, which are the normal signal connection levels to and from the LEC and/or IXC. For purposes of the present invention the DSP subsystem is described as an individual subsystem for each DSØ trunk. It may be clear to those normally skilled in the art that a DSP subsystem with sufficient speed (digital bandwidth) could directly handle multiple DSØ trunks by
20 appropriately partitioning of memory and processing time.

Because the signal is digital form, it is not necessary to have analog to digital converters 872 and 874 shown in Figures 3A-3C. Instead, in the embodiment shown in Figure 3D, there is a single analog to digital converter 712 which is used solely to convert internal audio sources 710, if any, such as tones or recorded messages, such as those that might be initiated by controller 800, if a connection to a secondary destination is confirmed.

In the case shown in Figure 3D, there are no loop current detectors or hybrid functions. In DSØ circuits, the audio paths are always connected but not necessarily active. The equivalent to the controlled telephone going off hook is, in the case of in-band or robbed bit signalling, when the A-bit as part of signal 561 from the controlled telephone equipment PSTN is activated. The equivalent signal is now a remote 'service request' but is, in effect, the same as the controlled telephone equipment going off hook. The controlled telephone equipment service request A-bit is monitored by the indicated transceiver 560. This transceiver may be a combination of available circuits from, for example, Crystal Semiconductor Corporation, Austin, Texas, or may be implemented in a field programmable gate array such as available from Xilinx, Inc., San Jose, California. This A-bit signal is handled exactly as the E-lead in Figure 3C. The signal equivalent to the M-lead is an outgoing or return A-bit sent by the controller 800 as signal 185 which is inserted into the PCM signal 567.

Similarly, the in-band or robbed bit service request from the present invention would be sent from the controller 800 as signal 125 which transceiver 570 inserts into the PCM bit stream 577 in the same manner as the other transceiver. The outgoing service acceptance will be sent by the PSTN receiving switch as the
5 A-bit in PCM signal 571 which, in turn, is decoded by transceiver 570 and sent to controller 800 as signal 120.

An option to the in-band or robbed bit signals is the use of out-of-band signalling as in the case of SS7 or ISDN implementations. In this case the transceivers 560, 570 are primarily PCM buffers and the service request and
10 acceptance signals are provided on the signal 195 from the controlled telephone equipment end and on signal 190 from the monitored telephone equipment end.

It should be noted that the use of the terms "local" and "remote" with respect to particular telephones, are not intended to limit the invention in any way, other
15 than to illustrate specific embodiments or to assist in defining the location of the apparatus of the invention with respect to other pieces of equipment. In fact, the apparatus of this invention may be connected to any telecommunication between two parties in which one of the parties has a three-way calling feature or other conferencing capability, such as two line bridging, PBX switching, etc.

20 Similarly, it should be understood that reference to the apparatus of this invention being "connected" to a telecommunication includes any configuration in

which the apparatus of this invention is capable of monitoring the desired signals and responding in the desired manner, if the initiation of a three-way, conference call, or call diversion is detected.

5 The invention has been described in detail with reference to particular embodiments thereof, but it will be understood that various other modifications can be effected within the spirit and scope of this invention.

 For example, in the embodiment described herein, the signal generated by the transmitter of the local party and the echo signal are used for monitoring the
10 characteristics of the established connection to determine whether an event of interest has occurred. Typically this includes the sound of the local party's voice and associated background noise which is picked up by the local party's microphone. Instead of relying solely on the local party's voice for the reference signal, it would be possible to inject a signal of low amplitude to use for reference purposes. Care
15 must be taken in determining the appropriate type of signal to use for this purpose. The injected signal should be of low enough amplitude to not be annoying to the call in progress, yet sufficiently strong that it will have a viable echo. One further qualification used for the injected signal is that it has to be of high enough
20 amplitude in order to be useful notwithstanding the processing devices commonly used for echo cancellation and band limiting in telephone communications.

In addition, it is possible to use the technology of the present invention in conjunction with that of the '702 and '812 patents identified previously to determine whether a three-way call or conference call has been initiated. This could occur in both serial or parallel configurations that could increase the overall accuracy and effectiveness obtained over that to be achieved by any of the implementations alone. For example, one could use the detection means described in the '702 patent as a means for verifying that the output of the adaptive FIR filter should be analyzed more closely to determine if there has been any change in the telephone channel characteristics. Or if the filter output indicates that a change in channel characteristics has occurred, the signal detection means in the '702 Patent could be used for further confirmation that a three way call had been attempted. Other combinations of these technologies could be employed.

I claim:

1. A method for detecting whether a remote party, using a remote telephone in telecommunication with a local telephone, has added a third party at a secondary telephone destination to said telecommunication comprising:
5
 establishing a telephone connection between the local telephone and the remote telephone;
 identifying an echo characteristic to said telephone connection; and
 monitoring the echo characteristic for a significant change in the
10 characteristic consistent with the addition of the secondary telephone destination by said remote party.

2. The method of Claim 1, wherein said identifying and said monitoring of an echo characteristic is accomplished by ascertaining differences between a signal
15 and an echo of said signal in the time domain.

3. The method of Claim 1, wherein said identifying and said monitoring of an echo characteristic is accomplished by ascertaining differences between a signal and an echo of said signal in the frequency domain.

20

4. The method of Claim 3, wherein said monitoring of the echo characteristic is a step selected from the group consisting of identifying differences in the magnitude of the signal and an echo of the signal and identifying differences in the shape of the original signal and an echo of that signal.

5

5. The method of Claim 1, wherein said identifying and said monitoring of an echo characteristic is accomplished by means selected from the group consisting of adaptive filtration with an FIR filter, adaptive filtration with an IIR filter, and adaptive filtration with a lattice filter.

10

6. The method of Claim 1, wherein said identifying of a characteristic echo includes intercepting a signal returned from the remote telephone on the trunk side of the remote central office.

15

7. The method of Claim 1, wherein said identifying of a characteristic echo includes receiving at the local telephone of a signal returned from the remote telephone.

8. The method of Claim 1, wherein said identifying of a characteristic echo utilizes signals transmitted from and received by said local telephone.

20

9. The method of Claim 1, wherein the signals transmitted from said local telephone includes a known signal generated for the purpose of identifying and monitoring the echo characteristic.

5 10. The method of Claim 9, wherein the signals generated are selected from the group consisting of a signal with a specific tone and white noise.

11. The method of Claim 10, wherein the signals are generated intermittently.

10

12. The method of Claim 10, wherein the signals are generated when the sound being received by the microphone of the local telephone is abated.

13. The method of Claim 1, wherein the identifying of a characteristic echo
15 is accomplished by adaptive filtration with an FIR filter.

14. The method of Claim 1, wherein the identifying of a characteristic echo is accomplished by summing the squares of the coefficients used by an adaptive FIR filter to minimize the echo.

20

15. The method of Claim 14, wherein said monitoring is accomplished by comparing the sum of the squares output of an adaptive FIR filter to the sum of the squares output of said filter at an earlier time.

5 16. The method of Claim 15, wherein the earlier time is approximately 1 to 3 to seconds earlier.

10 17. The method of Claim 1, further including the step of verifying that a change in the echo characteristic is caused by the addition of a secondary telephone destination by continuing to monitor the echo characteristic after the significant change to determine whether the echo characteristic has returned to its original value.

15 18. The method of Claim 17, wherein the step of verifying comprises continuing to monitor the echo characteristic for a period of approximately 3 seconds to 3 minutes after the significant change to determine whether the echo characteristic has returned to its original value.

20 19. The method of Claim 1, further including the making of a response when it is determined from said monitoring that a significant change in the echo

characteristic has occurred consistent with the addition of the secondary telephone destination by said remote party.

20. The method of Claim 19, wherein said response is selected from the
5 group consisting of terminating the telephone connection, playing a prerecorded message, generating a tone which may be heard at one or more of the local or remote telephones, muting the microphone of the local telephone, and recording the date and time of the remote party's addition of a secondary telephone destination.

10

21. A method for detecting whether a remote party, using a remote telephone in telecommunication with a local telephone, has added a third party at a secondary telephone destination to said communication:

establishing a telephone connection between the local telephone and
5 the remote telephone;

comparing a transmitted signal and an echo signal with an adaptive
FIR filter to generate tap values;

summing the squares of the tap values to identify an echo characteristic
to said telephone connection; and

10 monitoring the echo characteristic for a significant change in the echo
characteristic consistent with the addition of the secondary telephone destination by
said remote party.

22. The method of Claim 21, wherein the monitoring is conducted by
15 comparing a recent value of the echo characteristic to a prior value for such
characteristic to determine whether the ratio of the two values falls below a certain
predetermined ratio.

23. The method of Claim 22, wherein the ratio is in the range of
20 approximately 0.8 to 0.5.

24. The method of Claim 22, wherein the ratio is approximately 0.6.

25. The method of Claim 21, wherein said comparing of said transmitted signal and said echo signal includes intercepting a signal returned from the remote
5 telephone on the trunk side of the remote central office.

26. The method of Claim 21, wherein said comparing of said transmitted signal and said echo signal includes receiving at the local telephone of a signal returned from the remote telephone.

10

27. The method of Claim 21, wherein said comparing of said transmitted signal and said echo signal employs signals transmitted from and received by said local telephone.

15

28. The method of Claim 27, wherein the transmission of signals from said local telephone includes a known signal generated for the purpose of ascertaining and monitoring the echo characteristic.

29. The method of Claim 28, wherein the signals generated are selected
20 from the group consisting of a signal with a specific tone and white noise.

30. The method of Claim 28, wherein the signals are generated intermittently.

31. The method of Claim 30, wherein the signals are generated when the
5 sound being received by the microphone of the local telephone is abated.

32. The method of Claim 31, further including the step of verifying that a
change in the echo characteristic is caused by the addition of a secondary telephone
destination by continuing to monitor the echo characteristic after the significant
10 change to determine whether the echo characteristic returns to its original value.

33. The method of Claim 32, wherein the step of verifying comprises
continuing to monitor the echo characteristic for a period of approximately 3
seconds to 3 minutes after the significant change in echo characteristic to determine
15 whether the echo characteristic has returned to its original value.

34. The method of Claim 21, further including the making of a response
when it is determined from said monitoring that a significant change in the echo
characteristic has occurred consistent with the addition of the secondary telephone
20 destination by said remote party.

35. The method of Claim 34, wherein said response is selected from the group consisting of terminating the telephone connection, playing a prerecorded message, generating a tone which may be heard at one or more of the local or remote telephones, muting the microphone of the local telephone, and recording
5 the date and time of the remote party's addition of a secondary telephone destination.

36. The method of Claim 32, further including the making of a response when it is determined from said monitoring that a significant change in the echo
10 characteristic has occurred consistent with the addition of the secondary telephone destination by said remote party.

37. The method of Claim 36, wherein said response is selected from the group consisting of terminating the telephone connection, playing a prerecorded
15 message, generating a tone which may be heard at one or more of the local or remote telephones, muting the microphone of the local telephone, and recording the date and time of the remote party's addition of a secondary telephone destination.

38. A method for detecting whether a remote party, using a remote telephone in telecommunication with a local telephone, has added a third party at a secondary telephone destination to said communication:

establishing a telephone connection between the local

5 telephone/equipment and the remote telephone;

inputting the signal transmitted by the local telephone and the signal received by the local telephone into an adaptive FIR filter to generate tap values;

summing the squares of the tap values to identify an echo characteristic to said telephone connection;

10 monitoring the echo characteristic for a significant change in the echo characteristic resulting from the addition of the secondary telephone destination by said remote party;

15 verifying that a change in the echo characteristic is caused by the addition of a secondary telephone destination by continuing to monitor the echo characteristic after the significant change to determine whether the echo characteristic has returned to its original value; and

making a response if it is verified from said monitoring that the significant change in the echo characteristic was consistent with the addition of the secondary telephone destination by said remote party.

20

39. The method of Claim 37, wherein the monitoring is conducted by comparing a recent value of the echo characteristic to a prior value for such characteristic to determine whether the ratio of the two values falls below a certain predetermined ratio.

5

40. The method of Claim 39, wherein the ratio is in the range of approximately 0.8 to 0.5.

41. The method of Claim 39, wherein the ratio is approximately 0.6.

10

42. The method of Claim 38, wherein said comparing of said transmitted signal and said echo signal includes intercepting a signal returned from the remote telephone on the trunk side of the remote central office.

15 43. The method of Claim 38, wherein said comparing of said transmitted signal and said echo signal includes receiving at the local telephone of a signal returned from the remote telephone.

20 44. The method of Claim 38, wherein said comparing of said transmitted signal and said echo signal employs signals transmitted from and received by said local telephone.

45. The method of Claim 38, wherein the transmission of signals from said local telephone includes a known signal generated for the purpose of ascertaining and monitoring the echo characteristic.

5

46. The method of Claim 45, wherein the signals generated are selected from the group consisting of a signal with a specific tone and white noise.

47. The method of Claim 45, wherein the signals are generated
10 intermittently.

48. The method of Claim 47, wherein the signals are generated when the sound being received by the microphone of the local telephone is abated.

49. A method for detecting whether a remote telephone to which a telecommunication has been directed by a local telephone has been forwarded to a secondary telephone destination:

initiating a telephone communication from the local telephone to the
5 remote telephone;

identifying an echo characteristic for said telephone communication;
and

comparing the identified echo characteristic with at least one stored
value for said echo characteristic from previous telecommunications between said
10 local telephone and said remote telephone to determine whether there is a
significant difference between the identified echo characteristic and the stored echo
characteristic indicating that the telecommunication to the remote telephone has
been forwarded to a secondary telephone destination.

15 50. The method of Claim 49, wherein said identifying and said monitoring
of an echo characteristic is accomplished by ascertaining differences between a signal
and an echo of said signal in the time domain.

20 51. The method of Claim 49, wherein said identifying and said monitoring
of an echo characteristic is accomplished by ascertaining differences between a signal
and an echo of said signal in the frequency domain.

52. The method of Claim 51, wherein said monitoring of the echo characteristic is a step selected from the group consisting of identifying differences in the magnitude of the signal and an echo of the signal and identifying differences in the shape of the original signal and an echo of that signal.

53. The method of Claim 49, wherein said identifying and said monitoring of an echo characteristic is accomplished by means selected from the group consisting of adaptive filtration with an FIR filter, adaptive filtration with an IIR filter, and adaptive filtration with a lattice filter.

54. The method of Claim 49, wherein said identifying of a characteristic echo includes intercepting a signal returned from the remote telephone on the trunk side of the remote central office.

55. The method of Claim 49, wherein said identifying of a characteristic echo includes receiving at the local telephone of a signal returned from the remote telephone.

56. The method of Claim 49, wherein said identifying of a characteristic echo utilizes signals transmitted from and received by said local telephone.

57. The method of Claim 49, wherein the signals transmitted from said local telephone includes a known signal generated for the purpose of identifying and monitoring the echo characteristic.

5

58. The method of Claim 57, wherein the signals generated are selected from the group consisting of a signal with a specific tone and white noise.

59. The method of Claim 49, wherein the identifying of a characteristic echo is accomplished by adaptive filtration with an FIR filter.

10

60. The method of Claim 49, wherein the identifying of a characteristic echo is accomplished by summing the squares of the coefficients used by an adaptive FIR filter to minimize the echo.

15

61. The method of Claim 49, further including the step of verifying that a change in the echo characteristic is caused by the forwarding of the remote telephone to a secondary telephone destination by continuing to monitor the echo characteristic after the significant change to determine whether the echo characteristic has returned to its stored value.

20

62. The method of Claim 61, wherein the step of verifying comprises continuing to monitor the echo characteristic for a period of approximately 3 seconds to 3 minutes after the significant change to determine whether the echo characteristic has returned to its stored value.

5

63. The method of Claim 49, further including the making of response when it is determined that a significant change in the echo characteristic has occurred consistent with the forwarding of the remote telephone to a secondary telephone destination.

10

64. The method of Claim 63, wherein said response is selected from the group consisting of terminating the telephone connection, playing a prerecorded message, generating a tone which may be heard at one or more of the local or remote telephones, muting the microphone of the local telephone, and recording the date and time of the remote party's addition of a secondary telephone destination.

15

20

65. An apparatus for use in determining whether a remote party, using a remote telephone in telecommunication with a local telephone has added a secondary telephone destination to said telecommunication comprising:

5 first means for determining a characteristic echo associated with the telecommunication between the local telephone equipment and the remote telephone, and

second means for monitoring the echo for significant changes in the echo caused by the addition of a third telephone destination by said remote party.

10 66. The apparatus of Claim 65, in which the first means is selected from the group consisting of an adaptive FIR filter, an adaptive IIR filter, or an adaptive lattice filter.

15 67. The apparatus of Claim 66, in which the FIR, IIR or adaptive lattice filter is emulated by a digital computer.

68. The apparatus of Claim 65, in which said second means includes means for comparing a recent value of the echo characteristic with an earlier value of the echo characteristic.

20

69. The apparatus of Claim 68, in which said second means is accomplished by a digital computer.

70. A method for detecting whether a remote party, using a remote telephone in telecommunication with a local telephone, is relaying messages between a third party at a secondary telephone destination to said telecommunication and the party at a local telephone comprising:

5 establishing a telephone connection between the local telephone and the remote telephone;

 identifying an echo characteristic to said telephone connection;

 monitoring the echo characteristic for a significant change in the characteristic consistent with the addition of the secondary telephone destination by
10 said remote party:

 continuing to monitor the echo after the significant change has occurred to determine whether the echo fluctuates between the characteristic for the telephone connection between the local and remote telephone and the characteristic consistent with the addition of the secondary telephone destination.

15

71. The method of Claim 70, wherein said identifying and said monitoring of an echo characteristic is accomplished by means selected from the group consisting of adaptive filtration with an FIR filter, adaptive filtration with an IIR filter, and adaptive filtration with a lattice filter.

20

72. The method of Claim 71, wherein said identifying of a characteristic echo includes intercepting a signal returned from the remote telephone on the trunk side of the remote central office.

5 73. The method of Claim 71, wherein said identifying of a characteristic echo includes receiving at the local telephone of a signal returned from the remote telephone.

74. The method of Claim 71, wherein said identifying of a characteristic
10 echo utilizes signals transmitted from and received by said local telephone.

75. The method of Claim 71, wherein the signals transmitted from said local telephone includes a known signal generated for the purpose of identifying and monitoring the echo characteristic., wherein the signals generated are selected
15 from the group consisting of a signal with a specific tone and white noise.

76. The method of Claim 75, wherein the signals are generated intermittently.

20 77. The method of Claim 75, wherein the signals are generated when the sound being received by the microphone of the local telephone is abated.

78. The method of Claim 71, wherein the identifying of a characteristic echo is accomplished by adaptive filtration with an FIR filter.

5 79. The method of Claim 71, wherein the identifying of a characteristic echo is accomplished by summing the squares of the coefficients used by an adaptive FIR filter to minimize the echo.

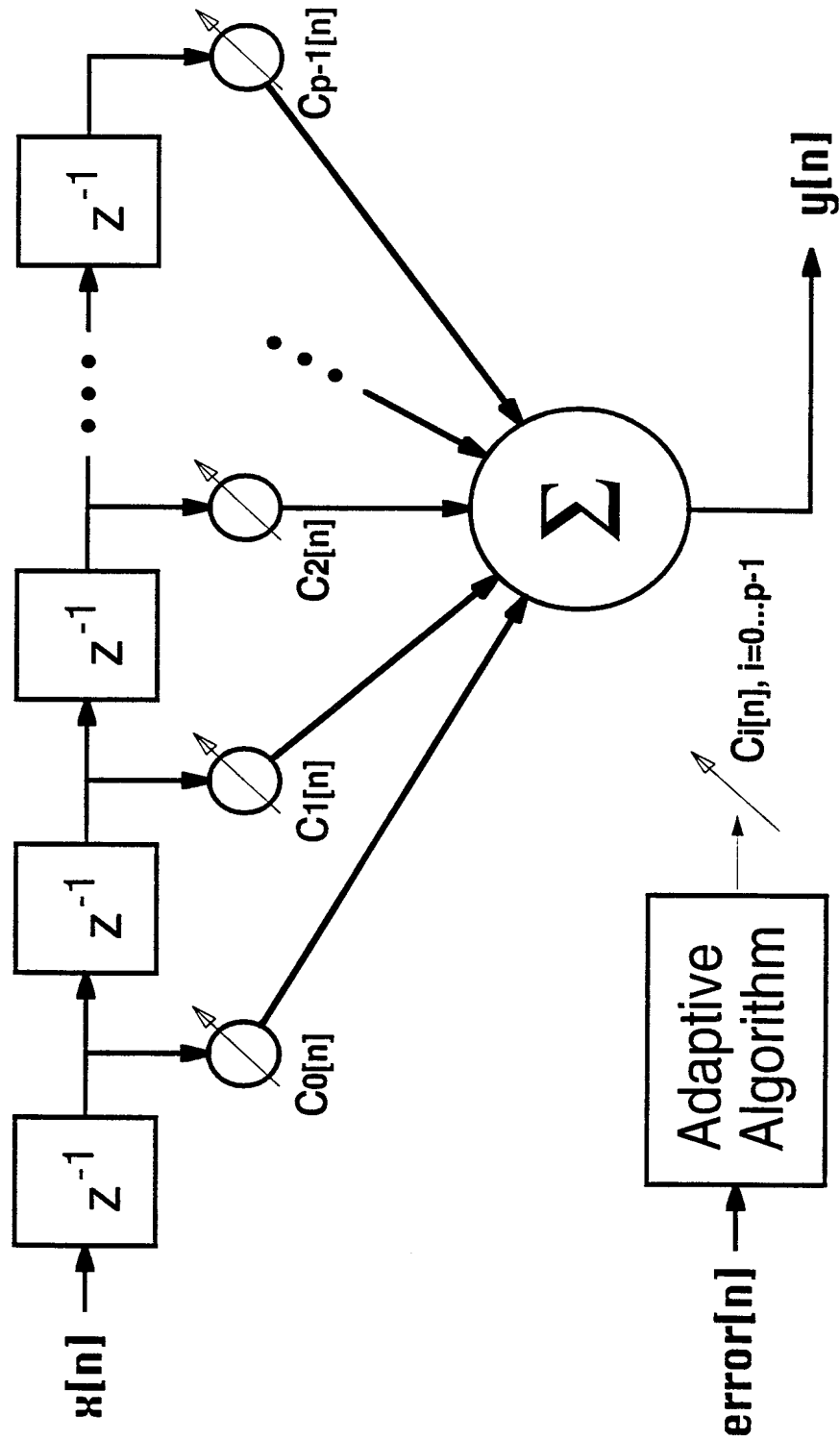
10 80. The method of Claim 79, wherein said monitoring is accomplished by comparing the sum of the squares output of an adaptive FIR filter to the sum of the squares output of said filter at an earlier time.

15 81. The method of Claim 80, wherein the earlier time is approximately 1 to 3 to seconds earlier.

20 82. The method of Claim 71, further including the making of a response when it is determined from said monitoring that a significant change in the echo characteristic has occurred consistent with the addition of the secondary telephone destination by said remote party.

83. The method of Claim 82, wherein said response is selected from the group consisting of terminating the telephone connection, playing a prerecorded message, generating a tone which may be heard at one or more of the local or remote telephones, muting the microphone of the local telephone, and recording
5 the date and time of the remote party's addition of a secondary telephone destination.

Figure 1a
Basic Adaptive FIR Filter Structure



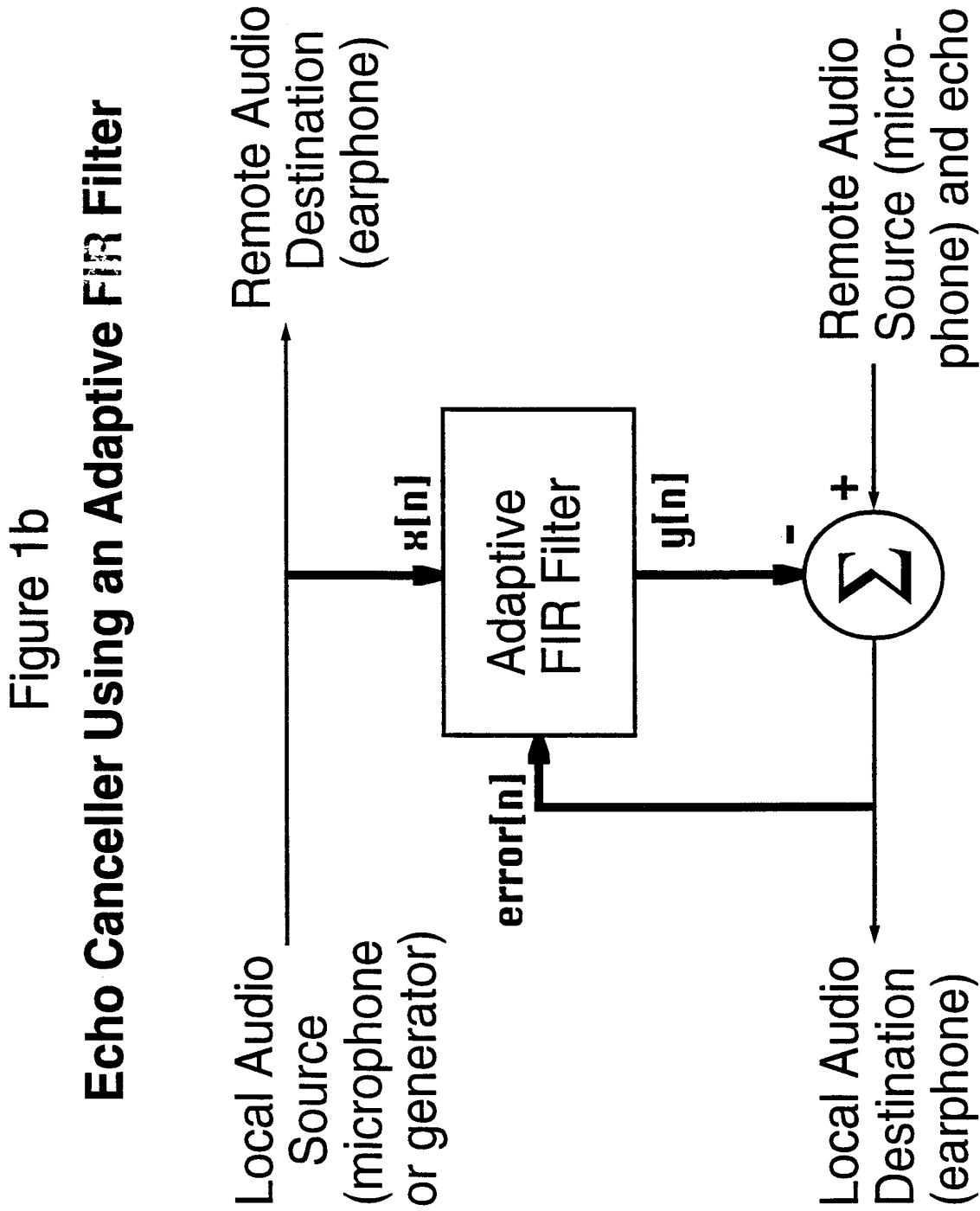


Figure 2
ADAPTIVE FIR FILTER ATTAINING STEADY STATE

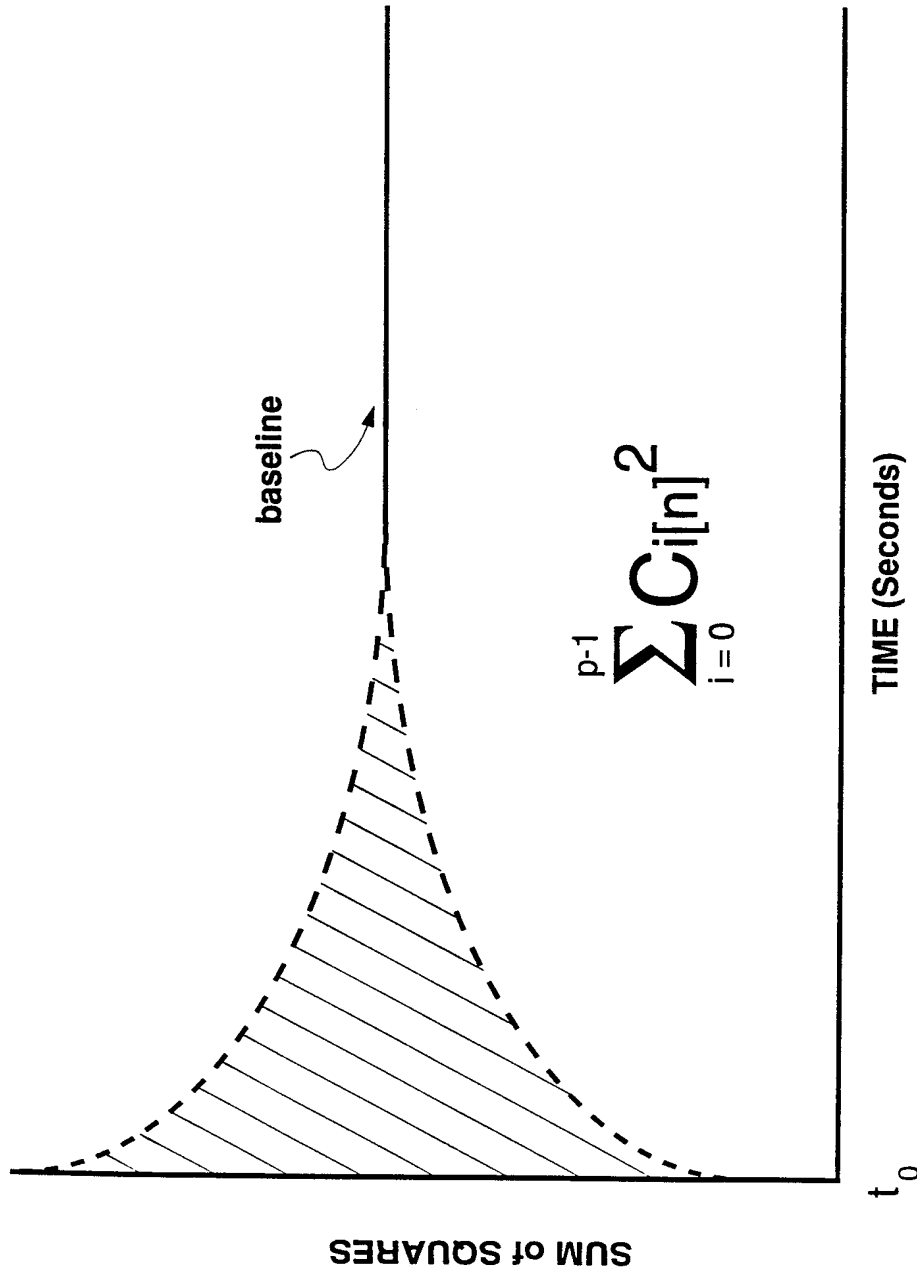
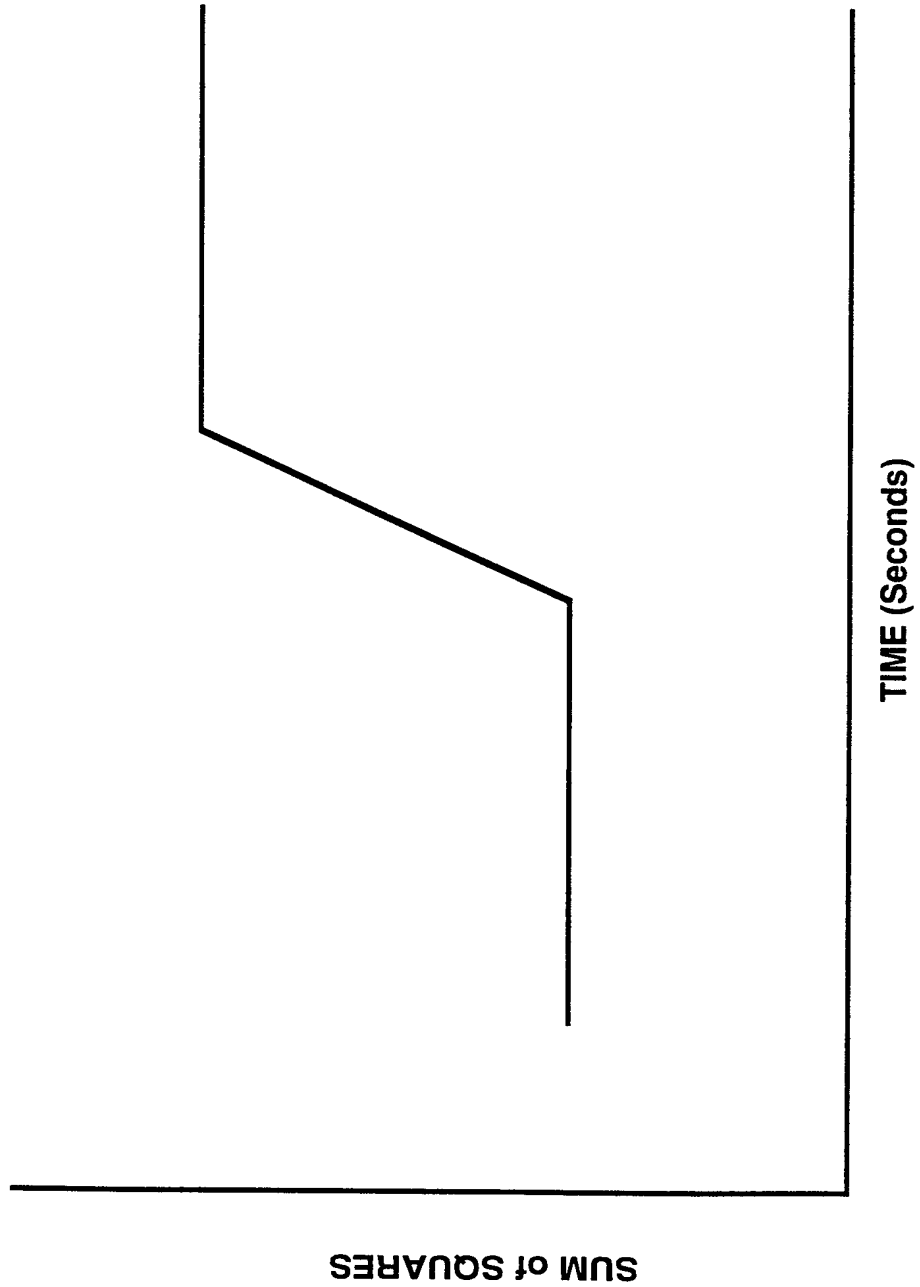


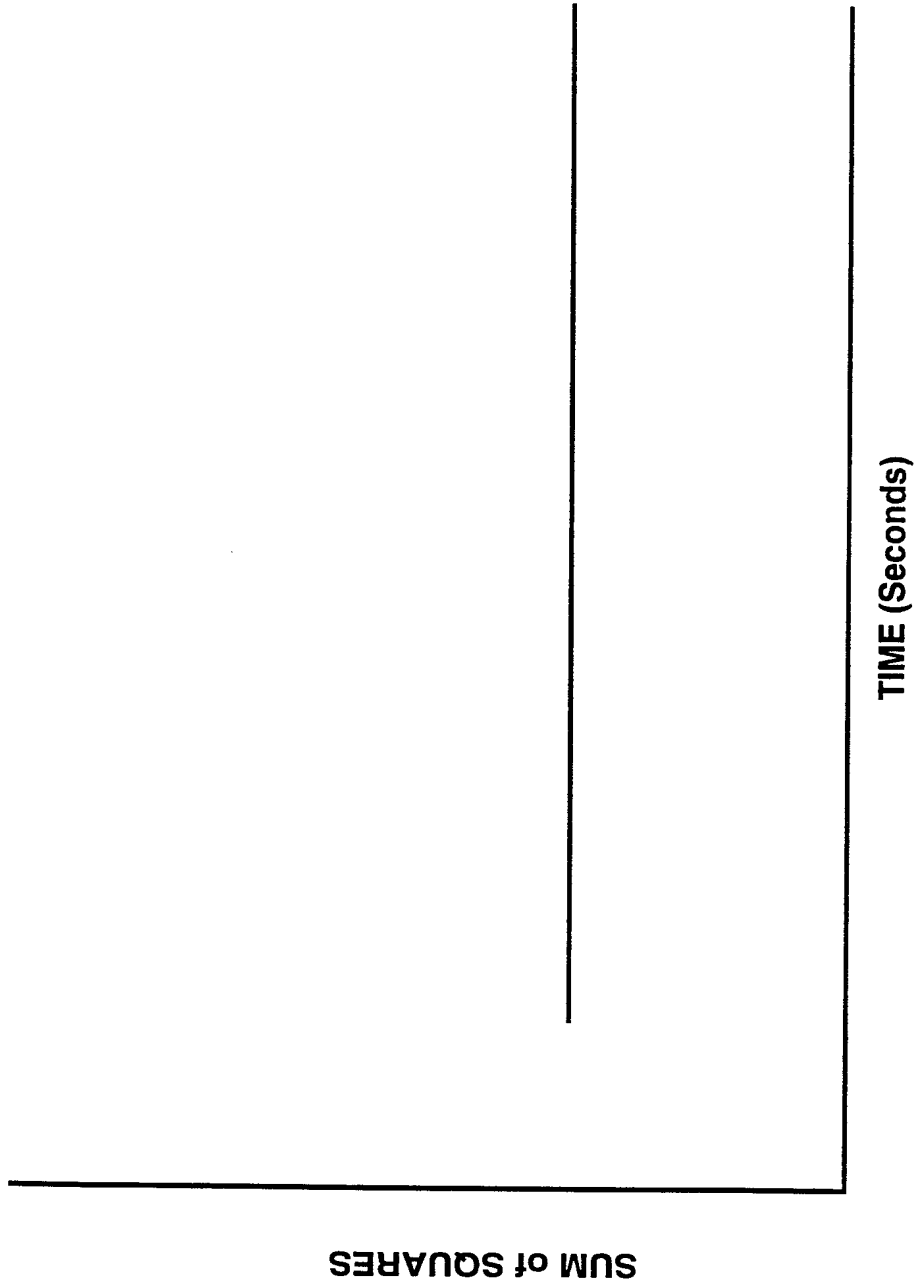
Figure 2A
TYPICAL THREE-WAY FILTER RESPONSE



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Figure 2B

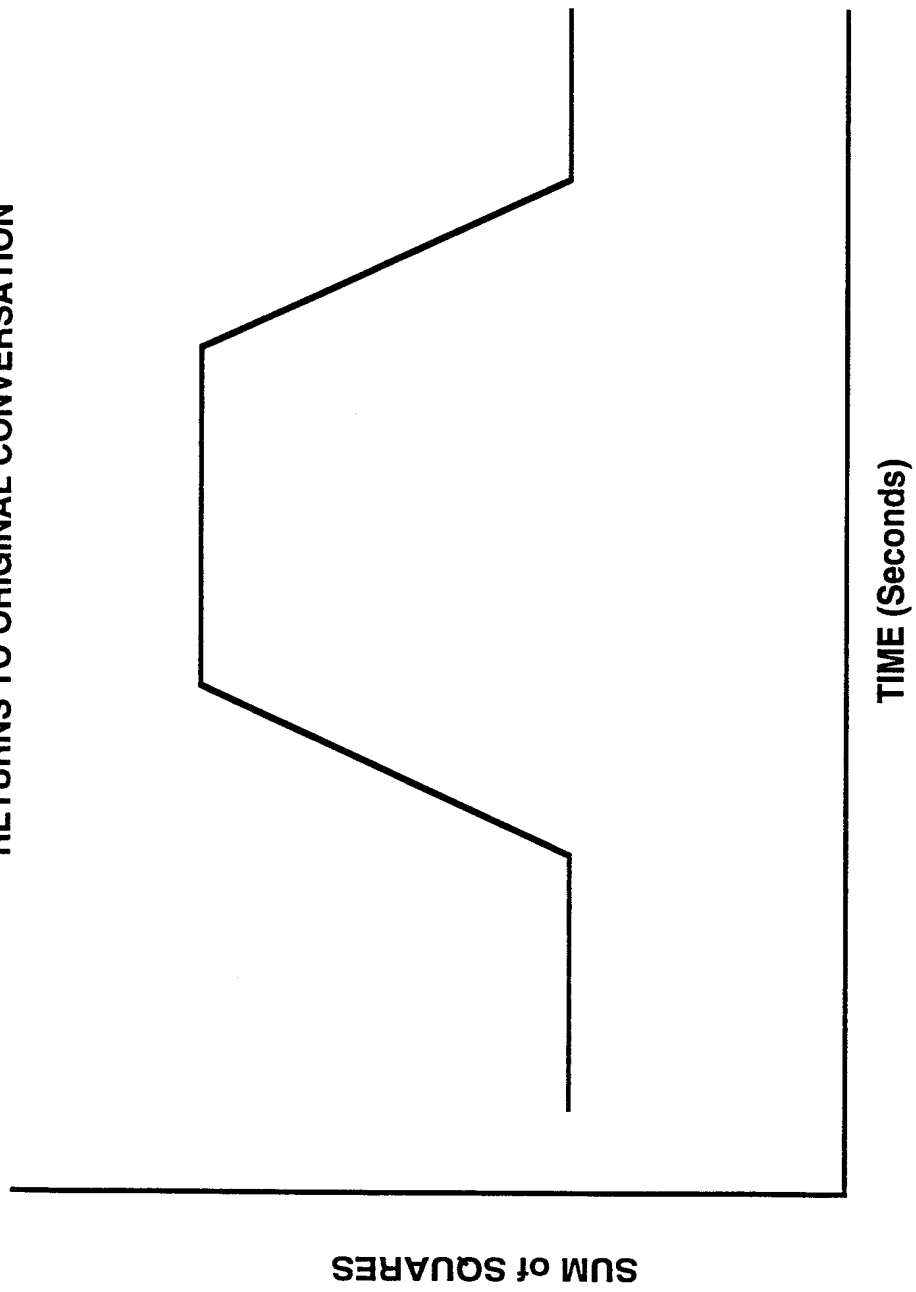
TYPICAL FILTER RESPONSE WHEN CALLED PARTY
IGNORES CALL WAITING NOTIFICATION



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Figure 2C

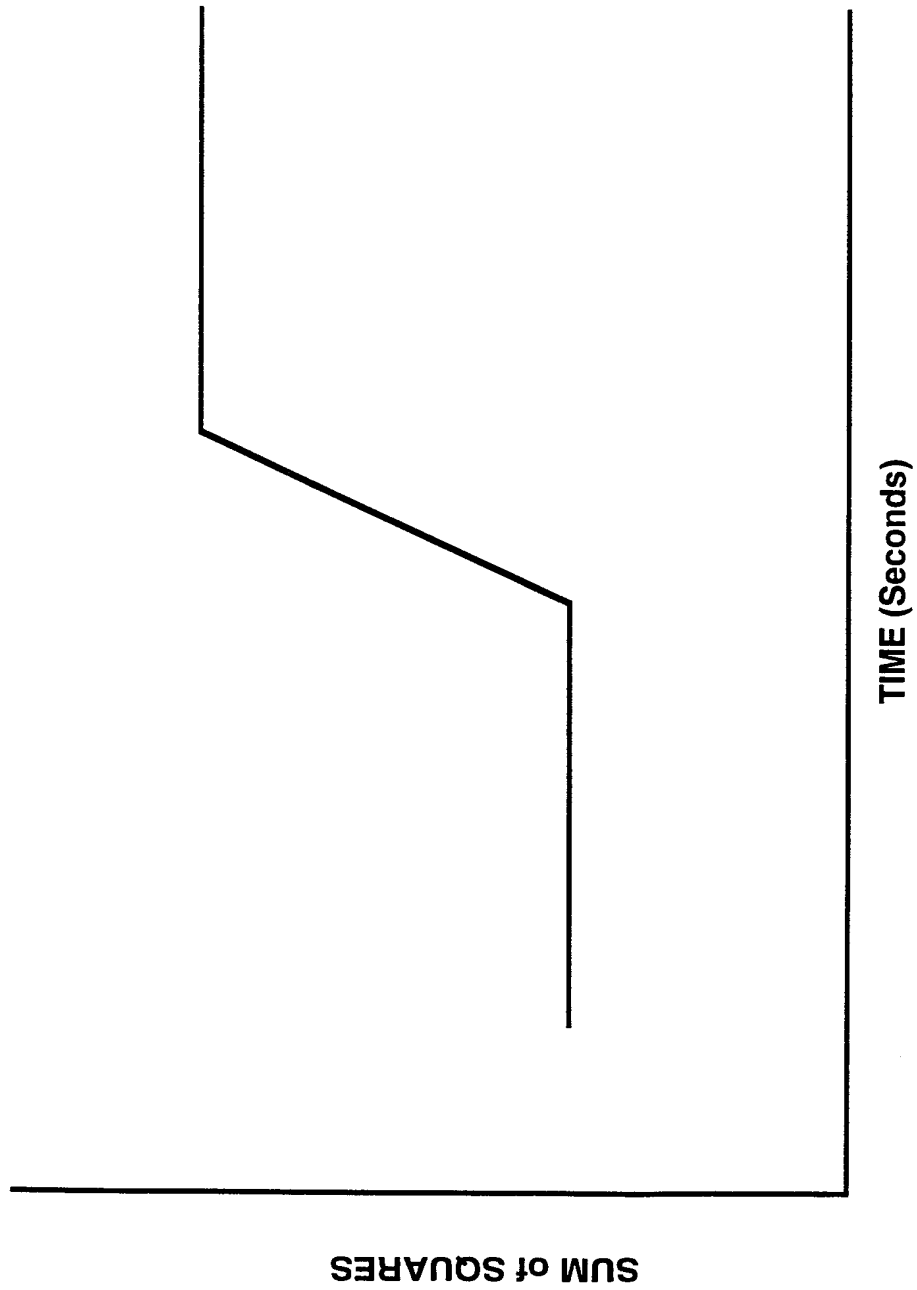
TYPICAL FILTER RESPONSE WHEN CALLED PARTY
TALKS TO CALL WAITING PARTY AND THEN
RETURNS TO ORIGINAL CONVERSATION



7/14

Figure 2D

TYPICAL FILTER RESPONSE WHEN CALLED
PARTY TALKS TO CALL WAITING PARTY



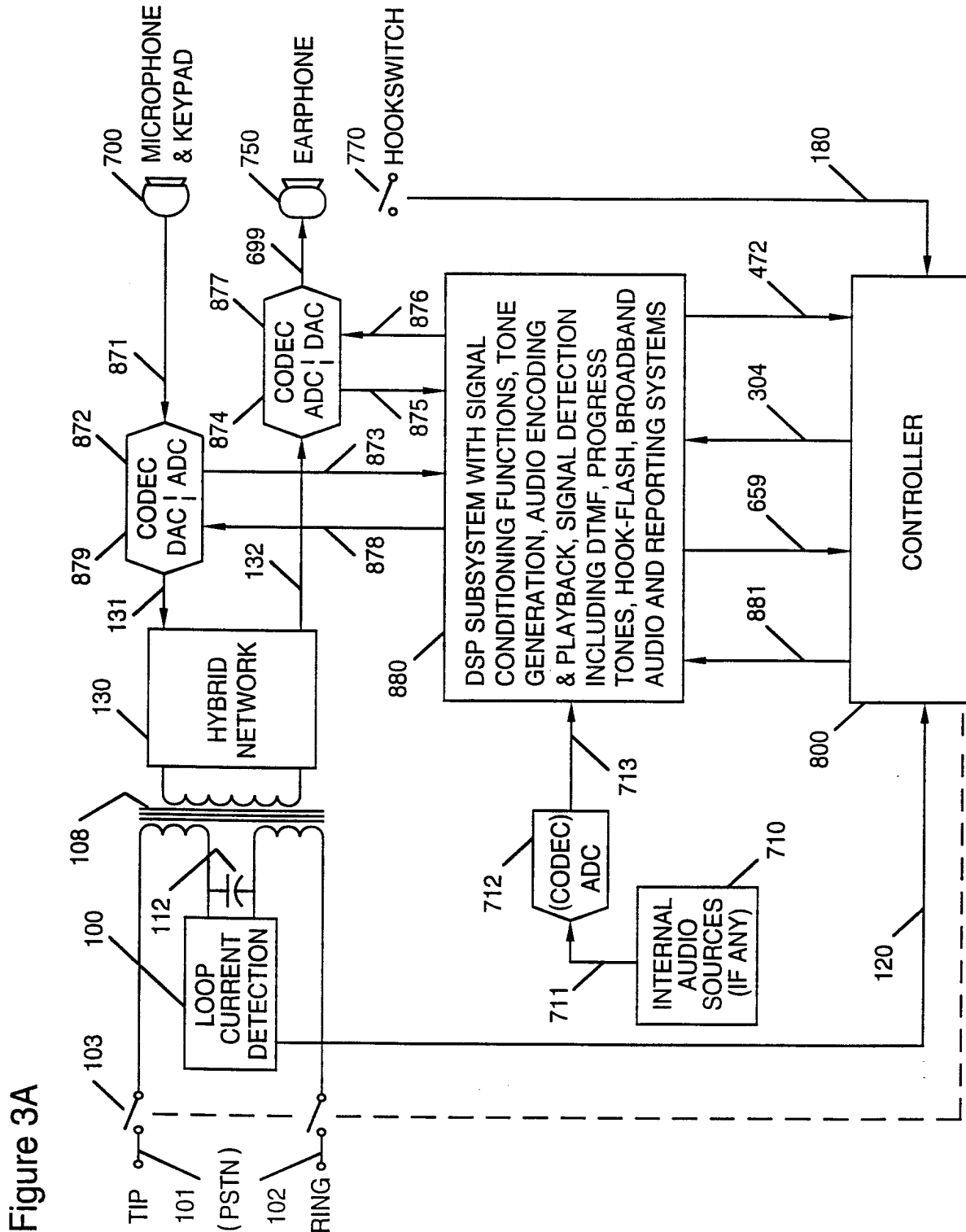


Figure 3A

10/14

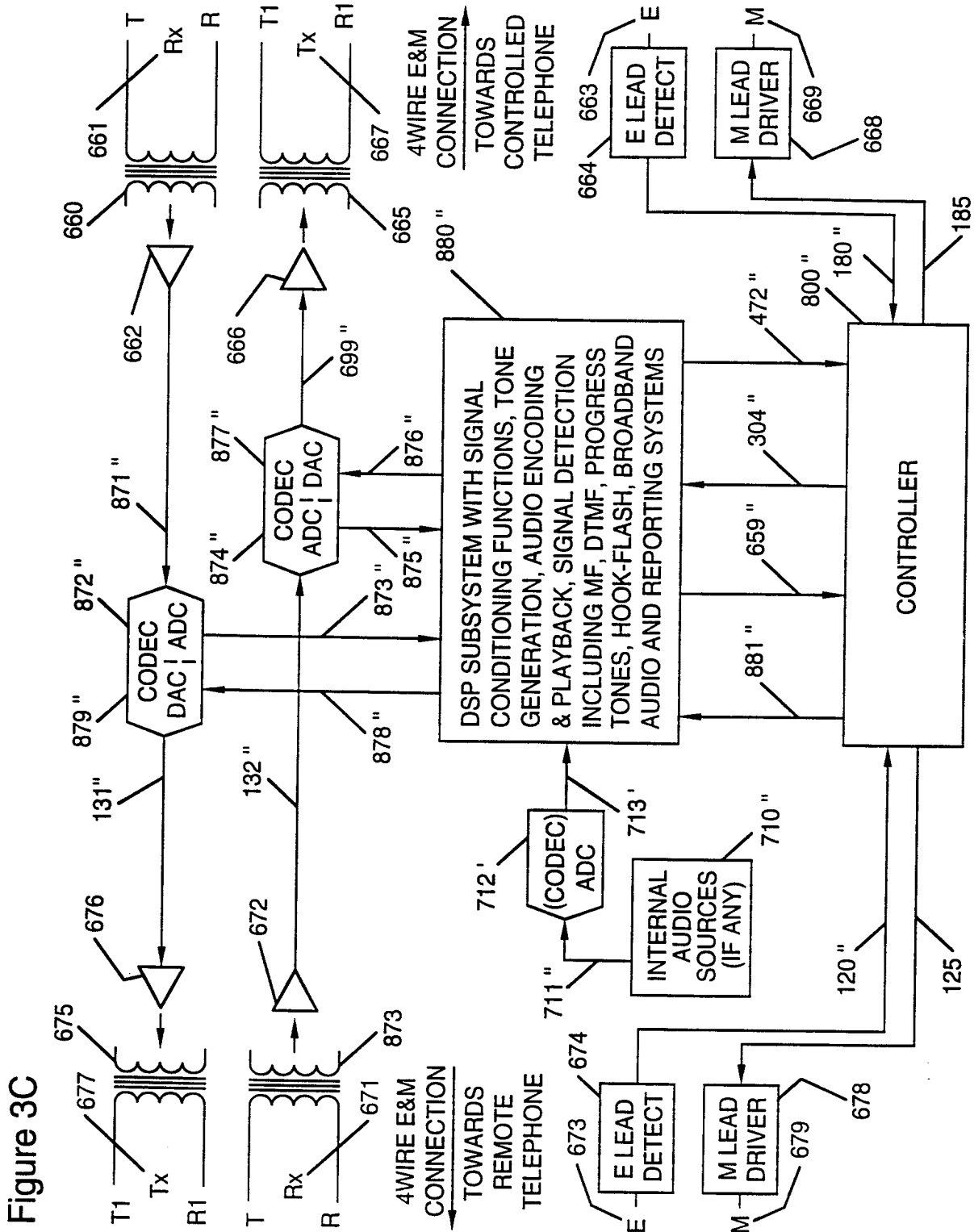
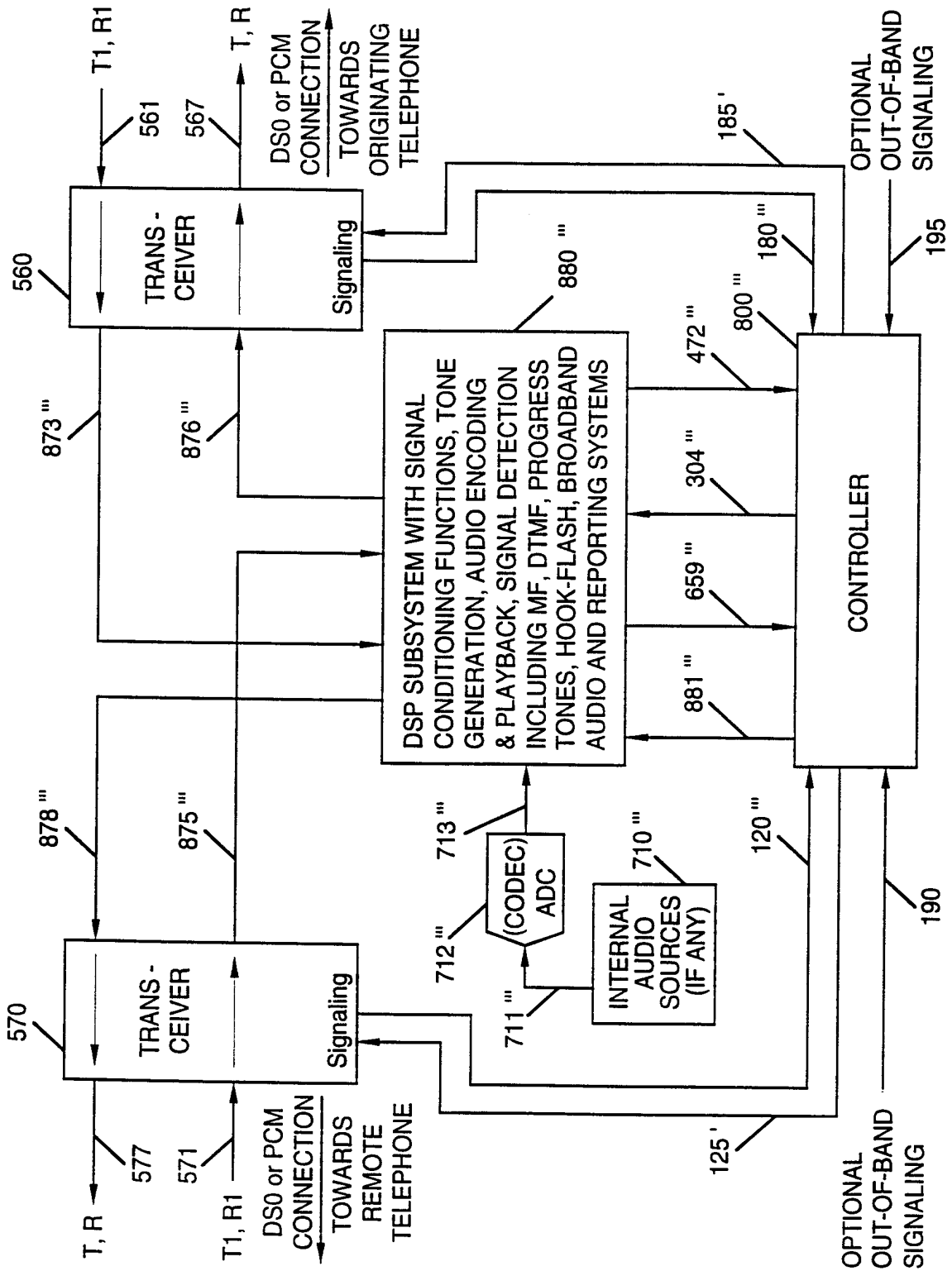


Figure 3C

Figure 3D



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Figure 4A

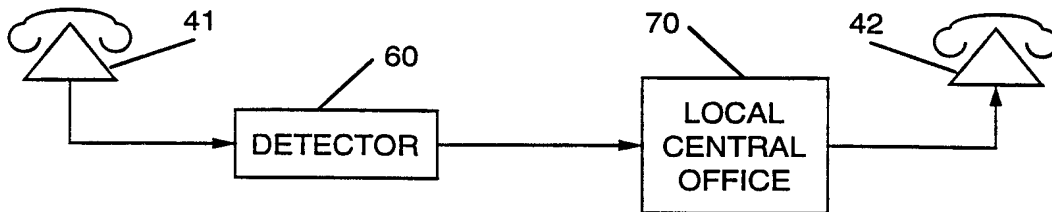


Figure 4B

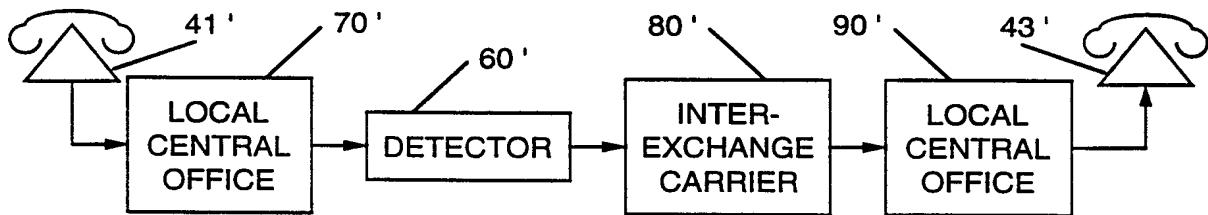


Figure 4C

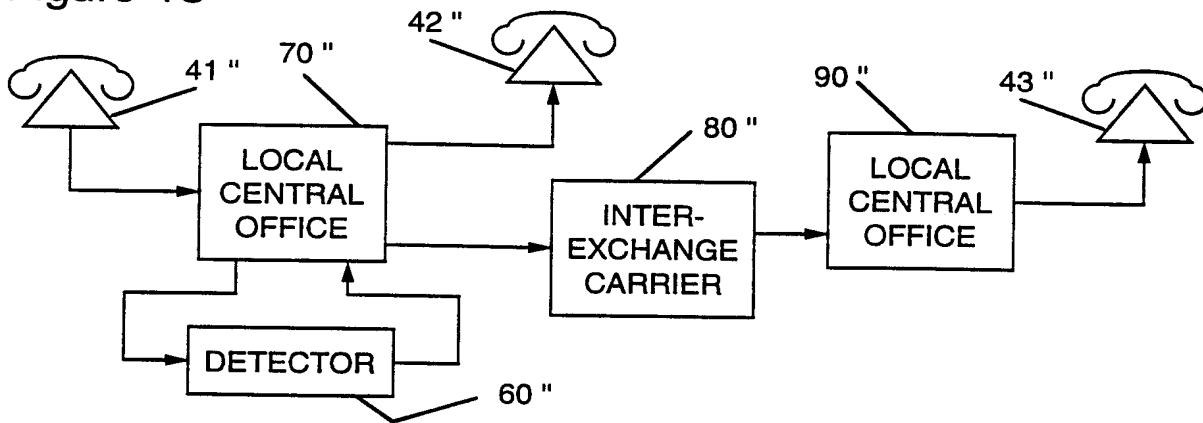


Figure 4D

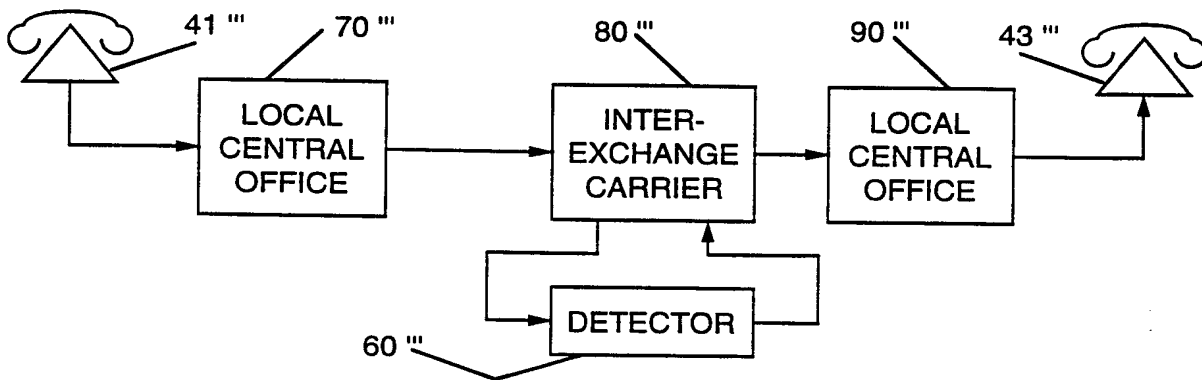
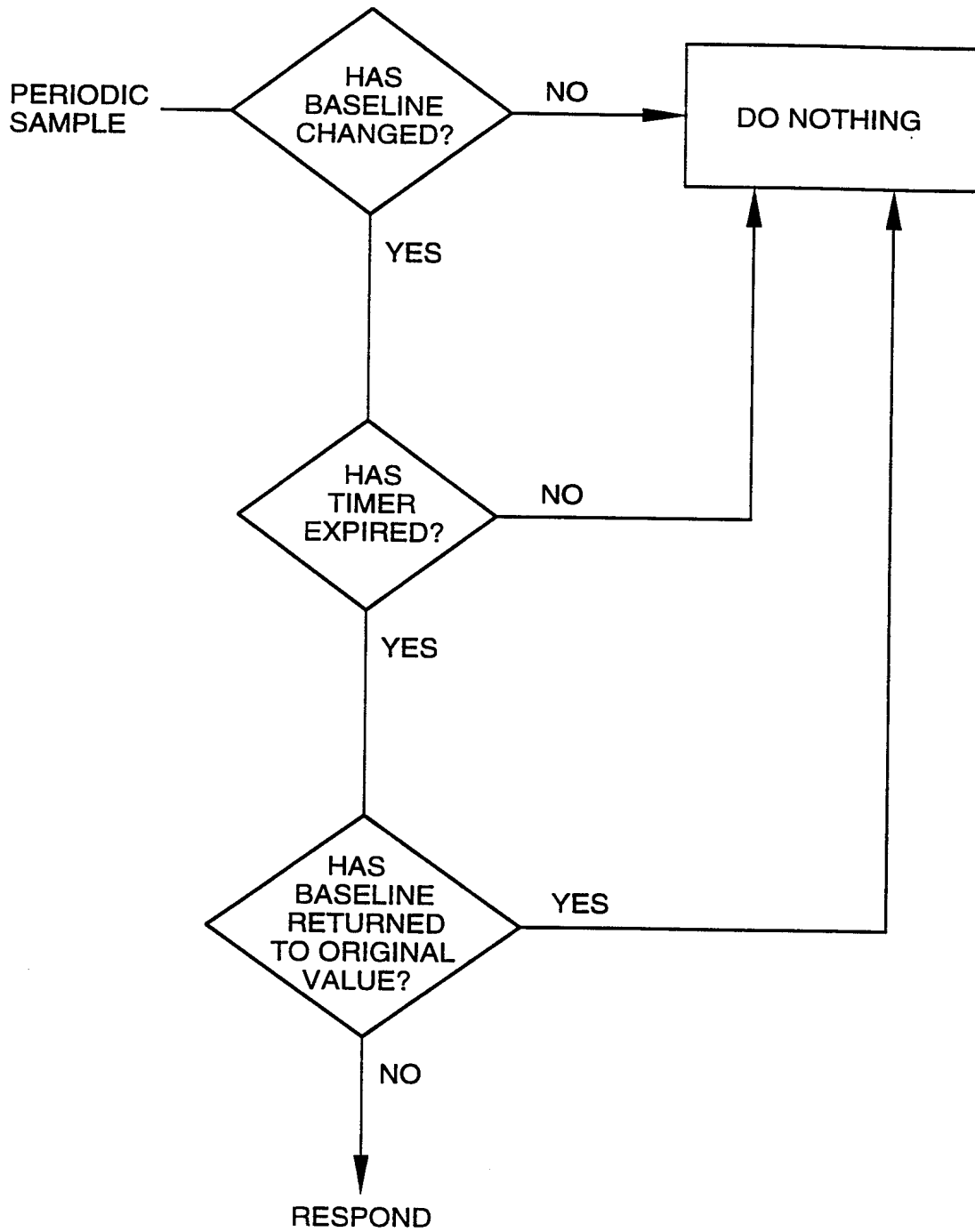


Figure 5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/10954

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04M 3/00
US CL :379/189, 93.02, 411,
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 379/189, 93.02, 411,

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
APS, search terms: three-way call detection, echo monitoring, echo cancellation, adaptive filtering.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|---------------------------|
| Y | US 5,539,812 A (KITCHIN et al) 23 July 1996, col.3, lines 8-18, col.4, lines 43-47, col.6, lines 20-24 | 1-83 |
| Y | US 5,745,558 A (RICHARDSON, JR. et al) 28 April 1998, col.3, lines50-67, col.4 lines 1-6, col.12, lines 57-67, col.13, lines 21-27. | 1-20, 37-38, 61-64, 82-83 |
| A | US 5,535,261 A (BROWN et al.) 9 Jul. 1996. | 1-83 |
| Y | US 5,592,548 A (SIH) 7 Jan. 1997, Figs.3 and 4, col.4, lines 21-31, col.5, lines 60-65. | 1-83 |
| P, A | US 5,655,013 A (GAINSBORO) 5 Aug. 1997 | 1-83 |
| E, Y | US 5,796,811 A (McFARLEN) 18 Aug. 1998 | 1-83 |

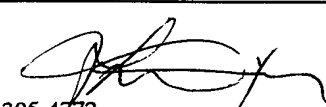
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Date of the actual completion of the international search
16 SEPTEMBER 1998

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21 OCT 1998

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US98/10954

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

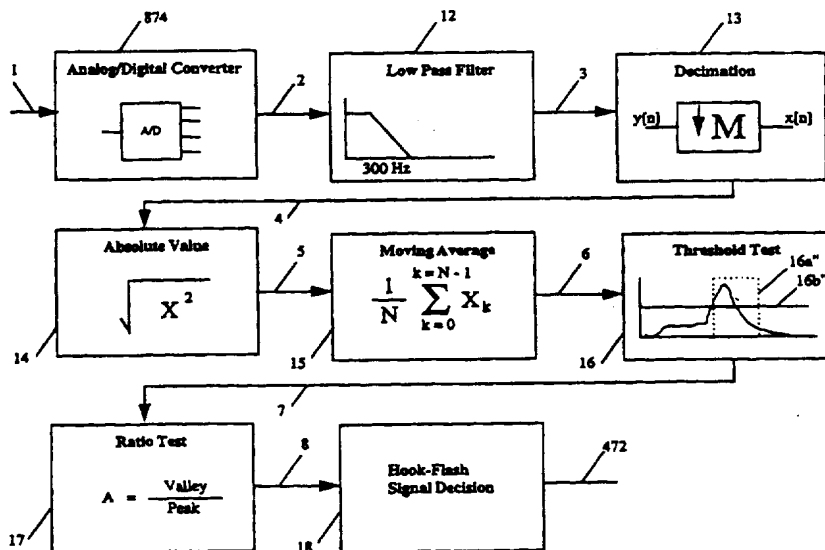
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| E, Y | US 5,768,355 A (SALIBRICI et al) 16 Jun. 1998 | 1-83 |
| E, A | US 5,809,110 A (ULRICH et al) 15 Sep. 1998 | 1-83 |
| P, Y | US 5,664,011 A (CROCHIERE et al) 2 Sep. 1997 | 1-83 |
| P, Y | US 5,793,801 A (FERTNER) 11 Aug. 1998 | 1-83 |
| P, Y | US 5,657,384 A (STAUDCHER et al) 12 Aug. 1997 | 1-83 |
| E, Y | US 5,805,685 A (McFARLEN) 8 Sep. 1998 | 1-83 |
| A | US 5,319,702 A (KITCHIN et al) 7 Jun. 1994 | 1-83 |



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

| | | |
|---|------------------|---|
| <p>(51) International Patent Classification ⁶ : H04M 3/20, 1/66</p> | <p>A1</p> | <p>(11) International Publication Number: WO 96/14703 (43) International Publication Date: 17 May 1996 (17.05.96)</p> |
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(54) Title: IMPROVED METHOD AND APPARATUS FOR DETECTING AN ATTEMPTED THREE-WAY CONFERENCE CALL ON A REMOTE TELEPHONE



(57) Abstract

A system for use in detecting whether one of the parties to a telecommunication has attempted to initiate a three-way call using a hook-flash signal. The apparatus includes a low pass filter (12) for passing energy having frequencies below about 500 Hz, and an energy detector (16) for detecting a specific electrical energy pulse characteristic of the hook-flash having passed through the low pass filter. The existence of the hook-flash is confirmed by digital signal processing equipment (18) which identifies a rapid drop-off in energy also characteristic of the hook-flash signal. Optionally, the hook-flash may be further confirmed by including software for cooperating with the energy detector to ascertain whether sound has occurred in the communication during a predetermined period following the first hook-flash signal.

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| GA | Gabon | | | | |

IMPROVED METHOD AND APPARATUS FOR
DETECTING AN ATTEMPTED THREE-WAY CONFERENCE CALL
ON A REMOTE TELEPHONE

5

TECHNICAL FIELD OF THE INVENTION

The invention described herein relates to hook-flash detection apparatus for use with a telephone system and which is capable of detecting when a called party has opened the telephone circuit by flashing (momentarily depressing) the hook switch of either a pulse-dial or tone-dial telephone which occurs when the called party attempts to initiate a "three-way call," i.e., a call which adds an additional party to the previously existing two-party call making it a "conference" call. The invention may also be used to detect when a called party has answered the phone and can distinguish a hook-flash or answer from other events, such as those associated with notification of a call waiting. The invention is typically employed with a computer such that the detection of an unwanted attempt to initiate a third-party call results in an action, such as, termination of the initial two party call.

The apparatus of the present invention may be located in association with the telephone initiating the call. For example, it may be contained on an "card" that is physically housed in a single telephone. It may also be embodied in the control system for a number of phones housed at a particular location, such as, the phone system for an institution, i.e., a prison, hospital or

5 hotel. In embodiments, such as these, the apparatus of
the invention is "connected" in the line at a point prior
to the switch at the central office. The apparatus of
this invention is also particularly suited for connection
to a telecommunication between a local telephone in
telecommunication with a remote telephone at a point
within the telephone network. As used herein, the term
"network" refers to any system in which the detection
equipment is connected in the line at some point after
10 the call reaches the initial switch at the central
office, local exchange carrier ("LEC"), etc. In the
network embodiment, the equipment is likely to be located
at a site remote from the calling party, such as, at a
local exchange, or at a private off-site facility to
15 which calls are routed by the local exchange.

BACKGROUND OF THE INVENTION

Prior to a June, 1984, FCC decision, pay telephones
were the exclusive province of local telephone companies.
20 Others were precluded from the business of providing pay
telephone services. Today, however, subject to state
Public Utility Commission regulations, Customer Owned
Coin Operated Telephone ("COCOT") service is permitted.
An outgrowth of COCOT service has been the private
25 operation of institutional telephone services. As might
be expected, this "privatization" of phone systems has
created a number of technical challenges including the

5 automated detection of a called party's response to some appropriate prompt (such as, a request for acceptance of a collect call) by dialing a pulse-dial telephone and, in the case of prison systems, the prevention of three-way calling.

10 Coin telephones owned by local telephone companies generally utilize DC signals to signal called-party-answer. This information is transmitted between telephone company central offices and then to the originating pay telephone telling it, in effect, to accept payment for the call. This information is not, however, normally communicated to conventional, i.e., regular business and residential, telephones nor has this information been available to COCOT equipment.

15 Collect calls placed through COCOT equipment are typically handled by an automated operator service ("AOS"), thus providing the owner of the COCOT equipment with the ability to provide collect call service and bill users of that service for both intra- and inter-LATA calls. However, the use of an AOS for collect calls is expensive. In addition, it opens the possibility of fraudulent activity in certain instances.

25 In many institutions the phone calls placed by a patient/client or prison inmate are primarily, if not exclusively, collect calls. Collect calls initiated by a patient/client must be indicated as such to the called party. In addition, calls placed by an inmate to an

outside party often begin with a prerecorded message stating that the call or collect call is from "a prison" and is being placed by "prisoner's name." In the above cases the called party is usually asked to dial a digit, commonly a "0" or a "1", to accept the call or the attendant charges. The phone system providing such service must be able to detect such acceptance both as a dual-tone-multi-frequency ("DTMF") tone response from a "Touch-Tone" phone as well as to detect the equivalent response on a pulse-dial telephone. ("Touch-Tone" is a trademark of the AT&T corporation.)

The clients/inmates in some institutions may be allowed to call only numbers on a pre-authorized list in order to deter fraudulent activity. A prison phone system, for example, must be able to detect the called party's flashing the hook switch in order to prevent the called party from activating three-way (i.e., conference) calling, dialing another number and then connecting the prisoner to an unauthorized phone number.

Accordingly, a need has arisen for a telecommunications system which can automate and simplify the processes currently handled by a traditional AOS. Specifically, a need has arisen for telephone call handling equipment which can automatically route local and long distant calls without the intervention of an outside service or live operator, and which enables the telephone owner/service provider to charge for the

completion of a call or collect call while preventing three-way calling.

Several methods of detecting a three-way call initiated by a hook-flash are known in the prior art. The hook-flash results in a temporary disconnect and reconnect which can be observed as a momentary interruption of loop current at the telephone company central office. The loop current loss, however, is not observed elsewhere in the network nor is the loop current loss made known to the respective parties. Thus, this attribute of a hook-flash cannot be employed, except at the central office. Alternatively, the attempt to initiate a three-way call has been detected utilizing the technology shown in the '702 Patent. That system, which is based on analog technology, accurately detects the vast majority of attempted three-way calls. The current invention, which is based on the detection of additional characteristics of the hook-flash signal and utilizes digital signal processing ("DSP"), is more discerning of the attempted three-way call and more reliable in distinguishing an attempted three-way call from other events that occur on the telephone line (such as, voice fluctuations, noises from physical contact, e.g. dropping or tapping, of the handset, etc.).

SUMMARY OF THE INVENTION

The present invention addresses these needs by providing an apparatus for use in connection with a telecommunication between a local telephone in
5 telecommunication with a remote telephone, wherein one of said telephones has a three-way calling service which is not associated with the apparatus. When the local equipment/telephone is in telecommunication with a remote telephone, (i.e., when a telephone call is established
10 therebetween), the apparatus is capable of indicating whether the remote party has performed a specific act causing the generation of a hook-flash signal which is detected by the apparatus.

The apparatus of the present invention includes a
15 low pass filter (or filter means) for passing energy having frequencies below about 500 Hz (preferably below 300 Hz and, even more preferably, in the range of 100 - 300 or 200 - 300 Hz) and an energy detector (energy
20 detection means) for detecting a specific electrical energy pulse having been filtered by, i.e. passed through, the low pass filter and having a predetermined minimum magnitude which is characteristic of the hook-flash initiating a three-way call.

The apparatus further includes first means for
25 confirming that the peak energy pulse identified as being above the predetermined minimum magnitude is, in fact, the result of a hook-flash. In that regard, an important

part of this invention is the discovery that the hook-
flash signal, which is characterized by a peak in energy
below a certain frequency and above a minimum magnitude,
is then followed by an immediate, precipitous drop (i.e.,
5 a "rapid drop-off" in energy. This characteristic spike
of the hook-flash "click" sound is distinguishable from
other intermittent sounds on the telephone, such as, the
end of a word enunciated by a voice, in that the drop in
energy associated with the latter is not precipitous.
10 A typical signal initiated in the momentary disconnect
and reconnect associated with a hook flash is shown in
Figure 1A. While the analog system disclosed in
connection with certain figures of the '702 Patent, also
identifies features characteristic of a hook-flash
15 signal, it does not focus on the rapid drop off in energy
which, we have now discovered is also characteristic of
the hook-flash "click." Indeed, an analog system is not
readily used for the storing and retrieval of line
information from which an analysis of the energy over
20 time can be made. While such an analysis could be
performed with an analog system, it is much more
difficult to implement than the DSP system described
herein.

In the preferred embodiment of the present
25 invention, the energy detected on the line (when in
analog form) is sampled intermittently and repeatedly
using DSP based circuitry (i.e., a "DSP analyzer"). The

DSP analyzer stores the detected information in digital format and analyzes it to determine the existence of a peak energy below a maximum frequency and above a minimum energy level which is followed by a rapid drop off, all of which is characteristic of the hook-flash signal.

While the existence of the hook-flash signal can be determined by this means alone, the system can also contain software also referred to herein as "window analyzation means" (or "software window analyzer") as described in the '702 Patent. The window analyzation means also cooperates with the energy detector to provide second means for confirming the hook-flash attempting to initiate a three-way call on the telephone line. It is activated when the DSP analyzer determines that a hook-flash has occurred and operates by determining whether sound occurs on the line during a predetermined maximum time window following the first confirmation of the three-way call by the DSP analyzer. If sound is detected during window analyzation, it is likely that what was previously detected by the DSP analyzer, was not, in fact, a hook-flash signal associated with a three-way call. Thus, the use of the window analyzation means provides a further confirmation as to whether the remote party has attempted to initiate a three-way conference call.

The apparatus also includes response means for implementing a predetermined response when a three-way

5 call is confirmed. Some of the responses which can be programmed into the software include call termination, playing a prerecorded message, generating a tone which may be heard by one or more parties to the call, muting the microphone of the local telephone and recording the date and time of the remote party's attempt to initiate the three-way call. Examples are illustrated in Figure 9.

10 The invention is particularly suitable for use in a computer controlled telephone wherein the energy detector detects when a called party who has answered a call initiated by the computer operated telephone has activated (flashed) the hook switch. Such a system is depicted generally in Figure 12B. However, an advantage of the present invention is that the apparatus may be
15 located at a site remote from the computer controlled telephone. Figures 12A through 12D illustrate typical locations where the equipment may be located relative to a telephone network.

BRIEF DESCRIPTION OF THE DRAWINGS

20 A more complete understanding of the present invention may be derived by referring to the detailed description and claims which follow when considered in connection with the accompanying drawings, which are
25 briefly described as follows.

Figure 1A represents a characteristic signal of a hook-flash associated with the initiation of a three-way call and as it would be received by the apparatus of this invention either in analog or digital format. Figures 1B through 1E represent the signal as processed and sampled at various points in the DSP analyzer, with Figure 1E representing the final signal. Figure 1E, the result of processing a relatively strong signal, can be compared to Figure 1F, the result of processing a relatively weak initial signal.

Figure 2 is a chart summarizing various steps in the DSP analyzer's processing of an incoming hook-flash signal, such as that shown in Figure 1A.

Figure 3 illustrates the DSP subsystem circuitry.

Figures 4A through 4D are block diagrams of the hook-flash detection hardware of the present invention as connected in several different telephone line situations. Figure 4A shows the apparatus as associated with a local telephone. Figure 4B is a block diagram of the equipment as deployed in a local loop embodiment. Figure 4C is a block diagram of the equipment as deployed in a 4-wire E&M connection. Finally, Figure 4D is a block diagram of the equipment as deployed in an environment where the incoming signal is already in digital format. This would occur, for example, in many network configurations utilizing pulse code modulation ("PCM") or "DS0" signals.

Figure 5 illustrates the features of a high pass filter as implemented with a DSP algorithm.

Figure 6 is a software flow diagram of the present invention for implementing valid call set-up confirmation.

Figure 7 is a software flow diagram of the present invention for implementing a signal classification algorithm.

Figure 8 is a software flow diagram of the present invention for determining if telephone company (i.e., "Telco") loop current interruptions are called party hook-flash or on-hook sequences when used in a telephone ("CPE") implementation, i.e., an on-site/non-network configuration.

Figure 9 is a software flow diagram of the present invention for responding to detected three-way calls.

Figure 10 is a software flow diagram of the present invention for responding to signals detected by the DSP subsystem possibly being caused by called party pulse-dialing or hook-switch activation.

Figure 11 is a software flow diagram of the present invention for detecting called party answer.

Figures 12A through 12D depict various options for locating the apparatus of the present invention relative to the local and remote telephones and the telephone network.

DETAILED DESCRIPTION OF THE INVENTION

A more complete understanding of the present invention may be derived by referring to the following detailed description and the accompanying Figures 1 through 12, wherein like reference numbers indicate like features throughout the drawings. In addition, reference designations for branch points in the flow diagrams and for signals contained in the schematic diagrams indicate connections which could not otherwise be adequately demonstrated due to space constraints.

The apparatus disclosed may be conventionally encased within a telephone set which may be modified for use as a public access telephone, modified for use as a prison inmate telephone or embodied as a physically separate control module to which a conventional telephone instrument is connected. Throughout the description of the present invention the terms "pay telephone," "telephone," "station" or similar terms should be construed in their broadest sense. The teachings of the present invention are applicable to all publicly accessible telecommunications devices which charge for each call made whether or not the particular device has actual coin receipt capability. The aforementioned terms when used herein are intended to include all such telecommunications devices.

The apparatus disclosed may also be incorporated within numerous types of telephone or non-telephone

equipment where, in addition to some other primary purpose, the ability to remotely affect the operation of that equipment by use of a decadic, i.e. rotary or pulse, dialing telephone is desired. Examples would include answering machines and services, messaging services, tele-voting or tele-selection and operationally similar systems, VCR's or other appliances, sprinkler systems, or other premises automation systems.

A. DSP THREE-WAY CALL DETECTION:

Before discussing the detailed structure of the apparatus and its method of operation, it is helpful to understand, the basic steps by which an incoming signal is analyzed to detect the attempted initiation of a three-way call by the called party. Figure 2 shows the functional blocks from the DSP three-way call detection algorithm when processing a signal resulting from a hook-flash initiation of a three-way call. The input signal, i.e., the characteristic signal of the hook-flash, is shown in Figure 1A and the signal as modified at various stages in the processing are shown in Figures 1A through 1E. It is assumed for purposes of this description that the signal is an analog one and that the system is configured as shown in Figure 4A.

Initially, the signal 1 passes through an analog to digital converter 874, which changes the signal from an analog voltage to a digital representation 2. The analog

to digital converter is operated, for example, at an
8 KHz sampling rate. According to the Nyquist Theorem,
this would allow an operating frequency passband of just
under 4 KHz. With appropriate audio signal
5 preconditioning to satisfy Nyquist requirements other
sampling rates could be adequately employed.

The digitized signal 2 is then subjected to a
lowpass filter 12, which in this case is a digital
implementation of an infinite impulse response (IIR)
10 filter. A suitable IIR filter is a 16th order filter
with a 3 dB cutoff frequency of 300 Hz. The reason that
an IIR filter is used versus a finite impulse response
(FIR) filter is that the rolloff of the filter is much
sharper in the transition band for a smaller order
15 filter. The same transition band rolloff can be achieved
with an FIR filter given that a significantly higher
order filter is used. The higher order filter would
translate to more processing time.

The reason that the 3 dB cutoff frequency is set to
20 300 Hz is directly related to the energy distribution of
the hook-flash signal itself. The hook-flash signal from
the initiation of the three-way call contains energy
concentrated over the lower frequency extremes of the
pass band of the telephone channel. Using this fact
25 coupled with the fact that voice, data, and most other
signals carried by the telephone channel nominally will
contain little, if any, low frequency energy below

300 Hz, the cutoff frequency of the filter is set to 300 Hz. Also, due to the pass band characteristics of the phone channel, the hook-flash signal must contain significant energy in the lower frequency ranges in order to be seen at the calling party's phone as described in the '702 Patent. The resulting, i.e., filtered, signal 3 is as shown in Figure 1B. One skilled in the art would understand that there are alternatives to determining the presence of such low frequency energy, such as, spectrum analysis in various forms.

The decimation step 13 is an optional step. The reason for including it in the hook-flash detection is to save processing time by the DSP processor 880. In the previous step, i.e., lowpass filtering, the signal 2 entering the filter is sampled at 8 KHz. This means that the signal is band limited to 4 KHz. The filtering step 12 further reduces the frequency content of the signal 2 down from 4 KHz to 300 Hz at signal 3. This means that the filtered signal 3 is now over-sampled and contains redundant information. By performing a decimation 13 by a factor of 12, the effective sampling rate is reduced from 8 KHz to 666 Hz. This removes unnecessary samples and only processes the samples containing non-redundant signal information. The resulting decimated signal 4 is shown as in Figure 1C.

The signal 4 is then converted to an absolute value 5. The reason for using the absolute value function 14

is to allow the processing algorithm to operate with a single threshold value. If the algorithm did not use the absolute value function 14, then typically it would use both a positive and a negative level for the threshold. The use of a single threshold value greatly simplifies the algorithm. The absolute value of the signal 5 is as shown in Figure 1D. As depicted, the absolute value is computed by calculating the square root of the square of the signal. However, it may also be appropriate to use other algorithms, e.g., using the square of the signal alone, which could have the advantage of emphasizing the differences in the signal for later computational purposes.

The moving average processing step 15 is used to smooth signal 5 to signal 6. The smoothed data 6 helps eliminate spurious responses during the threshold test 16 and the ratio test 17 of the detection algorithm. A useful moving average may result from the successive summation of the low pass filtered and decimated samples taken over the immediately prior 60 to 250 μ S. A particularly convenient moving average can be computed using the sum of the current and immediately prior 120 μ S of samples, which corresponds to the most current 8 decimated samples of signal 5. The resulting moving average signal 6 is shown in Figure 1E. In contrast to Figure 1E, Figure 1F represents a relatively weak

original signal that has been processed by the DSP analyzer.

5 The threshold test 16 is the beginning of the main processing portion for the three-way hook-flash detection algorithm. Up until this point, the signal processing has been data preparation and manipulation. The threshold detection block 16 contains two parameters, the processing window 16a and the signal threshold 16b.

10 The processing window 16a operates in the following manner. Depending on the width of window 16a, a number of samples of signal 6 are stored in data memory. The current sample arrives at the threshold processing block 16. The processor looks back a predetermined length of time, i.e., the width of the processing window 16a, and also uses the stored prior sample combined with the current sample for hook-flash signal detection. The window length 16a can be adjusted anywhere from a zero length window to multiple second length window. We have found that a window length 16a of approximately 39 mS is preferred. A potentially usable range for the window length would be from approximately 17 mS to 50 mS.

15 Due to the band limiting and normal Telco channel characteristics, most voice and data signals on the Telco channel display the characteristic of a relatively slow decay. The length of the above window 16a is important because one of the distinguishing characteristics of the hook-flash signal is the sharply dampened decay portion

of the signal. Most signals carried by the telephone channel do not display this characteristic. If the window 16a is too short (e.g., less than 17 mS), this characteristic of the hook-flash may never be detected.

5 This is because it is not realistic for a signal carried by the bandwidth-limited telephone channel to transition this quickly. If the window 16a is too long (e.g. above 50 mS), it could be possible to confuse other signals as a false hook-flash.

10 In addition, the absolute threshold 16b is used as a discriminator for noise versus hook-flash signal. The threshold 16b can be adjusted from a zero height to a full-scale height of 7.17 dBmØ (2.5V). The preferred setting for the threshold is -32.8 dBmØ (25 mV).

15 However, other settings in the range of approximately -60 dBmØ to -20 dBmØ. (i.e., 1 mV to 110 mV) can be used.

The height of the threshold 16b is an important consideration. If the level is too low, the DSP analyzer 880 will waste its time looking at background noise during a telephone conversation. If the threshold 16b is too high, the DSP analyzer 880 may never see a valid hook-flash signal in the channel. The preferred setting of threshold 16b is far enough above the nominal background noise and yet low enough so that the DSP analyzer will see only valid low-frequency signal energy on the telephone channel.

20

25

If the sample of signal 6 corresponding to the beginning of window 16a is above threshold 16b, the threshold test 16 will pass both the stored value and the current value as signal 7 to the ratio test 17. In any case, employing circular buffer techniques, the oldest value is then replaced by the current value resulting in the window 16a of recent values of signal 6.

As a first confirmation that a hook-flash signal has been detected, the DSP subsystem 880 also performs a ratio test 17 between current and prior samples of signal 6 as described above. Among other things, this portion of the processing eliminates the need for signal normalization as shown in the analog system of the '702 Patent. It is not necessary to scale the signal 1 because the test 17 looks at a ratio of numbers 7 rather than their absolute magnitudes. The ratio 8 measures the steepness (i.e., "effective slope") of the decay of the signal 6. A smaller ratio number corresponds to a steeper decay. A larger ratio number corresponds to a more gentle decay. The hook-flash signal does not cause a transition of signal 6 from peak voltage to valley voltage in zero time. This is because there is a finite amount of time required for a voltage in a bandwidth-limited channel, such as, signal 6, to decay. If the ratio 8 is large, the signal 1 is probably due to something other than a hook-flash signal. This is because most voice and data signals have some rolloff and

some decay time associated with them. The decay time of other signals is usually much larger than that of the hook-flash signal. The preferred ratio limit for the DSP hook-flash detection algorithm is 0.078, utilizing the 39 mS window and 120 μ S moving average discussed previously. This means that the current sample 6 is less than 10 percent of the value of the stored prior sample 6 referred to in the threshold test 16. Other ratios in the range of approximately 0.05 to 0.17 may be useful, although the outer edges of this range could result in either false triggering or insensitivity.

The final stage of the DSP processing algorithm is the hook-flash signal detection decision 18. If the signal 8 passes test 18 using the appropriate ratio limit, then the signal is classified as a hook-flash signal to the overall control system 800 by interrupt signal 472. As described later, this signal to controller 800 causes window analyzation to commence which provides a second means for confirming the existence of the hook-flash signal. Alternatively, the signal could result in activation of the handling or response means resulting in one or more of the actions shown in Figure 9 without further confirmation.

B. BLOCK DIAGRAM OF THE SYSTEM:

Having described the basic steps involved in detecting and confirming the existence of the hook-flash,

it is now possible to explain the general organization of the hook-flash supervision architecture appropriate to implement the present invention as shown in Figures 3 and 4A through 4D.

5

1. DSP SUBSYSTEM:

10

Figure 3 discloses a digital signal processing subsystem 880 for implementing the answer and three-way call detection features of the present invention. As shown in Figure 3, a digital signal processor 890 is interconnected with other supporting components to complete the subsystem. A suitable DSP microprocessor 890 is the ADSP-2100 available from Analog Devices, Inc., of Norwood, Massachusetts.

15

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Depending on the exact implementation of the subsystem software and particular DSP 890, it may be that random access memory 892 ("RAM") in addition to that which may be provided in the DSP 890, as is the case of the above mentioned device, may be required. Suitable RAM 892 for use with the above mentioned DSP is a set of three TC55328 SRAM chips available from Toshiba America Electronic Components, Inc., of Sunnyvale, California. Three of the above 32K by 8 bit SRAM chips are required in the case of the ADSP-2100 to match the 24 bit data bus width of that particular device.

25

In many implementations, the DSP 890 may have internal preprogrammed instructions to implement the

functions required by the present invention. As this is not always the case, external (to the DSP) program storage 891 is provided by erasable programmable read only memory ("EPROM") or as some other form of suitable non-volatile memory such as EEPROM, FLASH, battery supported SRAM, etc.

When required, DSP 890 makes use of the RAM 892 and EPROM 891 by presenting a memory address on the address bus 885 and then either reading existing data from either RAM 892 or EPROM 891 or writing new data to RAM 892. The data is carried between the DSP 890 and the memory 891, 892 over the data bus 886.

In most applications, decoding of the various control signals from the DSP 890 will be required to completely separate the various pieces of data coming into and out of the DSP 890. The appropriate decoding may be implemented using discrete logic gates or programmable logic devices. However, a particularly suitable device for the decoding function 893 is the field programmable gate array XC3042 available from Xilinx, Inc, of San Jose, California. This, or a suitable similar, device may provide the chip select, read and write strobes and other control signals 884 as are required by the specific implementation. In addition, this, or a suitable, similar device, can also provide the clock timing and data synchronization signals 895 to the analog to digital convertors 877 and 879

("ADC" or the ADC portion of a coder/decoder "CODEC") and to the digital to analog convertors 872 and 874 ("DAC" or the DAC portion of a CODEC). A suitable CODEC for the present invention is the TP3054 available from National Semiconductor Corporation, Santa Clara, California. The digital data from the CODEC ADC's 872, 874 is shown connecting to the DSP 890 by serial data bus 897. In a similar manner, the digital data from the DSP 890 is shown connecting to the CODEC DAC's 877, 879 by serial data bus 896.

Crystal 882, or a similar fixed frequency oscillator is provided to ensure even data sampling as required by the DSP algorithms. A suitable oscillator is available from ECS, Inc., of Olathe, Kansas.

Also shown in Figure 3 are the communication signals of particular interest to and from the main controller 800. Block 800 is the microprocessor control section ("MCS"). MCS block 800 receives the detection signals from DSP subsystem 880 and other telephone status signals as may be useful and provides the control signals for all the blocks above requiring control and control of the rest of the telephone. MCS block 800 may be implemented using almost any microprocessor. However, particularly suitable microprocessors include the type V40 available from NEC Electronics, Inc., Mountain View, California.

The control signal 881 is used by the controller 800 to set up and change the operating mode of the DSP

subsystem 880. This signal would conveniently be implemented as a mailbox register that would be written to by controller 800 and polled by the DSP subsystem 880. In a similar manner, signal 659 is used by the DSP

5 subsystem 880 to send the results of various less time critical algorithms, such as tone detection and speech generation, to the main controller 800. This signal would conveniently be implemented as a mailbox register that would be written-to by the DSP subsystem and polled

10 by the controller 800. Due to the possible speed differences between the DSP subsystem and the main controller, it is a particularly useful adaption of this mailbox register system to provide an interrupt to the controller 800 when the DSP subsystem writes new

15 information into its portion of such a mailbox. As may be seen by those skilled in the art, the signals 659 and 881 are, in general, the normal intersystem communication signals. By comparison, the hook-flash detection interrupt signal 472 and muting signal 304 are probably

20 asynchronous to other signals and this should be assumed to be the case unless the intersystem polling rate is very high. Hook-flash detection signal 472 is generated by the DSP subsystem 880 when an input signal entering the DSP subsystem 880 via signal 897 matches all of the

25 hook-flash detection algorithm qualifications described elsewhere. As signal 472 is herein described as an interrupt signal, the controller 800 will very quickly

determine an appropriate response. It may be that potential sound from the "controlled" telephone equipment cause or mask the existence of a hook-flash signal coming from the monitored, or remote, telephone. To prevent this in an analog system as described in the '702 Patent, an audio signal switch was provided to open up the microphone circuit from the controlled telephone. Where the telephone transmission between the parties is digital, it is necessary only to stop the flow of the digital data from signal 873 to signal 879 (See Figures 4A-4D) in order to accomplish the same objective. The mute signal 304 is thus provided so that the main controller 800 may immediately mute the audio from the controlled telephone equipment.

As just described, the DSP subsystem contains DSP algorithms to analyze the energy drop off to confirm the existence of a hook-flash signal. It is also possible to use other digital or analog techniques known now or hereafter to one skilled in the art to accomplish this same task. For example, autocorrelation is an alternative digital technique that might be utilized. Analog techniques could be employed including those utilizing a comparator and means for creating a time delay in the analog signal to compare it against the current one. Time delays, of course, can be created utilizing a charge couple device ("bucket brigade"), an "all pass" filter or other available means. All of these

and other analog and digital techniques might be employed to determine the existence of a rapid energy drop off characteristic of the hook flash.

Other features of the invention as described herein can be implemented in either analog or digital form or combinations thereof.

2. SYSTEM ARCHITECTURE:

Refer now to Figures 4A-D and 12A-D. Figures 4A-D disclose four likely implementations for use of the present invention in telephone or telephone equipment related applications while Figures 12A-B disclose how the present invention may be connected relative to the various major parts of the public switched telephone network ("PSTN"). It will be clear to those skilled in the art that other combinations of input (controlled telephone equipment) connections and output (monitored or remote telephone equipment) connections are easily configured by appropriate use of the information provided.

Figure 4A pertains to telephone equipment wherein the apparatus of the present invention is included as a direct subsystem of the telephone equipment. Figure 12A indicates the relative placement of the present invention in such an implementation.

As shown in Figure 4A, the present invention is incorporated with the controlled telephone equipment, in this example shown as a conventional telephone user

interface consisting of a listening point indicated as an earphone 750 and sound sources indicated as microphone and DTMF generating keypad both shown as 700. In addition, a user activation element is shown as hookswitch 770. An example of such an arrangement is a telephone handset, cradle hookswitch, and DTMF generating keypad. In such an application the circuit shown could be powered by a power supply deriving its standby power requirements from a small wall-type transformer. The following discussion assumes such an application.

When the user of the controlled telephone equipment lifts the handset from the cradle the hookswitch 770 automatically sends user request signal 180 to the controller wherein the controller would send a command to the DSP subsystem via command signal 881 to generate a user dialtone and to begin looking for sound or, perhaps more simply, for DTMF tones on signal 871. The DSP subsystem 880 then creates the proper sequence of digital patterns which are sent as the current signal 876 to DAC 877 which in turn translates the digital signal 876 into the appropriate voltage pattern as analog signal 699 which is heard by the telephone equipment user on the earphone 750.

When the telephone equipment user presses a key on the keypad DTMF tone will be generated which will be presented on signal 871, which is digitized by ADC 872 and sent to the DSP subsystem 880 as the current signal

873. As the DSP subsystem is currently looking for, at least, DTMF tones it will detect and recognize the first DTMF tone. The DSP subsystem could then automatically stop generating the user dialtone or wait for the controller 800 to so instruct but in any case would send the value or meaning of the detected DTMF tone to the controller 800 over the circuit for signal 659. If so designed, the controller 800 would instruct the DSP subsystem 880 to stop generating the user dialtone going to the user earphone 750 but to continue looking for additional DTMF tones on signal 871. Each key pressed by the telephone equipment user would similarly be detected and sent to the controller 800 until the controller 800 determines that a complete sequence of digits has been entered. At that point, the controller 800 may optionally send a command to the DSP subsystem via signal 881 to discontinue looking for additional sound and/or DTMF digits.

At this point, the controller 800 might, for example, determine if the sequence of digits entered by the telephone equipment user corresponds to an "invalid" telephone number. A number may be deemed "invalid," for example, if the telephone equipment user were attempting to place a collect call to a public coin telephone or if the telephone equipment user were a prison inmate attempting to call a witness whose telephone number was listed in an appropriate database. If the controller

determines that the number is invalid, it may take appropriate action, such as denying the attempted call to that number.

When ready to forward the call to the number requested by the telephone equipment user, controller 800 would seize the line 101, 102 by activating an appropriate relay or switch indicated as relay 103. The loop current detector 100 completes the DC path for the LEC switch causing DC current to flow in through the TIP and RING wires from the serving central office. The indicated loop start circuits could easily be replaced by ground-start circuits by one skilled in the art. Controller 800 would also send a command to the DSP subsystem 880, via signal 881, to look for sound or, more particularly, network dialtone. Note that in this example the internal circuits of the present invention are isolated from the PSTN by transformer 108 and the loop current detector 100 which is commonly implemented using an optoisolator of sufficient voltage rating. Capacitor 112 is provided to complete the AC, or audio, path for the network TIP/RING pair. Note also that a two wire to four wire hybrid function 130 is provided to isolate the "outgoing" analog signals 131 from the "incoming" analog signals 132. The hybrid function 130 can be any of a number of the passive or active implementations well known in the art.

When the serving central office is ready to receive dialing instructions, it will send the dialtone signal on the TIP/RING pair. This signal will be coupled through transformer 108 to the hybrid function 130 where the dialtone signal is separated to the hybrid output signal 132. Signal 132, currently the network dialtone, is then connected to ADC 874 where the dialtone is converted to digital form and passed to the DSP subsystem 880 as signal 875. The DSP subsystem then passes information about the signal 132, 875 to the controller 880 via the reporting circuit signal 659. At this point the controller 800 would send an appropriate command to the DSP subsystem to prepare to generate DTMF tones via DAC 879 and a sequence of digits to the DSP subsystem to be sent to the PSTN. The DSP subsystem 880 accepts the command and digit sequence and proceeds to generate an appropriate digital pattern which is presented as signal 878 to the DAC 879 which in turn translates the digital pattern into an analog voltage 131. The hybrid function 130 takes the analog signal 131 and drives the transformer 108 and thus the PSTN TIP/RING pair with the requested DTMF tone. Clearly a pulse dial relay system could also be used to outpulse the requested digit sequence.

Two subsystems are available to send an audio, i.e. verbal, message to the telephone equipment user. First, the DSP subsystem can generate an appropriate sequence as

5 signal 876, preferably as described by an internally
stored message pattern. Alternately another audio source
such as a recorded message or live microphone system
indicated as 710 would provide the analog message 711
that can be digitized by ADC 712 into the digital signal
713 which the DSP subsystem would send as signal 876 to
DAC 877 recreating signal 699 to the telephone equipment
user earphone 750. A more direct, but perhaps more
expensive, method would be to provide a direct analog
10 path from source 710 to a mixer amplifier driving the
earphone 750.

After the requested digit sequence has been
delivered to the PSTN, the controller 800 would command
the DSP subsystem 880 to look for noise or more
15 specifically for hook-flash sounds. When the potential
hook-flash sounds associated with the called party
telephone equipment answering the call are detected by
the DSP subsystem 880 the DSP subsystem 880 will
preferably interrupt the controller 800 by signal 472.
20 The controller may or may not have previously commanded
the DSP subsystem to pass the digital signal 873 to
signal 878. If so, the direct signal 304 may be used to
mute the microphone 700 circuit. Alternatively, the DSP
subsystem 880 could be commanded to pass only a portion
25 of the microphone 700 signal such as through a high pass
filter function perhaps with a low end pass frequency of
1500 Hz or so until the called party answer has been

confirmed. After the called party answer has been confirmed controller 800 would proceed with an appropriate protocol and other command sequences not specifically concerned with the present invention. For the purpose of the present invention, at some point the combined controller 800 and DSP subsystem 880 can be assumed to enter a hook-flash detection state or mode. At that point, the DSP subsystem 880 will be looking for and reporting hook-flash signals to the controller 800 and the controller 800 will be using the window analyzation algorithm to detect call-waiting notification, call-waiting call acceptance, or three-way conference call attempts, or called party call termination, i.e., hanging up. (See Figure 7.) The ADC 872 and DAC 879 in cooperation with appropriate high pass filter, or appropriate echo cancellation equivalent, software in the DSP subsystem 880 provide an effective high pass filter with, in this case, a lower pass frequency of about 300 Hz for signals 871 to the hybrid input signal 131. Since the monitored incoming signal 132 passes through the DSP subsystem via ADC 874 and DAC 877 cooperating with the DSP subsystem, this same input signal 132 can and is also low pass filtered, or functional spectrum analysis equivalent, to the hook-flash detector software subsystem. Each time the DSP subsystem 880 detects a hook-flash signal controller 800 will be notified via signal 472. Controller 800 can

issue commands, for example, to stop passing audio from
signal 871 to 131, i.e., mute the controlled sound
source. In any case, all necessary circuits and
components are provided to detect and respond to
5 hook-flash related activity at the monitored telephone
equipment.

While Figure 4A shows certain features of the
apparatus of the present invention, it does not
illustrate the operation of the window analyzation means
10 which can be employed as a second confirmation that a
signal is a hook-flash signal. The software window
analyzer includes a timer or timer means for cooperating
with the energy detector so that the timer begins running
for a first predetermined period (about 1.4 seconds) when
15 a specific energy pulse is detected by the energy
detector. The software window analyzer also includes
sound detection means for detecting sound on a telephone
line and for cooperating with the timer so that the sound
detection means is activated at the end of the first
20 predetermined period for a second predetermined maximum
time period (up to about 1.3 seconds). If sound is not
detected during the second predetermined time period,
that further indicates that the remote party has
attempted to initiate a three-way conference call.

25 The apparatus further includes signal interference
prevention means for preventing signals originating at
the local party's telephone from interfering with signals

originating at the remote party's telephone. Signal interference prevention may be provided by an echo cancellation unit, by lower limiting the local party's bandwidth to about 300 Hz with a high pass filter or by muting the microphone of the local party's telephone when a specific pulse is detected by the energy detector. In addition, the apparatus includes means for un-muting the local party's telephone if sound is detected during the second predetermined period, the un-muting of which permits the local and remote parties to converse.

The accurate detection of an attempted three-way call is complicated if one or both of the parties on the line has "call waiting" service. In the case of an inmate call, the called party is typically notified prior to call acceptance that the call will be terminated if the called party either attempts to make a three-way conference call or accepts a call waiting call. This is so, because the called party can use call waiting to relay a conversation back and forth between the inmate and the third party. However, the fact that a call waiting notification is generated on the line, indicating that a third-party is attempting to also call the called party, should not cause call termination. Call waiting notification may be "accepted" or "ignored." Acceptance of the third-party call by the called party's activation of the hook-flash should, however, be detected and result in call termination. The apparatus of the present

invention can detect such acceptance while distinguishing the call waiting "notification" signal.

Figure 4B shows the apparatus of the present invention as connected to an otherwise independent loop-start telephone or piece of telephone equipment by being placed electrically between the serving central office and the independent telephone or piece of telephone equipment. The indicated loop start circuits could easily be replaced by ground-start circuits by one skilled in the art. Figure 12A indicates the relative placement of the present invention in such a case.

Comparing Figure 4B with Figure 4A, it is apparent that the only change to the overall circuit is to provide the circuitry necessary to disassociate the present invention from the controlled telephone equipment. This is accomplished by providing a loop bias ("talk battery") voltage and external telephone equipment off-hook detection circuits depicted as block 160. As the signals 871 and 699 are unidirectional, a second hybrid function 190 is provided to convert the unidirectional, i.e., four wire, signals to the two wire bi-directional form. Isolation is provided by transformer 168. AC audio circuit completion is provided by capacitor 172. The DC bias voltage is provided by the loop bias block 160. Block 160 also contains appropriate loop current detection in a manner similar to block 100. The resulting subscriber line interface circuit ("SLIC")

looks exactly like a standard Telco central office TIP/RING pair and is designated by leads 161, 162. Any standard telephone interface equipment can be connected to the TIP/RING pair 161, 162 as shown by the telephone instrument 50 via telephone line 51.

When the telephone equipment 50 goes off hook, the loop current detector 160 will sense the occurrence and report to the controller via signal 180 exactly as in Figure 4A.

Figure 4C pertains to a stand alone piece of telephone equipment using industry standard four wire plus E&M ("4E&M") analog interconnections intended to be connected within the PSTN. In this case, the present invention would not be connected directly to the telephone or telephone equipment receiving the control benefits of the present invention. Instead, it would be connected either between two switches (Figure 12B) or as an adjunct to a switch (Figures 12C and 12D).

In the case shown in Figure 4C, there are no loop current detectors or hybrid functions. In 4E&M circuits, the audio paths are always connected but not necessarily active. The equivalent to the controlled telephone going off-hook is when the E-lead 663 from the PSTN circuit providing the E-lead signal is activated. The equivalent signal is now called a "service request" but is, in effect, the same as the controlled telephone equipment going off hook. The controlled telephone equipment

E-lead is monitored by E-lead detector 664 and reported to the controller 800 as signal 180. Numerous circuits are known in the art, such as, isolation relays, transistor level shifters and, similar to loop current detectors, simple optoisolator circuits.

The controller 800 has the additional task in this network application of responding to the requesting PSTN switch with appropriate "winks" and "off hook" conditions on the M-lead. This is accomplished via signal 185 connected to an M-lead driver 668 which in turn commonly drives a mercury wetted relay as the actual M-lead signal. Other M-lead signal driving circuits are known in the art.

On the monitored telephone equipment side, a similar set of connections are disclosed. Instead of driving relay 103 as in Figure 4A the monitored telephone equipment network switch is notified that service is requested by asserting signal 125 to the monitored side M-lead driver 678 which in turn drives the monitored side M-lead 679. Instead of waiting for a dialtone as in Figure 4A and 4B, it is necessary to wait only for the monitored side switch to indicate service acceptance by the use of its E-lead signal 673. This is detected by the E-lead detector 674 and reported to the controller 800 via signal 120. In all other respects, the circuits described in Figure 4C act in a manner similar to those in Figures 4A and 4B.

Figure 4D is a block diagram which shows the general organization of the equipment of the present invention where the signals transmitted and received on the line are already digitized. This occurs, for example, where the detection equipment is located in the network as part of the transmission of a call which has already been digitized.

In this case, the present invention would not be connected directly to the telephone or telephone equipment receiving the control benefits of the present invention but rather either between two switches (Figure 12B) or as an adjunct to a switch (Figures 12C and 12D).

The standard practice is currently to digitize the telephone audio signals at the LEC end office before transmission in digital form to another intra-LATA end office or to an inter exchange carrier for transmission to an inter-LATA end office. Each audio path equivalent is referred to as a trunk and the digitized trunk is referred to as a "DS0" level signal. Multiple DS0 signals may be multiplexed over a single physical path, for example, DS1 and DS3 level paths, which are the normal signal connection levels to and from the LEC and/or IXC. For purposes of the present invention the DSP subsystem is described as an individual subsystem for each DS0 trunk. It may be clear to those normally skilled in the art that a DSP subsystem with sufficient speed (digital bandwidth) could directly handle multiple

DSØ trunks by appropriately partitioning memory and processing time.

Because the signal is digital form, it is not necessary to have analog to digital converters 872 and 874 shown in Figures 4A-4C. Instead, in the embodiment shown in Figure 4D, there is a single analog to digital converter 712 which is used solely to convert internal audio sources 710, if any, such as tones or recorded messages, such as those that might be initiated by controller 800, if a three-way call is confirmed.

In the case shown in Figure 4D, there are no loop current detectors or hybrid functions. In DSØ circuits, the audio paths are always connected but not necessarily active. The equivalent to the controlled telephone going off hook is, in the case of in-band or robbed bit signalling, when the A-bit as part of signal 561 from the controlled telephone equipment PSTN is activated. The equivalent signal is now called a "service request" but is, in effect, the same as the controlled telephone equipment going off hook. The controlled telephone equipment service request A-bit is monitored by the indicated transceiver 560. This transceiver may be a combination of available circuits from, for example, Crystal Semiconductor Corporation, Austin, Texas, or may be implemented in a field programmable gate array such as available from Xilinx, Inc., San Jose, California. This A-bit signal is handled exactly as the E-lead in Figure

4C. The signal equivalent to the M-lead is an outgoing or return A-bit sent by the controller 800 as signal 185 which is inserted into the PCM signal 567.

Similarly, the in-band or robbed bit service request from the present invention would be sent from the controller 800 as signal 125 which transceiver 570 inserts into the PCM bit stream 577 in the same manner as the other transceiver. The outgoing service acceptance will be sent by the PSTN receiving switch as the A-bit in PCM signal 571 which, in turn, is decoded by transceiver 570 and sent to controller 800 as signal 120.

An option to the in-band or robbed bit signals is the use of out-of-band signalling as in the case of SS7 or ISDN implementations. In this case the transceivers 560, 570 are primarily PCM buffers and the service request and acceptance signals are provided on the signal 195 from the controlled telephone equipment end and on signal 190 from the monitored telephone equipment end.

C. OVERALL SYSTEM OPERATION:

Figures 6-11 provide a combination of routines describing the processes needed to identify and appropriately respond to the signals and events related to (typically computer) controlled calls, collect calls and potential fraudulent abuses of calls, collect or not, caused by certain classes of telephone users. The software flow charts provided, portions thereof, or

functional equivalents, would commonly be incorporated as part of a comprehensive telephone control program.

The call completion algorithm, disclosed in Figure 6, is used to determine when the calling party's circuit to the called party's telephone, known as "call completion" or possibly to a busy indicator or other Telco intercept circuit, so that signal analysis is not performed on network switching noises prior to call completion.

The signal classification algorithm, disclosed in Figure 7, is an example of a top level software structure that, along with structures similar to Figures 6 and 8-11, or relevant portions thereof, would be added to the control program for a telephone system wishing to incorporate features of the present invention. The algorithms depicted in Figures 6-9 and 11 are presented in a manner consistent with a control program based on periodic execution of its primary control algorithms. Figure 10 is presented in a manner consistent with an interrupt to the periodic control program being initiated in response to signal 472. A suitably modified version of any or all of Figures 6-11 may be readily incorporated in control programs using structures other than a periodic and interrupt structure.

The algorithm described in Figure 7 is presented assuming a limited access telephone application which may be used in a prison inmate telephone system requiring

call and/or collect call acceptance and optionally disallowing three-way conference calls.

5 The algorithm described in Figure 7 provides control for the functions of call completion, call, or collect call, acceptance by the called party, detection of loop current loss if the called party is served by the same central office as the calling telephone system, protection against undesirable disconnection due to inadvertent system response to signals similar to those associated with three-way conference calling, and the second means for confirming an attempt to initiate a
10 three-way call, i.e., window analyzation.

The window analyzation algorithm presented in Figure 7 determines if a pulse detected by Block 880 has
15 been caused by some occurrence other than a three-way call setup request by the called party. Causes other than a three-way call setup request have audible sounds, including voice or tone signals, detectable by Block 880. If any of these indicators are present for about
20 40 milliseconds or more, with 200 milliseconds virtually guarantying voice, shortly after detection of a pulse by Block 880, preferably within about 2.7 seconds, (of which about 1.4 seconds is to ignore call-waiting signals and 1.3 seconds is to accept called party sounds) the pulse
25 was probably not caused by a three-way call attempt. For end-of-call-only detection where three-way calls are not of any concern, the second period may be extended to

about 10 to 60 seconds to reduce inadvertent disconnections.

The Telco local loop current test algorithm, disclosed in Figure 8, is an example of one method of detecting and responding to the loss of the telephone company loop current that often occurs when the calling party equipment and called party equipment share a common central office.

The three-way call handler or response means, disclosed in Figure 9, provides an example of some methods of dealing with an attempt by the called party to provide the calling party with three-way call access to a third party when this activity is prohibited by the institution or circumstances involved with the specific call in question.

The detected pulse handler, disclosed in Figure 10, provides a means of communicating the detection of a pulse by Block 880, to the algorithms of Figures 6-9 and 11. The algorithm of Figure 10 is presented in the form of a hardware interrupt response by the controlling program in Block 800.

The algorithm of Figure 10 provides the function of restricting multiple responses to original signals that were of a singular nature (referred to as debouncing of signal 472). Further, the algorithm of Figure 10 provides the function of counting the debounced pulses detected by Block 880. Further, the algorithm of

Figure 10 provides the function of starting a sequence of protective measures in an attempt to classify a detected pulse.

5 The pulse assisted answer supervision algorithm, disclosed in Figure 11, is an example of one method of providing a telephone, or related system, with the ability to recognize the moment, i.e. exactly, when the called party answers their telephone. This is important on many computerized or otherwise automated telephone
10 systems where the duration of the call is used to determine charges for the call or where automated voice systems communicate with the called party.

By following the flow charts in Figures 6-11, for each of the conditions mentioned previously, the reader
15 will understand how the apparatus of the present invention determines the cause of and response to one or more signals on lines 120 and 472, indicating for example, call answer, call acceptance, call waiting notification, and the detection of and optional response
20 to a detected (potentially fraudulent) three-way conference call or acceptance of (transfer to) an incoming call waiting by this called party.

D. NETWORK EMBODIMENT:

25 As noted briefly above, the apparatus of the present invention may be utilized in a number of different environments. For example, (1) it may be located in or

in connection with an individual telephone, (2) it may be utilized at or in connection with the phone system of an institution, such as, a prison, hotel, or hospital, or (3) it may be deployed in a network. Several embodiments are depicted in Figures 12A through 12D.

Figure 12A depicts a system in which the equipment for detecting the hook-flash is associated with one or more telephones at a particular institution. The methods by which the equipment can be connected with those phones are as shown in related Figures 4A and 4B. In Figure 12A, the phone is connected to the three-way call apparatus, i.e., "detector," 60 of the present invention located in the line between the local telephone and the local central office 70 which completes the call to remote phone 42.

The Figure 12A embodiment represents a configuration in which the detector is located between the calling party's telephone and the end office, LEC, or switch. In this configuration, the detector may monitor the initiation of a three-way call, regardless of whether the remote telephone on which such an attempt is made is connected either locally or by long distance.

Figure 12B figuratively depicts a system configuration in which the detection equipment 60 is located between the local office 70 and an inter-exchange carrier ("IXC") 80 which connects the call to remote local central office 90. In this arrangement, the

detection equipment 60 can monitor hook-flash signals of a called party on a long distance call between local telephone 41 and remote telephone 43.

Figure 12C figuratively depicts a system configuration in which the detection equipment 60 is located in connection with the local end office 70 and selectively connected into the path to telephone 42 or the IXC 80. In this arrangement, the detection equipment is capable of monitoring hook-flash signals of a called party on a long distance call between local telephone 41 and remote phone 43 through local central office 70, IXC 80 and remote local central office 90 or a local call between telephone 41 and telephone 42.

Figure 12D depicts an arrangement in which the detector 60 is located at the IXC 80, and selectively connected into the call path towards telephone 43. This arrangement permits selected long-distance calls to be monitored for attempts to initiate a three-way call.

Figures 12B, 12C and 12D are examples of detection equipment deployed in a network configuration. As previously indicated, the term "network," as used herein, refers to any system in which the detection equipment is connected in the telephone connection between the local and remote telephone at some point after the call reaches the initial switch, at the central office, LEC, etc. Network configurations, other than those specifically depicted, can be designed for particular applications.

Because it may not be necessary to monitor all calls, but only those emanating from a particular source, e.g., a prison, calls may be selectively routed to the detection equipment by the LEC. This may be done, for example, by using a combination of automatic number identification ("ANI") information which the telephone system automatically supplies in connection with a call identifying the calling telephone, "II digits" which identify a class of service or type of telephone, and/or the called telephone number, all of which should be available to the LEC. This information can be analyzed and used to determine which incoming calls should be sent to the detection equipment for line monitoring.

Whether or not the detection equipment is located prior to the switch or is in a network environment, as defined herein, the detection equipment hears essentially the same signal as that received by the telephone equipment not attempting to initiate the three-way conference call. In other words, the energy received by the apparatus has essentially the same characteristics as that received by the other party to the call.

In that regard, it should be noted that the use of the terms "local" and "remote" with respect to particular telephones or "called" and "calling" party, as used herein, are not intended to limit the invention in any way, other than to illustrate specific embodiments or to assist in defining the location of the apparatus of the

invention with respect to other pieces of equipment. In fact, the apparatus of this invention may be connected to any telecommunication between two parties in which one of the parties has three-way call conferencing capability. Because of the present needs of commercial users, e.g. prisons, emphasis has been placed herein on the use of the invention to detect attempts to initiate three-way calls by the called party. The invention, could also be applied to detect three-way calls which the calling party attempts to initiate with a hook-flash, so long as that is the signal which is being monitored.

Similarly, it should be understood that reference to the apparatus of this invention being "connected" to a telecommunication includes any configuration in which the apparatus of this invention is capable of monitoring the desired signal and responding in the desired manner, if the attempted initiation of a three-way call through a hook-flash is detected.

E. OTHER FUNCTIONS:

Those skilled in the art will appreciate that while the present invention has been described as being useful for detecting an attempted three-way call initiated by a hook-flash signal, any event which causes the generation of the hook-flash or hook-flash like signal such as a call waiting signal, call answering, call termination, and determining the specific number dialed number on a

rotary/pulse telephone, can also be detected. Accordingly, the detection of such other events is considered to be within the scope of the present invention.

5 For example, the invention provides an apparatus for detecting the called party's answering of the call. This embodiment also includes signal interference prevention means for preventing signals originating at the calling party's telephone from interfering with signals
10 originating at the called party's telephone.

 Again, signal interference can be prevented by muting the calling party's microphone or with echo cancellation. In addition, a ringback detector (ringback detection means) is provided for detecting the called
15 party's ringback signal energy level. Also provided is a low pass filter for passing energy having frequencies below about 500 Hz and energy detection means for detecting a specific electrical energy pulse having been filtered by said filter means and having a predetermined
20 minimum magnitude which is caused when a called (remote) party goes off-hook, i.e., removes the telephone's handset from the telephone's hookswitch. In addition, this apparatus includes means for activating the energy detector when the ringback signal is detected.

25 Those skilled in the art will appreciate that called party answer is indicated when the first specific energy pulse is detected after the apparatus has detected the

called party's ringback signal. If the signal
interference prevention means includes calling party
microphone muting means, means for un-muting the
microphone of the calling party's telephone must be
5 provided when a specific pulse is detected so that the
calling party may converse with the called party. This
embodiment of the invention is useful where the calling
party telephone is a pay telephone of a type wherein
charges are based upon the length of the call. This
10 apparatus can be used in conjunction with the end-of-
call-supervision apparatus as described in the '702
Patent, to provide an accurate way of determining the
length of a telephone call for billing purposes.

15 The invention has been described in detail with
reference to particular embodiments thereof, but it will
be understood that various other modifications can be
effected within the spirit and scope of this invention.

We claim:

1. An apparatus connected to a telecommunication between a local telephone in telecommunication with a remote telephone, wherein one of said telephones has a three-way calling service which is not associated with the apparatus, which apparatus is capable of determining whether the party using the telephone with three-way calling service has performed a specific act that is consistent with an attempt to initiate a three-way call utilizing a hook-flash signal comprising:

means for the detection of an energy pulse generated by the telephone having the three-way calling service, said pulse having a frequency characteristic of the hook-flash signal;

first means for confirming the existence of the hook-flash by analyzing the energy pulse to determine if there is a rapid drop-off in energy which is a further characteristic of the hook-flash signal; and

response means for implementing a predetermined response when said energy pulse is detected and confirmed.

2. The apparatus according to Claim 1 in which the apparatus is connected in the telecommunication at a point between the local telephone and the first switch in the local exchange.

3. The apparatus according to Claim 2 in which the first means for confirming the hook-flash comprises digital signal processing means for analyzing the energy pulse to determine if there is a rapid drop-off in energy which is a further characteristic of the hook-flash signal.

4. The apparatus according to Claim 2 in which the means for detecting and the means for confirming the hook flash comprises:

means for filtering the energy to a bandwidth less than approximately 500 Hz;

means for calculating the absolute value of the hook flash signal;

means for calculating the moving average of the signal;

means for determining whether the signal is greater than a predetermined minimum; and

means for determining whether there is a rapid drop off in the energy of the signal, if the energy of the signal is greater than the predetermined minimum, by comparing a current sample of the signal to a previous sample of the signal.

5. The apparatus according to Claim 4 further comprising second means for confirming the existence of the hook-flash by window analyzation.

5 6. The apparatus according to Claim 4 in which the means for the detection of an energy pulse generated by the telephone having the three-way calling service includes low pass filtering means for passing energy having a frequency between approximately 100 and 300 Hz.

10 7. The apparatus according to Claim 4 in which the low pass filtering means is accomplished with digital signal processing.

15 8. The apparatus according to Claim 4 in which the means for detecting and the first means for confirming are digital signal processing means.

 9. The apparatus according to Claim 8 in which the digital signal processing means analyzes the signal at a rate of once every 39 mS.

20 10. The apparatus according to Claim 9 in which the rapid drop-off in energy is characterized by having an effective slope of approximately 0.05 to 0.17.

25 11. The apparatus according to Claim 9 in which the rapid drop-off in energy is characterized by having an effective slope of approximately 0.078.

12. The apparatus according to Claim 8 further comprising second means for confirming the existence of the hook-flash signal by window analyzation.

5 13. The apparatus according to Claim 12 in which said window analyzation means includes:

timer means for cooperating with said energy detection means so that said timer means begins running for a first pre-determined time period when a specific energy pulse is detected and confirmed by said first confirmation means;

10 sound detection means for detecting sound during the telecommunication and for cooperating with said timer means so that said sound detection means is activated at the end of the first predetermined period for a second predetermined maximum time period; and

15 means for activating the response means if sound is undetected during the second predetermined period, the undetection of which provides an indication that the remote party has performed a specific act that is consistent with an attempt to initiate a three-way call.

20 14. The apparatus according to Claim 13 further including means for echo cancellation or for muting the sound from the telephone other than the one

which has three-way call services associated with it during the second predetermined period.

5 15. The apparatus according to Claim 4 in which the response means includes means for implementing at least one predetermined response selected from the group consisting of:

 means for terminating the telecommunication between the local and remote parties;

10 means for playing a pre-recorded message;

 means for generating a tone which is heard by one or more parties to the telecommunication;

 means for muting the local telephone; and

15 means for recording the date and time of the attempt to initiate the three-way call.

20 16. The apparatus according to Claim 4 in which the response means comprises means for terminating the telecommunication between the local and remote parties.

25 17. The apparatus according to Claim 1 in which the apparatus is connected in the telecommunication at a point in the network after the telecommunication from the local telephone reaches the initial switch at the local exchange.

18. The apparatus according to Claim 17 in which the first means for confirming the hook-flash comprises digital signal processing means for analyzing the energy pulse to determine if there is a rapid drop-off in energy which is a further characteristic of the hook-flash signal.

19. The apparatus according to Claim 17 in which the means for detecting and the means for confirming the hook flash comprises:

means for filtering the energy to a bandwidth less than approximately 500 Hz;

means for calculating the absolute value of the hook flash signal;

means for calculating the moving average of the signal;

means for determining whether the signal is greater than a predetermined minimum; and

means for determining whether there is a rapid drop off in the energy of the signal, if the energy of the signal is greater than the predetermined minimum, by comparing a current sample of the signal to a previous sample of the signal.

20. The apparatus according to Claim 19 further comprising second means for confirming the existence of the hook-flash by window analyzation.

21. The apparatus according to Claim 19 in which the means for the detection of an energy pulse generated by the telephone having the three-way calling service includes low pass filtering means for passing
5 energy having a frequency between approximately 100 and 300 Hz.

22. The apparatus according to Claim 19 in which the low pass filtering means is accomplished with
10 digital signal processing.

23. The apparatus according to Claim 19 in which the means for detecting and the first means for confirming are digital signal processing means.
15

24. The apparatus according to Claim 19 in which the digital signal processing means analyzes the signal at a rate of once every 39 mS.

25. The apparatus according to Claim 24 in which the rapid drop-off in energy is characterized by having an effective slope of approximately 0.05 to 0.17.
20

26. The apparatus according to Claim 24 in which the rapid drop-off in energy is characterized by having an effective slope of approximately 0.078.
25

27. The apparatus according to Claim 23 further comprising second means for confirming the existence of the hook-flash signal by window analyzation.

5 28. The apparatus according to Claim 27 in which said window analyzation means includes:

timer means for cooperating with said energy detection means so that said timer means begins running for a first pre-determined time period when a specific energy pulse is detected and confirmed by said first confirmation means;

10 sound detection means for detecting sound during the telecommunication and for cooperating with said timer means so that said sound detection means is activated at the end of the first predetermined period for a second predetermined maximum time period; and

15 means for activating the response means if sound is undetected during the second predetermined period, the undetection of which provides an indication that the remote party has performed a specific act that is consistent with an attempt to initiate a three-way call.

20 29. The apparatus according to Claim 28 further including means for echo cancellation or for muting the sound from the telephone other than the one

which has three-way call services associated with it during the second predetermined period.

5 30. The apparatus according to Claim 19 in which the response means includes means for implementing at least one predetermined response selected from the group consisting of:

 means for terminating the telecommunication between the local and remote parties;

10 means for playing a pre-recorded message;

 means for generating a tone which is heard by one or more parties to the telecommunication;

 means for muting the local telephone; and

15 means for recording the date and time of the attempt to initiate the three-way call.

 31. The apparatus according to Claim 19 in which the response means comprises means for terminating the telecommunication between the local and remote parties.

20

32. An apparatus connected to a telecommunication between a local telephone in telecommunication with a remote telephone, said connection being made at a point in the network after the telecommunication from the local telephone reaches the initial switch at the local exchange, wherein one of said telephones has a three-way calling service which is not associated with the apparatus, which apparatus is capable of determining whether a party using the telephone with the three-way calling service has performed a specific act that is consistent with an attempt to initiate a three-way call utilizing a hook-flash signal comprising:

low pass filtering means for passing energy having a frequency less than about 500 Hz;

means for the detection of an energy pulse generated by the telephone having the three-way calling service having a frequency less than about 500 Hz and above a pre-determined threshold which is characteristic of the hook-flash signal;

first means for confirming the existence of the hook-flash by analyzing the energy pulse to determine if there is a rapid drop-off in energy of the pulse which is a further characteristic of the hook-flash signal;

second means for confirming the existence of the hook-flash by window analyzation; and

response means for implementing a predetermined response when said energy pulse is detected and confirmed by said first and said second means for confirming.

5

33. The apparatus according to Claim 32 in which the low pass filtering means passes energy having a frequency between approximately 100 and 300 Hz.

10

34. The apparatus according to Claim 32 in which the low pass filtering means passes energy having a frequency between approximately 200 and 300 Hz.

15

35. The apparatus according to Claim 32 in which the first means for confirming the hook-flash comprises digital signal processing means for analyzing the energy pulse to determine if there is a rapid drop-off in energy which is a further characteristic of the hook-flash signal.

20

36. The apparatus according Claim 32 in which the means for the detection of an energy pulse characteristic of the hook-flash signal and the first means for confirming the existence of the hook-flash comprise digital signal processing:

25

means for calculating the absolute value of the hook flash signal;

means for calculating the moving average of the signal;

means for determining whether the signal is greater than a predetermined minimum;

5 means for determining whether there is a rapid drop off in the energy of the signal, if the signal is greater than the predetermined minimum, by comparing current sample of the signal to a previous sample of the signal.

10

37. The apparatus according to Claim 36 in which the low pass filtering means is accomplished with digital signal processing.

15

38. The apparatus according to Claim 36 in which the means for detecting and the first means for confirming comprises digital signal processing means.

20

39. The apparatus according to Claim 38 in which the digital signal processing means analyzes the signal at a rate of once every 39 Ms.

25

40. The apparatus according to Claim 39 in which the rapid drop-off in energy is characterized by having an effective slope of approximately 0.05 to 0.17.

41. The apparatus according to Claim 39 in which the rapid drop-off in energy is characterized by having an effective slope of approximately 0.078.

5 42. The apparatus according to Claim 36 in which said window analyzation means includes:

timer means for cooperating with said energy detection means so that said timer means begins running for a first pre-determined time period when a specific energy pulse is detected and confirmed by said first confirmation means;

10 sound detection means for detecting sound during the telecommunication and for cooperating with said timer means so that said sound detection means is activated at the end of the first predetermined period for a second predetermined maximum time period; and

15 means for activating the response means if sound is undetected during the second predetermined period, the undetection of which provides an indication that the remote party has performed a specific act that is consistent with an attempt to initiate a three-way call.

20 43. The apparatus according to Claim 42 further including means for echo cancellation or for muting the sound from the telephone other than the one

which has three-way call services associated with it during the second predetermined period.

44. The apparatus according to Claim 36 in which the response means includes means for implementing a predetermined response selected from the group consisting of:

means for terminating the telecommunication between the local and remote parties;

means for playing a pre-recorded message;

means for generating a tone which is heard by one or more parties to the telecommunication;

means for muting the local telephone; and

means for recording the date and time of the attempt to initiate the three-way call.

45. The apparatus according to Claim 36 in which the response means includes comprises means for terminating the telecommunication between the local and remote parties.

46. A method for determining whether a remote party using a remote telephone in telecommunication with local telephone equipment, wherein said remote telephone has a three-way calling service which is not associated with the apparatus, has performed a specific act that is consistent with an attempt to initiate a three-way call utilizing a hook-flash signal comprising:

detecting an energy pulse generated by the telephone having the three-way calling service, said pulse having a frequency characteristic of the hook-flash signal;

confirming the existence of the hook-flash by analyzing the energy pulse to determine if there is a rapid drop-off in energy which is a further characteristic of the hook-flash signal; and

responding in a predetermined response manner when said energy pulse is detected and confirmed.

47. The method of Claim 46 wherein the step of detecting energy comprises:

filtering the energy received by the local telephone equipment to a frequency range characteristic of the hook-flash signal; and

detecting a specific electrical energy pulse having passed through the filter.

48. The method of Claim 46 wherein the steps of detecting an energy pulse and for confirming the detection comprise:

filtering the energy pulse to pass filtered energy in a frequency range of less than approximately 500 Hz;

calculating the absolute value of the filtered energy;

calculating the moving average of the signal;
determining whether the signal is greater than a predetermined minimum,

determining whether there is a rapid drop off in the energy of the signal, if the signal is greater than the predetermined minimum, by comparing the current sample of the signal to a previous sample of the signal.

49. The method of Claim 48 in which the filtering step passes filtered energy in a frequency range of approximately 100 to 300 Hz;

50. The method of Claim 48 in which the filtering step passes filtered energy in a frequency range of approximately 200 to 300 Hz;

51. The method according to Claim 48 in which the detecting and confirming occurs by analyzing the signal at a rate of once every 39 mS.

52. The apparatus according to Claim 51 in which the rapid drop-off in energy is characterized by having an effective slope of approximately 0.05 to 0.17.

5 53. The apparatus according to Claim 51 in which the rapid drop-off in energy is characterized by having an effective slope of approximately 0.078.

10 54. The method of Claim 48 including further confirming the existence of the hook-flash by:

15 monitoring the telecommunication for a predetermined time period which commences after the existence of the pulse is detected and confirmed to detect a specific event occurring during that time period the detection of which further confirms whether the remote party has performed a specific act that is consistent with an attempt to initiate a three-way call and

20 the responding in a predetermined manner occurs when the remote party's performance of a specific act that is consistent with an attempt to initiate a three-way call has been detected, confirmed and further confirmed by said monitoring.

25 55. The method of Claim 53 including further confirming the existence of the hook-flash by:

monitoring the telecommunication for a predetermined time period which commences after the existence of the pulse is detected and confirmed to detect a specific event occurring during that time period the detection of which further confirms whether the remote party has performed a specific act that is consistent with an attempt to initiate a three-way call and

the responding in a predetermined manner occurs when the remote party's performance of a specific act that is consistent with an attempt to initiate a three-way call has been detected, confirmed and further confirmed by said monitoring.

56. The method of Claim 55 further comprising the step of preventing signals originating with the local telephone equipment from interfering with the further confirming of the hook-flash signal.

57. The method of Claim 56 wherein the step of preventing signals originating with the local telephone equipment from interfering with the further confirming of the hook-flash signal is accomplished by echo cancellation.

58. The method of Claim 56 wherein the step of preventing signals originating with the local telephone

equipment from interfering with the further confirming of the hook-flash signal is accomplished by:

muting the local telephone equipment when an energy pulse is detected; and

un-muting the local telephone equipment at the conclusion of the predetermined window.

59. The apparatus according to Claim 55 in which the step of responding comprises at least one step selected from the group consisting of:

terminating the telecommunication between the local and remote parties;

playing a pre-recorded message;

generating a tone which is heard by one or more parties to the telecommunication;

muting the local telephone; and

recording the date and time of the attempt to initiate the three-way call.

60. The apparatus according to Claim 55 in which the step of responding comprises terminating the telecommunication between the local and remote parties.

FIG. 1A

Analog Signal 1, Digital Signal 2

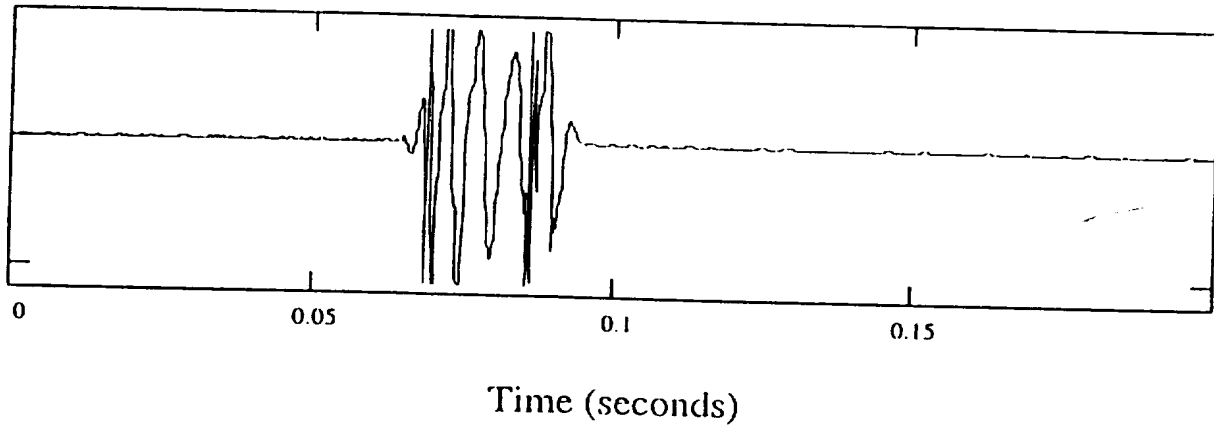


FIG. 1B

Signal 3

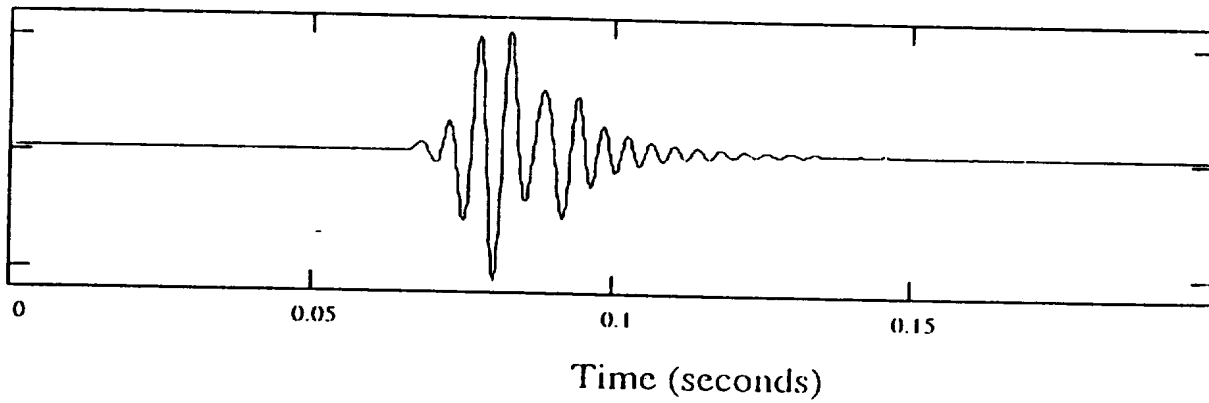


FIG. 1C

Signal 4

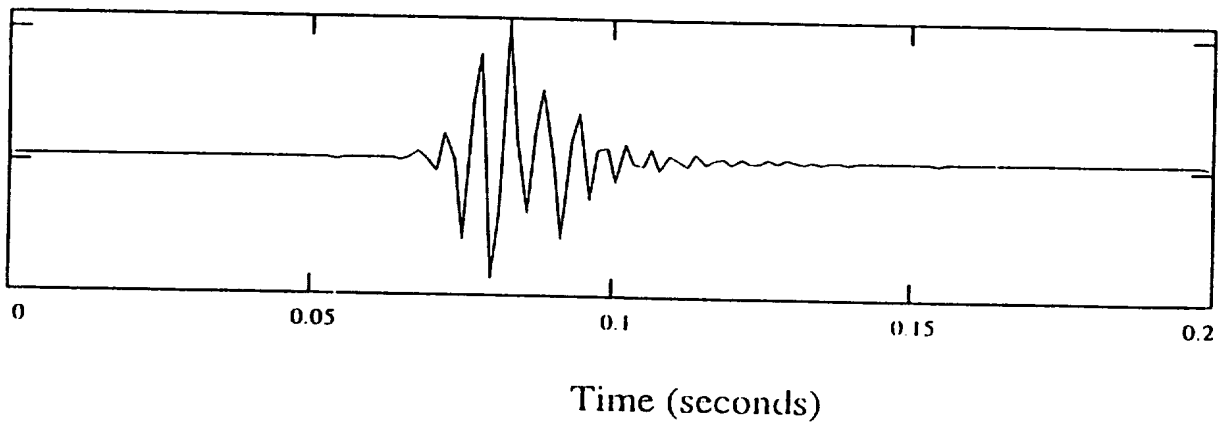


FIG. 1D

Signal-5

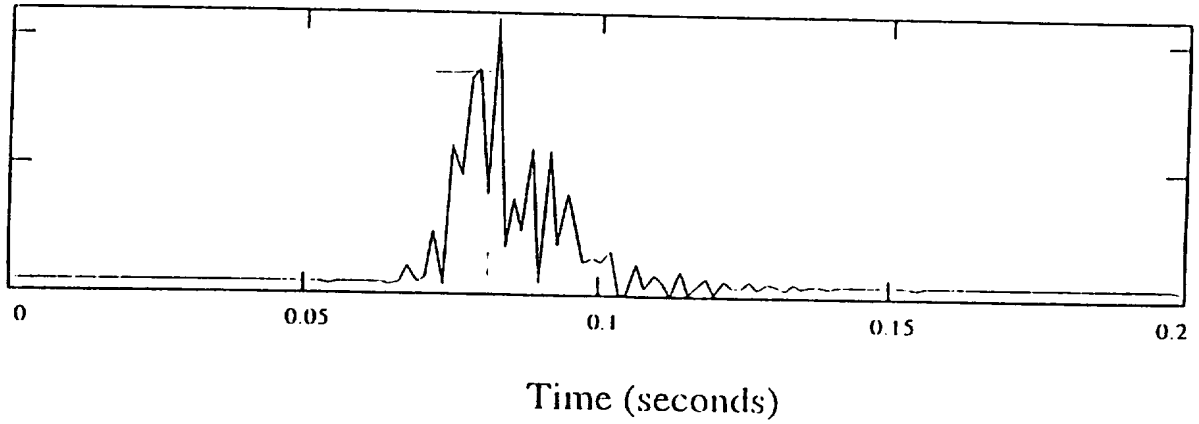


FIG. 1E

Strong Signal 6

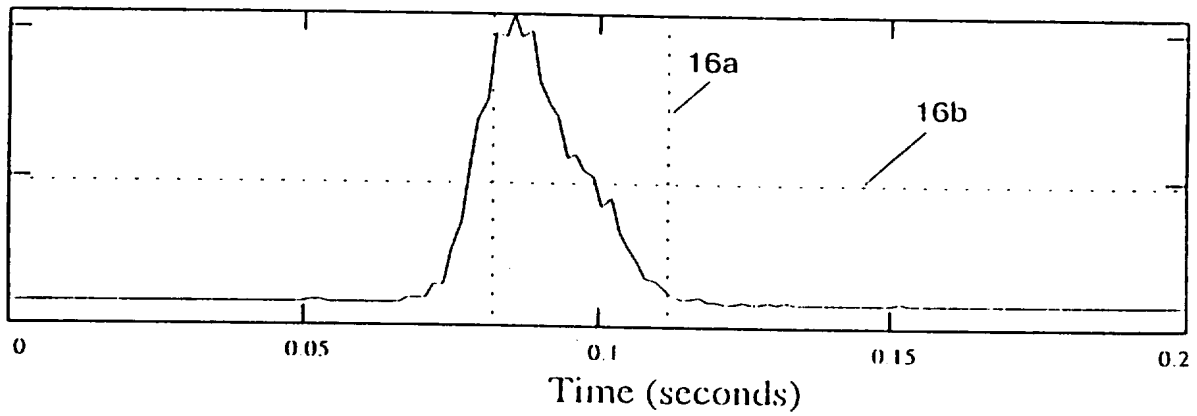
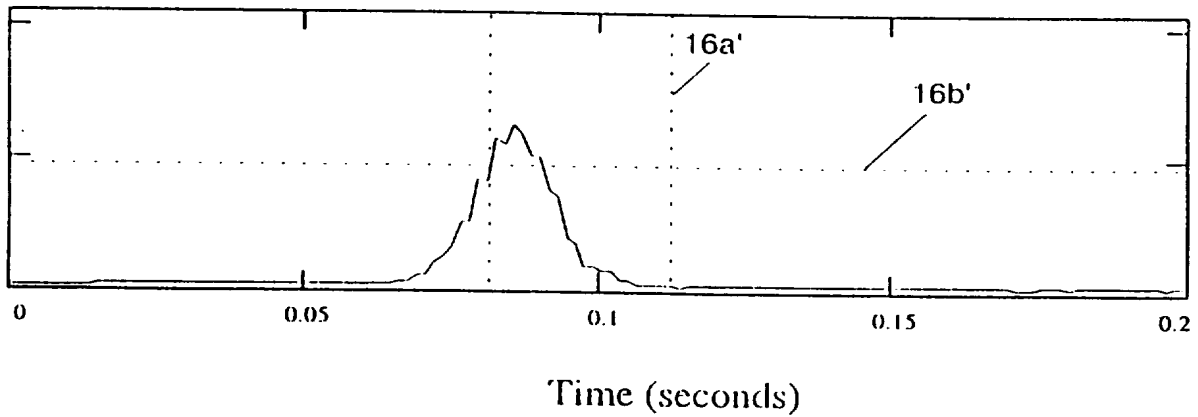


FIG. 1F

Weak Signal 6



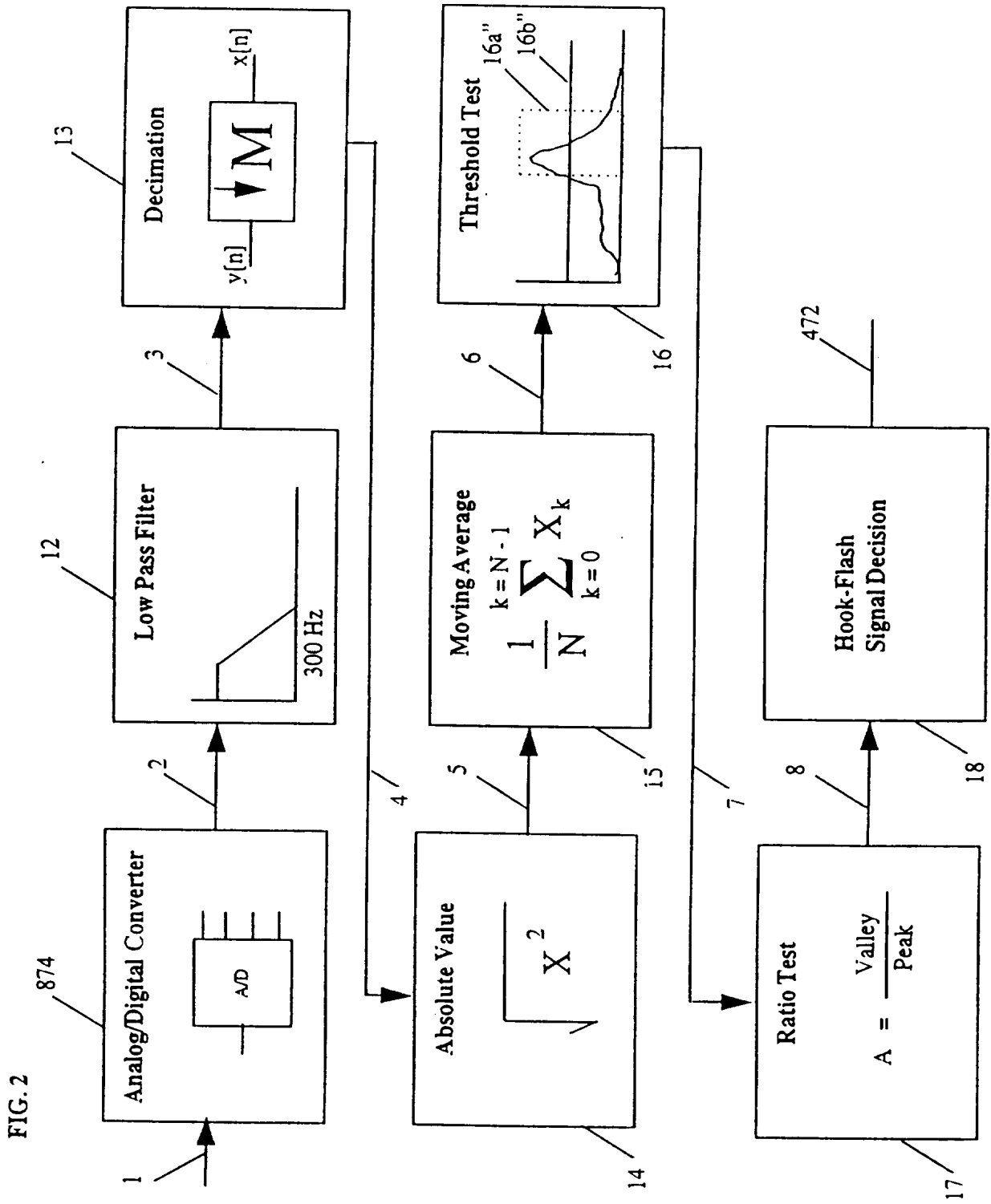
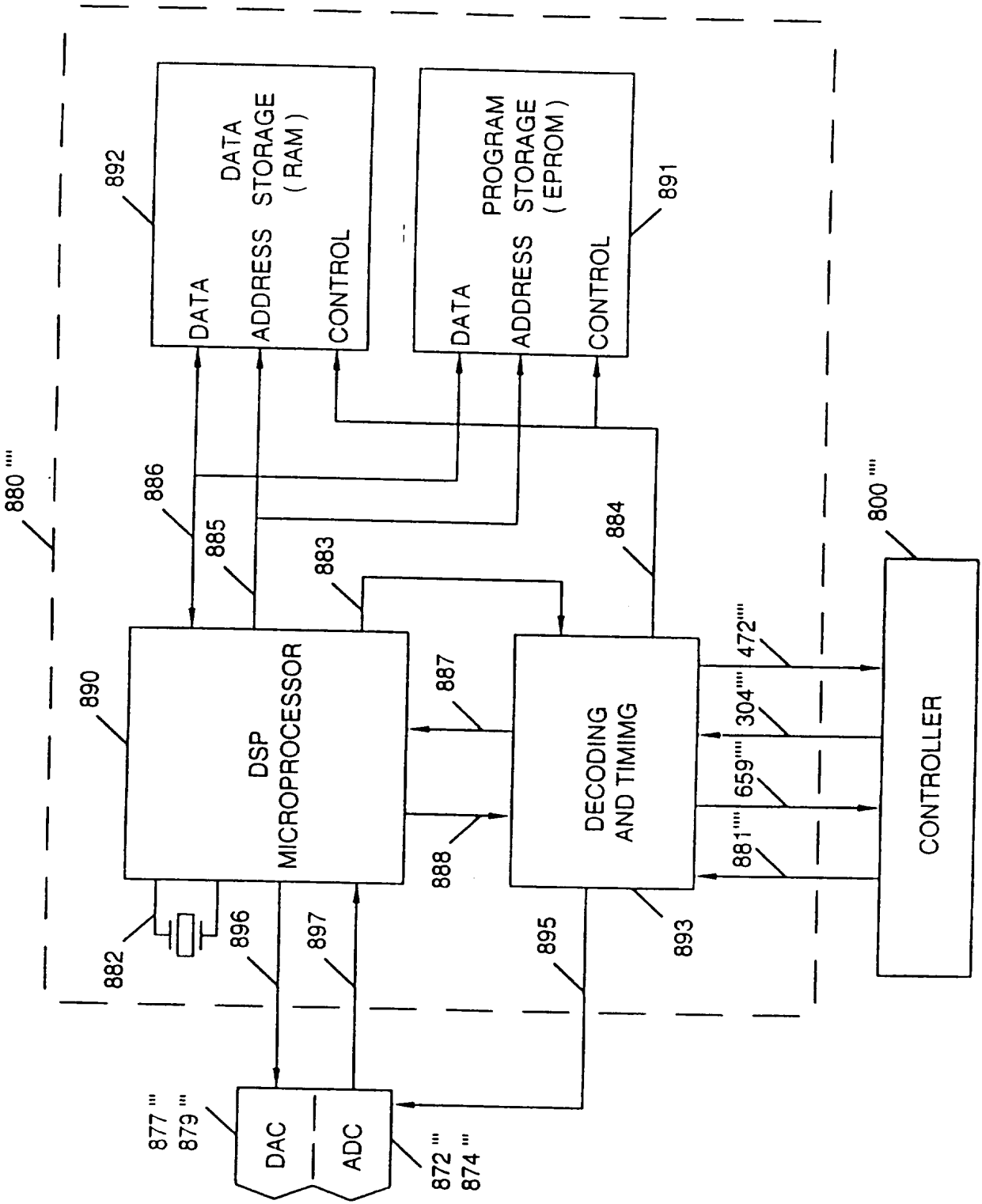
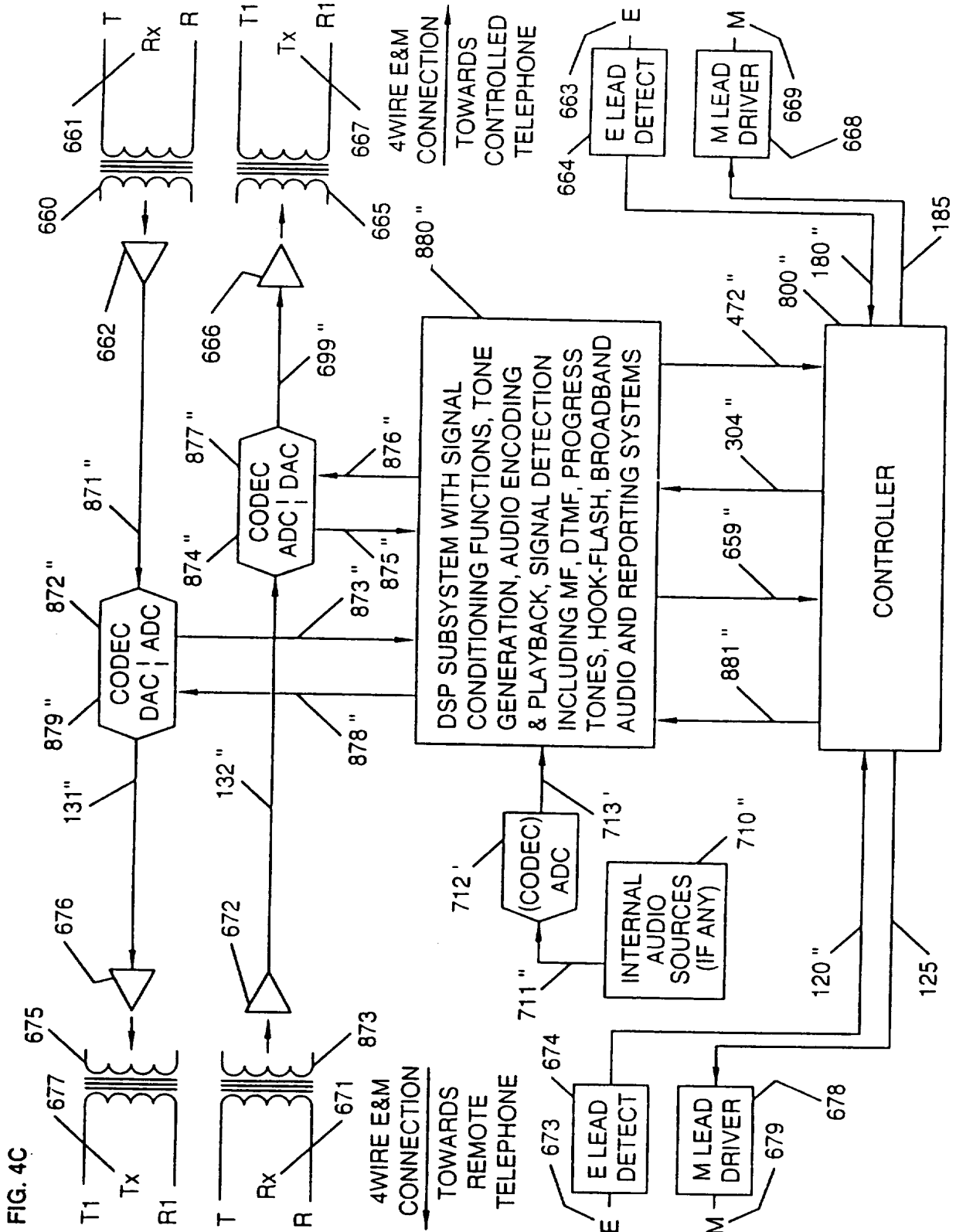


FIG. 3





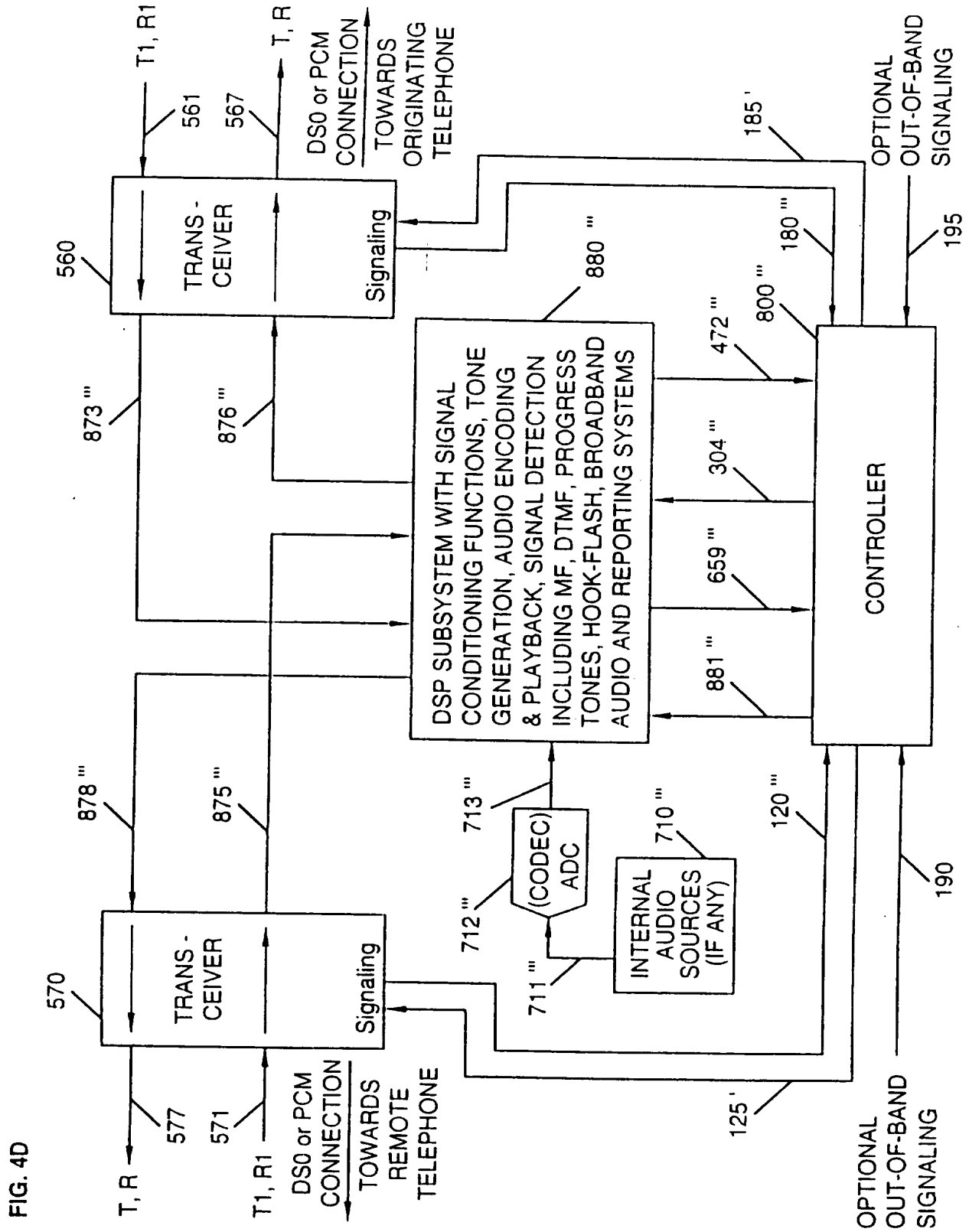


FIG. 5

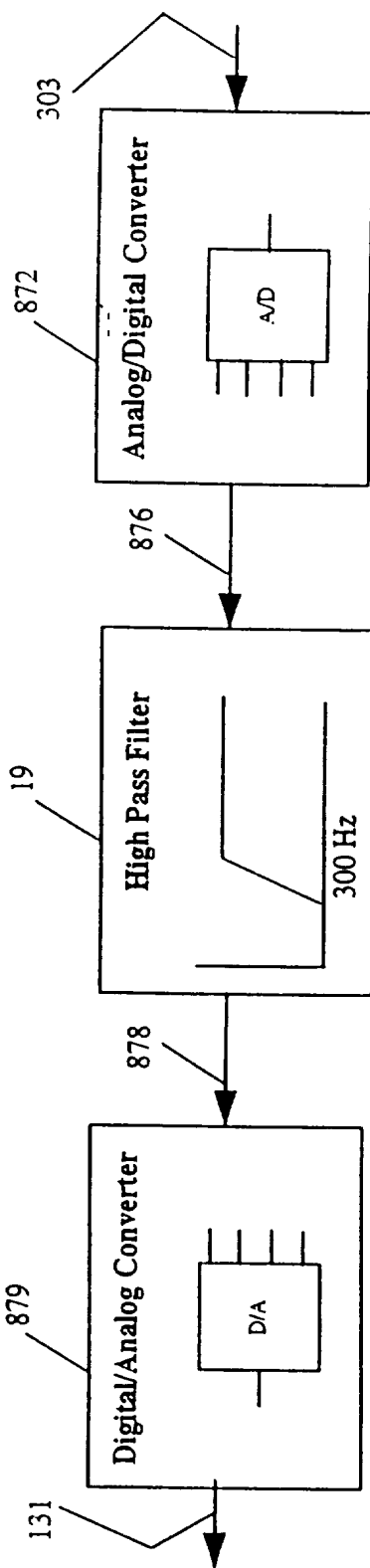


FIG 6

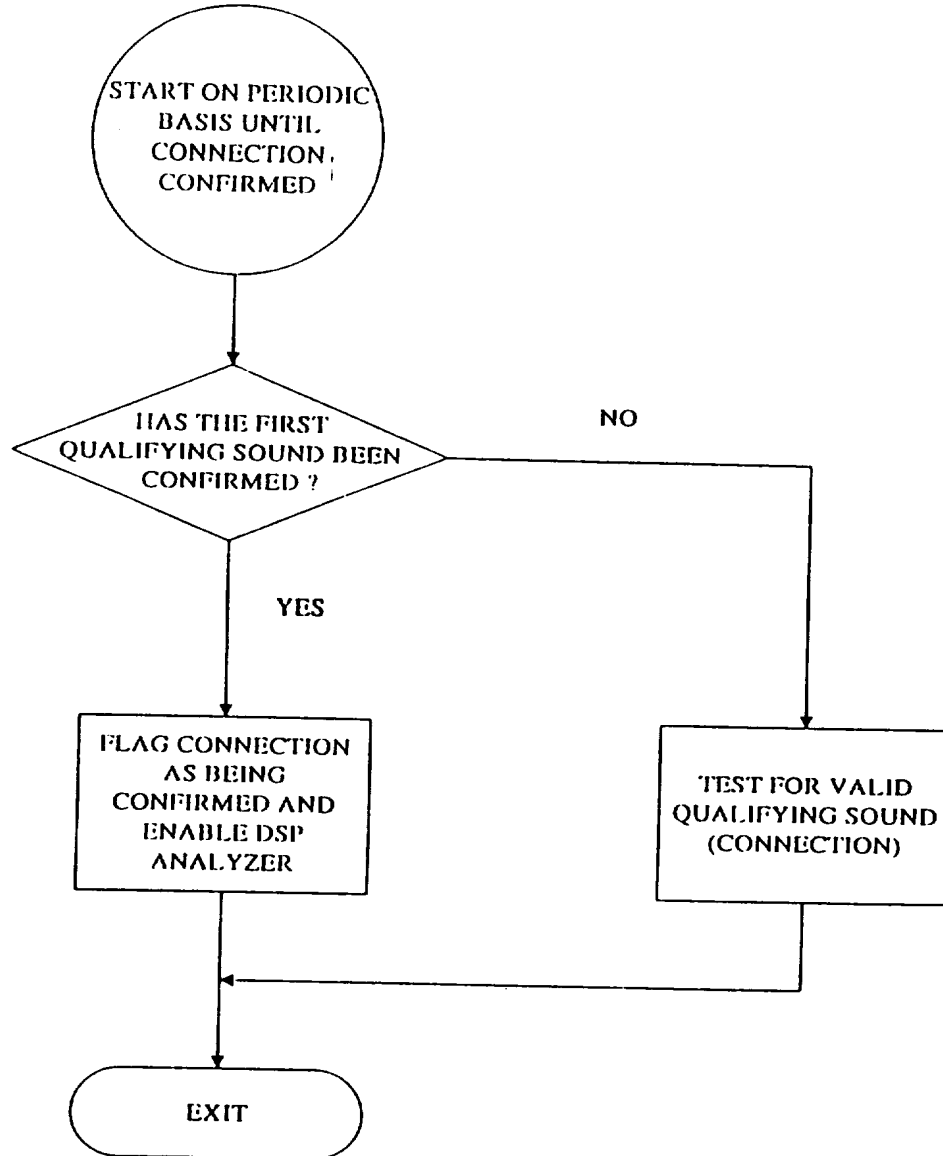
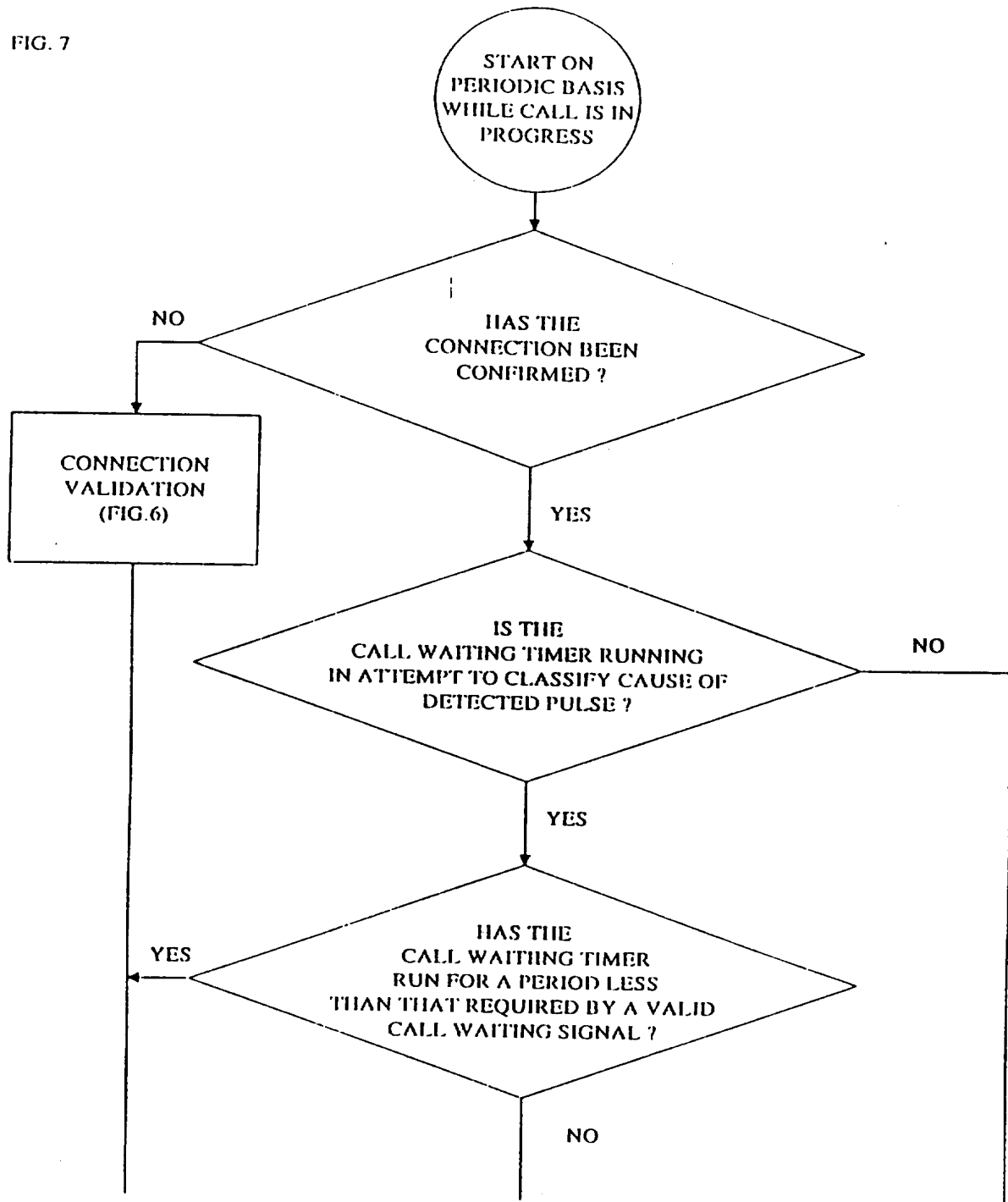
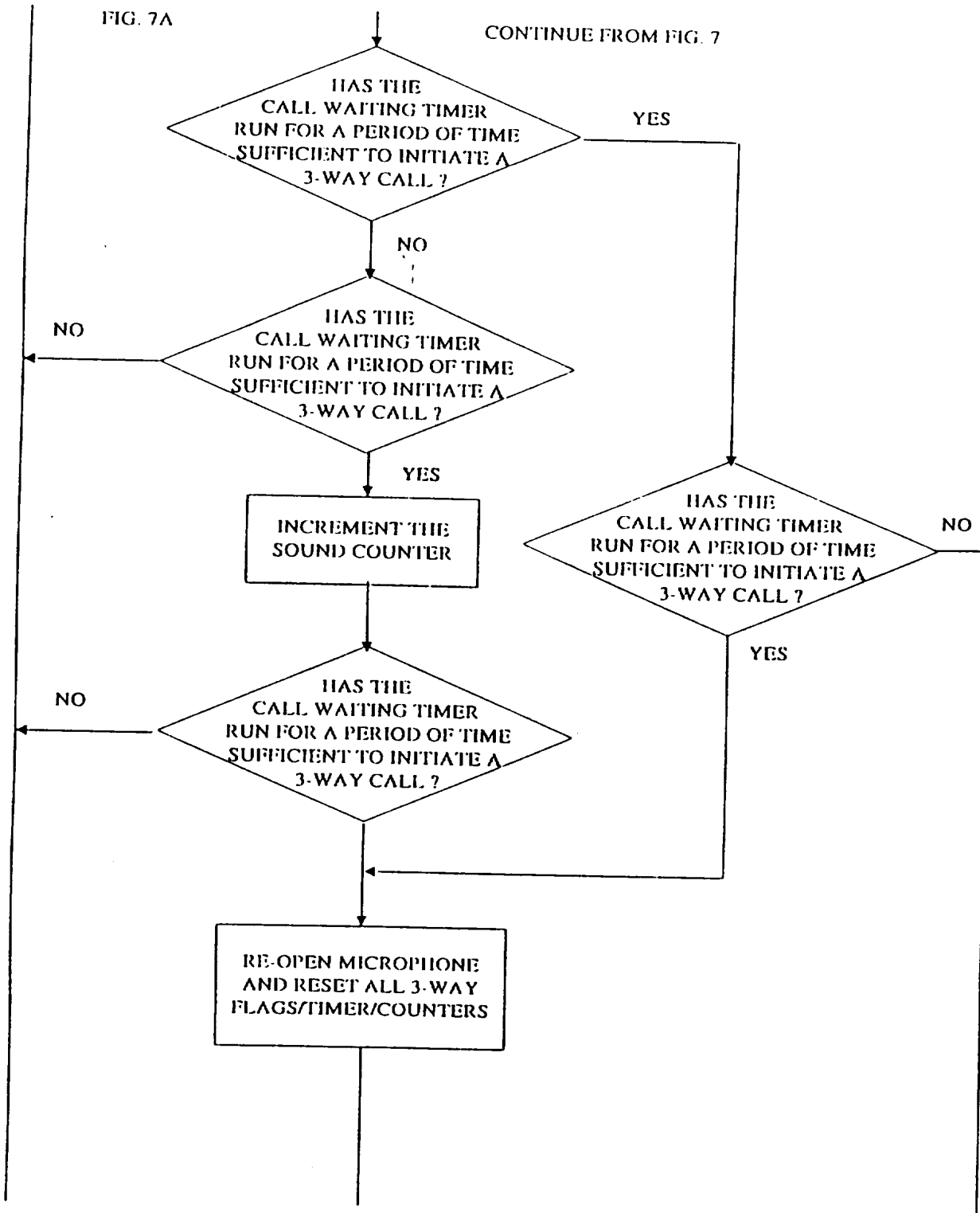


FIG. 7



CONTINUE ON FIG. 7A

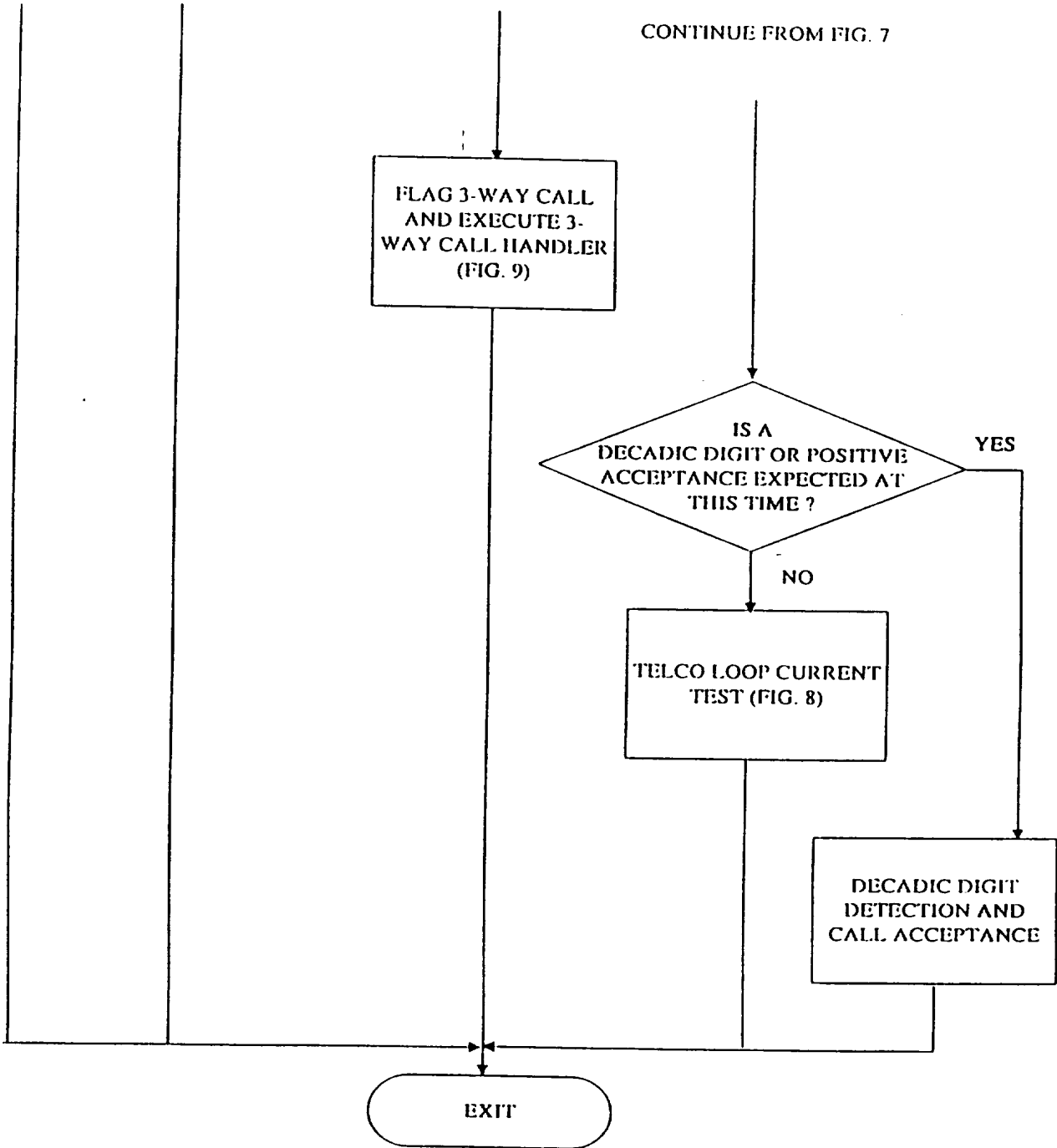
CONTINUE ON FIG. 7B

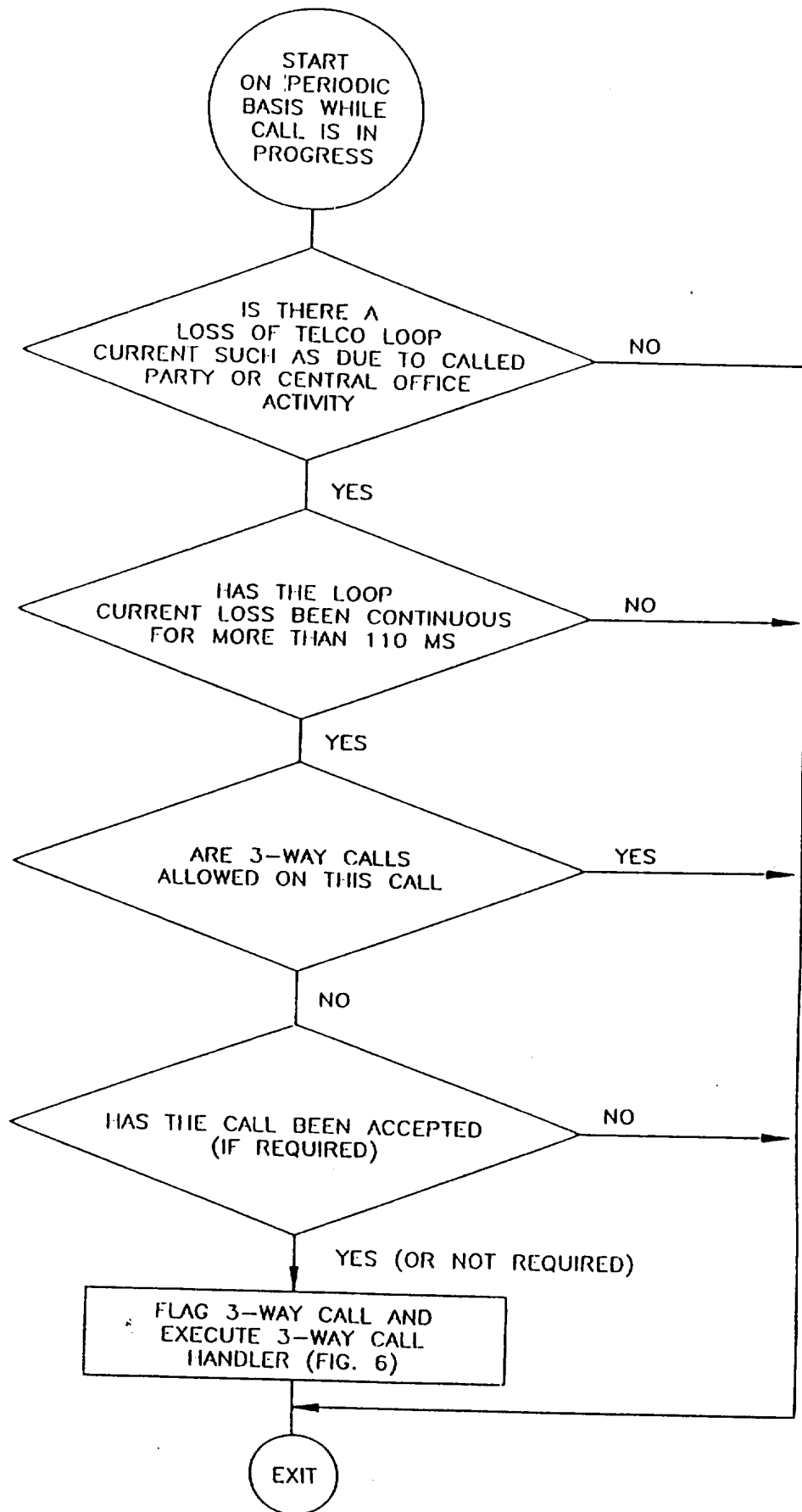


CONTINUE ON FIG. 7B

FIG. 7B

CONTINUE FROM FIG. 7A





15/20

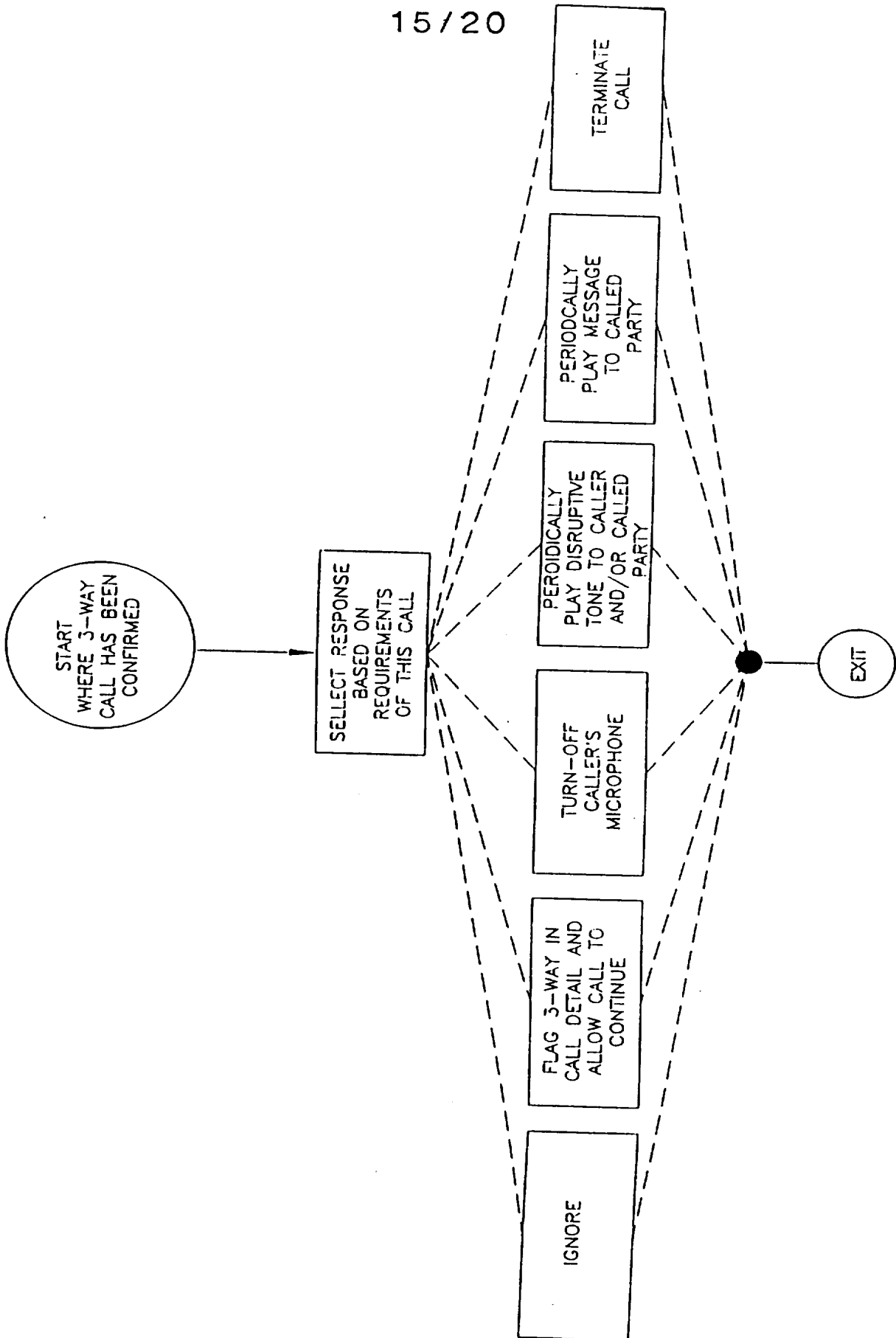


FIG. 10

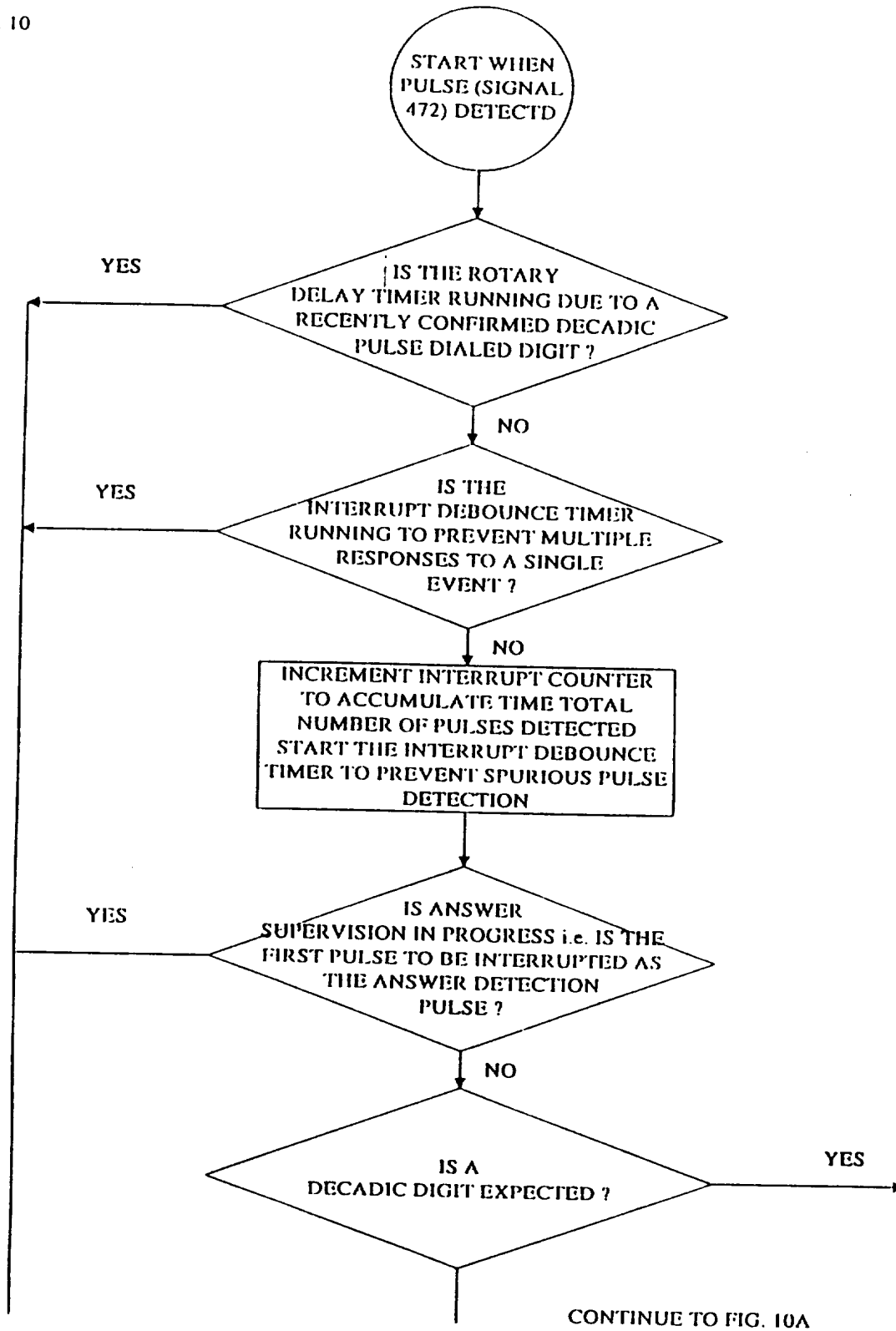


FIG. 10A

CONTINUED FROM FIG. 10

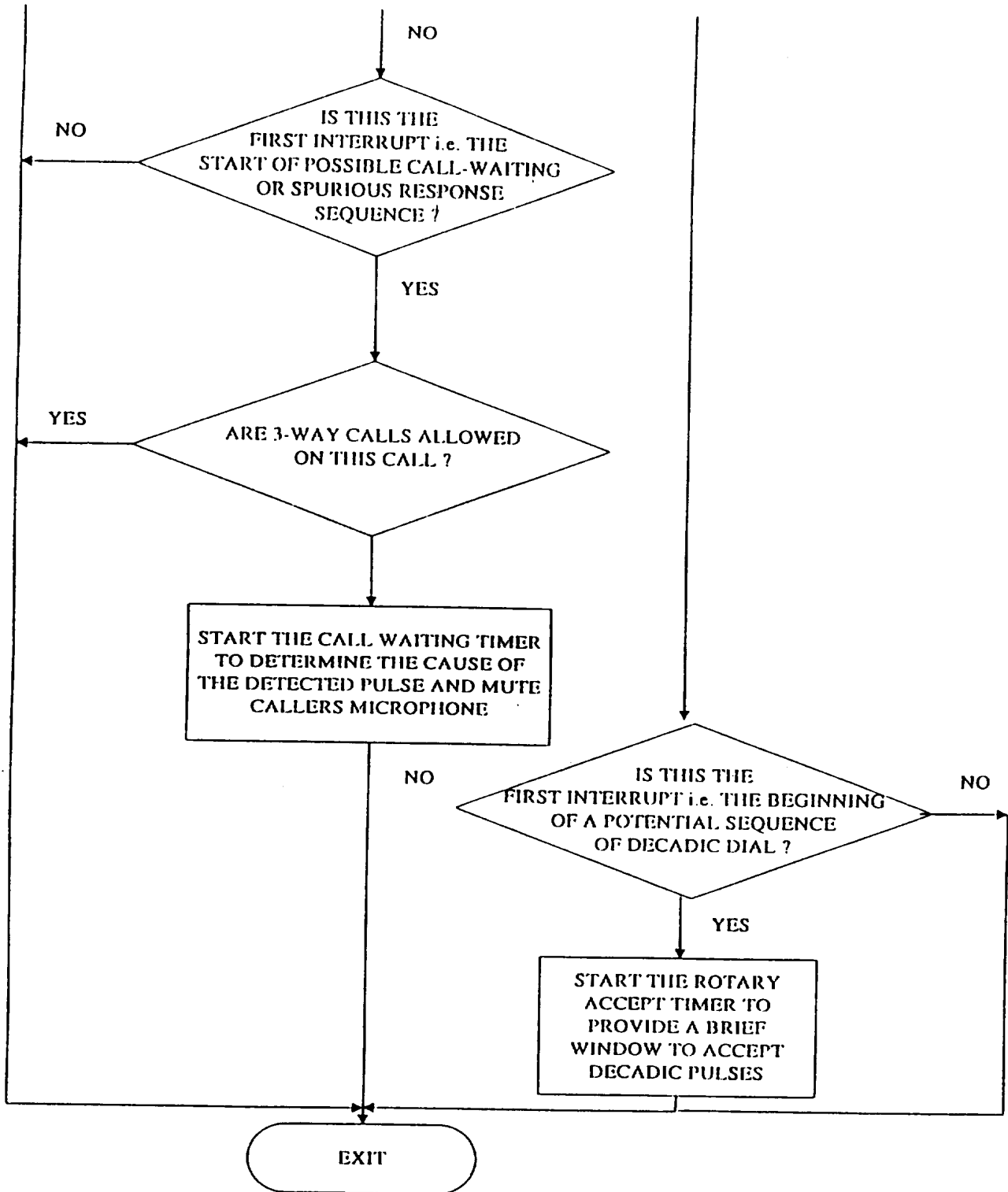


FIG. 11

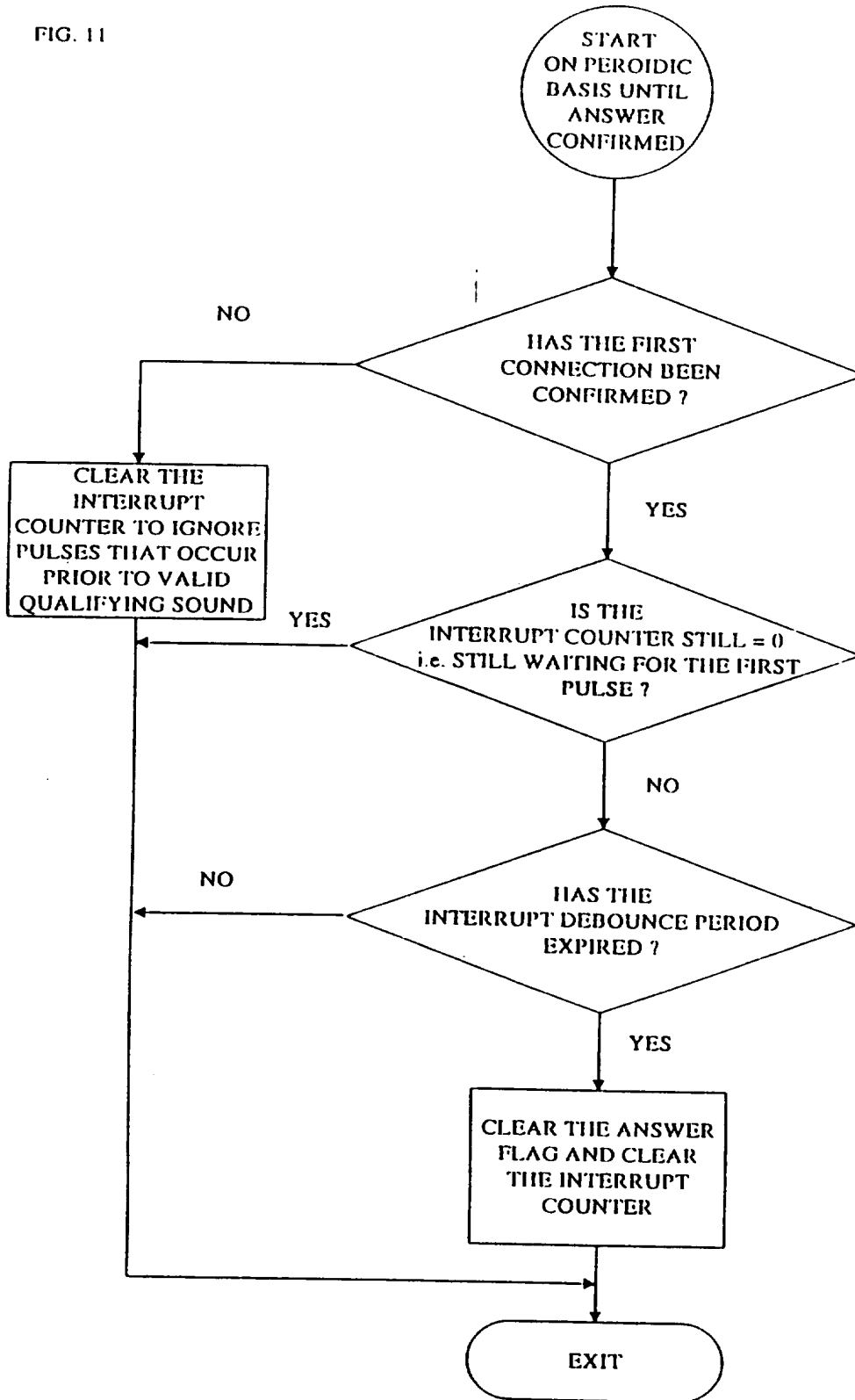


FIG. 12A

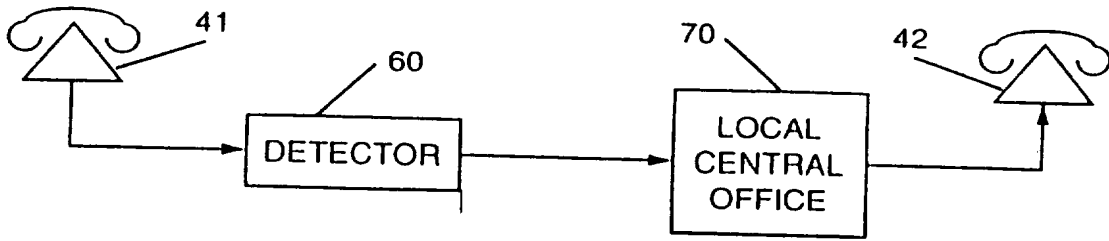


FIG. 12B

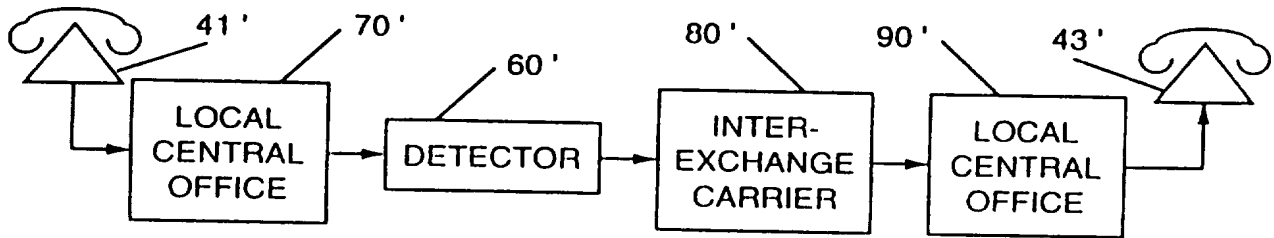


FIG. 12C

20/20

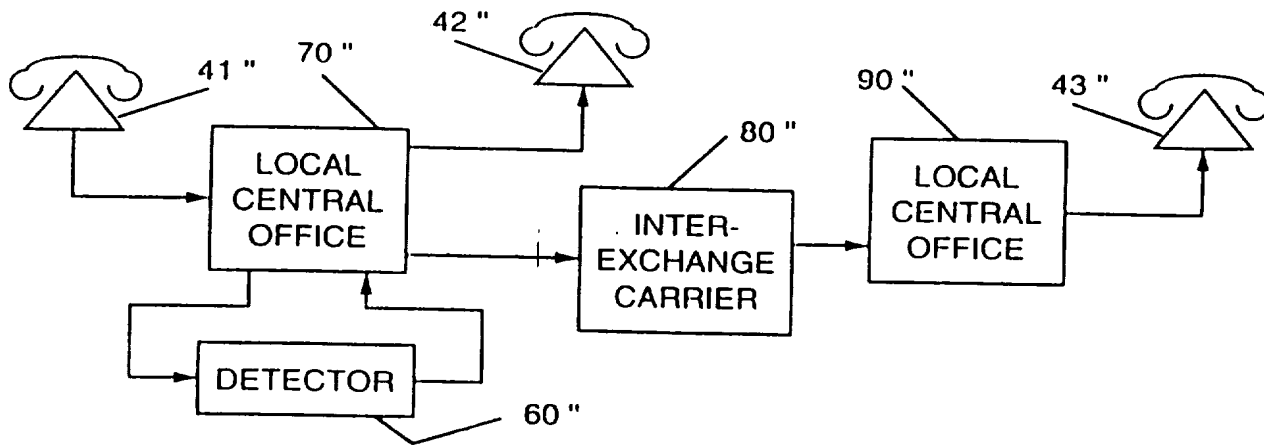
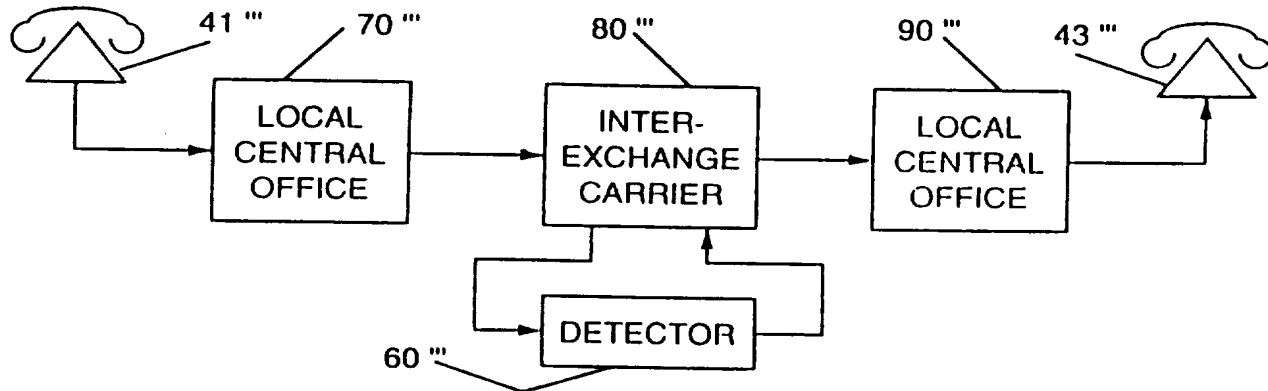


FIG. 12D



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/14230

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04M 3/20, 1/66
US CL :379/189, 199, 386, 114, 145
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 379/189, 199, 386, 114, 145, 190, 199, 93, 112, 123, 132, 144, 155, 157, 158, 159, 162, 201, 211, 286, 377, 424

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|-----------------------|
| X | US, A, 5,319,702 (KITCHIN ET AL) 07 June 1994, entire document, esp claims 23 and 48. | 1-60 |

Further documents are listed in the continuation of Box C. See patent family annex.

- | | |
|---|--|
| * Special categories of cited documents: | *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 |
| *A* document defining the general state of the art which is not considered to be part of particular relevance | *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 |
| *E* earlier document published on or after the international filing date | *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 |
| *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) | *G* document member of the same patent family |
| *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 | |

Date of the actual completion of the international search
17 JANUARY 1996

Date of mailing of the international search report
14 FEB 1996

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231
Facsimile No. (703) 305-3230

Authorized officer
DANIEL HUNTER *Joni Hill*
Telephone No. (703) 305-4700

Electronic Patent Application Fee Transmittal

| | |
|---|-----------------------------|
| Application Number: | 13009483 |
| Filing Date: | 19-Jan-2011 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Filer: | Dohyun Ahn/Sarah Glenn |
| Attorney Docket Number: | 18279-18190 |

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|--|----------|----------|--------|----------------------|
| Basic Filing: | | | | |
| Pages: | | | | |
| Claims: | | | | |
| Miscellaneous-Filing: | | | | |
| Petition: | | | | |
| Patent-Appeals-and-Interference: | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| Extension-of-Time: | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|---|----------|----------|--------|----------------------|
| Miscellaneous: | | | | |
| Submission- Information Disclosure Stmt | 1806 | 1 | 180 | 180 |
| Total in USD (\$) | | | | 180 |

Electronic Acknowledgement Receipt

| | |
|---|-----------------------------|
| EFS ID: | 15119099 |
| Application Number: | 13009483 |
| International Application Number: | |
| Confirmation Number: | 1820 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Customer Number: | 758 |
| Filer: | Dohyun Ahn |
| Filer Authorized By: | |
| Attorney Docket Number: | 18279-18190 |
| Receipt Date: | 05-MAR-2013 |
| Filing Date: | 19-JAN-2011 |
| Time Stamp: | 18:52:57 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|--|-----------------|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | \$180 |
| RAM confirmation Number | 7028 |
| Deposit Account | 192555 |
| Authorized User | |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.308 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---------------------|--|-------------------------------|---|------------------|------------------|
| 1 | | 18190_US_Amendment_A.pdf | 102558 81e070f70b70bd7548c468a9289ea964276d825 | yes | 12 |
| | Multipart Description/PDF files in .zip description | | | | |
| | Document Description | | Start | End | |
| | Amendment/Req. Reconsideration-After Non-Final Reject | | 1 | 1 | |
| | Claims | | 2 | 6 | |
| | Applicant Arguments/Remarks Made in an Amendment | | 7 | 12 | |
| Warnings: | | | | | |
| Information: | | | | | |
| 2 | | 18190IDS.pdf | 158912 7327dcd51be429e109b1ed9b2ce2a6d6d2074a96 | yes | 5 |
| | Multipart Description/PDF files in .zip description | | | | |
| | Document Description | | Start | End | |
| | Transmittal Letter | | 1 | 3 | |
| | Information Disclosure Statement (IDS) Form (SB08) | | 4 | 5 | |
| Warnings: | | | | | |
| Information: | | | | | |
| 3 | Foreign Reference | WO-98-54879.pdf | 2363790 78f363a8d3bf8b29e2a7d2f077daf5264b8781d1 | no | 78 |
| Warnings: | | | | | |
| Information: | | | | | |
| 4 | Foreign Reference | WO-96-14703.pdf | 2747620 3180d205b1dc4d912012287b12544b37e9975a40 | no | 92 |
| Warnings: | | | | | |
| Information: | | | | | |
| 5 | Non Patent Literature | Defendants_Answer.pdf 0307 | 879535 af501e508bb2c7cc4fdbb539dcff7bfa3251120f | no | 17 |

| | | | | | |
|-------------------------------------|-----------------------|--|---|----|-----|
| Warnings: | | | | | |
| Information: | | | | | |
| 6 | Non Patent Literature | Defendants_Supp_Invalidity_Contentions.pdf | 215317 ac4d9b72666fad65521edd58a4517eae4b2af329 | no | 19 |
| Warnings: | | | | | |
| Information: | | | | | |
| 7 | Non Patent Literature | Sundstrom.pdf | 4276058 72e3cf61335b581cdbc9c953a6290916dbd15698 | no | 140 |
| Warnings: | | | | | |
| Information: | | | | | |
| 8 | Fee Worksheet (SB06) | fee-info.pdf | 30062 b5e1826499131ea7e211062d0203d9ddbba51c1b | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| Total Files Size (in bytes): | | | 10773852 | | |

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.

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.

| | | | |
|---|---|----------------------------------|---------------------------------------|
| PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875 | Application or Docket Number 13/009,483 | Filing Date 01/19/2011 | <input type="checkbox"/> To be Mailed |
|---|---|----------------------------------|---------------------------------------|

| APPLICATION AS FILED – PART I | | | OTHER THAN SMALL ENTITY | | | | |
|---|---|--------------|---------------------------------------|----------|----|--------------|----------|
| | (Column 1) | (Column 2) | SMALL ENTITY <input type="checkbox"/> | OR | | SMALL ENTITY | |
| FOR | NUMBER FILED | NUMBER EXTRA | RATE (\$) | FEE (\$) | | RATE (\$) | FEE (\$) |
| <input type="checkbox"/> BASIC FEE <small>(37 CFR 1.16(a), (b), or (c))</small> | N/A | N/A | N/A | | OR | N/A | |
| <input type="checkbox"/> SEARCH FEE <small>(37 CFR 1.16(k), (j), or (m))</small> | N/A | N/A | N/A | | | N/A | |
| <input type="checkbox"/> EXAMINATION FEE <small>(37 CFR 1.16(o), (p), or (q))</small> | N/A | N/A | N/A | | | N/A | |
| TOTAL CLAIMS <small>(37 CFR 1.16(j))</small> | minus 20 = | * | X \$ = | | | X \$ = | |
| INDEPENDENT CLAIMS <small>(37 CFR 1.16(h))</small> | minus 3 = | * | X \$ = | | | X \$ = | |
| <input type="checkbox"/> APPLICATION SIZE FEE <small>(37 CFR 1.16(s))</small> | If the specification and drawings exceed 100 sheets of paper, 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). | | | | | | |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT <small>(37 CFR 1.16(j))</small> | | | | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | | | TOTAL | |

| APPLICATION AS AMENDED – PART II | | | | | OTHER THAN SMALL ENTITY | | | | |
|----------------------------------|---|----------------------------------|------------------------------------|---------------|-------------------------|---------------------|----|-----------------|---------------------|
| | (Column 1) | (Column 2) | (Column 3) | | SMALL ENTITY | OR | | SMALL ENTITY | |
| AMENDMENT | 03/05/2013 | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) | | RATE (\$) | ADDITIONAL FEE (\$) |
| | Total <small>(37 CFR 1.16(i))</small> | * 16 | Minus ** 20 | = 0 | X \$ = | | OR | X \$62= | 0 |
| | Independent <small>(37 CFR 1.16(h))</small> | * 2 | Minus ***3 | = 0 | X \$ = | | OR | X \$250= | 0 |
| | <input type="checkbox"/> Application Size Fee <small>(37 CFR 1.16(s))</small> | | | | | | | | |
| | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small> | | | | | | OR | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | 0 |

| APPLICATION AS AMENDED – PART II | | | | | OTHER THAN SMALL ENTITY | | | | |
|----------------------------------|---|----------------------------------|------------------------------------|---------------|-------------------------|---------------------|----|-----------------|---------------------|
| | (Column 1) | (Column 2) | (Column 3) | | SMALL ENTITY | OR | | SMALL ENTITY | |
| AMENDMENT | | CLAIMS REMAINING AFTER AMENDMENT | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) | | RATE (\$) | ADDITIONAL FEE (\$) |
| | Total <small>(37 CFR 1.16(i))</small> | * | Minus ** | = | X \$ = | | OR | X \$ = | |
| | Independent <small>(37 CFR 1.16(h))</small> | * | Minus *** | = | X \$ = | | OR | X \$ = | |
| | <input type="checkbox"/> Application Size Fee <small>(37 CFR 1.16(s))</small> | | | | | | | | |
| | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small> | | | | | | OR | | |
| | | | | | TOTAL ADD'L FEE | | OR | 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.

Legal Instrument Examiner:
/ANITA JOHNSON/

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. |
|---|-------------|----------------------|---------------------|------------------|
| 13/009,483 | 01/19/2011 | Robert L. Rae | 18279-18190 | 1820 |
| 758 | 7590 | 12/07/2012 | EXAMINER | |
| FENWICK & WEST LLP SILICON VALLEY CENTER 801 CALIFORNIA STREET MOUNTAIN VIEW, CA 94041 | | | SHAH, ANTIM G | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2652 | |
| | | | NOTIFICATION DATE | DELIVERY MODE |
| | | | 12/07/2012 | ELECTRONIC |

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

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOC@Fenwick.com

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 13/009,483 | RAE, ROBERT L. | |
| | Examiner | Art Unit | |
| | ANTIM SHAH | 2652 | |

-- 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) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 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 19 January 2011.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) 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

- 5) Claim(s) 1-16 is/are pending in the application.
- 5a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 6) Claim(s) _____ is/are allowed.
- 7) Claim(s) 1-16 is/are rejected.
- 8) Claim(s) _____ is/are objected to.
- 9) Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) The specification is objected to by the Examiner.
- 11) The drawing(s) filed on 19 January 2012 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).

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) Notice of References Cited (PTO-892)
- 2) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 3) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 4) 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. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *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) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Art Unit: 2652

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 1-16** are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-21 of U.S. Patent No. 7,899,167 ("patent '167"). Although, the conflicting claims are not identical, they are not patentably distinct from each other.

Claims 1-16 of the instant application are identical with the exception of the narrower claim limitation of "billing system/billing operation" as claimed in patent '167 claims 1-21.

The claimed invention in the instant application is fully disclosed in the patent '167 and it is broader than the claimed invention in the patent '167. No new invention or new improvement is being claimed in the instant application. Applicant is now attempting to claim broadly that which had been previously described in more detail in the claims of the patent '167 (In re Van Ornum, 214 USPQ 761 CCPA 1982).

Furthermore, there is no apparent reason why Applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent.

Claim Rejections - 35 USC § 103

3. 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

Art Unit: 2652

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.

4. **Claims 1-5, 8, 9-13 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Publication No. 2007/0041545 to *Gainsboro* ("*Gainsboro*") in view of U.S. Patent Publication No 2003/0091028 to *Chang* et al. ("*Chang*").

As to **claim 1**, *Gainsboro* discloses a centralized call processing system [paragraph 0067, Fig. 1], comprising:

a networking device connected to a plurality of call processing gateways, each call processing gateway installed at a prison facility located remote from the centralized call processing system [paragraphs 0067, 0073, Fig. 1-2, FTS central offices], the networking device configured to: receive outgoing Voice over Internet Protocol (VoIP) data packets from prison facilities; and send incoming VoIP data packets to the prison facilities [paragraphs 0067, 0073, Fig. 1-2];

an unauthorized call activity detection system connected to the networking device for detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets [paragraphs 0035, 0037, 0776-0788];

a call application management system connected to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the first telephone carrier network into the incoming VoIP data [paragraphs 0034-

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0037, 0074, 0838, Fig. 2, FMU is integrated with ITS-II components which includes call processing, call monitoring, IVR equipment]; and

a computing system connected to the call application management system for providing a function associated with the outgoing VoIP data packets or the incoming VoIP data packets other than detecting of the three-way call activity [*Gainsboro* paragraphs 0068-0069, 0082, 0306].

Gainsboro discloses the FMU 201 for call processing is installed at each prison facility [paragraphs 0034, 0074]. *Gainsboro* also discloses the FMU 231 at the central office to perform network monitoring and administrative tasks [paragraph 0084]. It would have been obvious to the person of ordinary skill in the art to have the functions of FMU 201 (such as call processing) at the FMU 231 which is located at the central office. The suggestion motivation would have been to have low cost system that will have centrally located call processing module. Also, it would be easy to upgrade and maintain the system.

Gainsboro does not expressly disclose gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the prison facilities. Even though, *Gainsboro* teaches internet technology and PCOF network [0315, 0690-0692]. It is extremely obvious and well known in the art to use VoIP to make voice calls over internet.

In the same or similar fields of endeavor, *Chang* discloses gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated

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with calls and to send incoming VoIP data packets associated with the calls to the multiple facilities [*Chang* Abstract, Fig. 3, 3A, 5, paragraphs 0085-0089, 0141].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Gainsboro* to have the gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the multiple facilities as taught by *Chang*. The suggestion/motivation would have been to provide a highly integrated voice gateway system for use within a company which can route a voice call between parties at two different locations over IP network [*Chang* paragraph 0016].

As to **claims 2 and 10**, *Gainsboro* discloses wherein the function comprises managing billing associated with calls made through the system [*Gainsboro* paragraphs 0068-0069, 0082, 0306].

As to **claims 3 and 11**, *Gainsboro* wherein the function comprises recording at least part of calls made through the system [*Gainsboro* paragraph 0002, 0036, 0054].

As to **claims 4 and 12**, *Gainsboro* wherein the call application management system is configured to select calls to be recorded [*Gainsboro* paragraph 0002, 0036, and 0054].

As to **claims 5 and 13**, *Gainsboro* discloses wherein the function comprises validating calls made through the system for authorizing connecting of calls to the telephone carrier network [*Gainsboro* paragraphs 0131, 0237].

As to **claims 8 and 16**, *Gainsboro* teaches wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the system [*Gainsboro* paragraphs 0037, 0135, 0777, 0782-0784].

As to **claim 9**, *Gainsboro* discloses a method for processing calls at a centralized call processing system [paragraph 0067, Fig. 1], the method comprising: receiving outgoing Voice over Internet Protocol (VoIP) data packets from a plurality of prison facilities, the plurality of prison facilities located remotely from the call processing gateways [paragraphs 0067, 0073, Fig. 1-2, FTS central offices]; sending incoming VoIP data packets to the prison facilities [paragraphs 0067, 0073, Fig. 1-2, FTS central offices]; detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets [paragraphs 0035, 0037, 0776-0788]; processing the outgoing VoIP data packets for transmission to a telephone carrier network; processing signals from the first telephone carrier network into the incoming VoIP data [paragraphs 0034-0037, 0074, 0838, Fig. 2, FMU is integrated with ITS-II components which includes call processing, call monitoring, IVR equipment]; and providing a function associated with the outgoing VoIP data packets or the incoming VoIP

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data packets other than detecting of the three-way call activity [*Gainsboro* paragraphs 0068-0069, 0082, 0306].

Gainsboro discloses the FMU 201 for call processing is installed at each prison facility [paragraphs 0034, 0074]. *Gainsboro* also discloses the FMU 231 at the central office to perform network monitoring and administrative tasks [paragraph 0084]. It would have been obvious to the person of ordinary skill in the art to have the functions of FMU 201 (such as call processing) at the FMU 231 which is located at the central office. The suggestion motivation would have been to have low cost system that will have centrally located call processing module. Also, it would be easy to upgrade and maintain the system.

Gainsboro does not expressly disclose gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the prison facilities. Even though, *Gainsboro* teaches internet technology and PCOF network [0315, 0690-0692]. It is extremely obvious and well known in the art to use VoIP to make voice calls over internet.

In the same or similar fields of endeavor, *Chang* discloses gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the multiple facilities [*Chang* Abstract, Fig. 3, 3A, 5, paragraphs 0085-0089, 0141].

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It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Gainsboro* to have the gateways to receive outgoing Voice over Internet Protocol (VoIP) data packets associated with calls and to send incoming VoIP data packets associated with the calls to the multiple facilities as taught by *Chang*. The suggestion/motivation would have been to provide a highly integrated voice gateway system for use within a company which can route a voice call between parties at two different locations over IP network [*Chang* paragraph 0016].

5. **Claims 6-7 and 14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Gainsboro* and *Chang* (as applied above) in further view of U.S. Patent No. 7,333,798 to *Hodge* ("*Hodge*").

As to **claims 6-7 and 14-15**, *Gainsboro* and *Chang* teaches everything claimed, as applied to claim 1, with the exception of a justice application management system and a commerce system for managing commissary orders placed by the inmates.

In the same field of endeavor, *Hodge* teaches the justice application management system [*Hodge* col. 21 lines 48-60] and a commerce system for managing commissary orders placed by the inmates [*Hodge* column 6 lines 33-49].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Gainsboro* and *Chang* to have the justice application management system as taught by *Hodge*. The suggestion/motivation

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would have been to identifying and authenticating an institutional calling party [Hodge column 9 lines 54-61].

6. **Claims 1 and 59** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,505,406 to *Spadaro et al* ("*Spadaro*").

As to **claim 1**, *Spadaro* discloses a centralized call processing system [Fig. 3-6, column 3 line 50-column 5 line 2], comprising:

a networking device connected to a plurality of call processing gateways, each call processing gateway installed at a prison facility located remote from the centralized call processing system, the networking device configured to: receive outgoing Voice over Internet Protocol (VoIP) data packets from prison facilities; and send incoming VoIP data packets to the prison facilities [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65];

an unauthorized call activity detection system connected to the networking device for detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets [column 4 lines 4-65, "three way call detection 30a];

a call application management system connected to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the first telephone carrier network into the incoming VoIP data [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65]; and

a computing system connected to the call application management system for providing a function associated with the outgoing VoIP data packets or the incoming VoIP data packets other than detecting of the three-way call activity [Fig. 1, element 24 “billing”, column 3 lines 28-50].

Spadaro discloses the plurality of Commander units at each site (column 8 lines 51-57). Commander is programmable computer that provides switching, accessing, routing, timing, billing and control functions (column 2 lines 45-43). *Spadaro* also discloses that the call processing and three-way call detect is connected to a WAN (Fig. 6, elements 30a and 12). *Spadaro* also discloses that the pluralities of sites are connected to the WAN. Multiple sites could share a common set of local access circuits. The edge routing negates the need for local access circuits at each facility (column 4 lines 56-65). It would have been obvious to the person of ordinary skill in the art to have the commander (which provides switching, accessing, routing, timing, billing and control functions) connected to the WAN and provides the centralize call processing to the different sites . The suggestion motivation would have been to have a low cost system that will have a centrally located call processing module. Also, it would be easy to upgrade and maintain the system.

As to **claims 2 and 10**, *Spadaro* discloses wherein the function comprises managing billing associated with calls made through the system [Fig. 1, element 24 “billing”, column 3 lines 28-50].

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As to **claims 3 and 11**, *Spadaro* wherein the function comprises recording at least part of calls made through the system [column 4 lines 14-24].

As to **claims 4 and 12**, *Spadaro* wherein the call application management system is configured to select calls to be recorded [column 4 lines 14-24].

As to **claims 5 and 13**, *Spadaro* discloses wherein the function comprises validating calls made through the system for authorizing connecting of calls to the telephone carrier network [column 3 lines 28-42].

As to **claim 9**, *Spadaro* a method for processing calls at a centralized call processing system, the method comprising [Fig. 3-6, column 3 line 50-column 5 line 2]:

receiving outgoing Voice over Internet Protocol (VoIP) data packets from a plurality of prison facilities, the plurality of prison facilities located remotely from the call processing gateways [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65]; sending incoming VoIP data packets to the prison facilities [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65]

detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets [column 4 lines 4-65, "three way call detection 30a]; and

processing the outgoing VoIP data packets for transmission to a telephone carrier network; processing signals from the first telephone carrier network into the incoming VoIP data [Fig. 3-6, column 3 lines 50-57, column 4 lines 4-65]; and providing a function associated with the outgoing VoIP data packets or the

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incoming VoIP data packets other than detecting of the three-way call activity [Fig. 1, element 24 “billing”, column 3 lines 28-50].

Spadaro discloses the plurality of Commander units at each site (column 8 lines 51-57). Commander is programmable computer that provides switching, accessing, routing, timing, billing and control functions (column 2 lines 45-43). *Spadaro* also discloses that the call processing and three-way call detect is connected to a WAN (Fig. 6, elements 30a and 12). *Spadaro* also discloses that the pluralities of sites are connected to the WAN. Multiple sites could share a common set of local access circuits. The edge routing negates the need for local access circuits at each facility (column 4 lines 56-65). It would have been obvious to the person of ordinary skill in the art to have the commander (which provides switching, accessing, routing, timing, billing and control functions) connected to the WAN and provides the centralize call processing to the different sites . The suggestion motivation would have been to have a low cost system that will have a centrally located call processing module. Also, it would be easy to upgrade and maintain the system.

7. **Claims 6-7 and 14-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Spadaro* (as applied above) in further view of U.S. Patent No. 7,333,798 to *Hodge* (“*Hodge*”).

As to **claims 6-7 and 14-15**, *Spadaro* teaches everything claimed, as applied to claim 1, with the exception of a justice application management

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system and a commerce system for managing commissary orders placed by the inmates.

In the same field of endeavor, *Hodge* teaches the justice application management system [*Hodge* col. 21 lines 48-60] and a commerce system for managing commissary orders placed by the inmates [*Hodge* column 6 lines 33-49].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Spadaro* to have the justice application management system as taught by *Hodge*. The suggestion/motivation would have been to identifying and authenticating an institutional calling party [*Hodge* column 9 lines 54-61].

8. **Claims 8 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Spadaro* (as applied above) in further view of U.S. Patent Publication No. 2007/0041545 to *Gainsboro* (“*Gainsboro*”).

As to **claims 8 and 16**, *Spadaro* teaches everything claimed, as applied to claim 1, with the exception wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the system.

In the same field of endeavor, *Gainsboro* teaches wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call

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numbers associated with calls made through the system [*Gainsboro* paragraphs 0037, 0135, 0777 and 0782-0784].

It would have been obvious to the person of ordinary skill in the art at the time of the invention to modify *Spadaro* to have wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the system as taught by *Gainsboro*. The suggestion/motivation would have been to provide security and call monitoring function in prison environment [*Gainsboro* paragraph 0035, 0037].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTIM SHAH whose telephone number is (571)270-5214. The examiner can normally be reached on Monday to Friday 8:30 am-5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ahmad Matar can be reached on (571)272-7488. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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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). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANTIM SHAH/
Primary Examiner, Art Unit 2652

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|-----------------------------------|---------------------------------------|---|-------------|
| Notice of References Cited | Application/Control No. 13/009,483 | Applicant(s)/Patent Under Reexamination RAE, ROBERT L. | |
| | Examiner ANTIM SHAH | Art Unit 2652 | Page 1 of 1 |

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| | F US- | | | |
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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.

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| <i>Index of Claims</i>  | Application/Control No. 13009483 | Applicant(s)/Patent Under Reexamination RAE, ROBERT L. |
| | Examiner ANTIM SHAH | Art Unit 2652 |

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| N | Non-Elected |
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| A | Appeal |
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Claims renumbered in the same order as presented by applicant
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| CLAIM | | DATE | | | | | | | | |
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| Final | Original | 12/02/2012 | | | | | | | | |
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| Search Notes  | Application/Control No. 13009483 | Applicant(s)/Patent Under Reexamination RAE, ROBERT L. |
| | Examiner ANTIM SHAH | Art Unit 2652 |

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|-----------------|-----------------------------|-------------|-----------------|
| SEARCHED | | | |
| Class | Subclass | Date | Examiner |
| 379 | 188, 189, 32.01, 35, 207.01 | 12/2/2012 | AS |
| 370 | 260, 261, 401, 352 | 12/2/2012 | AS |

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|--------------------------------|-------------|-----------------|
| SEARCH NOTES | | |
| Search Notes | Date | Examiner |
| Inventor name searched in EAST | 12/2/2012 | AS |
| EAST search | 12/2/2012 | As |

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | | | Application No. | 13/009,483 |
| | | | | Filing Date | January 19, 2011 |
| | | | | First Named Inventor | Robert L. Rae |
| | | | | Art Unit | 2614 |
| | | | | Examiner Name | Not yet known |
| Sheet | 1 | of | 2 | Attorney Docket Number | 18279-18190 |

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| /A.S./ | B1 | JP 2002/157327 A | 5/31/2002 | Kobayashi Kirokushi Co. Ltd. | |

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| Examiner Initials* | Cite No. ¹ | 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 ⁶ |
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| Examiner Signature | /Antim Shah/ (12/02/2012) | | Date Considered | 12/02/2012 | |

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | | | Application No. | 13/009,483 |
| | | | | Filing Date | January 19, 2011 |
| | | | | First Named Inventor | Robert L. Rae |
| | | | | Art Unit | 2614 |
| | | | | Examiner Name | Not yet known |
| | | | | Attorney Docket Number | 18279-18190 |
| Sheet | 2 | of | 2 | | |

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| /A.S./ | C11 | United States Office Action, U.S. Application No. 10/800,473, December 23, 2010, 31 pages. | |

18279/18190/DOCS/2476810.1

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|--------------------|---------------------------|-----------------|------------|
| Examiner Signature | /Antim Shah/ (12/02/2012) | Date Considered | 12/02/2012 |
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|---|---|-------------------------------|---|---|--------------------------------|
| SERIAL NUMBER 13/009,483 | FILING or 371(c) DATE 01/19/2011 | CLASS 370 | GROUP ART UNIT 2652 | ATTORNEY DOCKET NO. 18279-18190 | |
| APPLICANTS Robert L. Rae, Plano, TX; ** CONTINUING DATA ***** This application is a CON of 10/642,532 08/15/2003 PAT 7,899,167 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 01/31/2011 | | | | | |
| Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and Acknowledged <u>/ANTIM G SHAH/</u> Examiner's Signature | <input type="checkbox"/> Met after Allowance Initials _____ | STATE OR COUNTRY TX | SHEETS DRAWINGS 2 | TOTAL CLAIMS 16 | INDEPENDENT CLAIMS 2 |
| ADDRESS FENWICK & WEST LLP SILICON VALLEY CENTER 801 CALIFORNIA STREET MOUNTAIN VIEW, CA 94041 UNITED STATES | | | | | |
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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | | | Application No. | 13/009,483 |
| | | | | Filing Date | January 19, 2011 |
| | | | | First Named Inventor | Robert L. Rae |
| | | | | Art Unit | 2614 |
| | | | | Examiner Name | Not yet known |
| Sheet | 1 | of | 1 | Attorney Docket Number | 18279-18190 |

| U.S. PATENT DOCUMENTS | | | | |
|-----------------------|-----------------------|--|--------------------------------|--|
| Examiner Initials* | Cite No. ¹ | Document No. Number – Kind Code ² (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
| /A.S./ | A1 | US-7,248,680 | 07-24-2007 | Gainsboro |
| /A.S./ | A2 | US-2004/0181433 A1 | 09-16-2004 | Blair |
| /A.S./ | A3 | US-2003/0198325 A1 | 10-23-2003 | Bayne |
| /A.S./ | A4 | US-2003/0041326 A1 | 02-27-2003 | Novak et al. |

| FOREIGN PATENT DOCUMENTS | | | | | |
|--------------------------|-----------------------|--|--------------------------------|--|----------------|
| Examiner Initials* | Cite No. ¹ | Foreign Patent Document Country Code ³ – Number ⁴ Kind Code ⁵ (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | T ⁶ |
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| OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS | | | | |
|--|-----------------------|--|----------------|--|
| Examiner Initials* | Cite No. ¹ | 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 ⁶ | |
| /A.S./ | C1 | United States Office Action, U.S. Application No. 12/410,378, January 19, 2012, 11 pages. | | |
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18279/18190/DOCS/2691460.1

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|--------------------|---------------------------|-----------------|------------|
| Examiner Signature | /Antim Shah/ (12/03/2012) | Date Considered | 12/03/2012 |
|--------------------|---------------------------|-----------------|------------|

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1Applicant's unique citation designation number (optional). 2See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04.
3Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6Applicant is to place a check mark here if English language Translation is attached.

EAST Search History

EAST Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
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| L1 | 1 | "7505406".pn. | US-PGPUB; USPAT | ADJ | ON | 2012/12/02 23:02 |
| L2 | 10 | ("5375161" "5216702" "20030041326" "7248680" "5455819" "7529357" "20040181433" "5023896" "7505409" "20030198325").PN. | US-PGPUB; USPAT | ADJ | ON | 2012/12/02 23:18 |
| S110 | 170 | (rae near3 robert).inv. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:07 |
| S111 | 398 | (ITS or inmate telephone system) same (VOIP or voice\$1over\$1i\$) and gateway | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:08 |
| S112 | 40 | S111 and (@ad<="20030815" or @rlad<="20030815") | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:08 |
| S113 | 24063 | (370/260,261,401,352).ccls. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:08 |
| S114 | 1793 | (379/188,189,32.01,35,207.01).ccls. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:08 |
| S115 | 315 | (379/189).ccls. | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:08 |
| S116 | 10756 | (central\$ with bill\$3) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:09 |
| S117 | 3347876 | (inmate or jail or prison or facilit\$5) | US-PGPUB; | ADJ | ON | 2012/12/02 |

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| | | | USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | | | 17:09 |
| S118 | 771 | S117 with S116 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:09 |
| S119 | 552 | S118 and (@ad<="20030815" or @rlad<="20030815") | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:09 |
| S120 | 16542 | (inmate or jail or prison or (correction near2 facilit\$5)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:09 |
| S121 | 23 | S120 same S116 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:09 |
| S122 | 105 | gainsboro and (VOIP or voice\$1over\$internet\$ or sip) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:09 |
| S123 | 28 | 10/642532 | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB | ADJ | ON | 2012/12/02 17:10 |
| S124 | 28 | 10/642532 | US-PGPUB; USPAT | ADJ | ON | 2012/12/02 17:10 |
| S125 | 1 | "7899167".pn. | US-PGPUB; USPAT | ADJ | ON | 2012/12/02 17:15 |
| S126 | 1 | " 20110110276".pn. | US-PGPUB; USPAT | ADJ | ON | 2012/12/02 22:27 |

12/ 2/ 2012 11:25:29 PM

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT****Complete if Known**

| | |
|------------------------|------------------|
| Application No. | 13/009,483 |
| Filing Date | January 19, 2011 |
| First Named Inventor | Robert L. Rae |
| Art Unit | 2614 |
| Examiner Name | Not yet known |
| Attorney Docket Number | 18279-18190 |

Sheet

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of

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U.S. PATENT DOCUMENTS

| Examiner Initials* | Cite No. ¹ | Document No. Number – Kind Code ² (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
|--------------------|-----------------------|--|--------------------------------|--|
| | A1 | US-7,248,680 | 07-24-2007 | Gainsboro |
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|--------------------|-----------------------|--|--------------------------------|--|----------------|
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OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS

| Examiner Initials* | Cite No. ¹ | 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 ⁶ |
|--------------------|-----------------------|--|----------------|
| | C1 | United States Office Action, U.S. Application No. 12/410,378, January 19, 2012, 11 pages. | |
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18279/18190/DOCS/2691460.1

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|--------------------|--|-----------------|--|
| Examiner Signature | | Date Considered | |
|--------------------|--|-----------------|--|

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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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Electronic Acknowledgement Receipt

| | |
|---|-----------------------------|
| EFS ID: | 12842908 |
| Application Number: | 13009483 |
| International Application Number: | |
| Confirmation Number: | 1820 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Customer Number: | 758 |
| Filer: | Dohyun Ahn |
| Filer Authorized By: | |
| Attorney Docket Number: | 18279-18190 |
| Receipt Date: | 23-MAY-2012 |
| Filing Date: | 19-JAN-2011 |
| Time Stamp: | 19:48:43 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

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|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|--------------|--|------------------|------------------|
| 1 | | 18190IDS.pdf | 151096 3f1b181c82338d6e1f88057a9138415fe86c961d | yes | 4 |

| Multipart Description/PDF files in .zip description | | | |
|---|-------|-----|--|
| Document Description | Start | End | |
| Transmittal Letter | 1 | 3 | |
| Information Disclosure Statement (IDS) Form (SB08) | 4 | 4 | |

Warnings:

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|---|-----------------------|--|---|----|----|
| 2 | Non Patent Literature | 12-410378_Office_Action_2012-01-19_15449.pdf | 1160595 bb750e09ce8e163a7e0613b0a771816019001bf8 | no | 11 |
|---|-----------------------|--|---|----|----|

Warnings:

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| Total Files Size (in bytes): | | | 1311691 | | |
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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Robert L. Rae
APPLICATION NO.: 13/009,483
FILING DATE: January 19, 2011
TITLE: Centralized Call Processing
EXAMINER: Not yet known
GROUP ART UNIT: 2614
CONFIRMATION NO.: 1820
ATTY. DKT. NO.: 18279-18190

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the Pacific Time Zone of the United States on the local date shown below.

Dated: May 23, 2012

By: /Dohyun Ahn/

Dohyun Ahn, Reg. No. 63,237

**INFORMATION DISCLOSURE STATEMENT B
Under 37 CFR §§ 1.56 and 1.97-98**

SIR:

Pursuant to the provisions of 37 CFR §§ 1.56 and 1.97-98, enclosed herewith is modified form PTO/SB/08A listing references for consideration by the Examiner.

The filing of this Information Disclosure Statement shall not be construed as a representation regarding the completeness of the list of references, or that inclusion of a reference in this list is an admission that it is prior art or is pertinent to this application, or that a search has been made, or as an admission that the information listed is, or may be considered to be, material to patentability, or that no other material information exists, and shall not be construed as an admission against interest in any manner.

This Information Disclosure Statement is being filed:

- within three months of the filing date of the application, or date of entry into the national stage of an international application, or before the mailing date of a first office action on the merits, whichever event last occurred;
- before the mailing of a first official action after the filing of a request for continued examination (RCE) under 37 CFR § 1.114;

- after three months of the filing date of this national application or the date of entry of the national stage in an international application, or after the mailing date of the first official action on the merits, whichever event last occurred, but before the mailing date of the first to occur of either: (1) a final action under 37 CFR §1.113; or (2) an action that otherwise closes prosecution in the application, and:
 - attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(c); OR
 - Applicant certifies pursuant to 37 CFR § 1.97(e) that:
 - each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement; OR
 - no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement;
- on or before the payment of the issue fee but after the mailing date of the first to occur of either: (1) a final action under 37 CFR § 1.113; (2) a notice of allowance under 37 CFR § 1.311; or (3) an action that otherwise closes prosecution in the application, and:
 - Applicant certifies pursuant to 37 CFR. § 1.97(e) that:
 - each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement; OR
 - no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application

and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement; AND

- attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(d); OR
- after the payment of the issue fee. Applicant requests that the information contained in this Information Disclosure Statement be placed in the file according to 37 CFR § 1.97(i), although the information may not be considered by the USPTO.
- This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior application No. _____, filed on _____, and the references cited therein are hereby referenced, but are not required to be provided in this application under 37 CFR § 1.98(d).
- Each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not received by any individual designated in 37 CFR § 1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement. 37 CFR § 1.704(d).

Respectfully submitted,

Dated: May 23, 2012 _____ /Dohyun Ahn/
Dohyun Ahn, Reg. No.: 63,237
Fenwick & West LLP
Silicon Valley Center
801 California Street
Mountain View, CA 94041
Tel.: (650) 335-7291
Fax.: (650) 938-5200

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT****Complete if Known**

| | | | |
|------------------------|------------------|----|---|
| Application No. | 13/009,483 | | |
| Filing Date | January 19, 2011 | | |
| First Named Inventor | Robert L. Rae | | |
| Art Unit | 2614 | | |
| Examiner Name | Not yet known | | |
| Attorney Docket Number | 18279-18190 | | |
| Sheet | 1 | of | 1 |

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| | A1 | US-7,248,680 | 07-24-2007 | Gainsboro |
| | A2 | US-2004/0181433 A1 | 09-16-2004 | Blair |
| | A3 | US-2003/0198325 A1 | 10-23-2003 | Bayne |
| | A4 | US-2003/0041326 A1 | 02-27-2003 | Novak et al. |

FOREIGN PATENT DOCUMENTS

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OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS

| Examiner Initials* | Cite No. ¹ | 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 ⁶ |
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| Examiner Signature | | Date Considered | |
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Electronic Acknowledgement Receipt

| | |
|---|--|
| EFS ID: | 12842995 |
| Application Number: | 13006861 |
| International Application Number: | |
| Confirmation Number: | 5422 |
| Title of Invention: | Unauthorized Call Activity Detection And Prevention Systems And Methods For A Voice Over Internet Protocol Environment |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Customer Number: | 758 |
| Filer: | Dohyun Ahn |
| Filer Authorized By: | |
| Attorney Docket Number: | 18279-18200 |
| Receipt Date: | 23-MAY-2012 |
| Filing Date: | 14-JAN-2011 |
| Time Stamp: | 19:50:03 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

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| 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.) |
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| Multipart Description/PDF files in .zip description | | | |
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| Document Description | | Start | End |
| Transmittal Letter | | 1 | 3 |
| Information Disclosure Statement (IDS) Form (SB08) | | 4 | 4 |

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Robert L. Rae et al.
APPLICATION NO.: 13/006,861
FILING DATE: January 14, 2011
TITLE: Unauthorized Call Activity Detection and Prevention Systems and
Methods for a Voice Over Internet Protocol Environment
EXAMINER: Ahmad Matar
GROUP ART UNIT: 2614
CONFIRMATION NO.: 5422
ATTY. DKT. NO.: 18279-18200

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

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By: /Dohyun Ahn/

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Respectfully submitted,

Dated: May 23, 2012 /Dohyun Ahn/
 Dohyun Ahn, Reg. No.: 63,237
 Fenwick & West LLP
 Silicon Valley Center
 801 California Street
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT****Complete if Known**

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|--|---|----|---|-------------------------------|------------------|
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT | | | | Application No. | 13/009,483 |
| | | | | Filing Date | January 19, 2011 |
| | | | | First Named Inventor | Robert L. Rae |
| | | | | Art Unit | 2614 |
| | | | | Examiner Name | Not yet known |
| Sheet | 1 | of | 2 | Attorney Docket Number | 18279-18190 |

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| Examiner Initials* | Cite No. ¹ | Document No. Number – Kind Code ² (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
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| | A1 | US-7,529,357 | 05-05-2009 | Rae et al. |
| | A2 | US-7,505,409 | 03-17-2009 | DeCusatis et al. |
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| | B1 | JP 2002/157327 A | 5/31/2002 | Kobayashi Kirokushi Co. Ltd. | |

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| Examiner Initials* | Cite No. ¹ | 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 ⁶ |
|--------------------|-----------------------|--|----------------|
| | C1 | European Extended Search Report, European Application No. 07251570.3, August 20, 2007, 7 pages. | |
| | C2 | U.S. Appl. No. 10/642,532, Rae et al., Entitled "Centralized Cell Processing," filed Aug. 15, 2003 (Reference not included). | |
| | C3 | United States Office Action, U.S. Appl. No. 10/642,532, March 20, 2008, 26 pages. | |
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| | C8 | United States Office Action, U.S. Appl. No. 10/642,532, Jul. 21, 2010, 19 pages. | |
| | C9 | United States Office Action, U.S. Application No. 11/403,547, June 23, 2010, 5 pages. | |
| | C10 | United States Office Action, U.S. Application No. 10/800,473, November 17, 2009, 33 pages. | |

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|--------------------|-----------------|
| Examiner Signature | Date Considered |
|--------------------|-----------------|

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

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1Applicant's unique citation designation number (optional). 2See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6Applicant is to place a check mark here if English language Translation is attached.

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| Sheet | 2 | of | 2 | | |

OTHER REFERENCES – NON-PATENT LITERATURE DOCUMENTS

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|--------------------|-----------------------|--|----------------|
| | C11 | United States Office Action, U.S. Application No. 10/800,473, December 23, 2010, 31 pages. | |

18279/18190/DOCS/2476810.1

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| Examiner Signature | | Date Considered | |
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EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609.

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PATENT ABSTRACTS OF JAPAN

(11) Publication number: 2002157327 A

(43) Date of publication of application: 31.05.2002

(51) Int. Cl G06F 17/60

B09B 5/00, B42D 15/10, B65F 5/00, G03G 21/04, G07B 1/00, G09B 21/00 // B41M 3/14

(21) Application number: 2000355958

(22) Date of filing: 22.11.2000

(71) Applicant: KOBAYASHI KIROKUSHI CO LTD

(72) Inventor: INAGAKI YOSHITO

(54) SYSTEM FOR CLAIMING COOPERATIVE ISSUE OF WASTE DISPOSAL TICKET

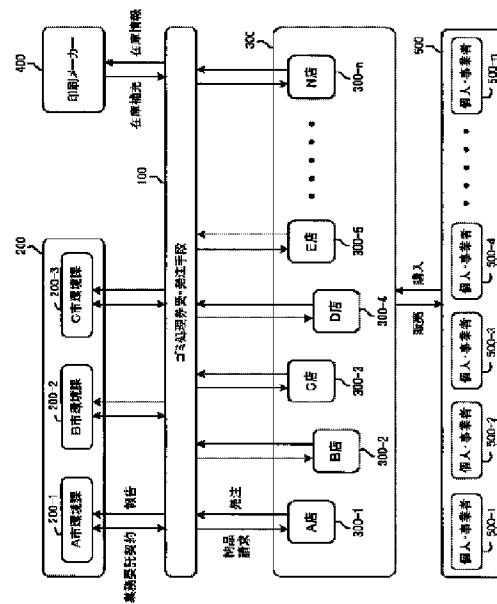
(57) Abstract:

PROBLEM TO BE SOLVED: To provide a system for claiming the cooperative issue of a waste disposal ticket capable of surely collecting waste disposal costs by preventing the alteration of a waste disposal ticket, and suppressing the use of the altered waste disposal ticket.

SOLUTION: A waste disposal ticket ordering and order receiving means 100 entrusted by a task entrusting means 200 for entrusting a waste disposal ticket issuing tank and a waste disposal cost claiming task is interposed between the task entrusting means 200 and a waste disposal ticket selling means 300 for selling a waste disposal ticket 20 to a final consumer 500. The waste disposal ticket ordering and order receiving means 100 is provided with a waste disposal ticket issuing means for printing waste disposal tickets based on the ordering of the waste disposal tickets of each task entrusting means 200 from the waste disposal ticket selling means 300 and a waste disposal ticket claiming means for claiming the amount of money for each task entrusting means 200 to the waste disposal

ticket selling means 300 which supplies the waste disposal tickets. Also, the waste disposal ticket 20 is provided with an alteration preventing means.

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| (51)Int.Cl. ⁷ | 識別記号 | F I | ターマート*(参考) |
|--------------------------|-------------------------|---------------|---|
| G 0 6 F 17/60 | 1 2 4 Z A B 1 5 4 | G 0 6 F 17/60 | 1 2 4 2 C 0 0 5 Z A B 2 H 0 3 4 1 5 4 2 H 1 1 3 |
| B 0 9 B 5/00 | | B 4 2 D 15/10 | 5 3 1 B 3 E 0 2 5 |
| B 4 2 D 15/10 | 5 3 1 | B 6 5 F 5/00 | 4 D 0 0 4 |

審査請求 未請求 請求項の数9 OL (全 8 頁) 最終頁に続く

(21)出願番号 特願2000-355958(P2000-355958)

(22)出願日 平成12年11月22日(2000.11.22)

(71)出願人 000186566

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弁理士 和田 成則

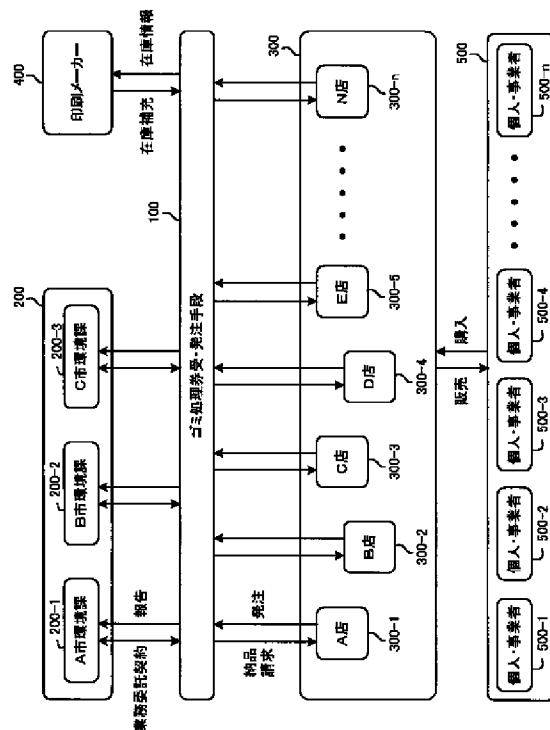
最終頁に続く

(54)【発明の名称】 ゴミ処理券の共同発行請求システム

(57)【要約】 (修正有)

【課題】 ゴミ処理券の偽造防止と偽造ゴミ処理券の使用を抑止し、ゴミ処理費用を確実に徴収できるゴミ処理券の共同発行請求システムを提供する。

【解決手段】 ゴミ処理券の発行業務とゴミ処理費用の請求業務を委託する業務委託手段200と、ゴミ処理券20を最終消費者500に販売するゴミ処理券販売手段300との間に、業務委託手段200により委託されたゴミ処理券受・発注手段100を介在させ、ゴミ処理券受・発注手段100は、ゴミ処理券販売手段300からの業務委託手段200別ゴミ処理券の発注に基づき、印刷するゴミ処理券発行手段と、供給したゴミ処理券販売手段300に対して業務委託手段200別金額を請求するゴミ処理券請求手段と、を具備し、かつ、ゴミ処理券20には偽造防止手段を施す。



【特許請求の範囲】

【請求項1】 有料化ゴミ処理のためのゴミ処理券の発行および請求システムにおいて、

ゴミ処理券の発行業務およびその処理費用の請求業務を委託する複数の業務委託手段と、ゴミ処理券を最終消費者に販売する複数のゴミ処理券販売手段との間に、上記複数の業務委託手段により委託されてゴミ処理券の受・発注、印刷加工、供給を行なうゴミ処理券受・発注手段を介在させてなり、

上記ゴミ処理券受・発注手段は、

上記各ゴミ処理券販売手段からの上記各業務委託手段別ゴミ処理券の発注に基づき、ゴミ処理券を印刷加工するとともに、供給する、ゴミ処理券発行手段と、

上記供給したゴミ処理券数量に基づき、上記各ゴミ処理券販売手段に対して上記各業務委託手段別金額を請求するゴミ処理券請求手段と、

を具備し、

かつ、上記ゴミ処理券には、偽造防止手段が施されていることを特徴とするゴミ処理券の共同発行請求システム。

【請求項2】 上記ゴミ処理券受・発注手段は、上記複数のゴミ処理券販売手段におけるゴミ処理券の販売実績、販売残、および保有在庫からなる情報を上記業務委託手段に対して報告する報告手段を具備することを特徴とする請求項1に記載のゴミ処理券の共同発行請求システム。

【請求項3】 上記ゴミ処理券請求手段は、上記ゴミ処理券販売手段における一定期間のゴミ処理券販売量に基づき発行される請求書および振込用紙の送付により行なわれることを特徴とする請求項1、2に記載のゴミ処理券の共同発行請求システム。

【請求項4】 上記ゴミ処理券受・発注手段は、上記ゴミ処理券販売手段からのゴミ処理券の発注を、電話による受付、ファクシミリによる発注用紙の受付、およびインターネットwebサイト上の発注画面による受付のいずれかの方法により受け付けることを特徴とする請求項1乃至3に記載のゴミ処理券の共同発行請求システム。

【請求項5】 上記業務委託手段は、自治体であることを特徴とする請求項1に記載のゴミ処理券の共同発行請求システム。

【請求項6】 上記ゴミ処理券は、上記ゴミ処理券受・発注手段から依頼された印刷メーカーにより上記偽造防止加工または視覚障害者用の識別加工が印刷された後に、上記ゴミ処理券受・発注手段により上記自治体別の可変情報または注意喚起情報が印字されることを特徴とする請求項1乃至5に記載のゴミ処理券の共同発行請求システム。

【請求項7】 請求項1乃至6に記載のゴミ処理券であって、券面に、アミ点および万線による隠し文字印刷、

レインボー印刷、マイクロ文字印刷、箔押し加工のうちいずれかの偽造防止加工が施されていることを特徴とするゴミ処理券。

【請求項8】 上記ゴミ処理券の券面に、ノッチ加工または点字加工からなる視覚障害者用の識別加工が施されていることを特徴とする請求項7に記載のゴミ処理券。

【請求項9】 上記ゴミ処理券の券面に、上記自治体別の可変情報または注意喚起情報を印字するためのフリースペースが設けられていることを特徴とする請求項7、8に記載のゴミ処理券。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、粗大ゴミ等、有料化ゴミの処理のためのゴミ処理券の発行および請求システムに関し、特に、自治体の負担を低減させることができるゴミ処理券の共同発行請求システムに関する。

【0002】

【従来の技術】粗大ゴミ等の有料化ゴミの収集、処理のためには、金券としてのゴミ処理券を発行する必要があるが、現在では、各自自治体がゴミ処理券面にそれぞれ自治体名を印刷し、個別に製作したものを発行し、対応している。また、平成13年4月より施行される特定家庭用機器再商品化法（家電リサイクル法）によって、粗大ゴミの有料化は各自自治体にとって避けることができない課題である。

【0003】そこで、上記自治体の一例としてN市では、粗大ゴミの有料化にあたり、次のような収集方法を採用している。すなわち、図5に示すように、粗大ゴミを排出する各家庭1は、自治体2に対して、ゴミ収集を依頼すると、自治体2は、ゴミ料金、ゴミ収集日、およびゴミ収集場所3を指定する。各家庭1は、自治体2に指定されたゴミ料金の金額分のゴミ処理券を処理券販売店4から購入し、自治体2に指定された収集日、収集場所に上記ゴミ処理券を貼付した粗大ゴミを出すと、回収業者が、ゴミ処理券の有無を確認して収集するという流れである。

【0004】次に、上記ゴミ処理券の発行および請求方法について見てみると、ゴミ処理券の販売は、自治体2の預託品として処理券販売店4で取り扱われている。つまり、上記処理券販売店4は、自治体2に対して、各家庭1に販売するゴミ処理券の販売枚数および必要に応じてラベルの在庫補充の連絡をすると、自治体2は、処理券販売店4に対して、上記販売枚数に応じた料金の請求をするために、振込用紙を送付し、上記ラベルの在庫補充の連絡に対しては、ラベルの発送業務を行なう。実際には、上記振込用紙の送付、ラベルの在庫補充の連絡、ラベルの発送の業務は物流会社5に委託するものとしている。

【0005】しかし、上述したようなゴミ処理券の発行および請求システムでは、以下のような問題点が考えら

れる。

(1) 各自治体にとってゴミ処理券の発行および請求業務は負担が大きい。

(2) ゴミ処理券は金券であるため偽造を防止する必要があるが、券面に高度な偽造防止加工を施そうとすると、製作ロットがまとまらず、コスト高となるため、各自治体は、偽造されることを覚悟で、これといった偽造防止加工を施さずにゴミ処理券を発行しているのが現状であり、これによっては、正確なゴミ収集が不可能であるなどの問題点がある。

【0006】

【発明が解決しようとする課題】本発明は、上記のような問題点を鑑みてなされたものであり、その目的とするところは、自治体の負担を低減してゴミ処理券に偽造防止加工を施すことができ、かつ、偽造ゴミ処理券の使用を抑止でき、ゴミ処理のための費用を確実に徴収し、正確なゴミ収集を行なうことができるゴミ処理券の共同発行請求システムを提供することにある。

【0007】

【課題を解決するための手段】上記目的を達成するために、本発明に係るゴミ処理券の共同発行請求システムは、有料化ゴミ処理のためのゴミ処理券の発行および請求システムにおいて、ゴミ処理券の発行業務およびその処理費用の請求業務を委託する複数の業務委託手段と、ゴミ処理券を最終消費者に販売する複数のゴミ処理券販売手段との間に、上記複数の業務委託手段により委託されてゴミ処理券の受・発注、印刷加工、供給を行なうゴミ処理券受・発注手段を介在させてなり、上記ゴミ処理券受・発注手段は、上記各ゴミ処理券販売手段からの上記各業務委託手段別ゴミ処理券の発注に基づき、ゴミ処理券を印刷加工するとともに、供給する、ゴミ処理券発行手段と、上記供給したゴミ処理券数量に基づき、上記各ゴミ処理券販売手段に対して上記各業務委託手段別金額を請求するゴミ処理券請求手段と、を具備し、かつ、上記ゴミ処理券には、偽造防止手段が施されていることを特徴とするものである。

【0008】また、上記ゴミ処理券受・発注手段は、上記複数のゴミ処理券販売手段におけるゴミ処理券の販売実績、販売残、および保有在庫分からなる情報を上記業務委託手段に対して報告する報告手段を具備することとしてもよい。

【0009】また、上記ゴミ処理券請求手段は、上記ゴミ処理券販売手段における一定期間のゴミ処理券販売量に基づき発行される請求書および振込用紙の送付により行なわれることとしてもよい。

【0010】また、上記ゴミ処理券受・発注手段は、上記ゴミ処理券販売手段からのゴミ処理券の発注を、電話による受付、ファクシミリによる発注用紙の受付、およびインターネットwebサイト上の発注画面による受付等のいずれかの方法により受け付けることとしてもよ

い。

【0011】また、本発明システムに使用されるゴミ処理券には、偽造防止手段が施されており、その手段として、ゴミ処理券の券面に、アミ点および万線による隠し文字印刷、レインボー印刷、マイクロ文字印刷、箔押し加工のうちいずれかの偽造防止加工が施されていることを特徴とする。

【0012】また、上記ゴミ処理券には、券面に、ノッチ加工または点字加工からなる視覚障害者用の識別加工が施されていてもよい。

【0013】また、上記ゴミ処理券には、券面に、自治体別の可変情報または注意喚起情報を印字するためのフリースペースが設けられていてもよい。

【0014】また、上記ゴミ処理券は、上記ゴミ処理券受・発注手段から依頼された印刷メーカーにより上記偽造防止加工または視覚障害者用の識別加工が印刷された後に、上記ゴミ処理券受・発注手段により上記自治体別の可変情報または注意喚起情報が印字されることとしてもよい。

【0015】

【発明の実施の形態】(1)以下、本発明に係るゴミ処理券の共同発行請求システムについて、添付図面を参照しながら詳細に説明する。

【0016】図1は、本発明に係るゴミ処理券の共同発行請求システム全体の構成を示す概略図である。

【0017】同図に示すように、このシステムは、ゴミ処理を行なう複数の地方自治体200-1, 200-2, 200-3, …(以下、業務委託手段200という。)と、複数のゴミ処理券販売店300-1, 300-2, 300-3, 300-4, 300-5, …, 300-n(以下、ゴミ処理券販売手段300という。)との間に、ゴミ処理券受・発注手段100、例えば上記業務委託手段200である自治体から委託されてゴミ処理券の受・発注、印刷加工、供給を行なうゴミ処理券受・発注センターを介在させることにより大略構成されている。

【0018】さらに詳しくは、ゴミ処理券受・発注手段100と業務委託手段200である自治体とは、自治体のゴミ処理券の発行業務およびその処理費用を請求する業務をゴミ処理券受・発注手段100に委託する業務委託契約によって結ばれており、ゴミ処理券受・発注手段100は、業務委託手段200である自治体から、上記業務を行なうための相当の対価を受ける。

【0019】ゴミ処理券受・発注手段100は、ゴミ処理券発行手段を具備するものとし、周知のコンビニ店や量販店等のゴミ処理券販売店からなるゴミ処理券販売手段300からの各自治体別ゴミ処理券の発注を受け付け、この各自治体別ゴミ処理券の発注に基づいて、必要事項を印刷加工後ゴミ処理券販売手段300にゴミ処理券を納品する。

【0020】ゴミ処理券受・発注手段100は、ゴミ処理券の供給分については、印刷メーカー400にゴミ処理券の印刷業務を依頼し、供給を受ける。ゴミ処理券に必要な事項を印刷した後、各ゴミ処理券販売手段300にゴミ処理券を納品する。

【0021】ここで、上記ゴミ処理券には、後述する偽造防止手段が施されるものとする。

【0022】次に、ゴミ処理券販売手段300であるゴミ処理券販売店は、個人や事業者等の消費者500-1, 500-2, 500-3, 500-4, …, 500-n (以下、最終消費者500という。)にゴミ処理券を販売する役割を担う。

【0023】業務委託契約のうちゴミ処理券の請求業務について、ゴミ処理券受・発注手段100は、上記ゴミ処理券発行手段に加えて、ゴミ処理券請求手段を具備するものとし、ゴミ処理券販売手段300に供給した上記ゴミ処理券の数量に基づいて、各自治体別金額を請求することによって、ゴミ処理券販売手段300により最終消費者500に販売されたゴミ処理券の販売代金を請求する業務を行なう。

【0024】このゴミ処理券の請求業務として、ゴミ処理券受・発注手段100は、ゴミ処理券販売手段300に対して、例えば月に一回といった一定期間におけるゴミ処理券販売量に応じて請求書の発行および振込用紙の送付を行なうようにする。ゴミ処理券販売手段300であるゴミ処理券販売店が、ゴミ処理券受・発注手段100に、上記振込用紙によって請求書金額を支払うことで、ゴミ処理券受・発注手段100は、業務委託手段200である自治体から委託されたゴミ処理のための費用を請求することができる。

【0025】次に、ゴミ処理券受・発注手段100は、業務委託手段200である自治体に対して、複数のゴミ処理券販売手段300であるゴミ処理券販売店におけるゴミ処理券の店舗別販売実績、店舗別販売残、および保有在庫分等のゴミ処理券の在庫情報を報告する報告手段を具備していてもよい。本発明において、業務委託手段200である自治体は、ゴミ処理券の発行および請求業務の一切をゴミ処理券受・発注手段100に委託するものであるが、上記報告を受けることによって、ゴミ処理券受・発注手段100の業務内容を監督することもできる。

【0026】さらに、ゴミ処理券受・発注手段100は、印刷メーカー400に、ゴミ処理券の作成を依頼することにより、高度な偽造防止加工を施したゴミ処理券を作成することができる。ゴミ処理券受・発注手段100は、各ゴミ処理券販売店からの発注があった分のみ必要事項を印字し、納品すればよいので、未使用ゴミ処理券の在庫低減を図ることができる。また、印刷メーカー400でも、複数のゴミ処理券販売手段300発注のゴミ処理券の印刷をまとめて行なうことができるので、製

作ロットを大きくすることができ、ゴミ処理券作成コストを低減できる。

【0027】なお、上記実施形態において、ゴミ処理券受・発注手段100は、ゴミ処理券の発行業務を行なうにあたり、印刷メーカー400にゴミ処理券の印刷業務を依頼し、印刷メーカー400は、ゴミ処理券受・発注手段100にゴミ処理券を供給するものとしたが、印刷メーカー400が、ゴミ処理券受・発注手段100の業務をすべて行なうこととしてもよい。

【0028】(2)次に、上記ゴミ処理券の発注方法について、図2に基づき説明する。

【0029】ゴミ処理券受・発注手段100は、ゴミ処理券販売手段300からのゴミ処理券の発注を、電話による受付、ファクシミリによる発注用紙の受付、およびインターネットwebサイト上の発注画面による受付等のいずれかの方法により受け付けることができる。

【0030】電話による受付の場合、ゴミ処理券受・発注手段100は、ゴミ処理券の受注のための専用ダイヤルにオペレーターを配置してもよく、ゴミ処理券の種類、枚数、発注者、納期等を確認することによって発注を受け付ける。

【0031】ファクシミリによる場合、図2(a)に示すように、ゴミ処理券種別欄11、ゴミ処理券販売店名欄12が記載された発注用紙10aを、あらかじめゴミ処理券販売手段300であるゴミ処理券販売店毎に用意しておき、ゴミ処理券販売手段300は、ゴミ処理券を発注する際に、枚数欄13、発注日欄14等を記入した上記発注用紙10aをファクシミリによってゴミ処理券受・発注手段100に送付することにより、ゴミ処理券の受・発注を行なってもよい。

【0032】インターネットによる場合、ゴミ処理券受・発注手段100は、WWW(World Wide Web)サーバとなり、ゴミ処理券の受・発注のためのwebサイトを開設する。webサイト上には、図2

(b)に示すような発注画面10bが設けられ、発注画面10bには、あらかじめゴミ処理券種別欄11が表示されている。ゴミ処理券販売手段300は、上記webサイトに接続可能なWWWブラウザを搭載する通信端末機によって、ゴミ処理券販売店名欄12、枚数欄13、発注日欄14、IDコード欄15を入力し、上記発注内容をインターネット回線を通じて送信するだけで、ゴミ処理券の発注を行なうことができる。

【0033】(3)次に、本発明システムに使用されるゴミ処理券について、図3、図4に基づき説明する。

【0034】ゴミ処理券は金券としての性格を有するため、券面に偽造防止加工を施すことは不可欠である。本発明システムに使用されるゴミ処理券20には偽造防止手段が施されるが、この偽造防止手段は、印刷メーカー400が印刷加工することにより施されるものとする。

【0035】その印刷加工方法としては、図3に示すよ

うに、ゴミ処理券の券面に、例えば「無効」という文字を隠し文字21で印刷する。すなわち、カラー複写機の光学的解像力の限界値を利用し、その能力によって複写不能な線幅の万線、または細かいアミ点を用いて背景を印刷し、かつ、隠し文字21を複写可能な線幅の万線、または細かいアミ点で印刷することにより、カラー複写機で複写すると、背景が薄くなり、「無効」という隠し文字21が現われるようにして、複製物か否かの判別をすることができる。

【0036】また、ゴミ処理券20の券面に、異なるインキによって隣接部がぼかされるように傾斜状に濃度を変化させるいわゆるレインボー印刷22を施し、カラー複写機で複写すると、レインボー印刷22によるぼかしがカラー複写機の色に対する感度に応じて、元の色彩とは異なる色彩で現れ、目視によって複製物であるか否かを判別できるようにしてもよい。

【0037】また、ゴミ処理券20の券面に、文字、図形、数字などの微細パターンからなるマイクロ文字23を印刷し、目視では視認可能であるが、複写機では再現できないために、複写機による複製を防止することもできる。

【0038】また、透明フィルム上に、真空蒸着やその他のコーティング技術を用いて箔を形成し、さらに紙材の材質に対して転写性の良い接着剤の膜を備えるいわゆる転写箔24を形成し、ゴミ処理券20の券面に、この転写箔24を公知の箔押し機を用いて箔押し加工してもよい。

【0039】さらに、印刷メーカー400は、上記ゴミ処理券20の券面に、V字形などの切込み加工、いわゆるノッチ加工25を施したり、または、図示しない点字加工による文字等を印刷加工するなど、視覚障害者用の識別加工を施してもよい。

【0040】印刷メーカー400によって上記偽造防止加工、または視覚障害者用の識別加工が施されたゴミ処理券20は、上述したように、ゴミ処理券受・発注手段100にゴミ処理券の保有在庫分として納品される。

【0041】次に、ゴミ処理券受・発注手段100は、各ゴミ処理券販売手段300から自治体別のゴミ処理券の発注を受け付けると、上記保有在庫分から補充が必要となった分のゴミ処理券に必要な事項を印刷加工し、ゴミ処理券販売手段300に納品する。

【0042】すなわち、図4に示すように、予め上記偽造防止加工または視覚障害者用の識別加工が施されたゴミ処理券20の券面に、「家電用」、「粗大」、「事業系」、「家庭用」といったゴミ処理券の種別31を印刷する。また、「リサイクル用途」や「破碎」といったゴミ収集後の用途32を印刷してもよい。

【0043】次に、上記ゴミ処理券20の券面には、例えば200円、500円、1000円、2000円といったゴミ処理券の相当金額を印刷する。また、上記事業

系ゴミ、家庭用ゴミのためのゴミ処理券の場合には、例えば10リットル、20リットル、30リットルといったゴミ処理券の処理量33を印刷する。ここで、このゴミ処理券の相当金額や処理量33の記載はゴミ処理券20の金券としての価値を決定するものとなるため、偽造防止対策として、上記転写箔24による箔押し加工や、干渉縞が施されたホログラム加工等の偽造防止加工が施されることが好ましい。

【0044】また、ゴミ処理券20の券面には、発行自治体名34、この発行自治体名34を含む連続番号(シーケンシャルNo)35を印刷する。また、個人名、事業者名等、ゴミを出す者の責任者名を印刷してもよい。このことにより、ゴミを出した責任者が分かるので、規定内容以上のゴミを出したり、間違った出し方をすることを予防できる。

【0045】さらに、ゴミ処理券20には、フリースペース36が設けられているため、例えば、「落ち葉は良く乾燥させて入れてください」といった季節性のある情報や、「稲わらは入れないようにしてください」といった地域性の高い情報等の注意喚起情報や、「ゴミ処理券は、〇月〇日より〇〇〇販売店でも扱えるようになります」といった発行自治体別の可変情報を印字することもできる。

【0046】従来のゴミ処理券にあっては、高度な偽造防止加工を施そうとすると、製作ロットがまとまらず、コスト高となるため、複数の自治体がゴミ処理券を発行するにあたって偽造防止加工は施されていなかったが、本発明システムによれば、業務委託手段としての自治体が、ゴミ処理券の発行業務をゴミ処理券受・発注手段に委託することにより、製作ロットがまとまるため、ゴミ処理券のラベル媒体コストを低減でき、券面に比較的安価に上記いずれかの偽造防止加工を施すことが可能となる。

【0047】(4)以下に、上記構成からなる本発明システムによるゴミ処理手順について説明する。

【0048】業務委託手段200である自治体は、有料化ゴミ処理を行なうにあたり、ゴミ処理券の発行および請求業務をゴミ処理券受・発注手段100に委託する。

【0049】上記業務を委託されたゴミ処理券受・発注手段100は、印刷メーカー400にゴミ処理券の印刷業務を依頼し、印刷メーカー400は、ゴミ処理券受・発注手段100にゴミ処理券を供給する。ゴミ処理券受・発注手段100は、ゴミ処理券販売手段300であるゴミ処理券販売店からの各自治体別ゴミ処理券の発注を受け付け、必要事項を印字した後、各自治体別のゴミ処理券20をゴミ処理券販売手段300に納品する。ゴミ処理券販売手段300は、最終消費者500に上記ゴミ処理券20を販売する。

【0050】一方、粗大ゴミを排出する最終消費者500は、自治体に対して、ゴミ収集を依頼すると、自治体

は、最終消費者500に対して、ゴミ料金、ゴミ収集日、およびゴミ収集場所を指定する。最終消費者500は、自治体に指定されたゴミ料金の金額分のゴミ処理券20をゴミ処理券販売手段300であるゴミ処理券販売店から購入し、自治体に指定された収集日、収集場所に上記ゴミ処理券20を貼付した粗大ゴミを出すと、自治体に委託された回収業者が、ゴミ処理券20の有無を確認して収集する。

【0051】

【発明の効果】以上詳細に説明したように、本発明によれば、以下のような効果を奏する。

(1) 自治体がゴミ処理券の発行および請求業務から解放される。

(2) 印刷メーカーは、ゴミ処理券受・発注手段から在庫情報の報告を受けることにより、販売・消費されたゴミ処理券であって、複数の自治体で印刷が必要となったタイプのゴミ処理券のみを印刷してゴミ処理券受・発注手段に供給するので、製作ロットがまとまり製作コストを低減することができる。

(3) 本発明システムに採用されるゴミ処理券には、偽造防止加工が施されているため、偽造ゴミ処理券の使用を抑止でき、ゴミ処理のための費用を確実に徴収できるので、正確なゴミ収集を行なうことが可能となる。

【図面の簡単な説明】

【図1】本発明に係るゴミ処理券の共同発行請求システム全体の構成を示す概略図である。

【図2】ゴミ処理券の発注方法を説明する図であり、

(a)はファクシミリによる発注用紙の例、(b)はインターネットwebサイト上の発注画面の例を示す図である。

【図3】本発明システムに使用されるゴミ処理券を示す外観平面図である。

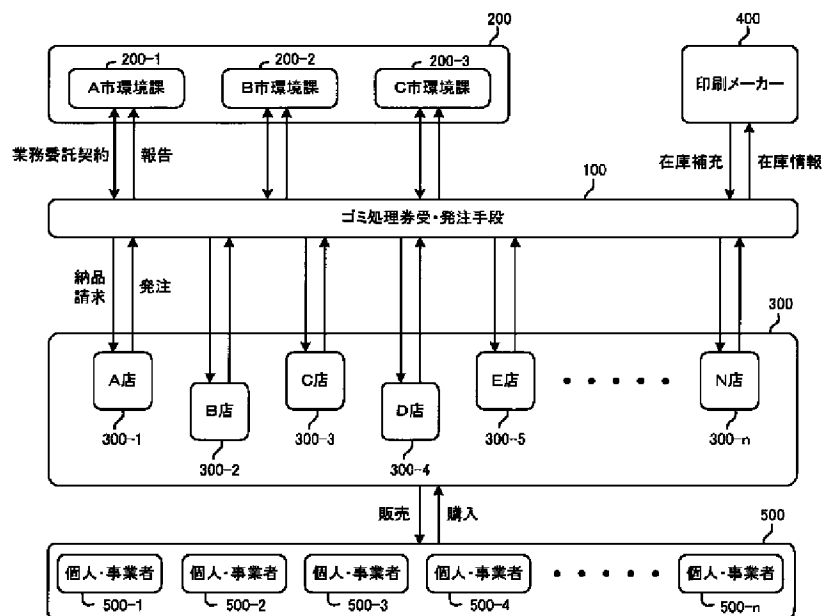
【図4】図3に示すゴミ処理券の印刷加工内容を説明する外観平面図である。

【図5】従来のゴミ処理券の発行および請求システムの構成の一例を示す概略図である。

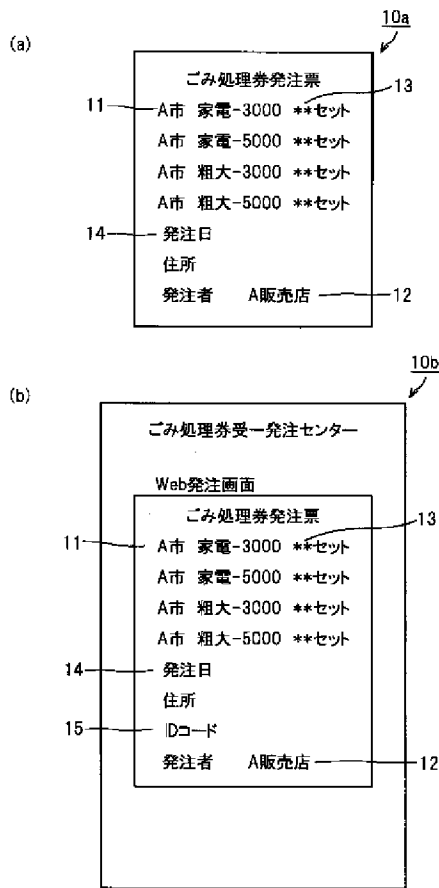
【符号の説明】

- 10 a 発注用紙
- 10 b 発注画面
- 20 ゴミ処理券
- 100 ゴミ処理券受・発注手段
- 200, 200-1, 200-2, 200-3 業務委託手段(自治体)
- 300, 300-1, 300-2, 300-3, 300-4, 300-5, ..., 300-n ゴミ処理券販売手段(ゴミ処理券販売店)
- 400 印刷メーカー
- 500, 500-1, 500-2, 500-3, 500-4, ..., 500-n 消費者(最終消費者)

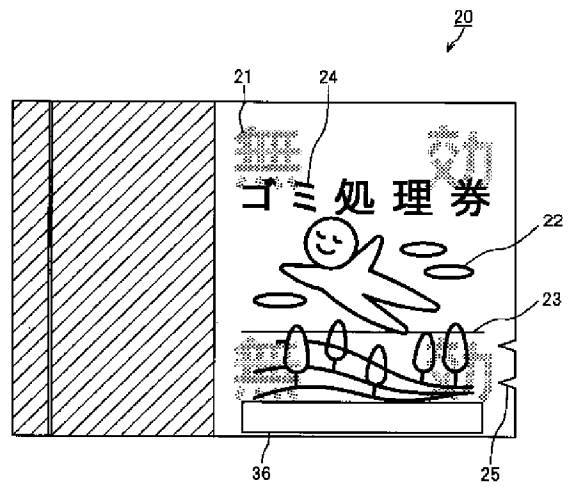
【図1】



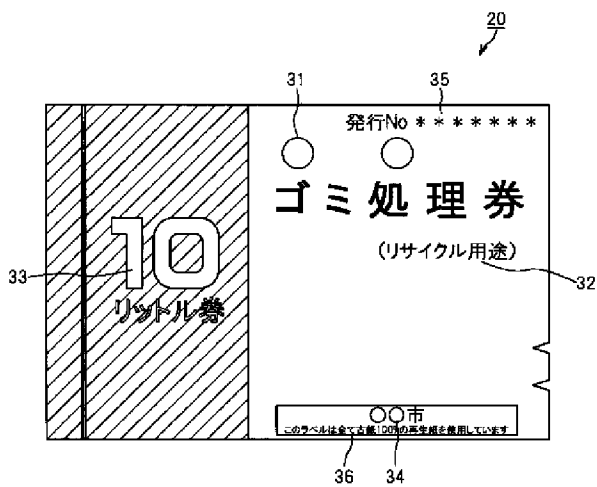
【図2】



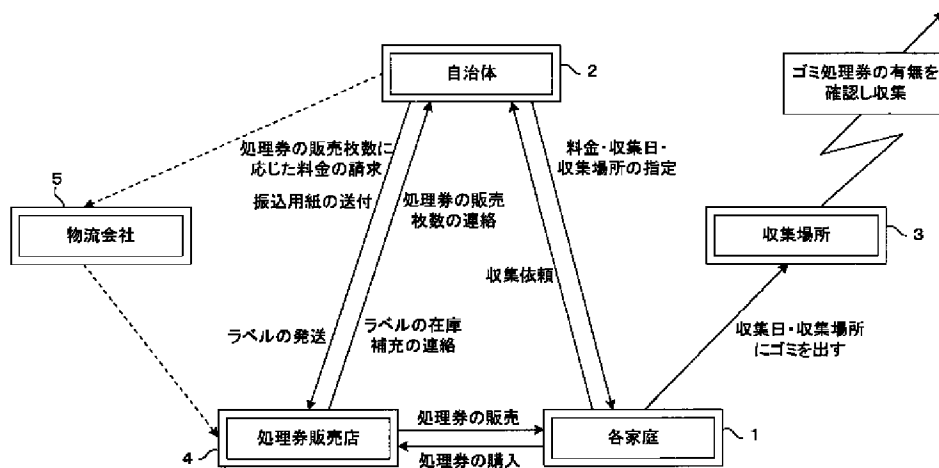
【図3】



【図4】



【図5】



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| Warnings: | | | | | |
| Information: | | | | | |
| 2 | Foreign Reference | JP-2002-157327-A.pdf | 566519 d9df1cd8fb63ae4636ab3f79f10468a7b6122389 | no | 9 |
| Warnings: | | | | | |
| Information: | | | | | |
| 3 | Non Patent Literature | EP_Ext_Search_Report_EP07251570_3_August_20_2007.pdf | 233844 695fea45238586edfd6294263ef2bca684746708 | no | 7 |
| Warnings: | | | | | |
| Information: | | | | | |
| 4 | Non Patent Literature | 10-642532_Office_Action_March_20_2008.pdf | 901655 cf61c39dafaf0a29eae556703f64d6fb81e861e9 | no | 26 |
| Warnings: | | | | | |
| Information: | | | | | |
| 5 | Non Patent Literature | 10-642532_Office_Action_November_7_2008.pdf | 542688 08686217b7a410d741fdbe1c668bd706e265607d | no | 16 |
| Warnings: | | | | | |
| Information: | | | | | |
| 6 | Non Patent Literature | 10-642532_Office_Action_February_23_2009.pdf | 506596 1895d49b11c3c389326c4187c836d0cce9722df3 | no | 15 |
| Warnings: | | | | | |
| Information: | | | | | |
| 7 | Non Patent Literature | 10-642532_Office_Action_September_9_2009.pdf | 605440 23e2694bd5aae7ef730ff6f9837b90be812fe96 | no | 18 |
| Warnings: | | | | | |
| Information: | | | | | |
| 8 | Non Patent Literature | 10-642532_Office_Action_January_6_2010.pdf | 570222 35e08576aa3d6e0ee8b4a05e452e5c75cd20f1ed | no | 17 |
| Warnings: | | | | | |
| Information: | | | | | |

| | | | | | |
|-------------------------------------|-----------------------|--|---|----|----|
| 9 | Non Patent Literature | 10-642532_Office_Action_July_21_2010.pdf | 663323 8744b66fc115d71b16bf0bbb97b82c1497817c8e | no | 19 |
| Warnings: | | | | | |
| Information: | | | | | |
| 10 | Non Patent Literature | 11-403547_Office_Action_June_23_2010.pdf | 176273 c6a5f23021ebe6d4b77657935207975a378aedf1 | no | 5 |
| Warnings: | | | | | |
| Information: | | | | | |
| 11 | Non Patent Literature | 10-800473_Office_Action_November_17_2009.pdf | 1425710 76941e3c7379f19d0e9407db2a8e0080113d5791 | no | 33 |
| Warnings: | | | | | |
| Information: | | | | | |
| Total Files Size (in bytes): | | | 6347352 | | |

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Robert L. Rae
APPLICATION NO.: 13/009,483
FILING DATE: January 19, 2011
TITLE: Centralized Call Processing
EXAMINER: Not yet known
GROUP ART UNIT: 2614
CONFIRMATION NO.: 1820
ATTY. DKT. NO.: 18279-18190

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the Pacific Time Zone of the United States on the local date shown below.

Dated: September 2, 2011

By: /Dohyun Ahn/

Dohyun Ahn, Reg. No. 63,237

**INFORMATION DISCLOSURE STATEMENT A
Under 37 CFR §§ 1.56 and 1.97-98**

SIR:

Pursuant to the provisions of 37 CFR §§ 1.56 and 1.97-98, enclosed herewith is modified form PTO/SB/08A listing references for consideration by the Examiner.

The filing of this Information Disclosure Statement shall not be construed as a representation regarding the completeness of the list of references, or that inclusion of a reference in this list is an admission that it is prior art or is pertinent to this application, or that a search has been made, or as an admission that the information listed is, or may be considered to be, material to patentability, or that no other material information exists, and shall not be construed as an admission against interest in any manner.

This Information Disclosure Statement is being filed:

- within three months of the filing date of the application, or date of entry into the national stage of an international application, or before the mailing date of a first office action on the merits, whichever event last occurred;
- before the mailing of a first official action after the filing of a request for continued examination (RCE) under 37 CFR § 1.114;

- after three months of the filing date of this national application or the date of entry of the national stage in an international application, or after the mailing date of the first official action on the merits, whichever event last occurred, but before the mailing date of the first to occur of either: (1) a final action under 37 CFR §1.113; or (2) an action that otherwise closes prosecution in the application, and:
 - attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(c); OR
 - Applicant certifies pursuant to 37 CFR § 1.97(e) that:
 - each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement; OR
 - no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement;
- on or before the payment of the issue fee but after the mailing date of the first to occur of either: (1) a final action under 37 CFR § 1.113; (2) a notice of allowance under 37 CFR § 1.311; or (3) an action that otherwise closes prosecution in the application, and:
 - Applicant certifies pursuant to 37 CFR. § 1.97(e) that:
 - each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Statement;
 - no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application

and, to the knowledge of the person signing this certification after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated under 37 CFR § 1.56(c) more than three months prior to the filing of this Statement; AND

- attached hereto is the fee set forth under 37 CFR §1.17(p) for submission of this Information Disclosure Statement under 37 CFR. § 1.97(d); OR
- after the payment of the issue fee. Applicant requests that the information contained in this Information Disclosure Statement be placed in the file according to 37 CFR § 1.97(i), although the information may not be considered by the USPTO.
- This application relies, under 35 U.S.C. § 120, on the earlier filing date of prior application No. _____, filed on _____, and the references cited therein are hereby referenced, but are not required to be provided in this application under 37 CFR § 1.98(d).
- Each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application, and the communication was not received by any individual designated in 37 CFR § 1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement. 37 CFR § 1.704(d).

Respectfully submitted,

Dated: September 2, 2011 /Dohyun Ahn/
Dohyun Ahn, Reg. No.: 63,237
Fenwick & West LLP
Silicon Valley Center
801 California Street
Mountain View, CA 94041
Tel.: (650) 335-7291
Fax.: (650) 938-5200



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Table with 7 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY. DOCKET NO, TOT CLAIMS, IND CLAIMS. Row 1: 13/009,483, 01/19/2011, 2614, 1090, 18279-18190, 16, 2

CONFIRMATION NO. 1820

CORRECTED FILING RECEIPT



758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

Date Mailed: 05/24/2011

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections

Applicant(s)

Robert L. Rae, Plano, TX;

Assignment For Published Patent Application

SECURUS TECHNOLOGIES, INC., Dallas, TX

Power of Attorney: The patent practitioners associated with Customer Number 00758

Domestic Priority data as claimed by applicant

This application is a CON of 10/642,532 08/15/2003 PAT 7,899,167

Foreign Applications (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 01/31/2011

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US 13/009,483

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

Title

CENTRALIZED CALL PROCESSING

Preliminary Class

370

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 13/009,483 | 01/19/2011 | Robert L. Rae | 18279-18190 |

CONFIRMATION NO. 1820

POA ACCEPTANCE LETTER



758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

Date Mailed: 05/23/2011

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/12/2011.

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.

/atesfai/

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



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www.uspto.gov

Table with 4 columns: APPLICATION NUMBER (13/009,483), FILING OR 371(C) DATE (01/19/2011), FIRST NAMED APPLICANT (Robert L. Rac), ATTY. DOCKET NO./TITLE (18279-18190)

CONFIRMATION NO. 1820

PUBLICATION NOTICE



758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

Title:CENTRALIZED CALL PROCESSING

Publication No.US-2011-0110276-A1

Publication Date:05/12/2011

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

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(b).

I hereby appoint:

Practitioners associated with the Customer Number: 00758

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 |
|------|---------------------|--|------|---------------------|
| | | | | |
| | | | | |
| | | | | |
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| | | | | |

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 | | Email | | |

Assignee Name and Address:

Securus Technologies, Inc.
 14651 Dallas Parkway, Suite 600
 Dallas, TX 75254

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

| | | | |
|-----------|--|-----------|----------------|
| Signature | | Date | 1/17/11 |
| Name | Dennis J. Rainhold | Telephone | (972) 277-0318 |
| Title | Vice President, General Counsel, Secretary | | |

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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| | | | |
|---|-----------------------------|------------------------|-------------|
| Application Data Sheet 37 CFR 1.76 | | Attorney Docket Number | 18279-18190 |
| | | Application Number | |
| Title of Invention | CENTRALIZED CALL PROCESSING | | |
| The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application. | | | |

Secrecy Order 37 CFR 5.2

Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

| | | | | | |
|---|-------------------|---|--------------------|--|---------------------------------------|
| Applicant 1 | | | | | <input type="button" value="Remove"/> |
| Applicant Authority | | <input checked="" type="radio"/> Inventor | | <input type="radio"/> Legal Representative under 35 U.S.C. 117 | |
| | | | | <input type="radio"/> Party of Interest under 35 U.S.C. 118 | |
| Prefix | Given Name | Middle Name | Family Name | Suffix | |
| | Robert | L. | Rae | | |
| Residence Information (Select One) <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service | | | | | |
| City | Plano | Country Of Residenceⁱ | US | | |
| Citizenship under 37 CFR 1.41(b) i | | US | | | |
| Mailing Address of Applicant: | | | | | |
| Address 1 | 2529 Scenic Drive | | | | |
| Address 2 | | | | | |
| City | Plano | State/Province | TX | | |
| Postal Code | 75025 | Countryⁱ | US | | |
| All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. | | | | | <input type="button" value="Add"/> |

Correspondence Information:

| | | | |
|--|------------------|--|---|
| Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a). | | | |
| <input type="checkbox"/> An Address is being provided for the correspondence information of this application. | | | |
| Customer Number | 00758 | | |
| Email Address | dahn@fenwick.com | <input type="button" value="Add Email"/> | <input type="button" value="Remove Email"/> |

Application Information:

| | | | |
|--|-----------------------------|--|--------------------------|
| Title of the Invention | CENTRALIZED CALL PROCESSING | | |
| Attorney Docket Number | 18279-18190 | Small Entity Status Claimed | <input type="checkbox"/> |
| Application Type | Nonprovisional | | |
| Subject Matter | Utility | | |
| Suggested Class (if any) | | Sub Class (if any) | |
| Suggested Technology Center (if any) | | | |
| Total Number of Drawing Sheets (if any) | 2 | Suggested Figure for Publication (if any) | |

0371

| | | |
|---|-----------------------------|-------------|
| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 18279-18190 |
| | Application Number | |
| Title of Invention | CENTRALIZED CALL PROCESSING | |

Publication Information:

| | |
|--------------------------|--|
| <input type="checkbox"/> | Request Early Publication (Fee required at time of Request 37 CFR 1.219) |
| <input type="checkbox"/> | Request Not to Publish. I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing. |

Representative Information:

| | | | |
|--|--|--|---|
| <p>Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.</p> | | | |
| Please Select One: | <input checked="" type="radio"/> Customer Number | <input type="radio"/> US Patent Practitioner | <input type="radio"/> Limited Recognition (37 CFR 11.9) |
| Customer Number | 00758 | | |

Domestic Benefit/National Stage Information:

| | | | |
|---|-----------------|--------------------------|--------------------------|
| <p>This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.</p> | | | |
| Prior Application Status | Pending | Remove | |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | Continuation of | 10642532 | 2003-08-15 |
| <p>Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.</p> | | | Add |

Foreign Priority Information:

| | | | |
|--|----------------------|---------------------------------|---|
| <p>This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).</p> | | | |
| | | | Remove |
| Application Number | Country ⁱ | Parent Filing Date (YYYY-MM-DD) | Priority Claimed |
| | | | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| <p>Additional Foreign Priority Data may be generated within this form by selecting the Add button.</p> | | | Add |

Assignee Information:

| | |
|--|------------------------|
| <p>Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.</p> | |
| Assignee 1 | Remove |

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.

| | | |
|---|-----------------------------|-------------|
| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 18279-18190 |
| | Application Number | |
| Title of Invention | CENTRALIZED CALL PROCESSING | |

| | | | |
|--|---------------------------------|----------------|------------------------------------|
| If the Assignee is an Organization check here. <input checked="" type="checkbox"/> | | | |
| Organization Name | Securus Technologies, Inc. | | |
| Mailing Address Information: | | | |
| Address 1 | 14651 DALLAS PARKWAY, SUITE 600 | | |
| Address 2 | | | |
| City | Dallas | State/Province | TX |
| Country i | US | Postal Code | 75254 |
| Phone Number | | Fax Number | |
| Email Address | | | |
| Additional Assignee Data may be generated within this form by selecting the Add button. | | | <input type="button" value="Add"/> |

Signature:

| | | | | | |
|--|--------------|-----------|-----|---------------------|------------|
| A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature. | | | | | |
| Signature | /Dohyun Ahn/ | | | Date (YYYY-MM-DD) | 2011-01-19 |
| First Name | Dohyun | Last Name | Ahn | Registration Number | 63237 |

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

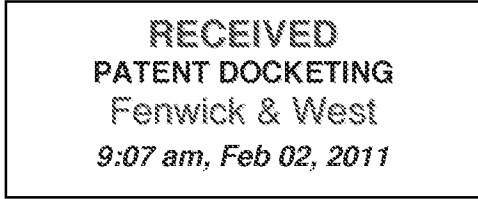


UNITED STATES PATENT AND TRADEMARK OFFICE

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

Table with 7 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY. DOCKET NO, TOT CLAIMS, IND CLAIMS. Row 1: 13/009,483, 01/19/2011, 2614, 1090, 18279-18190, 16, 2

758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041



CONFIRMATION NO. 1820
FILING RECEIPT



Date Mailed: 02/02/2011

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections

Applicant(s) Robert L. Rae, Residence Not Provided;
Assignment For Published Patent Application SECURUS TECHNOLOGIES, INC., Dallas, TX
Power of Attorney: None

Domestic Priority data as claimed by applicant This application is a CON of 10/642,532 08/15/2003

Foreign Applications (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see http://www.uspto.gov for more information.)

If Required, Foreign Filing License Granted: 01/31/2011

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US 13/009,483

Projected Publication Date: 05/12/2011

Non-Publication Request: No

Early Publication Request: No

Title

CENTRALIZED CALL PROCESSING

Preliminary Class

379

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

APPLICANT(S): Robert L. Rae
APPLICATION NO.: 13/009,483
FILING DATE: January 19, 2011
TITLE: CENTRALIZED CALL PROCESSING
EXAMINER: Not yet known
GROUP ART UNIT: 2614
ATTY. DKT. NO.: 18279-18190

CERTIFICATE OF ELECTRONIC (EFS-WEB) TRANSMISSION

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.8(a)(i)(C) from the Pacific Time Zone of the United States on the local date shown below.

Dated: May 12, 2011

By: /Dohyun Ahn/

Dohyun Ahn, Reg. No. 63,237

COMMISSIONER FOR PATENTS
OFFICE OF INITIAL PATENT EXAMINATION
CUSTOMER SERVICE CENTER
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

REQUEST FOR CORRECTED FILING RECEIPT

SIR:

Enclosed is a copy of the Official Filing Receipt. It contains the following error:

1. The Applicant's residence is erroneously stated as --Residence Not Provided--.

Please correct Applicant's residence to "Plano, TX" as evidenced by a copy of Application Data Sheet which is enclosed.

Please issue a corrected Filing Receipt rectifying this error.

Respectfully submitted,

Dated: May 12, 2011

By: /Dohyun Ahn/
Dohyun Ahn, Reg. No. 63,237
FENWICK & WEST LLP
801 California Street
Mountain View, CA 94041
Tel.: 650.335.7291
Fax.: 650.938.520

Electronic Acknowledgement Receipt

| | |
|---|-----------------------------|
| EFS ID: | 10075701 |
| Application Number: | 13009483 |
| International Application Number: | |
| Confirmation Number: | 1820 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Customer Number: | 00758 |
| Filer: | Dohyun Ahn |
| Filer Authorized By: | |
| Attorney Docket Number: | 18279-18190 |
| Receipt Date: | 12-MAY-2011 |
| Filing Date: | 19-JAN-2011 |
| Time Stamp: | 18:45:42 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

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(b). | 18190_US_3_73b_Statement. PDF | 427077 <small>162322432e5468c1c45d8dc0e5edc8234fdcf96</small> | no | 2 |

Warnings:

| | |
|---------------------|------|
| Information: | 0380 |
|---------------------|------|

| | | | | | |
|-------------------------------------|--------------------------------------|--|--|----|---|
| 2 | Power of Attorney | 18190_US_POA.pdf | 92380 | no | 1 |
| | | | 6972c9089775bd0dba672fd5aa247e1e099fcc63 | | |
| Warnings: | | | | | |
| Information: | | | | | |
| 3 | Application Data Sheet | 18190_US_ADS.PDF | 1031638 | no | 4 |
| | | | 9c9282cfd4ca22646ca7c07d508484e96c17f28 | | |
| Warnings: | | | | | |
| Information: | | | | | |
| 4 | Miscellaneous Incoming Letter | 18190_US_Filing_Receipt.PDF | 154739 | no | 3 |
| | | | 0fff6467132d4c9e87d742acb09ac0ed66a5a72e | | |
| Warnings: | | | | | |
| Information: | | | | | |
| 5 | Request for Corrected Filing Receipt | 18190_US_Request_for_Corrected_FR_residence_.pdf | 110708 | no | 2 |
| | | | 6bb646bdcd903d0597e7b93c69713ec2cc2d01e7 | | |
| Warnings: | | | | | |
| Information: | | | | | |
| Total Files Size (in bytes): | | | 1816542 | | |

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.

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.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Robert L. Rae

Application No./Patent No.: 13/009,483 Filed/Issue Date: January 19, 2011

Titled: CENTRALIZED CALL PROCESSING

SECURUS TECHNOLOGIES, INC., a Delaware 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 in;
- 2. an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
- 3. the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)
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 _____, or for which a copy therefore is attached.

OR

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

1. From: Robert L. Rae To: EVERCOM SYSTEMS, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 014408, Frame 0043, or for which a copy thereof is attached.

2. From: EVERCOM SYSTEMS, INC. To: SECURUS TECHNOLOGIES, INC.

The document was recorded in the United States Patent and Trademark Office at
Reel 025663, Frame 0351, 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(s).

As required by 37 CFR 3.73(b)(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.

/Dohyun Ahn/
Signature

May 12, 2011
Date

Dohyun Ahn, Reg. No. 63,237
Printed or Typed Name

Attorney for Assignee
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 1.11 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.** 0382

Privacy Act Statement

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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).
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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.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
13/009,483

APPLICATION AS FILED - PART I

(Column 1) (Column 2)

| FOR | NUMBER FILED | NUMBER EXTRA |
|---|---|--------------|
| BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A |
| SEARCH FEE (37 CFR 1.16(k), (l), or (m)) | N/A | N/A |
| EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A |
| TOTAL CLAIMS (37 CFR 1.16(j)) | 16 | minus 20 = * |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | 2 | minus 3 = * |
| APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$270 (\$135 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). | |
| MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | |

SMALL ENTITY

| RATE(\$) | FEE(\$) |
|----------|---------|
| N/A | |
| N/A | |
| N/A | |
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL | |

OR OTHER THAN SMALL ENTITY

| RATE(\$) | FEE(\$) |
|----------|---------|
| N/A | 330 |
| N/A | 540 |
| N/A | 220 |
| x 52 = | 0.00 |
| x 220 = | 0.00 |
| | 0.00 |
| | 0.00 |
| TOTAL | 1090 |

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED - PART II

(Column 1) (Column 2) (Column 3)

| AMENDMENT A | | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA |
|---|---------------------------------------|----------------------------------|-------|------------------------------------|---------------|
| | Total (37 CFR 1.16(i)) | * | Minus | ** | = |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = |
| | Application Size Fee (37 CFR 1.16(s)) | | | | |
| FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | |

SMALL ENTITY

| RATE(\$) | ADDITIONAL FEE(\$) |
|-----------------|--------------------|
| x = | |
| x = | |
| | |
| | |
| | |
| TOTAL ADD'L FEE | |

OR OTHER THAN SMALL ENTITY

| RATE(\$) | ADDITIONAL FEE(\$) |
|-----------------|--------------------|
| x = | |
| x = | |
| | |
| | |
| | |
| TOTAL ADD'L FEE | |

(Column 1) (Column 2) (Column 3)

| AMENDMENT B | | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA |
|---|---------------------------------------|----------------------------------|-------|------------------------------------|---------------|
| | Total (37 CFR 1.16(i)) | * | Minus | ** | = |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = |
| | Application Size Fee (37 CFR 1.16(s)) | | | | |
| FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | |

SMALL ENTITY

| RATE(\$) | ADDITIONAL FEE(\$) |
|-----------------|--------------------|
| x = | |
| x = | |
| | |
| | |
| | |
| TOTAL ADD'L FEE | |

OR OTHER THAN SMALL ENTITY

| RATE(\$) | ADDITIONAL FEE(\$) |
|-----------------|--------------------|
| x = | |
| x = | |
| | |
| | |
| | |
| 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 found in the appropriate box in column 1.



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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

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 13/009,483 | 01/19/2011 | Robert L. Rae | 18279-18190 |

CONFIRMATION NO. 1820

758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
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NOTICE



Date Mailed: 02/02/2011

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CONFIRMATION NO. 1820

FILING RECEIPT



758
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Date Mailed: 02/02/2011

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Applicant(s)

Robert L. Rae, Residence Not Provided;

Assignment For Published Patent Application

SECURUS TECHNOLOGIES, INC., Dallas, TX

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 10/642,532 08/15/2003

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US 13/009,483

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Title

CENTRALIZED CALL PROCESSING

Preliminary Class

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CENTRALIZED CALL PROCESSING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of United States patent application serial number 10/642,532, filed on August 15, 2003, entitled “Centralized Call Processing,” which is incorporated by reference herein in its entirety. The application is also related to United States patent application serial number 10/135,878, entitled “Information Management and Movement System and Method,” filed April 29, 2002; serial number 10/135,883 entitled “Optimizing Profitability in Business Transactions,” filed April 29, 2002; serial number 10/190,315 entitled “System and Methods for Offering a Service to a Party Associated with a Blocked Call,” filed July 3, 2002; serial number 09/640,831, entitled “System and Method for Reverse Billing of a Telephone Call,” filed August 17, 2000; serial number 10/022,946, entitled “Method for Determining an Entity Responsible for Billing a Called Party,” filed December 17, 2001; serial number 10/217,149, entitled “System and Method for Call Treatment,” filed August 12, 2002; serial number 10/252,956, entitled “Three-Way Telephone Call Prevention System and Method,” filed September 20, 2002; serial number 09/995,253, entitled “Method and Apparatus for Exchanging Data Between a Primary Computer System and an External Computer System to Ensure Transaction Reconciliation Between the Systems,” filed November 27, 2001; serial number 10/360,248 entitled “System and Method for Account Establishment and Transaction Management Using Interrupt Messaging,” filed February 7, 2003; serial number 10/360,442, entitled “Systems and Methods for Transaction Authorization Determination,” filed February 7, 2003; serial number 10/437,839 entitled “Intelligent Queuing of Transaction Requests,” filed May 14, 2003; and serial number 10/420,585 entitled “System and Method for Detecting Unauthorized Call Activity,” filed April 22, 2003, which are incorporated by reference in their entirety.

TECHNICAL FIELD

[0002] The present invention relates generally to call processing systems, and more particularly, to a centralized or nodal architecture utilized with respect to call processing.

BACKGROUND OF THE INVENTION

[0003] Automated systems for providing call processing functions are not new. For example, United States patent number 5,247,569 entitled “System and Method for Controlling Outbound and Inbound Calls in a Telephone Communication System,” the disclosure of which is incorporated herein by reference, teaches a call handling system for controlling inbound and outbound calls automatically for placing agents in communication with calling and called parties. United States patent number 5,255,305 entitled “Integrated Voice Processing System,” the disclosure of which is incorporated herein by reference, teaches a general purpose computer platform providing voice processing functions, including voice messaging, call processing, and interactive voice response. United States patent number 4,935,956 entitled “Automated Public Phone Control for Charge and Collect Billing,” the disclosure of which is incorporated herein by reference, teaches a microcomputer system for use in automatically controlling charge and collect-call functions. United States patent number 6,052,454 entitled “Telephone Apparatus With Recording of Phone Conversations on Massive Storage,” the disclosure of which is incorporated herein by reference, teaches a telephone apparatus for providing service to a plurality of telephones located at a particular facility, having the capability of controlling the connection of calls and recording selected phone conversations.

[0004] Such call processing systems have typically implemented configurations in which substantial amounts of call processing functionality is disposed or deployed in association with a facility being serviced. For example, discrete and substantially independent call processing systems are disposed at prison facilities, or other facilities, served by the system of above mentioned United States patent number 4,935,956. Similarly, although call authorization functionality is disposed remotely to a facility being served in the system of above mentioned United States patent number 6,052,454, call processing is provided by the phone system disposed at the facility.

[0005] A service provider may have a relatively large number of facilities for which calling services are provided, such as on the order of hundreds or even thousands of individual facilities, perhaps distributed throughout a large geographic area. The aforementioned locally disposed call processing systems provide a number of disadvantages in addition to the equipment costs associated with such a configuration. For example, a large number of call processing systems,

particularly when distributed throughout a large geographic area, presents challenges from a maintenance standpoint. When system aspects are modified or updated, such as to provide new rate tables or dialing area codes, each such call processor requires individual attention. For example, an operations, administration, maintenance, and provisioning (OAM&P) terminal may be utilized to establish a dial-up connection with each affected call processor and provide update information and/or reconfiguration. However, merely establishing such dial-up connections with a large number of remote systems is burdensome, even ignoring the time and effort required in actually providing the update. Even where a persistent data link is maintained between such an OAM&P terminal and the remote systems, managing an update of a large number of remote systems is difficult.

[0006] Additionally, data sharing, aggregation, and statistical analysis available using such discrete or distributed call processing systems is very limited. The distributed and discrete nature of such previous configurations is not well suited for widespread data sharing, aggregation, and analysis. Moreover, the lack of persistent and/or high bandwidth data connections, such as in the case of the typical dial-up configuration, does not readily facilitate the aggregation of large amounts of data as might otherwise be useful in developing an image across many facilities for which calling services are provided.

[0007] Introducing new features and functions in such call processing systems can be problematic. For example, a particular feature requiring a minimum resource configuration or particular hardware may require a significant capital investment to introduce the feature for use at a number of sites as each corresponding call processing system may require hardware upgrades etcetera.

[0008] Additional challenges may be presented with respect to use of the aforementioned discrete or distributed call processing systems in particular situations. For example, where such call processing systems are deployed for use with respect to particular controlled environment facilities, such as prison facilities, functionality such as call recording may be implemented. Recording calls typically require substantial recording media space. Accordingly, personnel at each facility, whether employed by the service provider or by the facility itself, is required to periodically, often daily, archive or otherwise refresh the recording media to ensure the continued ability to record calls.

[0009] Where such call processing systems are used in providing collect calling or other subsequently billed calling services, discrete or distributed call processing system configurations can present issues with respect to billing and/or risk management. For example, billing records may only be polled periodically, such as by establishing a dial-up connection every night, thereby delaying billing as much as 24 hours with respect to any particular call. Moreover, analysis with respect to call velocity (information with respect to a number of calls placed to or from a particular number over a period of time) and/or credit limits may not be possible until the aforementioned periodic collection of data, allowing calls which otherwise would not be allowed to be completed to continue to be placed during the time of a polling period.

BRIEF SUMMARY OF THE INVENTION

[0010] The present invention is directed to systems and methods which provide a centralized architecture for call processing. According to a preferred embodiment of the present invention voice over Internet protocols (VoIP) is utilized to carry calls from a location at which calling services are provided to a centralized call processing platform providing all or substantially all call processing functionality, such as calling party identification, call validation, call routing, connection to the public switched telephone network (PSTN), call recording, etcetera. High bandwidth persistent data connections provided between locations at which calling services are provided and a centralized call processing platform are utilized not only to carry call content as data, but also to provide persistent data links for data processing use, such as by management terminals and/or other data processing systems (e.g., commerce computer systems, justice application management computer systems, various peripheral devices, etcetera) disposed at the facility locations.

[0011] Preferred embodiments of the present invention provide devices having relatively limited or specialized functionality, such as VoIP gateways or integrated access devices (IADs) (collectively referred to herein in centralized call processing configurations as call processing gateways), at facility locations for which calling services are provided. These call processing gateways are preferably utilized to provide plain old telephone service (POTS) analog line interfaces for use with a plurality of telephone sets disposed for use at the facility and at least one wide area network (WAN) interface for providing high speed data communication to a

centralized call processing platform. Call processing gateways utilized according to the present invention may provide additional interfaces, such as a local area network (LAN) for connecting systems such as management terminals to the gateway and/or centralized call processing platform and/or switched network interfaces such as to couple PSTN lines directly to the gateway, if desired.

[0012] Call processing gateways of embodiments of the invention become the collection point for calls and data for a particular facility and provide a link to one or more central sites for call processing and other functionality. For example, one centralized call processing platform may be implemented with respect to a plurality of facilities serviced. Additionally or alternatively, a plurality of call processing platforms, such as might be deployed regionally and/or to provide redundancy, may be networked to a plurality of facilities serviced. WAN circuits may be purchased from a carrier for connecting each individual facility to the call processing platform or platforms. The WAN circuits may be purchased according to the bandwidth capacity desired for each corresponding facility, e.g., to provide less bandwidth where few telephone terminals are deployed at a facility and more bandwidth where many telephone terminals are deployed at another facility. The WAN circuits may be collected together as they proceed through a carrier's network, thereby providing a larger aggregate data pipe or pipes at a centralized call processing platform.

[0013] Centralized call processing platforms of preferred embodiments of the present invention comprise high capacity and high speed routing/switching functionality, such as a router and gigabit Ethernet switch, to facilitate low latency data communication between call processing functionality and/or PSTN interfacing functionality of the call processing platform and call processing gateways of a plurality of facilities. Call processing functionality of embodiments of a call processing platform may be provided by a plurality of servers operable under control of instruction sets defining operation to provide call processing features such as calling party identification, call validation, call routing, etcetera. PSTN interfacing functionality of embodiments of a call processing platform may be provided as a data connection (e.g., media gateway control protocol (MGCP) or session initiation protocol (SIP)) to the PSTN. Additionally or alternatively, PSTN interfacing functionality of embodiments of a call processing platform may be provided as POTS trunking or other more traditional telephone line interface. Preferred embodiments, however, may place calls on the PSTN in VoIP protocols to receive the benefit of such advantages as lower

connection cost offered by the carrier when introduced to the PSTN in VoIP protocols, reduced latencies associated with repeated conversion of the call between VoIP and analog protocols, and improved call quality associated with carrying the call in digital format closer to the called party before conversion back to analog.

[0014] Call processing platforms of the present invention may implement interactive voice response (IVR) features, such as to solicit information from a caller, to provide call status announcements, to solicit funds for a call, etcetera. Additionally or alternatively, call processing platforms of the present invention may implement call recording and/or other centralized data collection, such as through use of a storage area network (SAN), interconnected redundant array of inexpensive disks (RAID) or fixed disk platforms, and/or the like.

[0015] Preferred embodiment call processing platforms provide for data sharing, aggregation, and/or analysis across multiple facilities served, whether affiliated (such as facilities of a particular city, county, or state or facilities having an association, e.g., sheriff's association) or non-affiliated (such as all facilities served by the service provider). Accordingly, information, such as inmate booking information, dossiers, etcetera, may be shared across facilities. Similarly, information, such as called party number, uncollectable call statistics, usage frequency or velocity, etcetera, may be aggregated and/or analyzed across facilities.

[0016] Call processing platforms of preferred embodiments implement a data structure for segmenting the calling activity for each individual facility to control access with respect to each facility's data and/or to facilitate independent accounting, maintenance, and other functionality, thereby providing, in some respects, a virtual facility call processor with respect to facilities. For example, administrative personnel of a particular facility are preferably enabled to perform maintenance and other operations, e.g., call processor configuration, recorded call playback, billing and commission record access, etcetera, with respect to that particular facility. According to a preferred embodiment, management terminals disposed locally at a facility are provided data access to portions of the call processing platforms relevant to the operation of that facility via the aforementioned call processing gateway, such that it appears from the user's viewpoint as if a local call processor system is being accessed and maintained. Additionally or alternatively, independent

WAN connections with respect to such management terminals may be supported according to embodiments of the present invention.

[0017] The foregoing has outlined rather broadly the features and technical advantages of the present invention in order that the detailed description of the invention that follows may be better understood. Additional features and advantages of the invention will be described hereinafter which form the subject of the claims of the invention. It should be appreciated that the conception and specific embodiment disclosed may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should also be realized that such equivalent constructions do not depart from the invention as set forth in the appended claims. The novel features which are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and advantages will be better understood from the following description when considered in connection with the accompanying figures. It is to be expressly understood, however, that each of the figures is provided for the purpose of illustration and description only and is not intended as a definition of the limits of the present invention.

BRIEF DESCRIPTION OF THE DRAWING

[0018] For a more complete understanding of the present invention, reference is now made to the following descriptions taken in conjunction with the accompanying drawing, in which:

[0019] FIGURE 1 shows a call processing system implementing a centralized or nodal call processing platform according to an embodiment of the present invention; and

[0020] FIGURE 2 shows a flow diagram of operation of the call processing system of FIGURE 1 according an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0021] Directing attention to FIGURE 1, an embodiment of a centralized or nodal call processing system according to the present invention is shown as call processing system 100. Call processing system 100 of the illustrated embodiment includes call processing platform 101 in

communication with facilities 150-180 via network 130. It should be appreciated that, although only a single call processing platform is represented in FIGURE 1, any number of call processing platforms, perhaps having varied configurations and/or disposed at different geographic locations, may be implemented with respect to a call processing system of the present invention. Likewise, the number and configurations of facilities for which calling services may be provided by a call processing system of the present invention is not limited to that shown in FIGURE 1.

[0022] To better aid the reader in understanding the concepts of the present invention, call processing system 100 of FIGURE 1 is described herein with reference to its configuration and use in providing calling services to jail or prison facilities. However, it should be appreciated that call processing systems of the present invention are not limited to use with respect to such facilities. Embodiments of the present invention may be utilized with respect to any number of controlled environment facilities (e.g., prisons, hospitals, nursing homes, camps, dormitories, and the like) or other locations (e.g., businesses, residences, kiosks, etcetera).

[0023] Preferred embodiments of the present invention dispose one or more call processing gateways, shown here as call processing gateways 140, at or near sites for which call processing services are to be provided, here facilities 150-180. Call processing gateways 140 may provide interfacing and arbitration between a number of protocols, signals, and/or interfaces. For example, preferred embodiment call processing gateways 140 provide a plurality of analog telephone line interfaces (e.g., POTS line interfaces) for coupling to a plurality of telephone terminals 141 and providing loop current, dial tone, etcetera thereto. Preferred embodiment call processing gateways 140 further provide at least one WAN interface (e.g., T1 interface) for coupling to a data, e.g., packet switched, network. Call processing gateways 140 of this preferred embodiment provide conversion of analog signals associated with telephone terminals 141 and visitation telephones 143 and digital data packets of the packet switched network to provide a VoIP gateway. Call processing gateways 140 may include additional or alternative interfaces, such as LAN interfaces (e.g., 100 Mbit Ethernet interface), wireless interfaces (e.g., 802.11 interface), etcetera, if desired. Embodiments of the present invention utilize commercially available devices, such as the IAD 2400 series of integrated access devices available from Cisco Systems, Inc., San Jose, California, in providing a call processor gateway.

[0024] It should be appreciated that communications provided by call processing gateways 140 utilized according to the present invention are not limited to communication between devices implementing different protocols and/or signals. For example, communications between a plurality of telephone terminals disposed within a particular facility, e.g., visitation telephones 143 shown in facilities 150 and 180, may be provided by call processing gateways 140 of the present invention. Although not requiring signal/protocol conversion to facilitate communication between two such similarly configured devices, call processing gateways 140 of the present invention are preferably leveraged to provide such communication arbitration, e.g., analog to VoIP and VoIP to analog functionality, to provide a data stream to call processing platform 101 containing the communication content between such terminals, such as to provide word search and/or call recording as will be described further below.

[0025] A plurality of call processing gateways 140 may be disposed with respect to a particular facility, if desired. For example, a plurality of call processing gateways 140 may be coupled to cooperate in providing call processing services using a network, such as network 144. A network router or switch, such as router 145, may be utilized in coupling call processing gateways 140 to call processing platform 101 via network 130. Router 145 of preferred embodiments may provide communication security, such as in the form of firewall protection, if desired. Of course, other components, such as call processing gateway 140, may be configured to provide communication security in addition to or in the alternative to router 145.

[0026] A particular configuration and/or number of call processing gateways 140 utilized with respect to any of facilities 150-180 is preferably selected as a function of the facility's configuration. Depending upon the number of telephone terminals 141 to be provided calling services and/or the number of visitation telephones 143 at a particular facility (typical facilities may have from two telephones to approximately 600 telephones phones or more based on the physical size of the location), a configuration of call processing gateways 140 and/or a number of call processing gateways 140 deployed may be selected having more or less analog telephone line interfacing capacity. Similarly, depending upon the communication volume expected to be utilized at a particular facility, a configuration of call processing gateways 140 and/or a number of call processing gateways 140 deployed may be selected providing more or less bandwidth with respect

to a WAN interface thereof. Where local management terminals, e.g., workstations 142, or other data processing equipment, e.g., justice application management 143 and/or commerce system 146, is to be provided WAN access at a particular facility, a configuration of call processing gateways 140 may be selected to provide a LAN interface and/or appropriate WAN bandwidth.

[0027] The bandwidth of a connection between a particular facility and network 130 provided by a carrier access network may be scaled to correspond to an expected communication volume. For example, where relatively few telephone terminals 141 and/or visitation telephones 143 are present and management terminal or other data processing equipment communication is expected to be relatively low, a lower bandwidth connection (e.g., fraction of T1 or, perhaps in cases where reliability is not an issue, digital subscriber line (DSL) such as asynchronous DSL (ADSL) high bit rate DSL (HDSL) etcetera (referred to collectively as xDSL) or cable modem technology) may be provided. However, where a large number of telephone terminals 141 and/or visitation telephones 143 are present and/or management terminal or other data processing equipment communication is expected to be relatively high, a higher bandwidth connection (e.g., T1 or DS3) may be provided. These data links may be aggregated as they pass through the carrier's access network, thereby providing a larger bandwidth aggregated connection or connections (e.g., OC3 or OCX) from network 130 to call processing platform 101.

[0028] The data links between call processing gateways 140 and call processing platform 101 are preferably packet switched links, such as those provided using various IP or frame relay protocols. However, any type of data connectivity protocol that may be relied upon to deliver VoIP and data packets may be utilized according to embodiments of the present invention. Embodiments of the present invention may utilize carrier access network and backbone network links implementing protocols such as Ethernet, asynchronous transfer mode (ATM), synchronous optical network (SONET), and the like.

[0029] Call processing platform 101 of the illustrated embodiment includes router/switch 118 coupling network 130 to various systems and components comprising call processing platform 101 via network 111. Router/switch 118 of preferred embodiments may provide communication security, such as in the form of firewall protection, if desired. Of course,

other components, such as validation system 113, may be configured to provide communication security in addition to or in the alternative to router/switch 118.

[0030] The illustrated embodiment of call processing platform 101 includes a number of functional aspects, ones of which may be omitted in optional configurations, shown as various systems cooperating to provide call processing according to embodiments of the present invention. Call application management system 110, billing system 112, validation system 113, unauthorized call activity detection system 114, call treatment system 115, call recording system 116, and media gateway 117 may be utilized in various combinations to provide primary calling service functionality according to embodiments of the present invention. Justice application management system 121 and/or commerce system 122 of call processing platform 101 may be utilized in providing enhanced functionality as will be described further below. It should be appreciated that, although the illustrated embodiment is described with reference to a justice application management system providing enhanced functionality with reference to use in providing calling services to jail or prison facilities, embodiments of the present invention may implement information management systems useful with respect to a variety of applications, such as hospital management, business management, demographic collection and/or analysis, usage statistics, etcetera. Accordingly, justice application management system 121 as shown in FIGURE 1 may correspond to any number of information management systems providing data collection and/or sharing among facilities as described herein.

[0031] Call application management system 110 of the preferred embodiment, as may comprise one or more processor-based servers as are well known in the art, forms the heart of call processing functionality provided by call processing platform 101. For example, preferred embodiments of call application management system 110 control completing a call between a party using any one of telephone terminals 141 or visitation telephones 143 and another party, such as may be using one of visitation telephones 143 or a telephone terminal (not shown) coupled to call processing platform 101 via SIP/MGCP network 191 or PSTN 192. Additionally or alternatively, call application management system 110 may include interactive voice response (IVR), text-to-speech, voice recognition, and/or dual tone multi-frequency (DTMF) recognition/generation functionality such as may be useful for playing announcements to various ones of the calling and

called parties, soliciting information (such as personal identification numbers (PINs), account numbers, called number, etcetera) from the parties, signaling other systems, etcetera.

[0032] Detail with respect to operation in providing call processing by a call application manager according to embodiments of the present invention is shown in the above referenced patent application entitled “Information Management and Movement System and Method.” However, call application management system 110 of the embodiment illustrated in FIGURE 1 herein provides a data interface coupling call application management system 110 to facilities 150-180 via network 130 and providing VoIP communication therebetween. Additionally, call application management system 110 of FIGURE 1 provides a data interface coupling call application management system 110 to user terminals (e.g., telephone terminals, not shown) via SIP/MGCP network 191 and providing VoIP communication through the carrier network to a point more near the user terminal. Accordingly, call application manager 110 of a preferred embodiment need not implement analog voice cards for interfacing with particular user terminals and need not convert between digital and analog signal formats when providing communication between particular users.

[0033] Call processing platforms of the present invention are not limited to operation in the digital domain. Accordingly, the illustrated embodiment of call processing platform 101 includes media gateway 117 in communication with call application management system 110 via network 111. Media gateway 117 of a preferred embodiment, as may comprise one or more processor-based servers having analog voice cards as are well known in the art, provides interfacing and arbitration between a number of protocols, signals, and/or interfaces, such as to facilitate communications between digital VoIP protocols present on network 111 and analog protocols present on PSTN 192. Using media gateway 117, call application management system 110 may provide communications to user terminals (e.g., telephone terminals, not shown) via PSTN 192.

[0034] However, it should be appreciated that providing communication to a carrier in digital format, such as SIP or MGCP, may provide several advantages. For example, research has revealed that considerable cost advantages with respect to carrying the traffic through the public network may be realized when the communications are provided to the network in a digital format. The cost savings have been found to be significant with respect to interstate and interlata calls, such

as on the order of \$.05 to \$.02 per minute. Additionally, issues of latency in processing digitally processed calls may be avoided by providing communication to a carrier in digital format by avoiding repeated conversion between digital and analog formats. Call quality may be improved through the use of digital communication in as much of the communication link as is possible, thereby avoiding signal degradation typically inherent in analog communication networks.

[0035] Embodiments of call processing platforms of the present invention are preferably coupled to multiple carriers (whether through POTS links, digital links, etcetera) to allow switching connections to be made by the call processing platform based upon considerations such as least cost routing, rate changes, regulatory issues, reliability issues, and/or the like. Call application management system 110 of one embodiment may make determinations with respect to a particular carrier network to utilize in connecting a calling party to a called party on a call by call basis or in response to a particular event. Preferred embodiments of the present invention provide the ability to switch quickly between available carriers in response to an event, such as a service disruption or rate change. In contrast, distributed call processing system architectures typically require a long period of coordination, physical dispatch, and often the implementation of different hardware to facilitate a switch between particular carriers providing calling connections.

[0036] Additionally or alternatively, call application management system 110 may cooperate with other systems to provide robust call processing functionality. For example, call application management system 110 may cooperate with validation system 113 and/or unauthorized call activity detection system 114 to provide call intelligence for use in determinations with respect to allowing a particular call to be continued. According to one embodiment, unauthorized call activity detection system 114 provides real-time intelligence with respect to fraudulent or otherwise unauthorized activity being attempted during a call. For example, unauthorized call activity detection system 114 may employ silence detection techniques to identify attempts at establishing an unauthorized three-way call. Detail with respect to detecting unauthorized call activity is provided in the above referenced patent applications entitled “Three-Way Telephone Call Prevention System and Method” and “System and Method for Detecting Unauthorized Call Activity.”

[0037] Call recording system 116 of the illustrated embodiment, as may comprise a SAN providing large amounts of data storage (e.g., terabytes), is coupled to call application

management system 110 and operates under control thereof to store information with respect to calls. Information stored by call recording system 116 may comprise the content of the call, i.e., record the conversation or exchange of data provided by the call. Additionally or alternatively, information stored by call recording system 116 may comprise ancillary call information, such as identification of the calling and/or called party, calling number (e.g., automatic number information (ANI)), called number (e.g., dialed number information service (DNIS)), time of call, duration of call, account information, entity responsible for billing the call, and/or the like. Although the content of a call may be recorded in an analog format, preferred embodiments of the present invention record the content in a digital format to readily facilitate retrieval and/or playback via digital means, such as upon workstations 142 via network 130.

[0038] According to embodiments of the invention, call application management system 110 may signal call recording system 116 to record or not record particular calls processed by call processing platform 101. For example, all calls placed from any of facilities 150-180 to any party except an attorney representing a party to the call may be recorded by call recording system 116. It should be appreciated that, as the content of the call is provided in digital form, packets may readily be routed not only between a call processing gateway 140 and call application management system 110 for placing parties in communication, but also between call processing gateway 140, call application management system 110, or router 118 and call recording system 116 for archiving the content of the call.

[0039] Call processing gateways 140 of embodiments of the invention provide digital data streams including the content of calls not necessarily processed by call processing platform 101 to facilitate recording of those calls by call recording system 116. For example, although call application management system 110 may not be involved in a particular call between visitation telephones 143 of a facility, except perhaps to initially allow the connection and/or establish a time limit or other parameters for the connection, a data stream containing the content of the call may continue to be provided from a call processing gateway 140 to call processing platform 101 to facilitate archiving of the call content by call recording system 116.

[0040] It should be appreciated that disposing call recording system 116 at the centralized location associated with call processing platform 101 according to preferred embodiment

provides several advantages. For example, infrastructure, such as the aforementioned SAN, which otherwise would be cost prohibitive to deploy with respect to a facility may be utilized in an optimized fashion. Moreover, individual facilities need not implement backup procedures for the archiving of recorded calls, thereby not only avoiding the administrative burden but quite likely avoiding the need for additional information technology personnel.

[0041] Call recording system 116 of embodiments of the present invention may provide functionality in addition to or in the alternative to archiving call content. For example, call recording system 116 may comprise processor-based functionality to analyze the content of calls for investigative or other purposes, such as to recognize particular words and phrases. Such word search functionality may cooperate with investigative functionality, as may be provided by justice application management system 121, to alert investigators of a potential threat associated with a caller's utterance of words such as "kill," "bomb," or particular names such as that of a victim or judge. Further detail with respect to investigative uses of such word search functionality as well as investigative functionality which may be provided using a call processor is shown in the above referenced patent application entitled "Information Management and Movement System and Method."

[0042] Validation system 113, as may comprise one or more processor-based servers as are well known in the art, may operate to make determinations with respect to allowing a particular call to be completed and/or continued. For example, validation system 113 may cooperate with call application management system 110 when a call is initiated to verify the identity of the calling party, that the calling party is authorized to place a call, that the called party will receive calls or is authorized to receive calls from the calling party, that the calling party and/or called party have not exceeded a particular velocity of calls or a preselected value point (e.g., billing limit), that an identified prepaid account has sufficient monies to fund the call, that, in the case of a collect call, a billing arrangement exists between an entity responsible for billing calls to the called party and the service provider and that the called party presents an acceptable collection risk, etcetera. Detail with respect to call validation functionality is provided in the above referenced patent applications entitled "Information Management and Movement System and Method," "Optimizing Profitability

in Business Transactions,” “System and Methods for Offering a Service to a Party Associated with a Blocked Call,” and “Systems and Methods for Transaction Authorization Determination.”

[0043] It should be appreciated that the validation process as provided by validation system 113 of a preferred embodiment provides improved validation determination response as compared to a typical distributed validation scheme. For example, where a distributed architecture is utilized, validation often requires a call processor local to the calling party to establish a link with one or more centralized clearing houses or other databases to perform a validation. However, the centralized configuration of the call processing architecture of FIGURE 1 provides for communication between application management system 110 and validation system 113 locally, using packet transmissions, thereby facilitating improved validation determination responsiveness.

[0044] Additionally or alternatively, validation system 113 may cooperate with other systems to provide enhanced call validation. For example, validation system 113 may cooperate with call treatment system 115 to provide call intelligence for use in the aforementioned determinations with respect to allowing a particular call to be completed and/or continued. Accordingly, robust information, perhaps including information harvested from a signaling network, such as the signaling system 7 (SS7) network, may be utilized in call processing by call processing platform 101 of a preferred embodiment. For example, determinations with respect to a call forwarding feature being activated for a called number may be made from information available from SS7 data and, thus, validation system 113 may utilize this information in a determination as to whether the call should be completed. Detail with respect to use of call intelligence for use in making determinations with respect to the treatment of calls is shown in the above referenced patent application entitled “System and Method for Call Treatment.”

[0045] Additionally or alternatively, validation system 113 may cooperate with other systems of call processing system 100 to provide robust call processing functionality. For example, when identifying a call going to a certain telephone number, rather than blocking the call attempt, validation system 113 may cooperate with justice application management system 121 to notify an investigator that a call was made to that telephone number and/or to forward the call content for monitoring purposes to an investigator’s telephone (e.g., cell phone or office phone) number. Detail

with respect to such intelligence functionality is provided in the above referenced patent application entitled “Information Management and Movement System and Method.”

[0046] Billing system 112, as may comprise one or more processor-based servers as are well known in the art, may operate to provide accounting, billing, and/or reconciliation of charges for calling and other services provided by call processing system 100. For example, billing system 112 may cooperate with call application management system 110 to collect billing information with respect to calls processed by call processing platform 101. This information may be used in real-time to deduct monies from prepaid accounts associated with a party to the call, to compile call detail records for out-clearing to local exchange carriers providing service to a called party, to provide direct billing by the service provider, etcetera. Detail with respect to accounting, billing, and reconciliation functionality is provided in the above referenced patent applications entitled “Information Management and Movement System and Method,” “System and Method for Reverse Billing of a Telephone Call,” “Method for Determining an Entity Responsible for Billing a Called Party,” and “Method and Apparatus for Exchanging Data Between a Primary Computer System and an External Computer System to Ensure Transaction Reconciliation Between the Systems.”

[0047] Additionally or alternatively, billing system 112 may cooperate with other systems to provide robust call processing functionality. For example, billing system 112 may cooperate with validation system 113 to provide billing information or portions thereof for use in the aforementioned determinations with respect to allowing a particular call to be completed and/or continued. As a specific example, debit card amounts may be debited real time by billing system 112 and the debit card threshold monitored by validation system 113 to shut off a call immediately upon crossing the debit card threshold. Accordingly, real-time, dynamic control of call processing services may be provided by embodiments of the present invention without the delay associated with periodic polling of distributed and/or discrete systems.

[0048] Billing system 112 of embodiments of the present invention implements various functionality to facilitate the performance of revenue producing services and/or to optimize the amounts of revenues and/or profits attained. For example, billing system 112 may cooperate with validation system 113 and/or call application management system 110 to solicit funds from a

party or create a prepaid account when a collection risk is determined to be unacceptably high or monies are not otherwise available to fund a call. Accordingly, embodiments of the present invention provide the ability to set up a call account real-time, e.g., when a caller picks up a telephone terminal in a served facility but has not already established a way to bill the call. Detail with respect to such functionality is shown in the above referenced patent application entitled “System and Method for Account Establishment and Transaction Management Using Interrupt Messaging.”

[0049] Billing system 112 may additionally or alternatively provide intelligent management of accounts receivable, such as to hold out-clearing of call detail records to local exchange carriers to consolidate call charges on billing statements, to maintain visibility and control with respect to accounts, to allow flexibility in account collection, etcetera. Detail with respect to intelligent account management functionality is shown in the above referenced patent application entitled “Intelligent Queuing of Transaction Requests.”

[0050] It should be appreciated that, because call processing platform 101 of the preferred embodiment provides call processing with respect to a plurality of facilities, embodiments of the present invention include the capability to segment the data being stored in relation to each facility. For example, all of the calling records, all the call recordings, system parameters and configuration settings, etcetera may be tagged or otherwise associated with the facility to which it belongs. Using such information, call processing system 100 of a preferred embodiment is able to control access to the data when a user logs onto the central data from a facility, based on their logon ID information, where they are logging in from, or other information. A user logging on from a particular facility may be provided only information associated with that facility for which their logon ID provides them access. For example, a user at workstation 142 at facility 180 may be provided access to play recorded calls made from facility 180, provided that user’s logon ID permits such activity. Similarly, a user at workstation 142 at facility 160 may be allowed to change configuration settings, such as preselected value points establishing billing limits, blocked telephone numbers, etcetera, affecting operation of call processing platform 101 with respect to facility 160, provided that user’s logon ID permits such activity. Of course, using appropriate security protocols,

users are not limited to data access to the call processing platform from terminals disposed at the various facilities and, therefore, may access aspects of the systems from other remote locations.

[0051] It should be appreciated that a virtual local facility call processor system is provided using the aforementioned management terminals disposed locally at a facility and coupled to the centralized call processing platform via a data connection. Accordingly, a facility can enjoy the benefits of having a call processor system without the full expense of such systems. For example, in the illustrated embodiment, a facility may have only a few telephone terminals, a general purpose computer system for use as a management terminal, and a data network connection coupled to a call processing gateway in order to receive the benefits of a full featured call processing system of the present invention. Expansion and updating of such a call processing system with respect to each facility is highly simplified as most updates and expansions may be accomplished centrally, at the call processing platform, without direct involvement of the facility or its personnel. Where the facility or its personnel are involved in an expansion or update, such as to increase communication capacity, the level of such involvement is expected to be insubstantial, such as to deploy additional call processing gateways, connect additional telephone terminals thereto, and provide a network connection.

[0052] Moreover, the centralized configuration of call processing platforms of embodiments of the present invention may be utilized to provide additional advantages. For example, data associated with a plurality of facilities may be made available for sharing, aggregation, and/or analysis. According to one embodiment, particular facilities, such as facilities within a same county or state are provided shared data access to collect intelligence, to improve facility management, to minimize administrative burden, etcetera. As one specific example of data sharing between facilities, assume that facility 150 corresponds to a local police department and that facility 170 corresponds to a county prison facility to which prisoners of the police department are transferred when incarcerated for extended periods of time. Booking in an inmate into the jail at the local police department of facility 150 enters the inmate information into a justice application management database coupled to call processing platform 101, such as within justice application management system 121. That inmate may be uniquely coded, such as by assigning an inmate number or using otherwise unique information (e.g., social security number), and might even be

given a machine readable version of the unique code (e.g., a barcoded wristband). When transferred from the jail at the local police department of facility 150 to the county prison of facility 170, the inmate's unique code (such as might be scanned from the aforementioned barcoded wristband) may be utilized to populate a database entry of facility 170, such as within justice application management system 121 of call processing platform 101 and/or justice application management system 143 of facility 170. Accordingly, the administrative time associated with soliciting and entering such information is foregone, as well as the added opportunity for data entry error avoided.

[0053] It should be appreciated that access to data made available by call processing systems of the present invention is not limited to data connections from a facility site, such as WAN connections from workstations 142 to call processing platform 101. For example, access to such data may be provided via an application service provider (ASP) type configuration, such as may be provided via the Internet. An ASP hosting site may be collocated with other functional aspects of a call processing platform of the present invention or could be hosted at other locations, such as using WAN connections to a call processing platform.

[0054] Advantages in the sharing, aggregation, and/or analysis of data extends beyond the situation where associated or otherwise affiliated facilities share data. Where a large number of facilities are coupled to a centralized call processing system of the present invention, such data sharing, aggregation, and/or analysis provides appreciable advantages in conducting homeland security. For example, an appreciable amount of homeland security intelligence may be gleaned from data derived from all of the inmates and all of the facilities, such as all of their calling records, all of their calling patterns, all of their call recordings, etcetera, which might be scrubbed and parsed to find patterns indicative of particular activities.

[0055] It should be appreciated that additional advantages of embodiments of a centralized call processing system are exemplified in the foregoing example. Enhanced features may be provided with respect to a facility which might not otherwise have the funding or work load to fully justify the expense for the corresponding infrastructure. For example, justice application management, which may comprise a back office software product for a jail to facilitate management of the inmates in the facility (e.g., what cells they are assigned to, what medications are to be administered to them, tracking their medical records, tracking their privileges, etcetera),

management of facility personnel (e.g., scheduling working hours, tracking vacation days, administering benefits, etcetera), management of facility resources (e.g., scheduling use of vehicles and conference rooms, establishing telephone availability schedules, etcetera), and/or providing intelligence functionality (e.g., investigative analysis of call and money flow data, analyzing call and commerce transaction velocity, etcetera), may be highly desirable to all of facilities 150-180 but economically out of reach of all but the largest of these facilities. However, because a plurality of facilities are served, infrastructure costs may be spread across a number of such facilities to make it practical to provide such enhanced features to any or all facilities.

[0056] Moreover, although larger facilities are free to take advantage of such shared infrastructure, embodiments of the present invention accommodate distributed deployment of such infrastructure, such as where a facility has a legacy system in place or where a facility has a sufficient work load to justify local deployment of particular infrastructure. In the case where justice application management system 143 is disposed locally with respect to a facility, embodiments of the present invention may provide backhauling of data to the centralized call processing platform for backup purposes, for centralized storage, for sharing, etcetera. Additionally or alternatively, the data network provided by call processing system 100 may be utilized to link two or more justice application management systems 143 for sharing of data between facilities. The data connections via network 130 of the illustrated embodiment facilitate sharing of data in any of the foregoing configurations.

[0057] Enhanced functionality provided by embodiments of centralized call processing systems of the present invention is not limited to the aforementioned justice application management functionality. For example, in addition to or in the alternative to justice application management system 121 disposed at a call processing platform of the present invention, commerce system 122 may be disposed at a call processing platform to provide various commerce functions. For example, inmates or other residents of facilities 150-180 may utilize telephone terminals 141 to place commissary orders, such as for candy bars, cigarettes, bed sheets, toiletries, etcetera. By bringing all this data back to a central site, embodiments of the present invention enable a commissary company to readily deploy commissary functionality with respect to a number of facilities which might not otherwise be economically feasible to do so. Moreover, commissary data

with respect the various facilities may be aggregated for electronic delivery to the commissary company, without the commissary company having to deal with placing commissary systems at every facility to collect this data. Of course, as with the justice application management functionality discussed above, where such functionality is provided locally with respect to a facility, such as by commerce systems 146, the data links of the present invention facilitate operation therewith.

[0058] It should be appreciated that the use of resources in addition to the aforementioned call application management system, call recording system, justice application management system, and commerce system may be optimized by embodiments of the present invention. For example, customer service agents (not shown) may be provided with respect to call processing platform 101 to provide such services as account establishment, call assistance, etcetera, even where call volume associated with any one of facilities 150-180 is insufficient to economically support such personnel.

[0059] Similarly, the use of communication lines may be optimized using a centralized configuration of the present invention. For example, where discrete call processing systems are deployed with respect to facilities, it may be necessary to purchase telephone lines on the order of one to every two or three telephone terminals provided at the facility. However, centralized configurations of the present invention are expected to allow improved telephone trunking such that telephone lines on the order of one to every four or five telephone terminals served at the facilities by the call processing platform will be sufficient. Such efficiencies in telephone trunking may be achieved because each of the facilities is unlikely to be experiencing similar calling demand simultaneously. For example, the call processing system may provide services to facilities in different time zones, allowing one facility to utilize telephone lines at a time another facility is not using the telephone lines. Additionally, some facilities may be experiencing periods of exceptionally low telephone utilization, such as during lock-down, allowing the system to readily accommodate other facilities experiencing periods of exceptionally high telephone utilization, such as associated with a facility providing unusually numerous break periods to inmates. The variations in calling across all of the facilities allow centralized call processing systems of the present invention to optimize utilization of bandwidth.

[0060] It should be appreciated that the aforementioned trunking of resources at the call processing platform substantially mitigates capacity limitations with respect to each particular facility. For example, rather than being limited at any one instant to processing a number of calls equal to the individual telephone lines (or telephone line equivalents) purchased with respect to a particular facility, embodiments of the present invention will allow processing of a number of calls equal to the number of telephone terminals at a particular facility. Such instantaneous peak capacities may be accommodated in part by embodiments of the present invention taking advantage of the fact that digital communication, e.g., VoIP, allows aggregating calls into less bandwidth as well as taking advantage of the optimized utilization of bandwidth as discussed above.

[0061] Having described embodiments of the various aspects of a call processing system of the present invention above, reference will now be made to FIGURE 2 wherein a flow diagram of operation of such a call processing system in providing calling services according to an embodiment is shown. Operation according to the flow diagram illustrated in FIGURE 2 begins at step 201 where a calling party places a telephone terminal, such as one of telephone terminals 141, in an off hook condition. At step 202, a call processing gateway, such as one of call processing gateways 140, coupled to the telephone terminal establishes a link between the telephone terminal and a centralized call processing platform of the present invention, such as call processing platform 101. The link between the telephone terminal and call processing platform may be established by call processing gateway providing loop current to the telephone terminal and beginning a VoIP packet flow directed to an IP address associated with the call processing platform via a packet network, such as network 130.

[0062] At step 203 of the illustrated flow diagram, the call processing platform interacts with the calling party and collects call data, such as by utilizing IVR functionality of call application management system 110. The aforementioned interaction with the calling party may comprise soliciting calling party identification information and/or presenting menu options, such as may allow selection of placing an outbound call, ordering commissary items, and checking an account balance. These menu selections may present further queries based upon the menu selection made. For example, when the calling party selects placing an outbound call, the call application

management system may solicit a number to be called and a desired payment method (e.g., prepaid account, postpaid account, collect call, etcetera).

[0063] Assuming outbound calling services are desired, the illustrated flow diagram proceeds to step 204 wherein the call application management system interacts with the validation system to determine call treatment. For example, validation system 113 may analyze calling party identification information to verify that the party has outbound calling privileges at the present time. Additionally or alternatively, validation system 113 may analyze the number to be called to verify that calls are allowed to be placed to that number. Validation system 113 may further analyze the desired payment method, perhaps interacting with call treatment system 115 and/or billing system 112, to determine if sufficient funds are available to allow the call and/or to determine if an acceptable risk with respect to collecting monies is associated with the desired payment method.

[0064] A determination is made at step 205 with respect to whether the call is authorized based upon information provided by the validation system. If the call is determined not to be authorized at step 205, processing according to the illustrated embodiment proceeds to step 206 wherein the call application management system does not connect the call, perhaps playing a message to the calling party stating the reason(s) the call will not be completed. However, if the call is determined to be authorized at step 205, processing according to the illustrated embodiment proceeds to step 207 wherein the call application management system connects the call.

[0065] It should be appreciated that processing of the call according to embodiments of the invention to this point in the illustrated flow diagram has been in the digital domain, with the exception of the link between the telephone terminal and the call processing gateway. Preferred embodiments of the present invention provide connection of the call to a carrier network, such as SIP/MGCP network 191, in digital format. However, embodiments of the present invention may provide connection of the call to a carrier network, such as PSTN 192, in analog format, such as by call application management system 110 cooperating with media gateway 117 to connect the call.

[0066] There is no limitation according to the present invention that connection to a carrier network being provided at the centralized location of the call processing platform. For example, a caller in a particular facility may place a call to a called party which is local to the

facility, whereas the centralized location is not. In such a situation, call application management system 110 of an embodiment of the present invention may implement the call connection by “hairpinning” the call content data (e.g., VoIP data packets) back through network 130 to the call processing gateway 140 of the particular facility and controlling call processing gateway 140 to connect the data stream to an interface coupled to a local carrier line, where such a line has been provided. Even where such local carrier connections are supported, embodiments of the present invention continue to provide call content data streams from the call processing gateway to the call processing platform, such as for recording of the call by call recording system 116, accounting for the call by billing system 112, and/or real-time monitoring of the call by call application management system 110, unauthorized call activity detection system 114, and/or word search functionality of call recording system 116.

[0067] It should be appreciated that the aforementioned redirection of the call content data stream for local carrier connection at a facility is not limited to redirection at the facility at which the calling party is located. For example, it may be determined that, although a called party is not local to the call processing platform, the called party is local to a facility of the call processing system other than that associated with the calling party. Accordingly, where that facility supports local carrier connections, a call application management system of the present invention may redirect the call content data flow for local connection by that facility.

[0068] Although it may appear at first impression that connection of call content data streams to carrier networks at a centralized location such as that associated with call processing platform 101 may unnecessarily incur long distance and other toll charges, research has revealed that contrary to such conventional thoughts significant savings may be had through an embodiment employing centralized carrier connection. In a typical scenario, one may expect to pay approximately \$.05 per minute for intralata calling and from approximately \$.02 to \$.03 per minute for interstate calling where significant call volume is present. Also typically, one may expect to pay no per minute charges for interlata calling, although a monthly line charge will be incurred for having line availability. In contrast, however, research has revealed that intralata and interstate calling may be provided for per minute charges on the order of \$.01 when calls are delivered to the carrier network in digital format (e.g., SIP), which presents a significant savings over the above

interlata call charges and appreciable savings over the above interstate call charges. Accordingly, even where calls local to a facility and would not otherwise experience a per minute charge, embodiments of the present invention are expected to provide economic savings by backhauling the call to a centralized location for connection to a carrier network. These economic advantages are further expected to be enhanced through the optimization of bandwidth, as discussed above, allowing a reduced number of total lines to be purchased, thereby lowering the monthly line charges to the service provider.

[0069] Continuing with the flow diagram illustrated in FIGURE 2, after connecting a call at step 207, the call application management system interacts with other systems of the call processing platform in providing a continued connection at step 208. For example, call application management system 110 may signal call recording system 116 to record the call content. Additionally or alternatively, call application management system 110 may cooperate with unauthorized call activity detection system 114 to ensure that a calling or called party does not implement an unauthorized calling feature, such as three-way calling, during the call.

[0070] At step 209 a determination is made as to whether the call is terminated. For example, call application management system 110 may determine that an attempt has been made to implement an unauthorized calling feature and therefore may terminate the call. Similarly, call application management system 110 may determine that a call time limit or account balance has expired and therefore may terminate the call. Alternatively, either of the calling or called parties may terminate the call. If it is determined that the call has not been terminated at step 209, the illustrated embodiment returns to step 208 for the call application management system to continue interaction with other systems of the call processing platform in providing a continued connection. However, if it is determined that the call has been terminated at step 209, processing according to the illustrated embodiment proceeds to step 210 wherein the call application management system releases the call.

[0071] Although embodiments herein have been described with reference to telephone terminals, it should be appreciated that the present invention is not limited to use with respect to any particular type of user device. For example, video phones, multi-media computers, cellular phones,

personal digital assistants (PDAs), and the like may be coupled to a call processing platform of the present invention for providing call processing services, if desired.

[0072] Although the present invention and its advantages have been described in detail, it should be understood that various changes, substitutions and alterations can be made herein without departing from the invention as defined by the appended claims. Moreover, the scope of the present application is not intended to be limited to the particular embodiments of the process, machine, manufacture, composition of matter, means, methods and steps described in the specification. As one will readily appreciate from the disclosure, processes, machines, manufacture, compositions of matter, means, methods, or steps, presently existing or later to be developed that perform substantially the same function or achieve substantially the same result as the corresponding embodiments described herein may be utilized. Accordingly, the appended claims are intended to include within their scope such processes, machines, manufacture, compositions of matter, means, methods, or steps.

CLAIMS

What is claimed is:

1. A centralized call processing system, comprising:
 - a networking device connected to a plurality of call processing gateways, each call processing gateway installed at a prison facility located remote from the centralized call processing system, the networking device configured to:
 - receive outgoing Voice over Internet Protocol (VoIP) data packets from prison facilities; and
 - send incoming VoIP data packets to the prison facilities;
 - an unauthorized call activity detection system connected to the networking device for detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets;
 - a call application management system connected to the networking device for processing the outgoing VoIP data packets for transmission to a telephone carrier network, the call application management system processing signals from the first telephone carrier network into the incoming VoIP data; and
 - a computing system connected to the call application management system for providing a function associated with the outgoing VoIP data packets or the incoming VoIP data packets other than detecting of the three-way call activity.
2. The system of claim 1, wherein the function comprises managing billing associated with calls made through the system.

3. The system of claim 1, wherein the function comprises recording at least part of calls made through the system.

4. The system of claim 3, wherein the call application management system is configured to select calls to be recorded.

5. The system of claim 1, wherein the function comprises validating calls made through the system for authorizing connecting of calls to the telephone carrier network.

6. The system of claim 1, wherein the function comprises managing information about inmates at the prison facilities.

7. The system of claim 1, wherein the function comprises managing commissary orders placed by inmates at the prison facilities.

8. The system of claim 1, wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the system.

9. A method for processing calls at a centralized call processing system, the method comprising:

receiving outgoing Voice over Internet Protocol (VoIP) data packets from a plurality of prison facilities, the plurality of prison facilities located remotely from the call processing gateways;

sending incoming VoIP data packets to the prison facilities;

detecting three-way call activity associated with the outgoing VoIP data packets or the incoming VoIP data packets;

processing the outgoing VoIP data packets for transmission to a telephone carrier network;

processing signals from the first telephone carrier network into the incoming VoIP data; and

providing a function associated with the outgoing VoIP data packets or the incoming VoIP data packets other than detecting of the three-way call activity.

10. The method of claim 9, wherein the function comprises managing billing associated with calls made through the centralized call processing system.
11. The method of claim 9, wherein the function comprises recording at least part of calls made through the centralized call processing system.
12. The method of claim 11, further comprising selecting calls to be recorded.
13. The method of claim 9, wherein the function comprises validating calls made through the system for authorizing connecting of calls to the telephone carrier network.
14. The method of claim 9, wherein the function comprises managing information about inmates at the prison facilities.
15. The method of claim 9, wherein the function comprises managing commissary orders placed by inmates at the prison facilities.

16. The method of claim 9, wherein the function comprises communicating with a signaling network of the telephone carrier network to determine whether a call forwarding feature is activated for call numbers associated with calls made through the centralized call processing system.

ABSTRACT

Disclosed are systems and methods which provide a centralized architecture for call processing. Embodiments utilize voice over Internet protocols (VoIP) to carry calls from a location at which calling services are provided to a centralized call processing platform providing call processing functionality, such as calling party identification, call validation, call routing, and connection to the public switched telephone network (PSTN). Call processing gateways may be utilized to provide plain old telephone service (POTS) analog line interfaces for use with a plurality of telephone sets disposed for use at a location and at least one wide area network (WAN) interface for providing high speed data communication to a centralized call processing platform. PSTN interfacing by a call processing platform may be provided as a VoIP connection to the PSTN and/or as POTS trunking. Call processing platforms may provide for data sharing, aggregation, and/or analysis across multiple facilities served.

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.

| | | | |
|---|-----------------------------|------------------------|-------------|
| Application Data Sheet 37 CFR 1.76 | | Attorney Docket Number | 18279-18190 |
| | | Application Number | |
| Title of Invention | CENTRALIZED CALL PROCESSING | | |
| The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application. | | | |

Secrecy Order 37 CFR 5.2

Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

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| | | | |
|--|------------------|--|---|
| Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a). | | | |
| <input type="checkbox"/> An Address is being provided for the correspondence information of this application. | | | |
| Customer Number | 00758 | | |
| Email Address | dahn@fenwick.com | <input type="button" value="Add Email"/> | <input type="button" value="Remove Email"/> |

Application Information:

| | | | |
|--|-----------------------------|--|--------------------------|
| Title of the Invention | CENTRALIZED CALL PROCESSING | | |
| Attorney Docket Number | 18279-18190 | Small Entity Status Claimed | <input type="checkbox"/> |
| Application Type | Nonprovisional | | |
| Subject Matter | Utility | | |
| Suggested Class (if any) | | Sub Class (if any) | |
| Suggested Technology Center (if any) | | | |
| Total Number of Drawing Sheets (if any) | 2 | Suggested Figure for Publication (if any) | |

0421

| | | |
|---|-----------------------------|-------------|
| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 18279-18190 |
| | Application Number | |
| Title of Invention | CENTRALIZED CALL PROCESSING | |

Publication Information:

| | |
|--------------------------|--|
| <input type="checkbox"/> | Request Early Publication (Fee required at time of Request 37 CFR 1.219) |
| <input type="checkbox"/> | Request Not to Publish. I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing. |

Representative Information:

| | | | |
|--|--|--|---|
| <p>Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.</p> | | | |
| Please Select One: | <input checked="" type="radio"/> Customer Number | <input type="radio"/> US Patent Practitioner | <input type="radio"/> Limited Recognition (37 CFR 11.9) |
| Customer Number | 00758 | | |

Domestic Benefit/National Stage Information:

| | | | |
|---|-----------------|--------------------------|--------------------------|
| <p>This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.</p> | | | |
| Prior Application Status | Pending | Remove | |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | Continuation of | 10642532 | 2003-08-15 |
| <p>Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.</p> | | | Add |

Foreign Priority Information:

| | | | |
|--|----------------------|---------------------------------|---|
| <p>This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).</p> | | | |
| | | | Remove |
| Application Number | Country ⁱ | Parent Filing Date (YYYY-MM-DD) | Priority Claimed |
| | | | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| <p>Additional Foreign Priority Data may be generated within this form by selecting the Add button.</p> | | | Add |

Assignee Information:

| | |
|--|------------------------|
| <p>Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.</p> | |
| Assignee 1 | Remove |

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| | | |
|---|-----------------------------|-------------|
| Application Data Sheet 37 CFR 1.76 | Attorney Docket Number | 18279-18190 |
| | Application Number | |
| Title of Invention | CENTRALIZED CALL PROCESSING | |

| | | | |
|--|---------------------------------|----------------|------------------------------------|
| If the Assignee is an Organization check here. <input checked="" type="checkbox"/> | | | |
| Organization Name | Securus Technologies, Inc. | | |
| Mailing Address Information: | | | |
| Address 1 | 14651 DALLAS PARKWAY, SUITE 600 | | |
| Address 2 | | | |
| City | Dallas | State/Province | TX |
| Country i | US | Postal Code | 75254 |
| Phone Number | | Fax Number | |
| Email Address | | | |
| Additional Assignee Data may be generated within this form by selecting the Add button. | | | <input type="button" value="Add"/> |

Signature:

| | | | | | |
|--|--------------|-----------|-----|---------------------|------------|
| A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature. | | | | | |
| Signature | /Dohyun Ahn/ | | | Date (YYYY-MM-DD) | 2011-01-19 |
| First Name | Dohyun | Last Name | Ahn | Registration Number | 63237 |

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention CENTRALIZED CALL PROCESSING

As the below named inventor(s), I/we declare that:

The declaration is directed to:

The attached application, or

Application No. _____, filed on _____,

as amended on _____ (if applicable).

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME(S) OF INVENTORS:

Inventor one: Robert L. Rae

Signature:  Date: 8-8-03 Citizen of: US

Inventor two: _____

Signature: _____ Date: _____ Citizen of: _____

Inventor three: _____

Signature: _____ Date: _____ Citizen of: _____

Inventor four: _____

Signature: _____ Date: _____ Citizen of: _____

Additional inventors are being named on _____ additional form(s) attached hereto.

FIG. 1

1/2

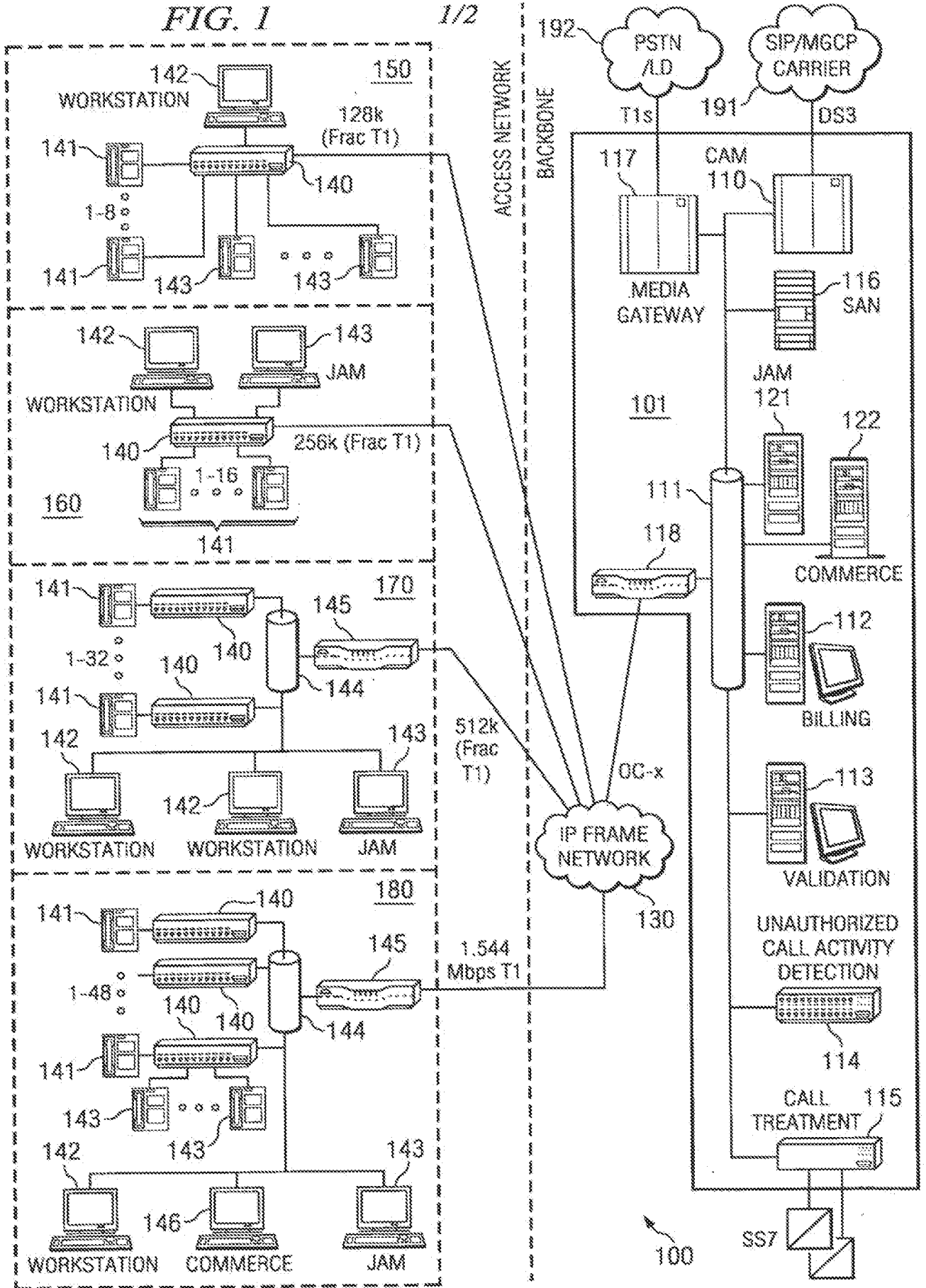
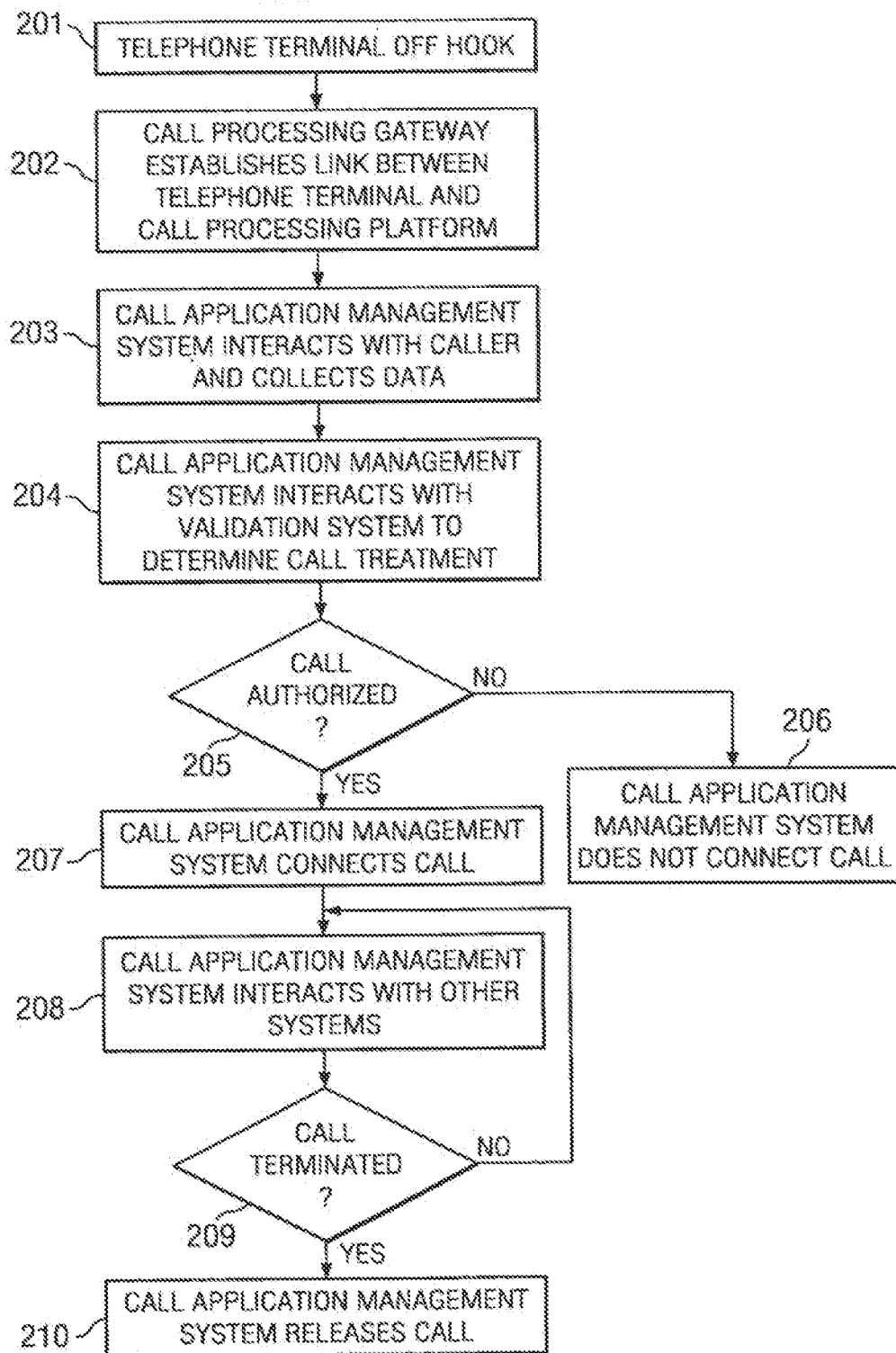


FIG. 2



Electronic Patent Application Fee Transmittal

| | |
|---|-----------------------------|
| Application Number: | |
| Filing Date: | |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Filer: | Dohyun Ahn/Larisa Burshteyn |
| Attorney Docket Number: | 18279-18190 |

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|----------------------------|----------|----------|--------|----------------------|
| Basic Filing: | | | | |
| Utility application filing | 1011 | 1 | 330 | 330 |
| Utility Search Fee | 1111 | 1 | 540 | 540 |
| Utility Examination Fee | 1311 | 1 | 220 | 220 |

Pages:

Claims:

Miscellaneous-Filing:

Petition:

Patent-Appeals-and-Interference:

| Description | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|--|----------|----------|--------|----------------------|
| Post-Allowance-and-Post-Issuance: | | | | |
| Extension-of-Time: | | | | |
| Miscellaneous: | | | | |
| Total in USD (\$) | | | | 1090 |

Electronic Acknowledgement Receipt

| | |
|---|-----------------------------|
| EFS ID: | 9259964 |
| Application Number: | 13009483 |
| International Application Number: | |
| Confirmation Number: | 1820 |
| Title of Invention: | CENTRALIZED CALL PROCESSING |
| First Named Inventor/Applicant Name: | Robert L. Rae |
| Customer Number: | 00758 |
| Filer: | Dohyun Ahn |
| Filer Authorized By: | |
| Attorney Docket Number: | 18279-18190 |
| Receipt Date: | 19-JAN-2011 |
| Filing Date: | |
| Time Stamp: | 16:55:45 |
| Application Type: | Utility under 35 USC 111(a) |

Payment information:

| | |
|--|-----------------|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | \$1090 |
| RAM confirmation Number | 3571 |
| Deposit Account | 192555 |
| Authorized User | |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|--|---|----------------------------|--|------------------|------------------|
| 1 | | 18190_US_Specification.pdf | 144544 b99eb7a1219b318a8dbcb605aa1413494126edb8 | yes | 32 |
| Multipart Description/PDF files in .zip description | | | | | |
| | Document Description | | Start | | End |
| | Specification | | 1 | | 27 |
| | Claims | | 28 | | 31 |
| | Abstract | | 32 | | 32 |
| Warnings: | | | | | |
| Information: | | | | | |
| 2 | Application Data Sheet | 18190_US_ADS.PDF | 1031614 9c9282cfd4ca22646ca7c07d508484e96c17128 | no | 4 |
| Warnings: | | | | | |
| Information: | | | | | |
| 3 | Oath or Declaration filed | 18190_Declaration.pdf | 993592 01f3192887bfcaccd1bb5d7328d01c4b4a2bcb84 | no | 1 |
| Warnings: | | | | | |
| Information: | | | | | |
| 4 | Drawings-only black and white line drawings | 18190_US_Drawings.pdf | 631134 44c66466b9816cd62c57322ff8c3a39dc5cd4532 | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| 5 | Fee Worksheet (PTO-875) | fee-info.pdf | 33023 ba01a13e56a9380ca043021a08891110c8560784 | no | 2 |
| Warnings: | | | | | |
| Information: | | | | | |
| Total Files Size (in bytes): | | | 2833907 | | |

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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

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