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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY.DOCKET NO./TITLE	REQUEST ID
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	151499

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 11/02/2021 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

☒ Applicant changing to regular undiscounted fee status.

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

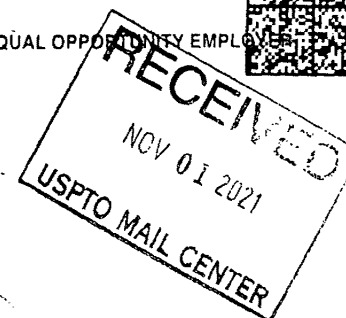
This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/Joseph T. Cygan/
Name:	Joseph T. Cygan
Registration Number:	50937

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1

CONFIRMATION NO. 2064
POWER OF ATTORNEY NOTICE



15346
Lemko Corporation
One Pierce Place
Suite 700
Itasca, IL 60143

Date Mailed: 10/21/2021

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/14/2021.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71.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

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/Itaba/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1

CONFIRMATION NO. 2064
POA ACCEPTANCE LETTER



171308
Lemko Corporation c/o Cygan Law Offices, P.C.
2300 Barrington Road
Suite 400
Hoffman Estates, IL 60169

Date Mailed: 10/21/2021

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/14/2021.

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.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/ltaba/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1

15346
Lemko Corporation
One Pierce Place
Suite 700
Itasca, IL 60143

CONFIRMATION NO. 2064
POWER OF ATTORNEY NOTICE



Date Mailed: 10/21/2021

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

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/Itaba/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	(SEE TABLE)	Confirmation No.:	(SEE TABLE)
Patent No:	(SEE TABLE)	Group Art Unit:	N/A
Issue Date:	(SEE TABLE)	Customer No.:	171308

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

**PATENT – REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF
ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS**

Dear Commissioner:

LEMKO CORPORATION hereby revokes all previous powers of attorney given in the below-listed patents and in each patent file in which the present document is filed.

LEMKO CORPORATION hereby appoints Practitioner(s) associated with Customer Number **171308** as our attorney(s) or agent(s) with respect to the patents identified below, and to transact all business in the United States Patent and Trademark Office connected therewith.

Please recognize or change the correspondence address for the below-identified patents to the address associated with the above-identified Customer Number.

I am the patent owner and an accompanying Statement under 37 C.F.R. 3.73(c) is filed contemporaneously herewith for each patent identified below.

<u>Patent No.</u>	<u>Issue Date</u>	<u>App. No.</u>	<u>Confirmation</u>	<u>Assignment Recordation Reel/Frame No.</u>	<u>Title</u>
9515770	12/06/16	14/177119	1973	032187/0791	SYSTEM, METHOD, AND DEVICE TO CONTROL WIRELESS COMMUNICATIONS
8744435	06/03/14	13/670262	3432	029254/0167	MULTIPLE IMSI NUMBERS
9332478	05/03/16	13/648704	3818	029105/0936	System, Method, and Device for Routing Calls Using a Distributed Mobile Architecture
9198020	11/24/15	13/334753	1778	027435/0137	OAMP FOR DISTRIBUTED MOBILE ARCHITECTURE
9191980	11/17/15	13/235021	2302	026921/0782	SYSTEM AND METHOD TO CONTROL WIRELESS COMMUNICATIONS
8326286	01/04/12	13/113819	1332	026326/0626	MULTIPLE IMSI NUMBERS
8310990	11/13/12	12/942642	2064	025337/0066; 035620/0609	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

8359029	01/22/13	12/946012	9057	025360/0435	SYSTEM, METHOD, AND DEVICE FOR PROVIDING COMMUNICATIONS USING A DISTRIBUTED MOBILE ARCHITECTURE
7840230	11/23/10	12/471253	5521	022728/0890	COMMUNICATIONS USING A DISTRIBUTED MOBILE ARCHITECTURE
7979066	07/12/11	12/238269	1333	021588/0277	MULTIPLE IMSI CONNECTIONS
7855988	12/21/10	12/172639	5341	021234/0219; 035632/0948	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
8340667	01/25/12	12/146618	5489	021155/0968; 035621/0802	SYSTEM AND METHOD TO CONTROL WIRELESS COMMUNICATIONS
8046420	10/25/11	12/108209	1152	020846/0601	SYSTEM AND METHOD TO CONTROL WIRELESS COMMUNICATIONS
8224322	07/17/12	11/451238	4852	018029/0407; 018165/0034	ROAMING MOBILE SUBSCRIBER REGISTRATION IN A DISTRIBUTED MOBILE ARCHITECTURE

7856233	12/21/10	11/393993	7919	017702/0684	SYSTEM, METHOD, AND DEVICE FOR PROVIDING COMMUNICATIONS USING A DISTRIBUTED MOBILE ARCHITECTURE
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Respectfully submitted,

DocuSigned by:
Dr. Shaowei Pan /
F77975C858434BF...

Shaowei Pan
Chief Technology Officer
LEMKO CORPORATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: (SEE TABLE)

Confirmation No.: (SEE TABLE)

Patent No: (SEE TABLE)

Group Art Unit: N/A

Issue Date: (SEE TABLE)

Customer No.: 171308

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

STATEMENT UNDER 37 C.F.R. 3.73(c) FOR LEMKO CORPORATION PATENTS

Dear Commissioner:

LEMKO CORPORATION states that, for the patents identified below, it is the ASSIGNEE of the entire right, title, and interest. Assignments from the inventor(s) of the patents identified below are recorded in the United States Patent and Trademark Office at the reel and frame numbers indicated:

<u>Patent No.</u>	<u>Issue Date</u>	<u>App. No.</u>	<u>Confirmation</u>	<u>Assignment Recordation Reel/Frame No.</u>	<u>Title</u>
9515770	12/06/16	14/177119	1973	032187/0791	SYSTEM, METHOD, AND DEVICE TO CONTROL WIRELESS COMMUNICATIONS
8744435	06/03/14	13/670262	3432	029254/0167	MULTIPLE IMSI NUMBERS

9332478	05/03/16	13/648704	3818	029105/0936	System, Method, and Device for Routing Calls Using a Distributed Mobile Architecture
9198020	11/24/15	13/334753	1778	027435/0137	OAMP FOR DISTRIBUTED MOBILE ARCHITECTURE
9191980	11/17/15	13/235021	2302	026921/0782	SYSTEM AND METHOD TO CONTROL WIRELESS COMMUNICATIONS
8326286	01/04/12	13/113819	1332	026326/0626	MULTIPLE IMSI NUMBERS
8310990	11/13/12	12/942642	2064	025337/0066; 035620/0609	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
8359029	01/22/13	12/946012	9057	025360/0435	SYSTEM, METHOD, AND DEVICE FOR PROVIDING COMMUNICATIONS USING A DISTRIBUTED MOBILE ARCHITECTURE
7840230	11/23/10	12/471253	5521	022728/0890	COMMUNICATIONS USING A DISTRIBUTED MOBILE ARCHITECTURE
7979066	07/12/11	12/238269	1333	021588/0277	MULTIPLE IMSI CONNECTIONS

7855988	12/21/10	12/172639	5341	021234/0219; 035632/0948	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
8340667	01/25/12	12/146618	5489	021155/0968; 035621/0802	SYSTEM AND METHOD TO CONTROL WIRELESS COMMUNICATIONS
8046420	10/25/11	12/108209	1152	020846/0601	SYSTEM AND METHOD TO CONTROL WIRELESS COMMUNICATIONS
8224322	07/17/12	11/451238	4852	018029/0407; 018165/0034	ROAMING MOBILE SUBSCRIBER REGISTRATION IN A DISTRIBUTED MOBILE ARCHITECTURE
7856233	12/21/10	11/393993	7919	017702/0684	SYSTEM, METHOD, AND DEVICE FOR PROVIDING COMMUNICATIONS USING A DISTRIBUTED MOBILE ARCHITECTURE

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

Respectfully submitted,

DocuSigned by:
/ *Dr. Shaowei Pan* /
F77975C858434BF...

Shaowei Pan
Chief Technology Officer
LEMKO CORPORATION

DATE: 10/1/2021

Electronic Acknowledgement Receipt	
EFS ID:	44035566
Application Number:	12942642
International Application Number:	
Confirmation Number:	2064
Title of Invention:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
First Named Inventor/Applicant Name:	Shaowei Pan
Customer Number:	15346
Filer:	Joseph T. Cygan
Filer Authorized By:	
Attorney Docket Number:	1082-0013-C1
Receipt Date:	14-OCT-2021
Filing Date:	09-NOV-2010
Time Stamp:	18:40:34
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	Transmittal Letter	07_8310990_12942642_LEMK O_USA_POA_373_XMIT_14OC T2021.pdf	20869 fed5a882047ed0f866aefcca3641bcf01d61a 7c3	no	1
Warnings:					

Information:					
2	Power of Attorney	LEMKO_PATENT_POWER_OF_ATTORNEY_01OCT2021.pdf	159745 4e0b6120ce386558104a6183833c0c2f7be1611	no	4
Warnings:					
The PDF file has been signed with a digital signature and the legal effect of the document will be based on the contents of the file not the digital signature.					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73	LEMKO_PATENT_STATEMENT_OF_OWNERSHIP_01OCT2021.pdf	161997 28d2547076f1c8deaf7cee5d00e3c6241efe3bdb	no	4
Warnings:					
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Information:					
Total Files Size (in bytes):			342611		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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

Application No.:	12/942642	Confirmation No.:	2064
Patent No:	8310990	Group Art Unit:	
Issue Date:	11/13/12	Customer No.:	
Title:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		

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

TRANSMITTAL OF POWER OF ATTORNEY AND STATEMENT OF OWNERSHIP

Dear Commissioner:

A patent power of attorney and Statement Under 37 C.F.R. § 3.73(c) is hereby submitted
for the above-identified patent.

Respectfully submitted,

Please forward all correspondence to:
Cygan Law Offices, P.C.
2300 Barrington Road, Suite 400
Hoffman Estates, IL 60169

/Joseph T. Cygan/
Joseph T. Cygan October 14, 2021
Registration No. 50,937
Telephone: (847) 973-5246, (ext. 100)



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

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Sale Accounting Date:04/20/2020

Sale Item Reference Number
12942642

Effective Date
04/20/2020

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20204JF12239903	2552	MAINTENANCE FEE DUE AT 7.5 YEARS	\$1,800.00	Credit Card

12/942,642

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Shaowei Pan :
: Art Unit: 2412
Patent No.: 8,310,990 :
: Examiner: Bob A. Phunkulh
Issued: November 13, 2012 :
: Confirmation No. 2064
For: SYSTEM, METHOD, AND DEVICE :
FOR ROUTING CALLS USING A :
DISTRIBUTED MOBILE ARCHITECTURE :

WRITTEN ASSERTION OF SMALL ENTITY

Fax: 1-571-273-6500
Mail Stop: MAINTENANCE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

The Applicant qualifies as a small entity according to 37 C.F.R. 1.27 and is entitled to reduced fees. Please charge the small entity maintenance fee in the attached credit card form to maintain this patent.

Respectfully submitted,

Date: April 20, 2020

/Philip S. Hof/
Philip S. Hof, Reg. No. 72,606
The Small Patent Law Group LLC
225 S. Meramec, Ste. 725
St. Louis, MO 63105
314-584-4098

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**CHANGE OF
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Patent**Address to:
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Alexandria, VA 22313-1450

Patent Number	8,310,990
Issue Date	2012-11-13
Application Number	12/942,642
Filing Date	2010-11-09
First Named Inventor	Shaowei Pan
Attorney Docket Number	1082-0013-C1

Please change the Correspondence Address for the above-identified patent to:

☒ The address associated with Customer Number:

15346

OR

☐ Firm or
Individual Name

Address

City

State

ZIP

Country

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Email

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This form will not affect any "fee address" provided for the above-identified patent. To change a "fee address" use the "Fee Address Indication Form" (PTO/SB/47).

I am the:

☐ Patentee.☐ If the Patentee was not the applicant for patent (37 CFR 1.42), then a Statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is enclosed or was filed on _____. See 37 CFR 3.71.☒ Attorney or agent of record. Registration Number 38,342☐ Patent practitioner acting in a representative capacity whose correspondence address is the correspondence address of record. Notice has been given to the patentee or owner. Registration Number 38,342

Signature

Typed or
Printed Name Jeffrey G. Toler

Date

6-11-2014

Telephone (512) 327-5515

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.33. 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: Mail Stop Post Issue, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

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NO. 210 P. 1/6

Toler Law Group, PC
8500 Bluffstone Cove, Suite A201
Austin, Texas 78759
Phone 512-327-5515
Fax 512-327-5575

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JUN 13 2014

FACSIMILE COVER SHEET

DATE: June 13, 2014

TO: USPTO

FAX NO.: 571-273-0177

FROM: Diane Jacobs
(512) 327-5515

RE: PTO/AIA/123 - Change of Correspondence Address

NO. OF PAGES (including Cover Sheet): 6

MESSAGE:

Please process the attached Change of Correspondence Address for the following files:

	Application No.	Patent No.
1	12/942,642	8,310,990
2	12/163,601	8,706,105
3	12/146,618	8,340,667
4	12/946,012	8,359,029
5	13/718,054	8,688,111

8500 Bluffstone Cove
Suite A201
AUSTIN, TEXAS 78759

Tel: (512) 327-5515
Fax: (512) 327-5575

CONFIDENTIALITY NOTE

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PAGE 7/15 * RCVD AT 6/13/2014 8:57:26 AM [Eastern Daylight Time] * SVR:W-PTOFAX-002/18 * DNIS:2730177 * CSID:5123275575 * DURATION (mm-ss):04-24

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/942,642	11/13/2012	8310990	1082-0013-C1	2064

60533 7590 10/24/2012
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

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 0 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):

Shaowei Pan, Kildeer, IL;

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.

PART B - FEE(S) TRANSMITTAL

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

60533 7590 07/10/2012
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

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.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064

TITLE OF INVENTION: SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$0	\$1170	10/10/2012
EXAMINER	ART UNIT	CLASS-SUBCLASS				
PHUNKULH, BOB A	2477	370-401000				

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list	1	Toler Law Group, PC
	(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,	2	
	(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.	3	

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

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

(A) NAME OF ASSIGNEE

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

Lemko Corporation

Itasca, Illinois

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

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

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

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 502469 (enclose an extra copy of this form).

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

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

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 Jeffrey G. Toler
 Typed or printed name Jeffrey G. Toler

Date 10-10-2012
 Registration No. 38,342

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:		12942642		
Filing Date:		09-Nov-2010		
Title of Invention:		SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		
First Named Inventor/Applicant Name:		Shaowei Pan		
Filer:		Jeffrey G. Toler/Katherine Meals		
Attorney Docket Number:		1082-0013-C1		
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	1770	1770
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2070

Electronic Acknowledgement Receipt	
EFS ID:	13954785
Application Number:	12942642
International Application Number:	
Confirmation Number:	2064
Title of Invention:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
First Named Inventor/Applicant Name:	Shaowei Pan
Customer Number:	60533
Filer:	Jeffrey G. Toler/Katherine Meals
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013-C1
Receipt Date:	10-OCT-2012
Filing Date:	09-NOV-2010
Time Stamp:	17:04:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 2070
RAM confirmation Number	4454
Deposit Account	502469
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 1.20 (Post Issuance fees)	

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)	1082-0013-C1_Issue_Fee.pdf	271925 29c50b56fafd83fa7be3980ecbfff8b796ea4e0c0	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32295 7594cc601036713a58abbdf16491305bec187bb3	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			304220		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					



UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

60533 7590 07/10/2012
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

EXAMINER

PHUNKULH, BOB A

ART UNIT

PAPER NUMBER

2477

DATE MAILED: 07/10/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064

TITLE OF INVENTION: SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$0	\$1170	10/10/2012

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 SMALL ENTITY status shown above.

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

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

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

If the SMALL ENTITY is shown as NO:

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

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

II. PART B - FEE(S) TRANSMITTAL, 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)

60533 7590 07/10/2012
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

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.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064

TITLE OF INVENTION: SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$0	\$1170	10/10/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHUNKULH, BOB A	2477	370-401000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(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 _____
3 _____

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

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

(A) NAME OF ASSIGNEE

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

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

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

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

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ 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).

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

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

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

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

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



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UNITED STATES DEPARTMENT OF COMMERCE
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064
60533 7590 07/10/2012 TOLER LAW GROUP TOLER LAW GROUP 8500 BLUFFSTONE COVE SUITE A201 AUSTIN, TX 78759			EXAMINER PHUNKULH, BOB A	
			ART UNIT 2477	PAPER NUMBER

DATE MAILED: 07/10/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

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

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

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

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 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.	Applicant(s)	
	12/942,642	PAN, SHAOWEI	
	Examiner	Art Unit	
	BOB PHUNKULH	2477	

-- 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 7/06/2012.

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 1-25.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____ .
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 * Certified copies not received: ____.

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

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.

 (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>7/06/2012</u> 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. ☐ Notice of Informal Patent Application 6. ☐ Interview Summary (PTO-413), Paper No./Mail Date ____ . 7. ☐ Examiner's Amendment/Comment 8. ☐ Examiner's Statement of Reasons for Allowance 9. ☐ Other _____.
---	--

/BOB A PHUNKULH/ Primary Examiner, Art Unit 2477	
---	--

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (07-09)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	12942642
	Filing Date	2010-11-09
	First Named Inventor	Shaowei Pan
	Art Unit	2477
	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

U.S.PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
	1	6760325	B1	2004-07-06	HAMELEERS ET AL.			
If you wish to add additional U.S. Patent citation information please click the Add button.								
U.S.PATENT APPLICATION PUBLICATIONS								
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Published Application citation information please click the Add button.								
FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							☐
If you wish to add additional Foreign Patent Document citation information please click the Add button.								
NON-PATENT LITERATURE DOCUMENTS								
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T ⁵

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	12942642
	Filing Date	2010-11-09
	First Named Inventor	Shaowei Pan
	Art Unit	2477
	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

1	B.G. Evans and K. Baughan; "Visions of 4G"; Electronics & Communication Engineering Journal; December 2000; pgs 293-303	☐
2	Shirshanka Das, Alok Nandan & Giovanni Pau (University of CA, Los Angeles, CA, USA); "SPAWN: A Swarming Protocol For Vehicular Ad-Hoc Wireless Networks"; VANET'04, October 1, 2004, Philadelphia, PA, USA; ACM 1-58113-922-5/04/0010; 2 pgs	☐
3	Yu-Chee Tseng, Chia-Ching Shen (National Chiao Tung University) & Wen-Tsuen Chen (National Tsing Hua University); "Integrating Mobile IP with AD Hoc Networks"; IEEE Computer Society; 0018-9162/03; 2003 IEEE; May 2003; pgs. 48-55	☐
4	Halim Yanikomeroglu, David D. Falconer & Van M. Sreng; "Coverage Enhancement Through Two-Hop Peer-to-Peer Relaying in Cellular Radio Networks"; Broadband Communications and Wireless Systems (BCWS) Centre Department of Systems & Computer Engineering, Carleton University, Ottawa, Canada; WWRF Meeting #7, Eindhoven, the Netherlands, 3-4 December 2002, WG4: Spectrum, New Air Interfaces and Ad-Hoc Networking Multi-Hop Wireless Systems; 10 pages	☐
5	Bur Goode; "Voice Over Internet Protocol (VoIP)"; 0018-9219/02 2002 IEEE; Proceedings of the IEEE; Vol. 90, No. 9, September 2002; pgs. 1495-1517	☐
6	Kyung-Hyu Lee, Kyu-Ok Lee & Kwon-Chul Park (Network Research Laboratory ETRI Korea) Jong-Ok Lee and Yoon-Hak Bang (Network Planning Team KT Korea); "Architecture To be Deployed on Strategies of Next-Generation Networks"; 0-7803-7802-4/03 2003 IEEE; pgs. 819-822	☐
7	Wolfgang Kellerer, Christian Bettstetter, Christian Schwingenschlögl & Peter Sties (Technische Universität München) Karl-Ernst Steinberg (BMW) & Hans-Jörg Vögel (the Fantastic Corp); "(Auto) Mobile Communication in a Heterogeneous and Converged World"; IEEE Personal Communications; December 2001; 1070-9916/01; 2001 IEEE pgs. 41-47	☐
8	Nilanjan Banerjee & Sajal K. Das (University of Texas, Arlington) & Arup Acharya (IBM T.J. Watson Research Center) "Peer-to-peer SIP-based Services over Wireless Ad Hoc Networks"; BROADWIM: Broadband Wireless Multimedia Workshop; October 29, 2004 - broadnets.org; *This work was supported by NSF under the ORBIT testbed project, grant # NSF NRT Project #ANI-0335244 and by NSF ITR grant IIS-0326505; 8 pages	☐
9	Hung-Yu Wei (Columbia University) & Richard D. Gitlin (NEC Laboratories America); "Two-Hop-Relay Architecture for Next-Generation WWAN/WLAN Integration"; 4G Mobile Communications: Toward Open Wireless Architecture; 1536-1284/04 2004 IEEE; IEEE Wireless Communications; April 2004; pgs 2-9	☐
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11	Willie W. Lu & Jenny Hu (U.S. Center for Wireless Communications, Stanford University, CA); "Open Wireless Architecture - The Core to 4G Mobile Communications"; China Communications; April 2006; pgs 32-39	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12942642
	Filing Date		2010-11-09
	First Named Inventor	Shaowei Pan	
	Art Unit	2477	
	Examiner Name	PHUNKULH, Bob A.	
	Attorney Docket Number	1082-0013-C1	

12	Ralf Pabst, Bernard H. Walke & Daniel C. Schultz (RWTH Aachen University) Patrick Herhold & Gerhard P. Fettweis (Technical University of Dresden) Halim Yanikomeroglu & David D. Falconer (Carleton University) Sayandev Mukherjee & Harish Viswanathan (Lucent Technologies) Matthias Lott & Wolfgang Zirwas (Siemens ICM) Mischa Dohler & Hamid Aghvami (Kings College); "Relay-Based Deployment Concepts for Wireless and Mobile Broadband Radio"; 0163-6804/04; 2004 IEEE; IEEE Communications Magazine; September 2004; pgs 80-89	☐
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15	Brian Woerner (Virginia Tech, Blacksburg, VA) & Mostofa Howlader (University of Tennessee, Knoxville, TN); "Research Directions for Fourth Generation Wireless"; Proceedings of the 10th IEEE International Workshops on Enabling Technologies: Infrastructure for Collaborative Enterprises (WETICE 2001); 20-22 June 2001; Cambridge, MA, USA; IEEE Computer Society 2001; ISBN 0-7695-1269-0; 2 pages	☐
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Issue Classification 	Application/Control No. 12942642	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB PHUNKULH	Art Unit 2477

ORIGINAL						INTERNATIONAL CLASSIFICATION												
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED							
370			328			H	0	4	W	4 / 00 (2009.01.01)								
CROSS REFERENCE(S)																		
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																	
370	352	400																

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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NONE		Total Claims Allowed:	
		25	
(Assistant Examiner)	(Date)		
/BOB PHUNKULH/	07/09/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)							
Application Number	12942642	Filing Date	2010-11-09	Docket Number (if applicable)	1082-0013-C1	Art Unit	2477
First Named Inventor	Shaowei Pan			Examiner Name	PHUNKULH, Bob A.		
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							
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Name	Jeffrey G. Toler	Registration Number	38342

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.

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	Filing Date		2010-11-09
	First Named Inventor	Shaowei Pan	
	Art Unit	2477	
	Examiner Name	PHUNKULH, Bob A.	
	Attorney Docket Number	1082-0013-C1	

U.S.PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
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	Art Unit	2477
	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

1	B.G. Evans and K. Baughan; "Visions of 4G"; Electronics & Communication Engineering Journal; December 2000; pgs 293-303	☐
2	Shirshanka Das, Alok Nandan & Giovanni Pau (University of CA, Los Angeles, CA, USA); "SPAWN: A Swarming Protocol For Vehicular Ad-Hoc Wireless Networks"; VANET'04, October 1, 2004, Philadelphia, PA, USA; ACM 1-58113-922-5/04/0010; 2 pgs	☐
3	Yu-Chee Tseng, Chia-Ching Shen (National Chiao Tung University) & Wen-Tsuen Chen (National Tsing Hua University); "Integrating Mobile IP with AD Hoc Networks"; IEEE Computer Society; 0018-9162/03; 2003 IEEE; May 2003; pgs. 48-55	☐
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	Art Unit	2477	
	Examiner Name	PHUNKULH, Bob A.	
	Attorney Docket Number	1082-0013-C1	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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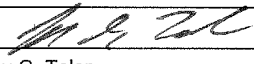
☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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Signature		Date (YYYY-MM-DD)	2012-07-16
Name/Print	Jeffrey G. Toler	Registration Number	38342

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Electronic Patent Application Fee Transmittal				
Application Number:		12942642		
Filing Date:		09-Nov-2010		
Title of Invention:		SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		
First Named Inventor/Applicant Name:		Shaowei Pan		
Filer:		Jeffrey G. Toler/Katherine Meals		
Attorney Docket Number:		1082-0013-C1		
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
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Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Request for continued examination	1801	1	930	930
Total in USD (\$)				930

Electronic Acknowledgement Receipt	
EFS ID:	13193034
Application Number:	12942642
International Application Number:	
Confirmation Number:	2064
Title of Invention:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
First Named Inventor/Applicant Name:	Shaowei Pan
Customer Number:	60533
Filer:	Jeffrey G. Toler/Katherine Meals
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013-C1
Receipt Date:	06-JUL-2012
Filing Date:	09-NOV-2010
Time Stamp:	15:37:23
Application Type:	Utility under 35 USC 111(a)

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RAM confirmation Number	2065
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Warnings:					
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19	Fee Worksheet (SB06)	fee-info.pdf	30757 70e065ccc1a3ed16ee85fab55c53bb4e708b118b	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			46666807		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Address: COMMISSIONER FOR PATENTS
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NOTICE OF ALLOWANCE AND FEE(S) DUE

60533 7590 04/09/2012
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

EXAMINER

PHUNKULH, BOB A

ART UNIT

PAPER NUMBER

2477

DATE MAILED: 04/09/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064

TITLE OF INVENTION: SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$0	\$1170	07/09/2012

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 SMALL ENTITY status shown above.

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

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

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

If the SMALL ENTITY is shown as NO:

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

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

II. PART B - FEE(S) TRANSMITTAL, 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)

60533 7590 04/09/2012
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

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.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064

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nonprovisional	YES	\$870	\$300	\$0	\$1170	07/09/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHUNKULH, BOB A	2477	370-401000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(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 _____
3 _____

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

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

(A) NAME OF ASSIGNEE

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

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

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

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

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ 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).

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

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

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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064
60533 7590 04/09/2012 TOLER LAW GROUP TOLER LAW GROUP 8500 BLUFFSTONE COVE SUITE A201 AUSTIN, TX 78759			EXAMINER PHUNKULH, BOB A	
			ART UNIT	PAPER NUMBER
			2477	

DATE MAILED: 04/09/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

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

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

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

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 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.	Applicant(s)	
	12/942,642	PAN, SHAOWEI	
	Examiner	Art Unit	
	BOB PHUNKULH	2477	

-- 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 3/30/2012.

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 1-25.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____ .
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 * Certified copies not received: ____.

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

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.

 (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>3/30/2012</u> 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. ☐ Notice of Informal Patent Application 6. ☐ Interview Summary (PTO-413), Paper No./Mail Date ____ . 7. ☐ Examiner's Amendment/Comment 8. ☐ Examiner's Statement of Reasons for Allowance 9. ☐ Other _____.
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/BOB A PHUNKULH/ Primary Examiner, Art Unit 2477	
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Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

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PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12942642
	Filing Date		2010-11-09
	First Named Inventor	SHAOWEI PAN	
	Art Unit	2477	
	Examiner Name	PHUNKULH, Bob A.	
	Attorney Docket Number	1082-0013-C1	

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5623495		1997-04-22	ENG ET AL.	
	2	6122499		2000-09-19	MAGNUSSON	
	3	6141564		2000-10-31	BRUNER ET AL.	
	4	6421325	B1	2002-07-16	KIKINIS	
	5	6678155	B1	2004-01-13	BRESNIKER	
	6	6704409	B1	2004-03-09	DILIP ET AL.	
	7	6763226	B1	2004-07-13	MCZEAL JR.	
	8	6859652	B2	2005-02-22	KARABINIS ET AL.	

EFS Web 2.1.17

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /BAP/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	12942642
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	Art Unit	2477
	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

	9	4284848		1981-08-18	FROST	
	10	5590175		1996-12-31	GALLANT ET AL.	
	11	6816706	B1	2004-11-09	HOHNSTEIN ET AL.	
	12	6871072	B1	2005-03-22	MECHE	
	13	7136651	B2	2006-11-14	KALAVADE	
	14	5734979		1998-03-31	LU ET AL.	
	15	7760695	B2	2010-07-20	GOPALAKRISHNAN ET AL.	
	16	6131038		2000-10-10	SEKINE ET AL.	
	17	6958983	B2	2005-10-25	MUSIKKA ET AL.	
	18	6917813	B2	2005-07-12	ELIZONDO	
	19	7050414	B2	2006-05-23	LIN	

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	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

	20	7120435	B2	2006-10-10	USHER ET AL.	
	21	7313399	B2	2007-12-25	RHEE ET AL.	
	22	7324478	B2	2008-01-29	PARK ET AL.	
	23	7787879	B1	2010-08-31	PHILIPS ET AL.	
	24	7349412	B1	2008-03-25	JONES ET AL.	
	25	7328268	B1	2008-02-05	FOLTAK ET AL.	
	26	5933784		1999-08-03	GALLAGHER ET AL.	
	27	5991639		1999-11-23	RAUTIOLA ET AL.	
	28	6160804		2002-12-12	AHMED ET AL.	
	29	6542497	B1	2003-04-01	CURRY ET AL.	
	30	6697355	B1	2004-02-04	LIM	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	12942642
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	Art Unit	2477
	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

	31	7385947	B2	2008-06-10	WU ET AL.	
	32	7406069	B2	2008-07-29	YASHAR ET AL.	
	33	7003286	B2	2006-02-21	BROWN ET AL.	
	34	6831903	B2	2004-12-14	KANG	
	35	6839356	B2	2005-01-04	BARANY ET AL.	
	36	6879582	B1	2005-04-12	DHARA ET AL.	
	37	7133670		2006-11-07	MOLL ET AL.	
	38	7552670		2009-06-30	GOLDMAN ET AL.	
	39	7054307	B2	2006-05-30	PAPADIMITRIOU ET AL.	
	40	7738488	B2	2010-06-15	MARISCO ET AL.	
	41	6731932	B1	2004-05-04	RUNE ET AL.	

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	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

	42	6411825	B1	2002-06-25	CSAPO ET AL.	
	43	7424313	B2	2008-09-09	HAM ET AL.	
	44	7359700	B2	2008-04-15	SWENSON ET AL.	
	45	7299039	B2	2007-11-20	LEE ET AL.	
	46	7158621	B2	2007-01-02	BAYNE	
	47	6937708	B2	2005-08-30	HIROSE	
	48	6879677	B2	2005-04-12	TRANDAL ET AL.	
	49	7486967		2009-02-03	PAN ET AL.	
	50	8036158		2011-10-11	PAN ET AL.	
	51	7548763		2009-06-16	PAN	
	52	6515985	B2	2003-02-04	SHMULEVICH ET AL.	

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	Art Unit	2477
	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

	53	7653414		2010-01-26	PAN	
	54	8046420		2011-10-25	PAN	
	55	8107409		2012-01-31	PAN	
	56	7855988		2010-12-21	PAN	
	57	7979066		2011-07-12	PAN	
	58	7840230		2010-11-23	PAN	
	59	8089920		2012-01-03	PAN	
	60	6418308	B1	2002-07-09	HEINONEN ET AL.	
	61	6791988	B1	2004-09-14	HAMELEERS	
	62	6807432	B2	2004-10-19	HWANG	
	63	6539237	B1	2003-03-25	SAYERS ET AL.	

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	Examiner Name	PHUNKULH, Bob A.
	Attorney Docket Number	1082-0013-C1

	64	6584098	B1	2003-06-24	DUTNALL	
	65	6611533	B1	2003-08-26	LIAO ET AL.	
	66	6614784	B1	2003-09-02	GLITHO ET AL.	
	67	6647426	B2	2003-11-11	MOHAMMED	
	68	6694134	B1	2004-02-17	LU ET AL.	
	69	6763233	B2	2004-07-13	BHARATIA	
	70	6791988	B1	2004-09-14	HAMELEERS ET AL.	
	71	6795444	B1	2004-09-21	VO ET AL.	
	72	6819652	B1	2004-11-16	AHKTAR ET AL.	
	73	7171216		2007-01-30	CHOKSI	
	74	7346334	B2	2008-03-18	GAETA ET AL.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12942642	
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	Art Unit		2477	
	Examiner Name		PHUNKULH, Bob A.	
	Attorney Docket Number		1082-0013-C1	

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	Art Unit	2477	
	Examiner Name	PHUNKULH, Bob A.	
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Issue Classification 	Application/Control No. 12942642	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB PHUNKULH	Art Unit 2477

ORIGINAL						INTERNATIONAL CLASSIFICATION													
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED								
370			328			H	0	4	W	4 / 00 (2009.01.01)									
CROSS REFERENCE(S)																			
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																		
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☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	17												
2	2	18	18												
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NONE		Total Claims Allowed:	
		25	
(Assistant Examiner)	(Date)		
/BOB PHUNKULH/ Primary Examiner, Art Unit 2477	04/03/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

Search Notes 	Application/Control No. 12942642	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB PHUNKULH	Art Unit 2477

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (text search)	10/18/2011	BAP
EAST (text search)	10/19/2011	BAP
370/315, 316, 328, 329, 330, 352, 353, 354, 355, 356, 400, 401 (text search)	02/22/2012	BAP

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
	See attachment	2/15/2012	BAP

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Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

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	Attorney Docket Number		1082-0013-C1	

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	First Named Inventor	SHAOWEI PAN		
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	Attorney Docket Number	1082-0013-C1		

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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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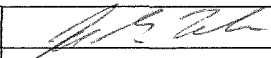
☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	2012-03-30
Name/Print	JEFFREY G. TOLER	Registration Number	38342

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour 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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54 **Satellite cellular telephone and data communication system.**

57 A system for facilitating global cellular/trunked mobile communication is disclosed. This system permits communication with hand held and mobile mounted cellular telephones. The system permits two-way communications anywhere on or above the earth up to a particular height above the earth of several hundred nautical miles. The system employs a number of low-earth orbiting satellites (1,2, etc.) moving about the earth in orbit. Links (i) are provided from the satellites directly to the users and via the public switched telephone network (20) to other users (30). The satellites are interconnected via links (j) in a ring structure surrounding the earth. Switching is performed by each of the satellites. In addition, each of the satellites hands off a call as it moves out of the range of a particular user.

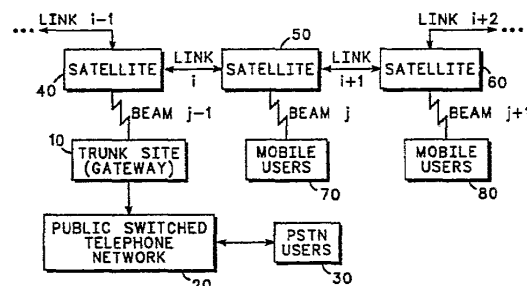


FIG. 2

EP 0 365 885 A2

SATELLITE CELLULAR TELEPHONE AND DATA COMMUNICATION SYSTEM

Background of the Invention

The present invention pertains to global mobile communications and more particularly to a satellite cellular telephone and data communication system.

Present geostationary satellite communication systems allow point-to-point communication. That is, the satellite functions as a relay station or a "bent pipe". The satellite simply receives information from one point on earth and transmits it to another fixed point on earth.

One such point-to-point satellite communication system is shown in U.S. Patent 4,720,873. This system shows point-to-point communications through a satellite for network programming and advertising purposes.

Some basic multiplexing functions may be supplied within the satellites of a satellite communication system. One such system is shown in U.S. Patent 4,480,328. This patent teaches a satellite communication system in which the satellite is a relay station for TDMA multiplexed data.

The above-mentioned systems and other systems teach the use of a single satellite for communications from one point to another. These satellite systems show no selectivity or switching of data among a plurality of users.

Accordingly, it is an object of the present invention to provide a global low-earth orbiting multiple satellite cellular communication system which interfaces directly among a number of cellular telephone and data transmission equipped users and also interfaces these users to the public switched telephone network (PSTN).

Summary of the Invention

In accomplishing the object of the present invention, a novel satellite cellular telephone and data communication system is shown.

A satellite cellular telephone communication system establishes communication among a plurality of users. This communication system includes satellite switches positioned in low-earth orbit. Wireless communication links couple the users to the satellite switches. The satellite switches establish a communication link between selected ones of the users.

Each user's present location is determined and the system is periodically updated. Then the satellites relay these locations to the proper ground-based data base for storage. When a mobile user places a call, the satellite which is in his spatial

vicinity handles the call. When a mobile user is called, the satellite switches route the call through the appropriate satellites to the called user's current location. Other user-unique data may also be stored at these same data base storage sites.

Brief Description of the Drawings

FIG. 1 is a layout diagram depicting the satellite switching system configuration of the present invention.

FIG. 2 is a block diagram depicting the interconnection of the satellite switching units with its association mobile users and interconnection to the public switched telephone network.

FIG. 3 is a projection of the areas served by a plane of cellular satellite switches about the earth.

FIG. 4 is a block diagram of a data base arrangement for a satellite cellular communication system.

Description of the Preferred Embodiment

Referring to FIG. 1, a satellite configuration for the satellite cellular telephone communication system is shown. In this configuration, a number of satellites are shown in low-earth orbit. A number of satellites are placed in each orbiting plane. There are several orbiting planes (3 through 8) as shown which are highly inclined in nature and provide switching coverage for the entire earth.

This satellite cellular structure is somewhat analogous to the present day cellular mobile telephone system. In that system, cellular sites are fixed and users are mobile. As a user travels from one cell site to another, his telephone call is handed off from one cellular switching unit to another.

In the present invention, users are relatively fixed at any given time while the satellites, which are the cells, are in continuous movement. With a hand-held or mobile mounted cellular telephone, connection to one of the satellite switches shown in FIG. 1 is made directly from the hand-held mobile mounted or remotely fixed telephone to one of the nearest satellite switches. Each satellite is moving about the earth. As the satellite which originally acted as the switching unit for a particular user leaves a cell of that switch, the user's call is "handed off" to the appropriate adjacent cell. Adjacent cells may be cells within one satellite or cells of other satellites located either in a particular

orbiting plane or an adjacent orbiting plane. Users may "roam", but this roaming distance is relatively small compared to the traveling distance of the satellite switches.

Similar to the cellular mobile telephone system, the satellite cellular communication system provides spectral efficiency. This means that the same frequency may be simultaneously used by different satellite switches. Spectral efficiency is provided by the spatial diversity between the satellite switches and users.

The users may be located anywhere on a land mass, on the water or in the air at an altitude less than that of the low-earth orbiting satellites. For example, a person on one land mass could call a person on another land mass, a person on a boat or a person in an aircraft.

Low power hand-held mobile mounted or fixed radio telephones may be used in this system. The power requirement is less than 10 watts with present technology.

In this system, each satellite shown is a switching unit. Current satellite communication systems act primarily as a relay station or "bent pipe". That is, they provide fixed point-to-point communications. In the present invention, a switching function is provided within each of the orbiting satellites.

As previously mentioned, each of the orbiting planes of satellites is highly inclined in the preferred embodiment of the invention. Orbiting satellite planes with lower inclination are also workable. However, the lower inclination requires more satellite switching units and/or higher orbiting altitudes to achieve whole earth coverage than does the highly inclined orbiting satellite configuration.

In a preferred embodiment, highly inclined orbit configuration, it was found that satisfactory earth coverage could be accomplished with forty-eight (48) low earth orbiting satellites. These satellites could be arranged in six (6) highly inclined orbiting planes, eight (8) satellites per plane. Other configurations could be used. Other lower inclined orbiting arrangements would require substantially more satellites in order to achieve the same coverage of the earth as highly inclined configuration.

Each satellite contains a satellite switching unit, suitable antennas 11 (helical antennas for up/down links and lenses for cross links, for example) and an unfolding array of solar cells 12 along with storage batteries (not shown) connected to the solar cells to provide power for the switching unit. The satellite buses or vehicles themselves are low-earth orbiting satellites such as those commercially available. The satellites are put into orbit by a launching vehicle. When in orbit, the solar cell array is opened and the switching unit thereby activated. The satellites are then individually brought on line via standard telemetry, tracking and

control (TT&C) channels to form the network.

As shown in FIG. 1, a user A with a hand-held telephone goes off-hook. This request for a channel is received by a particular satellite 1, as shown in FIG. 1. A frequency channel is assigned to the user and the caller's desired number is then routed through the system. Each satellite is a distributed local processor and determines how switching of the call is to occur. Satellite 1 switches the call to the appropriate cell contained either within its own cell complement or to the appropriate satellite cell complement. The path is determined by each satellite switching unit until the call is received by satellite 2. Satellite 2 then routes this call to the particular hand-held user B shown in FIG. 1.

Although two hand-held users are shown, the users may be on the water, in a moving vehicle, airborne or part of a PSTN where the link is through a gateway. Each satellite is a local processor. The system determines to which appropriate satellite or cell the call is to be switched. Each satellite determines an optimal path from itself to the next appropriate satellite. These determinations may be made based upon the office code portion of the telephone number of the called user.

Each satellite typically may project four (4) or more lobes onto the earth and contain four (4) or more corresponding cells for switching. These lobes of coverage are achieved via antennas (helical typically) with fixed beam widths appropriate to the number of lobes. Overlapping cells will be differentiated using present cellular techniques. These areas or lobes are shown in FIG. 3 for one particular plane of satellites about the earth. This figure depicts a high inclined orbiting satellite cellular switches. Each satellite determines the optimal path from it to the next satellite through which to route a particular call or data transmission. These satellite switches operate on data packets and therefore may transmit digital voice or data. Downlink and uplink data/digital voice is received on an FDM basis demodulated and then packetized for satellite-to-satellite communication.

FIG. 2 depicts the interconnection of a portion of one plane of satellites. In addition, the connection of the satellite to the satellite's corresponding mobile users and to the public switched telephone network is shown. Three satellites are shown. Satellite 40, Satellite 50 and Satellite 60. Satellite 40 is connected to Satellite 50 by link i . Satellite 50 is connected to Satellite 60 by link $i+1$. Satellite 60 is connected to the next sequential satellite of the plane (not shown) via link $i+2$. Satellite 40 is connected to the next preceding satellite (not shown) via link $i-1$. Each plane of satellites forms a ring of connected satellites around the earth.

As previously mentioned, the drawing of FIG. 2 shows one plane of the satellites. In addition, each

satellite is connected to one or more satellites in other orbiting planes. That is, each satellite is connected to a previous and next satellite in its orbiting plane and to one or more satellites in other orbiting planes.

The intersatellite links link i-1, link i, etc. may be implemented via data transmission on a microwave beam or via a laser beam. Existing technologies currently provide for such data transmission.

Connection between the satellites and its mobile users is achieved by beams j-1, and j+1, for example. These beams correspond to the lobes shown in FIG. 3 and to the switching cells mentioned above. These beams are achieved via the satellite up/down link antennas which provide communication to users via the users omnidirectional antenna. The limit on the number of users that a particular satellite may handle at one time depends on bandwidth allocated plus power available on the satellite. Typically this number may be 50,000 users per satellite.

Satellite 40 is shown connected to a trunk site or gateway 10 via beam j-1. Any satellite, such as Satellite 40, is capable of transmitting and receiving data from a gateway, such as gateway 10. This gateway link can be accomplished using the packetized data similar to the satellite-to-satellite links.

Gateway 10 includes units which interconnect to the public switched telephone network (PSTN) 20. All public switched telephone network users 30 are connected to the public switched telephone network 20. As a result of the satellite 40 being connected through gateway 10 to PSTN 20, a mobile user of the satellite cellular system which is connected directly via a beam to a satellite may transmit voice or data via the satellite structure (satellite-to-satellite via corresponding links), through gateway 10, through the public switched telephone network 20 to selected users of the PSTN 30 or vice versa.

Each satellite provides several data transmission beams. These data transmission beams project the lobes of coverage shown in FIG. 3 which depicts four beams. Each satellite projects four such lobes. As shown in FIG. 2, a satellite may use one or more of its beams to provide interface to a gateway. At least one beam is required for establishing a link between each gateway and the satellite. Typically a satellite links to only one gateway. One gateway provides sufficient trunking to interconnect a number of mobile users to the public switched telephone network 20.

Each satellite performs internal switching among its four beams or cells. This is analogous to intraoffice switching for conventional telecommunication systems.

The up/down linking arrangement between the satellites and its mobile users or gateways via the

beams may transmit and receive data in the range of approximately 2.1 to 3.9 GHz, for example. The present technology and band availability makes this a preferred data transmission range. However, the scope of the present invention is not limited to data transmission exclusively within this range.

As previously mentioned, the data (digital voice or data) is transmitted in packet form. As a result, high-speed data transmission as well as voice data transmission may be accomplished via the satellite system. Data transmission rates, given the present available bandwidths, are at least 1200 baud. However, with extended bandwidth, substantially higher data rates can be achieved by this system.

FIG. 4 depicts one satellite switching unit 100 directly connected to mobile users 120 via beam 102. Satellite 100 is connected to data base computer 110 via beam 104. Satellite 100 is also connected to data base computer 130 via beam 106. This connection may be direct via a beam 106 as shown in FIG. 4 or indirect through other satellites to data base computer 130.

A mobile user might "roam" or travel in a home area. The home area may be a city, such as New York, Los Angeles, etc. The data base computer 110 contains all the information relative to each of its mobile users. As long as a particular mobile user is operating within his home area, all the available information concerning that user is available at the local home area data base computer.

If, for example, a home area user in Los Angeles travels to New York City and attempts to use his satellite cellular telephone for communication, the data base computer in the user's new area, New York City, is not aware of the existence of that user. If data base computer 110 is the mobile user's home area, Los Angeles, data base computer 110 has all the information for this particular mobile user. As a result, the mobile user would not be allowed to place calls because he was not recognized by his home area's data base computer.

In order to overcome this problem, each mobile user is periodically interrogated by the system as to its location so when he goes off-hook, his call for service can be recognized and routed. However, since the data base of a particular user is stored in his home area data base computer via the satellite system, the satellite system first interrogates the home area to determine that he is no longer there and to obtain the user's switching information. When that determination is made, the new home area's data base computer can be updated to include this "roaming" user. As a result, this user is then allowed to originate and receive calls in his new area. Because the satellite system interrogates the user's home data base computer to determine

his location, the user can be found throughout the entire satellite system. Thus, the system provides the capability for finding "roaming" users and establishing communications with them.

To facilitate tracking of each mobile user, each mobile telephone provides a control signal which is periodically monitored so that when a subscriber originates a call, the nearest satellite can track him and through the satellite network interrogate his home data base computer to determine his pertinent customer information. The mobile telephone may automatically indicate to the satellite network a new location for updating the data base computer. This control signal allows the incoming calls of "roaming" users to be validated via satellite-to-satellite linking to the home area's data base computer.

Each satellite in the satellite cellular communication system is self-navigating. That is, it uses the Global Positioning Satellite system (GPS) or time and ephemeris data from which to compute its location information. In addition, from the fixed location of the Global Positioning Satellite system or other vehicle, each satellite can determine its position and alter its course accordingly to stay within its proper orbit while providing switching services.

Each satellite may switch a call intrasatellite (within the particular switching unit or cell) or may connect the call via a microwave or laser links (link *i*, *i* + 1, etc.) to another satellite within its plane or out of plane (adjacent). Each satellite may distinguish a particular telephone number and determine whether that number is within its own calling area or the area of another satellite. If it is within the area of another satellite, the call is cross-linked to the next appropriate satellite or cell which makes the same determination until the satellite serving that telephone number is reached. That satellite down-links to the particular mobile user sought to be called. Due to this structure, the satellite network provides a distributed nodal switching capability. Each satellite is a local switch for a particular area, but the area is constantly changing. Therefore, calls are handed-off as satellites move out of the range of a particular telephone user.

Various multiplexing techniques (i.e. FDMA, TDM CDMA, etc.) may be used to enhance the transmission capability between various satellites on the links as shown in FIG. 2.

Since the switching units of this system are orbiting the earth and relatively secure from tampering, this system provides the capability to support secure voice and data transmission via data encryption and decryption techniques commonly known in the art. Since the switching units enjoy the security of being hundreds of miles above the earth, the system also lends itself to military communication applications.

Although the current preferred embodiment of the invention has been illustrated, and that form described in detail, it will be readily apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

Claims

1. A satellite cellular communication system for establishing communication among a plurality of users comprising:

satellite switching means (1,2, etc.) positioned in low- earth orbit; and link means (i) for coupling said users to said satellite switching means whereby a communication link is established between selected ones of said users via said satellite switching means.

2. A satellite cellular communication system as claimed in claim 1, said satellite switching means including:

a plurality of satellite switching unit means (40-60 etc.) positioned surrounding the earth in low-earth orbit; and

second link means (j) for permitting multi-directional communication between one satellite switching unit means and any adjacent satellite switching unit means.

3. A satellite cellular communication system as claimed in claim 2, said second link means including microwave communication means.

4. A satellite cellular communication system as claimed in claim 2, said second link means including laser communication means.

5. A satellite cellular communication system as claimed in claim 2, said satellite switching unit means including:

antenna means (11) coupled to said plurality of users for establishing communication between said users and satellite switching unit means;

solar cell means (12) for providing power for said satellite switching unit means; and

storage battery means connected to said solar cell means for storing said power.

6. A satellite cellular communication system as claimed in claim 1, said satellite switching means including a plurality of cell means coupled to one another, one said cell means operating to hand-off said established communication link between users to another one of said cell means.

7. A satellite cellular communication system as claimed in claim 1, wherein each of said users is connected to said link means by cellular telephone means (A,B).

8. A satellite cellular communication system for establishing communication among a plurality of

users comprising:

satellite switching means (1,2, etc.) positioned in low-earth orbit;

link means (j) for directly coupling certain ones of said users to said satellite switching means; and public switched telephone network means (10,20) coupled to said satellite switching means via said link means, other ones of said users being connected to said public switched telephone network means, said public switched telephone network means operating to selectively connect users of said public switched telephone network means with users directly coupled to said satellite switching means via said link means.

9. A satellite cellular communication system as claimed in claim 8, wherein there is further included means for connecting (10) said link means to said public switched telephone network means, said means for connecting providing gateway facility services between said satellite switching means and said public switched telephone network means.

10. A satellite cellular communication system for establishing communication among a plurality of users comprising:
satellite switching means (1,2, etc.) positioned in low-earth orbit;
link means (j) for coupling said users to said satellite switching means whereby a communication link is established between selected ones of said users via said satellite switching means; and data base means (110-130) coupled to said satellite switching means via said link means, said data base means for storing and transmitting switching information describing each of said plurality of users.

11. A satellite cellular communication system for establishing communication among a plurality of users comprising:
satellite switching means (1,2, etc.) positioned in low earth orbit;
link means (j) for coupling said users to said satellite switching means whereby a communication link is established between selected ones of said users via said satellite switching means;
cellular telephone means (A,B) having a control signal for connecting each of said users to said satellite switching means via said link means;
data base means (110-130) coupled to said satellite switching means via said link means, said data base means for storing and transmitting switching information describing each of said plurality of users; and said satellite switching means operating in response to said control signal of each of said user's cellular telephone means to update said data base means with a present location of each user.

12. A satellite cellular communication system for establishing communication among a plurality of

users comprising:

satellite switching means (1,2, etc.) positioned in orbit about the earth; and

link means (j) for coupling said users to said satellite switching means whereby a communication link is established between selected ones of said users via said satellite switching means.

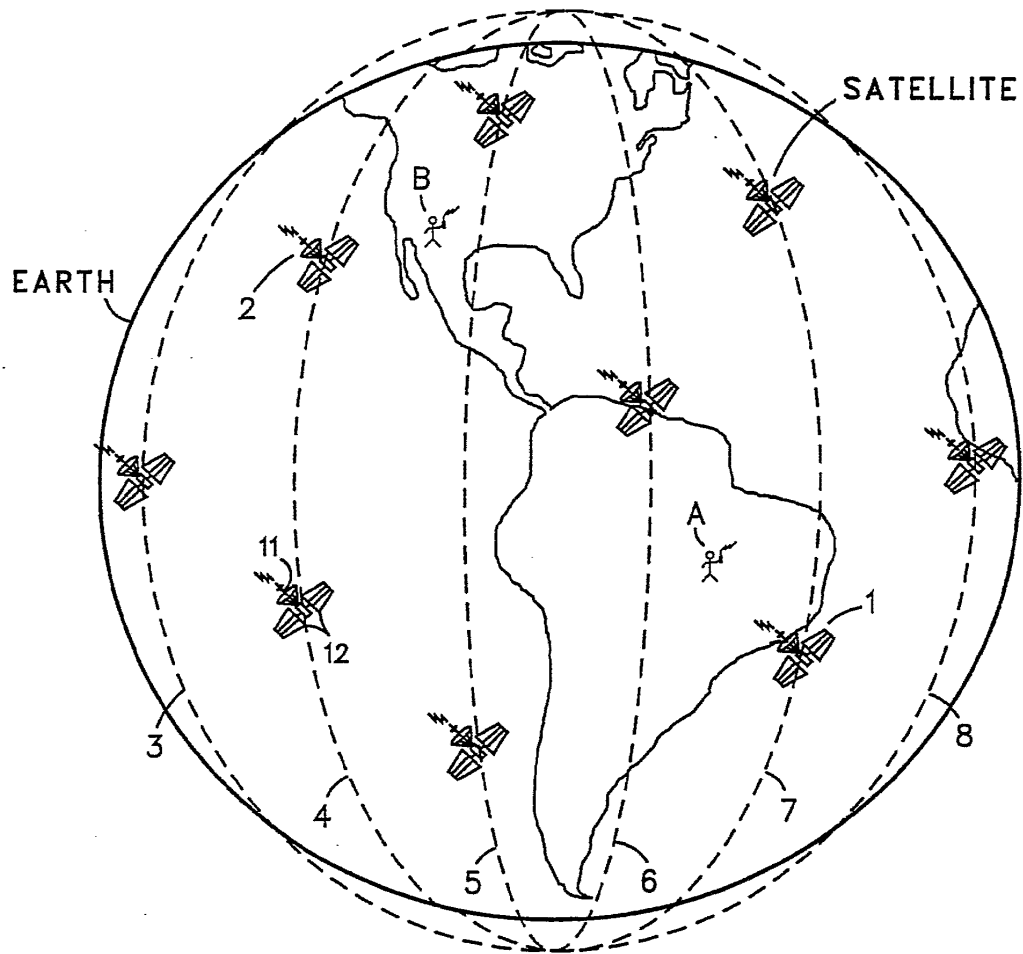


FIG. 1

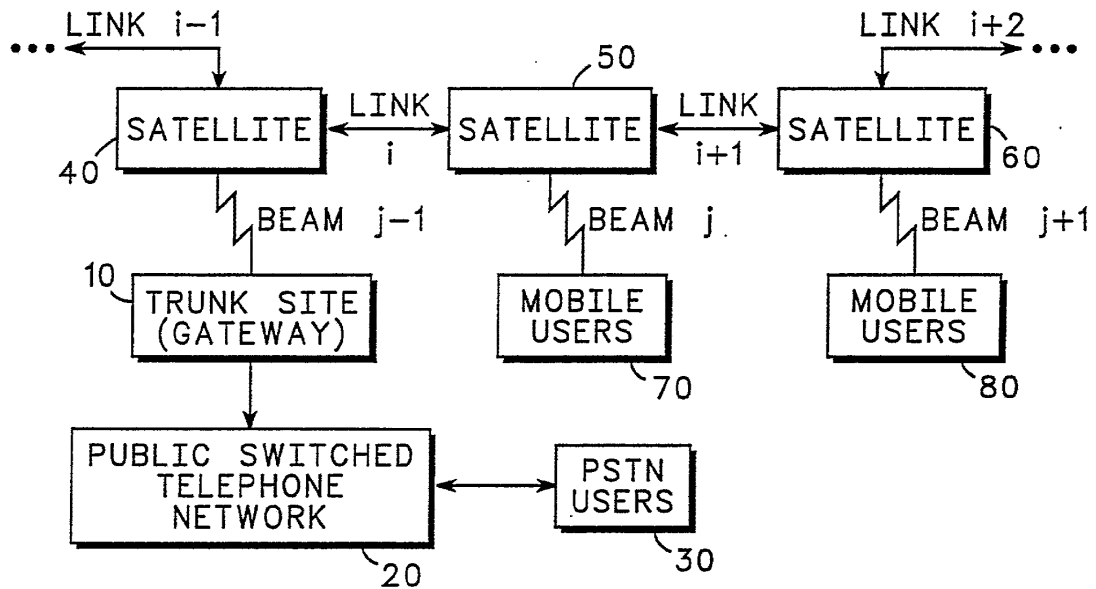
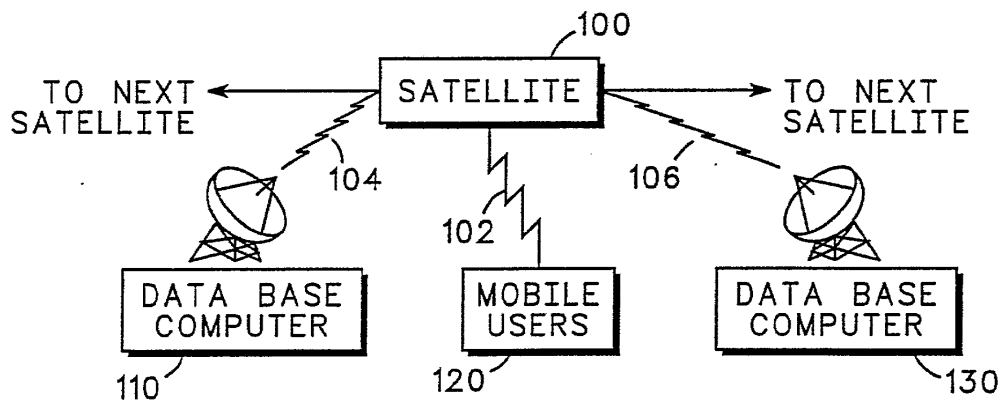


FIG. 2

FIG. 4



400NM POLAR ORBIT 6x8 CONSTELLATION

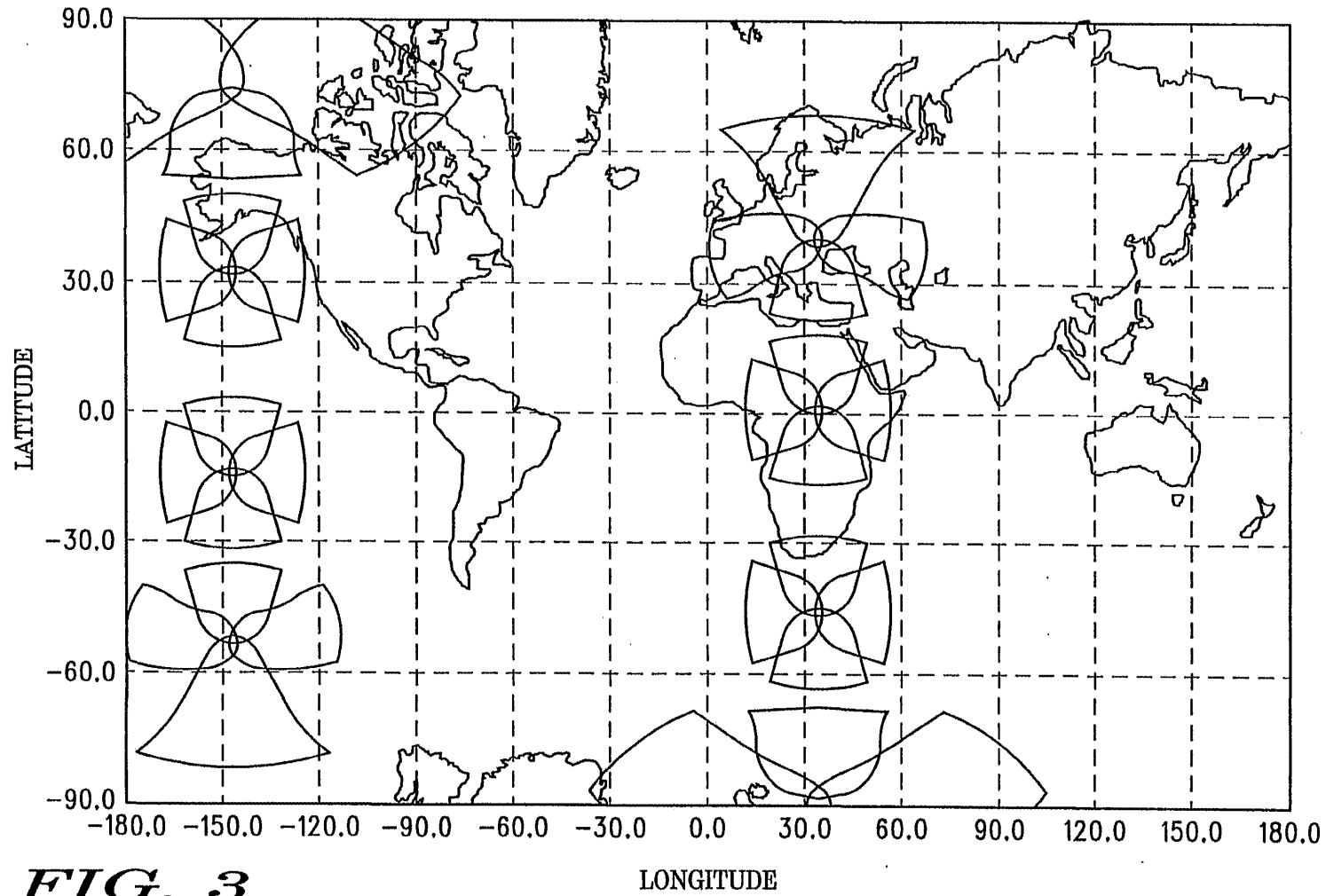


FIG. 3

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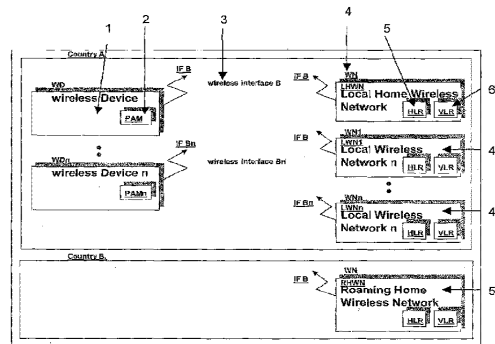
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(54) **Title:** METHOD OF AND APPARATUS FOR INTERFACING AND CONNECTING A WIRELESS DEVICE AND A WIRELESS NETWORK USING A SUBSCRIBER IDENTITY MODULE HAVING PLURAL IMSI ASSOCIATED WITH DIFFERENT NETWORK OPERATORS



(57) **Abstract:** A wireless device includes a single SIM, plus an application module adapted to enable the device to operate as though it included two or more different SIMs. The module, referred to as a 'proprietary applications module' (PAM) is connected to, or built into, a wireless device (WD). The PAM is capable of switching all incoming traffic by associating the WD to one specific subscriber identity sub-module, referred to as "Local SIM" (LS). It can also switch or re-route all outgoing traffic by associating the same WD with a different subscriber identity sub-module, typically a "Roaming SIM" (RS). The "Local SIM" comprises an IMSI associated with a first network operator based in a first country; the "Roaming SIM" comprises an IMSI associated with a second network operator in a second country. In a preferred embodiment, the PAM, RS and LS are built-into a single SIM for use in a WD; alternatively the PAM is built-into a WD and the RS and LS are built-into the single SIM.

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METHOD OF AND APPARATUS FOR INTERFACING AND CONNECTING A WIRELESS DEVICE AND A
WIRELESS NETWORK USING A SUBSCRIBER IDENTITY MODULE HAVING PLURAL IMSI
ASSOCIATED WITH DIFFERENT NETWORK OPERATORS

5 **FIELD OF THE INVENTION**

This invention relates to a method and apparatus for interfacing and connecting a wireless device and a wireless network using a subscriber identity module (SIM). It enables incoming and out-going SMS, voice and data calls to be routed cost effectively and flexibly.

10 **BACKGROUND OF THE INVENTION**

Wireless devices can now handle voice and/or data, allowing simplex and/or duplex voice calls, video calls, text messaging, and internet browsing. Some wireless communication devices can now handle voice-over-internet-protocol (VoIP) calls, and others are able to handle multimedia (voice, video, graphics) calls through wireless networks and/or through
15 wireless networks connected to the internet or media servers.

Different types of calls, initiated by wireless devices, can be restricted for some or most of their outgoing traffic; for example voice and data calls, as well as internet web browsing, can be restricted to those call tariffs made available by the wireless network(s) that is subscribed to. Those wireless networks could be operated by traditional wireless network
20 operators or so called virtual network operators. The restrictions can even limit which web servers the user is actually allowed to access. In most or all cases the restrictions will limit the users in their home country to only one wireless network, i.e. the home wireless network to which the user is subscribed to.

Users of wireless devices subscribed to a specific wireless network in their home country,
25 may however wish to have a choice of call set-up route(s), and also have the choice of viewing any web server or web-page that they desire, and to initiate their outgoing calls at the tariff of their choice and through any of the wireless network(s) available in their home country as well as when roaming abroad. This would give each wireless device user the

freedom to choose the cheapest option for each call set-up route for any outgoing traffic, such as outgoing -SMS, -voice call, -data call.

There are several ways of achieving this, but all have drawbacks.

- It is known to provide a wireless device (e.g. a mobile telephone) with 2 separate SIMs, each associated with a different network operator; the 2 separate SIMs sometimes need to be cut down to fit a single SIM reader, or else a special carrier for two SIMs is provided that itself connects to a conventional SIM package. These devices are sometimes called 'ghost SIMs'. So, for example, a person who frequently travels between the UK and the US would have a single mobile telephone that he could use in both countries, fitted with a dual SIM 'ghost'. If his home mobile operator is based in the UK, he would normally pay roaming charges when he makes calls from the US; call costs can be 10X greater from the US because of this. But with a dual SIM 'ghost' on his mobile telephone, the user can toggle between SIMs by repeatedly turning the device off/on. So he can use a SIM from a US operator when in the US and a SIM from a UK operator when in the UK. But that means that incoming calls to the UK telephone number will go unanswered when the US SIM is being used, and vice versa, which is inconvenient. The user could simply toggle the phone to the US SIM only when he needs to make a call from the US, and then remember to toggle back afterwards. But that is inconvenient. And the user also has to obtain the 2 separate SIMs in the first place, which can again be inconvenient.
- He could alternatively keep 2 different mobile telephones, one for use in the UK and one for the US, with each associated with a UK and US operator respectively. Then, no roaming charges will be paid when he calls from the US, because he uses the mobile telephone associated with the US operator. But having 2 different mobile telephones is costly and inconvenient, especially as people will no doubt call him on his UK mobile telephone number when he is in the US, so he would need to have both devices constantly at hand when traveling in the US.

- Another solution is to have a conventional mobile telephone using just a single SIM, but to have 2 different SIMs, and to physically swap the SIM from a UK operator into the device when in the UK, and swap in a SIM from a US operator when in the US. But that is very inconvenient, and can mean that calls to the UK telephone number will just divert to voicemail when the US SIM is in use, and vice versa when the UK SIM is in use.

Before summarising the invention, we will explain some background terms. The IMSI is a unique non-dialable number allocated to each mobile subscriber that identifies the subscriber and his or her operator subscription. The IMSI is stored in the Subscriber Identity Module (SIM). The IMSI is made up of three parts (1) the mobile country code (MCC) consisting of three digits, (2) the Mobile Network Code (MNC) consisting of two digits, and (3) the Mobile Subscriber Identity Number (MSIN) with up to 10 digits.

A Home Location Register (HLR) is a database that contains mobile subscriber information for all subscribers to an operator. A Visitor Location Register (VLR) is a database owned and maintained by a mobile operator. It contains temporary information about mobile subscribers that are currently located in a geographic area served by that mobile operator, but whose Home Location Register (HLR) is elsewhere.

HLR subscriber information includes the International Mobile Subscriber Identity (IMSI), service subscription information, location information (the identity of the currently serving Visitor Location Register (VLR) to enable the routing of mobile-terminated calls), service restrictions and supplementary services information. The HLR also initiates transactions with VLRs to complete incoming calls and to update subscriber data.

When a mobile subscriber roams away from his home location and into a remote location (typically to a different country), SS7 messages are used to obtain information about the subscriber from the HLR, and to create a temporary record for the subscriber in the VLR. There is usually one VLR per operator. The VLR automatically updates the HLR with the new location information, which it does using an SS7 Location Update Request Message. The Location Update Message is routed to the HLR through the SS7 network, based on the global title translation of the IMSI that is stored within the SCCP Called Party Address portion of the message. The HLR responds with a message that informs the VLR whether the subscriber should be provided service in the new location.

SUMMARY OF THE INVENTION

The present invention is a wireless device including a single SIM, the wireless device further including an application module adapted to enable the device to operate as though it included two or more different SIMs.

The application module may be adapted to switch the single SIM between (a) operating as a local SIM and (b) operating as a roaming SIM. The application module can be a software module that is downloaded to the device.

The user can manually control the switching between the local SIM and roaming SIM operation; switching can for example be done by an end-user operating a switch, or an end-user interacting with an on-screen menu displayed on the device.

In one implementation, when the device is operating with a local SIM, it uses a Local SIM sub-module that is associated with a network operator 1 based in country A; when the device is operating with a roaming SIM, it uses a roaming SIM sub-module that is associated with a network operator 2 based in country B. The local SIM sub-module includes an IMSI number associated with a subscriber and operator 1. The roaming SIM sub-module includes an IMSI number associated with the subscriber and operator 2. Its standby mode is to use the local SIM sub-module so that incoming calls using the IMSI number associated with operator 1 are received. But the user can use the roaming SIM sub-module so that outgoing calls use the IMSI number associated with operator 2. The advantage to the user comes because the tariff associated with operator 2 for outgoing calls is lower than the tariff associated with operator 1 for outgoing calls; the tariff associated with operator 2 for outgoing calls made when the subscriber is outside country A can for instance be lower than the tariff associated with operator 1 for outgoing calls made when the subscriber is outside country A. The tariff associated with operator 2 for outgoing calls made when the subscriber is inside country A can also be lower than the tariff associated with operator 1 for outgoing calls made when the subscriber is inside country A. Operator 2 might also place fewer restrictions than operator 1, including restrictions on destination servers accessed. When a call terminates, the device reverts to its standby mode of using the local SIM sub-module.

The local SIM sub-module and the roaming SIM sub-module are sub-modules within the single SIM (so that, for example, the application module, although in the wireless device, is not part of the SIM itself). Alternatively, the application module, the local SIM sub-module and the roaming SIM sub-module are each sub-modules within the single SIM.

Other implementation features are that: the application module controls communication to a wireless network and includes one or more of the following sub-modules: SIM control unit; features control unit; local SIM sub-module, roaming SIM sub-module; external switch controlling the selection of either the local SIM or roaming SIM sub-modules. The SIM control unit enables the local SIM sub-module or roaming SIM sub-module to be selected. The features control unit enables the caller ID to be modified. The features control unit enables the roaming SIM sub-module to be selected when a user presses a predefined key on a wireless device in which the single SIM is used. The external switch allows the applications module to control the selection of the local SIM sub-module or the roaming SIM sub-module. The applications module selects the local SIM sub-module as a default when powered on. The SIM control unit stores a PIN associated with each of the local and roaming sub-modules and uses that PIN automatically to eliminate the need for manual entry of that PIN. The SIM control unit selects the local SIM sub-module as a default when powered on.

The present invention can enable communications with a mobile virtual network operator, virtual telecoms operator or a virtual telecoms provider. The wireless device itself can be a mobile telephone, wireless card, smart phone or wireless module.

Another aspect of the invention is a downloadable software based application module that, when running on a wireless device, results in that device being a device as defined above.

A further aspect is a method of communicating with a wireless network, comprising the step of using a wireless device as defined above.

A final aspect is a SIM including a local SIM sub-module with a first IMSI and a second SIM sub-module with a different IMSI, the SIM being switchable between either of the

sub-modules. The SIM is physically packaged in the same package as a conventional SIM. The SIM may include an application module to control the switching. The SIM, when used in combination with a wireless device, renders that wireless device as a wireless device as defined above.

5

In a preferred implementation, a proprietary applications module (**PAM**) in the SIM is connected to, or built into, a wireless device (**WD**). The PAM is capable of switching all incoming traffic by associating the WD to one specific subscriber identity sub-module (SIM), referred to as "Local SIM" (**LS**). It can also switch or re-route all outgoing traffic by associating the same WD with a different subscriber identity sub-module (SIM), which we will call a "Roaming SIM" (**RS**). The PAM, RS and LS can be embedded into one single physical SIM.

The PAM establishes data communication between the WD and a wireless network (WN). Each time the WD powers-on, the PAM selects the Local SIM, which gives a location update to the home location register (HLR) attached to its local home wireless network (LHWN). This allows all incoming traffic to be associated with the Local SIM. The PAM can however switch from the Local SIM towards the Roaming SIM; the Roaming SIM then gives location updates to a visitor location register (VLR) attached to any of the available wireless networks (WN or WNN), associated with the Roaming SIM. This can be done any time the WD user chooses so manually (or, optionally, automatically). This is normally done prior to the WD user initiating outgoing traffic, such as outgoing voice and data calls and, optionally, also outgoing short message service (SMS).

This allows the WD to make use of any of the available local wireless networks. By associating the WD with the Roaming SIM, outgoing traffic will be billed at the roaming tariffs established between the home wireless network (RHWN) and each individual local wireless network (LHWN or LWN1 to LWNn). This can be much cheaper for the subscriber and can give greater flexibility – for example enabling a broader range of web servers to be used.

The PAM will, after ending each originated outgoing traffic session, switch (automatically or manually using an external switch) back to the Local SIM, which provides a location update to its home location register (HLR) attached to its local home wireless network

30

(LHWN) when the WD is in its Local SIM home country. This allows the WD to receive any incoming traffic at no charge as 'calling-party-pays' is applicable to its local home wireless network (LHWN). Alternatively and optionally, when the WD is in a different country, the Local SIM is also still used; it sends location updates to a visitor location register (VLR) attached to a roaming wireless network (RWN). This allows the WD to receive any incoming traffic at the tariff rate established by its local home wireless network (LHWN).

But in essence, the WD user always has the option to choose which SIM operation (Local SIM or Roaming SIM) it will use for its incoming and/or outgoing traffic.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a block diagram of a communications system with wireless devices communicating through a wireless interface and a wireless network(s) in accordance with the present invention.

FIGURE 2 shows two example implementations and some of the different combinations using the proprietary applications module (PAM).

FIGURES 3 and **4** are example implementations with respect to the sub-modules of the proprietary application module (PAM).

DETAILED DESCRIPTION OF THE DRAWINGS

Specifically, **Figure 1** is a block diagram of a wireless communications system, which can be used to implement an embodiment of the present invention. For this exemplary embodiment, there is shown a wireless device (WD) **1**, with a built-in PAM **2**, and a wireless network which provides connection for voice and data communication between the WD and the wireless network through a wireless interface IF-B **3**. The wireless interface IF-B **3** in turn allows connection to any communication device with a wired or wireless connection wired to such wireless networks. Examples of components in this system include, but are not limited to, a fixed network, an application server, a media server, a voice over IP network or even a different wireless network, or a multiple configuration of the previous. There can be multiple wireless devices (WD *n*), multiple wireless interfaces (IF-B_{*n*}), multiple wireless networks (WN_{*n*}), multiple fixed networks, multiple application servers, a media servers, multiple voice over IP networks.

In **Figure 1**, there is shown a wireless device (WD) **1**, with a built-in PAM **2**, and several wireless networks (WN, WN_{*n*}) **4**, **4A**, **4B**, such as a local home wireless network (LHWN) **4**, additional different wireless networks (WN₁, WN_{*n*}) **4A**, **4B** called local wireless networks (LWN₁, LWN_{*n*}) **4A**, **4B** and a different wireless network (WN) called the roaming home wireless network (RHWN) **5**.

The wireless device WD 1 has an embedded PAM 2. The WD 1 is configured in accordance with a combination of technologies used in the field of handheld wireless devices and personal digital handheld wireless devices, such as (but not limited to) wireless
5 phones, cellular phones, mobile phones, hand held radio frequency digital communication devices, personal digital assistants and so called smart-phones, which can each communicate with the wireless networks as described.

A wireless network WN 4 is shown. The wireless network is configured in accordance with a combination of technologies used in the field of wireless digital communications
10 networks; such as but not limited to GSM-GPRS-WAP based wireless networks, GSM-GPRS-WAP-EDGE based wireless networks, UMTS based wireless networks, PCS based wireless networks, DCS based wireless networks, TDMA based wireless networks, WiFi or WiMax based wireless networks.

15 The preferred embodiment of the present invention and its advantages will now be described. Essentially, in accordance with an embodiment of the present invention, we have a method and apparatus for interfacing and connecting a wireless device(s) 1 and a wireless network 4, 4A, 4B and 5 for in-and out-going traffic, such as SMS and/or voice and/or data call(s). The method and apparatus enable routing, interfacing and connecting
20 a handheld wireless device and a wireless network. Calls can be set up in accordance with a user's own choice of routing to any 3rd party end user, connecting over wireless networks, fixed networks, servers or the internet.

The WD 1 with a built-in PAM 2 establishes data communication between the WD 1 and a
25 wireless network 4 – 5 coupled to a digital communication system associated with one of the Local SIM (LS) 21 or Roaming SIM (RS) 22 identities; both LS 21 and RS 22 are embedded into a single SIM, and are each defined by a unique IMSI number. As a first step, the PAM 2, 2n chooses either the Local SIM (LS) 21 or Roaming SIM (RS) 22 identity. The WD 1 provides location updates each time the PAM 2 (e.g. built into the WD)
30 changes SIM identity (e.g. selects a different SIM sub-module, LS 21 or RS 22, each embedded into the single SIM, which itself resides in the WD 1. Each sub-module LS 21 and RS 22 is associated with a different IMSI and therefore network operator. WD 1 also

provides a location update each time it changes wireless network name or wireless network country or region or state.

When the WD 1 is in the home country associated with the Local SIM (LS) 21, the PAM 2
5 establishes data communication between the WD 1 and a wireless network (WN) 4 – 5. As
a first step, the PAM 2 selects the Local SIM 21 to provide location updates to its home
location register (HLR) 6 attached to its local home wireless network (LHWN) 4,
associated with the Local SIM 21. This occurs each time the WD 1 powers-on, allowing all
incoming traffic to be associated with the Local SIM 21. The PAM 2 can switch from the
10 Local SIM 21 to the Roaming SIM 22 (which involves changing the IMSI number declared
by the WD 1) to give location updates to a visitor location register (VLR) 7 attached to any
of the available wireless networks (WN or WNN) 4, 4A, 4B, associated with the Roaming
SIM 22, any time the WD 1 user chooses. This choice is done manually or optionally
automatically prior to any time the WD 1 user is about to initiate outgoing traffic, such as
15 outgoing voice and/or data calls and optionally also outgoing SMS.

This allows the WD 1 to make use of any of the available local wireless networks 4, 4A, 4B,
based in the home country of the LS 21; associating the WD 1 with the Roaming SIM 22
enables the outgoing traffic to be at the roaming tariffs established between the roaming
20 home wireless network (RHWN) 5, based in a different country to the country of the LS
21, and each individual local wireless network (LHWN or LWN1 to LWNn) 4, 4A, 4B.

The PAM 2 will, after ending each originated outgoing traffic session, switch to the Local
SIM (LS) 21 to provide location updates to its home location register (HLR) 6 attached to
25 its local home wireless network (LHWN) 4 when the WD 1 is in its Local SIM 21 home
country. Switching can be done automatically or manually by the user, through an internal
user menu or an external switch. This switching allows the WD 1 to receive any incoming
traffic at no charge as 'calling party pays' is applied by its local home wireless network
(LHWN) 4. Alternatively and optionally, location updates can be made to a visitor location
30 register (VLR) 7 attached to a roaming wireless network (RWN) 5 when the WD 1 is in a
country different then the one associated with the LS, allowing the WD 1 to receive any
incoming traffic at the tariff rate established by its local home wireless network (LHWN) 4
and the roaming wireless network for such incoming roaming calls. The WD 1 user always

has the option to choose which of the SIM (Local SIM 21 or Roaming SIM 22) it will use for either or both of its incoming or its outgoing traffic.

5 **Figure 2** show two of the preferred integration embodiments of the proprietary application module (PAM) of the invention, which in the context of the foregoing are self explanatory, basically showing the integration of a PAM within a wireless device.

Figures 3 and **4** show two different preferred embodiments of the proprietary application module (PAM) of the invention, which in the context of the foregoing are self explanatory, basically showing some examples of the different combinations of PAM by combining its sub-modules respectively. In particular, the embodiment of the proprietary application module (PAM) of the invention as shown in **Figure 4** allows for the integration of the PAM within a single subscriber identity module (SIM) capable of handling at least two different identities, corresponding respectively to the LS and the RS as described above.

15 It should be clear from the preceding disclosures that the present invention provides a method and apparatus of interfacing and connecting a wireless device(s) and a wireless network(s) for in- and out-going traffic, such as SMS and/or voice and/or data call(s) routing. The principals, preferred embodiments and modes of operation of the present invention have been described in the claims, descriptions of implementation and drawings.

20 This invention provides an advantage allowing any wireless device (WD) with a built-in proprietary applications module (PAM) and any wireless network (WN) to be interconnected through the existing wireless interfaces using any of the (at least two) SIM identities that declare different IMSI numbers, such as a Local SIM (LS) or Roaming SIM (RS). Moreover this invention provides an advantage allowing any wireless device with a

25 built-in PAM to choose the call routing for both in- and out-going calls.

This ability to interconnect and communicate the LS and/or RS between the PAM and a wireless device (WD) (that includes the built-in PAM), with a wireless network (WN, WNN), is particularly advantageous for data and voice calls and optionally SMS routing. Freedom of choice of wireless networks is not readily possible with prior art approaches;

but is fully in the hand of the end-user of any wireless network for any WD with a built-in PAM, that implements this invention.

The implementation of this invention and any variations and improvements, where the PAM(s) would reside in the wireless end-users wireless device(s) (WD), could in effect
5 allow setting-up a "mobile virtual network operator" (MVNO), a "virtual telecoms operator" (VTO) or a "virtual telecoms provider (VTP), thus introducing more competition in the wireless and/or cellular market place, greatly benefiting end-users, without the need for any wireless device and/or wireless handheld user to change its current Local SIM subscription (LS) with its current home wireless network operator in the
10 country the end-user resides.

Instead, the end-user can benefit from the advantages of this invention by simply downloading or embedding a PAM, as described within this invention, within his wireless device (WD) and additionally subscribe to a Roaming SIM subscription (RS) with a so called roaming wireless network operator (RHWN) based in a country different from the
15 country where he resides; the roaming wireless network operator must have an advantageous call tariff for roaming calls, and in particular a more advantageous call tariff for the end-user when originating calls with such RS from the country he resides in compared to calls tariffs when originating calls with his LS from the country he resides in.

This allows the end-user to keep his original phone number identity associated with the LS
20 and the corresponding local home wireless network (LHWN) based in the country (Country A) where the end-user resides, whilst benefiting from the advantageous tariffs whenever applicable for his originated outgoing calls associated with the RS and the corresponding roaming home wireless network (RHWN) based in a country different from the previously mentioned (Country A). This applies if the end-user is in his home country,
25 or even when he is in a different country. The latter is traditionally referred to as roaming, meaning the LS is roaming; in the embodiment of this invention the RS is almost always roaming, but does not have to be.

A practical example will illustrate this. Typically, the RHWN is associated with the RS and LS, each having their own unique IMSI; each embedded into the same single SIM. The
30 IMSI of the LS is associated with the LHWN. The RHWN could be a small mobile network operator in a small country with limited growth potential, and therefore is more

willing to provide call tariffs with smaller margins for international calls. The LHWN however provides in-country and international tariffs in line with market average, higher margins. This means that, for example, when switching to the RS for outgoing international calls, the cost to the WD user can be more advantageous as margins are kept more competitive, and still provide additional revenue to the smaller RHWN which it otherwise could not obtain. This allows revenue growth to the RHWN and more competitive lower pricing to the WD users. And in the case that the SIM with a built-in PAM, RS and LS is provided by a Mobile Virtual Network Operator (MVNO) to its WD users, it would allow the MVNO to compete even in the country of its own LHWN for international call tariffs, and definitely abroad when its WD users are roaming. This is an advantage that few or no other MVNOs have in the country of their own LHWN, allowing subscribers to this innovative MVNO to make use of any of the Wireless Networks, using the PAM and RS in their own devices; this will always ensure the best available wireless coverage.

The architecture as described herein, in as far as related to virtual networks, allows scalability where the Roaming SIMs (RS) can be the same for any country with whom the associated roaming wireless network has roaming agreements with, and where the tariffs for outgoing traffic are more advantageous in comparison to the tariffs of outgoing call tariffs with Local SIMs in such countries. This invention applies partly or fully, by simply substituting in each different country the Local SIM, as described within this invention, by the actual Local SIM (LS) identity of each individual end-user of such different country.

Summary of various implementation features

The following are each optional features of the preferred implementation.

- 25 The wireless device includes a proprietary applications module (**PAM**) capable of communicating with a Wireless Device (**WD**) and Wireless Network(s) through a wireless interfaces (IF-B).
- WD and WDn are wireless devices and/or wireless handheld devices in any available current and future wireless technologies respectively, with a built-in PAM.
 - 30 • IF-B and IF-Bn are wireless interfaces in any available current and future wireless technologies respectively.

- WN and WNN are wireless networks in any available current and future wireless technologies respectively.

Any individual or multiple **PAM** may be built-in into any WD or any such other wireless device, such as but not limited to so called “handsets”, “handy”, “mobile phones”, “cellular phones”, “wireless phones”, “smart phones”, “wireless devices”, “wireless PC cards”, “wireless modules”

Any individual or multiple PAM may include all of the following proprietary sub-modules or any single or multiple combination of these sub-modules (or an equivalent of each such sub-module(s) performing a similar function):

- Sub-module; SIM Control Unit (**SCU**)
- Sub-module; Features Control Unit (**FCU**)
- Local SIM (**LS**)
- Roaming SIM (**RS**)
- External Switch (**ES**)

Any individual or multiple wireless device (WD) with a built-in PAM, may be capable of communicating with any Wireless Network (WN) through

- a wireless connection with a wireless or mobile network, or
- a first wireless connection with a wireless or mobile network and then through a second wireless and/or wired connection through a fixed network or switching network to an applications server, or
- a first wireless connection with a wireless or mobile network and then through a second wireless and/or wired connection through a voice over internet protocol network or server to an applications server.

The wireless device (WD), with a build-in PAM, is capable of communicating with the Local Home Wireless Network (LHWN) and/or any Local Wireless Network (LWN1, LWNn) through the SIM Control Unit (**SCU**) sub-module. This SIM Control Unit (**SCU**) is a sub-part of the PAM and allows the WD, through its built in PAM, to select either the Local SIM (**LS**) or Roaming SIM (**RS**) to, for example, provide the WD location update

with the Wireless Network WN (example: LHWN and/or LWN) for incoming and/or outgoing traffic respectively.

5 The wireless device (WD), with a built-in PAM, is optionally capable of automatically modifying certain settings of the WD, through the Features Control Unit (FCU). The Features Control Unit (FCU) sub-module is optionally a sub-part of the PAM and allows the WD, through its built in PAM, to automatically modify the settings of the WD outgoing caller identification (caller ID) for any specific outgoing traffic and/or select the Roaming SIM when any number key is hit and/or when a pre-defined hotkey is hit for
10 such function, for example to disable the outgoing caller ID of the WD for all outgoing-traffic.

The wireless device (WD), with a built-in PAM, is optionally capable of communicating with the Local Home Wireless Network (LHWN) and/or any Local Wireless Network
15 (LWN1, LWNn) through the External Switch (ES) and the SIM Control Unit (SCU). The External Switch (ES), optionally a sub-part of the PAM, allows the WD through its built in PAM to select either the Local SIM (LS) or Roaming SIM (RS), to, for example, provide the location update to the wireless network WN (for example: LHWN and/or LWN) for incoming- and/or outgoing- traffic respectively.

20 The PAM can be built into a single SIM, where such single SIM provides all of the functions of at least one of each of a LS, RS and SCU. The PAM monitors the power supply provided by the WD, and at power-on selects, as a default, the LS. Optionally, the SCU will store, in its internal temporary memory, the PIN corresponding to its internal LS and RS respectively, such that when the SCU switches between its internal LS and RS, the
25 user does not have to enter each time the corresponding PIN (except once after power-on of the WD). In the event this optional function is available within the SCU, then the SCU will at each power-on also reset the value of its internal PIN memory. The WD device user has the option to manually switch from the LS to the RS, through an external switch (ES) if
30 available or through an internal user menu embedded in each of the LS and/or the RS and/or the single SIM. For example, the user can switch to the LS when the WD is in idle mode, allowing the WD to locate update to the WN with the LS identity and monitor for any incoming traffic assigned to the LS identity. And it can then switch to the RS, allowing

the WD to locate update to the WN with the RS identity, prior to initiating some or all of the outgoing traffic assigned to the RS identity. Hence, when ending any outgoing traffic, the SCU will automatically, by means of an embedded user menu within each of the LS and RS and/or single SIM, or manually by the user activating the external switch (ES), revert
5 back to the LS. This allows the WD to provide a location update to the WN with the LS identity and location and therefore receive incoming traffic and/or signalling assigned to the LS identity.

The SCU can monitor the power supply of the PAM, provided by the WD, and at power-
10 on select as default the Local SIM (LS). Optionally, the SCU will store in its internal temporary memory the personal identification number (PIN) corresponding to the LS and RS respectively, such that when switching between the LS and RS, the user does not have to enter each time the corresponding PIN (except once after power-on of the WD and PAM). In the event this optional function is available within the SCU, then the SCU will at
15 each power-on also reset the value of its internal PIN memory. The WD device user has the option to manually switch from the LS to the RS manually through an external switch (ES) or optimally through an internal user menu embedded in each of the LS and/or the RS. For example, the user can switch to the LS when the WD is in idle mode, allowing the WD to provide location updates to the WN with the LS identity and monitor for any
20 incoming traffic assigned to the LS identity. But the user can then switch to the RS, allowing the WD to provide location updates to the WN with the RS identity, prior to initiating some or all of the outgoing traffic. But, when ending any outgoing traffic, the SCU can automatically (or manually by the WD user, by means of the external switch (ES)), switch back to the LS, thus allowing the WD to provide location updates to the WN with
25 the LS identity and location; and hence receive incoming traffic and/or signalling assigned with the LS identity.

Any individual or multiple PAM may be stored in any storage device(s) and/or server(s)
30 connected to any communications system(s), such as, but not limited to, so called "servers", "internet servers", "computers", "PCs", "media servers", "wireless switching exchanges", "fixed switching exchanges", "wireless network processors", "fixed network processor", "ATM network", "ADSL network", "DSL network", "internet servers",

“intranet servers”. From these storage/server devices, any current and/or future wireless device (and in particular any WD capable of downloading applications, for example GPRS, WAP, JAVA), can download a PAM or any evolution-, update-, upgrade-, modification- of the PAM.

5

Any individual or multiple PAM may be a part of any wireless device (WD), be it as software, firmware, hardware or a combination thereof which perform the same or an equivalent function.

10 Any such individual or multiple PAM may be activated or de-activated by the user of each individual WD.

Many modifications and variations of this present invention are possible in view of the above disclosures, drawings and explanations. Thus, it is to be understood that, within the scope of the appended claims, the invention can be practiced other than as specifically
15 described above. The invention which is intended to be protected should not, however, be construed as limited to the particular forms disclosed, or implementation examples outlined, as these are to be regarded as illustrative rather than restrictive. Variations in changes could be made by those skilled in the art without deviating from the spirit of the
20 invention. Accordingly, the foregoing detailed descriptions and drawings should be considered exemplary in nature and not limited to the scope and spirit of the invention as set forth in the claims.

CLAIMS

1. A wireless device including a single SIM, the wireless device further including an
5 application module adapted to enable the device to operate as though it included two or
more different SIMs.
2. The wireless device of Claim 1, in which the application module is adapted to
switch the single SIM between (a) operating as a local SIM and (b) operating as a roaming
10 SIM.
3. The wireless device of Claim 1, in which the application module that controls the
switching between operation as a local SIM and operation as a roaming SIM is a software
module that is downloaded to the device.
- 15 4. The wireless device of Claim 2 or 3 in which the user can manually control the
switching between the local SIM and roaming SIM operation.
5. The wireless device of Claim 4 in which switching is done by an end-user operating
20 a switch.
6. The wireless device of Claim 4 in which switching is done by an end-user
interacting with an on-screen menu displayed on the device.
- 25 7. The wireless device of any preceding Claim 2 – 6, in which, when the device is
operating as a local SIM, it uses a local SIM sub-module that is associated with a network
operator 1 based in country A.
8. The wireless device of Claim 7 in which, when the device is operating as a roaming
30 SIM, it uses a roaming SIM sub-module that is associated with a network operator 2 based
in country B.
9. The wireless device of Claim 8 in which the local SIM sub-module includes an
IMSI number associated with a subscriber and operator 1.

10. The wireless device of Claim 9 in which the roaming SIM sub-module includes an IMSI number associated with the subscriber and operator 2.
- 5 11. The wireless device of Claim 10 in which its standby mode is to use the local SIM sub-module so that incoming calls using the IMSI number associated with operator 1 are received.
- 10 12. The wireless device of Claim 11 in which the user can use the roaming SIM sub-module so that outgoing calls use the IMSI number associated with operator 2.
13. The wireless device of Claim 12 in which the tariff associated with operator 2 for outgoing calls is lower than the tariff associated with operator 1 for outgoing calls.
- 15 14. The wireless device of Claim 13 in which the tariff associated with operator 2 for outgoing calls made when the subscriber is outside country A is lower than the tariff associated with operator 1 for outgoing calls made when the subscriber is outside country A.
- 20 15. The wireless device of Claim 12 in which the tariff associated with operator 2 for outgoing calls made when the subscriber is inside country A is lower than the tariff associated with operator 1 for outgoing calls made when the subscriber is inside country A.
- 25 16. The wireless device of Claim 12 in which operator 2 places fewer restrictions than operator 1, including restrictions on destination servers accessed.
17. The wireless device of Claim 8 – 16, in which the local SIM sub-module and the roaming SIM sub-module are sub-modules within the single SIM.
- 30 18. The wireless device of Claim 8 – 16, in which the application module, the local SIM sub-module and the roaming SIM sub-module are each sub-modules within the single SIM.

19. The wireless device of Claim 7 in which, when a call terminates, then the device reverts to its standby mode of using the local SIM sub-module.

5 20. The wireless device of any preceding Claim, in which the application module controls communication to a wireless network.

21. The wireless device of any preceding Claim in which the application module includes one or more of the following sub-modules: SIM control unit; features control unit;
10 local SIM sub-module, roaming SIM sub-module; external switch controlling the selection of either the local SIM or roaming SIM sub-modules.

22. The wireless device of Claim 21 in which the SIM control unit enables the local SIM sub-module or roaming SIM sub-module to be selected.

15

23. The wireless device of Claim 21 in which the features control unit enables the caller ID to be modified.

24. The wireless device of Claim 23 in which the features control unit enables the
20 roaming SIM sub-module to be selected when a user presses a predefined key on the wireless device.

25. The wireless device of Claim 21 in which the external switch allows the application module to control the selection of the local SIM sub-module or the roaming SIM sub-
25 module.

26. The wireless device of Claim 21 in which the application module selects the local SIM sub-module as a default when powered on.

30 27. The wireless device of Claim 21 in which the SIM control unit stores a PIN associated with each of the local and roaming sub-modules and uses that PIN automatically to eliminate the need for manual entry of that PIN.

28. The wireless device of Claim 27 in which the SIM control unit selects the local SIM sub-module as a default when powered on.

29. The wireless device of any preceding Claim, when enabling communications with a mobile virtual network operator, virtual telecoms operator or a virtual telecoms provider.

30. The wireless device of any preceding Claim, being is a mobile telephone, wireless card, smart phone or wireless module.

31. A downloadable software based application module that, when running on a wireless device, results in that device being a device as defined in any preceding claim.

32. A method of communicating with a wireless network, comprising the step of using a wireless device as claimed in any preceding Claim 1- 31.

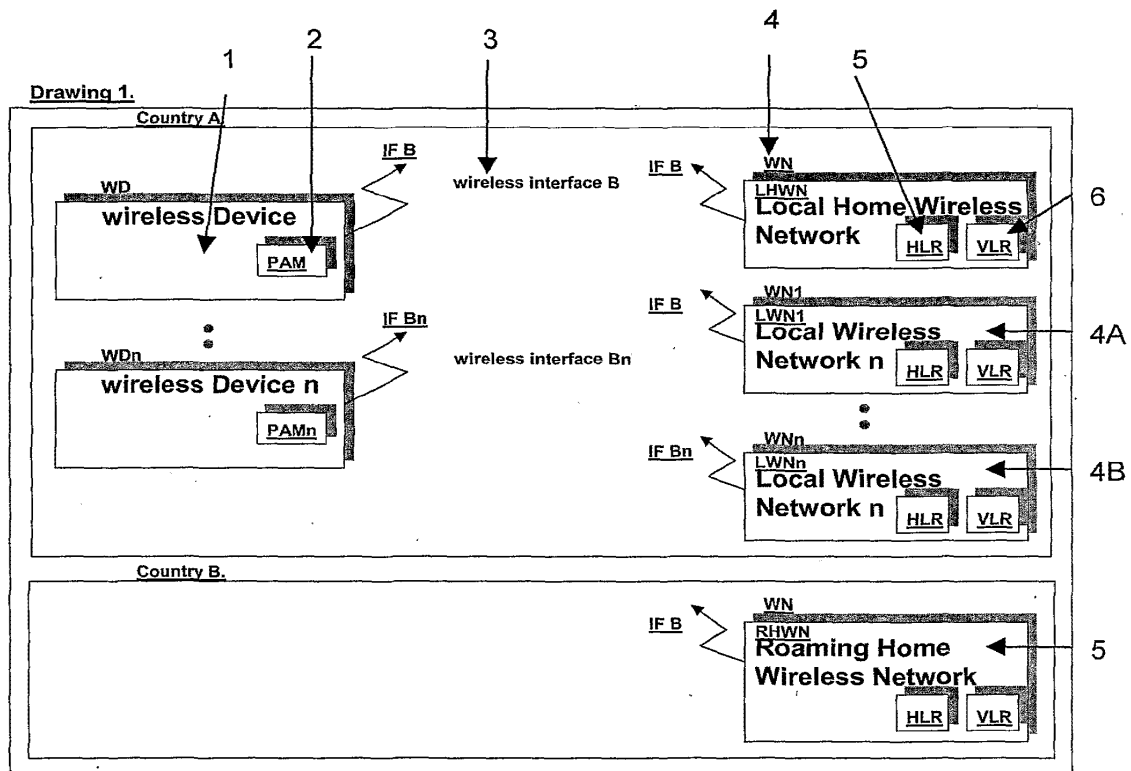
33. A SIM including a local SIM sub-module with a first IMSI and a second SIM sub-module with a different IMSI, the SIM being switchable between either of the sub-modules.

34. The SIM of claim 33, further including an application module to control the switching.

35. The SIM of Claim 33 or 34, which, when used in combination with a wireless device, renders that wireless device as a wireless device as defined in any preceding Claim 1

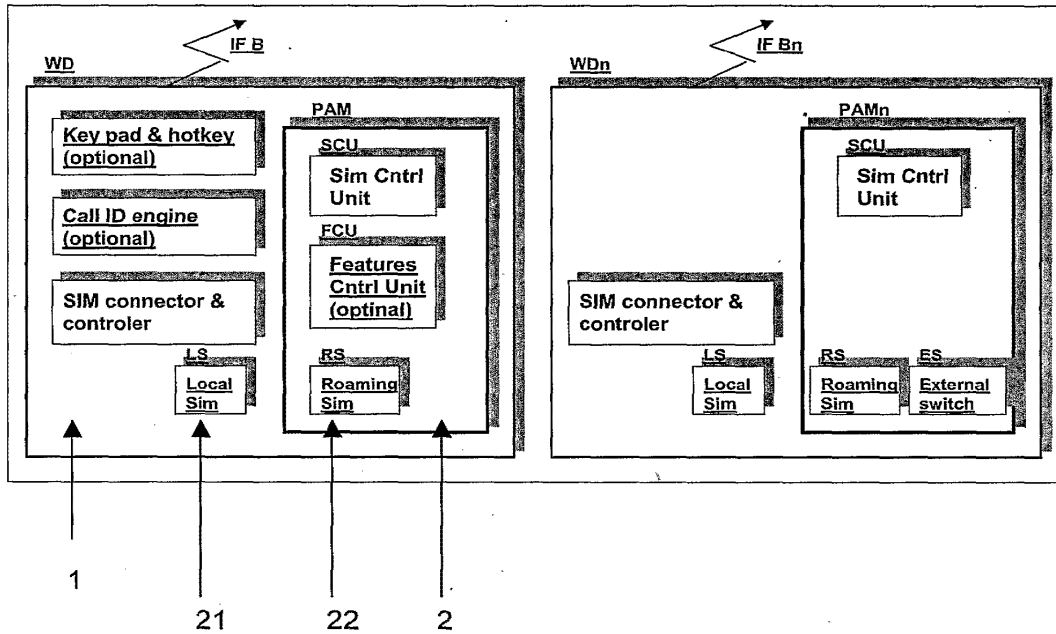
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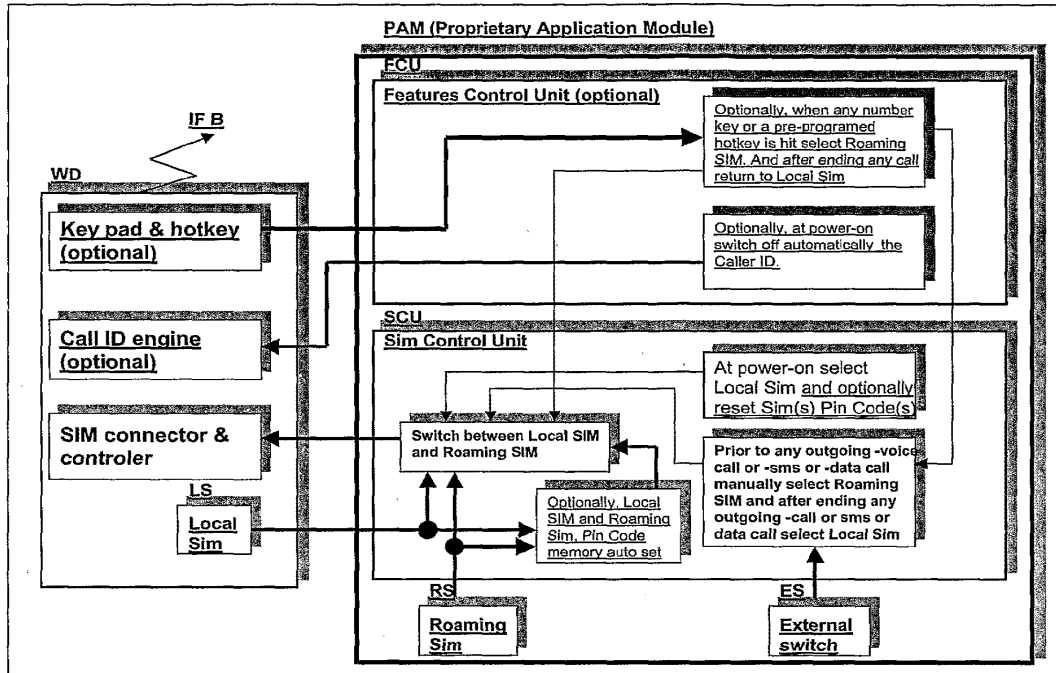
2/3

Drawing 2.

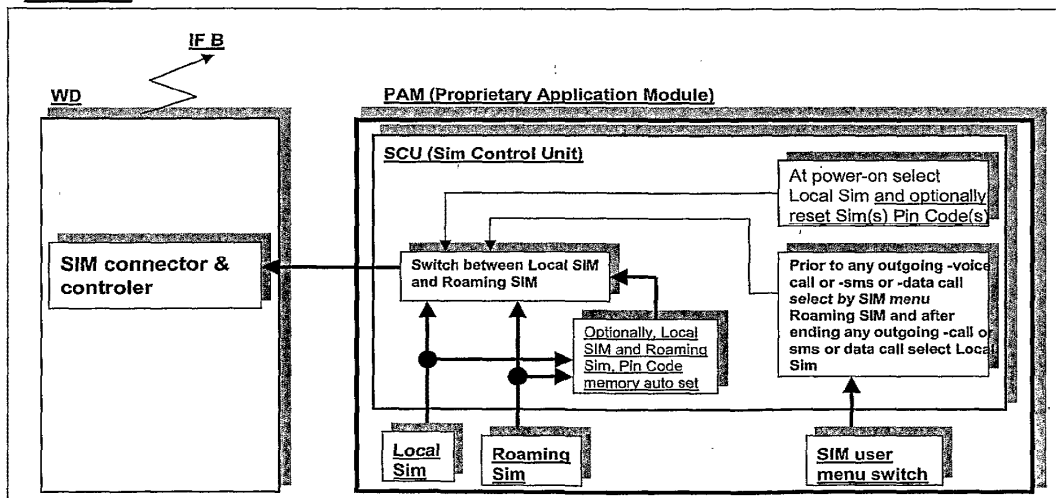


3/3

Drawing 3.



Drawing 4.



INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2007/000799

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04Q7/38
ADD. H04Q7/32

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)
H04Q

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

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

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/55107 A (SWISSCOM AG [CH]; STADELMANN ANTON NIKLAUS [CH]; HIRZEL WERNER [CH]; H) 28 October 1999 (1999-10-28) abstract page 2, line 23 - page 3, line 21 page 6, line 23 - page 7, line 8 page 8; table 1 page 11, line 14 - page 12, line 2 claims 1,2,7,8,12 ----- -/--	1-35

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

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E earlier document but published on or after the international filing date

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

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

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

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

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

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

G document member of the same patent family

Date of the actual completion of the international search

22 June 2007

Date of mailing of the international search report

02/07/2007

Name and mailing address of the ISA/

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Möll, Hans-Peter

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2007/000799

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 814 030 A1 (TRANSATEL [FR]) 15 March 2002 (2002-03-15) abstract figures 1,2 page 3, lines 6-18,25-29 page 4, lines 1-8 page 6, line 27 - page 7, line 21 page 9, line 22 - page 10, line 6 page 10, line 27 - page 12, line 25 page 14, line 26 - page 15, line 20 page 16, lines 5-9 -----	1-35
X	FR 2 790 161 A (SCHLUMBERGER SYSTEMS & SERVICE [FR]) 25 August 2000 (2000-08-25) abstract figures 1-3 page 5, line 23 - page 9, line 14 claim 6 -----	1,2, 31-35

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2007/000799

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9955107	A	28-10-1999	AT 201948 T AU 747302 B2 AU 2824399 A BR 9906361 A CA 2293384 A1 CN 1263682 A CZ 9904271 A3 DE 59900110 D1 DK 990364 T3 EP 0990364 A1 ES 2159988 T3 GR 3036495 T3 HU 0003259 A2 ID 23524 A JP 2002511223 T NO 996146 A NZ 501860 A PL 337282 A1 PT 990364 T RU 2216881 C2 TR 200000205 T1 US 6738622 B1 ZA 9907597 A	15-06-2001 16-05-2002 08-11-1999 19-09-2000 28-10-1999 16-08-2000 15-03-2000 12-07-2001 17-09-2001 05-04-2000 16-10-2001 30-11-2001 28-02-2001 27-04-2000 09-04-2002 17-02-2000 31-08-2001 14-08-2000 30-11-2001 20-11-2003 21-09-2000 18-05-2004 12-06-2000
FR 2814030	A1	15-03-2002	AU 8782301 A EP 1316237 A1 WO 0221872 A1	22-03-2002 04-06-2003 14-03-2002
FR 2790161	A	25-08-2000	CN 1341332 A EP 1153517 A1 WO 0049820 A1 JP 2002537738 A	20-03-2002 14-11-2001 24-08-2000 05-11-2002

Form PCT/ISA/210 (patent family annex) (April 2005)

Electronic Patent Application Fee Transmittal				
Application Number:		12942642		
Filing Date:		09-Nov-2010		
Title of Invention:		SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		
First Named Inventor/Applicant Name:		Shaowei Pan		
Filer:		Jeffrey G. Toler/Katherine Meals		
Attorney Docket Number:		1082-0013-C1		
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	930	930
Total in USD (\$)				930

Electronic Acknowledgement Receipt	
EFS ID:	12439491
Application Number:	12942642
International Application Number:	
Confirmation Number:	2064
Title of Invention:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
First Named Inventor/Applicant Name:	Shaowei Pan
Customer Number:	60533
Filer:	Jeffrey G. Toler/Katherine Meals
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013-C1
Receipt Date:	30-MAR-2012
Filing Date:	09-NOV-2010
Time Stamp:	17:18:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 930
RAM confirmation Number	5065
Deposit Account	502469
Authorized User	
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	1082-0013-C1_RCEX.pdf	248710	no	2
			01fbcd0ab6a3040f796b647190dfe2997eb04838b		
Warnings:					
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2	Information Disclosure Statement (IDS) Form (SB08)	1082-0013-C1_IDS.pdf	2358150	no	17
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3	Foreign Reference	EP0365885A2.pdf	574697	no	9
			3db79d66ba179fb31a7bf4c0225ae2be4b3c137d		
Warnings:					
Information:					
4	Foreign Reference	WO2007102003A1.pdf	1376101	no	28
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5	Non Patent Literature	Reference_1.pdf	1811844	no	19
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Warnings:					
Information:					
6	Non Patent Literature	Reference_2.pdf	5391042	no	40
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Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	30757	no	2
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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.

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)

Approved for use through 07/31/2012. OMB 0651-0031

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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL (Submitted Only via EFS-Web)							
Application Number	12/942,642	Filing Date	2010-11-09	Docket Number (if applicable)	1082-0013-C1	Art Unit	2477
First Named Inventor	Shaowei Pan			Examiner Name	PHUNKULH, Bob A.		
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							
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☒ Patent Practitioner Signature ☐ Applicant Signature							

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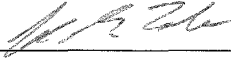
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)

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Signature of Registered U.S. Patent Practitioner			
Signature		Date (YYYY-MM-DD)	2012-03-30
Name	JEFFREY G. TOLER	Registration Number	38342

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.

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AUSTIN, TX 78759

EXAMINER

PHUNKULH, BOB A

ART UNIT

PAPER NUMBER

2477

DATE MAILED: 03/01/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064

TITLE OF INVENTION: SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$0	\$1170	06/01/2012

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 SMALL ENTITY status shown above.

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

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

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

If the SMALL ENTITY is shown as NO:

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

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

II. PART B - FEE(S) TRANSMITTAL, 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)

60533 7590 03/01/2012
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

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.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064

TITLE OF INVENTION: SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$0	\$1170	06/01/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHUNKULH, BOB A	2477	370-401000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(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 _____
3 _____

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

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

(A) NAME OF ASSIGNEE

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

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

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

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

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ 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).

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

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

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.

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064
60533 7590 03/01/2012 TOLER LAW GROUP TOLER LAW GROUP 8500 BLUFFSTONE COVE SUITE A201 AUSTIN, TX 78759			EXAMINER PHUNKULH, BOB A	
			ART UNIT 2477	PAPER NUMBER

DATE MAILED: 03/01/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

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

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

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

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 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.	Applicant(s)	
	12/942,642	PAN, SHAOWEI	
	Examiner	Art Unit	
	BOB PHUNKULH	2477	

-- 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 2/7/2012.

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 1-25.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

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

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.

(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date ____ 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. ☐ Notice of Informal Patent Application 6. ☐ Interview Summary (PTO-413), Paper No./Mail Date ____. 7. ☐ Examiner's Amendment/Comment 8. ☐ Examiner's Statement of Reasons for Allowance 9. ☐ Other _____.
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/BOB A PHUNKULH/ Primary Examiner, Art Unit 2477	
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Search Notes 	Application/Control No. 12942642	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB PHUNKULH	Art Unit 2477

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (text search)	10/18/2011	BAP
EAST (text search)	10/19/2011	BAP
370/315, 316, 328, 329, 330, 352, 353, 354, 355, 356, 400, 401 (text search)	02/22/2012	BAP

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
	See attachment	2/15/2012	BAP

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EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	39532	(wireless mobile) near2 (gateway access near2 (node point))	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:36
S2	65143	(wireless mobile) near2 (gateway access near2 (node point) server)	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:36
S3	1845	(dma) near2 (host server)	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:52
S4	66909	S2 or S3	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:52
S5	17713	370/328,329,330.ccls.	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:56
S6	3755	S4 and S5	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:56
S7	903	S6 and (rout\$4 forward\$4) near2 (information)	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:57
S8	653	S7 and @ad<"20080714"	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:57
S9	124	S6 and (rout\$4 forward\$4) near2 (information) same (relay\$4)	US-PGPUB; USPAT	OR	OFF	2012/02/22 10:59
S10	13501	370/352,353,354,355,356.ccls.	US-PGPUB; USPAT	OR	OFF	2012/02/22 11:00
S11	1838	S4 and S10	US-PGPUB; USPAT	OR	OFF	2012/02/22 11:00
S12	79	S11 and (rout\$4 forward\$4) near2 (information) same (relay\$4)	US-PGPUB; USPAT	OR	OFF	2012/02/22 11:00
S13	61	S12 and @ad<"20080714"	US-PGPUB; USPAT	OR	OFF	2012/02/22 11:00
S14	2070	(wireless mobile) near2 (gateway access near2 (node point) server host) same (destination) same (receiv\$4)	US-PGPUB; USPAT	OR	OFF	2012/02/22 11:06
S15	2361	370/315,316.ccls.	US-PGPUB; USPAT	OR	OFF	2012/02/22 11:06
S16	23	S14 and S15	US-PGPUB;	OR	OFF	2012/02/22 11:06

EAST Search History

			USPAT			
S17	15	S16 and @ad<"20080714"	US- PGPUB; USPAT	OR	OFF	2012/02/22 11:06
S18	14325	370/400,401.ccls.	US- PGPUB; USPAT	OR	OFF	2012/02/22 11:17
S19	166	S18 and S14	US- PGPUB; USPAT	OR	OFF	2012/02/22 11:17
S20	149	S19 and @ad<"20080714"	US- PGPUB; USPAT	OR	OFF	2012/02/22 11:17

2/ 22/ 2012 11:28:54 AM

C:\ Users\ bphunkulh\ Documents\ EAST\ Workspaces\ amendment\ % 12942642.wsp

Issue Classification 	Application/Control No. 12942642	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB PHUNKULH	Art Unit 2477

ORIGINAL						INTERNATIONAL CLASSIFICATION												
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED							
370			328			H	0	4	W	4 / 00 (2009.01.01)								
CROSS REFERENCE(S)																		
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																	
370	352	400																

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	17												
2	2	18	18												
3	3	19	19												
4	4	20	20												
5	5	21	21												
6	6	22	22												
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11	11		27												
12	12		28												
13	13		29												
14	14		30												
15	15														
16	16														

NONE		Total Claims Allowed:	
		25	
(Assistant Examiner)	(Date)		
/BOB PHUNKULH/	02/22/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

Application Number 	Application/Control No.	Applicant(s)/Patent under Reexamination	
	12/942,642	PAN, SHAOWEI	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 2/7/12	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:
jean proctor

U.S. Patent and Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Shaowei Pan

Title: SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A
DISTRIBUTED MOBILE ARCHITECTURE

App. No.: 12/942,642 Filed: November 9, 2010

Examiner: PHUNKULH, Bob A. Group Art Unit: 2477

Customer No.: 60533 Confirmation No.: 2064

Atty. Dkt. No.: 1082-0013-C1

M/S: Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NON-FINAL OFFICE ACTION

Dear Sir:

In response to the Non-Final Office Action mailed November 7, 2011 (the "Office Action"), please reconsider the above-identified application in light of the following amendments and remarks:

CLAIM AMENDMENTS:

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

1. (Original) A non-transitory computer-readable storage medium comprising instructions that, when executed by a processor, cause the processor to:

receive, at a first distributed mobile architecture (DMA) gateway of a DMA gateway communications network, communications information associated with a communications network that is accessible by a second DMA gateway of the DMA gateway communications network;

store the communications information at a memory of the first DMA gateway;

receive a communication associated with a destination device that is indicated by the communications information to be served by the second DMA gateway; and

route the communication to the destination device by relaying the communication from the first DMA gateway to the second DMA gateway via the DMA gateway communications network.

2. (Original) The non-transitory computer-readable storage medium of claim 1, wherein at least one of the first DMA gateway and the second DMA gateway includes a satellite-based DMA gateway, and wherein the DMA gateway communications network includes a satellite communications network.

3. (Original) The non-transitory computer-readable storage medium of claim 1, wherein the communications information is stored in a home location register, and wherein the communications information indicates one or more devices that are accessible by a DMA server.

4. (Original) The non-transitory computer-readable storage medium of claim 3, wherein the DMA server includes one of a ground-based DMA server and a satellite-based DMA server.

5. (Original) The non-transitory computer-readable storage medium of claim 1, wherein the communications information indicates one or more devices that are accessible by a legacy communications network.

6. (Original) The non-transitory computer-readable storage medium of claim 5, wherein the legacy communications network includes one of a public switched telephone network (PSTN), a wireless communication network serviced by a mobile switching center (MSC), a public internet protocol (IP) network, and an American National Standards Institute 41 (ANSI-41) network.

7. (Original) The non-transitory computer-readable storage medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to send a notification from the first DMA gateway to the second DMA gateway, wherein the notification indicates that the communications information is stored at the first DMA gateway.

8. (Original) The non-transitory computer-readable storage medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to automatically send at least a portion of the communications information from the first DMA gateway to the second DMA gateway via the DMA gateway communications network in response to the first DMA gateway receiving the communications information.

9. (Original) The non-transitory computer-readable storage medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to send at least a portion of the communications information from the first DMA gateway to the second DMA gateway via the DMA gateway communications network in response to the first DMA gateway receiving a query from the second DMA gateway for the communications information.

10. (Original) The non-transitory computer-readable storage medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to determine that the communications network that is accessible by the second DMA gateway is within a communications range of the first DMA gateway.

11. (Original) The non-transitory computer-readable storage medium of claim 10, further comprising instructions that, when executed by the processor, cause the processor to send communications network information from the first DMA gateway to the second DMA gateway, wherein the communications network information indicates that the communications network that is accessible by the second DMA gateway is within the communications range of the first DMA gateway.

12. (Original) The non-transitory computer-readable storage medium of claim 10, further comprising instructions that, when executed by the processor, cause the processor to send communications network information from the first DMA gateway to a central database, wherein the communications network information indicates that the communications network that is accessible by the second DMA gateway is within the communications range of the first DMA gateway.

13. (Original) The non-transitory computer-readable storage medium of claim 10, further comprising instructions that, when executed by the processor, cause the processor to receive additional communications network information from the second DMA gateway in response to the second DMA gateway determining that an additional communications network is within a second communications range of the second DMA gateway.

14. (Original) The non-transitory computer-readable storage medium of claim 12, further comprising instructions that, when executed by the processor, cause the processor to receive a second notification from the central database, the second notification indicating that second register data is stored at the central database.

15. (Original) The non-transitory computer-readable storage medium of claim 14, further comprising instructions that, when executed by the processor, cause the processor to determine that a second communications network is within a service area of the first DMA gateway.

16. (Original) The non-transitory computer-readable storage medium of claim 15, wherein the first DMA gateway determines that a private Internet Protocol (IP) network access point is within a communications range of the first DMA gateway, and wherein the first DMA gateway is adapted to communicate with the second communications network via the private IP network.

17. (Original) The non-transitory computer-readable storage medium of claim 1, wherein the first DMA gateway receives the communications information from one of the second DMA gateway and a central database.

18. (Original) A non-transitory computer-readable storage medium comprising instructions that, when executed by a processor, cause the processor to:

- receive, at a first distributed mobile architecture (DMA) server, first routing instructions from a first DMA gateway when the first DMA server is in a first service area of the first DMA gateway, wherein the first DMA gateway comprises a first orbiting satellite; and
- send a first call to the first DMA gateway via a private Internet Protocol (IP) network according to the first routing instructions, wherein the first call is received at the first DMA server from a first mobile communication device via a wireless transceiver integrated with the first DMA server,

wherein the first call is placed to a destination device that is accessible via a legacy communications network, wherein the legacy communications network is accessible via the first DMA gateway.

19. (Original) The non-transitory computer-readable storage medium of claim 18, wherein the first DMA server is adapted to send the first call while being transported from a first location to a second location.

20. (Original) The non-transitory computer-readable storage medium of claim 19, further comprising instructions that, when executed by the processor, cause the processor to receive second routing instructions from a second DMA gateway in response to the first DMA server moving into a second service area of the second DMA gateway, wherein the second service area includes the second location, and wherein the second DMA gateway comprises a second orbiting satellite.

21. (Original) The non-transitory computer-readable storage medium of claim 20, further comprising instructions that, when executed by the processor, cause the processor to send a second call received at the first DMA server from the first mobile communication device to the second DMA gateway via the private IP network according to the second routing instructions.

22. (Original) The non-transitory computer-readable storage medium of claim 21, wherein the second call is associated with a second destination device that is accessible via the legacy communications network.

23. (Original) The non-transitory computer-readable storage medium of claim 21, wherein the second call is associated with a second mobile communication device that is accessible via a second DMA server, wherein the second DMA server is accessible to the second DMA gateway via the private IP network.

24. (Original) The non-transitory computer-readable storage medium of claim 20, wherein the first DMA server receives the second routing instructions from the second DMA gateway during the first call.

25. (Original) The non-transitory computer-readable storage medium of claim 20, further comprising instructions that, when executed by the processor, cause the processor to send first DMA server register data from the first DMA server to the second DMA gateway in response to receiving the second routing instructions from the second DMA gateway.

26.- 30. (Canceled).

REMARKS

Applicant thanks the Examiner for indicating that claims 3-17 are allowable. Claims 1-25 are pending. Claims 26-30 have been canceled without prejudice or disclaimer.

Double Patenting Rejections

The Office has rejected claims 1, 2, and 18-25, at page 3 of the Office Action, under the judicially created doctrine of obviousness-type double patenting, as being unpatentable over claims 1, 2, and 33-40 of U.S. Patent No. 7,855,988. As suggested by the Examiner, Applicant has attached a terminal disclaimer. As such, Applicant respectfully requests the rejection of claims 1, 2, and 18-25 be withdrawn. Thus, all claims are allowable.

CONCLUSION

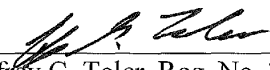
Accordingly, Applicant respectfully requests reconsideration and withdrawal of each of the objections and rejections, as well as an indication of the allowability of each of the pending claims.

The Examiner is invited to contact the undersigned attorney at the telephone number listed below if such a call would in any way facilitate allowance of this application.

The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account Number 50-2469.

Respectfully submitted,

2-7-2012
Date


Jeffrey G. Toler, Reg. No. 38,342
TOLER LAW GROUP
8500 Bluffstone Cove, Suite A201
Austin, TX 78759
Telephone: (512) 327-5515
Facsimile: (512) 327-5575

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**TERMINAL DISCLAIMER TO OBTAIN A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)
1082-0013-C1

In re Application of: SHAOWEI PAN

Application No.: 12/942,642

Filed: NOVEMBER 9, 2010

For: SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

The owner*, LEMKO CORPORATION, of 100 percent interest 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 **prior patent** No. 7,855,988 as the term of said prior patent is defined in 35 U.S.C. 154 and 173, and 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 as defined in 35 U.S.C. 154 and 173 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:

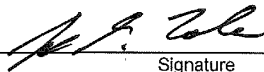
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner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

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

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.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 38342


Signature

3-7-2012
Date

Jeffrey G. Toler
Typed or printed name

512-327-5515
Telephone Number

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

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

*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.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Electronic Patent Application Fee Transmittal				
Application Number:		12942642		
Filing Date:		09-Nov-2010		
Title of Invention:		SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		
First Named Inventor/Applicant Name:		Shaowei Pan		
Filer:		Jeffrey G. Toler/Katherine Meals		
Attorney Docket Number:		1082-0013-C1		
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:				
Statutory or terminal disclaimer	1814	1	160	160
Total in USD (\$)				160

Electronic Acknowledgement Receipt	
EFS ID:	12021425
Application Number:	12942642
International Application Number:	
Confirmation Number:	2064
Title of Invention:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
First Named Inventor/Applicant Name:	Shaowei Pan
Customer Number:	60533
Filer:	Jeffrey G. Toler/Katherine Meals
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013-C1
Receipt Date:	07-FEB-2012
Filing Date:	09-NOV-2010
Time Stamp:	17:24:37
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	4682
Deposit Account	502469
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 1.21 (Miscellaneous fees and charges)	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		1082-0013- C1_Response_NFOA.pdf	964826 0340de4b2acbd5ad9be2a38e19e58cc3dd7cbb1	yes	7
	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	7	
Warnings:					
Information:					
2	Terminal Disclaimer Filed	1082-0013- C1_Terminal_Disclaimer.pdf	221557 6629450fae4be1246c3535178140106197d73fa	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30564 9014c69ae05f0b617acdf3d0d4d878c9cee677a6	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1216947		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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 12/942,642		Filing Date 11/09/2010		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)		SMALL ENTITY ☒		OR		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)			RATE (\$)	FEE (\$)		
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A				N/A			
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A				N/A			
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A				N/A			
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$	=			X \$	=		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=			X \$	=		
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	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).									
☐ 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				TOTAL			
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT	02/07/2012	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 25	Minus	** 30	= 0	X \$30 =	0	OR	X \$	=
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X \$125 =	0	OR	X \$	=
	☐ Application Size Fee (37 CFR 1.16(s))							OR		
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)		RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$	=	OR	X \$	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$	=	OR	X \$	=
	☐ Application Size Fee (37 CFR 1.16(s))							OR		
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							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:
/VENICE WILLIAMS/

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.
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1	2064
60533 7590 11/07/2011 TOLER LAW GROUP TOLER LAW GROUP 8500 BLUFFSTONE COVE SUITE A201 AUSTIN, TX 78759			EXAMINER PHUNKULH, BOB A	
			ART UNIT 2477	PAPER NUMBER
			MAIL DATE 11/07/2011	DELIVERY MODE PAPER

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.

Office Action Summary	Application No.		Applicant(s)		
	12/942,642		PAN, SHAOWEI		
	Examiner		Art Unit		
BOB PHUNKULH		2477			

-- 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 09 November 2010.

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) 1-30 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) 1,2 and 18-30 is/are rejected.

8) ☒ Claim(s) 1,2 and 18-30 is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 09 November 2010 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).

12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13) ☐ 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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>11/12/10, 11/09/10</u>	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
--	--

DETAILED ACTION

Double Patenting

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.

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).

Claims 1, 2, 18-25, are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 33-40 of U.S. Patent No. 7,855,988. Although the conflicting claims are not identical, they are not patentably distinct from each other because the metes and bounds of the claims cover the same subject matters.

Claim Rejections - 35 USC § 102

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

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims **PAN** are rejected under 35 U.S.C. 102(a) as being anticipated by **PAN** et al. (US 2006/0234774 A1), hereinafter **PAN**.

Regarding claim 26, **PAN** discloses a non-transitory computer-readable storage medium comprising instructions that, when executed by a processor, cause the processor to:

receive a first call via a first interface of an orbiting satellite, wherein the first interface is adapted to communicate with a legacy communications network, and wherein the call is directed to a mobile communication device that is accessible to a first

distributed mobile architecture (DMA) server (the first interface of the satellite 1814 receives call from legacy communication network via transceiver 1810, see figure 18 and paragraph 0085); and

route the first call to the first DMA server via a second interface of the orbiting satellite, wherein the second interface is adapted to communicate with a private internet protocol (IP) network, wherein the first DMA server includes a wireless transceiver to communicate with the mobile communication device (routing the call to DMA server 1802 via the second interface of the satellite 1814, see figure 18 and paragraph 0085).

Regarding claim 28, **PAN** discloses instructions that, when executed by the processor, cause the processor to: receive a second call via the second interface of the orbiting satellite, wherein the second call is directed to a destination device that is accessible to the legacy communications network; and route the second call to the legacy communications network via the first interface of the orbiting satellite (the call received from the DMA 1802 is forward to the calls destination via satellite 1814, see paragraph 0085 and figure 18).

Regarding claim 30, **PAN** discloses instructions that, when executed by the processor, cause the processor to: receive a second call via the second interface of the orbiting satellite, wherein the second call is directed to a destination device that is associated with a second legacy communication network; and route the second call to a second orbiting satellite via a third interface of the orbiting satellite, wherein the third

interface is adapted to communicate with a satellite communications network, wherein the second orbiting satellite is adapted to route the second call to the destination device via the second legacy communications network (the call receive from the first legacy communication via transceiver 1810 is further forwards to it destination via the second legacy communication via transceiver 1812, see figure 18 and paragraph 0085).

Claim Rejections - 35 USC § 103

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.

Claims 27, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over **PAN**, in view of **WIEDEMAN** et al. US 6,985,454 B1, hereinafter **WIEDEMAN**.

Regarding claims 27, 29, **PAN** fails to disclose a second mobile devices that is accessible to a second DMA server or the satellite communication system includes other satellites for relaying the call to it destination.

WIEDEMAN, on the other hand, discloses the satellites communication system includes a plurality of satellites and a plurality of gateways for routing the communication call to it indented destination (see figure 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to includes **WIEDEMAN** teaching especially the plurality of satellites and a plurality of gateways (DMA) in the system taught by **PAN** in order to

provides a technique to extend the Internet with satellites thereby enabling remote users to access the Internet.

Allowable Subject Matter

Claims 3-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any response to this action should be mailed to:

The following address mail to be delivered by the United States Postal Service (USPS) only:

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

or faxed to:

(571) 273-8300, (for formal communications intended for entry)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Bob A. Phunkulh** whose telephone number is **(571) 272-3083**. The examiner can normally be reached on Monday-Thursday from 8:00 A.M. to 5:00 P.M. (first week of the bi-week) and Monday-Friday (for second week of the bi-week).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor **Chirag G. Shah**, can be reach on **(571) 272-3144**. The fax phone number for this group 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).

/BOB A PHUNKULH/
Primary Examiner, Art Unit 2477

Notice of References Cited	Application/Control No. 12/942,642	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI	
	Examiner BOB PHUNKULH	Art Unit 2477	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2006/0234747 A1	10-2006	Pan, Shaowei	455/519
*	B	US-2006/0234774 A1	10-2006	Pan et al.	455/560
*	C	US-2009/0003269 A1	01-2009	Kumazawa et al.	370/328
*	D	US-6,735,184 B1	05-2004	Davidson et al.	370/316
*	E	US-6,985,454 B1	01-2006	Wiedeman et al.	370/316
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No. 12942642	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB PHUNKULH	Art Unit 2477

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (text search)	10/18/2011	BAP
EAST (text search)	10/19/2011	BAP

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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BIB DATA SHEET

CONFIRMATION NO. 2064

SERIAL NUMBER 12/942,642	FILING or 371(c) DATE 11/09/2010 RULE	CLASS 370	GROUP ART UNIT 2477	ATTORNEY DOCKET NO. 1082-0013-C1		
APPLICANTS Shaowei Pan, Kildeer, IL; ** CONTINUING DATA ***** This application is a CON of 12/172,639 07/14/2008 PAT 7,855,988 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 11/22/2010						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /BOB A PHUNKULH/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY IL	SHEETS DRAWINGS 15	TOTAL CLAIMS 30	INDEPENDENT CLAIMS 3
ADDRESS TOLER LAW GROUP TOLER LAW GROUP 8500 BLUFFSTONE COVE SUITE A201 AUSTIN, TX 78759 UNITED STATES						
TITLE SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE						
FILING FEE RECEIVED 722	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees		
				☐ 1.16 Fees (Filing)		
				☐ 1.17 Fees (Processing Ext. of time)		
				☐ 1.18 Fees (Issue)		
				☐ Other _____		
				☐ Credit		

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	7	12/172639	US-PGPUB; USPAT	OR	ON	2011/10/18 08:15
S2	1	"20060114934".pn.	US-PGPUB; USPAT	OR	ON	2011/10/18 09:11
S3	1825	dma near2 (host server)	US-PGPUB; USPAT	OR	ON	2011/10/18 09:21
S4	129	S3 and (satellite)	US-PGPUB; USPAT	OR	ON	2011/10/18 09:21
S5	117	S4 and @Ad< "20080714"	US-PGPUB; USPAT	OR	ON	2011/10/18 09:22
S7	86	distribut\$3 near2 mobile near2 architecture	US-PGPUB; USPAT	OR	ON	2011/10/18 09:30
S8	66	S7 and @Ad< "20080714"	US-PGPUB; USPAT	OR	ON	2011/10/18 09:30
S9	1	"7561569".pn.	US-PGPUB; USPAT	OR	ON	2011/10/18 10:51
S10	1	"7855988".pn.	US-PGPUB; USPAT	OR	ON	2011/10/19 11:22
S11	7021	(mobile wireless) near2 (hosts! servers!)	US-PGPUB; USPAT	OR	ON	2011/10/19 11:26
S12	8946	(mobile wireless) near2 (hosts! servers! gateways!)	US-PGPUB; USPAT	OR	ON	2011/10/19 11:26
S13	2279	(mobile wireless) near2 (hosts! servers! gateways!) same (rout\$4 forward\$4)	US-PGPUB; USPAT	OR	ON	2011/10/19 11:28
S14	12247	(mobile wireless) near2 (host server gateway) same (rout\$4 forward\$4)	US-PGPUB; USPAT	OR	ON	2011/10/19 11:29

S15	834	S14 same (receiv\$4) same (destinat\$4)	US-PGPUB; USPAT	OR	ON	2011/10/19 11:29
S16	719	S15 and @Ad<"20080714"	US-PGPUB; USPAT	OR	ON	2011/10/19 11:29
S17	210	S14 same (receiv\$4) same (destinat\$4) same (stor\$4)	US-PGPUB; USPAT	OR	ON	2011/10/19 11:30
S18	183	S17 and @Ad<"20080714"	US-PGPUB; USPAT	OR	ON	2011/10/19 11:30
S19	6	S14 same (receiv\$4) same (destinat\$4) same (stor\$4) same relay\$4	US-PGPUB; USPAT	OR	ON	2011/10/19 11:30
S20	5	S19 and @Ad<"20080714"	US-PGPUB; USPAT	OR	ON	2011/10/19 11:31
S21	27127	(mobile wireless) near2 (host server gateway node point router) same (stor\$4)	US-PGPUB; USPAT	OR	ON	2011/10/19 11:32
S22	885	S21 same relay\$4	US-PGPUB; USPAT	OR	ON	2011/10/19 11:32
S23	656	S22 and @Ad<"20080714"	US-PGPUB; USPAT	OR	ON	2011/10/19 13:32
S24	7577	S21 same (rout\$4 forward\$4)	US-PGPUB; USPAT	OR	ON	2011/10/19 13:33
S25	361	S24 same relay\$4	US-PGPUB; USPAT	OR	ON	2011/10/19 13:34
S26	278	S25 and @Ad<"20080714"	US-PGPUB; USPAT	OR	ON	2011/10/19 13:34
S27	99	S26 and satellite	US-PGPUB; USPAT	OR	ON	2011/10/19 13:42
S28	86	distribut\$4 near2 mobile near2 architecture	US-PGPUB; USPAT	OR	ON	2011/10/20 12:11
S29	66	S28 and @Ad<"20080714"	US-PGPUB; USPAT	OR	ON	2011/10/20 12:11

S30	62982	(satellite) same (ip adj network packet adj network internet)	US-PGPUB; USPAT	OR	ON	2011/10/21 14:55
S31	3243	S30 and (legacy)	US-PGPUB; USPAT	OR	ON	2011/10/21 14:55
S32	1353	S31 and router	US-PGPUB; USPAT	OR	ON	2011/10/21 14:55
S33	1027	S32 and @Ad< "20080714"	US-PGPUB; USPAT	OR	ON	2011/10/21 14:55
S34	927	S33 and (distribut\$4)	US-PGPUB; USPAT	OR	ON	2011/10/21 14:56
S35	630	S34 and private	US-PGPUB; USPAT	OR	ON	2011/10/21 14:56
S36	414	S34 and private near4 network	US-PGPUB; USPAT	OR	ON	2011/10/21 14:56
S37	239	receiv\$4 near2 call same (satellite) same (ip adj network packet adj network internet)	US-PGPUB; USPAT	OR	ON	2011/10/21 14:57
S38	70	S37 same (rout\$4 forward \$4)	US-PGPUB; USPAT	OR	ON	2011/10/21 14:58
S39	46	S38 and @Ad< "20080714"	US-PGPUB; USPAT	OR	ON	2011/10/21 14:58
S40	280	receiv\$4 near2 call same (satellite) same rout\$4	US-PGPUB; USPAT	OR	ON	2011/10/21 15:00
S41	248	S40 and @Ad< "20080714"	US-PGPUB; USPAT	OR	ON	2011/10/21 15:00
S42	712	satellite.ab,ti. and rout\$4.ab,ti.	US-PGPUB; USPAT	OR	ON	2011/10/21 15:02
S43	650	S42 and @Ad< "20080714"	US-PGPUB; USPAT	OR	ON	2011/10/21 15:02
S44	43	S43 and (ip adj network)	US-PGPUB; USPAT	OR	ON	2011/10/21 15:03

S45	1	"7855988".PN.	US-PGPUB; USPAT	OR	ON	2011/10/22 11:08
S46	6	(US-20060234774-\$ or US-20060234747-\$ or US-20060098661-\$ or US-20090003269-\$).did. or (US-6985454-\$ or US-6735184-\$).did.	US-PGPUB; USPAT	OR	ON	2011/10/22 11:14
S47	5	S46 AND (satellite)	US-PGPUB; USPAT	OR	ON	2011/10/22 11:14
S48	5	S46 AND (satellite) and internet	US-PGPUB; USPAT	OR	ON	2011/10/22 11:19
S49	2	S46 AND (satellites!) and internet	US-PGPUB; USPAT	OR	ON	2011/10/22 12:15

EAST Search History (Interference)

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10/ 23/ 11 6:41:45 PM

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12942642.wsp**

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12942642	
	Filing Date		2010-11-09	
	First Named Inventor	Shaowei Pan		
	Art Unit	2477		
	Examiner Name	Bob A. Phunkulh		
	Attorney Docket Number	1082-0013-C1		

U.S.PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Patent citation information please click the Add button.								
U.S.PATENT APPLICATION PUBLICATIONS								
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
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If you wish to add additional U.S. Published Application citation information please click the Add button.								
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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							☐
If you wish to add additional Foreign Patent Document citation information please click the Add button								
NON-PATENT LITERATURE DOCUMENTS								
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T ⁵

EFS Web 2.1.17

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /BAP/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12942642
	Filing Date		2010-11-09
	First Named Inventor	Shaowei Pan	
	Art Unit	2477	
	Examiner Name	Bob A. Phunkulh	
	Attorney Docket Number	1082-0013-C1	

1	Non-Final Office Action for U.S. Application No. 12/172,639 (Attorney Docket No. 1082-0013), mailed May 21, 2010, 6 pages.	☐
2	Notice of Allowance and Fee(s) Due for U.S. Application No. 12/172,639 (Attorney Docket No. 1082-0013), mailed September 17, 2010, 4 pages.	☐
If you wish to add additional non-patent literature document citation information please click the Add button		
EXAMINER SIGNATURE		
Examiner Signature	/Bob Phunkulh/	Date Considered 11/03/2011
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.		
¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.		

<i>Index of Claims</i> 	Application/Control No. 12942642	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB PHUNKULH	Art Unit 2477

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant											☐ CPA											☐ T.D.											☐ R.1.47										
CLAIM			DATE																																								
Final	Original	10/23/2011																																									
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	2	✓																																									
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Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12/942,642	
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	First Named Inventor	Shaowei Pan		
	Art Unit	2477		
	Examiner Name	Bob A. Phunkulh		
	Attorney Docket Number	1082-0013-C1		

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7054322	B2	2006-05-30	D'Annunzio et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						
U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060114934	A1	2006-06-01	Shin et al.	
	2	20030048766	A1	2003-03-13	D'Annunzio et al.	
	3	20020009060	A1	2002-01-24	Gross	
	4	20070230352	A1	2007-10-04	Kokku et al.	
	5	20050091392	A1	2005-04-28	Gesswein et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12/942642	
	Filing Date			
	First Named Inventor	Shaowei Pan		
	Art Unit	2477		
	Examiner Name	Bob A. Phunkulh		
	Attorney Docket Number	1082-0013-C1		

	6	20060258358	A1	2006-11-16	Kallio	
	7	20060098661	A1	2006-05-11	Pan	
	8	20070147598	A1	2007-06-28	Somes et al.	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							☐

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	1	The International Search Report and the Written Opinion from the International Searching Authority (ISA/KR) for International Application No. PCT/US2009/045973, mailed January 18, 2010, 14 pages.	☐

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/942,642	11/09/2010	Shaowei Pan	1082-0013-C1

CONFIRMATION NO. 2064

PUBLICATION NOTICE



OC000000046470934

60533
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

Title:SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

Publication No.US-2011-0060853-A1

Publication Date:03/10/2011

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.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/942,642	11/09/2010	2182	722	1082-0013-C1	30	3

CONFIRMATION NO. 2064

FILING RECEIPT



OC000000044619505

60533
TOLER LAW GROUP
TOLER LAW GROUP
8500 BLUFFSTONE COVE
SUITE A201
AUSTIN, TX 78759

Date Mailed: 12/03/2010

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)

Shaowei Pan, Kildeer, IL;

Assignment For Published Patent Application

Lemko Corporation, Schaumburg, IL

Power of Attorney: The patent practitioners associated with Customer Number 60533

Domestic Priority data as claimed by applicant

This application is a CON of 12/172,639 07/14/2008 PAT 7,855,988

Foreign Applications

If Required, Foreign Filing License Granted: 11/22/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/942,642**

Projected Publication Date: 03/10/2011

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE
ARCHITECTURE

Preliminary Class

710

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 12/942,642				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA		RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)		
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	82		N/A			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A		N/A	270		N/A			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	110		N/A			
TOTAL CLAIMS (37 CFR 1.16(i))	30	minus 20 =	*	10	x 26 =	260	OR			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3	minus 3 =	*		x 110 =	0.00				
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).				0.00					
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					0.00					
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL		TOTAL		
						722				
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
TOTAL ADD'L FEE								OR	TOTAL ADD'L FEE	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							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 found in the appropriate box in column 1.										

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET Substitute for Form PTO-1360 (For use with Form PTO/SB/06)							Application Number 12942642		Filing Date		
							Applicant(s) Shaowei Pan				
							* May be used for additional claims or amendments				
CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT			*		*	
	Indep	Depend	Indep	Depend	Indep	Depend		Indep	Depend	Indep	Depend
1	1										
2		1									
3		1									
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46											
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48											
49											
50											
Total Indep	3		0		0						
Total Depend	27		0		0						
Total Claims	30		0		0						
51											
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Electronic Acknowledgement Receipt

EFS ID:	8801999
Application Number:	12942642
International Application Number:	
Confirmation Number:	2064
Title of Invention:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
First Named Inventor/Applicant Name:	Shaowei Pan
Customer Number:	60533
Filer:	Jeffrey G. Toler/Hanna Kim
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013-C1
Receipt Date:	09-NOV-2010
Filing Date:	
Time Stamp:	16:39:59
Application Type:	Utility under 35 USC 111(a)

11/22/2010 VVAN11 00000007 502469 12942642
01 FC:2202 78.00 DA

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$644
RAM confirmation Number	3199
Deposit Account	502469
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 1.17 (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		0013_C1_Application.pdf	164543 9077e20c9a2a57c7cf9e14f505cc1d3ae94c95e4	yes	40
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	31	
	Claims		32	39	
	Abstract		40	40	
Warnings:					
Information:					
2	Drawings-only black and white line drawings	0013_C1_Drawings.pdf	261478 245004dc06a47945d1d6cddb7d7a9ba97a7e7cd	no	15
Warnings:					
Information:					
3	Application Data Sheet	ADS.pdf	635693 d3d5512a0389eeed4edf162944f1040944253ec57	no	3
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
4	Oath or Declaration filed	Declaration_and_POA.pdf	353388 5a6aca6f97ed14b662424689ea626ca667132b6b	no	2
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Filed (SB/08)	IDS.pdf	627290 cdfdc0a6009fd7847ce1fd4c3ec96f4def0e309	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12942642
	Filing Date		2010-11-09
	First Named Inventor	Shaowei Pan	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	1082-0013-C1	

U.S.PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Patent citation information please click the Add button.								
U.S.PATENT APPLICATION PUBLICATIONS								
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1							
If you wish to add additional U.S. Published Application citation information please click the Add button.								
FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							☐
If you wish to add additional Foreign Patent Document citation information please click the Add button								
NON-PATENT LITERATURE DOCUMENTS								
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T ⁵

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12942642
	Filing Date		2010-11-09
	First Named Inventor	Shaowei Pan	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	1082-0013-C1	

1	Non-Final Office Action for U.S. Application No. 12/172,639 (Attorney Docket No. 1082-0013), mailed May 21, 2010, 6 pages.	☐
2	Notice of Allowance and Fee(s) Due for U.S. Application No. 12/172,639 (Attorney Docket No. 1082-0013), mailed September 17, 2010, 4 pages.	☐
If you wish to add additional non-patent literature document citation information please click the Add button		
EXAMINER SIGNATURE		
Examiner Signature		Date Considered
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.		
¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12942642
	Filing Date		2010-11-09
	First Named Inventor	Shaowei Pan	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		1082-0013-C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the 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 the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

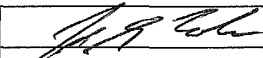
☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature		Date (YYYY-MM-DD)	2010-11-12
Name/Print	Jeffrey G. Toler	Registration Number	38,342

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour 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.**

Electronic Acknowledgement Receipt	
EFS ID:	8830050
Application Number:	12942642
International Application Number:	
Confirmation Number:	2064
Title of Invention:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
First Named Inventor/Applicant Name:	Shaowei Pan
Customer Number:	60533
Filer:	Jeffrey G. Toler/Hanna Kim
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013-C1
Receipt Date:	12-NOV-2010
Filing Date:	
Time Stamp:	17:31:40
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	Information Disclosure Statement (IDS) Filed (SB/08)	0013_C1_IDS.pdf	493292	no	3
			06fd8e7d72874a963d6438dbb4ff1495c92 eff33		
Warnings:					
Information:					

This is not an USPTO supplied IDS fillable form					
2	NPL Documents	NFOA_05_21_2010.pdf	173486 e2b54bc20b43065fc664bdb6411c4fd620903866	no	6
Warnings:					
Information:					
3	NPL Documents	NOA_09_17_2010.pdf	252615 d997ac2c52686e545d4dd81940f173405d68e94	no	4
Warnings:					
Information:					
Total Files Size (in bytes):			919393		
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. <u>New Applications Under 35 U.S.C. 111</u> 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Shaowei Pan	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	1082-0013-C1	

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	7054322	B2	2006-05-30	D'Annunzio et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						
U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	20060114934	A1	2006-06-01	Shin et al.	
	2	20030048766	A1	2003-03-13	D'Annunzio et al.	
	3	20020009060	A1	2002-01-24	Gross	
	4	20070230352	A1	2007-10-04	Kokku et al.	
	5	20050091392	A1	2005-04-28	Gesswein et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Shaowei Pan	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	1082-0013-C1	

	6	20060258358	A1	2006-11-16	Kallio	
	7	20060098661	A1	2006-05-11	Pan	
	8	20070147598	A1	2007-06-28	Somes et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	The International Search Report and the Written Opinion from the International Searching Authority (ISA/KR) for International Application No. PCT/US2009/045973, mailed January 18, 2010, 14 pages.	☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

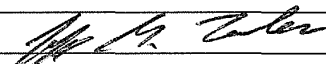
Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Shaowei Pan	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	1082-0013-C1	

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Shaowei Pan	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	1082-0013-C1	

CERTIFICATION STATEMENT			
Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):			
☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).			
OR			
☐ That no item of information contained in the 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 the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).			
☐ See attached certification statement.			
☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.			
☒ None			
SIGNATURE			
A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.			
Signature		Date (YYYY-MM-DD)	2010-11-09
Name/Print	Jeffrey G. Toler	Registration Number	38,342
This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour 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.			

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

JEFFREY G. TOLER

8500 BLUFFSTONE COVE, SUITE A201 AUSTIN TX 78759
USA**PCT****NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION**

(PCT Rule 44.1)

Applicant's or agent's file reference

1082-0013-WO

International application No.

PCT/US2009/045973

Date of mailing

(day/month/year) 18 JANUARY 2010 (18.01.2010)

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International filing date

(day/month/year)

02 JUNE 2009 (02.06.2009)

Applicant

LEMKO CORPORATION et al

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70**For more detailed instructions,** see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.**4. Reminders**

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/KR



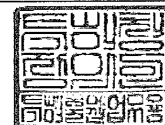
Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro,
Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

COMMISSIONER

Telephone No. 82-42-481-5762



Form PCT/ISA/220 (July 2009)

(See notes on accompanying sheet)

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*.

In these Notes, "Article", "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Annex B).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, paragraph 296).

What parts of the international application may be amended ?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When ? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments ?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How ? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet or sheets containing a complete set of claims in replacement of all the claims previously filed must be submitted.

Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively in Arabic numerals (Section 205(a)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments ?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1 - 10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the proceduer before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1*bis*(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43*bis*.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, National Chapters.

* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for three months from the date of mailing of the international search report.

<http://www.kipo.go.kr/en/> => Patent Search => PCT-Service

ID : PCT international application number

PW : **H4UQ3CEB**

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: <http://www.ipkcenter.com>

Email: ipkc@ipkcenter.com

Phone: +1 703 388 1066

Fax: +1 703 388 1084

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 1082-0013-WO	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2009/045973	International filing date (<i>day/month/year</i>) 02 JUNE 2009 (02.06.2009)	(Earliest) Priority Date (<i>day/month/year</i>) 14 JULY 2008 (14.07.2008)
Applicant LEMKO CORPORATION et al		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1
☒ as suggested by the applicant.
☐ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figure is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/045973**A. CLASSIFICATION OF SUBJECT MATTER****H04L 12/56(2006.01)**

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC : H04L, H04Q, H04J, H04M, G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

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

eKOMPASS(KIPO internal) "Distributed Mobile Architecture (DMA), gateway, server, rout*, HLR, VLR"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006-0258358 A1 (Juha Kallio) 16 November 2006 See the abstract; figures 2 and 4B; paragraph [0012]-[0014], [0018], [0053]-[0055] and [0062]	1-46
A	US 2006-0098661 A1 (Shaowei Pan) 11 May 2006 See figures 14-15; paragraph [0033], [0063] and [0069]-[0070]; claims 52-60	1-46
A	US 2007-0147598 A1 (Brian E. Somes et al.) 28 June 2007 See figure 1; paragraph [0006], [0013]-[0015] and [0018]-[0020]	1-46
A	US 2007-0230352 A1 (Ravindranath Kokku et al.) 04 October 2007 See the abstract; figure 1; paragraph [0011] and [0022]	1-46
A	US 2005-0091392 A1 (Lothar Gesswein et al.) 28 April 2005 See the abstract; figure 1; paragraph [0029]-[0030]	1-46

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search

15 JANUARY 2010 (15.01.2010)

Date of mailing of the international search report

18 JANUARY 2010 (18.01.2010)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-
gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KIM, Sae Young

Telephone No. 82-42-481-5685



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/045973

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006-0258358 A1	16.11.2006	FI 20050500 D0 WO 2006-120289 A2 WO 2006-120289 A3	11.05.2005 16.11.2006 04.01.2007
US 2006-0098661 A1	11.05.2006	CN 101044769 A0 CN 101044769 A EP 1810465 A2 GB 2435751 A US 2008-0039144 A1 US 07486967 B2 US 07539158 B2 US 07548763 B2 US 2006-0234747 A1 US 2006-0234774 A1 WO 2006-052342 A2 WO 2006-052342 A3	26.09.2007 26.09.2007 25.07.2007 05.09.2007 14.02.2008 03.02.2009 26.05.2009 16.06.2009 19.10.2006 19.10.2006 18.05.2006 18.05.2006
US 2007-147598 A1	28.06.2007	US 07424106 B2	09.09.2008
US 2007-230352 A1	04.10.2007	NONE	
US 2005-0091392 A1	28.04.2005	DE 10163478 A1 DE 10163478 C2 EP 1457021 A1 WO 2003-056776 A8 WO 2003-056776 A1	17.07.2003 18.12.2003 15.09.2004 08.05.2008 10.07.2003

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

JEFFREY G. TOLER

8500 BLUFFSTONE COVE, SUITE A201 AUSTIN TX
78759 USA

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

18 JANUARY 2010 (18.01.2010)

Applicant's or agent's file reference
1082-0013-WO

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2009/045973

International filing date (day/month/year)

02 JUNE 2009 (02.06.2009)

Priority date(day/month/year)

14 JULY 2008 (14.07.2008)

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

H04L 12/56(2006.01)i

Applicant

LEMKO CORPORATION et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR
Korean Intellectual Property Office
Government Complex-Daejeon, 139
Seonsa-ro, Seo-gu, Daejeon 302
-701, Republic of Korea
Facsimile No. 82-42-472-7140



Date of completion of this opinion

15 JANUARY 2010 (15.01.2010)

Authorized officer

KIM, Sae Young

Telephone No.82-42-481-5685



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2009/045973

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
- ☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper
- ☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
- ☐ filed together with the international application in electronic form.
- ☐ furnished subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2009/045973

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-46	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-46	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-46	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: US 2006-0258358 A1
D2: US 2006-0098661 A1
D3: US 2007-0147598 A1
D4: US 2007-0230352 A1
D5: US 2005-0091392 A1

D1 relates to a method for performing inter-system handovers in a communication system comprising at least a mobile station, a call state control function, a first and a second call control node, a first and a second media gateway and a radio network node.

D2 relates generally to the distributed mobile communication systems.

D3 relates generally to telecommunications and, more particularly, to providing connections between carriers.

D4 relates to communication networks, and more particularly, to a multipath routing architecture and congestion control protocol for harnessing network capacity across multiple Internet paths for point-to-point large data transfers.

D5 relates to a method for codec negotiation for a data transmission between two media gateways and to a device related hereto.

1. Novelty and Inventive Step

1.1 Claims [1-21]

Claim 1 discloses a method, comprising: receiving at a first distributed mobile architecture (DMA) gateway communications information for a communications network accessible by a second DMA gateway,

(Continued on the Supplemental Box)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2009/045973

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- The expression "the call" in claim 22, line 35 is more or less vague and unclear.
- The number "20" in claim 31 appears to be a mistake of a number "22" in writing.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2009/045973

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of :

(Box No. V)

the communications information indicating one or more devices accessible by one of a DMA server and a legacy communications network, wherein the first DMA gateway and the second DMA gateway participate in a DMA gateway communications network; storing the communications information in a home DMA register of the first DMA gateway; receiving a communication at the first DMA gateway for a target device indicated by the communications information to be served by the second DMA gateway; and routing the communication from the first DMA gateway to the target device by relaying the communication from the first DMA gateway to the second DMA gateway via the DMA gateway communications network.

However, none of the documents D1-D5 disclose the technical features of claim 1. Moreover, it is not obvious for a person skilled in the art to arrive at claim 1 by applying the features in D1-D5.

Therefore, claim 1 is considered to be novel under PCT Article 33(2) and an inventive step is also present in the subject matter of the claim under PCT Article 33(3). Accordingly, the subject matter of claims 2-21, which are directly or indirectly dependent on claim 1, is considered to be novel under PCT Article 33(2) and to involve an inventive step under PCT Article 33(3).

1.2 Claims [22-32]

Claim 22 discloses a network communications system, comprising: a first interface adapted to communicate with a legacy communications network; a second interface adapted to communicate with a private Internet Protocol (IP) network; a third interface adapted to communicate with a DMA gateway communications network; and a server having logic adapted to: receive legacy network information from a second DMA gateway, the legacy network information indicating that the legacy communications network is in a communications range of the second DMA gateway; and forward information associated with a communication received from a DMA server via the second interface to the second DMA gateway via the third interface; wherein the call is placed to a destination device accessible via the legacy communications network.

(Continued on the next page)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2009/045973

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of :

(the previous page)

However, none of the documents D1-D5 disclose the technical features of claim 22. Moreover, it is not obvious for a person skilled in the art to arrive at claim 22 by applying the features in D1-D5. Therefore, claim 22 is considered to be novel under PCT Article 33(2) and an inventive step is also present in the subject matter of the claim under PCT Article 33(3). Accordingly, the subject matter of claims 23-32, which are directly or indirectly dependent on claim 22, is considered to be novel under PCT Article 33(2) and to involve an inventive step under PCT Article 33(3).

1.3 Claims [33-41]

Claim 33 discloses a method of routing calls via a communications network, the method comprising: receiving first routing instructions at a first distributed mobile architecture (DMA) server from a first DMA gateway when the first DMA server is in a first service area of the first DMA gateway, the first DMA gateway comprising a first orbiting satellite; and sending a first call received at the first DMA server from a first mobile communications device via a wireless transceiver integrated with the first DMA server to the first DMA gateway via a private Internet Protocol (IP) network according to the first routing instructions; wherein the first call placed to a destination device accessible via a legacy communications network, the legacy communication network accessible via the first DMA gateway.

However, none of the documents D1-D5 disclose the technical features of claim 33. Moreover, it is not obvious for a person skilled in the art to arrive at claim 33 by applying the features in D1-D5. Therefore, claim 33 is considered to be novel under PCT Article 33(2) and an inventive step is also present in the subject matter of the claim under PCT Article 33(3). Accordingly, the subject matter of claims 34-41, which are directly or indirectly dependent on claim 33, is considered to be novel under PCT Article 33(2) and to involve an inventive step under PCT Article 33(3).

1.4 Claims [42-45]

Claim 42 discloses a network communications system, comprising: a distributed mobile architecture (DMA) server coupled to a wireless transceiver, the DMA server including: a first interface adapted to communicate with a private Internet Protocol (IP) network; a second interface adapted to communicate with a gateway communications network; and a server having logic adapted to: receive a call from a mobile communications device via the wireless transceiver; and send call information related to the call to a DMA gateway, the DMA

(Continued on the next page)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2009/045973

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of :

(the previous page)

gateway; wherein the call is placed to a destination device accessible via a legacy communications network, the legacy communications network accessible via the DMA gateway.

However, none of the documents D1-D5 disclose the technical features of claim 42. Moreover, it is not obvious for a person skilled in the art to arrive at claim 42 by applying the features in D1-D5. Therefore, claim 42 is considered to be novel under PCT Article 33(2) and an inventive step is also present in the subject matter of the claim under PCT Article 33(3). Accordingly, the subject matter of claims 43-45 dependent on claim 42, is considered to be novel under PCT Article 33(2) and to involve an inventive step under PCT Article 33(3).

1.5 Claim 46

Claim 46 discloses an orbiting satellite, comprising: a first interface adapted to communicate with a legacy communications network; second interface adapted to communicate with a private Internet Protocol (IP) network; and a server having logic adapted to: receive a call via the first interface, the call placed to a first mobile communications device accessible to a first distributed mobile architecture (DMA) server; and route the call to the first DMA server via the second interface, wherein the first DMA server includes a wireless transceiver to communicate with the first mobile communications device.

However, none of the documents D1-D5 disclose the technical features of claim 46. Moreover, it is not obvious for a person skilled in the art to arrive at claim 46 by applying the features in D1-D5. Therefore, claim 46 is considered to be novel under PCT Article 33(2) and an inventive step is also present in the subject matter of the claim under PCT Article 33(3).

2. Industrial Applicability

The industrial applicability of claims 1-46 is self-evident in the sense of PCT Article 33(4) because the subject matter claimed can be made or used in industry.

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.

UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	1082-0013-C1
	First Inventor	Shaowei Pan
	Title	System, Method, and Device for...
	Express Mail Label No.	

APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents.	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria VA 22313-1450										
1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) 2. ☒ Applicant claims small entity status. See 37 CFR 1.27. 3. ☒ Specification [Total Pages <u>40</u>] Both the claims and abstract must start on a new page (For information on the preferred arrangement, see MPEP 608.01(a)) 4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets <u>15</u>] 5. Oath or Declaration [Total Sheets <u> </u>] a. ☐ Newly executed (original or copy) b. ☒ A copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional with Box 18 completed) i. ☐ DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b). 6. ☒ Application Data Sheet. See 37 CFR 1.76 7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) ☐ Landscape Table on CD 8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. – c. are required) a. ☐ Computer Readable Form (CRF) b. ☐ Specification Sequence Listing on: i. ☐ CD-ROM or CD-R (2 copies); or ii. ☐ Paper c. ☐ Statements verifying identity of above copies	ACCOMPANYING APPLICATION PARTS 9. ☒ Assignment Papers (cover sheet & document(s)) Name of Assignee <u>Lemko Corporation</u> 10. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☒ Power of Attorney 11. ☐ English Translation Document (if applicable) 12. ☒ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☒ Copies of citations attached 13. ☐ Preliminary Amendment 14. ☐ Return Receipt Postcard (MPEP 503) (Should be specifically itemized) 15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 16. ☐ Nonpublication Request under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. 17. ☐ Other: _____										
18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76: ☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: <u>12/172,639</u>..... Prior application information: Examiner <u>Phunkulh, Bob A.</u> Art Unit: <u>2477</u>											
19. CORRESPONDENCE ADDRESS											
☒ The address associated with Customer Number: <u>60533</u> OR ☐ Correspondence address below											
<table border="1"><tr><td colspan="2">Name</td></tr><tr><td colspan="2">Address</td></tr><tr><td>City</td><td>State</td></tr><tr><td>Country</td><td>Zip Code</td></tr><tr><td>Telephone</td><td>Email</td></tr></table>		Name		Address		City	State	Country	Zip Code	Telephone	Email
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<table border="1"><tr><td>Signature</td><td></td><td>Date</td><td><u>11-09-2010</u></td></tr><tr><td>Name (Print/Type)</td><td>Jeffrey G. Toler</td><td>Registration No. (Attorney/Agent)</td><td>38,342</td></tr></table>		Signature		Date	<u>11-09-2010</u>	Name (Print/Type)	Jeffrey G. Toler	Registration No. (Attorney/Agent)	38,342		
Signature		Date	<u>11-09-2010</u>								
Name (Print/Type)	Jeffrey G. Toler	Registration No. (Attorney/Agent)	38,342								

This collection of information is required by 37 CFR 1.53(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.**
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Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		
First Named Inventor/Applicant Name:		Shaowei Pan		
Filer:		Jeffrey G. Toler/Hanna Kim		
Attorney Docket Number:		1082-0013-C1		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Claims in excess of 20	2202	7	26	182
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				644

Electronic Acknowledgement Receipt	
EFS ID:	8801999
Application Number:	12942642
International Application Number:	
Confirmation Number:	2064
Title of Invention:	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
First Named Inventor/Applicant Name:	Shaowei Pan
Customer Number:	60533
Filer:	Jeffrey G. Toler/Hanna Kim
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013-C1
Receipt Date:	09-NOV-2010
Filing Date:	
Time Stamp:	16:39:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 644
RAM confirmation Number	3199
Deposit Account	502469
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 1.17 (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		0013_C1_Application.pdf	164543 9077e20c9a2a57e7cf9e14f505cc1d3aea4c95e4	yes	40
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	31	
	Claims		32	39	
	Abstract		40	40	
Warnings:					
Information:					
2	Drawings-only black and white line drawings	0013_C1_Drawings.pdf	261478 245004dc06a47945d1d6cddb7d7a9ba97a7e7cd	no	15
Warnings:					
Information:					
3	Application Data Sheet	ADS.pdf	635693 d3d5512a0389eeec4edf162944f1040944253ec57	no	3
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Information:					
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4	Oath or Declaration filed	Declaration_and_POA.pdf	353388 5a6aca6f97ed14b662424689ea626ca667132b6b	no	2
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Filed (SB/08)	IDS.pdf	627290 cefdc0a6009fdc7847ce1fd4c3ec96f4def0e309	no	4
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Information:					
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6	NPL Documents	ISR_WO_01_18_2010.pdf	2437231 9fa733d5465b3a390ef03c5d3d505de4093b4449	no	14
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Information:					
7	Transmittal of New Application	Application_Transmittal.pdf	241323 6d37445531a6611ff4d179e4683cf9751c06d15f	no	1
Warnings:					
Information:					
8	Fee Worksheet (PTO-875)	fee-info.pdf	36702 00388090c1fa6d99ba52802dd05368d3e25736f1	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			4757648		
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**SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A
DISTRIBUTED MOBILE ARCHITECTURE**

Shaowei Pan

CLAIM OF PRIORITY

[0001] The present application claims priority from and is a continuation of patent application number 12/172,639 filed on July 14, 2008 and entitled “SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE,” the contents of which are expressly incorporated herein by reference in their entirety.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates generally to mobile communications systems.

BACKGROUND

[0003] Access to basic telephony service is particularly important for rural and isolated communities. Telephony access allows small-scale enterprises, cooperatives, and farmers to obtain accurate information on fair prices for their products and to access regional and national markets. Access also reduces the cost of transportation and supports the local tourist industry. By bringing markets to people via telecommunications, rather than forcing people to leave in search of markets, urban migration is reduced and greater income and employment potential are generated in rural areas.

[0004] Unfortunately, the last decade of the telecommunications boom has not alleviated the disparities between urban and rural communities. The average imbalance, in terms of telephone penetration, in Asia, for example, is over ten to one and is often as high as twenty to one. This means that a country whose urban markets have a penetration of four (4) telephone lines per one-hundred (100) inhabitants, e.g., India and Pakistan, has a rural penetration of less than 0.2 per one-hundred (100). The situation is more acute in most African countries and in some parts of Latin America. By comparison, the disparity in

average income level between urban and rural residents in the developing world is usually less than four to one.

[0005] Current telephone systems are expensive to deploy. For example, a typical cellular system that includes a mobile switching center (MSC), a base station controller (BSC), and a home location register/visitor location register (HLR/VLR) can cost over \$2.0 million. Moreover, such a system may require a minimum of ten thousand users in order to be economically viable. In many rural areas, the population is not large enough to support the installation of such a system. Further, in many cases, the conditions in which the equipment (e.g., the MSC, BSC, and HLR/VLR) is to be operated are extremely harsh and environmentally prohibitive. An alternative to such a cellular system can include a wired system, but the costs associated with deploying and maintaining land lines are too high for certain rural areas.

[0006] In deploying telephone systems in such situations, a further concern is how to expand an existing telephone system or implement a new phone system capable of operating with existing telephone systems. For example, it may be desirable to allow communications with users serviced by existing public switched telephone network (PSTN) services, Voice over Internet Protocol (VoIP) systems, wireless communications systems, and other systems. Providing compatibility between these systems presents a challenge. Moreover, because some of these systems may be deployed in rural or other remote areas, providing a medium through which newly deployed systems can communicate with one another presents a further challenge.

[0007] Accordingly, there exists a need for an improved communications system that is relatively inexpensive to deploy and relatively inexpensive to operate, as well as able to integrate different communications systems.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The present disclosure is pointed out with particularity in the appended claims. However, other features are described in the following detailed description in conjunction with the accompanying drawings in which:

[0009] FIG. 1 is a view of a particular illustrative embodiment of a distributed mobile architecture (DMA) server having a first illustrative form factor;

[0010] FIG. 2 is a view of another particular illustrative embodiment of an alternative embodiment of a DMA server having a second illustrative form factor;

[0011] FIG. 3 is a diagram of another particular illustrative embodiment of an alternative embodiment of a DMA server having a third illustrative form factor;

[0012] FIG. 4 is a diagram of a particular illustrative embodiment of a distributed and associative communications system;

[0013] FIG. 5 is a block diagram of a particular illustrative embodiment of a DMA server;

[0014] FIG. 6 is a diagram of a particular illustrative embodiment of a network incorporating a plurality of DMA gateways linking a plurality of DMA servers and a legacy network;

[0015] FIG. 7 is a diagram of a particular illustrative embodiment of a network incorporating a plurality of satellite-based DMA gateways linking a plurality of DMA servers and a legacy network;

[0016] FIG. 8 is a diagram of a particular illustrative embodiment of a network incorporating a DMA gateway linking a plurality of satellite-based DMA servers and ground-based DMA servers;

[0017] FIG. 9 is a diagram of a particular illustrative embodiment of a network incorporating a plurality of satellite-based and ground-based DMA gateways linking a plurality of satellite-based and ground-based DMA servers;

[0018] FIG. 10 is a diagram of a particular illustrative embodiment of a network incorporating a plurality of DMA gateways and a plurality of legacy networks utilizing a central register database for communications devices accessible within the network;

[0019] FIG. 11 is a block diagram of a particular illustrative embodiment of a DMA gateway;

[0020] FIG. 12 is a diagram of a particular illustrative embodiment of an exemplary data structure used by a DMA gateway for maintaining information about communications devices accessible through other gateways;

[0021] FIG. 13 is a diagram of a particular illustrative embodiment of an exemplary structure maintained in a central database accessible by DMA gateways to maintain information about communications devices accessible throughout a network;

[0022] FIG. 14 is a flow chart to illustrate a particular illustrative embodiment of the use of information about accessible networks and devices for routing communications between DMA gateways; and

[0023] FIG. 15 is a flow chart to illustrate a particular illustrative embodiment of a selective routing of a communication by a DMA gateway via a private Internet Protocol network or a gateway network.

DETAILED DESCRIPTION

[0024] Methods and devices for routing communications between distributed mobile architecture (DMA) servers using DMA gateways are disclosed. Communications information is received at a first DMA gateway for a communications network accessible by a second DMA gateway. The communications information indicates one or more devices that are accessible by one of a DMA server and a legacy communications network. The first DMA gateway and the second DMA gateway participate in a DMA gateway communications network. The communications information is stored by the first DMA gateway (e.g., in a home DMA register of the first DMA gateway). A communication is received at the first DMA gateway for a target device indicated by the communications information to be served by the second DMA gateway. The communication is routed from the first DMA gateway to the target device by relaying the

communication from the first DMA gateway to the second DMA gateway via the DMA gateway communications network.

[0025] In a particular embodiment, a non-transitory computer-readable storage medium includes instructions that are executable by a processor. The instructions, when executed by the processor, cause the processor to receive communications information at a first DMA gateway of a DMA gateway communications network. The communications information is associated with a communications network that is accessible by a second DMA gateway of the DMA gateway communications network. The communications information is stored at a memory of the first DMA gateway. A communication is received that is associated with a destination device indicated by the communications information to be served by the second DMA gateway. The communication is routed to the destination device by relaying the communication from the first DMA gateway to the second DMA gateway via the DMA gateway communications network.

[0026] In another particular embodiment, a non-transitory computer-readable storage medium includes instructions that are executable by a processor. The instructions, when executed by the processor, cause the processor to receive first routing instructions at a first DMA server. The first routing instructions are received when the first DMA server is in a first service area of the first DMA gateway (e.g., an orbiting satellite). A first call is sent to the first DMA gateway via a private Internet Protocol (IP) network according to the first routing instructions. The first call is received at the first DMA server from a first mobile communication device via a wireless transceiver integrated with the first DMA server. The first call is placed to a destination device that is accessible via a legacy communications network. The legacy communications network is accessible via the first DMA gateway.

[0027] In another particular embodiment, a non-transitory computer-readable storage medium includes instructions that are executable by a processor. The instructions, when executed by the processor, cause the processor to receive a first call via a first interface of an orbiting satellite. The first interface is adapted to communicate with a legacy communications network, and the call is directed to a mobile communication device that

is accessible to a first DMA server. The first call is routed to the first DMA server via a second interface of the orbiting satellite that is adapted to communicate with a private IP network. The first DMA server includes a wireless transceiver to communicate with the mobile communication device.

[0028] In another particular embodiment, a first DMA gateway includes a number of interfaces. A first interface is adapted to communicate with a legacy communications network. A second interface is adapted to communicate with a private Internet Protocol (IP) network. A third interface is adapted to communicate with a DMA gateway communications network. The gateway also includes a server having logic adapted to receive legacy network information from a second DMA gateway, the legacy network information indicating that the legacy communications network is in a communications range of the second DMA gateway. The DMA gateway forwards information associated with a communication received from a DMA server via the second interface to the second DMA gateway via the third interface. The call is placed to a destination device accessible via the legacy communications network.

[0029] In another particular embodiment, first routing instructions at a first distributed mobile architecture (DMA) server from a first DMA gateway when the first DMA server is in a first service area of the first DMA gateway. The first DMA gateway comprises a first orbiting satellite. A first call received at the first DMA server from a first mobile communications device via a wireless transceiver integrated with the first DMA server is sent to the first DMA gateway via a private Internet Protocol (IP) network according to the first routing instructions. The first call is placed to a destination device accessible via a legacy communications network, the legacy communications network accessible via the first DMA gateway.

[0030] In another embodiment, a distributed mobile architecture (DMA) server is coupled to a wireless transceiver. The DMA server includes a first interface adapted to communicate with a private Internet Protocol (IP) network and a second interface adapted to communicate with a satellite communications network. The DMA server includes a server having logic adapted to receive a call from a mobile communications device via

the wireless transceiver and send call information related to the call to a DMA gateway. The DMA gateway comprises an orbiting satellite. The call is placed to a destination device accessible via a legacy communications network, the legacy communications network accessible via the DMA gateway.

[0031] In yet another embodiment, an orbiting satellite includes a first interface adapted to communicate with a legacy communications network and a second interface adapted to communicate with a private Internet Protocol (IP) network. The satellite also includes a server having logic adapted to receive a call via the first interface. The call is placed to a first mobile communications device accessible to a first distributed mobile architecture (DMA) server. The call is then routed to the first DMA server via the second interface, wherein the first DMA server includes a wireless transceiver to communicate with the first mobile communications device.

[0032] According to the present disclosure, one or more of the communications devices between which a communication, such as a voice communication and/or a data communication, participates in a communications network via a DMA server. A DMA server enables the deployment or expansion of a communications network to, for example, rural areas where remoteness of the area to be served or a relatively small customer base to be served make the installation of a conventional telephone system impractical or otherwise undesirable. As further described below according to embodiments of this disclosure, while one or more DMA servers may communicate with one another over a private IP network, when a private IP network is not available, the DMA servers may communicate through a plurality of DMA gateways that communicate with one another through a gateway communications network. For example, the DMA gateways may be implemented as orbiting satellites that participate in a gateway communications network that includes a satellite communications network.

[0033] In introducing the operation of DMA gateways, exemplary embodiments of DMA servers and their operation are described below.

[0034] Referring to FIG. 1, a DMA server is shown and is generally designated 100. As illustrated in FIG. 1, the DMA server 100 includes a base 102 and a lid 104. As shown,

the lid 104 is attached to the base by a first lid hinge 106 and a second lid hinge 108. In a particular embodiment, the lid 104 can be rotated about the first lid hinge 106 and the second lid hinge 108 between an open position, shown in FIG. 1, and a closed position (not shown) in which the lid 104 overlays the base 102 and the DMA server 100 is essentially shaped like a box or a briefcase.

[0035] As indicated in FIG. 1, the base 102 has a length 110, a width 112 and a height 114. FIG. 1 shows that the DMA server 100 includes a keyboard input device 116 that is incorporated in an upper surface of the base 102. Further, the DMA server 100 includes a mouse input device 118 that is also incorporated into the upper surface of the base 102. In a particular embodiment, the mouse input device 118 is a touch mouse input device 118. Additionally, the DMA server 100 includes a left side button 120 and a right side button 122. In a particular embodiment, the left side button 120 can be used to perform left-click functionality associated with the mouse input device 118. Moreover, the right side button 122 can be used to perform right-click functionality associated with the mouse input device 118.

[0036] FIG. 1 further indicates that the base 102 of the DMA server 100 is formed with a vent 124 to permit air exchange with the interior of the base 102 of the DMA server 100 and to facilitate cooling of the electronic components of the DMA server 100 housed within the base 102. Moreover, the base 102 of the DMA server 100 includes a handle 126 that is attached to the base 102 via a first handle hinge 128 and a second handle hinge 130. The base 102 also includes a pair of latch engagement notches 132.

[0037] As shown in FIG. 1, the lid 104 includes a flat panel display 134 incorporated therein. When the lid 104 is closed, the display 134 is adjacent to the keyboard 116. Moreover, when the lid 104 is closed, the lid 104 and the base 102 cooperate to protect the display 134, the keyboard 116, the mouse 118, and the buttons 120, 122. FIG. 1 also depicts a latch 136 that is incorporated into the lid 104. When the lid 104 is closed, the latch 136 can engage the latch engagement notches 132 in order to lock the lid in the closed position. As depicted in FIG. 1, an antenna 138 is incorporated into the lid 104.

The antenna 138 can be extended during operation and retracted when the DMA server 100 is not operating.

[0038] In a particular embodiment, the length 110 of the base 102 is 31.0 centimeters. Further, in a particular embodiment, the width 112 of the base 102 is 25.5 centimeters. Additionally, in a particular embodiment, the height 114 of the base 102 with the lid 104 in the closed position is 7.0 centimeters. Accordingly, the DMA server 100 has a total volume of 5,533.5 centimeters cubed and a footprint area of 790.5 centimeters squared. Further, in a particular embodiment, the DMA server 100 weighs approximately 5.8 kilograms (kg). As such, in a particular embodiment, the DMA server 100 has a total volume that is less than 6,000 centimeters cubed, a footprint area that is less than 800 centimeters squared, and a weight that is less than 6.0 kilograms.

[0039] In a particular embodiment, the DMA server 100 is relatively rugged. Particularly, the DMA server 100 is operable in a temperature range from negative twenty degrees Celsius to positive fifty-five degrees Celsius (-20° C to 55° C). Also, the DMA server 100 is substantially shock resistant and can withstand a one meter drop. Further, the DMA server 100 is substantially weather resistant, substantially dust resistant, and substantially sand resistant. The DMA server 100 is portable and it can be mounted in a vehicle or carried like a brief case. Further, multiple DMA servers 100 can be deployed as described herein.

[0040] FIG. 2 depicts an alternative embodiment of a distributed mobile architecture (DMA) server that is generally designated 200. As shown in FIG. 2, the DMA server 200 includes a base 202 and a lid 204 that is coupled to the base 202 via a plurality of fasteners (not shown). Additionally, the DMA server 200 has a length 208, a width 210, and a height 212. Further, the base 202 of the DMA server 200 includes a first vent 214, a second vent 216, and a third vent 218. In a particular embodiment, the vents 214, 216, 218 permit air exchange with the interior of the base 202 of the DMA server 200 and facilitate cooling of the electronic components of the DMA server 200 housed within the base 202. As shown in FIG. 2, the DMA server 200 includes an access window 220. One or more interfaces 222, e.g., wires can be accessed via the access window 220 and

coupled to a base transceiver station (BTS) during deployment of the DMA server 200. As shown in FIG. 2, the DMA server 200 can be mounted within a vehicle 224. Further, multiple DMA servers 200 can be deployed as described herein.

[0041] In a particular embodiment, the length 208 of the base 202 is 92.0 centimeters. Further, in a particular embodiment, the width 210 of the base 202 is 45.0 centimeters. Additionally, in a particular embodiment, the height 212 of the base 202 is 34.0 centimeters. Accordingly, the DMA server 200 has a total volume of approximately 140,760 centimeters cubed and a footprint area of approximately 4,140 centimeters squared. Further, in a particular embodiment, the DMA server 200 weighs approximately 48 kilograms (kg). As such, in a particular embodiment, the DMA server 100 has a total volume that is less than 150,000 centimeters cubed, a footprint area that is less than 5,000 centimeters squared, and a weight that is less than 50.0 kilograms.

[0042] FIG. 3 illustrates another alternative embodiment of a distributed mobile architecture (DMA) server that is generally designated 300. As depicted in FIG. 3, the DMA server 300 includes a housing 302 that has a length 304, a width 306, and a height 308. Additionally, the housing 302 can be formed with a first vent 310 and a second vent 312. In a particular embodiment, the vents 310, 312 permit air exchange with the interior of the housing 302 of the DMA server 300 and facilitate cooling of the electronic components of the DMA server 300 within the housing 302.

[0043] As shown in FIG. 3, at least one side of the housing 302 is formed with a rib 314 to enable the DMA server 300 to be slid into a server rack (not shown). Further, the DMA server 300 includes a clip 316 that is coupled to the housing 302 via a fastener, e.g., a bolt. The clip 316 can be engaged with a server rack (not shown) to prevent the DMA server 300 from unintentionally sliding out of the server rack (not shown).

[0044] In a particular embodiment, the length 304 of the housing 302 is approximately 76.2 centimeters. Further, in a particular embodiment, the width 306 of the housing 302 is approximately 48.2 centimeters. Additionally, in a particular embodiment, the height 308 of the housing 302 is approximately 4.3 centimeters. Accordingly, the DMA server 300 has a total volume of approximately 15,756.5 centimeters cubed and a footprint area

of approximately 3,672.9 centimeters squared. Further, in a particular embodiment, the DMA server 300 weighs approximately 17.7 kilograms (kg). Also, in a particular embodiment, the DMA server 300 is stackable in order to support various capacity requirements. As such, in a particular embodiment, the DMA server 100 has a total volume that is less than 16,000 centimeters cubed, a footprint area that is less than 4,000 centimeters squared, and a weight that is less than 20.0 kilograms.

[0045] The description of embodiments of DMA servers with reference to FIGS. 1-3 are provided for illustration, not limitation. DMA servers also may be embodied in any other suitable form. For example, as described further below, a DMA server may be incorporated within an orbiting satellite that communicates with DMA gateways and other devices via satellite and ground-based communication networks.

[0046] FIG. 4 illustrates a non-limiting, exemplary embodiment of a distributive and associated telecommunications system generally designated 400. As depicted in FIG. 4, the system 400 includes four cellular coverage sites 402. Each coverage site 402 includes an antenna 404. In one embodiment, the antenna 404 is connected to a transceiver belonging to a base transceiver station (BTS) and the BTS is a 3-sector BTS. FIG. 4 also indicates that a distributed mobile architecture (DMA) server 406 (abbreviated in FIG. 4 and figures as “DMAS”) can be connected to each antenna 404. In one embodiment, each DMA server 406 is physically and directly connected to its respective antenna 404, e.g., by a wire or cable 408. Further, in an illustrative embodiment, the DMA servers 406 can be any of the DMA servers shown in FIG. 1, FIG. 2, and FIG. 3.

[0047] As illustrated in FIG. 4, each DMA server 406 is interconnected with the other DMA servers 406 via an Internet protocol network 410. As such, there exists a peer-to-peer connection 412 between each DMA server 406 in the system 400. As described in detail below, the DMA servers 406 can handle telephony traffic that is communicated at each antenna 404. For example, the DMA servers 406 can switch and route calls received via each antenna 404. Additionally, the DMA servers 406 can hand-off calls to each other as mobile communications devices move around and between the cellular coverage sites 402. The DMA servers 406 can communicate with each other via the IP

network 410 and can further transmit calls to each other via the IP network 410. It should be understood that more than four cellular coverage sites 402 can be included in the system and that the inclusion of only four cellular coverage sites 402 in FIG. 4 is merely for clarity and explanation purposes.

[0048] Within the distributed and associative telecommunications system 400 the controlling logic can be distributed and de-centralized. Moreover, the wireless coverage provided by the disclosed system 400 is self-healing and redundant. In other words, due to the interconnectivity via the IP network 410, if one or more of the DMA servers 406 loses powers, fails, or is otherwise inoperable, telephony traffic handled by the inoperable DMA server 406 can re-routed to one of the remaining operable DMA servers 406. Additionally, user data stored in a database, e.g., a home location register (HLR) or a visitor location register (VLR), can be distributed equally and fully among all of the DMA servers 406. It can also be appreciated that new cellular coverage sites can be easily added to the system 400 as the demand for users increases. Specifically, a DMA server can be deployed as described below, connected to an antenna, connected to the IP network, and activated to provide cellular coverage in a new area.

[0049] FIG. 5 shows an exemplary, non-limiting, detailed embodiment of a DMA server, e.g., one of the DMA servers 406 described in conjunction with FIG. 4. Further, any of the DMA servers 100, 200, 300 shown in FIG. 1, FIG. 2, and FIG. 3 can include the components depicted in FIG. 5 and described herein.

[0050] In a particular embodiment, the DMA server 406 is essentially a processor, or computer, having a housing and a computer readable medium 500 that is disposed therein. A power supply 502 can also be disposed within the housing of the DMA server 406 in order to provide power to the DMA server 406. The power supply 502 can be a rechargeable battery disposed within the DMA server 406 or it can be external to the DMA server 406, i.e., a standard power outlet. Moreover, a cooling system 504, e.g., a fan with a thermostat, can be within the DMA server 406 in order to keep the DMA server 406 from overheating. In an alternative embodiment, the DMA server 406 can be a single board processor that does not require a fan.

[0051] As depicted in FIG. 5, the DMA server 406 may include a mobile switching center (MSC) module 506 and a base station controller (BSC) module 508 embedded within the computer readable medium 500. In an exemplary, non-limiting embodiment, the MSC module 506 can include a gatekeeper (GK) 510 that is connected to several gateways. For example, a circuit gateway (CGW) 512 can be connected to the GK 510 and can provide connectivity to an integrated services digital network/public switched telephone network (ISDN/PSTN) interface 514. The CGW 512 can provide a circuit switched to packet data conversion. In an exemplary, non-limiting embodiment, the PSTN portion of the ISDN/PSTN interface 514 can be an inter-office interface that uses the Bellcore industry standard ISDN user part (ISUP) signaling on a signaling system seven (SS7) link set. Moreover, the voice trunks on this interface can be timeslots on a T1 connection. Inbound and outbound voice calls can be supported on the ISDN portion of the ISDN/PSTN interface 514.

[0052] As further illustrated in FIG. 5, a packet data server node (PDSN) gateway 516 for CDMA, or a Gateway GPRS Support Node (GGSN) for Global System for Mobile Communication (GSM), and a Session Initiation Protocol (SIP) gateway 518 can also be connected to the GK 510. The PDSN gateway 516 and the SIP gateway 518 can provide connectivity to an IP interface 520. Further, the PDSN gateway 516 or a GGSN can establish a reverse tunnel with the PDSN or GGSN gateway 516 using generic routing encapsulation (GRE). Moreover, the PDSN gateway 516, or GGSN, can implement the Pseudo Random Function (PRF)/ Foreign Agent (FA) functionality of the DMA server 406 which supports mobile IP functions.

[0053] FIG. 5 further shows an SS7 gateway 522 that provides connectivity to an American National Standards Institute 41 (ANSI-41) and GSM Mobile Application Part (MAP) interface 524. In a particular embodiment, the ANSI-41 interface can be an SS7 TCAP/SCCP interface on the same SS7 link set used for ISUP signaling. The same SS7 point code can be used to identify the DMA server 406 in the ANSI-41 network. The ANSI-41 interface can be used for roamer registration. Further, in an exemplary, non-limiting embodiment, the GSM MAP interface can be an SS7 TCAP/SCCP interface on the same SS7 link set used for ISUP signaling. It can be appreciated that there are

different protocols of MAP from MAP/B to MAP/I, but in the illustrative embodiment, the different MAP/x protocols are not stacked – they are used independently. As described with reference to FIG. 11, the SS7 interface may be included in either the DMA server 406 or the DMA gateway 1102.

[0054] As depicted in FIG. 5, a media gateway 526 can also be coupled to the GK 510. In an exemplary, non-limiting embodiment, the media gateway 526 can include cellular transcoders, one or more intranet gateways, conferencing bridges, and group calling functionality. Further, an authentication, authorization, and accounting (AAA) module 528 can be coupled to the GK 510. In an exemplary, non-limiting embodiment, there are three levels of authentication management. The highest level is for administration, the mid-level is for operations, and the lowest level is for normal users. The functions of the AAA module 528 can be included in the user level.

[0055] In an exemplary, non-limiting embodiment, the GK 510 can act as an AAA server and a feather server to support advanced supplementary service, short message service, etc. Moreover, the GK 510 can act as a call manager and can support ISUP and PSTN function calls. Additionally, the GK 510 can act as a signal gateway, e.g., IP to SS7 inter-working, ISUP, GSM MAP or ANSI-41 to PSTN and ANSI-42/GSM. The GK 510 can also function as a data call server.

[0056] As illustrated in FIG. 5, the BSC module 508 includes a cellular radio network controller (CRNC) 530 and a cellular selection/distribution unit (CSDU) 532 that are connected to a call protocol controller (CPC) 534. In turn, the CPC 534 can be connected to a plurality of base transceiver stations (BTSs) 536. Specifically, the DMA server 406 includes a BTS interface 538 at the CPC 534 that can be physically and directly connected to the BTSs 536. The CRNC 530 can provide cellular radio resource management and cellular call control. The CSDU 532 can provide Fundamental Channel (FCH) soft handoff and distribution, Link Access Control (LAC) processing for inband signaling, multiplexer (MUX) functions, and centralized power control. Further, the CPC 534 can convert a T1 or E1 message or ATM interface to a data packet message. In a particular embodiment, each BTS 536 supports signals and traffic up to the front point of

the CPC 534, e.g., up to the BTS interface 538. Further, in a particular embodiment, the CRNC 530, the CPC 534, the CSDU 532 and the OAMP 540 can perform one or more of the functions of legacy Base Station Controllers (BSC).

[0057] In an exemplary, non-limiting embodiment, the BTS interface 538 can be an IS-95A OR IS-2000 interface over E1 or ATM, or the BTS interface 538 can be a GSM BTS interface using MAP or customized application for mobile network enhanced logic (CAMEL). In an illustrative embodiment, the CPC 534 can be connected to one or more BTSs 536. FIG. 5 further shows that the BSC module 508 includes an operations, administration, maintenance, and provisioning (OAMP) module 540. In an exemplary, non-limiting embodiment, the OAMP module 540 can use simple network management protocol (SNMP) for operations interfaces. Further, the OAMP module 540 can include a JAVA user interface. The OAMP module 540 can also include a software agent that is assigned to each component within the DMA server 406. The agents independently monitor their respective components. Moreover, each agent can provision its respective component.

[0058] When deployed in a network, such as illustrated in FIG. 4, embodiments of DMA servers are configured to handle the handing off of communications when, for example, a mobile device passes from a coverage site 402 (FIG. 4) covered serviced by one DMA server 406 to another coverage site 402 serviced by another DMA server 406. As previously described, the DMA servers 406 participate in an IP network 410 through which the communications are routed between the DMA servers 406. However, in not all cases will the DMA servers 406 be able to participate as peers in an IP network 410. For example, if one or more of the coverage sites 402 are in rural locations or other locations remote from other coverage sites 402, there may not be access to the IP network 410 in the remote coverage sites 402. Accordingly, embodiments of the present disclosure describe DMA gateways to enable DMA servers to communicate with one another when one or more of the DMA servers cannot participate directly in the IP network. In addition, embodiments of the DMA gateways also enable legacy networks and devices participating in the legacy networks to communicate with devices serviced by one or more of the DMA servers as further described below.

[0059] Because of the mobility of various forms of the DMA servers and devices that may communicate via these servers, as well as the DMA gateways described below, the communications network accounts for the movement of these devices. In other words, as the devices move, information regarding the accessibility of these devices and how communications are routed among them is dynamic. Thus, even when such devices move during the course of a communication, information pertaining to the routing of the communication is updated to support continuation of the communication.

[0060] FIG. 6 illustrates a network 600 that includes a first DMA gateway (abbreviated as “DMAG” in FIG. 6 and other figures) 602 and a second DMA gateway 604 that communicate with each other over a DMA gateway network 606. The DMA gateway network 606 may include a dedicated wired or wireless communication medium or be included within a network carrying other communications. The second DMA gateway 604 communicates with a legacy network that, for example, includes a public switched telephone network 610 that services communication with wired, landline devices such as landline telephone 612. The DMA gateway also may enable communication with public IP networks that enable data communications, Voice over Internet Protocol (VoIP) communications, and other communications, as well as other types of legacy networks. Although a pair of DMA gateways 602 and 604 and a single legacy network 610 are shown in FIG. 6, any number of DMA gateways and legacy networks may participate in the network 600.

[0061] In addition to the DMA gateways 602 and 604 and the legacy network 610, the network 600 includes two groups of DMA servers in which the DMA servers communicate with each other over separate private IP networks. For example, in a first group communicating via a first private IP network 620, three DMA servers 622, 624, and 626 communicate with each other. In a second group communicating via a second private IP network 640, three DMA servers 642, 644, and 646 communicate with each other. Two different groups each including three DMA servers are shown for illustration. However, it will be appreciated that any number of groups of DMA servers could communicate with each other within each of the groups, and any number of groups

could be bridged using DMA gateways as described below to enable communications between devices associated with different DMA servers in different groups.

[0062] Each of the DMA servers may service a plurality of voice and/or data communications devices. For example, a first DMA server 622, through an associated wireless transceiver, may service a plurality of communications devices such as a first wireless telephone device 632. As previously described with reference to FIG. 4, the first wireless telephone device 632 may communicate with devices serviced by other DMA servers that participate in the first private IP network 620. Thus, for example, the first wireless telephone device 632 would be able to engage in voice and/or data communications with a second wireless telephone device 634 serviced by a second DMA server 624. Also, it should be appreciated that the second wireless telephone device may communicate with other devices, such as a third wireless telephone device 636 that is serviced by a same DMA server, such as the second DMA server 624. Although the DMA servers in FIG. 6 are only shown servicing wireless telephone devices, it should be appreciated that other devices, such as computers and other communication devices also may participate in the network 600 by communicating through the DMA servers.

[0063] As shown in FIG. 6, the groups of DMA servers communicating via the two private IP networks 620 and 640 are separate networks. The wireless telephone devices 632, 634, and 636 serviced by DMA servers 622 and 624 participating in the first private IP network 620 do not have a network connection with any of the DMA servers 642, 644, and 646 that communicate with each other via the second private IP network. Thus, a fourth wireless telephone device 652 in communication with a fourth DMA server 642 can communicate with a fifth wireless telephone device 654 serviced by a fifth DMA server 644 because the DMA servers 642 and 644 can communicate with each other via the second private IP network 640. Similarly, the sixth wireless telephone device 656 and the seventh wireless telephone device 658 can communicate with each other through the sixth DMA server 646 with which each communicates and each can communicate with the other wireless telephone devices 652 and 654 serviced by the other DMA servers 642 and 644 participating in the second private IP network. However, without a bridge between the first private IP network 620 and the second private IP network 640, neither

the DMA servers nor the wireless telephone devices serviced by each of the private IP networks 620 and 640 can communicate with devices serviced by the other private IP network. Similarly, neither the DMA servers nor the wireless telephone devices serviced by each of the private IP network 620 and 640 can communicate with the public switched telephone network 610 or any of the devices, such as the landline telephone device 612, serviced by the public switched telephone network 610.

[0064] Embodiments of the present disclosure enable devices on separate networks to communicate with each other via DMA gateways that bridge separate network and communications systems. In the example of FIG. 6, the first private IP network 620 communicates with the first DMA gateway 602 and the second private IP network 640 communicates with the second DMA gateway 604. The DMA gateways 602 and 604 are configured to route communications from one private IP network to another and the DMA gateways 602 and 604 are in communication with each other via the DMA gateway network 606. As a result, the DMA gateways 602 and 604 can route communications from the DMA servers 622, 624, and 626 and the devices they service to the DMA servers 642, 644, and 646 and the devices they service and vice versa. Also, because the second DMA gateway is coupled with the second public switched telephone network 640, the wireless telephone devices 652, 654, 656, and 658 and other devices serviced by the DMA servers 642, 644, and 646 can communicate with the landline telephone device 612 and other devices serviced by the public switched telephone network 610. In short, the DMA gateways can provide communications between wireless devices serviced by associated DMA servers and wired or wireless devices serviced by legacy networks coupled with the DMA gateways.

[0065] To facilitate communications between devices serviced by different networks, the DMA gateways 602 and 604 maintain information identifying the devices that each services. For example, when the first wireless telephone device 932 initiates a communication to the fourth wireless telephone device 952, the first DMA gateway 602 accesses data identifying what other DMA gateway, if any, services the fourth wireless telephone device and which DMA server or other network or device associated with the first DMA gateway services the targeted fourth wireless telephone device 952. DMA

gateways provide information to one another regarding the communications networks they service by exchanging register data describing the networks they service. The register data describes devices for which the networks they service are the home network as well as for what devices are visiting on their networks. This information is exchanged directly between the DMA gateways or through a central database described further below with reference to FIG. 10.

[0066] A DMA server may associate itself with different DMA gateways. For example, as described with reference to FIGs. 1 and 2, a DMA server may include a mobile device that is easily moved from one place to another. A mobile DMA server that communicates wirelessly with a private IP network and the DMA gateway servicing that private IP network may move out of communications range of a DMA gateway with which it was previously associated into communications range with another DMA gateway. For further example, for purposes of traffic management, fault tolerance, or other reasons, it may be desirable to reassociate a DMA server previously associated with one DMA gateway to another DMA gateway. This reassociation may be initiated manually or automatically by the DMA server, the DMA gateway, or any combination thereof. Thus, for example, the fourth DMA server 642 may be reassociated with the first private IP network 620 and the first DMA gateway 602 servicing the first private IP network 620 as shown by the dashed line 660 in FIG. 6. Because the DMA gateways 602 and 604 bridge the private IP networks 620 and 640, devices serviced by the fourth DMA server 642, such as the fourth wireless telephone device 652 may continue to communicate with the wireless telephone devices 654, 656, and 658 serviced by the DMA servers 644 and 646 associated with the second private IP network 640.

[0067] The DMA gateways and DMA servers can be arrayed in any number of ways to facilitate the deployment and proliferation of communications networks. For example, FIG. 7 illustrates a network 700 that includes satellite-based DMA gateways including a first satellite-based DMA gateway 702 and a second satellite-based DMA gateway 704. The satellite-based DMA gateways 702 and 704 are placed in orbits suitable to enable communications with ground-based private IP networks 720 and 740 and a ground-based legacy network 710. The satellite-based DMA gateways 702 and 704 communicate with

each other via a satellite communications network 706. The second satellite-based DMA gateway 704 communicates with a legacy network, such as a public switched telephone network 710, over a communications uplink 714 via the same satellite communications network 706 through which the satellite-based DMA gateways 702 and 704 communicate or another uplink communications medium. The satellite-based DMA gateways 702 and 704 communicate with private IP networks 720 and 740 that may include ground-based private IP networks, via the same satellite communications network 706 or other uplink communications media. An advantage of including satellite-based DMA gateways is the ability to bridge DMA servers or groups of DMA servers with one another even though the DMA servers or groups of DMA servers may be disposed remotely from each other where ground-based DMA gateways or ground-based communications media between the DMA servers are overtaxed, unreliable, unavailable, or otherwise undesirable.

[0068] Using the satellite-based DMA gateways 702 and 704, communications between the DMA servers, the devices they serve, and the legacy network operates in a similar manner to the communications between devices as described with reference to FIG. 6. A first group of DMA servers 722, 724, and 726 communicate via a first private IP network 720. A first wireless telephone device 732 in communication with a first DMA server 722 is able to communicate with a second wire telephone device 734 in communication with a second DMA server 724 via the first private IP network 720. Further, the first wireless telephone device 732 is enabled, via the first DMA server 722 and the first private IP network 720, to communicate with the first DMA gateway 702. Then, via the satellite communications network 706, the first DMA gateway 702 is able to communicate with the second DMA gateway 704 to enable communications with devices served by the second private IP network 740. Thus, the DMA gateways 702 and 704 allow the first wireless telephone device 732 to communicate with a third wireless telephone device 762 even though the wireless telephone devices 732 and 762 participate in separate private IP networks 720 and 740. In addition, because the second DMA gateway 704 is in communication with both the second private IP network 740 and the public switched telephone network 710, the second DMA gateway 704 enables mobile-to-land communications between third wireless telephone device 762 and a wired

landline device 712. The use of satellite-based DMA gateways 702 and 704 enables this communication even as vast distances separate the communication devices and there are little or no land-based communications networks between the devices.

[0069] FIG. 8 illustrates a communications network 800 in which, instead of utilizing satellite-based DMA gateways, employs a ground-based DMA gateway 830 facilitating communications between satellite-based DMA servers 810 and 820. In areas where, for example, a ground-based DMA server cannot be employed or the distance between wireless communication devices 812 and 814 is so large that one or more DMA servers may not be able to effectively service the wireless communication devices 812 and 814, it may be desirable to enable communications with the deployment of satellite-based DMA servers such as DMA servers 810 and 820. In such a case, the wireless communications devices 812 and 814 may include wireless satellite communications devices or other devices with access to a satellite uplink communications medium. As in the case of DMA servers previously described, a first wireless communications device 812 in communication with a first DMA server 810 may wirelessly communicate with a second wireless communications device 814 that is also in communication with the first DMA server 810.

[0070] In addition, because the first DMA server 810 is in communication with a ground-based DMA gateway 830 via a suitable uplink communications medium 840, the first DMA server 810 is able to route communications between the devices it serves and other devices in communication with the DMA gateway 830. For example, the DMA gateway 830 is in communication with a first ground-based DMA server 850 that services a first wireless telephone device 852. As a result, the wireless communications devices 812 and 814 are able to communicate with the first wireless telephone device 852. Similarly, the DMA gateway 830 also is in communication with a private IP network 880 that provides communications between the second satellite-based DMA server 820 and two ground-based DMA servers 860 and 870. As a result, the DMA gateway 830 enables communications between the wireless communications devices 812 and 814 serviced by the first satellite-based DMA server 810, the first wireless telephone device 852 serviced by the ground-based DMA server 850, a second wireless telephone device 862 serviced

by a second ground-based DMA server 860, a third wireless telephone device 872 serviced by a third ground-based DMA server 870, and any devices (not shown in FIG. 8) serviced by the second satellite-based DMA server 820. In addition, if the DMA gateway 830 were in communication with one or more legacy networks, the DMA gateway 830 could enable communications between devices serviced by the legacy networks and devices serviced by the DMA servers 810, 820, 860, and 870 in communication with the DMA gateway 830.

[0071] FIG. 9 illustrates a communications network 900 illustrating how a communications network may include a combination of satellite-based and ground-based DMA servers and satellite-based and ground-based DMA gateways. Embodiments of the present disclosure are not restrictive to including only ground-based or satellite-based DMA gateways or DMA servers and thus provide flexibility in creating and proliferating communications networks based on the communications needs for which the network is deployed.

[0072] A first satellite-based DMA server 910 communicates with wireless communications devices 912 and 914. The first satellite-based DMA server 910 also is in communications with a satellite communications network 940 and a private IP network 950. Via the satellite communications network 940, first the satellite-based DMA server is able to communicate with a satellite-based DMA gateway 930 to, for example, enable communications between devices served by a first ground-based DMA server, such as a first wireless telephone 992. Via the private IP network 950, the satellite-based DMA server 910 also is able to communicate with other DMA gateways, such as a first ground-based DMA gateway 960 and a second ground-based DMA gateway 970. Thus, the devices served by the satellite-based DMA server 910 would be able to communicate with devices in communication with the ground-based DMA gateways 960 and 970, such as the second wireless telephone device 974 that is serviced by a second ground-based DMA server 972 in communication with the second ground-based DMA gateway 970. In sum, as described in the particular illustrative embodiments depicted in FIGs. 6-9, satellite-based or ground-based DMA servers and satellite-based or ground-based

gateways can be deployed as desired to enable communications between various communications devices.

[0073] To facilitate communications between devices serviced by different networks, the DMA gateways maintain information identifying the devices that each services. For example, a user of a wireless telephone device serviced by a first DMA server may send a communication to the user of the target wireless telephone device that is serviced by a second DMA server. The first and second DMA servers both are in communication with a DMA gateway that enables communications between the devices serviced by the different DMA servers. The DMA gateway is configured to route the communications by accessing information indicating which DMA servers provide service to which wireless devices. The DMA gateway may maintain the information locally in the DMA gateway or access information maintained in a central register accessible to the DMA gateway. When the information is maintained locally in the DMA gateway, DMA gateways in the network provide information to one another regarding the devices they service by exchanging register data describing the devices they service. The register data describes devices for which the networks they service are the home network as well as for what devices are visiting on their networks. This information is exchanged directly between the DMA gateways or through a central database described further below with reference to FIG. 10.

[0074] FIG. 10 shows a network 1000 including a pair of DMA gateways 1010 and 1050 that facilitate communications between devices on different types of networks. A first DMA gateway 1010 communicates with a plurality of DMA servers 1012, 1014, and 1016 and a plurality of legacy networks 1020, 1030, and 1040. As described below with reference to FIG. 11, the DMA gateway 1010 includes interfaces configured to communicate with a PSTN 1020, a mobile switching center (MSC) 1030 such as used by wireless telephones and communications devices, and a public IP network 1040. The DMA gateway 1010 thus permits communication between devices serviced by the DMA servers 1012, 1014, and 1016 and devices serviced by the associated legacy networks 1020, 1030, and 1040.

[0075] In addition, the DMA gateway 1010, through the satellite communications network 1080 or other DMA gateway network, communicates with other DMA gateways to support communications between the devices serviced by different DMA gateways. For example, the second DMA gateway 1050 is associated with a private IP network 1060 that services a plurality of DMA servers 1052, 1054, 1056 and the devices they serve. Thus, through the DMA gateways 1010 and 1050, devices serviced by one of the DMA servers 1012, 1014, and 1016 or devices serviced by the legacy networks 1020, 1030, and 1040, can communicate with devices serviced by the DMA servers 1052, 1054, and 1056 or other networks serviced by the second DMA gateway 1050. The private IP network 1060 also includes a central register database 1070 that maintains information serviced by DMA gateways and DMA servers within the network 1000. The operation of this central register database 1070 is described further below.

[0076] As shown in FIG. 10, one or more of the DMA servers 1012, 1014, and 1016 may communicate directly with a respective DMA gateway, such as DMA gateway 1010, through a satellite uplink or other communications medium. Alternatively, one or other DMA servers 1052, 1054, and 1056 may communicate with a DMA gateway, such as DMA gateway 1050, via a private IP network 1060 in which the DMA servers 1052, 1054, and 1056 and the DMA gateway 1060 participate. When a DMA server communicates with a DMA gateway over a private IP network, the respective DMA server and DMA gateway may communicate with each other by transmitting IP packet data over the private IP network. On the other hand, when the DMA server communicates with the DMA gateway via a different medium, the DMA server and DMA gateway may communicate with each other according to the protocol of the available medium.

[0077] In the networks of FIGs. 6-10, embodiments of DMA gateways exchange communications information identifying devices serviced by one or more DMA servers or other communications networks that the DMA gateways service. When a DMA gateway detects that it is in communications range with one or more DMA servers, the DMA gateway sends communications information from the DMA servers or other communications networks to one or more other DMA gateways or to a central database,

such as the central register database 1070. The communications information may include a notification of what DMA server or servers with which the DMA gateway is in communication. As DMA gateways move between communications ranges of various DMA servers or vice versa, the DMA gateways may send additional notifications or other information to update the previously-communicated communications information as to what communications networks are accessible to the various DMA gateways.

[0078] The communications information, in one embodiment, includes register information, such as home location register (HLR) information and visitor location register (VLR) information maintained by the DMA servers or other communications networks. As described with reference to FIG. 1 and FIG. 2, because a DMA server may include a portable or mobile device, the DMA server information also may identify whether the DMA gateway is a home gateway for the DMA server or whether the DMA server is temporarily registered with the DMA gateway in a visitor DMA register.

[0079] When another DMA gateway receives the DMA server information from a first DMA gateway, a second DMA gateway stores the DMA server information in a home DMA register in which the second DMA gateway also stores information regarding the devices it services. The second DMA gateway receives a communication from one of the devices it services targeted for a wireless device that is serviced by the first DMA gateway. The second DMA gateway then routes the communication via a DMA gateway network to the first DMA gateway. The first DMA gateway, using its own home DMA register storing information about the devices it services, then directs the communication to the network and/or DMA server that services the targeted communications device.

[0080] When the DMA gateway receives DMA server information about one or more DMA services associated with the DMA gateway or information about other networks the DMA gateway services, the DMA gateway may provide the DMA server information to other DMA gateways in a number of ways. For example, the DMA gateway may send a notification to other DMA gateways that it has received the DMA server information and that the DMA server information can be retrieved from the DMA gateway or, as described below, from a central database. The DMA server information is then

transmitted to other DMA gateways in response to queries from one or more gateways requesting the DMA server information. Alternatively, the DMA gateway may automatically send the DMA server information to other gateways upon receiving the DMA server information.

[0081] Instead of or in addition to sending the DMA server information to other DMA gateways, the DMA gateway may send the DMA server information to a central database as shown in FIG. 10. Then, for example, when a DMAG gateway such as DMA gateway 1010 is in communications range of a DMA server such as DMA server 1012, the DMA server information is sent to the central register database 1070. The DMA server information is sent from the DMA gateway 1010 via the satellite communications network 1080 to the DMA gateway 1050 where the DMA server information is routed via the private IP network 1060 to the central register database. Thus, as DMA server networks and other networks are added to the system, the DMA gateway servicing each of these communications networks receives the communications information for the communications network and sends the communications information to the central register database 1070. Then, other DMA gateways each can receive the new communications information from the central register database 1070.

[0082] The new communications information may be automatically sent by the central register database 1070 via the DMA gateway 1050 that services the central register database. Alternatively, when new communications information is received, the DMA gateway receiving the communications information or the central register database 1070 may send a notification to other DMA gateways that the new information is available for retrieval.

[0083] FIG. 11 shows an operating environment 1100 including a plurality of networks serviced by a DMA gateway 1102. The DMA gateway 1102 services networks through a plurality of interfaces configured to support different types of networks. The DMA gateway 1102 communicates with a private IP network 1104, such as that used to communicate with one or more DMA servers and/or a central register database as shown in FIG. 7, via a data network interface 1106. The DMA gateway 1102 communicates

with the DMA gateway network, which in this example includes a satellite network 1108, via a satellite network interface 1110. In addition, the DMA gateway 1102 includes one or more interfaces that enable the DMA gateway 1102 to communicate with one or more legacy networks. For example, the DMA gateway 1102 communicates with a public switched telephone network (PSTN) or integrated services digital network (ISDN) 1112 via a PSTN/ISDN interface 1114. The DMA gateway 1102 communicates with a public IP network 1116 via a public IP interface 1118 that enables the DMA gateway 1102 to, for example, exchange Internet data or voice over Internet protocol (VoIP) calls. The DMA gateway 1102 also communicates with a wireless network 1120 via a mobile device interface 1122. The DMA gateway 1102 also communicates with an ANSI-41 network 1124 via an SS7 TCAP/SCCP interface 1126 operable to be used in ISUP signaling, DMA server identification, roamer registration, and other functions described with reference to the SS7GW interface 522 described with reference to FIG. 5.

[0084] One or more processors 1130 is coupled with the interfaces 1106, 1110, 1114, 1118, and 1122 and a memory device 1140. The memory device 1140 may include one or more of a random access memory, including volatile and nonvolatile rewritable memory devices, a read-only memory, and data storage devices. The memory device 1140 maintains a plurality of software modules providing executable instructions to the processor 1130 to support for the functions of the DMA gateway 1102. The modules include one or more gateway modules 1142 that include the operating system and basic control software that enables the processor 1130 to interact with its network interfaces. One or more conversion modules 1144 control the translation of data and data formats used by one of the networks to that of one or more other networks to which data is to be communicated. One or more routing modules 1146 provide instructions to the processor for routing communications between the appropriate interfaces. The routing instructions use information about the accessibility of devices through various servers, gateways, and networks. Thus, as information about a communication is received, routing instructions are provided indicating through which DMA gateways the communication is to be directed from its source to its destination.

[0085] One or more legacy network communications modules provide instructions for the processor 1130 to interact with each of the legacy communications network interfaces 1114, 1118, 1122. One or more DMA detection modules 1152 provide instructions to the processor for detecting the presence of accessible DMA servers and integrating the servers into the DMA network. One or more register data management modules 1154 receive, maintain, and/or forward register data for various networks and devices. The one or more register data management modules 1154 are operably coupled with a community location register (CLR)/visitor location register gateway (VLR)/gateway (GW)/global title (GT) (collectively, CVGG) data storage 1160 to maintain register data for DMA servers and other networks that communicate through the DMA gateway 1102. The register data stored by embodiments according to the present disclosure are described below with reference to FIGS. 9 and 10.

[0086] The DMA gateway 1102 may be implemented in a number of forms. For example, the DMA gateway 1102 may be implemented as an orbiting satellite, as described with reference to FIGS. 6 and 7. Alternatively, the DMA gateway 1102 may include either a fixed or portable ground station. The DMA gateways 1102 communicate with each other through a gateway network. In the example of FIGS. 6 and 7, the gateway network includes a satellite communications network. However, if the DMA gateways include only ground-based stations, the gateway network may include a point-to-point network facilitated by microwave communications, optical or other cabled connections, or other types of communications systems. If the gateway network includes both orbiting and ground-based stations, the gateway network may include a combination of satellite-based and non-satellite based communications systems.

[0087] FIGS. 12 and 13 show tables depicting how communications information including register data is stored in the DMA gateways or a central register database. The tables in FIGS. 12 and 13 are a logical representation. The entries within the tables do not represent a single value as might be found, for example, in a single entry of a spreadsheet document. Instead, the entries within the rows and columns of the table represent a category of information stored within the table.

[0088] In the example of FIGS. 12 and 13, representative data is shown for three DMA gateways and three DMA servers, although data for any number of DMA gateways and DMA servers participating in a DMA network may be included in register data tables. In this example, it is assumed that each DMA gateway is in communication with a respective DMA server designated with the same number, e.g., DMA gateway 1 is in communication with DMA server 1, etc. FIG. 12 shows tables 1200 and 1250 representing the register data stored in each of DMA gateway 1 and DMA gateway 2, respectively, while FIG. 10 shows a table 1000 representing the register data stored in a central register database for the three DMA gateways.

[0089] In the table 1200 for the DMA gateway 1, three rows 1210, 1212, and 1214 store register data for each of the respective DMA servers, DMA server 1, DMA server 2, and DMA server 3. In a CLR database column 1220, CLR data is stored for each of the three DMA servers and, in a VLR database column 1222, VLR data is stored for each of the three DMA servers. In DMAG 2 Community HLR database column 1224 and DMAG 3 Community HLR database column 1226, the HLR data for each of the DMA servers is stored for DMA gateway 2 and DMA gateway 3, respectively. In a Visitor DMA Server Register column 1228, data is stored for one or more DMA servers that are temporarily registered with DMA gateway 1.

[0090] In the table 1250 for the DMA gateway 2, three rows 1260, 1262, and 1264 store register data for each of the respective DMA servers, DMA server 1, DMA server 2, and DMA server 3. In a CLR database column 1270, CLR data is stored for each of the three DMA servers and, in a VLR database column 1272, VLR data is stored for each of the three DMA servers. In DMAG 1 Community HLR database column 1274 and DMAG 3 Community HLR database column 1276, the HLR data for each of the DMA servers is stored for DMA gateway 1 and DMA gateway 3, respectively. In a Visitor DMA Server Register column 1278, data for one or more DMA servers that are temporarily registered with DMA gateway 2.

[0091] Referring to FIG. 13, in the table 1300 for the central register database, three rows 1310, 1312, and 1314 store register data for each of the respective DMA servers, DMA

server 1, DMA server 2, and DMA server 3. In a DMA gateway 1 HLR database column 1320, HLR data is stored for each of the three DMA servers. In a DMA gateway 1 VLR database column 1322, VLR data is stored for each of the three DMA servers. In DMAG 1 Visitor DMA server register column 1324, data is stored for one or more DMA servers that are temporarily registered with DMA gateway 1. In a DMA gateway 2 HLR database column 1326, HLR data is stored for each of the three DMA servers. In a DMA gateway 2 VLR database column 1328, VLR data is stored for each of the three DMA servers. In DMAG 2 Visitor DMA server register column 1330, data is stored for one or more DMA servers that are temporarily registered with DMA gateway 2.

[0092] FIG. 14 shows a flow diagram 1400 of an exemplary process for routing communications using DMA gateways. In the example of FIG. 14, a first DMA server comes in communications range or otherwise becomes accessible to a first DMA gateway while a legacy communications network becomes accessible to a second DMA gateway.

[0093] At 1402, information is received at a first DMA gateway indicating the location of register data for a DMA server. This register data may be stored in another DMA gateway or a central register database. At 1404, information is received indicating that a second DMA gateway is in communication with a legacy communications network. At 1406, it is detected that the first DMA server is now in communications range of the first DMA gateway. At 1408, the first DMA gateway receives the DMAS register data for the first DMA server from the location identified at 1402. As previously described, this information may be automatically transmitted to the first DMA gateway when it comes within communications range of the first DMA server or the first DMA gateway may request the information from the location where it is stored.

[0094] At 1410, information is received that relates to a data and/or voice communication placed by a mobile device associated with the first DMA server. The information indicates that the communication is directed or placed to a target device accessible via the legacy communications network. The accessibility of the legacy communications network to the second DMA gateway was previously identified to the first DMA gateway at 1404. Thus, at 1412, the communication information is routed from the first DMA

gateway to the second DMA gateway. The process ends at 1414. The process repeats indefinitely as desired to relay communications using the DMA gateways.

[0095] FIG. 15 shows a flow diagram 1500 of an exemplary process for routing communications to a DMA gateway depending on whether the DMA gateway communicates with a server through a private IP network or through another medium. At 1502, routing instructions are received at a DMA server from a DMA gateway when the DMA server is in communication with the DMAG, such as when the DMA gateway comes within communications range of the DMA server. At 1504, a communication is received at the DMA server from a mobile communications device via a wireless transceiver coupled to the DMA server. At 1506, it is determined whether the DMA server communicates with the DMA gateway via a private IP network. If so, at 1510, packet data related to the communication is sent as packet data over the private IP network that is received by the DMA gateway via its private IP network interface. On the other hand, if it is determined at 1506 that the DMA server does not communicate with the DMA gateway via a private IP network, at 1512, the information related to the communication is transmitted to the DMA gateway via another medium, such as a direct satellite uplink. The information related to the communication is thus received by the DMA gateway via a satellite communications network interface.

[0096] At 1514, the communication is routed from the DMA gateway to the destination device. The communication is routed using information received and maintained by the DMA gateway as described, for example, in FIG. 14. The process ends at 1516. The process repeats indefinitely as desired to relay communications using the DMA gateways.

[0097] The above-disclosed subject matter is to be considered illustrative, and not restrictive, and the appended claims are intended to cover all such modifications, enhancements, and other embodiments, which fall within the scope of the disclosure. Thus, to the maximum extent allowed by law, the scope of the disclosure is to be determined by the broadest permissible interpretation of the following claims and their equivalents, and shall not be restricted or limited by the foregoing detailed description.

WHAT IS CLAIMED IS:

1. A non-transitory computer-readable storage medium comprising instructions that, when executed by a processor, cause the processor to:
 - receive, at a first distributed mobile architecture (DMA) gateway of a DMA gateway communications network, communications information associated with a communications network that is accessible by a second DMA gateway of the DMA gateway communications network;
 - store the communications information at a memory of the first DMA gateway;
 - receive a communication associated with a destination device that is indicated by the communications information to be served by the second DMA gateway; and
 - route the communication to the destination device by relaying the communication from the first DMA gateway to the second DMA gateway via the DMA gateway communications network.
2. The non-transitory computer-readable storage medium of claim 1, wherein at least one of the first DMA gateway and the second DMA gateway includes a satellite-based DMA gateway, and wherein the DMA gateway communications network includes a satellite communications network.
3. The non-transitory computer-readable storage medium of claim 1, wherein the communications information is stored in a home location register, and wherein the communications information indicates one or more devices that are accessible by a DMA server.
4. The non-transitory computer-readable storage medium of claim 3, wherein the DMA server includes one of a ground-based DMA server and a satellite-based DMA server.

5. The non-transitory computer-readable storage medium of claim 1, wherein the communications information indicates one or more devices that are accessible by a legacy communications network.

6. The non-transitory computer-readable storage medium of claim 5, wherein the legacy communications network includes one of a public switched telephone network (PSTN), a wireless communication network serviced by a mobile switching center (MSC), a public internet protocol (IP) network, and an American National Standards Institute 41 (ANSI-41) network.

7. The non-transitory computer-readable storage medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to send a notification from the first DMA gateway to the second DMA gateway, wherein the notification indicates that the communications information is stored at the first DMA gateway.

8. The non-transitory computer-readable storage medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to automatically send at least a portion of the communications information from the first DMA gateway to the second DMA gateway via the DMA gateway communications network in response to the first DMA gateway receiving the communications information.

9. The non-transitory computer-readable storage medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to send at least a portion of the communications information from the first DMA gateway to the second DMA gateway via the DMA gateway communications network in response to the first DMA gateway receiving a query from the second DMA gateway for the communications information.

10. The non-transitory computer-readable storage medium of claim 1, further comprising instructions that, when executed by the processor, cause the processor to determine that the communications network that is accessible by the second DMA gateway is within a communications range of the first DMA gateway.

11. The non-transitory computer-readable storage medium of claim 10, further comprising instructions that, when executed by the processor, cause the processor to send communications network information from the first DMA gateway to the second DMA gateway, wherein the communications network information indicates that the communications network that is accessible by the second DMA gateway is within the communications range of the first DMA gateway.

12. The non-transitory computer-readable storage medium of claim 10, further comprising instructions that, when executed by the processor, cause the processor to send communications network information from the first DMA gateway to a central database, wherein the communications network information indicates that the communications network that is accessible by the second DMA gateway is within the communications range of the first DMA gateway.

13. The non-transitory computer-readable storage medium of claim 10, further comprising instructions that, when executed by the processor, cause the processor to receive additional communications network information from the second DMA gateway in response to the second DMA gateway determining that an additional communications network is within a second communications range of the second DMA gateway.

14. The non-transitory computer-readable storage medium of claim 12, further comprising instructions that, when executed by the processor, cause the processor to receive a second notification from the central database, the second notification indicating that second register data is stored at the central database.

15. The non-transitory computer-readable storage medium of claim 14, further comprising instructions that, when executed by the processor, cause the processor to determine that a second communications network is within a service area of the first DMA gateway.

16. The non-transitory computer-readable storage medium of claim 15, wherein the first DMA gateway determines that a private Internet Protocol (IP) network access point is within a communications range of the first DMA gateway, and wherein the first DMA gateway is adapted to communicate with the second communications network via the private IP network.

17. The non-transitory computer-readable storage medium of claim 1, wherein the first DMA gateway receives the communications information from one of the second DMA gateway and a central database.

18. A non-transitory computer-readable storage medium comprising instructions that, when executed by a processor, cause the processor to:

receive, at a first distributed mobile architecture (DMA) server, first routing instructions from a first DMA gateway when the first DMA server is in a first service area of the first DMA gateway, wherein the first DMA gateway comprises a first orbiting satellite; and

send a first call to the first DMA gateway via a private Internet Protocol (IP) network according to the first routing instructions, wherein the first call is received at the first DMA server from a first mobile communication device via a wireless transceiver integrated with the first DMA server, wherein the first call is placed to a destination device that is accessible via a legacy communications network, wherein the legacy communications network is accessible via the first DMA gateway.

19. The non-transitory computer-readable storage medium of claim 18, wherein the first DMA server is adapted to send the first call while being transported from a first location to a second location.

20. The non-transitory computer-readable storage medium of claim 19, further comprising instructions that, when executed by the processor, cause the processor to receive second routing instructions from a second DMA gateway in response to the first DMA server moving into a second service area of the second DMA gateway, wherein the second service area includes the second location, and wherein the second DMA gateway comprises a second orbiting satellite.

21. The non-transitory computer-readable storage medium of claim 20, further comprising instructions that, when executed by the processor, cause the processor to send a second call received at the first DMA server from the first mobile communication device to the second DMA gateway via the private IP network according to the second routing instructions.

22. The non-transitory computer-readable storage medium of claim 21, wherein the second call is associated with a second destination device that is accessible via the legacy communications network.

23. The non-transitory computer-readable storage medium of claim 21, wherein the second call is associated with a second mobile communication device that is accessible via a second DMA server, wherein the second DMA server is accessible to the second DMA gateway via the private IP network.

24. The non-transitory computer-readable storage medium of claim 20, wherein the first DMA server receives the second routing instructions from the second DMA gateway during the first call.

25. The non-transitory computer-readable storage medium of claim 20, further comprising instructions that, when executed by the processor, cause the processor to send first DMA server register data from the first DMA server to the second DMA gateway in response to receiving the second routing instructions from the second DMA gateway.

26. A non-transitory computer-readable storage medium comprising instructions that, when executed by a processor, cause the processor to:

- receive a first call via a first interface of an orbiting satellite, wherein the first interface is adapted to communicate with a legacy communications network, and wherein the call is directed to a mobile communication device that is accessible to a first distributed mobile architecture (DMA) server; and
- route the first call to the first DMA server via a second interface of the orbiting satellite, wherein the second interface is adapted to communicate with a private internet protocol (IP) network,

wherein the first DMA server includes a wireless transceiver to communicate with the mobile communication device.

27. The non-transitory computer-readable storage medium of claim 26, further comprising instructions that, when executed by the processor, cause the processor to:

- receive a second call via the first interface of the orbiting satellite, wherein the second call is directed to a second mobile communication device that is accessible to a second DMA server; and
- route the second call to the second DMA server via the second interface of the orbiting satellite,

wherein the second DMA server includes a second wireless transceiver to communicate with the second mobile communication device.

28. The non-transitory computer-readable storage medium of claim 26, further comprising instructions that, when executed by the processor, cause the processor to:

- receive a second call via the second interface of the orbiting satellite, wherein the second call is directed to a destination device that is accessible to the legacy communications network; and
- route the second call to the legacy communications network via the first interface of the orbiting satellite.

29. The non-transitory computer-readable storage medium of claim 26, further comprising instructions that, when executed by the processor, cause the processor to:

- receive a second call via the first interface of the orbiting satellite, wherein the second call is directed to a second mobile communication device that is accessible to a second DMA server associated with a second orbiting satellite; and
- route the second call to the second orbiting satellite via a third interface of the orbiting satellite, wherein the third interface is adapted to communicate with a satellite communications network,

wherein the second orbiting satellite is adapted to communicate with the second DMA server via a second private IP network, and

wherein the second DMA server includes a second wireless transceiver to communicate with the second mobile communication device.

30. The non-transitory computer-readable storage medium of claim 26, further comprising instructions that, when executed by the processor, cause the processor to: receive a second call via the second interface of the orbiting satellite, wherein the second call is directed to a destination device that is associated with a second legacy communication network; and route the second call to a second orbiting satellite via a third interface of the orbiting satellite, wherein the third interface is adapted to communicate with a satellite communications network, wherein the second orbiting satellite is adapted to route the second call to the destination device via the second legacy communications network.

ABSTRACT OF THE DISCLOSURE

[0098] Methods and devices for routing communications between distributed mobile architecture (DMA) servers using DMA gateways are disclosed. Communications information is received at a first DMA gateway of a DMA gateway communications network. The communications information is associated with a communications network that is accessible by a second DMA gateway of the DMA gateway communications network. The communications information is stored at a memory of the first DMA gateway. The first DMA gateway receives a communication that is associated with a destination device indicated by the communications information to be served by the second DMA gateway. The communication is routed from the first DMA gateway to the destination device by relaying the communication from the first DMA gateway to the second DMA gateway via the DMA gateway communications network.

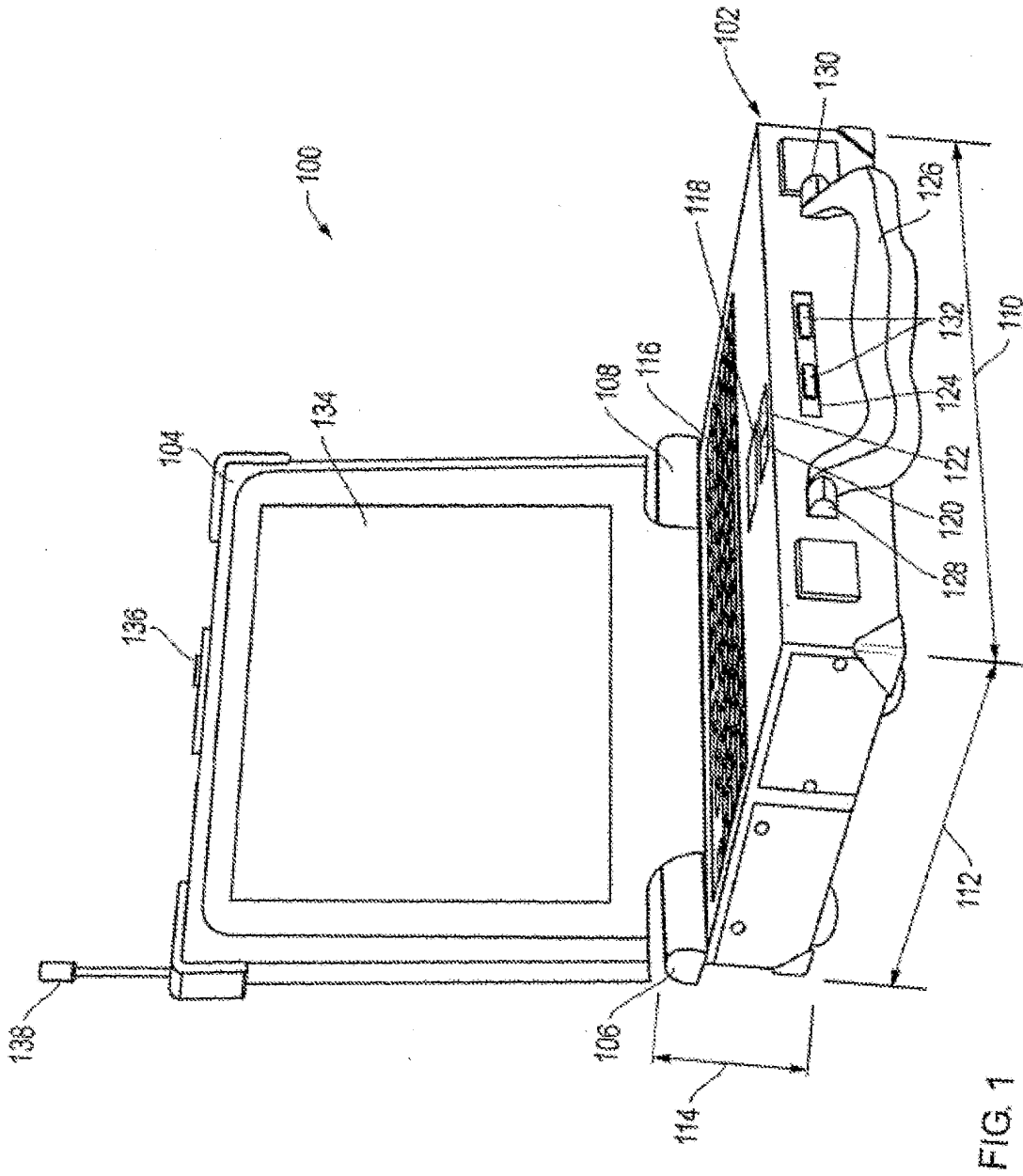


FIG. 1

Attorney Docket No.: 1082-0013-C1
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 Attorney: Jeffrey G. Toler
 (512) 327-5515
 1/15

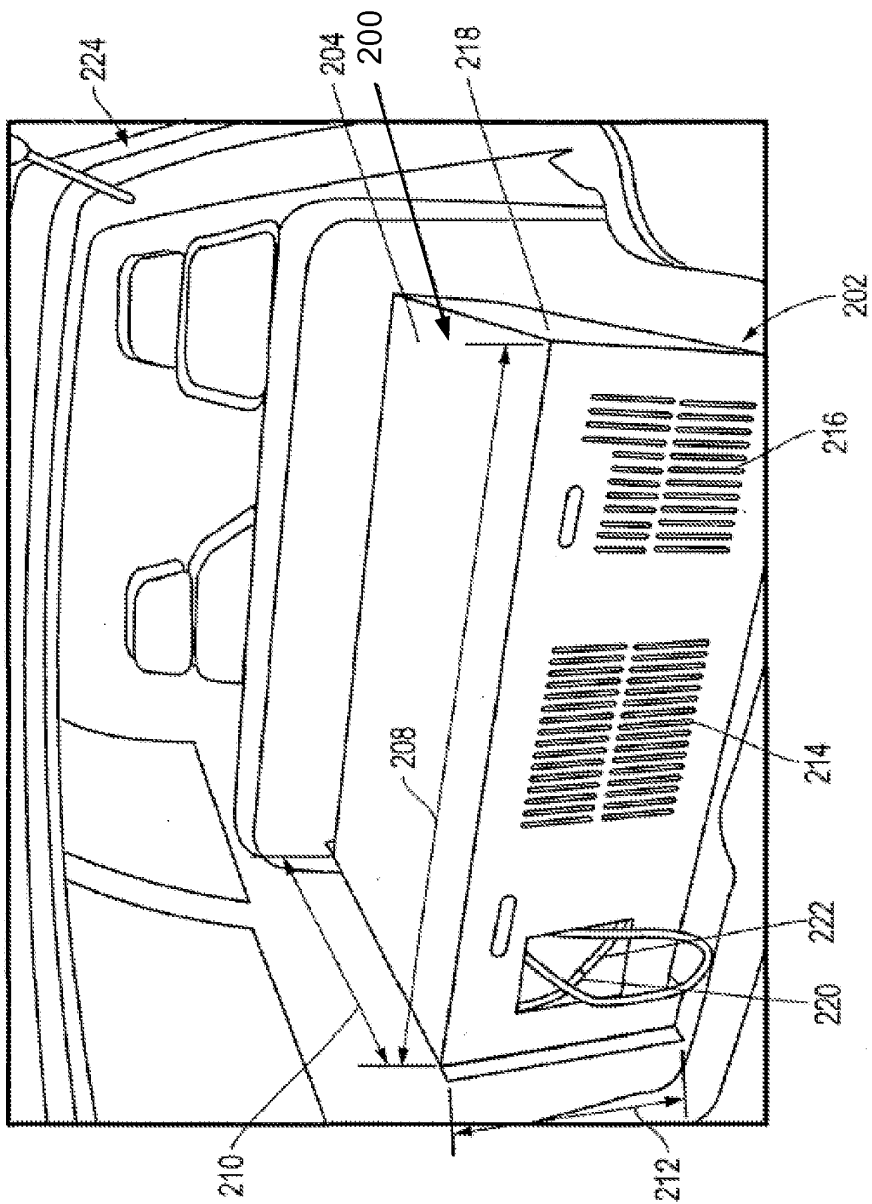


FIG. 2

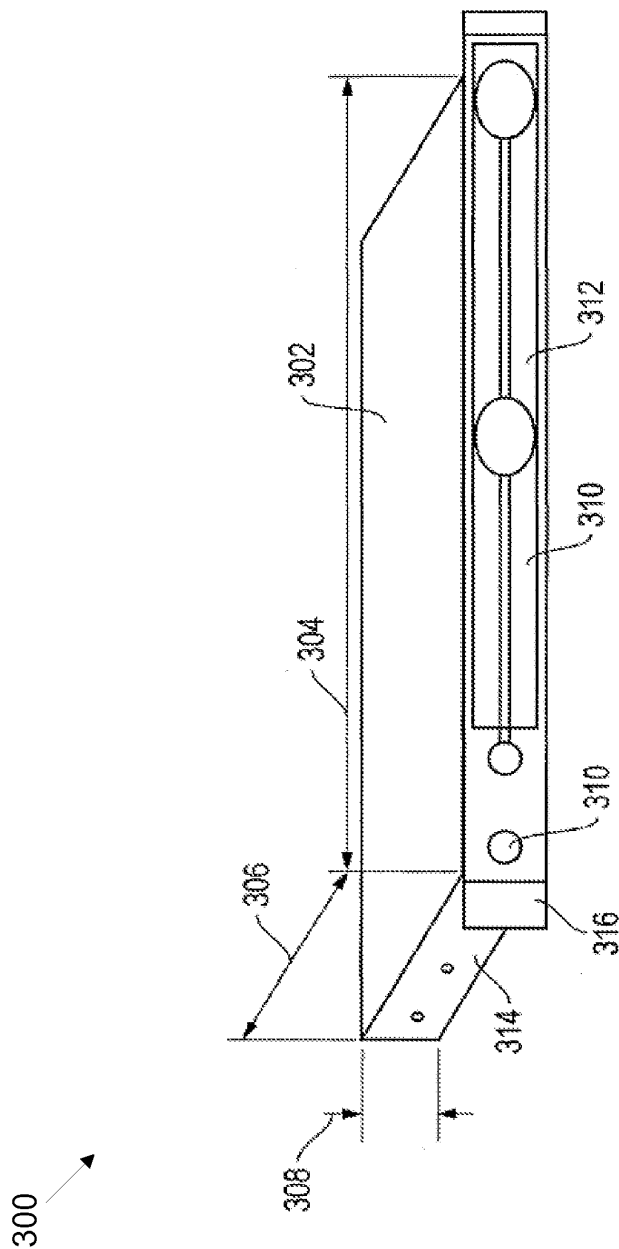


FIG. 3

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 3/15

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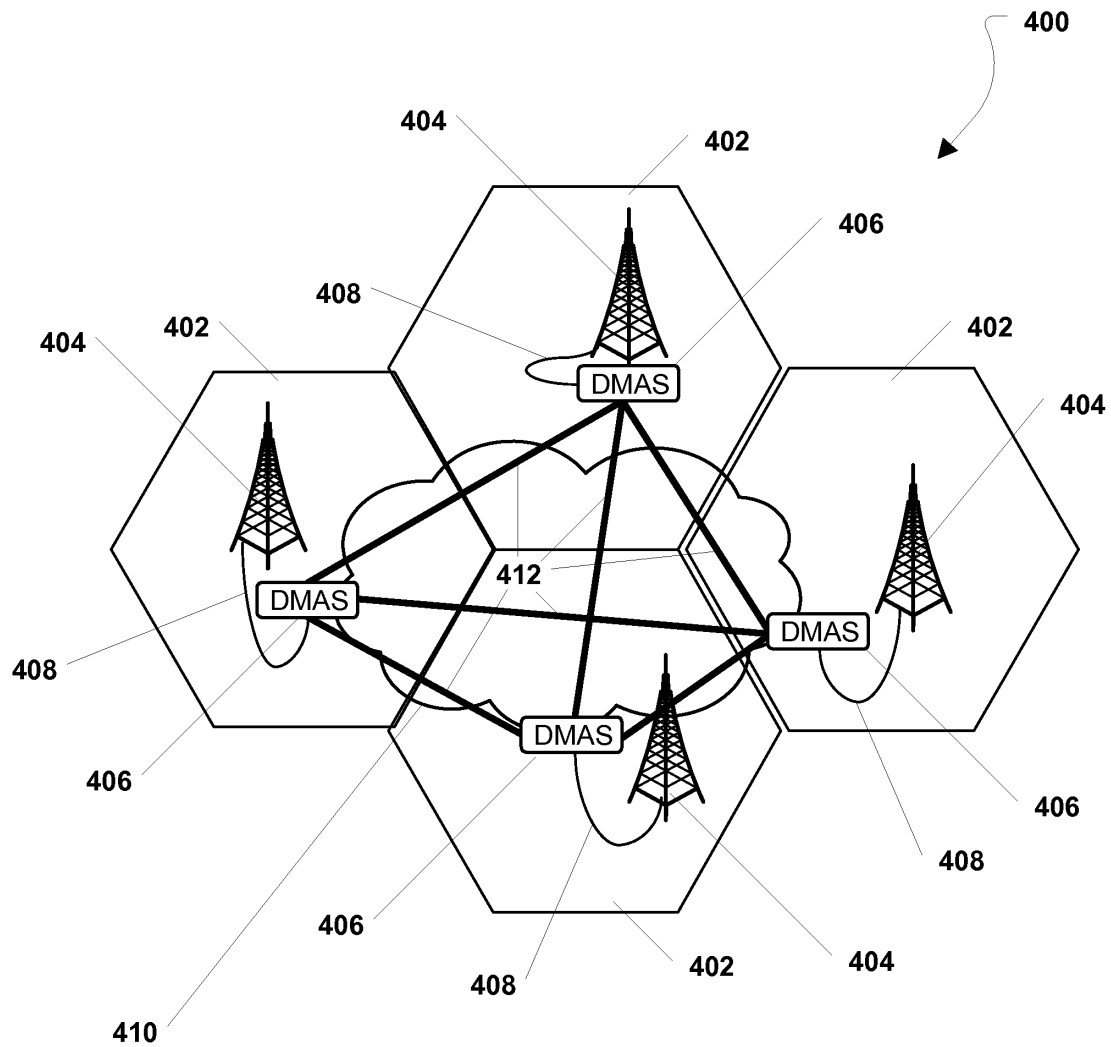


FIG. 4

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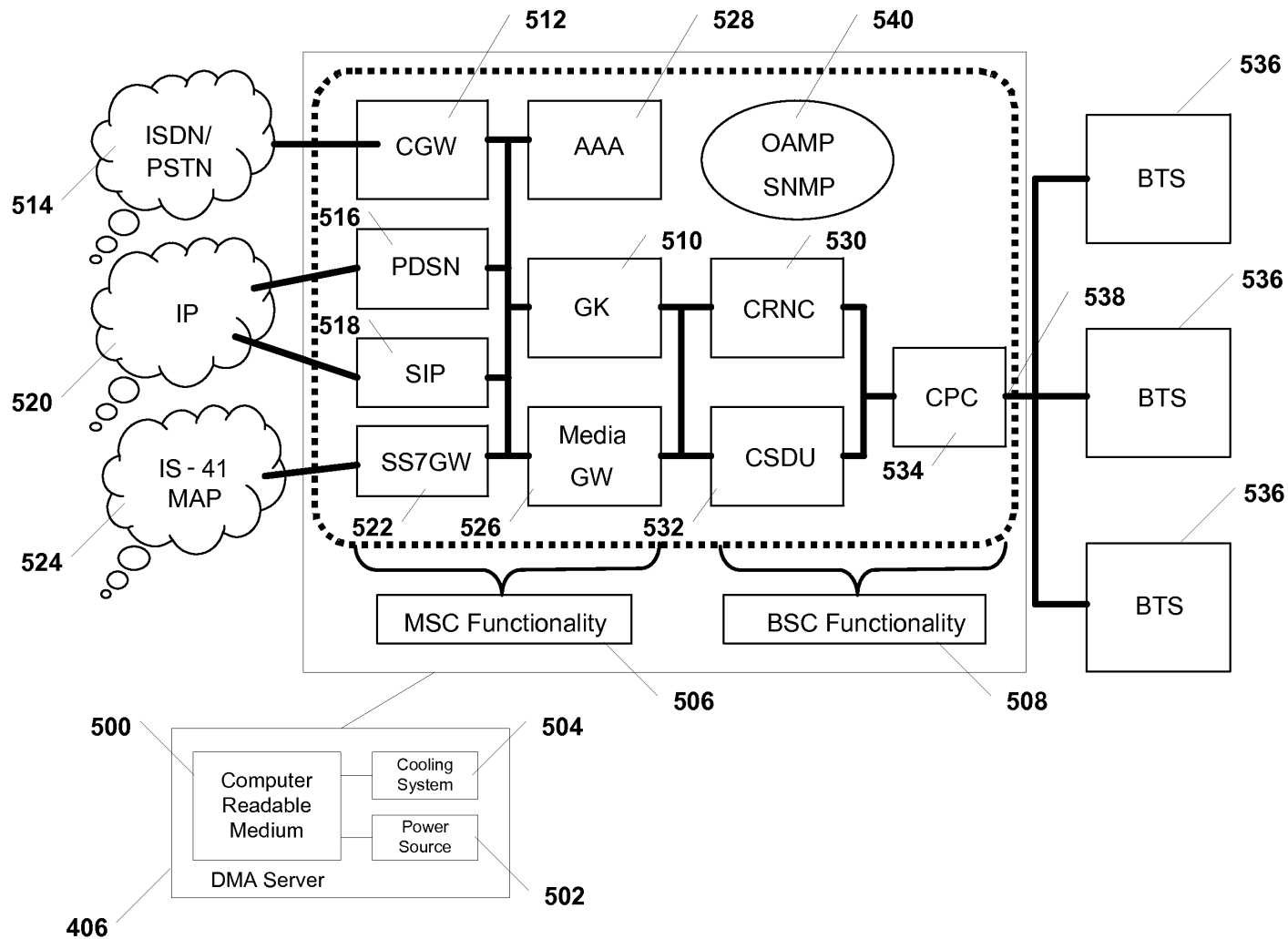


FIG. 5

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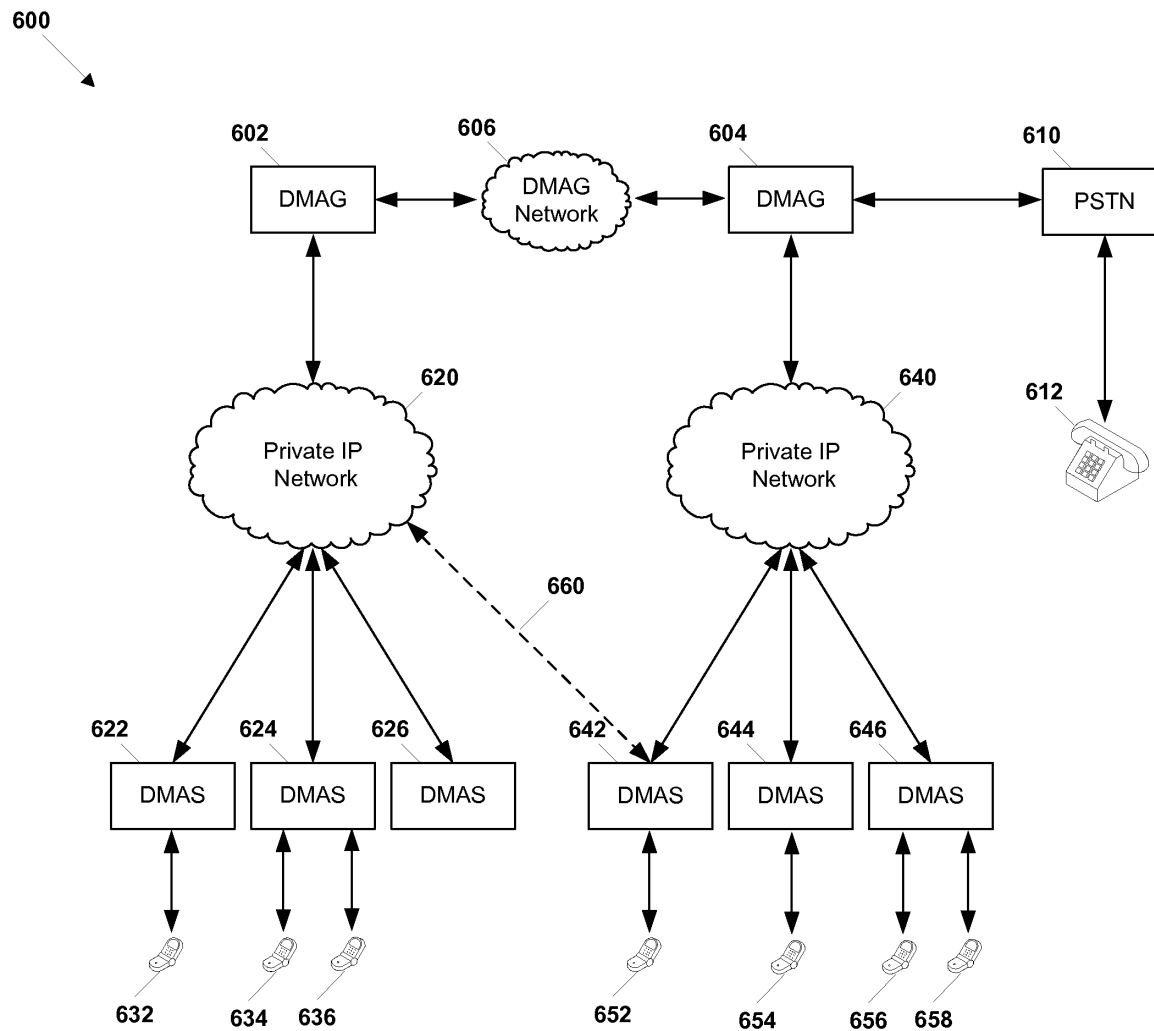


FIG. 6

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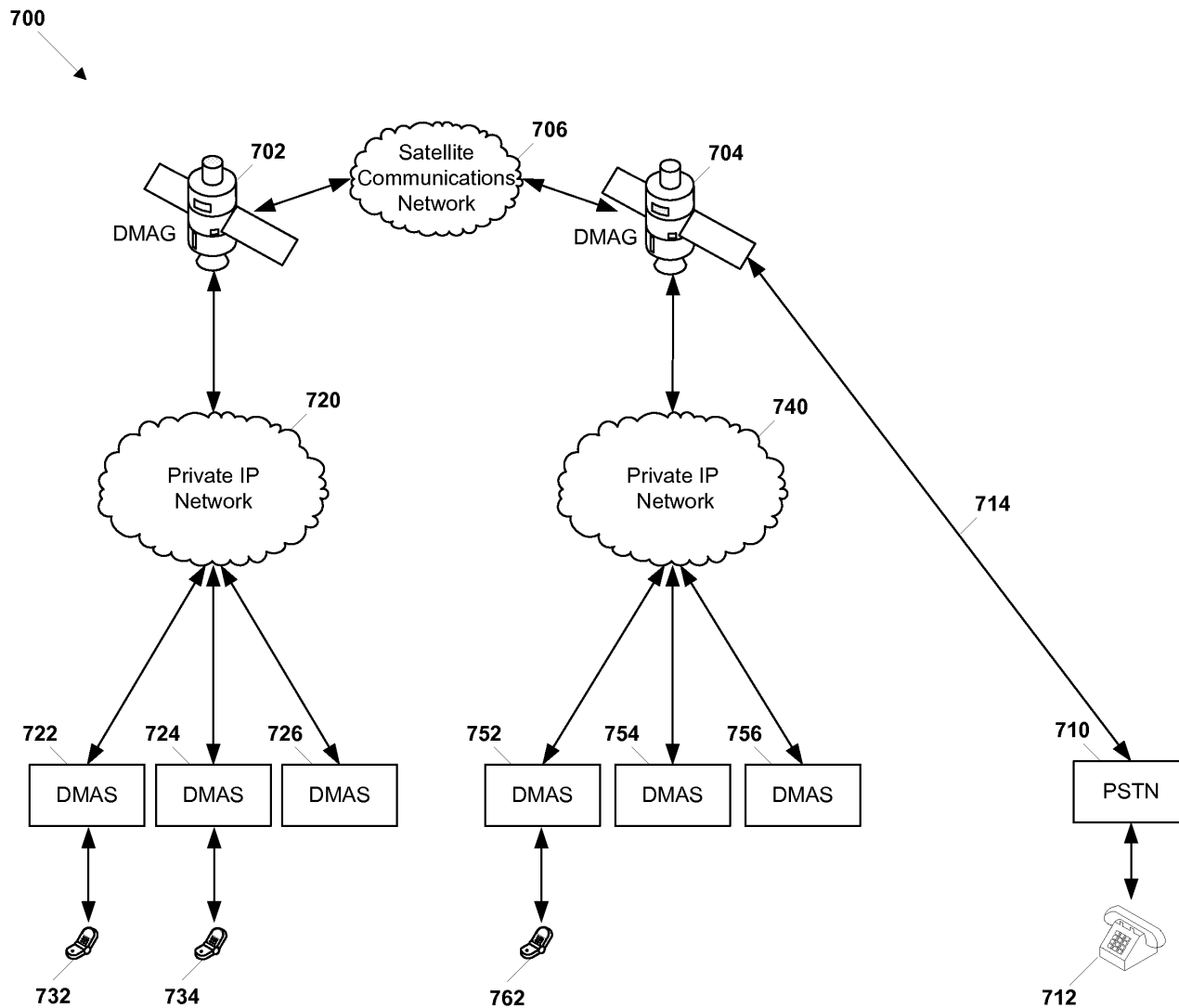


FIG. 7

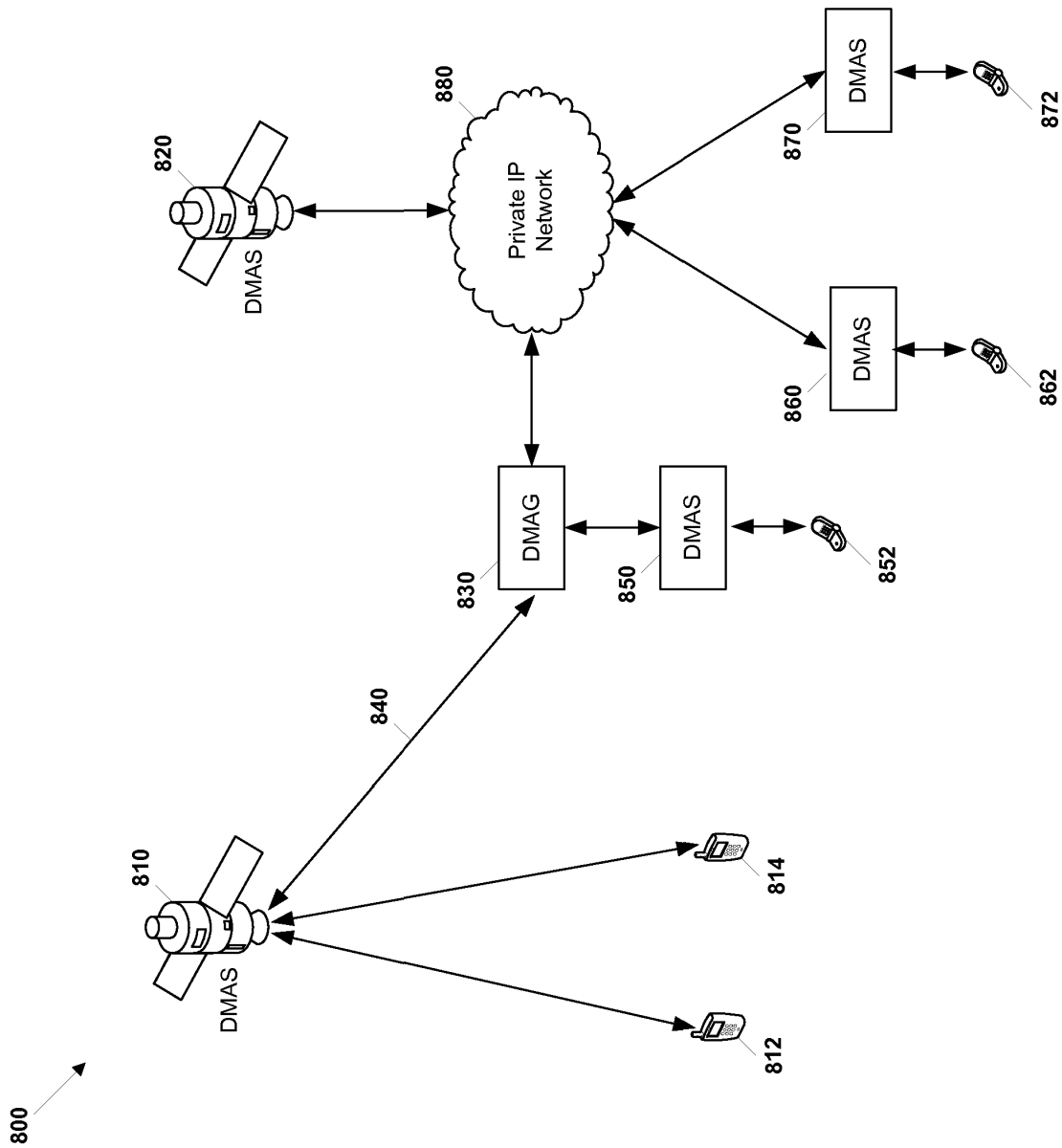


FIG. 8

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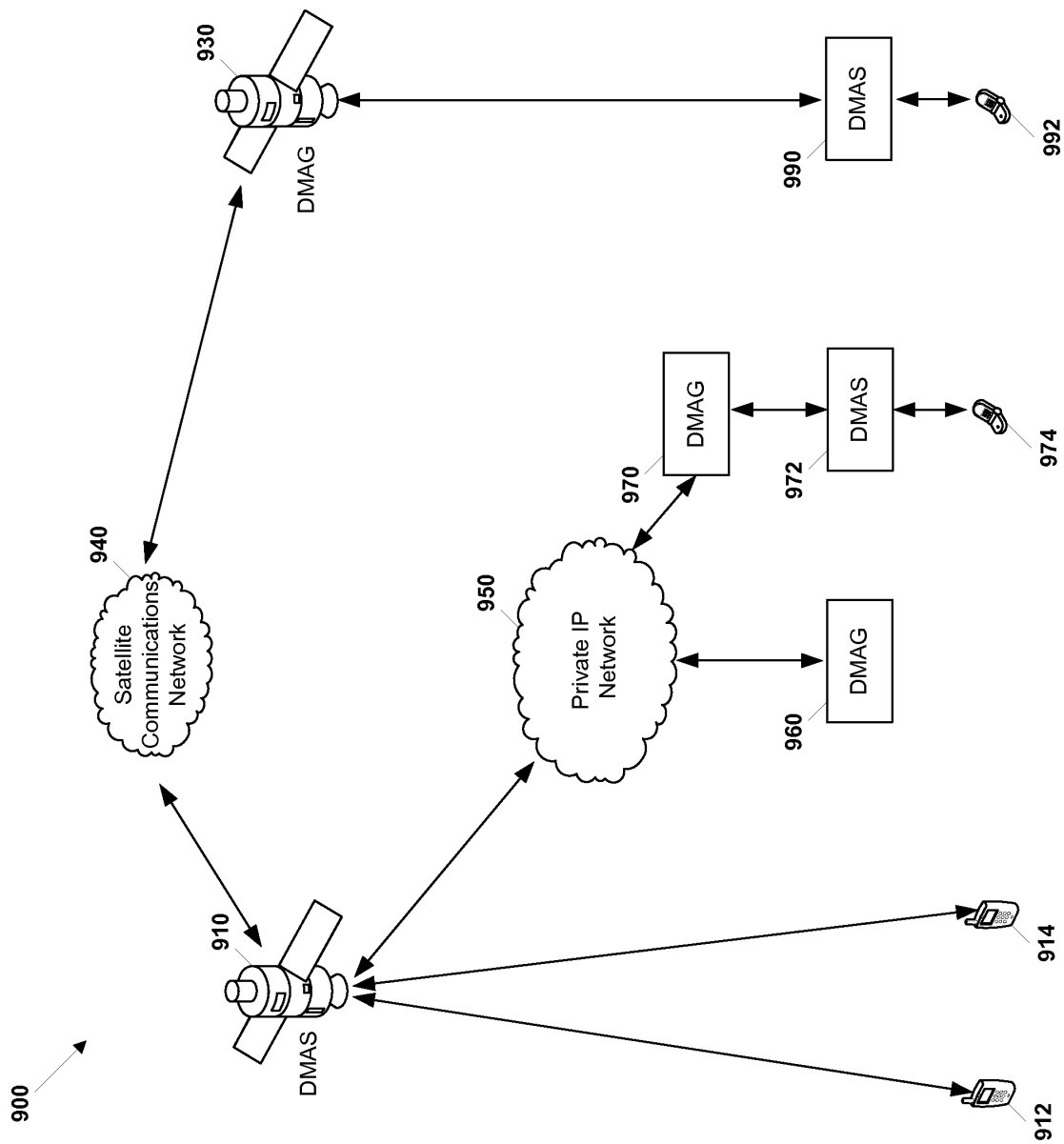


FIG. 9

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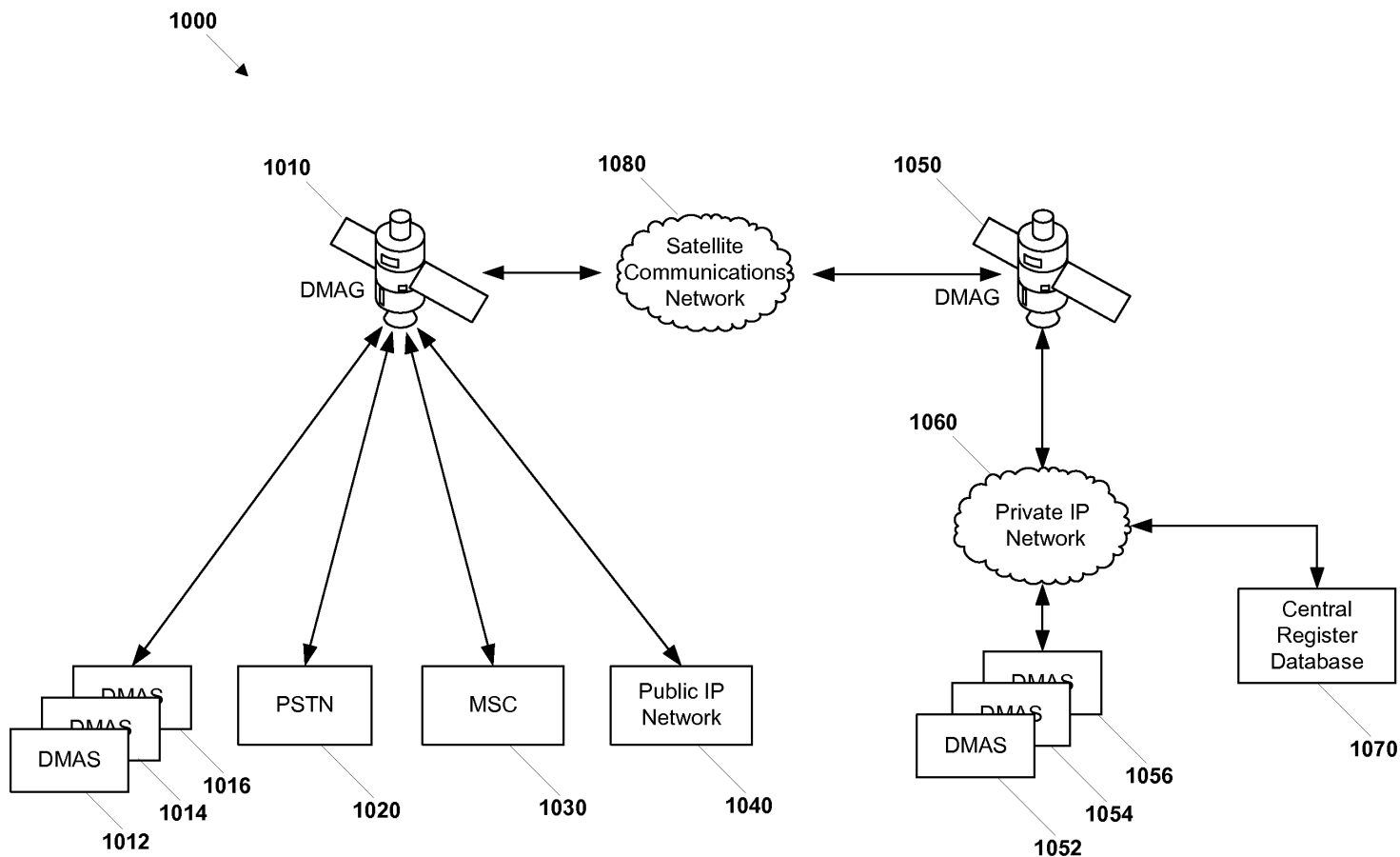


FIG. 10

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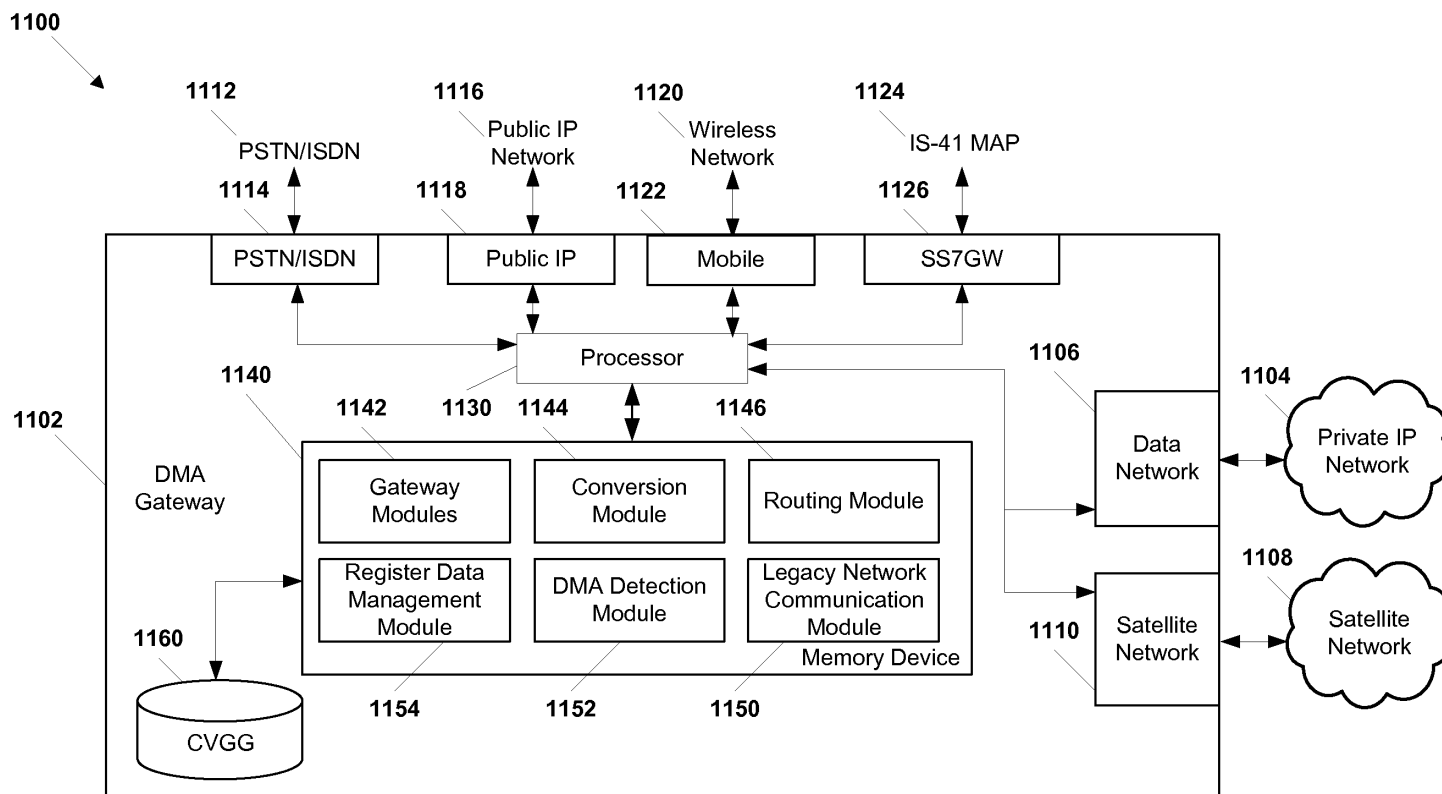


FIG. 11

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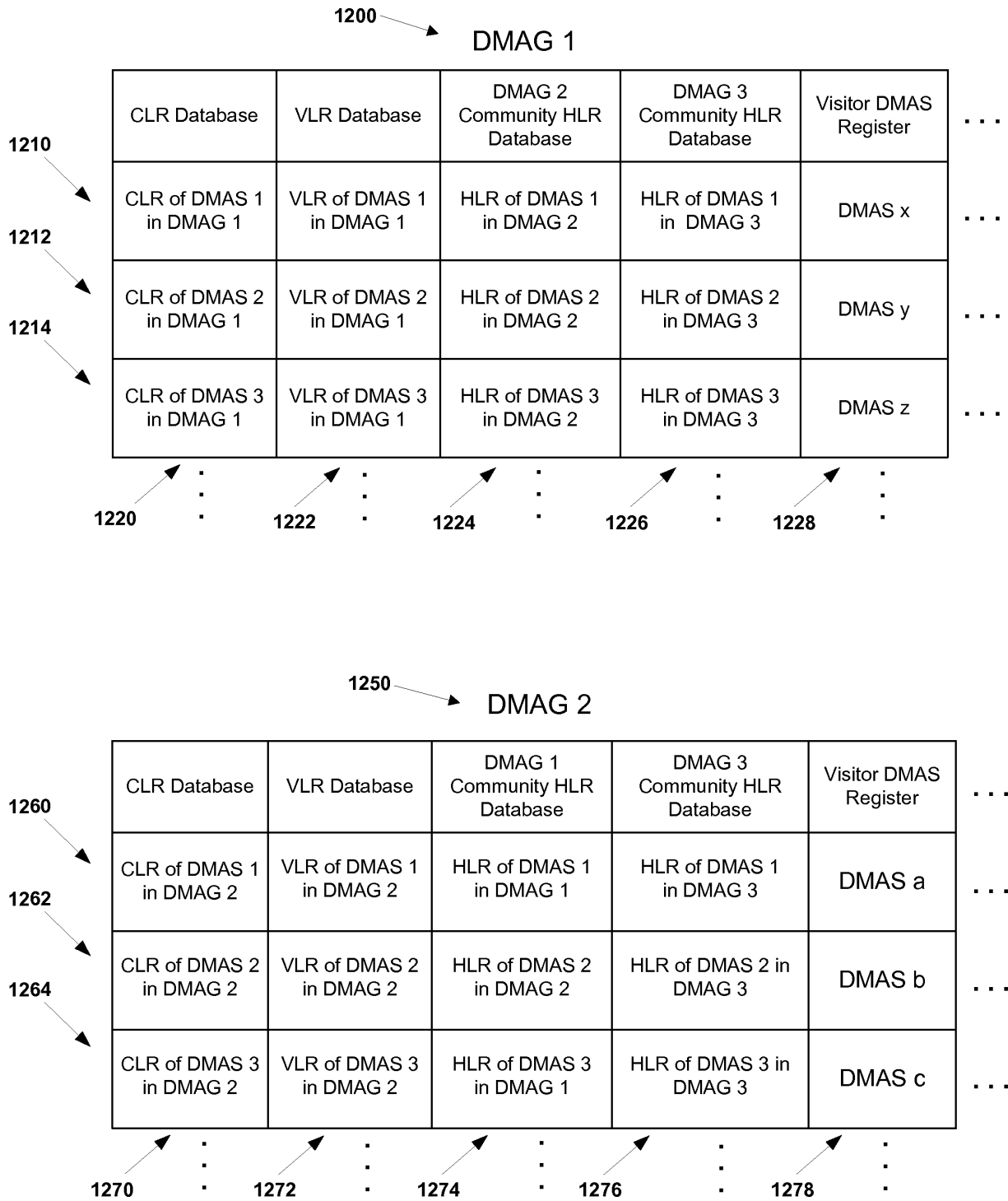


FIG. 12

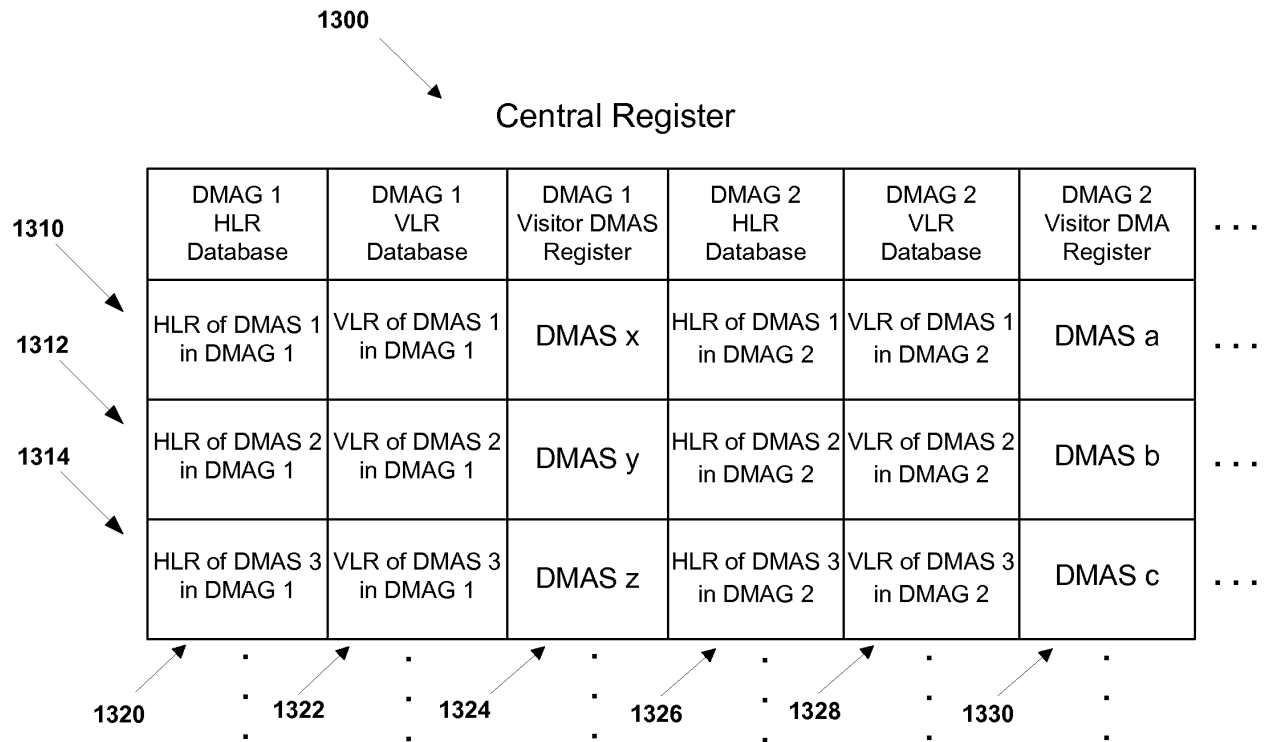


FIG. 13

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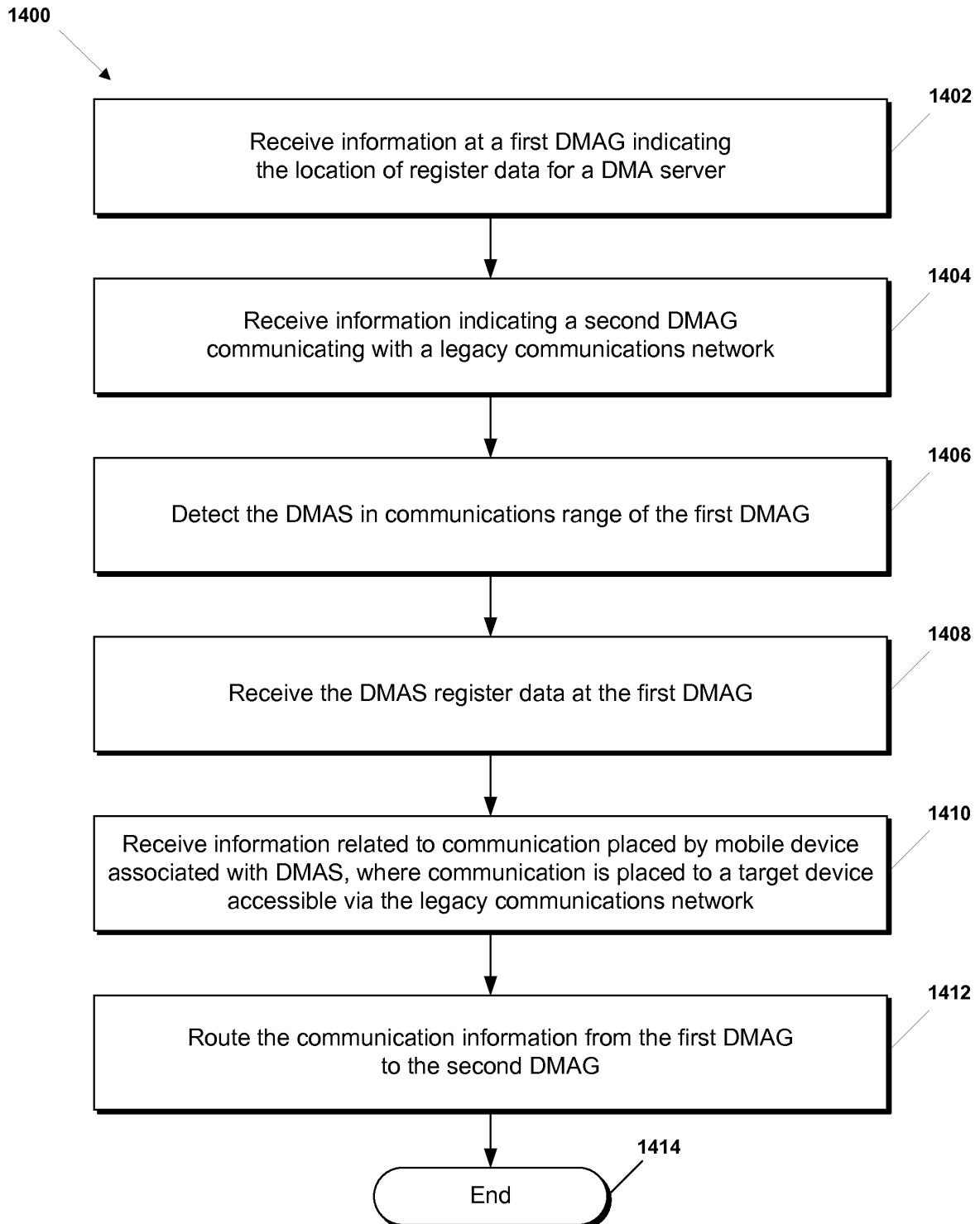


FIG. 14

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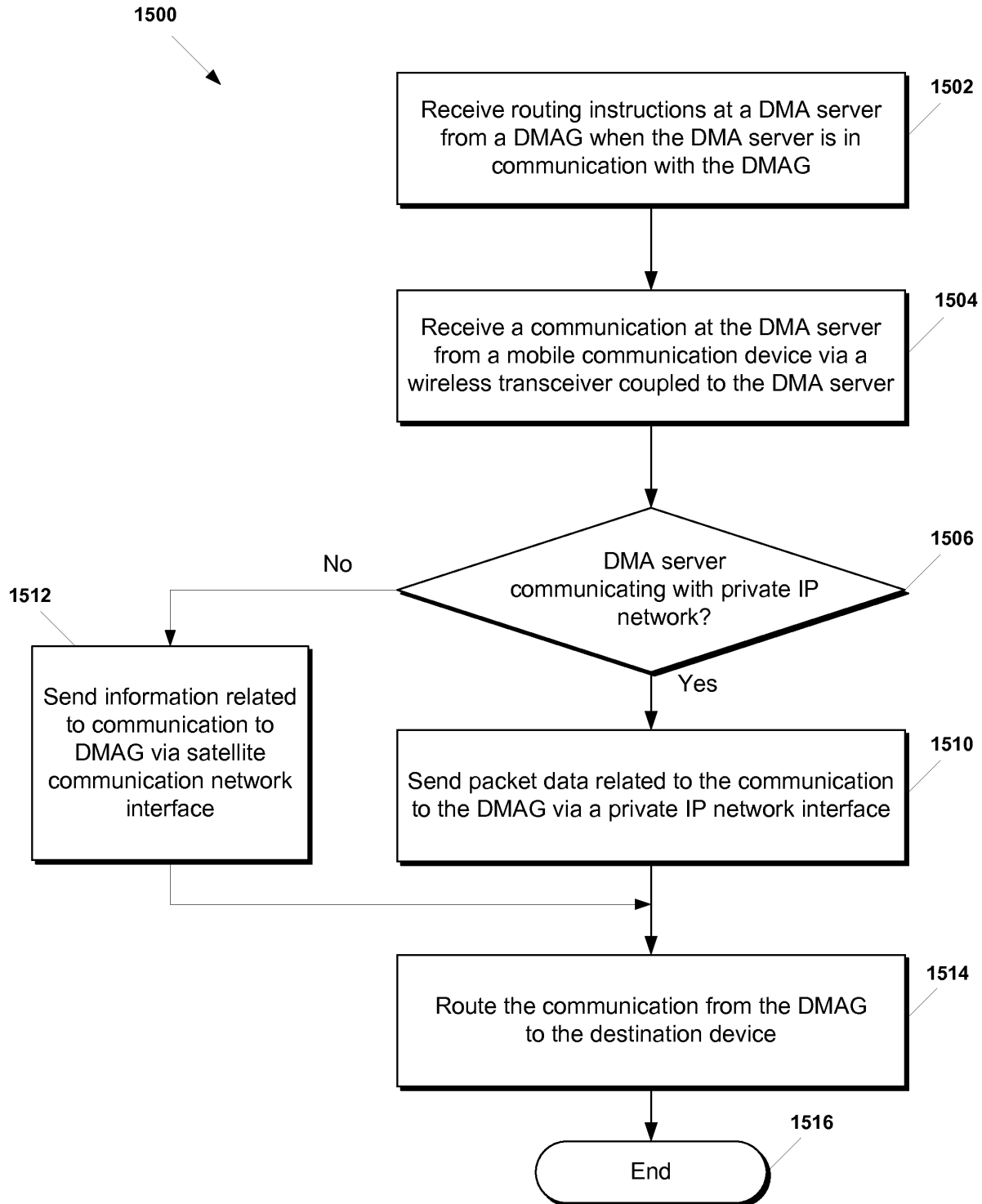


FIG. 15

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1082-0013-C1
		Application Number	
Title of Invention	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		
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					
Applicant Authority		☒ Inventor		☐ Legal Representative under 35 U.S.C. 117	
				☐ Party of Interest under 35 U.S.C. 118	
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Shaowei		Pan		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Kildeer	State/Province	IL	Country of Residence	US
Citizenship under 37 CFR 1.41(b)		US			
Mailing Address of Applicant:					
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Address 2					
City	Kildeer	State/Province	IL		
Postal Code	60047	Country	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
☐ An Address is being provided for the correspondence information of this application.	
Customer Number	60533
Email Address	Add Email Remove Email

Application Information:

Title of the Invention	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		
Attorney Docket Number	1082-0013-C1	Small Entity Status Claimed	☒
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)	15	Suggested Figure for Publication (if any)	1

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1082-0013-C1
		Application Number	
Title of Invention	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		

Publication Information:
☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

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:

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.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	60533		

Domestic Benefit/National Stage Information:

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.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	12172639	2008-07-14

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

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).

Remove			
Application Number	Country ¹	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			☒ Yes ☐ No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Assignee Information:

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.

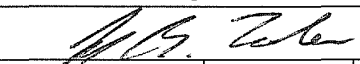
Assignee 1

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1082-0013-C1
		Application Number	
Title of Invention	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		

If the Assignee is an Organization check here. ☒			
Organization Name		Lemko Corporation	
Mailing Address Information:			
Address 1		1700 E. Golf Road, Seventh Floor	
Address 2			
City		Schaumburg	State/Province IL
Country	US	Postal Code	60173
Phone Number		Fax Number	
Email Address			
Additional Assignee Data may be generated within this form by selecting the Add button.			

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			Date (YYYY-MM-DD) 2010-11-09
First Name	Jeffrey G.	Last Name	Toler
Registration Number		38342	

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.**

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below adjacent to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter that is claimed and for which a patent is sought by way of the application entitled

SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE

which (check) ☒ is filed with this Declaration and Power of Attorney and marked with the above title and/or Attorney Docket Number, and which is the final application provided to me by TOLER LAW GROUP, INTELLECTUAL PROPERTIES
☐ and is amended by the Preliminary Amendment attached hereto.
☐ was filed on _____ as Application Serial No.
☐ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in Title 37, Code of Federal Regulations, § 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.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate or under § 365(a) of any PCT international application(s) designating at least one country other than the United States of America, listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
Number	Country	Day/Month/Year Filed	Yes	No

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Data (MM/DD/YYYY)

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U. S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

I hereby appoint the following attorney(s) and/or agent(s) associated with Customer No. 60533 to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith.

Customer No. 60533

I 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 are punishable by fine or imprisonment, or both, under Title 18, United States Code, § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Please direct all correspondence concerning this application to the USPTO Customer Number, if provided, or otherwise to the firm named below:

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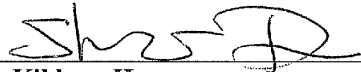
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