

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

APPLICATION ELEMENTS <i>See MPEP chapter 600 concerning utility patent application contents.</i>	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria VA 22313-1450
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1. ☒ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing)	ACCOMPANYING APPLICATION PARTS
2. ☒ Applicant claims small entity status. See 37 CFR 1.27.	
3. ☒ Specification [Total Pages <u>41</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>2</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	
9. ☒ Assignment Papers (cover sheet & document(s)) Name of Assignee <u>Lemko, Corporation</u>	
10. ☐ 37 CFR 3.73(b) Statement ☒ Power of Attorney (when there is an assignee)	
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.: _____

Prior application information: _____ Examiner: _____ Art Unit: _____

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Signature _____	Date <u>7-11-2008</u>
Name (Print/Type) <u>Jeffrey G. Toler</u>	Registration No. (Attorney/Agent) <u>38,342</u>

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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APPLICATION DATA SHEET**APPLICATION INFORMATION**

Application Number::	Unknown
Filing Date::	Herewith
Application Type::	Regular
Subject Matter::	Utility
Suggested Classification::	
Suggested Group Art Unit::	
CD-ROM or CD-R?::	None
Title::	SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE
Attorney Docket Number::	1082-0013
Request for Early Publication?::	No
Request for Non-Publication?::	No
Suggested Drawing Figure::	1
Total Drawing Sheets::	15
Small Entity?::	Yes
Secrecy Order in Parent Appl.?::	No

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REPRESENTATIVE INFORMATION

Representative Customer Number:: 60533

DOMESTIC PRIORITY INFORMATION

Application::	Continuity Type::	Parent Application::	Parent Filing Date::

FOREIGN PRIORITY INFORMATION

Country::	Application No::	Filing Date::	Priority Claimed::

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

Shaowei Pan

FIELD OF THE DISCLOSURE

[0001] The present disclosure relates generally to distributed mobile communications systems.

BACKGROUND

[0002] 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.

[0003] 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 4 to 1.

[0004] 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) are 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.

[0005] 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 in itself. 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 concern.

[0006] 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

[0007] The present invention 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:

[0008] FIG. 1 is a view of a particular illustrative embodiment of a distributed management architecture (DMA) server having a first illustrative form factor;

[0009] FIG. 2 is a view of another particular illustrative embodiment of an alternative embodiment of a DMA server having a second illustrative form factor;

[0010] FIG. 3 is a diagram of another particular illustrative embodiment of an alternative embodiment of a DMA server having a third illustrative form factor;

[0011] FIG. 4 is a diagram of a particular illustrative embodiment of a distributed and associative communications system;

[0012] FIG. 5 is a block diagram of a particular illustrative embodiment of a DMA server;

[0013] 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;

[0014] 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;

[0015] 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;

[0016] 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;

[0017] 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;

[0018] FIG. 11 is a block diagram of a particular illustrative embodiment of a DMA gateway;

[0019] 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;

[0020] 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;

[0021] 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

[0022] 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 OF THE DRAWINGS

[0023] Methods and devices for routing communications between distributed management 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 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.

[0024] In a particular embodiment, a first distributed mobile architecture (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.

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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.

[0029] In introducing the operation of DMA gateways, exemplary embodiments of DMA servers and their operation are described below.

[0030] 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.

[0031] 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.

[0032] 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.

[0033] 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.

[0034] 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.

[0035] 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.

[0036] FIG. 2 depicts an alternative embodiment of a distributed management 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.

[0037] 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.

[0038] FIG. 3 illustrates another alternative embodiment of a distributed management 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.

[0039] 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).

[0040] 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.

[0041] 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.

[0042] 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.

[0043] 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.

[0044] 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 locator resource (HLR) or a visitor locator resource (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.

[0045] 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.

[0046] 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.

[0047] 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.

[0048] 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.

[0049] 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.

[0050] 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.

[0051] 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.

[0052] 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).

[0053] 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.

[0054] 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.

[0055] 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.

[0056] 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.

[0057] 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.

[0058] 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.

[0059] 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.

[0060] 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.

[0061] 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.

[0062] 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.

[0063] 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.

[0064] 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 a vast distances separate the communication devices and there are little or no land-based communications networks between the devices.

[0065] 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 is also in communication with the first DMA server 810.

[0066] 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.

[0067] 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 were DMA servers and thus provide flexibility in creating and proliferating communications networks based on the communications needs for which the network is deployed.

[0068] 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 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.

[0069] 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.

[0070] 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.

[0071] 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.

[0072] 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.

[0073] 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.

[0074] 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.

[0075] 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.

[0076] 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.

[0077] 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.

[0078] 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.

[0079] 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.

[0080] 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.

[0081] 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.

[0082] 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.

[0083] 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.

[0084] 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.

[0085] 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.

[0086] 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.

[0087] 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.

[0088] 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.

[0089] 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.

[0090] 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.

[0091] 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.

[0092] 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.

[0093] 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 true spirit and scope of the present invention. Thus, to the maximum extent allowed by law, the scope of the present invention 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 method, comprising:
receiving at a first distributed mobile architecture (DMA) gateway
communications information for a communications network accessible by
a second DMA gateway, 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.
2. The method of claim 1, wherein:
at least one of the first DMA gateway and the second DMA gateway includes a
satellite-based DMA gateway; and
the DMA gateway communications network includes a satellite communications
network.
3. The method of claim 1, wherein the DMA server includes one of the group
including:
a ground-based DMA server; or
a satellite-based DMA server.

4. The method of claim 1, wherein the communication includes at least one of the group including:

- a voice communication; or
- a data communication.

5. The method of claim 1, wherein the legacy communications network includes one of the group including:

- a public switched telephone network (PSTN);
- a wireless communications network serviced by mobile switching center (MSC);
- a public internet protocol (IP) network; and
- an American National Standards Institute 41 (ANSI-41) network.

6. The method of claim 1, further comprising the first DMA gateway sending a notification to the second DMA gateway, the notification indicating that the communications information is stored at the first DMA gateway.

7. The method of claim 1, further comprising, upon receiving the communications information, the first DMA gateway automatically sending at least a portion of communications information to the second DMA gateway via the gateway communications network.

8. The method of claim 1, further comprising, in response to receiving a query from the second DMA gateway for the communications information, the first DMA gateway sending at least a portion of the communications information to the second DMA gateway via the gateway communications network.

9. The method of claim 1, wherein the communications information includes communications register data including at least one of the group including:

- a portion of the community location register;
- a portion of the home location register (HLR) data for the communications network; and
- a portion of the visitor location register (VLR) for the communications network.

10. The method of claim 9, wherein the register data stored at the first DMA gateway indicates that the register data is for a DMA server temporarily registered in a visitor DMA register of the second DMA gateway.

11. The method of claim 1, further comprising the first DMA gateway detecting the presence of the communications network in a communications range of the first DMA gateway.

12. The method of claim 11, further comprising the first DMA gateway sending communications network information to the second DMA gateway indicating that the communications network is within the communications range of the first DMA gateway.

13. The method of claim 11, further comprising the first DMA gateway sending communications network information to a central database indicating that the communications network is in the communications range of the first DMA gateway.

14. The method of claim 11, further comprising the first DMA gateway receiving additional communications network information from the second DMA gateway indicating that the second DMA gateway detects the presence of an additional communications network within a communications range of the second DMA gateway.

15. The method of claim 1, further comprising the first DMA gateway receiving a second notification from a central database, the second notification indicating that second register data is stored at the central database.

16. The method of claim 15, further comprising the first DMA gateway detecting a second communications network in a service area of the first DMA gateway.

17. The method of claim 16, wherein the first DMA gateway detects a private Internet Protocol (IP) network access point in 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 Internet protocol (IP) network.

18. The method of claim 16, wherein the first DMA gateway sends second communications information to the central database indicating that calls associated with the second communications network are accessible to the first DMA gateway.

19. The method of claim 18, wherein the first DMA gateway receives second register data from the central database.

20. The method of claim 1, wherein the first DMA gateway receives the communications information from the second DMA gateway.

21. The method of claim 1, wherein the first DMA gateway receives the communications information from a central database.

22. A network communications system, comprising:
a first distributed mobile architecture (DMA) gateway including:
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.
23. The system of claim 22, wherein at least one of the first DMA gateway and the second DMA gateway comprises a satellite-based DMA gateway.
24. The system of claim 22, wherein at least one of the first DMA gateway and the second DMA gateway comprises a ground-based DMA gateway.
25. The system of claim 22, wherein the DMA server includes one of the group including:
a ground-based DMA server; or
a satellite-based DMA server.

26. The system of claim 22, wherein the logic is adapted to receive DMA server register data from the DMA server indicating that a mobile communications device is accessible to the DMA server via a wireless transceiver coupled to the DMA server.

27. The system of claim 22, wherein the first DMA gateway communicates with a central database via the third interface, the central database storing register data associated with the DMA server.

28. The system of claim 22, wherein the first DMA gateway communicates with the central database via the second interface, the central database storing register data associated with the DMA server.

29. The system of claim 22, wherein the first DMAG and the second DMAG communicate via C-Band, Ku-Band, Ka-Band, L-Band, or any combination thereof.

30. The system of claim 22, wherein the gateway communications network at least one of an IP network and a microwave network.

31. The system of claim 20, wherein the legacy communications network includes one or more of the group including:

a public switched telephone network (PSTN);

a wireless network;

a public IP network; and

an American National Standards Institute 41 (ANSI-41) network.

32. The system of claim 22, wherein the DMA server is one of a plurality of DMA servers communicating with the first DMAG via the second interface.

33. 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 communications network accessible via the first DMA gateway.

34. The method of claim 33, wherein the first DMA server is adapted to send the first call while being transported from a first location to a second location.

35. The method of claim 33, wherein the first DMA server receives second routing instructions from a second DMAG when the first DMA server moves into a second service area of the second DMAG, the second service area comprising the second location and the second DMAG comprising an orbiting satellite.

36. The method of claim 33, wherein the first DMA server sends a second call received at the first DMA server from the first mobile communications device to the second DMA gateway via the private IP network according to the second routing instructions.

37. The method of claim 36, wherein the second call is associated with a destination device accessible via the legacy communications network.

38. The method of claim 36, wherein the second call is associated with a second mobile communications device accessible to a second DMA server, the second DMA server accessible to the second DMA gateway via the private IP network.

39. The method of claim 33, wherein the first DMA server receives the second routing instructions from the second DMAG during the first call.

40. The method of claim 33, wherein the first DMA server sends first DMA server register data to the second DMA gateway in response to receiving the second routing instructions.

41. The method of claim 33, wherein the first DMA server receives second routing instructions from a second DMA gateway when the first DMA server leaves the first service area and enters a second service area of the second DMA gateway due to orbital motion of the first DMA gateway and the second DMA gateway, the second DMA gateway comprising an orbiting satellite.

42. 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 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.

43. The system of claim 42, wherein the logic is adapted to send the call
information to the DMA gateway via the first interface according to routing instructions
received at the DMA server from the DMA gateway.

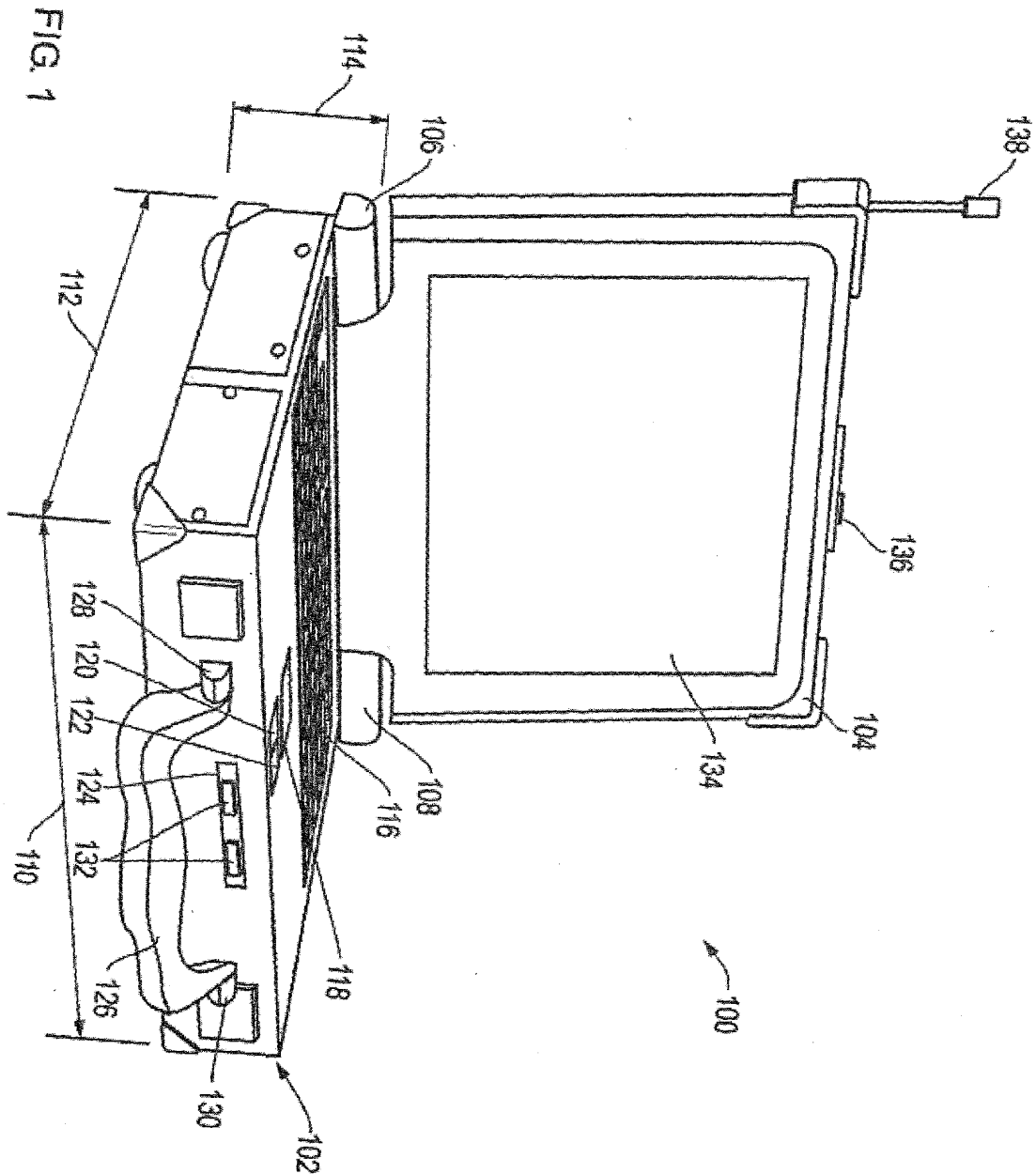
44. The system of claim 42, wherein the logic is adapted to send the call
information to the DMA gateway via the second interface according to routing
instructions received at the DMA server from the DMA gateway.

45. The system of claim 42, wherein the logic is adapted to convert the call
information to packet data when the call information is sent to the DMAG via the first
interface.

46. An orbiting satellite, 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; 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.

ABSTRACT OF THE DISCLOSURE

[0094] Methods and devices for routing communications between distributed management 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 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.



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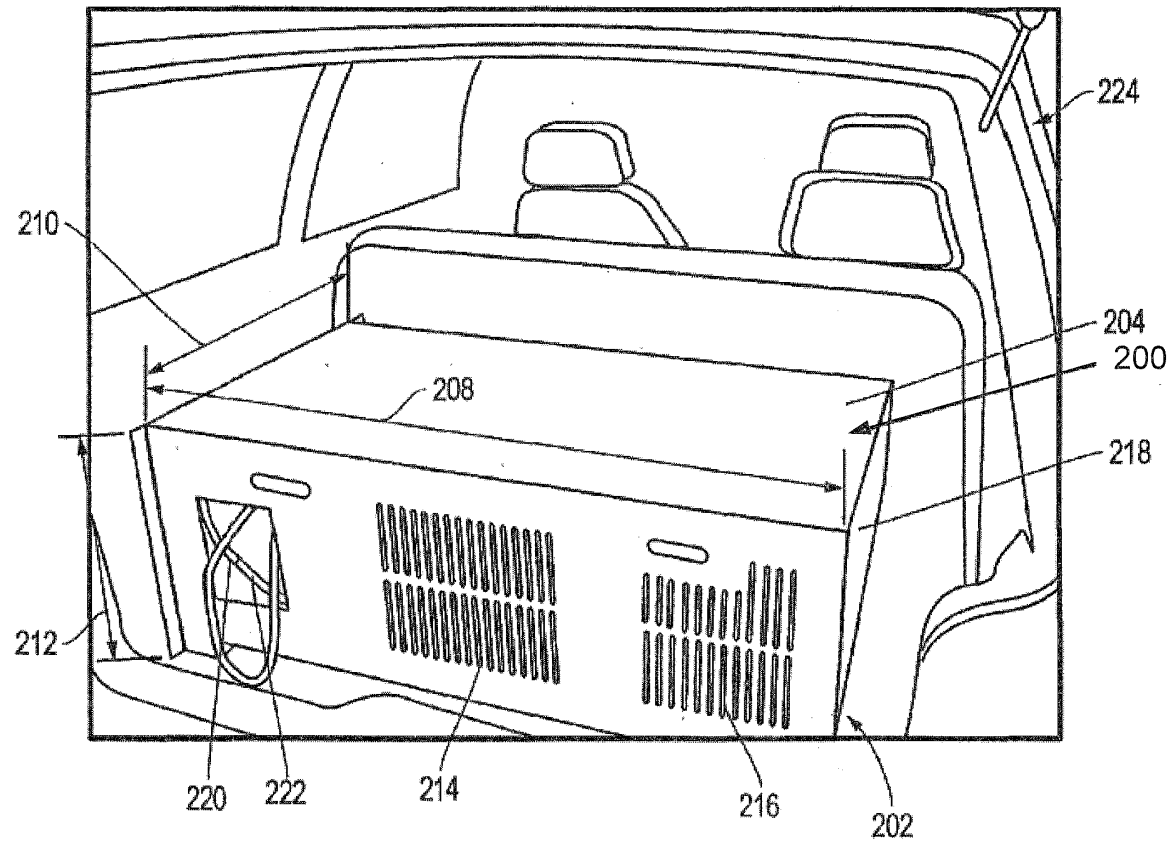


FIG. 2

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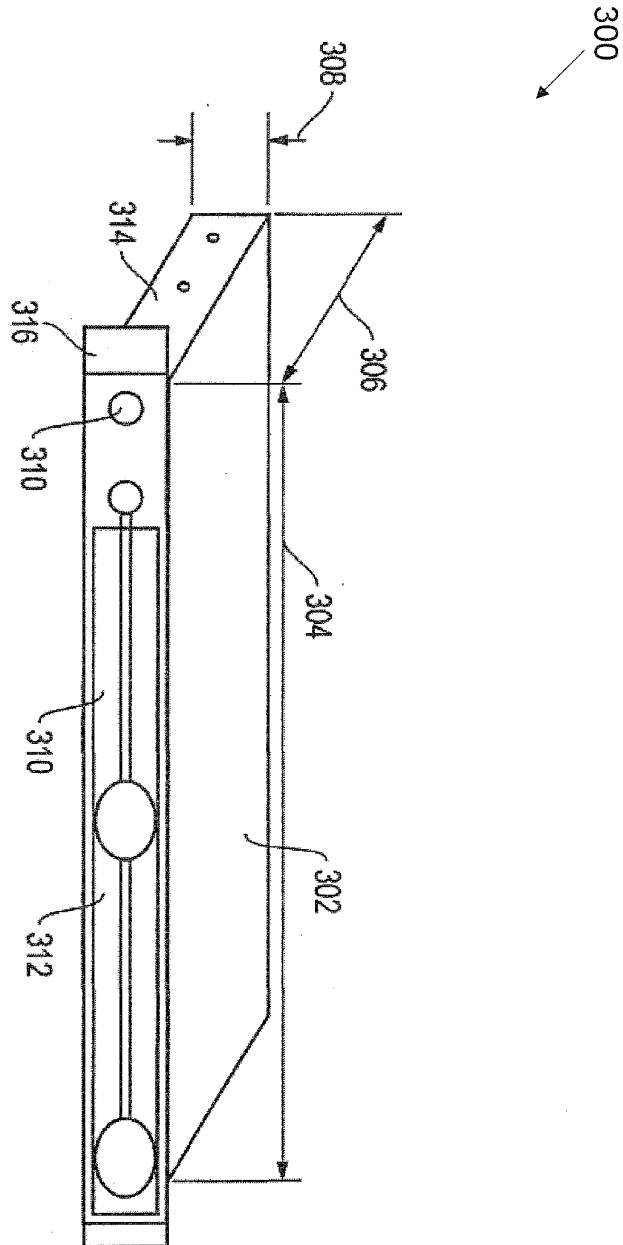


FIG. 3

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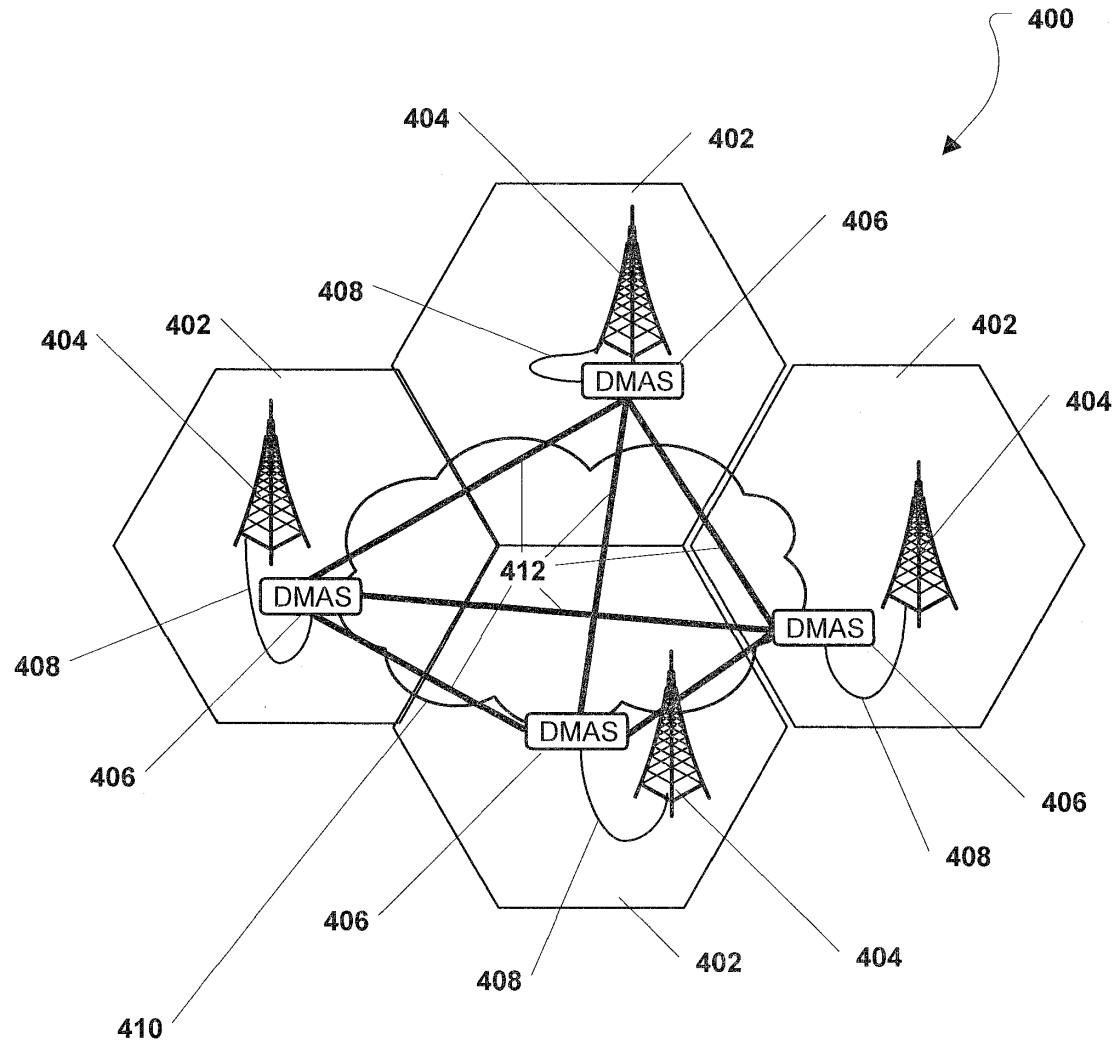


FIG. 4

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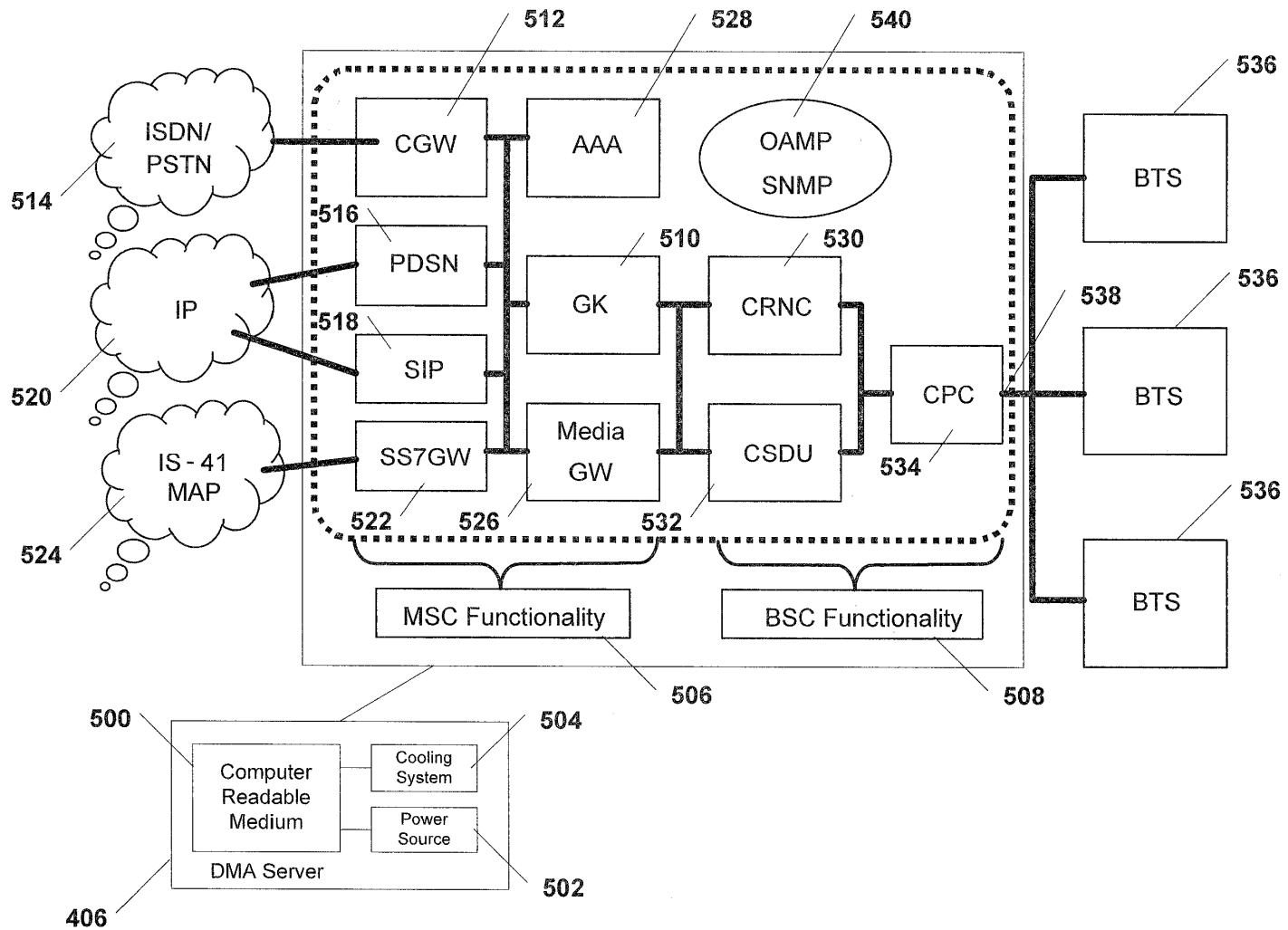


FIG. 5

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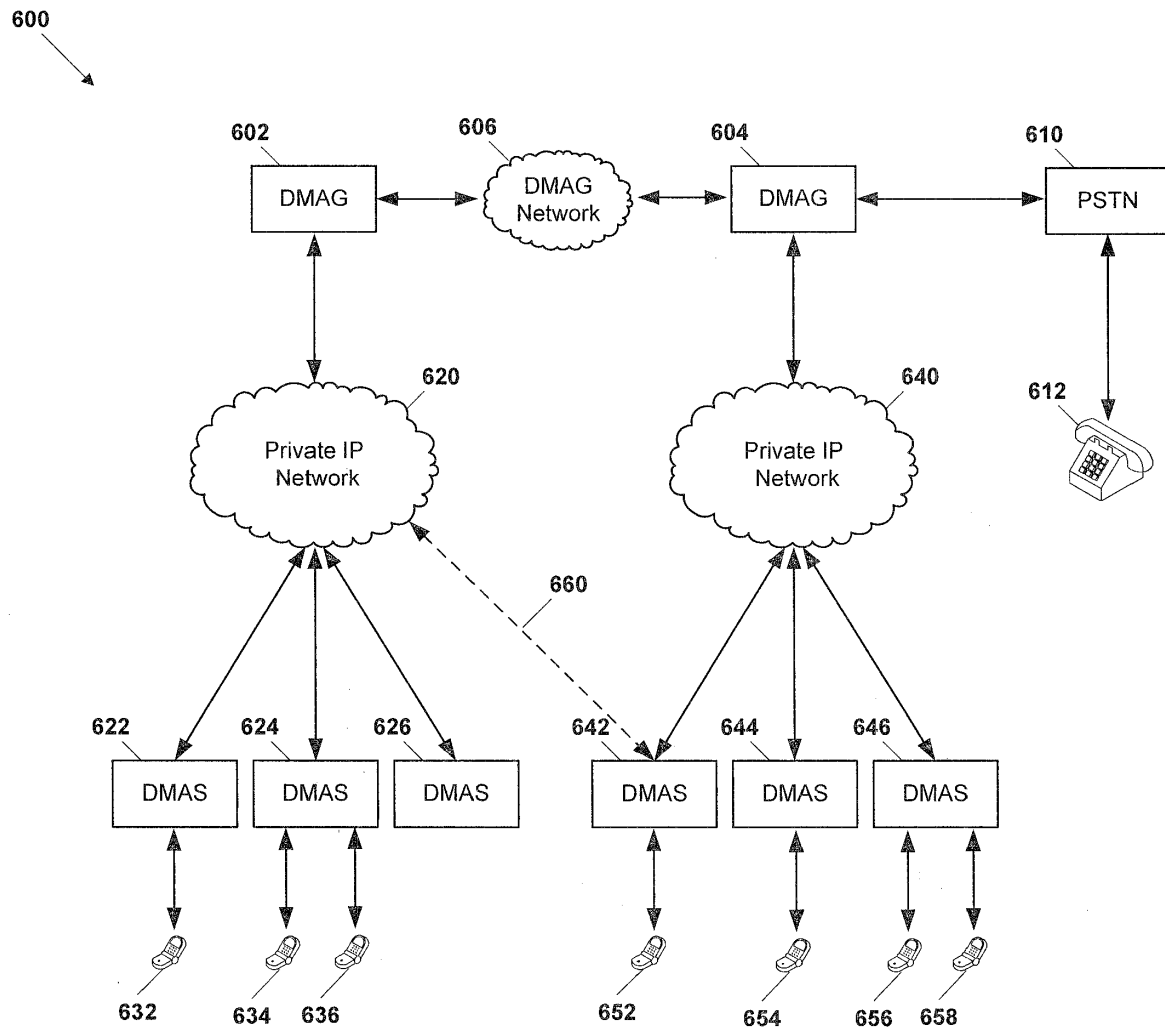


FIG. 6

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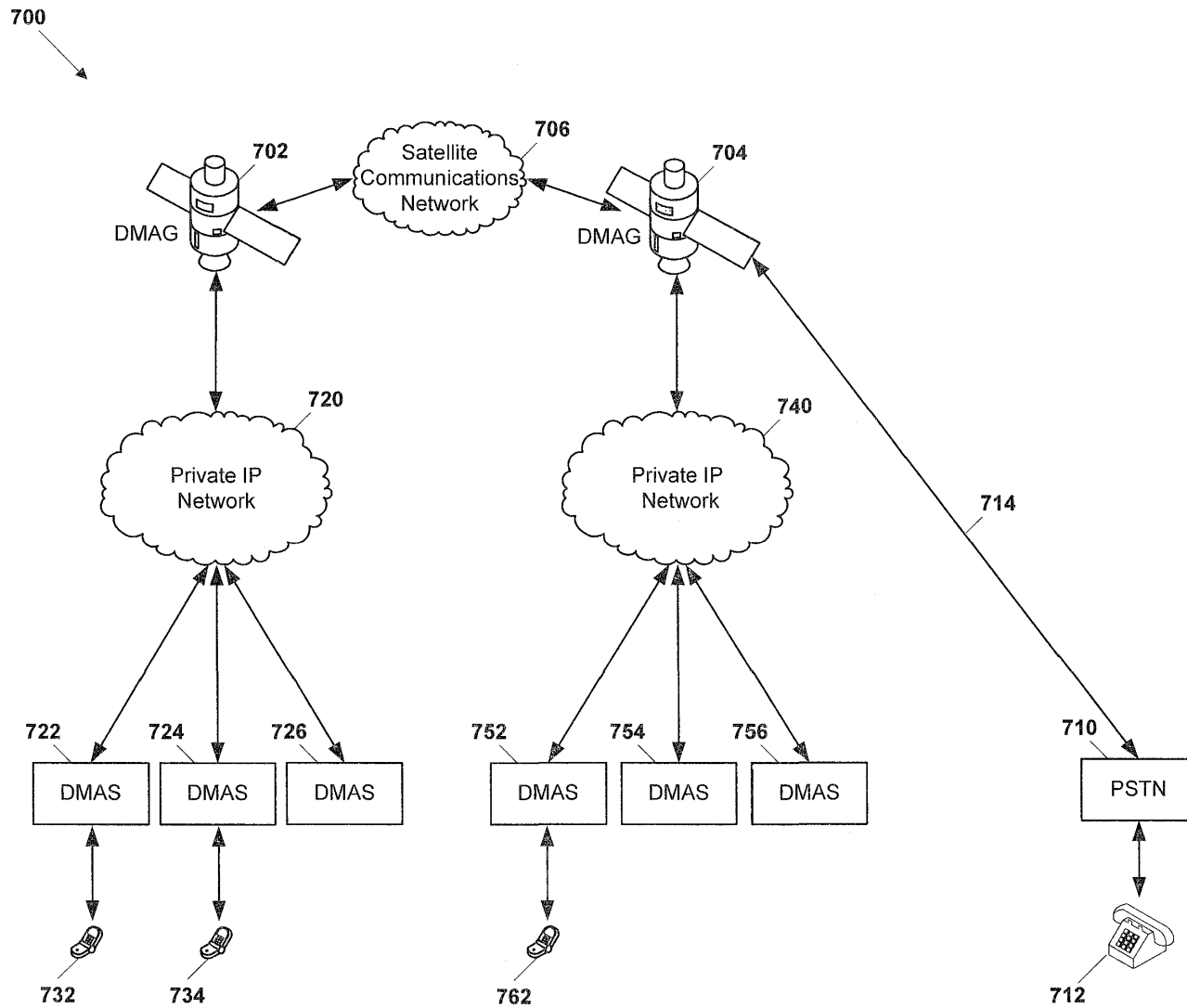
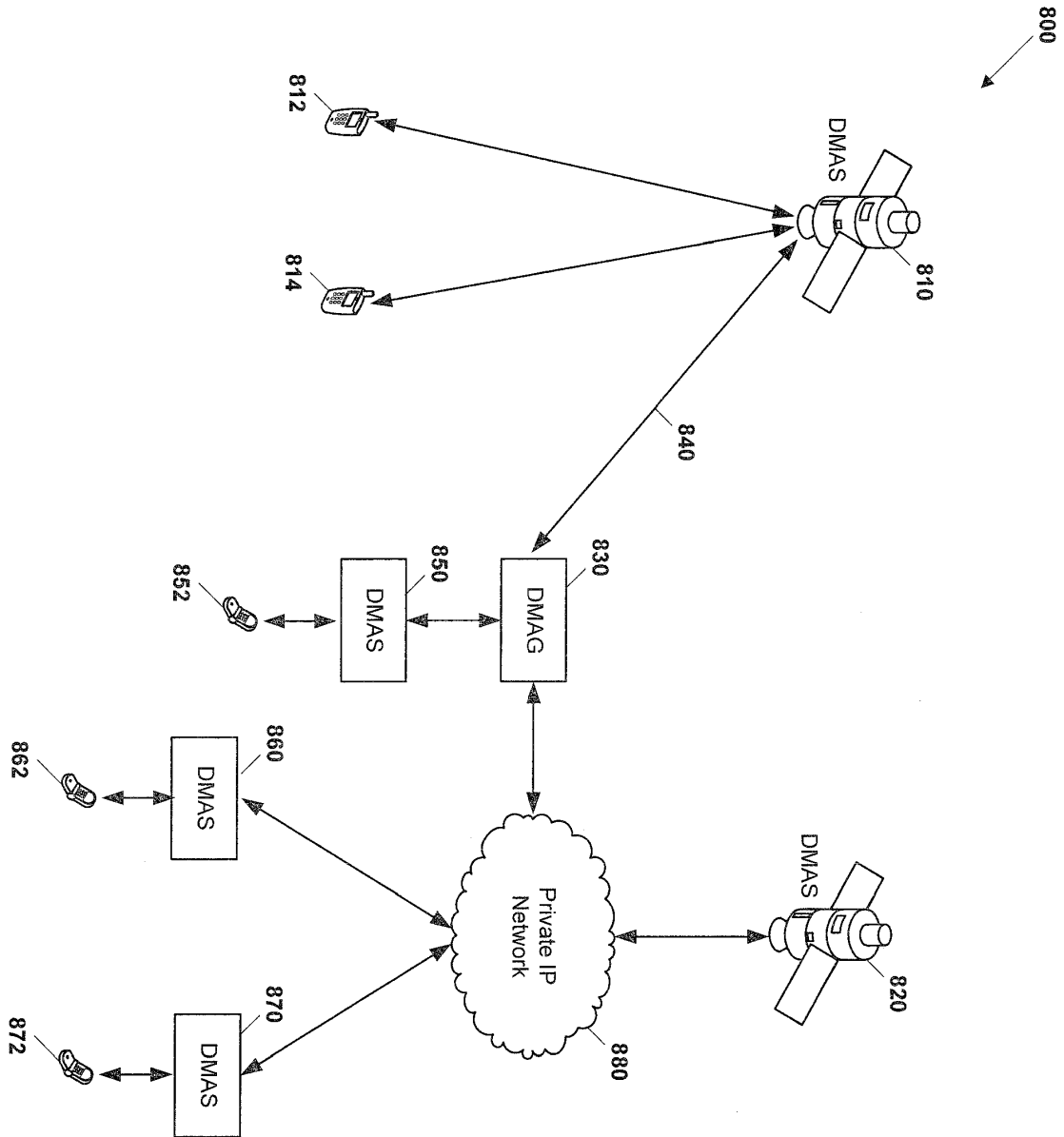


FIG. 7

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FIG. 8



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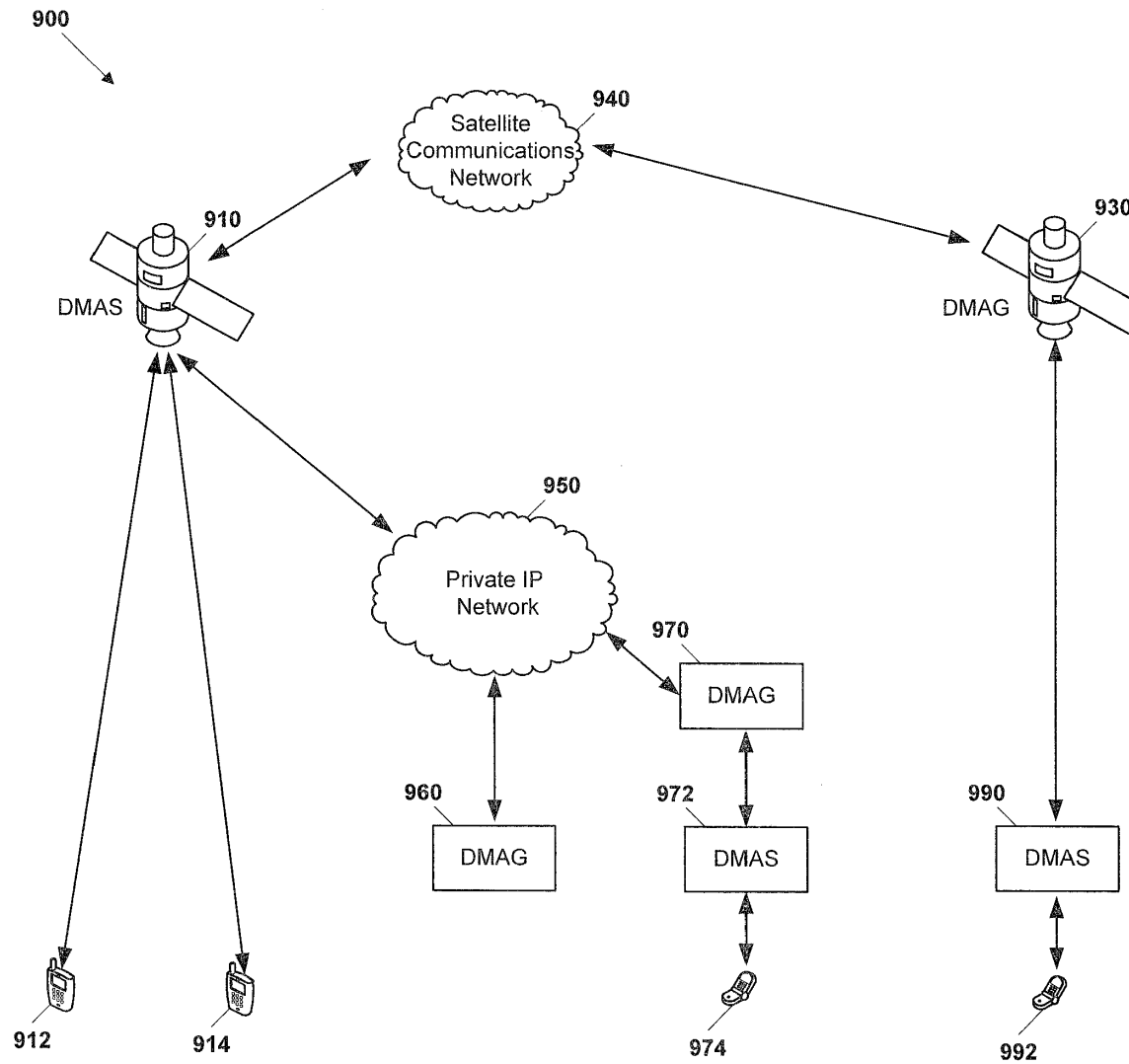


FIG. 9

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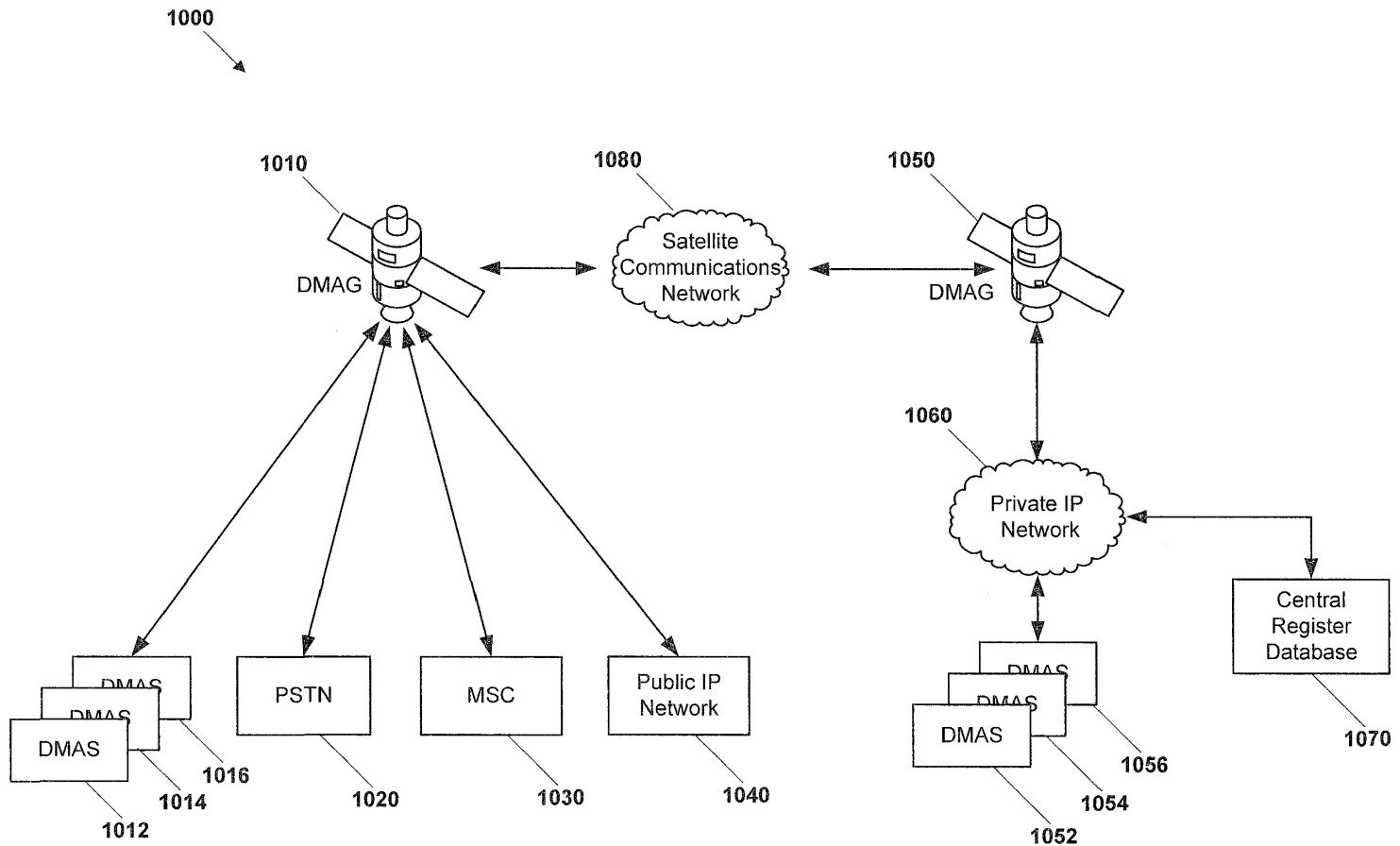


FIG. 10

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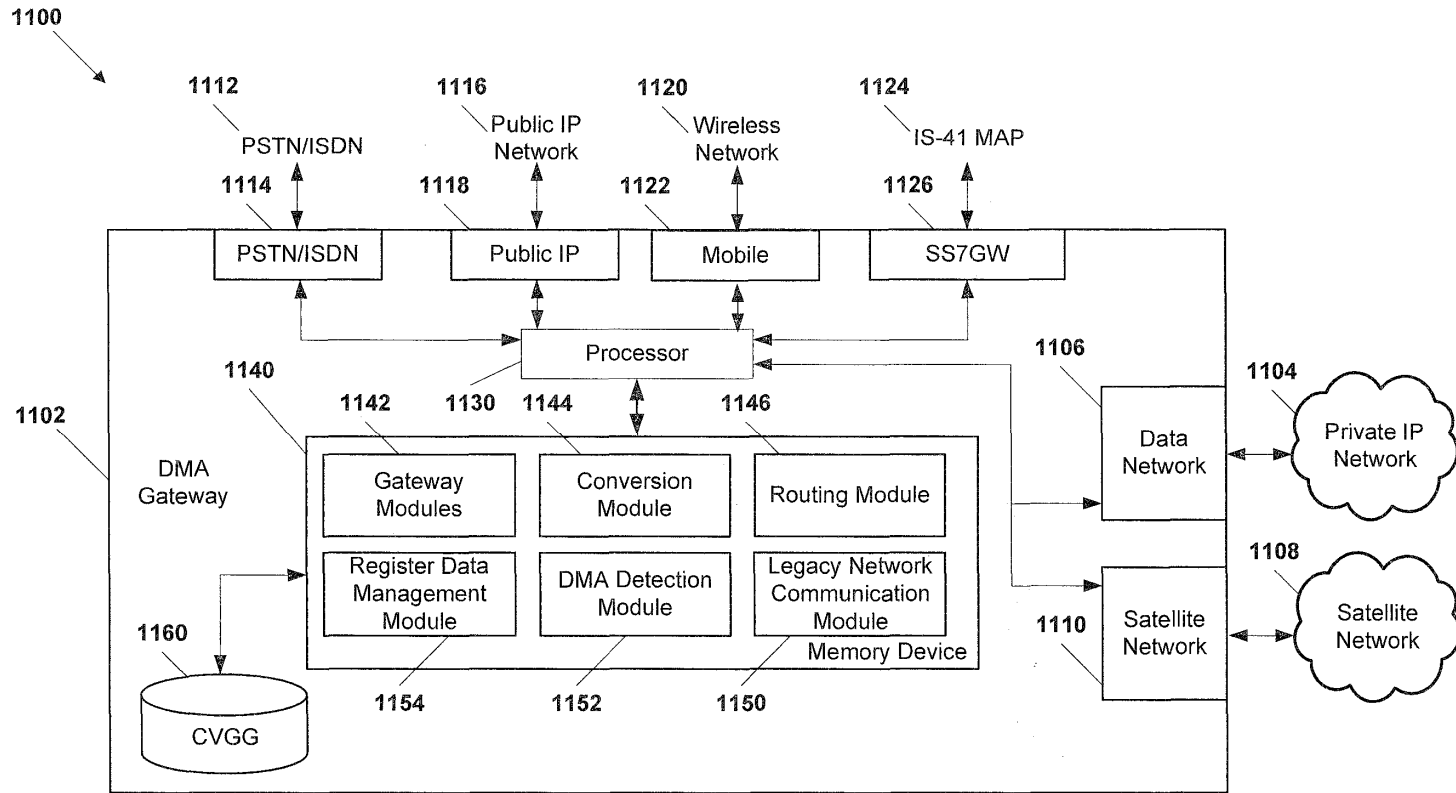


FIG. 11

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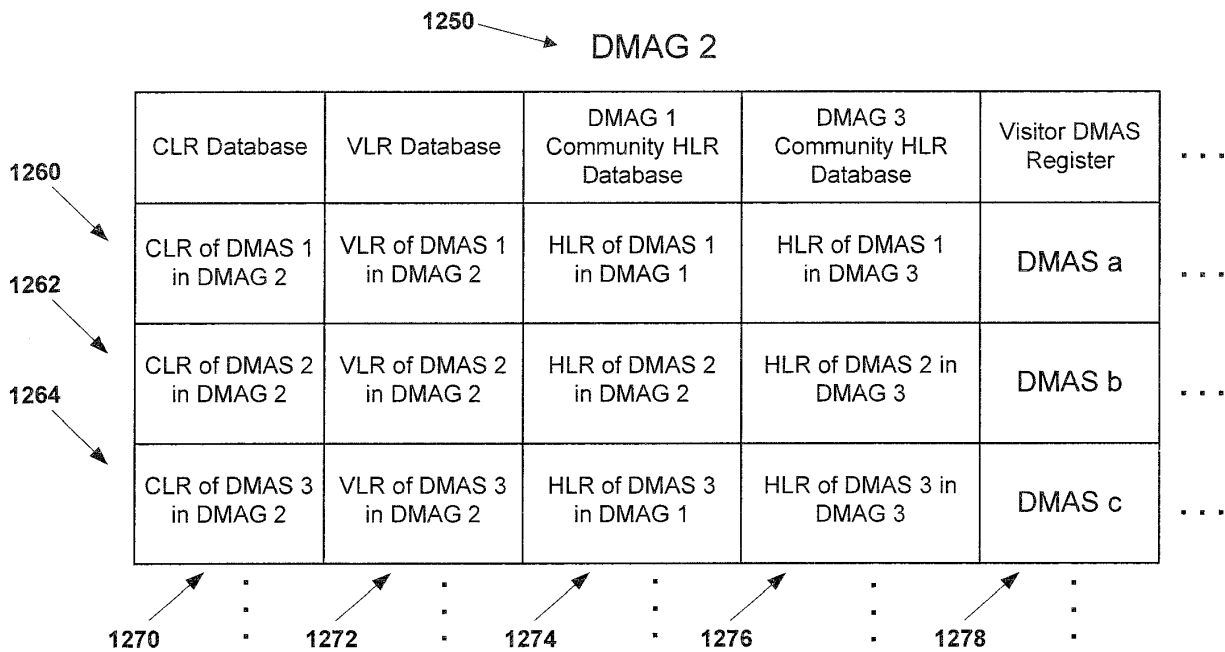
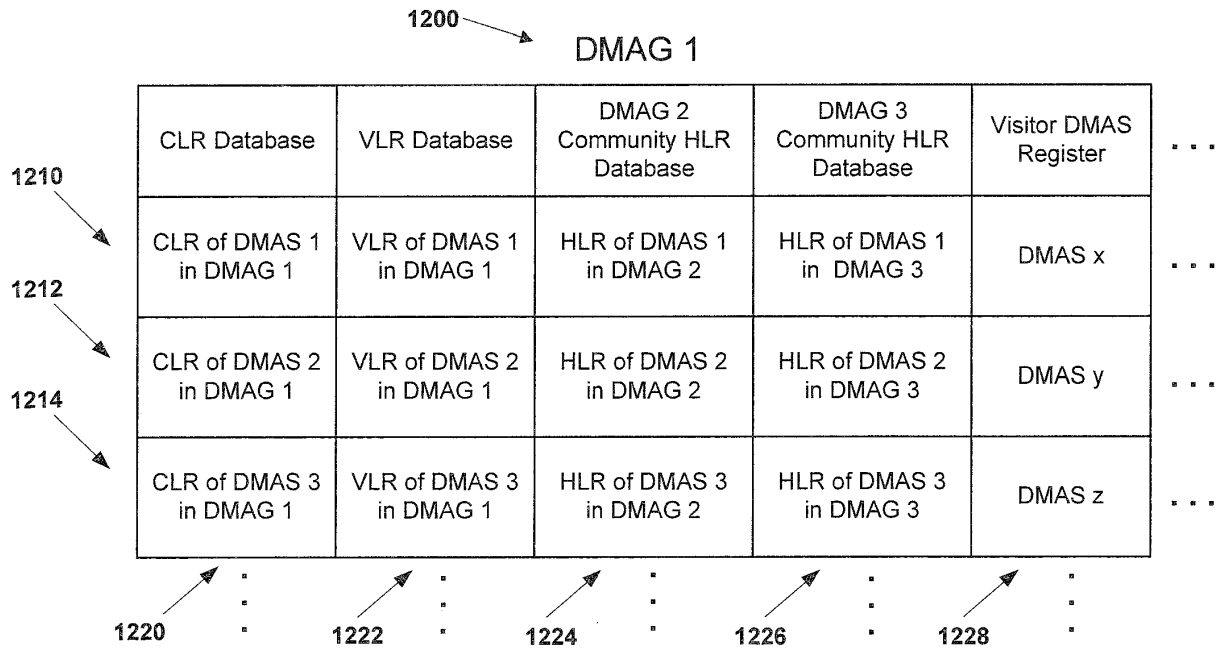


FIG. 12

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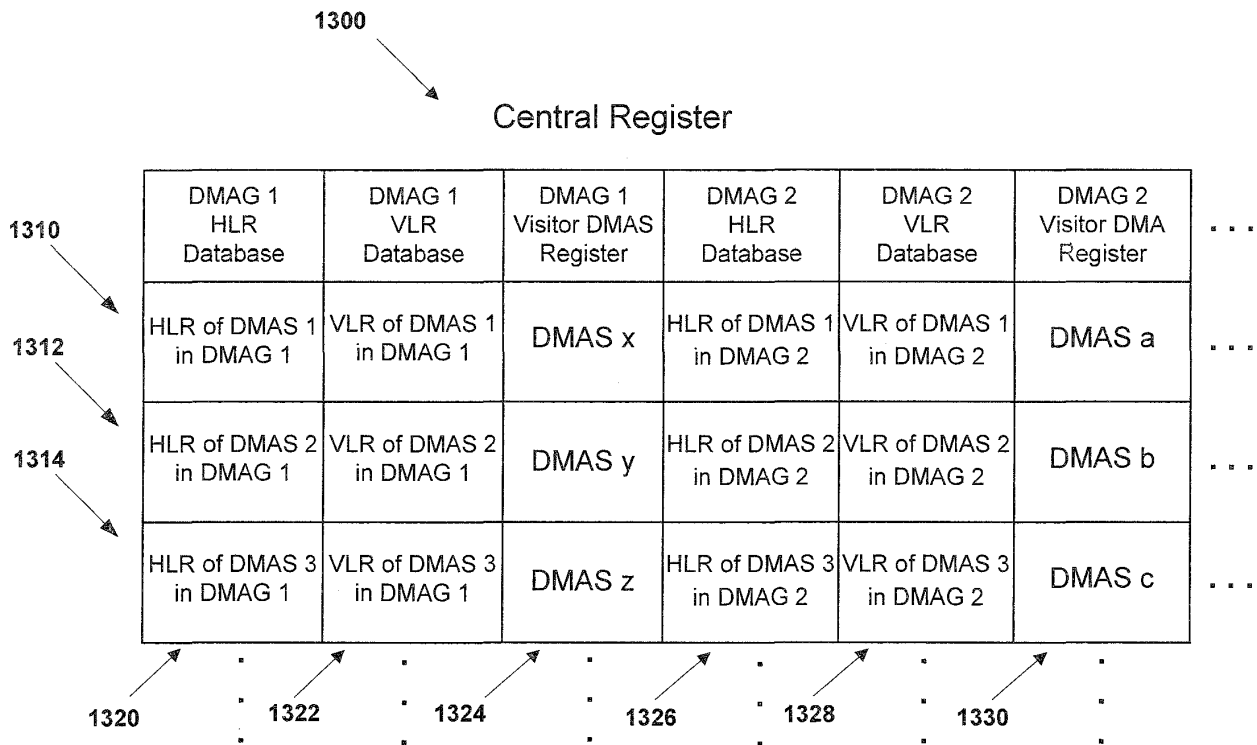


FIG. 13

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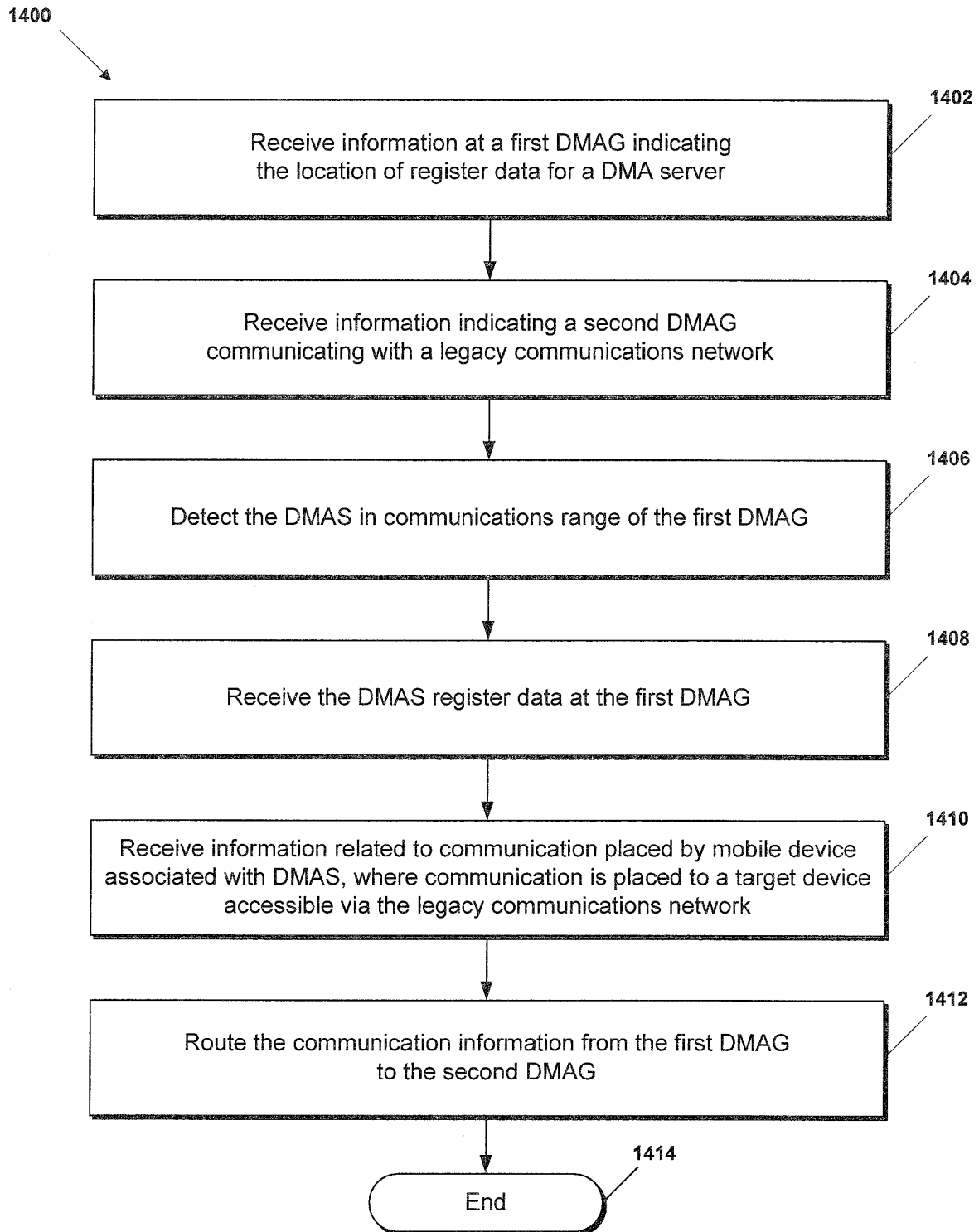


FIG. 14

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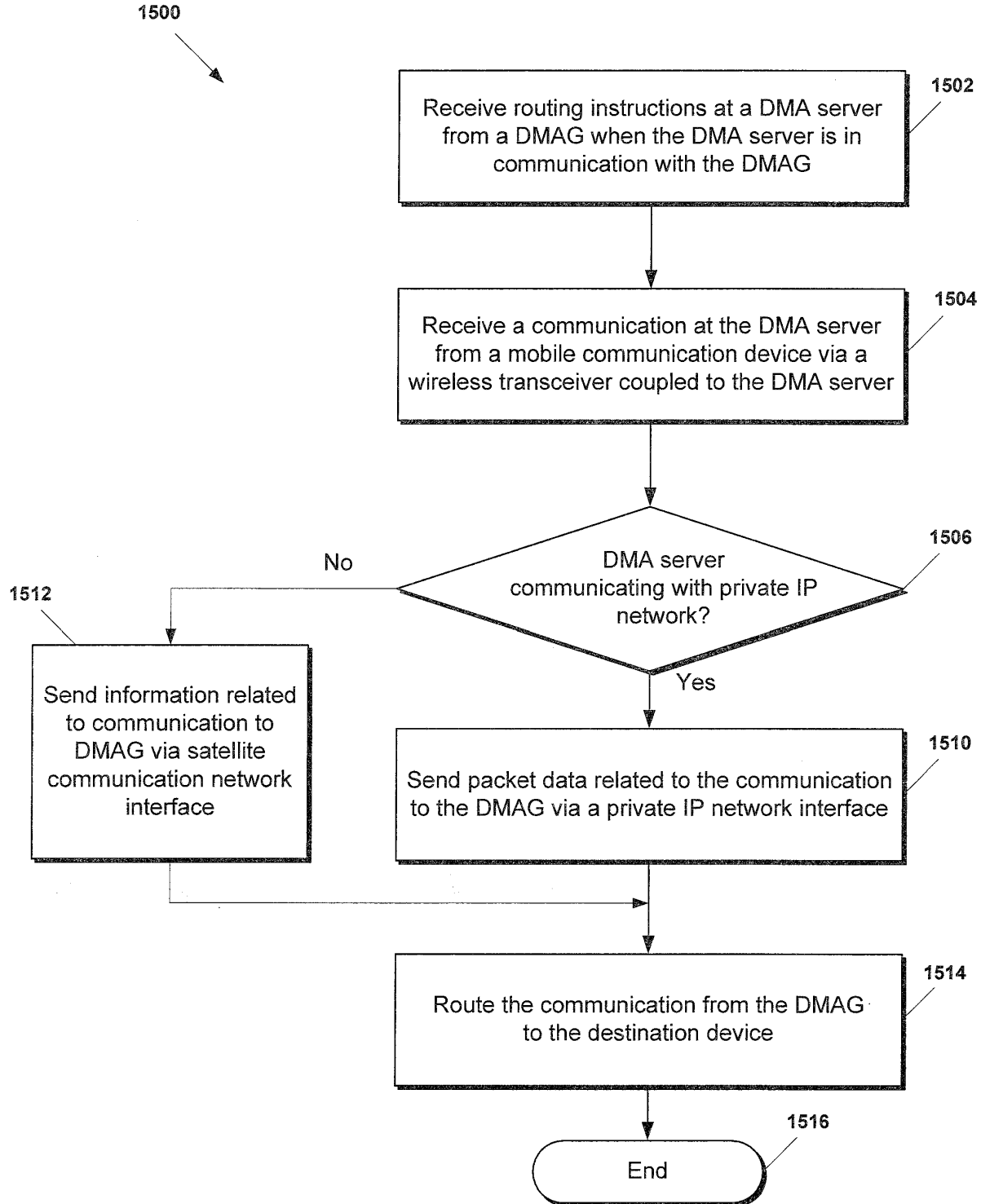


FIG. 15

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/jeaneaux jordan		
Attorney Docket Number:		1082-0013		
Filed as Small Entity				
Utility Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	75	75
Utility Search Fee	2111	1	255	255
Utility Examination Fee	2311	1	105	105
Pages:				
Claims:				
Claims in excess of 20	2202	26	25	650
Independent claims in excess of 3	2201	2	105	210
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1295

Electronic Acknowledgement Receipt	
EFS ID:	3611929
Application Number:	12172639
International Application Number:	
Confirmation Number:	5341
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/jeaneaux jordan
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013
Receipt Date:	14-JUL-2008
Filing Date:	
Time Stamp:	16:12:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 1295
RAM confirmation Number	1561
Deposit Account	502469
Authorized User	
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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1		1082-0013_Patent_Application.pdf	16650889 dec0b9e071b1001c84a5b3f5dacbb88952ab9	yes	61
	Multipart Description/PDF files in .zip description				
	Document Description	Start	End		
	Transmittal of New Application	1	1		
	Application Data Sheet	2	3		
	Oath or Declaration filed	4	5		
	Specification	6	35		
	Claims	36	45		
	Abstract	46	46		
	Drawings-only black and white line drawings	47	61		
Warnings:					
Information:					
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Warnings:					
Information:					
Total Files Size (in bytes):			16659480		

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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.

Filing Date: 07/14/08

Approved for use through 7/31/2006. OMB 0651-0032

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 12/172,639	
APPLICATION AS FILED – PART I					
(Column 1)		(Column 2)		SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OTHER THAN SMALL ENTITY
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75	N/A
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	255	N/A
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	105	N/A
TOTAL CLAIMS (37 CFR 1.16(i))	46	minus 20 = 26	X\$ 25	650	X\$50
INDEPENDENT CLAIMS (37 CFR 1.16(h))	5	minus 3 = 2	X\$105	210	X\$210
APPLICATION SIZE FEE (37 CFR 1.16(s))			If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$260 (\$130 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).		
12153552 MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
			180		370
			TOTAL	1295	TOTAL 0
* If the difference in column 1 is less than zero, enter "0" in column 2.					
APPLICATION AS AMENDED – PART II					
(Column 1)		1E+06	(Column 2)		(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	
	Total (37 CFR 1.16(i))	*	Minus	**	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=
	Application Size Fee (37 CFR 1.16(s))				
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				
(Column 1)		(Column 2)	(Column 3)		SMALL ENTITY
RATE (\$)	ADDITIONAL FEE (\$)	RATE (\$)	ADDITIONAL FEE (\$)	OTHER THAN SMALL ENTITY	ADDITIONAL FEE (\$)
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TOTAL ADD'T FEE		TOTAL ADD'T FEE		TOTAL ADD'T FEE	
(Column 1)		(Column 2)	(Column 3)		SMALL ENTITY
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X =		X =		X =	
X =		X =		X =	
N/A		N/A		N/A	
TOTAL ADD'T FEE		TOTAL ADD'T FEE		TOTAL ADD'T FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.					

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

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

Filing Date: 07/14/08

Approved for use through 7/31/2006. OMB 0651-0032

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

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PATENT APPLICATION FEE DETERMINATION RECORD					Application or Docket Number					
Substitute for Form PTO-875					12/172,639					
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY			
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)		
BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A				
SEARCH FEE (37 CFR 1.16(k), (l), or (m))		N/A		N/A		N/A		310		
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A		510		
TOTAL CLAIMS (37 CFR 1.16(i))		20 minus 20 =		0		N/A		210		
INDEPENDENT CLAIMS (37 CFR 1.16(h))		3 minus 3 =		0		X\$50		0		
APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$260 (\$130 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).				X\$210		0		
12153552 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		1030		
APPLICATION AS AMENDED - PART II										
(Column 1)		1E+06 (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 (\$)
Total (37 CFR 1.16(i))		*		Minus **		=		X =		
Independent (37 CFR 1.16(h))		*		Minus ***		=		X =		
Application Size Fee (37 CFR 1.16(s))										
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								N/A		
TOTAL ADD'T FEE								TOTAL ADD'T FEE		
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)
Total (37 CFR 1.16(i))		*		Minus **		=		X =		
Independent (37 CFR 1.16(h))		*		Minus ***		=		X =		
Application Size Fee (37 CFR 1.16(s))										
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								N/A		
TOTAL ADD'T FEE								TOTAL ADD'T FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.										
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".										
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".										
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

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

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www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO.	TOT CLAIMS	IND CLAIMS
12/172,639	07/14/2008	2616	1295	1082-0013	46	5

CONFIRMATION NO. 5341

FILING RECEIPT



OC000000031152428

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

Date Mailed: 07/24/2008

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

Foreign Applications

If Required, Foreign Filing License Granted: 07/23/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/172,639**

Projected Publication Date: 01/14/2010

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

370

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

page 2 of 3

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/172,639	07/14/2008	Shaowei Pan	1082-0013

CONFIRMATION NO. 5341

PUBLICATION NOTICE



OC000000039660936

60533
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-2010-0008369-A1

Publication Date:01/14/2010

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publicly available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

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

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	12172639
	Filing Date	2008-07-14
	First Named Inventor	Shaowei Pan
	Art Unit	
	Examiner Name	
	Attorney Docket Number	1082-0013

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	20070230352	A1	2007-10-04	Kokku et al.	
	2	20050091392	A1	2005-04-28	Gesswein et al.	
	3	20060258358	A1	2006-11-16	Kallio	
	4	20060098661	A1	2006-05-11	Pan	
	5	20070147598	A1	2007-06-28	Somes et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12172639
	Filing Date		2008-07-14
	First Named Inventor	Shaowei Pan	
	Art Unit		
	Examiner Name		
Attorney Docket Number		1082-0013	

	6					
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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 i	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	International Search Report and Written Opinion received in corresponding PCT Application No. PCT/US2009/045973 from the International Searching Authority (KR) mailed January 18, 2010, 14 pages	☐

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

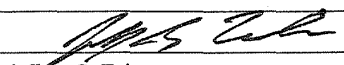
EXAMINER SIGNATURE

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*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	12172639
	Filing Date	2008-07-14
	First Named Inventor	Shaowei Pan
	Art Unit	
	Examiner Name	
	Attorney Docket Number	1082-0013

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)	2010-02-15
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.			

Privacy Act Statement

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

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

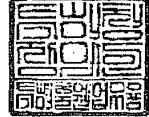
1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information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

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: JEFFREY G. TOLER 8500 BLUFFSTONE COVE, SUITE A201 AUSTIN TX 78759 USA DOCKETED FILE 1082-0013-WO FEB 08 2010 DUE FILE 5105 IN US CASE 2/18/10 (4/18/10)		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		Date of mailing (day/month/year) 18 JANUARY 2010 (18.01.2010)	
International application No. PCT/US2009/045973		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	
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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 66.1bis(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 43bis.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		
<i>H04L 12/56(2006.01)i</i>		
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 

Form PCT/ISA/210 (second sheet) (July 2008)

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
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Form PCT/ISA/237 (cover sheet) (April 2007)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2009/045973

Box No. 1 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 43bis.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.

Electronic Acknowledgement Receipt	
EFS ID:	7016507
Application Number:	12172639
International Application Number:	
Confirmation Number:	5341
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/Kimberly Brown
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013
Receipt Date:	16-FEB-2010
Filing Date:	14-JUL-2008
Time Stamp:	13:53:25
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		ids_as_filed.pdf	3111915	yes	18
			d268e3a397eed2158dc9731d136590dbe6535891		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Information Disclosure Statement (IDS) Filed (SB/08)	1	4
	NPL Documents	5	18
Warnings:			
Information:			
Total Files Size (in bytes):		3111915	
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.			



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/172,639	07/14/2008	Shaowei Pan	1082-0013	5341
60533 7590 05/21/2010 TOLER LAW GROUP 8500 BLUFFSTONE COVE SUITE A201 AUSTIN, TX 78759			EXAMINER PHUNKULH, BOB A	
			ART UNIT 2477	PAPER NUMBER
			MAIL DATE 05/21/2010	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)	
	12/172,639	PAN, SHAOWEI	
	Examiner	Art Unit	
	BOB A. 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 ____.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-46 is/are pending in the application.

4a) Of the above claim(s) ____ is/are withdrawn from consideration.

5) ☒ Claim(s) 1-21 and 33-41 is/are allowed.

6) ☒ Claim(s) 22-32 and 42-46 is/are rejected.

7) ☐ Claim(s) ____ is/are objected to.

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

Application Papers

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

10) ☒ The drawing(s) filed on 14 July 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

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

Priority under 35 U.S.C. § 119

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

a) ☐ All b) ☐ Some * c) ☐ None of:

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

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

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

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

Attachment(s)

1) ☒ 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>2/16/2010</u> .	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5) ☐ Notice of Informal Patent Application 6) ☐ Other: _____.
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DETAILED ACTION

Claim Objections

Claims 1, 22, 33, 42, and 46, are objected to because of the following informalities: a "DMA" server should be spell out as –distributed management architecture (DMA) server—in claim 1 line 5; claim 22 line 15; claim 33 line 3; claim 42 lines 2; claim 46 line 7-8. Appropriate correction is required.

Claim 35 is objected to because of the following informalities: please clarify what "DMAG" is referring to. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22-32, 42-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 22, the claimed subject matter "the call" is vague and indefinite. Please explain.

Regarding claim 42, it is not clear what it meant by "send call information related the call to a DMA gateway, **the DMA gateway**" as cited the claim.

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 –

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

Claim 46 is rejected under 35 U.S.C. 102(b) as being anticipated by **SHIN** et al. (US 2006/0114934 A1), hereinafter **SHIN**.

Regarding claim 46, **SHIN** discloses an orbiting satellite (satellite 201, figure 1), comprising:

a first interface adapted to communicate with a legacy communications network (interface connected to base station 107, see figure 1);

a second interface adapted to communicate with a private Internet Protocol (IP) network (the interface connected to terminal station 405, see figure 1); 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 (see paragraph 0004).

Allowable Subject Matter

Claims 1-21, 33-41 are allowed.

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.

Application/Control Number: 12/172,639

Page 5

Art Unit: 2477

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. 12/172,639	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI	
	Examiner BOB A. 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-7,054,322 B2	05-2006	D'Annunzio et al.	370/401
*	B	US-2006/0114934 A1	06-2006	Shin et al.	370/466
*	C	US-2003/0048766 A1	03-2003	D'Annunzio et al.	370/338
*	D	US-2002/0009060 A1	01-2002	Gross, Todd	370/321
	E	US-			
	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)
	U	
	V	
	W	
	X	

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

Index of Claims 	Application/Control No. 12172639	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB A 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	05/10/2010										
	1	=										
	2	=										
	3	=										
	4	=										
	5	=										
	6	=										
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	34	=										
	35	=										
	36	=										

<i>Index of Claims</i> 	Application/Control No. 12172639	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB A 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
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CLAIM			DATE							
Final	Original	05/10/2010								
	37	=								
	38	=								
	39	=								
	40	=								
	41	=								
	42	✓								
	43	✓								
	44	✓								
	45	✓								
	46	✓								

Search Notes 	Application/Control No. 12172639	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB A PHUNKULH	Art Unit 2477

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
370/315, 316 (text search)	05/05/2010	BAP
EAST (text search)	05/07/2010	BAP

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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BIB DATA SHEET

CONFIRMATION NO. 5341

SERIAL NUMBER 12/172,639	FILING or 371(c) DATE 07/14/2008 RULE	CLASS 370	GROUP ART UNIT 2477	ATTORNEY DOCKET NO. 1082-0013		
APPLICANTS Shaowei Pan, Kildeer, IL; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** * SMALL ENTITY ** 07/23/2008						
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 46	INDEPENDENT CLAIMS 5
ADDRESS 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 1295	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	51899	(satellite) same (ip packet near2 network internet)	US-PGPUB; USPAT	OR	ON	2010/05/05 16:26
S2	15928	(satellite) same (ip packet near2 network internet) same (host server)	US-PGPUB; USPAT	OR	ON	2010/05/05 16:27
S3	34	S2 same dma	US-PGPUB; USPAT	OR	ON	2010/05/05 16:29
S4	31	S3 and @ad<"20080714"	US-PGPUB; USPAT	OR	ON	2010/05/05 16:30
S5	4	12/172639	US-PGPUB; USPAT	OR	ON	2010/05/05 16:32
S6	1186	S2 same ((public near2 (packet ip) near2 network) pstn)	US-PGPUB; USPAT	OR	ON	2010/05/05 16:38
S7	79	S6 same call	US-PGPUB; USPAT	OR	ON	2010/05/05 16:38
S8	71	S7 and @ad<"20080714"	US-PGPUB; USPAT	OR	ON	2010/05/05 16:39
S9	900	370/315.ccls.	US-PGPUB; USPAT	OR	ON	2010/05/05 16:46
S10	45	S1 and S9	US-PGPUB; USPAT	OR	ON	2010/05/05 16:46
S11	44	S10 and @ad<"20080714"	US-PGPUB; USPAT	OR	ON	2010/05/05 16:46
S12	635	370/316.ccls.	US-PGPUB; USPAT	OR	ON	2010/05/05 16:56
S13	98	S2 and S12	US-PGPUB; USPAT	OR	ON	2010/05/05 16:56

S15	91	S13 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/05/05 16:57
S16	57135	(dma)	US- PGPUB; USPAT	OR	ON	2010/05/07 09:39
S17	89	(dma) near2 (router gateway)	US- PGPUB; USPAT	OR	ON	2010/05/07 09:39
S18	86	S17 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/05/07 09:39
S19	107	satellite same ip near2 private	US- PGPUB; USPAT	OR	ON	2010/05/08 10:25
S20	84	S19 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/05/08 10:25
S21	1519	370/315,316.ccls.	US- PGPUB; USPAT	OR	ON	2010/05/08 11:05
S22	51	S21 and (ip internet) near2 private	US- PGPUB; USPAT	OR	ON	2010/05/08 11:06
S23	45	S22 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/05/08 11:06
S24	1956	satellite.ab,ti. and ip	US- PGPUB; USPAT	OR	ON	2010/05/08 11:09
S25	1811	S24 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/05/08 11:09
S26	794	satellite.ab,ti. and (ip internet).ab,ti.	US- PGPUB; USPAT	OR	ON	2010/05/08 11:09
S27	770	S26 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/05/08 11:10
S28	39	satellite.ab,ti. and (ip internet).ab,ti. and (private).ab,ti.	US- PGPUB; USPAT	OR	ON	2010/05/08 11:10
S29	39	S28 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/05/08 11:10
S30	10074	satellite same relay\$4	US- PGPUB; USPAT	OR	ON	2010/05/08 13:47

EAST Search History (Interference)

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12172639.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

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	12172639
	Filing Date	2008-07-14
	First Named Inventor	Shaowei Pan
	Art Unit	2477
	Examiner Name	Bob A. Phunkulh
	Attorney Docket Number	1082-0013

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	20070230352	A1	2007-10-04	Kokku et al.	
	2	20050091392	A1	2005-04-28	Gesswein et al.	
	3	20060258358	A1	2006-11-16	Kallio	
	4	20060098661	A1	2006-05-11	Pan	
	5	20070147598	A1	2007-06-28	Somes et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12172639
	Filing Date		2008-07-14
	First Named Inventor	Shaowei Pan	
	Art Unit	2477	
	Examiner Name	Bob A. Phunkulh	
Attorney Docket Number		1082-0013	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² i	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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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	International Search Report and Written Opinion received in corresponding PCT Application No. PCT/US2009/045973 from the International Searching Authority (KR) 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	/Bob Phunkulh/	Date Considered	05/10/2010
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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.

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.

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.: 12/172,639 Filed: July 14, 2008
Examiner: Bob A. Phunkulh Group Art Unit: 2477
Customer No.: 60533 Confirmation No.: 5341
Atty. Dkt. No.: 1082-0013

MS: 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 May 21, 2010 (the "Office Action"), please reconsider the above-identified application in light of the following amendments and remarks.

ABSTRACT AMENDMENTS:

Please replace the abstract with the following amended abstract:

Methods and devices for routing communications between distributed ~~management~~ 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 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.

SPECIFICATION AMENDMENTS:

Please replace paragraphs [0008], [0023], [0036], and [0038] of the specification with the following amended paragraphs:

[0008] FIG. 1 is a view of a particular illustrative embodiment of a distributed ~~management~~ mobile architecture (DMA) server having a first illustrative form factor;

[0023] Methods and devices for routing communications between distributed ~~management~~ 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 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.

[0036] FIG. 2 depicts an alternative embodiment of a distributed ~~management~~ 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.

[0038] FIG. 3 illustrates another alternative embodiment of a distributed ~~management~~ 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.

CLAIM AMENDMENTS:

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

1. (Original) A method, comprising:

receiving at a first distributed mobile architecture (DMA) gateway communications information for a communications network accessible by a second DMA gateway, 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.

2. (Original) The method of claim 1, wherein:

at least one of the first DMA gateway and the second DMA gateway includes a satellite-based DMA gateway; and

the DMA gateway communications network includes a satellite communications network.

3. (Currently Amended) The method of claim 1, wherein the DMA server includes one of ~~the group including:~~

a ground-based DMA server; [[or]] and

a satellite-based DMA server.

4. (Currently Amended) The method of claim 1, wherein the communication includes at least one of ~~the group including~~:

a voice communication; ~~[[or]]~~ and
a data communication.

5. (Currently Amended) The method of claim 1, wherein the legacy communications network includes one of ~~the group including~~:

a public switched telephone network (PSTN);
a wireless communications network serviced by mobile switching center (MSC);
a public internet protocol (IP) network; and
an American National Standards Institute 41 (ANSI-41) network.

6. (Original) The method of claim 1, further comprising the first DMA gateway sending a notification to the second DMA gateway, the notification indicating that the communications information is stored at the first DMA gateway.

7. (Currently Amended) The method of claim 1, further comprising, upon receiving the communications information, the first DMA gateway automatically sending at least a portion of the communications information to the second DMA gateway via the gateway communications network.

8. (Original) The method of claim 1, further comprising, in response to receiving a query from the second DMA gateway for the communications information, the first DMA gateway sending at least a portion of the communications information to the second DMA gateway via the gateway communications network.

9. (Currently Amended) The method of claim 1, wherein the communications information includes communications register data including at least one of ~~the group including~~:
a portion of ~~the~~ a community location register;
a portion of ~~the~~ home location register (HLR) data for the communications network; and
a portion of ~~the~~ visitor location register (VLR) data for the communications network.

10. (Original) The method of claim 9, wherein the register data stored at the first DMA gateway indicates that the register data is for a DMA server temporarily registered in a visitor DMA register of the second DMA gateway.

11. (Currently Amended) The method of claim 1, further comprising the first DMA gateway detecting the presence of the communications network ~~[[in]]~~ within a communications range of the first DMA gateway.

12. (Original) The method of claim 11, further comprising the first DMA gateway sending communications network information to the second DMA gateway indicating that the communications network is within the communications range of the first DMA gateway.

13. (Currently Amended) The method of claim 11, further comprising the first DMA gateway sending communications network information to a central database indicating that the communications network is ~~[[in]]~~ within the communications range of the first DMA gateway.

14. (Original) The method of claim 11, further comprising the first DMA gateway receiving additional communications network information from the second DMA gateway indicating that the second DMA gateway detects the presence of an additional communications network within a communications range of the second DMA gateway.

15. (Original) The method of claim 1, further comprising the first DMA gateway receiving a second notification from a central database, the second notification indicating that second register data is stored at the central database.

16. (Original) The method of claim 15, further comprising the first DMA gateway detecting a second communications network in a service area of the first DMA gateway.

17. (Currently Amended) The method of claim 16, wherein the first DMA gateway detects a private Internet Protocol (IP) network access point [[in]] 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 Internet protocol (IP) network.

18. (Original) The method of claim 16, wherein the first DMA gateway sends second communications information to the central database indicating that calls associated with the second communications network are accessible to the first DMA gateway.

19. (Currently Amended) The method of claim 18, wherein the first DMA gateway receives the second register data from the central database.

20. (Original) The method of claim 1, wherein the first DMA gateway receives the communications information from the second DMA gateway.

21. (Original) The method of claim 1, wherein the first DMA gateway receives the communications information from a central database.

22. (Currently Amended) A network communications system, comprising:
a first distributed mobile architecture (DMA) gateway including:
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~~ call 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.

23. (Original) The system of claim 22, wherein at least one of the first DMA gateway and the second DMA gateway comprises a satellite-based DMA gateway.

24. (Original) The system of claim 22, wherein at least one of the first DMA gateway and the second DMA gateway comprises a ground-based DMA gateway.

25. (Currently Amended) The system of claim 22, wherein the DMA server includes one of the group including:
a ground-based DMA server; [[or]] and
a satellite-based DMA server.

26. (Original) The system of claim 22, wherein the logic is adapted to receive DMA server register data from the DMA server indicating that a mobile communications device is accessible to the DMA server via a wireless transceiver coupled to the DMA server.

27. (Original) The system of claim 22, wherein the first DMA gateway communicates with a central database via the third interface, the central database storing register data associated with the DMA server.

28. (Currently Amended) The system of claim 22, wherein the first DMA gateway communicates with ~~the~~ a central database via the second interface, the central database storing register data associated with the DMA server.

29. (Currently Amended) The system of claim 22, wherein the first ~~DMA~~ DMA gateway and the second ~~DMA~~ DMA gateway communicate via C-Band, Ku-Band, Ka-Band, L-Band, or any combination thereof.

30. (Currently Amended) The system of claim 22, wherein the gateway communications network comprises at least one of an IP network and a microwave network.

31. (Currently Amended) The system of claim ~~[[20]]~~ 22, wherein the legacy communications network includes one or more of ~~the group including~~:

- a public switched telephone network (PSTN);
- a wireless network;
- a public IP network; and
- an American National Standards Institute 41 (ANSI-41) network.

32. (Currently Amended) The system of claim 22, wherein the DMA server is one of a plurality of DMA servers communicating with the first ~~DMA~~ DMA gateway via the second interface.

33. (Currently Amended) 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 is placed to a destination device accessible via a legacy communications network, the legacy communications network accessible via the first DMA gateway.

34. (Original) The method of claim 33, wherein the first DMA server is adapted to send the first call while being transported from a first location to a second location.

35. (Currently Amended) The method of claim ~~[[33]]~~ 34, wherein the first DMA server receives second routing instructions from a second DMA gateway ~~DMAG~~ when the first DMA server moves into a second service area of the second DMA gateway ~~DMAG~~, the second service area comprising the second location and the second DMA gateway ~~DMAG~~ comprising an orbiting satellite.

36. (Currently Amended) The method of claim ~~[[33]]~~ 35, wherein the first DMA server sends a second call received at the first DMA server from the first mobile communications device to the second DMA gateway via the private IP network according to the second routing instructions.

37. (Original) The method of claim 36, wherein the second call is associated with a destination device accessible via the legacy communications network.

38. (Original) The method of claim 36, wherein the second call is associated with a second mobile communications device accessible to a second DMA server, the second DMA server accessible to the second DMA gateway via the private IP network.

39. (Currently Amended) The method of claim ~~[[33]]~~ 35, wherein the first DMA server receives the second routing instructions from the second ~~DMA~~ DMA gateway during the first call.

40. (Currently Amended) The method of claim ~~[[33]]~~ 35, wherein the first DMA server sends first DMA server register data to the second DMA gateway in response to receiving the second routing instructions.

41. (Original) The method of claim 33, wherein the first DMA server receives second routing instructions from a second DMA gateway when the first DMA server leaves the first service area and enters a second service area of the second DMA gateway due to orbital motion of the first DMA gateway and the second DMA gateway, the second DMA gateway comprising an orbiting satellite.

42. (Currently Amended) 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~~ gateway, the
DMA ~~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.

43. (Original) The system of claim 42, wherein the logic is adapted to send the call
information to the DMA gateway via the first interface according to routing instructions received
at the DMA server from the DMA gateway.

44. (Original) The system of claim 42, wherein the logic is adapted to send the call
information to the DMA gateway via the second interface according to routing instructions
received at the DMA server from the DMA gateway.

45. (Currently Amended) The system of claim 42, wherein the logic is adapted to convert
the call information to packet data when the call information is sent to the ~~DMAG~~ DMA gateway
via the first interface.

46. (Cancelled).

REMARKS

Applicant thanks the Examiner for the indication of allowable subject matter. Claims 1-45 are pending. Claims 3-5, 7, 9, 11, 13, 17, 19, 22, 25, 28-33, 35, 36, 39, 40, 42, and 45 have been amended to correct typographical and antecedent basis issues. Claim 46 has been cancelled without prejudice or disclaimer. No new matter has been added. Support for the claim amendments may be found in the specification, drawings, and claims as originally filed.

Claim Objections

The Office has objected to claims 1, 22, 33, 42, and 46 because of informalities, indicating that “DMA” server should be spelled out as “distributed management architecture (DMA) server”. Applicant has amended the abstract and the specification to correct several typographical errors that defined the acronym “DMA” as distributed “management” architecture, rather than distributed “mobile” architecture. Applicant submits that support for these amendments can be found in paragraphs [0024] – [0027], [0042], all of which define the acronym “DMA” as distributed “mobile” architecture. Therefore, Applicant requests that the Office withdraw the objections to claims 1, 22, 33, 42, and 46.

The Office has objected to claim 35 because of informalities, requesting that the Applicant clarify what “DMAG” is referring to. Claim 35 has been amended to replace the acronym “DMAG” with DMA gateway, as supported by the specification at paragraph [0056]. Therefore, Applicant requests that the Office withdraw the objections to claim 35.

35 U.S.C. §112 Rejections

The Office has rejected claims 22-32 and 42-45, under 35 U.S.C. §112, second paragraph. Regarding claim 22, the Office has requested that Applicant clarify what “the call” refers to. Regarding claim 42, the Office has requested that Applicant clarify the meaning of “send call information related to the call to a DMA gateway, the DMA gateway.”

Claim 22 has been amended to provide antecedent basis for “the call.” As such, Applicant requests that the Office withdraw the §112 rejections of claims 22-32 and indicate that claims 22-32 are allowable.

Claim 42 has been amended to correct the typographical error. As such, Applicant requests that the Office withdraw the §112 rejections of claims 42-45 and indicate that claims 42-45 are allowable.

Claim 46

The Office has rejected claim 46, under 35 U.S.C. §102(b), as being anticipated by U.S. Patent Publication No. 2006/0114934 ("Shin"). Claim 46 has been cancelled without prejudice or disclaimer, rendering the rejection moot.

CONCLUSION

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.

Any changes to the claims in this response that have not been specifically noted to overcome a rejection based upon the cited art should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

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, which may be required, or credit any overpayment, to Deposit Account Number 50-2469.

Respectfully submitted,

6-29-2010
Date


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Electronic Acknowledgement Receipt	
EFS ID:	7918582
Application Number:	12172639
International Application Number:	
Confirmation Number:	5341
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/Emma Meyer
Filer Authorized By:	Jeffrey G. Toler
Attorney Docket Number:	1082-0013
Receipt Date:	29-JUN-2010
Filing Date:	14-JUL-2008
Time Stamp:	16:57:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		1082-0013_Response.pdf	1843383 7c5cda86e61aa5a9a51abb905de217bc645d3ebc	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Abstract	2	2
	Claims	3	13
	Applicant Arguments/Remarks Made in an Amendment	14	15
Warnings:			
Information:			
Total Files Size (in bytes):		1843383	
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 12/172,639		Filing Date 07/14/2008		☐ 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), (j), 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(j))		minus 20 =		*		X \$ =				OR		X \$ =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =				OR		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	06/29/2010		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)		RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))		* 45		Minus ** 46		= 0		X \$26 =		0		OR		X \$ =		
	Independent (37 CFR 1.16(h))		* 4		Minus *** 4		= 0		X \$110 =		0		OR		X \$ =		
	☐ Application Size Fee (37 CFR 1.16(s))																
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))																
											TOTAL ADD'L FEE		0		OR		TOTAL ADD'L FEE
(Column 1)			(Column 2)			(Column 3)											
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))																
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))																
											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.											Legal Instrument Examiner: Trina Steptoe/						
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".																	
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".																	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.																	

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

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NOTICE OF ALLOWANCE AND FEE(S) DUE

60533 7590 09/17/2010

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

EXAMINER

PHUNKULH, BOB A

ART UNIT

PAPER NUMBER

2477

DATE MAILED: 09/17/2010

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/172,639	07/14/2008	Shaowei Pan	1082-0013	5341

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	\$755	\$300	\$0	\$1055	12/17/2010

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 Stop ISSUE FEE**
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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 09/17/2010

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.

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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.
12/172,639	07/14/2008	Shaowei Pan	1082-0013	5341

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	\$755	\$300	\$0	\$1055	12/17/2010

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
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- ☐ 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.

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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.
12/172,639	07/14/2008	Shaowei Pan	1082-0013	5341
60533	7590	09/17/2010	EXAMINER	
TOLER LAW GROUP 8500 BLUFFSTONE COVE SUITE A201 AUSTIN, TX 78759			PHUNKULH, BOB A	
			ART UNIT	PAPER NUMBER
			2477	
DATE MAILED: 09/17/2010				

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 249 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 249 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.

Notice of Allowability	Application No.	Applicant(s)	
	12/172,639	PAN, SHAOWEI	
	Examiner	Art Unit	
	BOB A. 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 6/29/2010.

2. ☒ The allowed claim(s) is/are 1-45.

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

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

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

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

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

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

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO/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	
---	--

Search Notes 	Application/Control No. 12172639	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB A PHUNKULH	Art Unit 2477

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
370/315, 316 (text search)	05/05/2010	BAP
EAST (text search)	05/07/2010	BAP
370/328, 329, 330, 352, 353, 354, 355, 356, 400, 401 (text search)	09/13/2010	BAP
370/338 (text search)	09/13/2010	BAP

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
	See attachment	09/13/2010	BAP

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Issue Classification 	Application/Control No. 12172639	Applicant(s)/Patent Under Reexamination PAN, SHAOWEI
	Examiner BOB A 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	401	352																	

☒ 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		17		33																
	2		18		34																
	3		19		35																
	4		20		36																
	5		21		37																
	6		22		38																
	7		23		39																
	8		24		40																
	9		25		41																
	10		26		42																
	11		27		43																
	12		28		44																
	13		29		45																
	14		30		46																
	15		31																		
	16		32																		

NONE		Total Claims Allowed:	
		45	
(Assistant Examiner)	(Date)		
/BOB A PHUNKULH/ Primary Examiner, Art Unit 2477		O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	5

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

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	11995	(mobile wireless) near2 gateway	US-PGPUB; USPAT	OR	ON	2010/09/04 14:29
S2	27503	(wireless mobile) near2 (server)	US-PGPUB; USPAT	OR	ON	2010/09/04 14:31
S3	1969	S1 same (pstn circuit near2 switch\$4 pots!)	US-PGPUB; USPAT	OR	ON	2010/09/04 14:33
S4	716	S3 same (register database data adj base)	US-PGPUB; USPAT	OR	ON	2010/09/04 14:34
S5	78	S2 and S4	US-PGPUB; USPAT	OR	ON	2010/09/04 14:34
S6	74	S5 and @ad<"20080714"	US-PGPUB; USPAT	OR	ON	2010/09/04 14:34
S7	2590	distributed near2 mobile	US-PGPUB; USPAT	OR	ON	2010/09/09 17:32
S8	380	S7 and (pstn pots! and circuit near2 switched)	US-PGPUB; USPAT	OR	ON	2010/09/09 17:32
S9	257	S8 and (iP)	US-PGPUB; USPAT	OR	ON	2010/09/09 17:32
S10	228	S9 and @ad<"20080714"	US-PGPUB; USPAT	OR	ON	2010/09/09 17:32
S11	1	"20060114934".pn.	US-PGPUB; USPAT	OR	ON	2010/09/09 17:51
S12	1	(US-20060098661-\$).did.	US-PGPUB	OR	ON	2010/09/13 06:42
S13	1	S12 and gateway	US-PGPUB; USPAT	OR	ON	2010/09/13 06:42

S14	34312	(wireless mobile) near2 (server gatekeeper host)	US- PGPUB; USPAT	OR	ON	2010/09/13 06:52
S15	5828	370/328.ccls.	US- PGPUB; USPAT	OR	ON	2010/09/13 06:52
S16	834	S14 and S15	US- PGPUB; USPAT	OR	ON	2010/09/13 06:52
S17	726	S16 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/09/13 06:53
S18	6477	S14 and (circuit near2 switched pstn pots!) and (ip adj network packet adj network internet)	US- PGPUB; USPAT	OR	ON	2010/09/13 06:54
S19	244	S18 and S15	US- PGPUB; USPAT	OR	ON	2010/09/13 06:54
S20	6354	370/329,330.ccls.	US- PGPUB; USPAT	OR	ON	2010/09/13 07:01
S21	113	S20 and S18	US- PGPUB; USPAT	OR	ON	2010/09/13 07:01
S22	99	S21 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/09/13 07:01
S23	41	S18 and (receiv\$4) near2 (control\$4 manag\$4) near2 (instruction)	US- PGPUB; USPAT	OR	ON	2010/09/13 07:04
S24	81	S18 and (receiv\$4) near2 (control\$4 manag\$4 routing forwarding) near2 (instruction function)	US- PGPUB; USPAT	OR	ON	2010/09/13 07:05
S25	65	S24 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/09/13 07:05
S26	10316	370/352,353,354.ccls.	US- PGPUB; USPAT	OR	ON	2010/09/13 07:07
S27	420	S18 and S26	US- PGPUB; USPAT	OR	ON	2010/09/13 07:07
S28	224	S27 and (control\$4 manag \$4 routing forwarding) near2 (instruction function)	US- PGPUB; USPAT	OR	ON	2010/09/13 07:07

S29	203	S28 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/09/13 07:08
S30	1856	370/355,356.ccls.	US- PGPUB; USPAT	OR	ON	2010/09/13 07:26
S31	57	S18 and S30	US- PGPUB; USPAT	OR	ON	2010/09/13 07:26
S32	55	S31 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/09/13 07:27
S33	12139	370/400,401.ccls.	US- PGPUB; USPAT	OR	ON	2010/09/13 07:27
S34	293	S33 and S18	US- PGPUB; USPAT	OR	ON	2010/09/13 07:29
S35	282	S34 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/09/13 07:29
S36	7839	370/338.ccls.	US- PGPUB; USPAT	OR	ON	2010/09/13 07:36
S37	335	S36 and S18	US- PGPUB; USPAT	OR	ON	2010/09/13 07:36
S38	307	S37 and @ad<"20080714"	US- PGPUB; USPAT	OR	ON	2010/09/13 07:36

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S39	11594	(wireless mobile) near2 (server gatekeeper host)	USPAT; UPAD	OR	ON	2010/09/13 07:30
S40	2052	S39 and (pstn pots! and circuit near2 switched)	USPAT; UPAD	OR	ON	2010/09/13 07:30
S41	2439	S39 and (circuit near2 switched pstn pots!) and (ip adj network packet adj network internet)	USPAT; UPAD	OR	ON	2010/09/13 07:31

S42	1028	S41 and (control\$4 manag\$4 routing forwarding) near2 (instruction function)	USPAT; UPAD	OR	ON	2010/09/13 07:32
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9/ 13/ 10 7:38:21 AM

C:\ Documents and Settings\ BPhunkulh\ My Documents\ EAST\ Workspaces\ amendment\ %
12172639.wsp



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

BIB DATA SHEET

CONFIRMATION NO. 5341

SERIAL NUMBER 12/172,639	FILING or 371(c) DATE 07/14/2008 RULE	CLASS 370	GROUP ART UNIT 2477	ATTORNEY DOCKET NO. 1082-0013		
APPLICANTS Shaowei Pan, Kildeer, IL; ** CONTINUING DATA ***** ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** * SMALL ENTITY ** 07/23/2008						
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 46	INDEPENDENT CLAIMS 5
ADDRESS 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 1295	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			

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 09/17/2010

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.

Hanna Kim	(Depositor's name)
	(Signature)
	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/172,639	07/14/2008	Shaowei Pan	1082-0013	5341

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	\$755	\$300	\$0	\$1055	12/17/2010

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,
(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.

1 Toler Law Group, IP
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

Lemko Corporation

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

Schaumburg, IL

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

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

- ☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☒ Advance Order - # of Copies 1

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 50-2469 (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

11-10-2010

Typed or printed name Jeffrey G. Toler

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:		12172639		
Filing Date:		14-Jul-2008		
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		
Filed as Small 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	2501	1	755	755
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Printed copy of patent - no color	8001	1	3	3
Total in USD (\$)				1058

Electronic Acknowledgement Receipt	
EFS ID:	8818339
Application Number:	12172639
International Application Number:	
Confirmation Number:	5341
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
Receipt Date:	11-NOV-2010
Filing Date:	14-JUL-2008
Time Stamp:	15:05:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$1058
RAM confirmation Number	11988
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	Issue Fee Payment (PTO-85B)	Fee_Transmittal.pdf	271274	no	1
			3a5730394adb1a15933ec6451dc1da22542eccc0		
Warnings:					
Information:					
2	Fee Worksheet (PTO-875)	fee-info.pdf	33857	no	2
			2911ff4d80ad16a742a46db651fb3229f254c2054		
Warnings:					
Information:					
Total Files Size (in bytes):			305131		
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
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www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/172,639	12/21/2010	7855988	1082-0013	5341
60533	7590	12/01/2010		
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 249 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;

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.

"FEE ADDRESS" INDICATION FORM

Address to:
Mail Stop M Correspondence
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Fax to:
571-273-6500

- OR -

INSTRUCTIONS: The issue fee must have been paid for application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. **When to check the first box below:** If you have a Customer Number to represent the fee address. **When to check the second box below:** If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:



Customer Number:

15346

OR



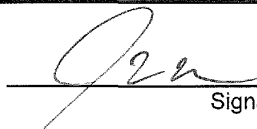
The attached Request for Customer Number (PTO/SB/125) form.

PATENT NUMBER (if known)	APPLICATION NUMBER
7,855,988	12/172,639

Completed by (check one):



Applicant/Inventor



Signature

Attorney or Agent of record 52,046

(Reg. No.)

Jason L. Moore

Typed or printed name



Assignee of record of the entire interest. See 37 CFR 3.71.
 Statement under 37 CFR 3.73(b) is enclosed.
 (Form PTO/SB/96)

512-327-5515

Requester's telephone number



Assignee recorded at Reel _____ Frame _____

July 26, 2012
 Date

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

* Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.363. 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 5 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 COMPLETE D FORMS TO THIS ADDRESS.
SEND TO: Mail Stop M Correspondence, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Electronic Acknowledgement Receipt	
EFS ID:	13351087
Application Number:	12172639
International Application Number:	
Confirmation Number:	5341
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
Receipt Date:	26-JUL-2012
Filing Date:	14-JUL-2008
Time Stamp:	16:55:05
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	Post Allowance Communication - Incoming	1082-0013_Fee_Address.pdf	236498 8a59f8fe9497eb7bby988902a2a837087cbd7f80d	no	1

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

SEP. 17. 2012 2:49PM

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PTO/SB/123 (11-0a)

Approved for use through 11/30/2011. OMB 0851-0035

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

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**CHANGE OF
CORRESPONDENCE ADDRESS
Patent**Address to:
Mail Stop Post Issue
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Patent Number	7,855,988
Issue Date	12-21-2010
Application Number	12/172,639
Filing Date	07-14-2008
First Named Inventor	Shaowei Pan
Attorney Docket Number	1082-0013

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

Telephone

Email

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

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.☐ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).☒ Attorney or agent of record. Registration Number 52,046

Signature

Typed or

Printed Name Jason Moore

Date

9/17/12

Telephone 512-327-5515

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

☐ Total of _____ 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.

PETITION TO ACCEPT UNINTENTIONALLY DELAYED PAYMENT OF MAINTENANCE FEE IN AN EXPIRED PATENT (37 CFR 1.378(b))				
Patent Number	Issue Date	Application Number	Filing Date	Docket Number (if applicable)
7855988	21-Dec-2010	12172639	14-Jul-2008	
CAUTION: Maintenance fee (and surcharge, if any) payment must correctly identify: (1) the patent number and (2) the application number of the actual U.S. application leading to issuance of that patent to ensure the fee(s) is/are associated with the correct patent. 37 CFR 1.366(c) and (d).				
Applicants claims the following fee status:				
☒ Small Entity				
☐ Micro Entity				
☐ Regular Undiscounted				
Applicants selects the following :				
☐ 3 1/2 ☒ 7 1/2 ☐ 11 1/2				
PETITION FEE The petition fee required by 37 CFR 1.17(m) (Fee Code 1558/2558) must be paid as a condition of accepting unintentionally delayed payment of the maintenance fee.				
MAINTENANCE FEE (37 CFR 1.20(e)-(g)) The appropriate maintenance fee must be submitted with this petition.				
STATEMENT THE UNDERSIGNED CERTIFIES THAT THE DELAY IN PAYMENT OF THE MAINTENANCE FEE TO THIS PATENT WAS UNINTENTIONAL				
PETITIONER(S) REQUEST THAT THE DELAYED PAYMENT OF THE MAINTENANCE FEE BE ACCEPTED AND THE PATENT REINSTATED				
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES 37 CFR 1.378(c) states: "Any petition under this section must be signed in compliance with 37 CFR 1.33(b)." I certify, in accordance with 37 CFR 1.4(d)(4) that I am				
☐ An attorney or agent registered to practice before the Patent and Trademark Office who has been given power of attorney in this application. ☒ An attorney or agent registered to practice before the Patent and Trademark Office ☐ A sole patentee ☐ A joint patentee; I certify that I am authorized to sign this submission on behalf of all the other patentees as evidenced by the power of attorney in the application ☐ A joint patentee; all of whom are signing this e-petition ☐ The assignee of record of the entire interest that qualifies as an authorized party under 37 CFR 1.33(b)				

Patent Practitioner			
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	/Philip Hof/		
Name	Philip Hof	Registration Number	72606

Electronic Patent Application Fee Transmittal				
Application Number:		12172639		
Filing Date:		14-Jul-2008		
Title of Invention:		SYSTEM, METHOD, AND DEVICE FOR ROUTING CALLS USING A DISTRIBUTED MOBILE ARCHITECTURE		
First Named Inventor/Applicant Name:		Shaowei Pan		
Filer:		Dean D. Small/Philip Hof		
Attorney Docket Number:		1082-0013		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
MAINTENANCE FEE DUE AT 7.5 YEARS	2552	1	1800	1800
PET. DELAY PYMT MAINTAIN PATENT IN FORCE	2558	1	1000	1000
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2800



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Patent No. 7855988 :
Issue Date: December 21, 2010 :
Application No. 12172639 :DECISION GRANTING PETITION
Filed: July 14, 2008 :UNDER 37 CFR 1.378(b)
Attorney Docket No. 1082-0013 :

This is a decision on the electronic petition, filed May 27, 2020, under 37 CFR 1.378(b) to accept the unintentionally delayed payment of the 7.5 year maintenance fee for the above-identified patent.

The petition is **GRANTED**.

The maintenance fee is accepted, and the above-identified patent reinstated as of May 27, 2020. This decision also constitutes notice that the fee has been accepted. An electronic copy of the petition and this decision has been created as an entry in the Image File Wrapper. Nevertheless, petitioner should print and retain an independent copy.

Telephone inquiries related to this electronic decision should be directed to the Electronic Business Center at 1-866-217-9197.

Electronic Acknowledgement Receipt	
EFS ID:	39551820
Application Number:	12172639
Patent Number:	7855988
Confirmation Number:	5341
Petition Issued Date:	May 27,2020
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:	Dean D. Small/Philip Hof
Filer Authorized By:	Dean D. Small
Attorney Docket Number:	1082-0013
Receipt Date:	27-MAY-2020
Filing Date:	14-JUL-2008
Time Stamp:	15:49:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$2800
RAM confirmation Number	E20205QF50131848
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Petition automatically granted by EFS	petition-request.pdf	32626	no	2
			3d876c4fc06faf53d8238938a879f08a1daaa7af		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32261	no	2
			77160a4746c3af4634dbf0308907339fe26152d3		
Warnings:					
Information:					
Total Files Size (in bytes):			64887		
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.:	(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:	44035716
Application Number:	12172639
International Application Number:	
Confirmation Number:	5341
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
Receipt Date:	14-OCT-2021
Filing Date:	14-JUL-2008
Time Stamp:	18:58:04
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	11_7855988_12172639__LEMKO_USA_POA_373_XMIT_14OCT2021.pdf	20873 382b66bf93b8823f92e9e9516d5551e860859cc2	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:					
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:					
Total Files Size (in bytes):			342615		
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.:	12/172639	Confirmation No.:	5341
Patent No:	7855988	Group Art Unit:	
Issue Date:	12/21/10	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

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/172,639	07/14/2008	Shaowei Pan	1082-0013

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

CONFIRMATION NO. 5341
POWER OF ATTORNEY NOTICE



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.

/zabaha/



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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/172,639	07/14/2008	Shaowei Pan	1082-0013

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

CONFIRMATION NO. 5341
POA ACCEPTANCE LETTER



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.

/zabaha/

Organization _____ Bldg/Room _____
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P.O. Box 1450
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If Undeliverable Return in Ten Days

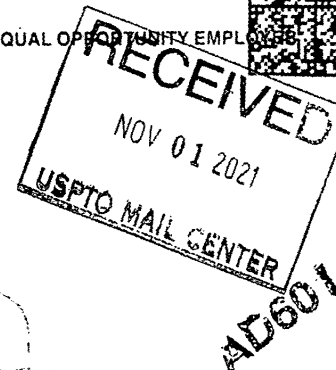
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AN EQUAL OPPORTUNITY EMPLOYER



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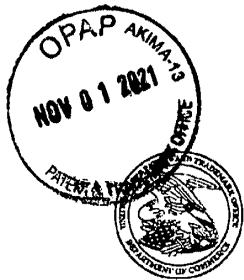
ZIP 22206 \$ 000.53⁰
02 4W
0000355069 OCT 21 2021



NIXIE 601 FE 1 0010/26/21

RETURN TO SENDER
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UNABLE TO FORWARD

22313-1450
6014332806 C003
BC: 22313145050 *0117-09835-21-40



Fr

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/172,639	07/14/2008	Shaowei Pan	1082-0013

CONFIRMATION NO. 5341

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

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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.

/zabaha/



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY.DOCKET NO./TITLE	REQUEST ID
12/172,639	07/14/2008	Shaowei Pan	1082-0013	151504

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