IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION AND AFFIRMED NETWORKS, INC.,
Petitioners,

v.

LEMKO CORPORPORATION,
Patent Owner.

Case No. IPR2023-00529
U.S. Patent No. 7,653,414

DECLARATION OF JAMES PROCTOR IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,653,414

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TABLE OF EXHIBITS

Ex. No.	Brief Description
1001	U.S. Patent No. 7,653,414
1002	File History of U.S. Patent No. 7,653,414
1003	RESERVED
1004	*Curriculum Vitae* of Mr. James Proctor
1005	U.S. Patent No. 7,395,085 to Mauer et al. ("Mauer")
1006	U.S. Patent No. 8,184,603 to Waylett et al. ("Waylett")
1007	RESERVED
1008	RESERVED
1009	U.S. Pat. No. 6,816,706 to Hohnstein ("Hohnstein")
1010	U.S. Pat. No. 6,871,072 to Meche ("Meche")
1011	U.S. Pat. No. 4,284,848 to Frost ("Frost")
1012	U.S. Pat. No. 7,136,651 to Kalavade ("Kalavade")
1013	Excerpt from "GSM Networks: Protocols, Terminology, and Implementation," by Gummar Heine, Artech House Mobile Communications, published December 1998
1014	Excerpt from Newton's Telecom Dictionary, 20th Edition, published March 2004
1015	U.S. Patent No. 9,755,825 to O'Brien ("O'Brien")
1016	U.S. Patent No. 7,260,384 to Bales ("Bales")
1017	RESERVED
1018	Excerpt from "WiMAX: Taking Wireless to the MAX" by Deepak Pareek, Auerbach Publications, published 2006

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I. Introduction And Qualifications

1. My name is James A. Proctor, Jr. At the request of Microsoft, I have been asked to analyze and offer my opinion regarding the validity of Claims 1–8, 11–16, and 21 of U.S. Patent No. 7,653,414 ("the '414 Patent").

2. For purposes of this declaration, I will provide my detailed analysis and opinions regarding validity below.

3. Prior to that, I summarize some of my relevant educational background, work experience, and other relevant qualifications. A more detailed recitation of my professional qualifications and background is reflected in my Curriculum Vitae ("CV"), attached hereto as Exhibit 1004.

4. I have worked as an engineer and entrepreneur in the field of wireless communications for over 25 years and have been involved with various aspects of wireless communications for the duration of my career.

5. I matriculated from the University of Florida with my Bachelor of Science in Electrical Engineering in 1991 and from Georgia Institute of Technology with my Master of Science in Electrical Engineering in 1992. My Master's studies focused on digital signal processing.

6. From 1986 to 1991, while at the University of Florida, I interned with Harris Corporation in various roles including mechanical design, software development, and digital design. From 1991 to 1992, while at Georgia Institute of

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Technology, I worked at the Georgia Tech Research Institute as a graduate research assistant, performing software development on classified government programs.

7. From 1993 to 1995, while working for Harris Corporation, I designed various cellular communications systems for voice, data, and tracking/location. Many of these systems used advanced communications technologies, such as those codified in the then-developing and future telecommunication standards, such as Interim Standard 95 ("IS-95"), wideband code-division multiple access ("W-CDMA"), and aspects of the 3rd Generation Partnership Project's ("3GPP's") long-term evolution ("LTE").

8. From 1995 to 1998, I worked at Spectrian Corporation ("Spectrian") in advanced development and technical marketing. At Spectrian, I interfaced with Nortel Networks Corporation and Qualcomm Technologies, Inc. ("Qualcomm") and performed advanced technology development and systems analysis. In this role, I designed IS-95 CDMA and Global System for Mobile communication ("GSM") base station power amplifiers and control electronics, and received several patents associated with advanced linearization techniques for the reduction of transmitted intermodulation distortion within multicarrier and single carrier amplifiers and transceivers. My work and patents encompassed both analog (radio frequency ("RF")) and digital linearization approaches.

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9. From 1998 to 2002, I served as the Director of Strategic and Technical Marketing at Tantivy Communications ("Tantivy"), a venture capital-funded 3G cellular data and chipset company. At Tantivy, I helped to architect and standardize the Internet-CDMA ("I-CDMA") Spread Spectrum Systems Air Interface Standard (T1P1.4). I also developed both wireless access terminals and base stations that complied with the standard. The base stations utilized various Internet Protocol ("IP") protocols and interfaced with the wireline network utilizing IP over Ethernet. Additionally, I participated in and provided technical contributions to 3GPP/3GPP2 standardization efforts related to the development of CDMA2000 and 1xEV-DO technical specifications. This work resulted in me contributing as a named inventor to more than 150 pending or issued U.S. patents and applications.

10. From 2002 to 2007, as co-founder of WiDeFi, Inc. ("WiDeFi"), I served in various roles including President, CEO, CTO, and board member. As the CEO, my responsibilities included advanced development of platform technologies. I was a named inventor of wireless technology components, including a frequency translating time division duplex ("TDD") repeater, frequency repeater architecture for frequency division duplex ("FDD") and TDD based systems, and physical layer multi-stream multiple-input and multiple-output ("MIMO") repeater technology. WiDeFi invented and provided wireless home

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networking products based on Wi-Fi and cellular technologies. While at WiDeFi, I was a named inventor on over 25 issued U.S. patents or patent applications.

11. From 2007 to 2009, I consulted as a principal engineer for Qualcomm as part of Qualcomm's acquisition of WiDeFi's technology. While at Qualcomm, I worked with its corporate Research and Development division and developed consumer 3G and 4G cellular coverage enhancement systems utilizing WiDeFi's baseband interference cancellation technologies. My responsibilities included working with international cellular operators on product requirements, detailed W-CDMA simulations, LTE systems analysis, and participation in prototype product realization. I am currently a named inventor on roughly 45 issued United States patents or patent applications assigned to Qualcomm.

12. From 2010 to the present, I have served as managing director and co-founder of Proxicom Wireless, LLC ("Proxicom"), which has developed and continues to develop cloud-based, mobile social networking and mobile payments technology based upon the proximity and location of mobile devices. Proxicom currently holds fifteen issued U.S. patents and multiple pending patent applications, and I am a named inventor on each of those patents and patent applications. The significant aspects of Proxicom's technology include a mobile device's use of short-range wireless technologies (*e.g.*, 802.11, near field communications, and Bluetooth®) in combination with cellular data links

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(3G/WCDMA or 4G/LTE, for example) to facilitate frictionless interactions via a wireless networked central cloud server.

13. I have also served as the principal of Proctor Consulting, LLC since 2007. In this role, I have been a consultant on issues relating to wired, wireless, and cellular communications and technologies, start-up companies, and intellectual property. I have also been involved with numerous patent infringement, patent validity, and patent analysis assignments for public and private companies in the wired, wireless, and cellular networking industries.

14. Additionally, I have worked and consulted for both cellular infrastructure and device focused companies (*e.g.*, Spectrian, Qualcomm, Fastback Networks), and defense contractors (*e.g.*, Harris Corporation), where I developed covert-tracking and location technologies involving CDMA and smart-antenna technologies.

15. In several of the above-detailed roles, I have been responsible for the development of business plans, product development plans, product development budgets, and product bill of materials estimations. I have been responsible for numerous product development teams, including schedules and costs for the development process at various stages of my career. For example, at Tantivy, I ran a joint development of I-CDMA cellular base stations in Seoul, South Korea that were used in a field trial in that country. Additionally, as co-founder and CEO of

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WiDeFi, I was responsible for similar such activities, as well as raising venture capital funding and reporting to the board of directors.

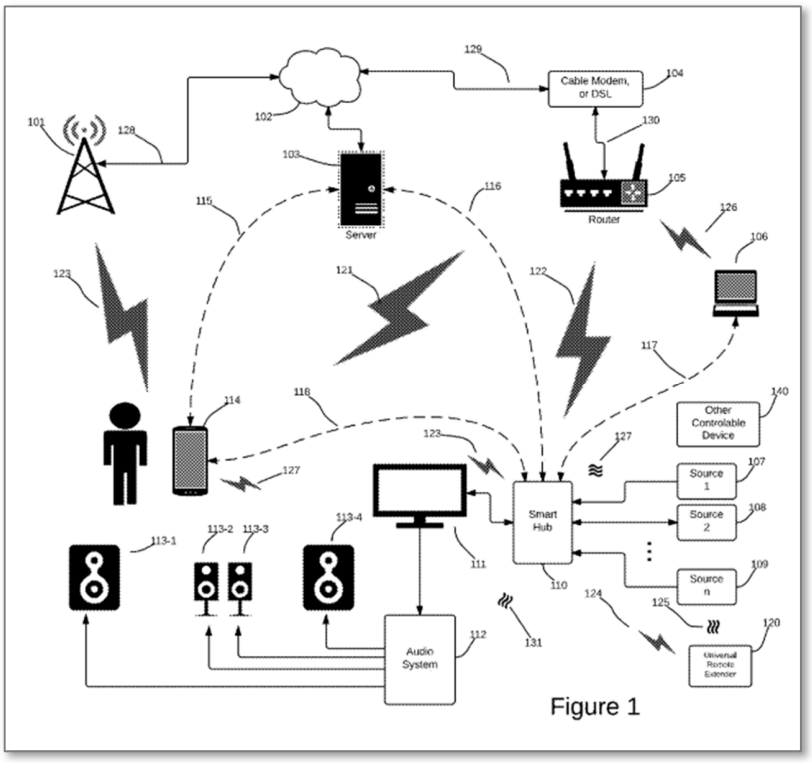
16. I am currently a named inventor on more than 320 issued U.S. patents and more than 700 international patent publications. A substantial portion of my work has been focused on wireless communication systems and products. A number of these patents and patent applications are related to the subject matter of the patents asserted in this matter, specifically methods for initiating calls in a wireless telecommunications system. The following patents, for which I am a named inventor, provide a few examples of some of my experience relevant to the subject matter of this declaration:

U.S. Pat. No.	Title	Priority Date
6,542,481	Dynamic Bandwidth Allocation for Multiple Access Communication Using Session Queues	1998-06-01
8,908,654	Dynamic Bandwidth Allocation for Multiple Access Communications Using Buffer Urgency Factor	1998-06-01
9,306,658	Method and Apparatus for a Spectrally Compliant Cellular Communication System	1999-12-20
8,321,542	Wireless Channel Allocation in a Base Station Processor	2000-05-05
6,937,562	Application Specific Traffic Optimization in a Wireless Link	2001-02-05
6,941,152	Wireless Subscriber Network Registration System for Configurable Services	2001-04-24
6,888,807	Applying Session Services Based on Packet Flows	2002-06-10
9,554,061	Smart Hub	2006-12-15

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8,370,955	Enforcing Policies in Wireless Communication Using Exchanged Identities	2008-09-08
9,020,621	Network Based Media Enhancement Function Based on an Identifier	2009-11-18

17. For instance, I am a named inventor of U.S. Patent No. 9,554,061 ("the '061 patent") entitled "Smart Hub." There, I developed an intelligent hub for interfacing with other devices and performing smart audio or video source selection. The United States Patent and Trademark Office ("USPTO") awarded me a patent on my claimed invention on January 24, 2017. Figure 1 from this patent is pictured below:



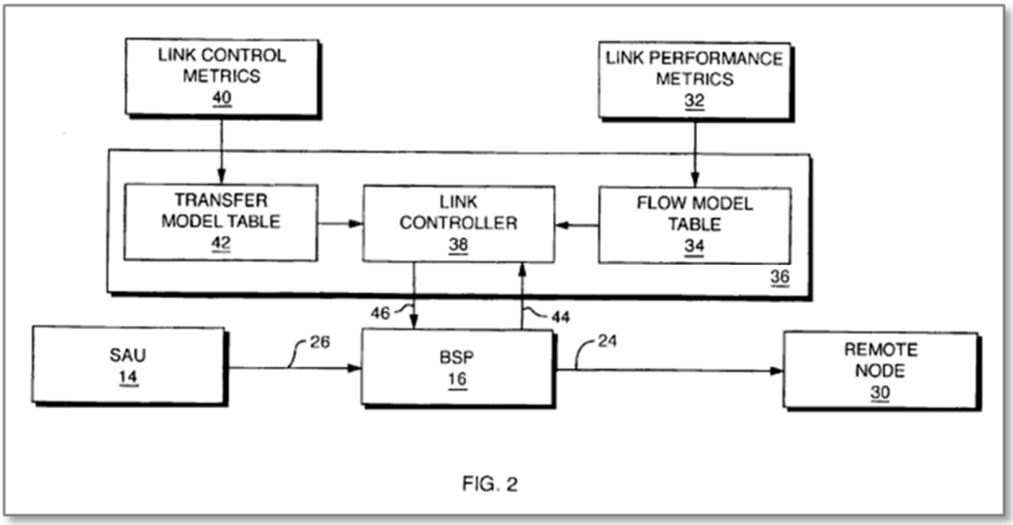
U.S. Patent 9,554,061 ("Smart Hub") at Figure 1.

18. The claimed invention uses wired and/or wireless physical communication links, such as wired Institute of Electrical and Electronic Engineers ("IEEE") 803.2 Local Area Network ("LAN") connections, IEEE 802.11 Wi-Fi connections, Bluetooth® connections, Wi-Fi Direct®, intermediary network nodes, cellular mobile communications via a base station, wireless and wired routers, Near Field Communications ("NFC"), Ultra-wideband ("UWB"), and the like. The '061 patent further discloses Voice over Internet Protocol ("VoIP") and Session Initiation Protocol ("SIP") processing, including a user agent in an approach compatible with the 3GPP cellular standards, including IP Multimedia Subsystem ("IMS") services.

19. By way of further example, I am a named inventor of U.S. Patent No. 6,937,562 ("the '562 patent") entitled "Application Specific Traffic Optimization in a Wireless Link." This patent is directed to a data packet system for use in a network, such as a Transmission Control Protocol ("TCP")/IP network, for transmitting a variety of data types along links in the network. The packets are transmitted in a stream between nodes and interconnected by the links, which conform to transport layer protocols and include wireless links. I filed the patent application that issued as the '562 patent on February 5, 2001, and the USPTO issued the patent on August 30, 2005. The '562 patent is one of many examples demonstrating that I was at least

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a person of ordinary skill in the art ("POSITA") well before the earliest possible priority date of the asserted patents. Figure 2 from the '562 patent is pictured below:



U.S. Patent 6,937,562 ("Application Specific Traffic Optimization in a Wireless Link") at Figure 2.

20. I included Figure 2 here because it depicts a block diagram of my claimed invention as shown in a telecommunication system, the conventional components of which were well known to me and any other POSA long before the earliest claimed priority date. For example, here, base station processor ("BSP") 16 maintains a database table of link performance metrics 32 and link control metrics 40 and communicates directly with link controller 38.

21. And finally, for purposes of my discussion here, I am a named inventor of U.S. Patent No. 9,020,621 ("the '621 patent") entitled "Network Based Media Enhancement Function Based on an Identifier." I filed the earliest provisional application to which that patent claims priority on September 18, 2009,

and the USPTO issued this patent on April 28, 2015. This was directed to a network-based processing element for processing audio information to improve the understanding of speech or music for intended listeners based on an identifier. Relevant to this Report, my device was intended for use in a wireless communications-based system utilizing both a cellular communications network and an IP network as shown in Figure 2 below:

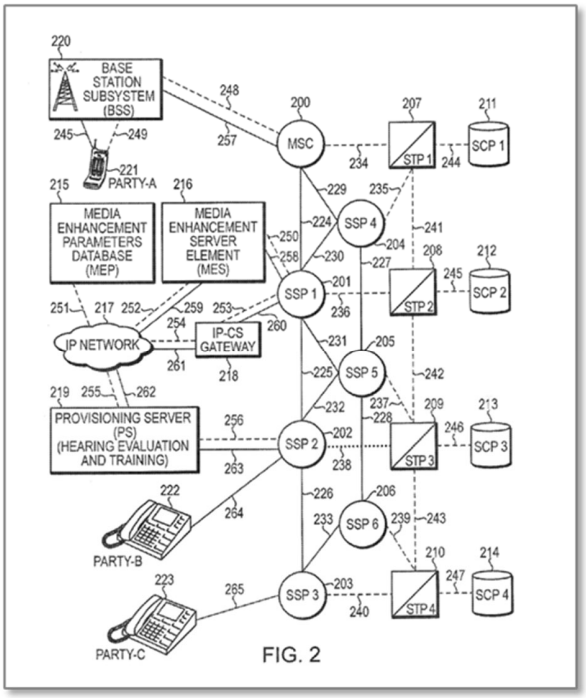


FIG. 2

U.S. Patent 9,020,621 ("Network Based Media Enhancement Function Based on an Identifier") at Figure 2.

22. The claimed invention in this patent was directed to calls made to a telephony network or a VoIP network where voice or a voice and video call is transacted. In addition to the inventive features of my patent, the patent specification also walks through some well-known architectures and methods for

routing calls, including VoIP calls. Figure 2 above depicts the integration of the media enhancement architecture with legacy circuit switch telephony networks. Figure 3 below depicts the integration of the media enhancement architecture with the 3GPP Internet Media Subsystem (IMS) packet-based telephony system, which supported Voice over LTE ("VoLTE") telephony services.

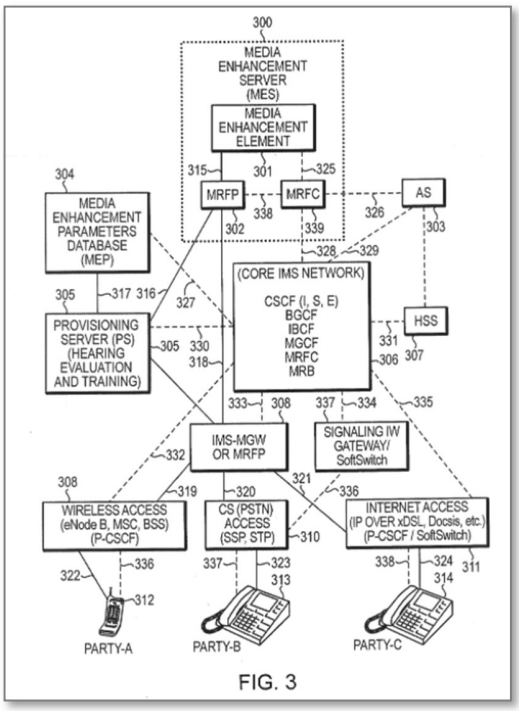


FIG. 3

Id. at Figure 3.

23. My CV, which includes a more detailed summary of my background and experience, as well as a complete list of my publications and a list of previous engagements in patents, is included as Exhibit 1004.

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II. Understanding of the Governing Law

A. Legal Standard for Prior Art

24. I understand that a patent or other publication must first qualify as prior art before it can be used to invalidate a patent claim.

25. I am informed by counsel that the applicable law in this case for prior art is 35 U.S.C. § 102 as written before the America Invents Act.

26. I am informed that the patent owner Lemko Corporation ("Lemko") contends that the '414 patent claims priority to February 24, 2006.

27. I understand that the "priority date" of a patent is the date on which it is filed, or the date on which an earlier-filed patent application is filed if the patentee claims it is entitled to the benefit of priority to that earlier-filed patent application. To be entitled to that benefit, I further understand that the earlier filed application must support the claimed subject matter in the manner required by 35 U.S.C. § 112. I understand that this section requires the patent's specification to contain a sufficient written description of the claimed invention to demonstrate that the applicant actually possessed the invention as of the filing date as broadly as it is claimed. In considering whether this written description requirement is met, I understand that I should consider the written description from the viewpoint of a person of ordinary skill in the art. I also understand that I should consider whether this person of ordinary skill would have recognized that the written description

describes the full scope of the claimed invention and that the inventor actually possessed that full scope as of the claimed effective filing date. I also understand that law for priority is not the same as the obviousness analysis under 35 U.S.C. § 103.

28. I further understand that the priority date is significant because patents, systems, or documents that are public prior to the priority date may invalidate the claims.

29. I understand that a U.S. patent or published patent application may qualify as prior art to an asserted patent if the date of publication or issuance is prior to the invention in the asserted patent. I understand that a U.S. patent or published patent application may qualify as prior art to the asserted patent if the application for that U.S. patent or published patent application was filed in the United States before the invention of the asserted patent. I further understand that a printed publication, such as a book or an article published in a magazine or trade publication, may qualify as prior art to an asserted patent if the date of publication is prior to the invention of the asserted patent. A paper or presentation may also qualify as prior art if presented at a publicly available seminar, conference, or trade show prior to the invention in the asserted patent.

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30. I understand that to qualify as prior art, a reference must contain an enabling disclosure that allows one of ordinary skill to practice the claims without undue experimentation.

31. I understand that documents and materials that qualify as prior art can be used to invalidate a patent claim as anticipated or as obvious.

B. Invalidity by Anticipation

32. I understand that once the claims of a patent have been properly construed, determining anticipation of a patent claim requires a comparison of the properly construed claim language to the prior art on a limitation-by-limitation basis.

33. I understand that a prior art reference "anticipates" an asserted claim, and thus renders the claim invalid, if all elements of the claim are disclosed in that prior art reference, either explicitly or inherently (i.e., necessarily present or implied).

34. I have written this report with the understanding that in an inter partes review, anticipation must be shown by a preponderance of the evidence.

C. Invalidity by Obviousness

35. I have been instructed by counsel on the law regarding obviousness, and understand that even if a patent is not anticipated, it is still invalid under 35 U.S.C. § 103, as written before the America Invents Act, if the differences between

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the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person of ordinary skill in the pertinent art.

36. I understand that a person of ordinary skill in the art provides a reference point from which the prior art and claimed invention should be viewed. This reference point prevents a person of ordinary skill from using one's insight or hindsight in deciding whether a claim is obvious.

37. I also understand that an obviousness determination includes the consideration of various factors such as (1) the scope and content of the prior art, (2) the differences between the prior art and the challenged claims, (3) the level of ordinary skill in the pertinent art, and (4) the existence of secondary considerations such as commercial success, long-felt but unresolved needs, failure of others, etc.

38. I am informed that secondary considerations of non-obviousness may include (1) a long-felt but unmet need in the prior art that was satisfied by the invention of the patent, (2) commercial success or lack of commercial success of processes covered by the patent, (3) unexpected results achieved by the invention, (4) praise of the invention by others skilled in the art, (5) taking of licenses under the patent by others, and (6) deliberate copying of the invention. I also understand that there must be a relationship or "nexus" between any such secondary indicia and the invention. I further understand that contemporaneous and independent

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invention by others is a secondary consideration supporting an obviousness determination.

39. I understand that an obviousness evaluation can be based on a combination of multiple prior art references. I understand that the prior art references themselves may provide a suggestion, motivation, or reason to combine, but other times the link between two or more prior art references is simple common sense. I further understand that obviousness analysis recognizes that market demand, rather than scientific literature, can drive innovation, and that a motivation to combine references may be supplied by the direction of the marketplace.

40. I understand that if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

41. I also understand that practical and common-sense considerations should guide a proper obviousness analysis, because familiar items may have obvious uses beyond their primary purposes. I further understand that a person of ordinary skill in the art looking to overcome a problem will often be able to fit the teachings of multiple publications together like pieces of a puzzle, although the prior art need not be like two puzzle pieces that must fit perfectly together. I

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understand that obviousness analysis therefore considers the inferences and creative steps that a person of ordinary skill in the art would employ under the circumstances.

42. I understand that a particular combination may be proven obvious by showing that it was obvious to try the combination. For example, when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp because the result is likely the product not of innovation but of ordinary skill and common sense.

43. I understand that the combination of familiar elements according to known methods may be proven obvious when it does no more than yield predictable results. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, obviousness likely bars its patentability.

44. It is further my understanding that a proper obviousness analysis focuses on what was known or obvious to a person of ordinary skill in the art, not just the patentee. Accordingly, I understand that any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed. Additionally,

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a reference outside of the field of endeavor may still be prior art if the reference is reasonably pertinent to the particular problem being solved by the patentee.

45. I understand that a claim can be obvious in light of a single reference, without the need to combine references, if the elements of the claim that are not found explicitly or inherently in the reference can be supplied by the common sense and knowledge of one of skill in the art.

46. I understand that a person of ordinary skill could have combined two pieces of prior art or substituted one prior art element for another if the substitution can be made with predictable results, even if the swapped-in element is different from the swapped-out element. In other words, the prior art need not be like two puzzle pieces that must fit together perfectly. The relevant question is whether prior art techniques are interoperable with respect to one another, such that a person of skill would view them as a design choice, or whether a person of skill could apply prior art techniques into a new combined system. The person of ordinary skill would use ordinary creativity and is not limited like an automaton.

47. In sum, my understanding is that prior art teachings are properly combined where a person of ordinary skill in the art, having the understanding and knowledge reflected in the prior art and motivated by the general problem facing the inventor, would have been led to make the combination of elements recited in the claims. Under this analysis, the prior art references themselves, or any need or

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problem known in the field of endeavor at the time of the invention, can provide a reason for combining the elements of multiple prior art references in the claimed manner.

48. I have been informed and understand that the obviousness analysis requires a comparison of the properly construed claim language to the prior art on a limitation-by-limitation basis.

49. I have written this report with the understanding that in an inter partes review, obviousness must be shown by a preponderance of the evidence.

D. Interpreting Claims Before the Patent Office

50. I understand that IPR is a proceeding before the United States Patent & Trademark Office ("USPTO") for evaluating the validity of issued patent claims. I understand that, in an IPR, a claim term is interpreted in a manner consistent with the standard used in patent litigation. That standard generally construes the claims according to their "ordinary and customary" meaning in view of the claim language, specification, and file history, and where applicable, relevant other evidence.

51. I understand that a patent's "specification" includes all the figures, discussion, and claims within the patent. I understand that the USPTO will look to the specification and prosecution history to see if there is a definition for a given

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claim term, and if not, will apply the ordinary and customary meaning from the perspective of a POSA at the time in which the alleged invention was made.

E. Materials Relied on in Forming My Opinions

52. In forming my opinions expressed in this declaration, I have relied on my own knowledge, experience, and expertise, as well as the knowledge of a POSA in the relevant timeframe.

53. In addition, I have reviewed the Challenged Patent (Ex. 1001), its prosecution history (Ex. 1002), and the references listed in the Table of Exhibits of this declaration.

F. Level of Ordinary Skill in the Art

54. My opinions are provided based on what a person of ordinary skill in the art in the technical field of the purported invention would have understood at the time of the purported invention of the Challenged Patent. Around 2006, a person of ordinary skill in the art ("POSITA") in the field of the '414 Patent's field would have had a bachelor's degree in electrical engineering, computer engineering, or an equivalent, as well as two years of industry experience related to telecommunications networks. Such knowledge would encompass the design, architecture, and operations of mobile telecom networks, including gateways, servers, and user devices that were compliant with various standards, and how they interact with other components of a radio access network. Additional graduate

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education of a POSA could substitute for professional experience, or significant experience in the field could substitute for formal education. The basis for my familiarity with the level of ordinary skill is my interaction with large numbers of workers in the telecommunications and communications industry who were at this level of skill. As shown by my experience listed above and my CV (Ex. 1004), I was qualified as a POSA at the relevant time.

55. In reaching this opinion as to the hypothetical person of ordinary skill in the art, I have considered the types of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level and professional capabilities of workers in the field.

56. I have been informed and understand that the content of a patent and prior art should be interpreted the way a person of ordinary skill in the art would have interpreted those references at the time of the invention of the patent. I understand that the person of ordinary skill is a hypothetical concept referring to one who thinks along the lines of conventional wisdom at the time.

G. Identification of Challenge

57. In my opinion, claims 1–8, 11–16, and 21 of the ’414 patent are obvious over Mauer in view of Waylett.

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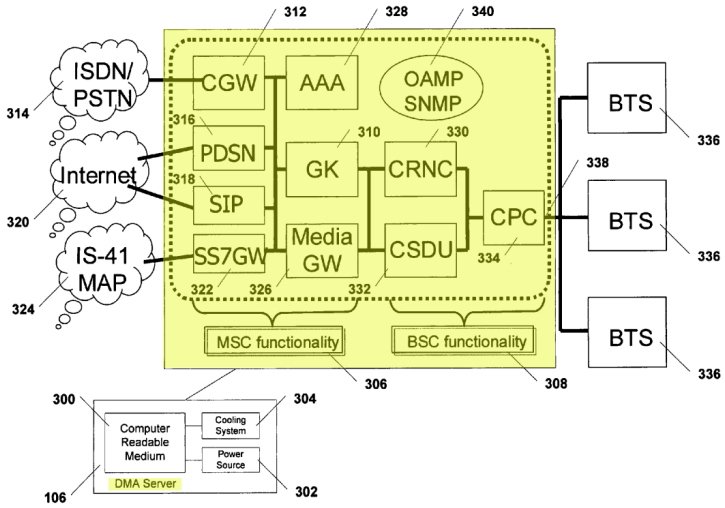
III. U.S. Patent No. 7,653,414

A. Assumed Effective Filing Date

58. The ’414 patent was filed on February 24, 2006. For purposes of this Declaration, I have been informed by counsel for this Petition to assume that the ’414 patent claims are entitled to a priority date of February 24, 2006.

B. Technology Overview

59. The ’414 patent relates to telecommunication apparatuses and systems. Ex. 1001, 4:15–17. It describes a “distributed management architecture” (DMA) server (e.g., DMA 106, also referred to as a “Distributed Mobile Architecture,” 4:23) including conventional features of a BSC and MSC in a single enclosure, which allows mobile subscribers to communicate wirelessly, shown in Figure 3 below.



Ex. 1001, Fig. 3 (annotated).

60. The ’414 patent states that “[c]urrent telephone systems are expensive to deploy [and] 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.” Ex. 1001, 1:35-48. The ’414 patent claims that its DMAs supposedly address the problem of high installation costs of conventional systems. The ’414 patent explains that DMAs which are “implemented as a system or a device,” are used to receive and route calls between mobile subscribers. Ex. 1001, 2:65-3:4; 7:56-59. The ’414 patent contends that “there exists a need for an improved communications system that is relatively inexpensive to deploy and relatively inexpensive to operate” and proceeds to describe DMAs and their use in routing phone calls as the allegedly inventive technology. Ex. 1001, 1:49-51; 2:65-3:4; *see id.*, 4:45–60.

61. Figure 2 (shown below) illustrates a DMA network with multiple mobile subscribers. Figure 2 shows that mobile subscribers 208, 210 are wirelessly coupled to DMA 202 and mobile subscribers 212, 214 are wirelessly coupled to DMA 204. Ex. 1001, Figure 2. Further, each DMA is illustrated as being connected via interfaces to different kinds of networks, such as cellular, VoIP, or satellite.

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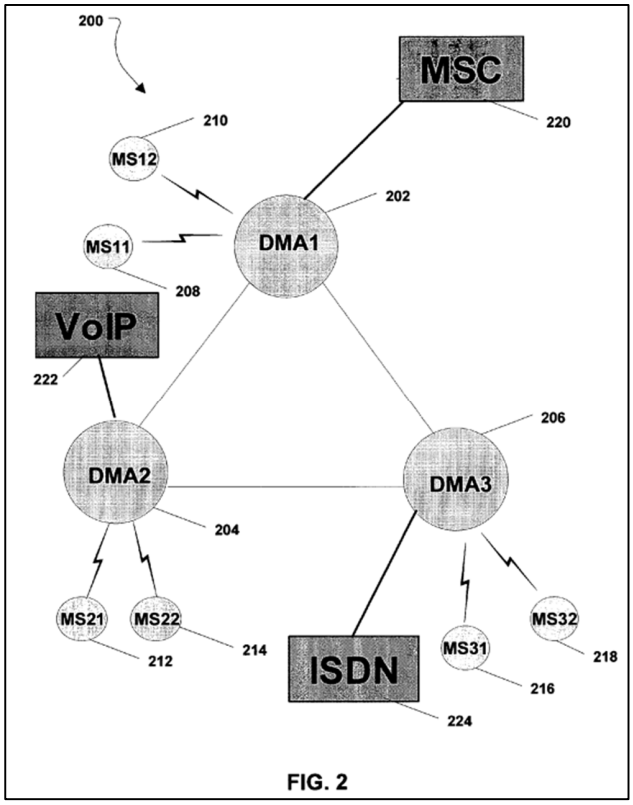


FIG. 2

Ex. 1001, Fig. 2. Figure 2 illustrates that DMA1 includes a MSC interface 220, which provides access to a mobile telephone network. Ex. 1001, 5:3-36. As another example, Figure 2 illustrates that DMA2 includes a VoIP interface 222, which provides access to a VoIP network. *See id.* Figure 2 illustrates that DMA3 includes an integrated services digital network (ISDN) interface 224, which provides connectivity to an ISDN. *See id.* The '414 patent describes a simple, known concept of routing calls via a the respective network interface such that "calls can be made from a mobile subscriber to an external destination, i.e., external to the DMA network, vie the MSC interface 220, the VoIP interface 222, or the ISDN interface 224. A user can create a preferred hierarchy of interfaces to make calls external to

the DMA network. As such, a user can indicate that all calls made from a mobile subscriber to an external device are to be established via the VoIP interface 222. If the VoIP interface 222 is unavailable, a second preferred interface can be used to establish the external call. Ex. 1001, 5:62-6:4.

62. To route calls, the ’414 patent generally describes a system in which user data is distributed among various databases (such as home location or visitor location registers) stored in one or more DMAs and some of these databases are associated with one another. Ex. 1001, 4:45-60; 8:3-29; *see* also Figure 4. For example, a DMA includes a visitor location register (VLR), a home location register (HLR), at least one community location register (CLR), and a destination preference register (DPR), which are databases storing records about the mobile stations. *See id.*; 4:53-56, 8:2-40. The ’414 acknowledges that conventional cellular systems include such registers, including an HLR and VLR. Ex. 1001, 1:35–48. The VLR, for example, includes information associated with roaming mobile subscribers that are temporarily registered with a given DMA. Ex. 1001, 3:36-40. The CLR within a DMA includes information about HLRs in different DMAs. Ex. 1001, 8:9-15; Fig. 4. “As a mobile subscriber roams into a coverage area that is not provided by the DMA to which the mobile subscriber is registered, the mobile subscriber can be temporarily registered with a new DMA while the mobile subscriber is roaming. CLR information concerning the roaming mobile

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subscriber can be obtained from the new DMA … to complete a call to the roaming mobile subscriber." Ex. 1001, 5:55-61. A DPR (included in a DMA) stores information relating to a preferred call path for calls to be routed outside of a DMA network, for example, on a per subscriber or DMA basis. Ex. 1001, 2:67-3:4, 8:30-40.

C. Relevant Prosecution History of the '414 Patent

63. The '414 patent application went through multiple rounds of back and forth with the USPTO. The Examiner rejected the claims over numerous references, such as such as U.S. Pat. No. 6,816,706 to Hohnstein (Ex. 1009); U.S. Pat. No. 6,871,072 to Meche (Ex. 1010); U.S. Pat. No. 4,284,848 to Frost (Ex. 1011); and U.S. Pat. No. 7,136,651 to Kalavade (Ex. 1012). On September 4, 2009, the applicant filed an amendment deleting all of the previous claims and introduced the claims at issue. Ex. 1002, 172–182. Via an examiner's amendment, the Examiner allowed the claims. The Examiner's reasons for allowance focused primarily on how the prior art cited during prosecution did not teach or suggest the claim limitations involving the community location register (CLR) or destination preference register (DPR). *See* Ex. 1002, 195–196. In particular, the Examiner focused on the features of a community location register (CLR) included in a DMA system associated with another DMA system, and a destination preference register (DPR) storing one or more preferred call paths for calls to be routed outside of a

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DMA network that is accessible to the DMA system. *Id.* As discussed below, however, these supposedly novel features were taught by Mauer and Waylett years earlier.

IV. Claim Construction

64. It is my opinion that, for purposes of this Declaration, no construction of claim terms is necessary.

V. The Challenged Claims are Obvious

65. Based on my study of the references below, as well as on my education and years of experience in the relevant art, it is my opinion that these references render obvious each and every element of the challenged '414 patent claims. In my opinion, the challenged claims are unpatentable based the combination of Mauer and Waylett. First, I show that claims 1–8 are obvious over Mauer in view of Waylett. Next, I show that claims 11–16 and 21 are obvious over Waylett in view of Mauer.

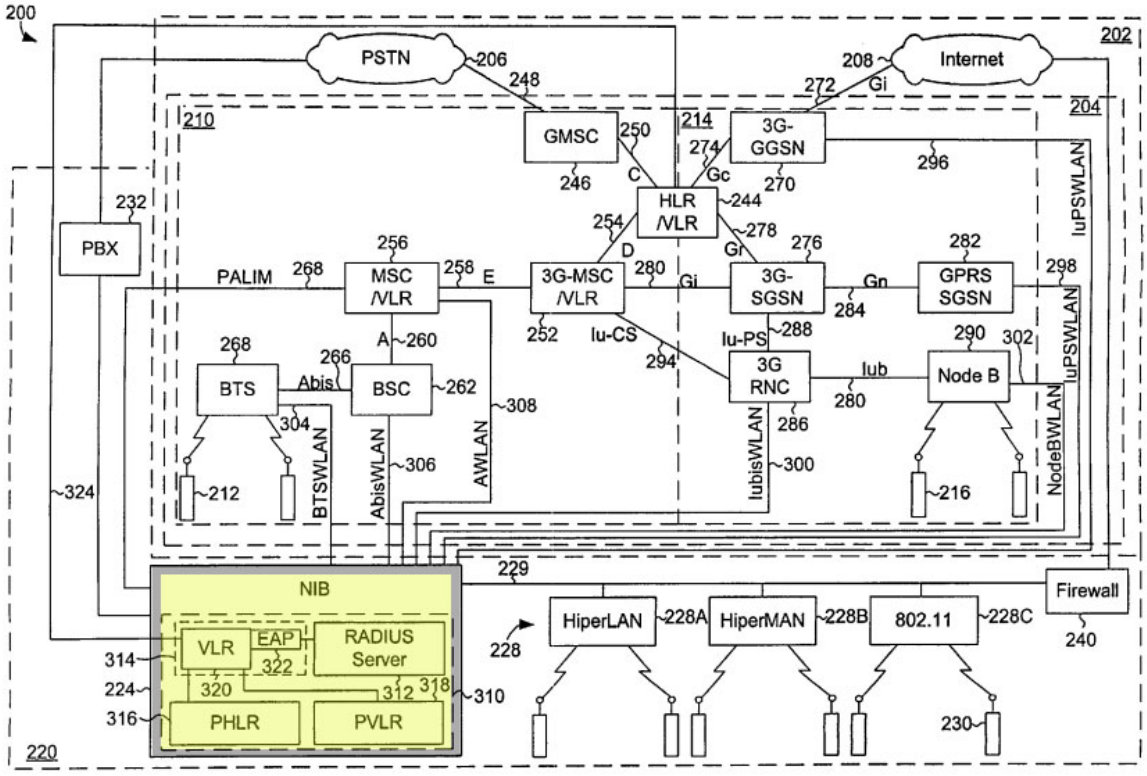
A. Prior Art Overviews

(1) Waylett (Ex. 1006)

66. Waylett was filed on July 15, 2004 and claims priority through several continuations filed as early as January 14, 2003. Waylett also claims priority to a provisional application filed on January 31, 2002. I am informed by counsel that it qualifies as prior art under at least pre-AIA 35 U.S.C. § 102(e).

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67. Waylett describes a device termed Network-In-A-Box (e.g., NIB 224) including conventional features of a BSC and MSC in a single enclosure. The NIB allows user equipment terminals to communicate wirelessly, shown in Figure 6 below. Waylett states that "[t]he NIB 224 includes a MSC, a BSC, and a BTS in a single enclosure." Ex. 1006, 9:41–42.



Ex. 1006, Fig. 6 (annotated).

68. Waylett identifies that "[a] fundamental drawback to the use of conventional wireless networks is the cost associated with radios or user equipment terminals (UEs) capable of communicating with [various wireless] networks" which is caused by "the difficulty and expense of scaling the network to provide

services to additional users or additional services." Ex. 1006, 1:44-49, 1:57-60. To address these high costs, Waylett discloses "a complete, stand-alone Network-In-a-Box," *e.g.*, NIB 224 for use in a communication system "providing voice and data communication between a public network and a number of UEs." Ex. 1006, 8:7-8, 2:25-27. Waylett's invention helps expanding networks to "underserved areas or communities" or "communities hitherto unserved by conventional wireless or wired communications systems." Ex. 1006, 7:59-63, 7:67-8:3.

(2) Mauer (Ex. 1005)

69. Mauer was filed on March 11, 2005, and I am informed by counsel that it qualifies as prior art under at least pre-AIA 35 U.S.C. § 102(e).

70. Mauer relates to communication networks and systems. As shown in the wireless telecommunications system of Figure 1 below, mobile station 16 is wirelessly coupled to WLAN 12 and WWAN 14:

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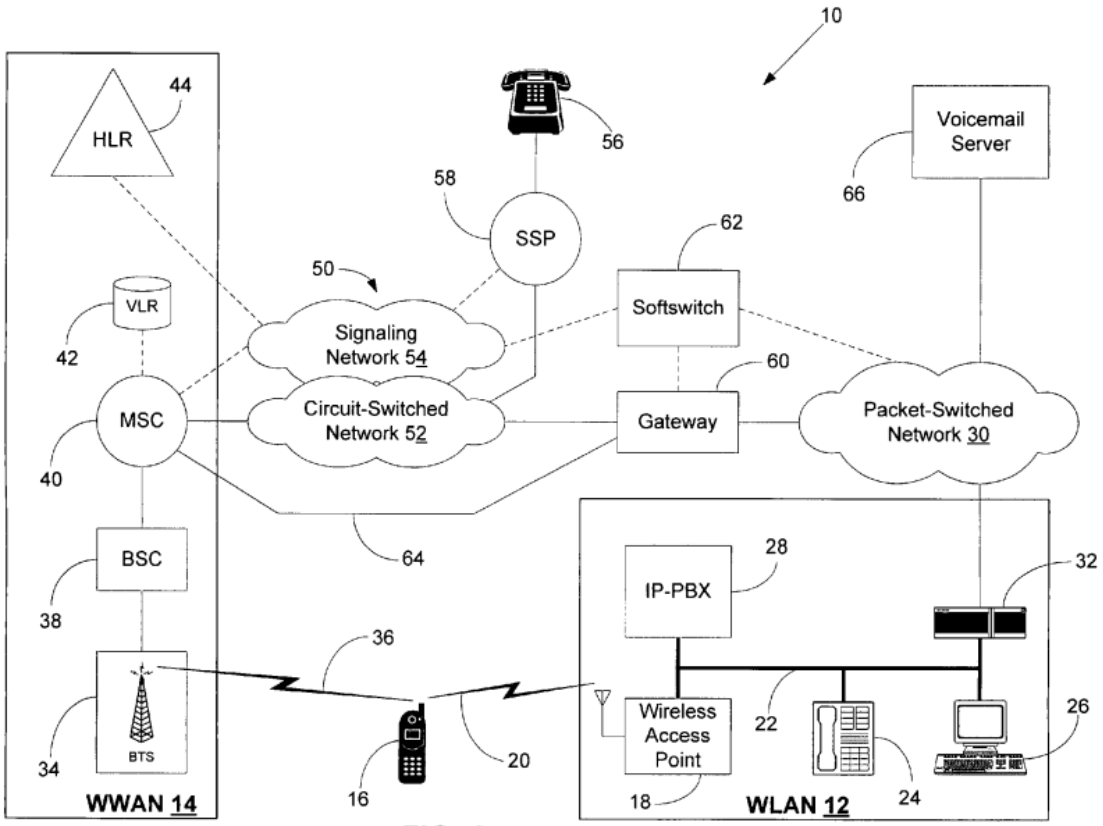


FIG. 1

Ex. 1005, Fig. 1, 4:64-5:10. Each of WLAN 12 and WWAN 14 is connected via interfaces to different networks, such as cellular network and local area network (LAN). Ex. 1005, 3:10-24, 4:54-63, 5:11-26. For example, WWAN 14 includes a MSC 40, which provides access to a mobile telephone network. Ex. 1005, 7:1-8. As another example, WLAN 12 includes a network access device 32, which provides access to a packet-switched network 30. Ex. 1005, 5:27-34. If a call is destined for a mobile device, the call is routed via the respective network. Ex. 1005, 4:64-5:11, 6:45-48, 6:63-66, 7:22-36. Figure 2 of Mauer depicts how to communicate with a mobile station 16 based whether mobile station moves out of

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the coverage area for WLAN 12, WWAN 14, or both networks. Ex. 1005, 8:38-44, 10:43-53; *see also* Figure 2.

71. Mauer generally describes a system in which data records for mobile stations are distributed among various databases stored in multiple networks (such as WLAN 12 and WWAN 14) and some of these databases are associated with one another. Ex. 1005, 6:18-44, 7:55-62. For example, WWAN 14 includes a "VLR 42 [that] stores data records for mobile stations … that are being served by MSC 40" and "a home location register (HLR) 44 that stores a data record for multi-mode mobile station 16." *See id.* Mauer expressly states that multiple networks can be deployed and a mobile station may use different wireless networks at different times. Ex. 1005, 3:10-34. Furthermore, Mauer expressly states that various network elements may be combined or co-located with the MSC in some embodiments. Ex. 1005, 6:30-32, 7:18-21.

B. A POSA Would Have Been Motivated to Modify Mauer's Network Architecture to Include Waylett's Network-in-a-box.

72. A POSA would have considered the systems described in Mauer in conjunction with those described in Waylett, as both concern analogous art. Both belong to the same field of endeavor—that is, telecommunication systems over wireless networks. Ex. 1005, 1:8–10; Ex. 1006, 1:25–31; Ex. 1001, 1:8–51. Likewise, both Mauer and Waylett are pertinent to the problem being solved by the inventor of the '414 patent: "there exists a need for an improved communications

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system that is relatively inexpensive to deploy and relatively inexpensive to operate." Ex. 1001, 1:49–51; Ex. 1005, 1:32-69; Ex. 1006, 2:3–13.

73. Mauer discloses a communication system that includes a wireless wide area network ("WWAN") 14 and wireless local area network ("WLAN") 12:

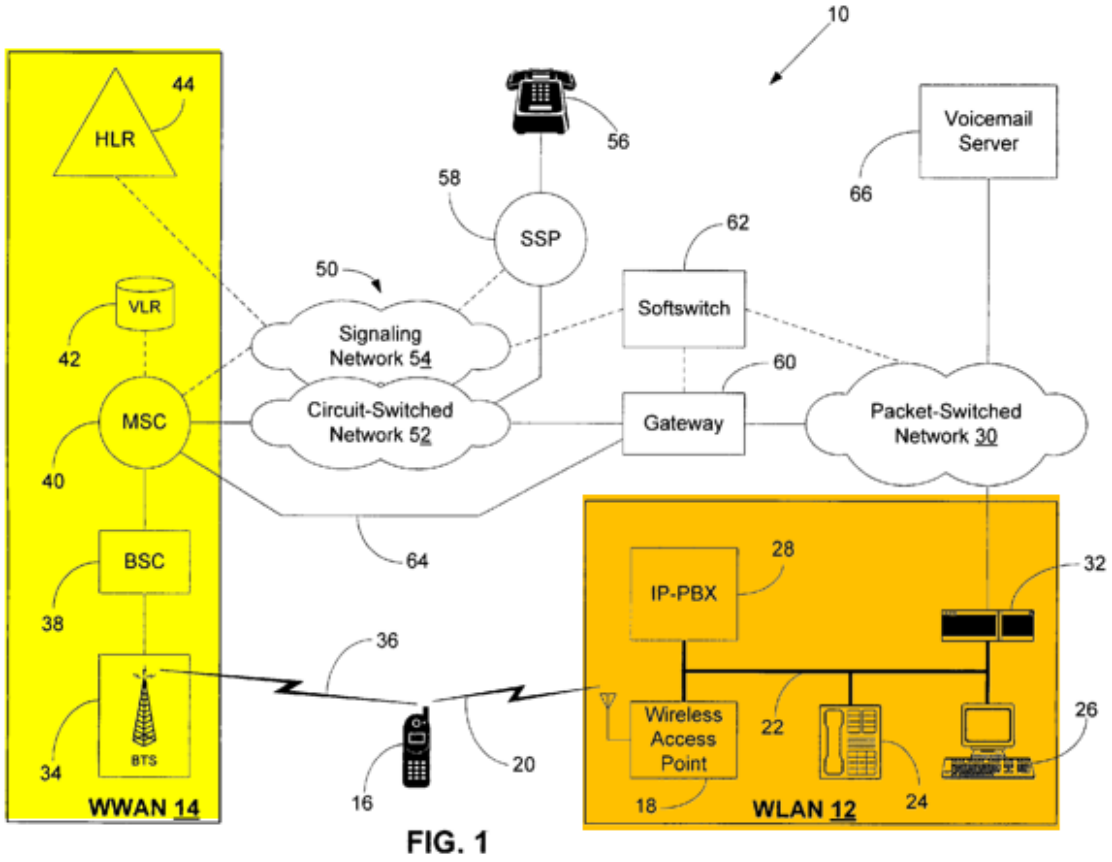


FIG. 1

Ex. 1005, Fig. 1. Each of these wireless networks includes different components used to communicate with mobile stations based on various telecommunication protocols, such as WWAN's GSM or WLAN's 802.11x. Ex. 1005, 3:12–17 ("A multi-mode mobile station includes a plurality of interfaces for wireless communication with a plurality of different wireless networks. Such wireless

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networks may include wireless wide area networks (WWANs), e.g., using CDMA, or GSM, and wireless local area networks (WLANs), e.g., using 802.11x or Bluetooth."). These various network protocols, as Mauer explains, are used to provide coverage for different environments:

> For example, wireless wide area networks (WWANs), which often use wireless access technologies such as CDMA, TDMA, or GSM, typically provide wireless coverage in relatively large geographic areas. However, in many cases, WWANs do not provide good wireless coverage in buildings. . . . However, wireless local area networks (WLANs), which may use wireless access technologies, such as IEEE 802.11, Bluetooth, HiperLAN, and Multichannel Multipoint Distribution Service (MMDS), have been used to provide wireless coverage in more limited areas, such as the inside of buildings.

Ex. 1005, 1:18-29. Accordingly, a POSA would have recognized that providing sufficient network coverage to mobile stations, including, for example, the use of different kinds of networks, network interfaces, and protocols, is an important consideration in the system of Mauer.

74. Service providers, unfortunately, incur a high cost to provide sufficient network coverage for mobile stations that they ultimately pass on to consumers. Ex. 1006, 1:49–56. Waylett recognizes such a "need for an inexpensive communication system and method for operating the same." Ex.

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1006, 2:3-4. Accordingly, a POSA would have recognized that the network architecture described in Mauer would be costly to implement and would benefit from the teachings of Waylett.

75. To address the problem of high costs, Waylett discloses that Network-in-a-box 224 implements the same GSM and WLAN technology used by Mauer's WWAN 14 and WLAN 12. *See* Ex. 1006, 2:38–48; 9:32–46; Ex. 1005, 4:40–49; 4:57–63; 6:4–7. A POSA would have thus recognized that Waylett discloses an inexpensive way to implement the same networks used in Mauer's WWAN 14 and WLAN 12. Accordingly, a POSA would have found it obvious to implement Waylett's NIB solution into Mauer's system architecture because, at a minimum, it would reduce expenses in provisioning a network. Ex. 1006, 2:3–11.

76. The combination of Mauer and Waylett would involve using Waylett's Network-in-a-box 224 in each of Mauer's WWAN 14 and WLAN 12, resulting in at least two DMA systems. Ex. 1006, 9:32–46; Fig. 6. A POSA would have recognized such a modification would necessarily implement certain components, such as Mauer's HLR and VLR in WWAN 14, as part of Waylett's NIB 224. *See* Ex. 1006, Fig. 6 (showing that the NIB already contains a PHLR and PVLR); *see also id.*, 14:23–30. Such a person would have also recognized that these components would be commonly used across these systems because both Waylett and Mauer disclose the same types of wireless networks. Mauer discloses

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that it is possible to integrate some of the network elements with an MSC as well (*e.g.*, Ex. 1005, 6:30–32, 7:18–21) providing for a reasonable of success in the combination of the NIB into Mauer, which itself is a combination of network elements with an MSC. Ex. 1006, 9:36–42; 13:64–14:1; 14:23–30. A POSA would also have recognized that these overlapping components, along with the same wireless technologies being used, also show how compatible Waylett's NIB 224 is with Mauer's networks. Accordingly, a POSA would have been able to modify Mauer's WWAN 14 and WLAN 12 so that each of these networks uses Waylett's NIB 224.

77. The resulting combination of Mauer and Waylett would also include several beneficial features from Mauer that would have been included in Waylett's NIB 224. Mauer's Figure 1, shown above, also discloses a multi-mode mobile station 16 that can use both WWAN 14 and WLAN 12. Ex. 1005, 5:2-10. Mauer also discloses a method of how to reach a mobile station that may be traveling in each of these networks. Ex. 1005, Fig. 2, 2:53–56. As combined, Mauer's method shown in Figure 2 would be incorporated into Waylett's NIB 224 to allow the multi-mode mobile station to be reached. This method is beneficial so multiple networks do not unnecessarily search for a mobile device. As shown in Mauer's Figure 2, a POSA would have recognized that there is no reason to check the second wireless network if the mobile station is found in the first wireless network.

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To implement Mauer's technique in Figure 2, Mauer discloses a soft-switch 62 or other controller may facilitate calls directed to mobile stations located in WWAN 14 and WLAN 12. Ex. 1005, 7:37-41, Abstract. Mauer's method helps identify a possible target location of the mobile station based on its last known network connection. This is beneficial to Mauer's system because a mobile station may have never left the last network it visited. A POSA would have recognized that these benefits would also be applicable if Waylett's NIB 224, which already includes controllers, was modified to include the technique shown in Mauer's Figure 2 and SIP register. Ex. 1006, 9:41–46; Ex. 1018 at 4 (stating "[o]ne of the vendors recently acquired by Alvarion, interWave, offers a similar solution, 'network-in-a-box,' which collapses the functionality of all three — a softswitch, base station controller, and mobile switching center elements — into a single rack for GSM applications.").

78. A POSA would be motivated to combine Mauer and Waylett in the manner described above for three reasons. First, the references each provide reasoning to make such a combination. As explained above, Waylett explains that it provides an inexpensive solution to implement the same wireless networks described in Mauer. *See* Ex. 1006, 2:3–14. Mauer likewise explains that it provides an improved method and system for notifying mobile stations, like those in Waylett, of incoming calls. Ex. 1005, 1:57–59. Second, a POSA would be

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motivated by the teachings of Waylett's complete, stand-alone NIB in a single enclosure and Mauer's network architecture because the resulting combination would improve Mauer's distributed wireless network system by consolidating it into a single box, making it compact in design allowing for faster deployment and network scaling in rural and underserved communities, which is a central focus in Waylett. Ex. 1006, 1:57-2:15, 8:4-32; Ex. 1018 ("[interWave's network-in-a-box"] provides a turnkey solution for carriers, and will be valuable in markets in which budgets are tight, especially rural or developing regions where populations may be sparse and carriers small."). Indeed, a POSA would have recognized that to facilitate faster deployment, Waylett's complete, stand-alone NIB "such as a WAVEXpress NIB platform, [is] commercially available from Interwave Communications, of Menlo Park, Calif." Ex. 1006, 8:8-10. Third, Waylett's NIB would help mitigate the shared concern of Mauer—that is, reaching a mobile station as it roams or moves outside of the service or coverage area. *See* Ex. 1005, 9:32-38; Ex. 1006, 4:28-37. For any of the above reasons, a POSA would have been motivated to combine Mauer and Waylett in the manner described above. In addition, such a person also would have been motivated to include specific features from Waylett's NIB into Mauer's network architecture for the reasons set forth below.

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C. Mauer and Waylett Render Claims 1-8 Obvious

(1) Claim 1

a. Preamble

79. The preamble recites "A method, comprising:"

80. To the extent the preamble is limiting, Mauer discloses this limitation.

81. Mauer discloses "[*a*] *method*," shown in Figure 2 below:

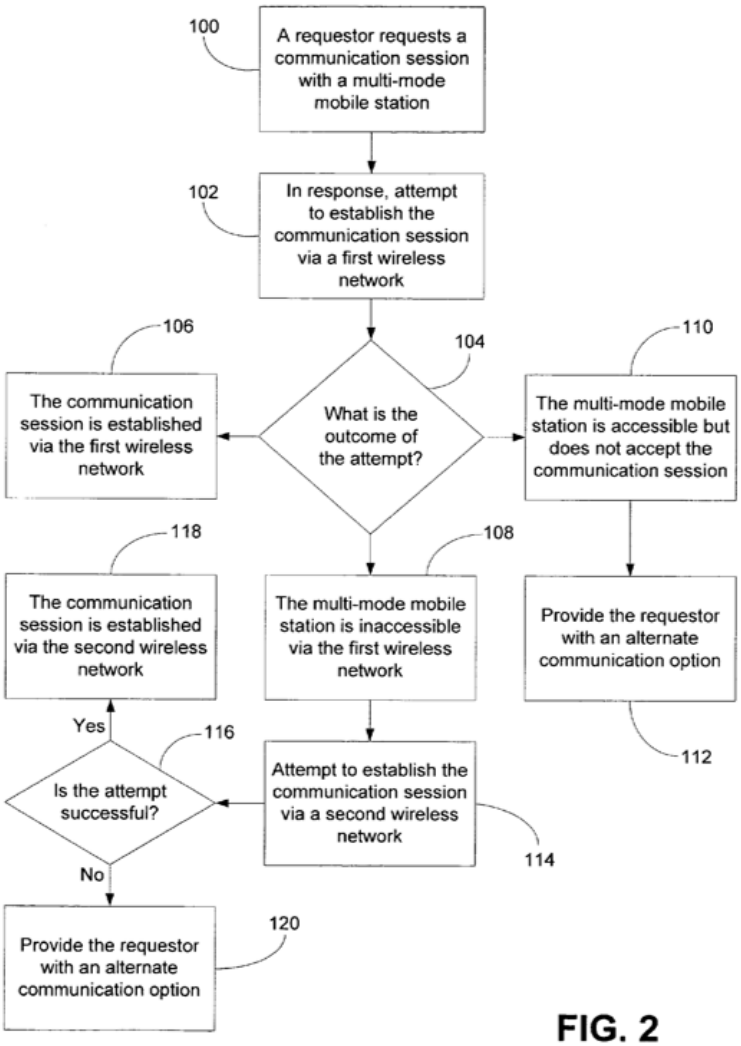


FIG. 2

Ex. 1005, Fig. 2; *see also* Ex. 1005, 2:53–56 ("Fig. 2 is a flow chart illustrating a method of attempting to communicate with a multi-mode mobile station, in accordance with an exemplary embodiment of the present invention.").

b. Receiving a Call

82. Claim element 1.b recites "*receiving, at a first distributed mobile architecture (DMA) system of a DMA network, a call from a first mobile subscriber to a second mobile subscriber, wherein the DMA network includes at least the first DMA system and a second DMA system*".

83. Mauer in combination with Waylett renders this limitation obvious.

84. As modified above, *see* §V.B, Mauer in combination with Waylett discloses "*receiving, at a first distributed mobile architecture (DMA) system of a DMA network, a call from a first mobile subscriber to a second mobile subscriber*."

85. Mauer's Figure 1, as modified with Waylett's NIBs above, *see* § V.B, discloses multiple telecommunication systems ("*DMA systems*") belonging to Figure 1's wireless telecommunication system 10 ("*DMA network*"). As shown in Figure 1 below, Mauer discloses a first WWAN 14 (a "*first distributed mobile architecture system*") and a second WLAN 12:

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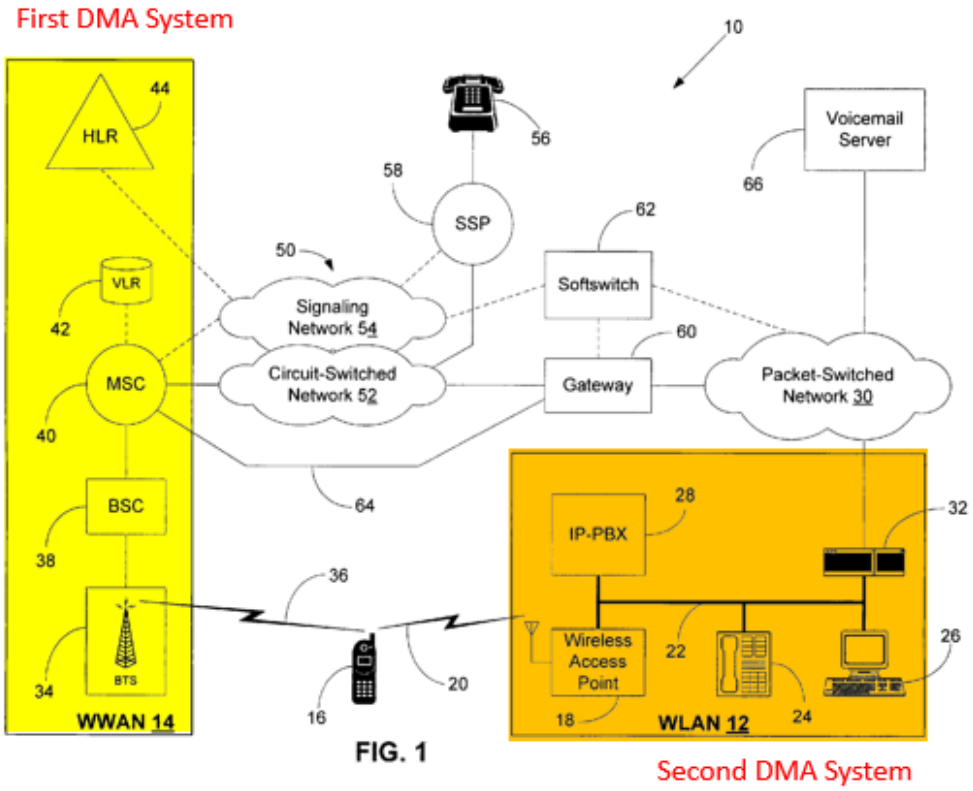


FIG. 1

Ex. 1005, Fig. 1 (annotated); *see* Ex. 1005, 4:35–63 (describing WLAN 12 and WWAN 14). As shown above, Mauer, as modified, discloses a "*a first distributed mobile architecture (DMA) system of a DMA network*."

86. A POSA would have understood that Mauer's multi-mode mobile stations are "*mobile subscribers*." Ex. 1005, 4:64–5:10; Ex. 1001, 5:55–6:4; 5:3–20; 17:25–44; 12:32–44. Figure 2 of Mauer illustrates the process when a call is received for multi-mode mobile station 16 in Figure 1's wireless telecommunication system 10. Ex. 1005, 8:40-44 ("The process of FIG. 2 may make use of wireless telecommunications system 10 and multi-mode mobile

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station 16, as shown in FIG. 1. It is to be understood, however, that other network architectures could be used to implement the process of FIG. 2."). First, a requestor ("*first mobile subscriber*") requests a communication session (a "*call*") with a multi-mode mobile station 16 (a "*second mobile subscriber*"), shown below at step 100:

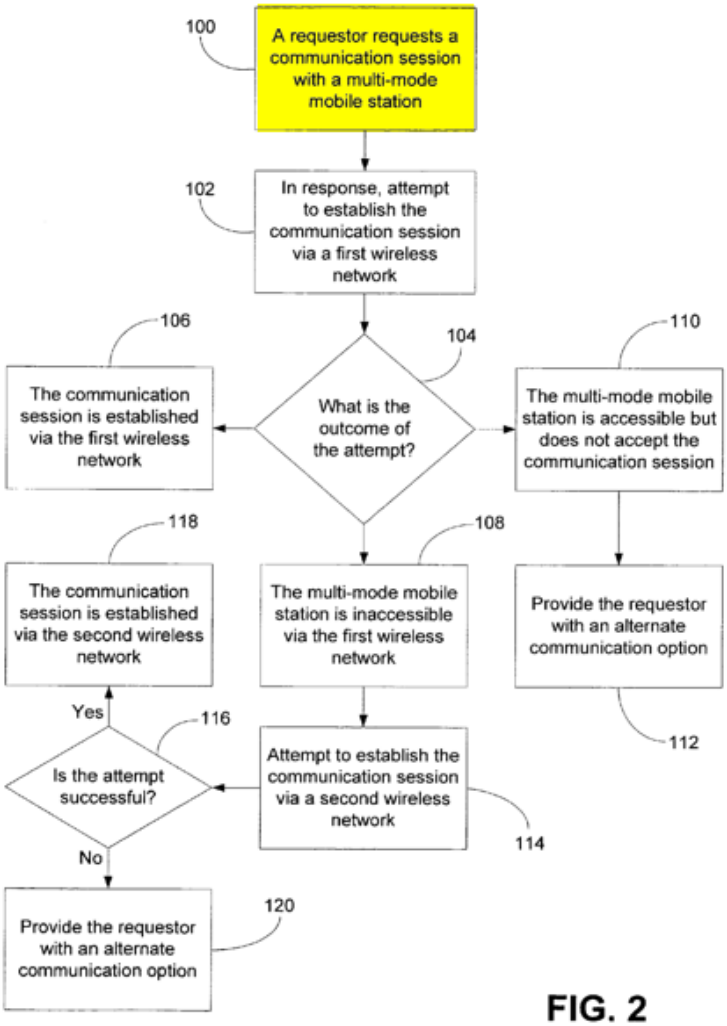


FIG. 2

See Ex. 1005, Figure 2, step 100. "The requested communication session could be, for example, a voice call." Ex. 1005, 8:47–48. Further, Mauer explains in detail

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the way the communication session is requested. For example, Mauer describes that a wireless device communicating via WWAN 14 requests a voice call with a multi-mode mobile station:

> "The requester might make this request via a communication device that is to be involved in the requested communication session. The communication device could be, for example, a landline device that communicates via PSTN 50 (e.g., landline telephone 56) or via packet-switched network 30, ***or a wireless device that communicates via WWAN 14 or WLAN 12***. The request may be embodied in signaling, such as SS7 signaling (e.g., if the requestor communicates via PSTN 50) or SIP signaling (e.g., if the requestor communicates via packet-switched network 30). ***The request might identify the multi-mode mobile station in different ways.*** For example, the request might identify the multi-mode mobile station by a directory number (DN) that is associated with the multi-mode mobile station." *Id*. at 8:52–65 (emphasis added).

87. Based on the above disclosures, Mauer thus discloses "*receiving*" a request for a communications session between a requestor and mobile station 16 ("*a call from a first mobile subscriber to a second mobile subscriber*"). Accordingly, Mauer in combination with Waylett thus renders obvious "*receiving, at a first distributed mobile architecture (DMA) system of a DMA network, a call from a first mobile subscriber to a second mobile subscriber*." In addition, Mauer further discloses multiple such systems may be present, for example "[a]lthough Fig. 1 shows only one MSC and only one BSC, WWAN 14 may include a plurality of MSCs, which in turn, may control a plurality of BTSs, via a plurality of BSCs,"

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Ex. 1005, 6:15-19, each of which, as modified to include a respective network in a box (NIB) of Waylett, may further act as another DMA system.

c. A DMA Network

88. Claim 1 also recites "*wherein the DMA network includes at least the first DMA system and a second DMA system*."

89. Mauer in combination with Waylett renders this limitation obvious in two ways.

90. First, Mauer's Figure 1, as modified with Waylett's NIBs, *see* §V.B, also discloses "*wherein the DMA network includes at least the first DMA system and a second DMA system*." As shown in Figure 1 below, Mauer discloses a DMA network with two separate and distinct DMA systems: the first WWAN 14 and second WLAN 12. Both WWAN 14 and WLAN 12 belong to the same system 10 ("*DMA network*"):

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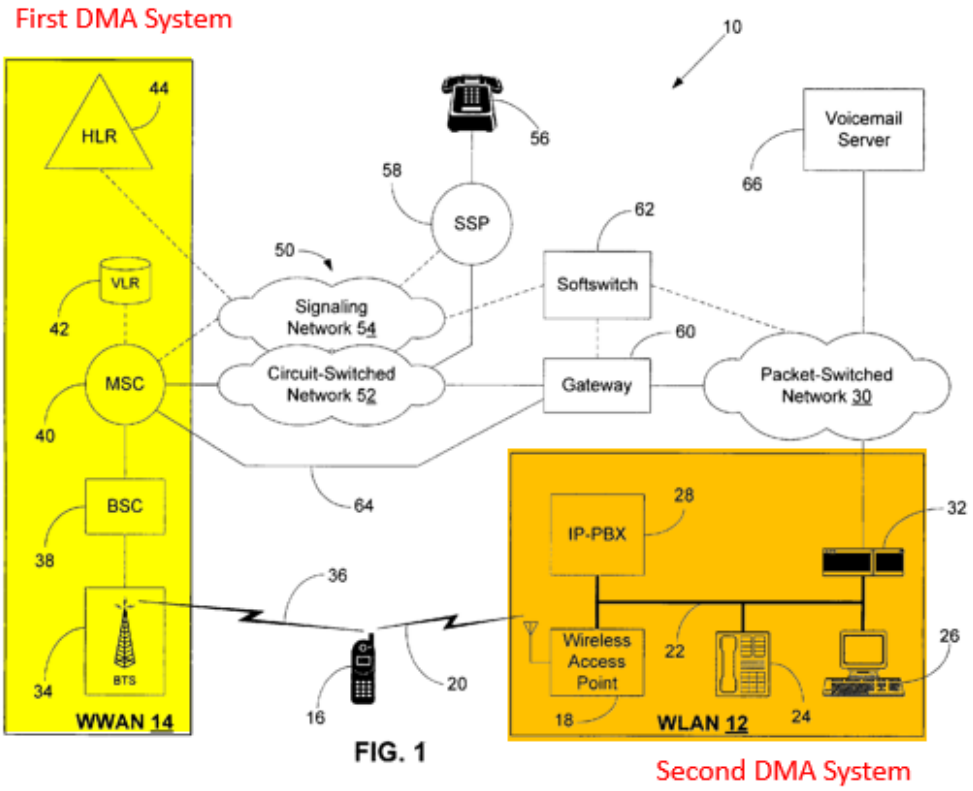


FIG. 1

Ex. 1005, Fig. 1 (annotated); *see* Ex. 1005, 4:35–63 (describing "[w]ireless telecommunications system 10 includes network elements that function together as a wireless local area network (WLAN) 12 and network elements that function together as a wireless wide area network (WWAN) 14."); *see also id.* at 4:64-5:7; Ex. 1001, 4:15-40 (describing "[in system 100] each DMA 106 is interconnected with the other DMAs 106 …"). Mauer thus discloses "*wherein the DMA network includes at least the first DMA system and a second DMA system*."

91. Alternatively, and to the extent that Patent Owner argues that Mauer's WLAN 12 would not satisfy a DMA system after modifying it to include Waylett's

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NIB, it would have been further obvious to modify Mauer's network architecture to substitute WLAN 12 for another WWAN. Mauer discloses a WWAN that would implement multiple Waylett's NIBs 224: WWAN 14 "may include a plurality of MSCs, which may, in turn control a plurality of BTSs, via a plurality of BSCs." Ex. 1005, 6:15-18. Mauer also states that various network elements may be combined or co-located with the MSC in some embodiments. *See* Ex. 1005, 6:30-32, 7:18-21. A POSA would have understood that, as combined with Waylett, each MSC would be implemented in Waylett's NIB 224 for the same reasons stated above, *see* § V.B. Such a modification would change Figure 2 of Mauer to refer to the new WWAN as the "second wireless network." In addition, such a person would have been motivated to modify Mauer's network architecture to include multiple WWANs, each using Waylett's NIB 224, because it would be an inexpensive way to expand the network, especially to unserved or underserved communities. Ex. 1006, 1:17-2:8, 2:15-16. Such a modification would result in another WWAN 14 network being a "wireless network" in Figure 2 of Mauer and would satisfy a "*second DMA system*."

d. Location of second mobile subscriber

92. Claim 1 recites "*determining whether the second mobile subscriber is located within a first wireless coverage area of the DMA network that is associated with the first DMA system based on information stored at a home location register*

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(HLR) of the first DMA system and a visitor location register (VLR) of the first DMA system."

93. Mauer in combination with Waylett renders this limitation obvious.

94. It is my opinion that a POSA would have understood that Mauer's WWAN 14 is a "*first wireless network*" and includes both a "*home location register (HLR)*" 44 and "*a visitor location register (VLR)*" 42 shown below:

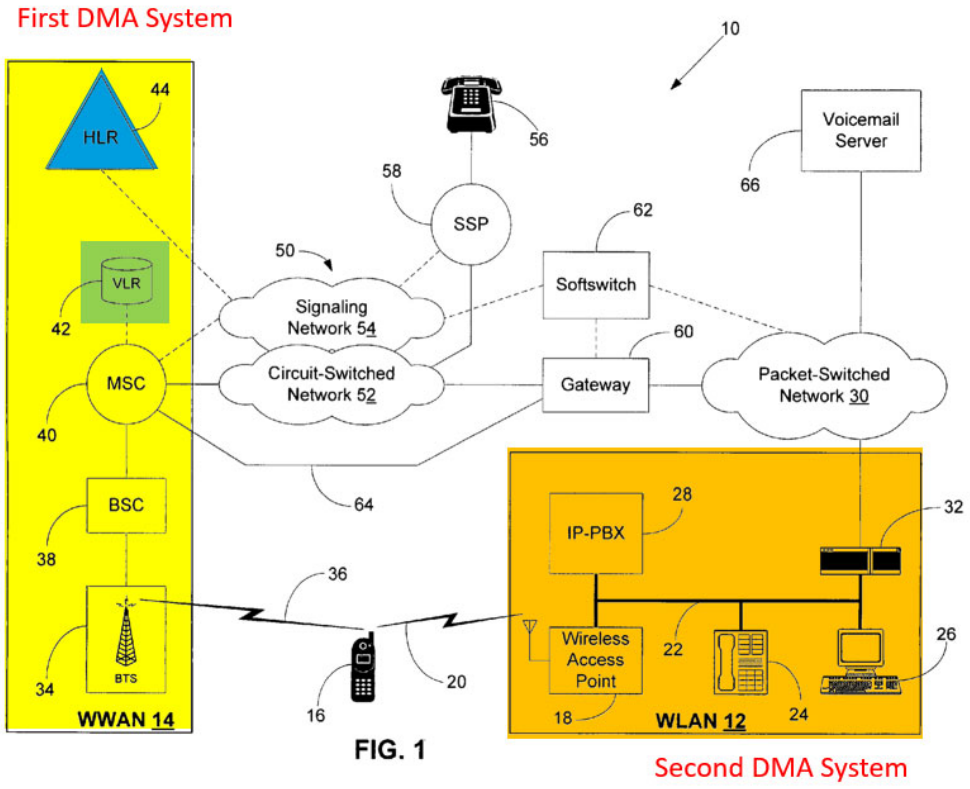


FIG. 1

Ex. 1005, Fig. 1 (annotated). Waylett similarly discloses that its NIB 224 include both an HLR and a VLR, shown in Figure 6 below:

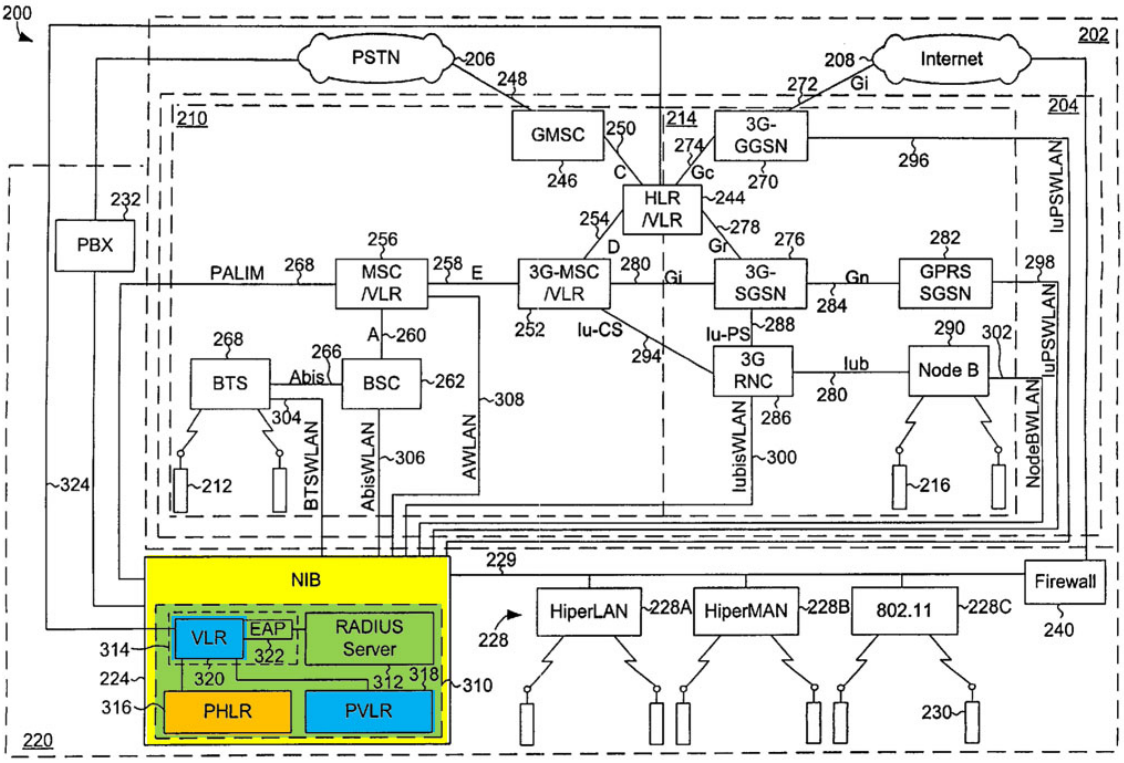


FIG. 6

Ex. 1006, Fig. 6 (annotated), 9:36-41.

95. As Mauer explains, the visitor location register 42 likewise "stores data records for mobile stations, such as multi-mode mobile station 16, that are being served by MSC 40." Ex. 1005, 6:19–21. This VLR data record "may identify the mobile station e.g., by mobile directory number (MDN), mobile station identification (MSID) and/or electronic serial number (ESN)." Ex. 1005, 6:21–24. Waylett's VLR operates similarly. Ex. 1006, 12:53–61, 14:35–37.

96. Mauer's home location register (HLR) 44 likewise "stores a data record for multi-mode mobile station 16," which "may identify multimode mobile station 16, such as by MDN, MSID, and/or ESN and may include a last known

location of multi-mode mobile station 16" (and Waylett's HLR operates similarly). Ex. 1005, 6:33–38; Ex. 1006, 12:30–36. Mauer explains: "the data record may identify the VLR that most recently registered multi-mode mobile station 16 with HLR 44." Ex. 1005, 6:39–41; *see also* Ex. 1006, 12:30-36. *see also id*., 14:32-38.

97. Based on the above disclosures, a POSA would have understood that Mauer's VLR 42 and HLR 44, as modified, store records indicating whether a "*mobile subscriber is located within a first wireless coverage area*" of WWAN 14.

98. Figure 2 of Mauer shows that, in response to receiving (in step 100) a communication session request, the next step 102 seeks to "*establish the communication session via a first wireless network*":

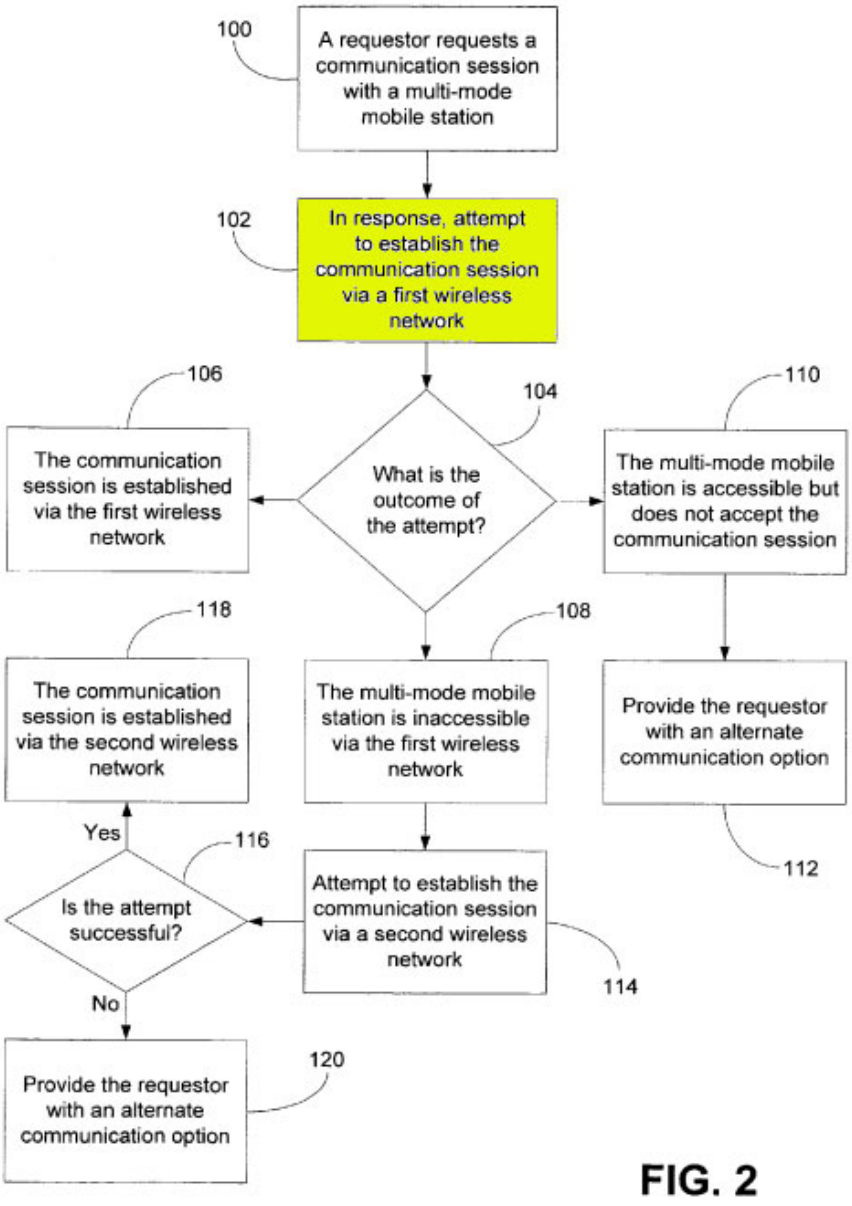


FIG. 2

Ex. 1005, Fig. 2 (annotated). Mauer also explains that the first wireless network mentioned in Figure 2 above can be the same wireless networks described in Figure 1, such as WWAN 14. Ex. 1005, 10:20–23 ("If the first wireless network is a WLAN, e.g., WLAN 12, then the second wireless network could be a WWAN,

such as WWAN 14."). To establish a communication session S102 with a mobile station 16 located in via WWAN 14, *see* Fig. 2, a POSA would understand that a network must necessarily determine whether the mobile station 16 is located within the network coverage of a first wireless network—that is, WWAN 14. To do so, such a person would have understood that information stored in Mauer's VLR 42 and HLR 44 would indicate whether mobile station 16 is located in the coverage area of WWAN 14. Mauer as modified thus discloses that, to determine whether mobile station 16 is located within a "*wireless coverage area*" of WWAN 14, Mauer discloses using "*information stored at a home location register (HLR)*" 44 and "*a visitor location register (VLR)*" 42, both of which are located in WWAN 14 ("*first DMA system*").

e. When the Second Mobile Subscriber is Located in the First Wireless Coverage Area

99. Claim 1 recites "when the second mobile subscriber is located within the first wireless coverage area, connecting the call to the second mobile subscriber via the first DMA system."

100. Mauer in combination with Waylett renders this limitation obvious.

101. As shown below, Figure 2 of Mauer shows that a communication session is established (in step 106) over the first wireless network after a successful attempt in step 104:

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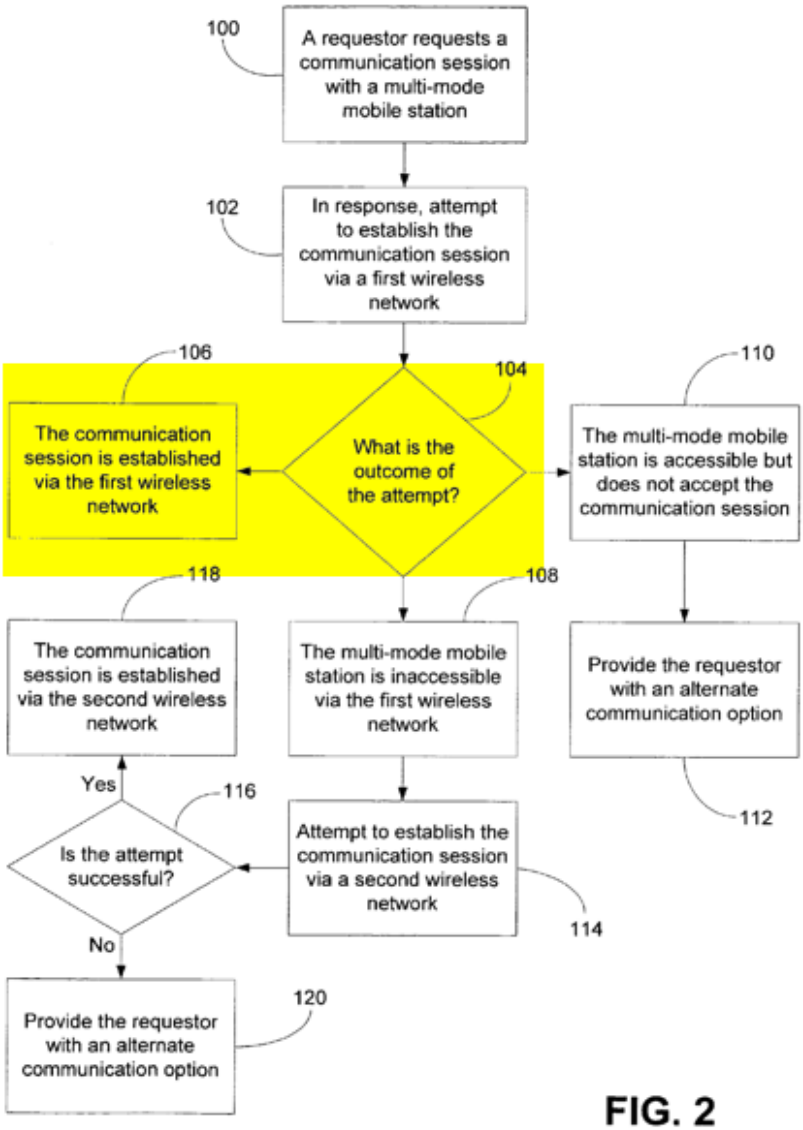


FIG. 2

Ex. 1005, Fig. 2 (annotated). Mauer explains that, when this happens, "the requestor and the multi-mode mobile station may then be able to exchange voice, data, and/or other media via the first wireless network." Ex. 1005, 9:25–32. Based on this disclosure, a POSA would have understood that a communication session in WWAN 14 can be established only when mobile station 16 is located within the

coverage area. *See* Ex. 1005, 9:32–55. Therefore, Mauer as modified discloses that "*when the second mobile subscriber is located within the first wireless coverage area, connecting the call to the second mobile subscriber via the first DMA system*."

f. When the Second Mobile Subscriber is Not Located in the First Wireless Coverage Area

102. Claim 1 also recites "*when the second mobile subscriber is not located within the first wireless coverage area, determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system based on information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system.*"

103. Mauer in combination with Waylett renders this limitation obvious.

104. As I explain below, Mauer discloses "when the second mobile subscriber is not located within the first wireless coverage area, determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system." Mauer, however, does not expressly disclose using "information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system" to

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make that determination. The combination of Mauer and Waylett renders this limitation obvious.

i. when the second mobile subscriber is not located within the first wireless coverage area, determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system

105. Mauer, as modified, discloses "*when the second mobile subscriber is not located within the first wireless coverage area, determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system*."

106. Figure 2, shown below, illustrates that if communication session cannot be established over the first wireless network in step 108, establish a communication session over a second wireless network will be attempted in step 114:

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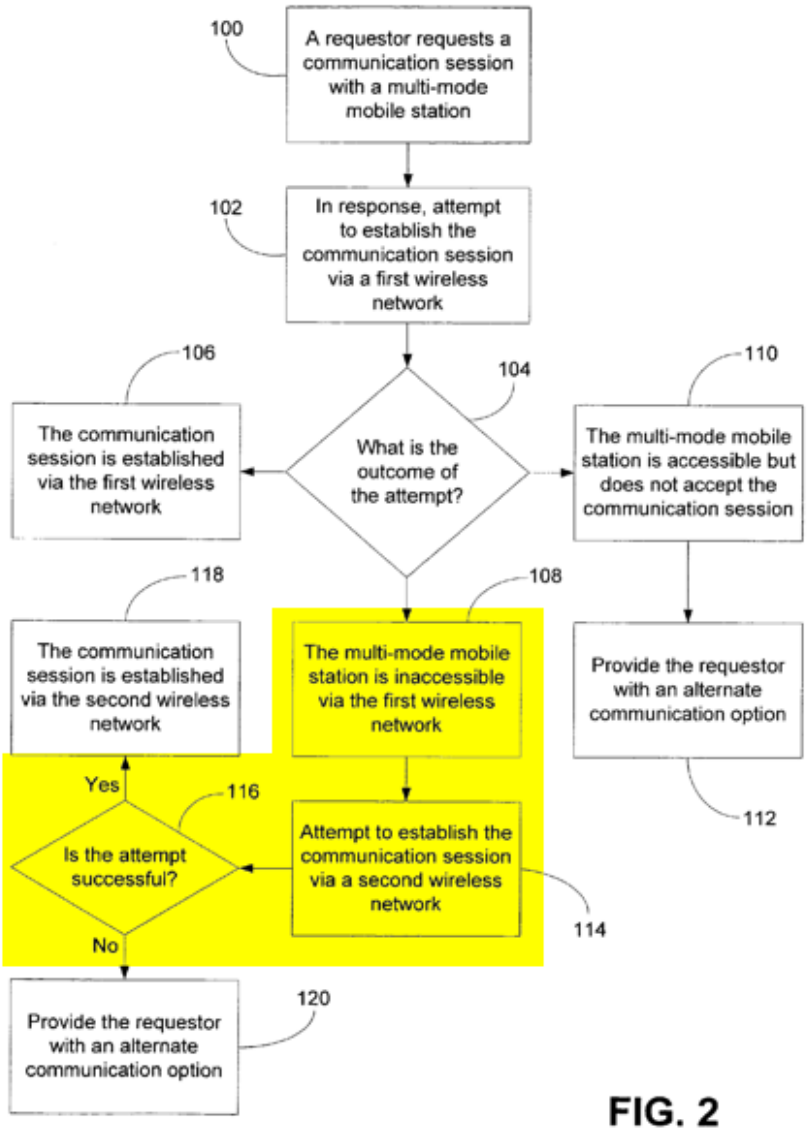


FIG. 2

Ex. 1005, Fig. 2 (annotated). Mauer further explains that if "the multi-mode mobile station is found to be inaccessible via the first wireless network, an attempt may be made to establish the communication session via the second wireless network, as indicated by block 114." Ex. 1005, 10:17–20. Mauer's network architecture, as modified to include Waylett's NIBs, therefore discloses the

claimed "*second DMA system*." There are two different networks in Mauer that can serve as the "*second DMA system*." A POSA would have understood that Mauer's "second wireless network" would have been WLAN 12 from Mauer's Figure 1 (a "*second DMA system*"). *See* Ex. 1005, 8:38-65, 10:20–23, Fig. 1. Alternatively, and as Mauer's network architecture is modified to include to Waylett's NIB and substitute WLAN 12 for another WWAN modified above, *see* § V.C(1)c, a POSA would have understood that Mauer's "*second wireless network*" would have been a second WWAN in Mauer's modified network architecture. *See* Ex. 1005, 8:38-65, 10:20–23. Such a person would have also understood that a communication session in each of these networks can be established only when mobile station 16 is located within the coverage area of either WLAN 12 or a second WWAN. *See* Ex. 1005, 9:32–55.

ii. information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system

107. Mauer does not expressly disclose making this determination using "*information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system*." Waylett renders this limitation obvious.

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108. Waylett discloses using "*information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system*."

109. As explained above, using Waylett's NIB 224 in Mauer's system would result in at least two DMA systems. *See* § V.B. The combined system would also be a "distributed public" or "distributed private" HLR/VLR maintaining subscriber profile information, Ex. 1006, 18:45-49, resulting in Waylett's RADIUS server 312 in each NIB 224 "rout[ing] an interpretation of either a username or a user identity provided in the authentication procedure, to the appropriate public or private HLR." Ex. 1006, 14:61-66. To do so, Waylett discloses that RADIUS server 312 uses a "configuration table that matches the [International Mobile Subscriber Identity] ranges with the appropriate or controlling public or private HLR," Ex. 1006, 15:6-8. Stated another way, Waylett discloses RADIUS server 312 in each NIB 224 would use a table of subscriber identities to send user information to the appropriate HLR during the authentication procedure. Configuration tables are particularly helpful, as Waylett explains, when a network architecture includes multiple DMA servers each having their own HLR as in the Mauer's modified network architecture with two DMA servers, Ex. 1006, 15:8-10 ("This last model works well if IMSI partitioning is implicitly or explicitly enabled for subscriber provisioning across multiple public or private HLR 244, 316.").

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Waylett's HLRs include private "distributed" HLRs (316) associated with each NIB. Ex. 1006, 14:63-66.

110. A POSA would have recognized that the International Mobile Subscriber Identity is used to identify specific "*mobile subscriber devices*." Ex. 1014 at 3 (defining IMSI as "International Mobile Subscriber Identity" that is "used to uniquely identify a subscriber to mobile telephone service"). Waylett's configuration table (a "*community location register*") stores these subscriber identities along with their appropriate HLR. A POSA would have understood that Waylett's configuration tables necessarily include "*information associated with one or more mobile subscriber devices that are registered with*" other HLRs, including the HLR in the second DMA. Indeed, Waylett envisions more than one HLR because Waylett teaches "multiple … HLR[s]." Ex. 1006, 15:8-10. In the resulting combination of Mauer and Waylett, each NIB (included in a "DMA system") would store subscriber identities along with their appropriate HLRs. Ex. 1006, 15:6-10 ("(ii) using a configuration table that matches the IMSI ranges with the appropriate or controlling public or private HLR. The last model works well is IMSI partitioning is implicitly or explicitly enabled for subscriber provisioning across multiple public or private HLR 244, 316".)

111. A POSA would have also recognized that because RADIUS server 312 uses a "configuration table" and the RADIUS server is included in the NIB, it

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would be stored locally in the NIB. See, e.g., Ex. 1006, 13:67-14:1. Waylett teaches local storage, such as "a memory system … coupled to the NIB 224" for storing subscriber identification and security information. Ex. 1006, 10:45-48. Accordingly, such a person would have recognized that Waylett's configuration table is a "*information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system*."

112. As such, Maurer as modified with the NIB of Waylett would allow determining which coverage area the mobile is currently located. This determination would be applicable not only for WLAN 12 as the second DMA, but also when the WLAN 12 is substituted for another WWAN, *see* § V.C(1)c acting as the second DMA. This is because Mauer further discloses multiple WWAN coverage areas, each having a BSC/MSC present. Ex. 1005, 6:15-19 ("Although Fig. 1 shows only one MSC and only one BSC, WWAN 14 may include a plurality of MSCs, which in turn, may control a plurality of BTSs, via a plurality of BSCs."). Each WWAN coverage area, as modified to include a respective network in a box (NIB) of Waylett, may further act as a second DMA system. As modified, each NIB would be a separate wireless network further satisfying the claim limitation.

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iii. It would have been obvious to modify Mauer's system to use Waylett's configuration tables

113. It is my opinion that it would have been obvious for a POSA to modify Mauer's system to use Waylett's information. As explained above, Mauer and Waylett are analogous art. *See* § V.B.

114. A POSA would have been motivated to use Waylett's configuration tables stored in each NIB when they are incorporated in Mauer's network architecture for two reasons. First, a POSA would have understood that it would improve the processing time for locating a mobile device by storing information locally as opposed to sending requests for the same information to other NIBs. Otherwise, such a person would have understood that Waylett's NIB would need to query all other NIBs to determine whether they included the sought-after mobile device in its HLR. Doing so would necessarily take additional time. Second, a POSA would have understood that these additional queries would consume additional network resources. Such a person would have recognized that, by storing the information locally, no additional messages or network resources would need to be used. For these reasons, a POSA would have been motivated to use Waylett's configuration tables in its NIBs used in Mauer's network architecture.

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g. When the Second Mobile Subscriber is not located in either the First or Second Wireless Coverage area

115. Claim 1 recites "*when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area, determining a preferred call path to route the call outside of the DMA network based on information stored at a destination preference register (DPR), wherein the DPR is stored at the first DMA system.*"

116. Mauer in combination with Waylett renders this limitation obvious.

117. Mauer discloses determining a call path outside the DMA network when the mobile subscriber is not located in the first or second wireless coverage area. Mauer, however, does not expressly disclose making this determination using "*information stored at a destination preference register (DPR)*" stored "*at the first DMA system.*" As explained below, the combination of Mauer and Waylett render this claim limitation obvious.

i. when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area, determining a preferred call path to route the call outside of the DMA network

118. Mauer also discloses "*when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area, determining a preferred call path to route the call outside*

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of the DMA network." Figure 2 of Waylett, shown below, illustrates that, in step 116, if is determined that communication session cannot be established over the first or second wireless network, the requestor is given an alternate communication option in step 120:

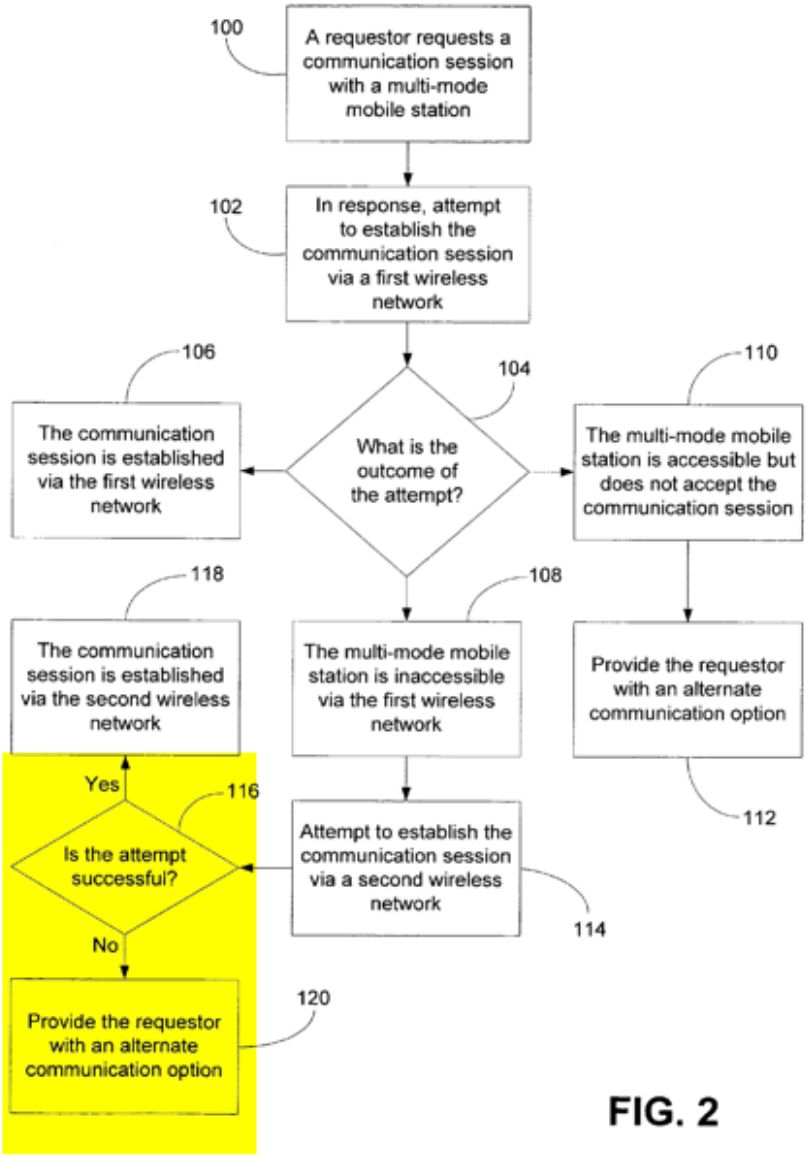


FIG. 2

Ex. 1005, Fig. 2 (annotated).

119. Mauer further explains what that alternate communication option may be:

> [It] could, for example, allow the requestor to leave a voice message on a voicemail system, e.g., voicemail server 66, or to send a message to the multi-mobile station, e.g., as an instant message or SMS message. Other types of alternative communication options could also be provided.

Ex. 1005, 10:59–64. Mauer also discloses "establish[ing] a call to voicemail server." Ex. 1005, 8:33-34.

120. Based on the above disclosures, a POSA would have understood that the "alternate communication option," such as voicemail server 66, serves as "*a preferred call path to route the call*." Such a person would have recognized that voicemail server 66 (shown with a red box) would be outside the two DMA networks of Mauer, as modified:

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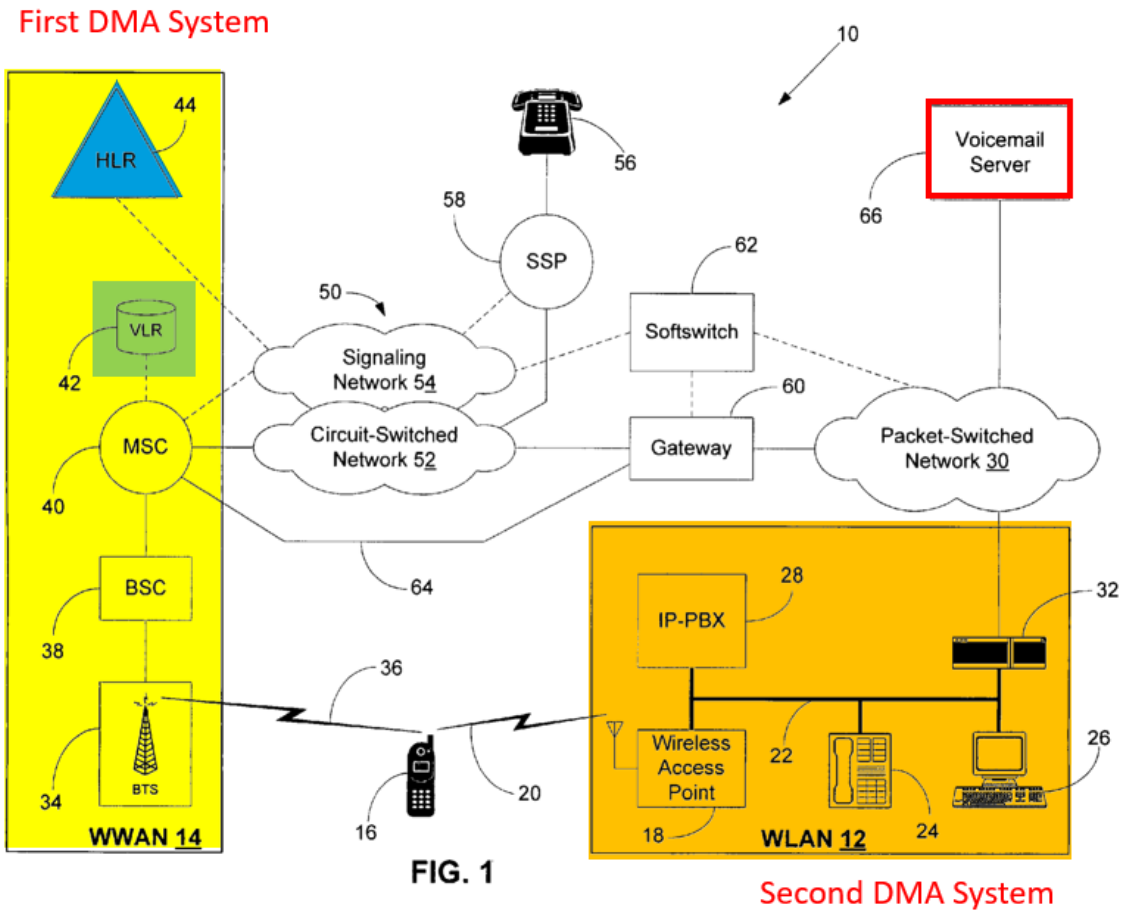


FIG. 1

Ex. 1005, Fig. 2 (annotated); *see* Ex. 1005, 8:25–34, 10:59–64.

121. Such a person would have further understood that a communication session with the voicemail server 66 would be established whenever a mobile device is inaccessible to both WWAN 14 and WLAN 12, (*see* Ex. 1005, 9:32–55), as well as another WWAN when Mauer is modified above, *see* § V.C(1)c. Accordingly, a POSA would have recognized that the voicemail server would be the "*preferred call path to route the call outside of the DMA network*" whenever

"*the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area*."

ii. A POSTIA Would Have Found It Obvious to modify Mauer's system to use information to "*route the call outside of the DMA network*" from "*a destination preference register (DPR)*" "*stored at the first DMA system*."

122. It is my opinion that it would have been obvious for a POSA to modify Mauer to store information used to "*route the call outside of the DMA network*" in "*a destination preference register* (*DPR*)" that is "*stored at the first DMA system*." Mauer does not expressly disclose using "*information stored at a destination preference register (DPR), wherein the DPR is stored at the first DMA system.*" But a POSA would have understood that this feature would have been obvious. As I explained above, Mauer discloses performing the claimed determination: determining "*when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area*" and "*determining a preferred call path to route the call outside of the DMA network*."

123. A POSA would have understood that these actions would necessarily require storing information, such as the IP address or a domain name for the voicemail server 66 to establish a communication session. Thus, *e.g.*, information such as the IP address or a domain name for the external voicemail server 66 (to

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establish a communication session) would qualify as "a preferred call path to route the call outside of the DMA network." A POSA would recognize that an IP address or a domain name of a voicemail server would serve as a preferred call path to route the call outside of a DMA network. *See*, *e.g.*, Ex. 1016 at 27:34-38 (describing the use of domain names or IP addresses to identify voicemail servers "the domain or IP address of the IVRU (VM policy server) 98, and (ii) descriptors and domain names or IP addresses of the voice mail servers that are available to handle the call, *i.e.*, the voice mail servers that host voice mail boxes[.]") Indeed, Mauer teaches "establish[ing] a call to voicemail server." Ex. 1005, 8:33-34. The GSM standard specifies that routing calls to voicemail is one of three options for when a mobile station is unavailable. *See* Ex. 1013. For example, the GSM standard explains that secondary call treatment can be voicemail:

> The mobile station sends an IMSI_DET_IND message to the network each time it is powered down. The VLR keeps track of that state. The merit of this approach is that it saves radio resources and processing time. The call processing can switch to secondary call treatment, without the need of first sending a PAGING message and then waiting for expiration of the respective timers. Secondary call treatment means initiating call forwarding, voice mail, or simply indicating to the caller that the subscriber is currently not reachable. The complementary operation to IMSI detach is IMSI attach. It indicates to the network that

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> a mobile station is active again. IMSI attach is related to periodic location updating. The location updating procedure is utilized to perform IMSI attach."
> Ex. 1013, 357.

Consequently, a POSA would have understood that information necessary to establish a call to Mauer's voicemail server 66 is stored in a "*destination preference register*."

124. A POSA would have been motivated to store information pertaining to Mauer's voicemail server 66 in a "*a destination preference register (DPR)*" in the "*first DMA server*" for at least four reasons.

125. First, a POSA would have recognized that information about the voicemail server would be the type of information needed to be shared across multiple DMAs in case any DMA failed. That way, such a person would have understood that another DMA system would be able to route a call to voicemail if the DMA network connection to the destination phone failed.

126. Second, using a "*destination preference register (DPR)*" to store the address of voicemail server 66 in each DMA server would be consistent with the GSM standard used in both Mauer and Waylett. Ex. 1005, 6:4-6; Ex. 1006, 5:32-36. For example, when a mobile device is detached from a network (*e.g.*, "*when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area*"), the GSM standard

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specifies routing calls to voicemail. *See* Ex. 1013. Based on this standard, a POSA would have understood that storing the address information of the voice mail server allows a call to be routed to a voicemail server when a mobile subscriber is unreachable.

127. Third, as I explained above, a POSA would have also recognized that Waylett discloses storing *similar* types of information in registers, such as a VLR, pVLR, and pHLR. Ex. 1006, 14:23-25, 14:32-38. Accordingly, modifying Mauer's network architecture to include Waylett's NIB 224 would have been obvious to a POSITA.

128. Fourth, using a "*destination preference register (DPR)*" to store address information for the voicemail server 66 in each DMA would have been obvious because it would merely include using a known element (*i.e.*, a register) to perform the same function (*i.e.*, storing contact information for another device) and yielding expected results (*i.e.*, capability of accessing that information for use to communicate with the voicemail server 66).

129. For any of the above reasons, a POSA been motivated to store information pertaining to Mauer's voicemail server 66 in a "*a destination preference register (DPR)*" in the "*first DMA server*".

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(2) Claim 2

130. Claim 2 depends on claim 1 and further recites "*routing the call outside of the DMA network via the preferred call path when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area*."

131. Mauer discloses this limitation or renders it obvious. Mauer teaches that if the multi-mode mobile station is found to be "inaccessible" via the first or second wireless network (the "first" and "second wireless coverage area[s]"), "then the requestor may be provided with an … option … to leave a voice message on a voicemail system, e.g., voicemail server 66." Ex. 1005, 10:17–20, 10:54-61; *see also* Figure 2. Mauer also discloses "establish[ing] a call to voicemail server," which is "*the preferred call path*." Ex. 1005, 8:33-34; Figure 1. Further, Mauer's Figure 1 shows that voicemail server 66 is external to its WWAN 14 and WLAN 12 (*i.e.*, "*outside of the DMA network*"). *See id*. Based on the above passages, a POSA would have understood that Mauer discloses "*routing the call outside of the DMA network via the preferred call path*." Accordingly, a POSA would have recognized that the voicemail server would be the "*preferred call path*" for "*routing the call outside of the DMA network*" whenever *"the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area*."

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(3) Claim 3

132. Claim 3 depends on claim 1 and further recites "*connecting the call via an Internet Protocol (IP) peer-to-peer connection between the first DMA system and the second DMA system when the second mobile subscriber is located within the second wireless coverage area*."

133. Mauer in view of Waylett renders this limitation obvious.

134. Mauer discloses this limitation. Mauer teaches "IP packets carry[ing] voice … through packet-switched network 30 in a real-time format." Ex. 1005, 5:34-38. Further, Figure 1 shows WLAN 12 ("*the second DMA system*") connected to packet-switched network 30, which is communicatively coupled to softswitch 62, which is further communicatively coupled to signaling network 54, which, in turn, is communicatively coupled to MSC 40 included in WWAN 14 ("*the first DMA system*"). Further, Mauer's network architecture uses Session Initiation Protocol ("SIP"), *see* Ex. 1005, 3:59-61 ("For example, if the first wireless network is a WLAN, the first notification message might be a Session Initiation Protocol (SIP) Invite message."), which is a peer-to-peer connection. Accordingly, a POSA would have recognized that Mauer discloses an Internet Protocol (IP) peer-to-peer connection between the first DMA system and the second DMA system. A POSA would have recognized that SIP is a peer-to-peer protocol. *See, e.g.,* Ex. 1015 at Abstract ("A method and system for providing secure access to a

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device initiating communications using a peer-to-peer signaling protocol, such as a [Session Initiation Protocol]. . ..”), 1:17–20 (“Session Initiation Protocol (SIP) is an Internet Engineering Task Force (IETF) peer-to-peer, signaling protocol that facilitates openness, connectivity, choice and personalization.”). Additionally, Mauer discloses “set[ting] up communication sessions through packet-switched network 30 that involve WLAN 12” so that “multi-mode mobile station 16 is able to communicate with WLAN 12 when operating in an area served by WLAN 12.” Ex. 1005, 5:56-58, 4:66-5:2. Based on the above passages, a POSA would have understood that Mauer discloses “*connecting the call via an Internet Protocol (IP) peer-to-peer connection between the first DMA system and the second DMA system when the second mobile subscriber is located within the second wireless coverage area.*”

(4) Claim 4

135. Claim 4 depends on claim 1 and further recites “*wherein the CLR associated with the second DMA system includes information associated with a second HLR that is stored at the second DMA system.*”

136. Mauer in view of Waylett renders this limitation obvious.

137. Waylett discloses this limitation. Waylett discloses that RADIUS server 312 uses a “configuration table that matches the [International Mobile Subscriber Identity] ranges with the appropriate or controlling public or private

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HLR," Ex. 1006, 15:6-8. Stated otherwise, Waylett discloses RADIUS server 312 in each NIB 224 would use a table of subscriber identities send user information to the appropriate HLR during the authentication procedure. A POSA would have recognized that the International Mobile Subscriber Identity is used to identify specific "*mobile subscriber devices*." Ex. 1014 at 3 (defining IMSI as "International Mobile Subscriber Identity" that is "used to uniquely identify a subscriber to mobile telephone service"). Waylett's configuration tables (a "*community location register*") store these subscriber identities along with their appropriate HLR. Consequently, Waylett's configuration tables necessarily include "*information associated with one or more mobile subscriber devices that are registered with*" the same HLR, *i.e.*, including the second HLR that is stored in the second DMA.

(5) Claim 5

138. Claim 5 depends on claim 1 and further recites "*wherein the preferred call path includes one of a first preferred Voice over Internet Protocol (VoIP) call path of a plurality of VoIP call paths, a first preferred mobile switching center (MSC) call path of a plurality of MSC call paths, and a first preferred Integrated Services Digital Network (ISDN) call path of a plurality of ISDN call paths*."

139. Mauer in view of Waylett renders this limitation obvious.

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140. Mauer discloses this limitation. Mauer teaches "IP packets carry[ing] voice … through packet-switched network 30 in a real-time format" and "LAN 22 [may be communicatively coupled to a wide area packet-switched network 30 and] may carry voice, data, and/or other media in a packet-based format. Thus, LAN 22 may be connected to other communication devices that exchange voice in a packet-based format. For example, LAN 22 may be connected to a voice-over-packet (VoP) telephone 24[.]" Ex. 1005, 5:34-38, 5:17-28. Further, Mauer discloses "establish[ing] a call to voicemail server," which is "*the preferred call path*" and Figure 1 shows packet-switched network 30 communicatively coupled to voicemail server 66 via "*the preferred call path*." Ex. 1005, 8:33-34; Figure 1. Mauer also states "voicemail server 66 could be … coupled to MSC 40[.]" Ex. 1005, 8:30-31. Based on the above passages, a POSA would have understood that "*the preferred call path*" is a "*preferred Voice over Internet Protocol (VoIP) call path* [or] *a preferred mobile switching center (MSC) call path.*" A POSA would have recognized that Mauer discloses "*a plurality of VoIP call paths*" because a POSA would have understood Waylett to disclose multiple mobile stations making voice calls with each other over an IP network. Mauer likewise discloses "*a plurality of MSC call paths*" because a POSA would have understood Mauer to disclose multiple mobile stations making voice calls with each other using the MSC. Accordingly, Mauer discloses "*wherein the preferred call path includes one*

of a first preferred Voice over Internet Protocol (VoIP) call path of a plurality of VoIP call paths, *a first preferred mobile switching center (MSC) call path of a plurality of MSC call paths*."

(6) Claim 6

141. Claim 6 depends on claim 1 and further recites "*wherein the preferred call path is determined based on information provided by the first mobile subscriber*."

142. Mauer discloses this limitation. Mauer teaches "[it] could, for example, allow the requestor to leave a voice message on a voicemail system, e.g., voicemail server 66 ... Other types of alternative communication options could also be provided." Ex. 1005, 10:59–64. A POSA would have understood that the requestor in Mauer is the "*first mobile subscriber*," which would have dialed a phone number to establish a call with the second mobile subscriber. In trying to establish a call via the first wireless network, "[i]f the user does not answer the call, the controller may establish the call to a voicemail system." Ex. 1005, 3:55-4:7. Mauer further discloses: "However, if the multi-mode mobile station is found not to be accessible via the first wireless network, the controller may then try to establish the call via the second wireless network. … If the user does not answer the call, the controller may establish the call to a voicemail system." Ex. 1005, 4:8-26. -. Such a person would have further understood that, for example, an IP

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address or a domain name for the voicemail server 66 would serve as "*the preferred call path.*" *See*, *e.g.*, Ex. 1016 at 27:34-38. Because "*the preferred call path*" to voicemail server 66 is based on information provided by the requestor, such as the requestor dialing the second mobile subscriber's phone number and ultimately reaching the voicemail server, a POSA would have understood that Mauer discloses "*wherein the preferred call path is determined based on information provided by the first mobile subscriber.*"

(7) Claim 7

143. Claim 7 depends on claim 1 and further recites "*wherein the first DMA system is associated with a first preferred call path, and wherein the second DMA system is associated with a second preferred call path*."

144. Mauer in view of Waylett renders this limitation obvious.

145. Mauer discloses this limitation. Mauer teaches "softswitch 62 may route the call to voicemail server 66, via gateway 60 and packet-switched network 30" and further that "MSC 40 [included in WWAN 14] may have a bearer connection with gateway 60 via an intermachine trunk 64." Ex. 1005, 12:63-64, 7:20-21; 10:17–23. Thus, "*a first preferred call path*" from WWAN 14 ("*the first DMA system*") to voicemail server 66 traversing MSC 40, trunk 64, gateway 60, and packet-switched network 30. Additionally, Mauer discloses "LAN 22 may be communicatively coupled to a wide area packet-switched network 30, via a

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network access device 32. Network access device 32 [included in WLAN 12] may be a cable modem, DSL modem, or router, for example." Ex. 1005, 5:27-30; *see also id.*, Figure 1; 10:17–23. Thus, a POSA would have recognized "*a second preferred call path*" from either WLAN 12 or a second WWAN ("*the second DMA system*"), when Mauer is modified as described in § V.C(1)c, to voicemail server 66 traversing network access device 32 and packet-switched network 30. Ex. 1005, 8:25-29, 12:63-64, 13:62-64. Based on the above passages, a POSA would have understood that Mauer discloses "*wherein the first DMA system is associated with a first preferred call path, and wherein the second DMA system is associated with a second preferred call path.*"

(8) Claim 8

a. Preamble

146. The preamble recites: "*A method, comprising*." To the extent the preamble is limiting, Mauer in combination with Waylett discloses this limitation for the same reasons as described above, *see* § V.C(1)a.

b. Receiving a call

147. As modified above, *see* § V.C(1)b, Mauer in combination with Waylett discloses "*receiving, at a first distributed mobile architecture (DMA) system of a DMA network, a call from a first mobile subscriber to a second mobile subscriber, wherein the DMA network includes at least the first DMA system, a second DMA system, and a third DMA system*." As explained above, *see* § V.B,

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Mauer in combination with Waylett discloses "receiving, at a first distributed mobile architecture (DMA) system of a DMA network, a call from a first mobile subscriber to a second mobile subscriber."

i. wherein the DMA network includes at least the first DMA system, a second DMA system, and a third DMA system

148. Claim 8 recites "*receiving, at a first distributed mobile architecture (DMA) system of a DMA network, a call from a first mobile subscriber to a second mobile subscriber, wherein the DMA network includes at least the first DMA system, a second DMA system, and a third DMA system*." Mauer in combination with Waylett discloses this limitation for the same reasons as described above, see § V.C(1)c, except "a third DMA system."

149. A POSA would have understood that adding a third DMA system to the network architecture in the Mauer-Waylett combination would have been obvious. Mauer envisioned implementing its method illustrated in Figure 2 in network architectures for mobile stations other than Figure 1: "[i]t is to be understood … that other network architectures could be used to implement to [sic] the process of FIG. 2." Ex. 1005, 8:42-44; *id.*, 3:22-24 (disclosing "the multi-mode mobile station may have more than two interfaces and/or may communicate with wireless networks other than WWANs and WLANs").

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150. Mauer also discloses that WWAN 14 that would implement multiple Waylett's NIBs 224—that is, one NIB for each MSC. Ex. 1005, 6:15-18 ("WWAN 14 "may include a plurality of MSCs, which may, in turn control a plurality of BTSs, via a plurality of BSCs.").

151. Based on the above disclosures, A POSA would have understood that one example of another network architecture would have included an architecture with an additional (third) network. Such a person would have been motivated to add an additional network to expand its coverage area for users, especially to unserved or underserved communities. Ex. 1006, 1:17-2:8, 2:15-16. A POSA would have been motivated to modify Mauer's network architecture to include multiple WWANs, each using Waylett's NIB 224, because that was an inexpensive way to expand the network. Ex. 1006, 1:17-2:8, 2:15-16. As explained above, *see* § V.B, it would have been obvious to a POSA to use Waylett's Network-In-A-Box in each of Mauer's networks. In doing so, the resulting implementation of Waylett's NIB in Mauer's additional network would result in a "*third DMA system*." In view of the above passages, a POSA would have understood that Mauer renders obvious three wireless networks.

c. Location of second mobile subscriber

152. Claim 8 also recites "*determining whether the second mobile subscriber is located within a first wireless coverage area of the DMA network that*

is associated with the first DMA system based on information stored at a home location register (HLR) of the first DMA system and a visitor location register (VLR) of the first DMA system." Mauer in combination with Waylett discloses this limitation for the same reasons described above, see § V.C(1)d.

d. When the Second Mobile Subscriber is located within the First Wireless Coverage area

153. Claim 8 additionally recites "*when the second mobile subscriber is located within the first wireless coverage area, connecting the call to the second mobile subscriber via the first DMA system.*" Mauer in combination with Waylett discloses this limitation for the same reasons described above, see § V.C(1)e.

e. When the Second Mobile Subscriber is not located in the First Wireless Coverage area

154. Claim 8 also recites "when the second mobile subscriber is not located within the first wireless coverage area, determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system based on information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system." Mauer in combination with Waylett disclose this limitation for the same reasons described above, see § V.C(1)f.

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f. When the Second Mobile Subscriber is not located in either the First or Second Wireless Coverage area

155. Claim 8 recites "*when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area, determining whether the second mobile subscriber is located within a third wireless coverage area of the DMA network that is associated with the third DMA system*."

156. The above limitation is similar to the one in claim 1 (and the preceding limitation). Claims 1 and 8 and of the 414 Patent both include determining whether the same subscriber device is or is not located within a wireless coverage area of a DMA network using information from a community location register:

Claim 1	Claim 8
when the second mobile subscriber is not located within the first wireless coverage area,	when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area,
determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system based on information stored at a community location register (CLR) associated with the second DMA system,	determining whether the second mobile subscriber is located within a third wireless coverage area of the DMA network that is associated with the third DMA system based on information stored at a [community location register (CLR)] associated with the third DMA system,

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Ex. 1001, Claims 1 and 8. The community location registers in claims 1 and 8 are likewise stored at the first DMA system. Ex. 1001, Claims 1 and 8. A POSA would have found this feature of claim 8 obvious for the same reasons as described above for the similar feature in claim 1. *See* § V.C(1)g.

157. Mauer in combination with Waylett renders this limitation obvious for similar reasons. As explained above, *see* § V.C(8)b.i, a POSA would have found it obvious to expand Mauer's network architecture to incorporate a third DMA system for a third wireless network. Such a modification of Mauer's network architecture would require additional steps in Mauer's Figure 2.

158. A POSA would have recognized that, by incorporating a third DMA system and corresponding network, Mauer's method in Fig. 2 would need additional steps to address this third DMA system and network shown below:

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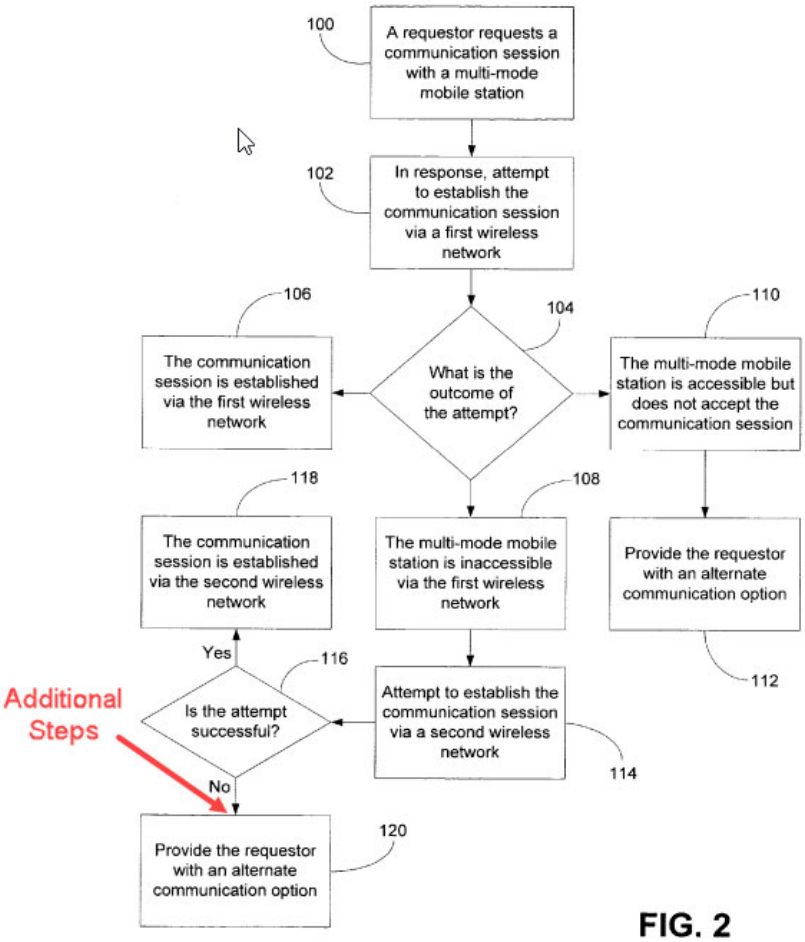


FIG. 2

Ex. 1005, Fig. 2 (annotated). Such a person would have also understood that such additional steps would mirror steps for the first two wireless networks—that is, steps 102, 104, 108, 114, 116 of Figure 2.

159. Based on the above disclosures in Mauer, four additional steps between steps 116 and 120 of Fig. 2 would be needed by adding a third network:

- **Step A:** the multi-mode mobile station is inaccessible via the first and second wireless networks ("*when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area*"), *see* Ex. 1005, Fig. 2, step 108;
- **Step B:**Attempt to establish the communication session via a third wireless network ("*determining whether the second mobile subscriber is located within a third wireless coverage area of the DMA network that is associated with the third DMA system*"), *see* Ex. 1005, Fig. 2, steps 102, 114;
- **Step C:** Is the attempt successful? *see* Ex. 1005, Fig. 2, steps 104, 116;
    - **Step D:** If yes, the communication session is established via the third wireless network*, see* Ex. 1005, Fig. 2, steps 106, 118;
    - If no, go to step 120.

By incorporating an additional DMA system and network in Mauer-Waylett's network architecture in Figure 1, the above steps would likewise have been added to Figure 2. *See* § V.C(8)b.i. These additional steps render obvious "*when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area*" and "*determining whether the second mobile subscriber is located within a third wireless coverage area of the DMA network that is associated with the third DMA system*."

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i. information stored at a CLR associated with the third DMA system, wherein the CLR associated with the third DMA system is stored at the first DMA system

160. Claim 8 also recites that "*determining whether the second mobile subscriber is located within a third wireless coverage area*" is "*based on information stored at a CLR associated with the third DMA system, wherein the CLR associated with the third DMA system is stored at the first DMA system.*" As shown above, Mauer as modified renders the following limitation obvious for the same reasons disclosed above, see §§V.C(1)f–V.C(1)f.ii:

Claim 1	Claim 8
determining whether the second mobile subscriber is located within a second wireless coverage area. . . based on information stored at a community location register (CLR) associated with the second DMA system,	determining whether the second mobile subscriber is located within a third wireless coverage area. . . based on information stored at a [community location register (CLR)] associated with the third DMA system,
wherein the CLR associated with the second DMA system is stored at the first DMA system	wherein the CLR associated with the third DMA system is stored at the first DMA system;

161. To the extent that Patent Owner argues "*the CLR associated with the third DMA system*" must be a different CLR than the "*CLR associated with the second DMA system*," a POSA would have understood such a feature to have been obvious. As explained above, *see* § V.C(1)f.ii, Waylett's configuration table (a "*community location register*") stores these subscriber identities along with their appropriate HLR.

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162. A POSA would have found it obvious to use multiple configuration tables—that is, one for each HLR. Using multiple tables—rather than one table—would be a simple substitution of one known element for another (i.e., using two tables instead of one) to obtain predictable results (i.e., using the table to lookup whether a device is registered with a particular HLR). In addition, a POSA would have recognized that using multiple tables would allow the option to delete a configuration table when a DMA server for one network is brought offline rather than delete certain entries. Such a system would also improve network management by allowing a network provider to quickly check that only the appropriate table entries for a network of DMA servers are included.

g. When the Second Mobile Subscriber is not located in any of the First, Second, and Third Wireless Coverage Areas

163. Claim 8 recites "*when the second mobile subscriber is not located in any of the first wireless coverage area, the second wireless coverage area, and the third wireless coverage area, determining a preferred call path to route the call outside of the DMA network based on information stored at a destination preference register (DPR), wherein the DPR is stored at the first DMA system*."

164. The combination of Mauer and Waylett render this claim limitation obvious for the same reasons as described above, *see* § , except for "*when the second mobile subscriber device is not located in. . . the third wireless coverage*

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area." By including a third network in Mauer's architecture, as explained above in § V.C(8)b.i, three following steps would have been added between steps 116 and 120 of Fig. 2:

- **Step A:** the multi-mode mobile station is inaccessible via the first and second wireless networks ("*when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area*"), *see* Ex. 1005, Fig. 2, step 108;
- **Step C:** Is the attempt successful? *see* Ex. 1005, Fig. 2, steps 104, 116;
    - **Step D:** If yes, the communication session is established via the third wireless network*, see* Ex. 1005, Fig. 2, steps 106, 118;
    - If no ("*when the second mobile subscriber device is not located in. . . the third wireless coverage area*"), go to step 120.

As shown above, a POSA would have recognized that Mauer's modified method in Figure 2 would have determined '*when the second mobile subscriber is not located in any of the first wireless coverage area, the second wireless coverage area, and the third wireless coverage area*" prior to going to step 120. As explained above, the remaining features would have been obvious for the same reasons specified above, *see* § V.C(8)b.i.

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D. Waylett in view of Mauer Render Claims 11, 13–18, and 21 Obvious

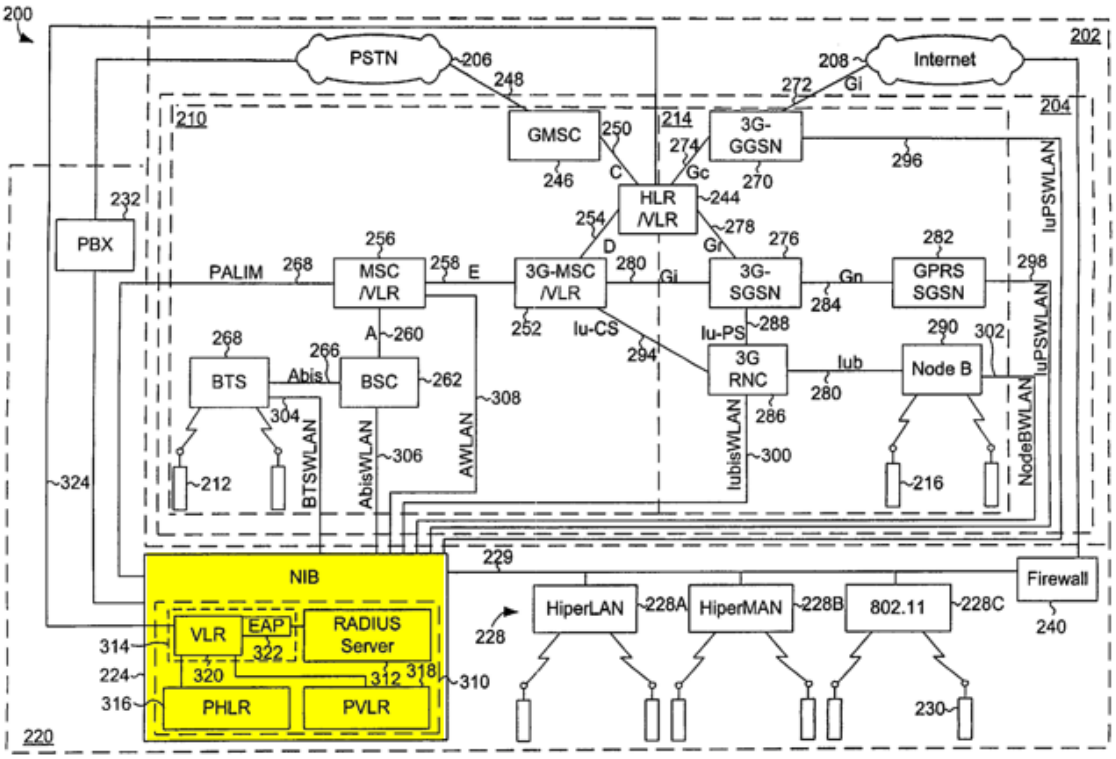
(1) Claim 11

a. Preamble

165. Claim element 11.a recites "*A distributed mobile architecture (DMA) system, comprising*:"

166. To the extent the preamble is limiting, Waylett discloses this limitation.

167. Waylett discloses "[*a*] *distributed mobile architecture (DMA) system*." Waylett's Network-In-a-Box 224, shown in Figure 6 below, is a "*DMA system*":



Ex. 1006, Fig. 6 (annotated); *see also* Ex. 1006, Fig. 1B, 8:7–9.

168. Waylett discloses that "[t]he NIB 224 includes a MSC, a BSC, and a BTS in a single enclosure" Ex. 1006, 9:41–42. Waylett also discloses that the NIB 224 may include a private HLR and private VLR 318. *See* Ex. 1006, Fig. 6 (showing a VLR, PHLR, and PVLR included in the NIB), Fig. 15 (showing PHLR 316, VLR 318, and VRAD 314 being part of NIB 224), 18:16–64. It is my opinion that the afore-mentioned description in Waylett mirrors how the '414 patent describes a DMA system" Ex. 1001, Fig. 3, 6:5–25. Accordingly, Waylett's NIB satisfies "[*a*] *distributed mobile architecture (DMA) system.*"

b. Housing

169. Claim element 11.b recites "a housing."

170. Waylett discloses this limitation.

171. Waylett discloses NIB 114 is included in "*a housing*." Specifically, Waylett states that NIB 224 "includes a MSC, a BSC, and a BTS in a single enclosure." Ex. 1006, 9:41–42. A POSA would have understood that a single enclosure is included in a housing. Waylett thus teaches this limitation.

c. Base Transceiver Station

172. Claim 1 recites "a base transceiver station coupled to the housing, the base transceiver station operable to receive a call from a mobile subscriber."

173. Waylett discloses this limitation.

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174. Waylett discloses "a base transceiver station coupled to the housing, the base transceiver station operable to receive a call from a mobile subscriber." Specifically, Waylett states that NIB 224 "includes a MSC, a BSC, and a BTS in a single enclosure." Ex. 1006, 9:41–42. A POSA would have understood that a "BTS" mentioned in this sentence is a "base transceiver station." *See* Ex. 1006, Abstract (showing acronym for "CBTS" is "centralized base transceiver station"). Such a person would further understand that the BTS in NIB 224 is used to receive calls from UEs—that is, making it "operable to receive a call from a mobile subscriber." Ex. 1006, 9:37-46 (describing "the private cellular network 222 includes … a Network-In-A-Box™ (NIB 224) [that] includes … a [base transceiver station] BTS" and further that "[t]he private cellular network 220 (sic, 222) is coupled to the GSM network 210, the GPRS network 218, and the 3G-network 214 of the public cellular network 204 through a number or interface functions or links"). Therefore, Waylett teaches this limitation.

d. Computer Readable Medium

175. Claim element 11.d recites "a computer readable storage medium within the housing, the computer readable storage medium comprising:."

176. Waylett discloses this limitation.

177. Waylett discloses "*a computer readable storage medium within the housing*." The NIB includes multiple processors and plug-in-modules or cards that

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provide access to different networks. Ex. 1006, 8:10-27. Waylett also discloses "a memory system … coupled to the NIB 224" for storing subscriber identification and security information. Ex. 1006, 10:45-48. Moreover, a POSA would have understood that processors necessarily include a "*computer readable storage medium*" to store the instructions operable on the processors. Accordingly, such a person would have understood that including a "*computer readable storage medium*" in the housing would be inherent.

e. AAA Module

178. Claim element 11.e recites "an authentication, authorization, and accounting (AAA) module embedded within the computer readable storage medium, the AAA module comprising:."

179. Waylett discloses this limitation.

180. Waylett discloses "*an authentication, authorization, and accounting (AAA) module embedded within the computer readable storage medium*." For example, Waylett discloses that the NIB 224 may include a Remote Authentication Dial In User Service (RADIUS) system 310 (an "*authentication, authorization, and accounting module*"), shown in Figure 6 below:

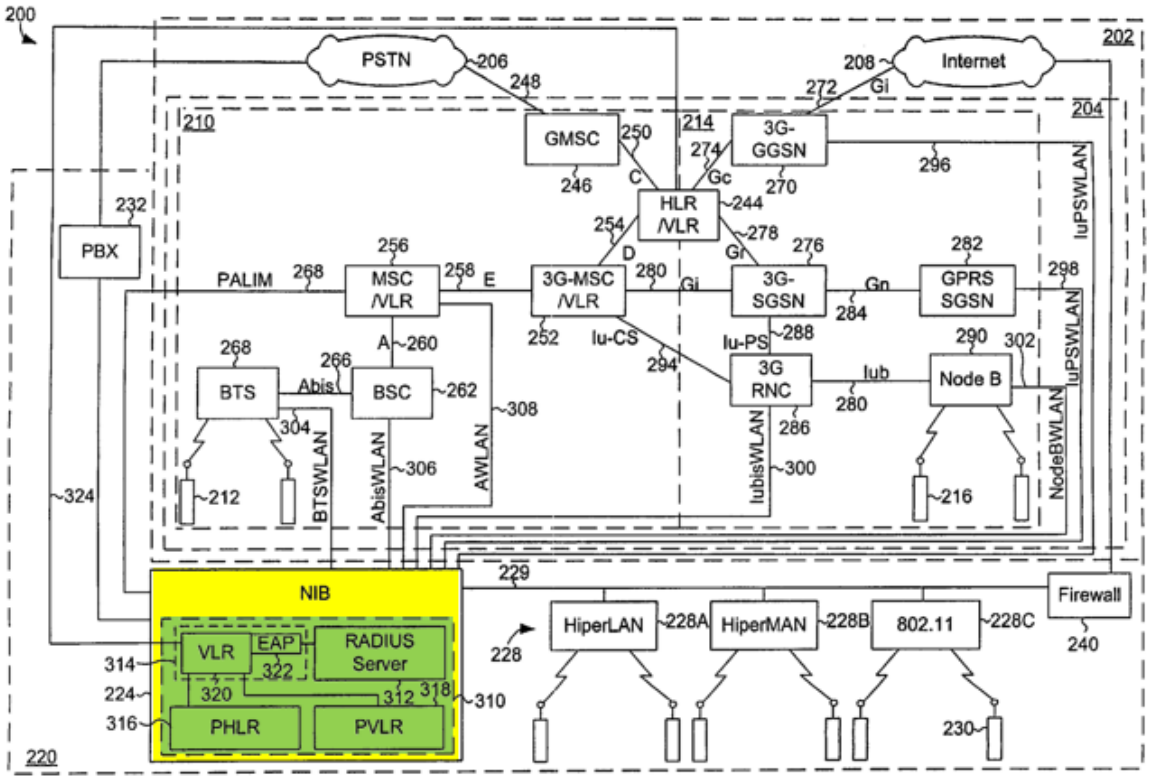


FIG. 6

Ex. 1006, Fig. 6 (annotated). Waylett further discloses that the RADIUS system 310 includes a "authentication and accounting gateway or server" 312 and explains that "RADIUS is an authentication and accounting system used by many service providers to authorize access to a communication system." Ex. 1006, 13:65-14:5. Moreover, Waylett also discloses that "RADIUS requires users to enter a username and password, which is passed to the RADIUS server 312 to check that the information is correct, and ***authorize access*** to the communication system 200." Ex. 1006, 14:8-11 (emphasis added). Accordingly, a POSA would have

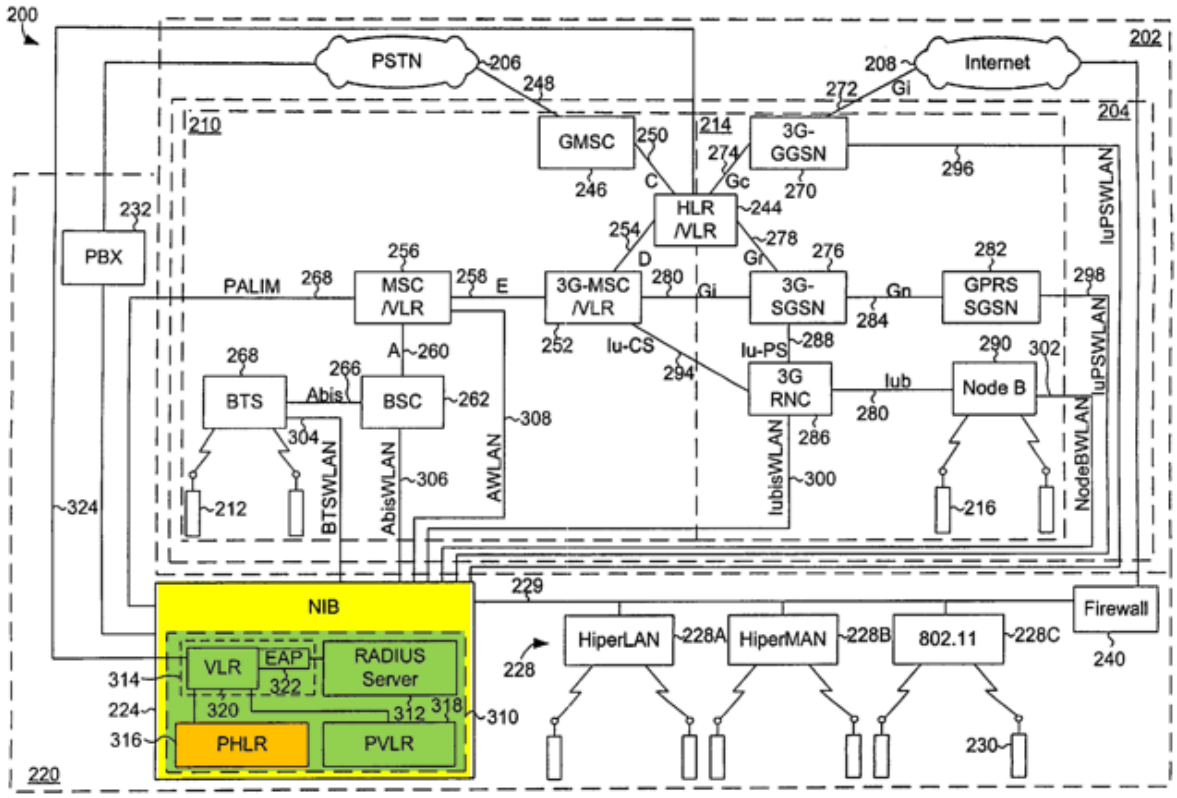
recognized that RADIUS system 310 is an "*authentication, authorization, and accounting module*."

f. Home Location Register

181. Claim element 11.f recites "a home location register (HLR) that stores information associated with one or more mobile subscriber devices that are registered with the DMA system."

182. Waylett discloses this limitation.

183. As shown in Figure 6 below, Waylett discloses that the RADIUS system 310 includes a private home location registry ("PHLR"):



Ex. 1006, Fig. 6 (annotated).

184. Waylett further discloses that "[t]he private HLR 316 stores information on UEs 230 registered or subscribing to the communication system 200, and more particularly to the WLAN 228 and/or the private cellular network 222." Ex. 1006, 14:32-35. Accordingly, a POSA would have recognized that Waylett's private HLR "*stores information associated with one or more mobile subscriber devices that are registered with the DMA system*."

g. Visitor Location Register

185. Claim element 11.g recites "a visitor location register (VLR) that stores information associated with one or more roaming mobile subscriber devices that are temporarily registered with the DMA system."

186. Waylett discloses this limitation.

187. As shown in Figure 6 below, Waylett discloses that the RADIUS system 310 includes a private home visitor location registry ("PVLR"):

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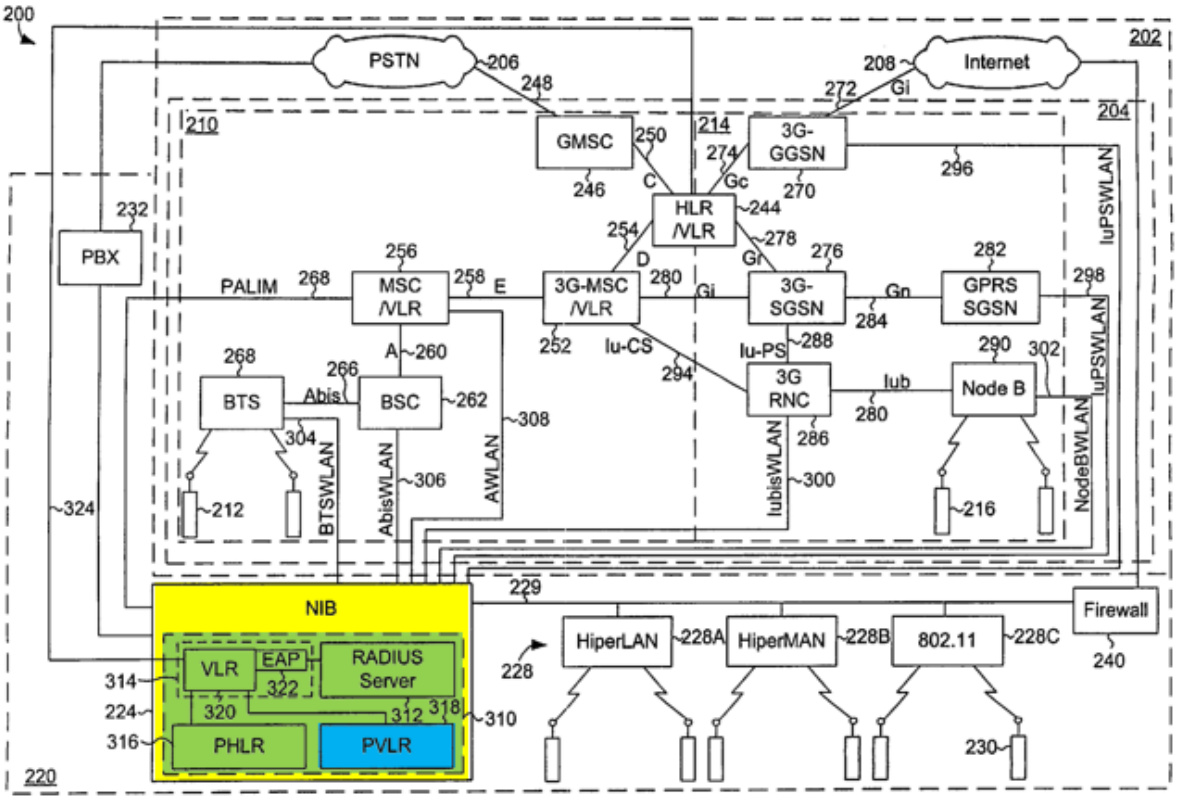


FIG. 6

Ex. 1006, Fig. 6 (annotated). Waylett further discloses that "[t]he private VLR 318 is capable of temporarily storing information on subscribers or UEs 230 considered as roaming within the service area of the WLAN 228." Ex. 1006, 14:35-38. Accordingly, a POSA would have recognized that Waylett's private VLR 318 "*stores information associated with one or more roaming mobile subscriber devices that are temporarily registered with the DMA system*."

h. Community Location Register

188. Claim element 11.h recites "a community location register (CLR) that stores information associated with a second HLR of a second DMA system,

wherein the second HLR stores information associated with one or more mobile subscriber devices that are registered with the second DMA system."

189. Waylett discloses this limitation.

190. Figure 6 of Waylett discloses a RADIUS system 310 including a RADIUS Server 312:

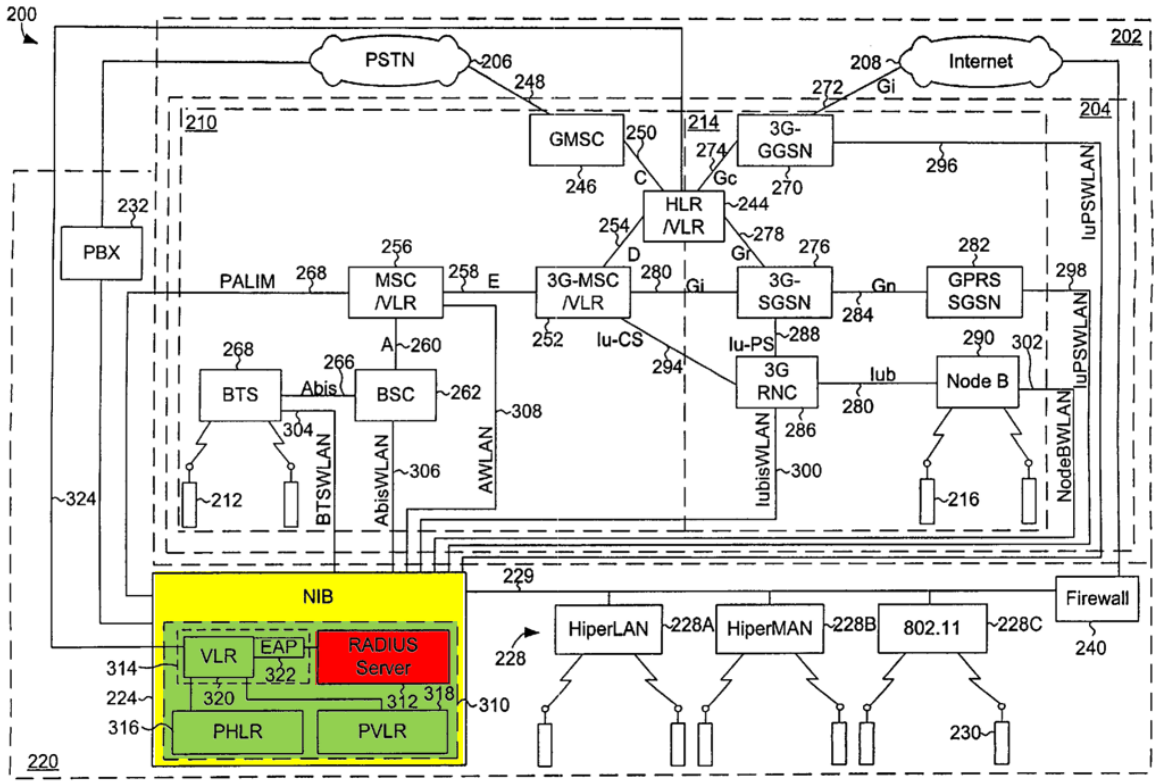


FIG. 6

Ex. 1006, Fig. 6 (annotated). When Waylett's system includes a "distributed public" or "private HLR/VLR," *id.* 14:61-63, Waylett discloses that the RADIUS server 312 "routes an interpretation of either a username or a user identity provided in the authentication procedure, to the appropriate public or private HLR." Ex. 1006, 14:64-66. To do so, Waylett discloses that RADIUS server 312 uses a

"configuration table that matches the [International Mobile Subscriber Identity] ranges with the appropriate or controlling public or private HLR," Ex. 1006, 15:6-8. Stated otherwise, a POSA would have understood that Waylett discloses RADIUS server 312 uses a table of subscriber identities send user information to the appropriate HLR during the authentication procedure.

191. A POSA would have recognized that the International Mobile Subscriber Identity is used to identify specific "*mobile subscriber devices*." Ex. 1014 at 3 (defining IMSI as "International Mobile Subscriber Identity" that is "used to uniquely identify a subscriber to mobile telephone service"). Waylett's configuration tables (a "*community location register*") store these subscriber identities along with their appropriate HLR. Consequently, Waylett's configuration tables necessarily include "*information associated with one or more mobile subscriber devices that are registered with*" other HLRs, which as shown above are included in other NIBs (*e.g.*, included as part of other "*DMA systems*" in the resulting combination), *see* § V.C(1)f. A POSA would have also recognized that because RADIUS server 312 uses a "configuration table" and the RADIUS server is included in the NIB, it would be stored locally in the NIB. *See, e.g.*, Ex. 1006, 13:67-14:1. Indeed, Waylett teaches local storage. For example, Waylett discloses "a memory system … coupled to the NIB 224" for storing subscriber identification and security information. Ex. 1006, 10:45-48. Accordingly, such a

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person would have recognized that Waylett's configuration table is a "*a community location register (CLR) that stores information associated with a second HLR of a second DMA system, wherein the second HLR stores information associated with one or more mobile subscriber devices that are registered with the second DMA system.*"

i. Destination Preference Register

192. Claim element 11.i recites "a destination preference register (DPR) that stores one or more preferred call paths for calls to be routed outside of a DMA network that is accessible to the DMA system, wherein the DMA network includes at least the first DMA system and the second DMA system."

193. Waylett in combination with Mauer renders this limitation obvious.

194. Waylett does not expressly disclose that the AAA module includes *"a destination preference register (DPR) that stores one or more preferred call paths for calls to be routed outside of a DMA network that is accessible to the DMA system, wherein the DMA network includes at least the first DMA system and the second DMA system.*"

195. As explained above, it would have been obvious for a POSA to include Waylett's NIB 224 in the wireless network architecture of Mauer's Figure 1. *See* § V.B. Such a POSA would have also recognized that using Waylett's NIB 224 in Mauer's network architecture would satisfy a "*DMA network includes at*

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least the first DMA system and the second DMA system"—that is, WWAN 14 (a "*first DMA system*") and WLAN 12 (a "*second DMA system*") (collectively, being a "*DMA network*") each include a Waylett's NIB 224 (a "*DMA server*"). As also explained above, Mauer's network architecture provides a voicemail server 66 external to its WWAN 14 and WLAN 12 and that is accessible to the network. Finally, and as explained above in § V.C(1)g, it would have been obvious to a POSA to modify Waylett's NIB 224 to include a "*destination preference register (DPR) that stores one or more preferred call paths for calls to be routed outside of a DMA network that is accessible to the DMA system.*" Waylett thus renders this claim obvious.

j. Call Routing Component

196. Claim element 11.j recites "a call routing component embedded within the computer readable storage medium, the call routing component comprising processor executable instructions to route the call via a particular preferred call path of the one or more preferred call paths stored at the DPR when the AAA module determines that the call is directed to a destination device that is outside of the DMA network."

197. Waylett discloses that the AAA module includes "*a call routing component embedded within the computer readable storage medium, the call routing component comprising processor executable instructions to route the call*

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via a particular preferred call path of the one or more preferred call paths stored at the DPR when the AAA module determines that the call is directed to a destination device that is outside of the DMA network."

198. Waylett discloses "*a call routing component embedded within the computer readable storage medium.*" Waylett discloses "the RADIUS server 312 receives accounting packets or call detail records (CDRs) … and forwards these accounting packets to a billing server … to bill telecommunications charges to the appropriate parties." Ex. 1006, 14:16-22. A POSA would have understood that call detail records for the RADIUS server 312 demonstrate that the NIB 224 routes voice calls. Based on these passages, a POSA would have understood Waylett's NIB 224 to include computer readable storage medium and further that the functionality of "*a call routing component embedded within the computer readable storage medium*."

199. Modifying Waylett's NIB 224 to be used in the communication network of Mauer would include modifying NIB 224 "to route the call via a particular preferred call path of the one or more preferred call paths stored at the DPR when the AAA module determines that the call is directed to a destination device that is outside of the DMA network." As explained above, a POSA would have found it obvious to include Waylett's NIB 224 in either WWAN 14, another WWAN, and/or WLAN 12 of Mauer. See §§ V.B, V.C(1)c. Such a modification

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would also include using Mauer's method shown in Figure 2 in Waylett's NIB 224. *See* § V.B. Part of that method includes Mauer disclosing that, if communication session cannot be established over the first or second wireless network, the requestor is given an alternate communication option in step 120:

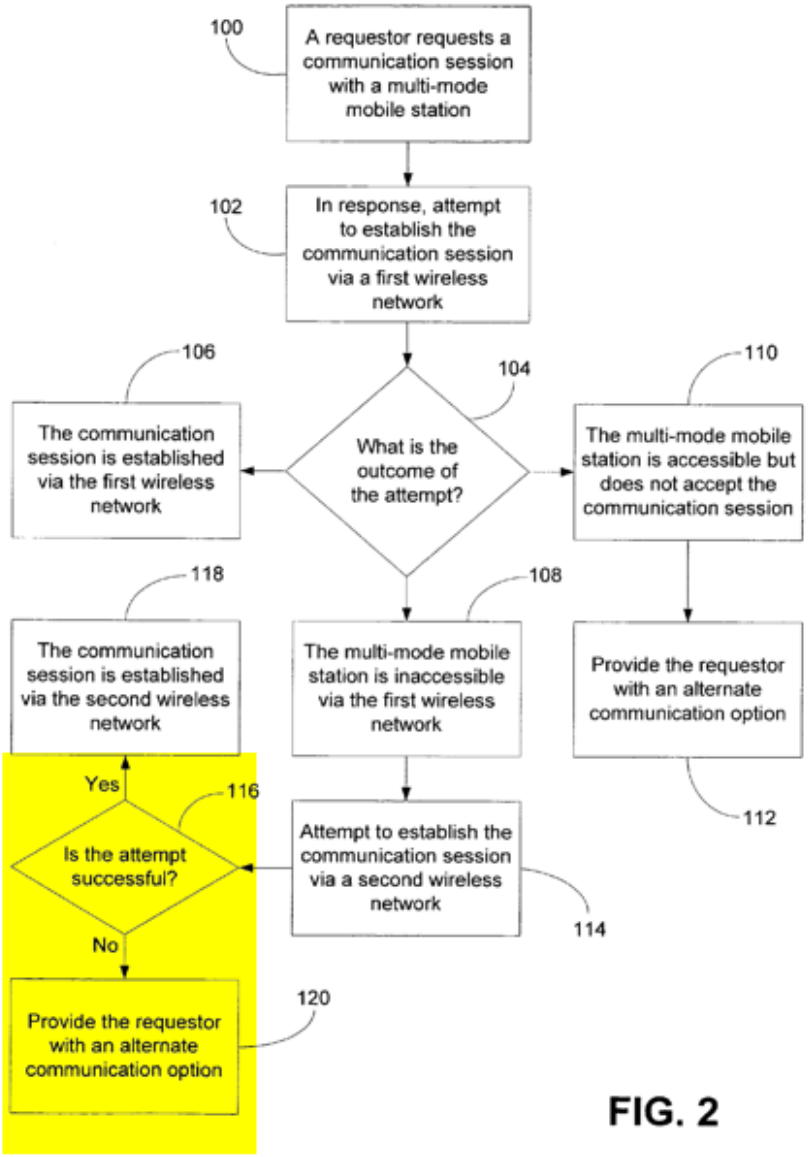


FIG. 2

Ex. 1005, Fig. 2 (annotated).

200. Mauer further explains what that alternate communication option may be:

> [It] could, for example, allow the requestor to leave a voice message on a voicemail system, e.g., voicemail server 66, or to send a message to the multi-mobile station, e.g., as an instant message or SMS message. Other types of alternative communication options could also be provided.

Ex. 1005, 10:59–64.

201. From these disclosures, a POSA would have understood that the "alternate communication option," such as voicemail server 66 ("*route the call via a particular preferred call path of the one or more preferred call paths*"), which is outside the two DMA networks:

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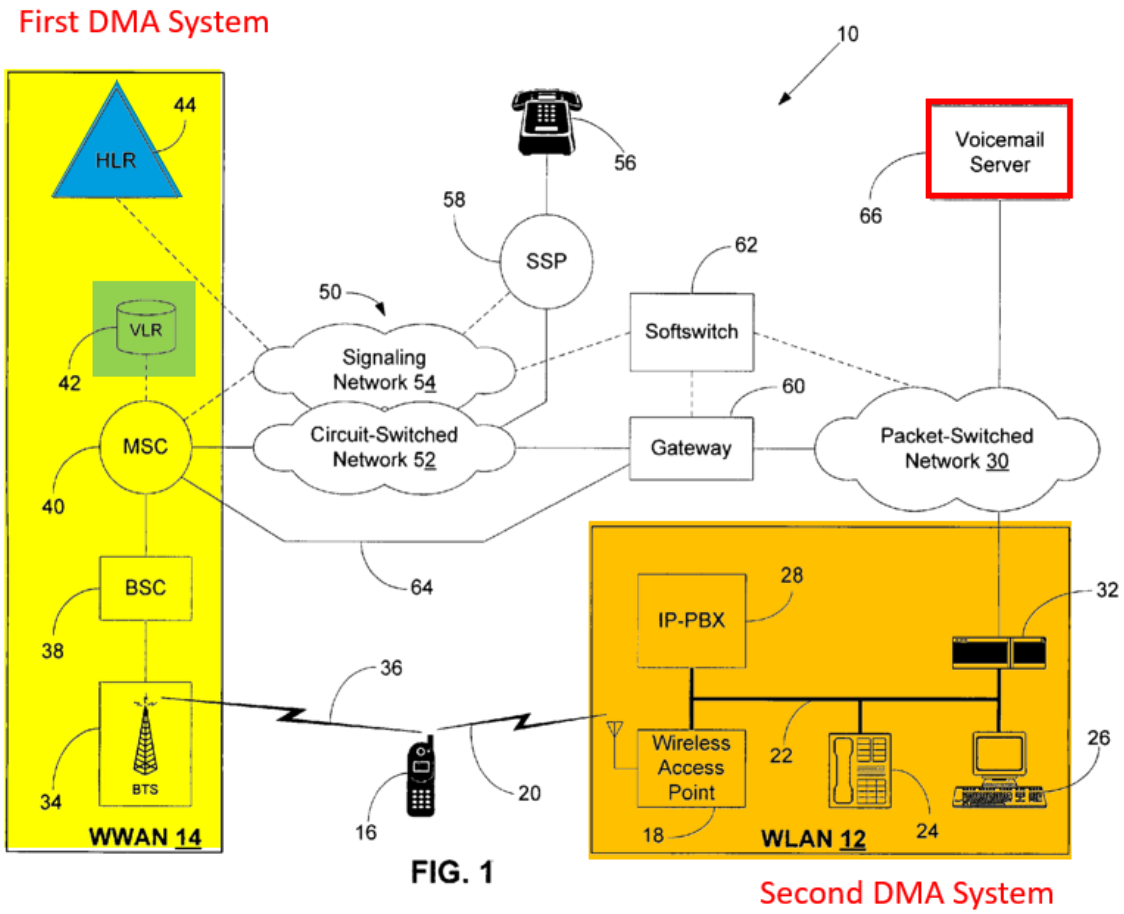


FIG. 1

Ex. 1005, Fig. 2 (annotated); *see* Ex. 1005, 8:25–34 10:59–64.

202. Such a person would have further understood that a communication session with the voicemail server 66 would be established whenever a mobile device is inaccessible to both WWAN 14 and WLAN 12 ("*when the AAA module determines that the call is directed to a destination device that is outside of the DMA* network"). *See* Ex. 1005, 9:32–55. Accordingly, Waylett's NIB 224 as modified to work in the network of Mauer discloses this limitation.

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(1) Claim 12

203. Claim 12 depends on claim 11 and further recites "*wherein the AAA module determines that the destination device is outside of the DMA network based on the information stored at the HLR, the information stored at the VLR, and the information stored at the CLR.*"

204. Waylett, as combined with Mauer, renders this limitation obvious.

205. Waylett's NIB 224, as modified to use in Mauer's network architecture, *see* § V.B, uses information from its HLR and VLR to determine whether a mobile device is located inside or outside its registered area. Waylett explains that the HLR and VLR "provide roaming capabilities for the UEs among the plurality of WLANs." Ex. 1006, 4:33-37. In doing so, HLRs and VLRs include information about whether a device is roaming within or outside of a wireless network that they are registered. Ex. 1006, 14:32-38 ("The private HLR 316 is stores information on UEs 230 registered or subscribing to the communication system 200, and more particularly to the WLAN 228 and/or the private cellular network 222. The private VLR 318 is capable of temporarily storing information on subscribers or UEs 230 considered as roaming within the service area of the WLAN 228."). Accordingly, Waylett's HLR and VLR helps determine whether a mobile device is located inside or outside its registered area.

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206. Waylett's RADIUS server 312 located in NIB 224—and includes configuration tables (the claimed "*CLR*")—helps determine whether a mobile device is located inside or outside its registered area. Ex. 1006, 14:49-53; ("RADIUS server 312 "supports roaming of private UEs 230 based on a RADIUS/DIAMETER roaming model along with traditional GSM subscriber roaming based upon the mobile application part (MAP) standard for address registration of roamers and inter-system hand-off procedures."); *see also id*., 15:6-8. To do so, RADIUS server 312 uses information from its configuration tables. Ex. 1006, 14:67-15:8 ("the RADIUS server 312 is enhanced to contact the appropriate or controlling public or private HLR 244, 314, either by:. . . .(ii) using a configuration table that matches the IMSI ranges with the appropriate or controlling public or private HLR."). Accordingly, Waylett's NIB 224 uses its local configuration tables (the claimed "*CLR*") to determine whether a mobile device is roaming inside or outside its registered area.

207. A POSA would have recognized that Waylett's NIB uses information from its HLR, VLR, and configuration table (the claimed "*CLR*") to help determine whether a device is roaming inside or outside its registered location ("*determin*[*ing*] *that the destination device is outside of the DMA network*.")

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(2) Claim 13

208. Claim 13 depends on claim 11 and further recites "*a mobile switching center (MSC) interface that provides communication access to a mobile* telephone *network.*" Waylett in view of Mauer renders this limitation obvious.

209. Waylett, as combined with Mauer, renders this limitation obvious.

210. Waylett discloses that the NIB 224 may include an MSC. Ex. 1006, 9:41–45 ("The NIB 224 includes a MSC, a BSC, and a BTS in a single enclosure. . . ."), Mauer's network architecture likewise includes a MSC in WWAN 14. *See* Ex. 1005, Fig. 1., 6:15-21 ("FIG. 1 shows only one MSC and only one BSC, WWAN 14 may include a plurality of MSCs, which may, in turn, control a plurality of BTSs, via a plurality of BSCs. . . . VLR 42 [accessible by MSC 40] stores data records for mobile stations, such as multi-mode mobile station 16, that are being served by MSC 40."). Accordingly, a POSA would have understood that Waylett's NIB 224, as modified, discloses "*a mobile switching center (MSC) interface that provides communication access to a mobile telephone network*."

(3) Claim 14

211. Claim 14 depends on claim 11 and further recites "*a Voice over Internet Protocol (VoIP) interface that provides communication access to a VoIP network.*"

212. Waylett, as combined with Mauer, renders this limitation obvious.

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213. Mauer states "LAN 22 may carry voice, data, and/or other media in a packet-based format. Thus, LAN 22 may be connected to other communication devices that exchange voice in a packet-based format. For example, LAN 22 may be connected to a voice-over-packet (VoP) telephone 24[.]" Ex. 1005, 5:17-22. Indeed, Mauer discloses that "[a] … mobile station includes a plurality of interfaces for wireless communication with a plurality of different wireless networks." Ex. 1005, 3:12-14. Waylett likewise discloses facilitating VoIP communication using "a standard VoIP program". Ex. 1006, 12:11-16 (disclosing "UE 230 includes a computer program to simultaneously enable voice over an internet protocol network communication (VoIP), with a telephone or terminal … coupled to the Internet The VoIP program can include a standard VoIP program[.]").

214. Based on the above disclosures, a POSA would have understood that Waylett's NIB 224, as modified, may be connected to a voice-over-packet (VoP) telephone 24 via "*a VoIP interface that provides communication access to a VoIP network*."

(4) Claim 15

215. Claim 15 depends on claim 11 and further recites "an Integrated Services Digital Network (ISDN) interface that provides communication access to an ISDN network." Waylett in view of Mauer renders this limitation obvious.

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216. Waylett, as combined with Mauer, renders this limitation obvious.

217. The '414 patent describes that the ISDN interface as integrated with the PSTN interface and using the SS7 communications protocol for voice calls. For example, the '414 patent describes the ISDN interface as follows

> A circuit gateway (CGW) 312 … connected to the GK 310 [included in MSC module 306] can provide connectivity to an integrated services digital network/public switched telephone network (ISDN/PSTN) interface 314. . . . [T]he PSTN portion of the ISDN/PSTN interface 314 can be an inter-office interface that uses … a signaling system seven (SS7) link set … Inbound and outbound voice calls can be supported on the ISDN portion of the ISDN/PSTN interface 314. Ex. 1001, 6:25-37.

Similarly, Mauer discloses "MSC 40 is connected to the public switched telephone network (PSTN) 50. PSTN 50 may use an out-of-band signaling system, such as Signaling System 7 (SS7) to route calls." Ex. 1005, 6:45-48. Because Waylett contemplates an ISDN/PTSN network, *see* Ex. 1006, Fig. 6, PTSN 206, 5:33–36, and Mauer's network architecture includes such a network, a POSA would have understood that Waylett's NIB 224, as modified, would have included "*an Integrated Services Digital Network (ISDN) interface that provides communication access to an ISDN network*."

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(5) Claim 16

218. Claim 16 depends on claim 11 and further recites "*wherein the particular preferred call path includes one of a Voice over Internet Protocol (VoIP) call path, a mobile switching center (MSC) call path, and an Integrated Services Digital Network (ISDN) call path*."

219. Waylett in view of Mauer renders this limitation obvious.

220. Mauer's network architecture uses "IP packets carry[ing] voice … through packet-switched network 30 in a real-time format" and "LAN 22 [may be communicatively coupled to a wide area packet-switched network 30 and] may carry voice, data, and/or other media in a packet-based format. Thus, LAN 22 may be connected to other communication devices that exchange voice in a packet-based format. For example, LAN 22 may be connected to a voice-over-packet (VoP) telephone 24[.]" Ex. 1005, 5:34-38, 5:17-28. Further, Mauer discloses "establish[ing] a call to voicemail server," which is "*the particular preferred call path*" and Figure 1 shows packet-switched network 30 communicatively coupled to voicemail server 66 via "*the particular preferred call path*." Ex. 1005, 8:33-34; Figure 1. Mauer also states "voicemail server 66 could be … coupled to MSC 40[.]" Ex. 1005, 8:30-31. Based on the above passages, a POSA would have understood that "*the preferred call path*" includes one of "*a preferred Voice over*

Internet Protocol (VoIP) call path," or "*a preferred mobile switching center (MSC) call path.*"

(6) Claim 21

221. Claim 21 depends on claim 11 and further recites "*a mobile switching center (MSC) module embedded within the computer readable storage medium; a base station controller (BSC) module embedded within the computer readable storage medium; and a call detail record (CDR) generation program embedded within the computer readable storage medium, the CDR generation program adapted to store a set of call detail records.*"

222. Waylett in view of Mauer renders this limitation obvious.

223. Waylett, as combined with Mauer, renders this limitation obvious. First, Waylett discloses "*a mobile switching center (MSC) module embedded within the computer readable storage medium; a base station controller (BSC) module embedded within the computer readable storage medium.*" For example, Waylett states that "[t]he NIB 224 includes a MSC, a BSC, and a BTS in a single enclosure." Ex. 1006, 9:41–42. A POSA would have understood that Waylett's NIB 224 includes computer readable storage medium. Accordingly, Waylett discloses "a mobile switching center (MSC) module embedded within the computer readable storage medium; a base station controller (BSC) module embedded within the computer readable storage medium." Further, Waylett

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discloses "the RADIUS server 312 receives accounting packets or call detail records (CDRs) … and forwards these accounting packets to a billing server … to bill telecommunications charges to the appropriate parties." Ex. 1006, 14:16-22. A POSA would have understood that the RADIUS server 312, along with its call detail records, is a "a call detail record (CDR) generation program embedded within the computer readable storage medium, the CDR generation program adapted to store a set of call detail records." Thus, a POSA would have understood that Waylett discloses this limitation.

E. No Secondary Considerations Exist

224. As described above, the combination of Mauer and Waylett, or Mauer and Waylett renders the challenged claims of the '414 patent obvious. No secondary indicia of non-obviousness exist having a nexus to the putative "invention" of these claims contrary to that conclusion. However, I reserve the right to supplement my opinions if Patent Owner alleges or offers any purported evidence of objective indicia of non-obviousness.

225. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine

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or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed this 14th day of February, 2023.

Respectfully submitted,



_____

James A. Proctor, Jr

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Appendix A: Table of Challenged Claims of the '414 Patent

Claim Element	Claim Language
1.a	A method, comprising:
1.b	receiving, at a first distributed mobile architecture (DMA) system of a DMA network, a call from a first mobile subscriber to a second mobile subscriber, wherein the DMA network includes at least the first DMA system and a second DMA system;
1.c	determining whether the second mobile subscriber is located within a first wireless coverage area of the DMA network that is associated with the first DMA system based on information stored at a home location register (HLR) of the first DMA system and a visitor location register (VLR) of the first DMA system;
1.d	when the second mobile subscriber is located within the first wireless coverage area, connecting the call to the second mobile subscriber via the first DMA system;
1.e.	when the second mobile subscriber is not located within the first wireless coverage area, determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system based on information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system; and
1.f	when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area, determining a preferred call path to route the call outside of the DMA network based on information stored at a destination preference register (DPR), wherein the DPR is stored at the first DMA system.

Dependent Claim	Claim Language
2	The method of claim 1, further comprising: routing the call outside of the DMA network via the preferred call path when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area.
3	The method of claim 1, further comprising: connecting the call via an Internet Protocol (IP) peer-to-peer connection between the first DMA system and the second DMA system when the second mobile subscriber is located within the second wireless coverage area.
4	The method of claim 1, wherein the CLR associated with the second DMA system includes information associated with a second HLR that is stored at the second DMA system.
5	The method of claim 1, wherein the preferred call path includes one of a first preferred Voice over Internet Protocol (VoIP) call path of a plurality of VoIP call paths, a first preferred mobile switching center (MSC) call path of a plurality of MSC call paths, and a first preferred Integrated Services Digital Network (ISDN) call path of a plurality of ISDN call paths.
6	The method of claim 1, wherein the preferred call path is determined based on information provided by the first mobile subscriber.
7	The method of claim 1, wherein the first DMA system is associated with a first preferred call path, and wherein the second DMA system is associated with a second preferred call path.

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Claim Element	Claim Language
8.a	A method, comprising:
8.b	receiving, at a first distributed mobile architecture (DMA) system of a DMA network, a call from a first mobile subscriber to a second mobile subscriber, wherein the DMA network includes at least the first DMA system, a second DMA system, and a third DMA system;
8.c	determining whether the second mobile subscriber is located within a first wireless coverage area of the DMA network that is associated with the first DMA system based on information stored at a home location register (HLR) of the first DMA system and a visitor location register (VLR) of the first DMA system;
8.d	when the second mobile subscriber is located within the first wireless coverage area, connecting the call to the second mobile subscriber via the first DMA system;
8.e	when the second mobile subscriber is not located within the first wireless coverage area, determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system based on information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system;
8.f	when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area, determining whether the second mobile subscriber is located within a third wireless coverage area of the DMA network that is associated with the third DMA system based on information stored at a CLR associated with the third DMA system, wherein the CLR associated with the third DMA system is stored at the first DMA system; and
8.g	when the second mobile subscriber is not located within any of the first wireless coverage area, the second wireless coverage area, and the third wireless coverage area, determining a preferred call path to route the call outside of the DMA network based on information stored at a destination preference register (DPR), wherein the DPR is stored at the first DMA system.

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Claim Element	Claim Language
11.a	A distributed mobile architecture (DMA) system, comprising:
11.b	a housing;
11.c	a base transceiver station coupled to the housing, the base transceiver station operable to receive a call from a mobile subscriber;
11.d	a computer readable storage medium within the housing, the computer readable storage medium comprising:
11.e	an authentication, authorization, and accounting (AAA) module embedded within the computer readable storage medium, the AAA module comprising:
11.f	a home location register (HLR) that stores information associated with one or more mobile subscriber devices that are registered with the DMA system;
11.g	a visitor location register (VLR) that stores information associated with one or more roaming mobile subscriber devices that are temporarily registered with the DMA system;
11.h	a community location register (CLR) that stores information associated with a second HLR of a second DMA system, wherein the second HLR stores information associated with one or more mobile subscriber devices that are registered with the second DMA system; and
11.i	a destination preference register (DPR) that stores one or more preferred call paths for calls to be routed outside of a DMA network that is accessible to the DMA system, wherein the DMA network includes at least the first DMA system and the second DMA system,
11.j	a call routing component embedded within the computer readable storage medium, the call routing component comprising processor executable instructions to route the call via a particular preferred call path of the one or more preferred call paths stored at the DPR when the AAA module determines that the call is directed to a destination device that is outside of the DMA network.

Dependent Claim	Claim Language
12	The DMA system of claim 11, wherein the AAA module determines that the destination device is outside of the DMA network based on the information stored at the HLR, the information stored at the VLR, and the information stored at the CLR.
13	The DMA system of claim 11, further comprising a mobile switching center (MSC) interface that provides communication access to a mobile telephone network.
14	The DMA system of claim 11, further comprising a Voice over Internet Protocol (VoIP) interface that provides communication access to a VoIP network.
15	The DMA system of claim 11, further comprising an Integrated Services Digital Network (ISDN) interface that provides communication access to an ISDN network.
16	The DMA system of claim 11, wherein the particular preferred call path includes one of a Voice over Internet Protocol (VoIP) call path, a mobile switching center (MSC) call path, and an Integrated Services Digital Network (ISDN) call path.
17	The DMA system of claim 16, wherein the call is directed to a mobile directory number (MDN), and wherein the particular preferred call path is determined based on an MDN prefix.
18	The DMA system of claim 17, wherein the MDN prefix includes the first three digits of the MDN.
21.a	The DMA system of claim 11, further comprising:
21.b	a mobile switching center (MSC) module embedded within the computer readable storage medium;
21.c	a base station controller (BSC) module embedded within the computer readable storage medium; and
21.d	a call detail record (CDR) generation program embedded within the computer readable storage medium, the CDR generation program adapted to store a set of call detail records.

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