

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION AND AFFIRMED NETWORKS, INC.,
Petitioners,

v.

LEMKO CORPORATION,
Patent Owner.

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

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 7,653,414**

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TABLE OF EXHIBITS

Exhibit No.	Brief Description
1001	U.S. Patent No. 7,653,414
1002	File History of U.S. Patent No. 7,653,414
1003	Declaration of Mr. James Proctor
1004	<i>Curriculum Vitae</i> 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	Service of Complaint for Patent Infringement served on Microsoft Corp., <i>Lemko Corp. v. Microsoft Corp. and Affirmed Networks Inc.</i> , 3:22-CV-00363-L (N.D. Texas)
1008	Service of Complaint for Patent Infringement served on Affirmed Networks Inc., <i>Lemko Corp. v. Microsoft Corp. and Affirmed Networks Inc.</i> , 3:22-CV-00363-L (N.D. Texas)
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, 20 th 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”)

Exhibit No.	Brief Description
1017	RESERVED
1018	Excerpt from “WiMAX: Taking Wireless to the MAX” by Deepak Pareek, Auerbach Publications, published 2006

I. Introduction

Petitioners request *inter partes* review (IPR) of claims 1–8, 11–16, and 21 (the “challenged claims”) of U.S. Patent No. 7,653,414 (the “’414 patent”/“challenged patent”).

The supposed inventive feature of the ’414 patent is a distributed mobile architecture (“DMA”) system. Multiple DMA systems can be combined to form various network configurations, like the configuration recited in claim 1. But Waylett—which was never considered by the Examiner—disclosed this supposed inventive system years earlier. And Mauer discloses the claimed network configuration and operation described in the claims. Taken together, the combination of Mauer and Waylett render the alleged inventive concept of the ’414 patent and the challenged claims obvious.

All challenged claims should be found unpatentable given the strength of the prior art as shown herein.

II. Requirements for *Inter Partes* Review

This Petition complies with all statutory requirements, as well as 37 C.F.R. §§ 42.104, 42.105, and 42.15, and should be accorded a filing date pursuant to 37 C.F.R. § 42.106. The required fee is being paid electronically through P-TACTS.

A. Petitioners’ Certification

As required by 37 C.F.R. § 42.104(a), Petitioners certify that the ’414 patent “is available for *inter partes* review and that the Petitioners are not barred or

estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in the petition.” Petitioners certify that this Petition is filed within one year of the date of service of the complaint—February 16, 2022. Exs. 1007, 1008. Neither Petitioners, nor any party in privity with Petitioners, have filed a civil action challenging the validity of any claim of this patent. Petitioners therefore certify that the ’414 patent is available for *inter partes* review.

B. Identification of Challenge

Under 37 C.F.R. §§ 42.104(b) and 42.22, Petitioners request that the Board institute this IPR on claims 1–8, 11–16, and 21 of the ’414 patent and cancel those claims as unpatentable on the following grounds:

Ground	Claims	Basis for Unpatentability
1	1–8	Obvious over Mauer (EX 1005) in view of Waylett (EX 1006)
2	11–16 and 21	Obvious over Waylett in view of Mauer

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

A. Earliest Effective Filing Date

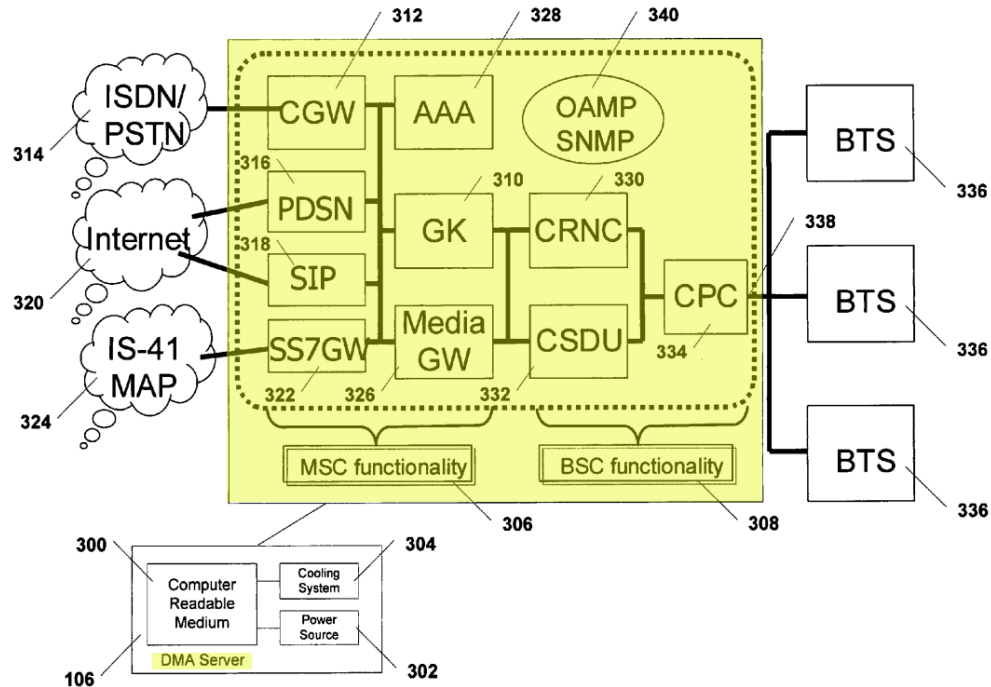
The ’414 patent was filed on February 24, 2006. For purposes of this Petition, Petitioners assume that the ’414 patent claims are entitled to a priority date of February 24, 2006.

B. Level of Ordinary Skill in the Art

As of February 2006, a person of ordinary skill in the art (“POSITA”) would have been a person with a degree in computer science, electrical or computer engineering, physics, or a similar discipline. EX 1003, ¶ 54. Such a person would also have at least two years of relevant experience including, for example, work related to telecommunications networks. *Id.* As shown by his CV (EX 1004) and as described in his expert declaration (EX 1003, ¶¶ 3-23), Mr. Proctor was qualified as a POSITA at the relevant time.

C. ’414 Patent Overview

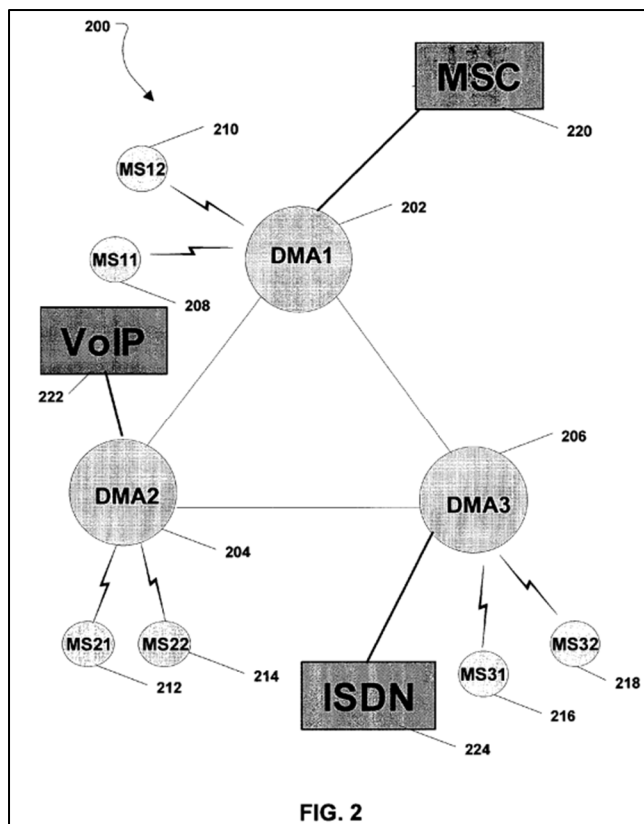
The ’414 patent relates to telecommunication systems. EX 1001, 4:15–17. It describes a DMA server (*e.g.*, DMA 106) including conventional wireless communication features of a base station controller (“BSC”) and mobile switching center (“MSC”) in a single enclosure as shown in Figure 3 below.



EX 1001, Fig. 3 (annotated).

The '414 patent alleges that that conventional systems have high installation costs . The '414 patent touts DMAs as an improvement because they are allegedly “relatively inexpensive to deploy” and “operate.” EX 1001, 1:49-51; *see id.*, 4:45–60.

The '414 patent discloses DMAs “implemented as a system or a device” to receive and router calls between mobile subscribers. EX 1001, 2:65-3:4; 7:56-57. As shown in Figure 2 below, mobile subscribers 208, 210 are wirelessly coupled to DMA 202 and mobile subscribers 212, 214 are wirelessly coupled to DMA 204. EX 1001, Fig. 2. Each DMA is connected via interfaces to different networks, such as cellular, VoIP, or satellite. *Id.*



EX 1001, Fig. 2.

Each DMA above is connected via interfaces to different networks. DMA1 includes a MSC interface 220 to a mobile telephone network, DMA2 includes a VoIP interface 222 for a VoIP network, and DMA3 includes an ISDN interface 224 for an ISDN network. Ex. 1001, Fig 2; 5:3-36. If a call is destined for a mobile device external to the DMA network, the call is routed via the respective network interface. EX 1001, 5:62-6:4.

The '414 patent generally describes routing calls using a system where user data is distributed among various databases stored in one or more DMAs and some of these databases are associated with one another. EX 1001, 8:3-29; *see also* Figure

4; EX 1003, ¶ 62. 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. The '414 patent acknowledges that conventional cellular systems include such registers, including HLRs and VLRs. EX 1001, 1:35–48. The VLR includes information associated with roaming mobile subscribers that are temporarily registered with a 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 ... CLR information concerning the roaming mobile 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.

D. Relevant Prosecution History of the '414 Patent

The Examiner rejected the '414 patent claims over numerous references, such as U.S. Pat. No. 6,816,706 (EX 1009); U.S. Pat. No. 6,871,072 (EX 1010); U.S. Pat. No. 4,284,848 (EX 1011); and U.S. Pat. No. 7,136,651 (EX 1012). The Applicant responded by deleting all the claims and introducing the claims at issue. EX 1002, 172–182. The Examiner's reasons for allowance 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 DMA network that is accessible to the DMA system. *See* EX 1002, 195–196.

IV. Claim Construction

The Board construes claims under the same standard used in civil actions in federal district court. The district court for the related litigation has not yet construed the claim terms.

V. Detailed Discussion of the Grounds for Unpatentability

The challenged '414 patent's claims are unpatentable based on two different grounds. First, Ground 1 establishes that claims 1–8 are obvious over Mauer in view of Waylett. Ground 2 likewise establishes that claims 11–16 and 21 are obvious over Waylett in view of Mauer. These Grounds are further explained below.

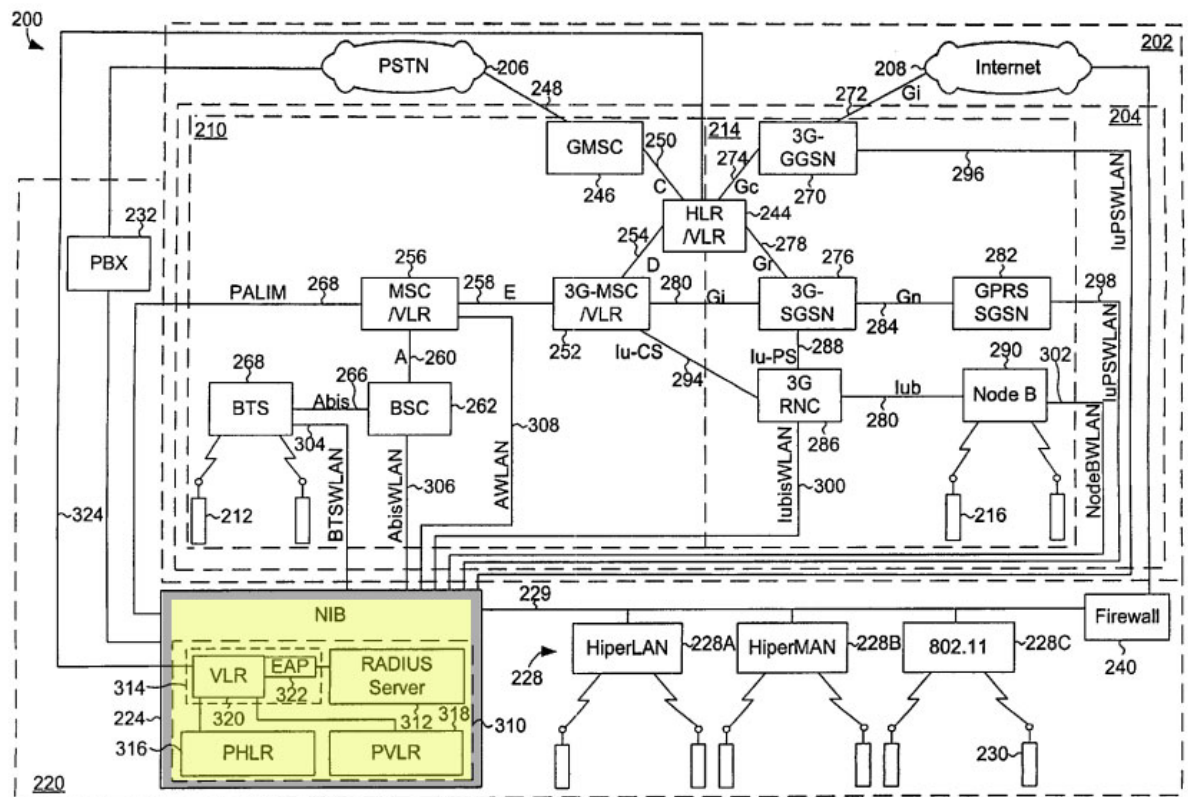
A. Prior Art Overviews

1. Waylett (EX 1006)

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

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, which

allows user equipment terminals to communicate wirelessly, shown in Figure 6 below. .



EX 1006, Fig. 6; EX 1006, 9:41–42 (“[t]he NIB 224 includes a MSC, a BSC, and a BTS in a single enclosure.”).

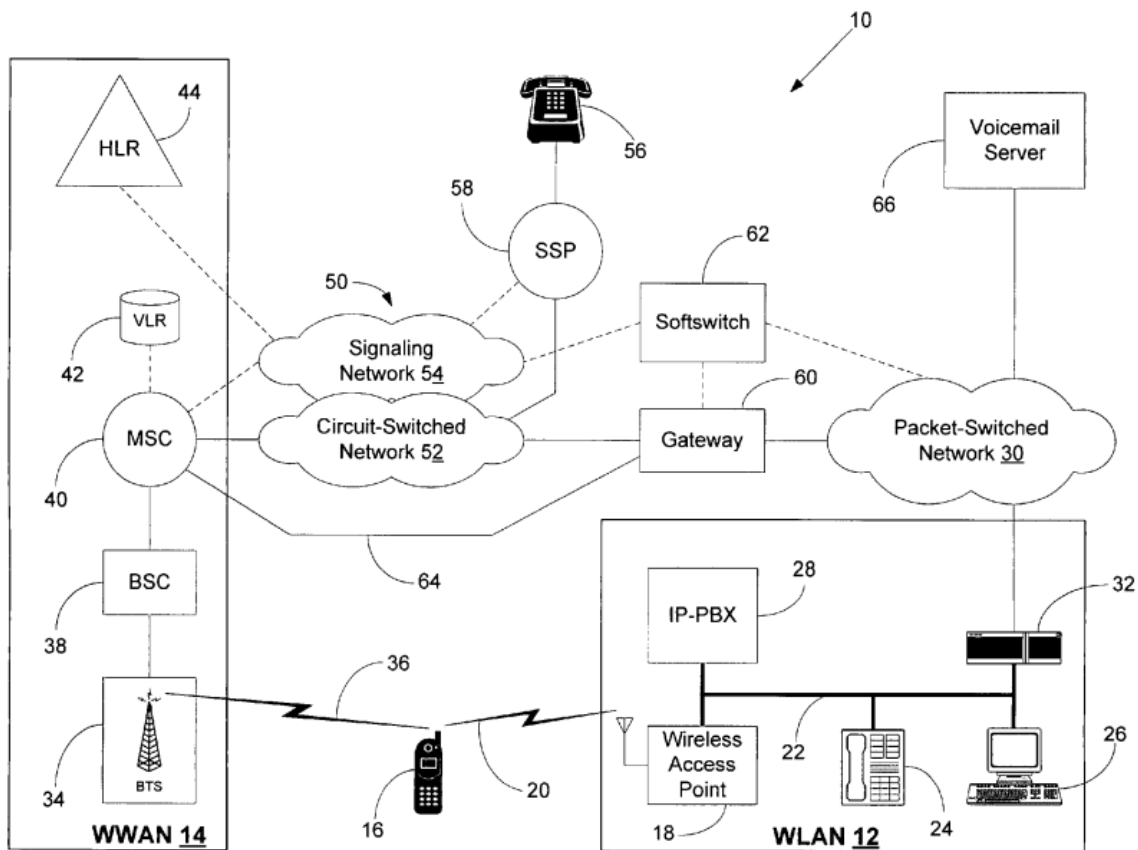
Waylett identifies that “[a] fundamental drawback to the use of conventional wireless networks is the cost associated with radios or user equipment terminals (UEs) capable of communicating with [various wireless] networks” which is caused by “the difficulty and expense of scaling the network to provide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

2. Mauer (EX 1005)

Mauer was filed on March 11, 2005, so it qualifies as prior art under at least pre-AIA 35 U.S.C. § 102(e).

Mauer relates to communication systems. Figure 1 of Mauer shows mobile station 16 is wirelessly coupled to WLAN 12 and WWAN 14:



EX 1005, Fig. 1, 4:64-5:10.

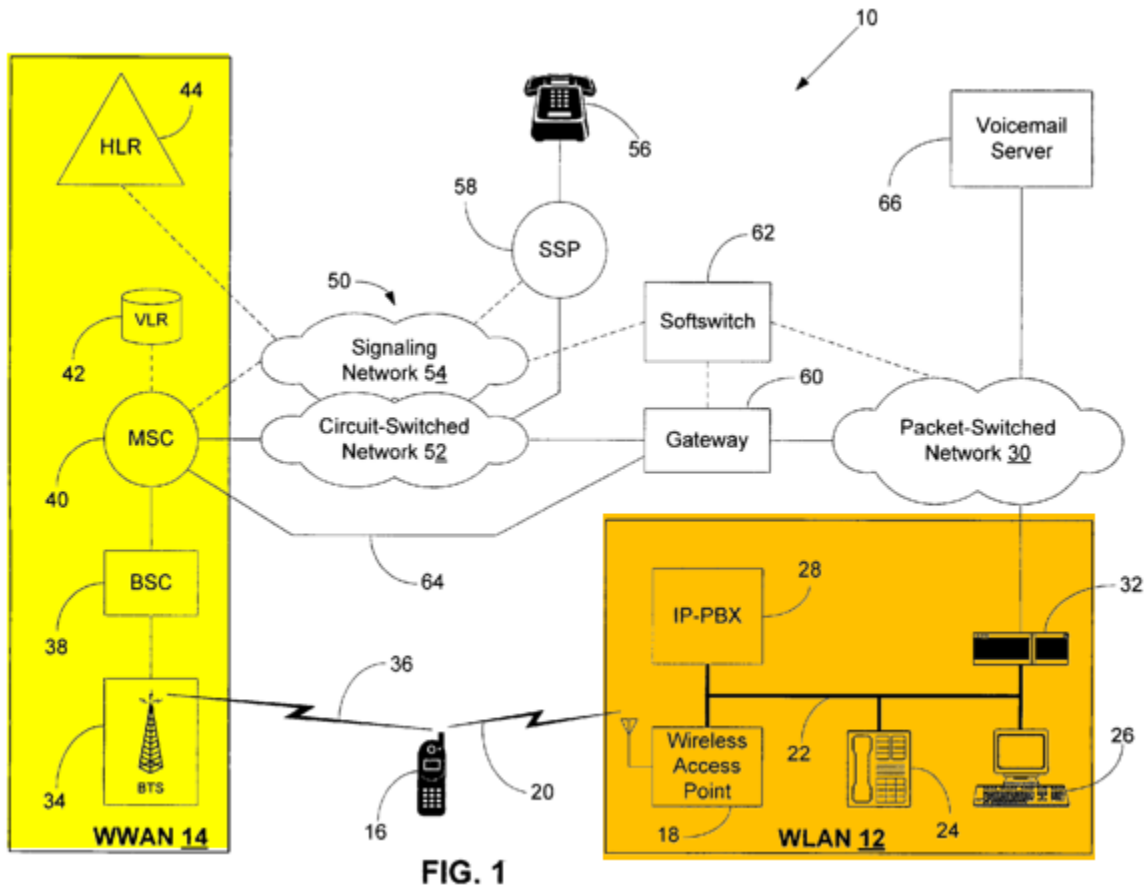
Each of WLAN 12 and WWAN 14 is connected via interfaces to different networks, such as cellular network and local area network (LAN). EX 1005, 3:10-24, 4:54-63, 5:11-26. WWAN 14 includes a MSC 40, which provides access to a mobile telephone network (EX 1005, 7:1-8) and WLAN 12 includes a network access 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. Mauer's Figure 2 depicts how to communicate with a mobile station 16 if it moves out of the coverage area for WLAN 12, WWAN 14, or both networks. EX 1005, 8:38-44, 10:43-53; *see also* Fig. 2.

Mauer describes mobile station data records as distributed among various databases stored in multiple networks (e.g., WLAN 12 and WWAN 14) and some of these databases are associated with one another. EX 1005, 6:18-44, 7:55-62. 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." *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. EX 1005, 6:30-32, 7:18-21.

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

A POSITA would have considered the systems described in Mauer in conjunction with those described in Waylett, as both concern analogous art. EX 1003, ¶ 72. Both belong to the same field of endeavor—telecommunication systems over wireless networks. EX 1005, 1:8–10; EX 1006, 1:25–31; EX 1001, 1:8-51, 4:14-60; EX 1003, ¶ 72. Likewise, both are pertinent to the problem being solved by the inventor of the '414 patent: “there exists a need for an improved communications 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; EX 1003, ¶ 72.

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



EX 1005, Fig. 1 (annotated); EX 1003, ¶ 73. Each of these wireless networks includes components to communicate with mobile stations using 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 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.”). EX 1003, ¶ 73. These various network protocols, as Mauer explains, provide coverage for different environments. EX 1005, 1:18-29; EX 1003, ¶ 73. A

POSITA would have recognized that Mauer teaches providing sufficient network coverage by use of different kinds of networks, network interfaces, and protocols. EX 1003, ¶ 73.

A POSITA would have recognized that Mauer's network architecture Mauer would be costly to implement and would benefit from the Waylett's teachings. EX 1003, ¶ 74. 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 POSITA would have thus recognized that Waylett discloses an inexpensive way to implement the same networks used in Mauer's WWAN 14 and WLAN 12. EX 1003, ¶ 75. Accordingly, it would have been obvious to a POSITA to implement Waylett's NIB solution into Mauer's system architecture because, at a minimum, it would reduce expenses in provisioning a network. EX 1003, ¶ 75; EX 1006, 2:3–11.

The combination 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 POSITA 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. EX 1003, ¶ 76.

Such a person would have also recognized that these components would be redundant because both Waylett and Mauer disclose the same types of wireless networks. EX 1003, ¶ 76. Mauer discloses 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 success in the combination of the NIB into Mauer, EX 1003, ¶ 76, which itself is a combination of network elements with an MSC. EX 1006, 9:36–42; 13:64–14:1; 14:23–30. A POSITA would have recognized that these overlapping components, along with the same wireless technologies being used, show how compatible Waylett’s NIB 224 is with Mauer’s networks. EX 1003, ¶ 76. Accordingly, a POSITA would have been able to modify Mauer’s WWAN 14 and WLAN 12 networks so that each network uses Waylett’s NIB 224. EX 1003, ¶ 76.

The resulting combination of Mauer and Waylett would also include several beneficial features from Mauer 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 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 in Figure 2 would be incorporated into Waylett’s NIB 224 to allow the multi-mode mobile station to be reached. EX 1003, ¶ 77.

Mauer’s Figure 2 method is beneficial so multiple networks do not unnecessarily search for a mobile device. EX 1003, ¶ 77. As shown in Figure 2, a

POSITA 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. EX 1003, ¶ 77. To implement Mauer's Figure 2 technique, Mauer discloses that 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; EX 1003, ¶ 78. Mauer's method helps identify possible target locations of mobile stations based on last known network connections. EX 1003, ¶ 78. This is beneficial because a mobile station may have never left the last network visited. EX 1003, ¶ 78. A POSITA would have recognized that these benefits would be applicable if Waylett's NIB 224, which already includes controllers, was modified to include the technique shown in Mauer's Figure 2. EX 1003, ¶¶ 77-78; EX 1006, 9:41-46; EX 1018 at 4 (stating "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").

A POSITA would be motivated to combine Mauer and Waylett in the manner described above for three reasons. EX 1003, ¶ 78. First, the references each provide reasoning to make such a combination. EX 1003, ¶ 78. Waylett explains that it provides an inexpensive solution to implement the same wireless networks described in Mauer. *See* EX 1006, 2:3-14; EX 1003, ¶ 78. 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; EX 1003, ¶ 78. Second, a POSITA would be 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. EX 1003, ¶ 78; EX 1006, 1:57-2:15, 8:4-32; EX 1018. 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. EX 1003, ¶ 78; *see* EX 1005, 9:32-38; EX 1006, 4:28-37. For any of the above reasons, a POSITA would have been motivated to combine Mauer and Waylett in the manner described above. EX 1003, ¶ 78.

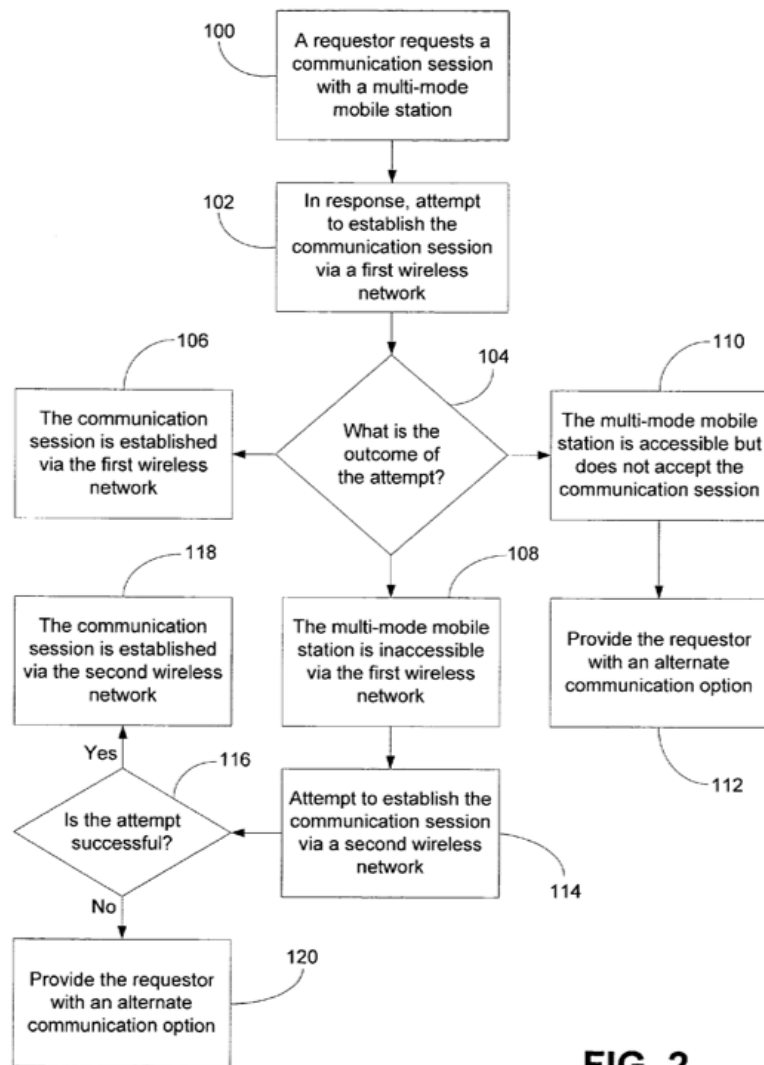
C. Ground 1: Mauer and Waylett Render Claims 1-8 Obvious

1. Claim 1

a. Preamble

The preamble recites “[a] *method, comprising:*” To the extent the preamble is limiting, Mauer discloses this limitation.

Mauer discloses “[a] *method,*” shown in Figure 2 below:

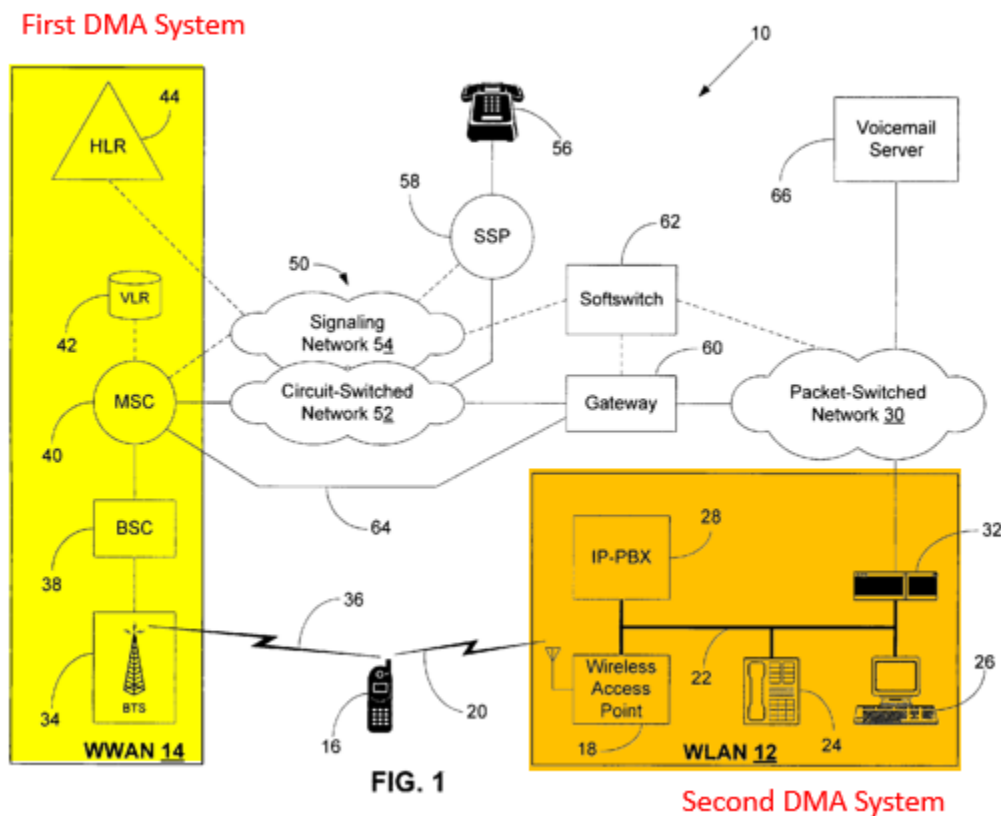
**FIG. 2**

EX 1005, Fig. 2; EX 1003, ¶¶ 79-81; *see also* EX 1005, 2:53–56 (“a method of attempting to communicate with a multi-mode mobile station.”). Accordingly, Mauer discloses this limitation.

b. Receiving a Call

Claim 1 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.*”

Mauer in combination with Waylett renders this limitation obvious. Ex. 1003, ¶¶ 82–87. Mauer’s Figure 1, as modified with Waylett’s NIBs, *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:



EX 1005, Fig. 1 (annotated), EX 1003, ¶ 85; *see* EX 1005, 4:35–63 (describing WLAN 12 and WWAN 14). As shown above, Mauer, as modified, discloses “a *first distributed mobile architecture (DMA) system of a DMA network*” along with “*mobile subscribers.*”

A POSITA would have understood that Mauer's multi-mode mobile stations are "*mobile subscribers*." EX 1003, ¶ 86; EX 1005, 4:64–5:10; EX 1001, 5:55–6:4; 5:3–20; 17:25–44; 12:32–44. Mauer's Figure 2 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. 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:

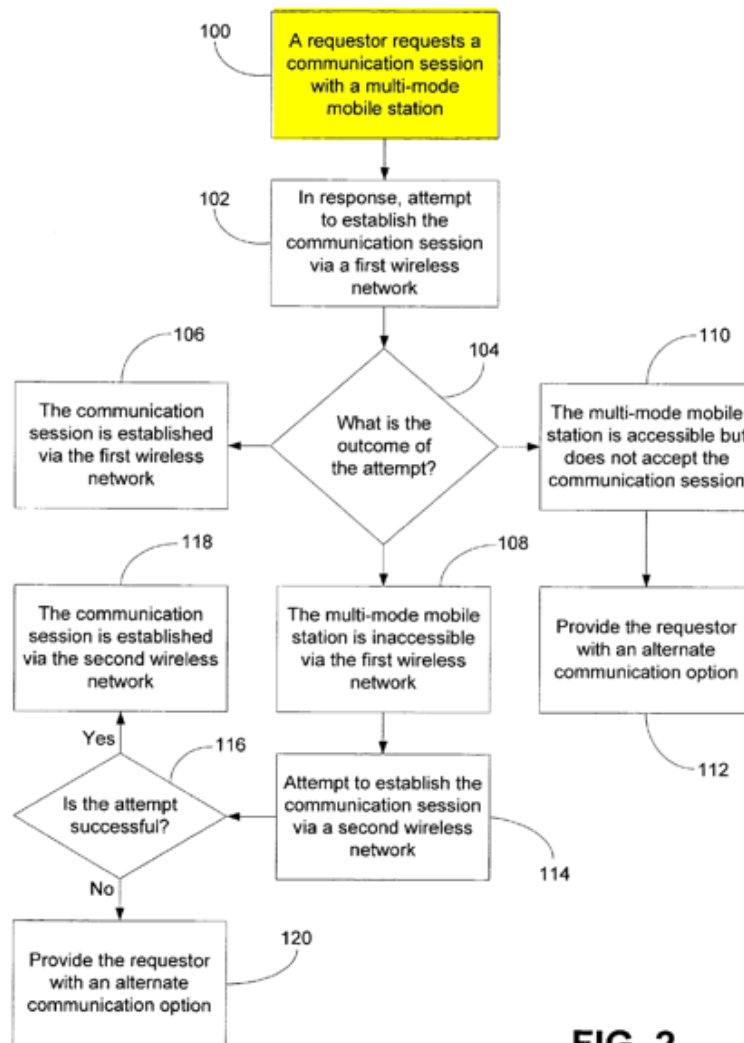


FIG. 2

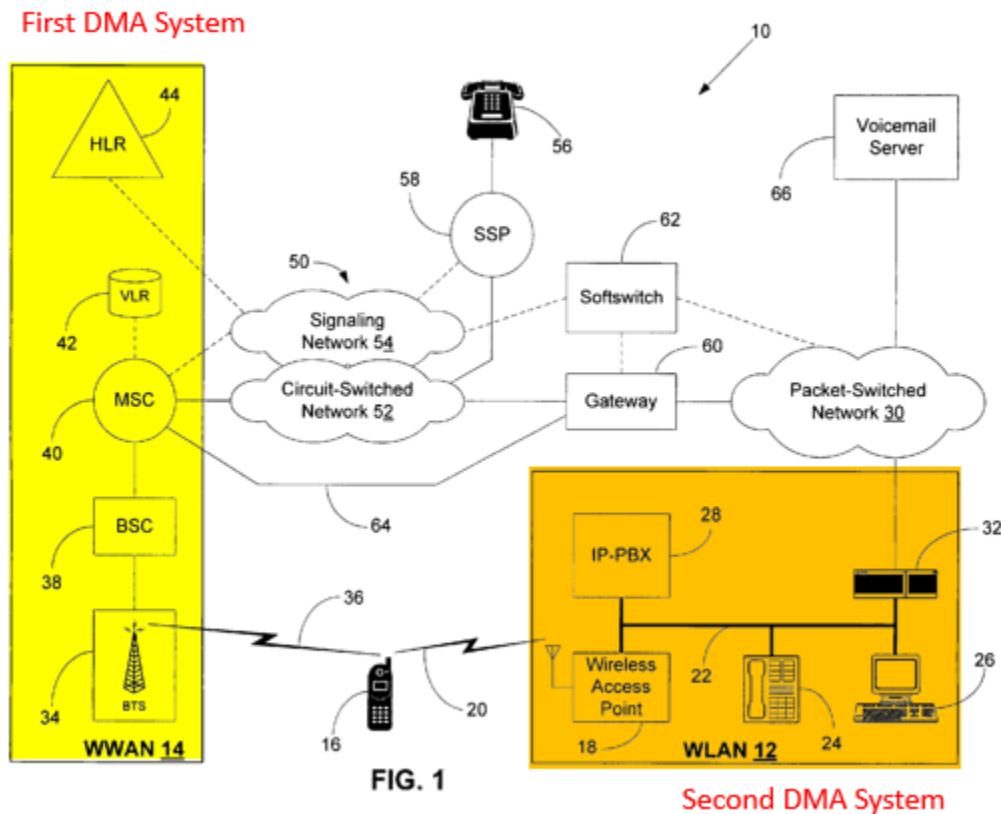
See EX 1005, Figure 2, step 100; EX 1003, ¶ 86. “The requested communication session could be, for example, a voice call.” EX 1005, 8:47–48. Further, Mauer describes that a wireless device communicating via WWAN 14 requests a voice call with a multi-mode mobile station. See *id.* at 8:52–65. Mauer thus 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”). EX 1003, ¶ 87. Accordingly, Mauer in combination with Waylett discloses this limitation. 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,” EX 1005, 6:15-19, each of which as modified, to include a respective NIB of Waylett, may further act as another DMA system. EX 1003, ¶ 87.

c. A DMA Network

Claim 1 also recites “*wherein the DMA network includes at least the first DMA system and a second DMA system.*” Mauer’s network architecture, as modified to include Waylett’s NIB, renders this limitation obvious. Alternatively, Mauer’s network further modified to substitute a WWAN for WLAN 12 and incorporate Waylett’s NIB likewise renders the claim obvious.

i. Mauer's WLAN renders a second DMA Network obvious

Mauer in combination with Waylett renders this limitation obvious. 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.*” EX 1003, ¶¶ 88-91. 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. EX 1003, ¶ 90. Both WWAN 14 and WLAN 12 belong to the same system 10 (“DMA network”):



EX 1005, Fig. 1 (annotated), EX 1003, ¶ 90; *see* EX 1005, 4:35–5:7; 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.*”

ii. Mauer’s network architecture further modified to substitute a WWAN for WLAN 12 also renders a second DMA Network obvious

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 NIB, it would have been obvious to modify Mauer’s network architecture to substitute WLAN 12 for another WWAN. EX 1003, ¶ 91. 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. *See* EX 1005, 6:30–32, 7:18–21. A POSITA 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. EX 1003, ¶ 91. Such a modification would change Mauer’s Figure 2 to refer to the new WWAN as the “second wireless network.” EX 1003, ¶ 91. In addition, motivation to modify Mauer’s network architecture to include multiple WWANs, each using Waylett’s NIB 224, exists because it is an inexpensive way to expand the network, especially to unserved or underserved communities. EX 1006, 1:17–2:8,

2:15-16; EX 1003, ¶ 91. 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.*” EX 1003, ¶ 91.

d. Location of second mobile subscriber

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

Mauer in combination with Waylett renders this limitation obvious. Ex. 1003, ¶¶ 92–98. Mauer’s WWAN 14 (a “*first wireless network*”) includes both a “*home location register (HLR)*” 44 and “*a visitor location register (VLR)*” 42 shown below:

First DMA System

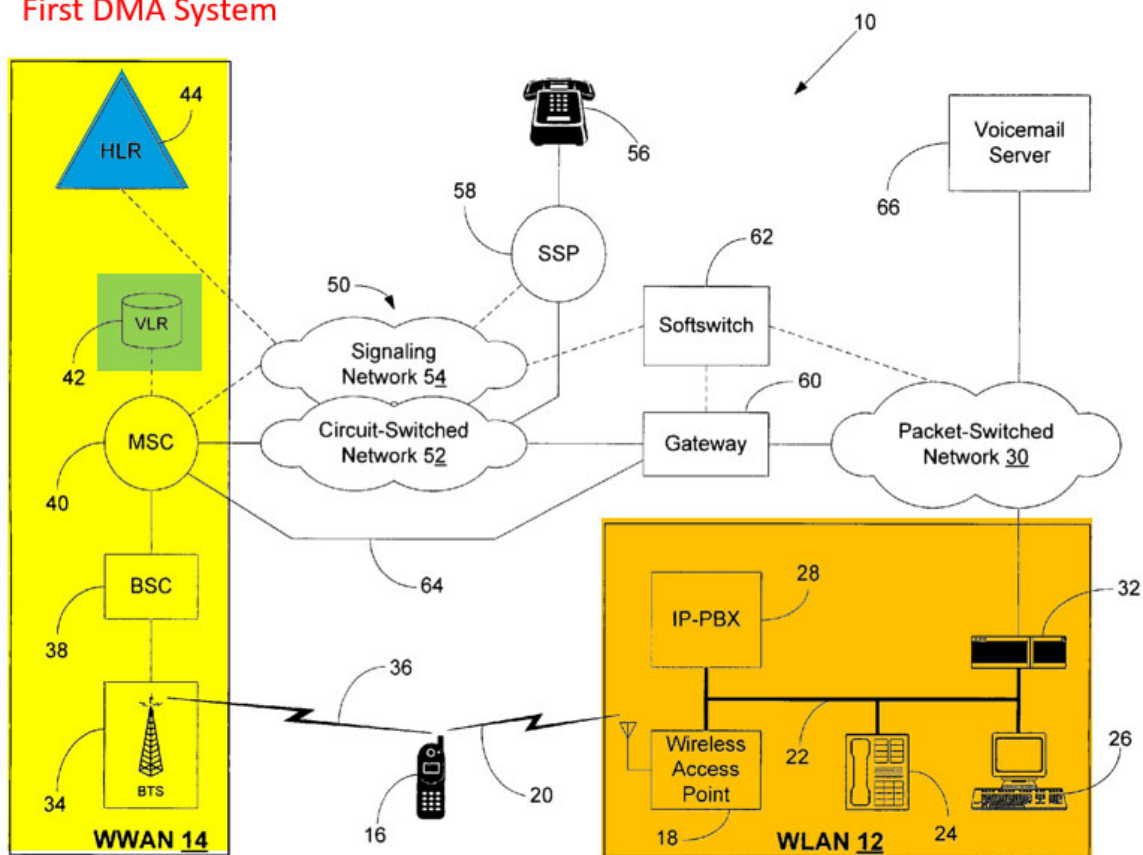


FIG. 1

Second DMA System

Ex.1005, Fig. 1 (annotated); EX 1003, ¶ 94. Waylett's NIB 224 likewise includes an HLR and VLR, shown in Figure 6 below:

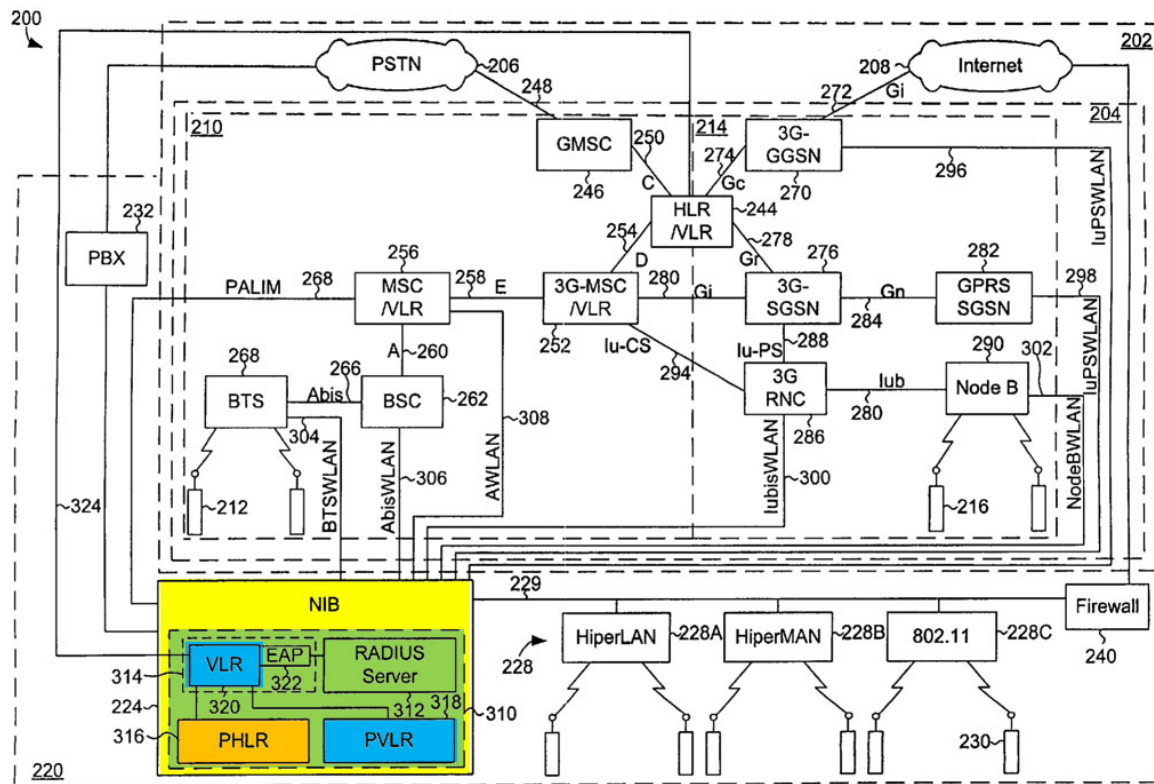
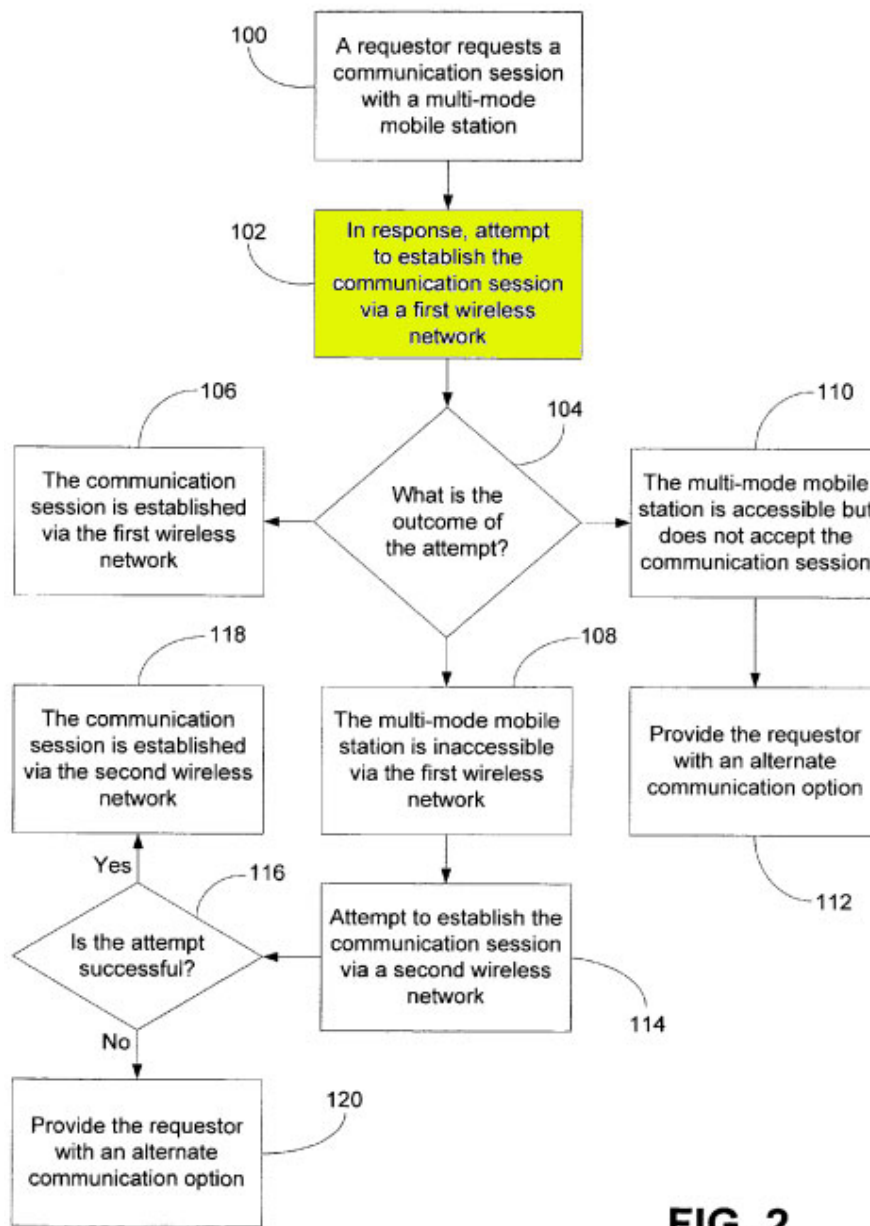


FIG. 6

EX 1006, Fig. 6 (annotated), 9:36-41; EX 1003, ¶ 94. As Mauer explains, the visitor location register 42 “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 VLRs operates in a similar manner. *See* EX 1006, 12:36-38, 12:53-61, 14:35-37; EX 1003, ¶ 95. Mauer’s 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.” EX 1005, 6:33-38; EX

1006, 12:30–36. Mauer explains that the “data record may identify the VLR that most recently registered multi-mode mobile station 16 with HLR 44.” EX 1005, 6:39–41; EX 1006, 12:30-36. *See also id.*, 14:32-38. Based on these disclosures, a POSITA 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. EX 1003, ¶¶ 92-97.

Mauer’s Figure 2 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*”:



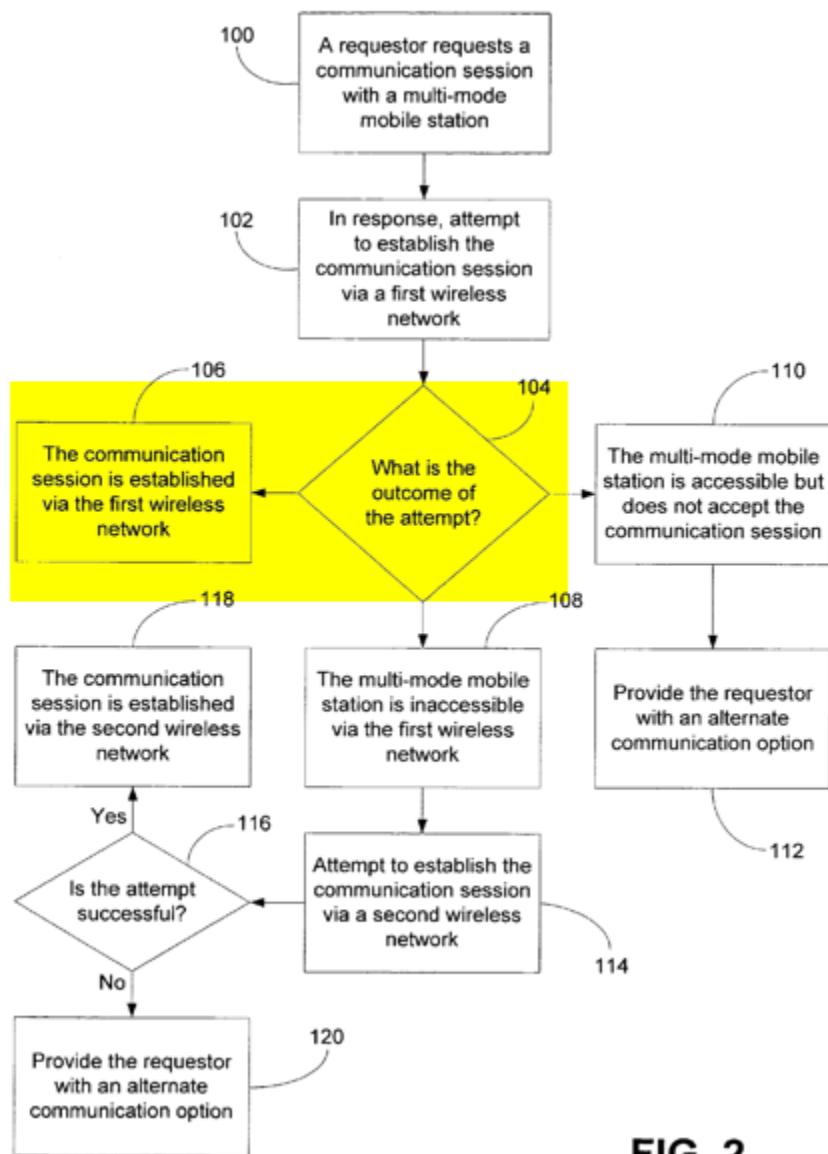
EX 1005, Fig. 2 (annotated); EX 1003, ¶ 98. The first wireless network mentioned in Figure 2 above can be the same wireless networks described in Figure 1, such as WWAN 14. EX 1005, 10:20–23 (“If the first wireless network is a WLAN, e.g., WLAN 12, then the second wireless network could be a WWAN, such as WWAN

14.”). To establish a communication session in step 102 with a mobile station 16 located in via WWAN 14, *see* Fig. 2, a POSITA 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. EX 1003, ¶ 98. 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 within the coverage area of WWAN 14. *Id.* 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 within WWAN 14 (“*first DMA system*”). EX 1003, ¶ 98

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

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.*” Mauer in combination with Waylett discloses this limitation.

Mauer’s Figure 2 depicts establishing a communication session (in step 106) over the first wireless network after a successful attempt in step 104:

**FIG. 2**

EX 1005, Fig. 2 (annotated); EX 1003, ¶¶ 99-101. 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. Thus, a POSITA would have understood that a communication session in WWAN 14 can be established only when mobile station 16 is located within the coverage area. EX

1003, ¶ 101; *see* EX 1005, 9:32–55. Therefore, Mauer as modified discloses this limitation.

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

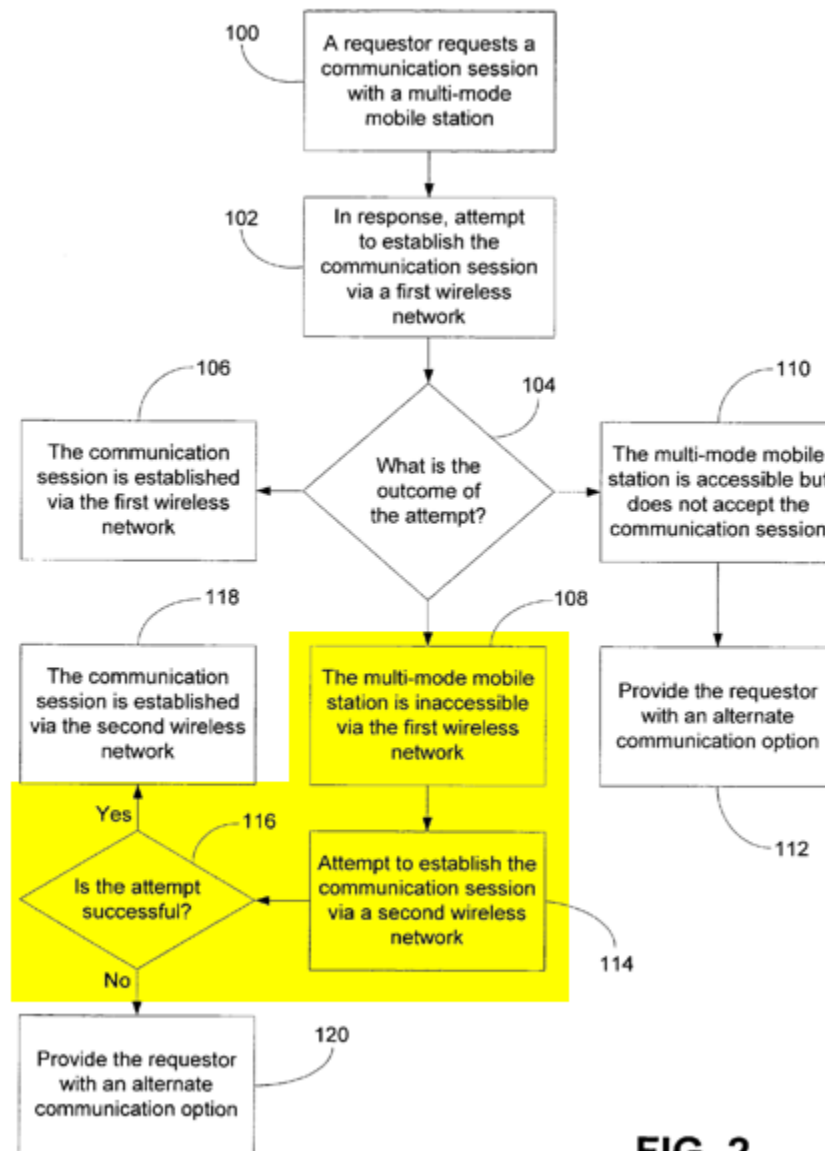
Claim 1 also recites “*when the second mobile subscriber is not located within the first wireless coverage area, determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system based on information stored 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.*”

Mauer in combination with Waylett renders this limitation obvious. Mauer discloses “*determining whether a second mobile subscriber is located in a second wireless coverage area associated with a second DMA system*” when the first wireless coverage area is unavailable. 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 make that determination. The combination of Mauer and Waylett renders this limitation obvious for the reasons discussed below.

- i. **Mauer discloses “determining whether the second mobile subscriber is located within a second wireless coverage area” when “not located within the first wireless coverage area”**

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.*”

Mauer’s Figure 2 illustrates establishing a communication session over a second wireless network (step 114) if a session cannot be established over the first wireless network (step 108):

**FIG. 2**

EX 1005, Fig. 2 (annotated); EX 1003, ¶ 106. Maurer 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. Thus, Maurer, as modified to include Waylett’s NIBs, discloses the claimed “*second DMA system*.” EX 1003, ¶ 106. There are two different networks in Maurer that can serve as the “second DMA

system.” As Mauer’s network architecture is modified above to include Waylett’s NIBs, *see* § V.B, a POSITA would have understood that Mauer’s “second wireless network” would have been WLAN 12 from Mauer’s Figure 1 (a “*second DMA system*”). EX 1003, ¶ 106; *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.ii, a POSITA would have understood that Mauer’s “second wireless network” would have been a second WWAN in Mauer’s modified network architecture. EX 1003, ¶ 106; *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. EX 1003, ¶ 106; *see* EX 1005, 9:32–55.

ii. Waylett renders “information stored at a community location register (CLR)” obvious

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.

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 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. Waylett discloses that RADIUS server 312 uses a "configuration table that matches the IMSI ranges with the appropriate or controlling public or private HLR," EX 1006, 15:6-8. Thus, Waylett discloses that 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. EX 1003, ¶ 109. Configuration tables are particularly helpful, as Waylett explains, when a network architecture includes multiple DMA servers each having their own HLR as in Mauer's modified network architecture with two DMA servers. EX 1003, ¶ 109; 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."). Waylett's HLRs include private "distributed" HLRs (316) associated with each NIB. EX 1006, 14:63-66.

A POSITA would have recognized that the International Mobile Subscriber Identity ("IMSI") is used to identify specific "*mobile subscriber devices*." EX 1003, ¶ 110; EX 1014 at 3 (defining IMSI as "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. EX

1003, ¶ 110. Consequently, 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. EX 1003, ¶ 110; EX 1006, 15:8–10 (contemplating “multiple ... HLR[s].”). 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. EX 1003, ¶ 110.

A POSITA would have 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. EX 1003, ¶ 111; *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 second HLR stores information associated with one or more mobile subscriber devices that are registered with the second DMA system.*” EX 1003, ¶¶ 111–112.

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

As explained above, Mauer and Waylett are analogous art. *See* § V.B.

A POSITA 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 POSITA 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. EX 1003, ¶ 114. Otherwise, additional time would be needed for Waylett's NIB to query all other NIB HLR's to determine whether they included the sought-after mobile device. *Id.*, ¶ 114. Second, a POSITA would have understood that these additional queries, which consume network resources, are avoidable by storing the information locally. *Id.*, ¶ 114. For these reasons, a POSITA would have been motivated to use Waylett's configuration tables in its NIBs used in Mauer's network architecture. *Id.*, ¶ 114.

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

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.*”

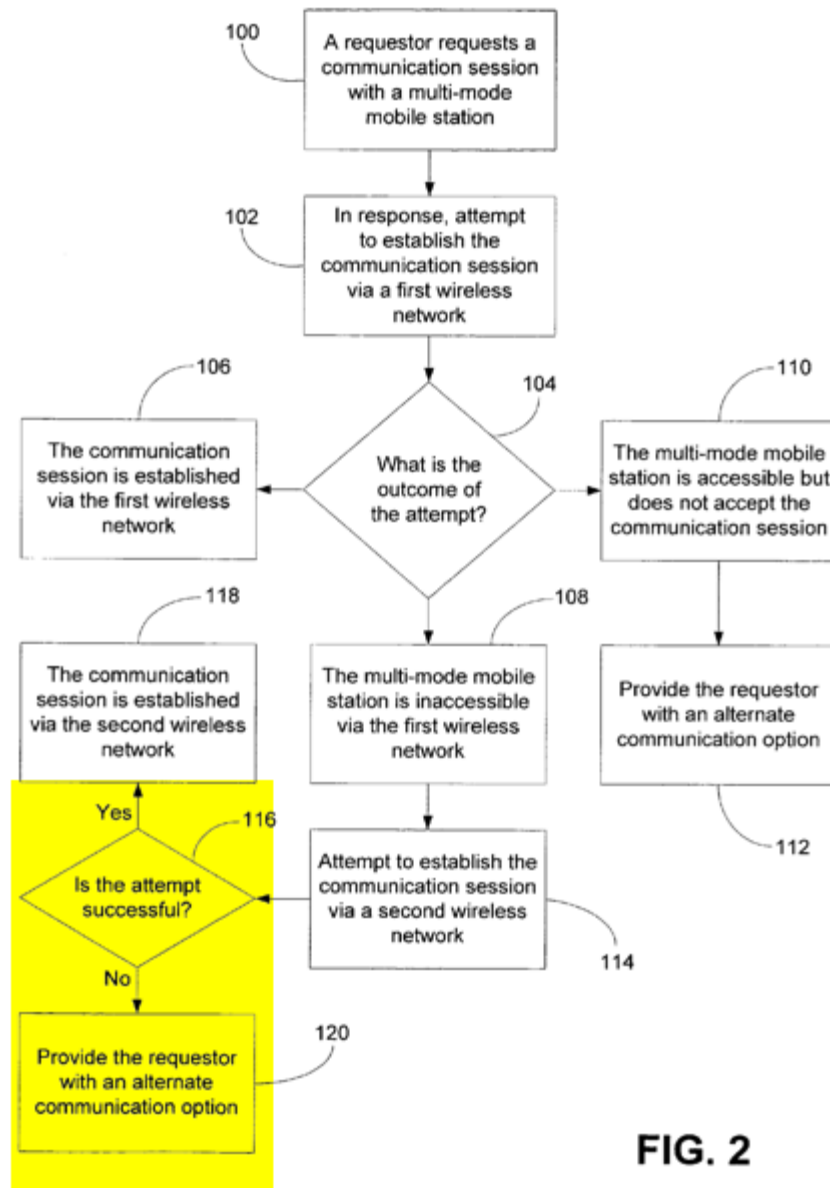
Mauer in combination with Waylett renders this limitation obvious. Mauer discloses determining a call path outside the DMA network when the mobile subscriber is not located in the first or second wireless coverage area. Mauer,

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.

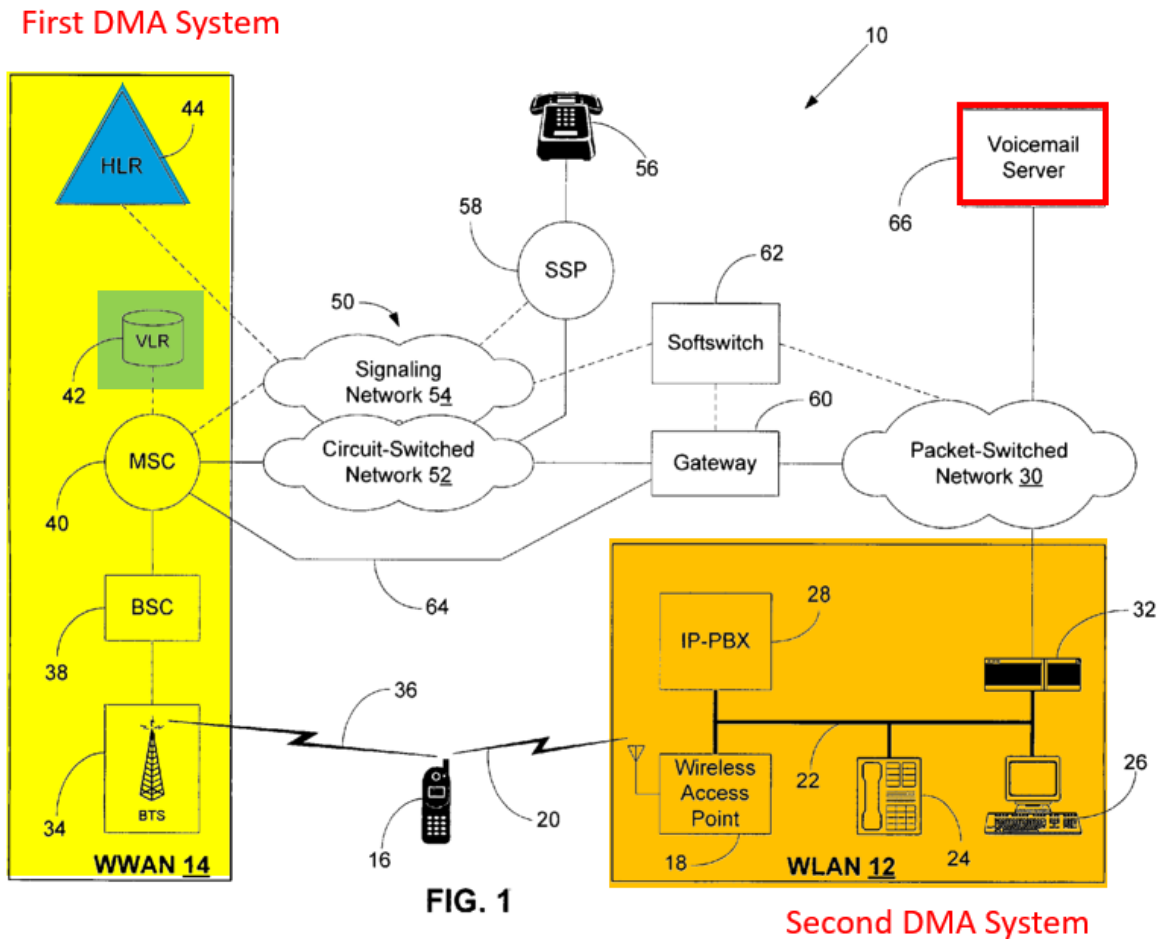
i. Mauer discloses “determining a preferred call path to route the call outside of the DMA network” when the second mobile subscriber is not located within the first wireless coverage or second wireless coverage area

Mauer 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 of the DMA network.*” EX1003, ¶¶ 118-121. Figure 2 illustrates 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); EX 1003, ¶ 118. Mauer discloses that the alternate communication option may be a voice message on a voicemail server, or a message sent to the multi-mobile station. *See* EX 1005, 10:59–64; 8:33-34. A POSITA would have understood that the “alternate communication option,” such as voicemail

server 66, serves as “a preferred call path to route the call.” EX 1003, ¶ 120. 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:



EX 1005, Fig. 2 (annotated); EX 1003, ¶ 120; *see* EX 1005, 8:25–34 10:59–64.

A POSITA 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, or alternatively, two WWANs. EX 1003, ¶ 121; *see* EX 1005, 9:32–55. Accordingly, a POSITA 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.” EX 1003, ¶¶ 118-121.

- ii. **It would have been 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.”**

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 this feature would have been obvious to a POSITA. As explained above, Mauer discloses performing the claimed actions—that is, 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.*” EX 1003, ¶¶ 122-123. A POSITA would have understood that these actions would necessarily require storing information, such as the IP address, a domain name, or other identifying information for the voicemail server 66, to establish a communication session. *Id.*, ¶ 123. This information for the external voicemail server 66 (to establish a communication session) would qualify as “*a preferred call path to route the call outside of the DMA network.*” *Id.*, ¶ 123. A POSITA 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); EX 1003, ¶ 123. Mauer teaches “establish[ing] a call to voicemail server.” EX 1005, 8:33-34; EX 1003, ¶ 123. Consequently, a POSITA would have understood that information necessary to establish a call to Mauer’s voicemail server 66 is stored in a “*destination preference register*.” EX 1003, ¶ 123.

A POSITA 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*”. First, information about the voicemail server would be the type of information needed to be shared across multiple DMAs in case any DMA failed. EX 1003, ¶ 125. That way, another DMA system would be able to route a call to voicemail if the DMA network connection to the destination phone failed. *Id.*, ¶ 125. Second, using a “*destination preference register (DPR)*” to store the address of the 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; EX 1003, ¶ 126. When a mobile device is detached from a network (*e.g.*, “*when the second mobile subscriber is not located within the first*” or “*second wireless coverage area*”), the GSM standard specifies routing calls to voicemail as one of three options for when a mobile subscriber is unavailable. *See* EX 1013; EX 1003, ¶ 126. Based on this standard, a POSITA 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. EX 1003, ¶ 126. Third, modifying Mauer’s network architecture to include Waylett’s NIB 224 would have been an “application of a known technique to a piece of prior art ready for the improvement.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007); *Id.*, ¶ 127. As explained above, a POSITA would have also recognized that Waylett discloses storing *similar* types of information in registers, such as a VLR, PVLR, and PHLR. *Id.*, ¶ 127; EX 1006, 14:23-25, 14:32-38. 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 a known element (*i.e.*, a register) to perform the same function (*i.e.*, storing contact information for another device) and yielding no more than one would expect from an arrangement (*i.e.*, accessing that information for use to communicate with the voicemail server 66). *KSR*, 550 U.S. at 417 (stating “when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious”) (internal quotes omitted); EX 1003, ¶ 128. Thus, this element is obvious.

2. Claim 2

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.*”

Mauer and Waylett render this limitation obvious. EX 1003, ¶¶ 130-131. 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; Fig. 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.* A POSITA would therefore have understood that Mauer discloses “*routing the call outside of the DMA network via the preferred call path.*” EX 1003, ¶ 131. Accordingly, a POSITA 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.*” *Id.*, ¶¶ 130-131.

3. Claim 3

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.*” Mauer and Waylett render this limitation obvious. EX 1003, ¶¶ 132-134.

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 of Mauer 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*”). Mauer’s network architecture also 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. EX 1003, ¶ 134. Accordingly, a POSITA would have recognized that Mauer discloses an Internet Protocol (IP) peer-to-peer connection between the first DMA system and the second DMA system. EX 1003, ¶ 134; EX 1015 at Abstract (“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.”). 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. A

POSITA would therefore have understood that Mauer discloses this limitation. EX 1003, ¶ 134.

4. Claim 4

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.*” Mauer and Waylett render this limitation obvious. EX 1003, ¶¶ 135-137.

Waylett discloses that RADIUS server 312 uses a “configuration table that matches the IMSI ranges with the appropriate or controlling public or private HLR,” EX 1006, 15:6-8. Waylett thus discloses that RADIUS server 312 in each NIB 224 would use a table of subscriber identities to send user information to the appropriate HLR during authentication. EX 1003, ¶ 137. A POSITA would have recognized that the IMSI is used to identify specific “*mobile subscriber devices.*” *Id.*, ¶ 137; EX 1014 at 3. Waylett’s configuration tables (a “*community location register*”) store subscriber identities and their appropriate HLR. EX 1003, ¶ 137. 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. *Id.*, ¶¶ 135-137.

5. Claim 5

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.” Mauer and Waylett render this limitation obvious. EX 1003, ¶¶ 138-140.

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; EX 1003, ¶ 140. Mauer also states “voicemail server 66 could be ... coupled to MSC 40[.]” EX 1005, 8:30-31. Based on the above passages, a POSITA 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.*” EX 1003, ¶ 140. A POSITA would have recognized that Mauer discloses “*a plurality of VoIP call paths*” because a POSITA would have understood Waylett to disclose multiple mobile stations making voice

calls with each other over an IP network. *Id.*, ¶ 140. Mauer likewise discloses “*a plurality of MSC call paths*” because a POSITA would have understood Mauer to disclose multiple mobile stations making voice calls with each other using the MSC. EX 1003, ¶ 140. Accordingly, Mauer discloses this limitation.

6. Claim 6

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.*” Mauer and Waylett render this limitation obvious. EX 1003, ¶¶ 141-142.

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 POSITA would have understood that the requestor in Mauer is the “*first mobile subscriber,*” who would have dialed a phone number to establish a call with the second mobile subscriber. EX 1003, ¶ 142. 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 “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 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. EX 1003, ¶ 142. 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 POSITA would have understood that Mauer discloses this limitation. *Id.*, ¶¶ 141-142.

7. Claim 7

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.*” Mauer and Waylett render this limitation obvious. EX 1003, ¶¶ 143-145.

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 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 POSITA would have recognized

“a second preferred call path” from either WLAN 12 or a second WWAN (“the second DMA system”) to voicemail server 66 traversing network access device 32 and packet-switched network 30. EX 1003, ¶ 145; EX 1005, 8:25-29, 12:63-64, 13:62-64. A POSITA would therefore have understood that Mauer discloses this limitation. EX 1003, ¶¶ 143-145.

8. Claim 8

a. Preamble

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. EX 1003, ¶ 146.

b. Receiving a call

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, wherein the DMA network includes at least the first DMA system, a second DMA system, and a third DMA system.” As shown above, *see* § V.C.1.b, the combination of Mauer and Waylett discloses this limitation. EX 1003, ¶ 147.

i. Mauer, as modified, discloses a DMA network with multiple DMA systems.

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.b, except “*a third DMA system.*” EX 1003, ¶¶ 148–151.

Adding a third DMA system to the network architecture in the Mauer-Waylett combination would have been obvious. *Id.*, ¶ 149. 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”). Mauer also discloses that WWAN 14 would implement multiple Waylett’s NIBs 224—that is, one NIB for each MSC. *Id.*, 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.”). A POSITA would have understood that one example of another network architecture includes an architecture with an additional (third) network. EX 1003, ¶ 151. Such a person would have been motivated to add an additional network to expand its coverage area, especially to unserved or underserved communities. EX 1006, 1:17-2:8, 2:15-16; EX 1003, ¶ 151. A POSITA would have modified 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 1003, ¶ 151; EX 1006, 1:17-2:8, 2:15-16. As explained above, *see* § V.B, it would have been obvious 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.*" EX 1003, ¶ 151. Accordingly, a POSITA would have understood that Mauer renders obvious three wireless networks. *Id.*, ¶¶ 148-151.

c. Location of second mobile subscriber

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. EX 1003, ¶ 152.

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

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. EX 1003, ¶ 153.

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

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 discloses this limitation for the same reasons described above, *see* § V.C.1.f. EX 1003, ¶ 154.

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

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.*”

This limitation in Claim 8 is like limitations found in claim 1 (and the preceding limitation). Both claims 1 and 8 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. *See* EX 1001, Claims 1 and 8; EX 1003, ¶ 156. The community location registers in claims 1 and

8 are both stored at the first DMA system. EX 1001, Claims 1 and 8; EX 1003, ¶ 156. Accordingly, this limitation is very similar to one found in claim 1, which is rendered obvious for the reasons described above, *see* § V.C.1.g. EX 1003, ¶ 156.

Mauer in combination with Waylett renders this limitation obvious for similar reasons. As explained above, *see* § V.C.8.b.i, a POSITA would have found it obvious to expand Mauer's network architecture to incorporate a third DMA system for a third wireless network. EX 1003, ¶ 157. Such a modification of Mauer's network architecture would require additional steps in Mauer's Figure 2. *Id.*, ¶ 157.

A POSITA 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:

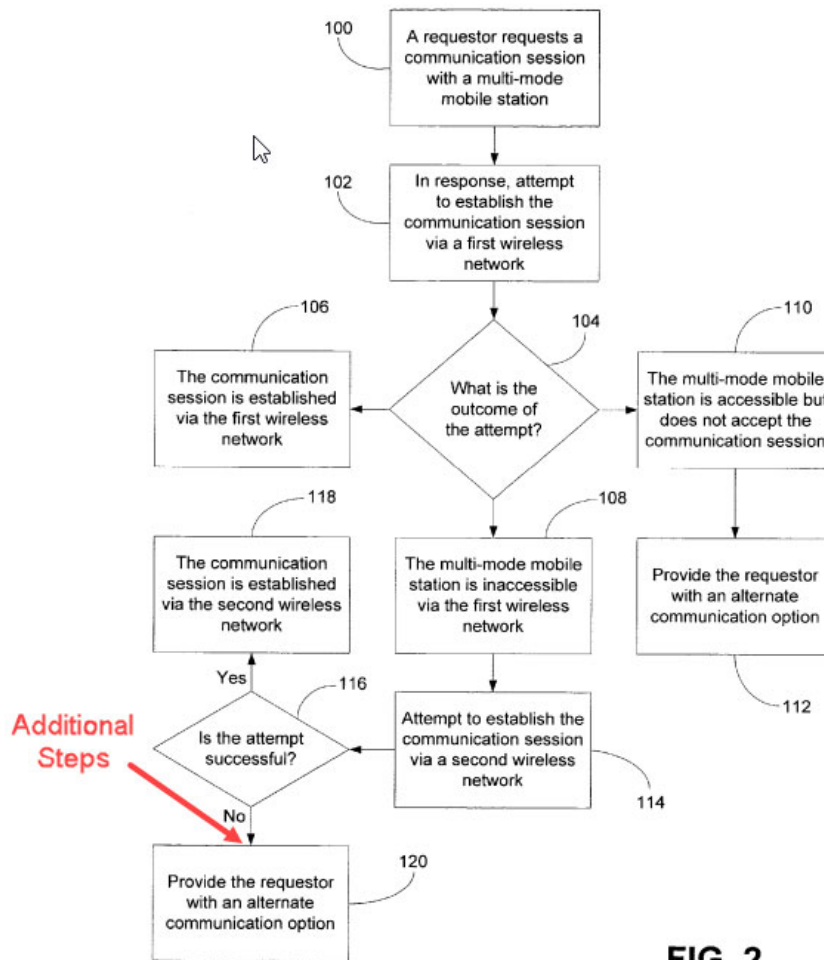


FIG. 2

EX 1005, Fig. 2 (annotated); EX 1003, ¶ 158. 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. *Id.*, ¶ 158. By adding a third network, these additional steps would have included the following four additional steps 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 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 *Id.*, Fig. 2, steps 102, 114;
- **Step C:** Is the attempt successful? see *Id.*, Fig. 2, steps 104, 116;
 - **Step D:** If yes, the communication session is established via the third wireless network, see *Id.*, Fig. 2, steps 106, 118;
 - If no, go to step 120.

EX 1003, ¶ 159. 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. *Id.*, ¶ 159. These additional steps render obvious this limitation.

i. Mauer, as modified, renders “information stored at a CLR associated with the third DMA system” obvious

Claim 8 further recites that the claimed determination in the preceding limitation (i.e., *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.” This feature is the same as a feature in Claim 1, besides referring to a *third* wireless coverage area and DMA system rather than a second area and system. EX 1003, ¶ 160. Accordingly, Mauer as modified renders the following limitation obvious for the same reasons disclosed above, *see* §V.C.1.f– V.C.1.f.iii:

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 POSITA 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. A POSITA would have found it obvious to use multiple configuration tables—that is, one for each HLR. EX 1003, ¶ 161. 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). *Id.*, ¶ 162. In addition, a POSITA 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. *Id.*, ¶ 162. 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. *Id.*, ¶ 160.

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

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.*”

The combination of Mauer and Waylett renders this claim limitation obvious for the same reasons as described above, *see* § V.C.1.g, except for “*when the second mobile subscriber device is not located in . . . the third wireless coverage area.*” By including a third network in Mauer’s architecture, as explained above in § V.C.1.g, three additional 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 Id.*, Fig. 2, steps 104, 116;

- **Step D:** If yes, the communication session is established via the third wireless network, *see Id.*, 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.

EX 1003, ¶ 164. As shown above, a POSITA 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.1.g; *see also* EX 1003, ¶ 164.

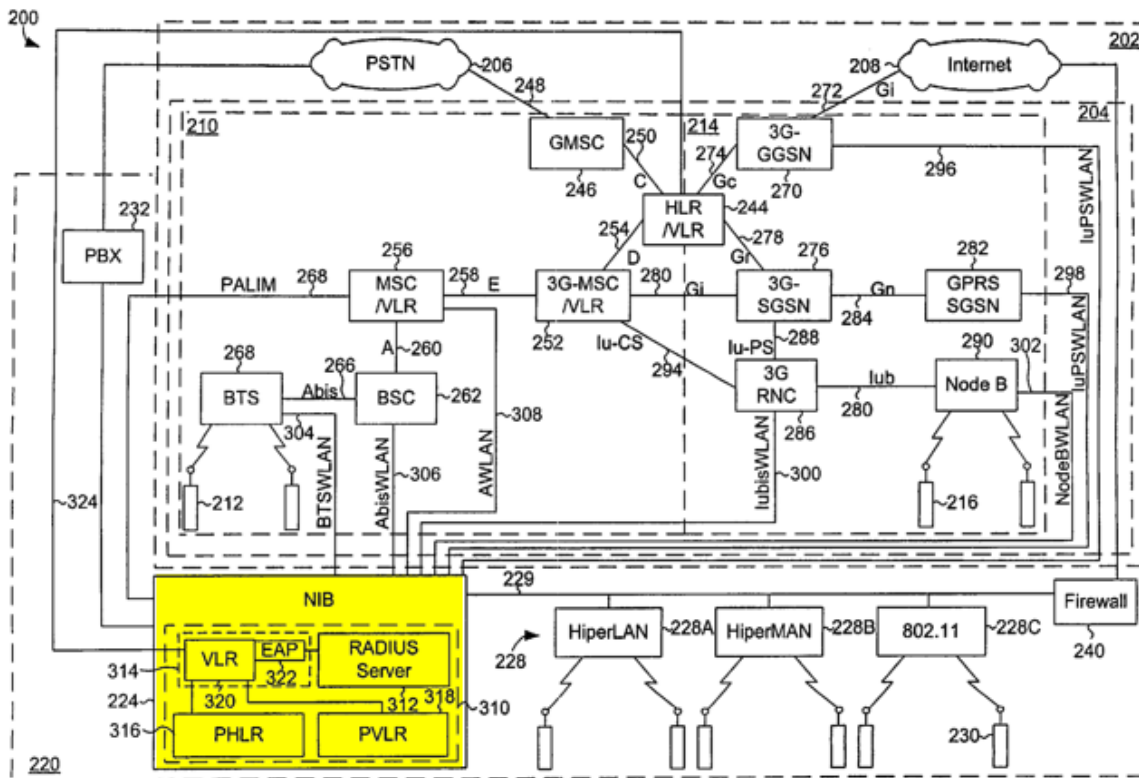
D. Ground 2: Waylett and Mauer Render Claims 11–16 and 21 Obvious

1. Claim 11

a. Preamble

Claim 11’s preamble recites “*A distributed mobile architecture (DMA) system.*”

To the extent the preamble is limiting, Waylett discloses this limitation. EX 1003, ¶ 166. 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); EX 1003, ¶ 167; *see also* EX 1006, Fig. 1B, 8:7–9. 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 Id.*, 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. This description mirrors how the ’414 patent describes a DMA system” EX 1003, ¶ 168; EX 1001, Fig. 3, 6:5–25. Accordingly, Waylett discloses a “[a] *distributed mobile architecture (DMA) system.*”

b. Housing

Waylett discloses that NNB 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 POSITA would have understood that a single enclosure is a housing. EX 1003, ¶¶ 169–171. Waylett thus teaches this limitation.

c. Base Transceiver Station

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 POSITA would have understood that a “BTS” mentioned in this sentence is a “base transceiver station.” EX 1003, ¶ 174; *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 1003, ¶ 174; 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

Waylett discloses “*a computer readable storage medium within the housing.*” The NIB includes multiple processors and plug-in-modules or cards that 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. *Id.*, 10:45-48. Moreover, a POSITA would have understood that processors necessarily include a “*computer readable storage medium*” to store the instructions operable on the processors. EX 1003, ¶ 177. Accordingly, such a person would have understood that including a “*computer readable storage medium*” in the housing would be inherent.

e. AAA Module

Waylett discloses “*an authentication, authorization, and accounting (AAA) module embedded within the computer readable storage medium.*” Specifically, 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:

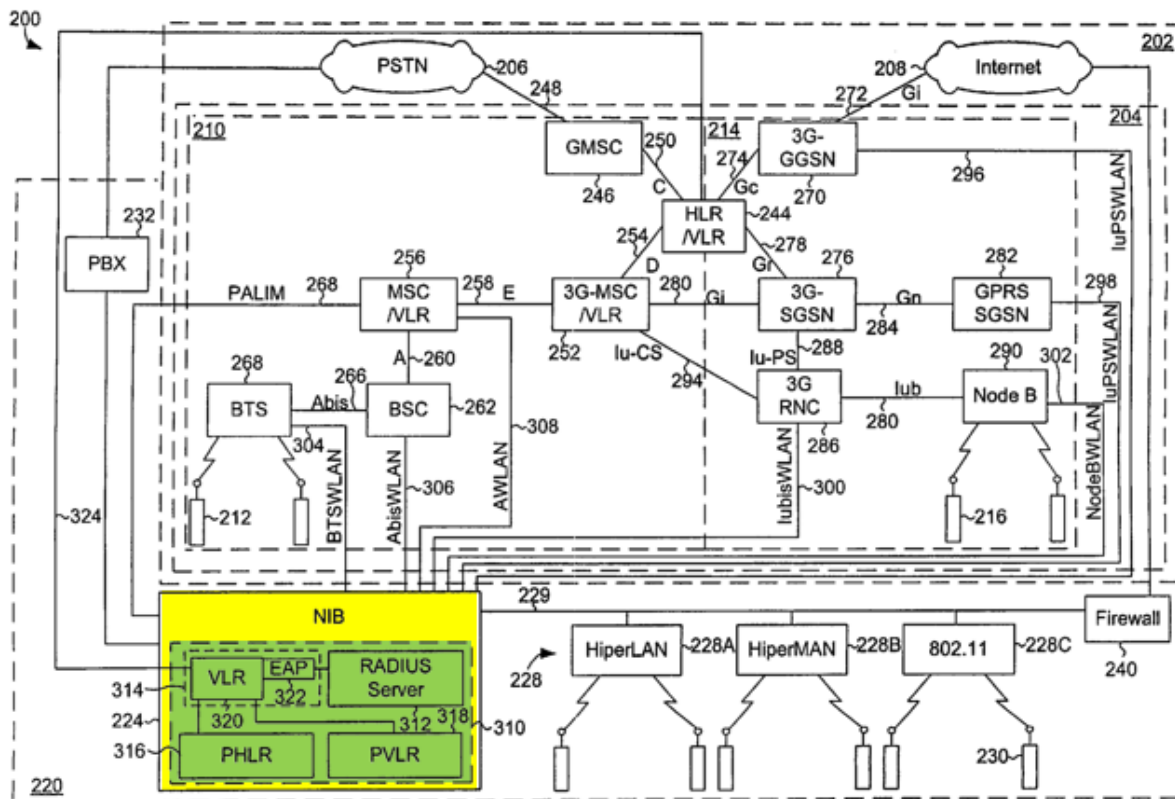


FIG. 6

EX 1006, Fig. 6 (annotated), EX 1003, ¶ 180. 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 POSITA would have recognized that RADIUS system 310 is a “*authentication, authorization, and accounting module*.” EX 1003, ¶¶ 178-180.

f. Home Location Register

Waylett discloses that the AAA module includes “a home location register (HLR) that stores information associated with one or more mobile subscriber devices that are registered with the DMA system.”

Figure 6 of Waylett discloses that the RADIUS system 310 includes a private home location registry (“PHLR”):

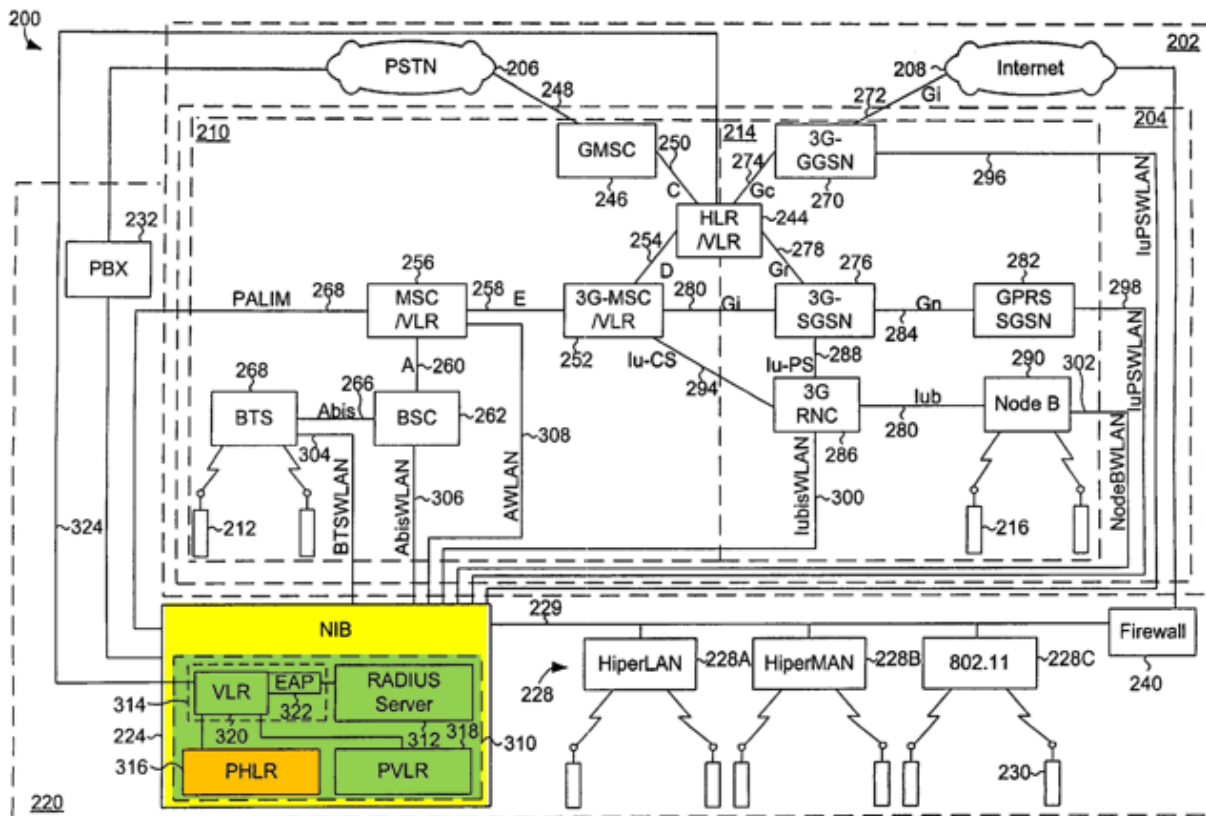


FIG. 6

EX 1006, Fig. 6 (annotated), EX 1003, ¶¶ 181-184. 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 POSITA 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.” EX 1003, ¶ 184.

g. Visitor Location Register

Waylett discloses that the AAA module includes “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.”

Figure 6 of Waylett discloses that the RADIUS system 310 includes a private home visitor location registry (“PVLR”):

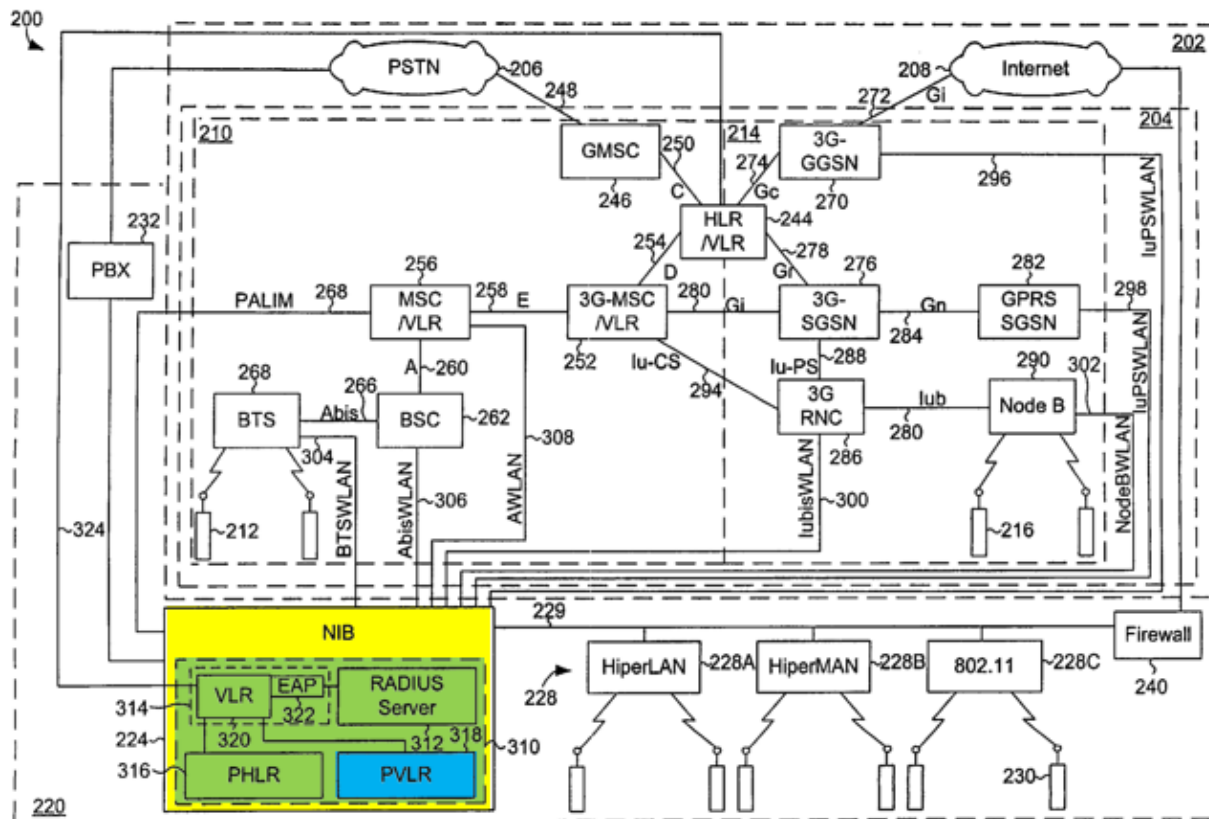


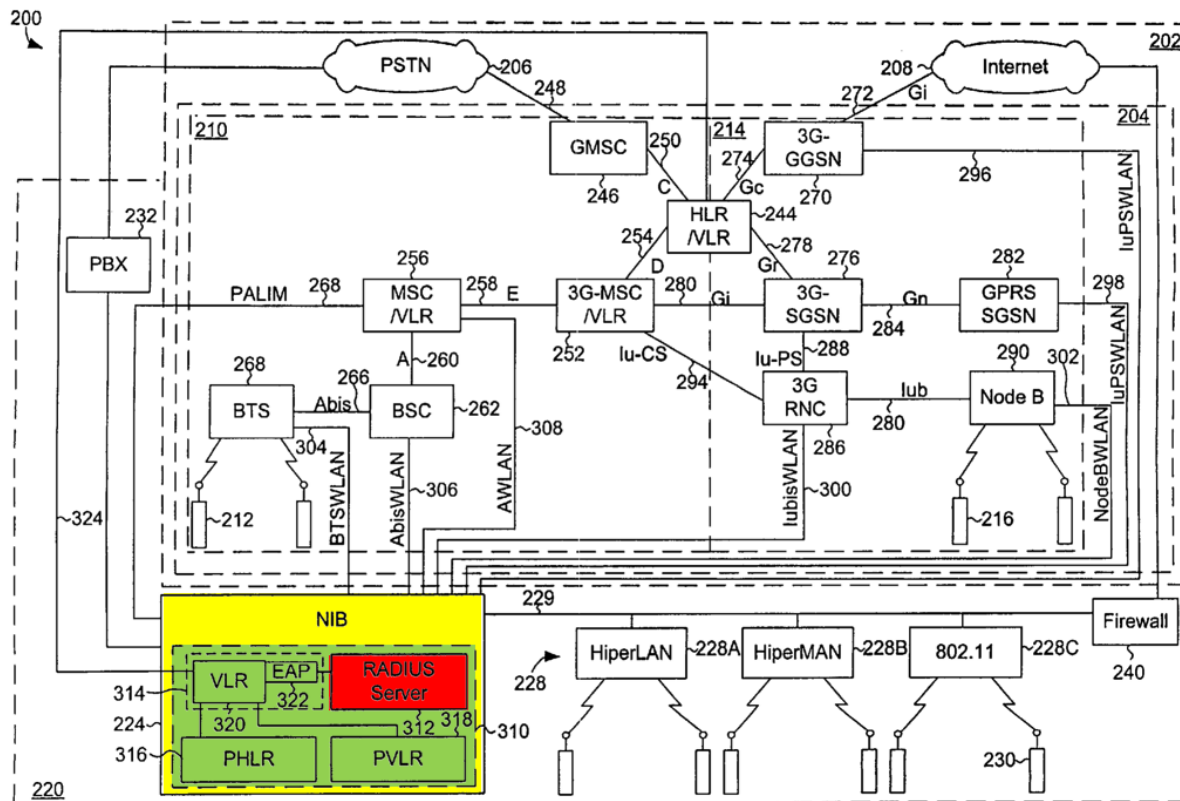
FIG. 6

EX 1006, Fig. 6 (annotated), EX 1003, ¶¶ 185-187. 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 POSITA 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.*” EX 1003, ¶ 187.

h. Community Location Register

Waylett discloses that the AAA module includes “*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.*”

Figure 6 of Waylett discloses a RADIUS system 310 includes a RADIUS Server 312:



66

A POSITA would have recognized that the IMSI 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”); EX 1003, ¶ 191. Waylett’s configuration tables (a “*community location register*”) store these subscriber identities along with their appropriate HLR. *Id.*, ¶ 191; EX 1006, 15:6-8. Consequently, Waylett’s configuration tables necessarily include “*information associate 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.D.1.f. EX 1003, ¶ 191.

A POSITA would have also recognized that, because RADIUS server 312 uses a “configuration table” and the RADIUS server is included in the NIB, the configuration table would be stored locally in the NIB. *See e.g.*, EX 1006, 13:67-14:1. Waylett teaches local storage. For example, Waylett discloses “a memory system ... coupled to the NIB 224” for storing subscriber identification and security information. *Id.*, 10:45-48. Accordingly, such a 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.*” EX 1003, ¶ 191.

i. Destination Preference Register

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.*”

As explained above, it would have been obvious to include Waylett’s NIB 224 in the wireless network architecture of Mauer’s Figure 1. *See* § V.B; EX 1003, ¶ 195. Such a POSITA would have also recognized that using Waylett’s NIB 224 in Mauer’s network architecture would satisfy a “*DMA network includes at 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*”). *Id.*, ¶ 195. 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. *Id.*, ¶ 195. Finally, and as explained above in § V.C.1.f, it would have been obvious to a POSITA to modify Waylett’s NIB 224 to use its configuration tables stored in each NIB, which satisfy 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.*” EX 1003, ¶ 195. Waylett thus renders this claim obvious.

j. Call Routing Component

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 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.*”

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 POSITA would have understood that call detail records for the RADIUS server 312 demonstrate that the NIB 224 routes voice calls. EX 1003, ¶ 198. Accordingly, a POSITA 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.*” *Id.*, ¶ 198.

As explained above, *see* § V.B, 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 shown above, it would have been 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.ii; EX 1003, ¶ 199. Such a modification would also include using Mauer’s method shown in Figure 2 in Waylett’s NIB 224. *See* § V.B; *Id.*, ¶ 199. 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:

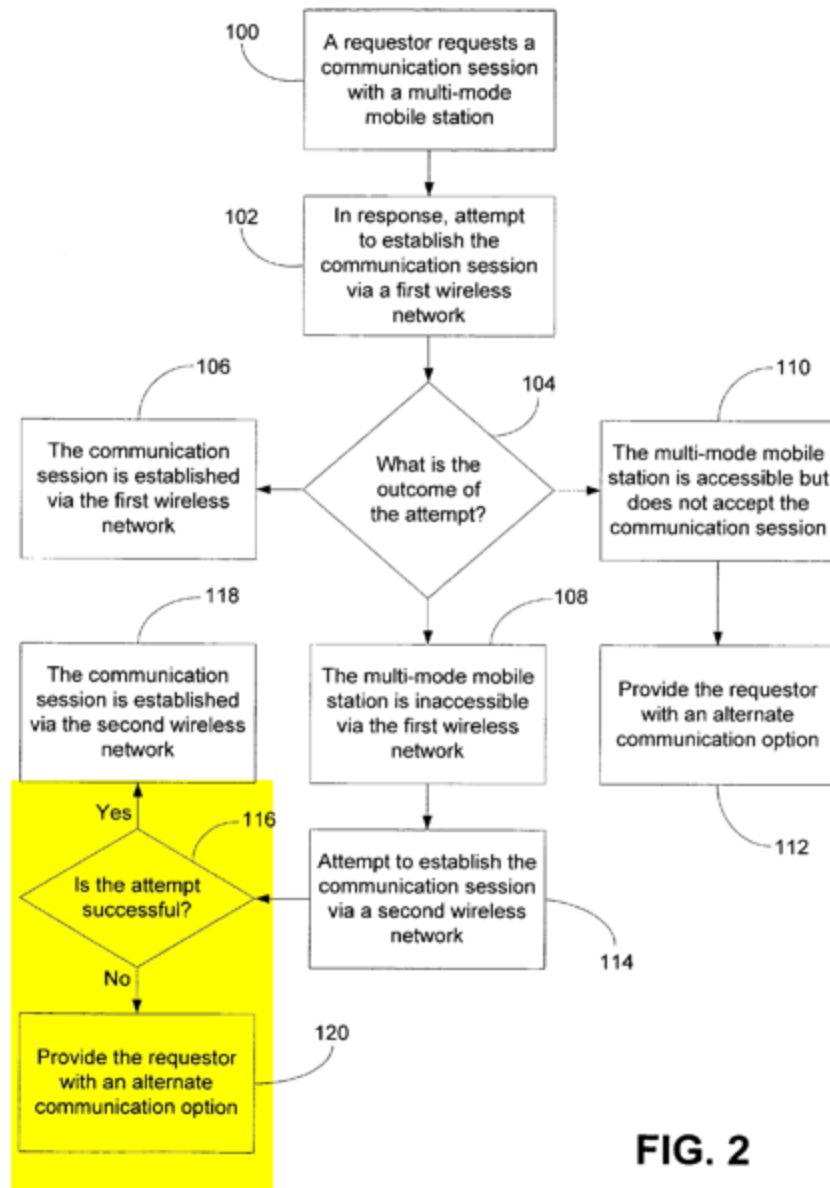
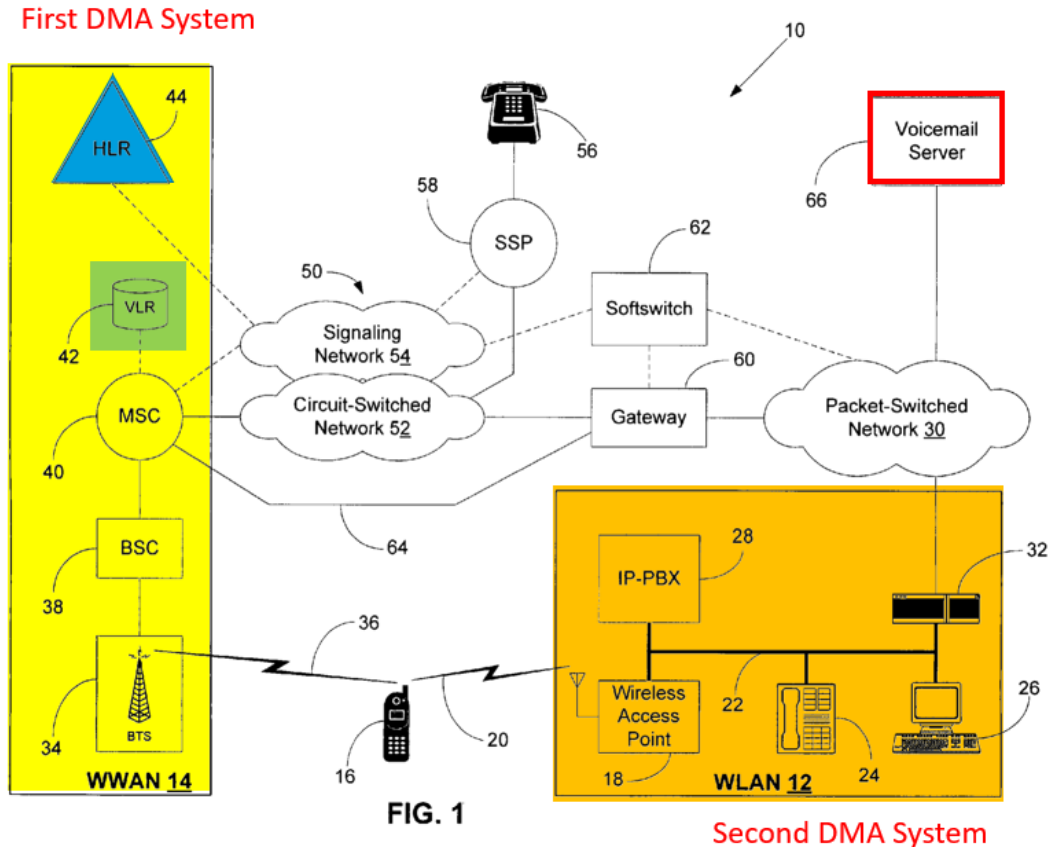


FIG. 2

EX 1005, Fig. 2 (annotated); EX 1003, ¶¶ 196-199. Mauer discloses several alternate communication options. *See* EX 1005, 10:59–64. A POSITA 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:



EX 1005, Fig. 2 (annotated); EX 1003, ¶ 201; *see* EX 1005, 8:25–34 10:59–64. 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*”). EX 1003, ¶ 202; *see* EX 1005, 9:32–55. Accordingly, Waylett’s NIB 224 as modified to work in the network of Mauer discloses this limitation. EX 1003, ¶¶ 196-202.

2. Claim 12

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.”

Waylett, as combined with Mauer, renders this limitation obvious. EX 1003, ¶¶ 203-207. Waylett’s NIB 224, as modified to be used 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. *Id.*, ¶ 205. 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 it is registered to. EX 1003, ¶ 205; EX 1006, 14:32-38 (“The 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. 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 help determine whether a mobile device is located inside or outside its registered area. EX 1003, ¶ 205.

Likewise, 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 1003, ¶ 206; 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. EX 1003, ¶ 206.

Therefore, a POSITA 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—that is, “*determin[ing] that the destination device is outside of the DMA network.*” EX 1003, ¶¶ 203-207.

3. Claim 13

Claim 13 depends on claim 11 and recites “*a mobile switching center (MSC) interface that provides communication access to a mobile telephone network.*” Waylett and Mauer render this limitation obvious. EX 1003, ¶¶ 206-210.

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, which is a mobile telephone network. EX 1003, ¶ 210; *see* EX 1005, Fig. 1., 6:15-21. Accordingly, a POSITA would have understood that Waylett’s NIB 224, as modified, discloses this limitation. EX 1003, ¶ 210.

4. Claim 14

Claim 14 depends on claim 11 and recites “*a Voice over Internet Protocol (VoIP) interface that provides communication access to a VoIP network.*” Waylett and Mauer render this limitation obvious. EX 1003, ¶¶ 211-214.

Mauer discloses using “voice in a packet-based format” and voice-over-packet (VOP) telephones.” EX 1005, 5:17-22; *see id.*, EX 1005, 3:12-14. Waylett likewise discloses facilitating VoIP communication using “a standard VoIP program.” EX 1006, 12:11-16. Based on these disclosures, a POSITA would have understood that Waylett’s NIB 224, as modified, may be connected to a voice-over-packet (VoP) telephone 24, thus meeting this limitation. EX 1003, ¶¶ 211-214.

5. Claim 15

Claim 15 depends on claim 11 and recites “*an Integrated Services Digital Network (ISDN) interface that provides communication access to an ISDN network.*” Waylett and Mauer renders this limitation obvious. EX 1003, ¶¶ 215-217.

Mauer discloses that “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. EX 1005, 6:25-37. Similarly, the ’414 patent describes that the ISDN interface as integrated with the PSTN interface and using the SS7 communications protocol for voice calls. EX 1003, ¶ 217; EX 1001, 6:25–37 (“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 . . . Inbound and outbound voice calls can be supported on the ISDN portion of the ISDN/PSTN interface 314.”). Because Waylett contemplates an ISDN/PSTN network, *see* EX 1006, Fig. 6, PTSN 206, 5:33–36, and Mauer’s network architecture includes such a network, a POSITA would have understood that Waylett’s NIB 224, as modified, would disclose this limitation. EX 1003, ¶ 217.

6. Claim 16

Claim 16 depends on claim 11 and 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.*” Waylett and Mauer render this limitation obvious. EX 1003, ¶¶ 218-220.

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 coupled

to a 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 POSITA 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*.” EX 1003, ¶¶ 218-220.

7. Claim 21

Claim 21 depends on claim 11 and recites “*a mobile switching center (MSC) module*,” “*a base station controller (BSC) module*,” “*and a call detail record (CDR) generation program*,” each of which “*embedded within the computer readable storage medium*” and “*the CDR generation program adapted to store a set of call detail records*.” Waylett and Mauer render this limitation obvious. EX 1003, ¶¶ 221-223.

Waylett discloses “*a mobile switching center (MSC) module*” and “*a base station controller (BSC) module*.” Specifically, 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 POSITA would have understood that Waylett’s NIB 224 includes these modules on its computer readable storage medium. EX 1003, ¶ 223, *see* § V.D.1.d; EX 1003, ¶ 223. Waylett thus discloses the claimed MSC and BSC “*modules.*” *Id.*

Waylett also 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 POSITA would have understood that the RADIUS server 312, along with its call detail records, satisfies the claimed “*a call detail record (CDR) generation program.*” EX 1003, ¶ 223. Thus, Waylett discloses this limitation. *Id.*, ¶¶ 221-223.

E. No Secondary Considerations Exist

As described above, the combination of Mauer and Waylett renders the challenged claims of the ’414 patent obvious. No secondary indicia of non-obviousness exist. Petitioners reserve their right to respond to any secondary considerations argument advanced by Patent Owner.

VI. The Parallel District Court Case Does Not Warrant Denying Institution

Under the Director’s interim procedure for evaluating requests for discretionary denial under 35 U.S.C. §314(a), regardless of any factors that otherwise apply, “the PTAB will not discretionarily deny institution of an IPR or PGR and parallel district court litigation where a petitioner stipulates not to pursue

in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition.” *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation*, 7 (USPTO Dir. June 21, 2022).

Petitioners stipulate that, should the Board institute review, Petitioners will not pursue in parallel district court proceedings the same grounds as in the Petition or any grounds that could have reasonably been raised in the Petition. Thus, the Board should not exercise discretion to deny institution under §314(a).

VII. Mandatory Notices

A. Real Parties-in-Interest

The named Petitioners are the only entities who are funding and controlling this Petition and are therefore all named as real parties-in-interest. No other entity is funding, controlling, or otherwise has an opportunity to control or direct this Petition or Petitioners’ participation in any resulting IPR.

B. Related Proceedings

No previous IPR or post-grant proceeding has been filed challenging the ’414 Patent. The ’414 Patent has been asserted by Patent Owner in the following district court litigation: *Lemko Corporation v Microsoft Corporation*, No. 3-22-cv-00363 (N.D. Tex.).

C. Lead and Backup Counsel

Petitioners’ lead and backup counsel are:

Lead Counsel for Petitioner	Backup Counsel for Petitioner
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D. Electronic Service

Petitioners consent to electronic service at:

EMAIL ADDRESS: Winston-MSFT-Lemko-IPR@winston.com.

VIII. Fees

The required fee is being paid electronically through P-TACTS.

IX. Conclusion

Petitioners respectfully request that the Board institute IPR and enter a final written decision finding the challenged claims unpatentable.

Dated: February 15, 2023

Respectfully submitted,

/ Matthew Hopkins /
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CERTIFICATE OF COMPLIANCE

This Petition complies with the word count limits set forth in 37 C.F.R. § 42.24(a)(1)(i), because this Petition contains 13,994 words, excluding the parts of the Petition exempted by 37 C.F.R. § 42.24(a)(1) and determined using the word count provided by Microsoft Word, which was used to prepare this Petition.

Dated: February 15, 2023

Respectfully submitted,

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CERTIFICATE OF SERVICE

Under 37 C.F.R. §§ 42.6(e) and 42.105(a), this is to certify that on February 15, 2023, I caused to be served a true and correct copy of the foregoing “**PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 7,653,414**” and Exhibits 1001-1018 by Federal Express on the Patent Owner at the correspondence address of record for U.S. Patent No. 7,653,414:

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

A courtesy copy of this Petition and supporting material was also served on litigation counsel for Patent Owner via email:

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