

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

**SAMSUNG ELECTRONICS CO., LTD., and
SAMSUNG ELECTRONICS AMERICA, INC.,**

Petitioners,

v.

VASU HOLDINGS, LLC,

Patent Owner.

Case IPR2025-00446
Patent No. 8,886,181

PETITION FOR *INTER PARTES* REVIEW

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EXHIBIT LIST

Exhibit No.	DESCRIPTION
1001	U.S. Patent No. 8,886,181 (“’181”)
1002	File History of U.S. Application No. 13/240,776 (“’181FH”)
1003	Declaration of Mark Lanning (“Lanning”)
1004	U.S. Patent App. Pub. 2005/0282541 (“Iizuka”)
1005	U.S. Patent App. Pub. 2002/0126654 (“Preston”)
1006	U.S. Patent App. Pub. 2003/0177267 (“Orava”)
1007	U.S. Patent App. Pub. 2004/0192211 (“Gallagher”)
1008	U.S. Provisional App. No. 60/534,466 (“’466-Prov”)
1009	U.S. Provisional App. No. 60/643,829 (“’829-Prov”)
1010	U.S. Patent App. No. 11/031,498 (“’498-CIP”)
1011	<i>Reserved</i>
1012	U.S. Patent Pub. 2007/0146475 (“Inoue”)
1013	<i>Reserved</i>
1014	Docket Control Order (Dkt. No. 28), <i>Vasu Holdings, LLC v. Samsung Electronics Co., Ltd.</i> , No. 2:24-cv-00034-JRG-RSP (E.D. Tex.)
1015	Appendix B-1 to Plaintiff Vasu Holdings, LLC’s Disclosure of Asserted Claims and Preliminary Infringement Contentions Under Patent Local Rules 3-1 and 3-2 (May 15, 2024)
1016	Jim Zyren, Intersil Corporation, “IEEE 802.11g Explained” (2001), available at https://www.3g4g.co.uk/Other/WiLan/802_11g/WP_IEEE802gExpla_12_06.pdf

Exhibit No.	DESCRIPTION
1017	Guide to IEEE 802.11 Wireless LAN Standards, EE Times (May 23, 2003), available at https://www.eetimes.com/guide-to-ieee-802-11-wireless-lan-standards/
1018	U.S. Patent No. 6,304,560 (“Archambaud”)
1019	Plaintiff Vasu Holdings, LLC’s Objections and Responses to Defendants Samsung Electronics Co., Ltd, and Samsung Electronics America, Inc.’s First Set of Interrogatories (Nos. 1-25)
1020	Plaintiff Vasu Holdings, LLC’s Supplemental Objections and Responses to Defendants Samsung Electronics Co., Ltd, and Samsung Electronics America, Inc.’s Interrogatories (Nos. 1-5, 8, 9, 13-15, 19-22, 25)
1021	Plaintiff Vasu Holdings, LLC’s Objections and Responses to Defendants Samsung Electronics Co., Ltd, and Samsung Electronics America, Inc.’s Second Set of Interrogatories (No. 26)
1022	U.S. Patent No. 7,359,979 (“Gentle”)
1023	Declaration of Jonathan Bradford

TABLE OF ABBREVIATIONS

Abbreviation	DESCRIPTION
'181	U.S. Patent No. 8,886,181 (“’181”) (Ex. 1001)
'181FH	File History of U.S. Application No. 13/240,776 (Ex. 1002)
Claims / Challenged Claims	Claims 1-4, 8, and 9 of the '181
IPR	<i>Inter Partes</i> Review
Petitioners	Petitioners Samsung Electronics Co. Ltd. and Samsung Electronics America Inc.
PO	Patent Owner
POSITA	Person of Ordinary Skill in the Art
PTAB	Patent Trial and Appeal Board
USPTO	United States Patent and Trademark Office

LIST OF CHALLENGED CLAIMS

[1.pre] A method of providing communications for a mobile communication device that roams between multiple different types of wireless networks, the method comprising:

[1.a] establishing a first communication link between the mobile communication device and an end destination device, wherein the first communication link includes a first wireless communication link between the mobile communication device and a first type of wireless network;

[1.b] monitoring a signal strength of the first wireless communication link;

[1.c] when the signal strength drops below a predetermined threshold, notifying an interface server with the mobile communication device and establishing a second communication link between the interface server and the end destination device without disrupting the first communication link;

[1.d] notifying the mobile communication device to terminate transmission over the first communication link; and

[1.e] re-directing the second communication link from the interface server to the mobile communication device, thereby establishing a second wireless communication link between the mobile communication device and the second type of wireless network.

[2] The method of claim 1 wherein the first type of wireless communication link comprises a IEEE 802.11 standard based communication link, and the first type of wireless network includes a IEEE 802.11 standard based network access point.

[3] The method of claim 2 wherein the second type of wireless network includes a wireless cellular network.

[4] The method of claim 1 wherein establishing the first communication link includes routing through a voice over internet protocol network.

[8] The method of claim 1 further comprising providing a connectivity status by the mobile communication device to the interface server while the mobile communication device is within a first coverage area of the first type of wireless network.

[9] The method of claim 8 further comprising providing a routing association to a mobile switching center within the second type of wireless network, wherein the routing association associates the mobile communication device to the interface server.

Pursuant to §§311-319 and §42.1,¹ Samsung Electronics Co. Ltd. and Samsung Electronics America Inc. (“Petitioners”) respectfully petition for *inter partes* review of claims 1-4, 8, and 9 (“Claims”) of U.S. Patent No. 8,886,181 (Ex. 1001, “’181”). There is a reasonable likelihood—and it is highly likely—that at least one challenged claim is unpatentable as explained herein. Petitioners request review of the Claims and judgment finding them unpatentable under §103.

I. INTRODUCTION

The ’181’s purported invention is a method for a mobile communication device to roam between different types of wireless networks (e.g., from a WiFi network to a cellular network) without disrupting an in-progress phone call by using an “interface server” (or “nomadic server”) to facilitate switching between the networks. ’181, 2:49-63, 6:6-12, 6:39-42, 14:62-15:18. The signal strength of the in-progress call is monitored until it drops below a predetermined threshold at which point a second communication link is established. *Id.*, 3:7-22, 10:27-38. The allegedly inventive concept that led to allowance of the claims was establishing the

¹ Section cites are to 35 U.S.C. or 37 C.F.R. as context indicates. All emphasis/annotations added unless noted. Figure annotations herein generally quote the Claims for reference. Citations herein are exemplary and not meant to be limiting.

second communication link “without disrupting the first communication link,” which allows the mobile device to roam between different network types during a call. *Id.*, 1:42-54; Ex. 1002 (’181FH), 577, 620.

But methods for roaming between multiple different types of wireless networks during an ongoing call, and using an interface server, were already well known in the art. For example, **Iizuka** (Ex. 1004) discloses a method that enables a mobile terminal to roam between different types of networks, such as between a wireless local area network (LAN) and a wireless telephone network. In **Iizuka’s** method, when the signal strength “deviates from a predetermined criterion,” the mobile terminal notifies a call-management server by “originat[ing] a call to switching processing unit 212 in the call-management server.” Iizuka, [0159]-[0160]. The call-management server then establishes a voice call through the mobile telephone network as a second communication link while the VoIP call “still continues.” *Id.*, [0160]-[0162], [0170]-[0175].

Accordingly, Petitioners request that the Board institute trial and find the Claims unpatentable.

II. MANDATORY NOTICES UNDER 37 C.F.R. §42.8

A. Real Party-in-Interest

Petitioners Samsung Electronics Co. Ltd. and Samsung Electronics America, Inc. are the real parties-in-interest. No other party had access to or control over the

present Petition, and no other party funded or participated in preparation of the present Petition.

B. Related Matters

The '181 is the subject of the following co-pending civil action:

Vasu Holdings, LLC v. Samsung Electronics Co., Ltd. et al, 2-24-cv-00034
(EDTX) filed Jan. 22, 2024 (“Texas Case”).

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Petitioners consent to electronic service of documents to the email addresses of the counsel identified above.

III. PAYMENT OF FEES

The undersigned authorizes the Office to charge the fee required by §42.15(a) and any additional fees that might be due to Deposit Account No. 18-1945, under Order No. 110797-0055-651.

IV. REQUIREMENTS FOR *INTER PARTES* REVIEW

A. Grounds for Standing

Pursuant to §42.104(a), Petitioners certify the '181 is available for IPR. Petitioners and any real parties-in-interest are not barred or estopped from requesting IPR challenging the Claims on the grounds identified herein.

B. Identification of Challenge

Pursuant to §§42.104(b) and (b)(1), Petitioners request IPR of the Claims and that the Board cancel the same as unpatentable.

1. The Specific Art on Which the Challenge Is Based

Petitioners rely upon the following art (Lanning ¶63):

Name	Ex.	Publication	Filed	Published/ Issued	Prior art under at least
Iizuka	1004	US2005/0282541	12/6/2004	12/22/2005	§§102(a)/ 102(e)
Preston	1005	US2002/0126654	3/8/2001	9/12/2002	§102(b)
Orava	1006	US2003/0177267	12/5/2002	9/18/2003	§102(b)
Gallagher	1007	US2004/0192211	9/20/2002	9/30/2004	§102(b)

Each of the above references is prior art to the Claims based on the 1/11/2006 filing date of App. No. 11/330,675 listed in the '181's priority claim.² Moreover, even if the Claims were entitled to the benefit of the '829-Prov (filed 1/14/2005) and/or the '498-CIP (filed 1/6/2005), all of the above references are still prior art. Lanning ¶¶5, 8.

2. Statutory Grounds on Which the Challenge Is Based

Ground	Claim(s)	Basis	References
1	1, 4, 8	§103	Iizuka
2	1, 4, 8	§103	Iizuka in view of Preston
3-4	2, 3	§103	Iizuka in view of Orava (and optionally in view of Preston)
5-6	9	§103	Iizuka in view of Gallagher (and optionally in view of Preston)

V. '181 PATENT AND PROSECUTION HISTORY

A. '181

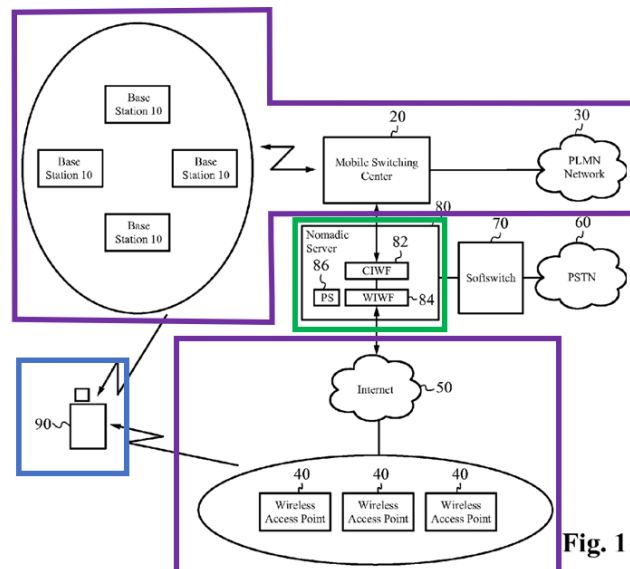
The purported “invention” of the '181 relates to an “**interface server**,” referred to as a **nomadic server**, and a related system that provides seamless roaming of a

² As discussed in §V.C, the Claims are not entitled to the benefit of at least the '466-Prov, '829-Prov, and '498-CIP filing dates. The only other priority claims are to App. No. 13/240,776, filed 9/22/2011, and App. No. 11/330,675, filed 1/11/2006.

mobile communication device between different types of wireless networks.”

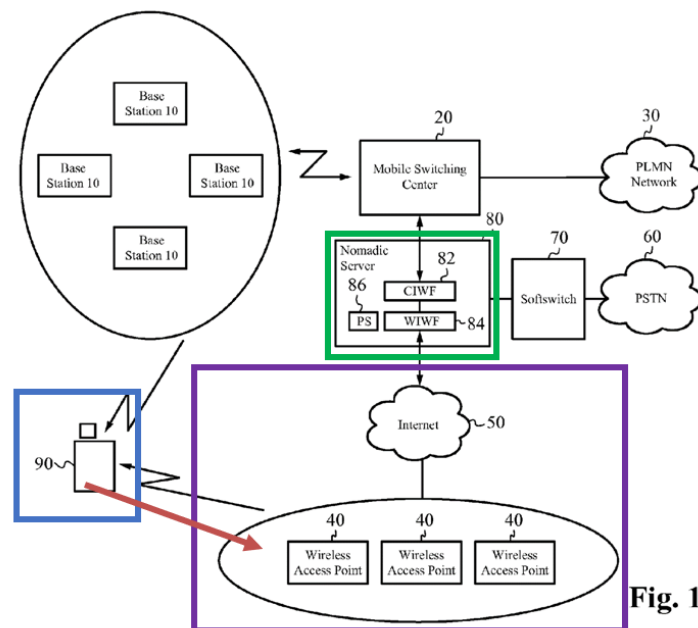
’181, 2:49-52. The ’181 purports to solve the problem that most telephones are allegedly “restricted for use with only one specific network.” *Id.*, 1:42-43. Lanning ¶40.

More specifically, the ’181 describes a method using a nomadic server 80 that is coupled to a system of different networks, including a cellular network (including mobile switching center 20, public land mobile network 30, and base stations 10) and wireless IP network (including access points 40 coupled to internet 50), and a mobile communication device 90 that “provides VoIP client functionality over a WiFi network and GSM/CDMA mobile telephony functionality over a cellular network.” *Id.*, 6:6-12, 6:29-31, 6:39-42, Figs. 1, 2. Lanning ¶41.

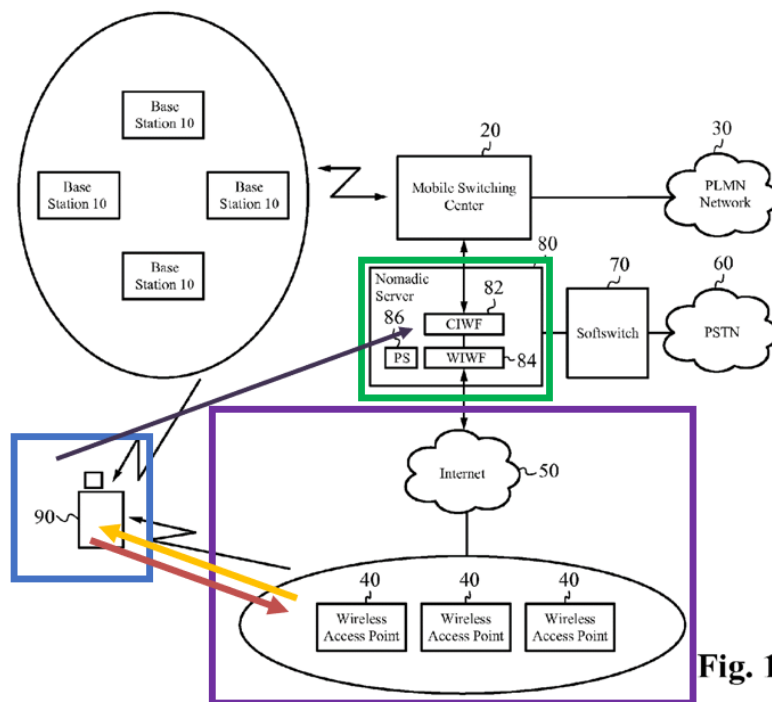


The only two embodiments of the '181 that discuss “redirecting”—a concept recited in the Claims—are the “second scenario” and “third scenario,” which are nearly identical to each other, with the main difference being whether the initial call is over a VoIP network or involves a back end over a cellular network. *Id.*, 10:10-11:58. Both embodiments involve roaming from WiFi coverage to non-WiFi coverage. *Id.* This overview will focus on the “second scenario,” with annotated Figure 1 below. Lanning ¶42.

In the second scenario, when the **mobile communication device** makes a call over a VoIP network within a first WiFi coverage area, a “**WiFi communication link**” is established between the mobile communication device and a first wireless access point associated with the first WiFi coverage area.” *Id.*, 10:10-21. The device also registers with the **nomadic server**. *Id.*, 10:21-24. Lanning ¶43.



The “mobile communication device monitors a signal strength ... of the WiFi communication link” so that when it “drops below a predetermined threshold, the mobile communication device registers with the nearest mobile switching center.” *Id.*, 10:27-33. Thus, even before a second call is established, the mobile communication device is already in communication with the mobile switching center of the cellular network (this is as expected—the mobile communication device would need to be connected to the cellular network to know whether a switch is possible). In other embodiments, the mobile communication device also “notifies the nomadic server.” *Id.*, 8:55-59. The ’181 does not specify or limit the communication path of this notification. Lanning ¶44.



The **mobile communication device** makes a request to setup a second call with the same end destination as the first call, and in response a “second call is setup by the home mobile switching center, and the second call is routed to the CIWF block within the home **nomadic server**.” *Id.*, 10:33-38. The CIWF block of the nomadic server is a cellular inter-working function block which is connected to the mobile switching center of the cellular network. *Id.*, 7:27-31, Fig. 1. The home mobile switching center sends a message to the mobile communication device, and in response “the mobile communication device stops media streaming over the WiFi communication link and powers down the WiFi part.” *Id.*, 10:40-48. Next, “[m]edia streaming associated with the first call is then **redirected to the [cellular inter-working function] block [of the nomadic server], where the media is then switched over to the home mobile switching center**.” *Id.*, 10:53-56. After this step, “media associated with the first call is now associated with the second call, where the media is now streamed from the VoIP network to the [WiFi inter-working function] block to the [cellular inter-working function] block to the home mobile switching center to the mobile communication device.” *Id.*, 10:56-60. Lanning ¶45.

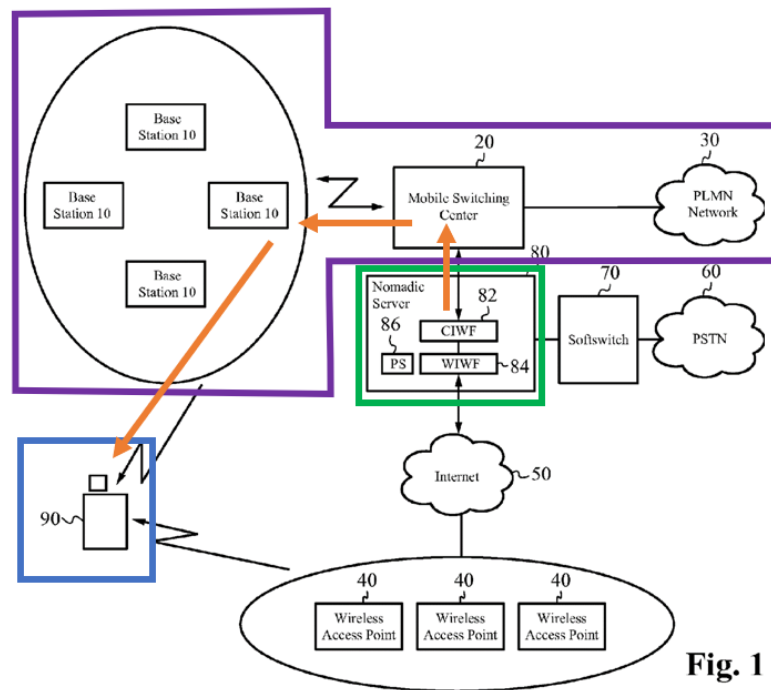


Fig. 1

B. Prosecution History

The '181 patent issued from U.S. Pat. App. No. 13/240,776 ("'181 Application"), filed 9/22/2011.

During prosecution of the '181, the Examiner issued a series of Office Actions rejecting the claims under pre-AIA §103(a) based on various references. See *generally* '181FH, 376-521.

On 4/27/2013, the Examiner issued a final Office Action again rejecting all pending claims under §103(a). *Id.*, 535-46. On 9/17/2013, Applicant filed a Request for Continued Examination and amended independent claims 1, 14, and 38. *Id.*, 577-80, 600-01. Claim 1 was amended to recite a second communication link would be established "without disrupting the first communication link." *Id.*, 577. Claims 14

and 18 (claims that Applicant eventually cancelled) were also amended. *Id.*, 581. Lanning ¶¶46-48.

On 11/15/2013, the Examiner allowed claims 1-13 and rejected claims 14-18 and 38. '181FH, 608. The Examiner pointed to Applicant's 9/17/2013 amendments and arguments with respect to independent claim 1 as a reason for allowance for claims 1-13. *Id.*, 620. Thus, these claims were allowed because the prior art of record allegedly did not teach that a second communication link would be established "without disrupting the first communication link." Lanning ¶49.

There was further prosecution on claims 14-18 and 38 before those claims were ultimately cancelled by the Applicant. '181FH, 690. The Examiner then issued a Notice of Allowance on 7/10/2014 for the previously allowed claims. *Id.*, 696. Lanning ¶50.

C. Priority Date of the Claims

The Claims are not entitled to the 2004 and 2005 filing dates of their two provisional applications (Nos. 60/534,466 ("'466-Prov," Ex. 1008) and 60/643,829 ("'829-Prov," Ex. 1009)), or the 2005 filing date of the continuation-in-part application (No. 11/031,498, now U.S. Patent No. 7,991,399 ("'498-CIP," Ex. 1010)) because each fails to provide written description support for at least the following limitations: (a) "notifying an interface server with the mobile communication device," (b) "establishing a second communication link between the

interface server and the end destination device without disrupting the first communication link,” and (c) “re-directing the second communication link from the interface server to the mobile communication device.” Lanning ¶¶51.

In addition to failing to discuss the above notifying, establishing, and re-directing steps involving an interface server, the applications also fail to disclose an “interface server”:

First, ’466-Prov’s disclosure is limited to subcomponents internal to a mobile communication device, a “radiotelephone.” *See* Ex. 1008 (’466-Prov), 2:2-5:20; Lanning ¶¶52-53.

Second, ’829-Prov does not use the terms “server,” “interface server,” or “nomadic server,” and while it references an “interface,” there is no discussion of the “interface” being used for the above-listed notifying, establishing, or re-directing steps—in fact, those steps are not discussed at all. The ’829-Prov broadly defines “interface” as “any device, system or part thereof that interacts between one unit and the other unit” and states it that can implemented “hardware, firmware or software, or some combination of at least two.” Ex. 1009 (’829-Prov), [0008]. The term appears again only in the description of Figure 1, where it is again used merely to describe standard interfaces between components. Ex. 1009 (’829-Prov), [0011]. For instance, a controller connected to a CELL Telephone Network includes a “‘Cellular Network’ hardware and software interface” and an entirely separate

controller connected to a VOIP Telephone Network has a “‘VOIP Network’ hardware and software interface.” Ex. 1009 (’829-Prov), [0011]. Any such controller is not the ’181’s “interface server” (or “nomadic server”) that connects to multiple network types. ’181, 6:6-9, Fig. 1; Lanning ¶54. Likewise, the various “interfaces” shown as arrows in Fig. 1 of the ’829-Prov are merely connections between various components and are not an “interface server.” Ex. 1009 (’829-Prov), [0011], Fig 1; Lanning ¶54.

Lastly, ’498-CIP does not refer to a “server,” “interface server,” or “nomadic server,” and while it refers generally to network components, such as an “access point” (Ex. 1010 (’498-CIP), [0005]), a POSITA would not have understood this network component, or any other component disclosed, to be the ’181’s interface server that connects to multiple network types. ’181, 6:6-9, Fig. 1; Lanning ¶55.

VI. §325(d) AND §314(a) DISCRETION DOES NOT APPLY

A. §325(d)

There is no basis for discretionary denial under §325(d). The references relied upon in this Petition—**Iizuka**, **Orava**, and **Gallagher**—were not cited in an IDS or otherwise identified by the Examiner, or applied to reject claims during ’181’s prosecution. The Examiner also never considered the testimony of Petitioners’ expert Mark Lanning (Ex. 1003) regarding the scope and content of these documents. Lanning ¶¶1-166. The presented grounds are not cumulative of any prior

art previously considered, and are not the same or substantially the same as prior art or arguments previously considered. Indeed, the references describe the claimed features the Examiner found missing from the prior art during prosecution. *See* §IX.

B. §314(a)

The Texas Case also does not warrant the exercise of discretion under §314(a) based on the *Fintiv* factors.

1: Following institution, Petitioners intend to seek a stay of the Texas Case pending the outcome of this IPR, along with other IPRs collectively challenging all asserted claims.

2-3: The Texas Case trial is currently set for 11/3/2025 (Ex. 1014), more than three months after the deadline for institution. The Texas Case is in its early stages; the court has not issued any substantive orders related to the validity of the '181, and the parties have only just begun the claim construction process. Samsung has diligently prepared and filed these IPRs.

4: The Texas Case will involve multiple grounds of invalidity not at issue here, enabling the court to focus its limited trial time on different invalidity defenses, if the suit is not stayed.

5: The litigation and PTAB parties are the same.

6: The merits of this Petition are compelling as shown herein. For example, **Iizuka** discloses or renders obvious every element of independent claim 1 of the

'181.

VII. LEVEL OF ORDINARY SKILL IN THE ART

For purposes of this Petition only, Petitioners assume the Claims are entitled to the benefit of the 1/6/2006 filing date of App. No. 11/330,675 listed in the '181's priority claim. As discussed in §V.C, the Claims are not entitled to the benefit of at least the '466-Prov, '829-Prov, and '498-CIP filing dates.

On or before 1/6/2006, a POSITA would have had a Bachelor's degree in electrical engineering, computer engineering, computer science, or the equivalent thereof, and approximately two years of professional experience working with networking and wireless communications systems. Additional education could substitute for professional experience, or vice-versa. Lanning ¶¶56-59.

VIII. CLAIM CONSTRUCTION

Claim terms subject to IPR are to be construed according to the *Phillips* standard applied in district court. §42.100(b). Petitioners apply the plain and ordinary meanings of terms. Lanning ¶¶60-61. Only terms necessary to resolve the controversy must be construed. *Nidec Motor v. Zhongshan Broad Ocean Motor*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

IX. GROUNDS OF UNPATENTABILITY

Although the '181 purports to have invented a method for a mobile communication device to switch between different types of wireless networks using

an interface server and setting up a second communication link without disrupting the first communication link, such a method was already known. Lanning ¶¶37-39, 62-67. For example, **Iizuka** describes a method for a mobile terminal to roam between a wireless LAN and a wireless telephone network using a call-management server that establishes a voice call through the mobile telephone network while the VoIP call “still continues.” In addition, **Orava** and **Gallagher** teach features relating certain challenged dependent claims. As demonstrated below, the prior art renders the Claims unpatentable. Lanning ¶¶37-39, 62-152.

A. Ground 1: Iizuka (Claims 1, 4, and 8)

1. Overview of Iizuka

Iizuka discloses a method that enables a **mobile terminal** to roam between **different types of networks**, such as between a **wireless local area network (LAN)** and a **wireless telephone network**. Iizuka, [0014], [0057]. Like the '181, **Iizuka** recognizes the problem of “dynamically switch[ing]” between the different types of networks “so as to smoothly continue a call.” *Id.* [0010]. **Iizuka** addresses this by providing “a mobile terminal, a program for controlling a mobile terminal, a program for a call-management server, and a call-management process for performing wireless communication,” which enable a continuous wireless call by “dynamically switching between [a] plurality of communication mediums during a call.” *Id.* [0014]. Lanning ¶68.

Figures 1 and 2 of **Iizuka**, annotated below, illustrate an exemplary system with a **mobile terminal** connected to a **call-management server 200**, which functions as an interface server, through **wireless LAN 3** (via wireless LAN access point 23) and **mobile telephone network 10**. *Id.* [0057]-[0059], Figs. 1-2. The **mobile terminal** makes a call to a **telephone** (e.g., **IP telephone 21**) through one of the networks, for example through the **wireless LAN**. *Id.* [0061]-[0062]. When the quality of the call “deteriorates and deviates from a predetermined criterion during a call through the wireless LAN, the call is switched from a connection through the wireless LAN to a connection through a **wireless telephone network**.” *Id.* [0212]. This allows the system to “dynamically switch the call between a connection through the wireless LAN and a connection through the wireless telephone network.” *Id.* Lanning ¶69.

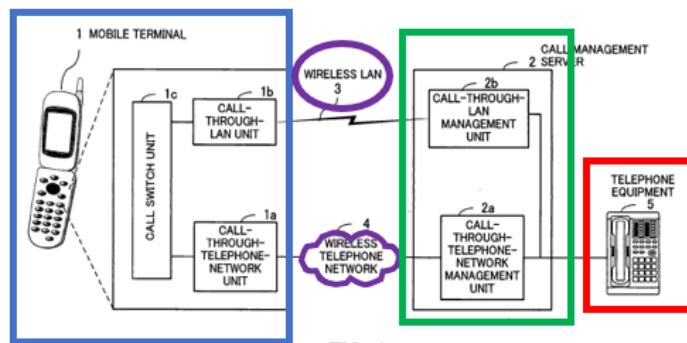
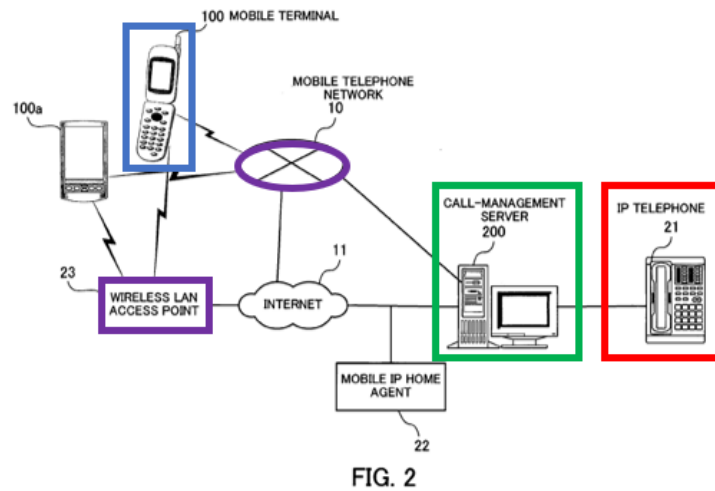


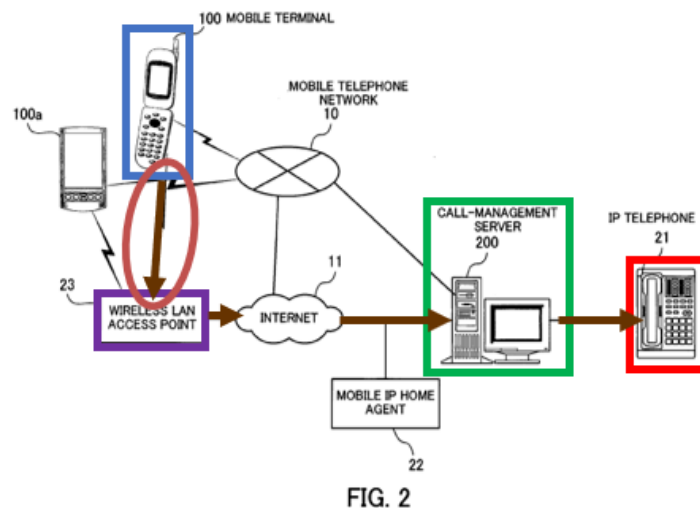
FIG. 1



Iizuka describes in detail the process of switching a call from a wireless LAN to a wireless telephone network.³ **Iizuka's** **mobile terminal** makes a call to **IP**

³ **Iizuka** describes the same switching embodiment in connection with Figure 13, which illustrates functional units of the mobile terminal and call-management server, and Figure 14, which illustrates a sequence diagram for the switching process. Iizuka, [0033]-[0034], [0157]-[0162], [0163]-[0176]; Lanning ¶70. Accordingly, this Petition includes parallel citations to the relevant disclosures for both Figures 13 and 14. To the extent it is argued that these figures pertain to different embodiments, it would have been obvious to a POSITA to use the disclosures of both together because they describe compatible teachings for **Iizuka's** process of “switching (roaming) from a VoIP call to a voice call through the mobile telephone network.” Iizuka, [0033]-[0034]; Lanning ¶70.

telephone 21 (i.e., a **first communication link**), which can be a Voice over Internet Protocol (IP) (VoIP) call made “through the **wireless LAN**” which is connected to the internet. *Id.*, [0039], [0061]-[0062], [0109], [0204], Fig. 13; *see also* Iizuka, [0158], [0169]. Thus, the process establishes “wireless communication” (i.e., **first wireless communication link**) between the **mobile terminal** and the **wireless LAN** (via the **wireless LAN access point**). *Id.*, [0061], [0064], Fig. 14 (arrow labelled “S76”); *see also* Iizuka, [0158], [0169]. Lanning ¶¶70-71.



Iizuka’s **mobile terminal** includes a **medium monitor unit 117** that “monitors the conditions of the network mediums,” including **monitoring the “intensity of a radio wave”** received from the wireless LAN access point (i.e., the **first wireless communication link**). *Id.*, [0045], [0078], [0105], Fig. 4. During the call, these conditions such as the intensity of the radio wave are monitored to determine “when the condition of the communication deviates from a predetermined

criterion.” *Id.*, [0060]-[0061], [0159], Fig. 13; *see also* Iizuka, [0159]-[0160], [0170]. Lanning ¶72.

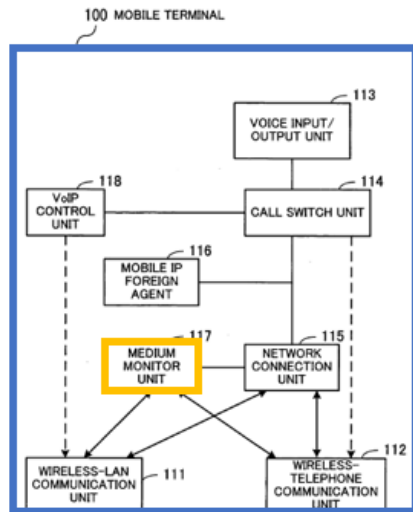


FIG. 4

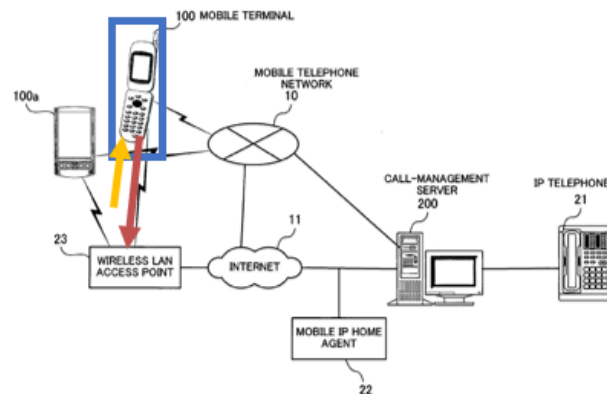


FIG. 2

When the signal strength “deviates from a predetermined criterion,” the **mobile terminal** notifies the **call-management server** by “originat[ing] a call to the switching processing unit 212 in the call-management server 200 by dialing.” *Id.*, [0159]-[0160]; *see also* Iizuka, [0162], [0170]. Lanning ¶73.

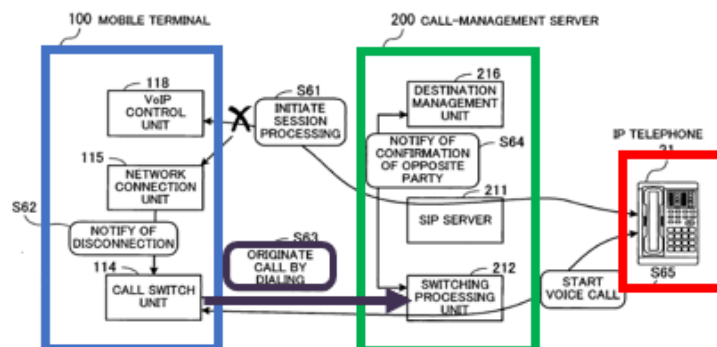
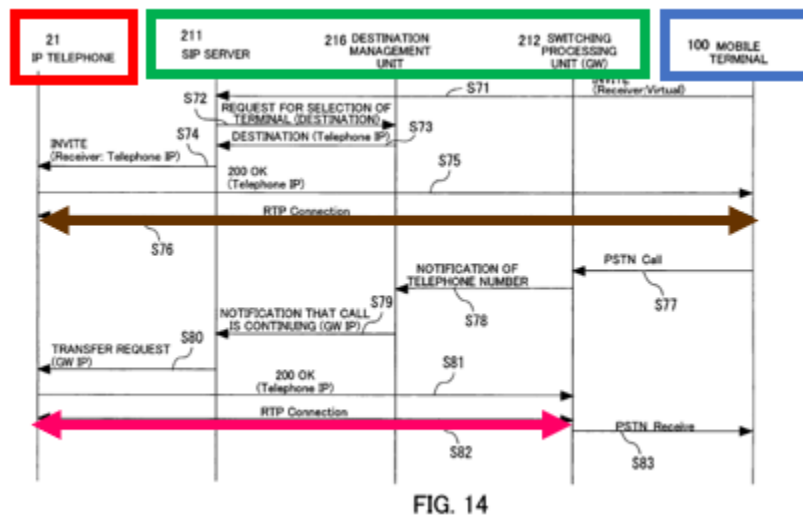


FIG. 13

The **call-management server** then establishes a voice call through the mobile telephone network while the VoIP call (over the **first communication link**) “still continues.” *Id.*, [0160]-[0162], [0170]-[0176]. As part of this process of establishing a voice call, the method proceeds in stages. First, an RTP or Real-time Transport Protocol connection (i.e., **second communication link**) is established between the **call-management server** (interface server) and the **IP telephone** (end destination device) as depicted in Iizuka’s Fig. 14. Iizuka, Fig. 14, [0175]. Lanning ¶74.



As shown below, after the RTP connection between the **call-management server** and **IP telephone** is established (i.e., **second communication link**), the switching processing unit 212 of the call-management server 200 returns a response to mobile terminal 100. Iizuka, [0176]; *see also* Iizuka, [0162]. **Iizuka** explains that this response “**establishes a connection through the mobile telephone network 10**” between the **call-management server** and the **mobile terminal**. Iizuka, [0176];

see also Iizuka, [0162]. This process thus establishes a “voice call” between the mobile terminal and IP telephone, which uses the mobile telephone network. Iizuka, [0162], [0176]. Lanning ¶75.

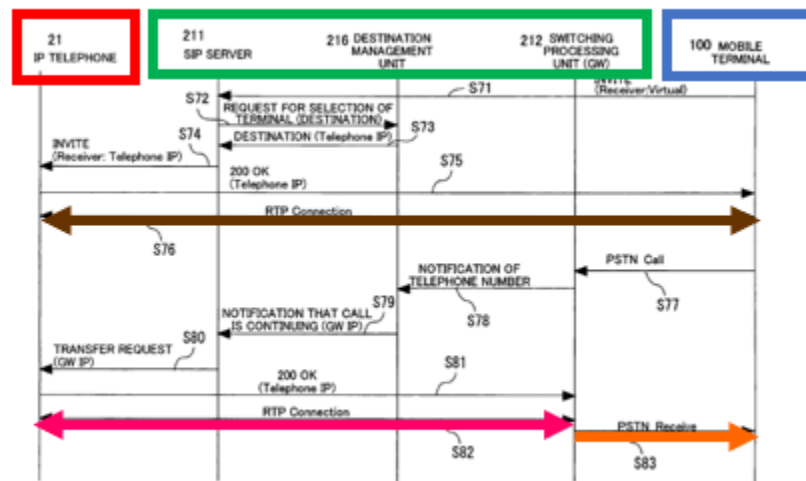


FIG. 14

After the voice call is established, the SIP server 211, located within call-management server 200, “disconnects the session which has been established through the Internet 11 between the mobile terminal 100 and the call-management server 200” (i.e., terminates transmission over the **first communication link**) such that the call can continue through the voice call Iizuka, [0162]; see also Iizuka, [0176]. Lanning ¶76.

2. Claim Chart

'181	Iizuka
[1.pre] A method of providing communications for	To the extent the preamble is limiting, Iizuka discloses a method of providing communications (e.g., providing “wireless communication”) for a mobile

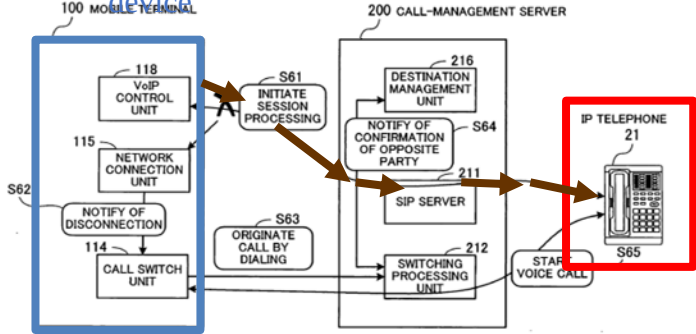
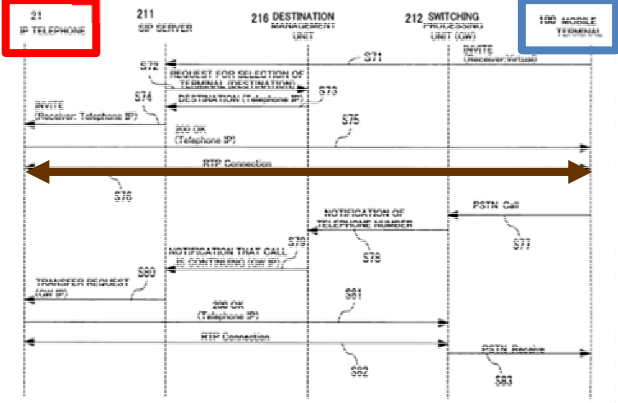
'181	Iizuka
a mobile communication device that roams between multiple different types of wireless networks, the method comprising:	communication device (e.g., for “mobile terminal [1, 100]”) that roams (e.g., “switching (roaming)”) between multiple different types of wireless networks (e.g., “from a connection through the wireless LAN to a connection through a wireless telephone network”). <u>E.g., Iizuka:</u> Iizuka discloses a method that enables a mobile terminal (including “mobile terminal [1, 100]”) to roam between different types of networks, such as between a wireless local area network (LAN) (including “wireless LAN [3],” which contains “Internet 11”) and a wireless telephone network (including “wireless telephone network 4” and “mobile telephone network 10”). Iizuka, [0014], [0057]. For example, a call initiated over a wireless LAN may be “switched from a connection through the wireless LAN to a connection through a wireless telephone network.” Iizuka, [0015], [0212]. Lanning ¶¶78-80. • Fig. 1 “mobile communication device” “multiple different types of wireless networks” FIG. 1

'181	Iizuka
	Fig. 2 FIG. 2 [0014] (“[T]he present invention...provide[s] a mobile terminal, a program for controlling a mobile terminal, a program for a call-management server, and a call-management process <i>for performing wireless communication which are able to use a plurality of communication mediums enabling a wireless call, by dynamically switching between the plurality of communication mediums during a call.</i>”) [0057] (“FIG. 2 is a diagram illustrating an example of a construction of a system of the embodiment of the present invention. In the present embodiment, <i>a mobile telephone network 10 and the Internet 11 containing a wireless LAN are provided as the communication mediums through which calls can be made.</i>”) [0015] (“[A] mobile terminal for making a wireless call is provided. <i>The mobile terminal comprises: a call-through unit which has a function of making a call through a wireless LAN; a call-through-telephone-network unit which has a function of making a call through a wireless telephone</i>

'181	Iizuka
	<i>network</i>; and a call switch unit which establishes a connection through the call-through-telephone-network unit and <i>switches from a first call through the call-through-LAN unit to a second call through the call-through-telephone-network unit....</i>") • [0212] ("[W]hen the condition of communication through a wireless LAN deteriorates and deviates from a predetermined criterion <i>during a call through the wireless LAN, the call is switched from a connection through the wireless LAN to a connection through a wireless telephone network.</i> ... Therefore, it is possible to dynamically switch the call between a connection through the wireless LAN and a connection through the wireless telephone network....") • [0157] ("FIG. 13 is a diagram illustrating processing for <i>switching (roaming)</i> from a VoIP call to a voice call through the mobile telephone network.") • [0039] ("As illustrated in FIG. 1, a mobile terminal 1 and a call-management server 2 can communicate with each other through two wireless communication mediums, a wireless LAN 3 and a wireless telephone network 4.") • [0043] ("When the condition of a connection realized by the call-through-LAN unit 1 b deteriorates and deviates from a predetermined criterion <i>during a call through the call-through-LAN unit 1 b, the call switch unit 1 c establishes a connection through the call-through-telephone-network unit 1 a, and switches from the call through the call-through-LAN unit 1 b to a call</i>

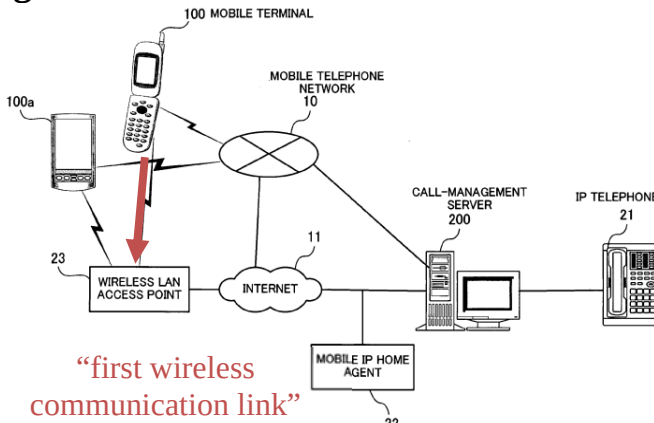
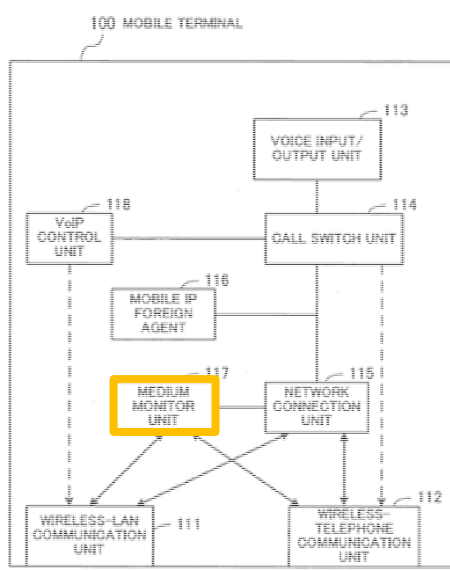
'181	Iizuka
	<i>through the call-through-telephone-network unit 1 a.</i>) • <i>See also</i> [0157]-[0176]
[1.a] establishing a first communication link between the mobile communication device and an end destination device, wherein the first communication link includes a first wireless communication link between the mobile communication device and a first type of wireless network;	Iizuka discloses establishing a first communication link (<i>e.g.</i>, establishing a “VoIP call”) between the mobile communication device (<i>e.g.</i>, between “mobile terminal [1, 100]”) and an end destination device (<i>e.g.</i>, and “telephone equipment 5,” “IP telephone 21”), wherein the first communication link includes a first wireless communication link between the mobile communication device and a first type of wireless network (<i>e.g.</i>, “VoIP call” includes “wireless communication” between “mobile terminal [1, 100]” and the “wireless LAN”). <u>E.g., Iizuka:</u> Iizuka discloses establishing a first communication link between the mobile terminal and a telephone. For example, Iizuka discloses establishing a VoIP call between a mobile terminal (including mobile device 1 and mobile device 100) and an IP telephone (including “telephone equipment 5” and “IP telephone 21”). Iizuka, [0039], [0158], [0169]. Iizuka further discloses that the VoIP call includes a first wireless communication link between the mobile terminal and a first type of wireless network (a wireless LAN). For example, the VoIP call is “through the wireless LAN.” Iizuka, [0109], [0204], Fig. 2. And when the mobile terminal makes a VoIP call, it “performs wireless communication” with the “wireless LAN access point 23” of the wireless LAN. Iizuka, [0061]; <i>see also</i> Iizuka, [0064]. To initiate the VoIP call, a Session Initiation Protocol (SIP) session is first established between the mobile terminal and a call-management server (including “call-

'181	Iizuka
	management server 2” and “call-management server 200”). Iizuka, [0049], [0061], [0088], [0158]; <i>see also</i> Iizuka, [0169]. Next, the call management server completes the connection with IP telephone, fully establishing the SIP session between the mobile terminal and the IP telephone. Iizuka, [0058]. The VoIP call is started after this SIP session has been established. Iizuka, [0158]; <i>see also</i> Iizuka, [0169]; Figs. 13-14. Lanning ¶¶81-85. Fig. 1 FIG. 1 “end destination device” Fig. 2 FIG. 2 Fig. 13

'181	Iizuka
	“mobile communication device” “first communication link”  FIG. 13 “end destination device” • Fig. 14 “end destination device” “mobile communication device” “first communication link”  FIG. 14 • [0039] (“As illustrated in FIG. 1,...Telephone equipment 5 is connected to the call-management server 2, so that <i>a call can be made between a user of the telephone equipment 5 and a user of the mobile terminal 1.</i>”) • [0049] (“[W]hen the call-management server 2 receives from the mobile terminal 1 information indicating restoration of communication between

'181	Iizuka
	the call-management server 2 and the mobile terminal 1 through the wireless LAN 3, the call-through-LAN management unit 2 <i>establishes a session between the call-management server 2 and the mobile terminal 1 through the wireless LAN 3.</i>") • [0058] ("The call-management server 200 is connected to the mobile telephone network 10 and the Internet 11 performs medium conversion between the telephone line and the VoIP, and transfers call data. In addition, <i>the call-management server 200 establishes and switches connections between the IP telephone 21 and the mobile terminals 100 and 100 a.</i>") • [0061] ("The mobile terminals 100 and 100 a each have...a function of making a VoIP call through the Internet 11. <i>When each of the mobile terminals 100 and 100 a makes a call through the Internet 11, the mobile terminal performs wireless communication with the wireless LAN access point 23....</i>") • [0064] ("The wireless-LAN communication circuit 101 <i>performs wireless data communication with the wireless LAN access point 23</i> through an antenna 101 a.") • [0158] ("[Step S61] <i>After an SIP session is initiated between the mobile terminal 100 and the IP telephone 21, a VoIP call is started.</i>") • [0169] ("[Step S76] <i>A VoIP call between the mobile terminal 100 and the IP telephone 21 is started.</i>") • [0088] ("The SIP server 211 manages communication through the Internet 11 using the SIP (Session Initiation Protocol), which is a

'181	Iizuka
	communication protocol for setting, releasing, and controlling sessions, where each of the sessions is formed with a series of VoIP messages.”) • [0109] (“[Step S14] The call switch unit 114 initiates <i>a VoIP call through the wireless LAN.</i>”) • [0204] (“In addition,...<i>a VoIP call is placed by establishing a connection to a network such as a wireless LAN with a network device</i> when the mobile terminal 100 receives an incoming call.”)
[1.b] monitoring a signal strength of the first wireless communication link;	Iizuka discloses monitoring a signal strength of the first wireless communication link (<i>e.g.</i>, monitoring the “intensity of a radio wave” transmitted from wireless LAN to mobile terminal 100). <u>E.g., Iizuka:</u> Iizuka discloses that the mobile terminal monitors the signal strength of communication link between the mobile terminal and the wireless LAN (<i>see</i> [1.a]). For example, mobile terminal 100 includes a medium monitor unit 117 that “monitors the conditions of the network mediums.” Iizuka, [0078], [0105]. This monitoring process involves detecting the “intensity of a radio wave” received from a wireless access point, including wireless LAN access point 23. Iizuka, [0045], [0105]. A measure of the intensity of a radio wave is a measure of signal strength, and at minimum it would have been obvious to measure signal strength as part of “intensity” in determining whether to switch networks. Lanning ¶¶86-88. During the VoIP call (<i>see</i> [1.a]), mobile terminal 100 communicates with wireless LAN access point 23 through the wireless LAN, receiving radio waves from wireless access point 23 as part of this communication. Iizuka, [0060]-[0061], [0159]; <i>see also</i> Iizuka, [0170].

'181	Iizuka
	The mobile terminal's medium monitor unit measures the signal strength of these radio waves to, for example, determine "when the condition of the communication deviates from a predetermined criterion." Iizuka, [0159]; <i>see also</i> Iizuka, [0170]. Lanning ¶89. Fig. 2  FIG. 2 Fig. 4  FIG. 4 [0045] ("The condition of the connection realized by the call-through-LAN unit 1 b (which is used as

'181	Iizuka
	a reference for determining whether or not the connection is to be switched) can be determined based on, <i>for example, the intensities of signals received from an access point, to which the LAN is to be connected.</i> In this case, a threshold value of the intensities of signals can be determined to be the predetermined criterion.”) • [0078] (“The medium monitor unit 117 monitors the conditions of the network mediums. That is, the medium monitor unit 117 <i>monitors the conditions of the wireless-LAN communication unit 111...and passes to the network connection unit 115 information on the conditions of the connections connected to the wireless-LAN communication unit 111...</i>”) • [0105] (“...[T]he network connection unit 115 receives from the medium monitor unit 117 information indicating the conditions of communication at the wireless-LAN communication unit 111 and the wireless-telephone communication unit 112. <i>For example, the medium monitor unit 117 passes to the network connection unit 115 information indicating the intensity of a radio wave which the wireless-LAN communication unit 111 can receive from the wireless LAN access point 23...</i>”) • [0060] (“A wireless LAN access point 23 is connected to the Internet 11, and performs communication with the mobile terminals 100 and 100 a through the wireless LAN.”) • [0061] (“When each of the mobile terminals 100 and 100 a makes a call through the Internet 11, the mobile terminal performs wireless communication with the wireless LAN access point 23, and

'181	Iizuka
	establishes a connection between the mobile terminal and the call-management server 200 through the wireless LAN access point 23.”) • [0106] (“In the present embodiment, the functions of the wireless-LAN communication unit 111 can be stopped during the absence of communication. In this case, <i>the medium monitor unit 117 confirms the condition of a connection through the wireless LAN</i> by activating the wireless-LAN communication unit 111.”) • [0159] (“[Step S62] Thereafter, when <i>communication through the wireless LAN becomes impossible (for example, when the condition of the communication deviates from a predetermined criterion)</i>, the network connection unit 115 notifies the call switch unit 114 of the condition of the communication.”) • [0170] (“[Step S77] Thereafter, the mobile terminal 100 detects the condition of the radio wave. When the mobile terminal 100 determines that use of the wireless LAN is impossible, the mobile terminal 100 originates a PSTN call to the switching processing unit 212 by dialing.”)
[1.c] when the signal strength drops below a predetermined threshold, notifying an interface server with the mobile communication device and establishing a second communication link between the interface server and the end	Iizuka discloses when the signal strength drops below a predetermined threshold (e.g., when the “intensity of signal[]” is below a “predetermined criterion” or “threshold value” such that “communication through the wireless LAN becomes impossible”), notifying an interface server (e.g., “originat[ing] a call to the switching processing unit 212 in the call-management server 200”) with the mobile communication device (e.g., “by dialing” with the “call switch unit 114” of mobile terminal 100) and establishing a second communication link between the interface server and the end destination device (e.g., establishing a “voice

'181	Iizuka
destination device without disrupting the first communication link;	call through the mobile telephone network 10” between call-management server 200 and IP telephone 21) without disrupting the first communication link (the “VoIP call” (<i>see</i> [1.a]) “still continues” while the voice call is being established). <u>E.g., Iizuka:</u> See [1.a]-[1.b]. Iizuka discloses that the mobile terminal informs an interface server when the signal strength drops below a threshold. For example, mobile terminal 100 monitors the signal strength of the communication through the wireless LAN (<i>see</i> [1.b]) to determine when the communication degrades to the point that it becomes “impossible.” Iizuka, [0159], [0170]. This occurs when the mobile terminal detects that the signal strength has weakened sufficiently, and, thus, “deviates from a predetermined criterion.” Iizuka, [0159]; <i>see also</i> Iizuka, [0170], [0146]. When this criterion is detected, the mobile terminal 100 notifies the call-management server 200 by “originat[ing] a call to the switching processing unit 212 in the call-management server 200 by dialing.” Iizuka, [0159]-[0160]; <i>see also</i> Iizuka, [0170]. The call-management server 200 is an interface server at least because it interfaces with both the wireless LAN and mobile telephone network (<i>see</i> [1.pre]). Iizuka, [0057]-[0058]. Iizuka discloses establishing a second communication link between the interface server and the end destination device without disrupting the first communication link. For example, after being dialed, the switching processing unit 212 in call-management server 200 establishes a voice call through the mobile telephone network 10 to IP telephone 21. Iizuka, [0160]-[0162], [0170]-[0175]. This voice call is established while the VoIP call (<i>see</i> [1.a]) “still continues.” Iizuka, [0162].

'181	Iizuka
	As part of this process of establishing a voice call, the method proceeds in stages. A second communication link (an RTP (Real-time Transport Protocol) connection for real-time audio streams) is established between the interface server and the end destination device as depicted in Iizuka's Fig. 14. Iizuka, [0175]. The subsequent step that redirects this link to the mobile terminal is discussed below in connection with [1.e]. Lanning ¶¶90-96. Fig. 13 Fig. 14

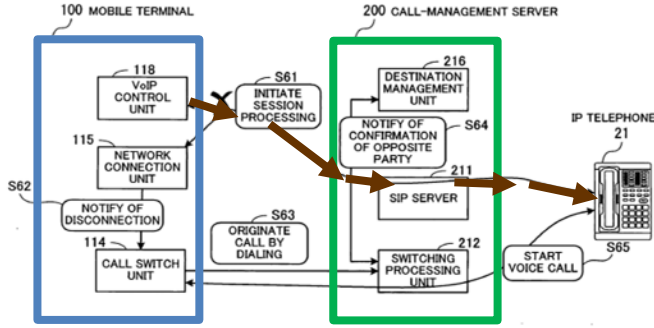
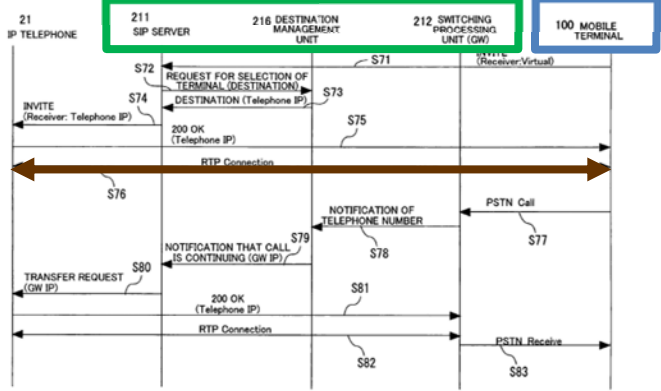
'181	Iizuka
	“interface server” “first communication link” 21 IP TELEPHONE, 211 SIP SERVER, 216 DESTINATION MANAGEMENT UNIT, 212 SWITCHING PROCESSING UNIT (GW), 100 MOBILE TERMINAL Steps: S71, S72, S73, S74, S75, S76, S77, S78, S79, S80, S81, S82, S83 “end destination device” “second communication link” “mobile communication device” FIG. 14
Fig. 5	“interface server” 200 CALL-MANAGEMENT SERVER, 201 CPU, 202 RAM, 203 HDD, 204 GRAPHIC PROCESSING DEVICE, 205 INPUT INTERFACE, 206 COMMUNICATION INTERFACE, 207 COMMUNICATION INTERFACE, 208 COMMUNICATION INTERFACE, 31 MONITOR, 32 KEYBOARD, 33 MOUSE, 10 MOBILE TELEPHONE NETWORK, 11 INTERNET FIG. 5 [0159] (“[Step S62] Thereafter, <i>when communication through the wireless LAN becomes impossible (for example, when the condition of the communication deviates from a predetermined criterion), the network connection unit 115 notifies the call switch unit 114 of the condition of the communication.</i>”)

'181	Iizuka
	• [0160] (“[Step S63] <i>The call switch unit 114 originates a call to the switching processing unit 212 in the call-management server 200</i> by dialing.”) • [0175] (“[Step S82] <i>A connection for originated call is established between the IP telephone 21 and the switching processing unit 212.</i>”) • [0146] (“[Step S56] The mobile terminal 100...detects the condition of the radio wave in the wireless LAN. At this time, the mobile terminal 100 detects that <i>the condition of the radio wave is not sufficiently good to perform communication (i.e., connection through the wireless LAN is impossible)....</i>”) • [0057] (“FIG. 2 is a diagram illustrating an example of a construction of a system of the embodiment of the present invention. ... <i>An IP telephone 21 is connected through a call-management server 200 to the mobile telephone network 10 and the Internet 11.</i>”) • [0058] (“<i>The call-management server 200 is connected to the mobile telephone network 10 and the Internet 11</i> performs medium conversion between the telephone line and the VoIP, and transfers call data. In addition, the call-management server 200 establishes and switches connections between the IP telephone 21 and the mobile terminals 100 and 100 a.”) • [0084] (“The communication interface 206 is connected to the mobile telephone network 10, and exchanges data with the mobile terminals 100 and 100 a through the mobile telephone network 10.”) • [0085] (“The communication interface 207 is connected to the Internet 11, and exchanges data

'181	Iizuka
	with the mobile terminals 100 and 100 a through the Internet 11.”) • [0069] (“<i>The mobile terminal 100 comprises... a call switch unit 114....</i>”) • [0073] (“<i>[T]he call switch unit 114 switches calls between the wireless LAN and the wireless telephone network according to the conditions of a connection through the wireless LAN and a connection through the wireless telephone network.</i>”) • [0170] (“[Step S77] Thereafter, the mobile terminal 100 detects the condition of the radio wave. When the mobile terminal 100 determines that use of the wireless LAN is impossible, the mobile terminal 100 originates a PSTN call to the switching processing unit 212 by dialing.”) • [0175] (“[Step S82] A connection for originated call is established between the IP telephone 21 and the switching processing unit 212.”); <i>see also</i> [0171]-[0174]
[1.d] notifying the mobile communication device to terminate transmission over the first communication link; and	Iizuka renders obvious notifying the mobile communication device to terminate transmission over the first communication link (<i>e.g.</i>, notifying the mobile terminal to terminate transmission before “SIP server 211” of “call-management server 200” “disconnects the session which has been established through the Internet 11 between the mobile terminal 100 and the call-management server 200”). <u>E.g., Iizuka:</u> Iizuka discloses terminating transmission over the first communication link (the VoIP call; <i>see</i> [1.a]). For example, Iizuka discloses that SIP server 211, located within call-management server 200, “disconnects the session which has been established through the Internet

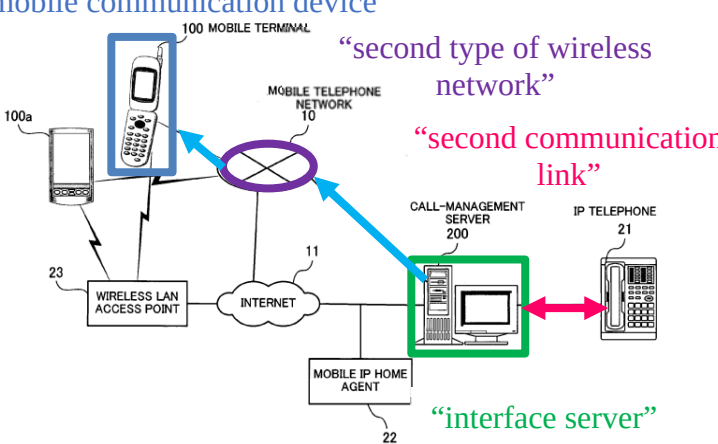
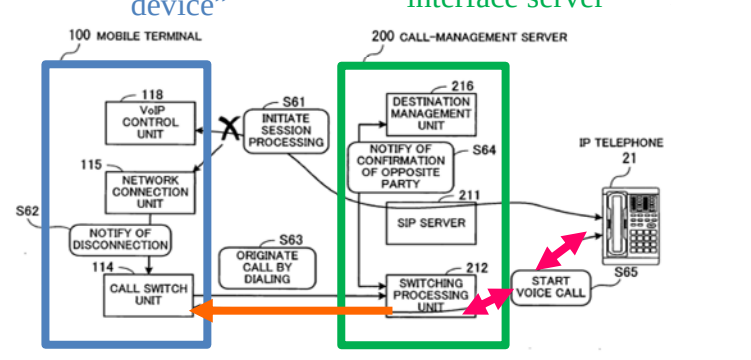
'181	Iizuka
	11 between the mobile terminal 100 and the call-management server 200.” Iizuka, [0162]; <i>see also</i> Iizuka, [0176]. Iizuka further discloses that the mobile terminal is involved in the termination process: “call-through-LAN management unit 2b [of mobile terminal] disconnects a corresponding session which has been established between” the mobile terminal and call-management server through the wireless LAN. Iizuka, [0052]. The disconnected session formed one leg of the complete SIP session established between the mobile terminal 100 and the IP telephone 21, as part of the VoIP call. Iizuka, [0158]. By disconnecting the session between the mobile terminal 100 and the call-management server 200, the transmission over the VoIP call is terminated. Lanning ¶¶97-99. A POSITA would have understood, or at minimum found obvious, that to disconnect (and thereby terminate transmission over) a SIP session with the mobile terminal, the server notifies the mobile terminal by sending a message a SIP BYE message such that the mobile phone knows to disconnect the session. Lanning ¶100.⁴ Therefore, Iizuka renders obvious notifying the mobile terminal to terminate transmission over the first communication link. Lanning ¶¶97-101. • Fig. 13

⁴ See Preston, [0043] (disclosing that termination of a SIP session involves transmitting a “SIP BYE message” to the phone, and that the phone replies with an “OK” message before the server “officially end[s] the communication”); Ex. 1012, [0103]-[0104], [0119] (disclosing transmitting a “BYE request signal” to “wireless communication terminal (10B)” followed by a response to finish the connection).

'181	Iizuka
	“mobile communication device” “first communication link”  FIG. 13 “interface server” • Fig. 14 “interface server” “first communication link”  FIG. 14 “mobile communication device” • [0162] (“[Step S65] The switching processing unit 212 realizes a voice call through the mobile telephone network 10 while the VoIP call which has already been established still continues. Thereafter, <i>the SIP server 211 disconnects the session which has been established through the Internet 11 between the mobile terminal 100 and the call-management server 200.</i>”)

'181	Iizuka
	• [0158] (“[Step S61] After an SIP session is initiated between the mobile terminal 100 and the IP telephone 21, a VoIP call is started.”) • [0052] (“[T]he call-through-telephone-network management unit 2 a in the call-management server 2 establishes a connection between the mobile terminal 1 and the telephone equipment 5 through the wireless telephone network 4. <i>Then, the call-through-LAN management unit 2 b disconnects a corresponding session which has been established between the mobile terminal 1 and the call-management server 2 through the wireless LAN 3.</i>”) • [0176] (“The switching processing unit 212 returns to the mobile terminal 100 a response to the origination of the call by dialing, and establishes a connection through the mobile telephone network 10. Thus, a call between the IP telephone 21 and the mobile terminal 100 becomes possible.”)
[1.e] re-directing the second communication link from the interface server to the mobile communication device, thereby establishing a second wireless communication link between the mobile communication device and the second type of wireless network.	Iizuka discloses re-directing the second communication link (<i>e.g.</i>, voice call over the RTP connection; see [1.c]) from the interface server (<i>e.g.</i>, from “call-management server 200”) to the mobile communication device (<i>e.g.</i>, to “mobile terminal 100” by providing a response), thereby establishing a second wireless communication link between the mobile communication device and the second type of wireless network (<i>e.g.</i>, providing the response “establishes a connection” to mobile terminal 100 “through the mobile telephone network 10”). <u>E.g., Iizuka:</u> Iizuka discloses re-directing the second communication link from the call-management server 200 to mobile terminal 100. For example, after the second

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	communication link between the call-management server 200 and IP telephone 21 is established by making a voice call to IP telephone 21 over an RTP link (<i>see</i> [1.c]), the switching processing unit 212 of the call-management server 200 returns a response to mobile terminal 100. Iizuka, [0176]; <i>see also</i> Iizuka, [0162]. This response “establishes a connection through the mobile telephone network 10” between call-management server 200 and mobile terminal 100. Iizuka, [0176]; <i>see also</i> Iizuka, [0162]. Thus, this response, labeled “PSTN Receive” in step S83 in Fig. 14, establishes the second communication link between the call-management server 200 and mobile terminal 100. Iizuka, Fig. 14, [0176]; <i>see also</i> Iizuka, [0162]. As illustrated in Figure 2, the “PSTN receive” process passes through mobile telephone network 10, such that a wireless connection for this communication link is established between mobile terminal 100 and mobile telephone network 10. Thereafter, a voice call between the IP telephone 21 and the mobile terminal 100 through mobile telephone network 100 becomes possible. Iizuka, [0176]; <i>see also</i> Iizuka, [0162]. Lanning ¶¶102-104.

'181	Iizuka
	• Fig. 2 “mobile communication device”  FIG. 2 “second wireless communication link between the mobile communication device and the second type of wireless network” • Fig. 13 “mobile communication device” “interface server”  FIG. 13 “second communication link” “re-directing the second communication link from the interface server to the mobile communication device” • Fig. 14

'181	Iizuka
	“interface server” “mobile communication device” FIG. 14 “second communication link” “re-directing the second communication link from the interface server to the mobile communication device” • [0160] (“[Step S63] The call switch unit 114 originates a call to the switching processing unit 212 in the call-management server 200 by dialing.”) • [0176] (“[Step S83] The switching processing unit 212 <i>returns to the mobile terminal 100 a response</i> to the origination of the call by dialing, and <i>establishes a connection through the mobile telephone network 10</i>. Thus, a call between the IP telephone 21 and the mobile terminal 100 becomes possible.”) • [0162] (“[Step S65] The switching processing unit 212 <i>realizes a voice call through the mobile telephone network 10</i> while the VoIP call which has already been established still continues.”)
[4] The method of claim 1 wherein establishing the first communication link	See [1]. Iizuka discloses establishing the first communication link (e.g., establishing the “VoIP call,” see [1.a]) includes routing through a voice over internet protocol network (e.g., transmitting “VoIP

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includes routing through a voice over internet protocol network.	packets” to “IP addresses of ... mobile terminals” over a “computer network”). <u>E.g., Iizuka:</u> Iizuka discloses that the VoIP call uses “VoIP (Voice over Internet Protocol technology” to “transmi[t]” “voice information and voice calls” over “computer networks.” Iizuka, [0005]. This technology involves a mobile terminal engaged in a VoIP call, converting voice data into “VoIP packets,” which are then transmitted over a network to an “IP address[]” of “[a] mobile terminal[],” and receiving VoIP packets at the “IP address[]” of “[a] mobile terminal[],” that have been transmitted to it over the network. Iizuka, [0059]. A POSITA would have understood that the procedure of transmitting or receiving VoIP packets to or from IP addresses is routing those packets through the network. Lanning ¶¶105-107. A POSITA further would have understood that the network responsible for routing the VoIP packets of a VoIP call is a VoIP network. Lanning ¶107. • [0005] (“In recent years, use of <i>the VoIP (Voice over Internet Protocol) technology for making a voice call through the Internet</i> or an intranet is widely spreading. <i>The VoIP technology enables transmission of voice information and voice calls between terminals by use of data communication protocols in computer networks.</i> Therefore, the VoIP technology can be applied to any networks in which predetermined data communication protocols are used, regardless of whether the networks are wired or wireless.”) • [0079] (“The VoIP control unit 118 performs VoIP communication of voice data by data communication through the wireless-LAN communication unit 111. Specifically, when the VoIP control unit 118 receives voice data from the

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	call switch unit 114, the VoIP control unit 118 <i>generates VoIP packets</i>, and passes the VoIP packets to the wireless-LAN communication unit 111. In addition, when the VoIP control unit 118 <i>receives VoIP packets</i> from the wireless-LAN communication unit 111, the VoIP control unit 118 reproduces the original voice data, and passes the reproduced voice data to the call switch unit 114.”) • [0059] (“A mobile IP home agent 22 is provided on a communication path between the call-management server 200 and the Internet 11. The mobile IP home agent 22...<i>relays VoIP packets to be transmitted to the mobile terminals 100 and 100 a</i>. That is, the mobile IP home agent 22 performs conversion into the current <i>IP addresses of the mobile terminals 100 and 100 a</i>, and <i>transmits the VoIP packets to the mobile terminals 100 and 100 a</i>.”) • [0061] (“<i>The mobile terminals 100 and 100 a each have ... a function of making a VoIP call through the Internet 11.</i>”)
[8] The method of claim 1 further comprising providing a connectivity status by the mobile communication device to the interface server while the mobile communication device is within a first coverage area of	<i>See [1]. Iizuka discloses providing a connectivity status</i> (e.g., transmitting the “condition of a connection through a communication medium,” which includes “information indicating whether or not” “communication through” the wireless LAN is “usable”) <i>by the mobile communication device</i> (by “mobile terminal [1, 100],” see [1.pre]) <i>to the interface server</i> (to “call-management server 200,” see [1.c])) <i>while the mobile communication device is within a first coverage area of the first type of wireless network.</i> (e.g., while the “mobile terminal [1, 100]” detects that the wireless LAN is “usable”). <u>E.g., Iizuka:</u>

'181	Iizuka
the first type of wireless network.	See [1.pre], [1.a], [1.c]. Iizuka further discloses that the mobile terminal provides “terminal-condition management unit 214” of the call-management server 200 with information regarding the “condition of a connection through” a wireless LAN that has been detected by the mobile terminal. Iizuka, [0091], [0087], [0152]. This information includes “whether or not” a communication medium is “usable.” Iizuka, [0096], Fig. 7 (depicting “Condition” as “USABLE”). Such information constitutes a connectivity status because it indicates whether the mobile terminal has established a type of connection through the wireless LAN that is sufficient to support the transmission of communication data.⁵ Lanning ¶¶108-112. Iizuka further discloses that such information is transmitted to the call-management server while the mobile terminal is within the coverage area of the wireless LAN. For example, Fig. 7 depicts the information the mobile terminal transmitted to the call-management server, which indicates “CONDITION” to be “USABLE.” A POSITA would have understood, and at minimum found obvious, that when the condition of a wireless LAN is identified as “USABLE” the mobile

⁵ In the related district court litigation, PO in its infringement contentions maps connectivity status to “wireless network conditions ... for conducting a session continuity operation.” Ex. 1015, 47. **Iizuka’s** disclosure of information about the condition of wireless LAN (i.e., “USABLE” or “UNUSABLE”) constitutes a wireless network condition, and thus is consistent with PO’s interpretation of this claim limitation. Lanning ¶112.

'181	Iizuka																														
	terminal is within the coverage area of the wireless LAN because that is when the signal intensity from the wireless LAN access point are sufficiently high, whereas signal strength diminishes outside this area such that the wireless LAN is unusable as a communication medium. Lanning ¶113. • Fig. 7 216a DESTINATION INFORMATION “a connectivity status” <table><tr><th>USER (Virtual ID)</th><th>DESTINATION</th><th>PRIORITY</th><th>CONDITION</th><th>IDENTIFICATION OF TERMINAL</th></tr><tr><td>USER1@abcd.com</td><td>01234567@telgw.abcd.com</td><td>MEDIUM</td><td>USABLE</td><td>TERMINAL 1</td></tr><tr><td>USER1@abcd.com</td><td>ADDRESS OF MOBILE TERMINAL</td><td>HIGH</td><td>UNUSABLE</td><td>TERMINAL 1</td></tr><tr><td>USER1@abcd.com</td><td>ADDRESS OF IP TELEPHONE</td><td>LOW</td><td>USABLE</td><td>~</td></tr><tr><td>USER2@abcd.com</td><td></td><td>HIGH</td><td>USABLE</td><td>~</td></tr><tr><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td></tr></table> FIG. 7 • [0091] (“<i>The terminal-condition management unit 214 acquires information on the conditions of terminals (including the conditions of networks) from the mobile terminals 100 and 100 a, and manages the acquired information.</i>”) • [0087] (“FIG. 6 is a block diagram illustrating the functions of the call-management server 200. The call-management server 200 comprises...a terminal-condition management unit 214...”) • [0096] (“The destination information 216 a includes fields of “USER,” “DESTINATION,” “PRIORITY,” “CONDITION,” and “TERMINAL IDENTIFICATION.” ... In the field “CONDITION,” <i>information indicating the condition of a connection through a communication medium corresponding to each destination (e.g., information indicating whether or not each destination is usable) is set. The terminal-condition managaement unit 214</i>	USER (Virtual ID)	DESTINATION	PRIORITY	CONDITION	IDENTIFICATION OF TERMINAL	USER1@abcd.com	01234567@telgw.abcd.com	MEDIUM	USABLE	TERMINAL 1	USER1@abcd.com	ADDRESS OF MOBILE TERMINAL	HIGH	UNUSABLE	TERMINAL 1	USER1@abcd.com	ADDRESS OF IP TELEPHONE	LOW	USABLE	~	USER2@abcd.com		HIGH	USABLE	~	...	...	...	...	...
USER (Virtual ID)	DESTINATION	PRIORITY	CONDITION	IDENTIFICATION OF TERMINAL																											
USER1@abcd.com	01234567@telgw.abcd.com	MEDIUM	USABLE	TERMINAL 1																											
USER1@abcd.com	ADDRESS OF MOBILE TERMINAL	HIGH	UNUSABLE	TERMINAL 1																											
USER1@abcd.com	ADDRESS OF IP TELEPHONE	LOW	USABLE	~																											
USER2@abcd.com		HIGH	USABLE	~																											
...	...	...	...	...																											

'181	Iizuka
	<i>manages the information indicating the condition of each connection, and updates the information when necessary.”)</i> • [0045] (“The condition of the connection realized by the call-through-LAN unit 1 b (which is used as a reference for determining whether or not the connection is to be switched) can be determined based on, for example, <i>the intensities of signals received from an access point, to which the LAN is to be connected</i>. In this case, <i>a threshold value of the intensities of signals can be determined to be the predetermined criterion.</i>”) • [0146] (“[Step S56] The mobile terminal 100 recognizes the call originated by the switching processing unit 212, and <i>detects the condition of the radio wave in the wireless LAN. At this time, the mobile terminal 100 detects that the condition of the radio wave is not sufficiently good to perform communication (i.e., connection through the wireless LAN is impossible)</i>, and transmits a PSTN response (“PSTN receive”) to the switching processing unit 212.”) • [0107] (“<i>The network connection unit 115 can determine whether or not communication can be realized through each communication medium (i.e., whether or not to be able to secure a condition of communication which can guarantee a predetermined call quality level through each communication medium)</i>, based on information on the intensity of a radio wave transmitted through the communication medium from the opposite party at one of the wireless-LAN communication unit 111 and the wireless-telephone communication unit 112 connected to the communication medium. Then, the network

'181	Iizuka
	connection unit 115 notifies the call switch unit 114 <i>whether or not communication through each communication medium is possible.</i>") • [0170] ("[Step S77] Thereafter, <i>the mobile terminal 100 detects the condition of the radio wave. When the mobile terminal 100 determines that use of the wireless LAN is impossible,</i> the mobile terminal 100 originates a PSTN call to the switching processing unit 212 by dialing.") • [0009] ("In the case of the mobile communication, the condition of communication varies with movement of the mobile terminal. Therefore, the condition of communication can deteriorate during a call.") • [0159] ("[Step S62] Thereafter, <i>when communication through the wireless LAN becomes impossible (for example, when the condition of the communication deviates from a predetermined criterion),</i> the network connection unit 115 notifies the call switch unit 114 of the condition of the communication.") • [0076] ("The mobile IP foreign agent 116 supports operations for roaming for LAN connections. That is, the mobile IP foreign agent 116 cooperates with the mobile IP home agent 22 (which is arranged on the network side) for maintaining sessions using LAN connections. Specifically, the mobile IP foreign agent 116 notifies the mobile IP home agent 22 of the position of the mobile terminal 100 on a network containing the wireless LAN. For example, the position of the mobile terminal 100 can be represented by using identification information <i>identifying a wireless LAN access</i>

'181	Iizuka
	<i>point through which communication is possible.”)</i> • [0181] (“[Step S93] The call switch unit 114 in the mobile terminal 100 notifies the terminal-condition management unit 214 in the call-management server 200 of the establishment of the connection through the wireless LAN.”) • [0152] (“In addition, <i>the call switch unit 114 can transmit to the switching processing unit 212 information on a usable communication medium</i> in response to the operation of originating a call performed in step S23. In this case, when the wireless LAN is usable, the SIP server 211 originates a VoIP call to the mobile terminal 100.”)

B. Ground 2: Iizuka in View of Preston (Claims 1, 4, and 8)

To the extent it is argued that further disclosure is required of “notifying the mobile communication device to terminate transmission over the first communication link” (limitation [1.d]), **Iizuka** in view of **Preston** renders obvious this limitation.

For example, **Preston** discloses that a “SIP proxy server” transmits a “SIP BYE message” to “SIP telephone.” Preston, [0043]. After receiving such a message and replying with an “OK” message, SIP proxy server proceeds to “officially end the communication.” Preston, [0043]. Thus, **Preston** discloses that terminating a transmission includes the step of notifying the mobile device in the form of transmitting to it a BYE message. Lanning ¶¶114-15.

Iizuka and **Preston** are analogous art, in the same field as the '181, which includes wireless communications, and reasonably pertinent to alleged problems addressed by the '181 of the restricted use of mobile communication devices to only one specific network. '181, 1:38-49; Iizuka, Abstract, [0007], [0014], [0052]; Preston, Abstract, [0002], [0006], [0018], [0020], [0028], [0029], [0040]-[0042], [0044]. For example, both **Iizuka** and **Preston** disclose a method of transmitting communication from and to mobile communication devices that are capable of communicating through multiple wireless networks. Iizuka, Abstract, [0014], [0015], [0041], [0042], Figs. 1-2; Preston, [0020], [0021], [0028], [0029], [0040], Fig. 1. Lanning ¶116.

A POSITA would have been motivated to apply **Preston's** teachings of transmitting to a mobile terminal a SIP BYE message before terminating a SIP session (communication link) to **Iizuka's** roaming method to advantageously inform a mobile communication device that it should cease transmitting over the first communication link because the link is being terminated. Lanning ¶117. **Iizuka's** call-management server 200 includes a SIP server 211, which manages VoIP communications. Iizuka, [0087]-[0088], [0093]. **Iizuka** aims to “smoothly” switch an ongoing VoIP call between a mobile terminal and an IP telephone to a voice call, seeking to “prevent [any] interruption[s] of [this] communication,” and further teaches “disconnect[ing] the [SIP] session which has been established through the

Internet 11 between the mobile terminal 100 and the call-management server 200,” but does not provide all of the details regarding the mechanism for terminating the SIP session. Iizuka, [0010], [0033], [0093], [0099], [0162]. A POSITA would have looked to a reference like **Preston**, which teaches how to terminate a SIP session (including by transmitting a SIP BYE message from the SIP server to the telephone), in connection with terminating **Iizuka’s** VoIP call that uses a SIP session managed by a SIP server, in order to disconnect the session as taught by **Iizuka**. Lanning ¶117. A POSITA would have understood that explicitly signaling to the mobile terminal to cease communication over that link would have advantageously followed the SIP protocol and prevented the mobile terminal from erroneously sending signals that would otherwise have been lost, thus avoiding disruptions to the call. Lanning ¶117.

In view of the above, a POSITA would have had a reasonable expectation of success and would have found the application of this functionality in **Iizuka’s** method to be a straightforward modification, as **Iizuka** already describes the mobile terminal using the SIP protocol to communicate with, for example, a call-management server that includes a SIP server. Iizuka, [0087]-[0088], [0158], [0162]; Lanning ¶118. Applying **Preston’s** teachings would have involved the simple step of adding the transmission of a SIP control signal to the overall SIP communication protocol (to the extent **Iizuka** does not already include it), and a POSITA would

have known such a combination would predictably work and provide the expected functionality. Lanning ¶118.

C. Grounds 3-4: Iizuka in View of Orava, and Iizuka in View of Preston and Orava (Claims 2 and 3)

Dependent claim 2 further requires that the first type of wireless communication link comprises “a IEEE 802.11 standard based communication link” and the network includes “a IEEE 802.11 standard based network access point.” Claim 3 depends from claim 2. While **Iizuka** discloses a Wireless LAN and wireless LAN access point, it does not expressly refer to IEEE 802.11. Lanning ¶119.

1. Overview of Orava

Orava discloses the “IEEE 802.11 standard determines ... the MAC layer protocols for data transmission.” Orava. [0020]. “In accordance” with this standard, the “MAC layer uses what is called a CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) technique” (Orava, [0020]), which is also used by **Iizuka** but without expressly identifying the IEEE 802.11 standard (Iizuka, [0012]). Lanning ¶120.

2. Motivation to Apply Orava’s Teachings to Iizuka (Optionally as Modified by Preston)

Iizuka and **Orava** are analogous art, in the same field as the ’181, which includes wireless communications, and reasonably pertinent to alleged problems addressed by the ’181 of performance (e.g., efficiency, bandwidth, and data transmission

speeds) of data transmission in wireless networks. '181, 1:50-2:27; Iizuka, [0008]; Orava, [0002]. For example, **Iizuka** discloses using wireless LAN because it “ha[s] a great bandwidth,” and thus less likely to cause “voice interruption” or “great delay” in the transmission of voice data (Iizuka, [0008]) and **Orava** discloses using a “IEEE 802.11-based [wireless LAN] WLAN” because it offers “very fast data transmission” (Orava, [0002]). Both **Iizuka** and **Orava** disclose employing “CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance)” techniques, which a POSITA would have understood as enhancing the performance of a wireless communication system by virtue of coordinating the timing of data transmissions among mobile communication devices within the same network to reduce collisions. Iizuka, [0012]; Orava, [0020]. Lanning ¶122.

A POSITA would have been motivated to apply **Orava’s** teachings of using an IEEE 802.11 standard for data transmission in a wireless LAN network to **Iizuka’s** roaming method (optionally as modified by **Preston**). Lanning ¶123. A POSITA would have recognized that adapting a standardized protocol, specifically an IEEE 802.11 protocol, would have advantageously improved performance of data transmission and maximized the compatibility and interoperability between mobile communication devices. Lanning ¶123. *First*, a POSITA would have recognized that an IEEE 802.11 communication protocol would have increased the overall wireless communication performance because it is (1) designed to minimize delays,

collisions, and retransmissions, improving overall throughput and reducing latency of data transmissions, (2) has error detection and correction mechanisms, improving data reliability and reducing the need for transmissions, and (3) is designed to optimize performance based on network conditions, ensuring the efficient management of network resources. Lanning ¶123. *Second*, a POSITA would have recognized the IEEE 802.11 standard would have increased the likelihood that mobile communication devices are compatible with and interoperable in the communication system. Lanning ¶123. For example, even before the time of filing the earliest provisional application of the '181, the IEEE 802.11 protocol family, which underpins Wi-Fi technology, had achieved widespread industry adoption and dominated the market. Ex. 1016 (“[In December 2001,] there [were] more than 15 million Wi-Fi devices world-wide ... [and] Wi-Fi [then] dominate[d] the WLAN market with nearly a 100% share.”); Ex. 1017 (“[By May 2003,] IEEE 802.11b standard ha[d] achieved a level of support and customer acceptance that is truly the envy of other standards[.]”). Lanning ¶123.

In addition, a POSITA would have regarded the application of **Orava’s** teachings to **Iizuka’s** method to be routine and straightforward given that the standard’s widespread adoption indicates there would have been no undue technical hurdles and that a POSITA would have had a reasonable expectation of success. Lanning ¶124. Moreover, **Iizuka** discloses using a CSMA/CA (Carrier Sense

Multiple Access with Collision Avoidance) technique (Orava, [0020]) that is used with the 802.11 Standard. Lanning ¶124. In light of the above, a POSITA would have known that the combination (yielding the claimed limitations) would predictably work and provide the expected functionality. Lanning ¶124.

3. Claim Chart

'181	Iizuka in view of Orava
[2] The method of claim 1 wherein the first type of wireless communication link comprises a IEEE 802.11 standard based communication link, and the first type of wireless network includes a IEEE 802.11 standard based network access point.	See [1]. Iizuka discloses the first type of wireless communication link (<i>e.g.</i>, “wireless communication” between “mobile terminal [1, 100]” and the “wireless LAN”; <i>see</i> [1.a]) and that the first type of wireless network (<i>e.g.</i>, wireless LAN; <i>see</i> [1.a]) includes a network access point (<i>e.g.</i>, “wireless LAN access point 23”). <u>E.g., Iizuka:</u> <i>See</i> [1.a]. Iizuka discloses that the wireless LAN includes a “wireless LAN access point 23.” Iizuka, [0060]. The wireless LAN is connected to the access point. <i>See</i> Iizuka, [0045], [0180]. Lanning ¶¶125-28.

'181	Iizuka in view of Orava
	Fig. 2 “first type of wireless communication link” FIG. 2 [0060] (“A <i>wireless LAN access point 23</i> is connected to the Internet 11, and <i>performs communication with the mobile terminals 100 and 100 a through the wireless LAN.</i>”) [0045] (“<i>an access point, to which the LAN is to be connected</i>”) [0180] (“communication between the mobile terminal 100 and the wireless LAN access point 23”) [0061] (“The mobile terminals 100 and 100 a each have ... a function of making a VoIP call through the Internet 11. <i>When each of the mobile terminals 100 and 100 a makes a call through the Internet 11, the mobile terminal performs wireless communication with the wireless LAN access point 23, and establishes a connection between the mobile terminal and the call-management server 200 through the wireless LAN access point 23.</i>”)

'181	Iizuka in view of Orava
	Orava discloses a IEEE 802.11 standard based communication link (<i>e.g.</i>, “data transmission” in “a WLAN network... according to any version of the IEEE802.11 standard”) and a IEEE 802.11 network standard based network access point (<i>e.g.</i>, “communicat[ing] with the access point AP ... according to the IEEE 802.11 standard”). <u>E.g., Orava:</u> Orava discloses a WLAN network with WLAN access points AP that use the IEEE 802.11 standard. Orava, [0020], [0029]. The “IEEE 802.11 standard determines ... the MAC layer protocols for data transmission.” Orava. [0020]. Lanning ¶¶129-30. As explained in §IX.C.2, a POSITA would have been motivated to apply Orava’s IEEE 802.11 teachings to Iizuka’s roaming method to use the IEEE 802.11 standard protocol for carrying out wireless communication over the wireless LAN and wireless LAN access points thus forming a IEEE 802.11 standard based communication link and a IEEE 802.11 standard based network access point for the LAN. Lanning ¶131. • [0020] (“<i>The WLAN network WLAN comprises WLAN access points AP</i>, which provide wireless connection for several terminals MT. <i>The IEEE 802.11 standard determines both the physical layer and the MAC layer protocols for data transmission over the radio interface. ... In accordance with the IEEE 802,11 standard, the MAC layer uses what is called a CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) technique.</i>”) • [0029] (“When there is a need to <i>communicate with the access point AP</i> (to join a BSS network or

'181	Iizuka in view of Orava
	an ESS network), an MT <i>according to the IEEE 802.11 standard can find the available access points AP</i> either with active or passive scanning.”)
[3] The method of claim 2 wherein the second type of wireless network includes a wireless cellular network.	See [2]. Iizuka discloses the second type of wireless network includes a wireless cellular network (e.g., “wireless telephone network 4” or “mobile telephone network 10,” see [1.pre]). <u>E.g., Iizuka:</u> Iizuka discloses that the mobile terminal making a voice call through the mobile telephone network (see [1.c]), involves “wireless data communication with a base station of the mobile telephone network.” Iizuka, [0064]; see also Iizuka, [0105]. A POSITA would have understood that the mobile telephone network is a wireless cellular network because cellular networks employ base stations to divide geographic areas into coverage areas (i.e., cells), enabling mobile terminals within each coverage area to engage in wireless communication by transmitting and receiving signals to and from the base station serving that area—and at minimum it would have been obvious to use the well-known concept of a cellular network for this purpose. Lanning ¶¶132-34. Iizuka further discloses that the second type of wireless network can alternatively be a “PHS (personal handyphone system).” Iizuka, [0007]. A POSITA would have understood that a PHS network is also a type of cellular network. Lanning ¶135.⁶

⁶ See, e.g., Ex. 1018, 3:58-54:7 (“[A] typical personal handy-phone system 10 ...

[is] configured to handover communications with a personal station 14 to an

'181	Iizuka in view of Orava
	• [0007] (“Further, the above functions of the wireless IP telephone can be implemented in a mobile telephone used in a <i>mobile telephone network</i> or a <i>PHS (personal handyphone system) network</i>.”) • [0064] (“The wireless-telephone communication circuit 102 performs <i>wireless data communication with a base station of the mobile telephone network</i> through an antenna 101 b.”) • [0105] (“...information indicating the intensity of a radio wave which the wireless-telephone communication unit 112 can receive from a <i>base station of the mobile telephone network 10</i>”)

D. Grounds 5-6: Iizuka in View of Gallagher, and Iizuka in View of Preston and Gallagher (Claim 9)

Claim 9 depends from claim 8 and further adds “providing a routing association to a mobile switching center within the second type of wireless network, wherein the routing association associates the mobile communication device to the interface server.” While **Iizuka** describes a method of roaming between first and second types of wireless networks using a call-management server (i.e., interface server), **Iizuka** is silent regarding certain routing details that would be relevant in a network that supports multiple mobile terminals. Lanning ¶136.

adjacent base station 12 responsive to the movement of the personal station 14 from one location to another.”).

1. Overview of Gallagher

Gallagher discloses a handover method in which a “subscriber device 12,” i.e., “a wireless transceiver, such as a cellular telephone,” switches between two different types of wireless networks: a wireless network served by “base station 18” and a “cellular network 14.” Gallagher, [0029], [0031]; *see also* Fig. 1. Handover is “facilitate[d] by” “system server 24” (i.e., an interface server) which communicates with the “cellular network 14” and with “base station 18” to “determine whether and when to route phone service over the PSTN 20, Internet 30, or cellular network 14.” Gallagher, [0031], [0044], [0048]. Lanning ¶137.

The “base station 18” of “base station subsystem 600” sends a “HandoverRequired” message to “mobile switching center 26” to initiate a handover. Gallagher, [0109], Fig. 14 (arrow 926). Upon receiving the message, the mobile switching center 26 “correlates the U-CGI value with the system server 24.” Gallagher, [0109]; *see also* Gallagher, [0105]. Lanning ¶138.

Gallagher further discloses providing a IMSI value to a mobile switching center within a cellular network. For example, “subscriber device 12” sends its IMSI value whenever it registers with “base station 18” of “base station subsystem 600.” Gallagher, [0081], Fig 11 (arrow 680). The IMSI value, or “international mobile subscriber identity,” is a unique identifier for a subscriber device. Gallagher, [0076]. Lanning ¶139.

After “the mobile switching center 26 correlates the U-CGI value with the system server 24,” it “sends the system server 24 the IMSI of the subscriber device 12” and “instruct[s] the system server 24 to prepare and execute a handover to the device designated by this IMSI.” Gallagher, [0109], Fig. 14 (arrow 928, “MAP-Prepare-HO”). Lanning ¶140.

2. Motivation to Apply Gallagher’s Teachings to Iizuka (Optionally as Modified by Preston)

Iizuka and **Gallagher** are analogous art, in the same field as the ’181, which includes switching wireless communications between disparate wireless networks, and reasonably pertinent to alleged problems addressed by the ’181 of allowing mobile communication devices to communicate over multiple networks. ’181, 1:38-49; Iizuka, Abstract, [0007], [0014], [0052]; Gallagher, Abstract, [0006], [0029], [0030], [0031], [0034], [0038], [0048], [0052], [0112], [0113]. For example, both **Iizuka** and **Gallagher** disclose a method of seamlessly (or smoothly) handing over voice communications between a wireless network and a cellular network. Iizuka, Abstract, [0010], [0014], [0015], [0043], [0073], [0074], [0157]-[0162], [0163]-[0176], Figs. 13-14; Gallagher, [0002], [0038], [0059], [0111]-[0115], Figs. 1, 14. Lanning ¶141.

A POSITA would have been motivated to apply **Gallagher’s** teachings of using a routing association that associates a mobile communication device to an

interface server in **Iizuka's** method (optionally as modified by **Preston**) in order to advantageously ensure seamless handover between the wireless networks. Lanning ¶142. **Iizuka** teaches that multiple communication devices can communicate simultaneously over the same wireless network. *See, e.g.*, Iizuka, Fig 2 (depicting mobile terminals 100 and 100a). A POSITA would have recognized that a successful handover method of **Iizuka** required correctly identifying the network entities involved, such as the interface server facilitating the handover and the specific mobile terminal involved. Lanning ¶142. A POSITA would have understood that using identifiers would advantageously have reduced the likelihood of erroneous handovers between other network devices and would achieve **Iizuka's** objective of “smoothly continu[ing] a call” without disruptions. Iizuka, [0010]. [0205]; Lanning ¶142. A POSITA would have looked to a reference like **Gallagher**, which teaches using identifiers like the U-CGI value and IMSI, to identify interface servers and the mobile communication devices, respectively. Lanning ¶142. Moreover, since **Iizuka** already discloses tracking each mobile terminal in a wireless network, the incorporation of unique identifiers for both mobile terminals and interface servers would have been straightforward as **Gallagher's** teachings provide implementation details for **Iizuka's** method. *See, e.g.*, Iizuka, [0096], Fig. 7 (“IDENTIFICATION OF TERMINAL”); Lanning ¶142.

Thus, a POSITA would have found it routine, straightforward and

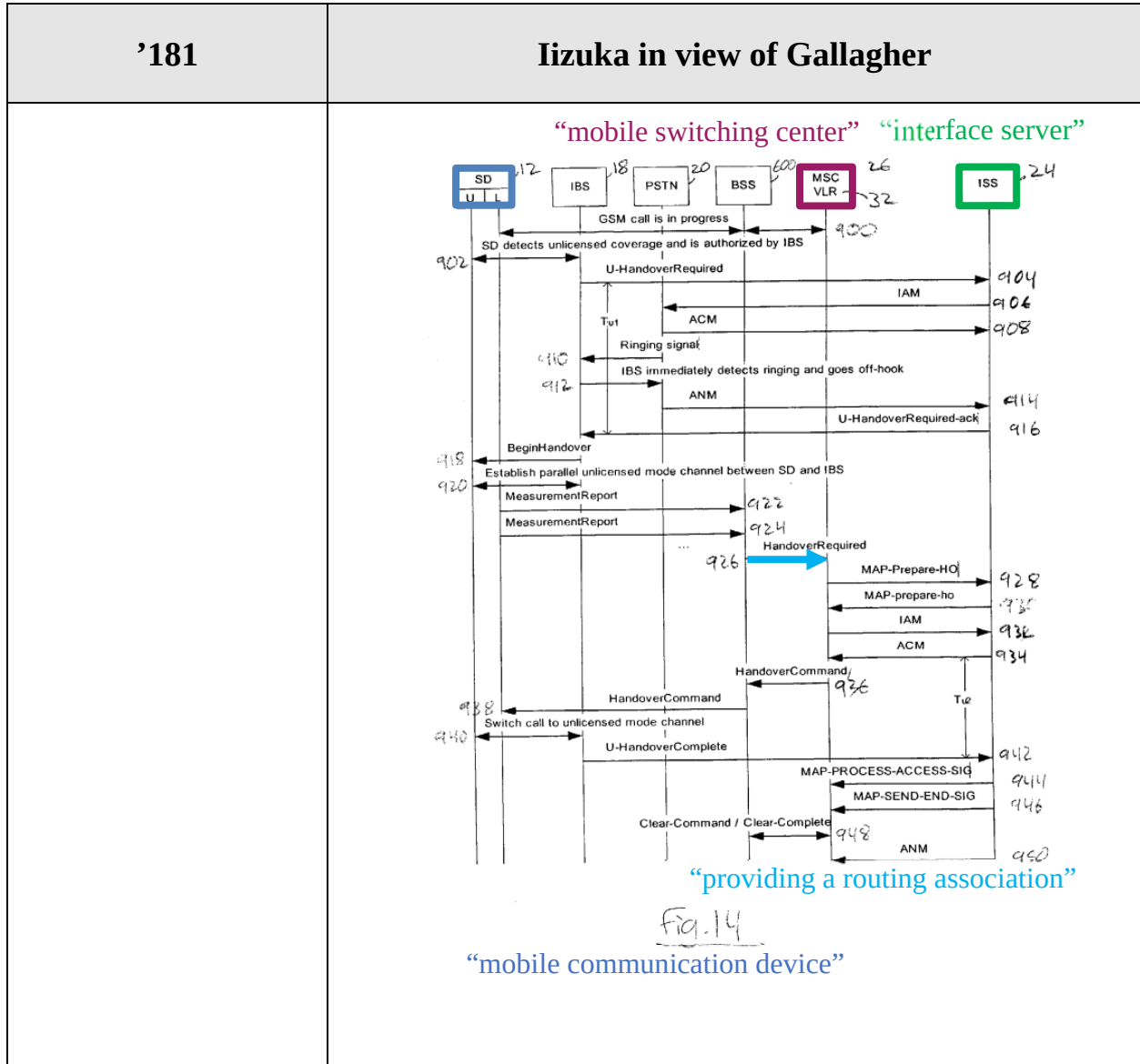
advantageous to apply **Gallagher’s** teachings of using a routing association that associates a mobile communication device to an interface server in **Iizuka’s** method, and would have known such a combination (yielding the claimed limitations) would predictably work and provide the expected functionality. Lanning ¶143.

3. Claim Chart

'181	Iizuka in view of Gallagher
[9] The method of claim 8 further comprising providing a routing association to a mobile switching center within the second type of wireless network, wherein the routing association associates the mobile communication device to the interface server.	See [8]. Iizuka discloses the second type of wireless network (e.g., “[wireless, mobile] telephone network [4, 10],” see [1.pre], [1.e]), the mobile communication device (e.g., “mobile terminal [1, 100],” see [1.pre]), and an interface server (e.g., “call-management server 200,” see [1.c]). See [1.pre], [1.c], [1.e]. Gallagher discloses providing a routing association (e.g., providing a “U-CGI value” and “IMSI”) to a mobile switching center (e.g., to “mobile switching center 26”) within a second type of wireless network (e.g., within “cellular network 14”), wherein the routing association (e.g., the “U-CGI value” and “IMSI”) associates a mobile communication device to an interface server (e.g., the U-CGI value “correlates” with a “system server 24,” which associates with “subscriber device 12” identified by an IMSI). <u>E.g., Gallagher:</u> Gallagher discloses a handover method in which a “subscriber device 12,” i.e., “a wireless transceiver, such as a cellular telephone,” switches between two different types of wireless networks: a wireless network served by “base station 18” and a “cellular network 14.” Gallagher, [0029], [0031]; see also Fig. 1. Handover is “facilitate[d]

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	by” “system server 24,” which communicates with the “cellular network 14” and with “base station 18” to “determine whether and when to route phone service over the PSTN 20, Internet 30, or cellular network 14.” Gallagher, [0031], [0044], [0048]. “System server 24” is an interface server because it serves as an interface for data communication between two different types of wireless networks. Lanning ¶¶144-48. Gallagher further discloses providing a U-CGI value to a mobile switching center within a cellular network. Gallagher teaches that “base station 18” of “base station subsystem 600” sends a “HandoverRequired” message to “mobile switching center 26” to initiate a handover. Gallagher, [0109], Fig. 14 (arrow 926). The mobile switching center is a component of “cellular network 14.” Gallagher, [0032]. Upon receiving the message, the mobile switching center 26 “correlates the U-CGI value with the system server 24.” Gallagher, [0109]; <i>see also</i> Gallagher, [0105]. A POSITA would have understood that the U-CGI value is either included in the HandoverRequired message or otherwise provided to the mobile switching center because Gallagher discloses that the base station subsystem—not the mobile switching center—first “identif[ies]” a U-CGI value by processing frequency information received from “subscriber device 12.” Gallagher, [0105]. Lanning ¶149. Gallagher further discloses providing a IMSI value to a mobile switching center within a cellular network. For example, “subscriber device 12” sends its IMSI value whenever it registers with “base station 18” of “base station subsystem 600.” Gallagher, [0081], Fig 11 (arrow 680). The IMSI value, or “international mobile subscriber identity,” is a unique identifier for a subscriber device. Gallagher, [0076]. This identification information is eventually sent to mobile switching center 26. Gallagher, [0081], Fig. 11 (arrow 684). Only after the mobile

'181	Iizuka in view of Gallagher
	switching center is provided with an IMSI value is it able to relay it to other network entities, such as system server 24. Gallagher, [0109]. Lanning ¶150. Gallagher further discloses that after “the mobile switching center 26 correlates the U-CGI value with the system server 24,” it “sends the system server 24 the IMSI of the subscriber device 12” and “instruct[s] the system server 24 to prepare and execute a handover to the device designated by this IMSI.” Gallagher, [0109], Fig. 14 (arrow 928, “MAP-Prepare-HO”). Thus, the mobile switching center uses the U-CGI value and IMSI to associate subscriber device 12, that is involved in the upcoming handover, to system server 24. Lanning ¶151. As explained in §IX.D.2, a POSITA would have been motivated to apply Gallagher’s routing association teachings to Iizuka’s method. Lanning ¶152. Fig. 1 The diagram illustrates a network architecture. At the top, an 'Indoor System Server' (24) is connected to an 'Internet' (30) and a 'PSTN' (20). The 'Internet' is also connected to a 'Cellular Core Network' (14). The 'Cellular Core Network' contains several components: a 'BSC' (38), an 'HLR' (34), an 'AuC' (36), an 'MSC' (26), and a 'VLR' (32). The 'Indoor System Server' is also connected to a 'PBX' (22). The 'PBX' is connected to an 'Indoor Base Station' (18). The 'Indoor Base Station' is connected to a 'Subscriber Device' (12). The 'Subscriber Device' is located within a dashed oval labeled 'Unlicensed Coverage Area'. The entire system is labeled 'FIG. 1'. Fig. 14



'181	Iizuka in view of Gallagher
	• Fig. 11 “interface server” “mobile switching center” “mobile communication device” FIG. 11 • Fig. 5 “interface server” FIG. 5 • [0109] (“The value of the U-AVAILABLE bit triggers the base station subsystem 600 to initiate handover to the unlicensed system. The base station subsystem 600 sends a HandoverRequired message to the mobile switching center 26 (arrow 926). This message includes an instruction for the

'181	Iizuka in view of Gallagher
	mobile switching center 26 to transfer the call to the base station 18. <i>The mobile switching center 26 correlates the U-CGI value with the system server 24. It then sends the system server 24 the IMSI of the subscriber device 12, along with a Mobile Application Part-Prepare-HandOver (MAP-Prepare-HO) command instructing the system server 24 to prepare and execute a handover to the device designated by this IMSI (arrow 928)."</i>) • [0029] ("FIG. 1 illustrates a system 10 that may be operated in accordance with an embodiment of the present invention. The system 10 includes <i>a subscriber device 12, which is a wireless transceiver, such as a cellular telephone, a PCS telephone, a wireless data modem and the like.</i> This subscriber device 12 is in wireless electronic communication with <i>a cellular network 14,</i> which provides licensed wireless service in the form of voice or data services. When the device 12 is within an unlicensed wireless service coverage area 16, the licensed wireless service is substituted without interruption for an unlicensed wireless service that is facilitated through a base station 18.") • [0031] ("<i>A system server 24 facilitates seamless transitions between the licensed wireless service and the unlicensed wireless service.</i> The system server 24 is in electronic communication with the standard cellular network 14. In one embodiment of the invention as shown in FIG. 1, the system server 24 is also in electronic communication with the base station 18 through a Local Area Network (LAN) 28 and a larger network 30, such as the Internet.")

'181	Iizuka in view of Gallagher
	• [0044] (“FIG. 4B illustrates the workplace environment of FIG. 4A modified to incorporate the base station 18 of the invention. The base station 18 is placed in electronic communication with both the telephone 300 and the LAN 28. This configuration allows base station 18 to receive landline voice and data from a PSTN 20 and broadcast it to subscriber devices 12 when they are within the coverage area 16. <i>The base station 18 is also connected to a LAN 28, which allows it to communicate with the system server 24 in order to coordinate handovers between the licensed wireless and unlicensed wireless systems.</i> Advantageously, the base station 18 operates transparently with respect to the PBX 22, the LAN 28, the telephone 300, and the PC 302.”) • [0048] (“FIG. 5 illustrates <i>a system server 24, which manages the mobility of subscriber devices 12 between a landline-based unlicensed wireless service from a base station 18 and a licensed wireless service, such as from a cellular network 14.</i>”) • [0032] (“FIG. 1 illustrates that <i>the cellular network 14 includes standard components, such as a cellular core network 15, a mobile switching center 26,</i> visitor location register 32, a home location register 34, an authentication center 38, and a base station controller 38. As discussed below, these standard components are utilized in a novel manner in order to provide extended functionality for a subscriber device 12.”) • [0105] (“As discussed below, the frequency information (e.g., the U-ARFCN) is processed by <i>the base station subsystem 600 to identify an Unlicensed Cell Global Identification (U-CGI)</i>”)

'181	Iizuka in view of Gallagher
	<i>value, which corresponds to the system server 24.</i> In this way, the frequency information bridges the licensed and unlicensed wireless communication systems.”) • [0076] (“FIG. 10 illustrates a licensed wireless system authentication process utilized in accordance with the prior art. In this example, the subscriber device 12 moves from the coverage area served by its home mobile switching center (referred to as MSC-A) to the coverage area served by MSC-B. As soon as the subscriber device 12 enters a cell that is served by MSC-B, it registers with the system by sending an authentication request and a location update to base station subsystem (BSS) 600, as shown with arrow 650. The location update request includes <i>an international mobile subscriber identity (IMSI).</i>”) • [0081] (“When the subscriber device 12 enters the service area of the base station 18, it registers with the base station. The authentication module 124 of the subscriber device 12 subsequently intercepts the registration message that is typically sent to the licensed wireless base station (e.g., BSS 600). <i>This information is sent to the base station 18, as shown with arrow 680.</i> The base station 18, at the direction of the authentication module 230, routes the information to the system server 24. Thus, the base station 18 emulates the operation of a BSS. As shown with arrow 684, the system server 24 forwards the information to the MSC-A. The authentication module 422 of the system server 24 may be used for this purpose. In this capacity, the authentication module 44 assists the system server 24 in its operation of emulating a visitor location register. The operations at arrows 656, 658, and

'181	Iizuka in view of Gallagher
	660 are identical to the operations performed in the prior art system of Fig. 10.”) • <i>See also</i> [0103]-[0104]

X. SECONDARY CONSIDERATIONS

The Challenged Claims of the '181 are overwhelmingly demonstrated as obvious by the grounds presented herein. The strength of these grounds cannot be overcome by any alleged objective indicia.

Although PO raises allegations of secondary considerations in the district court litigation (Ex. 1020, 36-47; Ex. 1021, 11-12), those allegations are unavailing at least because PO cannot demonstrate the required nexus between its allegations and the purported invention. Lanning ¶¶153-54.

In addition, PO's allegations are conclusory and ostensibly relate to four patents, providing no explanation as to any nexus to any particular claim of the four patents, let alone the '181 claims. Lanning ¶155.

To the extent these general arguments can be understood as being particular to the '181, PO's conclusory allegations additionally fail for the reasons set forth below. Lanning ¶¶156-62.

Commercial success: PO provides no evidence of commercial success. While PO asserts that such success “will be shown” based on Samsung's own

products (Ex. 1020, 37), the success of Samsung's own products has no nexus to the Claims at least because Samsung does not infringe and because the accused phone and tablet products include many unrelated features that drive their success.

Long-felt need: PO cites portions of the '181 specification as purported evidence of long-felt need, but such explanations are conclusory and self-serving, and regardless do not show any alleged need was "long-felt." *Id.*, 38-39.

Industry recognition: PO cites an award that Samsung received for Wi-Fi Innovation, but PO has not shown the requisite nexus between that award and the Claims. *Id.*, 39. PO also argues that praise and recognition is shown by Vasu patents being cited during prosecution of other patents, but PO does not explain how mere citation during prosecution is praise or recognition, and PO has not shown that any such citation would have the requisite nexus to the Claims. *Id.*, 40-47.

Skepticism in the industry: PO argues that unidentified contemporaneous publications acknowledged the difficulty of developing the claimed invention, but PO does explain how purported challenges show "skepticism" and also does not even attempt to explain the requisite nexus the Claims. *Id.*, 47.

Copying: PO argues that Samsung copied PO's technology, but PO's argument is conclusory and based only on alleged knowledge of "patents and application that Vasu had filed because they were cited as prior art against [Samsung's] own patent applications"—PO does not even allege that Samsung was

aware of the '181 specifically, as opposed to other Vasu patents and application, and does not allege knowledge of the '181 before Samsung developed its products. *Id.*, 37, 47-53; Ex. 1019, 21-26, 76-77; Ex. 1021, 11-12. In addition, there is no nexus because Samsung does not infringe.

XI. CONCLUSION

Substantial, new, and noncumulative technical teachings have been presented for each Challenged Claim, which are rendered obvious for the reasons set forth above. Lanning ¶¶62-167. There is a reasonable likelihood Petitioners will prevail as to each of these Claims. *Inter partes* review of Claims 1-4, 8, and 9 of the '181 is accordingly requested.

Dated: January 23, 2025

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. §42.24(a) and (d), the undersigned hereby certify that the Petition For *Inter Partes* Review complies with the type-volume limitation of 37 C.F.R. §42.24(a)(i) because, exclusive of the exempted portions, it contains 13,738 words as counted by the word processing program used to prepare the paper.

Dated: January 23, 2025

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CERTIFICATE OF SERVICE

The undersigned certifies service pursuant to 37 C.F.R. §§42.6(e) and 42.105(b) on the Patent Owner by FedEx of a copy of this Petition for Inter Partes Review and supporting materials at the correspondence address of record for the '181 patent:

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