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 IPR2025-00447
Patent No. 10,206,154

PETITION FOR *INTER PARTES* REVIEW

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EXHIBIT LIST

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1002	File History of U.S. Application No. 14/510,766 ("'154FH")
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	*Reserved*
1007	*Reserved*
1008	U.S. Provisional App. No. 60/534,466 ("'466-Prov")
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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
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/

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TABLE OF ABBREVIATIONS

Abbreviation	**DESCRIPTION**
’154	U.S. Patent No. 10,206,154 (“’154”) (Ex. 1001)
’154FH	File History of U.S. Application No. 14/510,766 (Ex. 1002)
’181FH	File History of U.S. Application No. 13/240,776 (Ex. 1018)
Claims / Challenged Claims	Claims 1, 2, 4, 43, and 45-47 of the ’154
IPR	*Inter Partes* 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 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 comprises a first communication link between the mobile communication device and a first network;

[1.b] monitoring a context of the first communication link;

[1.c] when a second context is preferred over the context of the first communication link, notifying an interface server and establishing a second communication link between the interface server and the end destination device without disrupting the first communication link, with a client;

[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 communication link between the mobile communication device and a second network, wherein the second network is within a set of known networks or from a newly discovered network.

[2] The method of claim 1 wherein the first communication link comprises a WiFi communication link, and the first network comprises a WiFi network access point.

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

[43.pre] A method of providing communications for a communication device that roams between multiple networks, the method comprising:

> **[43.a]** establishing, with a client, a first communication link between the communication device and an end destination device, wherein the first communication link comprises a first communication link between the communication device and a first network;
>
> **[43.b]** monitoring, with the client, a first context of a signal of the first communication link, wherein the first context comprises signal strength characteristics;
>
> **[43.c]** when a second network is detected as available and a second context of a second communication link corresponding to the second network is preferable, notifying an interface server and establishing a second communication link between the interface server and the end destination device without disrupting the first communication link, with the client;
>
> **[43.d]** notifying the communication device to terminate transmission over the first communication link; and
>
> **[43.e]** re-directing, with the client, the second communication link from the

interface server to the communication device, thereby establishing a second communication link between the communication device and the second network, wherein the second network is within a set of known networks or from a newly discovered network.

[45] The method of claim 43 wherein the interface server is coupled to a gateway device.

[46] The method of claim 45 wherein the gateway device is bi-directionally coupled to a packet network.

[47] The method of claim 46 wherein the packet network comprises packet switched telephone network.

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, 2, 4, 43, and 45-47 ("Claims") of U.S. Patent No. 10,206,154 (Ex. 1001, "'154"). 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 '154'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. '154, 2:54-67, 6:10-16, 6:44-47, 14:11-35. 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.*, 3:12-27, 10:37-48. 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.

allegedly inventive concept that led to allowance of the claims—as confirmed by the prosecution history of the very similar claims of the ’154’s parent, U.S. Patent No. 8,886,181 (“’181”)—was establishing the second communication link “without disrupting the first communication link,” which allows the mobile device to roam between different network types during a call. *Id.*, 1:46-59; Ex. 1018 (’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 ’154 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”).

C. Lead and Back-Up Counsel

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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. 110797-0055-652.

IV. REQUIREMENTS FOR *INTER PARTES* REVIEW

A. Grounds for Standing

Pursuant to §42.104(a), Petitioners certify the ’154 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 ¶65):

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)
Enzmann	1011	US2005/0136927	12/19/2003	6/23/2005	§§102(a)/ 102(e)
Inoue	1012	US2007/0146475	11/19/2003	6/28/2006	§§102(a)/ 102(e)
Sundar	1013	US2003/0134638	01/17/2002	07/17/2003	§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 ’154’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, 2, 4, 43, and 45-47	§103	**Iizuka** in view of **Enzmann**
2	1, 2, 4, 43, and 45-47	§103	**Iizuka** in view of **Enzmann** and **Inoue**
3-4	45-47	§103	**Iizuka** in view of **Enzmann** and **Sundar** (and optionally in view of **Inoue**)

V. ’154 PATENT AND PROSECUTION HISTORY

A. ’154

The purported “invention” of the ’154 relates to an “**interface server**, referred to as a **nomadic server**, and a related system that provides seamless roaming of a **mobile communication device** between **different types of wireless networks**.”

[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 next earliest priority claim is to App. No. 11/330,675.

'154, 2:54-57. The '154 purports to solve the problem that most telephones are allegedly "restricted for use with only one specific network." *Id.*, 1:47-48. Lanning ¶¶40-41.

More specifically, the '154 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.*, 6:10-16, 6:34-36, 6:44-47, Figs. 1, 2. Lanning ¶42.

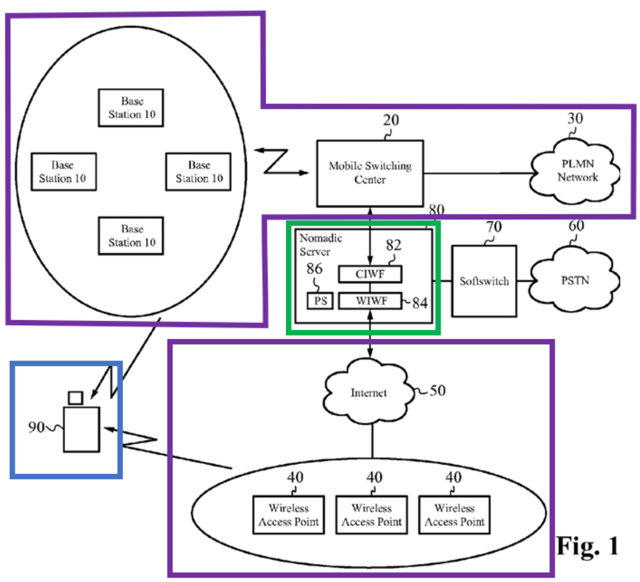

Fig. 1

The only two embodiments of the '154 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.*, 10:21-12:2. Both embodiments involve roaming from WiFi coverage to non-WiFi coverage. *Id*. This overview will focus on the "second scenario." Lanning ¶43.

In the second scenario, when the **mobile communication device** makes a call over a VoIP network within a first WiFI coverage area, and 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.*, 10:21-32. The device also registers with the **nomadic server**. *Id.*, 10:32-35. Lanning ¶44.

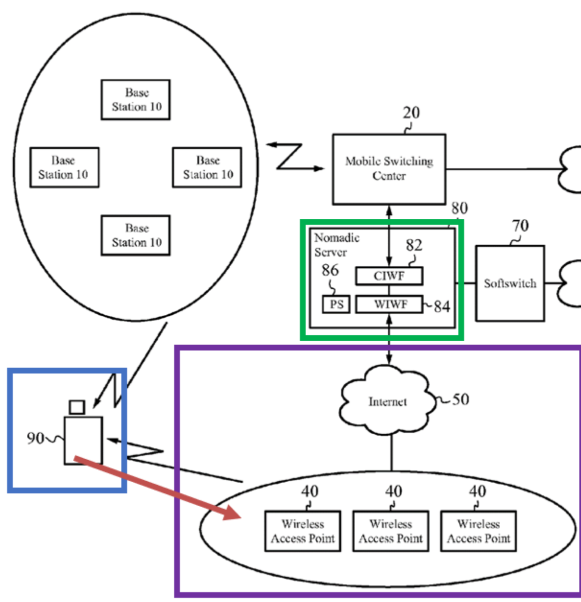

Fig. 1

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.*, 10:37-43. 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.*, 8:65-9:1. The '154 does not specify or limit the communication path of this notification. Lanning ¶45.

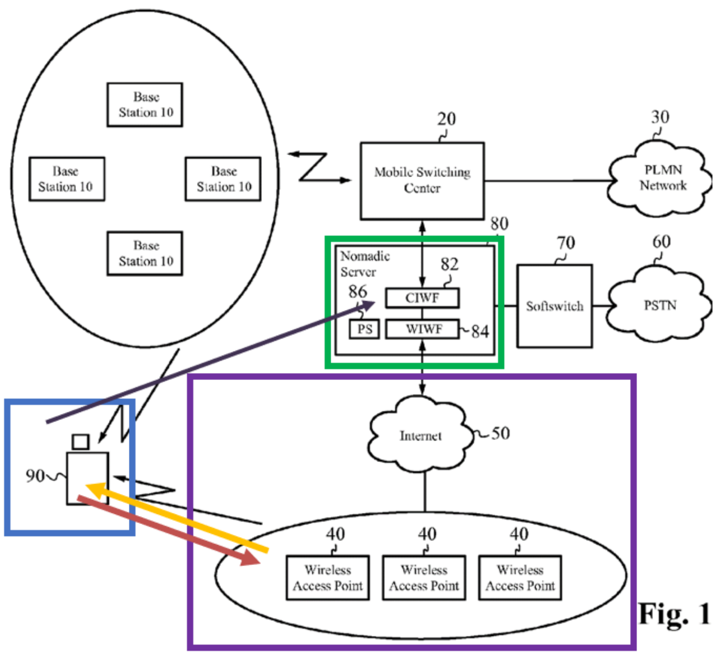

Fig. 1

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.*, 10:43-48. 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.*, 7:33-38, Fig. 1. The 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.*, 10:50-58. 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.*, 10:63-66. 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.*, 10:66-11:3. Lanning ¶46.

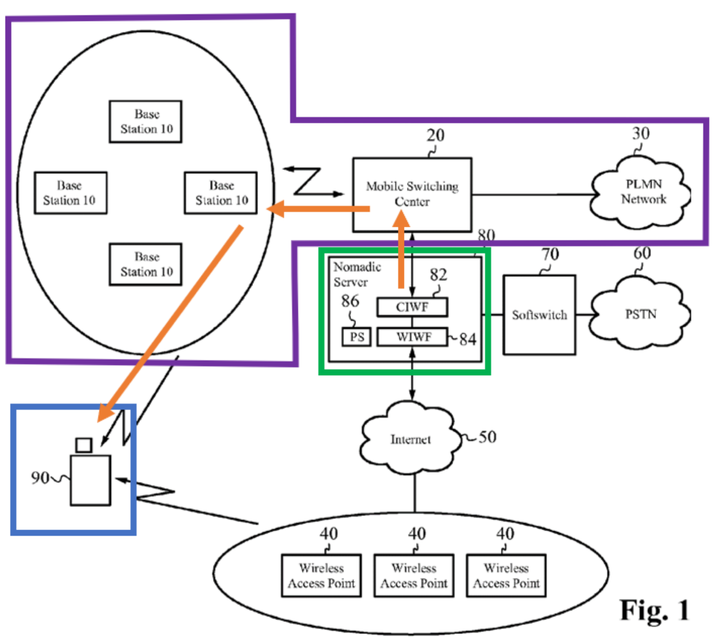

Fig. 1

B. Prosecution History

1. ’154 Prosecution

The ’154 issued from U.S. Pat. App. 14/510,766 (“’154 Application”), filed 10/9/2014. The claims were rejected for double patenting as claiming the same invention as the ’181, which is the parent to the ’154, and U.S. Patent No. 8,078,164, and allowed after terminal disclaimers were filed. ’154FH, 624-27, 708-16, 728-32, 790-94, 853-61. Lanning ¶47.

2. ’181 (Parent) Prosecution

As the above history indicates, the ’154 claims overlap extensively with the claims of the parent ’181.

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, 535-46. In response to the 4/27/2013 rejection, Applicant on 9/17/2013 amended independent claim 1 to recite a second communication link is established “without disrupting the first communication link.” *Id.*, 577. Lanning ¶¶48-50.

The Examiner then allowed claims 1-13. ’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. *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." *Id.*, 696; Lanning ¶51.

The "without disrupting the first communication link" limitation that apparently led to allowance of the '181 claims is also recited in the Challenged Claims of the '154, which did not have any other prior art-based rejections during its prosecution. Lanning ¶52.

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 ("'498-CIP," Ex. 1010)) because each fails to provide written description support for at least the following limitations: (a) "notifying an interface server," (b) "establishing a second communication link between the interface server and the end destination device without disrupting the first communication link, with [a/the] client" and (c) "re-directing[, with the client,] the second communication link from the interface server to the [mobile] communication device." Lanning ¶53.

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 ¶¶54-55.

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 ’154’s “interface server” (or “nomadic server”) that connects to multiple network types. ’154, 6:10-13, Fig. 1; Lanning ¶56. 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 ¶56.

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 '154's interface server that connects to multiple network types. '154, 6:10-13, Fig. 1; Lanning ¶57.

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**, **Enzmann**, **Inoue**, and **Sundar**—were not cited in an IDS or otherwise identified by the Examiner, or applied to reject claims during '154's prosecution. While a version of **Sundar**, U.S. Patent App. Pub. 2003/013342, was cited in an IDS ('154FH, 694), it was not discussed or applied in a rejection by the Examiner and was never considered in combination with the other references presented in this Petition, including **Iizuka** and **Enzmann**. The Examiner also never considered the testimony of Petitioners' expert Mark Lanning (Ex. 1003) regarding the scope and content of these documents. Lanning ¶¶1-192. 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 of the parent '181. *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 '154, 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** and **Enzmann** disclose or render obvious every element of independent claim 1 of the '154.

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 1/11/2006 filing date of App. No. 11/330,675 listed in the ’154’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 1/11/2006, 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 ¶¶58-61.

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 ¶¶62-63. 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 ’154 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, 64-69. 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: (1) **Enzmann** teaches monitoring the context of both the WLAN and cellular network before switching and switching only if the second context is preferred; (2) **Inoue** teaches a SIP client on a mobile terminal and transmitting a BYE message to the mobile terminal; and (3) **Sundar** teach features relating certain challenged dependent claims. As demonstrated below, the prior art renders the Claims unpatentable. Lanning ¶¶37-39, 64-177.

A. Ground 1: Iizuka in View of Enzmann (Claims 1, 2, 4, 43, and 45-47)

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 '154, **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 ¶70.

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 ¶71.

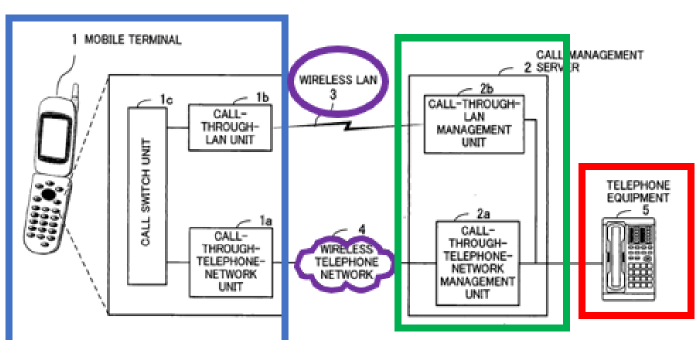

FIG. 1

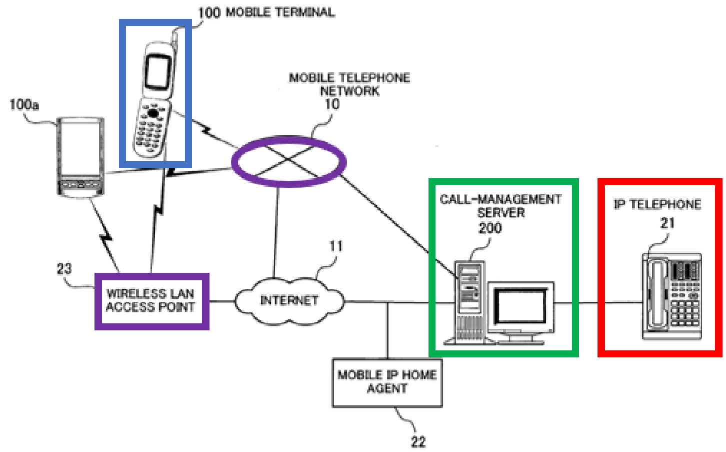

FIG. 2

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 ¶72. 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 ¶72.

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 ¶¶72-73.

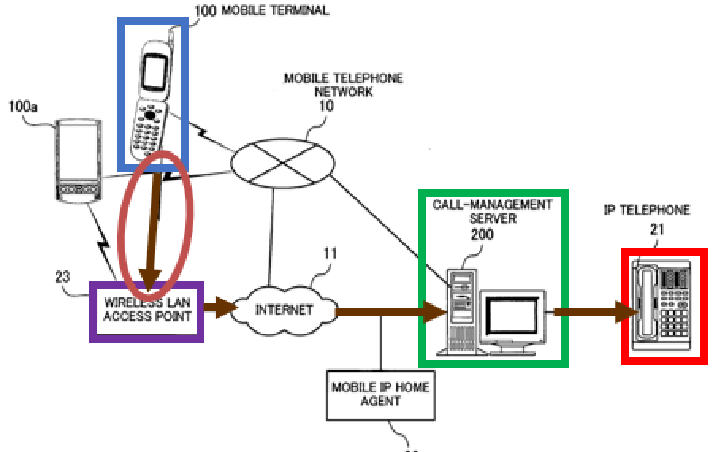

FIG. 2

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 ¶74.

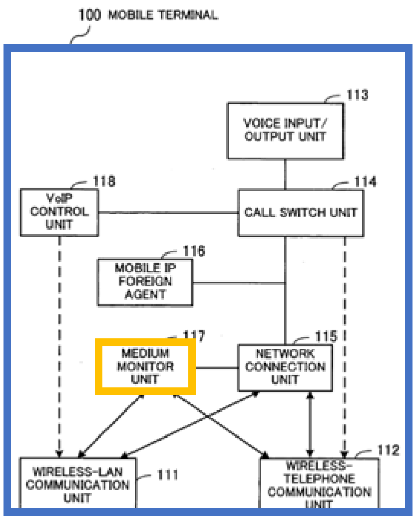

FIG. 4

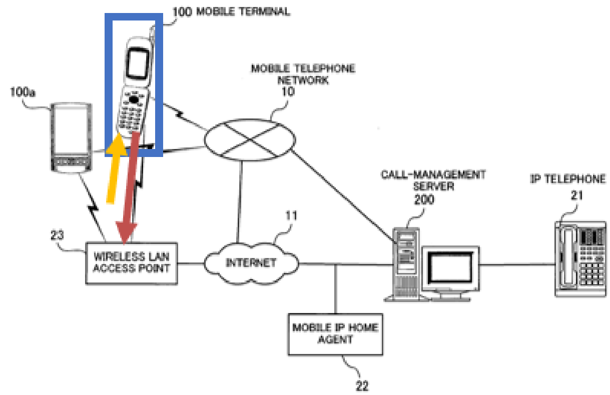

FIG. 2

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 ¶75.

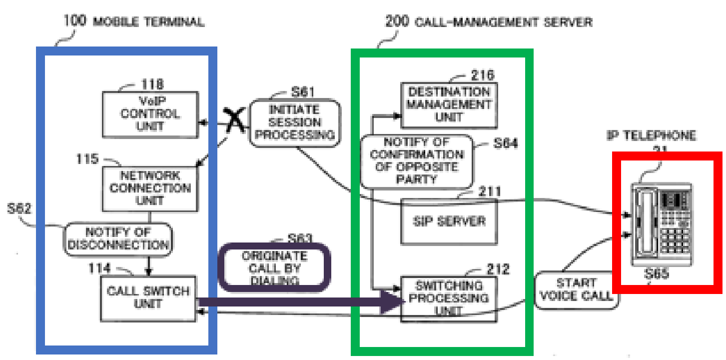

FIG. 13

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 ¶76.

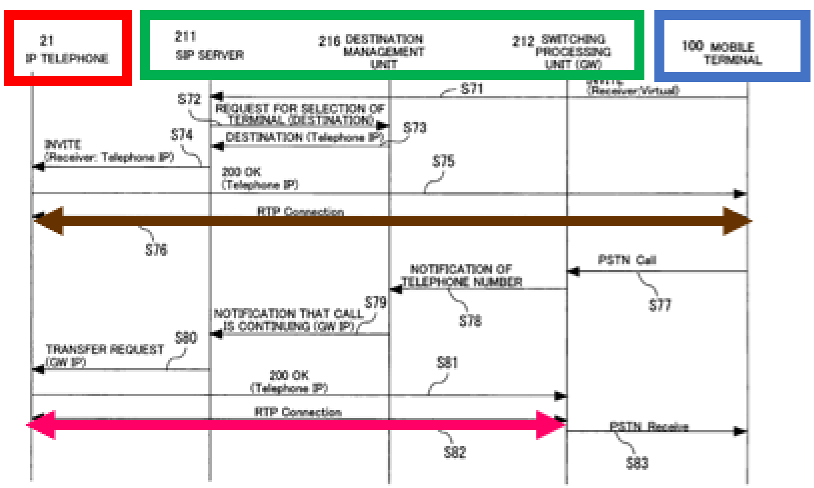

FIG. 14

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 ¶77.

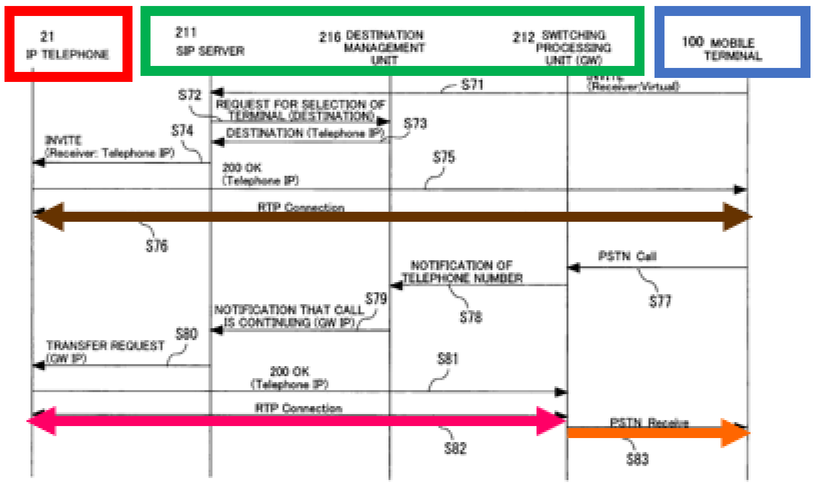

FIG. 14

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 ¶78.

2. Overview of Enzmann

Enzmann discloses, in a network roaming procedure that roams between two wireless networks (a wireless (802.1x) network and a cellular network), monitoring "signal levels" associated with a "call session" that "is active" in the wireless 802.1x network, and also monitoring “cellular … signal levels” in the cellular network. Enzmann, [0025]. **Enzmann** further discloses monitoring “strength of the signal[s]” from both the 802.1x network and cellular network to decide if the switch from the wireless network to the cellular network should occur because “the strength of the signal from the access point 7 [of the 802.1x network] has dropped below a certain threshold level” and “the strength of the signal from the cellular network is at or above a certain threshold level.” Enzmann, [0025]; *see also* Enzmann, [0032]. Lanning ¶79.

3. Motivation to Apply Enzmann’s Teachings to Iizuka

Iizuka and **Enzmann** are analogous art, in the same field as the ’154, which includes wireless communications, and reasonably pertinent to alleged problems addressed by the ’154 of allowing mobile communication devices to communicate over multiple networks. ’154, 1:43-54; Iizuka, Abstract, [0007], [0010], [0014], [0052]; Enzmann, [0002], [0005], [0007], [0009], [0019], [0021], [0025]-[0026]. For example, both **Iizuka** and **Enzmann** disclose a mobile communication device that is capable of communicating through multiple wireless networks and of seamlessly switching from communication over a first network, a WLAN, to communicating over a second network, a cellular network. Iizuka, Abstract, [0005], [0014]-[0015], [0039]-[0042], Figs. 1-2; Enzmann, [0004]-[0007], [0009], [0019], [0021], [0025]-[0026]. Lanning ¶80.

A POSITA would have been motivated to apply **Enzmann's** teachings of monitoring a first context of a communication link over a WLAN network, monitoring a second context of the cellular network, and switching to communicating over the cellular network when the second context is preferred over the first to **Iizuka** to advantageously increase efficiency of the system such that switching does not occur unless (1) the signal strength of the WLAN signals are insufficient to support an on-going call and (2) the signal strength of cellular signals is strong enough to support communication over the cellular network. Lanning ¶81. A POSITA would have recognized that restricting switching in this manner prevents the mobile device from switching to a cellular network when the WLAN is better suited to service the call based on signal reception, and when the cellular network cannot adequately support the call. Lanning ¶81. Since **Iizuka** already discloses mobile communication devices monitoring signal intensities from both a WLAN and cellular network, the incorporation of triggering the switching procedure after the measured signal intensities meet specific thresholds would have been a straightforward modification of **Iizuka**. Iizuka, [0069], [0078], [0105]; Lanning ¶81.

Thus, a POSITA would have found it straightforward and advantageous to apply **Enzmann's** teachings of conditioning a switching procedure on the measured signal strengths of a first network and a second network to **Iizuka's** method, and would have known such a combination (yielding the claimed limitations) would predictably work and provide the expected functionality. Lanning ¶82.

A POSITA would further have been motivated to apply **Enzmann's** teachings of using an 802.1x network (i.e., a WiFi network) and an 802.1x access point in a wireless LAN network to **Iizuka's** roaming method. Lanning ¶83. *First*, a POSITA would have recognized that an 802.1x 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 ¶83. *Second*, a POSITA would have recognized the 802.1x standard would have increased compatibility and interoperability. Lanning ¶83. For example, even before the earliest provisional application of the '154, the 802.11 protocol family, which underpins Wi-Fi technology, had achieved widespread industry adoption and dominated the market. Ex. 1016 ("[In December 2001,]…Wi-Fi…dominates the WLAN market with nearly a 100% share."); *see also* Ex. 1017. Lanning ¶83.

In addition, a POSITA would have regarded the application of **Enzmann'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 ¶84. Moreover, **Iizuka** discloses using a CSMA/CA (Carrier Sense Multiple Access with Collision Avoidance) technique that is used with the 802.1x standard. Lanning ¶84. 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 ¶84.

4. Claim Chart

'154	Iizuka in view of Enzmann
[1.pre] A method of providing communications for a mobile communication device that roams between multiple networks, the method comprising:	**To the extent the preamble is limiting, Iizuka discloses a method of providing communications** (*e.g.*, providing "wireless communication") **for a mobile communication device** (*e.g.*, for "mobile terminal [1, 100]") **that roams** (*e.g.*, "switching (roaming)") **between multiple networks** (*e.g.*, "from a connection through the wireless LAN to a connection through a wireless telephone network")**.** ***E.g.*, Iizuka:** **Iizuka** discloses a method that enables a mobile terminal (including "mobile terminal [1, 100]") to roam between multiple 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 ¶¶85-88.

<table>
<tr><th>’154</th><th>Iizuka in view of Enzmann</th></tr>
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- **Fig. 1**

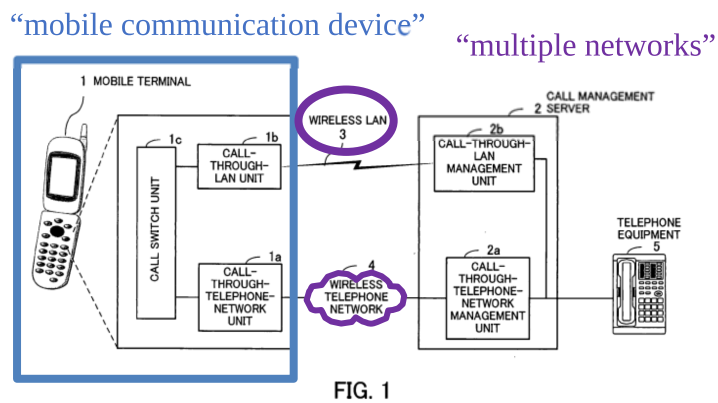

FIG. 1

- **Fig. 2**

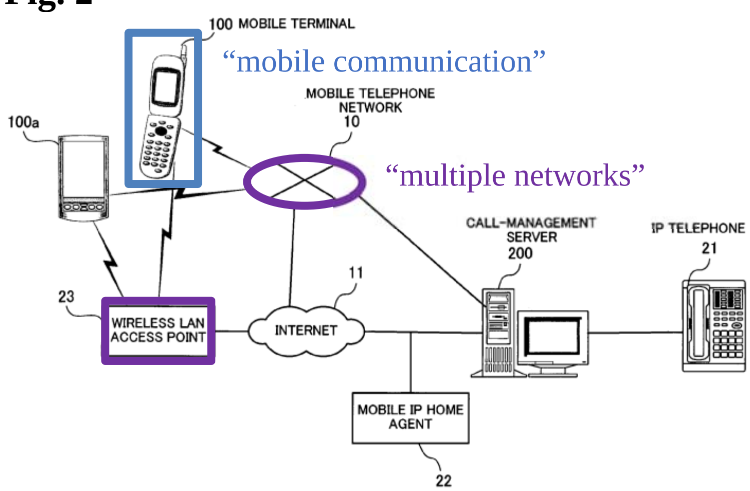

FIG. 2

[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 ***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***.”)

- **[0057]** (“FIG. 2 is a diagram illustrating an example of a construction of a system of the embodiment of the present invention. In the

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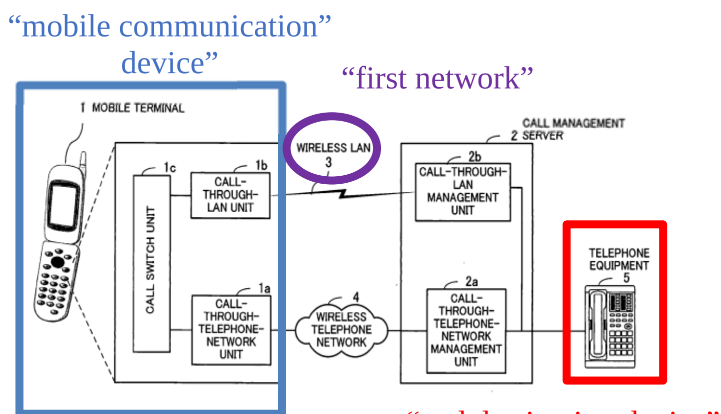
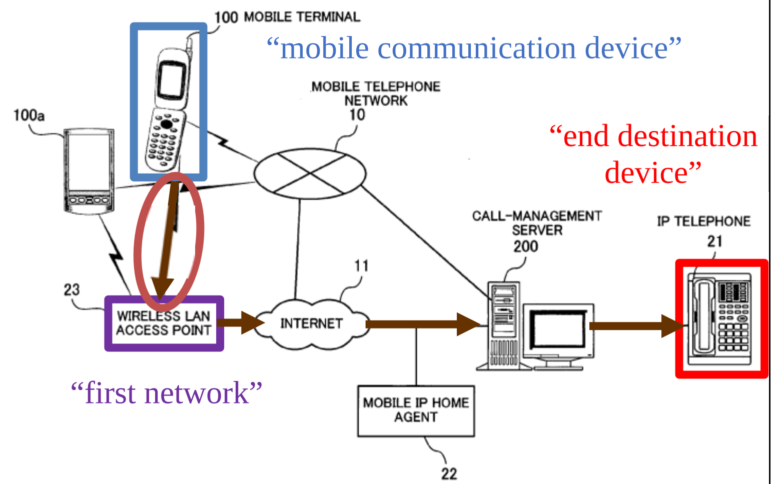
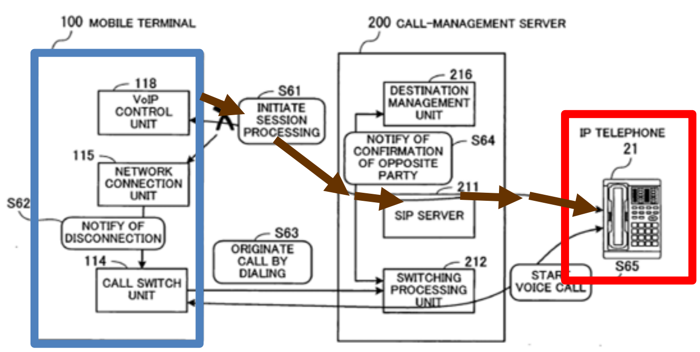
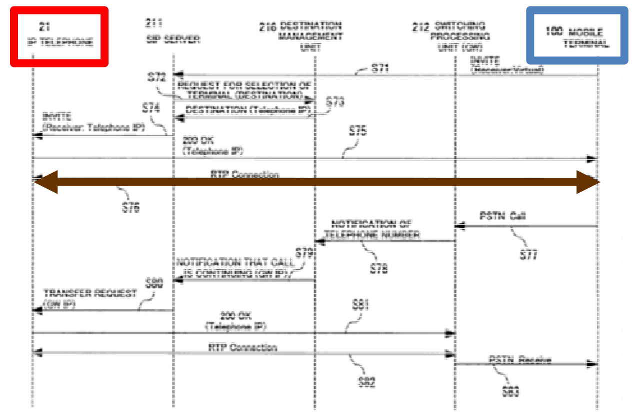
’154	Iizuka in view of Enzmann
	present embodiment, ***a mobile telephone network 10 and the Internet 11 containing a wireless LAN are provided as the communication mediums through which calls can be made.***”) • **[0015]** (“[A] mobile terminal for making a wireless call is provided. ***The mobile terminal 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 network***; and a call switch unit which establishes a connection through the call-through-telephone-network unit and ***switches from a first call through the call-through-LAN unit to a second call through the call-through-telephone-network unit*** ….”) • **[0212]** (“[W]hen the condition of communication through a wireless LAN 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***. ... Therefore, it is possible to dynamically switch the call between a connection through the wireless LAN and a connection through the wireless telephone network….”); ***see also*** **[0043]** • **[0157]** (“FIG. 13 is a diagram illustrating processing for ***switching (roaming)*** 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

’154	Iizuka in view of Enzmann
	communication mediums, a wireless LAN 3 and a wireless telephone network 4.”) • ***See also* [0157]-[0176]**
[1.a] establishing a first communication link between the mobile communication device and an end destination device, wherein the first communication link comprises a first communication link between the mobile communication device and a first network;	**Iizuka discloses establishing a first communication link** (*e.g.*, establishing a “VoIP call”) **between the mobile communication device** (*e.g.*, between “mobile terminal [1, 100]”) **and an end destination device** (*e.g.*, and “telephone equipment 5,” “IP telephone 21”)**, wherein the first communication link comprises a first communication link between the mobile communication device and a first network** (*e.g.*, “VoIP call” includes “wireless communication” between “mobile terminal [1, 100]” and the “wireless LAN”)**.** ***E.g.*, Iizuka:** **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 the VoIP call includes a first wireless communication link between the mobile terminal and a 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]; *see also* 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-management server 2” and “call-management server

’154	Iizuka in view of Enzmann
	200”). Iizuka, [0049], [0061], [0088], [0158]; *see also* 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]; *see also* Iizuka, [0169]; Figs. 13-14. Lanning ¶¶89-93. • **Fig. 1**  FIG. 1

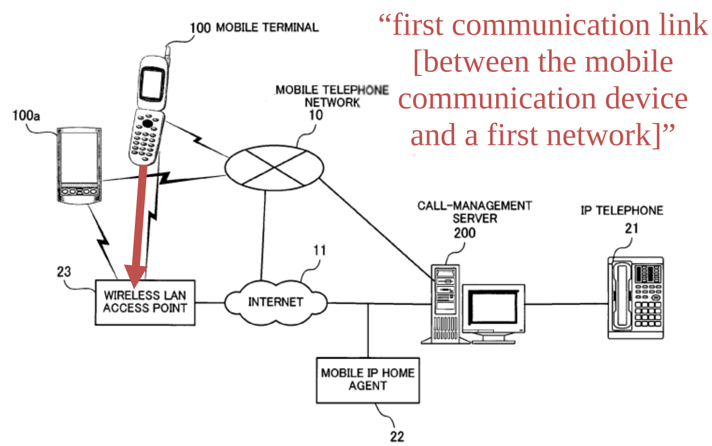
’154	Iizuka in view of Enzmann
	• **Fig. 2**  FIG. 2 • **Fig. 13**  FIG. 13 • **Fig. 14**

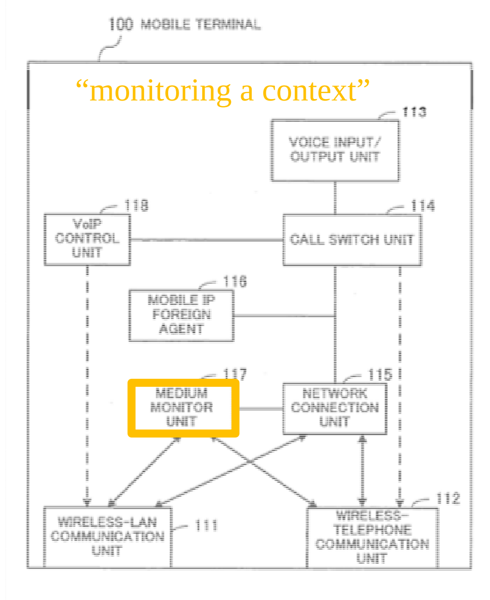
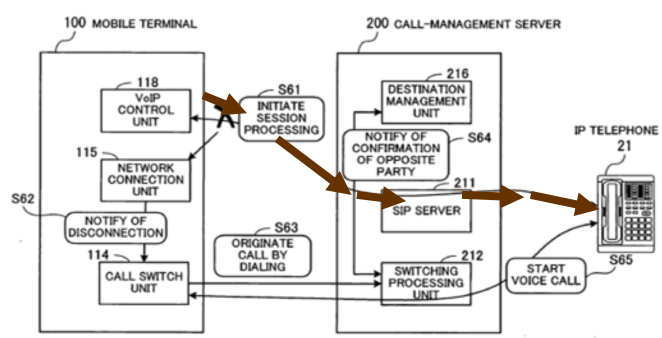
’154	Iizuka in view of Enzmann
	“first communication link between the mobile communication device and an end destination  FIG. 14 “end destination device” “mobile communication device” • **[0039]** (“As illustrated in FIG. 1,… Telephone equipment 5 is connected to the call-management server 2, so that ***a call can be made between a user of the telephone equipment 5 and a user of the mobile terminal 1***.”) • **[0049]** (“[W]hen the call-management server 2 receives from the mobile terminal 1 information indicating restoration of communication between the call-management server 2 and the mobile terminal 1 through the wireless LAN 3, the call-through-LAN management unit 2 b ***establishes a session between the call-management server 2 and the mobile terminal 1 through the wireless LAN 3***.”) • **[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, ***the call-management server 200 establishes and switches***

’154	**Iizuka in view of Enzmann**
	connections between the IP telephone 21 and the mobile terminals 100 and 100 a*.”) • **[0061]** (“The mobile terminals 100 and 100 a each have…a function of making a VoIP call through the Internet 11. ***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….”) • **[0064]** (“The wireless-LAN communication circuit 101 ***performs wireless data communication with the wireless LAN access point 23*** through an antenna 101 a.”) • **[0158]** (“[Step S61] ***After an SIP session is initiated between the mobile terminal 100 and the IP telephone 21, a VoIP call is started.***”) • **[0169]** (“[Step S76] ***A VoIP call between the mobile terminal 100 and the IP telephone 21 is started.***”) • **[0088]** (“The SIP server 211 manages communication through the Internet 11 using the SIP (Session Initiation Protocol), which is a 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 ***a VoIP call through the wireless LAN.***”) • **[0204]** (“In addition,…***a VoIP call is placed by establishing a connection to a network such as a wireless LAN with a network device*** when the mobile terminal 100 receives an incoming call.”)

’154	Iizuka in view of Enzmann
[1.b] monitoring a context of the first communication link;	**Iizuka discloses monitoring a context of the first communication link** (*e.g.*, monitoring the “intensity of a radio wave” transmitted from wireless LAN to mobile terminal 100; and transmitted from IP telephone 21 to mobile terminal 100)**.** ***E.g.*, Iizuka:** Regardless of whether “the first communication link” refers to either of the two recitations of “a first communication link” in [1.a], **Iizuka** discloses this limitation as both include at least the link between the mobile communication device and a first network. Lanning ¶¶94-96. **Iizuka** discloses monitoring a context of “a first communication link between the mobile communication device and a first network” (*see* [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]. Lanning ¶97. Intensity of radio waves is a context because it is a measurable quantity of the network conditions. In addition, 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.[4] Lanning ¶98; *see also* [1.c] (applying **Enzmann’s** teachings). During the VoIP call (*see* [1.a]), mobile terminal 100 communicates with wireless LAN access point 23 through the wireless LAN, receiving radio waves from

[4] “Context” includes signal strength. ’154 claims 43, 26, 27. Lanning ¶98.

’154	Iizuka in view of Enzmann
	wireless access point 23 as part of this communication. Iizuka, [0060]-[0061], [0159]; *see also* Iizuka, [0170]. 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]; *see also* Iizuka, [0170]. Lanning ¶99. • **Fig. 2**  FIG. 2 • **Fig. 4**

’154	Iizuka in view of Enzmann
	 FIG. 4 • **Fig. 13**  FIG. 13 “first communication link [between the mobile communication device and an end destination device]” • **[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, the intensities of signals received from an access point, to which the LAN is to be connected***. In this case, a threshold value

’154	**Iizuka in view of Enzmann**
	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 ***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***….”) • **[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. ***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***….”) • **[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 establishes a connection between the mobile terminal and the call-management server 200 through the wireless LAN access point 23.”)

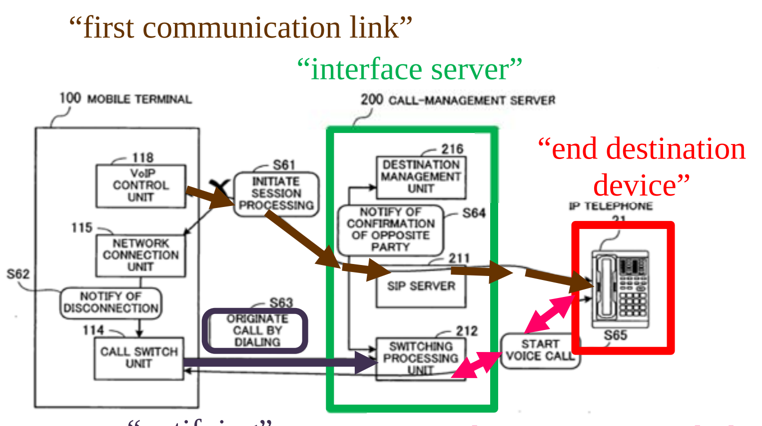
’154	**Iizuka in view of Enzmann**
	• **[0106]** (“In the present embodiment, the functions of the wireless-LAN communication unit 111 can be stopped during the absence of communication. In this case, ***the medium monitor unit 117 confirms the condition of a connection through the wireless LAN*** by activating the wireless-LAN communication unit 111.”) • **[0159]** (“[Step S62] Thereafter, 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.”) • **[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….”)
[1.c] when a second context is preferred over the context of the first communication link, notifying an interface server and establishing a second communication link between the interface server and the end destination device without disrupting the first communication link, with a client;	**Iizuka discloses when the context of the first communication link is not preferred** (*e.g.*, when the “intensity of [a] signal[]” received from a wireless access point, including wireless LAN access point 23, (*see* [1.b]), is detected as being 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”) **and establishing a second communication link between the interface server and the end destination device** (*e.g.*, establishing a “voice 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” (*see* [1.a]) “still continues” while the voice

’154	Iizuka in view of Enzmann
	call is being established)**, with a client** (*e.g.*, with a client on the mobile terminal 100)**.**[5] ***E.g.*, Iizuka**: ***See* [1.a]-[1.b].** **Iizuka** discloses that the mobile terminal informs an interface server when the context of the first communication link is not preferred (*see* [1.b]), such as when it is detected as being below a threshold. For example, mobile terminal 100 monitors the signal strength of the communication through the wireless LAN (*see* [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]; *see also* Iizuka, [0146]. When this criterion is detected, the context is no longer preferred and 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]; *see also* Iizuka, [0170]. The call-management server 200 is an interface server at least because it interfaces with both the wireless LAN and the mobile telephone network (*see* [1.pre]). Iizuka, [0057]-[0058]. **Iizuka** discloses that after the context of the first communication link is no longer preferred, establishing a second communication link between the interface server

[5] While [1.c] does not specify the location of the claimed “client,” the specification and claims explain that it may be located within the mobile communication device. ’154, 6:44-7:2, claim 30. Lanning ¶107.

’154	Iizuka in view of Enzmann
	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 (*see* [1.a]) “still continues.” Iizuka, [0162]. 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]. A POSITA would have understood that **Iizuka’s** mobile terminal is a “client,” and therefore that the above steps are performed with a client. Lanning ¶¶100-106.[6] If further disclosure is required of “with a client,” a POSITA would have also understood that a client (e.g., a SIP client) on **Iizuka’s** mobile terminal is involved in the

[6] The term “client” in the client-server context applicable to the ’154 at least encompasses a computer, like **Iizuka’s** mobile terminal, that obtains information from a server. ’154, 6:44-47 (mobile communication device provides client functionality over a network), 6:64-7:2 (same), 15:58-61 (client can be a standalone device like “an access point or a base station”); Ex. 1023, 78; Ex. 1024, 102; Iizuka, [0198] (describing the mobile terminal getting information from SIP server). Lanning ¶106.

’154	**Iizuka in view of Enzmann**
	notification and establishing the voice call, or at minimum found it obvious to do so. Lanning ¶107. For example, **Iizuka’s** mobile terminal uses the SIP protocol to communicate with the call-management server that includes a SIP server and the second communication link is established only after the mobile terminal dials (notifies) the call-management server. Iizuka, [0087]-[0088], [0158], [0160]-[0162], [0170]-[0176]. And it was well known to use a SIP client on the mobile terminal for such functionality.[7] Lanning ¶107. • **Fig. 13**  FIG. 13 • **Fig. 14**

[7] *See* Ex. 1015, [0060] (disclosing a “SIP client can be a software application running on [a] mobile station”), [0020]-[0021], [0046]-[0047].

’154	Iizuka in view of Enzmann

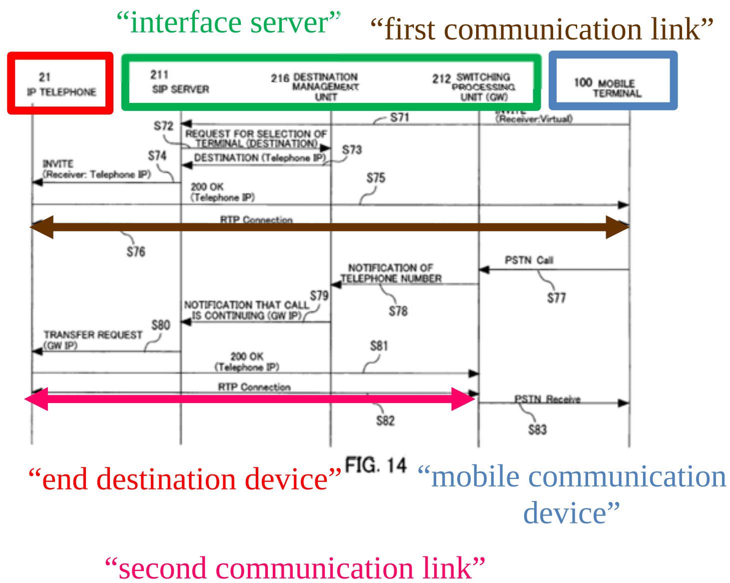


FIG. 14

- **Fig. 5**

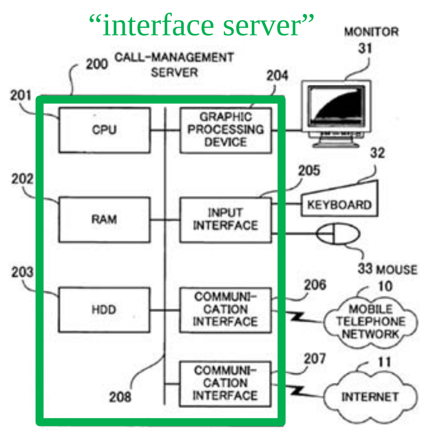


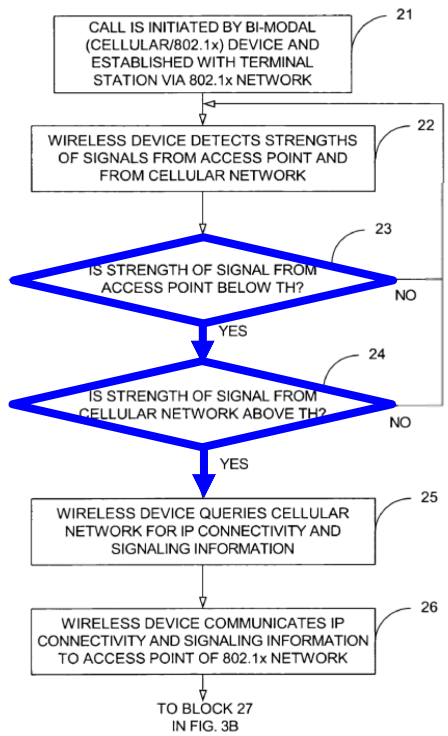
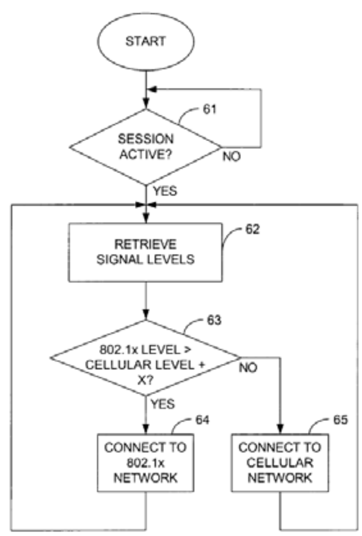
FIG. 5

- **[0159]** (“[Step S62] Thereafter, ***when communication through the wireless LAN becomes impossible (for example, when the condition of the communication deviates from a predetermined criterion), the network connection***

'154	**Iizuka in view of Enzmann**
	unit 115 notifies the call switch unit 114 of the condition of the communication.") • **[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.") • **[0175]** ("[Step S82] A ***connection for originated call is established between the IP telephone 21 and the switching processing unit 212***.") • **[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 ***the condition of the radio wave is not sufficiently good to perform communication (i.e., connection through the wireless LAN is impossible)***….") • **[0057]** ("FIG. 2 is a diagram illustrating an example of a construction of a system of the embodiment of the present invention. …. A***n IP telephone 21 is connected through a call-management server 200 to the mobile telephone network 10 and the Internet 11.***") • **[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, 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.")

’154	Iizuka in view of Enzmann
	• **[0085]** (“The communication interface 207 is connected to the Internet 11, and exchanges data with the mobile terminals 100 and 100 a through the Internet 11.”) • **[0069]** (“***The mobile terminal 100 comprises***…***a call switch unit 114***….”) • **[0073]** (“***[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.”) • **[0198]** (“[Step S114] The SIP server 211 outputs to the mobile terminal 100 a request for initiation of a session (INVITE).”) • **[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.”); ***see also*** **[0171]-[0174]** **Enzmann discloses when a second context is preferred over the context of the first communication link** (*e.g.*, “strength of the signal from the cellular network [being] at or above a certain threshold level” is preferred over “the strength of the signal from the access point…dropp[ing] below a certain threshold level”)**.** ***E.g.*, Enzmann**:

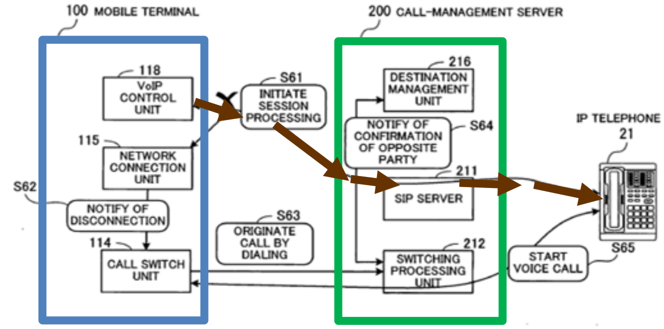
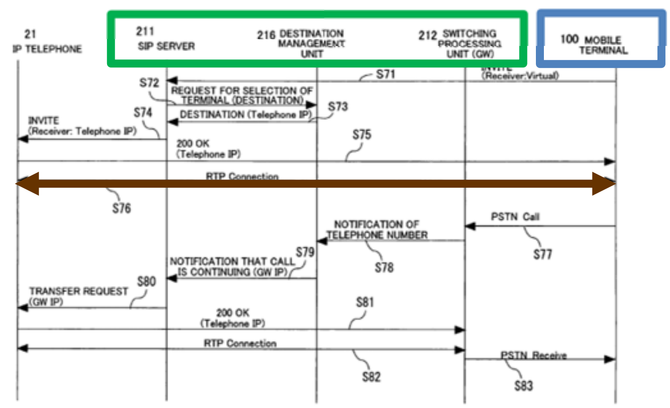
’154	Iizuka in view of Enzmann
	Enzmann discloses, in a network roaming procedure that roams between two wireless networks (an 802.1x network and a cellular network), monitoring a context of first communication link (“signal levels” associated with a “call session” that “is active”) and a second context for the second type of network (“cellular … signal levels”). Enzmann, [0025]. Specifically, Enzmann discloses monitoring “strength of the signal[s]” from both the 802.1x network and cellular network to decide if handover from the 802.1x network to the cellular network should occur because “the strength of the signal from the access point 7 [of the 802.1x network] has dropped below a certain threshold level” and “the strength of the signal from the cellular network is at or above a certain threshold level.” Enzmann, [0025], [0032]. In implementing **Enzmann’s** teachings in **Iizuka’s** method, the second communication link would be established only if both the signal strength of the cellular network is sufficient and the signal strength of the 802.1x network is insufficient, whereby a sufficient cellular signal is preferred over an insufficient 802.1x signal so that the ongoing VoIP call is not dropped. Lanning ¶¶108-110. As discussed in §IX.A.3, a POSITA would have been motivated to apply **Enzmann’s** teachings of detecting both a context of the wireless network (such as an 802.1x network) and a context of cellular network to **Iizuka’s** roaming method. Lanning ¶111. • **Fig. 3A**

’154	Iizuka in view of Enzmann
	 FIG. 3A “a second context preferred over the context of [a] communication link” • **Fig. 6**  FIG. 6 • **[0025]** (“While the call is being service by the 802.1x network 2, the strengths of the signals from the access point 7 and from the cellular network 6

’154	**Iizuka in view of Enzmann**
	are detected by the wireless device 1, as indicated by block 22. ***A determination is made as to whether the strength of the signal from the access point 7 has dropped below a certain threshold level, as indicated by decision block 23. If so, a determination is made as to whether the strength of the signal from the cellular network is at or above a certain threshold level, as indicated by decision block 24.***”) • **[0032]** (“Once a determination is made that a session is active, the process proceeds to block 62 and the server 10 retrieves both the cellular and 802.1x signal levels. A determination is then made at block 63 as to whether the 802.1x signal level is exceeds the cellular level plus an amount “X”. … When ***a determination is made at block 63 that the 802.1x signal level exceeds the cellular level plus X, the call control server 10 causes the media gateway 5 to switch the call from connection 53 to connection 52***….”)
[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** (*e.g.*, 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”)**.** ***E.g.*, Iizuka:** **Iizuka** discloses terminating transmission over the first communication link (the VoIP call; *see* [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 11 between the mobile terminal 100 and the call-

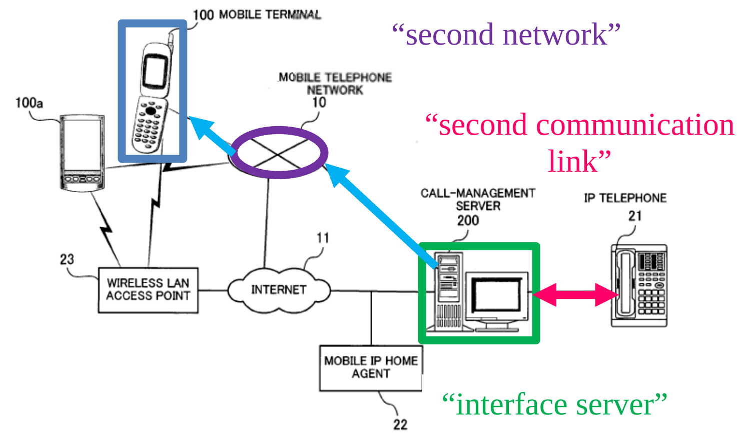
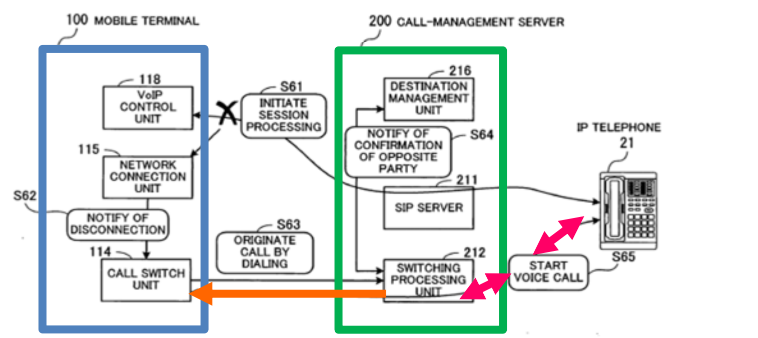
’154	**Iizuka in view of Enzmann**
	management server 200.” Iizuka, [0162]; *see also* Iizuka, [0176]. Iizuka further discloses that the mobile terminalis involved in the termination process: “call-through-LAN management unit 2b [of mobile terminal] disconnects a corresponding session which has been 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 ¶¶112-14. 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 ¶115.[8] Therefore, **Iizuka** renders obvious notifying the mobile terminal to terminate transmission over the first communication link. Lanning ¶116. • **Fig. 13**

[8] *See* Ex. 1005, [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”); Inoue**,** [0103]-[0104], [0119] (disclosing transmitting a “BYE request signal” to “wireless communication terminal (10B)” followed by a response to finish the connection).

’154	Iizuka in view of Enzmann
	“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, ***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***.”); ***see also* [0176]**

’154	Iizuka in view of Enzmann
	• **[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. ***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***.”)
[1.e] re-directing the second communication link from the interface server to the mobile communication device, thereby establishing a second communication link between the mobile communication device and a second network, wherein the second network is within a set of known networks or from a newly discovered network.	**Iizuka discloses re-directing the second communication link** (*e.g.*, voice call over the RTP connection, *see* [1.c]) **from the interface server** (*e.g.*, from “call-management server 200”) **to the mobile communication device** (*e.g.*, to “mobile terminal 100” by providing a response)**, thereby establishing a second communication link between the mobile communication device and a second type network** (*e.g.*, providing the response “establishes a connection” to mobile terminal 100 “through the mobile telephone network 10”)**, wherein the second network is within a set of known networks or from a newly discovered network** (*e.g.*, either the “mobile telephone network” is already known or it is newly detected by the “mobile terminal 100”)**.** ***<u>E.g.</u>*****<u>, 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 communication link between the call-management server 200 and IP telephone 21 is established by making a voice

’154	Iizuka in view of Enzmann
	call to IP telephone 21 over an RTP link (*see* [1.c]), the switching processing unit 212 of the call-management server 200 returns a response to mobile terminal 100. Iizuka, [0176]; *see also* Iizuka, [0162]. This response “establishes a connection through the mobile telephone network 10” between call-management server 200 and mobile terminal 100. Iizuka, [0176]; *see also* 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]; *see also* 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]; *see also* Iizuka, [0162]. Lanning ¶¶117-19. In **Iizuka**, the second network is either newly discovered or within a set of known networks—either way the claim is met. The “call switch unit 114,” located within mobile terminal 100, can obtain “information on a communication medium which is currently usable” from the “network connection 115,” also within mobile terminal 100. Iizuka, [0104]. Thus, by identifying the second network as a usable communication medium, **Iizuka** either discovers a new network or identifies an already known network. Lanning ¶120. • **Fig. 2**

’154	Iizuka in view of Enzmann
	“mobile communication device”  FIG. 2 “second communication link between the mobile communication device and a second 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**

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<tr><th>’154</th><th>Iizuka in view of Enzmann</th></tr>
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“interface server” “mobile communication device”

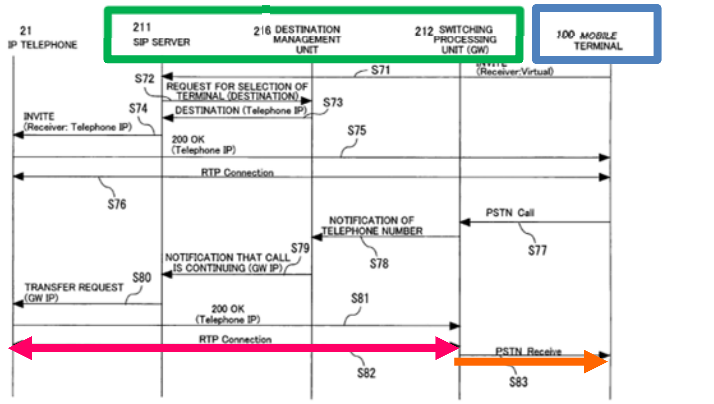

FIG. 14

“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 ***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***.”)
- **[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.”)
- **[0104]** (“The call switch unit 114 acquires from the network connection unit 115 ***information on a***

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<tr><th>’154</th><th>Iizuka in view of Enzmann</th></tr>
<tr><td></td><td>communication medium which is currently usable.”); see also [0105], [0107]</td></tr>
<tr><td>[2] The method of claim 1 wherein the first communication link comprises a <u>WiFi</u> communication link, and the first network comprises a <u>WiFi</u> network access point.</td><td>See [1]. Iizuka discloses the first communication link (e.g., “wireless communication” between “mobile terminal [1, 100]” and the “wireless LAN”; see [1.a]) and that the first network (e.g., wireless LAN; see [1.a]) comprises a network access point (e.g., “wireless LAN access point 23”).

<u>E.g., Iizuka:</u>

See [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. See Iizuka, [0045], [0180]. Lanning ¶¶121-23.

• Fig. 2

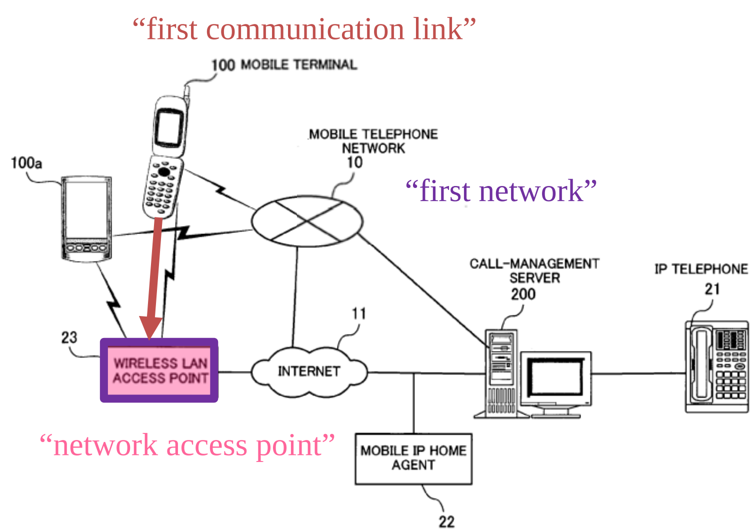

FIG. 2

• [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.”)

• [0045] (“The condition of the connection … can be determined based on, for example, the intensities</td></tr>
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’154	Iizuka in view of Enzmann
	of signals received from ***an access point, to which the LAN is to be connected***.”); *see also* **[0180]** • **[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 establishes a connection between the mobile terminal and the call-management server 200 through the wireless LAN access point 23***.”) **Enzmann discloses a WiFi communication link** (*e.g.*, a “call … serviced by the 802.1x network”) **and a WiFi network access point** (*e.g.*, an “802.1x network access point”)**.** ***E.g.*, Enzmann:** **Enzmann** discloses “a call from wireless device 1 is … serviced by [a] 802.1x network” and an “802.1x network access point.” Enzmann, [0017], [0005]; *see also* Enzmann, [0019]. 802.1x is refers to “IEEE standards that have the prefix 802.1, including … 802.11.” Enzmann, [0004]. Thus, a POSITA would have understood that a IEEE 802.1x standard includes and at least renders obvious a WiFi standard.[9] Lanning ¶¶124-25. As explained in §IX.A.3, a POSITA would have been motivated to apply **Enzmann’s** 802.1x teachings to **Iizuka’s** roaming method to use the 802.1x standard for carrying out wireless communication over the wireless

[9] Ex. 1022 (“[T]he IEEE 802.11 protocol…is known as WiFi.”); Ex. 1025 (“Wi-Fi networks use…IEEE 802.11b or 802.11a…”).

’154	**Iizuka in view of Enzmann**
	LAN and wireless LAN access points to form a WiFi communication link and a WiFi network access point for the LAN. Lanning ¶126. • **[0005]** (“An ***802.1x network access point*** … can communicate with a wireless device.”) • **[0007]** (“The present invention provides for seamless call handoff from an 802.1x network to a cellular network. … If ***a call is taking place over the 802.1x network***….”) • **[0017]** (“***a call from a wireless device 1 is being serviced by the 802.1x network 2***”) • **[0019]** (“The wireless device 1…sense[s] the strength of the signal between the wireless device 1 and the ***access point 7 of the 802.1x network*** 2….”) • **[0004]** (“The transmission methods used by 802.1x networks are governed by the applicable IEEE 802.1x standard. The term 802.1x, as that term is used herein, means all of the ***IEEE standards that have the prefix 802.1***, including, but not limited to, ***802.11***….”)
[4] The method of claim 1 wherein establishing the first communication link includes routing through a VOIP network.	***See*** **[1]. Iizuka discloses establishing the first communication link** (*e.g.*, establishing the “VoIP call,” *see* [1.a]) **includes routing through a VOIP network** (*e.g.*, transmitting “VoIP packets” to “IP addresses of … mobile terminals” over a “computer network”)**.** ***<u>E.g.</u>*****<u>, 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

’154	Iizuka in view of Enzmann
	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 ¶¶127-29. A POSITA further would have understood that the network responsible for routing the VoIP packets of a VoIP call is a VoIP network. Lanning ¶129. • **[0005]** (“In recent years, use of ***the VoIP (Voice over Internet Protocol) technology for making a voice call through the Internet*** or an intranet is widely spreading. ***The VoIP technology enables transmission of voice information and voice calls between terminals by use of data communication protocols in computer networks***.”) • **[0079]** (“[W]hen the VoIP control unit 118 receives voice data from the call switch unit 114, the VoIP control unit 118 ***generates VoIP packets***, and passes the VoIP packets to the wireless-LAN communication unit 111.”) • **[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 manages the current IP addresses of the mobile terminals 100 and 100 a and the like, and ***relays VoIP packets to be transmitted to the mobile terminals*** 100 and 100 a. That is, the mobile IP home agent 22 performs conversion into the current IP addresses of the mobile terminals 100 and 100 a, and ***transmits the VoIP packets to the mobile terminals 100 and 100*** a.”)

’154	**Iizuka in view of Enzmann**
[43.pre] A method of providing communications for a communication device that roams between multiple networks, the method comprising:	***See* [1.pre].** Lanning ¶¶130-31.
[43.a] establishing, with a client, a first communication link between the communication device and an end destination device, wherein the first communication link comprises a first communication link between the communication device and a first network;	***See* [1.a].** Limitation [43.a] adds that the “establishing” is performed “with a client.” As discussed for [1.a], **Iizuka** discloses that to initiate the VoIP call, a Session Initiation Protocol (SIP) session is first established between the mobile terminal and a call-management server. The mobile terminal 100 initiates the VoIP call when the “call switch unit 114 [of mobile terminal 100]” “outputs … a request for a connection through the wireless LAN” to the call-management server 200. Iizuka, [0109]-[0110]. This request is sent as a SIP message to request the initiation of a SIP session. Iizuka, [0140]; *see also* Iizuka, [0133]. Upon detecting that the mobile terminal intends to initiate a VoIP call, the call-management server 200 initiates a “SIP session … between the mobile terminal 100 and the IP telephone 21,” and thereafter the “VoIP call is started.” Iizuka, [0158]. The communication link is established when the “wireless-LAN communication unit 111 [of the mobile terminal 100] performs communication with the IP telephone 21.” Iizuka, [0071]. Thus, the mobile terminal (i.e., a client, *see* [1.c]) establishes the VoIP call by it initiating it. Lanning ¶¶132-135. Additionally, a POSITA would have understood (or at minimum would have found it obvious) that **Iizuka’s** mobile terminal includes a SIP client (*see* [1.c]), which establishes the SIP session discussed above. Lanning ¶135; Iizuka, [0087]-[0088], [0158], [0162]).

’154	Iizuka in view of Enzmann
[43.b] monitoring, with the client, a first context of a signal of the first communication link, wherein the first context comprises signal strength characteristics;	***See* [1.b].** Limitation [43.b] adds that the “monitoring” is performed “with the client” and that the “first context” includes “signal strength characteristics.” **Iizuka** teaches that the “monitoring” is performed “with the client.” As discussed for [1.b], **Iizuka** discloses that the mobile terminal (i.e., a client, *see* [1.c]) monitors a context. Additionally, as discussed for [1.c]/[43.a], a POSITA would have understood (or at minimum would have found it obvious) that **Iizuka’s** mobile terminal is or includes a SIP client, and the network condition information is “passe[d] to the network connection unit 115]” of the mobile terminal where it would be available to the SIP client. Lanning ¶¶136-38; Iizuka, [0078]; *see also*, Iizuka, [0105]. **Iizuka** further discloses the first context comprises signal strength characteristics. As discussed for [1.b], the mobile terminal’s monitoring process involves detecting the “intensity of a radio wave” received from a wireless access point. 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 ¶139.
[43.c] when a second network is detected as available and a second context of a second communication link corresponding to the second network is preferable, notifying an interface server	***See* [1.c].** Limitation [43.c] adds detecting “when a second network is detected as available” and that the second context is for “a second communication link corresponding to the second network.” **Iizuka** discloses detecting when the second network is available. The mobile terminal can determine “whether or not communication can be realized through each [network],” which is based on the detected “intensity of a radio wave” (*see* [1.c]). Iizuka, [0107]; *see also* Iizuka,

’154	**Iizuka in view of Enzmann**
and establishing a second communication link between the interface server and the end destination device without disrupting the first communication link, with the client;	[0104]. A communication can be realized only when “the conditions of communication” would “guarantee a predetermined call quality level through” that network. Iizuka, [0107]. Thus, a POSITA would have understood (or at minimum would have found it obvious) that **Iizuka’s** mobile terminal does not initiate the voice call to re-direct the ongoing VoIP call through the mobile telephone network (the second network) unless it detects that communication is possible over the mobile telephone network, which is a determination that the mobile network is available. Lanning ¶¶140-42. **Enzmann** discloses that the second context for the communication link corresponds to the second network. As discussed for [1.c], **Enzmann** teaches monitoring a second context for the signal for the second type of network (i.e., the cellular network). Lanning ¶143.
[43.d] notifying the communication device to terminate transmission over the first communication link; and	***See* [1.d].** Lanning ¶¶144-45.
[43.e] re-directing, with the client, the second communication link from the interface server to the communication device, thereby establishing a second communication link between the communication device and the second network,	***See* [1.e].** Limitation [43.e] adds that the re-directing is “with the client.” **Iizuka** discloses that re-directing the second communication link from the call-management server 200 to mobile terminal 100 involves the mobile terminal. For example, the mobile terminal initiates the switching process by dialing the call-management server (*see* [1.c], [43.c]), and receives a response from the switching processing unit 212 of the call-management server 200 after it has established the communication link between the call-management server 200 and IP telephone 21. Iizuka, [0176]. As discussed for [1.d], this response establishes the second communication link between the

’154	Iizuka in view of Enzmann
wherein the second network is within a set of known networks or from a newly discovered network.	call-management server 200 and mobile terminal 100 (i.e., redirects the communication link from the call-management server 200 to the mobile terminal 100). Therefore, Iizuka discloses that the re-directing step involves the mobile terminal (i.e., a client, *see* [1.c]). Lanning ¶¶146-49. Additionally, as discussed for [1.c]/[43.a], a POSITA would have understood (or at minimum would have found it obvious) that **Iizuka’s** mobile terminal includes a SIP client. Lanning ¶149.
[45] The method of claim 43 wherein the interface server is coupled to a gateway device.	***See* [43]. Iizuka discloses an interface server** (*e.g.*, a “call-management server 200,” *see* [43.c]) **is coupled to** (*e.g.*, receives signals from) **a gateway device** (*e.g.*, a “medium conversion unit 213”)**.** ***E.g.*, Iizuka:** **Iizuka** discloses “medium conversion unit 213,” which performs “conversion of data formats.” Iizuka, [0058], [0090]. Specifically, it “convert[s] … between the VoIP data format and the data format of information transmitted through the mobile telephone network 10.” Iizuka, [0058]. A POSITA would have understood that “medium conversion unit 213” is a gateway device because it converts information from a communication protocol used by the wireless LAN network to a protocol used by the mobile telephone network.[10] Lanning ¶¶150-52. **Iizuka** discloses that “medium conversion unit 213” is coupled to “call-management server 200” because the conversion unit is internal to the call-management server and receives signals from subcomponents of the call-management server. Iizuka, [0087], Fig. 6. For example, “medium conversion unit 213” receives signals from switching processing unit 212, a subcomponent of call-

[10] *See*, *e.g.*, Ex 1024, 232 (definition of “gateway”); Lanning ¶152.

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<tr><th>’154</th><th>Iizuka in view of Enzmann</th></tr>
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management server. Iizuka, [0089], [0090], [0178]; see also Iizuka, Fig. 6 (depicting the coupling). Lanning ¶153.
In addition, to the extent it is argued that the gateway must be a separate device, Iizuka teaches distributing the functions of the call-management server (e.g., the conversion function) to another server, instead of having all of the functions in the same server (Iizuka, [0100]), and therefore it would have been obvious to include the gateway functionality as a separate component external to and coupled to the interface server, for example for improved compatibility and scalability of the gateway. Lanning ¶154.

Fig. 6

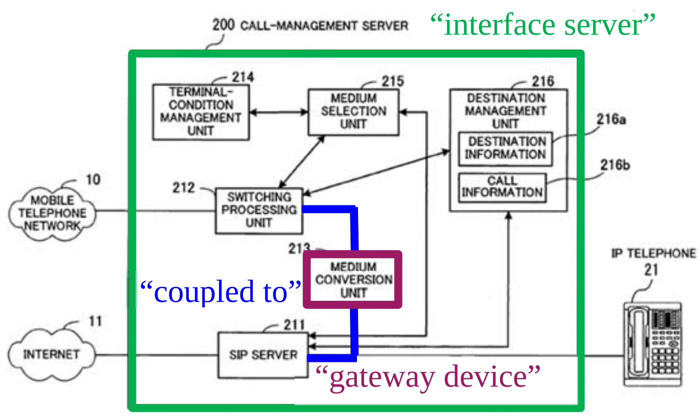

FIG. 6

[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.”)
[0087] (“The call-management server 200 comprises…a medium conversion unit 213….”)

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’154	Iizuka in view of Enzmann
	• **[0090]** (“The ***medium conversion unit 213 performs medium conversion (i.e., conversion of data formats) between the VoIP data format and the data format of information transmitted through the mobile telephone network 10***.”) • **[0089]** (“The switching processing unit 212 performs communication with the mobile terminals 100 and 100 a through the mobile telephone network 10.”) • **[0014]** (“dynamically ***switching between the plurality of communication mediums during a call***”) • **[0178]** (“FIG. 15 is a diagram illustrating processing for ***switching (roaming) from a voice call through the mobile telephone network to a VoIP call***.”)
[46] The method of claim 45 wherein the gateway device is bi-directionally coupled to a packet network.	***See* [45]. Iizuka discloses the gateway device** (*e.g.*, the “medium conversion unit 213,” *see* [45]) **is bi-directionally coupled to** (*e.g.*, receives signals from and transmitting signals to) **a packet network** (*e.g.*, “Internet 11,” which the VoIP call is made through)**.** ***E.g.*, Iizuka:** **Iizuka** discloses that the VoIP call that uses the gateway (discussed for claim 45) “is made through the Internet 11.” Iizuka, [0061]. Internet 11 is a packet network because it is a network that transmits VoIP packets to facilitate a VoIP call.[11] Iizuka, [0059], [0079], [0013]. Lanning ¶¶155-57.

[11] Ex 1026 (“calls placed using VOIP would be routed…over a packet network, such as Internet 38”).

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A POSITA would have understood that the gateway’s coupling to the Internet (packet network) is bidirectional. Lanning ¶158. For example, Iizuka discloses the “medium conversion unit 213” (gateway device, see [45]) performs conversion of data formats between the VoIP format and the data format of information transmitted through the mobile telephone network. Iizuka, [0090]. Because VoIP calls are bidirectional, information is converted in both directions, and the coupling to the Internet is likewise bidirectional—at minimum it would have been obvious to do so to accommodate both directions. Lanning ¶158.

Fig. 6

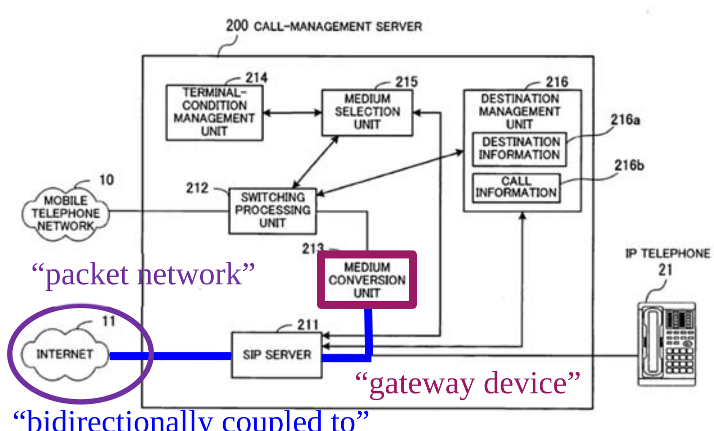

FIG. 6

[0061] (“The mobile terminals 100 and 100 a each have…a function of making a VoIP call through the Internet 11.”)
[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…relays VoIP packets to be transmitted to the mobile terminals 100 and 100 a.”); see also [0079]

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’154	**Iizuka in view of Enzmann**
	• **[0090]** (“The ***medium conversion unit 213 performs medium conversion (i.e., conversion of data formats) between the VoIP data format and the data format of information transmitted through the mobile telephone network 10***.”)
[47] The method of claim 46 wherein the packet network comprises packet switched telephone network.	***See* [46]. Iizuka discloses the packet network comprises [a] packet switched telephone network** (*e.g.*, “Internet 11” connected to the “wireless LAN” for handling VoIP calls from mobile terminals)**.** ***E.g.*, Iizuka:** **Iizuka** discloses that a VoIP call is made “through Internet 11.” Iizuka, [0061]. “Internet 11” is connected to the wireless LAN, which connects to mobile terminals. Iizuka, [0060]-[0061]. Moreover, **Iizuka’s** call-management server 200 facilitates the switching of VoIP calls on the wireless LAN. See Iizuka, [0157]-[0162], [0163]-[0177]. A POSITA would have understood that “Internet 11” coupled to “wireless LAN” is a packet switched telephone network because it is a packet network (*see* [46]) and routes VoIP calls to the mobile terminals (*see* [43.pre], [43.e]), with switching provided by the call-management server (*see* [1.e]). Lanning ¶¶159-61.

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- **Fig. 2**

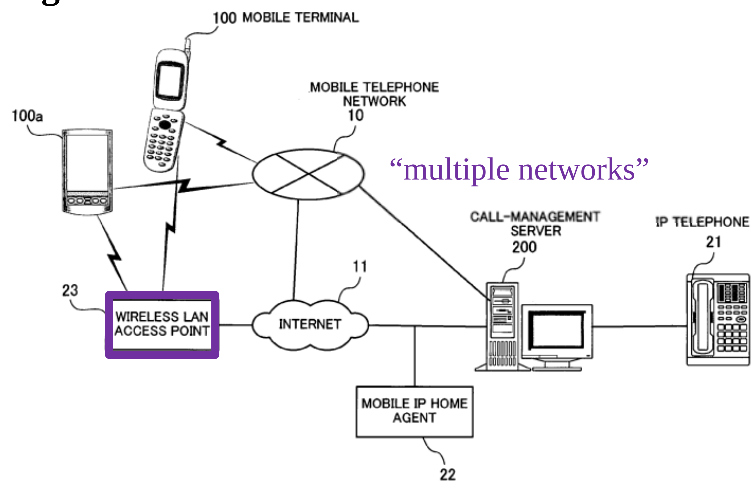

FIG. 2

- **[0061]** (“***The mobile terminals 100 and 100 a each have**…**a function of making a VoIP call through the Internet 11.*** 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.”)
- **[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***.”)

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B. Ground 2: Iizuka in View of Enzmann and Inoue (Claims 1, 2, 4, 43, and 45-47)

To the extent it is argued that further disclosure is required of performing various claimed functions “with [a/the] client” (*see* [43.c], [43.b], [1.c]/[43.c], [43.d]) and notifying the communication device to terminate transmission over the first communication link ([1.d]/[43.d]), **Iizuka** in view of **Inoue** renders obvious these limitations.

For example, **Inoue** discloses transmitting a "BYE request signal" to "wireless communication terminal (10B)." Inoue, [0103]. "[W]ireless communication terminal (10B)" then "issues a response of success…to the request" (i.e., an "OK") "thereby finish[ing] [the] connection." Inoue, [0103]-[0104], [0119]. Thus, **Inoue** discloses that terminating a transmission includes the step of notifying the mobile device in the form of transmitting to it a BYE message. Lanning ¶¶162-63.

Inoue further discloses a wireless communication terminal includes a "SIP client." Inoue, [0035]. The "SIP client" is used to manage communication links at least because it transmits instructions to other entities to connect or disconnect to a wireless network. Inoue, [0050], [0057], [0080], [0082]. The "SIP client" is involved in monitoring the signal strength of a communication link because the client sends instructions to switch networks when a signal strength is measured below a threshold value. Inoue, [0048], [0049], [0050], [0051], [0054]. Lanning ¶164.

Like **Iizuka** and **Enzmann**, **Inoue** is analogous art in the same field as the '154, which includes wireless communications, and reasonably pertinent to alleged problems addressed by the '154 of allowing a mobile communication devices to seamless and uninterrupted handover of communications between networks. '154, 1:43-54; Inoue, [0004]. For example, **Inoue** discloses a method of transmitting communication from and to mobile communication devices that are capable of communicating through multiple wireless networks. Inoue, Abstract, [0010], [0011]. Lanning ¶165.

A POSITA would have been motivated to apply **Inoue's** teachings of transmitting to a mobile terminal a SIP BYE message before terminating a communication link to **Iizuka's** roaming method (as modified by **Enzmann**) to advantageously inform a mobile communication device that it should cease transmitting over the first communication link because the link is being terminated. Lanning ¶166. **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 **Inoue**, which teaches relaying signals between network entities using a SIP protocol and using a SIP BYE message (*see, e.g.*, Inoue, [0087], [0103], [00920]), 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 ¶166. 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 ¶166.

A POSITA further would have been motivated to apply **Inoue's** teachings of a SIP client running on a mobile communication device to **Iizuka's** mobile terminal (as modified by Enzmann) such that the SIP client is involved in the various steps discussed for Ground 1 (*see* [43.c], [43.b], [1.c]/[43.c], [43.d]) because a SIP client would have facilitated **Iizuka's** disclosed use of the SIP protocol. Lanning ¶167. Because **Iizuka** already discloses mobile communication devices using the SIP protocol to communicate messages with a SIP server, the incorporation of SIP client functionality in the mobile device would have been a straightforward modification of **Iizuka**. Iizuka, [0124], [0126], [0127], [0164], Figs. 13-14; Lanning ¶167.

In view of the above, a POSITA would have had a reasonable expectation of success in applying **Inoue's** teachings to **Iizuka's** method and mobile terminal (as modified by Enzmann), and a POSITA would have known such a combination would predictably work and provide the expected functionality. Lanning ¶168.

C. Grounds 3-4: Iizuka in View of Enzmann and Sundar, and Iizuka in View of Enzmann, Inoue, and Sundar (Claims 45-47)

Sundar discloses the limitations of claims 45-47, which require that "the interface server is coupled to a gateway device" (claim 45), "the gateway device is bi-directionally coupled to a packet network (claim 46), and "the packet network comprises packet switched telephone network (claim 47). Lanning ¶¶169-70.

With respect to claim 45, **Sundar** discloses a "Media Gateway" (i.e., a gateway device) coupled to a control switch (i.e., an interface server), as shown below in Figure 3. The control switch is an interface server because it interfaces with and handles control signals for two types of networks, in this case a wide area mobile wireless network (WWAN) and an IP network 120 connected to a wireless local area network (WLAN). Lanning ¶171; Sundar, [0076], [0055], [0010]. The Media Gateway and control switch are collectively a new type of MSC that combines a legacy mobile switching center (MSC) with a "Media Gateway" so that it can support roaming between a WLAN and a WWAN. Sundar, [0003], [0076], Fig. 3; Lanning ¶171.

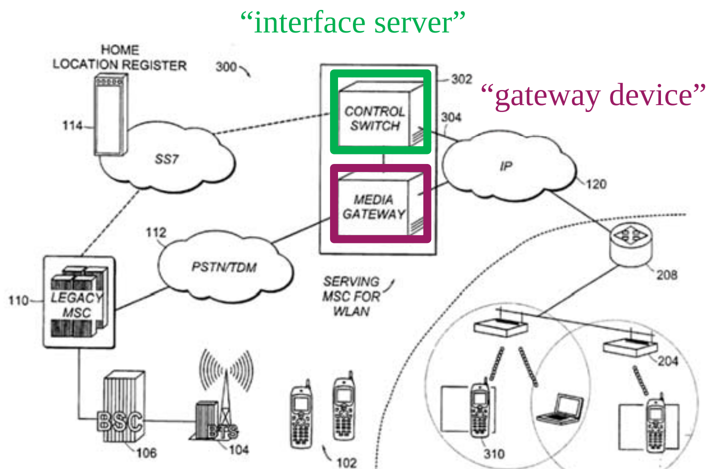
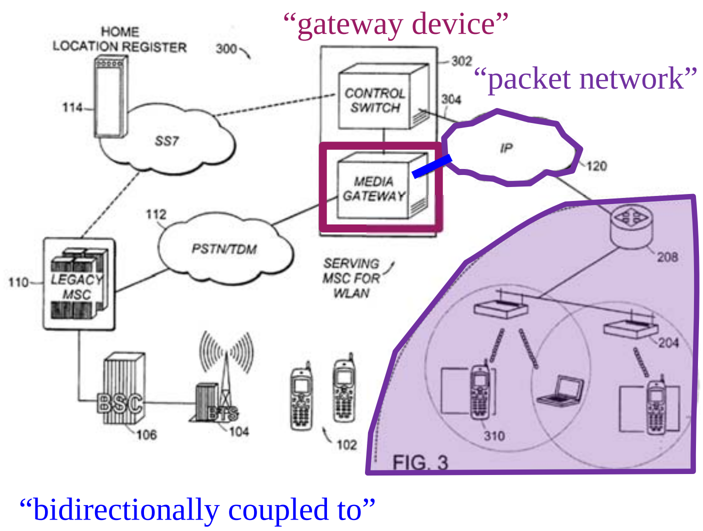


FIG. 3

With respect to claim 46, **Sundar** discloses that "Media Gateway" is bidirectionally coupled to "IP network 120," which is connected to "WLAN 200." Sundar, [0076], [0010], Figs. 2-3. An IP network is a packet network because voice traffic is carried over the IP network in packets.[12] Sundar, [0093], Lanning ¶172. A POSITA would have understood that that the coupling to the IP network is bi-directional such that "Media Gateway" transmits packets to and receives packets from the network, for example while carrying voice calls.[13] Lanning ¶172; Sundar, [0093], [0056].

[12] Ex. 1027 ("IP network 108 is provided as an example of a packet network").

[13] Ex. 1027 ("packets transmitted and received from IP network 108").



With respect to claim 47, a POSITA would have understood that WLAN 200 connected to IP network 120 is a packet switched telephone network because it is used to carry voice packets (discussed above), route phone calls to mobile terminals, for example the mobile handsets/phones 310, and is connected to an interface server (control switch) to facilitate the switching of voice calls. Lanning ¶173; Sundar, [0057].

Like **Iizuka, Enzmann** and **Inoue, Sundar** is analogous art in the same field as the '154, which includes wireless communications, and reasonably pertinent to alleged problems addressed by the '154 of allowing mobile communication devices to communicate over multiple networks. '154, 1:43-54; Sundar, [0003], [0021], [0024], [0075]-[0076]. For example, **Sundar** discloses a mobile communication device that is capable of communicating through multiple wireless networks and of seamlessly switching from communication over a first network to communicating over a second network. Sundar, [0003], [0021], [0023], [0076]. Lanning ¶174.

A POSITA would have been motivated to apply **Sundar's** teachings of a standalone gateway coupled to an interface server and bidirectionally coupled to a packet network (specifically, a packet switched telephone network) to **Iizuka's** roaming method (as modified by **Enzmann** and optionally **Inoue)**. Lanning ¶175. *First,* **Iizuka** expressly teaches distributing the functions of its call-management server (e.g., the conversion function) to another device (Iizuka, [0100]), and **Sundar** teaches one such implementation with a standalone gateway that would be used instead of **Iizuka's** media conversion unit internal to the call-management server. Lanning ¶175. *Second*, a POSITA would have recognized that using a standalone gateway would have more easily supported legacy infrastructure, such as legacy gateway devices. Lanning ¶175. *Third,* a POSITA would have recognized that a standalone gateway is more easily scalable, which was particularly important in the relevant time frame due to the rapid increase in VoIP traffic. Lanning ¶175; Ex. 1028, 1:24-25 ("VOIP phone services have been rapidly increasing in popularity").

When **Sundar's** teachings are applied to **Iizuka**, the standalone gateway would be coupled to at least **Iizuka's** call-management server (interface server), IP network with WLAN connection to mobile terminals (packet switched telephone network), and mobile telephone network, as taught by **Sundar**, such that the gateway provides conversion functionality, for example when a VoIP call is placed from a mobile terminal on the WLAN to a mobile terminal on the mobile telephone network. Lanning ¶176. And **Iizuka's** VoIP call would use bi-directional coupling to the gateway so that the mobile terminal could both transmit and receive voice packets. Lanning ¶176.

Thus, a POSITA would have found it straightforward and advantageous to apply **Sundar's** teachings of a standalone gateway coupled to an interface server and bidirectionally coupled to a packet network (specifically, a packet switched telephone network) to **Iizuka's** method (as modified by **Enzmann** and optionally **Inoue)**, and would have known such a combination (yielding the claimed limitations) would predictably work and provide the expected functionality. Lanning ¶177.

X. SECONDARY CONSIDERATIONS

The Challenged Claims of the '154 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 district court (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 ¶¶178-79.

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 '154 claims. Lanning ¶180.

To the extent these general arguments can be understood as being particular to the '154, PO's conclusory allegations additionally fail for the reasons set forth below. Lanning ¶¶181-87.

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 (parent to the '154) 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 '154 specifically, as opposed to other Vasu patents and application, and does not allege knowledge of the '154 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 ¶¶62-192. There is a reasonable likelihood Petitioners will prevail as to each of these Claims. *Inter partes* review of Claims 1, 2, 4, 43, and 45-47 of the '154 is accordingly requested.

Dated: January 23, 2025

Respectfully submitted,

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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 13,970 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 ’154 patent:

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