UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS, INC., HTC AMERICA, INC., and
LENOVO (UNITED STATES) INC.,

Petitioner

v.

KONINKLIJKE KPN N.V.,

Patent Owner

Case No. IPR2018-00558
U.S. Patent No. 9,014,667[1]

PATENT OWNER'S AMENDED NOTICE OF APPEAL

[1] Cases IPR2018-01639 and IPR2018-01645 have been joined with this proceeding.

Pursuant to 37 C.F.R §§ 90.2(a) and 90.3(b) and 35 U.S.C. §§ 141(c), 142, and 319, Patent Owner, Koninklijke KPN N.V., (hereinafter "Patent Owner"), respectfully provides Notice that it hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision entered on August 1, 2019 (Paper 34), the July 20, 2022 Order denying Patent Owner's Request for Director Review (Paper No. 42), and from all other underlying orders, decisions, rulings and opinions relating to U.S. Patent No. 9,014,667 ("the '667 patent"), set forth in Inter Partes Review IPR2018-00558,[2] including, without limitation, those within the Decision on Institution of Inter Partes Review, entered August 3, 2018 (Paper 6); the Decision on Institution and Joinder, entered November 1, 2018 (Paper 18); and the Decision on Institution and Joinder, entered January 15, 2019 (Paper 23).

A copy of the Final Written Decision is attached as Exhibit A, and a copy of the Order denying Patent Owner's Request for Director Review is attached as Exhibit B.

This amended notice of appeal is timely pursuant to 37 C.F.R § 90.3(b), since it is being filed within 63 days after the July 20, 2022 Order denying Patent Owner's request for Director review.

[2] Cases IPR2018-01639 and IPR2018-01645 have been joined with this proceeding.

For the limited purpose of providing the Director with the information requested in 37 C.F.R § 90.2(a)(3)(ii), issues in Patent Owner's appeal may include, but are not limited to, the following:

1. the Board's finding that Claims 31 and 33 are obvious in view of Obhan, Shatzkamer, and Budka under 35 U.S.C. § 103(a);
2. the Board's finding that Claim 35 is obvious in view of Obhan, Taniguchi, and Budka under 35 U.S.C. § 103(a);
3. the Board's improper claim constructions, including implicit constructions;
4. The Board's errors in determinations regarding the teachings of the references;
5. the Board's legal errors in undertaking its § 103 analyses, including without limitation errors in its analysis of motivations to combine references;
6. the Board's improperly finding Claim 35 obvious based on a ground not advanced by Petitioner in the Petition, by considering a different combination of references than those advanced by Petitioner with respect to a claim element thereof;
7. the Board's allowance of improper arguments in Petitioner's Reply;

8. the USPTO's denial of Patent Owner's request for Director review of the Final Written Decision, including the denial of Patent Owner's request to reverse the Final Written Decision; and
9. all other issues decided adversely to Patent Owner in any orders, decisions, rulings and opinions.

Pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a), this Amended Notice of Appeal is being filed simultaneously with the Director of the United States Patent and Trademark Office and the Patent Trial and Appeal Board. In addition, a copy of this Amended Notice of Appeal, together with a copy of the Final Written Decision and the Order denying Patent Owner's Request for Director Review, is being electronically filed with the Clerk's Office for the United States Court of Appeals for the Federal Circuit. Pursuant to the Federal Circuit's order dated August 17, 2022, no additional docketing fee is required for any amended notice of appeal in this matter. *Koninklijke KPN N.V. v. HTC America, Inc. et al.*, No. 19-2447, Dkt. 57 (Fed. Cir. August 17, 2022).

Respectfully submitted this 21st day of September, 2022.

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CERTIFICATE OF FILING

I hereby certify that on September 21, 2022, the original version of the above-captioned **Patent Owner's Amended Notice of Appeal** was filed by Priority Mail Express (Label No. **EJ820157959US**) in accordance with 37 C.F.R. § 1.10 with the Director of the United States Patent and Trademark Office, at the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
United States Patent and Trademark Office
P.O. Box 1450, Alexandria, VA 22313-1450

I further certify that on September 21, 2022, a true and correct copy of the above-captioned **Patent Owner's Amended Notice of Appeal** was electronically filed with the Patent Trial and Appeal Board through the Patent Trial and Appeal Board's E2E filing system.

I also hereby certify that a true and correct copy of the above-captioned **Patent Owner's Notice of Appeal**, together with the Final Written Decision of the PTAB and the Order denying Patent Owner's Request for Director Review, was filed via CM/ECF with the Clerk's Office of the United States Court of Appeals for the Federal Circuit, in Case No. 19-2447, on September 21, 2022.

Signed and Certified by,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I hereby certify that on September 21, 2022, the foregoing ***Patent Owner's Amended Notice of Appeal*** and accompanying Exhibits are being served electronically by agreement of the parties at the following email service addresses:

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EXHIBIT A

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Paper 34
Entered: August 1, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS, INC., HTC AMERICA, INC., and
LENOVO (UNITED STATES) INC.,
Petitioner,

v.

KONINKLIJKE KPN N.V.,
Patent Owner.

Case IPR2018-00558[1]
Patent 9,014,667 B2

Before KEVIN F. TURNER, JONI Y. CHANG, and
MICHELLE N. WORMMEESTER, *Administrative Patent Judges*.

WORMMEESTER, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

[1] Cases IPR2018-01639 and IPR2018-01645 have been joined with this proceeding.

I. INTRODUCTION

LG Electronics, Inc. filed a Petition requesting *inter partes* review of claims 31, 33, and 35 of U.S. Patent No. 9,014,667 B2 (Ex. 1001, "the '667 patent"). Paper 2 ("Pet."). Koninklijke KPN N.V. ("Patent Owner") filed a Preliminary Response. Paper 5. Pursuant to 35 U.S.C. § 314, we instituted an *inter partes* review of all challenged claims 31, 33, and 35 and all grounds presented in the Petition. Paper 6 ("Inst. Dec."). Patent Owner filed a Patent Owner Response (Paper 17, "PO Resp."), and Petitioner filed a Reply (Paper 22, "Pet. Reply").

Following institution, HTC America, Inc. and Lenovo (United States) Inc. timely filed motions for joinder in Cases IPR2018-01639 and IPR2018-01645, respectively, challenging the same claims of the '667 patent on the same grounds on which we instituted review in this proceeding. *See* Paper 18, 2, 5; Paper 23, 2, 5. To administer the proceedings more efficiently, we granted both motions, joining Cases IPR2018-01639 and IPR2018-01645 with the instant proceeding. Paper 18, 6; Paper 23, 6. For purposes of this Decision, we refer to LG Electronics, Inc., HTC America, Inc., and Lenovo (United States) Inc., jointly, as "Petitioner."

On April 11, 2019, we conducted an oral hearing. A copy of the transcript (Paper 30, "Tr.") is included in the record.

We have jurisdiction under 35 U.S.C. § 6(b). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 31, 33, and 35 of the '667 patent are unpatentable. This final written decision is issued pursuant to 35 U.S.C. § 318(a).

II. BACKGROUND

A. Related Proceedings

The parties identify several related district court cases. Pet. 66; Paper 4, 2–3. The parties also identify a related petition for *inter partes* review, which the parties represent has been terminated due to a settlement agreement. Pet. 66; Paper 4, 3.

B. The '667 Patent

The '667 patent describes a method for regulating access to a telecommunications network. Ex. 1001, 1:16–19, 1:38–40. Figure 1, which is reproduced below, illustrates an example of a telecommunications network according to the '667 patent. *Id.* at 3:44–46.

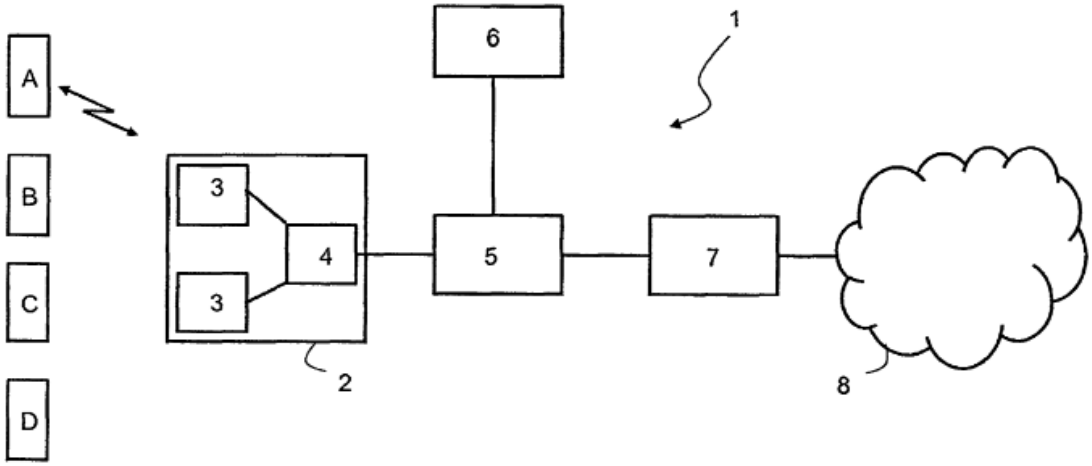

FIG. 1

In particular, Figure 1 shows packet service telecommunications network 1 along with terminals A, B, C, D, which may access network 1 for data communication. *Id.* at 3:56–59. Network 1 includes radio access network 2, which is connected to a mobile core network that comprises serving

controller entity 5, register 6, and gateway 7 and provides access to network 8. *Id.* at 3:60–65. Serving controller entity 5 may be a serving General Packet Radio Service (GPRS) support node (SGSN) that controls the connection between network 1 and the terminals. *Id.* at 3:66–4:2. Register 6 may be a home location register (HLR) that stores a unique identifier associated with the subscription for each terminal, such as the identifier of a SIM that is available in each terminal, as well as the time interval during which access to network 1 will be granted for each terminal. *See id.* at 1:47–49, 4:7, 4:54–59. Gateway 7 may be a GPRS gateway support node (GGSN) providing access to the internet. *Id.* at 4:9–10.

Access to network 1 involves a number of phases, including an attach phase during which authentication steps are taken and a phase during which a packet data protocol (PDP) context is established to carry traffic flows over network 1. *Id.* at 4:13–30.

To illustrate how network 1 operates, Figure 3A is reproduced below.

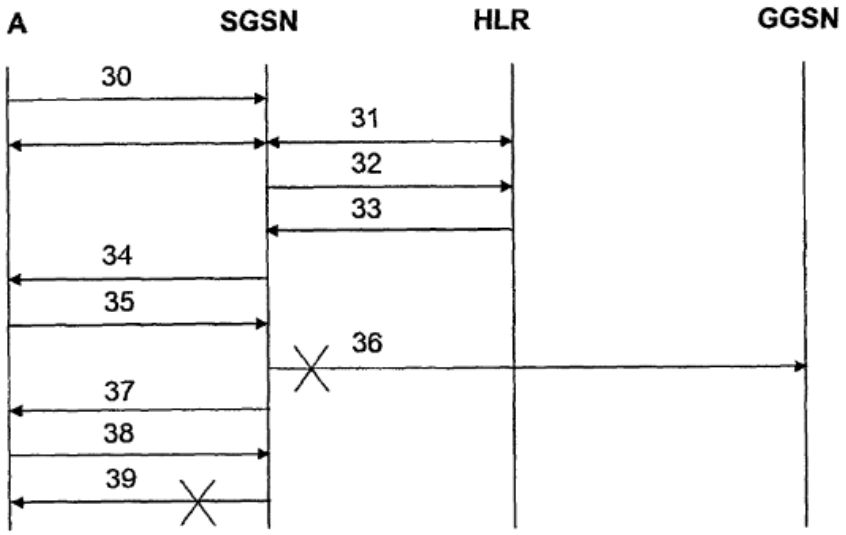

FIG. 3A

Figure 3A shows a time diagram of a method for using a telecommunications system according to the '667 patent. *Id.* at 3:49–50. In this scenario, the time interval during which access to network 1 will be granted for terminal A is 8–11 pm. *Id.* at 4:60–61, Fig. 2. At step 30, terminal A sends an attach request with its IMSI to SGSN 5 at 7 pm (which is outside the grant access time interval). *Id.* at 5:50–55. SGSN 5 sends the IMSI to HLR 6 to obtain the grant access time interval (i.e., 8–11 pm). *Id.* at 5:63–65. There are different ways in which HLR 6 may send the grant access time interval to SGSN 5. *Id.* at 5:66–67. For example, step 31 involves an authentication check during which an authentication triplet or quintet is exchanged. *Id.* at 6:1–4. HLR 6 may send the grant access time interval to SGSN 5 during the authentication check. *Id.* at 6:2–4. Alternatively, HLR 6 may send the grant access time interval to SGSN 5 during a subsequent location update procedure. *Id.* at 6:5–10. During this procedure, SGSN 5 sends an update location request to HLR 6 at step 32. *Id.* at 6:5–8. At step 33, HLR 6 sends its response to SGSN 5, which may include the grant access time interval if it was not sent during the authentication check. *Id.* at 6:8–10. At step 34, the attach phase is finalized with an attach accept message to terminal A. *Id.* at 6:10–12.

After receiving the attach accept message, terminal A sends an activate PDP context request to SGSN 5 at step 35. *Id.* at 6:13–17. Because SGSN 5 has determined that terminal A's access request was received outside the grant access time interval, however, a PDP context is not established. *Id.* at 6:18–22. This is indicated by the "X" shown at step 36. *Id.* At step 37, SGSN 5 informs terminal A of the denial. *Id.* at 6:22–23.

SGSN 5 maintains the data of the failed access request so that any subsequent access request from terminal A at a time outside the window 8–11 pm (step 38) may be denied directly (step 39). *Id.* at 6:34–35, 6:39–41.

C. Illustrative Claim

Petitioner challenges claims 31, 33, and 35 of the '667 patent. Each of these claims is independent. Claim 31 is illustrative of the claims under challenge:

> 31. A telecommunications network configured for providing access to a plurality of terminals, each terminal associated with a unique identifier for accessing the telecommunications network, wherein the telecommunications network comprises:
>
> a register configured to store the unique identifier of at least one terminal in combination with identification of at least one associated deny access time interval, the at least one associated deny access time interval being a time period during which telecommunications network access for the terminal is denied;
>
> one or more processors;
>
> memory storing processor instructions that, when executed by the one or more processors, cause the one or more processors to carry out operations including:
>
> an access request operation to receive an access request from the terminal and to receive or determine the unique identifier associated with the terminal;
>
> an access operation to deny access for the terminal if the access request is received within the time period, wherein the telecommunications network is further configured to monitor a network load of the telecommunications network,
>
> wherein the telecommunications network is further configured to adapt the time period depending on the monitored network load, and

> wherein machine-to-machine applications are executed, and wherein the plurality of terminals for the machine-to-machine applications are denied access to the telecommunications network during peak load time intervals, the time period being within peak load time intervals.

D. The Instituted Grounds

Petitioner asserts in its Petition two grounds based on obviousness under 35 U.S.C. § 103. Pet. 22–65. We instituted *inter partes* review of both grounds presented in the Petition. Inst. Dec. 44. The instituted grounds are as follows.

References	Basis	Claim(s) Challenged
Obhan,[2] Shatzkamer,[3] and Budka[4]	§ 103	31 and 33
Obhan, Taniguchi,[5] and Budka	§ 103	35

In support of the instituted grounds, Petitioner proffers a declaration of Craig Bishop (Ex. 1003). With its Response, Patent Owner submits a declaration of Regis Bates (Ex. 2006). The transcripts of the depositions of Mr. Bishop and Mr. Bates are entered in the record as Exhibits 1019[6] and 1020, respectively.

[2] Obhan, U.S. Patent No. 6,275,695 B1, issued Aug. 14, 2001 (Ex. 1005).
[3] Shatzkamer, U.S. Publ'n No. 2008/0220740 A1, published Sept. 11, 2008 (Ex. 1006).
[4] Budka, European Publ'n No. EP 1009176 A2, published June 14, 2000 (Ex. 1007).
[5] Taniguchi, U.S. Patent No. 7,505,755 B2, issued Mar. 17, 2009 (Ex. 1008).
[6] The same transcript of the deposition of Mr. Bishop also is entered in the record as Exhibit 2008.

III. DISCUSSION

A. Claim Construction

The claim construction standard applicable to this *inter partes* review proceeding is the broadest reasonable interpretation in light of the patent specification. *See* 37 C.F.R. § 42.100(b) (2017); *Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard).[7] Under this standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner provides proposed interpretations of the claim terms "register," "deny access time interval," and "machine-to-machine applications." Pet. 18–21. Patent Owner responds. PO Resp. 22–23. In light of the parties' arguments, we determine that no claim term requires express interpretation to resolve any controversy in this proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that "we need only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy'")

[7] The revised claim construction standard for interpreting claims in *inter partes* review proceedings as set forth in the final rule published October 11, 2018, does not apply to this proceeding because the new "rule is effective on November 13, 2018 and applies to all IPR, PGR and CBM petitions filed on or after the effective date." Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42). The instant Petition was filed on February 1, 2018.

(quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc*., 200 F.3d 795, 803 (Fed. Cir. 1999)).

B. Obviousness over Obhan, Shatzkamer, and Budka

Petitioner argues that claims 31 and 33 of the '667 patent would have been obvious over Obhan, Shatzkamer, and Budka. Pet. 22–51. Patent Owner traverses this ground. PO Resp. 23–52. For the reasons explained below, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 31 and 33 would have been obvious over Obhan, Shatzkamer, and Budka.

1. Obhan

Obhan relates to network resource management. Ex. 1005, at [57]. In particular, Obhan describes a spectrum yield management (SYM) system that manages available spectrum within a wireless communication system. *Id.* The SYM system divides a service coverage area into corridors and monitors the spectrum for each corridor as well as the subscribers in each corridor. *Id.* at 2:62–63, 3:1–3. When the loading within a corridor falls below a loading threshold, the system sends a service option signal that acts as a positive incentive for use to subscribers in the underutilized corridor. *Id.* at 6:28–31. For example, the signal may apprise some subscribers that they may make reduced rate calls or complete calls at no cost. *Id.* at 6:33–35. The signal also may instruct machine users, such as vending machines and billboards, to transfer data during idle times. *Id.* at 6:36–38. When the loading within a corridor exceeds the loading threshold, however, the system sends a service option signal that is a disincentive for use. *Id.* at 6:40–43.

For example, the signal may apprise some subscribers that subsequent use will be billed at a premium. *Id.* at 6:43–46.

The SYM system also divides subscribers into a plurality of classes that may be treated differently with respect to services provided. *Id.* at 3:10–12. The system may provide some classes with reduced rate offerings to increase system usage while increasing customer satisfaction. *Id.* at 3:13–15. The system may additionally reserve spectrum within corridors for premium subscribers, precluding access to the reserved spectrum except for members of a particular class. *Id.* at 3:15–19. Further, the system may limit access to reduced loading periods for machine users that do not require access at a particular time. *Id.* at 3:26–31.

In managing spectrum resources, the SYM system uses an admission control block (ACB). *Id.* at 15:45–59. The ACB is a memory in the modules that make channel allocation decisions, and the SYM system is responsible for updating the ACB in real-time. *Id.* at 15:51–55. Figure 9B, which is reproduced below, illustrates an example of how the SYM system operates using an ACB.

950

CORRID. NO.	MINIMUM ACC. CLASS	GOOD TILL
1	9	12:22:24
2	7	12:22:00
3	5	12:22:00

952
954
956

FIG. 9B

In particular, Figure 9B illustrates ACB 950 for corridors 1, 2, 3. *Id.* at 16:14–15. For each corridor, the ACB includes an access class indicating the lowest priority class for which the corridor will provide service. *Id.* at 16:15–17. The ACB also includes a time through which the ACB is valid for each corridor. *Id.* at 16:17–19. If the loading within a corridor exceeds a threshold value, the system may update the ACB so that access is limited. *Id.* at 17:31–33, 21:23–28. For example, only a premium class of subscribers may be allowed access to services, time indifferent data calls may be terminated, or some classes may be precluded from accessing services. *Id.* at 17:33–40, 21:28–30. The system also may provide service option signals to subscribers operating within the corridor. *Id.* at 11:41–47.

2. Shatzkamer

Shatzkamer relates to network security. Ex. 1006 ¶ 1. According to Shatzkamer, it may be determined that a device is misbehaving (e.g., due to a worm or a virus) and creating a security issue while connected to a network. *Id.* ¶¶ 12, 23. To address this, Shatzkamer provides a blacklist that the network system may use to deny service for the device when it attempts to connect. *Id.* ¶ 12. The device may be associated with identification information, such as an international mobile subscriber identity (IMSI), which is a unique number. *Id.* ¶ 15. The system adds this information to the blacklist. *Id.* ¶ 24. The system also may add information on how long the device is to be denied service to the blacklist. *Id.* ¶ 12. Thus, the device is disconnected from the network and denied service if it attempts to reconnect to the network. *Id.*

3. Budka

Budka relates to route optimization in General Packet Radio Service (GPRS) networks. Ex. 1007, at [57], ¶ 42. In its discussion of an attach procedure in the context of a conventional GPRS mobile registration, Budka explains that a mobile station initiates the attach procedure by sending to the serving GPRS support node (SGSN) its international mobile subscriber identity (IMSI). *Id.* ¶ 62. Budka further explains that the IMSI is unique to each subscriber. *Id.*

4. Analysis

a. Petitioner's Arguments

Petitioner presents arguments regarding claims 31 and 33 separately. We address these claims in turn.

i. Claim 31

The preamble of claim 31 recites a "telecommunications network configured for providing access to a plurality of terminals." Petitioner identifies Obhan's global standard for mobile communications (GSM) system as a "telecommunications network." Pet. 22 (citing Ex. 1005, 9:16–21). Petitioner also identifies Obhan's subscriber units as "terminals." *Id.* (citing Ex. 1005, 9:45–56). Obhan states that "[t]he wireless communication system provides wireless service within a service coverage area" in which "a plurality of subscriber units" operate. Ex. 1005, 9:45–47. Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Obhan teaches the recited "telecommunications network."

Claim 31 further recites a "register configured to store [a] unique identifier of at least one terminal in combination with identification of at least one associated deny access time interval," where the "deny access time interval" is "a time period during which telecommunications network access for the terminal is denied." That is, claim 31 requires a "register" that stores both a "unique identifier" and a "deny access time interval." For this limitation, Petitioner relies on both Obhan and Shatzkamer.

In particular, Petitioner relies on Obhan for teaching a "register" that stores a "deny access time interval." Petitioner identifies Obhan's admission control block (ACB) as a "register." Pet. 26. Petitioner further directs us to where Obhan teaches that the ACB stores both access class identifiers and a good till time, which Petitioner identifies as a "deny access time interval." *Id.* (citing Ex. 1005, 16:14–19, Fig. 9B). Petitioner contends that an ordinarily skilled artisan "would have recognized that, although the 'good till' time period indicates the time interval during which access for the terminals having access classes equal [to] or above the minimum access class is granted, it equivalently and implicitly indicates the time interval during which access for the terminals having access classes below the minimum access class is denied." *Id.* at 27. Referring to Figure 9B of Obhan, Petitioner further contends that, "[i]n one example, corridor 1 (representing a portion) of a network will deny access to terminals having an access class below access class 9 in a time slot that starts from the time the record was updated and ends at a specific ending time 12:22:24." *Id.* at 26 (citing Ex. 1005, Fig. 9B). As support, Petitioner points us to Obhan's teaching that "access to the base station may be reduced by altering an ACB for the base station," such that "one or more classes may be precluded from

initiating calls from/to the base station." *Id.* at 27 (citing Ex. 1005, 21:22–29); Ex. 1005, 21:22–29; *see also* Ex. 1005, 18:56–59 (teaching in Obhan that "the network infrastructure may simply block [a subscriber unit's] attempted call if the subscriber unit does not have access to the system (as may be determined upon access of an ACB)") (cited by Pet. 27); *id.* at 18:4–11 (teaching in Obhan that the SYM system waits for a triggering event to perform an ACB corridor update, where such triggering event may be the expiration of a periodic timer or notification that the loading has exceeded a threshold value) (cited by Pet. 30). Petitioner also points us to the teaching in the '667 patent that "an equivalent of the grant access time interval includes a deny access time interval identifying a time interval during which an access request for access to the telecommunications network is to be denied." Pet. 28 (citing Ex. 1001, 2:17–20).

According to Petitioner, however, Obhan does not teach a "register" that also stores a "unique identifier." *See id*. at 31 ("Obhan's access class identifiers are not unique."). For this aspect of the limitation, Petitioner relies on Shatzkamer. *Id.* Petitioner identifies Shatzkamer's international mobile subscriber identity (IMSI) as a "unique identifier." *Id.* at 32. Petitioner further directs us to where Shatzkamer teaches checking "to see if the IMSI for mobile node 104 is included" on a blacklist and, if it is so included, "deny[ing] access to network 110." *Id.* (citing Ex. 1006 ¶ 25). Petitioner also directs us to where Shatzkamer teaches that "the period of time for which the device is denied service [may be] included in the blacklist." *Id.* (citing Ex. 1006 ¶ 12). Relying on the declaration testimony of Mr. Bishop, Petitioner contends that an ordinarily skilled artisan would have modified Obhan's system by either replacing Obhan's access class

identifiers with Shatzkamer's IMSIs or including the IMSIs in addition to Obhan's access class identifiers in order to increase granularity. *Id.* at 31 (citing Ex. 1003 ¶ 87); *id.* at 33 (citing Ex. 1003 ¶ 91). Mr. Bishop explains that increasing granularity "could provide finer and more specific access control." Ex. 1003 ¶ 47 (cited by Pet. 13); *see also* Ex. 1009 ¶ 33 ("[T]he Access Control Class concept in UTRAN cannot be used for fine-grained Access Control. . . . With such a limited number of Access Control Classes, it is impossible to build any logic for access control."); *id.* ¶ 63 ("[F]emto access control database 44 is formatted to list . . . identifications of the user equipment units which have allowed access status to the respective femto radio base station. . . . [F]emto access control database 44 is consulted and used to determine if a candidate user equipment unit attempting to use the femto radio base station for access to the radio access network is to be given access.") (cited by Ex. 1003 ¶ 48).

Based on the entire trial record before us, we find that Petitioner has demonstrated sufficiently that the combination of Obhan and Shatzkamer teaches the recited "register." We also find that Petitioner's proffered reasoning for modifying the teachings of Obhan to include Shatzkamer's IMSIs, namely, to increase granularity, is sufficient to support the legal conclusion of obviousness.[8] *See In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[T]here must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.").

[8] Although Petitioner discusses increasing granularity in the context of modifying Obhan to replace the access class identifiers with Shatzkamer's IMSIs, we find that increasing granularity also supports modifying Obhan to include Shatzkamer's IMSIs in addition to the access class identifiers.

Claim 31 further recites "one or more processors" as well as a "memory storing processor instructions that, when executed by the one or more processors, cause the one or more processors to carry out operations." For these limitations, Petitioner directs us to where Obhan teaches that its system, which includes a database, "may be implemented by a separate computing device or a plurality of computing devices," each of which "has sufficient computing capacity to perform [] operations." Pet. 34 (citing Ex. 1005, 4:48–57); Ex. 1005, 4:48–57. Petitioner contends that "[i]t was well-known to a [person of ordinary skill in the art] that a computer includes one or more processors and memory storing processor instructions to carry out operations." Pet. 34. As support, Petitioner relies on the declaration testimony of Mr. Bishop. *Id.* (citing Ex. 1003 ¶ 93). Petitioner additionally relies on other references, including Budka, which describes a network system, where "[e]ach network element includes a processor 100 for controlling operations associated therewith, in cooperation with its associated memory 102." *Id.* (citing Ex. 1007 ¶ 57); Ex. 1007 ¶ 57. Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Obhan teaches the recited "processors" and "memory."

Claim 31 further recites an "access request operation to receive an access request from the terminal and to receive or determine the unique identifier associated with the terminal." For this limitation, Petitioner directs us to where Obhan teaches that "the network infrastructure may simply block [a subscriber unit's] attempted call if the subscriber unit does not have access to the system." Pet. 36 (citing Ex. 1005, 18:56–59). Relying on the declaration testimony of Mr. Bishop, Petitioner further contends that "[i]t was well-known to a [person of ordinary skill in the art] that a call

origination in a GSM network includes receiving an access request and a unique identifier associated with the terminal, such as the IMSI of the terminal." *Id.* (quoting Ex. 1003 ¶ 99). Mr. Bishop supports his testimony with other references including Budka, which states that a mobile station "initiates the attach procedure by sending to the SGSN its International Mobile Subscriber Identity (IMSI) which is unique to each GPRS/GSM subscriber." Ex. 1003 ¶ 99 (citing Ex. 1007 ¶ 62); Ex. 1007 ¶ 62; *see also* Ex. 1010 ¶ 49 ("The mobile station initiates an 'attach' procedure by transmitting an Attach Request message that provides among other things its IMSI (or other suitable identifier) to the SGSN.") (cited by Ex. 1003 ¶ 99). According to Petitioner, an ordinarily skilled artisan "seeking to implement the access control operation in a GSM network in Obhan would have found it obvious, in light of the teaching in Budka regarding the access procedures specified in GSM standards, to receive an access request that includes a unique identifier of the terminal, in order for the terminal to originate a data call." Pet. 38.

We find that the attempted call of Obhan's subscriber unit corresponds to the recited "access request." We also find that Budka's attach procedure (which includes receiving the IMSI) provides details for implementing an attempted call in Obhan. Accordingly, based on the entire trial record before us, we find that Petitioner has established sufficiently that the combination of Obhan and Budka teaches the recited "access request operation." We are additionally persuaded that Petitioner's proffered reasoning for modifying Obhan to incorporate Budka's attach procedure, namely, to provide a way to carry out a call, is sufficient to support the legal conclusion of obviousness.

Claim 31 further recites "an access operation to deny access for the terminal if the access request is received within the time period." For this limitation, Petitioner describes what it alleges to be "[a]n example operation of the access control system of Obhan as modified by Shatzkamer and Budka." Pet. 39. Specifically, Petitioner states:

> For "calls originating" from a terminal in Obhan's GSM network, the terminal sends an access request to the GSM network by implementing Budka's "attach procedure," which involves sending the terminal's International Mobile Subscriber Identity (IMSI) to the GSM network. When Obhan's GSM network receives the access request containing the IMSI, the GSM network accesses the ACB modified by Shatzkamer's teachings using the received IMSI. The modified ACB stores information of time slot during which accesses from a list of terminals are denied, in association with IMSI of the list of terminals. If the IMSI is found in the modified ACB, indicating that the terminal is one of the listed terminals, and if the access request is received within the time slot that is associated with the terminal as stored in the modified ACB, the access request is denied and the call origination is blocked.

Id. (internal citations omitted). Petitioner relies on the declaration testimony of Mr. Bishop. *Id.* (citing Ex. 1003 ¶¶ 104–105). Based on the entire trial record before us, we find that Petitioner has shown sufficiently that its proposed combination of Obhan, Shatzkamer, and Budka discussed above teaches the recited "access operation."

Claim 31 further recites that the telecommunications network "monitor[s] a network load of the telecommunications network" and "adapt[s] the time period depending on the monitored network load." For these limitations, Petitioner directs us to where Obhan teaches "collect[ing] real-time and potential loading information for the wireless communication

system." *Id.* at 40 (citing Ex. 1005, 15:47–51).[9] Petitioner also directs us to where Obhan further teaches that, when the actual loading exceeds a threshold value, "ACBs may be updated so that access to the base station is limited." *Id.* at 41 (citing Ex. 1005, 17:31–33); Ex. 1005, 17:31–33. Petitioner contends that an ordinarily skilled artisan "would have found it obvious that updating the ACB based on the current loading includes updating the 'good till' time period in the ACB, updating the 'minimum access class,' or updating both." Pet. 41 (quoting Ex. 1003 ¶ 109). Here, Petitioner seems to argue that it would have been obvious to try updating the good till time in order to reduce the loading. *See also* Ex. 1003 ¶ 109. According to Petitioner, "updating of the time period during which access is denied based on the current network load is a well-known, routine practice in the art." Pet. 42–43 (citing Ex. 1008, 4:31–36).

Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Obhan teaches the recited feature of "monitor[ing] a network load." We also are persuaded that an ordinarily skilled artisan would have had a reason to modify Obhan to provide the recited feature of "adapt[ing] the time period depending on the monitored network load." Petitioner's proffered reasoning for modifying Obhan to include updating the good till time, namely, because it would have been obvious to try, is sufficient to support the conclusion of obviousness. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue

[9] Petitioner cites Ex. 1005, 15:47–51, but the quoted language appears at Ex. 1005, at [57].

the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.").

Claim 31 further recites that "machine-to-machine applications are executed." For this limitation, Petitioner directs us to where Obhan discusses machine users, such as electronic billboards and vending machines. Pet. 43 (citing Ex. 1005, 7:18–32). Obhan teaches that an electronic billboard may communicate with a remote computer through a wireless link serviced by the wireless communication system to receive its updates. Ex. 1005, 7:26–32. Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Obhan teaches the recited "machine-to-machine applications."

Lastly, claim 31 recites that the "terminals for the machine-to-machine applications are denied access to the telecommunications network during peak load time intervals, the time period being within peak load time intervals." For this limitation, Petitioner directs us to where Obhan discusses Base Station Transceiving Subsystem (BTS) watermark profiling and provides an annotated version of Figure 15 of Obhan, which is reproduced below. Pet. 44 (citing Ex. 1005, 16:30–32, 20:64–21:7).

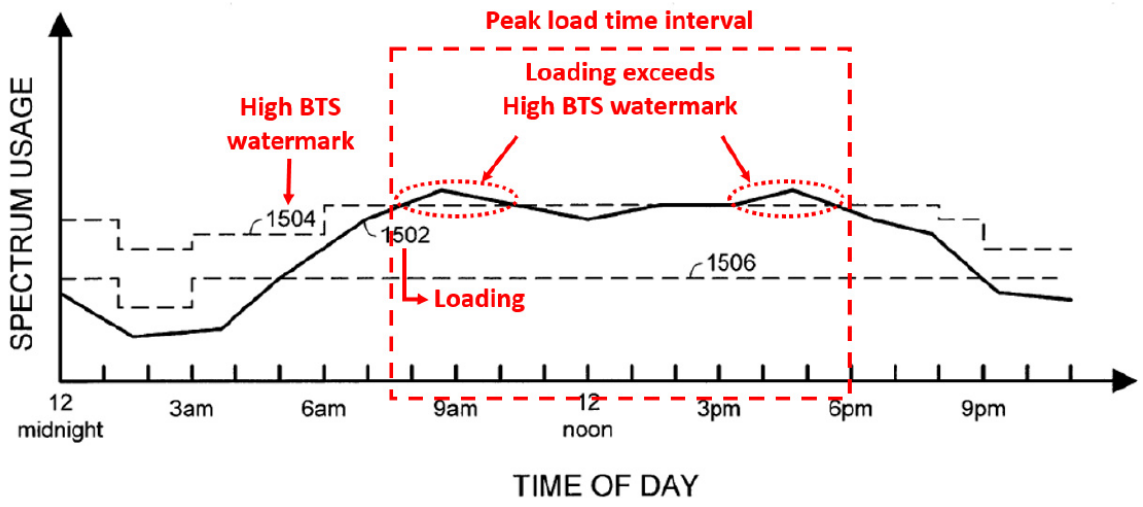

FIG. 15

Figure 15 of Obhan, as annotated by Petitioner (Pet. 44), shows load serviced by a base station throughout a 24-hour period and its relationship to BTS watermarks. *See* Ex. 1005, 20:64–66. Curve 1502 represents actual loading, curve 1504 represents a high BTS watermark profile, and curve 1506 represents a low BTS watermark profile. *Id.* at 20:66–21:5. Petitioner identifies the time interval during which the network loading is at or near the upper BTS watermark (i.e., 7:30 am to 6:00 pm) as a "peak load time interval." Pet. 44 (citing Ex. 1005, 21:22–29). Obhan teaches that "some classes may be precluded access to the base station" when the actual loading passes the high BTS watermark. *Id.* at 45 (citing Ex. 1005, 17:31–40). Petitioner further directs us to where Obhan teaches that, "[i]n the case of a low priority voice user, or a low priority data user (e.g., a vending machine), . . . the network infrastructure may simply block its attempted call if the subscriber unit does not have access to the system (as may be determined upon access of an ACB)." *Id.* at 47 (citing Ex. 1005, 18:51–59); Ex. 1005, 18:51–59; *see also* Ex. 1005, 3:26–31 ("Machine users of the system . . .

may be managed to access the system during reduced loading periods.") (cited by Pet. 47). Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Obhan teaches that "terminals for the machine-to-machine applications are denied access to the telecommunications network during peak load time intervals, the time period being within peak load time intervals."

ii. Claim 33

Claim 33 is directed to a "tangible, non-transitory computer-readable medium" and recites similar limitations as claim 31. For example, claim 33 recites receiving an access request and a unique identifier from a terminal; denying the terminal access to a telecommunications network, where the access request is received within a deny access time interval, which is a time period during which access for the terminal is denied; monitoring a network load of the network; adapting the time period based on the monitored network load; and denying access to the network to one or more terminals attempting to engage in machine-to-machine applications during peak load time intervals. As to these limitations, Petitioner relies on its arguments discussed above with respect to claim 31. Pet. 48–51. For the reasons given, we find Petitioner's arguments to be persuasive. *See supra* Part III.B.4.a.i.

Claim 33 additionally recites "accessing, using the unique identifier, an identification of at least one associated deny access time interval." For this limitation, Petitioner refers to its argument with respect to claim 31 regarding its proposed combination of Obhan and Shatzkamer, which provides an ACB that stores both good till times and IMSIs. Pet. 49–50;

Ex. 1005, 16:14–21, Fig. 9B; Ex. 1006 ¶¶ 12, 25. As discussed above, Petitioner identifies each good till time of Obhan as a "deny access time interval" and each IMSI of Shatzkamer as a "unique identifier." *See also* Pet. 49–50. Petitioner further contends that "Obhan in view of Shatzkamer renders obvious that the network device uses 'unique identifier associated with terminals' that are stored in combination with 'identification of at least one associated deny access time interval' to 'access' the 'identification of at least one associated deny access time interval,' and use at least one associated deny access time interval to perform access control by denying access to terminals based on their unique identifiers." *Id.* at 50. Based on the entire trial record before us, we find that Petitioner has shown sufficiently that its proposed combination of Obhan and Shatzkamer discussed above teaches the recited "accessing" step.

b. Patent Owner's Arguments

Patent Owner makes several arguments. In particular, Patent Owner argues that Petitioner fails to address certain differences between Obhan and the claimed invention. PO Resp. 23–34. Patent Owner further argues that the asserted prior art does not teach or suggest "stor[ing] the unique identifier of at least one terminal in combination with identification of at least one associated deny access time interval," and that an ordinarily skilled artisan would not have considered combining Obhan and Shatzkamer to provide this claim limitation. *Id.* at 34–43. In addition, Patent Owner argues that the asserted prior art also does not teach or suggest several other claim limitations: "access operation"; "adapt[ing] the time period depending on the monitored network load"; "accessing, using the unique identifier, an

identification of at least one associated deny access time interval"; and "denying the terminal access to the telecommunications network responsive to the access request being received within the . . . deny access time interval." *Id.* at 44–52. We address these arguments in turn.

i. Differences Between the Prior Art and the Claims

As Patent Owner points out, the question of obviousness is resolved on the basis of underlying factual determinations, including any differences between the claimed subject matter and the prior art. PO Resp. 23–24 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966)). The question, however, is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 164 (Fed. Cir. 1985); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983). That is, "[c]onsideration of differences . . . is but an aid in reaching the ultimate determination of whether the claimed invention *as a whole* would have been obvious." *Stratoflex*, 713 F.2d at 1537. If the claimed subject matter would have been obvious in light of any differences, "there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Kahn*, 441 F.3d at 988.

Patent Owner argues that "[t]he Petition's *Graham* analysis is deficient at least because the Petition fails to identify sufficiently the differences between independent claims 31 and 33 of the '667 patent and the asserted prior art references." PO Resp. 24. Patent Owner refers to three asserted differences, two relating to the recited "deny access time interval" and one relating to the recited "unique identifier" of a terminal.

In particular, Patent Owner contends that Obhan's system "selectively denies or completes a call to a subscriber unit" based on information about the corridor, not the good till time (which Petitioner identifies as the "deny access time interval"). PO Resp. 29. As support, Patent Owner directs us to where Obhan teaches receiving a call for a subscriber unit, identifying the corridor in which the subscriber was last located, and indicating the class supported by the corridor. *Id.* (citing Ex. 1005, 18:30–37). Patent Owner asserts that "[t]he 'good till' time stamp is never consulted." *Id.* According to Patent Owner, Obhan's "'good till' time stamp only indicates when previously obtained subscriber demand information for a corridor has expired" and does "not affect any determination of telecommunications network access for a particular subscriber." *Id.* at 30. Patent Owner relies on the declaration testimony of Mr. Bates that "the 'good till' time stamp identifies when previously obtained subscriber demand information has become stale such that a determination of the current subscriber demand at a location in Obhan's telecommunications network should be performed," that is, it "identifies the time the next scheduled update to the ACB entry will be triggered." *Id.* at 26–27 (citing Ex. 2006 ¶¶ 50, 78).

Patent Owner's contention does not undermine Petitioner's showing that Obhan's good till time teaches the "deny access time interval." Obhan describes "quer[ying] the ACB for the corridor in which the subscriber appears to be located," and explains that a received call is completed if the corridor supports delivery for the class of the subscriber or denied if the corridor does not support delivery to the subscriber. Ex. 1005, 18:32–46. Based on this disclosure, we agree with Patent Owner that Obhan's system relies on information about the corridor to selectively complete or deny a

call. Yet we do not agree that the good till time stamp is never consulted. *See* PO Resp. 29. For instance, Obhan teaches that "the mobile ACB includes an Access Class, which indicates the lowest priority class for which the corridor will provide service," and that "ACB 950 also includes a time stamp for each corridor through which the respective mobile ACB 950 is valid." Ex. 1005, 16:15–19 (cited by Pet. 26). According to these teachings, information on whether the corridor supports delivery for the subscriber's access class is valid only for a period lasting through the value of the time stamp (i.e., the good till time). *See id.* at Fig. 9B. That is, the validity of information on whether the corridor supports delivery for a particular access class depends on the value of the good till time. We therefore find that Obhan's system relies on information about the corridor, the class of the subscriber, as well as the good till time to selectively complete or deny a call.

Patent Owner further contends that Obhan's good till time is associated with a corridor, not a terminal or a class of terminals. PO Resp. 30–31. According to Patent Owner, "[i]t appears that the Petitioner is relying solely on Obhan's example depiction of an ACB having the 'GOOD TILL' column next to the 'MINIMUM ACC. CLASS' column," but "just because the 'good till' time stamp and the minimum access class are each independently related to a corridor, it does not follow that there is an association between the two." *Id.* at 31. As discussed above, however, Obhan teaches that "the mobile ACB includes an Access Class" and "a time stamp for each corridor through which the respective mobile ACB 950 is valid." Ex. 1005, 16:15–19. This teaching conveys an association between the Access Class and the good till time, where the value of the Access Class

is valid for a period lasting through the value of the good till time. Accordingly, Patent Owner's contention in this regard also does not undermine Petitioner's showing that Obhan's good till time teaches the "deny access time interval."

Lastly, referring to Petitioner's proposed substitution of Obhan's access class identifiers with Shatzkamer's unique terminal identifiers, Patent Owner contends that the proposed substitution "fails to consider the hierarchically-ordered nature of Obhan's access class identifiers in comparison with the unique identifiers of Shatzkamer." PO Resp. 33 (citing Pet. 12, 13, 33). As support, Patent Owner asserts that the hierarchically-ordered class identifiers "form a prioritized hierarchy that allows Obhan's ACB to store only a single minimum access class in an entry for each corridor." *Id.* (citing Ex. 1005, Fig. 9B). Relying on the declaration testimony of Mr. Bates, Patent Owner further asserts that the hierarchically-ordered classes are levels of service, which are not a property of a terminal or a specific subscriber, and that "substituting Obhan's Access Classes with unique identifiers for the terminals is not the same as substituting groups of terminals with individual terminals as Petitioner proposes." *Id.* (citing Ex. 2006 ¶ 21).

We disagree. Petitioner acknowledges that "Obhan's access class identifiers are not unique" and additionally relies on Shatzkamer to remedy this deficiency. Pet. 31 ("Obhan in view of Shatzkamer renders obvious replacing Obhan's access class identifiers with unique terminal identifiers disclosed by Shatzkamer or at least including Shatzkamer's unique terminal identifiers in addition to Obhan's access class identifiers."). Petitioner explains that "Shatzkamer discloses associating terminals with unique

identifiers, and denying terminal access to the network based on the unique identifiers." *Id.* at 32 (citing Ex. 1006 ¶ 25). Petitioner further directs us to where Shatzkamer describes "a list that is used to deny service for the device when it attempts to connect" to the network. *Id.* (quoting Ex. 1006 ¶ 12). We find that Shatzkamer's teachings can be applied in the context of Obhan's system. For example, a list of individual terminals that have been assigned to a particular class may be used to deny service to a listed terminal when the terminal attempts to connect to the network. *See also* Pet. 39 (describing "example operation of the access control system of Obhan as modified by Shatzkamer and Budka").

As discussed above, we are persuaded that Petitioner's proffered reasoning for modifying Obhan's system to include Shatzkamer's unique identifiers (IMSIs), namely, to increase granularity, is sufficient to support the legal conclusion of obviousness. Patent Owner's focus on the ability of Obhan's ACB to "store only a single minimum access class in an entry for each corridor" ignores that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." *See KSR*, 550 U.S. at 421. In modifying Obhan's system to include Shatzkamer's IMSIs, a person of ordinary skill in the art would have made any necessary modifications to allow Obhan's ACB to store more than one entry for each corridor. *See* Ex. 1005, 22:29–30 (teaching in Obhan that its invention "is susceptible to various modifications and alternative forms"). Patent Owner's contention therefore does not undermine Petitioner's obviousness argument with respect to the "unique identifier" of a terminal.

ii. "stor[ing] the unique identifier of at least one terminal in combination with identification of at least one associated deny access time interval"

This limitation is recited in claim 31. Patent Owner reiterates that "Obhan's ACB is configured to store an identification of the next scheduled determination of subscriber demand and does not store an '*identification of at least one associated deny access time interval*' to identify '*a time period during which telecommunications network access for the terminal is denied*.'" PO Resp. 35. As discussed above, however, Petitioner explains that "although the 'good till' time period indicates the time interval during which access for the terminals having access classes equal [to] or above the minimum access class is granted, it equivalently and implicitly indicates the time interval during which access for the terminals having access classes below the minimum access class is denied." Pet. 27. We find Petitioner's explanation persuasive. *See* Ex. 1001, 2:17–20 (teaching in the '667 patent that "an equivalent of the grant access time interval includes a deny access time interval identifying a time interval during which an access request for access to the telecommunications network is to be denied") (cited by Pet. 28); Ex. 1005, 16:15–19 (teaching in Obhan that "the mobile ACB includes an Access Class" and "a time stamp for each corridor through which the respective mobile ACB 950 is valid") (cited by Pet. 26). Thus, even if Obhan's good till time identifies the next scheduled determination of subscriber demand, the good till time nevertheless identifies a time period during which network access for a terminal with an access class below the minimum access class is denied. Accordingly, Patent Owner's argument fails to undermine Petitioner's showing that Obhan's good till time teaches the "deny access time interval."

Patent Owner also argues that Petitioner's proposed combination of Obhan and Shatzkamer does not arrive at the claimed invention "because the 'good till' time stamps are only associated with a location (*e.g.*, a corridor or a cell) and not a terminal." PO Resp. 36 (citing Ex. 2006 ¶ 87). According to Patent Owner, "if one were to modify the ACB of Obhan to store IMSIs for one or more terminals instead of a minimum access class, each IMSI would not even have a 'good till' time stamp stored next to it, as each corridor only has a single 'good till' time stamp (*i.e.*, the time at which the previous loading information for that corridor is no longer valid and needs to be determined again)." *Id.* at 38.

We disagree. Obhan teaches that "the mobile ACB includes an Access Class" and "a time stamp for each corridor through which the respective mobile ACB 950 is valid." Ex. 1005, 16:15–19. As discussed above, we find that this teaching conveys an association between the Access Class and the good till time, where the value of the Access Class is valid for a period lasting through the value of the good till time. Modifying Obhan's system to include Shatzkamer's unique identifiers would provide an association between the unique identifiers and the good till time, where the list of terminals (identified by their respective unique identifiers) would be valid for a period lasting through the value of the good till time. For these reasons, Patent Owner's argument does not undermine Petitioner's showing that Obhan's good till time teaches the "deny access time interval."

iii. Rationale for Combining Obhan and Shatzkamer

Patent Owner argues that "one of ordinary skill in the art would not have been motivated to modify Obhan's ACB to store an IMSI of a terminal

. . . in combination with the 'good till' time stamp[] because the 'good till' time stamp is not associated with any access classes and does not identify 'a *time period during which telecommunications network access for the terminal is denied*.'" PO Resp. 41–42; *see also id.* at 42 ("[I]f one of skill in the art were adding Shatzkamer's blacklist of IMSIs they would not attempt to associate Shatzkamer's IMSI with Obhan's 'good till' time stamp."). As discussed above, however, we find that Obhan teaches an association between the Access Class and the good till time, where the value of the Access Class is valid for a period lasting through the value of the good till time. *See* Ex. 1005, 16:15–19 (teaching in Obhan that "the mobile ACB includes an Access Class" and "a time stamp for each corridor through which the respective mobile ACB 950 is valid"). Moreover, modifying Obhan's system to include Shatzkamer's unique identifiers would provide an association between the unique identifiers and the good till time, where the list of terminals (identified by their respective unique identifiers) would be valid for a period lasting through the value of the good till time. Accordingly, Patent Owner's argument does not undermine Petitioner's obviousness showing.

Patent Owner further argues that "[t]he Petition fails to establish that one of ordinary skill in the art would have been motivated to combine Obhan . . . and Shatzkamer" because Obhan is "specifically limited to managing wireless spectrum (such as maximizing its usage) by location and class of device," while Shatzkamer is "specifically focused on blacklisting (i.e. denying service to) individual devices due to their detected malicious behavior." PO Resp. 39. Patent Owner contends that "Obhan and Shatzkamer are trying to solve disparate problems," as "Obhan is attempting

to mitigate over-utilization or under-utilization of spectrum resources by all subscribers in a particular region, while Shatzkamer is attempting to mitigate a security issue of an individual device having a virus or exhibiting malicious behavior regardless of network traffic and regardless of any particular region." *Id.* at 40–41. Patent Owner also contends that "Obhan and Shatzkamer provide their respective access controls for wholly different functions," as "Shatzkamer teaches use of a blacklist to protect the HLR from malicious terminals, while Obhan envisions managing (i.e., prioritizing) use of the available (wireless) spectrum according to operating goals, based on setting a (minimum) access class indicating the services provided in a cell or corridor." *Id.* at 41.

We disagree with Patent Owner's argument. Although Obhan and Shatzkamer may provide solutions to different problems and may use their access controls for different functions, both references relate to network access regulation within telecommunications network systems. For example, Obhan states that it relates to "managing spectrum in a wireless communication system," which includes a "network infrastructure." Ex. 1005, 1:14–19, 1:23–24. Shatzkamer states that it relates to "networking," where a "device may be placed on a blacklist . . . that is used to deny service for the device when it attempts to connect." Ex. 1006 ¶¶ 1, 12. Moreover, we note that the Patent Office classified both references under the same class number 455. Ex. 1005, at [52]; Ex. 1006, at [52]. Accordingly, we find that Obhan and Shatzkamer are from the same field of endeavor, and that the differences on which Patent Owner focuses would not have prevented an ordinarily skilled artisan from combining the references to solve a problem relating to access regulation in a network system.

Patent Owner additionally argues that "the proposed combination would lose the flexibility and granularity of Obhan's system to provide access to subscribers based on the mobile service requested." PO Resp. 42. According to Patent Owner, "[u]sing Obhan's hierarchically-ordered class of service identifiers, the system of Obhan is able to provide access to prioritized services for all subscribers while still managing the network usage in a corridor by denying access to low priority services." *Id.*

We disagree with Patent Owner's argument. As discussed above, an ordinarily skilled artisan would have understood that Obhan's ACB could be modified to include Shatzkamer's unique identifiers by using a list of individual terminals (identified by their respective unique identifiers) that have been assigned to a particular class (e.g., a low priority service) to deny service to a listed terminal when the terminal attempts to connect to the network. *See* Ex. 1005, 3:10–12 (teaching in Obhan that its system "divides the subscribers into a plurality of classes, each of which is treated differently with respect to services provided") (cited by Pet. Reply 13; PO Resp. 11); Ex. 1006 ¶ 12 (teaching in Shatzkamer that a "device may be placed on a blacklist . . . that is used to deny service for the device when it attempts to connect") (cited by Pet. 32); Pet. 39. An ordinarily skilled artisan also would have understood that Obhan's system, as modified by Shatzkamer, could therefore continue to provide access to prioritized services while denying access to low priority services.

Moreover, Petitioner proposes modifying Obhan's ACB by either "replacing Obhan's access class identifiers with unique terminal identifiers disclosed by Shatzkamer *or at least including Shatzkamer's unique terminal identifiers in addition to Obhan's access class identifiers*." Pet. 31

(emphasis added). An ordinarily skilled artisan would have understood that modifying Obhan's ACB to include Shatzkamer's unique terminal identifiers in addition to access class identifiers would allow Obhan's system, as modified by Shatzkamer, to continue to use its hierarchically-ordered class of service identifiers.

Next, Patent Owner directs us to where we stated in our Institution Decision that "modifying Obhan's ACB to include unique terminal identifiers in addition to access class identifiers would allow for increased granularity to provide better network security, while still allowing for Obhan's macro-level access control methodology." PO Resp. 42 (quoting Inst. Dec. 22). Patent Owner argues that our statement "is not advocated by the Petitioner or supported by expert testimony." *Id.*

We disagree. Petitioner contends that an ordinarily skilled artisan would have modified Obhan's system by either "replacing Obhan's access class identifiers with unique terminal identifiers disclosed by Shatzkamer or at least including Shatzkamer's unique terminal identifiers in addition to Obhan's access class identifiers" in order "to increase granularity." Pet. 31, 33. As discussed above, we are persuaded that increasing granularity is a sufficient reason to support the legal conclusion of obviousness. *See supra* Part III.B.4.a.i. Indeed, Patent Owner's counsel acknowledged during oral argument that there is a "possible motivation in terms of granularity." Tr. 37:21–22; *see also id.* at 37:12 (stating that "increased granularity, it could be beneficial"), 38:21–39:2 (stating that "in some circumstances, [increased granularity] could be beneficial"). Our statement in the Institution Decision with respect to providing better network security was not meant to be representative of Petitioner's argument; rather, it was meant

to supply our reasoning as to why we were persuaded that increased granularity is a sufficient reason to support the legal conclusion of obviousness. *See* Inst. Dec. 22–23 (addressing Patent Owner's argument that modifying Obhan's system "to include unique identifiers for each entry (instead of the entries specifying a minimum access class per cell or corridor) . . . would add hundreds, if not thousands, of additional entries per corridor," which "would be *needlessly* inefficient and duplicative for purposes of network management," and would "creat[e] a processing and traffic burden on the network due to [more] frequent updates [to the ACB]") (emphasis added). Namely, we found that increased granularity could help provide better network security, based on the cited teachings of Shatzkamer. *Id.* at 22–23 (citing Ex. 1006 ¶ 25); Ex. 1006 ¶ 25 (cited by Pet. 32).

Patent Owner further argues that "incorporating the blacklist of Shatzkamer into Obhan's system to increase granularity to provide better network security would ignore other claim requirements, and would not render the claim as a whole obvious." PO Resp. 43. In particular, Patent Owner contends that "if one attempted to associate a blacklisted IMSI with a 'good till' time period to 'provide better network security,' it would not be obvious '*to adapt the time period depending on the monitored network load*' or that '*the time period [be] within peak load time intervals*,'" as "the Petition provides no evidence or reasoning to show that a [person of ordinary skill in the art] would have considered altering network security based on current network load or during peak load times." *Id.* (internal citation omitted).

We disagree. Patent Owner's focus on associating a blacklisted IMSI with a good till time and on whether an ordinarily skilled artisan would have

considered altering network security based on current network load or during peak load times disregards the broader teaching in the prior art of providing increased granularity using unique identifiers. Ultimately, "[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference." *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). "Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art." *Id.* For example, as discussed above, we find that the combined teachings of Obhan and Shatzkamer would have suggested that a list of individual terminals (identified by their respective unique identifiers) that have been assigned to a particular class (e.g., a class below the minimum access class) could be used to deny service to a listed terminal when the terminal attempts to connect to the network. *See* Ex. 1005, 3:10–12 (teaching in Obhan that its system "divides the subscribers into a plurality of classes, each of which is treated differently with respect to services provided") (cited by Pet. Reply 13; PO Resp. 11); Ex. 1006 ¶ 12 (teaching in Shatzkamer that a "device may be placed on a blacklist . . . that is used to deny service for the device when it attempts to connect") (cited by Pet. 32). An ordinarily skilled artisan would have understood that, at the same time, another list of individual terminals that have been assigned to another class (e.g., a class equal to or above the minimum access class) could be used to complete service to a listed terminal. *See* Ex. 1005, 3:10–12; Ex. 1006 ¶ 12. In the latter case, should one of the listed terminals trigger a "security issue," the ordinarily skilled artisan would have further understood that the terminal may be included on still another list so that the terminal would be denied service when attempting to connect to the network. *See* Ex. 1006 ¶ 12. This

example illustrates a benefit of increased granularity, namely, better network security. It contemplates associating a unique identifier of a terminal assigned to a class with a good till time, but does not require associating a unique identifier of a "blacklisted" terminal with a good till time. *See* Tr. 39:6–10 (counsel for Patent Owner stating, "[M]y co-counsel and I may both be in a service class 7, right? But you know, if I do something bad in the computer system and I get blacklisted, I mean, that's specific to me . . . . [I]t doesn't have to do with time, it doesn't have to do with my access class."). Accordingly, contrary to Patent Owner's position, we find that combining the teachings of Obhan and Shatzkamer does not necessarily ignore other claim requirements. Further, in light of what the teachings of Obhan and Shatzkamer would have suggested to an ordinarily skilled artisan, we remain persuaded that increasing granularity provides sufficient rationale for why an ordinarily skilled artisan would have considered modifying Obhan's system to include unique identifiers. *See* Tr. 39:3–4 (counsel for Patent Owner stating, "[I]increased granularity is extremely beneficial to Shatzkamer, right? Because this is the blacklist, right?").

iv. "an access operation to deny access for the terminal if the access request is received within the time period"

Patent Owner argues that Petitioner has not met its burden with respect to this limitation, which is recited in claim 31, because Obhan's mobile switching center "is responsible for performing the access operation and only queries the minimum access class of the specific corridor the terminal is located in to determine whether the corridor supports delivery of the call." PO Resp. 44. According to Patent Owner, "[n]owhere does

Obhan disclose or suggest that the 'good till' time stamp is somehow involved in this access determination." *Id.* Patent Owner additionally contends that "whether the access request is received before the 'good till' time stamp could not possibly affect the access operation of Obhan because when the [mobile switching center] queries the ACB it is always before the 'good till' time stamp due to the 'good till' time stamp being reset to a time in the future (likely done on a periodic basis) after the ACB is updated." *Id.* at 45.

In its Reply, Petitioner counters that the claim limitation "only requires a condition, i.e., 'if the access request is received within the time period,' for which access is denied.'" Pet. Reply 18. Petitioner explains that "the 'good till' time identifies a time slot during which access to the telecommunications network is denied," and that "an access request for the terminal having an access class below the minimum access class would be denied **if** the request is received with[in] the time slot identified by the 'good till' time." *Id.* at 18–19. In addition, Petitioner reasons that, "[a]ccording to [Patent Owner], Obhan's system would always satisfy the 'if' condition because the 'good till' time would never expire." *Id.* at 19.

We agree with Petitioner. As discussed above, Obhan teaches that "the mobile ACB includes an Access Class, which indicates the lowest priority class for which the corridor will provide service," and that "ACB 950 also includes a time stamp for each corridor through which the respective mobile ACB 950 is valid." Ex. 1005, 16:15–19. According to these teachings, information on whether the corridor supports delivery for the subscriber's access class is valid only for a period lasting through the value of the time stamp (i.e., the good till time). *See also id.* at Fig. 9B.

Obhan's system therefore relies on information about the corridor, the class of the subscriber, as well as the good till time to selectively complete or deny a call. Thus, Obhan's system will deny a call that is made prior to the good till time included in the mobile ACB for a terminal with an access class below the Access Class included in the ACB.

v. *"the telecommunications network is further configured to adapt the time period depending on the monitored network load"*

This limitation is recited in claim 31. Claim 33 similarly recites "adapting the time period depending on the monitored network load." Patent Owner relies on the same arguments for both limitations. PO Resp. 46–48, 52. Accordingly, our consideration of Patent Owner's arguments applies to both limitations.

Patent Owner argues that "the Petition does not provide any explanation as to why a [person of ordinary skill in the art] would be motivated to extend the 'good till' time period beyond conclusory assertions." PO Resp. 47. Referring to Mr. Bishop's declaration testimony, Patent Owner also argues that "extending the 'good till' (update) time stamp to a time further in the future would only [] delay Obhan's determination of the network loading at a location (*e.g.*, corridor or cell), and thus would be the opposite of Obhan's stated goal of adapting admission control based on network loading." *Id.* at 46–47 (citing Ex. 1003 ¶ 109). According to Patent Owner, "Obhan's 'good till' time stamp is used to trigger the determination of subscriber demand in a specific corridor," and "[d]elaying the next triggered determination of the current demand or network load would never

be beneficial as it only increases the chance that admission control is not properly adapted to the current network conditions." *Id.* at 47.

In response, Petitioner counters that "Obhan discusses adapting the access control information in [the] ACB based on actual loading information of the wireless network, and a [person of ordinary skill in the art] would have found it obvious that updating the ACB based on the current loading includes updating the 'good till' time period in the ACB based on the current loading." Pet. Reply 19.

We agree with Petitioner. As discussed above, Obhan teaches "collect[ing] real-time and potential loading information for the wireless communication system," and updating ACBs when the actual loading exceeds a threshold value "so that access to the base station is limited." Ex. 1005, at [57] (Abstract),[10] 17:31–33 (cited by Pet. 40–41); *see also id.* at Ex. 1005, 18:5–11 (teaching in Obhan that its "system seeks and receives potential demand information at base stations" in response to "a triggering event," such as "the expiration of a periodic timer, notification from a base station that a BTS watermark has been passed or another event which initiates an update"). Mr. Bishop testifies in his declaration that:

> A [person of ordinary skill in the art] would have found it obvious that updating the ACB based on the current loading includes updating the 'good till' time period in the ACB, updating the "minimum access class," or updating both. For example, when the network loading is high, [Obhan's] system can update the ACB by increasing the "minimum access class" to reduce the number of terminals accessing the system,

[10] Petitioner cites column 15, lines 47 through 51, of Obhan, but the language cited in the Petition appears in the abstract.

> increasing the "good till" time period to prolong the access restriction period, or increasing both entries.

Ex. 1003 ¶ 109. As explained above, this reasoning—that it would have been obvious to try updating the good till time in order to reduce the loading—is sufficient to support the legal conclusion of obviousness. *See supra* Part III.B.4.a.i. Patent Owner does not proffer adequate evidence to the contrary. In Mr. Bishop's example, admission control is adapted to current network conditions by increasing the minimum access class, the good till time, or both. Further, determining network load is not necessarily delayed because Obhan's system may rely on various triggering events, including notifications from a base station that the actual loading has exceeded a threshold value, to initiate an update to the ACB. Accordingly, Patent Owner's argument does not undermine Petitioner's obviousness showing.

vi. "accessing, using the unique identifier, an identification of at least one associated deny access time interval"

This limitation is recited in claim 33. Patent Owner argues that Petitioner fails to meet its burden with respect to this limitation because "the Petition relies solely on its arguments with respect to claim 31" and "provides no additional explanation." PO Resp. 48–49. According to Patent Owner, "[t]he Petition does not articulate specific reasoning, based on evidence of record, to support that the claimed '*accessing*' step is taught or suggested by the combination of references," or to explain why an ordinarily skilled artisan would have considered combining the references to arrive at the claimed invention. *Id.* at 49–50. In addition, Patent Owner contends that modifying the ACB of Obhan to store the IMSI of Shatzkamer in

combination with the good till time stamp would not provide a system that "access[es] the 'good till' time stamp using the IMSI of a terminal, because the 'good till' time stamp is associated with the corridor or cell, and not any terminal or class of terminals." *Id.* at 49–50.

We disagree. With respect to the "accessing" limitation in claim 33, Petitioner directs us to where Obhan teaches that "the mobile ACB includes an Access Class, which indicates the lowest priority class for which the corridor will provide service," and that "ACB 950 also includes a time stamp for each corridor through which the respective mobile ACB 950 is valid." Pet. 50 (citing Ex. 1005, 16:15–19); Ex. 1005, 16:15–19; *see also* Pet. 26 (citing same with respect to claim 31). As discussed above, these teachings indicate that Obhan's system relies on (accesses) information about the corridor, the class of the subscriber, and the good till time (which Petitioner identifies as a "deny access time interval") to selectively complete or deny a call. *See also* Ex. 1005, Fig. 9B. The teachings also convey an association between the Access Class and the good till time, where the value of the Access Class is valid for a period lasting through the value of the good till time. Petitioner acknowledges that "Obhan's class identifiers are not unique" and contends that it would have been obvious to modify Obhan's system to include Shatzkamer's unique terminal identifiers to "increase granularity." Pet. 31, 33 (discussing claim 31). Modifying Obhan's system to include Shatzkamer's unique identifiers would provide an association between the unique identifiers and the good till time, where the list of terminals (identified by their respective unique identifiers) would be valid for a period lasting through the value of the good till time. For the reasons given above, Petitioner's reasoning for combining Obhan and Shatzkamer

(i.e., to increase granularity) is sufficient to support a legal conclusion of obviousness. *See supra* Part III.B.4.a.i. Accordingly, Patent Owner's argument does not undermine Petitioner's obviousness showing.

vii. "denying the terminal access to the telecommunications network responsive to the access request being received within the time period defined by the accessed identification of at least one associated deny access time interval"

This limitation also is recited in claim 33. Patent Owner similarly argues that Petitioner fails to meets its burden for this limitation because "the Petition relies solely on its arguments with respect to claim 31" and "provides no additional explanation." PO Resp. 50–51. In addition, Patent Owner argues that "no element of the system of Obhan considers or queries the 'good till' time while determining whether to deny or grant access." *Id.* at 51; *see also id.* ("Nowhere does Obhan disclose or suggest that the 'good till' time stamp is somehow involved in this access determination."). Patent Owner also reiterates its contention that "whether the access request is received before or after the 'good till' time stamp could not possibly affect the access operation of Obhan[] because when the [mobile switching center] queries the ACB it is always before the 'good till' time stamp due to the 'good till' time stamp being reset to a time in the future (*i.e.*, once the 'good till time is reached)." *Id.* at 51. According to Patent Owner, "the denial of access in Obhan cannot be "*responsive*" to the request being received before or after the 'good till' time stamp because . . . Obhan does not query the 'good till' time stamp, and . . . the access request is always received before the 'good till' time period." *Id.* at 52.

We disagree. The limitation in claim 33 requires only that the access request be denied if it is received within the time period during which access is denied. Petitioner contends that "Obhan discloses an access control system that blocks an attempted call o[f] terminals having access classes below the minimum access class in the time period identified by the 'good till' time period." Pet. 38–39 (cross-referencing Pet. 25–33 ("Ground 1, claim [31.1]")). This contention is persuasive. As discussed above, Obhan teaches that "the mobile ACB includes an Access Class, which indicates the lowest priority class for which the corridor will provide service," and that "ACB 950 also includes a time stamp for each corridor through which the respective mobile ACB 950 is valid." Ex. 1005, 16:15–19 (cited by Pet. 26). These teachings indicate that Obhan's system cannot rely on the minimum access class value without considering the good till time value because the good till time value indicates whether the minimum access class value is valid. Obhan's system relies on information about the corridor, the class of the subscriber, and the good till time (which Petitioner identifies as a "deny access time interval") to selectively complete or deny a call. *See also id.* at Fig. 9B (cited by Pet. 26). Thus, Obhan's system will deny a call that is made prior to the good till time included in the mobile ACB for a terminal with an access class below the Access Class included in the ACB, thereby satisfying the claim limitation. For these reasons, we find that Patent Owner's argument does not undermine Petitioner's obviousness showing.

In view of the foregoing, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 31 and 33 would have been obvious over Obhan, Shatzkamer, and Budka.

C. Obviousness over Obhan, Taniguchi, and Budka

Petitioner argues that claim 35 of the '667 patent would have been obvious over Obhan, Taniguchi, and Budka. Pet. 51–65. Patent Owner traverses this ground. PO Resp. 53–64. For the reasons explained below, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 35 would have been obvious over Obhan, Taniguchi, and Budka.

We discussed Obhan and Budka above.

1. Taniguchi

Taniguchi relates to a data communication restriction method. Ex. 1008, at [57]. According to Taniguchi's method, a network monitors the number of access requests from a user's terminal and the amount of data that the terminal uses for communication during a predetermined period. *Id.* at 4:17–21. When the number of access requests or the amount of data communication exceeds a respective predetermined threshold, the network sets the terminal as a communication restricted object. *Id.* at 3:37–40. If the terminal requests access to the network again, the network sends a communication restriction signal to the terminal. *Id.* at 3:40–42. The communication restriction signal includes communication restriction period information. *Id.* at 3:42–43. The network determines the communication restriction period based on the congestion condition of data communication. *Id.* at 4:32–36. Thus, the terminal will not have access to the network during the communication restriction period, and the load of the network can be reduced. *Id.* at 3:47–51.

2. Analysis

a. Petitioner's Arguments

Claim 35 is directed to a "terminal for use in a telecommunications network," which "is configured for providing access to a plurality of terminals." Petitioner identifies Obhan's wireless communication system as a "telecommunications network" and Obhan's subscriber units as "terminals." Pet. 52 (citing Ex. 1005, 9:45–56). Obhan states that "[t]he wireless communication system provides wireless service within a service coverage area" in which "a plurality of subscriber units" operate. Ex. 1005, 9:45–47. Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Obhan teaches the recited "telecommunications network" and "terminals."

Claim 35 further recites that "each terminal [is] associated with a unique identifier for accessing the telecommunications network." For this feature, Petitioner relies on Budka. Pet. 52. Petitioner directs us to where Budka teaches that a "[mobile station] initiates [an] attach procedure by sending to the SGSN its International Mobile Subscriber Identity (IMSI) which is unique to each GPRS/GSM subscriber." *Id.* (citing Ex. 1007 ¶ 62). Petitioner identifies Budka's IMSI as a "unique identifier." *See id.* Referring to its discussion of Budka with respect claim 31, Petitioner contends that "Obhan in view of Budka also renders obvious associating terminals in [] Obhan's system with unique identifiers for accessing the network in Obhan's system." *Id.* at 53. Petitioner explains that an ordinarily skilled artisan "seeking to implement the access control operation in a GSM network in Obhan would have found it obvious, in light of the teaching in Budka regarding the access procedures specified in GSM standards, to

include an implementation of receiving an access request that includes a unique identifier of the terminal, in order for the terminal to originate a call." *Id.* at 24–25 (discussing claim 31) (citing Ex. 1003 ¶ 76). Regarding the origination of calls, we note that Obhan teaches that, in some cases, "the network infrastructure may simply block [a subscriber unit's] attempted call if the subscriber unit does not have access to the system." Ex. 1005, 18:55–58.

Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Budka teaches the recited "unique identifier." Further, we find that Budka's attach procedure (which includes receiving the IMSI) provides details for implementing an attempted call in Obhan. Accordingly, we also find that Petitioner's proffered reasoning for modifying Obhan to include Budka's attach procedure, namely, to provide a way to carry out a call, is sufficient to support the legal conclusion of obviousness.

Claim 35 further recites that the terminal has "a message receiver configured for receiving a message from [a] telecommunications network." Petitioner does not identify any element in Obhan as a "message receiver," but directs us to where Obhan teaches that its network "transmits [a] new service option signal to subscriber units . . . operating in [a] corridor, altering accessibility in the corridor and attempting to alter subscriber loading in the corridor." *Id.* at 54 (citing Ex. 1005, 18:20–23). Relying on the declaration testimony of Mr. Bishop, Petitioner contends that an ordinarily skilled artisan "seeking to implement the terminal in Obhan would have found it obvious to include a message receiver in the terminal . . . to receive messages, such as the 'service option signals.'" *Id.* (quoting Ex. 1003

¶ 135). Here, Petitioner seems to identify Obhan's service option signal as a "message." Based on the entire trial record before us, we find that an ordinarily skilled artisan would have had a reason to modify Obhan to include the recited "message receiver." Petitioner's proffered reasoning for modifying Obhan's subscriber unit to include a message receiver, namely, to provide a way for Obhan's subscriber unit to receive the network's service option signal, is sufficient to support the legal conclusion of obviousness.

Claim 35 further recites that the "message" comprises "information relating to a deny access time interval, the deny access time interval being a time period during which telecommunications network access for the terminal is denied." For this limitation, Petitioner directs us to where Obhan teaches that, in some cases, "the origination of calls will be controlled by the subscriber unit to preclude call initiation when the subscriber unit does not have access" to the network. *Id.* (citing Ex. 1005, 18:47–61). Regarding this teaching, Mr. Bishop testifies:

> A [person of ordinary skill in the art] would have found it obvious that the terminal in Obhan would obtain knowledge of whether it has access to the network at a given time in order for the terminal to "preclude call initiation when the terminal does not have access." The [person of ordinary skill in the art] seeking to implement the access control method discussed in Obhan to provide such knowledge to the terminal would have found it obvious, in light of [] Obhan's teaching of sending service option signals to the terminal to alter access behaviors of the terminals, to include the information related to [the] time period when the terminal does not have access, i.e., the "good till" time period discussed in Obhan, in the "service option signal" that is sent from the network to the terminal.

Ex. 1003 ¶ 138 (internal citation omitted) (cited by Pet. 55); *see also* Ex. 1005, 18:20–23 ("system transmits the new service option signal to

subscriber units . . . operating in the corridor, altering accessibility in the corridor"). For the reasons discussed above with respect to claim 31, we find that Obhan's good till time corresponds to the recited "deny access time interval." *See also* Pet. 26–28. Accordingly, based on the entire trial record before us, we are persuaded that an ordinarily skilled artisan would have had a reason to modify Obhan to provide the recited "message." Petitioner's proffered reasoning for modifying Obhan's service option signal to include good till time information, namely, to provide a way to communicate whether the subscriber unit has access to the network, is sufficient to support the legal conclusion of obviousness.

We note that Petitioner relies alternatively on Taniguchi for teaching the recited "message receiver" as well as the recited "message." Pet. 55–56. In this regard, Petitioner directs us to where Taniguchi teaches that a "mobile terminal compris[es] means for receiving a communication restriction signal including communication restriction period information from a base station," where such information relates to "restrict[ing] or inhibit[ing]" the terminal "from getting access to the external network during the designated communication restriction period." *Id.* at 55 (citing Ex. 1008, 2:56–61); *id.* at 56 (citing Ex. 1008, 3:40–46). Petitioner contends that an ordinarily skilled artisan "seeking to implement the terminal in Obhan's system would have found it obvious to incorporate the teachings of Taniguchi and include means for receiving a communication restriction signal (message receiver) in the terminal in Obhan's system in order for the terminal to receive messages from the network." *Id.* at 55–56. Petitioner additionally contends that, "[b]y including Taniguchi's deny access time interval information in notifications, terminals and the wireless

communication network achieve improved performance because they avoid unnecessary access requests in intervals where those access requests will be denied." *Id.* at 56. Petitioner relies on the declaration testimony of Mr. Bishop. *Id.* at 56–57 (citing Ex. 1003 ¶¶ 140–143).

Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Taniguchi teaches the recited "message receiver" and the recited "message." We also find that Petitioner's proffered reasoning for modifying Obhan to include Taniguchi's means for receiving a communication restriction signal (which includes communication restriction period information), namely, to provide a way for Obhan's subscriber unit to receive messages from the network as well as to improve system performance, is sufficient to support the legal conclusion of obviousness.

Claim 35 further recites that "the time period is adapted by the telecommunications network depending on a monitored network load." For this limitation, Petitioner refers to its argument with respect to similar limitations in claim 31 discussed above and states that "the ACB can be updated in real-time based on the monitored network load, and a [person of ordinary skill in the art] would have found it obvious to adapt the access restriction time period in association with the 'good till' time period based on the current loading of the network." Pet. 59; *see also id.* at 40–43 (discussing claim 31). Petitioner explains that an ordinarily skilled artisan "would have found it obvious that updating the ACB based on the current loading includes updating the 'good till' time period in the ACB, updating the 'minimum access class,' or updating both." Pet. 41 (discussing claim 31) (quoting Ex. 1003 ¶ 109); *see also* Ex. 1005, at [57] (teaching in Obhan that its "system collects real-time and potential loading information

for the wireless communication system"); *id.* at 17:18–33 ("The low BTS watermark 1010 (and the high BTS watermark 1008) may be considered as loading thresholds . . . . [W]hen the actual loading compares unfavorably to the high BTS watermark 1008, ACBs may be updated so that access to the base station is limited.").

We find that Obhan's collected loading information corresponds to the recited "monitored network load." We also find that updating Obhan's good till time corresponds to adapting the recited "time period." Additionally, as explained above (*see supra* Part III.B.4.a.i), we find that Petitioner's proffered reasoning for modifying Obhan to include updating the good till time based on the collected loading information, namely, because it would have been obvious to try in order to reduce loading, is sufficient to support the conclusion of obviousness. *See KSR*, 550 U.S. at 421. Thus, we find that an ordinarily skilled artisan would have had a reason to modify Obhan to provide a "time period [that] is adapted by the telecommunications network depending on a monitored network load."

Petitioner also relies alternatively on Taniguchi for teaching this limitation, directing us to where Taniguchi teaches that its network "determines a communication restriction period . . . in accordance with congestion condition of data communication." Pet. 59 (citing Ex. 1008, 4:32–36). Relying on the declaration testimony of Mr. Bishop, Petitioner contends that an ordinarily skilled artisan "would have found it obvious to implement Obhan's updating of the ACB by implementing Taniguchi's [teaching]," which "would have produced predictable results without undue experimentation." *Id.* at 60 (citing Ex. 1003 ¶ 148). Mr. Bishop explains

that "Taniguchi updates the communication restriction period to reduce the load on the network." Ex. 1003 ¶ 148 (citing Ex. 1008, 3:46–51).

Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Taniguchi teaches "the time period is adapted by the telecommunications network depending on a monitored network load." We also find that Petitioner's proffered reasoning for modifying Obhan to include Taniguchi's feature of determining a communication restriction period (which we find is analogous to Obhan's good till time) based on data congestion (which we find is analogous to Obhan's collected loading information), namely, to reduce load on the network, is sufficient to support the legal conclusion of obviousness.

Claim 35 further recites that the terminal has "one or more processors" as well as "memory storing processor instructions that, when executed by the one or more processors, cause the one or more processors to carry out operations." For these limitations, Petitioner directs our attention to Budka, which teaches that its mobile station includes "a processor 100 for controlling operations associated therewith, in cooperation with its associated memory 102." Pet. 61 (citing Ex. 1007 ¶¶ 42, 57). Relying on the declaration testimony of Mr. Bishop, Petitioner contends that an ordinarily skilled artisan "seeking to implement a terminal in the GSM network in Obhan, would have found it obvious, in light of the GSM/GPRS teaching in Budka, to include the processor and memory in the terminal to perform the terminal procedures." *Id.* (citing Ex. 1003 ¶ 151). We note that Obhan's system, which includes a database, "may be implemented by a separate computing device or a plurality of computing devices," each of which "has sufficient computing capacity to perform the operations required

by [Obhan's] invention." Ex. 1005, 4:48–57. Based on the entire trial record before us, we find that Petitioner has shown sufficiently that Budka teaches the recited "one or more processors" and "memory." We also find that Petitioner's proffered reasoning for modifying Obhan to include Budka's processor and memory, namely, to provide a way for Obhan's subscriber unit to carry out operations, is sufficient to support the legal conclusion of obviousness.

Claim 35 further recites that the "operations" include "an access request operation for transmitting an access request to the telecommunications network in accordance with the deny access time interval." For this limitation, Petitioner directs us to where Obhan discusses origination of calls from a terminal in a GSM network. Pet. 62 (citing Ex. 1005, 18:47–61). Obhan teaches that "the origination of calls will be controlled by the subscriber unit to preclude call initiation when the subscriber unit does not have access" to the network, or "the network infrastructure may simply block [the subscriber unit's] attempted call if the subscriber unit does not have access." Ex. 1005, 18:52–58. Relying on the declaration testimony of Mr. Bishop, Petitioner contends that "[i]t was well-known to a [person of ordinary skill in the art] that a call origination in a GSM network includes transmitting an access request from the terminal to the GSM network." Pet. 62 (quoting Ex. 1003 ¶ 153). Mr. Bishop supports his testimony with other references including Budka, which states that a mobile station "initiates the attach procedure by sending to the SGSN its International Mobile Subscriber Identity (IMSI) which is unique to each GPRS/GSM subscriber." Ex. 1003 ¶¶ 153–154 (citing Ex. 1007 ¶ 62); *see also* Ex. 1010 ¶ 49 ("The mobile station initiates an 'attach' procedure by

transmitting an Attach Request message . . . to the SGSN.") (cited by Ex. 1003 ¶ 153). According to Petitioner, an ordinarily skilled artisan "seeking to implement the access control operation in a GSM network in Obhan would have found it obvious to, in light of the teaching in Budka regarding the access procedures specified in GSM standards, to include an implementation of transmitting an access request . . . in order for the terminal to originate a data call." Pet. 63.

We find that the attempted call of Obhan's subscriber unit corresponds to the recited "access request." As discussed above, we also find that Budka's attach procedure provides details for implementing an attempted call. Accordingly, based on the entire trial record before us, we find that Petitioner has shown sufficiently that its proposed combination of Obhan and Budka discussed above teaches the recited "access request operation." We note again that Petitioner's proffered reasoning for modifying Obhan to include Budka's attach procedure, namely, to provide a way to carry out a call, is sufficient to support the legal conclusion of obviousness.

Lastly, claim 35 recites that "machine-to-machine applications are executed in the telecommunications network" and that "the terminal[s] for the machine-to-machine applications are denied access to the telecommunications network during peak load time intervals, the time period being within peak load time intervals." For these limitations, Petitioner relies on its arguments with respect to similar limitations in claim 31 discussed above, where Petitioner directs our attention to Obhan's teachings about machine users and BTS watermark profiles. Pet. 43–47, 64–65. For the reasons explained above, we find that Petitioner has shown sufficiently

that Obhan teaches the recited limitations in claim 35 relating to "machine-to-machine applications." *See supra* Part III.B.4.a.i.

b. Patent Owner's Arguments

Patent Owner makes several arguments. In particular, Patent Owner argues that Petitioner fails to address certain differences between Obhan and the claimed invention. PO Resp. 53–54. Patent Owner also argues that an ordinarily skilled artisan would not have considered modifying Obhan or combining Obhan and Taniguchi to provide the recited "terminal compris[ing] a message receiver configured for receiving a message from the telecommunications network." *Id.* at 54–59. In addition, Patent Owner argues that the asserted prior art does not teach or suggest the recited "time period [that] is adapted by the telecommunications network depending on a monitored network load" and the recited "access request operation." *Id.* at 59–64. We address these arguments in turn.

i. Differences Between the Prior Art and the Claims

Patent Owner argues that "[t]he Petition's *Graham* analysis is deficient at least because the Petition fails to identify sufficiently the differences between independent claim 35 of the '667 patent and the asserted prior art references." PO Resp. 53. In this regard, Patent Owner relies on its arguments discussed above with respect to obviousness over Obhan, Shatzkamer, and Budka. *Id.* at 53–54. For the reasons given, we find that Patent Owner's argument also does not undermine Petitioner's obviousness showing based on Obhan, Taniguchi, and Budka. *See supra* Part III.B.4.b.i.

ii. Rationale for Modifying Obhan

Patent Owner further argues that Petitioner does not articulate sufficient reasoning for modifying Obhan to provide "a message receiver configured for receiving a message from the telecommunications network, the message comprising information relating to a deny access time interval, the deny access time interval being a time period during which telecommunications network access for the terminal is denied." PO Resp. 54–56. In particular, Patent Owner argues that "the Petition fails to 'articulate specific reasoning, based on evidence of record, to support [a] legal conclusion' that it would have been obvious 'to include the information related to time period when the terminal does not have access, i.e., the "good till" time period discussed in Obhan, in the "service option signal" that is sent from the network to the terminal.'" PO Resp. 56; *see* Pet. 55 (Petitioner identifying Obhan's good till time as a "deny access time interval"). According to Patent Owner, "Obhan's 'good till' time stamp is used to trigger the determination of subscriber demand in a specific corridor, and Obhan does not disclose use of the 'good till' time as part of its access control operation." PO Resp. 55.

We disagree. As discussed above, Obhan teaches that, in some cases, "the origination of calls will be controlled by the subscriber unit to preclude call initiation when the subscriber unit does not have access" to the network. Ex. 1005, 18:47–61 (cited by Pet. 54). Petitioner's reasoning for modifying Obhan's service option signal (which Petitioner identifies as a "message") to include good till time information is to provide a way to communicate whether the subscriber unit has access to the network. *See* Ex. 1003 ¶ 138 (cited by Pet. 55); *see also* Ex. 1005, 18:20–23 (teaching in Obhan that its

"system transmits the new service option signal to subscriber units . . . operating in the corridor, altering accessibility in the corridor").

Petitioner's reasoning is supported by Obhan's teachings. For example, as noted above in our analysis regarding obviousness over Obhan, Shatzkamer, and Budka (*see, e.g.*, *supra* Part III.B.4.b.i.), Obhan teaches that "the mobile ACB includes an Access Class, which indicates the lowest priority class for which the corridor will provide service" and "a time stamp for each corridor through which the respective mobile ACB 950 is valid" (Ex. 1005, 16:15–19). This teaching indicates that the value of the Access Class is valid for a period lasting through the value of the good till time, and that Obhan's system therefore relies on information about the corridor, the class of the subscriber, and the good till time to selectively complete or deny a call. Accordingly, Patent Owner's argument does not undermine Petitioner's obviousness showing.

Patent Owner further argues that Petitioner's proposed modification of Obhan "would not account for the real-time updates triggered by current network loading." PO Resp. 55–56. According to Patent Owner, "the system of Obhan is designed so that real-time updates to the ACB to change the minimum access class may be triggered at any time based on network loading in a specific corridor," such that "the knowledge of the 'good till' time would not even inform a terminal of the next time the ACB will be updated." *Id.*

We disagree. Obhan teaches that its system "seeks and receives current demand (real-time) at base stations in the corridor" after a triggering event occurs. Ex. 1005, 18:12–13 (cited at Pet. 54); *see also id.* at 18:5–11, Fig. 11. Based on that information, Obhan's system "updates the ACB for

the corridor" and "determines a service option signal" that is sent "to subscriber units operating in the [] corridor, altering accessibility in the corridor and attempting to alter subscriber loading in the corridor." *Id.* at 18:12–23 (cited by Pet. 54). Given this disclosure in Obhan, we find that Petitioner's proposed modification of Obhan does indeed account for real-time updates triggered by current network loading. Specifically, we find that the proposed modified service option signal includes good till time information from the *updated* ACB. As discussed above, the value of the minimum access class is valid for a period lasting through the good till time. *See id.* at Ex. 1005, 16:15–19. Patent Owner's argument therefore does not undermine Petitioner's obviousness showing.

iii. Rationale for Combining Obhan and Taniguchi

As discussed above, Petitioner relies alternatively on the combination of Obhan and Taniguchi for the recited "message comprising information relating to a deny access time interval," and contends that it would have been obvious to modify Obhan to include Taniguchi's deny access time interval information to improve system performance. Pet. 55–56. In response, Patent Owner argues that the proposed combination of Obhan and Taniguchi "would not improve the efficiency of Obhan's system because a terminal would not be able to determine whether the terminal would be denied access based on the 'good till' time stamp." PO Resp. 57. As we mentioned above, however, we find that that the value of the minimum access class is valid for a period lasting through the good till time, and that Obhan's system therefore relies on information about the corridor, the class of the subscriber, and the good till time to selectively complete or deny a

call. *See* Ex. 1005, 16:15–19. Accordingly, Patent Owner's argument does not undermine Petitioner's obviousness showing.

Patent Owner further argues that "a person of ordinary skill in the art would not have been motivated to combine Obhan . . . and Taniguchi" because Obhan "focus[es] on managing wireless spectrum (such as maximizing its usage) by location and service supported on that location," while Taniguchi "describes how to monitor data usage of a particular mobile terminal in order to determine whether that terminal has exceeded a predetermined threshold (e.g., data threshold, etc.), and, if so, restricting usage when that terminal makes a future access request." PO Resp. 57–58. Patent Owner contends that "Obhan and Taniguchi are fundamentally different in how each chooses to control access in a network," as "Taniguchi seeks to limit the amount of data individual subscribers us[e] in a given time period, whereas Obhan seeks to control network access based on a hierarchically-ordered prioritization of services to subscribers and current local network conditions." *Id.* at 58–59. Patent Owner adds that "Obhan's stated goal of adapting access control based on network loading is in opposition to Taniguchi's enforcing of time based individual data limits." *Id.* at 59.

We disagree with Patent Owner's argument. Although Obhan and Taniguchi may have different goals and may control network access differently, both references relate to network access regulation within telecommunications network systems. For example, Obhan states that it relates to "managing spectrum in a wireless communication system," which includes a "network infrastructure." Ex. 1005, 1:14–19, 1:23–24. Taniguchi states that it relates to "data communication restriction method, data

communication restriction system and mobile terminal." Ex. 1008, 1:9–11. Moreover, we note that the Patent Office classified both references under the same class number 455. Ex. 1005, at [52]; Ex. 1008, at [52]. Accordingly, we find that Obhan and Taniguchi are from the same field of endeavor, and that the differences on which Patent Owner focuses would not have prevented an ordinarily skilled artisan from combining the references to solve a problem relating to access regulation in a network system.

iv. "the time period is adapted by the telecommunications network depending on a monitored network load"

As discussed above, Petitioner proposes modifying Obhan, or, alternatively, combining Obhan and Taniguchi, to provide this limitation. Pet. 59–60. With respect to Petitioner's proposed modification of Obhan, Patent Owner argues that "the Petition fails to establish that Obhan teaches [this limitation], or that a [person of ordinary skill in the art] would have found it obvious to modify Obhan to provide [this limitation]." PO Resp. 59–60. Patent Owner directs us to its arguments discussed above regarding a similar limitation recited in claim 31: "the telecommunications network is further configured to adapt the time period depending on the monitored network load." *Id.* (cross-referencing PO Resp. 46–48 ("Section V.B.3")). For the reasons given, we disagree with Patent Owner's arguments. *See supra* Part III.B.4.b.v.

With respect to Petitioner's proposed combination of Obhan and Taniguchi, Patent Owner further argues that "[o]ne of skill in the art would not update Obhan's ACB by implementing Taniguchi's determination of a communication restriction time period because doing so would detract from

Obhan's stated goal of basing access control on current network conditions instead of on time. PO Resp. 60. We disagree.

Although Obhan's system relies on current network conditions for access control, the system also relies on the good till time for access control. Ex. 1005, 16:15–19, 18:12–17. As discussed above, Obhan's teaching that "the mobile ACB includes an Access Class, which indicates the lowest priority class for which the corridor will provide service," and a "time stamp for each corridor through which the respective mobile ACB 950 is valid" indicates that Obhan's system relies on the corridor, the Access Class, and the time stamp (i.e., the good till time) to selectively provide or deny service. *See id.* at 16:15–19, Fig. 9B. Obhan further teaches updating the ACB based on information about current network conditions. *Id.* at 18:12–17 ("[T]he SYM system seeks and receives current demand (real-time) at base stations in the corridor. Based upon the information received, the SYM system determines service levels that can be provided within the corridor . . . . Next, the SYM system updates the ACB for the corridor . . . . "). Patent Owner's argument therefore does not undermine Petitioner's obviousness showing.

v. "an access request operation for transmitting an access request to the telecommunications network in accordance with the deny access time interval"

With respect to this limitation, Patent Owner argues that "knowledge of the 'good till' time of Obhan, which Petitioner identifies as '*the deny access time interval*,' would not indicate to a terminal whether the terminal had access to the system." PO Resp. 61; *see also id.* at 62 ("Only the minimum access class of that specific corridor is used to determine whether the corridor supports delivery of the call. As such, a terminal in Obhan

would not require knowledge of the 'good till' time to prevent call initiation when the terminal does not have access to the network."). We disagree. As discussed above, Obhan's teaching that "the mobile ACB includes an Access Class, which indicates the lowest priority class for which the corridor will provide service," and a "time stamp for each corridor through which the respective mobile ACB 950 is valid" indicates that Obhan's system relies on the corridor, the Access Class, and the time stamp (i.e., the good till time) to selectively provide or deny service. Ex. 1005, 16:15–19, Fig. 9B. The good till time informs the system about whether the value of the Access Class is valid. Accordingly, Patent Owner's argument does not undermine Petitioner's obviousness showing.

Patent Owner further argues that "it is effectively impossible to be outside of the deny access time interval (*i.e.*, after the 'good till' time stamp) because once the 'good till' time is reached it resets to a time in the future." PO Resp. 63. This is unavailing. As discussed above, Obhan's system relies on the corridor, the Access Class (i.e., minimum access class), and the time stamp (i.e., good till time) to selectively provide or deny service. *See* Ex. 1005, 16:15–19, Fig. 9B. Obhan's system cannot rely on the minimum access class value without considering the good till time value because the good till time value informs the system about whether the minimum access class value is valid. Claim 35 recites "transmitting an access request . . . in accordance with the deny access time interval." This language does not require transmitting an access request based solely on the deny access time interval. That is, the claim does not preclude transmitting an access request based on the deny access time interval and some other parameter.

Lastly, Patent Owner asserts that "the Petition does not argue that one of skill in the art would be motivated to modify the teachings of Obhan to configure the terminals of Obhan to transmit an access request in accordance with its knowledge of a deny access time interval." PO Resp. 63.

We disagree. Petitioner contends that it would have been obvious to modify Obhan to include Budka's attach procedure in order to provide a way to carry out a call. Pet. 24–25, 53, 63. Additionally, Obhan describes a subscriber unit that has knowledge of whether it has access to the network, and teaches relying on the good till time to selectively complete or deny a call. Ex. 1005, 16:15–19 (cited by Pet. 57), 18:48–49 (cited by Pet. 64), Fig. 9B. According to Petitioner, in order to provide such a subscriber unit it would have been obvious to include in the service option signal that is sent to the subscriber unit information related to the time during which the subscriber unit does not have access to the network (i.e., the good till time). Pet. 55. As discussed above, Petitioner's proffered reasoning for modifying Obhan's system is sufficient to support the legal conclusion of obviousness. Accordingly, Patent Owner's argument does not undermine Petitioner's obviousness showing.

We note Patent Owner's argument that "the Petition only analyzes Obhan and Budka, never mentioning or citing to the disclosure of Taniguchi." PO Resp. 63 (citing Pet. 64). As discussed above, however, we are persuaded by Petitioner's argument with respect to the recited "access request operation" based on Obhan and Budka. Patent Owner does not explain why Petitioner's argument is deficient for not citing Taniguchi. Accordingly, Patent Owner's argument is not convincing.

In view of the foregoing, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 35 would have been obvious over Obhan, Taniguchi, and Budka.

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 31 and 33 of the '667 patent are unpatentable under 35 U.S.C. § 103 as obvious over Obhan, Shatzkamer, and Budka, and that claim 35 is unpatentable under 35 U.S.C. § 103 as obvious over Obhan, Taniguchi, and Budka.

V. ORDER

In consideration of the foregoing, it is hereby

ORDERED that claims 31, 33, and 35 of the '667 patent are held *unpatentable*; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Paper 42
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE OFFICE OF THE UNDERSECRETARY AND DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

LG ELECTRONICS, INC., LG ELECTRONICS USA, INC., LG ELECTRONICS MOBILECOMM USA, INC., HTC AMERICA, INC., HTC CORPORATION, LENOVO (UNITED STATES), INC., and MOTOROLA MOBILITY LLC,
Petitioner,

v.

KONINKLIJKE KPN N.V.,
Patent Owner.

IPR2018-00558[1]
Patent 9,014,667 B2

Before KATHERINE K. VIDAL, *Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office.*

ORDER

[1] Cases IPR2018-01639 and IPR2018-01645 have been joined with this proceeding.

The Office has received a request for Director review of the Final Written Decision in this case. *See* Ex. 3100. The request was referred to me. I have considered the request, and I deny Director review.

Accordingly,

It is ORDERED that the request for Director review is denied; and

FURTHER ORDERED that the Patent Trial and Appeal Board's Final Written Decision in this case is the final decision of the agency.

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