

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NetApp, Inc.,

Petitioner,

v.

Proven Networks, LLC,

Patent Owner.

U.S. Patent No. 8,687,573

Case No. IPR2022-00644

PETITION FOR *INTER PARTES* REVIEW

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LIST OF EXHIBITS

Exhibit	Description
Ex. 1001	U.S. Patent No. 8,687,573 (“the ’573 patent”)
Ex. 1002	Prosecution History of U.S. Patent No. 8,687,573
Ex. 1003	Declaration of Robert Akl, Ph.D.
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Ex. 1005	Pedersen, U.S. Patent No. 6,993,332 (“Pedersen”)
Ex. 1006	Universal Mobile Telecommunications System (UMTS); QoS Concept and Architecture (Release 1999) (3GPP TS 23.107 V3.5.0 (2000-12))
Ex. 1007	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; GPRS enhancements for E-UTRAN access (Release 8) (3GPP TS 23.401 V1.0.0 (2007-05))
Ex. 1008	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture (Release 7) (3GPP TS 23.203 V7.2.0 (2007-03))
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Ex. 1010	Joint Statement Proposing a Target Date, <i>In the Matter of Certain Networking Devices, Computers, and Components Thereof</i> , Investigation No. 337-TA-1298 (ITC Feb. 25, 2022)
Ex. 1011	Juha Korhonen, <i>Introduction to 3G Mobile Communications</i> , Second Edition (2003)
Ex. 1012	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Vocabulary for 3GPP Specifications (Release 8)
Ex. 1013	Complainant Proven Networks LLC’s Initial <i>Markman</i> Brief, <i>In the Matter of Certain Networking Devices, Computers, and Components Thereof</i> , Investigation No. 337-TA-1275 (ITC Oct. 12, 2021).
Ex. 1014	U.S. Patent No. 7,072,663
Ex. 1015	U.S. Patent No. 7,653,140
Ex. 1016	U.S. Patent App. Pub. No. 2004/0192317
Ex. 1017	U.S. Patent App. Pub. No. 2009/0016344

Ex. 1018	Complaint, <i>In the Matter of Certain Networking Devices, Computers, and Components Thereof</i> , Investigation No. 337-TA-1298 (ITC Feb. 14, 2022).
Ex. 1019	Reserved
Ex. 1020	Declaration of Friedhelm Rodermund
Ex. 1021	Notice of Institution of Investigation, <i>In the Matter of Certain Networking Devices, Computers, and Components Thereof</i> , Investigation No. 337-TA-1298 (ITC Feb. 14, 2022).
Ex. 1022	Complaint for Patent Infringement Against NetApp, Inc., <i>Proven Networks, LLC v. NetApp, Inc.</i> , No. 6:22-cv-00036, Dkt. 1 (W.D. Tex. Jan. 10, 2022).
Ex. 1023	U.S. Patent App. Pub. No. 2006/0019647
Ex. 1024	U.S. Patent No. 8,792,439
Ex. 1025	U.S. Patent App. Pub. No. 2021/0258832
Ex. 1026	U.S. Patent No. 8,599,778

I. PRELIMINARY STATEMENT

Petitioner NetApp, Inc., requests *inter partes* review of U.S. Patent No. 8,687,573 (Ex. 1001), assigned to Patent Owner Proven Networks, LLC, and cancellation of all claims.

The claims are directed to (i) receiving a matrix of priorities, where each priority is assigned to a service and a user subscriber level; and (ii) using the matrix to allocate resources in a communication system. The Examiner found both (i) and (ii) in the prior art during examination and allowed the claims only after they were amended to specify that the “user subscriber levels indicate subscriber value as measured by pricing levels associated therewith.” Ex. 1002, 288, 318. But one of the named inventors, Jeroen Wigard, had already disclosed this in a prior art patent, U.S. Patent No. 6,993,332 to Pedersen et al. (“Pedersen”).

Pedersen discloses nearly everything in the claims. Regarding (i), Pedersen describes a matrix of priorities, where each priority is assigned to a service, called a “traffic class,” and a user subscriber level, called a “user class.” *See, e.g.*, Pedersen, 5:30–40, Figure 2. Pedersen’s matrix is shown alongside the ’573 patent’s matrix below (both annotated).

	GOLD	SILVER	BRONZE
Voice over IP	1	2	4
Streaming	3	4	6
Internet Browsing	5	7	8
Gaming	9	10	11
P2P	15	15	15

Figure 2

'573 Patent's Matrix

*HO Priorities per user class and traffic class
based on e.g. allocation/retention priority*

<i>User Traffic Class</i>	Gold	Silver	Bronze
Conversational	1	2	5
Streaming	3	4	8
Interactive	6	7	9
Background	9	10	10

FIG. 2

Pedersen's Matrix

Notably, Pedersen's user classes, like the claimed user subscriber levels, "indicate subscriber value as measured by pricing levels associated therewith." Just as the '573 patent's user subscriber levels "indicate subscriber value from highest—gold, to lowest—bronze" and are "offered at a range of different pricing levels[,]" '573 patent, 5:6–7, 6:47–49, Pedersen describes "gold," "silver," and "bronze" user classes, where "'gold' class users will pay more per bit than 'bronze' class users," Pedersen, 5:63–6:7. According to Pedersen, "QoS discrimination between user classes (e.g., gold, silver, and bronze users)" was "one of the most important features for third generation wireless systems" by 2002—six years before the '573 patent. Pedersen, 4:15–18.

Regarding (ii), Pedersen teaches using the matrix to allocate resources in a communication system. In Pedersen, the matrix is used to determine how each

subscriber terminal should be treated during a “handover,” in which the subscriber terminal moves from one network entity to another. *See, e.g.*, Pedersen, 1:47–49, 6:31–41. The handover effected based on the matrix is an allocation of resources, both because differing handover treatments require differing transmit powers on a connection between the new network entity and the subscriber terminal, and because resources are allocated in establishing the connection between the new network entity and the subscriber terminal’s connection.

Pedersen alone renders obvious many of the claims of the ’573 patent. The remainder are rendered obvious by Pedersen in combination with publicly available documents describing the very “third generation wireless systems” Pedersen references, namely, Technical Specifications from the 3rd Generation Partnership Project (“3GPP”).

II. TECHNICAL BACKGROUND

A. Third-Generation Systems and the Creation of 3GPP

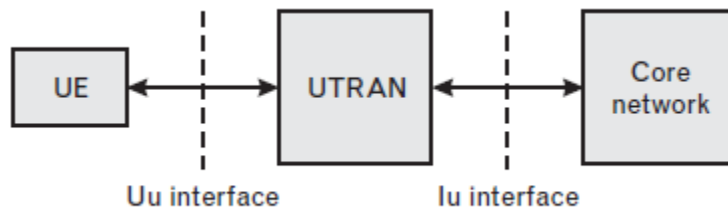
Following a “first generation” and “second generation” of mobile cellular telecommunications systems in the 1980s, in the 1990s, the European Telecommunications Standards Institute (“ETSI”) began developing standards for a “third generation” system known as the Universal Mobile Telecommunications System (“UMTS”). Ak1, ¶43. Thereafter, 3GPP was formed to produce specifications for the UMTS system based on ETSI’s Universal Terrestrial Radio

Access (“UTRA”) radio interface. *Id.* By the 2000s, 3GPP was the primary player in the development of third-generation systems. *Id.*; Ex. 1011, 9; Ex. 1020, ¶26. The 3GPP specifications for the UMTS system prescribe implementation details for all aspects of the system. Akl, ¶43. By 2008, 3GPP specifications were widely used by those skilled in the art in the design and implementation of telecommunication systems. *Id.*; Ex. 1011, 491–515.

B. The UMTS System

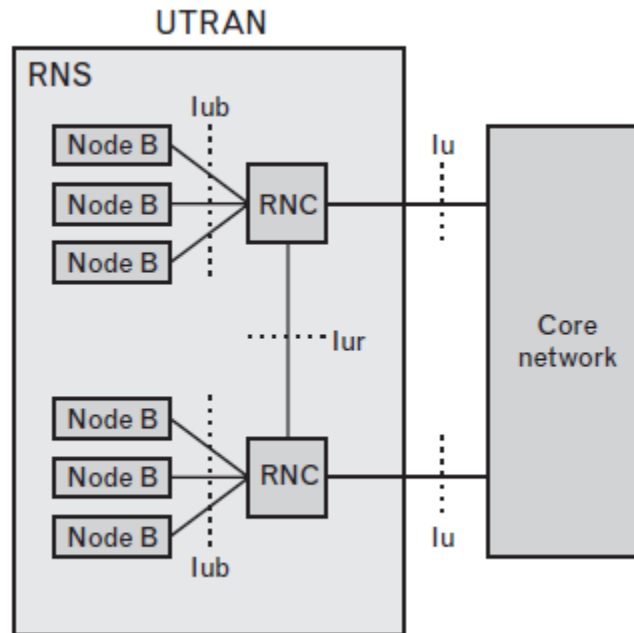
A typical UMTS system is shown below. Ex. 1011, 206; Akl, ¶44. As shown, the UMTS system includes a “Core network” connected to a UTRA Network (“UTRAN”), which is in turn connected to a user equipment (“UE”). *Id.* The UE communicates with the Core network through the UTRAN. *Id.*; Ex. 1011, 15–24.

FIGURE 8.2
High-level UMTS
architecture.



The UTRAN is shown below. Ex. 1011, 213–14; Akl, ¶45. The UTRAN includes radio network controllers (RNCs) and Node Bs. Ex. 1011, 213; Akl, ¶45. Together, the RNCs and Node Bs form the radio network system (“RNS”). Ex. 1011, 213; Akl, ¶45.

FIGURE 8.4
*UTRAN components and
interfaces.*



Each RNC controls one or more Node Bs. Ex. 1011, 214; Akl, ¶46; Ex. 1011, 24. A typical RNC is implemented in a combination of hardware and software. Akl, ¶46. For example, an RNC typically includes a processor, memory for storing executable instructions, and components to facilitate connections with the Node Bs and the entities of the core network. Akl, ¶46; Ex. 1015, 4:57–5:28 and Figure 2.

A UE communicates with the RNC through a Node B. Akl, ¶47; Pedersen, 1:41–47. The transmission path between a Node B and a UE is referred to as a “bearer.” Akl, ¶47; Ex. 1012, 8. When a UE moves within the UMTS system, the RNC effects a “handover” for the UE, in which the bearer between the UE and the Node B is replaced with a bearer between the UE and a new Node B. Akl, ¶47;

Ex. 1011, 37–38; Pedersen, 1:47–50, 2:39–41.

C. Admission Control and Quality of Service in the UMTS System

One function performed by an RNC in the UMTS system is admission control. Akl, ¶48; Ex. 1011, 214, 272–76. Admission control is the decision of whether and to what extent resources should be allocated to a bearer for a UE. Akl, ¶48; Ex. 1011, 272. Such a decision is made both when a UE initiates a call and when a UE’s call is handed over from one Node B to another, as both involve the establishment of a new bearer for the UE. Akl, ¶48; Ex. 1011, 214, 272.

Unlike in second-generation systems, in the UMTS system the UE can negotiate the so-called Quality of Service (QoS) parameters of a newly established bearer. Akl, ¶49; Ex. 1011, 402. This allows the bearer to be optimized for the QoS requirements of the particular traffic to be sent over the bearer. Akl, ¶49; Ex. 1011, 402. The UMTS system divides traffic into four “traffic classes”—conversational, interactive, streaming, and background—each of which has corresponding QoS requirements. Akl, ¶49; Ex. 1011, 402. By enabling the bearer to be optimized for the appropriate traffic class, the UMTS system ensures the QoS requirements of the traffic class can be met. Akl, ¶49; Ex. 1011, 402. To this end, 3GPP created standardized “bearer attributes” that indicate the QoS requirements for a bearer. Akl, ¶50; 3GPP23.107. Example attributes are guaranteed bit rate (“GBR”), maximum bit rate (“MBR”), and aggregate maximum bit rate (“AMBR”).

3GPP23.107, 16, 18. The attributes for a bearer may be collectively indicated by a QoS Class Identifier (“QCI”). *Akl*, ¶50; 3GPP23.203, 49; ’573 Patent, 2:11–61.

D. Enhancements to the UMTS System

By 2007, 3GPP began to develop specifications for an “Evolved” UTRAN, called E-UTRAN. *Akl*, ¶51; 3GPP36.300, 1. Like the UTRAN, the E-UTRAN optimized bearers according to attributes like GBR, MBR, and AMBR. In addition, the E-UTRAN uses a prioritised bit rate (“PBR”) attribute. *Akl*, ¶51; 3GPP36.300, 52.

III. OVERVIEW OF PRIOR ART

A. Pedersen

U.S. Patent No. 6,993,332 (“Pedersen”) issued January 31, 2006, and constitutes prior art under at least pre-AIA 35 U.S.C. §§ 102(a), 102(b), and/or 102(e).

Pedersen describes “a method for performing handover in a communication network,” such as a 3GPP UMTS system. Pedersen, 1:9–10, 24–32. In such a network, Pedersen teaches, “[c]ommunication with a subscriber terminal UE having subscribed to said network is performed by the intermediate of at least one network entity known as Node_B . . . handling the communication of said subscriber terminal.” *Id.*, 1:41–47. As the “subscriber terminal mov[es] . . . within the network[,]” the subscriber terminal “may be handed over to another such network entity.” *Id.*, 1:47–49. This is a “handover.” *Id.*, 1:49–50. The handover “is

performed under control of a control entity, e.g., RNC, of the communication network.” Pedersen, 4:66–5:3.

Sometimes, a subscriber terminal is handed over through a “hard handover (HHO)[,]” in which the subscriber terminal is “connected to only one Node_B” during the handover. *Id.*, 1:62–66. Alternatively, a subscriber terminal is handed over through a “soft-handover (SHO)[,]” in which the subscriber terminal is “connected to two more Node_B’s” during the handover. *Id.*, 1:58–62. “In general,” Pedersen explains, “application of SHO makes it possible to have seamless (transparent) handover and improved coverage[,],” but “the price paid for having SHO is a higher average transmit power level from Node_B’s[.]” *Id.*, 1:66–2:4.

At the time of Pedersen, all subscriber terminals in a cell were typically provided the same handover treatment. *Id.*, 2:61–62. Recognizing “[t]his approach is . . . not optimal,” Pedersen teaches selecting a “user specific handover” treatment when handing over a communication from a user’s subscriber terminal. *Id.*, 2:62–67, 3:63–65. The selected handover treatment, Pedersen explains, depends on a “traffic class” and a “user class” of the communication from the user’s subscriber terminal. *Id.*, 3:14–21.

In particular, as shown in annotated Figure 2 below, Pedersen teaches that handover treatment is selected using a “matrix” that “map[s] various **user classes** per respective **traffic class**” with “a respectively assigned handover **priority**.” *Id.*, 5:53–56, 6:8–10.

*HO Priorities per user class and traffic class
based on e.g. allocation/retention priority*

<div>User Class Traffic Class</div>	Gold	Silver	Bronze
Conversational	1	2	5
Streaming	3	4	8
Interactive	6	7	9
Background	9	10	10

FIG. 2

The **traffic classes** may include, for example, “conversational, streaming, interactive, and background” classes of traffic. *Id.*, 5:32–35. A **user class**, Pedersen explains, “is defined by the subscribed QoS profile for the users of this class.” *Id.*, 5:63–64. “For example, ‘gold’ **class** users have subscribed to the best available QoS in each **traffic class**, ‘silver’ **class** user[s] have subscribed to a lower QoS as compared to the ‘gold’ **class** user, and the ‘bronze’ **class** users have subscribed to the least good QoS profile as compared to ‘gold’ and ‘silver’ **class** respectively.” *Id.*, 5:64–6:2. One example of a subscribed QoS profile in Pedersen is a profile “determined by at least those radio access bearer attributes which are common to

all **traffic classes** as defined in” a 3GPP technical specification—3GPP23.107. *Id.*, 5:35–42. “The subscribed QoS[,]” Pedersen teaches, “will . . . be reflected in the charges that will be charged to the users[,]” meaning “‘gold’ **class** users will pay more per bit than ‘bronze’ **class** users for services the communication network offers.” *Id.*, 6:2–7.

The matrix is used to select a handover **priority** for each communication from a user’s subscriber terminal. The handover **priority** is “applied per **user class** per **traffic class**,” as shown in Figure 2’s matrix, such that “a **gold conversational** user experiences another handover as compared to a **bronze streaming** user.” *Id.*, 6:43–46.

By employing such “user specific handover settings[,]” Pedersen explains, numerous “advantages” are achieved, including “effectively impos[ing] QoS (Quality of Service) discrimination between different **user classes**” and “more optimal[ly] us[ing] . . . the different characteristics of the different **traffic classes**[.]” *Id.*, 3:63–4:34.

B. 3GPP Specifications

1. Public Availability of the 3GPP Technical Specifications

Aspects of the ’573 patent’s claims are taught by four technical specifications published by 3GPP (collectively, “the 3GPP specifications”), which constitute prior art under at least pre-AIA 35 U.S.C. §§ 102(a) and/or 102(b):

- Universal Mobile Telecommunications System (UMTS); QoS Concept and Architecture (Release 1999) (3GPP TS 23.107 V3.5.0 (2000-12)) (Ex. 1006) (“3GPP23.107”);
- Technical Specification Group Services and System Aspects; GPRS enhancements for E-UTRAN access (Release 8) (3GPP TS 23.401 V1.0.0 (2007-05)) (Ex. 1007) (“3GPP23.401”);
- Technical Specification Group Services and System Aspects; Policy and charging control architecture (Release 7) (3GPP TS 23.203 V7.2.0 (2007-03)) (Ex. 1008) (“3GPP23.203”); and
- Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2 (Release 8) (3GPP TS 36.300 V8.0.0 (2007-03)) (Ex. 1009) (“3GPP36.300”).

Each of the 3GPP technical specifications was publicly available before May 30, 2008, the earliest claimed priority date of the ’573 patent. *See* Ex. 1020 (Declaration of Friedhelm Rodermund).

Mr. Rodermund has personal knowledge of how 3GPP made technical specifications available to the public before 2008. *Id.*, ¶¶7–19. According to Mr. Rodermund, each of the 3GPP specifications “is a technical specification

published by 3GPP[,]” and before 2008 “would have been publicly accessible through” the file transfer protocol (“ftp”) server associated with the 3GPP website. *Id.*, ¶¶20–23, 28, 46–87. As Mr. Rodermund explains, “all draft technical specifications” and “[f]inal versions of the technical specification also were, and continue to be, publicly available” on that ftp server, which “[a]s early as December 1998, . . . was freely accessible to the general public with no login, password, or membership requirement.” *Id.*, ¶¶28, 31–32. Date stamps and metadata on the files corresponding to the 3GPP technical specifications in the ftp server indicate each was “published and freely available on” the ftp server before 2008. *Id.*, ¶¶46–48, 56–59, 67–70, 77–80.

Mr. Rodermund declares “[he] would expect any person implementing a cellular network or device, e.g., a UMTS network, to consult the corresponding specifications on the 3GPP ftp server, as well as other related documents” as “[t]he whole purpose of 3GPP creating and making these specifications available was so that engineers and other individuals would have ready access to them when developing and implementing cellular networks and devices.” *Id.*, ¶33. He notes that “[b]y 1999, at least 100 companies were members of 3GPP[,]” and delegated individuals in these companies would have received “emails notifying [them] as soon as new or additional documents had been uploaded to 3GPP’s ftp server.” *Id.* Mr. Rodermund further declares that “a person without prior knowledge of” the

3GPP specifications “would have been able to easily find the [specifications] for download via internet search” or through the 3GPP website. *Id.*, ¶¶49–55, 60–66, 71–76, 81–87.

The Board has repeatedly found 3GPP technical specifications are publicly available printed publications. *See, e.g., Cradlepoint, Inc. v. Sisvel Int’l S.A.*, IPR2020-01103, Paper 46, at 15 (PTAB Jan. 18, 2020); *Microsoft Corp. v. Uniloc 2017 LLC*, IPR2019-00224, Paper 11, at 12 (PTAB Nov. 13, 2020) (similar); *Huawei Device Co., Ltd. v. Optis Wireless Tech., LLC*, IPR2018-00585, Paper 20, at 32 (PTAB Sep. 16, 2019) (similar). The Board should likewise find the 3GPP specifications were publicly available printed publications before May 30, 2008.

2. 3GPP23.107

3GPP23.107 describes a “QoS Concept and Architecture” for a UMTS system like Pedersen’s. As 3GPP23.107 explains, **traffic classes** have varying QoS requirements, including “how delay sensitive the traffic is[.]” 3GPP23.107, 13–15. To ensure these QoS requirements are met, these **traffic classes** have defined bearer attributes used by the UTRAN that “limit the UMTS bearer service which can be provided.” *Id.*, 16, 20. Bearer attributes discussed in 3GPP23.107 include guaranteed bit rate (GBR) and maximum bit rate (MBR).

3. 3GPP23.401

3GPP23.401 describes an additional bearer attribute used by the UTRAN in

the UMTS system, “Aggregate Maximum Bit Rate (AMBR).” 23.401, 16.

4. 3GPP23.203

3GPP23.203 describes a “QoS Class Identifier (QCI) parameter” used by the UTRAN in a UMTS system that “has a 1:1 mapping to a set of QoS parameters defined” in 3GPP23.107. 3GPP23.203, 49.

5. 3GPP36.300

3GPP36.300 describes another bearer attribute, “prioritised bit rate (PBR).” 3GPP36.300, 52.

Pedersen and the 3GPP specifications are analogous art to the ’573 patent. Each “is from the same field of endeavor,” 3GPP telecommunication networks. *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1000–01 (Fed. Cir. 2016) (citation omitted). Moreover, each is reasonably pertinent to “one of the particular problems dealt with by the inventor,” such as allocating resources to maintain QoS. *Id.*; see e.g., ’573 patent, 3:8–10, 3:21–23; 3GPP23.107, 7–8, 11, 18; 3GPP23.401, 14–16; 3GPP23.203, 9, 12; 3GPP36.300, 12, 34–35, 53.

IV. THE ’573 PATENT

The ’573 patent describes “a method for allocating resources in a communications system.” ’573 patent, Abstract. Like in Pedersen, resources are allocated based on both a “service” and a “user subscriber level.” *Id.*, Abstract.

According to the ’573 patent, it was known to allocate resources based on services. For example, “[e]xisting systems” could “ensure that services such as

voice [were] prioritised over browsing.” *Id.*, 3:11–13. The purported innovation of the ’573 patent was to allocate resources based on *both* services and user subscriber levels. *Id.*, 3:18–23, 6:44–47. “This,” the patent explains, “enables operators of communications systems to offer subscribers a range of different user levels which may be offered at a range of different pricing levels.” *Id.*, 6:47–49.

To this end, the ’573 patent envisions a “matrix” nearly identical to that described by one of the named inventors, Jeroen Wigard, nearly six years earlier in Pedersen. As shown in annotated Figure 2 below, the matrix of the ’573 patent is “formed of a plurality of **services** against a plurality of **user levels**.” *Id.*, 5:11–12. The matrix maps five **services**—Voice Over IP (“VoIP”), Streaming, Internet Browsing, Gaming, and Peer to Peer (“P2P”)—against three **user subscriber levels**—Gold, Silver, and Bronze. *Id.*, 5:6–7, 5:16–19.

	GOLD	SILVER	BRONZE
Voice over IP	1	2	4
Streaming	3	4	6
Internet Browsing	5	7	8
Gaming	9	10	11
P2P	15	15	15

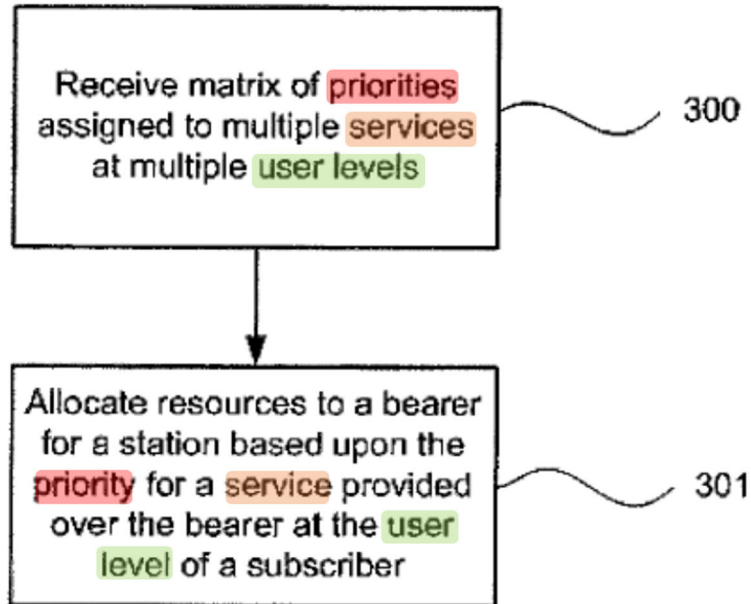
Figure 2

In the matrix, “[e]ach **service** at each **user level** may be assigned a **priority**.” *Id.*, 5:12–13. The **service** Streaming at a **user subscriber level** Gold is assigned the **priority** 3, for example, while the **service** Internet Browsing at the **user subscriber level** Bronze is assigned the **priority** 8. *Id.*, Figure 2.

According to the ’573 patent, the matrix is used to allocate resources in the communications network. The method of the ’573 patent is illustrated with reference to annotated Figure 3 below. As shown in Figure 3, the matrix is “received” at Step 300 and then, at Step 301, resources are “allocated to a bearer”¹

¹ Patent Owner has taken the position that “bearer” encompasses a “connection for a station” in a communication network. Ex. 1013, 4.

for a station based upon the priority for a service provided over the bearer at the user level of a subscriber.” *Id.*, Figure 3.



V. LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the art may be reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). A POSA at the time of the purported invention would have had a bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, and at least one year of experience in the design or development of telecommunications systems, or the equivalent. With more education, less experience is needed, and vice versa. Akl, ¶19.

VI. CLAIM CONSTRUCTION

Only claim terms “in controversy” need be construed in an IPR “and only to

the extent necessary to resolve the controversy.” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). No claim terms need be construed by the Board at this time, because Pedersen and the 3GPP Specifications render the claims obvious under any reasonable interpretation of the claims. Of note, Patent Owner has previously proposed constructions for “communication system,” “bearer for a station,” and “a service.” Ex. 1013, 4–5, 13. Pedersen teaches a “communication system,” a “bearer for a station,” and “a service” under Patent Owner’s proposed constructions.

VII. STATEMENT OF PRECISE RELIEF REQUESTED FOR EACH CLAIM CHALLENGED

NetApp requests review of claims 1–39 under the following grounds:

Ground	References	Basis	Claims
1	Pedersen	§ 103	1–4, 6, 14, 16, 18–23, 25, 33, 35, 37, 39
2	Pedersen and 3GPP23.107	§ 103	1–8, 11, 13–16, 18–27, 30, 32–35, 37–39
3	Pedersen, 3GPP23.107, and 3GPP23.401	§ 103	1–8, 10–11, 13–16, 18–27, 29–30, 32–35, 37–39
4	Pedersen, 3GPP23.107, and 3GPP23.203	§ 103	1–8, 11, 13–27, 30, 32–39
5	Pedersen, 3GPP23.107, and 3GPP36.300	§ 103	1–9, 11–16, 18–28, 30–35, 37–39

VIII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

As described below, Pedersen, alone or in combination with one or more the 3GPP specifications, renders obvious claims 1–39 of the '573 patent.

A. Ground 1: Pedersen Renders Obvious Claims 1–4, 6, 14, 16, 18–23, 25, 33, 35, 37, 39

1. Claim 1

Pedersen teaches claim 1.

a. [1p] A method comprising:

To the extent this preamble is limiting, Pedersen teaches “a method.”

Pedersen, Abstract.

b. [1a] receiving a matrix of **priorities**, each **priority** in said matrix being assigned to one of a plurality of **services** for one of a plurality of **user subscriber levels**, wherein said **user subscriber levels** indicate subscriber value as measured by pricing levels associated therewith; and

Pedersen teaches “a matrix of **priorities**, each **priority** in said matrix being assigned to one of a plurality of **services** for one of a plurality of **user subscriber levels**.” Ak1, ¶77. Pedersen’s Figure 2 is a “matrix” of “HO [handover] **priorities**.” Pedersen, 6:8–10. Pedersen’s matrix is shown alongside the '573 patent’s matrix below (both annotated).

200	203			201
		GOLD	SILVER	BRONZE
	Voice over IP	1	2	4
	204 Streaming	3	4	6
	Internet Browsing	5	7	8
	Gaming	9	10	11
	P2P	15	15	15
202				

Figure 2

'573 Patent's Matrix

<u>HO Priorities per user class and traffic class</u> based on e.g. allocation/retention priority			
<u>User</u> <u>Traffic Class</u>	Gold	Silver	Bronze
Conversational	1	2	5
Streaming	3	4	8
Interactive	6	7	9
Background	9	10	10

FIG. 2

Pedersen's Matrix

Pedersen's matrix "map[s] various **user classes** per respective **traffic class**" with "a respectively assigned handover **priority**[" as shown. *Id.*, 5:53–56, 6:8–10. A POSA would recognize Pedersen's **traffic classes** correspond to the claimed **services**. Ak1, ¶78. The '573 patent simply refers to its **traffic classes** as **services**. Compare Pedersen, 5:56–58 (listing exemplary **traffic classes** of "conversational," "streaming," "interactive," and "background"), with '573 patent, 4:53–58 (listing exemplary **services** of "Voice over IP," "Streaming," "Gaming," and "peer-to-peer"). A POSA would likewise recognize Pedersen's **user classes** correspond to the claimed **user subscriber levels**. Ak1, ¶78. The '573 patent's **user subscriber levels** "enable differentiation between different groups of subscribers," such as "Gold, Silver and Bronze." '573 patent, 5:17–18. The **user subscriber levels** may

be defined by, for example, “an allocation and retention priority (ARP).” *Id.*, 4:8–

9. Likewise, Pedersen’s **user classes** are “distinguishable according to [a] respective subscription profile defining a subscribed quality of service (QoS)[,]” such as “gold, silver, [and] bronze,” and may be “determined based on allocation/retention priority.” Pedersen, 5:35–42, 5:58–60.

Pedersen also teaches “wherein said **user subscriber levels** indicate subscriber value as measured by pricing levels associated therewith.” Just as the ’573 patent’s Gold, Silver and Bronze **user subscriber levels** are “offered at a range of different pricing levels[,]” ’573 patent, 6:47–49, Pedersen’s **user classes** are “reflected in the charges that will be charged to the users[,]” meaning “‘gold’ **class** users will pay more per bit than ‘bronze’ **class** users for services the communication network offers,” Pedersen, 6:2–7. And just as in the ’573 patent, where Gold **user subscriber level** subscribers have the “highest” value and Bronze **user subscriber level** subscribers the lowest, ’573 patent, 5:6–7, in Pedersen “‘gold’ **class** users have subscribed to the best available QoS in each **traffic class**, ‘silver’ **class** user[s] have subscribed to a lower QoS as compared to the ‘gold’ **class** user, and the ‘bronze’ **class** users have subscribed to the least good QoS profile as compared to ‘gold’ and ‘silver’ **class** respectively.” Pedersen, 5:64–6:2.

It would have been obvious to a POSA from Pedersen that the matrix is “received.” In the ’573 patent, the matrix is “receiv[ed]” at a Radio Resource

Management (RRM) network element. This receipt is not limited to receipt from another network entity, but rather encompasses receipt simply from the RRM's own memory. '573 patent, 5:23–25. As shown in Figure 4 below, the “receiving unit 404 (or other receiving means)” at the RRM is “for receiving the matrix either from the memory 403, from another network element in the communications system or from another element.” *Id.*, 6:36–39.

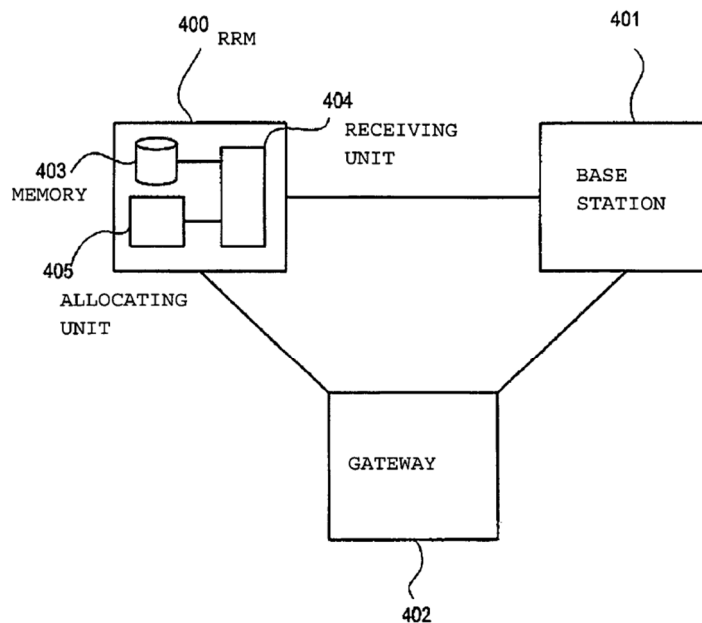


Figure 4

Similarly, in Pedersen, the “handover procedure,” and thus use of the matrix, “is performed under control of a control entity, e.g., RNC, of the communication network.” Pedersen, 4:66–5:3. Pedersen also teaches that the matrix is “configured” and the priorities of the matrix are “defined by the network operator.” *Id.*, 5:43–51, 6:27–30. It would have been obvious to a POSA that, whether

“configured” and “defined” at the RNC or at another entity, Pedersen’s matrix, like that of the ’573 patent, is “received.” Akl, ¶81. If Pedersen were implemented such that the matrix was “configured” and “defined” at the RNC, it would have been obvious to a POSA that Pedersen’s RNC, configured to use the matrix as Pedersen describes, would include a memory storing the matrix, and the RNC would “receive” the matrix from memory. Akl, ¶81; *see, e.g.*, Ex. 1015, 4:65–5:1. A POSA would have recognized that receiving the entire matrix (and not merely data therein) from the memory would allow the processor to simply and efficiently access the data therein. Akl, ¶81. If Pedersen were implemented such that the matrix was “configured” and “defined” at another network entity, it would have been obvious to a POSA that Pedersen’s RNC, configured to use the matrix as Pedersen describes, would “receive” the matrix from that other entity. *Id.*; *see, e.g.*, Ex. 1015, 5:1–5. For example, such an implementation would be obvious because it would allow for configuration and definition by the network operator of the matrix to occur at one RNC but use to occur at all other RNCs, making configuration and definition more efficient for the network operator. Akl, ¶81; Ex. 1011, 213–14. A POSA would have recognized that transmitting the matrix (and not merely data to create the matrix) between RNCs would allow the same matrix to be simply and efficiently transmitted to and received at multiple RNCs, without each RNC expending resources to construct the matrix. Akl, ¶81. Both

implementations—receipt from memory or receipt from another network entity—would have been within the skill of a POSA and would have yielded nothing more than predictable results. *Id.*; *see, e.g.*, Ex. 1015, 4:65–5:5. In either of these implementations, Pedersen’s RNC “receives” the matrix. Akl, ¶81.

Because a POSA would thus understand Pedersen to teach a matrix of **priorities**, each **priority** being assigned to one of a number of **traffic classes** and one of a number of **user classes**, each corresponding to a subscribed QoS profile and price, and would have found it obvious that Pedersen’s RNC, configured to use the matrix as Pedersen describes, would receive the matrix either from memory or from another entity in the UMTS system, Pedersen teaches “receiving a matrix of **priorities**, each **priority** in said matrix being assigned to one of a plurality of **services** for one of a plurality of **user subscriber levels**, wherein said **user subscriber levels** indicate subscriber value as measured by pricing levels associated therewith.” Akl, ¶81.

- c. **[1b] allocating resources to a bearer for a station of the communication system based at least in part upon the **priority** assigned to a **service** provided over the bearer at the **user subscriber level** associated with a subscriber.**

Pedersen teaches “allocating resources to a bearer for a station of the communication system based at least in part upon the **priority** assigned to a **service** provided over the bearer at the **user subscriber level** associated with a subscriber.”

Akl, ¶83. In Pedersen, a handover is effected by the RNC based on the **priority** “applied per **user class** per **traffic class**,” as show in Figure 2’s matrix, and “each HO [handover] **priority** signifies that a user of the concerned **user class** when communicating in a respective **traffic class** is treated in a specific manner as regards handover.” Pedersen, 5:46–51, 6:34–36, 6:43–46. Thus, “a **gold conversational** user experiences another handover as compared to a **bronze streaming** user.” *Id.*, 6:43–46. Thus, Pedersen teaches that the RNC effects a handover for a user’s subscriber terminal, *id.*, 1:15–20, based on the **priority** assigned to the **traffic class** of the user’s communication at the **user class** associated with the user.

A POSA would have understood from Pedersen that the user’s communication is “provided over [a] bearer” for the user’s subscriber terminal, and that the user’s subscriber terminal is “a station of the communication system.” Akl, ¶84. Pedersen describes a “UMTS network” that relies on “WCDMA (Wideband Code Divisional Multiple Access)” in which the subscriber terminal “UE [user equipment]” communicates with the network through a “network entity known as [a] Node_B[,]” and a handover is “performed under control of a control entity” such as the RNC. Pedersen. 1:37–47, 4:66–5:3. A POSA would have understood the communication between the Node_B and the subscriber terminal UE in Pedersen to be “provided over [a] bearer” because it is provided over the

connection between the Node_B and the subscriber terminal. Ak1, ¶84. This is also consistent with what Patent Owner has previously said about “bearer for a station.” Ex. 1013, 4.

The handover effected based on the matrix is an allocation of resources in each of two ways: (i) the handover is an allocation of power, because differing handover treatments require differing transmit powers for the bearer between the Node_B and the subscriber terminal, and (ii) establishment of the bearer between the Node_B and the subscriber terminal requires allocating resources to that bearer to ensure requested QoS parameters are met.

Regarding (i), Pedersen explains that soft handover (“SHO”) requires “a higher . . . transmit power level” for a bearer between a Node_B and a subscriber terminal than is required for hard handover (“HHO”). Pedersen, 2:1–4. Thus, in effecting the handover, power is allocated to the bearer differently for a SHO than for a HHO. In this way, Pedersen teaches allocating power to a bearer for the subscriber terminal based on Pedersen’s matrix.

Regarding (ii), a POSA would have recognized that, in effecting a handover in a UMTS system as Pedersen describes, a bearer is established between the Node_B and the subscriber terminal, and establishment of the bearer requires an allocation of resources to the bearer. Ak1, ¶87. This is because, as a POSA would know, at establishment, each bearer is allocated with certain resources to ensure

requested QoS parameters are met. Akl, ¶87. In particular, as explained in Section II.C, when a bearer is established, as during a handover, the subscriber terminal requests certain QoS parameters for the bearer to ensure the bearer is optimized for the QoS requirements of the particular traffic to be sent over the bearer. *Id.*; Ex. 1011, 177, 402; Ex. 1012, 12. Resources are then allocated to the bearer to ensure the requested QoS parameters can be met. Akl, ¶87; Ex. 1011, 177. Thus, a POSA would have understood, in establishing the bearer between the Node_B and the subscriber terminal during a handover to meet the subscriber terminal's requested QoS parameters, resources would be allocated by Pedersen's RNC to the bearer. Akl, ¶87; Pedersen at 2:39–41; Ex. 1012, 21; Ex. 1011, 165, 306, 410.

Because Pedersen thus teaches effecting a handover to a Node_B for a user's subscriber terminal based on the **priority** assigned to the **traffic class** of the user's communication at the **user class** associated with the user, and a POSA would have understood that effecting the handover is an allocation of resources to a bearer between the Node_B and the subscriber terminal, Pedersen teaches “allocating resources to a bearer for a station of the communication system based at least in part upon the **priority** assigned to a **service** provided over the bearer at the **user subscriber level** associated with a subscriber.” Akl, ¶88.

2. Claim 2: The method as claimed in claim 1, wherein the subscriber is associated with the station.

Pedersen teaches “the subscriber is associated with the station.” Akl, ¶89. In Pedersen, the subscriber, called a “user,” is “a user of [the] subscriber terminal.” Pedersen, 1:15–20.

3. Claim 3: The method as claimed in claim 1, wherein the station is a user equipment.

Pedersen teaches “the station is a user equipment.” Akl, ¶90. Pedersen’s subscriber terminal is also described as a “user equipment[] UE.” Pedersen, 1:24–32.

4. Claim 4: The method as claimed in claim 1, wherein the communications system is a cellular system.

Pedersen teaches “the communications system is a cellular system.” Akl, ¶91. A POSA would have understood Pedersen’s UMTS system to be a “cellular system.” Pedersen, 1:24–32; Akl, ¶91.

5. Claim 6: The method as claimed in claim 1, wherein the resources include time, power, codes, or frequencies.

Pedersen teaches “the resources include . . . power, codes, or frequencies.” Akl, ¶92. As explained in [1b], Pedersen teaches that the handover is an allocation of power, because differing handover treatments require differing transmit powers for the bearer between the Node_B and the subscriber terminal. As further explained in [1b], a POSA would have understood that Pedersen’s handover involves establishment of the bearer between the Node_B and the subscriber terminal, and this requires allocating resources to the bearer between the Node_B

and the subscriber terminal. Because Pedersen’s network relies on WCDMA, which a POSA would have understood uses a range of frequency bands and codes, a POSA would have known that allocating resources to the bearer involves allocating both frequencies and a code to the bearer. Akl, ¶92; Ex. 1011, 10, 25–27.

6. Claim 14: The method as claimed in claim 1, wherein the step of allocating the resources is performed by a Radio Resource Management (RRM) network element of the communications system.

Pedersen teaches that the “allocating” is “performed by a Radio Resource Management (RRM) network element.” Akl, ¶93. In Pedersen, the “handover procedure,” and thus the allocation of resources (*see* [1b]), “is performed under control of a control entity such as the RNC of the communication network.” Pedersen, 2:39–41. A POSA would have understood Pedersen’s RNC to be a “Radio Resource Management” network element because the RNC manages radio resources, including power, codes, and frequencies (*see* [6]). Akl, ¶93; Ex. 1012, 21; Ex. 1014, 3:58–64; Ex. 1016, [0007].

7. Claim 16: The method as claimed in claim 1, wherein the **user subscriber levels are ranked from high value to low value.**

Pedersen teaches “the **user subscriber levels** are ranked from high value to low value.” Akl, ¶94. Just like the ’573 patent’s Gold, Silver and Bronze **user subscriber levels**, Pedersen’s **user classes** are “distinguishable according to [a]

respective subscription profile defining a subscribed quality of service (QoS)[,]” such as “gold, silver, [and] bronze.” Pedersen, 5:35–42, 5:58–60. And just as in the ’573 patent, where Gold **user subscriber level** subscribers have the “highest” value and Bronze **user subscriber level** subscribers the lowest, ’573 patent, 5:6–7, in Pedersen “‘gold’ **class** users have subscribed to the best available QoS in each traffic class, ‘silver’ **class** user[s] have subscribed to a lower QoS as compared to the ‘gold’ **class** user, and the ‘bronze’ **class** users have subscribed to the least good QoS profile as compared to ‘gold’ and ‘silver’ **class** respectively[.]” Pedersen, 5:64–6:2.

8. Claim 18: The method as claimed in claim 1, wherein the user subscriber level is defined by an allocation and retention priority (ARP) of the bearer.

Pedersen teaches “the user subscriber level is defined by an [ARP] of the bearer.” Just as the **user subscriber levels** of the ’573 patent may be defined by “an allocation and retention priority (ARP)” of a bearer, ’573 patent, 4:8–9, Pedersen’s **user classes** may be “determined based on allocation/retention priority” of the bearer. Pedersen, 5:35–42, 5:58–60. Akl, ¶95; 3GPP23.107, 18.

9. Claim 19: A computer program product stored on a non-transitory computer usable medium, comprising a computer program arranged for effecting the method of claim 1.

Pedersen teaches the method of claim 1, *see* [1], may be carried out at an RNC. Pedersen, 4:66–5:3. And a POSA would have known that RNC’s like that in

Pedersen “typically include[] a digital signal processor and software for executing computer processes stored on a computer readable medium.” Akl, ¶96; *see, e.g.*, Ex. 1015, 4:65–5:1. Thus, a POSA would have known that Pedersen’s RNC would include a “computer program product stored on a non-transitory computer usable medium, comprising a computer program arranged for effecting” this method, or would have at least found such inclusion to be obvious, as this would have been the typical implementation of an RNC within the skill of a POSA and would have yielded nothing more than predictable results. Akl, ¶96; *see, e.g.*, Ex. 1015, 4:65–5:1.

10. Claim 20

Pedersen teaches claim 20.

a. [20p] An apparatus comprising:

To the extent this preamble is limiting, Pedersen teaches “[a]n apparatus.”

Pedersen describes an RNC. Pedersen, 4:66–5:3.

b. [20a] one or more processors; and one or more memories including computer program code, the one or more memories and the computer program code configured, with the one or more processors, to cause the apparatus to perform at least the following:

Pedersen’s RNC is configured to perform the steps [20b] and [20c] below.

See [1]; Pedersen, 4:66–5:3. And a POSA would have known that RNC’s like that in Pedersen “typically include[] a digital signal processor and software for executing computer processes stored on a computer readable medium.” Akl, ¶99;

see, e.g., Ex. 1015, 4:65–5:1 (another patent assigned to the same company as Pedersen describing an RNC likewise used for handovers). Thus, a POSA would have known that, to perform these steps, Pedersen’s RNC would include “one or more processors” and “one or more memories including computer program code,” and “the one or more memories and the computer code [would be] configured, with the one or more processors, to cause” Pedersen’s RNC to perform these steps, or at least would have found such inclusion to be obvious, as this would have been a typical implementation of an RNC within the skill of a POSA and would have yielded nothing more than predictable results. *Id.*; *see, e.g.*, Ex. 1015, 4:65–5:1.

- c. [20b] receiving a matrix of **priorities**, each **priority** in said matrix being assigned to one of a plurality of **services** for one of a plurality of **user subscriber levels**, wherein said **user subscriber levels** indicate subscriber value as measured by pricing levels associated therewith; and

Pedersen teaches this limitation. *See* [1a].

- d. [20c] allocating resources to a bearer for a station of the communication system based at least in part upon the **priority** assigned to a **service** provided over the bearer at the **user subscriber level** associated with a subscriber.

Pedersen teaches this limitation. *See* [1b].

11. Claim 21–23, 25, 33, 35, and 37.

These claims all depend from claim 20, which Pedersen teaches. *See* [20].

Pedersen also teaches the additional features of these claims. *See* [2-4], [6], [14],

[16], [18].

12. Claim 39

a. [39p]: A method comprising:

To the extent this preamble is limiting, Pedersen teaches “a method.”

Pedersen, Abstract.

b. [39a]: generating a matrix of **priorities, each **priority** in said matrix being assigned to one of a plurality of **services** for one of a plurality of **user subscriber levels**, wherein said **user subscriber levels** indicate subscriber value as measured by pricing levels associated therewith; and**

Pedersen teaches “a matrix of **priorities**, each **priority** in said matrix being assigned to one of a plurality of **services** for one of a plurality of **user subscriber levels**, wherein said **user subscriber levels** indicate subscriber value as measured by pricing levels associated therewith.” *See* [1a].

Pedersen also teaches “generating” the matrix. In Pedersen, the matrix is “configured.” Pedersen, 5:43–51. For example, Pedersen teaches that the priorities of the matrix are “defined by the network operator.” *Id.*, 6:27–30. A POSA would have understood such “configur[ing]” and “defin[ing]” to be “generating” the matrix. Akl, ¶105.

c. [39b]: transmitting the matrix.

It would have been obvious to a POSA from Pedersen that the matrix is “transmitt[ed].” Akl, ¶106. As explained in [1a], in the ’573 patent the matrix is

“receiv[ed]” at a Radio Resource Management (RRM) network element either from another network entity or from the RRM’s own memory. ’573 patent, 5:23–25, 6:36–39, Figure 4. From this, a POSA would have understood that the matrix could be “transmitt[ed]” to the RRM from either another network entity or the RRM’s own memory. Akl, ¶106.

In Pedersen, the matrix is “configured” and the priorities of the matrix are “defined by the network operator[.]” *Id.*, 5:43–51, 6:27–30. It would have been obvious to a POSA that, whether “configured” and “defined” at the RNC or at another entity, Pedersen’s matrix, like that of the ’573 patent, is “transmitted.” Akl, ¶107. If Pedersen were implemented such that the matrix was “configured” and “defined” at another network entity, it would have been obvious to a POSA that Pedersen’s RNC, configured to use the matrix as Pedersen describes, would “receive” the matrix from that other network entity, meaning that other network entity “transmitted” the matrix. *Id.*; *see, e.g.*, Ex. 1015, 5:1–5; Ex. 1011, 206–209. For example, such an implementation would be obvious because it would allow for configuration and definition by the network operator of the matrix to occur at one RNC or other network entity but use to occur at all other RNCs, making configuration and definition more efficient for the network operator. Akl, ¶107; Ex. 1011, 213–14. A POSA would have recognized that transmitting the matrix (and not merely data to create the matrix) between RNCs would allow the same

matrix to be simply and efficiently transmitted to and received at the other RNCs, without each RNC expending resources to construct the matrix. Akl, ¶107. If Pedersen were implemented such that the matrix was “configured” and “defined” at the RNC, it would have been obvious to a POSA that Pedersen’s RNC, configured to use the matrix as Pedersen describes, would include a memory storing the matrix, and the RNC would “receive” the matrix from the memory, meaning the memory would “transmit” the matrix. *Id.*; *see, e.g.*, Ex. 1015, 4:65–5:1. A POSA would have recognized that transmitting the entire matrix (and not merely data therein) from the memory would allow the processor to simply and efficiently access the data therein. Akl, ¶107. Both implementations—transmission from memory or transmission from another network entity—would have been within the skill of a POSA and would have yielded nothing more than predictable results. *Id.*; *see, e.g.*, Ex. 1015, 4:65–5:5. In either of these implementations, Pedersen’s matrix is “transmitt[ed].” Akl, ¶107.

B. Ground 2: Pedersen and 3GPP23.107 Render Obvious Claims 1–8, 11, 13–16, 18–27, 30, 32–35, 37–39

As explained in Section II, by 2008, 3GPP was the primary player in the development of third-generation systems, and the 3GPP technical specifications for the UMTS system prescribed implementation details for all aspects of the system. Akl, ¶108; Ex. 1011, 9; Ex. 1020, ¶26. For this reason, by that time, those implementing a UMTS system would have been familiar with the 3GPP technical

specifications as a resource. Ak1, ¶108; Ex. 1020, ¶33; Ex. 1011, 491–508, 515.

Indeed, Pedersen specifically envisions implementing its handover procedure in a 3GPP UMTS network. Pedersen, 1:37–40. Accordingly, by 2008, a POSA seeking to implement Pedersen would have been motivated and found it obvious to implement Pedersen’s UMTS system according to the implementation details set forth in the 3GPP technical specifications, and the POSA would have had a reasonable expectation of success in doing so. Ak1, ¶108.

A POSA would have been motivated not only by the 3GPP technical specifications’ role as a primary resource for those implementing UMTS networks, but also by Pedersen’s recommendation to use a specific 3GPP technical specification, 3GPP23.107: Pedersen specifically recommends implementing its matrix using “subscription profile[s]” in which a “subscribed quality of service (QoS)” is defined by the bearer attributes specified in a particular 3GPP technical specification—3GPP23.107. Pedersen, 5:38–42. Ak1, ¶109. This citation to 3GPP23.107 would have led a POSA directly to the 3GPP technical specifications—technical specifications the POSA would have recognized are designed to be used together in the design and implementation of a UMTS network. Ak1, ¶109; Ex. 1020, ¶¶35–36.

A POSA would have found it obvious to implement Pedersen’s UMTS system according to the implementation details set forth in the 3GPP technical

specifications, and a POSA would have had a reasonable expectation of success in doing so, because this was the very purpose of the 3GPP technical specifications, and POSAs commonly referenced the 3GPP technical specifications in the design and implementation of UMTS systems. Akl, ¶110; Ex. 1020, ¶33 (“The whole purpose of 3GPP creating and making these specifications available was so that engineers and other individuals would have ready access to them when developing and implementing cellular networks and devices.”); Ex. 1011, 9 (“[T]he goal of [3GPP] is to produce the specifications for a 3G system” and 3GPP “bears the greatest responsibility for the 3G development work.”). *See also, e.g.*, Ex. 1023 (patent publication recommending implementation of UMTS network by reference to 3GPP technical specifications); Ex. 1011, 491–508 (reference book listing 3GPP technical specifications as a reference), 515 (describing 3GPP standards are “the most widely used 3G standards”). A POSA would have found it particularly obvious, and would have had a particular expectation of success, implementing Pedersen’s UMTS system according to 3GPP23.107, as this 3GPP technical specification is specifically recommended by Pedersen for implementation. Akl, ¶110; Pedersen, 5:38–42.

1. Claims 1–4, 6, 14, 16, 18–23, 25, 33, 35, 37, and 39

As discussed in Ground 1, Pedersen teaches claims 1–4, 6, 14, 18–23, 25, 33, 35, 37, and 39. Because the combination of Pedersen and 3GPP23.107 would

retain the aspects of Pedersen relied on in Ground 1, the combination teaches these claims for the same reasons discussed in Ground 1, and they are further taught by 3GPP23.107, as explained herein. Akl, ¶111.

2. Claim 5: The method as claimed in claim 1, wherein allocating resources includes setting a bit rate provided for the bearer.

Pedersen and 3GPP23.107 teach “allocating resources includes setting a bit rate provided for the bearer.” Akl, ¶112. As explained in [1b], a POSA would have understood that effecting a handover to a Node_B for a user’s subscriber terminal in a UMTS system, as Pedersen teaches, according to the 3GPP technical specifications is an allocation of resources to a bearer between the Node_B and the subscriber terminal, and that the resources are allocated to ensure QoS parameters requested by the subscriber terminal are met. *Id.* In implementing Pedersen based on 3GPP23.107, as Pedersen recommends, allocating these resources would, a POSA would recognize, “include[] setting a bit rate provided for the bearer.” *Id.*

This is because, as explained in Section II.C, resources are allocated to the bearer by the RNC in accordance with requested QoS parameters to ensure the bearer is optimized for the QoS requirements of the particular traffic to be sent over the bearer. Akl, ¶113; Ex. 1011, 177, 402; Ex. 1012, 12. As 3GPP23.107 explains, **traffic classes** have varying QoS requirements, including “how delay sensitive the traffic is[.]” 3GPP23.107, 14–15. To ensure optimization of a bearer

for a particular **traffic class**, the QoS requirements for the **traffic class** are reflected in the requested QoS parameters, which 3GPP23.107 calls “bearer attributes” in 3GPP23.107. *Id.*, 16. Pedersen specifically envisions effecting handovers based on such bearer attributes. Pedersen, 5:38–40; *id.*, 6:21–25; Akl, ¶113. As 3GPP23.107 explains, these bearer attributes “describe the service provided by the UMTS network to the user of the UMTS bearer service.” 3GPP23.107, 16.

Several of these bearer attributes pertain to bit rates. The “maximum bitrate” bearer attribute, for example, defines the “maximum number of bits delivered by UMTS and to UMTS . . . within a period of time, divided by the duration of the period[,]” while the “guaranteed bitrate” bearer attribute defines the “guaranteed number of bits delivered by UMTS . . . within a period of time (provided that there is data to deliver), divided by the duration of the period.” *Id.* These bearer attributes, including those pertaining to bit rates, “limit the UMTS bearer service which can be provided.” *Id.*

Thus, Pedersen envisions effecting handovers based on the bearer attributes of 3GPP23.107. Pedersen, 5:38–40. Because effecting a handover includes allocating resources to a bearer between the Node_B and the subscriber terminal, *see* [1b], a POSA would have understood Pedersen and 3GPP23.107 to teach allocating resources to the bearer based on the bearer attributes of 3GPP23.107. Akl, ¶115. And because some of the bearer attributes in 3GPP23.107 specify bit

rates that limit the UMTS bearer service that can be provided, from Pedersen and 3GPP23.107, a POSA would have recognized that, allocating resources based on the bearer attributes of 3GPP23.107, as Pedersen envisions, would involve “setting a bit rate provided for the bearer” that accords with the bearer attributes specifying bit rates. Akl, ¶115. Thus, Pedersen and 3GPP23.107 teach that “allocating resources includes setting a bit rate provided for the bearer.”

3. **Claim 7: The method as claimed in claim 5, wherein at least one service includes a guaranteed bit rate (GBR) and, in the step of allocating resources, the resources are allocated to provide the guaranteed bit rate for the bearer over which that service is provided.**

Pedersen and 3GPP23.107 teach that “at least one service includes a guaranteed bit rate (GBR).” Akl, ¶116. As explained in [1a], Pedersen’s traffic classes correspond to the claimed services. 3GPP23.107 explains that a traffic class, also called a “QoS class” in 3GPP23.107, has an associated GBR. Akl, ¶116; 3GPP23.107, 13. In implementing Pedersen based on 3GPP23.107, as Pedersen recommends, the step of allocating the resources for traffic in a particular traffic class would, a POSA would recognize, involve “the resources [being] allocated to provide the [GBR] for the bearer over which” the traffic in that particular traffic class is provided. Akl, ¶116.

This is because, as explained in [5], Pedersen envisions allocating resources based on the bearer attributes described in 3GPP23.107, and one of these bearer

attributes is GBR. 3GPP23.107, 16. For the GBR bearer attribute, the 3GPP23.107 explains that the “[m]inimum resource requirement” for communications in both the conversational and streaming traffic classes “is determined by [the] guaranteed bitrate.” Akl, ¶117; 3GPP23.107, 16, 18.

3GPP23.107 further explains that the GBR bearer attribute is “include[d]” by the **traffic class**, as 3GPP23.107 teaches that certain **traffic classes** have associated bearer attributes, including GBR. For the “conversational” and “streaming” **traffic classes**, for example, one of the associated bearer attributes is a “guaranteed bitrate.” *Id.*, 18, Table 2; ’573 patent, 2:37–38 (describing usage of GBR in Background section).

Thus, Pedersen envisions allocating resources to a bearer between the Node_B and the subscriber terminal based on the bearer attributes of 3GPP23.107, *see* [1b], [5], and in 3GPP23.107 the conversational and streaming classes have an associated GBR that specifies a “[m]inimum resource requirement” for these traffic classes. Thus, from Pedersen and 3GPP23.107, a POSA would have recognized that allocating resources based on the bearer attributes of 3GPP23.107, as Pedersen envisions, would involve allocating the resources “to provide the [GBR] for the bearer over which” traffic in that **traffic class** is provided. Akl, ¶119.

Because Pedersen and 3GPP23.107 thus teach that Pedersen’s conversational and streaming traffic classes each have an associated GBR, and that

the resources are allocated to provide that associated GBR for the bearer over which conversational or streaming traffic is provided, Pedersen and 3GPP23.107 teach that “at least one **service** includes a guaranteed bit rate (GBR) and, in the step of allocating resources, the resources are allocated to provide the guaranteed bit rate for the bearer over which that **service** is provided.” Akl, ¶120.

4. **Claim 8: The method as claimed in claim 5, wherein at least one **service** includes a maximum bit rate (MBR) and, when the resources have been allocated for all bearers, surplus resources are allocated up to the maximum bit rate for the bearer over which that **service** is provided.**

Pedersen and 3GPP23.107 teach that “at least one **service** includes a maximum bit rate (MBR).” Akl, ¶121. As explained in [1a], Pedersen’s **traffic classes** correspond to the claimed **services**. 3GPP23.107 explains that a **traffic class** has an associated MBR. *Id.*; 3GPP23.107, 13 (“**QoS classes**, also referred to as **traffic classes**”). In implementing Pedersen based on 3GPP23.107, as Pedersen recommends, allocating the resources for traffic in a particular **traffic class** would, a POSA would recognize, involve “when the resources have been allocated for all bearers,” allocating “surplus resources . . . up to the [MBR] for the bearer over which” the traffic in that particular **traffic class** is provided. Akl, ¶121.

This is because, as explained in [5], Pedersen envisions allocating resources based on the bearer attributes described in 3GPP23.107, and one of these bearer attributes is “maximum bit rate.” 3GPP23.107, 16. The maximum bit rate bearer

attribute, the 3GPP23.107 explains, “specifies the upper limit of the bitrate with which the UMTS bearer delivers” the traffic. *Id.*, 18.

3GPP23.107 further explains that the MBR bearer attributes is “include[d]” by the **traffic class**, as 3GPP23.107 teaches that certain **traffic classes** have associated bearer attributes, including MBR. For the “conversational” and “streaming” **traffic classes**, for example, one of the associated bearer attributes is a “maximum bitrate.” *Id.*, 18, Table 2; ’573 patent, 2:39–43 (describing usage of MBR in Background section).

Thus, Pedersen envisions allocating resources to a bearer between the Node_B and the subscriber terminal based on the bearer attributes of 3GPP23.107, *see* [1b], [5], and in 3GPP23.107 the conversational and streaming classes have an associated MBR that “specifies the upper limit of the bitrate with which the UMTS bearer delivers” the traffic for these traffic classes. Thus, from Pedersen and 3GPP23.107, a POSA would have recognized that allocating resources based on the bearer attributes of 3GPP23.107, as Pedersen envisions, would involve allocating the resources in accordance with this upper limit for traffic in these traffic classes. Akl, ¶124.

A POSA would have recognized from 3GPP23.107’s teaching of the MBR that, “when the resources have been allocated for all bearers, surplus resources are allocated up to the [MBR] for [a] bearer over which” traffic in a particular traffic

class is provided. Akl, ¶125. This is because both the “[m]aximum and guaranteed bitrate attributes are used for resource allocation within UMTS,” and the “[m]inimum resource requirement” for a bearer “is determined by [the] guaranteed bitrate.” 3GPP23.107, 18. From this, a POSA would have understood that, once resources have been allocated to ensure each bearer’s GBR is met, surplus resources would be allocated but not in excess of any bearer’s MBR, as the MBR for a **traffic class** “specifies the upper limit of the bitrate with which the UMTS bearer delivers” the traffic for that traffic class. Akl, ¶125.

Because Pedersen and 3GPP23.107 thus teach that Pedersen’s conversational and streaming **traffic classes** each have an associated MBR, and that when resources remain after all bearers’ GBRs have been met, the remaining resources are allocated but not in excess of any bearer’s MBR, Pedersen and 3GPP23.107 teach that “at least one **service** includes a maximum bit rate (MBR) and, when the resources have been allocated for all bearers, surplus resources are allocated up to the maximum bit rate for the bearer over which that **service** is provided.” Akl, ¶126.

5. Claim 11: The method as claimed in claim 7, wherein the GBR is for the bearer in one of the uplink direction, the downlink direction, or both the uplink and the downlink directions.

Pedersen and 3GPP23.107 teach “the GBR is for the bearer in one of the uplink direction, the downlink direction, or both the uplink and the downlink

directions.” Akl, ¶127. As explained in [7], Pedersen and 3GPP23.107 teach that Pedersen’s conversational and streaming traffic classes each have an associated guaranteed bit rate, and that the resources are allocated to provide that associated guaranteed bit rate for the bearer over which a conversational or streaming communication is provided. 3GPP23.107 explains that both “[u]ni-directional and bi-directional bearer services” are supported, and “the attribute[] . . . Guaranteed bit rate should be possible to set separately for uplink/downlink in order to support [such] asymmetric bearers.” 3GPP23.107, 15. From this, a POSA implementing Pedersen based on 3GPP23.107, as Pedersen recommends, would have been motivated and found it obvious to employ the GBR for each bearer in one or both of the uplink and downlink directions. Akl, ¶127. A POSA would have had a reasonable expectation of success in doing so, as the UMTS system prescribed by 3GPP23.107 is designed to support both uplink and downlink GBR, and employing the GBR this way would have been within the skill of a POSA. *Id.*

6. Claim 13: The method as claimed in claim 1, wherein the service provided over the bearer is ascertained by a gateway of the communications system.

Pedersen and 3GPP23.107 teach “a gateway of the communications system.” Akl, ¶128. Pedersen envisions a UMTS system, and it would have been obvious to a POSA from 3GPP23.107 that such a UMTS system would include a “gateway.” 3GPP23.107 describes, in a UMTS system like Pedersen’s, a “CN Gateway”

connects the UMTS system to an external network, 3GPP23.107, 9–10. Because 3GPP23.107 thus teaches including a CN gateway in a UMTS system, a POSA implementing Pedersen’s UMTS system according to 3GPP23.107 would have found it obvious to include a CN gateway, and would have had a reasonable expectation of success in doing so. Akl, ¶128.

Pedersen and 3GPP23.107 teach that “the **service** provided over the bearer is ascertained by” the CN gateway, because the CN gateway ascertains **the traffic class**. Akl, ¶129. As shown in 3GPP23.107’s figure below, the CN gateway provides a “UMTS Bearer Service in the direction of the UMTS network and provides an “External Bearer Service” in the direction of the subscriber terminal (“TE” or “terminal equipment”). *Id.*, 9. Nevertheless, QoS is provided “End-to-End,” which means “from a Terminal Equipment (TE) to another TE” and, thus, across the External Bearer Service as well. As part of ensuring such End-to-End QoS, 3GPP23.107 explains, the CN gateway “translates the UMTS bearer service attributes into the external bearer service attributes” and vice versa. 3GPP23.107, 12. Within the UMTS network, QoS is ensured by allocating resources based on the bearer attributes described in 3GPP23.107, as explained in [5]. One such UMTS bearer attribute in need of translation is the “**traffic class**” bearer attribute which, 3GPP23.107 explains, indicates the “type of application,” namely, “conversational,” “streaming,” “interactive,” or “background.” *Id.*, 16. A POSA

would have understood that, to translate between the UMTS **traffic class** bearer attribute and a corresponding external bearer service attribute, the CN gateway would “ascertain[]” the **traffic class**. Akl, ¶129. From this, a POSA implementing Pedersen based on 3GPP23.107, as Pedersen recommends, would have been motivated and found it obvious to employ a CN gateway that, in order to translate between the UMTS **traffic class** bearer attribute and a corresponding external bearer service attribute, as 3GPP23.107 teaches, “ascertain[s]” the **traffic class**. Akl, ¶129. For example, it would be obvious to a POSA that, for an uplink bearer, the CN gateway would translate the external bearer service attributes into the corresponding UMTS bearer attributes, including, for example, the UMTS **traffic class** bearer attribute. *Id.* A POSA would have had a reasonable expectation of success in implementing the CN gateway this way, as implementation of a UMTS network including a CN gateway was within the skill of a POSA and is prescribed by the 3GPP technical specifications. *Id.*

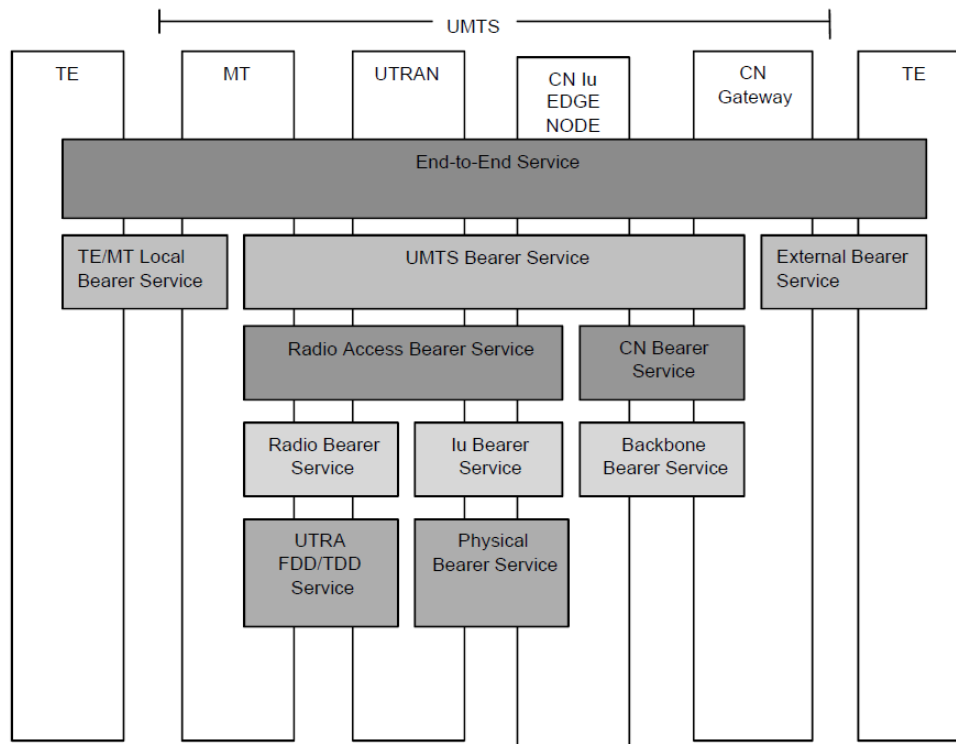


Figure 1: UMTS QoS Architecture

7. Claim 15: The method as claimed in claim 1, wherein the resources are allocated adaptively.

Pedersen and 3GPP23.107 teach that “the resources are allocated adaptively.” Akl, ¶130. As explained in [5], Pedersen envisions allocating resources based on the bearer attributes described in 3GPP23.107. According to 3GPP23.107, in a UMTS system like Pedersen’s, the “QoS behaviour” of these bearer attributes “should be dynamic,” which requires “modify[ing] QoS [bearer] attributes during an active session.” *Id.*, 8. Because Pedersen and 3GPP23.107 teach allocating resources based on the bearer attributes described in 3GPP23.107, and 3GPP23.107 directs that these bearer attributes be dynamic, a POSA

implementing Pedersen based on 3GPP23.107, as Pedersen recommends, would have been motivated and found it obvious to allocate the resources “adaptively.” Akl, ¶130; Ex. 1011, 164. A POSA would have had a reasonable expectation of success in implementing Pedersen to allocate resources adaptively, as the UTRAN air interface on which 3GPP’s UMTS system is based was designed to permit such adaptive allocation of resources, and bearer reconfiguration was a known technique. Akl, ¶130; Ex. 1011, 177–78.

8. Claims 24, 32, and 34.

These claims all depend from claim 20, which Pedersen teaches. *See* [20]. Pedersen and 3GPP23.107 teach the additional features of these claims. *See* [5], [13], [15].

9. Claim 26.

This claim depends from claim 24, which Pedersen and 3GPP23.107 teach. *See* [24]. Pedersen and 3GPP23.107 teach the additional features of this claim. *See* [7].

10. Claim 27.

This claim depends from claim 22, which Pedersen teaches. *See* [22]. Pedersen and 3GPP23.107 teach the additional features of this claim. *See* [8].

11. Claim 30.

This claim depends from claim 26, which Pedersen and 3GPP23.107 teach. *See* [30]. Pedersen and 3GPP23.107 also teach the additional features of this claim.

See [11].

12. Claim 38

a. [38p] A system comprising:

To the extent this preamble is limiting, Pedersen teaches “[a] system.”

Pedersen describes a UMTS communication system. Pedersen, 1:29–30.

b. [38a] the apparatus of claim 20;

Pedersen and 3GPP23.107 render obvious the additional features of this limitation. *See* [20].

c. [38b] a plurality of stations, each station associated with at least one subscriber and each subscriber associated with a user subscriber level;

Pedersen envisions “a plurality of stations.” Akl, ¶137. Pedersen’s UMTS system includes “subscriber terminals” and seeks to support those “terminals’ mobility.” Pedersen, 1:24–36. Pedersen also teaches that each “subscriber terminal” is “associated with [a] subscriber.” Akl, ¶137. In Pedersen, the subscriber, called a “user,” is a “a user of [the] subscriber terminal.” Pedersen, 1:15–20. Pedersen also teaches that “each subscriber is associated with a user subscriber level.” Akl, ¶137. Pedersen’s users each have a “respective subscription profile defining a subscribed quality of service (QoS),” such as “gold, silver, [and] bronze.” Pedersen, 5:35–40, 5:58–60.

d. [38c] a base station configured to provide bearers to the plurality of stations; and

Pedersen teaches “a base station configured to provide bearers to the plurality of stations.” Akl, ¶138. In Pedersen’s UMTS system, “the network is hierarchically constructed[,]” and “[c]ommunication with a subscriber terminal . . . is performed by the intermediate of at least one network entity known as Node_B in UMTS (or base station BS . . .) handling the communication of said subscriber terminal.” Pedersen, 1:41–47. Because each connection between the Node_B and a subscriber terminal is a “bearer,” *see* [1b], and the UMTS system includes a plurality of subscriber terminals, *see* [38b], a POSA would have understood that, in Pedersen’s UMTS system, the Node_B is “configured to provide bearers to the plurality of” subscriber terminals. Akl, ¶138.

e. [38d] a gateway configured to determine a service provided over the bearers.

Pedersen and 3GPP23.107 teach “a gateway configured to determine a service provided over the bearers.” Akl, ¶139. As explained in [13], a POSA would have been motivated and found it obvious to implement a CN gateway, as described in 3GPP23.107, in Pedersen’s UMTS system, and to employ such a gateway to ascertain, or “determine,” the **traffic class** provided over a bearer in order to translate between the UMTS **traffic class** bearer attribute to a corresponding external bearer service attribute. Akl, ¶139; 3GPP23.107, 9–10;

'573 patent, 1:16–18. Because Pedersen's UMTS system includes a plurality of subscriber terminals, [38b], and bearers are provided to the plurality of subscriber terminals, [38c], a POSA would have recognized that the CN gateway, implemented in Pedersen's UMTS system, would determine the **traffic class** provided over the bearers. Akl, ¶139.

C. Ground 3: Pedersen, 3GPP23.107, and 3GPP23.401 Render Obvious Claims 1–8, 10–11, 13–16, 18–27, 29–30, 32–35, and 37–39

As explained in Sections II and VIII.B, by 2008 a POSA seeking to implement Pedersen would have been motivated and found it obvious to implement Pedersen's UMTS system according to the implementation details set forth in the 3GPP technical specifications, and the POSA would have had a reasonable expectation of success in doing so. Akl, ¶140.

A POSA would have been motivated not only by the 3GPP technical specifications' role as a primary resource for those implementing UMTS networks, but also by Pedersen's recommendation to use a specific 3GPP technical specification, 3GPP23.107, for implementation. This citation to 3GPP23.107 would have led a POSA directly to the 3GPP technical specifications—technical specifications the POSA would have recognized are designed to be used together in the design and implementation of a UMTS network. Akl, ¶141; Ex. 1020, ¶¶35–36. In light of Pedersen's recommendation of 3GPP23.107, a POSA would have

been motivated in particular to look to other 3GPP technical specifications in the same “23.” series relating to “Technical realization” of the UMTS system in implementing Pedersen, and the POSA could easily have located such 23. series technical specifications, including 3GPP23.401, on the 3GPP website before 2008. Akl, ¶141; Ex. 1020, ¶¶35–36. A POSA would have found it particularly obvious, and would have had a particular expectation of success, implementing Pedersen’s UMTS system according to another 3GPP technical specification in the 23. series, given its known compatibility with 3GPP23.107, which Pedersen specifically recommends for implementation. Akl, ¶141; Pedersen, 5:38–42.

1. Claims 1–8, 11, 13–16, 18–27, 30, 32–35, 37–39

As discussed in Grounds 1 and 2, Pedersen and 3GPP teach claims 1–8, 11, 13–16, 18–27, 30, 32–35, 37–39. Because the combination of Pedersen and 3GPP23.107 with 3GPP23.401 would retain the aspects of the Pedersen-3GPP23.107 combination relied on in Ground 1, the combination of all three teaches these claims for the same reasons discussed in Grounds 1 and 2, and they are further taught by 3GPP23.401, as explained herein. Akl, ¶142.

2. Claim 10: The method as claimed in claim 5, wherein at least one service includes an aggregate maximum bit rate (AMBR) and, when the resources have been allocated for all bearers, surplus resources are allocated up to the aggregate maximum bit rate for all bearers over which that service is provided.

Pedersen, 3GPP23.107, and 3GPP23.401 teach that “at least one **service**

includes an aggregate maximum bit rate (AMBR).” Ak1, ¶143. As explained in [1a], Pedersen’s **traffic classes** correspond to the claimed **services**, and 3GPP23.107 explains that a **traffic class** has associated “bearer level attributes.” *Id.*; 3GPP23.107, 13. 3GPP23.401 teaches that one such attribute is “Aggregate Maximum Bit Rate (AMBR).” Ak1, ¶143; 23.401, 16; ’573 patent, 2:47–57 (describing AMBR in Background section). A POSA implementing Pedersen based on 3GPP23.107 and 23.401 would have been motivated to employ the AMBR attribute, as the AMBR, unlike the GBR and MBR, allows the RNC to control the aggregate amount of data being transferred between elements in the network. Ak1, ¶143; Ex. 1024, 1:47–52. Because Pedersen and 3GPP23.107 thus teach that a **traffic class** has associated “bearer level attributes,” and 3GPP23.401 teaches that one bearer level attribute is AMBR, a POSA would have understood Pedersen, 3GPP23.107, and 3GPP23.401 to teach that “at least one **service** includes an aggregate maximum bit rate (AMBR).”

In implementing Pedersen based on 3GPP23.107 and 23.401, a POSA would recognize that, “when the resources have been allocated for all bearers, surplus resources are allocated up to the [AMBR] for all bearers over which” traffic in a particular **traffic class** is provided. Ak1, ¶144. As explained in [5], Pedersen envisions allocating resources based on the bearer attributes described in 3GPP23.107, and one of these bearer attributes is “maximum bit rate.”

3GPP23.107, 16. The AMBR attribute, 3GPP23.401 teaches, “denotes a bit rate of traffic per group of bearers” and “limits the aggregate bit rate that can be expected to be provided by the . . . bearers sharing the AMBR.” 3GPP23.401, 16. This is because “each” of a number of “bearers could potentially utilize the entire AMBR” associated with the traffic class, but it is also possible that some of these “bearers do not carry any traffic.” 3GPP23.401, 16. From this, a POSA would have understood that when there are “surplus resources,” *e.g.*, when some bearers do not carry any traffic, these surplus resources would be “allocated up to the aggregate maximum bit rate for all bearers over which that **service** is provided,” in accordance with the bearers’ shared AMBR. Akl, ¶144; ’573 patent, 2:47–57 (explaining AMBR in Background).

3. Claim 29.

This claim depends from claim 24, which Pedersen and 3GPP23.107 teach. *See* [24]. Pedersen, 3GPP23.107, and 3GPP23.401 teach the additional features of this claim. *See* [10].

D. Ground 4: Pedersen, 3GPP23.107, and 3GPP23.203 Render Obvious Claims 1–8, 11, 13–27, 30, and 32–39

As explained in Sections II, VIII.B, and VIII.C, by 2008, a POSA seeking to implement Pedersen would have been motivated and found it obvious to implement Pedersen’s UMTS system according to the implementation details set forth in the 3GPP technical specifications and the POSA would have had a

reasonable expectation of success in doing so. A POSA would have found it particularly obvious, and would have had a particular expectation of success, implementing Pedersen's UMTS system according to another 3GPP technical specification in the 23. series, given its known compatibility with 3GPP23.107, which Pedersen specifically recommends for implementation. Akl, ¶146; Pedersen, 5:38–42.

1. Claims 1–8, 11, 13–16, 18–27, 30, 32–35, 37–39

As discussed in Grounds 1 and 2, Pedersen and 3GPP teach claims 1–8, 11, 13–16, 18–27, 30, 32–35, 37–39. Because the combination of Pedersen and 3GPP23.107 with 3GPP23.401 would retain the aspects of the Pedersen-3GPP23.107 combination relied on in Ground 2, the combination of all three teaches these claims for the same reasons discussed in Grounds 1 and 2, and they are further taught by 3GPP23.203, as explained herein. Akl, ¶147.

2. Claim 13: The method as claimed in claim 1, wherein the **service provided over the bearer is ascertained by a gateway of the communications system.**

As explained for [13] in Ground 2, a POSA implementing Pedersen based on 3GPP23.107, as Pedersen recommends, would have been motivated and found it obvious to employ a CN gateway that, in order to translate between the UMTS **traffic class** bearer attribute and a corresponding external bearer service attribute, as 3GPP23.107 teaches, “ascertain[s]” the **traffic class**. Akl, ¶148. One such

attribute in need of translation is the “QoS Class Identifier (QCI) parameter[,]” which “has a 1:1 mapping to a set of QoS parameters defined” in accordance with “3GPP23.107.” 3GPP23.203, 49. Ak1, ¶148; *see* [17]. For example, it would be obvious to a POSA that, for an uplink bearer, the CN gateway would translate the external bearer service attributes into the corresponding UMTS bearer attributes, including, for example, a QoS Class Identifier (QCI) indicating, among others, the UMTS **traffic class** bearer attribute. 3GPP23.203, 49. Ak1, ¶148; *see* [17]. A POSA would have had a reasonable expectation of success in implementing the CN gateway this way, as implementation of a UMTS network including a CN gateway was within the skill of a POSA and is prescribed by the 3GPP technical specifications. Ak1, ¶148.

3. Claim 17: The method as claimed in claim 1, wherein the service is defined by a quality control indication (QCI) of the bearer.

Pedersen, 3GPP23.107, and 3GPP23.203 teach that the “**service** is defined by a quality control indication (QCI).” Ak1, ¶149. As explained in [1a], Pedersen’s **traffic classes** correspond to the claimed **services**, and 3GPP23.107 explains that a **traffic class** has associated “bearer level attributes.” Ak1, ¶149; 3GPP23.107, 13. 3GPP23.203 teaches that QCI is used to indicate the **traffic class**’s bearer level attributes. Ak1, ¶149; 3GPP23.203, 49.

As 3GPP23.203 teaches, the “QoS Class Identifier (QCI) parameter² has a 1:1 mapping to a set of QoS parameters defined” in accordance with “3GPP23.107.” 3GPP23.203, 49. As shown in the table below, for example, the traffic classes have associated QCI values. *Id.* From this, a POSA would have understood that a traffic class “is defined by a quality control indication (QCI) of the bearer.” Akl, ¶150.

Table A.3: Recommended mapping for QoS Class Identifier to/from QoS parameters

GPRS QoS Class Identifier value	UMTS QoS parameters			
	Traffic Class	THP	Signalling Indication	Source Statistics Descriptor
a	Conversational	n/a	n/a	speech (NOTE)
b	Conversational	n/a	n/a	unknown
c	Streaming	n/a	n/a	speech (NOTE)
d	Streaming	n/a	n/a	unknown
e	Interactive	1	Yes	n/a
f	Interactive	1	No	n/a
g	Interactive	2	No	n/a
h	Interactive	3	No	n/a
i	Background	n/a	n/a	n/a
NOTE: The operator's configuration should reserve QCI values that map to "speech" for service data flows consisting of speech (and the associated RTCP) only.				

Because 3GPP23.203 thus teaches using a QoS Class Identifier parameter to

² While claims 17 and 36 say “quality control indication (QCI),” a POSA would recognize that this is the same thing as “QoS Class Identifier (QCI),” which is also used in the ’573 patent and throughout 3GPP technical specifications, including in 3GPP23.203. ’573 patent, 2:11; Akl, ¶150 (citing Ex. 1017; Ex. 1024; Ex. 1025).

indicate the QoS parameters of a **traffic class**, a POSA implementing Pedersen according to the 3GPP23.107 and 23.203 would have been motivated and found it obvious to define the traffic class using a QCI, which provides a simplified indication of the multiple QoS parameters defined in 3GPP23.107. Akl, ¶152. A POSA would have had a reasonable expectation of success in doing so, as each QCI maps to the QoS parameters of 3GPP23.107, making use of the QCI to indicate the QoS parameters straightforward and within the skill of a POSA. *Id.* Thus Pedersen, 3GPP23.107, and 3GPP23.203 teach that the “**service** is defined by a quality control indication (QCI).”

4. Claim 32.

This claim depends from claim 20, which Pedersen teaches. *See* [20]. Pedersen, 3GPP23.107, and 3GPP23.203 teach the additional features of this claim. *See* [13].

5. Claim 36.

This claim depends from claim 20, which Pedersen teaches. *See* [20]. Pedersen, 3GPP23.107, and 3GPP23.203 teach the additional features of this claim. *See* [17].

E. Ground 5: Pedersen, 3GPP23.107, and 3GPP36.300 Render Obvious Claims 1–9, 11–16, 18–28, 30–35, and 37–39

As explained in Sections II and VIII.B, by 2008, a POSA seeking to implement Pedersen would have been motivated and found it obvious to

implement Pedersen’s UMTS system according to the implementation details set forth in the 3GPP technical specifications, and the POSA would have had a reasonable expectation of success in doing so. Akl, ¶155.

Before 2008, a POSA would also have known that by 2007 3GPP began to develop technical specifications prescribing implementation details for an “Evolved” UTRAN, called E-UTRAN as well, including 3GPP36.300. Akl, ¶156; 3GPP36.300, 1. The ’573 patent itself acknowledges that the E-UTRAN network was known. ’573 patent, 1:60–66. A POSA would have been motivated and found it obvious to consider, in addition to the 23. series technical specifications like 3GPP23.107, the 36. series technical specifications from 3GPP in implementing Pedersen’s UMTS system. A POSA would have been motivated not only by the 3GPP technical specifications’ role as a primary resource for those implementing UMTS networks, but also by Pedersen’s citation to 3GPP23.107, which would have led a POSA directly to the 3GPP technical specifications—technical specifications the POSA would have recognized are designed to be used together in the design and implementation of a telecommunications network. Akl, ¶156; Ex. 1020, ¶¶35–36. Thus, a POSA would have been motivated in particular to look to other 3GPP technical specifications in implementing Pedersen, and the POSA could easily have located, in addition to the 23. series technical specifications, those in the 36. series, including 3GPP36.300, on the 3GPP website before 2008.

Akl, ¶156; Ex. 1020, ¶¶35–36.

A POSA would have found it obvious to implement Pedersen’s UMTS system according to the implementation details set forth in the 3GPP technical specifications, and a POSA would have had a reasonable expectation of success in doing so, because this was the very purpose of the 3GPP technical specifications, and POSAs commonly referenced the 3GPP technical specifications in the design and implementation of UMTS systems. Akl, ¶157; Ex. 1020, ¶33.

1. Claims 1–8, 11, 13–16, 18–27, 30, 32–35, 37–39

As discussed in Grounds 1 and 2, Pedersen and 3GPP teach claims 1–8, 11, 13–16, 18–27, 30, 32–35, 37–39. Because the combination of Pedersen and 3GPP23.107 with 3GPP36.300 would retain the aspects of the Pedersen-3GPP23.107 combination relied on in Ground 2, the combination of all three teaches these claims for the same reasons discussed in Grounds 1 and 2, and they are further taught by 3GPP36.300, as explained herein. Akl, ¶158.

2. Claim 9: The method as claimed in claim 5, wherein at least one service includes a prioritised bit rate (PBR) and, in the step of allocating resources, the resources are allocated to provide the prioritised bit rate for the bearer over which that service is provided.

Pedersen, 3GPP23.107, and 3GPP36.300 teach that “at least one **service** includes a prioritised bit rate (PBR).” Akl, ¶159. As explained in [1a], Pedersen’s **traffic classes** correspond to the claimed **services**.

3GPP36.300 describes “an overview and overall description of the E-UTRAN radio interface protocol architecture.” 3GPP36.300, 9. Just as in a UMTS system, as described in Pedersen and 3GPP23.107, the E-UTRAN system uses attributes like guaranteed minimum bit rate (GBR), maximum bit rate (MBR), and aggregate maximum bit rate (AMBR) to “manage[] . . . resources between bearers.” 3GPP36.300, 52; *see* [5], [7], [8], [10]. The E-UTRAN system additionally manages resources according to a new attribute, “prioritised bit rate (PBR).” 3GPP36.300, 52. As 3GPP36.300 explains, “[a]ll the radio bearer(s)” are served “in decreasing priority order up to their PBR[.]” Remaining resources are then allocated to the bearers, again “in decreasing priority,” while “ensur[ing] that the MBR and AMBR are not exceeded.” *Id.*

While Pedersen uses a UMTS system for explanation, Pedersen makes clear that the described handover method is not “limited to a specific communication network type.” Pedersen, 1:21–24. Thus, by the time of the ’573 patent, when the E-UTRAN system had already improved on the UTRAN in the UMTS system, a POSA would have been motivated and found it obvious to implement Pedersen’s handover method in connection with the PBR of the E-UTRAN system. Ak1, ¶161. A POSA would have been motivated by the additional capabilities provided by the PBR attribute, for example, that it “maximises the transmission of higher priority data.” 3GPP36.300, 52. A POSA would have found such an implementation

obvious, and would have had a reasonable expectation of success in such an implementation, as Pedersen's UTMS system was, as 3GPP23.107 explains, already equipped to allocate resources according to similar attributes, like GBR, MBR, and AMBR, and a POSA would have found it straightforward to allocate resources according to a single additional attribute. Akl, ¶161.

Because Pedersen and 3GPP23.107 thus teach that a **traffic class** has associated "attributes," and 3GPP36.300 teaches that, in an improved E-UTRAN system these attributes may include, in addition to GBR, MBR, and AMBR, a "prioritised bit rate (PBR)," a POSA would have understood Pedersen, 3GPP23.107, and 3GPP36.300 to teach that "at least one **service** includes a prioritised bit rate (PBR)." Akl, ¶162. Further, because 3GPP36.300 teaches managing resources between **traffic classes** in accordance with their PBRs, a POSA would have understood Pedersen, 3GPP23.107, and 3GPP36.300 to teach that, "in the step of allocating resources, the resources are allocated to provide the prioritised bit rate for the bearer over which that service is provided." Akl, ¶162.

3. Claim 12: The method as claimed in claim 9 wherein the PBR is for the bearer in one of the uplink direction, the downlink direction, or both the uplink and the downlink directions.

Pedersen, 3GPP23.107, and 3GPP36.300 teach that "the PBR is for the bearer in . . . the uplink direction." As explained in [9], Pedersen, 3GPP23.107, and 3GPP36.300 teach allocating resources based on the PBR. Because 3GPP36.300

uses PBR as part of the “uplink rate control function,” 3GPP36.300, 52, a POSA would have understood that the PBR “is for the bearer in . . . the uplink direction.” Ak1, ¶163. From this, a POSA implementing Pedersen based on 3GPP23.107 and 36.300 would have been motivated and found it obvious to employ the PBR for each bearer in the uplink direction. *Id.* A POSA would have had a reasonable expectation of success in doing so, as the UMTS system prescribed by 3GPP36.300 is designed to support uplink PBR, and employing the PBR this way would have been within the skill of a POSA. *Id.*

4. Claim 28.

This claim depends from claim 24, which Pedersen and 3GPP23.107 teach. *See* [24]. Pedersen, 3GPP23.107, and 3GPP36.300 teach the additional features of this claim. *See* [9].

5. Claim 31.

This claim depends from claim 28, which Pedersen, 3GPP23.107, and 3GPP23.300 teach. *See* [84]. Pedersen, 3GPP23.107, and 3GPP36.300 also teach the additional features of this claim. *See* [12].

IX. NONINSTITUTION UNDER 35 U.S.C. § 314 WOULD BE IMPROPER

The ’573 patent was asserted against NetApp in *Proven Networks, LLC v. NetApp, Inc.*, No. 6:22-cv-00036 (W.D. Tex. Jan. 10, 2022) (“Texas Litigation”) and *Certain Networking Devices, Computers, and Components Thereof and*

Systems Containing the Same; No. 337-TA-1298 (ITC Feb. 14, 2022) (“ITC Litigation”) (collectively, “Litigations”). On balance, the factors articulated in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”) weigh against discretionary denial.

Factor 1 is neutral because, while the ITC Litigation has not been stayed, neither party has moved to stay the ITC Litigation. *Apple, Inc. v. AliveCor, Inc.*, IPR2021-00970, Paper 10, at 11 (PTAB Dec. 8, 2021).

Regarding Factor 2, at the time of filing this petition, no target date in the ITC Litigation has yet been set, though the parties have proposed a target date of June 20, 2023, approximately three months before the anticipated deadline for a Final Written Decision (“FWD”) here. In this situation, the Board has found “this factor at most weighs only slightly in favor of” denial. *Volkswagon Grp. Am. v. Arigna Tech. Ltd.*, IPR2021-01321, Paper 10, at 7–8 (PTAB Feb. 15, 2022) (instituting where target date preceded FWD by three months). *See also Ocado Grp. PLC v. Autostore Tech. AS*, IPR2021-00274, Paper 12 (PTAB June 3, 2021) (instituting where target date preceded FWD by one year); *AliveCor*, at 11–12 (instituting where target date preceded FWD by seven weeks).

Factor 3 weighs against discretionary denial because the parties’ and the court’s investment in this case has been negligible due to NetApp’s filing of this petition less than two months after being served with complaints in both the Texas

and ITC Litigations, and a mere fifteen days after the ITC Litigation was instituted. Ex. 1018; Ex. 1021; Ex. 1022. NetApp is yet to even respond to Patent Owner’s complaints in the Texas and ITC Litigations. Where a Petitioner has filed so “expeditiously,” and no “orders related to the patent” have issued, this factor weighs against denial. *Fintiv*, at 9–11; *AliveCor*, at 15–16; *Ocado*, at 15.

Factor 4 weighs against discretionary denial because this proceeding would consider two additional claims, one of which is independent, not at issue in the ITC litigation. Ex. 1021 (asserting claims 1–37). *Volkswagon*, at 7. Moreover, Petitioner stipulates that, if review is instituted, Petitioner will not pursue in the ITC Litigation the grounds in this petition, thereby mitigating concerns of duplicative efforts. *Sand Rev’n II, LLC v. Continental Intermodal Grp.-Trucking LLC*, IPR2019-01393, Paper 24, at 16 (PTAB June 16, 2020) (informative); *AliveCor*, at 18 (same).

Factor 5 is neutral because NetApp is the defendant in the Texas and ITC Litigations. *Apple Inc. v. Maxell, Ltd.*, IPR2020-00199, Paper 11, at 20 (PTAB June 19, 2020).

Factor 6 weighs against discretionary denial. The challenged claims are unpatentable over Pedersen and the 3GPP Specifications—none of which was considered during prosecution. Further, this is the only petition challenging the ’573 patent, even though Proven Networks has asserted it against two other parties

in the last year. A determination of its validity by the Board could save resources not only in the ITC and Texas Litigations but in any future assertions as well.

X. MANDATORY NOTICES

A. Real Party-in-Interest

The real party-in-interest is NetApp, Inc.

B. Related Matters

The '573 patent was asserted against NetApp in *Proven Networks, LLC v. NetApp, Inc.*, No. 6:22-cv-0036 (W.D. Tex. Jan. 10, 2022) and *Certain Networking Devices, Computers, and Components Thereof and Systems Containing the Same*; No. 337-TA-1298 (ITC Feb. 14, 2022).

To the best of NetApp's knowledge, the '573 patent was also involved in the following litigations:

Name	Number	Court	Filed
<i>Certain Networking Devices, Computers, and Components Thereof</i>	337-TA-1275	USITC	May 28, 2021
<i>Proven Networks, LLC v. Juniper Networks, Inc.</i>	6:21-cv-00305	W.D. Tex.	March 29, 2021

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XI. GROUNDS FOR STANDING

NetApp certifies the '573 patent is available for IPR and NetApp is not barred or estopped from requesting IPR challenging the patent claims on the grounds identified herein.

XII. CONCLUSION

The Board should institute IPR and cancel the claims. The Office may charge any required fees to Deposit Account No. 06-0916.

Dated: March 1, 2022

Respectfully submitted,

/Erika H. Arner/

Erika H. Arner (Reg. No. 57,540)

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(a)(1)(i), the undersigned hereby certifies that the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,687,573 contains 13,991 words, excluding parts of this Petition exempted under § 42.24(a), as measured by the word-processing system used to prepare this paper.

Dated: March 1, 2022

/Erika H. Arner/
Erika H. Arner (Reg. No. 57,540)
Lead Counsel for Petitioner NetApp, Inc.

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing **Petition for *Inter Partes* Review**, the associated **Power of Attorney**, and **Exhibits 1001 through 1018 and 1020 through 1026** are being served on March 1, 2022, by FedEx Priority Overnight® at the following address of record for the subject patent.

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