

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

IPR2025-00343
Patent 10,292,138 B2

Before SCOTT A. DANIELS, FREDERICK C. LANEY, and
MATTHEW S. MEYERS, *Administrative Patent Judges*.

DANIELS, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
Determining Claims 1–6 and 8–13 Not Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Tesla Inc., (“Tesla,” or “Petitioner”), filed a Petition requesting inter partes review (“IPR”) of claims 1–6 and 8–13 of U.S. Patent No. 10,292,138 B2 (Ex. 1001, “the ’138 patent”). Paper 2 (“Pet.”). Intellectual Ventures II LLC (“Intellectual Ventures” or “Patent Owner”) filed a Request for Discretionary Denial. Paper 7 (“Request”). Patent Owner also filed a Preliminary Response to the Petition. Paper 8 (“Prelim. Resp.”). Petitioner filed an Opposition to Patent Owner’s Request. Paper 9. On July 2, 2025, the Acting Director of the United States Patent and Trademark Office issued a Decision denying Patent Owner’s Request resolving the discretionary denial issues. Paper 10.

We instituted an *inter partes* review of claims 1–6 and 8–13 of the ’138 patent on all of the grounds asserted by Petitioner. Paper 11 (“Dec. Inst.”). Patent Owner timely filed a Patent Owner Response. Paper 14 (“PO Resp.”). Petitioner subsequently filed a Reply (Paper 17, “Pet. Reply”), and Patent Owner timely filed a Sur-Reply to Petitioner’s Reply (Paper 18, “PO Sur-Reply”).

Oral argument was held on May 14, 2026, at USPTO Headquarters in Alexandria, VA, and a transcript of the hearing is entered in the record. Paper 25 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). Having reviewed the arguments of the parties and the supporting evidence, we find that Petitioner has not demonstrated by a preponderance of the evidence that each of the challenged claims 1–6 and 8–13 of the ’138 patent is unpatentable.

II. BACKGROUND

A. Real Parties in Interest

Petitioner identifies Tesla, Inc., as the real party in interest. Pet. 85. Patent Owner identifies Intellectual Ventures II LLC as the real party in interest. Paper 3, 2.

B. Related Matters

The parties indicate that the '138 patent has been asserted in the following lawsuits, including, *Intellectual Ventures II LLC v. Tesla, Inc.*, 1:24-cv-00390 (W.D.Tex) (terminated); *Intellectual Ventures II LLC v. Tesla, Inc.*, 1:24-cv-00390 (W.D.Tex); *Intellectual Ventures II LLC v. Tesla, Inc.*, 6:24-cv-00188 (W.D.Tex); *Intellectual Ventures II LLC v. Tesla, Inc.*, 1:24-cv-00884 (W.D.Tex) (transferred); *Intellectual Ventures II LLC v. Volvo Car Corp. et al.*, 6:23-cv-00429 (W.D.Tex) (transferred); *Intellectual Ventures I LLC et al. v. Toyota Motor Corp. et al.*, 2:21-cv-00389 (E.D.Tex); *Intellectual Ventures I LLC et al. v. General Motors Company*, 6:21-cv-01088 (W.D.Tex); and *Intellectual Ventures I LLC et al. v. Honda Motor Company, Ltd. et al.*, 3:22-cv-00761 (N.D.Tex); and *Intellectual Ventures I LLC and Intellectual Ventures II LLC, v. Honda Motor Co., Ltd. et al.* 2:21-cv-00390 (E.D.Tex).

Petitioner also indicates that the '138 patent has been involved in the following *inter partes* review proceedings: *American Honda Motor Co., Inc. v. Intellectual Ventures II LLC*, IPR2023-00020; and *Toyota Motor Corp. et al v. Intellectual Ventures II LLC*, IPR2022-01127. Pet. 86.

C. The '138 Patent (Ex. 1001)

The '138 patent, titled “Determining Buffer Occupancy and Selecting Data for Transmission on a Radio Bearer,” relates to allocation of bandwidth

resources for Internet Protocol data flows in a wireless network.¹ Ex. 1001 code 54, 1:23–25. The '138 patent explains that “[t]he invention is applicable to, but not limited to, gateway queuing algorithms in packet data transmissions, for example, for use in the universal mobile telecommunication standard,” (“UMTS”). *Id.* at 1:25–28.

Figure 1 of the '138 patent, as annotated by Petitioner, is reproduced below illustrating standard radio access network system 100. *Id.* at 6:12–13.

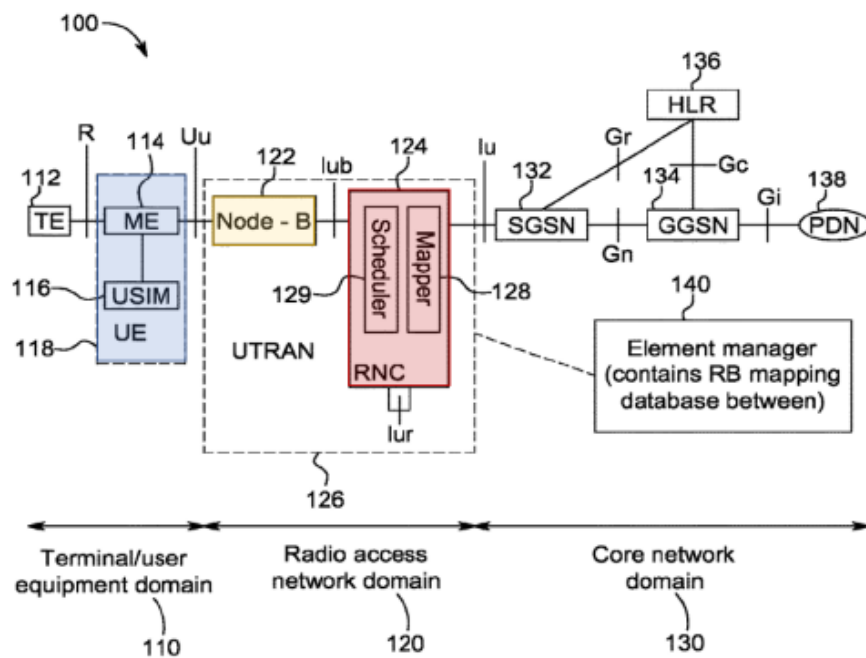


FIG. 1

Figure 1 illustrates user equipment (UE) 118 (highlighted blue) communicating data with Node-B 122 (highlighted yellow) which, in turn, communicates data with radio network controller (RNC) 124 within UTRAN (UMTS Radio Access Network) 126 (highlighted red). The '138 patent explains that:

¹ Petitioner explains that “[e]ach radio bearer forms a data pipe[] or flow that are created and flow down through each layer of the protocol stack (RLC layer to MAC layer to physical layer). Pet. 37–38 (citing Ex. 1003 ¶ 98).

[t]he UE may be for example a remote unit, a mobile station, a communication terminal, a personal digital assistant, a laptop computer, an embedded communication processor or any communication element communicating over the air interface of the cellular communication system.

Id. at 6:22–27. The ’138 patent describes that within RNC 124, “a Mapper 128 is responsible for mapping IP packets to separate RBs [radio bearers] . . . [a] scheduler 129 is responsible for allocating a certain proportion of the radio resource to each of the RBs.”² *Id.* at 7:49–53. (emphasis added). In addition, the ’138 patent provides that:

element manager logic 140 has been incorporated into the system, which is used to contain the database that defines the mapping characteristics for IP packets to RBs. The element manager logic 140 also contains the values of the queue weighting parameters, S_{tier} , as 60 described in more detail later.

Id. at 7:56–61.

The ’138 patent describes a particular embodiment of the radio resource allocation in Figures 5 and 6 reproduced below.

² Radio bearers, “RBs,” are also understood by those of ordinary skill in the art as Radio Access Bearer’s, “RABs.” Ex. 1003 ¶ 39.

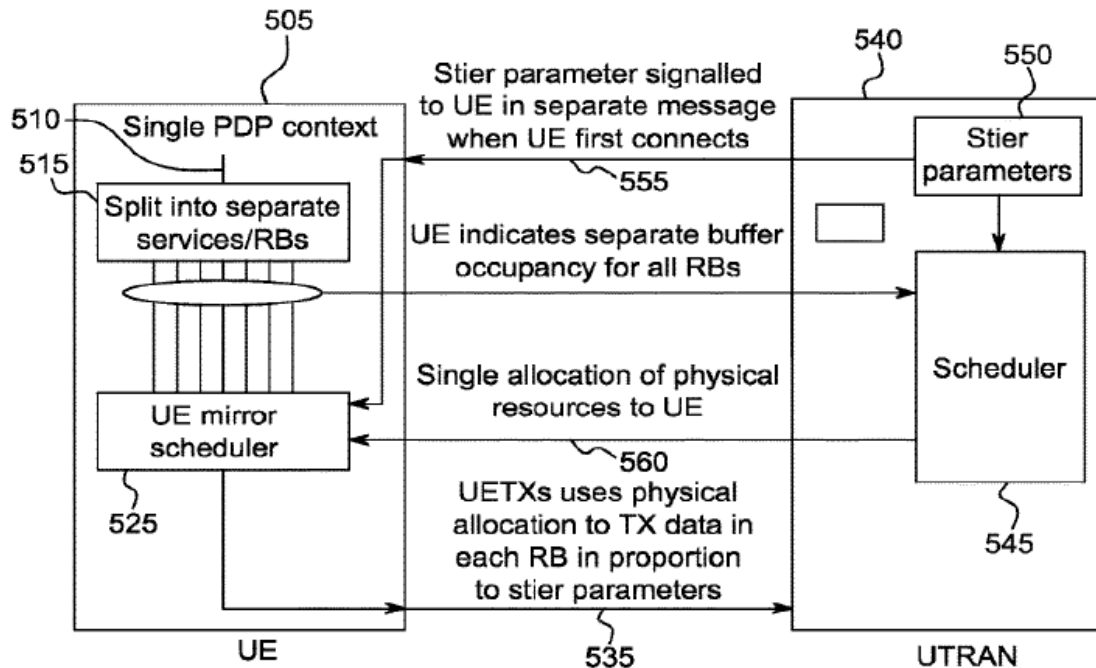


FIG. 5

Figure 5 illustrates “the communication between UE 505 and the UTRAN 540 to support an uplink scenario.” *Id.* at 10:3–5. The ’138 patent explains that “the UE 505 may receive a single PDP [packet data protocol] context 510 and split the single PDP context 510 into separate services on individual radio bearers in divider logic 515.” *Id.* at 10:5–8. The UE then informs UTRAN 540 and scheduler 545 of buffer occupancies for the individual radio bearers, and scheduler 545 returns a single allocation of physical resources to the UE based on S_{tier} parameters 550. *Id.* at 10:8–18. Subsequently, “[t]he UE mirror scheduler 525 is then able to inform the UTRAN 540 in a message 535 on its use of the physical allocation, in order to transmit data in each radio bearer in proportion to the informed S_{tier} parameters 550.” *Id.* at 10:18–22.

The ’138 patent describes that W'_{tier} weight values are computed for each radio bearer data queue from the S_{tier} parameter (*id.* at 8:44–54) and

that uplink data for each radio bearer is transmitted by dividing up the allocated bandwidth based on the W'_{tier} values (*id.* at 8:55–59, 10:23–28).

Figure 6, reproduced below as annotated by the Board, is a flow chart illustrating algorithm 600 that “describes one mechanism to limit a number of queues served at a single instant of time.” *Id.* at 10:49–50.

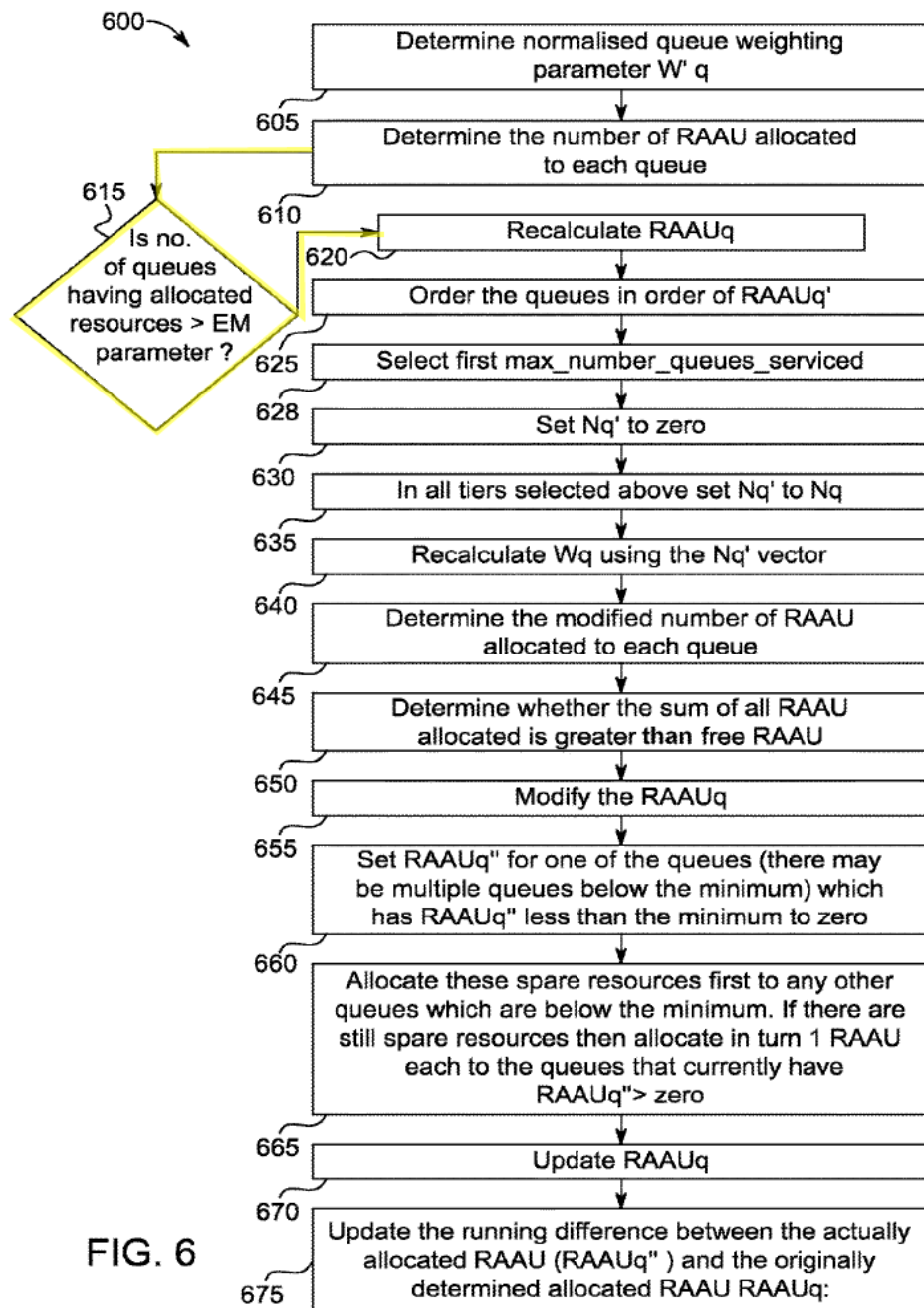


Figure 6 details an algorithm that is run “when a number of active users (i.e. those users known to have a buffer occupancy greater than zero in any queue) is greater than a known fixed parameter, for example ‘max_number_queues_served’, as defined by the Element Manager (EM).” *Id.* at 10:51–55. After determining the number of resources RAAU allocated to each queue at step 610,

[t]he algorithm may then determine whether the number of queues that have resources allocated greater than the EM parameter-max_number_queues_served, as shown in step 615 [highlighted yellow]. If the number of queues that have resources allocated is greater than a threshold, for example the EM parameter max_number_queues_served, the process moves to step 620.

Id. at 11:11–17.

As depicted in Figure 6, and following step 620, the algorithm begins a scheduling process for data packets where an amount of resources RAAU_q are allocated according to a weighted average of the priority level of each input flow. *Id.* at 10:47–11:10. The weighting of each input flow using a counter or running backlog, running_RAAU_delta, tracks flows that have been previously denied transmission. *Id.* at 11:22–11:30. Then, the running backlog that is added to the resources (RAAU_q) and allocated to a given radio bearer provides an adjusted RAAU_q’ at step 625. *Id.* at 11:31–33. Flows with lowest adjusted resource allocations RAAU_q’ are dropped, and the remaining resources RAAU_q’ are divided up among the surviving radio bearers. *Id.* at 11:38–44.

D. Illustrative Claim

Claims 1 and 8 are independent. Claims 2–6 each depend directly from claim 1, and claims 9–13 each depend directly from claim 8. Claim 1 is reproduced below.³

1. [1.0] A user equipment (UE) comprising:

[1.1] a processor communicatively coupled to a transmitter and circuitry configured to receive; and

[1.2] the processor is configured to:

[1.3] cause the circuitry to receive parameters associated with a plurality of radio bearers,

[1.4] determine a plurality of buffer occupancies, wherein each of the plurality of buffer occupancies is associated with one or more radio bearers of the plurality of radio bearers,

[1.5] cause the transmitter to transmit a message including the plurality of buffer occupancies to a network,

[1.6] cause the circuitry to receive a single allocation of uplink resources,

[1.7] select data from the plurality of radio bearers for transmission using the single allocation of uplink resources, wherein the selection of the data occurs using a first iteration and a second iteration,

[1.8] wherein in the first iteration, the selection of the data is selected from a subset of the plurality of radio bearers based on the received parameters,

[1.9] wherein in the second iteration, the selection of the data is based on buffered data for respective radio bearers, and

³ For consistency, we use Petitioner's claim limitation numbers and bracketing format.

[1.10] cause the transmitter to transmit a signal including the selected data.

Ex. 1001, 13:58–14:16. Independent claim 8 is a method claim reciting “[a] method performed by a user equipment (UE), the method comprising.” *Id.* at 14:33–34. Otherwise, independent claim 8 contains the same and similar limitations as claim 1, for example limitation [8.1] “receiving, by the UE, parameters associated with a plurality of radio bearers.” *Id.* at 14:35–36.

E. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–6 and 8–13 would have been unpatentable based on the following grounds:⁴

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–4 and 8–11	103(a) ⁵	Eckert, ⁶ Bucknell, ⁷ Lohr-1 ⁸
2	5 and 12	103(a)	Eckert, Bucknell, Lohr-1, Hans ⁹
3	6 and 13	103(a)	Eckert, Bucknell, Lohr-1 and Lohr-2 ¹⁰

⁴ Petitioner supports its challenges with Declarations of Zhi Ding, Ph.D. (Ex. 1003). Patent Owner offers the Declaration of Gary Lomp, Ph.D (Ex. 2007). *See infra*.

⁵ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011 amended 35 U.S.C. §§ 102–103, effective March 16, 2013. Because the application from which the ’138 patent issued has an effective filing date prior to March 16, 2013, the pre-AIA version of § 103 applies. *See* Ex. 1001, code (63).

⁶ Ex. 1005, US Patent Publ’n No. 2006/0088058 (Apr. 27, 2006).

⁷ Ex. 1006, US Patent Publ’n No. 2007/0297435 (Dec. 27, 2007).

⁸ Ex. 1007, PCT Publ’n No. WO2005/125252 (Dec. 29, 2005).

⁹ Ex. 1008, US Patent No. 7,245,636 B1 (July 17, 2007).

¹⁰ Ex. 1009, US Patent Publ’n No. 2008/0254804 (Oct. 16, 2008).

III. PATENTABILITY ANALYSIS

Petitioner contends that claims 1–6 and 8–13 of the ’138 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over either Eckert, Bucknell, and Lohr-1, or Eckert, Bucknell, Lohr-1, and either Hans or Lohr-2. Pet. 13.

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness.¹¹ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1889, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics*,

¹¹ Patent Owner does not present arguments or evidence of secondary considerations. Therefore, secondary considerations do not constitute part of our analysis.

Inc., 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

We organize our patentability analysis into four sections. First, we address the level of ordinary skill in the art. Second, we address claim construction. Third, we provide an overview of the necessary references asserted. And fourth, taking account of the information presented by both parties, we consider and determine for the reasons explained below why Petitioner has failed to show by a preponderance of the evidence that claims 1–6 and 9–13 of the ’138 patent are unpatentable under 35 U.S.C. § 103(a).

A. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art at the time of the ’138 patent

would have had a bachelor’s degree from an accredited program in electrical engineering, computer engineering, computer science, or equivalent training, and at least two years of professional experience relating to wireless communication technology. Lack of professional experience can be remedied by additional education, and vice versa.

Pet. 12 (citing Ex. 1003 ¶¶ 19–21).

Patent Owner does not expressly dispute Petitioner’s definition of a person of ordinary skill in the art. *See generally* PO Resp.

On this record, Petitioner’s proposed level of ordinary skill in the art is not disputed and is consistent with our review and understanding of the technology and descriptions in the ’138 patent and the asserted prior art references. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). For purposes of this Decision, we rely on Petitioner’s proposed level of ordinary skill in the art.

B. Claim Construction

We interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b) (2020). Under this standard, we construe the claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.* Furthermore, at this stage in the proceeding, we expressly construe the claims only to the extent necessary to resolve the parties’ dispute. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

1. a subset of radio bearers

Petitioner points out that in IPR2022-01127 the Board “preliminarily determined that *a subset of the plurality of radio bearers*” means “*less than all of the plurality of radio bearers*.” Pet 12 (citing Ex. 1019, 18–19). Petitioner explains that, in the present proceeding, it has applied “the prior art in accordance with that construction; however, in view of the asserted grounds, no claim term requires express construction to find the Challenged Claims unpatentable.” *Id.* (citing *Nidec* 868 F.3d 1017). Patent Owner neither disputes the prior construction of “a subset of radio bearers,” nor offers additional constructions. *See generally* PO Resp.

To the extent necessary, and in accordance with our prior determination, we construe “a subset of the plurality of radio bearers” to mean “less than all of the plurality of radio bearers.”

2. *a single allocation of uplink resources*

Patent Owner argues that “[i]n the ‘138 Patent, the ‘single allocation’ corresponds to a *finite quantum of physical resources* that can be shared out, such as the resources defined by a combination of spreading codes and timeslots.” PO Resp. 1 (citing Ex. 1001, 9:39–43, 11:7–10), *see also* PO Sur–Reply 1 (citing Ex. 1001, 9:39–43, 11:7–8) (arguing that “‘a *quantum*’ of physical ‘resource allocation *units*’ (*FreeRAAU*) is defined by the combination of ‘*codes and timeslots*’ that can be shared out”).

Petitioner does not directly dispute Patent Owner’s characterization of “a single allocation of resources,” but asserts that Eckert discloses a “defined time interval,” more specifically, “transmission time intervals,” or “TTIs” that are “a fixed period of time, such as 2 ms in UMTS.” Pet. Reply 5 (citing Ex. 1005 ¶ 20). The dispute is therefore not specifically a claim construction issue, but a matter of reference interpretation.

In accordance with a “finite quantum of physical resources,” Petitioner argues that Eckert’s “defined time interval . . . is both a finite length of time and would have included a finite number of TTIs (e.g., one TTI, two TTIs, etc.), as both experts agree.” *Id.* (citing Ex. 1071 ¶ 19; Ex. 1070, 24:6–12). Also, Petitioner argues that a person of ordinary skill in the art would have understood a transport channel, e.g., E-DCH, to employ a finite number of TTIs and spreading codes. *Id.* (citing Ex. 1071 ¶ 20; Ex. 1070, 11:1–10). Petitioner’s point is that Eckert, alone or combined with Lohr-1, meets this limitation by teaching that the UE receives from Node B an allocation of specific TTIs and spreading codes which the E-DCH transport channel uses to map data onto a physical channel. *Id.* at 4–5.

The parties mainly disagree as to what Eckert discloses and thus there is no outward disagreement over the “finite quantum of physical resources” interpretation advanced by Patent Owner.

Somewhat different from a “finite quantum of physical resources,” it bears pointing out that the specification of the ’138 patent appears to explain what “a single allocation” means:

If there are multiple QoS requirements within a single 3GPP PDP context, a single physical allocation of radio resources may be made to the UE. *In this manner, a single PDP context implies a single CCTrCh.* This single physical allocation of radio resources provided to a UE is shared amongst a number of services, in proportion to their respective QoS requirements, for example in proportion to the signalled weight values (*Stier*).

Ex. 1001, 9:36–43 (emphasis added). Petitioner’s expert, Dr. Ding, explains that the “abbreviation CCTrCh was understood in the art to refer to a transport channel known as the Coded Composite Transport Channel.” Ex. 1003 ¶ 88. Dr. Ding testifies that Eckert teaches selecting data for uplink within a determined TTI and scheduling the uplink transmission on a transport channel, E-DCH, where

scheduling of the E-DCH in a UE is controlled by a base station. Eckert, [0012] (“[A] new dedicated transport channel called Enhanced Dedicated Channel (E-DCH) has been introduced for this purpose. The fundamental characteristics of this new transport channel include . . . scheduling controlled by the base station, also called NodeB in UMTS...”

Id. ¶ 90. In addition to Eckert disclosing a single transport channel E-DCH, Petitioner argues that Eckert discloses using a “finite quantum of physical resources” where “[t]he ’138 patent disclosure parallels Eckert, with both the E-DCH and CCTrCH transport channels relating to a UMTS uplink, employing spreading codes in code division multiple access (CDMA), and

employing fixed time slots called transmission time intervals (TTIs).” Pet. Reply 6 (citing Ex. 1005, ¶¶ 3, 8, 15, 23; Ex. 1071 ¶¶ 17–20; Ex. 1011 ¶¶ 6, 51).

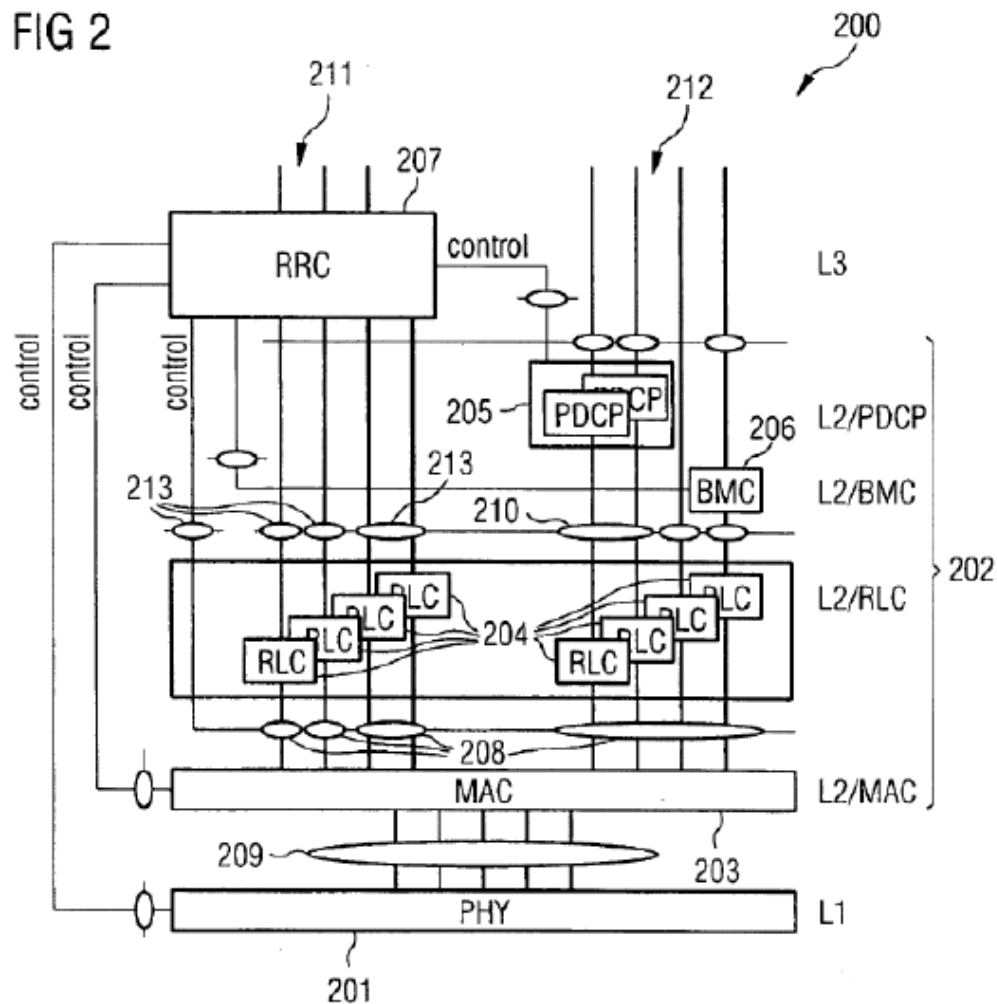
We do not need to specifically interpret this claim phrase because there is no actual dispute as to the meaning of the claim language itself and because, ultimately, the construction of this phrase plays no part in our Decision.

C. The Prior Art

Before turning to Petitioner’s initial ground of unpatentability, we provide a brief summary of the asserted references to Eckert, Bucknell, and Lohr-1.

1. Eckert (Ex. 1005)

Eckert describes that “UMTS air interface 117 is logically divided into three protocol layers,” where the “protocol layers...are implemented both in the mobile radio terminal 118 and in the UMTS base station 108, 109, 110, 111 or in the respective mobile radio network control unit 106, 107.” Ex. 1005 ¶ 143. Eckert illustrates in Figure 2, reproduced below, “layer 1” (L1), “layer 2” (L2), and “layer 3” (L3), corresponding respectively to “physical,” “data link,” and “network” layers. *Id.* ¶¶ 143–147. Layer 2 includes “a plurality of subprotocol layers,” including “the Medium Access Control protocol Layer (MAC protocol layer) 203” and “the Radio Link Control protocol layer 204 (RLC protocol layer).” *Id.* ¶ 146.

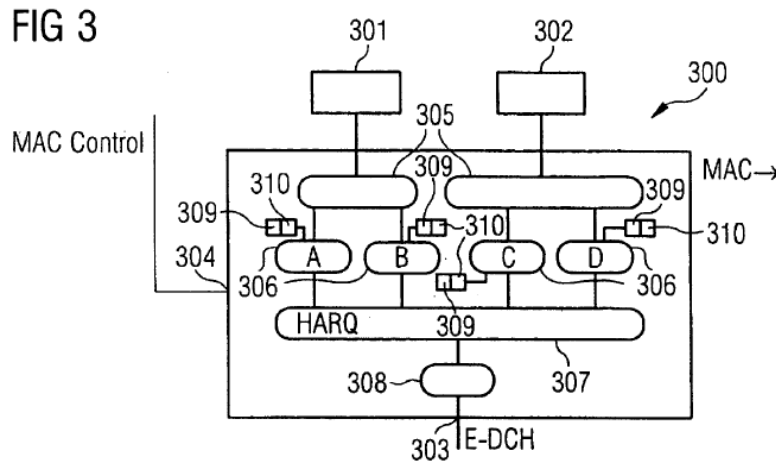


Eckert’s Figure 2 illustrates “a protocol structure for the UMTS air interface.” *Id.* ¶ 35. Eckert explains that Radio Resource Control (RRC) protocol layer 207 is responsible for “signalling radio bearers and radio bearers, and also for negotiating all parameters of the protocol layers of layer 1 and layer 2 on the basis of UMTS.” *Id.* ¶ 6.

Eckert further explains that “[t]he physical layer 201 provides the MAC protocol layer 203 with its services via transport channels 209 and these are used to stipulate how and with what characteristics the data are to be transported via the air interface 117.” *Id.* ¶ 153. In turn, the MAC protocol layer 203 “maps the data which are present on a logical channel 208

above the MAC protocol layer 203 onto the transport channels 209 of the physical layer 201.” *Id.* ¶ 154. Eckert further describes that “[t]he RLC protocol layer 204 is modelled such that there is an independent RLC entity for each radio bearer.” *Id.* ¶ 160.

Within MAC protocol layer 203 is subprotocol layer 300 as shown in Figure 3 reproduced below.



Eckert’s Figure 3 illustrates “the units in an MAC-e protocol layer,” which receive MAC-d flows 301 and 302. *Id.* ¶ 36. Each MAC-d flow is assigned “a priority . . . implemented in a priority queue distribution unit 305 in the MAC-e subprotocol layer 300, to split the data over the data buffer storages 306 with the different priorities.” *Id.* ¶ 170.

Eckert also describes an embodiment using weightings tied to a set of transport formats by which the mobile station proportionally allocates the total available transmission bandwidth among the queues. *Id.* ¶ 109. In this embodiment, Eckert uses a *single* index value (corresponding to the selected transport format) transmitted in the header of the MAC-e protocol data unit to signal the queue(s) from which the data transmitted originated. *Id.* ¶¶ 51–52.

2. *Bucknell (Ex. 1006)*

Bucknell discloses a MAC-e subprotocol layer including the E-DCH transport channel. Ex. 1006 ¶ 2. Bucknell describes output buffer 80 forming a MAC-e Protocol Data Unit (PDU) is divided into “a first portion 90 and a second portion 95.” *Id.* ¶ 20. Bucknell’s Figure 2 is reproduced below.

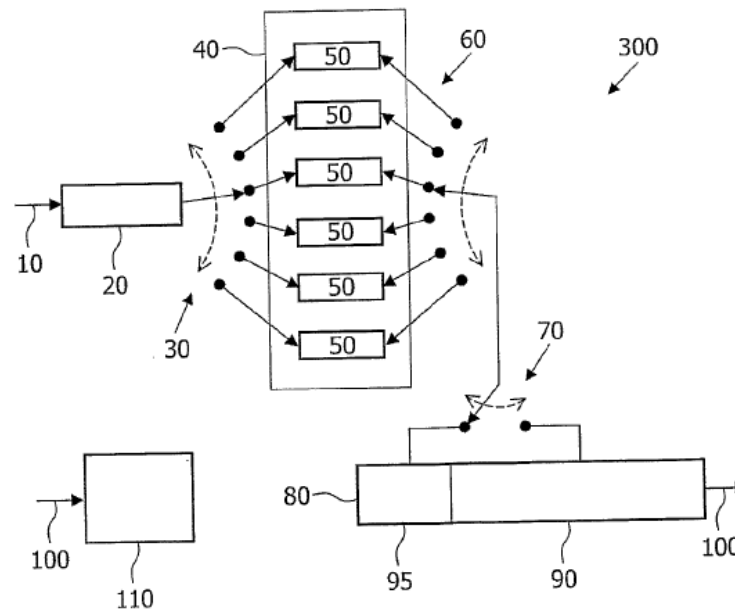


FIG. 2

Bucknell’s Figure 2 illustrates multiplexing unit 300 including output buffer 80 having first portion 90 and second portion 95. *Id.* Bucknell explains that “[t]he control means 110 controls the routing of the data packets to the output buffer 80 according to a predetermined criterion.” *Id.* In one embodiment, “each MAC-d flow is assigned a priority. Then for the first selection, data packets are taken from the queue having the highest priority until the resource available for the first portion 90 is filled.” *Id.* ¶ 26. Bucknell further explains that “[f]or the second portion 95 the same procedure is carried out, but for a subset of the queues.” *Id.*

3. *Lohr-1 (Ex. 1007)*

Consistent with Eckert and Bucknell, Lohr-1 describes the MAC-d subprotocol layer as having data flows and “different QoS (Quality of Service), e.g. delay and error requirements” so that “the data packets can be stored in different Priority Queues.” Ex. 1007, 5:26–6:1. Lohr-1 also describes a “radio bearer control message” sent from the network to a mobile terminal for providing uplink resources includes a “set of parameters indicating the priorities of a logical channel of the radio bearer” and that a radio bearer may be established according to these parameters. *Id.* at 20:14–24.

D. Ground 1: Claims 1–4 and 8–11 – Alleged Obviousness over Eckert in view of Bucknell and Lohr-1

On the complete record now before us, Petitioner has not established a preponderance of evidence that claims 1–4 and 8–11 would have been obvious over Eckert, Bucknell, and Lohr-1. For the reasons explained below we determine that Petitioner has failed to show why a person of ordinary skill in the art would have modified Eckert in view of Bucknell in the manner claimed. We focus our analysis below on claim 1, and more specifically on those limitations for which the combination of Eckert and Bucknell is asserted.

1. *Limitations [1.0]–[1.2] and the combination of Eckert and Bucknell*

The combination of Eckert and Bucknell is essential to each of Petitioner’s asserted grounds in this proceeding. Pet. 13. At the outset, we address this issue because our determination that Petitioner has failed to show why a person of ordinary skill in the art would have combined Eckert and Bucknell is dispositive as to all grounds.

Petitioner presents several reasons to combine Eckert and Bucknell with respect to different claim limitations. Pet. 23– 25, 48–53. We address each of these reasons under separate headings below.

a) *Petitioner’s motivation to combine Eckert and Bucknell as to limitations [1.1] and [1.2]*

Following from Eckert’s disclosure of user equipment (UE) for limitation [1.0], Petitioner argues that Eckert in view of Bucknell renders obvious limitations [1.1] and [1.2] which require a “a processor communicatively coupled to a transmitter and circuitry configured to receive,” limitation [1.1], and “the processor configured to,” limitation [1.2]. Pet. 21–25. Petitioner states that “Eckert provides insufficient details regarding the internal architecture of such user equipment.” *Id.* at 23. Petitioner argues that a person of ordinary skill in the art “would have been motivated to look to Bucknell, which provides details about the internal architecture of a UMTS-compatible mobile radio terminal as including a processor and a transceiver.” *Id.* (citing Ex. 1003 ¶ 60).

According to Petitioner, “Bucknell provides such details on the internal architecture of a mobile terminal for implementing an E-DCH, such as in Eckert, including a ‘transceiver’ and a ‘processor.’” *Id.* at 23 (citing Ex. 1006 ¶ 2, 32). Petitioner reasons that

[i]mplementing Eckert’s user equipment (UE) using Bucknell’s processor and transceiver would have involved combining prior art elements (Eckert’s UE having an architecture with Bucknell’s processor and transceiver) according to known methods (having a processor control a transceiver) to yield the predictable and beneficial result of a UE architecture for implementing the teachings of Eckert and Bucknell.

Id. at 24. Petitioner’s declarant, Dr. Ding testifies that a person of ordinary skill in the art

would have found it beneficial to implement the transmission and reception functions in a transceiver and control of the transceiver by a processor (e.g., to implement software modules) to achieve (1) simplicity of implementation via programming or configuration of a single processor and a single transceiver and (2) speed of implementation as a result of a simple architecture.

Ex. 1003 ¶ 63. Dr. Ding testifies further that a person of ordinary skill in the art “would have had a reasonable expectation of success in implementing Bucknell’s mobile terminal hardware architecture in Eckert’s UE because both Bucknell and Eckert describe the same MAC protocol layer having the same E-DCH channel.” *Id.* ¶ 65 (citing Ex. 1005 ¶ 168; Ex. 1007 ¶ 2).

Patent Owner does not substantively address the combination of Eckert and Bucknell with respect to limitations [1.0]–[1.2]. *See, generally*, PO Resp. 54–63. However, Patent Owner does dispute that a person of ordinary skill in the art would have combined Eckert and Bucknell because eliminating Eckert’s “solution based on the use of ‘weighting values’ for proportionally mapping data from queues to the transport channels based on weights” would make Eckert inoperable for its intended purpose. *Id.* at 55.

Considering limitations [1.1] and [1.2], Petitioner is relying on Bucknell in this instance essentially as background, and mainly to explain that a person of ordinary skill in the art would have understood that Eckert’s UE would have included a processor and transceiver as recited in claim 1. *See id.* at 23 (Petitioner arguing that “Eckert provides insufficient details regarding the internal architecture of such user equipment. Thus, a POSITA would have been motivated to look to Bucknell, which provides details about the internal architecture of a UMTS-compatible mobile radio terminal as including a processor and a transceiver.”) (citing Ex. 1003 ¶ 60).

Although Bucknell is informative and may show certain well-known components of a UE in more detail than Eckert, this is not a highly compelling reason or motivation to look to Bucknell as a whole, particularly when such components of UEs are well known in the art. *See, e.g.*, Ex. 1009 ¶ 127 (Lohr-2 explaining that “the mobile terminal may further use processing means, such as a DSP or processor, to determine the maximum amount of uplink resources the mobile terminal is allowed to utilize for uplink transmissions.”), *see also* Ex. 1010 ¶ 78 (Yi describing a mobile terminal where “[t]he processing unit module transfers the command information to the RF module in order to transmit wireless (radio) signals including voice communication signals. The RF module includes a transceiver for transmitting and receiving wireless (radio) signals”).

As confirmed by Lohr-2 and Yi, the asserted combination of Bucknell with Eckert as to these limitations is mainly background information. To the extent Bucknell’s components in Eckert’s UE are simply “[t]he combination of familiar elements according to known methods [and] likely to be obvious when it does no more than yield predictable results,” we cabin the asserted combination to limitations [1.1] and [1.2] as the Petition describes. Pet. 23–25; *KSR*, 550 U.S. at 416.

b) Petitioner’s motivation to combine Eckert and Bucknell as to limitations [1.7]–[1.9]

For limitation [1.7], reciting specifically that data selection occurs “using a first iteration and a second iteration,” Petitioner turns to Bucknell arguing that “Bucknell describes that its data selection process iterates over the MAC-d queues 50 multiple times to populate a MAC-e PDU.” Pet 44 (citing Ex. 1006 ¶¶ 6, 25–28). Petitioner argues that a person of ordinary skill in the art “would have been motivated to modify Eckert’s method of

selecting data from MAC-d priority queues for transmission with Bucknell’s method of selecting data from MAC-d priority queues for two reasons: (1) to reduce control signaling overhead and (2) to reduce complexity compared to Eckert’s method.” Pet. 48–49 (citing Ex. 1003 ¶ 119).

Below, we address these arguments, particularly considering several embodiments in Eckert for selecting data from priority queues based on “priorities of the data” and also “weightings”—that is—selecting data from priority queues “based on percentage weight values that have been sent to the UE from a base station.” Pet. 51 (citing Ex. 1005 ¶ 244). We also consider the further distinction and embodiment that the parties raise with respect to Eckert’s “weightings” embodiments, for example where “the weightings of the data buffer storages in the MAC-e subprotocol layer are not explicitly signalled” from the base station, “but rather the data traffic class is assigned to the weightings of the corresponding priority queues.” Ex. 1005 ¶ 118.

(i) Priorities of the data

As noted above, there are two, if not three, embodiments in Eckert which Petitioner considers with respect to the asserted combination with Bucknell. The first embodiment is Eckert’s disclosure of processing data at the MAC-d and MAC-e subprotocol layers where “data is split therein over various priority queues and processed in accordance with priorities.” Pet. 49 (citing Ex. 1005 ¶¶ 167–170). Petitioner argues specifically “that [in Eckert] a ‘MAC-e protocol data unit’ may be created by ‘retriev[ing], i.e., read[ing], the data from the various priority queues’ according to a number of alternatives, such as **‘according to particular criteria, such as the priorities of the data or the weightings or weighting value ranges transmitted using an RRC message.’**” *Id.* at 50 (quoting Ex. 1005 ¶ 228).

With respect to Eckert’s “priorities of the data” embodiment, Petitioner argues that “Bucknell specifies implementation detail for how to select data for a MAC-e PDU according to ‘priorities of the data,’ which fits seamlessly in Eckert’s framework to address this issue.” *Id.* (quoting Ex. 1003 ¶ 121). Petitioner’s declarant, Dr. Ding, parrots this argument, without further elaboration. Ex. 1003 ¶ 121.

(ii) *Weightings*

The second, and chief embodiment in Eckert upon which Petitioner focuses, is “a technique for selecting packets from MAC-d priority queues based on percentage weight values that have been sent to the UE from a base station.” *Id.* at 51 (citing Ex. 1005 ¶ 244). In other words, the bulk of Petitioner’s asserted reasoning and evidentiary underpinnings advanced to support the combination of Eckert and Bucknell are based on the asserted substitution of Bucknell’s priorities of the data selection embodiment for Eckert’s weightings embodiment. *See* Pet. 51–53.

For example, Dr. Ding testifies that in Eckert “the data packets buffer-storaged in the priority queue buffer storages are transmitted proportionally via the E-DCH transport channel 303 from the various priority queues 306 in line with their explicit weighting (i.e. the weighting values) and the selected transport format.” Ex. 1003 ¶ 122. Dr. Ding testifies that a person of ordinary skill in the art would have looked to Bucknell “for reading data from priority queues that involve dividing ‘a data packet, such as a MAC-e PDU’ into at least two different portions with ‘different multiplexing rules to be used for the different portions’ to beneficially avoid ‘starvation’ of ‘low priority’ queues, thus enabling ‘flexible and efficient multiplexing of data packets.’” *Id.* ¶ 123 (citing Bucknell ¶¶ 3–6).

According to Dr. Ding, a person of ordinary skill in the art would have substituted Bucknell's priority queues for Eckert's weighting scheme for two reasons:

First, Bucknell's alternatives do not require sending weighting values from a base station to a UE, as is done in Eckert, . . . thus beneficially achieving reducing control signaling overhead compared to Eckert's techniques. **Second**, Bucknell's methods reduce complexity compared to Eckert's use of queue weights by avoiding the use of calculations that involve selecting data from queues in exact proportion to weighting values. Eckert, [0280].

Id. (citing Ex. 1005 ¶¶ 244, 280). Dr. Ding testifies further that using Bucknell's multiplexing scheme instead of Eckert's weighting "would have involved the combination of prior art elements . . . according to known methods . . . to yield the predictable and beneficial result of using the information already existing in Eckert's user equipment to form protocol data units with data from multiple queues, while avoiding starvation of lower priority queues." *Id.* ¶ 124.

c) Patent Owner's argument as to motivation to combine Eckert and Bucknell

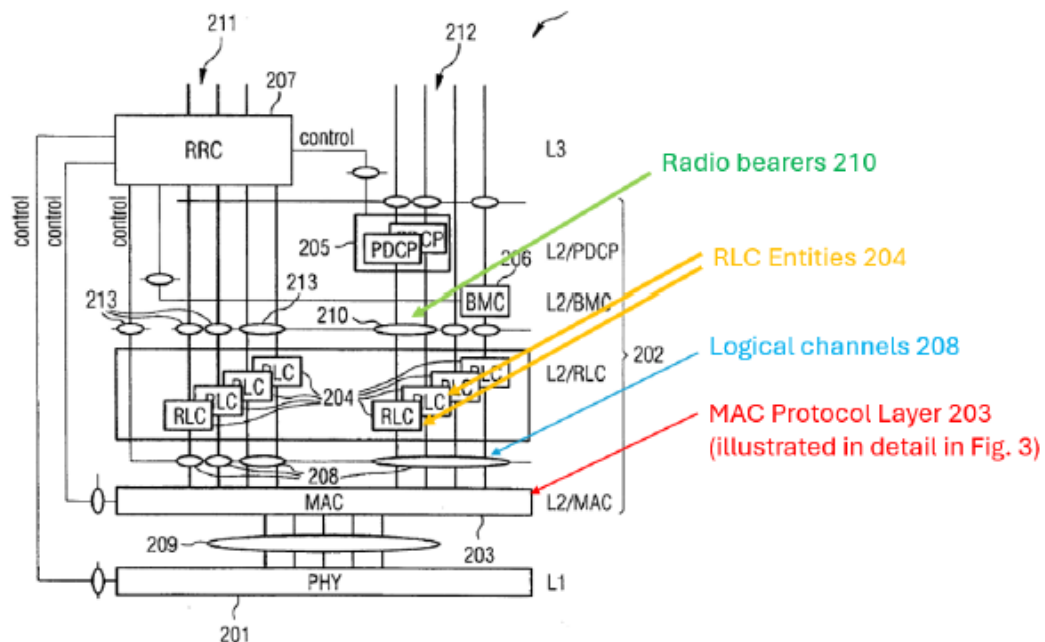
Patent Owner disputes Petitioner's proffered reasons and evidence for combining Eckert and Bucknell, and responds in kind to both Petitioner's priority of the data and the weighting combinations.

(i) Priorities of the data

The parties are at odds over the "priorities of the data" combination, initially because Petitioner argues that it *did* assert this combination in the Petition, whereas Patent Owner contends that "the Petition *never* espoused a cohesive theory that Eckert used 'priorities' *to select data from Eckert's*

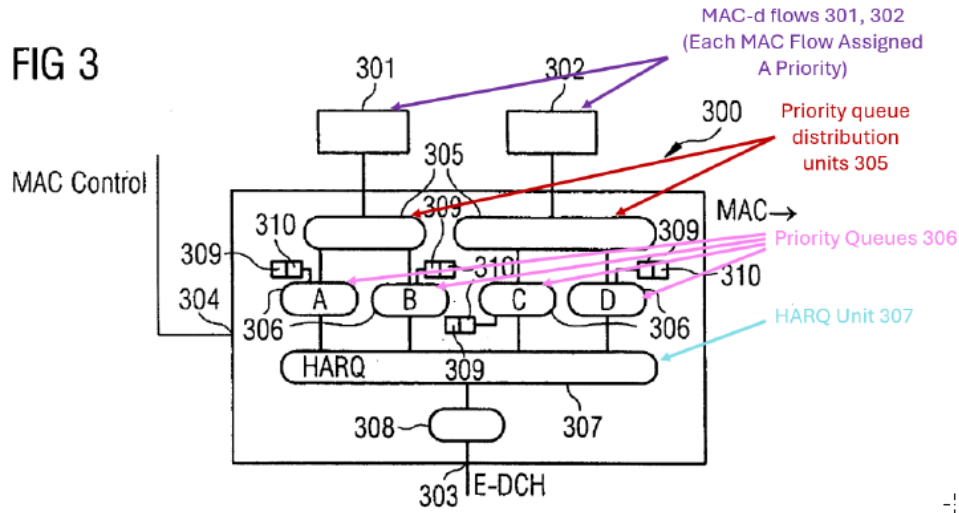
radio bearers 210 (mapped to the claimed ‘plurality of radio bearers’ in Elements [1.4] and [1.5]).” PO Sur-Reply, 11; *see also* Pet. Reply 10–13.

Limitation [1.7] also recites “select[ing] data from the plurality of radio bearers.” Ex. 1001, 14:5. Patent Owner’s argument is that “the ‘priorities’ disclosed in [0228] of Eckert and relied on by Petitioner for its ‘alternate theory’ are used to select data from Eckert’s *priority queues 306*’ which are *not* the same as *Eckert’s radio bearers 210*.” PO Sur-Reply, 11. Considering the annotated versions of Eckert’s Figures 2 and 3, reproduced below, Patent Owner argues that Petitioner’s combination is flawed because “priority queues 306” and “radio bearers 210” are substantially different elements.



Eckert’s Figure 2 diagrammatically illustrates radio bearers 210 (green) and MAC protocol layer 203 (red). *Id.* at 13.

FIG 3



Eckert's Figure 3 depicts schematically MAC layer 203 including priority queues 306 (pink) from which HARQ unit 307 (aqua) selects packet data units (PDUs) according to their priority to forward to E-DCH transport channel.

In sum, Patent Owner argues that Petitioner inaccurately asserts that it relied on a theory that Eckert used “priorities” to select data from Eckert’s *radio bearers 210*, as called for in claim limitation [1.7]. *Id.* at 14. Petitioner’s theory, Patent Owner argues, relies on selecting data from Eckert’s “priority queues 306,” that do not meet “select[ing] data from the plurality of radio bearers” as recited in limitation [1.7]. *Id.*

(ii) *Weightings*

Patent Owner argues that Petitioner’s main combination, which proposes eliminating Eckert’s weightings scheme for proportionally mapping data from queues to the E-DCH transport channel, “and substituting in place thereof several of the priority-based allocation algorithms disclosed in Bucknell . . . would have rendered Eckert inoperable for its intended purpose.” PO Resp. 54 (citing Ex. 1005 ¶¶ 51–52, 81, 235–236; Ex. 2007 ¶ 115).

In response to Petitioner and Dr. Ding’s argument that using Bucknell would reduce signaling overhead, Patent Owner argues that Eckert’s weighting scheme is already intended to *reduce* the signaling overhead. *Id.* at 55 (citing Ex. 1005 ¶ 40; Ex. 2007 ¶ 116). Specifically, Patent Owner argues that substituting Bucknell’s priorities of the data selection scheme goes entirely against Eckert’s weighting scheme for reducing signaling overhead due to “the need for an ‘enormous volume of additional signaling data in the control data header’ to convey the specifics of the queue(s) from which the data transmitted originated, as well as the amount of data from each such queue being transmitted.” *Id.* at 59 (quoting Ex. 1005 ¶ 25).

Patent Owner argues that a person of ordinary skill in the art would have understood that Eckert already disclosed “embodiments where the weightings ‘are *not explicitly signalled*’” and thus there was no need to look for a way, such as in Bucknell, to reduce signaling overhead. *Id.* at 60 (quoting Ex. 1005 ¶ 107) (emphasis added). Patent Owner asserts that Eckert discloses embodiments where:

weighting values can be *assigned* to the priority queues” on the basis of, e.g., the four known traffic classes provided in UMTS, i.e., “conversational, streaming, interactive, background.” *Id.*, [0118]- [0121]. By way of example, Eckert discloses that “streaming data are weighted with 40%, conversational data are weighted with 30%, interactive data are weighted with 20% and background data are weighted with 10%.

Id. (citing Ex. 1005 ¶¶ [0107], [0115] and [0118]).

Patent Owner’s declarant, Dr. Lomp, testifies that “[s]ince Eckert itself discloses a way to implement Eckert’s system without explicitly signaling the weights from the base station to the UE, it is illogical that a POSITA would have been motivated to cast aside Eckert’s weighting methodology to reduce the signalling overhead associated with transmitting

the weighting values.” Ex. 2007 ¶ 124. Dr. Lomp testifies further that “the quantity of signaling data when transmitting data populated into the ‘first portion 90’ and the ‘second portion 95’ using Bucknell’s Examples 1-3 would be enormous compared to Eckert’s solution which conveyed the makeup of the data being transmitted by using a *single* index value (corresponding to the selected transport format).” *Id.* at 61.

With respect to Petitioner and Dr. Ding’s arguments and testimony that Bucknell’s priority data selection would be less complex than Eckert’s weighting scheme, Patent Owner points out that Eckert’s weighting scheme involves “a simple multiplication operation where a weight value (e.g., 40%) is multiplied by the available bandwidth in Eckert.” *Id.* at 62. Patent Owner’s declarant, Dr. Lomp, also downplays the complexity, testifying that “there is no need for the UE in Eckert to do any ‘calculations’ to determine the amount of data associated with each weighting value because, in Eckert, the results of such calculations are already ‘baked into’ the pre-defined transport formats provided by the base station to the UE.” Ex. 2007 ¶ 126 (citing Ex. 1005 ¶ 24). Dr. Lomp testifies further that:

the fraction of a clock cycle of processing required to multiply an available bandwidth quantity by an allocation percentage is so trivial that it would not motivate a POSITA to do away with the benefits of Eckert’s weighting methodology, i.e., the ability to reduce signaling overhead by using a single index value (corresponding to the selected transport format) transmitted in the header to signal to the makeup of the transmitted data to the receiver.

Id.

c) Analysis

Considering the complete record before us, including the parties’ arguments and evidence for combining Eckert and Bucknell, we determine

that Petitioner has failed to provide persuasive reasoning and evidentiary underpinnings that a person of ordinary skill in the art would have combined Eckert and Bucknell as to limitations [1.7]–[1.9].

(i) *Priorities of the data*

In its Reply, Petitioner argues that the Petition “recognizes that Eckert maps data to queues based on *either priority or weighting*—and in the case of priority, the Petition proposes implementing Eckert’s pre-existing priority scheme based on Bucknell’s technique.” Pet. Reply 10 (citing Pet. 40). Petitioner argues that this “establishes obviousness alone.” *Id.* at 10–11. The problem with this theory is that just because two references disclose similar data selection schemes, it does not necessarily follow that a person of ordinary skill in the art would have combined the references. “In determining whether there would have been a motivation to combine prior art references to arrive at the claimed invention, it is insufficient to simply conclude the combination would have been obvious without identifying any reason *why* a person of skill in the art would have made the combination.” *Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017), *see id.* at 1367 (“[W]e also recognize that we cannot allow hindsight bias to be the thread that stitches together prior art patches into something that is the claimed invention.”) (citing *KSR* at 421).

We find that the Petition does not sufficiently explain, or provide persuasive evidence, as to why a person of ordinary skill in the art would have used Bucknell’s priority of the data scheme in place of Eckert’s priority scheme. The Petition states that “[c]onsistent with the teachings in Bucknell, Eckert’s MAC layer, as in Bucknell, includes MAC-e and MAC-d subprotocol layers, and data is split therein over various priority queues and processed in accordance with priorities.” Pet. 49 (citing Ex. 1005 ¶ 167–

170; Ex. 1006 ¶ 2; Ex. 1003 ¶ 120). We acknowledge that the Petition explains that Eckert’s “priorities” includes “priorities of the data,” as an alternative to weightings, and also states that “Bucknell specifies implementation detail for how to select data for a MAC-e PDU according to ‘priorities of the data,’ which fits seamlessly in Eckert’s framework to address this issue.” *Id.* at 50 (citing Ex. 1003 ¶ 121).

Subsequently, in its Reply, Petitioner points to pages 52–53 of the Petition describing that “it would have been obvious to try using *Bucknell’s multiplexing and packet formation techniques* in Eckert’s system because Eckert describes a system that has the information (e.g., priorities associated with queues) needed for applying Bucknell’s rules.” Pet. Reply 12 (quoting Pet. 52–53) (emphasis added). This conclusion is particularly unsatisfying, however, because it does not explain why Bucknell’s rules would be incorporated into Eckert. *See In re Nuvasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (The court explained that “conclusory statements alone are insufficient and, instead, the finding must be supported by a reasoned explanation.”) (internal quotation marks and citations omitted).

Moreover, this is essentially where the Petition, and the Reply, end any substantive analysis of the “priorities of the data” combination, i.e., that both references include embodiments using “priorities of the data” to create the MAC-e PDU, and that “Bucknell specifies implementation detail.” *Id.* Our review of Dr. Ding’s testimony reflects the same assertions and language, and Petitioner’s counsel stressed this same language during oral argument. Ex. 1003 ¶¶ 121–124; Tr. 27:13–20.

However, with respect to Bucknell’s “multiplexing and packet formation” details, Eckert also discusses the use of multiplexing techniques where:

one or more logical channels are multiplexed onto an MAC-d flow 301, 302, with each MAC-d flow 301, 302 in the MAC-d subprotocol layer being assigned a priority, said priority being used by the function priority queue distribution, implemented in a priority queue distribution unit 305 in the MAC-e subprotocol layer 300, to split the data over the data buffer storages 306 with the different priorities, i.e. for processing using data of different priorities in a respective data buffer storage, with a data buffer storage respectively buffer-storing data of one priority.

Ex. 1005 ¶ 170. In this instance, the Petition lacks explanation as to *why* Bucknell’s multiplexing technique, as it pertains to “priorities of the data,” would have been incorporated into Eckert, apart from the fact that both references disclose using “priorities of the data” multiplexing techniques. We appreciate that Bucknell may provide details of a different priority-based multiplexing scheme, for example, to “populate the group of data packets assembled in the first portion 90 and second portion 95 of the output buffer 80.” Ex. 1006 ¶ 25. However, Petitioner’s contention that Bucknell discloses another or different multiplexing scheme for selecting data does not address sufficiently the reason a person of ordinary skill in the art *would have* combined the relevant teachings of Eckert and Bucknell. *See In re Nuvasive*, 842 F.3d at 1381–82 (The court explaining that “[t]he factual inquiry whether to combine references must be thorough and searching, and [t]he need for specificity pervades [our] authority on the PTAB’s findings on motivation to combine.”) (internal quotation marks and citations omitted).

The additional allegation that the combination yields a predictable result is insufficient to persuasively support substituting a priority-based PDU formation as disclosed in Bucknell in place of Eckert’s priorities of the data scheme. *See* Ex. 1003 ¶ 124 (Dr. Ding testifying that “[u]sing Bucknell’s multiplexing scheme for the MAC-e subprotocol layer within the

more complete set of protocol layers of Eckert's system . . . which likewise already has priority queues[] to yield the predictable and beneficial result of using the information already existing in Eckert's user equipment to form protocol data units with data from multiple queues, while avoiding starvation of lower priority queues.").

We also disagree with Petitioner's assertion that "[t]he Petition (and Dr. Ding's original declaration) provided ample technical explanation regarding Bucknell's implementation of Eckert's pre-existing priority-based scheme." Pet. Reply 11–12. Petitioner's argument in its Reply that the combination would "yield the predictable and beneficial result of **using the information already existing in Eckert's user equipment to form protocol data units with data from multiple queues**, while avoiding starvation of lower priority queues," simply assumes a result, without sufficiently explaining the basis for any improvement or benefit. *Id.* at 12 (quoting Pet. 52–53). The mere fact that Eckert could be modified does not satisfy the requirements for a finding of obviousness. *In re Laskowski*, 871 F.2d 115, 117 (Fed. Cir. 1989); *In re Mills*, 916 F.2d 680,682 (Fed. Cir. 1990).

On the complete record before us, Petitioner has not persuasively explained why one of ordinary skill in the art would have been motivated to substitute Bucknell's multiplexing techniques for Eckert's. Petitioner mainly concludes that the combination would "yield the predictable and beneficial result of using the information already existing in Eckert's user equipment to form protocol data units with data from multiple queues," and as discussed above, that "it would have been obvious to try using Bucknell's multiplexing and packet formation techniques in Eckert's system because

Eckert describes a system that has the information (e.g., priorities associated with queues) needed for applying Bucknell's rules." Pet. 52–53.

Dr. Ding's declaration, submitted by Petitioner, is similarly deficient with respect to persuasive explanation or evidentiary support regarding the understanding of a person of ordinary skill as to why Bucknell's multiplexing would have been considered to replace Eckert's as it contains exactly the same language, arguments and unsupported conclusions as the Petition. *Compare* Ex. 1003 ¶ 124, *with* Pet. 52–53. Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight. 37 C.F.R. § 42.65(a). Dr. Ding's Declaration does not provide persuasive facts, data, or analysis to support the opinion stated. Merely repeating an argument from the Petition in the declaration of a proffered expert does not give that argument enhanced probative value.

(ii) Weightings

Different from the "priorities of the data" discussed above, the question here, is whether a person of ordinary skill in the art would have replaced Eckert's queue weighting with Bucknell's multiplexing scheme for the MAC-e subprotocol layer. As noted above, Petitioner provides two rationales that a person of ordinary skill in the art would have substituted Bucknell's multiplexing and packet formation technique for Eckert's queue weighting:

First, Bucknell's alternatives do not require sending weighting values from a base station to a UE, as is done in Eckert, . . . thus beneficially achieving reducing control signaling overhead compared to Eckert's techniques. **Second**, Bucknell's methods reduce complexity compared to Eckert's use of queue weights by avoiding the use of calculations that involve selecting data from queues in exact proportion to weighting values.

Pet. 52. We address each rationale in turn.

We do not find Petitioner’s first rationale persuasive because, as Patent Owner points out, Eckert specifically discloses an embodiment that does not send weightings. Ex. 1005 ¶¶ 118–121. Specifically, Eckert discloses an embodiment that assigns weighting values to the priority queues based on, for example, four known traffic classes in UMTS, “conversational, streaming, interactive, background.” *Id.* ¶ 120. In this embodiment, Eckert explains that “the weightings of the data buffer storages in the MAC-e Subprotocol layer are not explicitly signalled, but rather the data traffic class is assigned to the weightings of the corresponding priority queues.” *Id.* ¶ 118. Eckert describes:

[b]y way of example, the weighting values can be assigned to the priority queues on the basis of the data traffic classes such that streaming data are weighted with 40%, conversational data are weighted with 30%, interactive data are weighted with 20% and background data are weighted with 10%. In other words, this means that the streaming data are assigned 40% of the total available data transmission bandwidth, the conversational data are assigned 30%, the interactive data are assigned 20% and the background data are assigned 10%.

Id. ¶ 121. Patent Owner’s declarant, Dr. Lomp, testifies that “[s]ince Eckert itself discloses a way to implement Eckert’s system without explicitly signaling the weights from the base station to the UE, it is illogical that a POSITA would have been motivated to cast aside Eckert’s weighting methodology to reduce the signalling overhead associated with transmitting the weighting values.” Ex. 2007 ¶ 124. Dr. Lomp testifies, persuasively, that:

the quantity of signaling data when transmitting data populated into the “first portion 90” and the “second portion 95” using Bucknell’s Examples 1-3 would be enormous compared to

Eckert's solution which conveyed the makeup of the data being transmitted by using a *single* index value (corresponding to the selected transport format). The additional signaling overhead required in the control header of each transmission assembled with Bucknell's examples would be orders of magnitude larger than the bandwidth required to transmit Eckert's weightings from the base station to the UE at set-up time.

Id. ¶ 125. Thus, in sum, we are not persuaded by Petitioner's evidence and arguments that the teachings of Bucknell and the desire to reduce control signaling overhead would have motivated a skilled artisan at the time of the invention to modify Eckert in the manner claimed.

We also do not find Petitioner's second rationale persuasive that "Bucknell's methods reduce complexity compared to Eckert's use of queue weights by avoiding the use of calculations that involve selecting data from queues in exact proportion to weighting values." Pet. 52. Patent Owner's declarant, Dr. Lomp, testifies that "there is no need for the UE in Eckert to do any 'calculations' to determine the amount of data associated with each weighting value because, in Eckert, the results of such calculations are already 'baked into' the pre-defined transport formats provided by the base station to the UE." Ex. 2007 ¶ 126 (citing Ex. 1005 ¶ 204). As shown in Eckert's transport format (TF) table below, which is stored in the UE, all the UE needs to receive is the specific transport format, #1, #2, #3 etc., in order to be able to form the respective MAC-e PDU. Ex. 1005 ¶ 124.¹²

¹² Eckert's TF table is consolidated here in our Decision as it is divided (continued) between two columns in Eckert.

TF	PQ #1		PQ #2		PQ #3	
	# of TBs	TB size (bit)	# of TBs	TB size (bit)	# of TBs	TB size (bit)
#1	0	100	0	100	0	100
#2	1	100	0	100	0	100
#3	0	100	1	100	0	100
#4	0	100	0	100	1	100
...	...	...	...	...	...	...
#10	2	200	2	100	0	100
#11	3	200	2	100	1	100
#12	2	300	1	200	2	100
...	...	...	...	...	...	...
# n	5	300	3	300	1	300

Eckert’s table illustrates, for example, that transport format (TF) #12 provides for:

two data packets with a size of 300 bits each in the first priority queue A 306 are added to the protocol data unit, one data packet with a size of 200 bits from data packets in the second priority queue B306, and also two data packets with a size of 100 bits each from the third priority queue C 306. Hence, in line with this transport format, an MAC-e PDU needs to be formed with two data packets with a size of 300 bits, one data packet with a size of 200 bits and two data packets with a size of 100 bits.

Id.

Dr. Lomp testifies persuasively that even if Eckert’s weightings scheme required a calculation, such as “a simple multiplication operation where a weight value (e.g., 40%) is multiplied by the available bandwidth in Eckert,” such a calculation “is so trivial that it would not motivate a POSITA to do away with the benefits of Eckert’s weighting methodology, i.e., the ability to reduce signaling overhead by using a single index value (corresponding to the selected transport format) transmitted in the header to signal to the makeup of the transmitted data to the receiver.” Ex. 2007 ¶ 126. Thus, here also, we are not persuaded by Petitioner’s evidence and

arguments that the teachings of Bucknell and the desire to reduce complexity would have motivated a skilled artisan at the time of the invention to modify Eckert in the manner claimed.

(iii) Dr. Ding's Supplemental Declaration (Ex. 1071)

Responding to Dr. Lomp's testimony in his Supplemental Declaration, Dr. Ding asserts that Dr. Lomp's testimony should be given little weight because it fails to consider the "implementation detail" in Bucknell regarding the priorities of each queue that was provided in Dr. Ding's initial declaration. Ex. 1071 ¶ 27. However, for the same reasons as addressed above in Section III.D.1.c)(ii) we do not credit Dr. Ding's testimony as a sufficient reason to combine. Just because Bucknell's priority-based multiplexing scheme for selecting data from queues could have been implemented in Eckert's protocol stack does not persuade us that a person of ordinary skill in the art would have been motivated to replace Eckert's priority-based multiplexing scheme.

With respect to replacing Eckert's queue weighting with Bucknell's priority-based multiplexing scheme, Dr. Ding contends that Petitioner and Dr. Lomp have focused their arguments on embodiments in Eckert that Dr. Ding did not use in support of Petitioner's combination. *Id.* ¶ 32. Dr. Ding explains that "[m]y first declaration only addresses [Eckert's] embodiments in which queue weights are explicitly signaled from the base station - and in those embodiments, the signaling overhead associated with transmitting the weights is a tangible cost that Bucknell's approach eliminates." *Id.* ¶ 33.

Regardless of which of Eckert's weightings embodiments Petitioner relies on, Eckert clearly discloses a weightings embodiment that *does not* necessitate continuously transmitting control data signaling the weightings.

Ex. 1005 ¶¶ 115–118. Petitioner’s argument is not persuasive because neither Petitioner, nor Dr. Ding, explore why a person of ordinary skill in the art would have needed Bucknell’s priority-based queues to eliminate signaling the queue weightings when Eckert itself specifically discloses an embodiment where “[t]he weightings of the data buffer storages in the MAC-e Subprotocol layer are not explicitly signalled, but rather the data traffic class is assigned to the weightings of the corresponding priority queues.” Ex. 1005 ¶¶ 115–118; *see In re Anova Hearing Labs, Inc.*, 809 F. App’x 840, 843 (Fed. Cir. 2020) (The Federal Circuit faulting the Board because it “does not explain why a person of skill in the art would conclude that Brown needed to be modified.”).

Overall, we find that the most persuasive evidence suggesting combining Bucknell’s priority of the data selection scheme with Eckert and “using a first iteration and a second iteration” as recited in limitation [1.7] is the ’138 patent itself. *See* Ex. 1001, 11:63–66 (explaining data selection iterations where “if the sum of all RAAU allocated is greater than freeRAAU . . . then the RAAUq” may be modified in step 655.). The Supreme Court in *KSR* recognized “the distortion caused by hindsight bias” and the danger of “arguments reliant upon ex post reasoning” in determining obviousness. *KSR*, 550 U.S. at 421; *see InTouch Technologies, Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1351 (Fed. Cir. 2014) (“It appears that [the expert] relied on the . . . patent itself as her roadmap for putting what she referred to as pieces of a jigsaw puzzle together.”); *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) (“To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge,

is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.”).

Our review of the entirety of Dr. Ding’s testimony and the failure to cite any persuasive evidence to support his assertions regarding undertaking a first and second iteration as recited in limitation [1.7] leads us to the conclusion that Petitioner’s declarant fell victim to such *ex post* reasoning. We agree with and credit Dr. Lomp’s testimony that Dr. Ding’s testimony cannot support a motivation to combine. *See* Ex. 2007 ¶¶ 123–127. Thus, we agree with Patent Owner that Petitioner’s “reducing control signaling overhead” and “complexity” rationales lack the necessary “articulated reasoning with rational underpinnings” required to support Petitioner’s combination of Eckert and Bucknell in the asserted obviousness challenges. *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Finally, Lohr-1 is not relied on by Petitioner with respect to the step of “using a first iteration and a second iteration” as recited in limitation [1.7] and therefore does not cure the deficiencies discussed in our analysis above with respect to Eckert and Bucknell.

Accordingly, we determine on the complete record now before us that Petitioner has not proven by a preponderance of the evidence that claims 1–4 and 8–11 would have been obvious over Eckert in view of Bucknell and Lohr-1.

E. Ground 2: Claims 5 and 12 as obvious over Eckert in view of Bucknell, Lohr-1, and Hans

Petitioner contends that Eckert in view of Bucknell, Lohr-1, and Hans teaches or suggests each limitation of dependent claims 5 and 12. Pet. 63–73. Because we determine that Petitioner has failed to show that claims 1

and 8 would have been obvious over Eckert and Bucknell, and Petitioner's reliance on Lohr-1 and Hans does not remedy this deficiency for these dependent claims, Petitioner has not demonstrated by a preponderance of the evidence that claims 5 and 12 would have been obvious over Eckert in view of Bucknell, Lohr-1, and Hans. *Id.*

F. Ground 3: Claims 6 and 13 as obvious over Eckert in view of Bucknell, Lohr-1, and Lohr-2

Petitioner contends that Eckert in view of Bucknell, Lohr-1, and Lohr-2 teaches or suggests each limitation of dependent claims 6 and 13. Pet. 73–78. Because we determine that Petitioner has failed to show that claims 1 and 8 would have been obvious over Eckert and Bucknell, and Petitioner's reliance on Lohr-1 and Lohr-2 for these dependent claims does not remedy this deficiency, Petitioner has not demonstrated by a preponderance of the evidence that claims 6 and 13 would have been obvious over Eckert in view of Bucknell, Lohr-1, and Lohr-2. *Id.*

IV. CONCLUSION

Petitioner has not proven by a preponderance of the evidence that claims 1–4 and 8–11 would have been obvious over Eckert, Bucknell, and Lohr-1.

Petitioner has not proven by a preponderance of the evidence that claims 5 and 12 would have been obvious in view of Eckert, Bucknell, Lohr-1, and Hans.

Petitioner has not proven by a preponderance of the evidence that claims 6 and 13 would have been obvious in view of Eckert, Bucknell, Lohr-1, and Lohr-2.

Our conclusion is summarized in the following table.

Claim(s)	35 U.S.C. §	Reference(s) /Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1–4, 8–11	103(a)	Eckert, Bucknell, Lohr-1		1–4, 8–11
5, 12	103(a)	Eckert, Bucknell, Lohr-1, Hans		5, 12
6, 13	103(a)	Eckert, Bucknell, Lohr-1, Lohr- 2		6, 13
Overall Outcome				1–6, 8–13

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED, based on a preponderance of the evidence, that claims 1–6 and 8–13 are not unpatentable; and

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

IPR2025-00343
Patent 10,292,138 B2

FOR PETITIONER:

Scott Jarratt
Jonathan Bowser
Clint Wilkins
HAYNES AND BOONE LLP
scott.jarratt.ipr@haynesboone.com
jon.bowser.ipr@haynesboone.com
clint.wilkins.ipr@haynesboone.com

Paul Margulies
TESLA, INC.
pmargulies@tesla.com

FOR PATENT OWNER:

Brandon Theiss
Daniel Golub
Ryan O'Donnell
Robert Leonard
VOLPE KOENIG
btheiss@vklaw.com
dgolub@vklaw.com
rodonnell@vklaw.com
rleonard@vklaw.com
rrigby@intven.com

Russell Rigby
INTELLECTUAL VENTURES II LLC
rrigby@intven.com