UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

IPR2025-00217
Patent 10,952,153 B2

Before KRISTEN L. DROESCH, FREDERICK C. LANEY, and AARON W. MOORE, *Administrative Patent Judges.*

LANEY, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

We have authority to hear this *inter partes* review under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, Petitioner has not established by a preponderance of the evidence that claims 1–5, 10–15, and 20 ("challenged claims") of U.S. Patent No. 10,952,153 B2 (Ex. 1001, "the '153 Patent") are unpatentable.

A. Background and Procedural History

Tesla, Inc. ("Petitioner") filed a petition requesting *inter partes* review of claims 1–5, 10–15, and 20 of the '153 Patent. Paper 2 ("Petition" or "Pet."). Intellectual Ventures II LLC ("Patent Owner") timely filed a Preliminary Response. Paper 7 ("Prelim. Resp."). Upon review of the parties' arguments and supporting evidence, we instituted review with respect to all grounds and claims set forth in the Petition. Paper 11 ("Institution Decision" or "Inst. Dec.").

Following institution, Patent Owner filed a Response to the Petition (Paper 15, "PO Resp." or "Response") to which Petitioner filed a Reply (Paper 18, "Pet. Reply" or "Reply"), and Patent Owner filed a Sur-reply (Paper 19, "PO Sur-reply").

In support of the Petition, Petitioner relies upon the declaration of Michael D. Kotzin, Ph.D. Ex. 1003. In support of the Response, Patent Owner relies upon a declaration of Gary Lomp, Ph.D. Ex. 2016. In support of the Reply, Petitioner relies further upon the supplemental declaration of Dr. Kotzin (Ex. 1072) and Petitioner submits the transcript of Dr. Lomp's deposition (Ex. 1071).

An oral hearing was held on April 7, 2026, and a transcript of the hearing is included in the record. Paper 24.

B. Real Parties-in-Interest

Petitioner and Patent Owner each identifies itself as the real party in interest. Pet. 80; Paper 3 (Patent Owner's Mandatory Notices).

C. *Related Matters*

The parties identify the following related federal district-court litigation involving the '153 patent: *Intellectual Ventures II LLC v. Tesla, Inc.*, No. 1-24-cv-00390 (W.D. Tex. April 11, 2024); *Intellectual Ventures II LLC v. Tesla, Inc.*, No. 6-24-cv-00188 (W.D. Tex. April 12, 2024); *Intellectual Ventures II LLC v. Tesla, Inc.*, No. 1-24-cv-00884 (W.D. Tex. April 12, 2024). Pet. 80; Paper 3.

D. The '153 Patent

The '153 patent is titled "Power control in a wireless network" and relates to network-device transmit power control (TPC) commands that may have a plurality of predefined levels. Ex. 1001, codes (54), (57). The '153 patent describes that "wireless communication system[s] often employ one of either an open loop scheme or a closed loop scheme to control uplink transmit power of a mobile radio." *Id.* at 1:58–60. Uplink refers to the link from user equipment (UE) to a base station. *Id.* at 1:60–67. Transmitting with increased power results in fewer errors as compared with decreased power, but can interfere with other signals sharing the radio link. *Id.* at 1:35–41. Transmissions are evaluated using "signal to noise-plus-interference ratio (SNIR)," and open-loop control uses a "SNIR Target value that is derived by the network and signaled to the UE." *Id.* at 2:1–7, 2:24–26. In closed-loop control, "received SNIR measurement is made by the

network on an uplink signal" and then transmit power control (TPC) commands are sent from the network to the UE. *Id.* at 2:36–45.

Because the "open loop method is relatively slow at compensating for changes due to interfering signals from other transmitters" and "closed loop methods demand a very high command update rate," the '153 patent uses a combination of both approaches. Ex. 1001, 2:33–35, 2:44–48, 2:63–3:48. In addition, it discloses that a UE may accumulate TPC commands to determine uplink power level. *E.g., id.* at 7:4–6, 7:43–46, 9:28–40.

E. Challenged Claims

Petitioner challenges claims 1–5, 10–15, and 20 of the '153 Patent. *See* Pet. 1. Claim 1 is independent and is reproduced below, including the parties' bracketed limitation designations:

1. A user equipment (UE) comprising:

[1.1] a transmitter;

a receiver; and

a processor operatively coupled to the transmitter and the receiver,

wherein the processor is configured to cause:

[1.2] the receiver to receive, from a network device, an indication that transmit power control (TPC) command accumulation is enabled,

[1.3] the receiver to receive, from the network device, on a single physical channel, scheduling information and power control information that includes a multi-level TPC command, and

[1.4] the transmitter to transmit, to the network device, an uplink signal based on the received scheduling information and the multi-level TPC command.

Ex. 1001, 13:59–14:7. Claims 2–5 and 10 depend directly from claim 1. *Id.* at 14:8–19, 14:35–37. Claim 11 is independent and recites a method with limitations similar to claim 1. *Id.* at 14:38–49. Claims 12–15 and 20 depend directly from claim 11. *Id.* at 14:50–60, 15:9–11.

F. Patentability Challenges and Asserted Prior Art

Petitioner challenges the patentability of claims 1–5, 10–15, and 20 on the following grounds and prior art (*see* Pet. 16):

Claim(s) Challenged	35 U.S.C. §[1]	Reference(s)/Basis
1, 2, 4, 5, 11, 12, 14, 15	103(a)	Andersson[2], Baker[3], Khan[4]
3, 13	103(a)	Andersson, Baker, Khan, Dick[5]
1, 2, 4, 5, 10–12, 14, 15, 20	103(a)	Zeira[6], Baker, Khan, Tong[7]
3, 13	103(a)	Zeira, Baker, Khan, Tong, Dick

II. ANALYSIS

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is

[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the application from which the '153 patent issued claims priority to an application filed before this date, the pre-AIA version of § 103 applies.
[2] US 6,334,047 B1, iss. Dec. 25, 2001 (Ex. 1009).
[3] US 2001/0036238 A1, pub. Nov. 1, 2001 (Ex. 1010)
[4] US 2004/0190485 A1, pub. Sept. 30, 2004 (Ex. 1005).
[5] US 2004/0077370 A1, pub. Apr. 22, 2004 (Ex. 1008).
[6] US 6,600,772 B1, iss. July 29, 2003 (Ex. 1004).
[7] US 6,529,741 B1, iss. Mar. 4, 2003 (Ex. 1007).

unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 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 the patent owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). Moreover, a petitioner should not "place the burden on [the Board] to sift through information presented by the Petitioners, determine where each element [of the challenged claims] is found in [the cited references], and identify any differences between the claimed subject matter and the teachings of [the cited references]." *Google Inc. v. EveryMD.com LLC*, IPR2014-00347, Paper 9 at 25 (PTAB May 22, 2014).

A patent claim is unpatentable for obviousness under pre-AIA 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). In *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness that requires consideration of four factors: (1) the "level of ordinary skill in the pertinent art," (2) the "scope and content of the prior art," (3) the "differences between the prior art and the claims at issue," and (4) "secondary considerations" of nonobviousness such as "commercial success, long felt but unsolved needs, failure of others, etc."[8] *Id.* at 17–18;

[8] The parties do not present evidence of secondary considerations.

KSR, 550 U.S. at 407. An obviousness determination requires finding a reason to combine accompanied by a reasonable expectation of achieving what is claimed in the challenged patent. *See Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016). "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *KSR*, 550 U.S. at 419–20.

We analyze the asserted grounds of unpatentability in accordance with these principles

A. Level of Ordinary Skill in the Art

Petitioner asserts that ordinarily skilled artisans "would have a bachelor's degree in electrical engineering, computer engineering, computer science, or equivalent training, and approximately two years of experience working in the field of wireless communication systems or design of similar communication systems." Pet. 15. Petitioner's proposed definition, which Patent Owner does not dispute, appears reasonable and consistent with the asserted prior art and the '153 patent. Therefore, we adopt it as the ordinary level of skill of an artisan in the field of the patented technology for our analysis below.

B. Claim Construction

We interpret the challenged claims

> 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), including construing 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.

37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

In the Petition, Petitioner contends that "no claim term requires express construction." Pet. 15. This is so, Petitioner asserts, because all the terms in the challenged claims carry their ordinary and customary meaning to a skilled artisan. *Id.* In the Institution Decision, however, we noted that an apparent unaddressed dispute regarding the scope of "transmit power control (TPC) command accumulation" recited in limitation 1.2 existed and we invited the parties to address this dispute directly. Inst. Dec. 8–9.

Patent Owner accepted our invitation and, additionally, Patent Owner offers a proposed construction for the recited "single physical channel" found in limitation 1.3. PO Resp. 11–19. Petitioner likewise addresses the scope of TPC command accumulation, but Petitioner does not contest directly Patent Owner's proposed construction for "single physical channel." Pet. Reply 2–7. Because the scope of "TPC command accumulation" is central to resolving the dispute between the parties regarding whether the prior art discloses or suggests limitation 1.2 in this proceeding, we address that phrase below. But we determine that no express construction of any other claim term is necessary to resolve the dispute between the parties. *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))).

TPC Command Accumulation. Limitation 1.2 recites: "the receiver to receive, from a network device, an indication that transmit power control (TPC) command accumulation is enabled." Ex. 1001, 13:65–67. Although the prior art's user equipment (UE) indisputably receives a type of indicator, a controversy exists regarding whether the disclosed indicator(s) is an indication that *the TPC command accumulation is enabled*. This controversy necessitates resolving what exactly "TPC command accumulation" encompasses so as to know what limitation 1.2 requires the network device to be indicating is enabled.

Patent Owner contends that "TPC command accumulation" does not have any specialized meaning, that it is "broad on its face," and that "[t]he ordinary meaning of 'accumulate' is to collect or gather together so that the accumulated items have a combined effect." PO Resp. 12. Patent Owner states that "the plain language requires only that TPC commands cumulatively affect transmit power, such as by being added into an accumulator—even if the effect is applied once per frame or otherwise less frequently." *Id.* at 12–13. Patent Owner "submits that the claim language 'TPC command accumulation' should be construed to mean 'adding a TPC command value to an integrator.'" *Id.* at 17.

Responding to the Institution Decision, Petitioner asserts that we misapprehended the nature of claim construction dispute as "turn[ing] on ***when*** UE transmit power is updated based on the received TPC commands."

Pet. Reply 2 (citing Inst. Dec. 8–9). Petitioner agrees with Patent Owner's construction (and our characterization of Patent Owner's position in the Institution Decision) in so far as TPC command accumulation means "TPC commands cumulatively affect transmission power." *Id.* at 3 (citing Inst. Dec. 8). The dispute, Petitioner contends, is regarding ***how*** the "cumulative affect" is determined and whether *each* TPC command adjustment must be summed to cumulatively affect transmission power. *Id.* Regardless of when the accumulated TPC commands are applied in order to affect the transmission power, Petitioner states that the specification of the '153 Patent "describes summing adjustment magnitudes associated with received TPC commands and outputting a single, cumulative "sum" to update—and thus cumulatively affect—transmission power: an "accumulator [has] **an input for accepting step increase and decrease instructions** and **an output providing <u>a sum</u> of past step instructions**." *Id.* at 5 (citing Ex. 1001, 3:41–43). Petitioner contends that "TPC command accumulation is not enabled because TPC command values are not summed within an integrator." *Id.* at 4.

Responding to Patent Owner's proposed construction, however, Petitioner argues paradoxically that "requiring 'adding a TPC command value to an integrator' finds no support in the claims, specification, or even [Patent Owner]'s own claim construction arguments" because the '153 patent claims do not recite an "integrator," the specification does not "define or require TPC accumulation to use an integrator," and Patent Owner only points to instances an embodiment in the specification uses an integrator, but nothing that indicates the embodiment "***requires*** an integrator" to perform

TPC command accumulation. Pet. Reply 6–7 (citing PO Resp. 12–17, Ex. 1001, 3:13–33, 4:13–16, 7:4–6, 7:18–20, 7:43–46, 10:14–17, 13:33–36, 13:50–57, 13:59–15:11; Ex. 1072 ¶ 25). Petitioner argues that Patent Owner commits a "cardinal sin of patent law" by "impermissibly read[ing] the integrator example from the specification into the claims." *Id.* at 7.

We start our claim construction analysis at a point where there is apparent agreement between the parties: "TPC command accumulation" refers to a process that collects and uses TPC commands from a network device to cumulatively affect transmission power. And having studied the intrinsic record of the '153 patent, we are in accord. But, we decline to further limit the construction of "TPC command accumulation" in the manner proposed by either party—i.e., (1) *each* TPC command adjustment must be summed to cumulatively affect transmission power (as proposed by Petitioner) or (2) a TPC command value must be added to an integrator. Although both parties are able to point to disclosures in the '153 Patent where the TPC command accumulation of an exemplary embodiment is described as using an integrator and/or summing each TPC command adjustment to cumulatively affect a UE's transmission power (PO Resp. 16 (citing Ex. 1001, 3:39–43, 7:15–29, 9:27–42; Ex. 2016 ¶¶ 35–42); Pet. Reply 4–5 (citing Ex. 1001, 3:39–43, 7:2–6, 7:8–22, 9:28–40)), neither party has demonstrated persuasively that the intrinsic record of the '153 Patent demonstrates a clear intent to limit "TPC command accumulation" to those particular embodiments.

Turning first to the context in which "TPC command accumulation" is used in the claims, limitation 1.2 refers to TPC command accumulation as

something a network device can indicate is enabled to the UE's receiver, which suggests that the network device can control when the UE's receiver will receive an indication that the TPC command accumulation is enabled. *See* Ex. 1001, 13:65–67. The remaining limitations of claim 1 recite generally that the UE's receiver also receives TPC commands from that network device and that the UE's transmitter transmits an uplink signal based on the received TPC commands to that network device. *Id.* at 14:1–7. Notably, nothing about the context of TPC command accumulation within claim 1 suggest its cumulative affect must be determined in any particular way; instead, the affected transmission is recited broadly as being "based on" the received TPC commands.

The specification of the '153 Patent teaches that "[t]he UE accumulates the TPC commands and uses the accumulated TPC commands to set a transmit power for future uplink transmission." Ex. 1001, 7:43–46; *see id.* at 7:4–6 ("A UE accumulates the increase and decrease TPC commands to determine a proper uplink transmit power level"); 10:14–17 ("The UE accumulates the TPC commands and uses the accumulated TPC commands in part to set the transmit power level for future uplink transmissions.") (internal numbered references omitted). The specification explains that the TPC commands sent by a network device are collected by a UE to give the network device some control over the UE's transmission power, which is generally accomplished by using the TPC commands received from the network device to direct how the UE's previous transmission power should be adjusted to conform to the target power that the network device has determined is appropriate for the UE to transmit

information. *See* Ex. 1001, 6:66–7:12, 7:20–29. The '153 Patent explains that "the UE measures a power level of a received signal, receives a TPC command, and calculates a transmit power level based on the power level of the received signal and the TPC command." *Id.* at 13:28–31. The '153 Patent emphasizes that TPC commands need only be a factor in the cumulatively affected transmission power:

> a UE may receive a TPC command instructing it to change its transmit power by one step level in a particular direction, but the UE may actually change its transmit power level by a different amount or in fact an amount in the opposite direction. The UE uses the TPC only as a factor in determining whether to increase transmit power level, decrease transmit power level or leave the transmit power level unchanged.

Id. at 10:49–56; *see id.* at 11:23–28 ("Therefore, even though a UE receives a network TPC command instructing it to step up or down its uplink transmit power by 1 dB, the UE may actually change the transmit power level by a different amount."). These teachings from the '153 Patent support the understanding that "TPC command accumulation" refers broadly to the process of collecting and using the TPC commands to cumulatively affect the transmission power that a UE generates to transmit information because the specification makes clear that the way in which the TPC commands are actually processed to cumulatively affect the transmission power is flexible beyond the exemplary embodiments provided.

In view of the above context provided by the claims and the specification of the '153 Patent, we find that the portions of the specification cited by parties are merely describing exemplary embodiments and lack any clear indication that the embodiments are to be understood as coextensive

with the scope of the recited "TPC command accumulation." We agree with Petitioner that Patent Owner commits "a cardinal sin of patent law" by impermissibly reading the integrator example from the specification into the claims, but that reasoning applies equally to Petitioner's attempt to read into the claims the example of each TPC command adjustment being summed to cumulatively affect transmission power. Therefore, we determine that the "TPC command accumulation" is properly construed as "a process that collects and uses TPC commands from a network device to cumulatively affect transmission power."

In resolving what limitation 1.2 requires the network device to indicate is enabled, we note that the specification's only description of enabling accumulation treats it as a selection among power-control regimes. The '153 Patent describes "a new parameter . . . [that] instructs a UE to enable or disable" the setting of transmit power based on both path-loss estimation and TPC commands, and that "may indicate whether a UE is to use open loop power control, closed loop power control or a combined scheme." Ex. 1001, 13:11–20. We rely on this disclosure not to add a further limitation to our construction, but as intrinsic context confirming that the recited indication is directed to whether the accumulation regime is in use, as distinct from how an adjustment is carried out once such regime is operating.

C. Overview of the Relevant Prior Art[9]

1. Andersson

Andersson is titled "Adaptive Power Control in a Mobile Radio Communications System" and states that it relates to "radio transmission power control in a code division multiple access cellular radio communications system." Ex. 1009, code (54), 1:6–8. Andersson identifies the problem it addresses, stating that a "drawback with sending variable step size power control commands is added overhead," because, "[i]n order to compensate for quickly changing transmission conditions, the variable step sizes must be transmit[ted] very frequently," such that "there is a need to reduce undesirable signaling overhead." *Id.* at 5:15–27.

As its general approach, Andersson states that "[i]ncluded with the transmit power control command is a power control indicator indicating whether a first or a second type of power control adjustment should be used by the radio transceiver depending upon the determined difference." Ex. 1009, code (57). Andersson describes the transmit power control command, stating that a station sends a "transmit power control bit having one value . . . instructing the other station to decrease its transmit power by a predetermined increment, e.g., 1 dB." *Id.* at 3:40–47. Andersson states that

[9] Petitioner contends that each asserted reference is within the scope of available prior art for the '153 Patent under 35 U.S.C. § 102 and Patent Owner does not dispute that assertion. Pet. 16–17; *see generally* PO Resp. We are persuaded that the asserted references are properly within scope of available prior art. In addition, we provide an overview of only those references that are relevant to the issues addressed in this Decision.

TPC commands "may include a command to increase, decrease, or maintain transmit power." *Id.* at 9:12–20.

Andersson describes an example using more than one bit, stating that "two redundant TPC bits" may be used, where "'00'=lower power and '11'=raise power." Ex. 1009, 10:63–65. Andersson describes the power control indicator, stating that the "power control indicator includes only a single flag bit." *Id.* at 13:16–17. Andersson states that the indicator indicates whether a "first or a second type" of adjustment is used, such as "first and second step sizes." *Id.* at 9:40–42. Andersson describes the setting of the indicator, stating that the base station sets its value "according to the determined power control adjustment factor." *Id.* at 12:41–43, Fig. 8.

As to signaling, Andersson states that the "dedicated physical control channel (DPCCH)" is divided into frames and slots. Ex. 1009, 9:14–17. Andersson states that each slot "may include a pilot field . . . a traffic power control (TPC) command . . . a power control indicator or flag, and other bits." *Id.* at 9:17–21, Fig. 5. As to timing, Andersson states that the DPCCH is "divided into 72 frames," where each "10 msec frame is made up of 16 time slots each lasting 0.625 msec." *Id.* at 9:14–17.

2. Baker

Baker is titled "Radio Communication System" and states that it relates to a "radio communication system," with "particular reference to the emerging Universal Mobile Telecommunication System (UMTS)." Ex. 1010 code (54), ¶ 1. Baker states that the system uses the "UMTS Frequency Division Duplex (FDD) standard." *Id.* ¶ 6. Baker identifies the problem it addresses, stating that "[a] problem in a communication system

having variable power control step sizes is how to ensure that the step size remains set to its optimum value." *Id.* ¶ 7.

As its general approach, Baker describes a "receiving station" that "determines, from measurements of characteristics of signals received from the transmitting station, an appropriate rate of adjustment of the output power . . . and means for communicating said rate of adjustment." Ex. 1010 ¶ 9. Baker describes the transmit power control command, stating that instructions are "conveyed by two-state Transmit Power Control (TPC) commands, transmitted once per time slot." *Id.* ¶ 21. Baker states that, if a received command is "'0' then the MS 110 reduces its transmission power by Δ_TPC dB, while if the received command is '1' the MS 110 increases its transmission power by Δ_TPC dB." *Id.* ¶ 22. Baker describes combining commands, stating that the system may emulate "a power control step size of approximately 0.2 dB" by combining commands in groups of five. *Id.* ¶ 23.

Baker describes the parameters that govern the step size, stating that it is controlled by the "PCA (Power Control Algorithm) and Δ_TPC (uplink Transmit Power Control step size)." Ex. 1010 ¶ 21. Baker describes the setting of those parameters, stating that the base station "determines, based on the rate of change of SIR, appropriate settings for the PCA and Δ_TPC parameters." *Id.* ¶ 37. As to signaling, Baker states that communication occurs on a "downlink channel 122" and an "uplink channel 124," and that TPC commands are "transmitted once per time slot." *Id.* ¶¶ 20–21. As to timing, Baker states that there are "15 time slots per 10 ms frame." *Id.* ¶ 21.

3. Khan

Khan is titled "Method of Scheduling Grant Transmission in a Wireless Communication System" and states that the "invention relates to telecommunications and, more particularly, to wireless communications." Ex. 1005, code (54), ¶ 1. Khan identifies the problem it addresses, stating that, in systems supporting reverse link packet access, a "scheduling grant channel may be difficult to realize, given the time-multiplexed slot structure," and that "[c]onsequently, a need exists for a method of carrying control information, such as scheduling grants, for reverse link packet access transmission." *Id.* ¶ 11.

As its general approach, Khan describes a method that comprises "transmitting forward link data having at least one time multiplexed scheduling grant." Ex. 1005 ¶ 13. Khan describes the contents of the scheduling grant, stating that it may include "user identification information (e.g., AT ID), rate indication information . . . and HARQ control information." *Id.* ¶ 12. Khan states that the control information for the reverse link may also include "transmit power control ('TPC') information." *Id.* ¶ 12. Khan describes the use of a MAC index, stating that each mobile "may be allocated a unique MACIndex that is used as AT ID in order to indicate . . . if it has been scheduled." *Id.* ¶ 45.

Khan states that the forward link includes the "Pilot Channel, the Forward Medium Access Control ('MAC') Channel, and the Forward Traffic Channel or the Control Channel," which are "time-division multiplexed." Ex. 1005 ¶¶ 37–38. Khan describes the composition of the MAC Channel, stating that it includes subchannels such as the "Reverse

Power Control ('RPC') Channel," the "Reverse Activity ('RA') Channel," and the DRCLock channel. *Id.* ¶ 39. Khan states that the RPC Channel is used "for the transmission of the RPC bit stream," and that the "RPC data rate may be 600 bps." *Id.* ¶ 42. Khan states that the forward link consists of "slots of length 2048 chips (1.66 . . . ms)," and that each slot is "divided into two half slots." *Id.* ¶ 38.

4. Zeira

Zeira is titled "Combined Closed Loop/Open Loop Power Control in a Time Division Duplex Communication System" and states that the "invention generally relates to spread spectrum time division duplex (TDD) communication systems." Ex. 1004, code (54), 1:6–8. Zeira describes TDD systems as using "repeating frames 34 divided into a number of time slots 36, such as fifteen time slots." *Id.* at 1:45–48. Zeira identifies limitations in the two power-control approaches it addresses. It states that "[t]he update rate of closed loop power control in TDD is 100 cycles per second which is not sufficient for fast fading channels," and that "[o]pen loop power control is sensitive to uncertainties in the uplink and downlink gain chains and interference levels." *Id.* at 2:13–17. Zeira further states that, in a highly dynamic environment, "the path loss estimate for open loop severely degrades the overall system's performance." *Id.* at 2:43–47.

As its general approach, Zeira states that "[c]ombined closed loop/open loop power control controls transmission power levels in a spread spectrum time division duplex communication station." Ex. 1004, 2:52–55. Zeira describes setting a transmission power level "based on in part the path loss estimate weighted by a factor and power commands." *Id.* at 3:2–5.

Regarding the closed-loop component, Zeira states that, "[b]ased on a comparison of the determined SIR with a target SIR (SIR_TARGET), a closed loop power command is generated, b_TPC." *Id.* at 4:5–8. Zeira states that the command b_TPC is "either +1 or -1." *Id.* at 6:24.

Zeira describes the application of the command, stating that the closed-loop factor "increases by 1 dB if b_TPC is +1 and decreases by 1 dB if b_TPC is -1." Ex. 1004, 6:29–31. Zeira states that this factor is "typically updated at a rate of 100 ms in a TDD system." *Id.* at 6:25–27.

Zeira teaches weighting the open-loop component and states that "[t]he weighting value, α, is determined by the quality measurement device 114," and that "α is a measure of the quality of the estimated path loss and is, preferably, based on the number of time slots, D, between the time slot of the last path loss estimate and the first time slot of the communication transmitted by the transmitting station 52." Ex. 1004, 6:32–38. Zeira further states that an "operator may use solely closed loop power control by setting α to zero." *Id.* at 7:11–12.

Zeira states that, where the receiving station is a base station, communications are "preferably sent over a downlink common channel or a common control physical channel (CCPCH)." Ex. 1004, 4:17–20. Zeira states that TPC commands are "typically sent in a dedicated channel." *Id.* at 4:28–30. Zeira states that path-loss transmission power levels are "sent via the broadcast channel (BCH)." *Id.* at 5:24–25.

D. Grounds 1–4

Petitioner contends, in Grounds 1 and 2, that claims 1–5 and 11–15 are unpatentable because they recite obvious combinations in view of

Andersson, Baker, Khan and Dick. Pet. 16. In Grounds 3 and 4, Petitioner contends that claims 1–5, 11–15, and 20 are unpatentable because they recite obvious combinations in view of Zeira, Baker, Khan, Tong, and Dick. *Id.* Patent Owner asserts that all of the Grounds are deficient because Petitioner has failed to establish that the prior art discloses every recited limitation of independent claims 1 and 11; in particular, limitations 1.2 and 1.3, which are common to both challenged independent claims. *See* PO Resp. 31–65. Patent Owner does not otherwise dispute Petitioner's contentions in Grounds 1–4. *See id.* Therefore, we focus our analysis accordingly.

After studying the evidence and arguments developed by the parties throughout this proceeding, we agree with Patent Owner that limitations 1.2 and 1.3 are dispositive. For the reasons discussed below, Petitioner's evidence does not demonstrate persuasively that the prior art discloses or suggests either limitation 1.2 or limitation 1.3.

1. Limitation 1.2—the receiver to receive, from a network device, an indication that transmit power control (TPC) command accumulation is enabled

Relying exclusively on Andersson, Baker, and Zeira of the cited prior art, Petitioner contends first that Andersson, in view of Baker, describes a power control indicator sent from a base station (i.e., network device) to a mobile station's (i.e., UE's) receiver that discloses or suggests the recited "indication that TPC command accumulation is enabled"; Petitioner contends next that Zeira's "weighting factor α," which a *network operator* can, if they "desire," set to zero and nullify the results of the TPC command accumulation, discloses the recited indication and that, when viewed in light

of Baker, it would have been obvious for that indication to have been sent from a network device. *See* Pet. 34–36, 54–58. We address each in turn.

a. The Power Control Indicator of Andersson in View of Baker

Petitioner contends that the combination of Andersson and Baker renders limitation 1.2 obvious. Pet. 34–36; Ex. 1003 ¶¶ 88–93. Petitioner maps the claimed accumulation to Andersson's teaching that its "mobile station receives and detects the TPC command and power control indicator and makes the appropriate adjustment to its transmit power based thereon," and reasons that "each received TPC command iteratively 'adjust[s]' the 'current transmit power'--i.e., TPC command accumulation." Pet. 34 (citing Ex. 1009, 12:45–48, 9:4–6).

Petitioner then relies on Andersson's "power control indicator," which "indicate[s] whether a first type or a second type of power control adjustment should be used depending upon the difference" in signal quality, to argue that "the power control 'indicator' is an indication that a particular type of power control adjustment is enabled," and that "a well-known type of power control adjustment before the '153 patent was TPC accumulation." Pet. 34–35 (citing Ex. 1009, 9:1–11; Ex. 1003 ¶¶ 46–47, 90).

Recognizing the gap, Petitioner argues that "[t]o the extent Andersson does not explicitly teach 'transmit power control (TPC) command accumulation' as a 'type of power control adjustment' that may be indicated by Andersson's power control indicator, doing so would have been obvious in view of Baker." Pet. 35. Petitioner asserts that Baker's "Power Control Algorithm (PCA)" parameter "determines which of two power control schemes is used by the UE," that "when PCA is 1, TPC command

accumulation is enabled," and that "[w]hen PCA is 2, however, TPC command accumulation is not enabled." *Id.* at 35–36 (citing Ex. 1010 ¶¶ 21–23). On that basis Petitioner concludes that "Baker's PCA flag received by the UE from the network device is 'an indication that transmit power control (TPC) command accumulation is enabled,' and a [skilled artisan] would have been motivated to utilize such a flag as Andersson's 'power control indicator.'" *Id.* at 36 (citing Ex. 1003 ¶¶ 91–92).

Patent Owner responds that neither reference discloses an indication that accumulation "is enabled." PO Resp. 32–35. Patent Owner contends that in Andersson accumulation is always operating and is never turned off, and that the power control indicator selects only the magnitude or type of an adjustment, not whether the accumulation process runs. *Id.* at 32–35. As to Baker, Patent Owner contends that both PCA values still result in TPC commands being collected and used to adjust power, so that PCA = 2 is a different cadence or decision rule rather than a disabling of accumulation, and that an instance of leaving power "unchanged" reflects an adjustment value of zero, not a cessation of accumulation. *Id.* at 35–37. Patent Owner further contends that Dr. Kotzin's supporting testimony does no more than repeat the Petition's attorney argument. *Id.* at 29–31.

In reply, Petitioner argues that under PCA = 2 the UE "compares" rather than "sums" the TPC commands, such that power "is increased once" and the result "is not cumulative of the five TPC commands received." Pet. Reply 9 (citing Ex. 1072 ¶ 28). Petitioner maintains that because the PCA value controls whether accumulation is enabled, receipt of the PCA value is itself the recited indication. Pet. Reply 10 (citing Ex. 1072 ¶ 29).

Petitioner also argues, in a footnote, that "[t]he claim does not require receiving an indication that TPC command accumulation is disabled," so that an indication of the enabled state suffices. *Id.* at 12 n.3 (citing Ex. 1072 ¶¶ 35–37).

Patent Owner's Sur-reply contends that PCA = 2 defers, but does not disable, accumulation, because the TPC commands are still collected and used to affect transmit power, and that accumulation is therefore always enabled in Baker. PO Sur-reply 8–9. Patent Owner contends that neither reference discloses any network-side mechanism for enabling or disabling accumulation, and that on Petitioner's reading the recited "indication" would serve no function. *Id.* at 7, 14.

Applying the operative definition of TPC command accumulation (*see supra* § II.B), limitation 1.2 is met only by an indication that the process of collecting and using TPC commands to cumulatively affect transmission power is enabled. A signal that instead selects how an already-operating adjustment process is carried out—for example, the step size or scheme used to change power—is not, on its face, an indication that the accumulation process "is enabled." With that distinction in mind, we turn to the references. The specification conforms this distinction. The claimed indication operates at the level of whether the accumulation regime is in use—selecting among open loop, closed loop, and combined control—not at the level of how an adjustment is sized or scheduled once a TPC-driven scheme is already running. Ex. 1001, 13:11–20. An indicator that merely selects the type or step of an adjustment within a continuously operating closed loop scheme is therefore not an indication that the "TPC command

accumulation is enabled," regardless of how finely "accumulation" is construed.

Andersson discloses that, during transmit power regulation, "each station (mobile and base) continually measures the transmit power level received from the other station," and that a TPC bit is sent "instructing the other station to decrease its transmit power by a predetermined increment, e.g., 1 dB," or to "increase transmit power by a predetermined increment, e.g., 1 dB." Ex. 1009, 3:31–56. The mobile station "receives and detects the TPC command and power control indicator and makes the appropriate adjustment to its transmit power based thereon." *Id.* at 12:44–47. We find that these disclosures describe a process of collecting and using TPC commands to cumulatively affect transmit power that is operative throughout—that is, accumulation is already occurring.

We further find that Andersson's power control indicator does not enable that process, but instead selects how the adjustment is performed. Andersson states that the indicator indicates "whether a first type or a second type of power control adjustment should be used," and that "[t]he first and second type of power control adjustments may include a first and second power adjustment step size," or "alternatively" may "correspond to two different power control schemes." Ex. 1009, 5:48–58, 6:17–24, 9:8–10. Andersson's embodiments confirm the point: the indicator selects between, for example, a "step size change such as plus or minus 1 dB" and "a larger amount, e.g., 8 dB" (*id.* at 9:45–50), with the underlying "schemes and different step size values" "pre-stored in" the transceiver and "appropriately referenced by the radio transceiver when the associated power control

indicator is received." *Id.* at 11:5–13. The indicator thus governs which type or step of adjustment is applied; it does not indicate to a UE's receiver that the accumulation process is enabled.

Petitioner's own characterization confirms this reading. Petitioner describes the indicator as one that "indicate[s] whether a first type or a second type of power control adjustment should be used," and frames its conclusion in terms of "a particular type of power control adjustment" being "enabled." Pet. 34–35. Selecting which type of adjustment to apply, however, is not the same as indicating that the accumulation process itself is enabled, because, as Andersson discloses, that process operates regardless of which type or step the indicator selects. We are not persuaded that Andersson's indicator supplies the recited indication.

Petitioner relies on Baker to supply an indication that accumulation "is enabled." We find that Baker, like Andersson, discloses a parameter that selects how power is adjusted while the collection and use of TPC commands continues under either setting. Baker explains that "[t]he size of steps is controlled by two parameters, PCA . . . [and] Δ_{TPC}," yielding "three effective power control step sizes." Ex. 1010 ¶ 21. Under PCA = 1, the station changes power by Δ_{TPC} "upon each received TPC command"; under PCA = 2, the station instead combines TPC commands "in groups of five" before changing power. *Id.* ¶¶ 22–23. In both modes, multiple TPC commands are collected and used to affect transmit power; under PCA = 2 each command bears directly on the result, because it determines whether the five commands in a group are uniform.

Baker itself characterizes PCA = 2 as a step-size technique rather than a disabling of accumulation. Baker teaches generally that "[s]mall power control step sizes may be emulated, for example by only changing the output power when a certain number of identical power control commands have been received" (Ex. 1010 ¶ 10), and states that the PCA = 2 grouping "effectively emulates the use of a power control step size of approximately 0.2 dB" (*id.* ¶ 23). On this record, we find that Baker's PCA parameter selects a step-size or decision-rule regime; it is not, by its terms, an indication that the process of collecting and using TPC commands to cumulatively affect transmit power is enabled, because that process operates under both PCA values.

Because Andersson's indicator selects the type or step of an always-operating adjustment process, and Baker's PCA parameter likewise selects a step-size regime under which accumulation continues, the proposed substitution of Baker's PCA flag for Andersson's power control indicator yields, at most, a signal that selects how accumulation is carried out—not an indication that accumulation "is enabled." We find that Petitioner has not identified, in either reference, a network-transmitted indication directed to whether the accumulation process is enabled, as distinct from how it is performed. Petitioner's reliance on the proposition that "[t]he claim does not require receiving an indication that TPC command accumulation is disabled" (Pet. Reply 12 n.3) does not fill that gap, because the limitation affirmatively requires an indication that accumulation "is enabled," and we have found that neither reference discloses such an indication as opposed to a type- or step-selection signal.

To the extent Petitioner contends it would nonetheless have been obvious to treat a type- or step-selection signal as an accumulation-enable indication, we find that Petitioner has not supplied the necessary reasoning. Petitioner's showing establishes that the prior art communicated parameters governing the manner of power-control adjustment; it does not articulate why a person of ordinary skill would have understood, or been led to configure, such a parameter as an indication that the accumulation process is enabled. The supporting declaration testimony (Ex. 1003 ¶¶ 88–93; Ex. 1072 ¶¶ 28–37) restates the same mapping and does not bridge the distinction between selecting the type of adjustment and enabling the accumulation process.

On this record, therefore, applying the operative definition of TPC command accumulation, we determine that Petitioner has not demonstrated that the combination of Andersson and Baker discloses or suggests "an indication that transmit power control (TPC) command accumulation is enabled," as recited in limitation 1.2.

b. Zeira's "weighting factor α" in View of Baker

Petitioner contends also that Zeira in view of Baker discloses or suggests limitation 1.2. According to Petitioner, Zeira's weighting factor α governs the contribution of closed loop power control, and a network operator may set that factor so as to select among purely open loop, purely closed loop, or combined control. Pet. 56–57. Petitioner relies on Zeira's statement that "the network operator may desire to use solely open loop or solely closed loop power control" and may, "for example," "use solely closed loop power control by setting α to zero." *Id.* at 57 (citing Ex. 1004,

7:16–22). Petitioner maps Baker to the network-signaling aspect, citing Baker's disclosure that the base station's "appropriate settings for the PCA and ΔTPC parameters" are "communicated to the MS 110." *Id.* at 58–59 (citing Ex. 1003 ¶¶ 141–142; Ex. 1010 ¶¶ 2, 3, 19, 37, 43). Petitioner contends it would have been obvious for Zeira's network operator to set weighting factor α on a UE through such known network communications. Pet. 55–60; Pet. Reply 21–23.

Petitioner adds that a non-zero weighting applied to the closed loop factor itself indicates that closed loop control—and thus TPC command accumulation—is enabled, relying on the Institution Decision's observation that weighting factor α "determines whether the UE uses purely open loop (where accumulation is not enabled), purely closed loop[,] or a combined scheme." Pet. Reply 21 (citing Inst. Dec. 12).

Patent Owner responds that Zeira does not disclose a UE that receives the weighting factor from a network device. PO Resp. 51. Patent Owner emphasizes that "the weighting factor α Petitioner claims is the [factor] sent by the BS/Node-B is dynamically calculated at the UE," and that Zeira "does not disclose, or even suggest, how the UE would be made aware" of any such value, identifying "no disclosure of any mechanism for communicating this information to the UE." *Id.* at 51–52. Patent Owner's expert, Dr. Lomp, testifies that it is "highly unlikely" the value "would be done dynamically" and that doing so "would require a substantial re-design." *Id.* at 53 (citing Ex. 2016 ¶¶ 132–139).

Patent Owner adds that an operator's preference "could be preprogrammed into a phone (UE)," and that "there is no requirement in

Zeira that an 'indication' that α=0 be transmitted to the UE from the same network device." PO Sur-reply 21. Patent Owner further notes that weighting factor α "functions as a dynamic weighting factor tied to the quality of the pathloss estimate and is 'typically determined by' the transmitting device (the UE)." *Id.* at 22.

Limitation 1.2 requires that the receiver "receive, from a network device, an indication that" accumulation "is enabled." The claim thus specifies both a particular content (an indication that accumulation is enabled) and a particular source (a network device whose transmission the receiver receives). We assess Petitioner's showing against that source requirement. For purposes of this determination, we assume without deciding that adjusting α can bear on whether TPC command accumulation has an effect; Zeira states that, although its algorithms "only weighted the open loop factor, the weighting may be applied to the closed loop factor or both the open and closed loop factors." Ex. 1004, 7:16–18. That assumption does not resolve the dispositive question, which is the source of the setting.

The record persuades us that, in this art, the plain and customary understanding of a power-control indication "from a network device" is one that a device originates and transmits, rather than simply an indication acting as a relay for passing manually input data by a human operator. The '153 patent uses "network" to denote devices: a "network 100 may include one or more base station controllers 110, such as a radio network controller (RNC), and one or more base stations 120 and 130, such as a Node-B." Ex. 1001, 3:13–17. Those devices derive and initiate the power-control signaling from

data they measure: "[t]he TPC commands themselves are derived by the network and are signaled to the UE via a downlink channel," and "[w]hen calculating the proper TPC command to send, the network measures the received SNIR and compares this measured value to an SNIR Target value." *Id.* at 7:18–28. The decisional logic resides in the devices—an "SNIR comparison loop located in the network, and an SNIR update component also located in the network" (*id.* at 8:54–58)—and the network "generates and transmits" the command to the UE (*id.* at 9:60–67, Fig. 3). Throughout the '153 Patent specification, the actor that originates and sends a power-control indication is a device acting on measured data, not a human operator.

The asserted art accords with this understanding of the plain and customary meaning of "from a network device," and Baker makes it explicit. In Baker, the base station device "measures the received SIR," "determines, based on the rate of change of SIR, appropriate settings for the PCA and ΔTPC parameters," and those settings "are communicated to the MS 110 . . . as one or more commands instructing it to change its settings." Ex. 1010 ¶ 37. Baker defines the very actor responsible for setting those parameters as network devices—the "parts of the network fixed infrastructure responsible for the determining and setting of PCA and ATP parameter values," "for example in a 'Node B' . . . or . . . in the Radio Network Controller (RNC)." *Id.* ¶ 42. Zeira is to the same effect: where a value is set during operation, it is "determined by the quality measurement device" from measured data (Ex. 1004, 6:36–49), and the only operative setting of α to zero Zeira describes is one the device reaches when "the delay exceeds [the maximum allowed]" (*id.* at 6:52–54). Against this consistent backdrop,

Zeira's statement that "the network operator may desire to use . . . solely closed loop power control . . . by setting α to zero" (*id.* at 7:18–22) describes something different in kind: a configuration preference of the entity that programs the system, not an indication a device originates and transmits from data. Even if an operator's preference could be implemented in a manner that passes through a network device on its way to the UE—a possibility Petitioner asserts but does not demonstrate—the originating decision would remain the operator's configuration choice, and a device serving as a conduit for a pre-selected preference is not the source of the indication. On this record, we are not persuaded that an operator's desire to set α supplies an indication "from a network device," as claim 1 requires.

Unlike Andersson's and Baker's parameters, Zeira's weighting factor α does operate as a selection among open loop, closed loop, and combined control. *See* Ex. 1004, 7:18–22. The Zeira-based theory therefore fails not because weighting factor α is the wrong kind of parameter, but because, as we explain, Zeira does not disclose that weighting factor α is provided to the UE from a network device.

The evidence of record shows that Zeira determines the weighting factor α within the UE. Zeira states that "[t]he weighting value, α, is determined by the quality measurement device" and is a function of "the number of time slots, D," between the last path loss estimate and the communication, together with the quality of that estimate. Ex. 1004, 6:36–49. Consistent with that internal computation, Zeira's only embodiment of driving the factor to zero is a consequence that the UE reaches from its own measured delay: "If the delay exceeds [the maximum allowed], open loop

power control is effectively turned off by setting [the factor to zero]." *Id.* at 6:52–54. We find that these disclosures locate the setting of the weighting factor α at the UE, based on data the UE collects.

The only contrary hook Petitioner identifies is Zeira's statement that a "network operator may desire" a particular control mode and may set weighting factor α accordingly. Pet. 57 (citing Ex. 1004, 7:16–22). We are not persuaded that this statement supplies the recited indication. A network operator is the entity that designs, provisions, and configures the system; it is not the "network device" whose transmission the receiver receives. Zeira does not state that an operator's preference is conveyed to the UE by a device transmission, and Patent Owner's unrebutted point is that such a preference "could be preprogrammed into a phone (UE)," with "no requirement in Zeira that an 'indication' that α=0 be transmitted to the UE from the same network device." PO Sur-reply 21. On this record, we find that Zeira does not tie the setting of weighting factor α to a transmission received by the UE from a network device.

Baker confirms, at a general level, that a base station can communicate power-control parameters to a mobile station: Baker's "appropriate settings for the PCA and Δ_{TPC} parameters" are "communicated to the MS 110." Ex. 1010 ¶ 37. But in Baker those settings originate from the base station's own determinations. *Id.* ¶ 36. That disclosure does not establish that Zeira's weighting factor α—a value Zeira computes from UE-side delay and pathloss-estimate quality (Ex. 1004, 6:36–49)—would be set by, and transmitted from, a network device. We find that Baker establishes only the generic capability to signal power-control parameters and does not

cure the absence in Zeira of a device-sourced indication that accumulation is enabled.

Because Zeira computes weighting factor α from data the UE collects, a network device could not set weighting factor α—or signal an "is enabled" indication by setting it—without the UE's delay and pathloss-estimate information, which Zeira assigns to the UE. Ex. 1004, 6:36–49. Petitioner does not explain how a network device would obtain that information or determine when to send such an indication. The record evidence is to the contrary: Zeira discloses "no disclosure of any mechanism for communicating this information to the UE" (PO Resp. 52), and Dr. Lomp testifies that dynamic transmission of the value is "highly unlikely" and "would require a substantial re-design" (*id.* at 53 (citing Ex. 2016 ¶¶ 132–139)). We find that Zeira's statement that a network operator may set weighting factor α, together with Baker's generic signaling capability, does not amount to articulated reasoning with rational underpinning for modifying the references so that a network device provides the recited indication. We accord little weight to Dr. Kotzin's contrary testimony on this point because it does not address how the device would acquire the UE-side inputs or when it would act or why.

Assuming without deciding that adjusting weighting factor α can affect whether TPC command accumulation has an effect, we nonetheless find that Petitioner has not shown that Zeira, alone or in view of Baker, discloses or suggests a receiver that receives, from a network device, an indication that TPC command accumulation is enabled. On this record, the setting of weighting factor α is computed at the UE or reflects a network

operator's configuration choice, and Petitioner has not established that it would have been obvious to convert that UE-computed value or operator preference into a network device-transmitted indication received by the UE. Accordingly, we determine that Petitioner has not demonstrated persuasively that limitation 1.2 is disclosed or suggested by the Zeira-Baker combination.

2. Limitation 1.3—the receiver to receive, from the network device, on a single physical channel, scheduling information and power control information that includes a multi-level TPC command

Relying exclusively on Andersson, Khan, Tong, and Zeira of the cited prior art, Petitioner contends first that Andersson, in view of Khan, discloses or suggests receiving, on a single physical channel, scheduling information and power control information that includes a multi-level TPC command from the network device; Petitioner contends next that Zeira, in view of Tong and Khan, discloses or suggests the same. *See* Pet. 25–28, 36–41, 60–67. We address each combination in turn.

a. Andersson in View of Khan

Andersson is relied upon by Petitioner for a dedicated physical control channel (DPCCH) carrying a TPC command, and Khan is relied upon for an uplink scheduling grant. Pet. 36–41. The dispute is whether it would have been obvious to a skilled artisan to have placed scheduling information together with the power control information on a single physical channel in the manner claimed.

Petitioner's theory is one of simple substitution. Petitioner observes that Andersson describes a DPCCH time slot (*see* Ex. 1009, 9:14–21, Fig. 5) that, in addition to a pilot field, a TPC command, and a power control

indicator, may contain "other bits," and Petitioner proposes to use those bits to carry Khan's scheduling grant: The "'other bits' may be transmitted along with the TPC command and power control indicator in the dedicated physical control channel (DPCCH). A [skilled artisan] would have found it obvious that those other bits may include a scheduling grant as described by Khan." Pet. 28 (citing Ex. 1009, 9:14–21; Ex. 1003 ¶ 76).

Petitioner characterizes the modification as requiring "nothing more than 'the predictable use of prior art elements according to their established functions,'" asserting that the combination would improve Andersson "in the same way" the elements function in the prior art. Pet. 26. In its mapping, Petitioner relies on Khan's disclosure that a single channel may "carry the TPC bit in some slots and the scheduling grant in one or more of the remaining slots." *Id.* at 40 (citing Ex. 1005 ¶ 47).

Patent Owner responds that Petitioner's combination "is based on a fundamental misunderstanding of the various channels described in each of the Andersson and Khan references and ignores portions of these documents that lead away from the alleged combination," such that the references "cannot, in fact, be properly combined to arrive at this feature of Claim 1 of the '153 Patent." PO Resp. 38. Patent Owner describes Petitioner's theory as a proposal to "graft a scheduling grant, as taught by Khan, onto the DPCCH of Andersson using Andersson's 'other bits,'" and contends that the theory rests on two mistaken assumptions: "First, it assumes that fast per TTI scheduling was the technology to use for the UE's uplink transmission to the BS/Node-B. Second, it assumes that the 'scheduling' signaling

originates from the BS/Node-B." *Id.* at 39. According to, Patent Owner, "[b]oth these assumptions are wrong." *Id.*

As to the first assumption, Patent Owner contends that, in Andersson's underlying WCDMA technology, "dynamic per-TTI scheduling grants were not used to 'schedule' UEs' uplink transmissions," which were instead "configured semi-statically through RRC signaling." PO Resp. 40 (citing Ex. 2016 ¶¶ 62–63). As to the second, Patent Owner contends that the configuring RRC signaling "originated from the RNC, not the BS/Node-B," so that Andersson "separates these functions: the RNC provided the 'scheduling' configuration signaling, while the Node-B received uplink transmissions from the UE." *Id.* at 41–42 (citing Ex. 2016 ¶¶ 62–63). From this, Patent Owner concludes that, "[s]ince the RRC signaling originates from the RNC, while the TPC originates from the BS/Node-B, they cannot be transmitted on the same physical channel." *Id.* at 43.

Patent Owner further contends that the advantages Petitioner asserts "do not withstand scrutiny," and that each "in fact highlights why a skilled artisan would have avoided such a combination rather than pursued it." PO Resp. 40. In Patent Owner's account, Andersson and Khan "use fundamentally incompatible channel multiplexing structures": Andersson "discloses a DPCCH in which every 0.625 msec uplink slot carries a fixed structure of control fields, a TPC command, a power control flag, and other bits, repeated in each slot without time-multiplexing or dynamic scheduling," whereas Khan's forward link "was explicitly organized into time-multiplexed slots." *Id.* at 43–44 (citing Ex. 1009, 9:12–22, Fig. 5; Ex. 2016 ¶¶ 58–61, 78–80, 111, 116–117). Because "TPC commands must

be transmitted continuously and with extremely high reliability in every slot to maintain closed-loop power control, whereas scheduling information is larger, bursty, and tied to a different timing cycle," Patent Owner contends that combining the two "would either disrupt the timing-critical TPC stream or constrain scheduling flexibility, undermining both." *Id.* at 44 (citing Ex. 2016 ¶¶ 116–117).

Patent Owner thus contends that placing the TPC command and the scheduling grant together "was not a predictable or natural design choice, but rather a hindsight reconstruction that would require substantial re-design of Andersson's DPCCH/DPCH channel." PO Resp. 45 (citing Ex. 2016 ¶¶ 116–117). Patent Owner adds that Petitioner improperly relies on its expert to fill these gaps, because Dr. Kotzin's declaration "offers no citation to Andersson (or other evidence)" for the assertion that the "other bits" may include a scheduling grant, and "Andersson does not disclose or even suggest what the 'other bits' may be, nor does it disclose or suggest a need in the art for scheduling UEs." *Id.* at 30 (citing Ex. 2016 ¶¶ 102–111).

Petitioner replies that its theory does not require bodily incorporation or redesign, but only use of Andersson's existing spare capacity: "[A]s described in the Petition, no redesign is needed. The proposed combination merely contemplates . . . the existing 'other bits' in Andersson's DPCCH for an uplink signaling grant." Pet. Reply 14; *see* Ex. 1072 ¶ 41. Petitioner characterizes the combination as "a simple combination of Andersson and Khan" and asserts that Patent Owner's objections "address a physical incorporation of Khan's channel into Andersson's system, which the Petition does not propose." Pet. Reply 12–13. Petitioner further contends that a

person of ordinary skill would have had a reasonable expectation of success, observing that Andersson and Khan "are not exclusively directed to WCDMA and CDMA2000 HRPD" and that a POSITA "would have thus naturally expected to be successful applying well-known signaling techniques such as Khan's—especially in view of Andersson's statement that it utilizes 'well-known CDMA techniques.'" *Id.* at 15 (citing Ex. 1003 ¶ 76; Ex. 1009, 7:16–18; Ex. 1005 ¶¶ 5, 8, 18, 34, 37; Ex. 1072 ¶ 43).

Patent Owner responds that Petitioner "cannot satisfy that burden by abstractly asserting that the DPCCH has unused capacity ('other bits') that 'could' carry something else," and that Petitioner's position is "a hindsight 'you can always add bits' theory that evades the single physical channel requirements." PO Sur-reply 16. Patent Owner maintains that the references remain architecturally incompatible because Andersson's "dedicated channel is a continuous fixed-format stream rather than a slot-carved shared medium." *Id.* at 18.

Having considered the parties' positions and the cited evidence, we are not persuaded that Petitioner has shown limitation 1.3 would have been obvious over Andersson in view of Khan. Our reasoning follows.

We begin by fixing Petitioner's theory, because the obviousness inquiry must be measured against the specific modification proposed. Petitioner does not contend that Andersson itself discloses scheduling information on its control channel. Rather, Petitioner relies on a single sentence in Andersson describing the contents of a DPCCH time slot: "Each DPCCH time slot may include a pilot field used for synchronization, a traffic power control (TPC) command . . . , a power control indicator or flag, and

other bits." Pet. 28; Pet. Reply 14; Ex. 1003 ¶ 100; Ex. 1072 ¶ 41; Ex. 1009, 9:24–31. From the bare phrase "and other bits," Petitioner reasons that a POSITA would have placed Khan's scheduling grant there. Pet. 28, 38–40. The modification is therefore precise and narrow: insert the recited scheduling information into the unspecified "other bits" of Andersson's existing control-channel slot. Petitioner repeatedly emphasizes the simplicity of that step, describing it as "the predictable use of prior art elements according to their established functions" (*id.* at 26) and as requiring that "no redesign . . . [be] needed" because the combination "merely contemplates . . . the existing 'other bits' in Andersson's DPCCH" (Pet. Reply 14; Ex. 1072 ¶ 41).

Petitioner supports the modification with three asserted benefits. First, Petitioner asserts that carrying scheduling information on the control channel would allow "a larger number of active wireless units," a benefit it attributes to Khan. Pet. 26–27 (citing Ex. 1005 ¶¶ 43, 47). Second, Petitioner asserts that "complexity (and thus power usage) is reduced." *Id.* at 27 (citing Ex. 1003 ¶ 75). Third, Petitioner asserts that "[l]atency is similarly reduced." *Id.* (citing Ex. 1003 ¶ 75). Petitioner thus offers a rationale with an articulated underpinning, and we evaluate whether the evidence ties that rationale to the modification actually proposed.

A rationale supports obviousness only where the proffered benefit would flow from the specific modification proposed; a benefit that the prior art realizes in a different structural context does not, without more, establish that the same benefit would result from inserting one reference's element

into the other. On this record, the nexus between Khan's benefits and Petitioner's "other bits" modification is missing.

The first asserted benefit illustrates the disconnect. The only Khan passage that articulates the "larger number of . . . active wireless units" benefit ties that benefit to Khan's separate-slot, time-multiplexed scheme—the opposite of placing a grant in the spare bits of a single TPC slot:

> [I]t may also be possible to time-multiplex the TPC bits and the scheduling grant … carry the TPC bit in some slots and the scheduling grant in one or more of the remaining slots, as shown in FIG. 5. This may provide the benefit of supporting a larger number of simultaneously active wireless units, though it is conceivable that this may be achieved at the expense of decreased power control frequency.

Ex. 1005 ¶ 47.

Two features of this passage undercut Petitioner's reliance on it. First, the benefit Khan describes arises from dividing control information across separate slots—"the TPC bit in some slots and the scheduling grant in … the remaining slots"—not from co-locating a grant with the TPC command in the leftover bits of one slot, which is the modification Petitioner proposes. Second, Khan itself qualifies the benefit by noting it may come "at the expense of decreased power control frequency." Ex. 1005 ¶ 47. Petitioner does not address that the very benefit it borrows is, in Khan, paired with a cost to power-control cadence—the function for which Andersson's channel exists. Petitioner has therefore not shown that this benefit would be realized by the proposed substitution rather than by Khan's different arrangement.

The second and third asserted benefits—reduced complexity and reduced latency—rest on the declaration of Dr. Kotzin (Ex. 1003 ¶ 75) rather than on any disclosure of Andersson or Khan. We accord that testimony little weight on this point because it asserts the benefits in conclusory terms without explaining why they would result from inserting a scheduling grant into Andersson's undefined "other bits," as distinct from Khan's separate-slot design. An expert's say-so that a combination is beneficial, untethered to the specific modification and unsupported by the references, does not supply the missing nexus. Patent Owner's expert identifies the same deficiency, observing that Petitioner "relies heavily on conclusory assertions by its expert, Dr. Kotzin, . . . to fill in gaps where the cited references are silent." Ex. 2016 ¶ 91.

The weaker the correspondence between the structures of the two references, the harder it is to attribute a benefit observed in one to a modification made to the other. Here, the structures are materially different. Khan's benefit arises in the CDMA2000 High Rate Packet Data forward link, which uses a time-multiplexed slot "of length 2048 chips (1.66 . . . ms)" in which the pilot, MAC, and traffic or control channels are time-division multiplexed and the scheduling grant is carried in MAC fields on orthogonal Walsh codes. Ex. 1005 ¶¶ 35, 37–38, 47. Khan, in fact, explains that a code-multiplexed scheduling-grant channel "may not be used in the CDMA2000 HRPD," a circumstance Khan attributes to that system's "time-multiplexed slot structure." *Id.* ¶ 43.

Andersson's channel is different in kind. Andersson describes a DPCCH organized as "16 time slots each lasting 0.625 msec" (Ex. 1009,

9:16–17), and Patent Owner's expert describes the WCDMA DPCCH as a "continuous, fixed-format" stream, in contrast to Khan's scheme, which "is expressly organized to carve scheduling grants into time-multiplexed slots" (Ex. 2016 ¶ 116). A control slot of that kind is a fixed, time-bounded container whose bits are allocated to defined fields; the standardized uplink DPCCH, offered as background, confirms that each radio frame "is split into 15 slots, each of length T_{slot} = 2560 chips," that the "Layer 1 control information [that] consists of known pilot bits . . ., transmit power-control (TPC) commands, feedback information (FBI), and an optional transport-format combination indicator (TFCI)," and that "there are 10 bits per uplink DPCCH slot." Ex. 2014 §§ 5, 5.2.1. Petitioner offers insufficient analysis of how many bits a scheduling grant requires, how many uncommitted bits remain in Andersson's fixed slot, or how the grant would coexist with the per-slot TPC command without displacing it. The record thus lacks sufficient evidence that the recited scheduling information would, in fact, fit within the "other bits" of Andersson's slot.

The mismatch is compounded by the references' differing purposes. Andersson is not a packet-scheduling system; it is a power-control invention whose stated objective is to convey power-control information while minimizing the bits carried in each slot. Andersson teaches that "it is desirable not to use large numbers of bits to avoid increasing the signaling 'overhead'" (Ex. 1009, 3:54–58), that "only the indicator is sent (and not the details), [so that] signaling overhead and bandwidth consumption … are kept to a minimum" (*id.* at 6:6–12), and warns that adding content "adds considerable overhead in terms of numbers of bits . . . [and] also reduces the

bandwidth available for user traffic" (*id.* at 10:20–28). A reference whose design goal is to remove bits from the slot is an unlikely candidate for absorbing a scheduling grant, and Andersson supplies no scheduling function that would create a need to do so. This accords with Patent Owner's showing that, in Andersson's WCDMA framework, scheduling was performed semi-statically by the RRC in the RNC, not on the Node-B's power-control channel. PO Resp. 40–41, 43 (citing Ex. 2016 ¶¶ 62–63, 111). Because Andersson's scheduling context differs from Khan's, the benefit Khan associates with its own scheduling architecture is correspondingly less probative of any benefit in Andersson.

Petitioner's characterization of the modification as a "simple combination" that needs "no redesign" (Pet. Reply 12–14) does not cure the deficiency; it reflects it. Describing the step as "merely" using "other bits" presumes the existence of fixed, sufficient, and available capacity that Andersson never defines and that Petitioner never quantifies. Invoking *KSR*'s "predictable use" and "improve . . . in the same way" formulations (Pet. 26) does not relieve Petitioner of showing that the benefits it claims would actually follow from the proposed modification; an apparent reason supported by a rational underpinning is required, not a conclusory assertion of predictability. We need not resolve whether Patent Owner is correct that the modification would demand wholesale redesign, because the burden rests with Petitioner, and Petitioner has not connected the benefits drawn from Khan's separate-slot architecture to inserting a scheduling grant into Andersson's undefined "other bits."

For the foregoing reasons, we determine that Petitioner has not demonstrated persuasively that limitation 1.3 would have been obvious over Andersson in view of Khan. The rationale Petitioner offers lacks a sufficient nexus to the modification proposed: the benefits are tied to Khan's distinct, separate-slot communication scheme, the structural and functional differences between Andersson's control channel and Khan's forward-link slots are unaddressed, and the record does not establish that the recited scheduling information would fit within, or appropriately occupy, the undefined "other bits" of Andersson's slot.

b. Zeira in View of Khan

Petitioner challenges limitation 1.3, in relevant part[10], by relying on Zeira to supply the single physical channel carrying the power control information, and Khan is relied upon to supply the scheduling information. *See* Pet. 60–67. Petitioner identifies Zeira's dedicated channel as the recited single physical channel, relying on Zeira's teaching that the closed loop power control command is "typically sent in a dedicated channel" that "is dedicated to the communication between the receiving station 50 and transmitting station 52." *Id.* at 63 (citing Ex. 1004, 4:27–30). For the scheduling information, Petitioner relies on Khan's Figure 5, contending that Khan discloses a scheduling grant "multiplexed on the same physical channel as a TPC command" and a unit "receiving, over a single physical channel (e.g., Walsh channel, as identified by MACIndex value), both an

[10] Petitioner relies on the combination of Zeira and Tong to disclose "multi-level TPC commands," which Patent Owner does not challenge in this proceeding. Pet. 60–63; *see generally* PO Resp. Therefore, the combination of Zeira and Tong (and more specifically Tong) is not discussed here.

allocation of a scheduled uplink resource (e.g., scheduling grant) and a TPC command (e.g., TPC bit)." *Id.* at 65 (citing Ex. 1005 ¶ 43, Fig. 5; Ex. 1003 ¶¶ 151–152).

To bridge Zeira to Khan, Petitioner relies on Zeira's statement that the unit transmits "in the appropriate time slots and codes of the assigned resource units" (Ex. 1004, 2:62–63, 6:63–65), while acknowledging that Zeira "does not specify how such resource units are assigned to it." Pet. 66. From that silence, Petitioner infers that Zeira's reference to "assigned resource units" "would indicate to a [skilled artisan] that Zeira contemplates some scheduling function located at the receiving station" and would have "motivated" a skilled artisan to seek out Khan. *Id.* (citing Ex. 1003 ¶ 153).

Petitioner contends that the combination would require "nothing more than the predictable use of prior art elements according to their established functions" and would "improve Zeira's system in the same way." Pet. 65–66 (citing Ex. 1003 ¶¶ 153–155). For the asserted advantages, Petitioner cross-references its earlier motivation section, stating that there are "several advantages of combining TPC commands and uplink scheduling information in the same control channel . . . including reduced complexity and latency." *Id.* at 66 (citing Ex. 1003 ¶¶ 75, 154). Petitioner adds that "Zeira's disclosure is not limited to transmission of TPC commands over any particular channel." *Id.* at 66–67 (citing Ex. 1003 ¶ 155; Ex. 1004, 4:27–30).

Patent Owner responds that Zeira's "assigned resource units" "refer to a combination of time slots and spreading codes used for transmission" and are "not the same as a scheduling grant as taught by Khan, which includes

identification, rate, and HARQ control information transmitted dynamically by the BS to schedule uplink transmissions." PO Resp. 59 (citing Ex. 1004, 4:31–39; Ex. 2016 ¶ 151). Because Zeira's underlying UMTS/TDD technology "used RRC signaling to configure the uplink transport channel for the UE rather than dynamic, per-TTI scheduling," Patent Owner contends that the "assigned resource units" language does not motivate the proposed combination, and "Ground 3 should be dismissed." *Id.* at 59–60 (citing Ex. 1005 ¶¶ 13–15; Ex. 2016 ¶¶ 113, 151).

Patent Owner further contends that the references employ "fundamentally incompatible channel multiplexing structures." PO Resp. 60. Khan is from CDMA2000 HRPD, where "different types of control information, such as TPC bits, scheduling grants, rate indication, and HARQ, are transmitted in distinct fields within the same downlink slot," whereas Zeira's UTRA-TDD dedicated channel carries "continuous TPC commands at Layer 1 in every time slot," with scheduling and channel configuration "handled separately through Layer-3 RRC signaling procedures such as *Transport Channel Reconfiguration and Physical Channel Reconfiguration* in TS 25.331." *Id.* (citing Ex. 1005 ¶¶ 45–47, Fig. 5; Ex. 2016 ¶¶ 62–63, 115, 152). On that record, Patent Owner argues, a POSITA would not have viewed the channels as operating "in the same way" and the proposal is "a hindsight reconstruction that would require substantial re-design of the UTRA-TDD protocol stack." *Id.* at 61–62 (citing Ex. 1005 ¶¶ 43–47; Ex. 2016 ¶ 153).

As to the asserted advantages, Patent Owner contends each fails because importing Khan's multiplexing into Zeira "would not yield the

claimed benefits, but instead would compromise power control stability, increase implementation burden, and degrade system performance." PO Resp. 62 (citing Ex. 2016 ¶¶ 154–157). Specifically, Patent Owner argues the combination would not support "more active units" but would "deprive users of the reliable slot-by-slot power control that Zeira requires" (*id.* at 63 (citing Ex. 2016 ¶ 155); "would in fact increase complexity" (*id.* at 63–64 (citing Ex. 2016 ¶ 156); and risk less frequent or delayed power updates, degrading responsiveness rather than reducing latency (*id.* at 64 (citing Ex. 2016 ¶ 157).

Petitioner replies that the Petition presents "a simple combination of Zeira and Khan" in which both scheduling information and power control information are transmitted on Zeira's "dedicated channel" based on Khan's disclosure of "transmitting both parameters on a single physical channel." Pet. Reply 24 (citing Ex. 1003 ¶¶ 153–155; Ex. 1072 ¶ 47). Petitioner contends that Patent Owner does not engage that combination and instead attacks a physical incorporation of Khan into Zeira that the Petition does not propose. *See id.* at 24–25.

Petitioner maintains that the combination requires no "substantial re-design" of Zeira's channel, because it adds only a single parameter (an uplink signaling grant) to Zeira's existing dedicated channel rather than altering that channel's format. Pet. Reply 26 (citing Ex. 1072 ¶ 49). Petitioner further argues that no genuine incompatibility exists because neither Zeira nor Khan is limited to a single network type, noting that the terms UTRA and UMTS do not appear in Zeira's disclosure and that Zeira's reference to TDD denotes only a broadly applicable duplexing technique

used in many networks. *Id.* at 26–27 (citing Ex. 1004, 1:7–11, 4:10–30; Ex. 1005 ¶¶ 5, 8, 18, 34, 37; Ex. 1071, 33:9–34:1; Ex. 1072 ¶¶ 50–51).

In its Sur-reply, addressing the single-physical-channel limitation across the Khan-based grounds, Patent Owner contends that Petitioner's "technology family" rebuttal "do[es] not cure Petitioner's failure of proof, because the dispute is about whether a POSITA would have combined disparate channel structures to achieve the claimed co-carriage—not whether both systems can be described under a broad CDMA umbrella." PO Sur-reply 19. The question, Patent Owner urges, "turns on whether the prior art teaches receiving scheduling information and power control information on the same physical-channel instance addressed to the UE for the relevant uplink transmission." *Id.* (citing PO Resp. 24; Ex. 2016 ¶ 49).

Patent Owner adds that the dedicated-versus-shared mismatch "is not superficial," because shared-channel structures "require additional multiplexing methods and addressing mechanisms precisely because multiple UEs can demodulate shared channels," whereas a dedicated channel "is a continuous fixed-format stream rather than a slot-carved shared medium." PO Sur-reply 18 (citing Ex. 2016 ¶¶ 115–117).

Having considered the parties' positions and the cited evidence, we are not persuaded that Petitioner has shown limitation 1.3 would have been disclosed or suggested by the combination of Zeira, Tong, and Khan. Our reasoning follows.

Petitioner's theory is a modification theory: it proposes to convey, on Zeira's existing dedicated channel, both the TPC command Zeira already transmits and an uplink scheduling grant drawn from Khan. Pet. 65–66.

Petitioner casts that modification as a small one, contending it requires "nothing more than the predictable use of prior art elements according to their established functions" and would "improve Zeira's system in the same way." *Id.* at 65–66; Ex. 1003 ¶¶ 153–155. We take Petitioner at its word as to the modification it proposes, and we evaluate the obviousness of that modification on the rationale and evidence Petitioner has supplied.

Petitioner's rationale has two parts. First, Petitioner infers a motivation from Zeira itself: that Zeira's reference to "assigned resource units" "would indicate to a POSITA that Zeira contemplates some scheduling function located at the receiving station," which in turn "motivated" resort to Khan. Pet. 66; Ex. 1003 ¶ 153. Petitioner makes that inference while expressly acknowledging that Zeira "does not specify how such resource units are assigned to it." Pet. 66. Second, Petitioner asserts that combining scheduling and power control on one channel yields "several advantages . . . including reduced complexity and latency," cross-referencing its general motivation section and the supporting declaration testimony. Pet. 66; Ex. 1003 ¶¶ 75, 154.

A motivation to combine must be supported by articulated reasoning with a rational underpinning, and an asserted benefit carries weight only if it would flow from the proposed modification. Petitioner's benefits do not clear that bar on this record.

The capacity benefit — a "larger number of active wireless units" — is a benefit Khan attributes to its own scheme, and Khan obtains it precisely by reducing the frequency of power control: Khan teaches carrying the grant in slots in a manner that comes "at the expense of decreased power control

frequency." Ex. 1005 ¶ 47. Petitioner does not show that this benefit would be realized when Khan's approach is imported into Zeira; to the contrary, the persuasive testimony is that doing so "would not increase capacity; it would erode the reliability of TPC that Zeira relies on, destabilizing the loop and defeating Zeira's purpose." Ex. 2016 ¶ 155. The remaining benefits—reduced complexity and reduced latency—rest on a single, conclusory paragraph of declaration testimony (Ex. 1003 ¶ 75) that addresses the abstract idea of co-locating control information, not the specific consequences of conveying both a TPC command and an uplink scheduling grant on Zeira's dedicated channel. Patent Owner's expert explains, without persuasive rebuttal, that the modification would in fact increase complexity by forcing significant additional logic in both the UE and BS to parse mixed control types (Ex. 2016 ¶ 156), and would "risk delaying or thinning TPC updates" rather than reduce latency (*id.* ¶ 157). On this record, Petitioner has not tied the benefits it borrows from Khan's separate system to the modification it proposes for Zeira, and we accord that rationale little weight.

The weaker a benefit's connection to a reference's own architecture, the harder it is to assume the benefit will survive transplantation into a different architecture — and here the two architectures are markedly different. Khan arises from CDMA2000 HRPD, in which the forward link time-multiplexes "TPC bits, scheduling grants, rate indication, and HARQ" control information "in distinct fields within the same downlink slot." PO Resp. 60 (citing Ex. 1005 ¶¶ 45–47, Fig. 5; Ex. 2016 ¶ 152). Zeira, by contrast, is a power control invention whose dedicated channel exists to carry "continuous TPC commands at Layer 1 in every time slot to maintain

closed-loop power control," with scheduling and channel configuration "handled separately through Layer-3 RRC signaling procedures." *Id.* (citing Ex. 2016 ¶¶ 62–63, 115, 152). The functions Petitioner would merge are thus assigned, in Zeira's technology, to different protocol layers and different network elements—fast Layer-1 power control at the Node B, and semi-static Layer-3 configuration at the RNC. *Id.* at 60–61 (citing Ex. 2016 ¶¶ 62–63, 152); *see also* Ex. 2016 ¶¶ 149–150.

That difference also undermines the predicate for Petitioner's motivation. Petitioner reads "assigned resource units" as implying a base-station scheduling function (Pet. 66), but the unrebutted evidence is that a skilled artisan would read that phrase as "the time-slot + spreading-code allocations used for transmission, not as a dynamic, per-TTI grant carrying identity, rate, and HARQ fields as in Khan." Ex. 2016 ¶ 151. Because Zeira is a power control invention that routes scheduling and configuration off of its dedicated channel, Zeira's need — and any corresponding benefit — to fold a dynamic scheduling grant onto that channel is different from, and weaker than, the need Petitioner posits. The greater the architectural distance, the less Khan's in-context benefits can be attributed to the proposed Zeira modification, and Petitioner has not bridged that distance with evidence.

Petitioner's emphasis on simplicity — that the combination is "a simple combination" requiring "the predictable use of prior art elements" (Pet. 65; Pet. Reply 12–13) — does not fill the evidentiary gap; it presumes the very things that must be shown. Characterizing the modification as predictable assumes that Zeira contemplates a dynamic scheduling function

on its dedicated channel, that Khan's shared-slot grant mechanism is compatible with Zeira's continuous, fixed-format dedicated stream, and that Khan's benefits would result once the mechanism is moved. Each premise is contested and, on this record, unproven. As Patent Owner observes, the dispute "turns on whether the prior art teaches receiving scheduling information and power control information on the same physical-channel instance," not on whether both systems can be grouped under a "broad CDMA umbrella." PO Sur-reply 19. Invoking *KSR*'s "predictable use" language does not relieve Petitioner of supplying a rational underpinning for the specific modification it proposes.

Giving Petitioner's rationale the weight the record supports, we find that Petitioner has not shown that a skilled artisan would have been motivated to place a dynamic scheduling grant on Zeira's dedicated power-control channel with a reasonable expectation of success, or that the asserted benefits would result from that modification. The motivation Petitioner draws from Zeira's "assigned resource units" rests on conceded silence and an inference the unrebutted evidence contradicts; the asserted advantages are tied to Khan's different HRPD architecture and to conclusory testimony rather than to the proposed Zeira modification; and the architectural distance between the references makes the proposed transplantation neither predictable nor supported. Accordingly, on this record, we determine that Petitioner has not demonstrated persuasively that limitation 1.3 is met under the Zeira-Khan-Tong combination.

3. Conclusion

For the foregoing reasons, we are not persuaded that a preponderance of the evidence supports Petitioner's contentions that either the Andersson-Baker-Khan combination or the Zeira-Baker-Khan-Tong combination discloses or suggests all of the recited limitations of independent claim 1 (in particular, limitations 1.2 and 1.3). As noted above, the other challenged independent claim, claim 11, recites a method with limitations similar to claim 1 (Ex. 1001, 14:38–49) and, as a result, the deficiencies found with Petitioner's contentions for claim 1 permeate throughout all of the challenged claims in all of the asserted grounds. Therefore, based on the complete record developed during trial, we determine that Petitioner fails to demonstrate by a preponderance of the evidence that the challenged claims in Grounds 1–4 would have been unpatentable under 35 U.S.C. § 103 as being an obvious combination of elements of the identified prior art at the time of the invention.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has not demonstrated by a preponderance of the evidence that claims 1–5, 10–15, and 20 of the '153 Patent are unpatentable. Our conclusions are summarized in the following table.

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1, 2, 4, 5, 11, 12, 14, 15	103(a)	Andersson, Baker, Khan		1, 2, 4, 5, 11, 12, 14, 15

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
3, 13	103(a)	Andersson, Baker, Khan, Dick		3, 13
1, 2, 4, 5, 10–12, 14, 15, 20	103(a)	Zeira, Baker, Khan, Tong		1, 2, 4, 5, 10–12, 14, 15, 20
3, 13	103(a)	Zeira, Baker, Khan, Tong, Dick		3, 13
Overall Outcome				1–5, 10–15, 20

IV. ORDER

For the foregoing reasons, it is:

ORDERED that Petitioner has not demonstrated by a preponderance of the evidence that claims 1–5, 10–15, and 20 of the ’153 Patent are unpatentable; and

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

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