

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

APEX BEAM TECHNOLOGIES LLC,
Patent Owner.

IPR2025-00906
Patent 10,965,434 B1

Before JUSTIN T. ARBES, SCOTT A. DANIELS, and
KEVIN W. CHERRY, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. *Background and Summary*

Petitioner Apple Inc. filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–20 of U.S. Patent No. 10,965,434 B1 (Ex. 1001, “the ’434 patent”) pursuant to 35 U.S.C. § 311(a). Patent Owner Apex Beam Technologies LLC filed a Preliminary Response (Paper 9, “Prelim.

Resp.”) pursuant to 35 U.S.C. § 313. Patent Owner’s request for discretionary denial was denied and the Petition was forwarded to the Board. Paper 10.

Pursuant to 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” *See* 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”). For the reasons that follow, we institute an *inter partes* review as to claims 1–20 of the ’434 patent on all grounds of unpatentability asserted in the Petition.

B. Related Matters

The parties indicate that the ’434 patent is the subject of *Apex Beam Technologies LLC v. Apple Inc.*, No. 6:24-cv-00223 (W.D. Tex.), and was the subject of *Apex Beam Technologies LLC v. Samsung Electronics Co., Ltd.*, No. 2:24-cv-00203 (E.D. Tex.), which has been dismissed. *See* Pet. 76; Paper 4, 2.

C. The ’434 Patent

The ’434 patent discloses methods and systems to “enable semi-persistent scheduling and/or configured grants operation in a wireless device and/or one or more base stations.” Ex. 1001, col. 3, ll. 22–25. “A wireless device may be configured with periodic resources in uplink (e.g., based on uplink configured grants) or downlink (e.g., based on downlink semi-persistent scheduling (SPS)),” and may be configured with

multiple uplink or downlink configurations. *Id.* at col. 48, ll. 31–37.

Physical layer signaling is used to send “control information (e.g., downlink control information (DCI) or uplink control information (UCI)),” where DCI may include “scheduling information (e.g., downlink assignments and uplink grants).” *Id.* at col. 11, ll. 16–23, col. 48, ll. 37–41, Figs. 5A–5B. A user equipment (UE) may receive a DCI and validate it by determining whether “one or more fields for the DCI format are set according to . . . pre-defined values”; if so, the UE may activate or deactivate the uplink configured grant configuration, as appropriate. *Id.* at col. 31, l. 65–col. 32, l. 12, col. 49, ll. 16–21, Fig. 16. According to the ’434 patent, prior art validation methods were “inefficient when the wireless device is configured with multiple uplink configured grant configurations and/or multiple downlink SPS configurations,” such that there was “a need to enhance the validation process for an activation DCI or a deactivation/release DCI.” *Id.* at col. 48, ll. 46–57.

Figure 35 of the '434 patent is reproduced below.

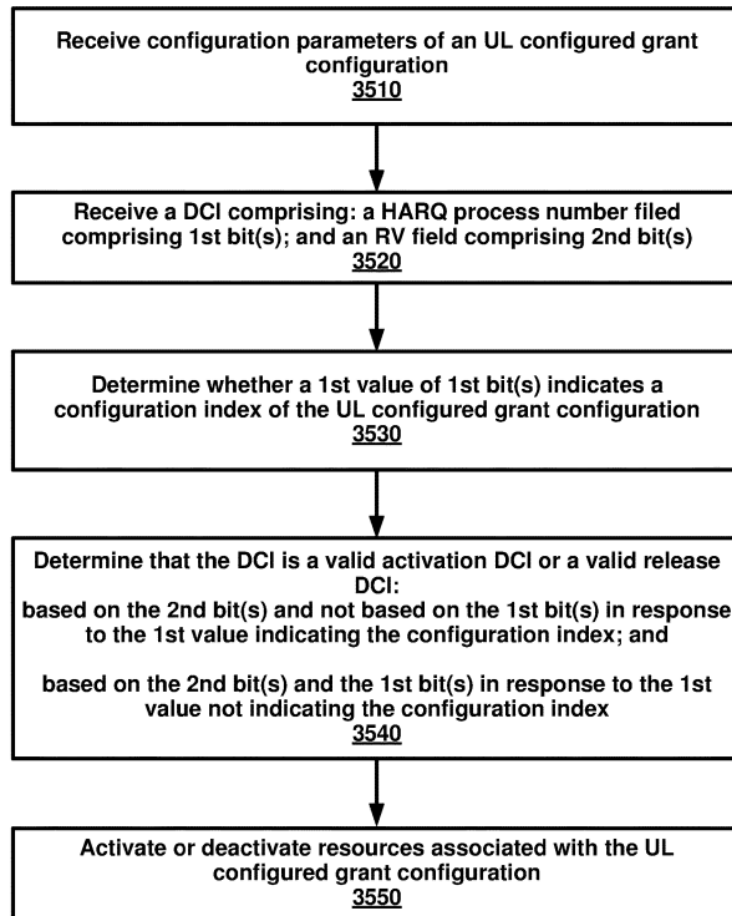


FIG. 35

Figure 35 depicts an exemplary DCI validation process. Ex. 1001, col. 55, ll. 38–40. At step 3510, a wireless device “receive[s] configuration parameters of an uplink configured grant configuration.” *Id.* at col. 55, ll. 40–41. At step 3520, the wireless device receives a DCI comprising “a hybrid automatic repeat request (HARQ) process number field comprising one or more first bits; and a redundancy version field comprising one or more second bits.” *Id.* at col. 55, ll. 41–46. At step 3530, the wireless device “determine[s] whether a first value of the one or more first bits [of the HARQ process number field] indicates a configuration index of the uplink configured grant configuration.” *Id.* at col. 55, ll. 46–49. If so,

at step 3540, the wireless device “determin[es] that the DCI is a valid activation DCI or a valid release DCI . . . based on the one or more second bits and *not* based on the one or more first bits.” *Id.* at col. 55, ll. 49–56 (emphasis added). If not, at step 3540, the wireless device “determin[es] that the DCI is a valid activation DCI or a valid release DCI . . . based on the one or more second bits and the one or more first bits.” *Id.* In either case, the wireless device may compare the one or more first bits, or one or more second bits, with “predetermined values” that “may be all zeros.” *Id.* at col. 50, ll. 15–29, col. 56, ll. 41–55. Finally, at step 3550, the wireless device “activate[s] or deactivate[s] a plurality of resources associated with the uplink configured grant configuration.” *Id.* at col. 55, ll. 56–58.

The ’434 patent also describes a similar DCI validation process shown in Figure 19, which is reproduced below.

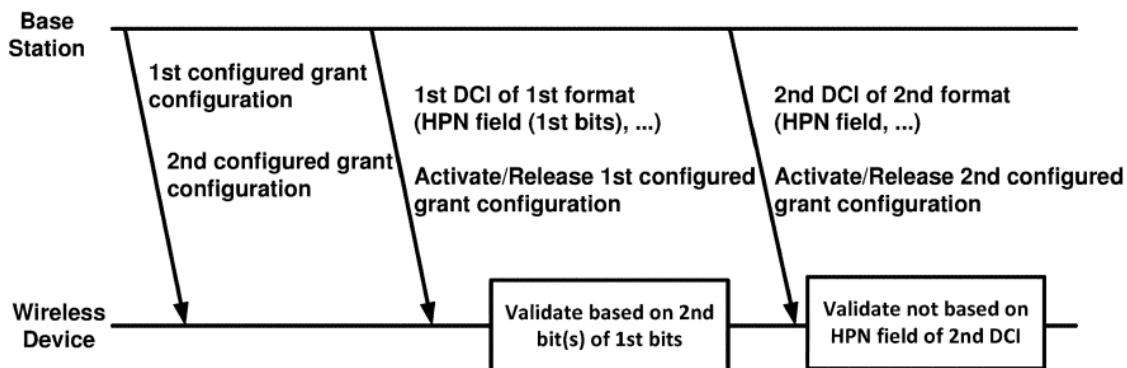


FIG. 19

Figure 19 depicts a process where the wireless device receives (1) “one or more messages comprising configuration parameters of a plurality of configured grant configurations” (i.e., first and second configurations), (2) a DCI of a “first format” indicating “scheduling activation of the first configured grant configuration,” and (3) a DCI of a “second format” indicating “scheduling activation of the second configured grant

configuration.” Ex. 1001, col. 36, ll. 44–63. With respect to the “first format” DCI, validation is performed based on one or more bits of the HARQ process number (HPN) field. *Id.* at col. 37, ll. 11–28. With respect to the “second format” DCI, validation is performed “without employing a value of the . . . HPN field” and instead may use “other fields” of the DCI. *Id.* at col. 37, ll. 29–37.

D. Illustrative Claim

Challenged claims 1 and 12 of the ’434 patent are independent. Claims 2–11 depend from claim 1 and claims 13–20 depend from claim 12. Claim 1 recites the following (with letter designations used in the Petition to refer to the various limitations):

1. [1.P] 1. A method comprising:

[1.1] receiving, by a wireless device;

[1.1.1] a first configuration parameter used in determination of a first sequence of one or more bits for downlink control information (DCI) validation;

[1.1.2] a second configuration parameter used in determination of a second sequence of one or more bits for DCI validation; and

[1.1.3] a third configuration parameter indicating a configuration index of an uplink configured grant configuration;

[1.2] receiving a DCI comprising:

[1.2.1] a hybrid automatic repeat request process number field comprising one or more first bits; and

[1.2.2] a redundancy version field comprising one or more second bits;

[1.3] validating the DCI:

[1.3.1] based on comparing the one or more second bits with the second sequence and not based on the one or more first bits in response to the one or more first bits indicating the configuration index; and

[1.3.2] based on comparing the one or more second bits with the second sequence and comparing the one or more first bits with the first sequence in response to the one or more first bits not indicating the configuration index; and

[1.4] activating or deactivating resources associated with the uplink configured grant configuration.

E. Evidence

Petitioner relies on the following prior art:

3GPP TS 38.213 v15.7.0 (2019-09) Technical Specification, 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; NR; Physical layer procedures for control (Release 15) (Ex. 1005, “3GPP-38.213”);

3GPP TSG-RAN WG1 Meeting #98bis, Chongqing, China, October 14–20, 2019, Draft Change Request, 38.213, Current Version 15.7.0 (Ex. 1006, “3GPP-38.213-CR”);

3GPP TSG-RAN WG1 Meeting #98bis, Chongqing, China, October 14–20, 2019, Draft Change Request, 38.212, Current Version 15.7.0 (Ex. 1007, “3GPP-38.212-CR”);

3GPP TSG-RAN2 Meeting #108, Reno, Nevada, November 18–22, 2019, Change Request, 38.331, Current Version 15.7.0 (Ex. 1012, “3GPP-38.331-CR”); and

3GPP TSG-RAN WG2 Meeting #107bis, Chongqing, China, October 14–18, 2019, R2-1913143 (Ex. 1011, “R2-1913143”).

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–20 of the '434 patent would have been obvious on the basis of prior art printed publications under 35 U.S.C. § 103:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 2, 4–6, 9–15, 18–20	103	3GPP-38.213, 3GPP-38.213-CR, 3GPP-38.212-CR
3	103	3GPP-38.213, 3GPP-38.213-CR, 3GPP-38.212-CR, R2-1913143
7, 8, 16, 17	103	3GPP-38.213, 3GPP-38.213-CR, 3GPP-38.212-CR, 3GPP-38.331-CR

II. ANALYSIS

A. Legal Standards

A claim is unpatentable for obviousness if, to one of ordinary skill in the pertinent art, “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” *See* 35 U.S.C. § 103; *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 “the scope and content of the prior art”; “differences between the prior art and the claims at issue”; and “the level of ordinary skill in the pertinent art.” *Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966). Additionally, secondary considerations, such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or

nonobviousness, these inquiries may have relevancy.”¹ *Id.* When conducting an obviousness analysis, we consider a prior art reference “not only for what it expressly teaches, but also for what it fairly suggests.”

Bradium Techs. LLC v. Iancu, 923 F.3d 1032, 1049 (Fed. Cir. 2019).

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. An obviousness determination based on a combination of references requires finding “both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) (quoting *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1360 (Fed. Cir. 2012)); *see also KSR*, 550 U.S. at 418 (for an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”).

“Although the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.’” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (quoting *Kinetic Concepts*, 688 F.3d at 1368). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to

¹ Patent Owner has not made any arguments regarding objective indicia of nonobviousness at this time. *See generally* Prelim. Resp.

support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *see also In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (stating that “conclusory statements” amount to an “insufficient articulation[] of motivation to combine”; “instead, the finding must be supported by a ‘reasoned explanation’” (quoting *In re Lee*, 277 F.3d 1338, 1342 (Fed. Cir. 2002))); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”).

B. Level of Ordinary Skill in the Art

Petitioner argues that at the time of the ’434 patent (November 2019),² a person of ordinary skill in the art would have had “a bachelor’s degree in electrical engineering, computer engineering, computer science, or a similar field, along with two years of experience designing or developing wireless networks, including long-term evolution LTE/4G or 5G new radio (NR) cellular technology,” where “[a]dditional years of experience could substitute for an advanced-level degree (and vice versa).” Pet. 14 (citing Ex. 1003 ¶¶ 39–42). Patent Owner “utilizes Petitioner’s proposed level of skill in the art” for its Preliminary Response. Prelim. Resp. 7. Based on the record presented, including our review of the ’434 patent and the types of

² Petitioner states that it “assumes for purposes of [its Petition] that the claims are entitled to the earliest claimed priority date—November 5, 2019.” Pet. 14; *see* Ex. 1001, code (60).

problems and solutions described in the '434 patent and cited prior art, we agree with Petitioner's proposed definition of the level of ordinary skill in the art and apply it for purposes of this Decision.

C. Claim Interpretation

We interpret each challenged 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), 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). Petitioner argues that “no claim terms need be construed.” Pet. 10. Patent Owner does not propose interpretations of any claim terms in its Preliminary Response. We conclude that no express interpretation of any claim term is necessary to determine whether to institute an *inter partes* review in this proceeding, but encourage the parties to address various claim interpretation issues identified below during trial. *See infra* Section II.D.5; *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“Because we need only construe terms ‘that are in controversy, and *only to the extent necessary* to resolve the controversy,’ we need not construe [a particular claim limitation] where the construction is not ‘material to the . . . dispute.’” (emphasis added) (citation omitted)).

D. Obviousness Ground Based on 3GPP-38.213, 3GPP-38.213-CR, and 3GPP-38.212-CR

Petitioner contends that claims 1–20 are unpatentable over 3GPP-38.213, 3GPP-38.213-CR, and 3GPP-38.212-CR under 35 U.S.C.

§ 103, citing the testimony of Narayan Mandayam, Ph.D., and Friedhelm Rodermund as support. Pet. 14–63 (citing Exs. 1003, 1008). Patent Owner responds. Prelim. Resp. 2–10. We are persuaded that Petitioner has established a reasonable likelihood of prevailing on its asserted ground as to claim 1. *See* 37 C.F.R. § 42.108(a).

1. 3GPP-38.213

3GPP-38.213 is a standards document created by the 3rd Generation Partnership Project (3GPP) specifying “the characteristics of the physical layer procedures for control operations” of 5G-NR communications networks. Ex. 1005, 1, 6. Section 10.2 of the document discloses that “[a] UE validates, for scheduling activation or scheduling release, a DL SPS assignment [physical downlink control channel (PDCCH)] or configured UL grant Type 2 PDCCH.” *Id.* at 83. “Validation of the DCI format is achieved if all fields for the DCI format are set according to Table 10.2-1 or Table 10.2-2,” shown below (*id.*).

Table 10.2-1: Special fields for DL SPS and UL grant Type 2 scheduling activation PDCCH validation

	DCI format 0_0/0_1	DCI format 1_0	DCI format 1_1
HARQ process number	set to all '0's	set to all '0's	set to all '0's
Redundancy version	set to '00'	set to '00'	For the enabled transport block: set to '00'

Table 10.2-2: Special fields for DL SPS and UL grant Type 2 scheduling release PDCCH validation

	DCI format 0_0	DCI format 1_0
HARQ process number	set to all '0's	set to all '0's
Redundancy version	set to '00'	set to '00'
Modulation and coding scheme	set to all '1's	set to all '1's
Frequency domain resource assignment	set to all '1's	set to all '1's

Tables 10.2-1 and 10.2-2 specify the fields for scheduling activation and release, respectively. *Id.* Both include the “HARQ process number” and

“[r]edundancy version.” *Id.* “If validation is achieved, the UE considers the information in the DCI format as a valid activation or valid release” *Id.*

2. 3GPP-38.213-CR

3GPP-38.213-CR is a “Draft Change Request” for the 3GPP-38.213 standards document showing comments and various changes in redline.

Ex. 1006, 1. 3GPP-38.213-CR discloses that validation is performed with reference to Tables 10.2-1 or 10.2-2 “[i]f a UE is provided a single configuration for UL grant Type 2 [physical uplink shared channel (PUSCH)] or for SPS [physical downlink shared channel (PDSCH)].” *Id.* at 4.

But “[i]f a UE is provided more than one configuration[,]” validation is performed differently. Ex. 1006, 4. For scheduling activation, “a value of the HARQ process number field in a DCI format indicates an activation for a corresponding UL grant Type 2 PUSCH or of a SPS PDSCH configuration with a same value as provided by *Configuredgrantconfig-index* or by *SPSconfig-index*, respectively,” and “[v]alidation of the DCI format is achieved if the [redundancy version (RV)] field for the DCI format is set as in Table 10.2-3,” shown below (*id.* at 4–5).

Table 10.2-3: Special fields for a single DL SPS or single UL grant Type 2 scheduling activation PDCCH validation when a UE is provided multiple DL SPS or UL grant Type 2 configurations			
	DCI format 0 0/0 1/0 2	DCI format 1 0	DCI format 1 1
Redundancy version	set to all '0's	set to all '0's	For the enabled transport block: set to all '0's

Table 10.2-3 specifies the “[r]edundancy version” field for scheduling activation when the UE is provided multiple configurations. *Id.*

For scheduling release, “if the UE is provided *Type2Configuredgrantconfig-ReleaseStateList* or *SPS-ReleaseStateList*,

a value of the HARQ process number field in a DCI format indicates a corresponding entry for scheduling release of one or more UL grant Type 2 PUSCH or SPS PDSCH configurations,” “if the UE is not provided *Type2Configuredgrantconfig-ReleaseStateList* or *SPS-ReleaseStateList*, a value of the HARQ process number field in a DCI format indicates a release for a corresponding value of an UL grant Type 2 PUSCH or of a SPS PDSCH configuration,” and “[v]alidation of the DCI format is achieved if all fields for the DCI format are set according to [Table 10.2-4],” shown below (Ex. 1006, 4–5).

Table 10.2-43: Special fields for multiple DL SPS and UL grant Type 2 scheduling release PDCCH validation		
	DCI format 0_0/0_1/0_2	DCI format 1_0/1_1/1_2
Redundancy version (if any)	set to all '0's	set to all '0's
Modulation and coding scheme	set to all '1's	set to all '1's
Frequency domain resource assignment	set to all '1's	set to all '1's

Table 10.2-4 specifies the “[r]edundancy version” and other fields for scheduling release when the UE is provided multiple configurations. *Id.*

3. 3GPP-38.212-CR

3GPP-38.212-CR is a “Draft Change Request” for the 3GPP-38.212 standards document showing comments and various changes in redline. Ex. 1007, 1. In relevant part, 3GPP-38.212-CR specifies the fields of data received by a UE when it receives a DCI with format 0_2 or 1_2. *Id.* at 7–11. For example, 3GPP-38.212-CR discloses that “DCI format 0_2 is used for the scheduling of PUSCH in one cell,” and includes a “[r]edundancy version” field of “x bits” and a “HARQ process number” of “0, 1, 2, 3 or 4 bits determined by [the] higher layer parameter *HARQProcessNumberSize-ForDCIFormat0_2*.” *Id.* at 7–8.

4. *Whether Petitioner Has Established a Reasonable Likelihood that the Asserted References are Prior Art Printed Publications*

As an initial matter, we must determine whether Petitioner has shown sufficiently for institution that the asserted references are prior art printed publications under 35 U.S.C. § 102(a)(1). *See* Pet. 2–3.

The determination of whether a document is a “printed publication” under 35 U.S.C. § 102 “involves a case-by-case inquiry into the facts and circumstances surrounding the reference’s disclosure to members of the public.” *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004).

“Because there are many ways in which a reference may be disseminated to the interested public, ‘public accessibility’ has been called the touchstone in determining whether a reference constitutes a ‘printed publication’ bar under 35 U.S.C. § 102[.]” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016) (citing *In re Hall*, 781 F.2d 897, 898–899 (Fed. Cir. 1986)). “A reference will be considered publicly accessible if it was ‘disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.’” *Id.* (citing *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340, 1350 (Fed. Cir. 2008)). “When a reference is uploaded to a website or deposited in a library, the fact that the reference is indexed or cataloged in some way can indicate that it is publicly accessible.” *Samsung Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1369 (Fed. Cir. 2019); *Voter Verified, Inc. v. Premier Election Solutions, Inc.*, 698 F.3d 1374, 1380 (Fed. Cir. 2012) (“indexing is a relevant factor in determining accessibility of potential prior art”); *Hall*, 781 F.2d at 899–900 (Fed. Cir. 1986) (holding that a thesis indexed in a university library catalog was a prior art printed publication based on affidavits explaining the “library’s general practice for

indexing, cataloging, and shelving theses”). The U.S. Court of Appeals for the Federal Circuit has “interpreted § 102 broadly, finding that even relatively obscure documents qualify as prior art so long as the relevant public has a means of accessing them.” *GoPro, Inc. v. Contour IP Holding LLC*, 908 F.3d 690, 693 (Fed. Cir. 2018).

“[A]t the institution stage, the petition must identify, with particularity, evidence sufficient to establish a reasonable likelihood that the reference was publicly accessible before the critical date of the challenged patent and therefore that there is a reasonable likelihood that it qualifies as a printed publication.” *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 13, 21 (PTAB Dec. 20, 2019) (precedential). The reasonable likelihood standard is “a higher standard than mere notice pleading,” but “lower than the ‘preponderance’ standard to prevail in a final written decision.” *Id.* at 13.

a) 3GPP-38.213

Petitioner argues that 3GPP-38.213 was “publicly available as early as September 28, 2019 and no later than September 30, 2019,” on 3GPP’s FTP server. Pet. 3–4 (citing Ex. 1008 ¶¶ 23, 103–111). Patent Owner does not dispute Petitioner’s showing as to 3GPP-38.213. We conclude that Petitioner has established, on this record, a reasonable likelihood that 3GPP-38.213 is a prior art printed publication under 35 U.S.C. § 102(a)(1), for the reasons explained by Petitioner. *See id.*

b) 3GPP-38.213-CR

Petitioner argues that 3GPP-38.213-CR was “publicly available as early as October 14, 2019 and no later than November 3, 2019,” relying on supporting testimony from Mr. Rodermund. Pet. 4–7 (citing Ex. 1008 ¶¶ 43–63, 72–80).

Mr. Rodermund testifies that he has “more than 20 years of experience working with standards development organizations including 3GPP” and the European Telecommunications Standards Institute (ETSI); was “an ETSI Project Manager and Secretary, from June 1998 to December 2004,” and has “remained knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility” since that time; and has “personal knowledge of 3GPP’s standard business and records keeping practices” that enables him to testify “regarding the authenticity of certain documents published by 3GPP and the timing of their publication.” Ex. 1008 ¶¶ 3, 7, 10, 14–15. Mr. Rodermund states that during his time as a “project manager for various ETSI Special Mobile Group (‘SMG’) and 3GPP working groups” from 1998 to 2004, he “edited all technical specifications produced by [his] working groups and presented results to the parent body for approval”; “attended all meetings (apart from some sub-working group meetings) and was . . . responsible for compiling meeting reports, for handling all the meeting documents, and managing the work plan”; and “guide[d] the groups and . . . advise[d] the chairmen regarding 3GPP working methods and procedures including document handling.” *Id.* ¶¶ 10, 12. Mr. Rodermund further testifies that he

acted as a 3GPP custodian of records by personally managing 3GPP’s public File Transfer Protocol (FTP) folders, which [he] used to make publicly accessible various 3GPP documents,

including versions of 3GPP specifications, technical reports, liaison statements, change requests, contributions, agendas, meeting reports, and other 3GPP documents from [his] working groups, [and is] knowledgeable about document management practices used in other working groups and within 3GPP in general with regard to making documents publicly accessible through the same public FTP server of 3GPP.

Id. ¶ 13.

Petitioner argues that, “[c]onsistent with 3GPP protocol,” 3GPP-38.213-CR was made available without restriction “to a working group including representatives of leading companies including, e.g., Huawei, Samsung, and Nokia,” when it was sent on November 3, 2019, as an attachment to an email from a Samsung employee, Aris Papasakellariou, to an ETSI “email exploder,” 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG.³ Pet. 4 (citing Ex. 1009, 1). Mr. Rodermund states that the email exploder currently has “around 1497 subscribers” and he “would expect a similar, or, only slightly lower, number” in November 2019. Ex. 1008 ¶ 72.

In addition to being sent to email subscribers, Petitioner contends that 3GPP-38.213-CR was made available by being “automatically posted to the 3GPP email archive for restriction free access by the general public . . . immediately after” the email was sent. Pet. 4–5. Mr. Rodermund explains how “3GPP maintains archives that include different versions of [its] specifications, as well as email communications to its membership,” and how “3GPP’s email archives . . . have been freely accessible to the general public with no login, password, or membership requirement and subscription

³ “ETSI manages 3GPP’s IT services such as the 3GPP website, FTP server, and email exploders.” Ex. 1008 ¶ 26.

was possible for every interested individual.” Ex. 1008 ¶¶ 43–44. He further testifies as follows:

Based on my personal knowledge and experience, emails sent via the 3GPP email exploders are stored and indexed in the archive at the time the emails are initially sent. Thus, they are accessible within seconds or minutes (depending on system load) after the time the sender hit the “send” button. I have been using the 3GPP email exploder tool for many years, and during my time working for ETSI, I was “list owner” of several email exploders which means I was responsible for managing and administrating several ETSI and 3GPP email exploder lists.

Id. ¶¶ 49, 77 (“emails were accessible via the archive immediately after they have been sent”). Mr. Rodermund provides an example from 2025 where an email was available in the archive minutes after it had been sent. *Id.*

¶¶ 50–51. According to Mr. Rodermund, emails in the email archive are indexed by list name, date, and subject, and searchable by author and keyword. *Id.* ¶¶ 53–60.

Petitioner identifies other evidence as allegedly corroborating 3GPP-38.213-CR’s public accessibility. Pet. 5–7. Mr. Rodermund was able to access the November 3, 2019, email from the email archive and download the 3GPP-38.213-CR attachment. Ex. 1008 ¶¶ 74–75. The metadata for the attachment indicates that the file was created and last modified on November 2, 2019. *Id.* ¶¶ 76, 79. And the front page of 3GPP-38.213-CR cites an October 14–20, 2019, 3GPP working group meeting in Chongqing, China. Ex. 1006, 1. Mr. Rodermund testifies that “based on [his] personal knowledge and experience with ETSI’s and 3GPP’s standard business practices, this information tells [him] that [3GPP-38.213-CR] was available either prior to or during or shortly after that meeting to 3GPP members, and to the general public.” Ex. 1008 ¶¶ 70–71.

Patent Owner responds that Petitioner fails to show that the 3GPP-38.213-CR “document sent to [the] 3GPP email list on November 3rd was available to non-3GPP members by November 5, 2019” (the alleged critical date for the ’434 patent). Prelim. Resp. 2 (emphasis omitted); *see* Pet. 14. According to Patent Owner, the listserv archive of emails cited by Mr. Rodermund “only shows that the November 3, 2019 email is available *now*—not that it was uploaded within a day of when the original email was sent”—and Mr. Rodermund provides only his uncorroborated opinion that uploads were “automatic” and “immediate.” Prelim. Resp. 5 (citing Ex. 1008 ¶¶ 43–63, 72–80). Patent Owner also contends that the November 2, 2019, metadata only relates to creation of 3GPP-38.213-CR and does not support Petitioner’s contention that the email was immediately uploaded. *Id.* at 6. Finally, Patent Owner argues that whether the subject matter of 3GPP-38.213-CR was discussed at the 3GPP meeting in October 2019 is “irrelevant,” given the date of the metadata, and has no bearing on whether the document itself was later publicly accessible. *Id.*

Assessing the evidence of record collectively, however, we are persuaded that Petitioner has shown a reasonable likelihood that 3GPP-38.213-CR was publicly accessible from the ETSI email archive before November 5, 2019. Given his many years of experience with ETSI, in particular his responsibilities pertaining to management of documents like change requests, and as the “list owner” “responsible for managing and administrating” several email exploder lists, Mr. Rodermund appears to be well-qualified to testify to the matters in his declaration. *See* Ex. 1008 ¶¶ 7, 10–15, 49. He explains in detail how, based on his experience, emails sent

to a 3GPP email exploder were accessible on the email archive immediately after being sent. *Id.* ¶¶ 44–60, 72–80.

That explanation is supported by screenshots from various websites and other corroborating evidence. *See* Ex. 1008 ¶¶ 44–60, 72–80. The November 3, 2019, email with 3GPP-38.213-CR as an attachment is currently available to the public via the email archive, with no login, password, or membership required to access it. *Id.* ¶¶ 44, 74; *see Kyocera*, 545 F.3d at 1351 (“[ETSI] specifications themselves were visible to any member of the interested public without requesting them from an ETSI member. Further, ETSI did not impose restrictions on ETSI members to prevent them from disseminating information about the standard to non-members.”). The metadata for the file indicates that it was created and last modified one day before the email was sent. Ex. 1008 ¶ 76. And Mr. Rodermund discusses one example where a listserv email was uploaded to the archive just minutes after being sent. *Id.* ¶¶ 50–51. Although that example is from 2025 rather than 2019, it provides some support for his opinion that the same “near contemporaneous” timing would have been the case in 2019 as well. *See id.* ¶ 52. Immediately making emails like the one with the 3GPP-38.213-CR change request available on the email archive is consistent with 3GPP’s overall purpose of making standards documents available “so that engineers and other individuals would have ready access to them when developing and implementing cellular networks and devices.” *See id.* ¶ 35; *Kyocera*, 545 F.3d at 1351 (finding that the “primary purpose of the [standard at issue] was to develop a system interoperable across national borders,” which “made it crucial to grant access to any interested parties”); *Cradlepoint, Inc. v. Sisvel Int’l S.A.*, IPR2020-01103, Paper 46 at

13–14 (PTAB Jan. 18, 2022) (finding, based on the preponderance of the evidence, that “testimony concerning [a 3GPP] email exploder and listserv provide further support for a conclusion of public accessibility because it tends to show that 3GPP was known beyond its members, that the meetings were widely publicized, and that 3GPP documents were, in general, widely available”). Finally, Mr. Rodermund explains in detail how a person of ordinary skill in the art could have accessed the email with 3GPP-38.213-CR, using the indexing of the email archive. *See* Ex. 1008 ¶¶ 49, 53–60.

We are persuaded that Mr. Rodermund’s testimony and supporting evidence are sufficient at this stage. Patent Owner will have the opportunity to cross-examine Mr. Rodermund and explore the bases for his statements. And our ultimate determination of the weight to be given to his testimony will be based on the complete record at the end of trial. Based on the totality of the evidence currently in the record, Petitioner has established a reasonable likelihood that 3GPP-38.213-CR is a prior art printed publication under 35 U.S.C. § 102(a)(1).

c) 3GPP-38.212-CR

Petitioner argues that 3GPP-38.212-CR was “publicly available as early as October 14, 2019 and no later than November 1, 2019,” applying the “same reasoning” as 3GPP-38.213-CR and again relying on testimony from Mr. Rodermund. Pet. 7–8 (citing Ex. 1008 ¶¶ 21, 43–61, 81–92; Ex. 1010). Patent Owner relies on its arguments regarding 3GPP-38.213-CR. Prelim. Resp. 6–7. For similar reasons to those explained above, on this record, Petitioner has established a reasonable

likelihood that 3GPP-38.212-CR is a prior art printed publication under 35 U.S.C. § 102(a)(1). *See supra* Section II.D.4.b.

5. *Claim 1*

Petitioner argues that 3GPP-38.213, 3GPP-38.213-CR, and 3GPP-38.212-CR collectively teach all of the limitations of claim 1 and a person of ordinary skill in the art would have been motivated to combine their teachings, with a reasonable expectation of success. Pet. 14–48. As to the combination with 3GPP-38.213-CR, Petitioner explains that the underlying standards document, 3GPP-38.213, “generally specifies fields and corresponding values considered for scheduling activation PDCCH validation and scheduling release PDCCH validation of a single DL SPS or UL grant Type 2 configuration,” and a person of ordinary skill in the art would have been motivated to modify the DCI validation operations described therein based on 3GPP-38.213-CR because “the express purpose of a change request . . . is to modify the main standard to which it corresponds.” *Id.* at 20–21. Similarly, as to the combination with 3GPP-38.212-CR, Petitioner points out that the title page of the change request references 3GPP-38.213 and argues that a person of ordinary skill in the art would have been motivated to modify the operations of 3GPP-38.213 “to include and configure the DCI format fields in the manner described by 3GPP-38.212-CR.” *Id.* at 22–23.

Turning to the limitations of the claim, claim 1 recites:⁴

[1.1] receiving, by a wireless device;

⁴ As Petitioner does, we read the semicolon in limitation [1.1] as a colon instead, given the three subsequent limitations reciting what is being “receiv[ed].” *See* Pet. v n.1.

[1.1.1] a first configuration parameter used in determination of a first sequence of one or more bits for downlink control information (DCI) validation;

[1.1.2] a second configuration parameter used in determination of a second sequence of one or more bits for DCI validation; and

[1.1.3] a third configuration parameter indicating a configuration index of an uplink configured grant configuration.

Petitioner identifies the HARQProcessNumberSize-ForDCIFormat0_2 parameter in 3GPP-38.212-CR as a “first configuration parameter.” Pet. 25. Petitioner argues that it “specifies a number of bits” in the HARQ process number field and using that number “would have allowed a bit-by-bit comparison of the HARQ process number field to the first sequence of one or more bits to determine if ‘all’ bits of the HARQ process number are set to ‘0.’” *Id.* at 26–28. Next, Petitioner identifies the NumberofbitsforRV-DCIFormat1_2 parameter in 3GPP-38.212-CR as a “second configuration parameter” and asserts that a person of ordinary skill in the art “would have understood and found it obvious to use” that parameter “to configure the ‘x bits’ of the ‘Redundancy Version’ field of DCI Format 0_2.” *Id.* at 28–31 (emphasis omitted). Finally, Petitioner identifies the Configuredgrantconfig-index parameter as a “third configuration parameter,” arguing that it “is used to set the value of [the] HARQ Process Number to ‘indicat[e] an activation for a corresponding UL grant Type 2 PUSCH’ if ‘a UE is provided more than one configuration[] for UL grant Type 2 PUSCH.’” *Id.* at 31–32 (quoting Ex. 1006, 4).

Claim 1 further recites:

[1.2] receiving a DCI comprising:

[1.2.1] a hybrid automatic repeat request process number field comprising one or more first bits; and

[1.2.2] a redundancy version field comprising one or more second bits.

Petitioner cites 3GPP-38.213-CR's description of "[v]alidation of the DCI format" and asserts that a person of ordinary skill in the art would have understood that "the UE would have received the DCI format" that is being validated. Pet. 32 (quoting Ex. 1006, 4). As to the two recited fields, Petitioner argues that 3GPP-38.213-CR describes DCI formats 0_2 and 1_2, the contents of which are described in 3GPP-38.212-CR. *Id.* at 33. For example, 3GPP-38.212-CR discloses that the formats each include a "HARQ process number" of "0, 1, 2, 3 or 4 bits" and a "[r]edundancy version" of "x bits" (i.e., "a 'placeholder' that refers to a variable number of one or more bits"). *Id.* at 33–35 (quoting Ex. 1007, 7–11) (emphasis omitted).

Limitation [1.3] recites "validating the DCI." Petitioner relies on 3GPP-38.213-CR's description of DCI validation—in a "first scenario" when the UE is provided a single configuration—"performed using one or more bits in the HARQ Process Number Field and one or more bits in the Redundancy Version Field," as shown in Tables 10.2-1 and 10.2-2 above. Pet. 35–36. Petitioner also cites 3GPP-38.213-CR's similar description of DCI validation—in the "alternative scenario" when the UE is provided more than one configuration—"performed using one or more bits of the Redundancy Version Field of the DCI and *not* using one or more bits of the HARQ Process Number," as shown in Tables 10.2-3 and 10.2-4. *Id.* at 36–37.

Limitations [1.3.1] and [1.3.2] recite that validating the DCI is:

[1.3.1] based on comparing the one or more second bits with the second sequence and not based on the one or more first bits in response to the one or more first bits indicating the configuration index; and

[1.3.2] based on comparing the one or more second bits with the second sequence and comparing the one or more first bits with the first sequence in response to the one or more first bits not indicating the configuration index.

Both limitations recite that validating the DCI is “based on comparing the one or more second bits with the second sequence.” Petitioner points out that the redundancy version field is used in all of Tables 10.2-1, 10.2-2, 10.2-3, and 10.2-4, and required to be “set to all ‘0’s.” Pet. 41–42; *see* Ex. 1006, 5. Petitioner contends that a person of ordinary skill in the art would have understood that determining whether the bits are set to zero would have been accomplished by comparing them with, for example, “a string or mask of all zeros corresponding to the bit length of the configured Redundancy Version Field.” Pet. 41.

Regarding limitation [1.3.1], which specifies that validating the DCI is “*not* based on the one or more first bits in response to the one or more first bits indicating the configuration index” (emphasis added), Petitioner explains how 3GPP-38.213-CR allegedly teaches validation without using the HARQ process number field when the UE is provided more than one configuration, as shown in Tables 10.2-3 and 10.2-4. Pet. 38–39. Petitioner argues that

when the UE is provided with more than one configuration for UL grant Type 2 PUSCH or for SPS PDSCH as disclosed by 3GPP-38.213-CR and this is indicated to the UE using *Configuredgrantconfig-index* or by *SPSconfig-index*, then a value of the HARQ Process Number field indicates an activation

for a corresponding UL grant Type 2 PUSCH configuration or for SPS PDSCH using the same value as provided by *Configuredgrantconfig-index* or by *SPSconfig-index*.

Id. at 39 (citing Ex. 1006, 4–5).

Regarding limitation [1.3.2], which specifies that validating the DCI is based on “comparing the one or more first bits with the first sequence in response to the one or more first bits *not* indicating the configuration index” (emphasis added), Petitioner argues that validation is performed in the single configuration scenario if all of the fields are set as in Tables 10.2-1 and 10.2-2, where both “the HARQ process number and . . . the Redundancy Version field are used for validation because the HARQ process number field is not used as . . . a configuration index” (unlike the disclosed multiple configuration scenario of Tables 10.2-3 and 10.2-4 where the UE is provided a configuration index). Pet. 42–47 (emphasis omitted).⁵

⁵ Petitioner explains how the asserted art teaches limitations [1.3.1] and [1.3.2], “whether or not [the limitations] are deemed to advance a mutually exclusive condition subject to interpretation under” *Ex parte Schulhauser*, No. 2013-007847, 2016 WL 6277792 (PTAB Apr. 28, 2016) (precedential). Pet. 10–11, 38–47. Petitioner has made a sufficient showing for both limitations based on the current record. The parties, however, are encouraged to address in their papers during trial the applicability and effect of *Schulhauser* with respect to limitations [1.3.1], [1.3.2], and any other relevant limitations. See *Hytera Comm’cns Co. Ltd. v. Motorola Solutions, Inc.*, 841 F. App’x 210, 215–218 (Fed. Cir. 2021) (discussing *Schulhauser* and related case law); *Cybersettle, Inc. v. Nat’l Arbitration Forum, Inc.*, 243 F. App’x 603, 607 (Fed. Cir. 2007); *Schulhauser*, 2016 WL 6277792, at *3 (concluding that “triggering” and “determining” steps of the claim at issue were “mutually exclusive,” under the claim’s broadest reasonable interpretation). The parties also are encouraged to address interpretation of the negative limitations in the challenged claims (i.e., those reciting the word “not”). See *United Services Auto. Ass’n v. PNC Bank N.A.*, No. 2023-2244, 2025 WL 706080, at *3 (Fed. Cir. Mar. 5, 2025) (“Silence is generally not

Finally, limitation [1.4] recites “activating or deactivating resources associated with the uplink configured grant configuration.” Petitioner argues that the asserted combination teaches activating resources when validation is performed with respect to Tables 10.2-1 or 10.2-3, and deactivating resources when validation is performed with respect to Tables 10.2-2 or 10.2-4. Pet. 47–48.

Patent Owner’s sole argument regarding Petitioner’s asserted ground is that Petitioner has not shown sufficiently that 3GPP-38.213-CR and 3GPP-38.212-CR are prior art printed publications. Prelim. Resp. 2–10. We disagree on this record for the reasons explained above. *See supra* Section II.D.4. Patent Owner does not dispute Petitioner’s arguments regarding the limitations of claim 1 or Petitioner’s asserted motivation to combine the references. *See* Prelim. Resp. 2–10.

Petitioner’s contentions are supported by the testimony of Dr. Mandayam and are persuasive based on the current record. *See* Pet. 14–48; Ex. 1003 ¶¶ 52–67, 81–113. Petitioner has shown a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable over 3GPP-38.213, 3GPP-38.213-CR, and 3GPP-38.212-CR. Accordingly, we institute review “on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” *See* 37 C.F.R. § 42.108(a).

disclosure. However, a reference need not state a feature’s absence in order to disclose a negative limitation. In determining what a prior art reference discloses, we look to what a skilled artisan would understand from reading the reference, which includes the internal context within the reference.” (citations and internal quotation marks omitted)).

6. *Claims 2–20*

Patent Owner does not raise any additional arguments specific to claims 2–20. *See* Prelim. Resp. 10. On this record, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable over 3GPP-38.213, 3GPP-38.213-CR, and 3GPP-38.212-CR, and thus need not determine at this time whether Petitioner also has shown a reasonable likelihood of prevailing as to any of the other challenged claims. *See supra* Section II.D.5; 37 C.F.R. § 42.108(a).

E. Additional Obviousness Grounds

Petitioner contends that claim 3 is unpatentable over 3GPP-38.213, 3GPP-38.213-CR, 3GPP-38.212-CR, and R2-1913143, and claims 7, 8, 16, and 17 are unpatentable over 3GPP-38.213, 3GPP-38.213-CR, 3GPP-38.212-CR, and 3GPP-38.331-CR, under 35 U.S.C. § 103. Pet. 63–75. Patent Owner relies on its arguments regarding 3GPP-38.213-CR and 3GPP-38.212-CR, which we disagree with on this record for the reasons explained above. Prelim. Resp. 10. Given our determination as to claim 1 based on the combination of 3GPP-38.213, 3GPP-38.213-CR, and 3GPP-38.212-CR, we need not determine at this stage whether Petitioner also has shown a reasonable likelihood of prevailing as to its other asserted grounds. *See* 37 C.F.R. § 42.108(a).

III. CONCLUSION

Based on the arguments presented in the Petition, we conclude that Petitioner has demonstrated a reasonable likelihood of prevailing with

respect to at least one claim of the '434 patent challenged in the Petition. Accordingly, we institute a trial on all claims and all grounds asserted in the Petition. The Board has not made a final determination under 35 U.S.C. § 318(a) with respect to the patentability of the challenged claims.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–20 of the '434 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '434 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

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Patent 10,965,434 B1

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