

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS INC.,
Petitioner,

v.

PANTECH CORPORATION,
Patent Owner.

IPR2023-01273
Patent 9,136,924 B2

Before DANIEL J. GALLIGAN, CHRISTOPHER L. OGDEN, and
SCOTT B. HOWARD, *Administrative Patent Judges*.

HOWARD, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background and Summary

LG Electronics Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 17–24 and 26–28 (“the challenged claims”) of U.S. Patent No 9,136,924 B2 (Ex. 1001, “the ’924 patent”). Pantech Corporation (“Patent Owner”) filed a Patent Owner Preliminary Response (Paper 22, “Prelim. Resp.”). With our authorization, Petitioner filed a Preliminary Reply to Patent Owner’s Preliminary Response (Paper 23, “Pet. Prelim. Reply,” “Preliminary Reply”) and Patent Owner filed a Preliminary Sur-reply (Paper 25, “Prelim. Sur-reply”).

We have authority, acting on the designation of the Director, to determine whether to institute an *inter partes* review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a). *Inter partes* review may not be instituted unless “the information presented in the petition filed under section 311 and any response filed under section 313 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.” 35 U.S.C. § 314(a) (2018). “When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a) (2023).

For the reasons set forth below, upon considering the briefing and the evidence of record, we determine that the information presented in the Petition establishes a reasonable likelihood that Petitioner will prevail with respect to at least one of the challenged claims, and we institute *inter partes* review on all of the challenged claims based on all of the grounds identified in the Petition.

B. Real Parties in Interest

Petitioner identifies itself and LG Electronics U.S.A, Inc. as the real parties in interest. Pet. 3

Patent Owner identifies itself as the real party in interest. Paper 3, 1 (Patent Owner's Mandatory Notices).

C. Related Matters

The parties identify the following district court proceeding in which the '924 patent is asserted: *Pantech Corporation, v. LG Electronics Inc.*, No. 5:22-cv-00113-RWS (E.D. Tex.). Pet. 3; Paper 3, 1.

D. The '924 Patent

The '924 patent is titled "Transmitting Device and a Method of Communicating Therewith, and Receiving Device and a Method of Communicating Therewith," and is directed "to a wireless communication system that uses multiple input multiple output (MIMO) in both a transmitting end and a receiving end." Ex. 1001, code (54), 1:19–22.

According to the '924 patent,

To embody an effective MIMO system, a MIMO wireless communication system may need to provide, to a transmitting device, information associated with a propagation channel or information associated with a precoder or a precoding matrix (hereinafter referred to as a precoding matrix) appropriate for a propagation channel, to increase transmission capacity. In this example, the former requires a large amount of feedback overhead, whereas the latter requires a relatively small amount of feedback overhead.

Ex. 1001, 3:57–65. In the case of the precoding matrix, "each of the user equipment 10 and the base station 20 stores a codebook that defines N available precoding matrices, and expresses an index or an indicator indicating or indexing (corresponding to) each precoding matrix, and

identification.” *Id.* at 3:66–4:3. “Each user equipment 10 selects a precoding matrix appropriate for a propagation channel, and transmits an index indexing the selected precoding matrix to the base station 20.” *Id.* at 4:3–6. “The base station 20 receives precoding matrix indices from each user equipment 10, and selects a MIMO mode or a user equipment or performs precoding based on the received precoding matrix indices.” *Id.* at 4:6–9. The ’924 patent describes that “when a large codebook is used, a codebook restriction or a codebook subset restriction that restricts at least one precoding matrix in a codebook may need to be used for more effective precoding.” *Id.* at 4:16–19.

The ’924 patent discloses a method, involving:

determining first information to restrict a precoding matrix from being used as a first precoding matrix of the first precoder, and second information to restrict a precoding matrix from being used as a second precoding matrix of the second precoder in a corresponding codebook with respect to each layer, and transmitting, to a receiving device, codebook restricting information including at least one of the determined first information and second information.

Ex. 1001, 1:41–51.

E. Illustrative Claim

Claims 17 and 23 are independent claims and claim 17, reproduced below, is illustrative of the subject matter of the challenged claims.

17. [17.pre] A communication method of a receiving device in a wireless communication system, the method comprising:

[17.a] receiving codebook restricting information including at least one of a first bit sequence to restrict at least one precoding matrix from a first precoding matrix group and a second bit sequence to restrict at least one precoding matrix from a second precoding matrix group, [17.b] each bit of the first bit

sequence corresponding to one precoding matrix of the first precoding matrix group, respectively, the at least one precoding matrix of the first precoding matrix group being restricted from being used as a precoding matrix of a first precoder, each bit of the second bit sequence corresponding to one precoding matrix of the second precoding matrix group, respectively, and the at least one precoding matrix of the second precoding matrix group being restricted from being used as a precoding matrix of a second precoder; and

[17.c] transmitting, to a transmitting device, 1st channel status information indicating the precoding matrix of the first precoder and 2nd channel status information indicating the precoding matrix of the second precoder, [17.d] the precoding matrix of the first precoder and the precoding matrix of the second precoder being selected, based on the codebook restricting information, from among precoding matrices that are not restricted,

[17.e] wherein a period of transmitting the information relating to the precoding matrix of the first precoder and a period of transmitting the information relating to the precoding matrix of the second precoder are different from each other.

Ex. 1001, 22:40–23:3.

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 17–24 and 26–28 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. § ¹	Reference(s)/Basis
17–19, 22–24, 28	103(a)	Sayana, ² Lee-689 ³
17–19, 22–24, 28	103(a)	Sayana, TS 36.213 ⁴
17–19, 22–24, 28	103(a)	Sayana, TS 36.213, TS 36.211 ⁵
20, 21, 26, 27	103(a)	Sayana, Lee-689, Koivisto ⁶
20, 21, 26, 27	103(a)	Sayana, TS 36.213, Koivisto
20, 21, 26, 27	103(a)	Sayana, TS 36.213, TS 36.211, Koivisto

Petitioner also relies on the testimony of Dr. Bertrand Hochwald (Ex. 1003).

II. ANALYSIS

A. Legal Standards

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under 35 U.S.C. § 103 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) if in evidence, objective evidence of non-obviousness such as

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’924 patent claims the benefit of the filing date from an application filed before March 16, 2013 and neither party contends that the AIA version applies, we apply the pre-AIA version of the statutory basis for unpatentability. See Ex. 1001, codes (22, 30, 86, 87).

² US 2011/0274188 A1, published November 10, 2011 (Ex. 1005).

³ WO 2010/050689 A2, published May 6, 2010 (Ex. 1007). All citations are to the native pagination.

⁴ 3GPP Technical Specification 36.213, “Physical layer procedures,” Version 8.8.0, published September 2009.

⁵ 3GPP Technical Specification 36.211, “Physical channels and modulation,” Version 8.8.0, published September 2009.

⁶ US 2013/0064129 A1, published Mar. 14, 2013 (Ex. 1010).

“commercial success, long-felt but unsolved needs, failure of others, etc.” *Id.* at 17–18. “While the sequence of these questions might be reordered in any particular case,” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the U.S. Court of Appeals for the Federal Circuit has repeatedly emphasized that “it is error to reach a conclusion of obviousness until all those factors are considered,” *WBIP, LLC v. Kohler*, 829 F.3d 1317, 1328 (Fed. Cir. 2016). Because Patent Owner does not address objective evidence of non-obviousness, we focus solely on the first three *Graham* factors.

B. Level of Ordinary Skill in the Art

The level of ordinary skill in the pertinent art at the time of the invention is a factor in how we construe patent claims. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). It is also one of the factors we consider when determining whether a patent claim is obvious over the prior art. *See Graham*, 383 U.S. at 17–18.

Factors pertinent to a determination of the level of ordinary skill in the art include “(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.” *Envtl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). “Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case.” *Id.*

Petitioner argues that a person having ordinary skill in the art would have had “a bachelor’s degree in electrical and computer engineering, computer science, or the equivalent thereof, and at least two years of

experience with networking and wireless communication systems; more education can supplement practical experience, and vice-versa.” Pet. 16 (citing Ex. 1003 ¶¶ 62–65).

Patent Owner does not address the level of ordinary skill in the art. *See* Prelim. Resp.

Because Petitioner’s proposed level of ordinary skill in the art is consistent with the field of the invention of the ’924 patent and not disputed by Patent Owner, for purposes of this Decision, we adopt Petitioner’s formulation of the person having ordinary skill in the art, with the exception of the open-ended phrase “at least.”⁷

C. Claim Construction

We apply the same claim construction standard used in the federal courts, in other words, the claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b), which is articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). Under the *Phillips* standard, the “words of a claim ‘are generally given their ordinary and customary meaning,’” which is “the meaning that the term would have to a person of ordinary skill

⁷ If Patent Owner disagrees with Petitioner’s formulation of the level of skill in the art, it must raise that disagreement in its Response. If a different level of skill would affect the outcome in this case, the parties must brief that issue as well. The failure of Patent Owner to describe how the different level of skill in the art is determinative will be a forfeiture of that argument. If disputed, the parties are also encouraged to submit evidence, other than conclusory expert testimony, that supports their position. *See* 37 C.F.R. § 42.65(a) (“(a) Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1312–13.

Petitioner argues that “the Board need not construe the Claims’ outer bounds and for purposes of this Petition, the Claims should [be] given their plain and ordinary meaning.” Pet. 17.

Patent Owner indicates it “applies the constructions adopted by the District Court in its claim construction order dated October 23, 2023, that removes any doubt as to the plain and ordinary meaning of certain terms.” Prelim. Resp. 31 (citing Ex. 2018, 14–15).

For the purposes of this Decision, we need not expressly construe any claim terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

We note that the Patent Owner has made a district court’s claim construction of record without making any affirmative arguments. The Consolidated Trial Practice Guide provides the parties guidance on how the Board construes claims and considers prior determinations:

The Board will determine the claim construction based on the record of the proceeding at issue. *Thus, as in a district court proceeding, the parties should point out the specific portions of the specification, prosecution history, and relevant extrinsic evidence they want considered, and explain the relevancy of any such evidence to the arguments they advance.* Each party bears the burden of providing sufficient support for any construction advanced by that party.

The claim construction rule also provides that “[a]ny prior claim construction determination concerning a term of the claim in a civil action, or a proceeding before the International Trade

Commission, that is timely made of record in the . . . proceeding will be considered.” 37 C.F.R. §§ 42.100(b), 42.200(b), 42.300(b). Under this provision, the Board will consider any prior claim construction determination in a civil action or ITC proceeding if a federal court or the ITC has previously construed a term of the involved claim using the same standard, and the claim construction determination has been timely made of record in the IPR, PGR, or CBM proceeding. The Board will give such other claim construction determinations appropriate weight. Non-exclusive factors considered by the Board when determining appropriate weight may include, for example, the similarities between the record in the district court or the ITC and the record before the Board. It may also be relevant whether the prior claim construction is final or interlocutory. These factors will continue to be relevant under the district court claim construction standard, which is articulated in *Phillips*. The Board may also consider whether the terms construed by the district court or ITC are necessary to deciding the issues before it. This is not an exclusive list of considerations, and the facts and circumstances of each case will be analyzed as appropriate.

Consolidated Trial Practice Guide 46–47 (emphasis added). Accordingly, without argument pointing out the specific portions of the specification, prosecution history, and relevant extrinsic evidence they want considered, and explaining the relevancy of any such evidence to the arguments they advance we will give little or no weight to a district court construction without argument by a party demonstrating why the construction was correct. To do otherwise would allow an improper incorporation by reference of the arguments of a document into a brief. *See* 37 C.F.R. § 42.6(a)(3) (prohibiting incorporation by reference).

D. Discretionary Denial – 325(d)

1. Legal Standard

Patent Owner urges us to exercise our discretion to deny institution of trial under 35 U.S.C. § 325(d). Prelim. Resp. 35–44. Under § 325(d), we

have discretion to deny a petition that presents the same or substantially the same prior art or arguments as previously presented to the Office. In evaluating whether the factual predicate under § 325(d) is met, we consider a number of non-exclusive factors, as set forth in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (Institution Decision) (precedential as to Section III.C.5, first paragraph) (“the *Becton Dickinson* factors”):

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;

- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;

- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

- (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;

- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and

- (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson, IPR2017-01586, Paper 8 at 17–18.

In performing an analysis under § 325(d), “the Board uses the following two-part framework:

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. . . . If, after review of [*Becton, Dickinson*] factors (a), (b), and (d), it

is determined that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8, 10 (PTAB Feb. 13, 2020) (Institution Decision) (precedential) (footnote omitted). Consequently, we first turn to an analysis of *Becton Dickinson* factors (a), (b), and (d) to determine whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office. Only if we determine that the same or substantially the same prior art or arguments were previously presented to the Office do we turn to *Becton Dickinson* factors (c), (e), and (f).

2. *Part One of the Advanced Bionics Analysis*

Becton Dickinson factors (a), (b), and (d) require us to determine, respectively: (a) “the similarities and material differences between the asserted art and the prior art involved during examination;” (b) “the cumulative nature of the asserted art and the prior art evaluated during examination,” and (d) “the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art.” *Becton, Dickinson*, IPR2017-01586, Paper 8 at 17.

Patent Owner argues that the Examiner considered Sayana during the prosecution of the '924 patent. *See* Prelim. Reply 37–40; Prelim. Sur-reply 1. Patent Owner also argues that Lee-689, TS 36.213, and TS 36.211 are substantially the same as Hammarwall,⁸ which was relied on by the

⁸ US 2011/0249713 A1, published October 13, 2011 (Ex. 1012).

Examiner in rejecting pending claims during the prosecution of the '924 patent. Prelim. Reply 41–42; Prelim. Sur-reply 2. For the reasons discussed below, we agree with Patent Owner about those references.

The Office previously considered Sayana, the primary reference Petitioner relies upon, during the prosecution of the '924 patent. Specifically, the Examiner included Sayana on a Notice of References Cited and it is printed on the face of the '924 patent. Ex. 1002, 435; Ex. 1001, code (56).

Although the Examiner did not consider Lee-689, TS 36.213, or TS 36.211 during the prosecution of the '924 patent, we agree that Hammarwall, which was considered by the Examiner, is substantially the same as Lee-689, TS 36.213, and TS 36.211. Specifically, Petitioner relies on Lee-689, TS 36.213, and TS 36.211 for their teaching of “bitmapped-based signaling.” Pet. 36–37, 58–59, 62–65. For example, Petitioner argues that “Lee-689 teaches using a ‘bitmap’ as a ‘codebook subset indication’ to ‘represent[] which precoding matrixes [sic] are included in a base codebook.’” *Id.* at 36 (quoting Ex. 1007, 18:5–15). TS 36.213 and TS 36.211 are cited for similar teachings. *See id.* at 58–59, 62–65.

Hammarwall has substantially the same teaching. Specifically, Hammarwall, citing TS 32.613, discusses using bitmaps to indicate restrictions in the codebooks: “The eNodeB also may use certain bitmap-based signaling to indicate the particular precoders within a codebook that the UE is restricted to using, see, e.g., Section 7.2 of the 3GPP Technical Specification, TS 36.213.” Ex. 1012 ¶ 10. Therefore, even though the Examiner did not consider Lee-689, TS 36.213, and TS 36.211, the Examiner considered substantially the same prior art teaching when the Examiner considered Hammarwall.

Petitioner argues that although “the Examiner cited Sayana in a Notice of References Cited attached to an [Office Action], the Examiner did not substantively discuss or rely on Sayana in any rejection of the Claims, or consider its teachings in the combinations set forth in this Petition.”

Pet. 13.^{9, 10} We do not find that argument persuasive. Although the Examiner did not rely on Sayana, the Examiner specifically cited it. Ex. 1002, 435. Therefore, Sayana was previously considered by the Office. *See Advanced Bionics*, IPR2019-01469, Paper 6 at 7–8 (“Previously presented art includes art made of record by the Examiner, and art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent.”).

Accordingly, with regard to grounds 1–3 ((1) Sayana and Lee-689, (2) Sayana and TS 36.213, and (3) Sayana, TS 36.213, and TS 36.211), the same or substantially the same prior art was presented to the Office.

Additional grounds rely on Koivisto. Patent Owner argues that Koivisto is substantially the same as Hammarwall and Jongren, which were considered by the Office:

Finally, Koivisto is relied upon by Petitioner but only for dependent claims. Koivisto discloses limited teachings of selecting beamforming and beam groups that were also already considered by the Office during examination with regard to Hammarwall and Jongren. *See, e.g., Ex. 1002 at 427-32.* Furthermore, because Koivisto is only relied upon for dependent

⁹ The names of prior art references are emphasized in the Petition. Here and elsewhere, we have removed the emphasis of prior art names.

¹⁰ Petitioner also argues that Sayana is not cumulative of Hammarwall. Pet. Prelim. Reply 1–2. We address that argument in Part Two of our analysis.

claims, any teachings it provides are not pertinent to the patentability of the independent claims.

Prelim. Resp. 43.

Based on the record and arguments before us, we do not agree with Patent Owner. Specifically, although Patent Owner makes a high-level argument about the teachings of Koivisto in comparison to the teachings of Hammarwall and Jongren, Patent Owner does not provide a detailed analysis comparing the teachings to show that they are substantially the same. We decline to perform the analysis that is missing from the Preliminary Response. *See United States v. Dunkel*, 927 F.2d 955, 956 (7th Cir. 1991) (“Judges are not like pigs, hunting for truffles buried in briefs.”); *DeSilva v. DiLeonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999) (“A brief must make all arguments accessible to the judges, rather than ask them to play archaeologist with the record.”). And without a detailed analysis showing that the structure in Koivisto is the same as that in the art the Examiner considered, we cannot say that the teachings are substantially the same.

3. *Part Two*

Having determined that part one of *Advanced Bionics* is met for grounds 1–3 (which includes all of the challenged independent claims), we consider whether Petitioner has shown that the Office materially erred. *Becton, Dickinson* factor (c) focuses on the record previously developed by the Office. *Advanced Bionics*, Paper 6 at 10. If the record, “is not well developed or silent, then a petitioner may show the Office erred by overlooking something.” *Id.* However, “if the alleged error is a disagreement with a specific finding of record by the Office, then ordinarily the petitioner’s required showing of material error must overcome persuasively that specific finding of record.” *Id.* at 10–11.

Although the Examiner did not rely on Sayana in rejecting any of the claims during prosecution of the '924 patent, the Examiner did rely on Hammarwall. Further, Patent Owner argues that “Sayana is relied on by Petitioner for the same teachings already found in Hammarwall.” Prelim. Resp. 39–40. If Patent Owner is correct, then we would need to consider whether the Office materially erred in making specific findings regarding Hammarwall. But, if Patent Owner is not correct, then the record is not well developed with respect to Sayana and we need only determine whether the Office materially erred by overlooking something.

We do not agree with Patent Owner’s argument. Although Patent Owner has shown some similarity between the features in Sayana and Hammarwall, Patent Owner has not shown how those features are relevant to specific findings made by the Examiner. *See* Prelim. Resp. 39–40; Prelim Sur-reply 2–3; *see also Advanced Bionics*, Paper 6 at 14–19 (comparing the prior art used in the Petition to specific findings made by the Examiner during prosecution).

Patent Owner also argues that the burden is on Petitioner to show some difference between Sayana and Hammarwall. *See* Prelim. Sur-reply 2–3. We disagree. At a minimum, the initial burden of production is on Patent Owner to show similarity between the disclosures of the two references. Because, as discussed above, Patent Owner has not met that initial burden of production, Petitioner does not have to explain why the references are different.

Accordingly, this case falls squarely into the first category, where the record is not well developed or silent, and Petitioner, therefore, must simply “show [that] the Office [materially] erred by overlooking something.” *Advanced Bionics*, Paper 6 at 10.

As discussed below in the analysis of the prior art, Petitioner has sufficiently shown a reasonable likelihood that claim 17 of the '924 patent is obvious in light of Sayana and Lee-689. *See* Section II.F.3, *infra*. By doing so, Petitioner demonstrates, based on the current record, that the Office overlooked that claim 17 would have been obvious over the combination of Sayana and Lee-689 (or the relevant teaching of bitmap-based signaling in Hammarwall) and, in doing so, erred in a manner material to the patentability of the challenged claims. *See Tokyo Ohka Kogyo Co. v. Fujifilm Elec. Materials U.S.A., Inc.*, PGR2022-00010, Paper 9 at 8–9 (PTAB June 6, 2022); *Samsung Elecs. Co. v. Evolved Wireless LLC.*, IPR2021-00943, Paper 9, 11 (PTAB Dec. 1, 2021).

Patent Owner argues that the Petition “fails to address why the prior consideration of Sayana was erroneous, or how the cumulative nature of Hammarwall, Lee-689, and the 3GPP Technical Specifications, is not material.” Prelim. Resp. 43. We disagree. As discussed below in detail, Petitioner sufficiently shows that claim 17 is unpatentable over Sayana and Lee-689. In doing so, Petitioner has sufficiently shown that the Office erred when it overlooked that combination of references.

Patent Owner directs our attention to *Albany International Corp. v. Kimberly-Clark Worldwide, Inc.*, PGR2021-00019, Paper 22 (PTAB June 22, 2021). However, *Albany* is not applicable to the facts of this case. In *Albany*, the PTAB panel found that the Examiner made specific findings about Lefkowitz during the prosecution of the patent. *Id.* at 15–16. The panel then found that because “[t]he Petition includes no substantive discussion of the prosecution history and does not address whether the Examiner erred in evaluating Lefkowitz,” “Petitioner has not demonstrated

persuasively that the Office erred in its evaluation of Lefkowitz in a manner material to the patentability of the challenged claims.” *Id.* at 16.

In this case, however, the Examiner did not make any specific findings about Sayana. *See* Ex. 1003. Therefore, there was no specific finding for Petitioner to point out and address.

For the reasons set forth above, we determine that the Office materially erred by overlooking Sayana.

4. Conclusion

Based on our analysis within the *Advanced Bionics* framework, we find that the Petition does not implicate § 325(d) in a sufficient manner as to warrant discretionary denial, and we decline to exercise our discretion to deny institution under § 325(d).

E. Discretionary Denial – Parallel Proceedings

Patent Owner argues that we should exercise our discretion and deny institution based on the district court proceedings. *See* Prelim. Resp. 17–19. Petitioner disagrees. *See* Pet. 44–52; Pet. Prelim. Reply 1.

Under § 314(a), the Director has discretion to deny institution of an *inter partes* review. *See Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an [*inter partes* review] proceeding.”).

In *NHK*, the Board denied institution relying, in part, on § 314(a) because the parallel district court proceeding was scheduled to finish before the Board reached a final decision. *NHK Spring Co. v. Intrix-Plex Techs., Inc.*, IPR2018-00752, Paper 8 (PTAB Sept. 12, 2018) (precedential) (Decision on Institution). “*NHK* applies to the situation where the district

court has set a trial date to occur earlier than the Board’s deadline to issue a final written decision in an instituted proceeding.” *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 3 (PTAB Mar. 20, 2020) (precedential) (Order). When determining whether to exercise discretion to deny institution under *NHK* due to an earlier trial date, we consider the following factors (“*Fintiv* factors”):

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Id. at 6. “These factors relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding.” *Id.* In evaluating these factors, we take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* (citing CTPG 58 (November 2019)).

On June 21, 2022, the Director issued an Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings With Parallel District

Court Litigation (“Interim *Fintiv* Guidance”).¹¹ The Interim *Fintiv* Guidance provides “several clarifications” to “the PTAB’s current application of *Fintiv* to discretionary denial where there is parallel litigation” in response to comments received from stakeholders in response to a Request for Comments. Interim *Fintiv* Guidance 2. For example, “the PTAB will not discretionarily deny institution of an IPR or PGR in view of parallel district court litigation where a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition.” Interim *Fintiv* Guidance 7.

Petitioner filed a *Sotera*-type stipulation. Ex. 1300. Specifically, Petitioner stipulates that if we institute this proceeding, “Petitioner will not pursue in *Pantech Corp. v. LG Elecs. Inc.*, No. 5:22-cv-00113 (E.D. Tex.), the grounds of invalidity asserted in the IPR, or any other ground that was raised or could have reasonably been raised in the IPR.” *Id.*

In view of the *Sotera*-type stipulation, we decline to exercise our discretion to deny institution. Interim *Fintiv* Guidance 7–8.

F. Sayana and Lee-689

Petitioner argues that claims 17–19, 22–24, and 28 would have been obvious over Sayana and Lee-689. Pet. 17–53. Based on the current record, we are persuaded that Petitioner has established a reasonable likelihood of prevailing on this asserted obviousness ground with respect to at least claim 17.

¹¹ Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

1. Overview of Sayana

Sayana is titled “Method and Precoder Information Feedback in Multi-Antenna Wireless Communication Systems,” and is directed “to a feedback framework in wireless communication systems.” Ex. 1005, code (54), ¶ 2. Sayana describes that “[i]n wireless communication systems, channel state information at a transmitter, for example, at a base station, is important for beam-forming transmissions (also referred to as precoding) that deliver more power to a targeted user while minimizing interference on other users.” *Id.* ¶ 3.

Sayana discloses a method for two-component feedback in wireless communication systems,

with a wireless communication device sending a first representation of a first matrix chosen from a first codebook, wherein the first matrix has at least two columns, the wireless communication device sending a second representation of a second matrix chosen from a second codebook, and the base station obtaining a precoder from the first representation and the second representation.

Ex. 1005 (code 57).

2. Overview of Lee-689

Lee-689 is titled “Method of Controlling Interference in a Wireless Communication System Having Multiple Antennas.” Ex. 1007, code (54). Lee-689 describes that “[i]n a closed-loop multiple antenna system, a receiver selects a precoding matrix from a predetermined codebook and transmits an index of the selected precoding matrix to a transmitter. Then, the transmitter multiplies data by the selected precoding matrix and transmits the data.” *Id.* at 3:6–10. Lee-689 also discloses that “[i]n a[n] open-loop multiple antenna system, a receiver does not transmit a feedback for a precoding matrix, and a transmitter precodes data using precoding

matrixes of a predetermined codebook rotationally.” *Id.* at 3:10–14.

However, Lee-689 explains, “when precoding and/or beamforming technology is used, a precoding matrix or beamformer may give interference to neighbor cells.” *Id.* at 3:15–17.

To address this, Lee-689 recites “generating a base codebook subset including at least one precoding matrix selected from a base codebook; transmitting a base codebook subset indication, which represents the at least one precoding matrix included in the base codebook subset, to a receiver; and precoding data using the base codebook subset or the base codebook.” Ex. 1007, 4:20–5:5. “In this case, the base codebook subset is generated by according precoding matrix index information received from neighbor cells.” *Id.* at 5:6–8.

3. *Analysis of Claim 17*

a) *Limitation 17.a*

Limitation 17.a recites “receiving codebook restricting information including at least one of a first bit sequence to restrict at least one precoding matrix from a first precoding matrix group and a second bit sequence to restrict at least one precoding matrix from a second precoding matrix group.” Ex. 1001, 22:42–46. Petitioner argues that the combination of Sayana and Lee-689 teaches that limitation. Pet. 32–37. Based on the current record, Petitioner has sufficiently shown that the combination of Sayana and Lee-689 teaches limitation 17.a.

Sayana teaches a “product design . . . to provide improved flexibility in the two component feedback.” Ex. 1005 ¶ 85. Sayana does this by using “codebook subset restrictions at wideband and subband level” that can be applied to a first codebook, a second codebook, or both:

However, further overhead reduction can be configured by eNB,¹² by enabling codebook subset restrictions at wideband and subband level. A codebook subset restriction is essentially where eNB signals the UE¹³ to only use a subset of codebook entries for the feedback. Subset restriction can be applied to either the first codebook, or the second codebook, or both.

Id. (footnotes added); *see also* Ex. 1003 ¶ 108, 110, 115. The wideband or long-term feedback is associated with the first codebook and precoder and the subband or short-term feedback is associated with a second codebook and precoder. Ex. 1005 ¶¶ 6, 48, 50, 85–87; Ex. 1003 ¶ 111. Sayana further teaches that the UE selects and sends back to the eNB a “preferred Precoding Matrix Index (PMI)” from each codebook based on the subset restrictions. Ex. 1003 ¶ 110; Ex. 1005 ¶¶ 29, 39, 58.

Sayana does not teach how the codebook subset restriction information is signaled from the eNB to a UE. Ex. 1003 ¶ 112. However, Petitioner has sufficiently shown that Lee-689 teaches using a base codebook subset indication expressed as a bitmap:

A base codebook subset indication represents which precoding matrixes are included in a base codebook subset among a rank 1 base codebook or not. *A base codebook subset indication can be expressed by bitmap.* For example, if *ith* element of a base codebook subset indication expressed by 10 bitmap is 0, a base codebook subset does not include *ith* element of a base codebook. And, if *ith* element of a base codebook subset indication expressed by bitmap is 1, a base codebook subset includes *ith* element of a base codebook. That is, a base codebook subset indication for a base codebook subset of equation 7 is “0b10011110”.

Ex. 1007, 18:5–15 (emphasis added).

¹² EnhancedNode-B. Ex. 1005 ¶ 15. eNB is a type of base station (BS). *Id.*

¹³ User equipment. Ex. 1005 ¶ 16.

Based on the current record, we are persuaded that modifying Sayana's "codebook subset restriction" information using Lee-689's bitmap, resulting in a system in which a separate bitmap is used for each of Sayana's codebooks (wideband and subband) to identify precoding matrices to restrict from each respective codebook, would have been obvious to a person having ordinary skill in the art. *See* Ex. 1003 ¶ 114; *see also* Ex. 1005 ¶ 85; Ex. 1007, 18:5-15. Specifically, Petitioner has sufficiently shown that a person having ordinary skill in the art would have made that modification in order to provide flexibility in the signaling of precoding matrices to UEs by specifying precoder subsets for each specific precoder codebook. *See* Ex. 1003 ¶ 114.

Accordingly, based on the current record, Petitioner has sufficiently shown that the combination of Sayana and Lee-689 teaches limitation 17.a.

Patent Owner argues Sayana, whether alone or in combination with Lee-689, does not teach or suggest "restricting using two bit sequences." Prelim. Resp. 53; *see also id.* at 53–58. Specifically, Patent Owner argues "Sayana specifically teaches one single 'precoder structure' that 'together convey[s] a precoder matrix of one or more vectors.'" *Id.* at 54 (quoting Ex. 1005 ¶ 58). Patent Owner further argues that the Petition is "missing" any of "the details of how Sayana's 'two component feedback' system allegedly particularly maps to the '924 Patent's two independent precoding matrix groups." *Id.*; *see also id.* at 54–55. According to Patent Owner, this is "important" as "the '924 Patent claimed invention requires receiving codebook restricting information (such as indexes) for two precoding matrix groups, as to 'restrict at least one precoding matrix from a first precoding

matrix group and . . . to restrict at least one precoding matrix from a second precoding matrix group.” *Id.* at 56.¹⁴

We do not agree with Patent Owner’s argument for two reasons. First, Patent Owner relies on a cropped version of limitation 17.a. Specifically, Patent Owner omits the language at the beginning of the limitation that makes it clear that only one of the bit sequences is needed, not both the first and second bit sequences: “receiving codebook restricting information *including at least one of a first bit sequence* to restrict at least one precoding matrix from a first precoding matrix group *and a second bit sequence* to restrict at least one precoding matrix from a second precoding matrix group.” Ex. 1001, 22:42–46 (emphasis added). The plain and ordinary meaning of “at least one” is that one of the listed items—in this case the first bit sequence and the second bit sequence—is needed, but that more are allowed. Patent Owner’s argument, which is based on the need for both bit sequences, is not commensurate with the scope of the claim.

Second, based on the current record, Patent Owner’s argument is inconsistent with Sayana paragraph 85. Paragraph 85 clearly identifies two separate codebooks and makes it clear that subset restrictions can be applied to either one of the codebooks or both. Patent Owner does not clearly address that teaching or Dr. Hochwald’s testimony about that paragraph in its Preliminary Response. *See* Prelim. Resp. 53–61.

Patent Owner also argues that Lee-689 only teaches “receiving one base codebook subset indication as a single bitmap with multiple bits, such as ‘0b10011110’ representing the precoding matrix to be selected by the

¹⁴ Although not cited in the Preliminary Response, this is a quote from limitation 17.a.

receiver.” Prelim. Resp. 58–59 (citing Ex. 1007, 18:5–19:9). According to Patent Owner, this means that “Lee-689 operates with multiple bits, but only one single bit sequence (its bitmap), but never a first and second bit sequences.” *Id.* at 59.

“The question in an obviousness inquiry is whether it would have been obvious to a person of ordinary skill in the art to combine the relevant disclosures of the two references, not whether each individual reference discloses all of the necessary elements.” *Game & Tech Co. v. Wargaming Grp. Ltd.*, 942 F.3d 1343, 1352 (Fed. Cir. 2019) (citing *Cohesive Techs., Inc. v. Waters Corp.*, 543 F.3d 1351, 1364 (Fed. Cir. 2008)). Because Petitioner relies on the combination of Sayana and Lee-689 to teach limitation 17.a, Patent Owner’s argument that Lee-689 does not teach the entirety of the claim limitation is inapposite. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (citations omitted) (“The test for obviousness is not whether . . . the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”).

Patent Owner also argues that Petitioner is improperly combining embodiments. Prelim. Resp. 61. However, Patent Owner does this in the abstract, without identifying any specific improper combinations. We decline to search the record *de novo* and determine which combinations are improper. If Patent Owner believes Petitioner is improperly combining embodiments, Patent Owner must explain this with specificity in the Response. Failure to do so will result in forfeiture of the argument.

Moreover, we disagree with Patent Owner’s statement that “Petitioner’s cited case law is easily distinguishable because what Petitioner is arguing for here is not ‘combining two embodiments’ but instead the

creation of a new embodiment all together from the teachings of Sayana's distinct disclosures." Prelim. Resp. 61 (citing Pet. 19). The precedential case cited by Petitioner, *Boston Scientific Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 991 (Fed. Cir. 2009), did exactly that when it approved of the combination of two different embodiments (shown in Figures 3B and 4) to achieve a new combination that was not explicitly described in the prior art patent. *See id.* Indeed, obviousness is often found from the combination of elements of different embodiments. As the Supreme Court has stated "[i]f a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability." *KSR*, 550 U.S. at 417.

b) Limitation 17.e

Limitation 17.e recites "wherein a period of transmitting the information relating to the precoding matrix of the first precoder and a period of transmitting the information relating to the precoding matrix of the second precoder are different from each other." Ex. 1001, 22:66–23:3. Petitioner argues Sayana teaches that limitation. *See* Pet. 43–44. Based on the current record, we are sufficiently persuaded by Petitioner's argument.

Sayana teaches that "the first matrix may be further feedback at different time instances and/or periodicities compared to the second matrix." Ex. 1005 ¶ 99. According to Sayana, "[t]his can, for example, be useful to alleviate the feedback load on the uplink in a single reporting instance like a subframe. Further, they may also be transmitted on different uplink physical channels like PUSCH and PUCCH defined in the current LTE Release-8." *Id.* Based on the current record, we are persuaded that a person having ordinary skill in the art would have understood this to teach that the UE sends the indicators of the first and second precoding matrices of the first

and second precoders back to a base station, such as the eNB, at different times or periodicities. *See* Ex. 1003 ¶¶ 136–138.

Patent Owner argues that Petitioner “relies on a single paragraph of Sayana that states its ‘first matrix may be further feedback [sic] at different time instances and/or periodicities compared to the second matrix.’” Prelim. Resp. 62 (quoting Pet. 19, 43) (alteration in original). Patent Owner further argues that “Sayana’s ‘two-component feedback’ precoder matrix, which is a function of the two-components, is always fed back in either wideband basis or sub-band basis as a single structure, such as, a Kronecker product of two precoders.” *Id.* at 62–63 (citing Ex. 1005 ¶48).

Based on the current record, we do not agree with Patent Owner’s argument. Sayana paragraph 99 plainly teaches that “[i]n another embodiment,” the first matrix is sent at a different time than the second matrix. The clear implication is that, for at least that embodiment, the two matrices must be distinct in order for them to be sent at different times. Thus, even if Patent Owner’s description of the embodiment disclosed in paragraph 48 is correct and there is only a single structure, that embodiment must be a different embodiment than the “another embodiment” referred to in paragraph 99 and relied upon by Petitioner, in which the different matrices are sent at different times.

Nor does it matter that Petitioner relies on only a single paragraph of Sayana. We are not aware of any case—nor has Patent Owner cited one—disregarding a teaching in the prior art that is described in a single paragraph.

c) Undisputed Elements

Petitioner argues that either Sayana or the combination of Sayana and Lee-689 teach the remaining undisputed limitations of claim 17¹⁵ and that a person having ordinary skill in the art would have combined the features of the prior art references. Pet. 23–32, 37–43. After reviewing Petitioner’s arguments and information regarding the limitations identified above, including the Hochwald Declaration, which are not addressed by Patent Owner at this stage (*see* Prelim. Resp.), we are persuaded that Petitioner sufficiently demonstrates, for purposes of this Decision, that the combination of Sayana and Lee-689 teaches limitations 17.pre and 17.b–17.d and that a person having ordinary skill in the art would have combined the teachings of the references in the manner set forth in the Petition.

d) Conclusion Regarding Claim 17

Based on the current record, there is a reasonable likelihood that Petitioner will prevail in demonstrating that claim 17 is unpatentable as obvious in view of Sayana and Lee.

4. Analysis of Claims 18, 19, 22–24, and 28

Because Petitioner demonstrates a reasonable likelihood of success in proving that at least one claim of the ’924 patent is unpatentable, we institute on all grounds and all claims raised in the Petition. *See* 37 C.F.R. § 42.108(a). Therefore, at this stage of the proceeding, it is not necessary for us to provide an assessment of every challenge raised by Petitioner, especially, as in this case, when Patent Owner does not separately argue

¹⁵ The undisputed limitations are limitations 17.pre and 17.b–17.d, which includes the preamble. Because Petitioner has sufficiently shown that the prior art teaches the preamble, we need not determine at this time whether the preamble is limiting. *See Nidec*, 868 F.3d at 1017.

those claims. *See* Prelim. Resp. 63. Those challenges, in our view, are best left for trial after full development of the record.

G. Sayana and TS 36.213 or TS 36.211

1. TS 36.213

Technical Specification 36.213 “specifies and establishes the characteristics of the physicals layer procedures in the FDD and TDD modes of E-UTRA.” Ex. 1008, 6. The Specification discloses that:

A UE is restricted to report PMI and RI within a precoder codebook subset specified by a bitmap parameter *codebookSubsetRestriction* configured by higher layer signalling. For a specific precoder codebook and associated transmission mode, the bitmap can specify all possible precoder codebook subsets from which the UE can assume the eNB may be using when the UE is configured in the relevant transmission mode. Codebook subset restriction is supported for transmission modes 3, 4, 5 and 6. The resulting number of bits for each transmission mode is given in Table 7.2-1b.

Id. at 34.

2. TS 36.211

Technical Specification 36.211 “describes the physical channels” for Evolved Universal Terrestrial Radio Access. Ex. 1009, 7. The Specification describes that the baseband signal representing a downlink physical channel is defined in terms of steps. *Id.* at 49. The steps include “precoding of the complex-valued modulation symbols on each layer for transmission on the antenna ports.” *Id.* The precoder takes as input a block of vectors, from the layer mapping, and generates a block of vectors to be mapped onto resources on each of the antenna ports. *Id.* at 52. The Specification discloses that the values for a precoding matrix is selected from a codebook, and discloses codebooks for 2 antenna ports and 4 antenna ports. *Id.* at 52–53.

3. *Analysis*

Because Petitioner demonstrates a reasonable likelihood of success in proving that at least one claim of the '924 patent is unpatentable, we institute on all grounds and all claims raised in the Petition. *See* 37 C.F.R.

§ 42.108(a). Therefore, at this stage of the proceeding, it is not necessary for us to provide an assessment of every challenge raised by Petitioner.

However, to provide guidance to the parties, we address the additional arguments Patent Owner made on these grounds.

Petitioner's and Patent Owner's arguments regarding TS36.213 and the combination of TS25.213 and TS.211 are substantially the arguments discussed above for Lee-689. *Compare* Pet. 36–37, Prelim Resp. 58–61 (Lee689), *with* Pet. 58–59, 62–65; Prelim Resp. 64–67 (TS36.213 and the combination of TS25.213 and TS.211). Specifically, like with Lee-689, Petitioner relies on both TS36.213 and the combination of TS25.213 and TS.211 to teach a bitmap that is used to indicate precoder restrictions. Pet. 58–59, 62–65. And, like with Lee-689, Patent Owner argues that “the Petition has not shown how TS 36.213 and/or TS 36.211 disclose any scenario where more than one bitmap is received by the UE or how the UE may be restricted to report PMI within a precoder codebook specified by a first and second bit sequence.” Prelim. Resp. 65. Accordingly, for substantially the same reasons as discussed above, we do not agree with Patent Owner's argument.

H. *Remaining Grounds*

Petitioner also asserts various other challenges against the challenged claims. *See* Pet. 65–78. Besides relying on the arguments addressed above and further arguing that the additional references do not cure the alleged deficiencies, Patent Owner does not address these grounds. *See* Prelim.

IPR2023-01273

Patent 9,136,924 B2

Resp. 67–68. Accordingly, further discussion of these grounds is best left for trial after full development of the record.

III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an inter partes review is instituted for claims 17–24 and 26–28 of the '924 patent on the unpatentability grounds asserted in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this decision.

IPR2023-01273
Patent 9,136,924 B2
FOR PETITIONER:

James L. Davis, Jr.
Daniel W. Richards
Shong Yin
ROPES & GRAY LLP
james.l.davis@ropesgray.com
LGE-Pantech-Ropes-IPR-Service@ropesgray.com
daniel.richards@ropesgray.com
shong.yin@ropesgray.com

FOR PATENT OWNER:

Amanda S. Bonner
James A. Fussell, III
Clark S. Bakewell
Baldine B. Paul
Luiz Miranda
MAYER BROWN LLP
asbonner@mayerbrown.com
jfussell@mayerbrown.com
cbakewell@mayerbrown.com
bpaul@mayerbrown.com
lmiranda@mayerbrown.com