

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SERCOMM CORPORATION,
Petitioner,

v.

ATLAS GLOBAL TECHNOLOGIES, LLC,
Patent Owner.

IPR2022-01520
Patent 10,020,919 B2

Before JOSIAH C. COCKS, DAVID C. McKONE, and
STEPHEN E. BELISLE, *Administrative Patent Judges*.

BELISLE, *Administrative Patent Judge*.

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

I. INTRODUCTION

Sercomm Corporation (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–9 and 11–19 (“Challenged Claims”) of U.S. Patent No. 10,020,919 B2 (Ex. 1001, “the ’919 patent”). Petitioner identifies itself as a real party in interest. Pet. 2. Atlas Global Technologies, LLC (“Patent Owner”) identifies itself as a real party in interest (Paper 4, 2), and timely filed a Preliminary Response to the Petition (Paper 20, “Prelim. Resp.”). With prior authorization from the Board, Petitioner also filed a Reply to Patent Owner’s Preliminary Response (Paper 23), and Patent Owner in-turn filed a Sur-Reply (Paper 24).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314(b) (2018); 37 C.F.R. § 42.4(a) (2022). We may not institute an *inter partes* review “unless . . . 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). 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.” *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 13 (PTAB Dec. 20, 2019) (precedential).

Applying those standards, and upon consideration of the information presented in the Petition, Preliminary Response, and related briefing, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to any of challenged claims 1–9 and 11–19 of the ’919 patent. *See* 35 U.S.C. § 314; 37 C.F.R. § 42.4(a). Accordingly, based on the record before us, we deny institution of an *inter partes* review of the ’919 patent.

II. BACKGROUND

A. Related Matters

Petitioner indicates that Patent Owner asserted the '919 patent, along with six other U.S. patents (Nos. 9,763,259, 9,825,738, 9,917,679, 10,756,851, 9,531,520, and 9,912,513), against Petitioner in a U.S. district court action, namely, *Atlas Global Techs. LLC v. Sercomm Corp.*, Case No. 6:21-cv-00818-ADA (W.D. Tex.) (“District Court Case”). Pet. 3. Petitioner also indicates that “[i]n one concurrently filed petition, Petitioner is also challenging the patentability of U.S. Patent No. 9,912,513.” Pet. 3; *see Sercomm Corp. v. Atlas Global Techs. LLC*, IPR2022-01519, Paper 1 (PTAB Sept. 9, 2022). Patent Owner identifies several district court actions as “related matters.” *See* Paper 4, 2 (listing cases a–j).

B. The '919 Patent

The '919 patent is titled “Protection Methods for Wireless Transmissions,” and issued July 10, 2018, from U.S. Patent Application No. 15/497,094, filed April 25, 2017. Ex. 1001, codes (10), (21), (22), (45), (54). The '919 patent claims priority through a continuation application, namely U.S. Patent Application No. 15/291,947, filed October 12, 2016, now U.S. Patent No. 9,667,394, to U.S. Provisional Patent Applications Nos. 62/240,419, filed Oct. 12, 2015; 62/331,380, filed May 3, 2016;

62/333,077, filed May 6, 2016; and 62/333,192, filed May 7, 2016.¹ *Id.* at 1:7–15, codes (60), (63).

The '919 patent relates to “Multi-User Multiple-Input-Multiple-Output (MU-MIMO) and Orthogonal Frequency Division Multiple Access (OFDMA) communications in a wireless network.” Ex. 1001, 1:21–24. According to the '919 patent, “[s]ounding operations are used to identify channel conditions in a wireless network:”

Identifying the channel conditions permits better utilization of the channel by enabling one or more of higher bit rates, use of a greater number of spatial streams, and more effective utilization of transmission power. However, sounding operations may contribute to the total amount of overhead in a wireless network. Therefore it is advantageous for sounding processes, including sounding processes used for UL MU [Up-Link Multi-User] transmissions, to be efficient.

Id. at 2:6–16.

The '919 patent discloses that a channel state information (CSI) feedback sounding procedure “consist[s] of a transmission, by the beamformer (such as an AP [access point]), of a non-data packet announcement (NDPA) transmission followed by non-data packet (NDP).” Ex. 1001, 18:19–23. “In response to the NDPA transmission and the NDP, a beamformee (such as a station) transmits CSI feedback to the beamformer.” *Id.* at 18:23–25. The '919 patent identifies, *inter alia*, two exemplary sounding procedures, namely a first sounding procedure illustrated in

¹ The parties dispute the effective filing date(s) of the Challenged Claims. Pet. 6–8; Prelim. Resp. 6–8. Because we deny institution upon consideration of the merits of all of Petitioner’s unpatentability challenges regardless of the '919 patent’s effective filing date, we need not and do not herein address this dispute.

Figure 8A and a second sounding procedure illustrated in Figure 8B, discussed further below. According to the '919 patent, “[w]hich of the first sounding procedure and the second sounding procedure is used is *indicated by a number of per-station information fields* in the NDPA frame,” and “[t]he NDPA frame contains parameters for CSI feedback as well as [a] list of STAs that are directed to participate in the CSI feedback process.” *Id.* at 18:50–57 (emphasis added).

Figure 8A of the '919 patent, reproduced below, illustrates first process 800A for obtaining CSI feedback using the first sounding procedure, where an AP transmits NPDA 804A designating only a single station, namely first station STA1, and the AP then transmits NDP 806. Ex. 1001, 18:58–62, Fig. 8A.

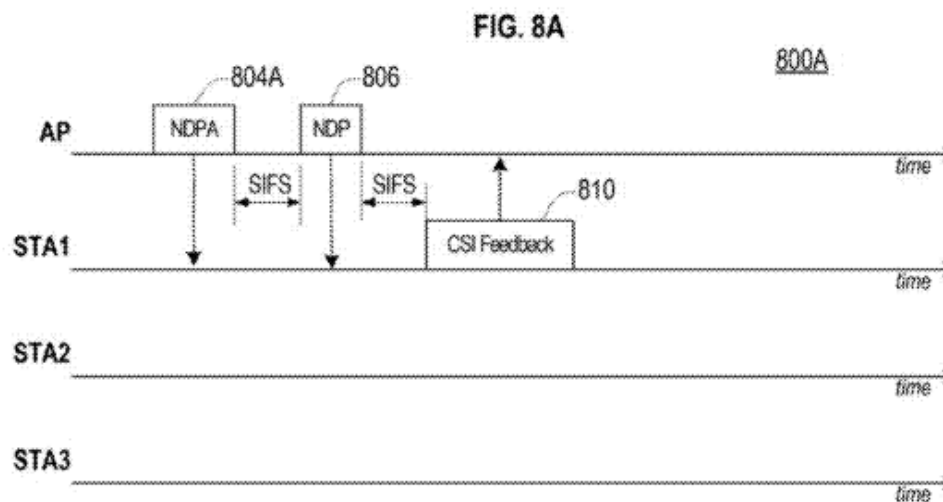


Figure 8A depicts a first process for obtaining Channel State Information (CSI) feedback using a first sounding procedure.

Id. at 5:40–42, Fig. 8A.

In Figure 8A above, first station STA1 receives NPDA 804A, “*determines that it indicates only a single station (itself), and based on the*

NPDA 804A indicating only a single station (that is, based on the NPDA 804A not indicating a plurality of stations) *determines that the first sounding procedure for obtaining CSI feedback is being used.*” Ex. 1001, 18:63–19:1 (emphases added). “The first station STA1 then receives the NDP 806 and uses it to compute CSI feedback.” *Id.* at 19:1–3. According to the ’919 patent:

When the first station STA1 determines that the first sounding procedure for CSI feedback is being used, then in response to the NDP 806, the first station STA1 transmits its CSI feedback after a SIFS has elapsed from the end of the NDP 806. The first station STA1 transmits its CSI feedback in a Single User MIMO (SU-MIMO) UL transmission 810.

Id. at 19:4–9.

Figure 8B of the ’919 patent, reproduced below, illustrates second process 800B for obtaining CSI feedback using the second sounding procedure, where an AP transmits NPDA 804B designating first, second, and third stations STA1, STA2, and STA3, respectively, and the AP then transmits NDP 806. Ex. 1001, 19:12–15, Fig. 8B.

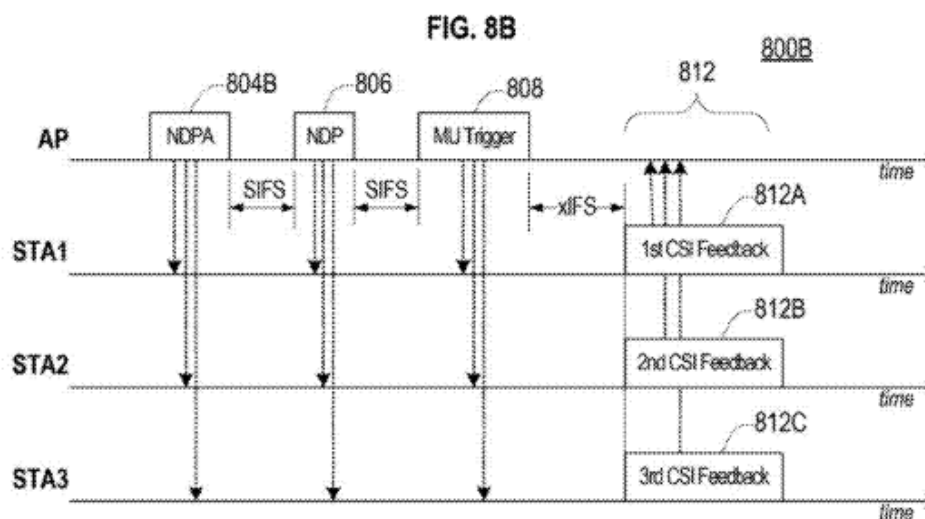


Figure 8B depicts a second process for obtaining Channel State Information (CSI) feedback using a second sounding procedure.

Id. at 5:40–42, Fig. 8B.

In Figure 8B above, each of first, second, and third stations STA1, STA2, and STA3 receives NPDA 804B, “*determines that it indicates a plurality of stations including itself, and based on the NPDA 804B indicating a plurality of stations, determines that the second sounding procedure for obtaining CSI feedback is being used.*” Ex. 1001, 19:16–22 (emphases added). “The first, second, and third stations STA1, STA2, and STA3 then receive the NDP 806 and use it to compute first, second, and third CSI feedback, respectively.” *Id.* at 19:23–25. According to the ’919 patent:

[After a] SIFS after the NDP, the AP transmits an MU Trigger frame 808. The MU Trigger frame 808 indicates to the stations which resources (such as OFDMA Resource Units (RUs), MIMO spatial streams, or both) each of the stations STA1, STA2, and STA3 that [are] providing the CSI feedback should use to provide the CSI feedback.

When the first, second, and third stations STA1, STA2, and STA3 have respectively determined that the second sounding procedure for CSI feedback is being used, in response to the MU Trigger 808, the first, second, and third stations STA1, STA2, and STA3 transmit the first, second, and third CSI feedback, respectively, an Inter-Frame Space (xIFS) after the end of the frame including the MU Trigger 808 as part of an MU UL transmission 812. The Inter-Frame Space may be any one of [a] SIFS, a PIFS, a DIFS, or an AIFS.

Id. at 19:26–41.

The ’919 patent discloses that MU Trigger frame 808 may allocate resources to fewer than all of the stations indicated in the NDPA 804B, and

when it does so, “only stations directed to participate in the sounding process 800B by the NDPA 804B and having resources allocated to them by the MU Trigger frame 808 transmit CSI information in response to the MU Trigger frame 808.” Ex. 1001, 19:56–64.

C. Illustrative Claim

The ’919 patent includes twenty claims, of which claims 1–9 and 11–19 are challenged. Claims 1 and 11 are the challenged independent claims, and both are reproduced below with bracketing added to mirror the parties’ usage thereof.

1. [1.PRE] A method performed by a wireless device, the method comprising:
 - [1.A] receiving a Null Data Packet Announcement (NDPA), the NDPA including one or more station information fields;
 - [1.B] determining exactly a number of the one or more station information fields in the NDPA;
 - [1.C] receiving a Null Data Packet (NDP); and
 - [1.D] in response to determining that the number of the one or more station information fields in the NDPA is one, transmitting first Channel State Information (CSI) feedback in response to receiving the NDP,
 - [1.E] wherein the number of the one or more station information fields in the NDPA is the cardinality of the one or more station information fields in the NDPA.

Ex. 1001, 32:64–33:10.

11. [11.PRE] A method performed by a wireless device, the method comprising:
 - [11.A] transmitting a Null Data Packet Announcement (NDPA), the NDPA including one or more station information fields;
 - [11.B] transmitting a Null Data Packet (NDP); and

[11.C] when a number of the one or more station information fields in the NDPA is one, receiving first Channel State Information (CSI) feedback transmitted in response to the NDP[A] having only one station information field,

[11.D] wherein the number of the one or more station information fields in the NDPA is exactly the cardinality of the one or more station information fields in the NDPA.

Ex. 1001, 33:54–34:11.

D. Evidence of Record

Petitioner relies on the following patent evidence.

Name	Patent Document	Exhibit
Ghosh	US 9,788,317 B2	1005
Chun '535	US 10,038,535 B2	1006
Chun '388	US 10,349,388 B2	1007

Petitioner also relies on the following non-patent literature evidence.

Name	Non-Patent Literature Title	Author	Exhibit
802.11ac	IEEE Std 802.11ac-2013 Amendment; Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 4: Enhancements for Very High Throughput for Operation in Bands below 6 GHz	The Institute of Electrical and Electronics Engineers, Inc. ("IEEE")	1004

Pet. 9.

Petitioner also relies upon the Declaration of Dr. Sumit Roy (Ex. 1003) and the Declaration of Christopher Childers (Ex. 1032).

Patent Owner relies upon the Declaration of Dr. Konstantinos Psounis (Ex. 2003).

E. Asserted Challenges to Patentability

Petitioner (Pet. 9–10) challenges the patentability of claims 1–9 and 11–19 of the ’919 patent on the following bases.

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1, 11	102 ²	802.11ac
1, 11	103	802.11ac
2–9, 12–19 ³	103	802.11ac, Ghosh
1, 11	102	Chun ’535
11	103	Chun ’535
2–9, 12–19 ⁴	103	Chun ’535, Ghosh
1–9, 11–19	102	Chun ’388
1, 8, 9, 11, 14, 19	103	Chun ’388

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102 and 103. Because the ’919 patent was effectively filed after March 16, 2013, the effective date of the relevant amendment, the AIA versions of §§ 102 and 103 apply.

³ In the Petition, Petitioner initially identifies “Ground 3” as applying to claims 1–9 and 11–19 (Pet. 9), but later identifies and substantively addresses only dependent claims 2–9 and 12–19 as “Ground 3” (Pet. 32–46). *See* Pet. 32 (“Ground 3: 802.11ac In View of Ghosh Renders Obvious Claims 2–9 and 12–19 Under 35 U.S.C. § 103”). Thus, in this Decision, we consider “Ground 3” to be directed only to claims 2–9 and 12–19.

⁴ In the Petition, Petitioner initially identifies “Ground 6” as applying to claims 1–9 and 11–19 (Pet. 10), but later identifies and substantively addresses only dependent claims 2–9 and 12–19 as “Ground 6” (Pet. 55–61). *See* Pet. 55 (“Ground 6: Chun 535 In View of Ghosh Renders Obvious Claims 2–9 and 12–19 Under 35 U.S.C. § 103”). Thus, in this Decision, we consider “Ground 6” to be directed only to claims 2–9 and 12–19.

III.ANALYSIS

A. Applicable Law

Petitioner challenges the patentability of claims 1–9 and 11–19 of the '919 patent on grounds that the claims would have been anticipated under 35 U.S.C. § 102 or obvious under 35 U.S.C. § 103 in light of various references, namely 802.11ac, Chun '535, Chun '388, and Ghosh. “In an [*inter partes* review], the petitioner has the burden from the onset to show *with particularity* why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)) (emphasis added). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review).

To serve as an anticipatory reference under 35 U.S.C. § 102, “the reference must disclose each and every element of the claimed invention, whether it does so explicitly or inherently.” *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009). “The identical invention must be shown in as complete detail *as is contained in the . . . claim.*” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989) (emphasis added). The elements must be arranged as required by the claim, “but this is not an ‘*ipsissimis verbis*’ test,” i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 832–33 (Fed. Cir. 1990) (citing *Akzo N.V. v. United States Int’l Trade Comm’n*, 808 F.2d 1471, 1479 & n.11 (Fed. Cir. 1986)).

A claim is unpatentable under 35 U.S.C. § 103 “if 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.” 35 U.S.C. § 103; *see KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when of record, objective evidence of obviousness or non-obviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Objective indicia of non-obviousness may include the following: “commercial success, long felt but unsolved needs, failure of others, etc.”⁵ *Id.* The totality of the evidence submitted may show that the challenged claims would not have been obvious to one of ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). When evaluating a combination of teachings, we must also “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

We analyze the challenges presented in the Petition in accordance with the above-stated principles.

⁵ Patent Owner has not presented objective evidence of non-obviousness.

B. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art, at the time of the earliest effective filing date of the '919 patent:

would have [had] a bachelor's degree in electrical engineering, computer science, computer engineering, or a similar discipline, and either a master's degree in one of these fields of study or a minimum of two years of experience working in the wireless communications industry. An individual with an advanced degree in a relevant field would require less experience in the design of wireless communication systems and methods.

Pet. 13 (citing Ex. 1003 ¶ 41).

Similarly, Patent Owner contends that the person of ordinary skill in the art:

would have had: (a) at least an undergraduate degree in electrical engineering, computer science, or computer engineering, or an equivalent field; (b) knowledge of the IEEE 802.11 standard including its channel sounding methods; and (c) at least two years' experience in the development of wireless local area networks (WLANs). This description is approximate, and a higher level of education or skill might make up for less experience, and vice-versa.

Prelim. Resp. 9 (citing Ex. 2003 ¶ 48) (internal citation omitted).

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted). The level of ordinary skill in the art also is reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Neither party argues that the outcome of this case would differ based on our adoption of any particular definition of the level of ordinary skill in the art. Although slight differences exist in the formulation of such skill level between the parties, we discern no meaningful differences because none of those differences would affect the outcome of our analysis. Considering the subject matter of the '919 patent, the background technical field, the prior art, and parties' proposed definitions of the skilled artisan, we apply the level of skill cumulatively set forth above by the parties, which is consistent with testimony of both parties' experts (Ex. 1003 ¶ 41; Ex. 2003 ¶ 48).

C. Claim Construction

We construe claims “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b) (2020); *see also Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

In this context, claim terms “are generally given their ordinary and customary meaning” as understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips*, 415 F.3d at 1312–13; *accord CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (There is “a ‘heavy presumption’ that a claim term carries its ordinary and customary meaning.”). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the

prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). Extrinsic evidence is “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” *Phillips*, 415 F.3d at 1317.

Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (stating 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))).

The parties do not dispute the meaning of any limitation in the Challenged Claims, except for the limitation “wherein the number of the one or more station information fields in the NDPA is [exactly] the *cardinality* of the one or more station information fields in the NDPA” in independent claims 1 and 11 (Ex. 1001, 33:8–10, 34:9–11 (emphasis added)), which we refer to herein as the “Cardinality Limitation.” See Pet. 10–12; Prelim. Resp. 20–27.

Cardinality Limitation

Petitioner contends the Cardinality Limitation means “wherein the number of the one or more station information fields in the NDPA is the number of the one or more station information fields in the NDPA.” Pet. 11 (citing Ex. 1003 ¶¶ 61–62). Petitioner argues that “[t]o practice the ‘transmitting’ element of claims 1 and 11 ([*i.e.*, where the CSI is transmitted ‘in response to’ determining that the number of STAInfo fields

in the NDPA is one), the number of station information fields in the NDPA *must be one*,” and therefore, “the ‘cardinality’ of the station information fields is also one since there will always only be one station information field in the NDPA.” Pet. 12 (citing Ex. 1001, 33:4–7, 34:5–8; Ex. 1003 ¶ 66).

Patent Owner contends the Cardinality Limitation “clarifies the ‘number of the one or more station information fields in the NDPA’ found earlier in the claims by explaining that this number is *the number of station information fields in the NDPA*, rather than, for example, the number of a particular station information field.” Prelim. Resp. 21. Patent Owner argues “Petitioner’s construction simply removes the term ‘cardinality’ from this claim element,” and “introduces ambiguity into the claims by suggesting that the number could be either the number of station information fields or the number (or index) of the station information field directed to a station,” which is the very ambiguity “the patentee sought to avoid” during prosecution.” *Id.* at 20–22; *see id.* at 21–27. We agree with Patent Owner and find Petitioner’s arguments unpersuasive. *See, e.g.*, Ex. 1002, 159 (Examiner stating, “The applicant proposed amending the claim to further define the process of determining a number and further defining the number as a cardinality *wherein the cardinality is a number of elements in a set or group*.” (emphasis added)).⁶

After filing of the Petition, the District Court in the District Court Case entered a *Markman* order (Ex. 2005) construing the Cardinality

⁶ Unless otherwise specified, citations to exhibits use the page numbers assigned by the parties, not the original page numbers.

Limitation, among others. *See* Ex. 2005, 67–68 (referring to the court’s analysis at 61–67). For that limitation, as here, in district court Patent Owner proposed the construction of “[p]lain and ordinary meaning,” which according to Patent Owner means, “wherein the number of the one or more station information fields in the NDPA is the number of elements in the set of station information fields.” *Id.* at 67–68.

The district court also agreed with Patent Owner and construed the Cardinality Limitation “according to its plain-and-ordinary meaning” for the same reasons as the court provided for its construction of a related limitation, namely, “in response to determining that the number of the one or more station information fields in the NDPA is one.” Ex. 2005, 68 (referring to the court’s analysis at 61–67). In adopting Patent Owner’s construction, the District Court explained:

Because the “heavy presumption” is that terms should be construed according to their plain-and-ordinary meaning and because [Petitioner] do[es] not allege lexicography or disclaimer, which are the only two exceptions to the general rule that a term should be construed as having its plain-and-ordinary meaning, the Court concludes that the term should be construed as having its plain-and-ordinary meaning.

Id. at 67.

We have reviewed the District Court’s reasoning, as well as the ’919 patent and other evidence of record before us, and agree that for reasons given by the District Court the Cardinality Limitation should be given the same construction as determined by the District Court. We therefore adopt the District Court’s construction for that term. Ex. 2005, 68. Accordingly, at this stage of the proceeding, we construe the Cardinality Limitation to have its plain and ordinary meaning, or in other words, to

mean “wherein the number of the one or more station information fields in the NDPA is the number of elements in the set of station information fields.” *See* Ex. 2005, 67–68 (referring to the court’s analysis at 61–67); Ex. 1002, 159.

D. Alleged Anticipation of Claims 1 and 11 by 802.11ac

Petitioner contends claims 1 and 11 are unpatentable under 35 U.S.C. § 102 as anticipated by 802.11ac (Ex. 1004). Pet. 23–30. Patent Owner opposes Petitioner’s contentions. Prelim. Resp. 1–2, 10–20, 28–32. Based on our review of the Petition and Preliminary Response, we determine that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that any of claims 1 and 11 is unpatentable as anticipated by 802.11ac, as discussed below. We begin with an overview of 802.11ac.

1. Overview of 802.11ac (Ex. 1004)

802.11ac is a 2013 amendment to prior IEEE 802.11 Wi-Fi standards. Ex. 1004, Cover, 1. Over about 400 pages, 802.11ac discloses various aspects of Wireless Local Area Networks (“WLANs”). The purpose of this amendment was “to improve the IEEE 802.11™ [WLAN] user experience by providing significantly higher basic service set (BSS) throughput for existing WLAN application areas and to enable new market segments for operation below 6 GHz including distribution of multiple multimedia/data streams.” *Id.* at 2. In one aspect, 802.11ac discloses a Very High Throughput (“VHT”) method of a WLAN. *See id.* at Cover. 802.11ac discloses a VHT sounding protocol that allows feedback only by a single station or beamformee at a time, as illustrated, for example, in Figures 9-41a and 9-41b, reproduced below.

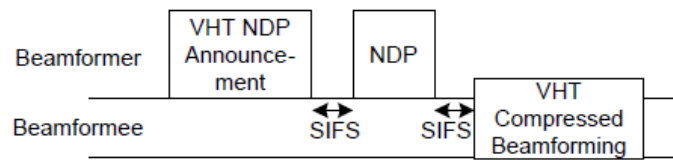


Figure 9-41a—Example of the sounding protocol with a single VHT beamformee

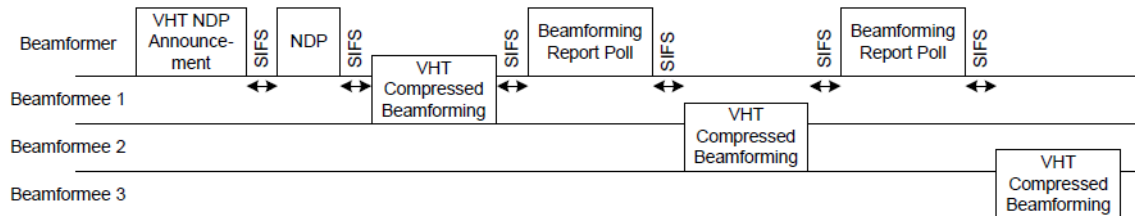


Figure 9-41b—Example of the sounding protocol with more than one VHT beamformee

Ex. 1004, 170, Figs. 9-41a, 9-41b.

Figs. 9-41a and 9-41b above disclose two methods for beamforming: the first, Fig. 9-41a, is directed only to a single station or beamformee, and the second, Fig. 9-41b, is directed to multiple stations. Ex. 1004, 169–70. In the first method (Fig. 9-41a), an AP or beamformer transmits a NDPA to a single station and sets the Feedback Type subfield of the station (“STA”) Info field to single-user (“SU”) and sets the Receive Address (“RA”) to the Medium Access Control (“MAC”) address of the station. *Id.* at 169. This signals to the station that a single-user feedback method will be used. *Id.* at 169–70. In the second method, an AP transmits a NDPA with more than one STA Info field and sets the RA of the NDPA to a broadcast address. *Id.* at 169. This informs the stations that the second method should be used, and stations whose STA Info fields are not the first in the set will wait for a beamforming report poll before sending feedback. *Id.* at 170.

We further discuss below the disclosure of 802.11ac in connection with the parties’ arguments.

2. *Independent Claim 1: “[1.D] in response to determining that the number of the one or more station information fields in the NDPA is one, transmitting first Channel State Information (CSI) feedback in response to receiving the NDP”*

Independent claim 1 recites, in relevant part, “[1.D] *in response to determining that the number of the one or more station information fields in the NDPA is one, transmitting first Channel State Information (CSI) feedback in response to receiving the NDP.*” Ex. 1001, 33:4–7 (emphases added; bracketed numbering added to match the parties’ usage). But this limitation is informed by two other limitations, namely, “[1.B] *determining exactly a number of the one or more station information fields in the NDPA,*” and “[1.E] wherein *the number of the one or more station information fields in the NDPA is the cardinality of the one or more station information fields in the NDPA.*” *Id.* at 33:1–2, 8–10 (emphases added). Thus, limitation 1.D, read in the context of these other limitations, relies upon “determining” that the number of elements in the set of station information fields (the meaning of “cardinality”) “is one,” and “in response to” that determination, “transmitting” first CSI feedback in response to receiving the NDP. *See* Prelim. Resp. 28–29 (Patent Owner arguing independent claims 1 and 11 “require knowledge of the total number of station information fields in the NDPA.”); Ex. 2003 ¶ 98. The parties dispute, *inter alia*, whether Petitioner’s cited evidence adequately supports Petitioner’s contention that 802.11ac discloses limitation 1.D. *See, e.g.*, Prelim. Resp. 1–2, 10–20, 28–32; Pet. 23–30.

Before turning to the parties’ arguments, we note that during prosecution the Examiner ultimately allowed independent claim 1 (and

similar independent claim 11) *because of limitation 1.D as informed by limitations 1.B and 1.E.* See Ex. 1002, 229. The Examiner stated that the “[i]nstant invention relates to techniques for channel sounding in wireless communications system, and *a novel method for indicating to a UE that it should respond to a channel sounding request and how.*” *Id.* (emphasis added). The Examiner focused on “features which, when combined with other features in the claims, conventional techniques of record in the art failed to anticipate or render obvious at the time when [the] instant invention was made,” and specifically identified the combination of features set forth in limitations 1.B, 1.D, and 1.E as the reason for allowance of the subject claims. *Id.* at 229–30; *see id.* at 159, 162, 166, 172–73, 210 (addressing “cardinality”), 210, 213, 217 (addressing “in response to”).

In this case, Petitioner contends for limitation 1.B:

802.11ac teaches that “[i]f the VHT NDP Announcement frame contains only one STA Info field, then the RA field value is the address of the STA identified by the AID in the STA Info field.” *Id.* at 44. Where the scope of claim 1 is limited to the NDPA including a total of one STA Info field, 802.11ac satisfies this disclosure. *Infra*, Section V.C.1.e. Thus, the STA “*determine[es] exactly a number of the one . . . station information field[] in the NDPA*” by checking the NDPA’s RA field to see whether it is the intended recipient and determining whether it is a STA address or a broadcast address. *Id.* at 44; SER-1003, ¶92.

Pet. 25. As for limitation 1.E, Petitioner contends 802.11ac discloses that a VHT NDPA includes one or more STA Info fields numbered from 1 to n, and that the “number of STA Info fields is equal to the cardinality since every STA Info field is distinct.” Pet. 27–28 (citing Ex. 1004, Fig. 8-29j; Ex. 1003 ¶ 102). As for limitation 1.D, Petitioner contends:

802.11ac discloses that a STA that receives the VHT NDPA from a beamformer “that contains the VHT beamformee’s AID in the AID subfield of the first (*or only*) STA Info field and also receives a VHT NDP a SIFS after the VHT NDP Announcement frame shall transmit the PPDU containing its VHT Compressed Beamforming feedback a SIFS after the VHT NDP” as depicted in Figure 9-41a below [image omitted]. 802.11ac, 169 (emphasis added). . . . The VHT Compressed Beamforming Report information includes an average SNR for each space-time stream and compressed beamforming feedback matrices for use by a transmit beamformer (*i.e.*, “*first Channel State Information*”). *Id.* at 54–55, 58; SER-1003, 99.

Pet. 27.

Patent Owner argues “[e]ven if the STA Info fields in the NDPA are ‘distinct’ from one another, that says nothing about the number of STA info fields in the NDPA set.” Prelim. Resp. 29. Patent Owner argues (and its expert testifies), “802.11ac does not describe any way or reason to know the cardinality of the station information fields (*i.e.*, the total number of fields),” and “[i]nstead, 802.11ac focuses entirely on the ordering of station information fields in the NDPA.” *Id.* (citing Ex. 2003 ¶¶ 101–103); *see id.* at 30 (“Nowhere in these passages (or anywhere else) does 802.11ac teach the claimed ‘cardinality;’” rather such passages “are focused entirely on station information field positioning within the NDPA, and are agnostic to the total number of STA Info fields.”).

Patent Owner further argues:

Petitioner essentially contends that, because 802.11ac’s VHT SU beamforming can be performed with a single station, that discloses sending feedback “*in response to determining that the*” or “*when a* number of the one or more station information fields in the NDPA is one,” as claimed.

But nothing in 802.11ac suggests that channel sounding feedback is sent or received in relation to the number of station information fields. Instead, 802.11ac's first station responds to the NDP if its AID is in the first station information field in an NDPA, regardless of the number of station information fields.

Prelim. Resp. 32. Patent Owner's expert, Dr. Psounis, testifies that "[a] key to 802.11ac's approach is that a station information field is addressed to a station, and that station information field is the first in the NDPA." Ex. 2003 ¶ 107 (cited at Prelim. Resp. 33).

We agree with Patent Owner and find Petitioner's arguments unpersuasive. In particular, we find Petitioner does not show sufficiently, let alone with particularity, how or why 802.11ac allegedly discloses (explicitly or inherently) the combined features of "determining" that the number of elements in the set of STA Info fields "is one," and "*in response to*" that determination, transmitting first CSI feedback in response to receiving the NDP. Instead, as noted by Patent Owner (Prelim. Resp. 32), Petitioner merely contends that, because 802.11ac's VHT SU beamforming *can be performed with a single station*, 802.11ac allegedly discloses sending feedback *in response to determining* that the number of the one or more STA Info fields in the NDPA is one. We find Petitioner's reasoning here unpersuasive, and agree with Patent Owner and its expert that Petitioner does not explain, sufficiently and with particularity, how any disclosure in 802.11ac describes channel sounding feedback *being sent or received in response to determining the number of STA Info fields*. See Prelim. Resp. 31–33; Ex. 2003 ¶¶ 104–109; *see also* Prelim. Resp. 28–31.

For the foregoing reasons, we are not persuaded that the cited evidence adequately supports Petitioner's contention that 802.11ac discloses

limitation 1.D, namely “in response to determining that the number of the one or more station information fields in the NDPA is one, transmitting first Channel State Information (CSI) feedback in response to receiving the NDP,” as recited in independent claim 1.

3. Independent Claim 11

Independent claim 11 recites, in relevant part, “[11.C] *when a number of the one or more station information fields in the NDPA is one*, receiving first Channel State Information (CSI) feedback transmitted in response to the NDP[A] having only one station information field,” and “[11.D] wherein *the number of the one or more station information fields in the NDPA is exactly the cardinality of the one or more station information fields in the NDPA.*” Ex. 1001, 34:5–11 (emphases added). These limitations are substantially the same as those at issue with independent claim 1, discussed above in Section III.D.2. *See* Ex. 1002, 229–230 (Examiner considering the subject limitations in claims 1 and 11 commensurate in scope for purposes of patentability.). Petitioner submits the same arguments for unpatentability against these limitations in claim 11 as for claim 1. *See* Pet. 29–30 (“This claim element [11.C] is satisfied for similar reasons as those detailed above for claim element [1.D].” “This claim element [11.D] is satisfied for the same reasons as those detailed above for claim element [1.E].”). Patent Owner likewise submits the same arguments for independent claims 1 and 11. *See* Prelim. Resp. 28–33. Accordingly, for the same reasons set forth above in Section III.D.2 for claim 1, we are not persuaded that the cited evidence adequately supports Petitioner’s contention that 802.11ac discloses limitation 11.C, as recited in independent claim 11.

4. Summary

For the foregoing reasons, we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of any of claims 1 and 11 as anticipated by 802.11ac.

E. Alleged Obviousness of Claims 1 and 11 over 802.11ac

Petitioner contends claims 1 and 11 are unpatentable under 35 U.S.C. § 103 as obvious over 802.11ac (Ex. 1004). Pet. 30–32. Patent Owner opposes Petitioner’s contentions. Prelim. Resp. 1–2, 10–20, 28–32. Based on our review of the Petition and Preliminary Response, we determine that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that any of claims 1 and 11 is unpatentable as obvious over 802.11ac, as discussed below.

Petitioner argues obviousness of independent claim 1 based on its same arguments for anticipation of claim 1 (*see supra*, Section III.D), and adds only that 802.11ac allegedly teaches limitation 1.B (if it were found not to explicitly disclose this limitation). Pet. 30–31. Because these arguments do not cure the deficiencies in Petitioner’s anticipation arguments concerning limitation 1.D (*see supra*, Section III.D.2), we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of claim 1 as obvious over 802.11ac.

Petitioner argues obviousness of independent claim 11 based on its same arguments for anticipation of claims 1 and 11 (*see supra*, Section III.D), and adds only that 802.11ac allegedly teaches an aspect of limitation 11.C (if it were found not to explicitly disclose this limitation), namely, the feature of transmitting CSI feedback “in response to the NDP[A] having only one station information field.” Pet. 30–31. Because

these arguments do not cure the deficiencies in Petitioner’s anticipation arguments concerning the entirety of limitation 11.C in the context of limitation 11.D (*see supra*, Section III.D.3), we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of claim 11 as obvious over 802.11ac.

In addition, based on our consideration of Petitioner’s stated reasons for why the ordinarily skilled artisan allegedly would have been motivated to include certain features of limitations 1.B and 11.C in claims 1 and 11, respectively, we affirm our determinations noted above. As for limitation 1.B, Petitioner argues the skilled artisan would have been “motivated to include this functionality to determine the number of stations to be included in the sounding process,” and “so that the STA would know the length of the data frame.” Pet. 30. As for limitation 11.C, Petitioner argues the skilled artisan would have been “motivated to include this functionality because it would have allowed for the inclusion of different STAs in the sounding process than the NDPA had chosen.” Pet. 31–32. Without more, we find these alleged reasons to be conclusory and fraught with hindsight, and therefore, unpersuasive. *See InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1351 (Fed. Cir. 2014) (“It appears that [the expert] relied on the [] patent itself as her roadmap for putting what she referred to as pieces of a ‘jigsaw puzzle’ together.”); *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570 (Fed. Cir. 1996) (citing *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983)) (“To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction—an illogical and inappropriate process by which to

determine patentability.”). Although “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton” (*KSR*, 550 U.S. at 421), the Federal Circuit has observed that “‘the prejudice of hindsight bias’ often overlooks that the ‘genius of invention is often a combination of known elements which in hindsight seems preordained.’” *Polaris Industries, Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068 (Fed. Cir. 2018).

F. Alleged Obviousness of Claims 2–9 and 12–19 over the Combination of 802.11ac and Ghosh

Petitioner contends claims 2–9 and 12–19 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of 802.11ac (Ex. 1004) and Ghosh (Ex. 1005). Pet. 32–46. Patent Owner opposes Petitioner’s contentions. Prelim. Resp. 1–2, 10–20, 28–32. Claims 2–9 and 12–19 depend, directly or indirectly, from one of independent claims 1 and 11. Petitioner does not argue that Ghosh (or the combination of 802.11ac and Ghosh) as directed to claims 2–9 and 12–19 cures the deficiencies in Petitioner’s anticipation or obviousness contentions concerning independent claims 1 and 11 (*see supra*, Section III.D, III.E). Accordingly, for the same reasons set forth above in Section III.D and III.E for independent claims 1 and 11, we determine that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that any of claims 2–9 and 12–19 is unpatentable as obvious over the combination of 802.11ac and Ghosh.

G. Alleged Anticipation of Claims 1 and 11 by Chun ’535

Petitioner contends claims 1 and 11 are unpatentable under 35 U.S.C. § 102 as anticipated by Chun ’535 (Ex. 1006). Pet. 47–54. Patent Owner opposes Petitioner’s contentions. Prelim. Resp. 1–2, 10–20, 33–36. Based on our review of the Petition and Preliminary Response, we determine that

Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that any of claims 1 and 11 is unpatentable as anticipated by Chun '535, as discussed below. We begin with an overview of Chun '535.

1. Overview of Chun '535 (Ex. 1006)

Chun '535 relates to “a method and apparatus for transmitting a frame on the basis of a sounding procedure” (Ex. 1006, 1:19–21), as shown, for example, in Figure 4, reproduced below.

FIG. 4

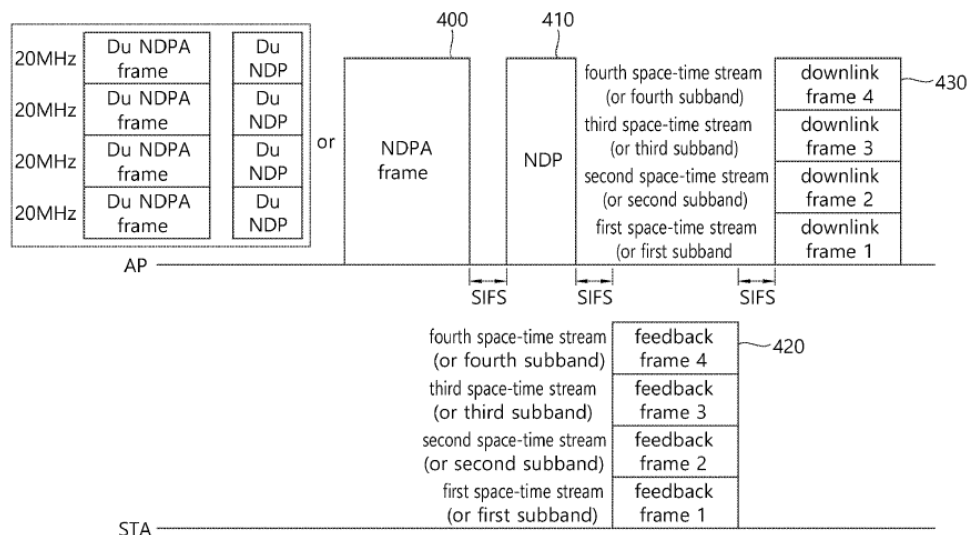


Figure 4 depicts a method of transmitting a frame on the basis of a sounding procedure.

Id. at 2:41–43, Fig. 4. Figure 4 depicts an AP performing a sounding procedure with respect to a STA, and transmitting a downlink frame to the STA through SU-MIMO (or OFDMA) according to feedback information acquired on the basis of the sounding procedure. *Id.* at 8:18–23. The AP may transmit NDPA frame 400 to the STA for the sounding procedure, and may transmit NDP 410 after a specific time (e.g., a SIFS). *Id.* at 8:24–27.

According to Chun '535:

The NDPA frame 400 may be used to report to the STA that the sounding procedure starts and the NDP 410 is transmitted. The NDPA frame 400 may include an STA information field. The STA information field may indicate an STA for receiving the NDP 410 to be transmitted after the NDPA frame 400 and for transmitting a feedback frame. The STA indicated on the basis of the STA information field may estimate a channel on the basis of the NDP 410 and may transmit a feedback frame 420 including the channel state information to the AP. That is, the STA may determine whether to transmit the feedback frame 420 to the AP by participating in channel sounding on the basis of the STA information field included in the received NDPA frame 400.

Ex. 1006, 8:28–40.

We further discuss below the disclosure of Chun '535 in connection with the parties' arguments.

2. Independent Claim 1: “[1.D] in response to determining that the number of the one or more station information fields in the NDPA is one, transmitting first Channel State Information (CSI) feedback in response to receiving the NDP”

As discussed above in Section III.D.2, limitation 1.D, read in the context of limitations 1.B and 1.E (and claim 1 as a whole), relies upon “determining” that the number of elements in the set of station information fields (the meaning of “cardinality”) “is one,” and “in response to” that determination, “transmitting” first CSI feedback in response to receiving the NDP.

Although Patent Owner focusses on limitation 1.A in preliminarily responding to Petitioner’s unpatentability challenge here (*see* Prelim. Resp. 33–36), we emphasize that *Petitioner* has the burden from the onset to

show *with particularity* why each of the Challenged Claims of the '919 patent is unpatentable, and that burden never shifts to Patent Owner. *See Harmonic*, 815 F.3d at 1363; *Dynamic Drinkware*, 800 F.3d at 1378.

As for limitation 1.D, Petitioner argues, with reference to Chun '535's Figure 4: "Chun 535 discloses that the single STA information field in the NDPA may indicate an STA to 'estimate a channel on the basis of the NDP 410 and may transmit a feedback frame 420 including the channel state information to the AP.'" Pet. 51–52 (citing Ex. 1006, 8:31–37, Fig. 4; Ex. 1003 ¶ 165). This is the entirety of Petitioner's argument for the subject limitation.

We find Petitioner's argument unpersuasive. In particular, we find Petitioner does not show sufficiently, let alone with particularity, how or why Chun '535 allegedly discloses (explicitly or inherently) the combined features of "determining" that the number of elements in the set of STA Info fields "is one," and "*in response to*" that determination, transmitting first CSI feedback in response to receiving the NDP. Indeed, as noted by Patent Owner (Prelim. Resp. 34), Petitioner's expert testifies that Chun '535 itself discloses a NDPA having only *a single* STA Info field. *See* Ex. 1003 ¶ 157 ("Chun 535 discloses that the NDPA *actually only includes a single STA Info field* with Info for multiple STAs" (emphasis added)). Yet Petitioner does not explain, sufficiently and with particularity, how or why a system using a NDPA designed with only a single STA Info field would still "determine" the number of STA Info fields, determine that that number is one, and *in response to that determination* of one STA Info field, transmit first CSI feedback in response to receiving the NDP.

For the foregoing reasons, we are not persuaded that the cited evidence adequately supports Petitioner's contention that Chun '535 discloses limitation 1.D, namely "in response to determining that the number of the one or more station information fields in the NDPA is one, transmitting first Channel State Information (CSI) feedback in response to receiving the NDP," as recited in independent claim 1.

3. Independent Claim 11

Petitioner submits the same arguments for unpatentability against limitations 11.C and 11.D in claim 11 as for limitations 1.D and 1.E in claim 1, respectively. *See* Pet. 54 ("Chun 535 satisfies this claim element [11.C] for similar reasons as those detailed above for claim element [1.D].") "Chun 535 satisfies this claim element [11.D] for the same reasons as those detailed above for claim element [1.E]."). Patent Owner likewise submits the same arguments for independent claims 1 and 11. *See* Prelim. Resp. 1–2, 10–20, 33–36. Accordingly, for the same reasons set forth above in Section III.G.2 for claim 1, we are not persuaded that the cited evidence adequately supports Petitioner's contention that Chun '535 discloses limitation 11.C, as recited in independent claim 11.

4. Summary

For the foregoing reasons, we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of any of claims 1 and 11 as anticipated by Chun '535.

H. Alleged Obviousness of Claim 11 over Chun '535

Petitioner contends claim 11 is unpatentable under 35 U.S.C. § 103 as obvious over Chun '535 (Ex. 1006). Pet. 55. Patent Owner opposes Petitioner's contentions. Prelim. Resp. 1–2, 10–20, 33–36.

Petitioner's entire obviousness argument here follows:

To the extent one might argue that 802.11ac [sic: Chun '535] does not disclose the transmission of CSI "*in response to the NDP having only one station information field,*" it would have been obvious to implement that functionality into Chun 535 for the same reasons as those detailed above for 802.11ac. *Supra*, Section V.D.2.a; SER-1003, ¶173.

Pet. 55.

Petitioner argues obviousness of independent claim 11 based on its same arguments for anticipation of claims 1 and 11 (*see supra*, Section III.G), and adds only that Chun '535 allegedly teaches an aspect of limitation 11.C (if it were found not to explicitly disclose this limitation), namely, the feature of transmitting CSI feedback "*in response to the NDP[A] having only one station information field,*" for the same reasons asserted by Petitioner for 802.11ac (*see supra*, Section III.E). Pet. 55. Because this argument does not cure the deficiencies in Petitioner's anticipation arguments concerning the entirety of limitation 11.C in the context of limitation 11.D (*see supra*, Section III.G.3), we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of claim 11 as obvious over Chun '535. *See supra* Section III.E (finding unpersuasive Petitioner's reasons for why the ordinarily skilled artisan allegedly would have been motivated to include certain features of limitation 11.C in claim 11).

I. Alleged Obviousness of Claims 2–9 and 12–19 over the Combination of Chun ’535 and Ghosh

Petitioner contends claims 2–9 and 12–19 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Chun ’535 (Ex. 1006) and Ghosh (Ex. 1005). Pet. 55–61. Patent Owner opposes Petitioner’s contentions. Prelim. Resp. 1–2, 10–20, 33–36. Claims 2–9 and 12–19 depend, directly or indirectly, from one of independent claims 1 and 11. Petitioner does not argue that Ghosh (or the combination of Chun ’535 and Ghosh) as directed to claims 2–9 and 12–19 cures the deficiencies in Petitioner’s anticipation or obviousness contentions concerning independent claims 1 and 11 (*see supra*, Section III.G, III.H). Accordingly, for the same reasons set forth above in Section III.G and III.H for independent claims 1 and 11, we determine that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that any of claims 2–9 and 12–19 is unpatentable as obvious over the combination of Chun ’535 and Ghosh.

J. Alleged Anticipation of Claims 1–9 and 11–19 by Chun ’388

Petitioner contends claims 1–9 and 11–19 are unpatentable under 35 U.S.C. § 102 as anticipated by Chun ’388 (Ex. 1007).⁷ Pet. 61–79. Patent Owner opposes Petitioner’s contentions. Prelim. Resp. 1–2, 10–20, 36–46. Based on our review of the Petition and Preliminary Response, we determine that Petitioner has not demonstrated a reasonable likelihood that it

⁷ The parties dispute whether Chun ’388 was effectively filed before the effective filing date of the Challenged Claims, and thus whether it constitutes prior art against the ’919 patent. Pet. 16–19; Prelim. Resp. 37–40; Papers 23 and 24. Because we deny institution upon consideration of the full disclosure of Chun ’388, we need not and do not herein address the effective filing date dispute.

would prevail in showing that any of claims 1–9 and 11–19 is unpatentable as anticipated by Chun '388, as discussed below. We begin with an overview of Chun '388.

1. Overview of Chun '388 (Ex. 1007)

Chun '388 relates to “a method for the uplink multi-user transmission of a channel state measured by an STA and a device supporting the same,” as shown, for example, in Figure 8, reproduced below. Ex. 1007, 1:17–20, Fig. 8.

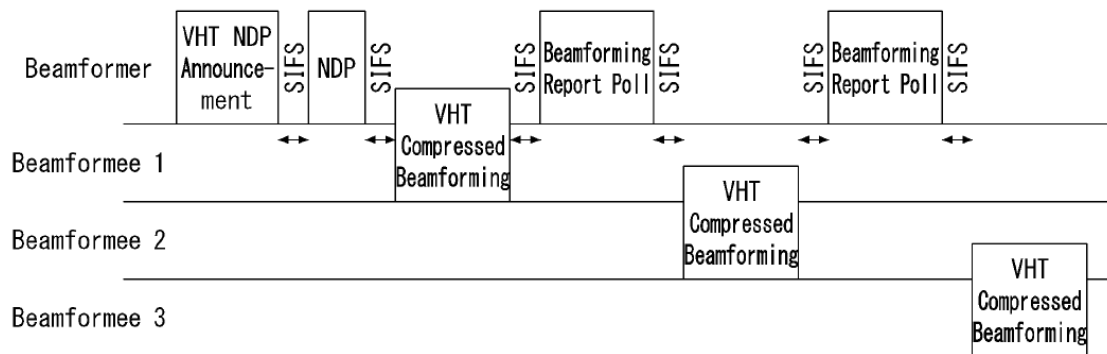


Figure 8 depicts a channel sounding method in a wireless communication system.

Id. at 4:36–39, Fig. 8.

As shown above in Figure 8, a beamformer or AP sends a VHT NDPA frame for providing notification of sounding transmission for the feedback of a beamformee or STA. Ex. 1007, 23:29–39. The VHT NDPA frame may include “association identifier (AID) information, feedback type information, etc.” about a beamformee which will send an NDP. *Id.* at 23:40–43. The VHT NDPA may also be transmitted using different methods if data is transmitted using MU-MIMO and if data is transmitted using SU-MIMO. *Id.* at 23:44–51. For the former, the VHT NDPA would

be transmitted to a single station, while the latter would be transmitted using broadcast methods. *Id.* Following the VHT NDPA, a VHT NDP is sent. *Id.* at 23:52–54.

A STA that has received the VHT NDPA frame “may check the value of an AID12 subfield included in an STA information field and check whether each of the [STAs] is a sounding target STA.” Ex. 1007, 23:55–58. STAs “may be aware of a feedback sequence through the sequence of an STA Info field” included in the NDPA, as illustrated in Figure 8 where “a feedback sequence is performed in order of a beamformee 1, a beamformee 2, and a beamformee 3.” *Id.* at 23:59–63. After receiving the VHT NDP, the first station in the sequence transmits feedback information to the beamformer. *Id.* at 24:1–3. Subsequent stations transmit their feedback information after a polling frame. *Id.* at 24:10–18.

We further discuss below the disclosure of Chun ’388 in connection with the parties’ arguments.

2. *Independent Claim 1: “[1.D] in response to determining that the number of the one or more station information fields in the NDPA is one, transmitting first Channel State Information (CSI) feedback in response to receiving the NDP”*

As discussed above in Section III.D.2, limitation 1.D, read in the context of limitations 1.B and 1.E (and claim 1 as a whole), relies upon “determining” that the number of elements in the set of station information fields (the meaning of “cardinality”) “is one,” and “in response to” that determination, “transmitting” first CSI feedback in response to receiving the NDP.

Petitioner's entire argument here follows:

Chun 388 teaches a sounding process for a single STA in which the beamformer sends a VHT NDPA “for providing notification of sounding transmission for the feedback of a beamformee.” [Ex. 1007,] 23:29–32. If selected for sounding based on its AID, the beamformee “obtains DL channel state – information based on a training field included in an NDP and generates [and transmits] feedback information ... to a beamformer.” *Id.* at 23:40–24:8; SER-1003, ¶209.

Like the 919 patent, Chun 388 also notes that “the (HE) NDPA frame may additionally indicate the start of a DL sounding procedure and simultaneously indicate that a trigger frame will be subsequently transmitted in the DL.” *Id.* at 72:43–51; SER-1001, 20:16–19, 21:23–38. A POSA would have understood that, by incorporating its Figure 8 techniques (SU response to NDP) into the Figure 30 (MU response to trigger frame) disclosure, Chun 388 teaches that, if the HE NDPA indicates an upcoming trigger frame, the STA(s) should wait for that trigger frame to perform a MU feedback response. *Id.*; Chun 388, 51:46–49; SER-1003, ¶210.

Pet. 66 (second alteration by Petitioner).

As with 802.11ac, Patent Owner responds: “Petitioner essentially contends that, because VHT SU beamforming can be performed with a single station, that discloses sending feedback ‘*[in response to determining that the/when a]* number of the one or more station information fields in the NDPA is one’ as claimed.” Prelim. Resp. 44. But, as argued by Patent Owner, “nothing in Chun 388 suggests that channel sounding feedback is sent or received *in relation to the total number of station information fields*—even accepting Petitioner’s proposed combination of Chun 388’s VHT and HE sounding methods.” *Id.* at 45 (emphasis added). Patent Owner argues Chun ’388 instead “uses data *within the NDPA frame* to indicate to the stations what feedback method will be used.” *Id.* (emphasis

added). Patent Owner argues “Chun 388 devotes several columns to describing the data that can be included in the NDPA to signal to the station how to provide feedback.” *Id.* (citing Ex. 1007, 52:56–54:56); *see* Ex. 2003 ¶ 131 (“[T]he key to Chun 388’s approach is using signaling information in the NDPA to indicate how feedback will be performed. Nothing suggests that feedback should be sent in response to determining that or when the number of the one or more station information fields in the NDPA is one.” (cited at Prelim. Resp. 45–46)).

We agree with Patent Owner and find Petitioner’s arguments unpersuasive. In particular, we find Petitioner does not show sufficiently, let alone with particularity, how or why Chun ’388 allegedly discloses (explicitly or inherently) the combined features of “determining” that the number of elements in the set of STA Info fields “is one,” and “*in response to*” that determination, transmitting first CSI feedback in response to receiving the NDP. Instead, as noted by Patent Owner (Prelim. Resp. 44), Petitioner merely contends that, because Chun ’388’s VHT SU beamforming *can be performed with a single station*, Chun ’388 allegedly discloses sending feedback *in response to determining* that the number of the one or more STA Info fields in the NDPA is one. We find Petitioner’s reasoning here unpersuasive, and agree with Patent Owner and its expert that Petitioner does not explain, sufficiently and with particularity, how any disclosure in Chun ’388 describes channel sounding feedback *being sent or received in response to determining the number of STA Info fields*. *See* Prelim. Resp. 40–46; Ex. 2003 ¶ 122 (“Chun 388 does not describe any way or reason to know the cardinality of the station information fields (i.e., the exact total number of fields),” and “[i]nstead, Chun 388 focuses entirely on

signaling information contained within subfields of the NDPA.”); *see also* Ex. 2003 ¶¶ 120–133.

For the foregoing reasons, we are not persuaded that the cited evidence adequately supports Petitioner’s contention that Chun ’388 discloses limitation 1.D, namely “in response to determining that the number of the one or more station information fields in the NDPA is one, transmitting first Channel State Information (CSI) feedback in response to receiving the NDP,” as recited in independent claim 1.

3. Independent Claim 11

Petitioner submits the same arguments for unpatentability against limitations 11.C and 11.D in claim 11 as for limitations 1.D and 1.E in claim 1, respectively. *See* Pet. 75–76 (“This claim element [11.C] is satisfied for similar reasons as those detailed above for claim element [1.D].” “This claim element [11.D] is satisfied for the same reasons as those detailed above for claim element [1.E].”). Patent Owner likewise submits the same arguments for independent claims 1 and 11. *See* Prelim. Resp. 1–2, 10–20, 36–46. Accordingly, for the same reasons set forth above in Section III.J.2 for claim 1, we are not persuaded that the cited evidence adequately supports Petitioner’s contention that Chun ’388 discloses limitation 11.C, as recited in independent claim 11.

4. Dependent Claims 2–9 and 12–19

Claims 2–9 and 12–19 depend, directly or indirectly, from one of independent claims 1 and 11. Thus, for the same reasons discussed above in Sections III.J.2 and III.J.3, we are not persuaded that the cited evidence

adequately supports Petitioner's contentions that Chun '388 discloses the subject matter of any of claims 2–9 and 12–19.

5. *Summary*

For the foregoing reasons, we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of any of claims 1–9 and 11–19 as anticipated by Chun '388.

K. Alleged Obviousness of Claims 1, 8, 9, 11, 14, and 19 over Chun '388

Petitioner contends claims 1, 8, 9, 11, 14, and 19 are unpatentable under 35 U.S.C. § 103 as obvious over Chun '388 (Ex. 1007). Pet. 79–82. Patent Owner opposes Petitioner's contentions. Prelim. Resp. 1–2, 10–20, 36–46. Based on our review of the Petition and Preliminary Response, we determine that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing that any of claims 1, 8, 9, 11, 14, and 19 is unpatentable as obvious over Chun '388, as discussed below.

Petitioner argues obviousness of independent claim 1 based on its same arguments for anticipation of claim 1 (*see supra*, Section III.J), and adds only that Chun '388 allegedly teaches limitation 1.B (if it were found not to explicitly disclose this limitation). Pet. 79–80. Because these arguments do not cure the deficiencies in Petitioner's anticipation arguments concerning limitation 1.D (*see supra*, Section III.J.2), we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of claim 1 as obvious over Chun '388.

Petitioner argues obviousness of independent claim 11 based on its same arguments for anticipation of claims 1 and 11 (*see supra*, Section III.J), and adds only that Chun '388 allegedly teaches an aspect of limitation 11.C

(if it were found not to explicitly disclose this limitation), namely, the feature of transmitting CSI feedback “in response to the NDP[A] having only one station information field.” Pet. 81–82. Because these arguments do not cure the deficiencies in Petitioner’s anticipation arguments concerning the entirety of limitation 11.C in the context of limitation 11.D (*see supra*, Section III.J.3), we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of claim 11 as obvious over Chun ’388. *See supra* Section III.E (finding unpersuasive Petitioner’s reasons for why the ordinarily skilled artisan allegedly would have been motivated to include certain features of limitations 1.B and 11.C in claims 1 and 11, respectively).

Claims 8, 9, 14, and 19 depend, directly or indirectly, from one of independent claims 1 and 11. Thus, for the same reasons discussed above, we determine that Petitioner has not demonstrated a reasonable likelihood of success in establishing the unpatentability of any of claims 8, 9, 14, and 19 as obvious over Chun ’388.

IV. DISCRETIONARY DENIAL UNDER 35 U.S.C. § 314(a)

Because we deny institution upon consideration of the merits of Petitioner’s challenges, Patent Owner’s arguments that we should exercise our discretion under 35 U.S.C. §§ 314(a) to deny institution are moot.

V. CONCLUSION

Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to any of claims 1–9 and 11–19 of the ’919 patent under any of its proffered challenges (i.e., Grounds 1–8 (Pet. 9–10)).

VI. ORDER

For the reasons given, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is not instituted for claims 1–9 and 11–19 of U.S. Patent No. 10,020,919 B2.

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Patent 10,020,919 B2

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