

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

SPEIR TECHNOLOGIES LTD.,
Patent Owner.

IPR2023-00496
Patent 8,345,780 B2

Before BARBARA A. PARVIS, SHEILA F. McSHANE, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

PARVIS, *Administrative Patent Judge*.

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

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–4 and 7–14 of U.S. Patent No. 8,345,780 B2 (Ex. 1001, “the ’780 patent”). Pet. 1. Speir Technologies Ltd. (“Patent Owner”) did not file a Preliminary Response.

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless it is determined that there is a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition. After considering the parties’ arguments and evidence, and for the reasons set forth below, Petitioner demonstrates a reasonable likelihood of prevailing with respect to at least one of the challenged claims of the ’780 patent. Accordingly, we institute an *inter partes* review with respect to all challenged claims and grounds asserted in the Petition. 37 C.F.R. § 42.108(a) (2022).

Our factual findings and conclusions at this stage of the proceeding are based on the evidentiary record developed thus far. This is not a final decision as to patentability of the challenged claims.

II. BACKGROUND

A. Related Matters

The parties identify *Speir Technologies Ltd. v. Apple Inc.*, No. 6:22-cv-00077 (W.D. Tex. Jan. 20, 2022) (“the Texas litigation”), which has been transferred to the Northern District of California and is captioned as *Speir Technologies Ltd. v. Apple Inc.*, No. 5:23-cv-00095 (N.D. Cal. Jan. 9, 2023). Pet. 80, 84; Paper 3, 2. Petitioner further identifies *Speir Technologies Ltd. v. Samsung Electronics Co., Ltd.*, No. 2:21-cv-00474 (E.D. Tex. Dec. 30,

2021); *Speir Technologies Ltd. v. Motorola Mobility LLC*, No. 1-22-cv-02101 (N.D. Ill. Apr. 22, 2022); and *Speir Technologies Ltd. v. Google LLC*, No. 3-22-cv-00371 (S.D. Cal. Mar. 21, 2022). Pet. 84. Patent Owner further identifies *Speir Technologies Ltd. v. TCL Technology Group Corp.*, No. 2-23-cv-00027 (E.D. Tex.).

B. Real Parties-in-Interest

Apple identifies itself as the only real party-in-interest (RPI). Pet. 84. Patent Owner identifies itself as the sole RPI. Paper 3, 2.

C. The '780 patent

The '780 patent “relates to the field of communications, and, more particularly, to interference compensation and related methods.” Ex. 1001, 1:7–9. The '780 patent states that “[a]s wireless communications has become prevalent in society, it is not uncommon for two wireless communications devices [‘WCDs’] to interfere with the operation of each other when operating within transmission range of each other.” *Id.* at 1:13–17. The '780 patent states that “[i]nterference is typically categorized into two types: narrowband interference and wideband interference,” and “[a]nother common type of interference is self interference.” *Id.* at 1:25–26, 41. The '780 patent states “it is therefore an object of the present invention to provide effective interference compensation.” *Id.* at 2:32–34.

Figure 1 of the '780 patent is reproduced below.

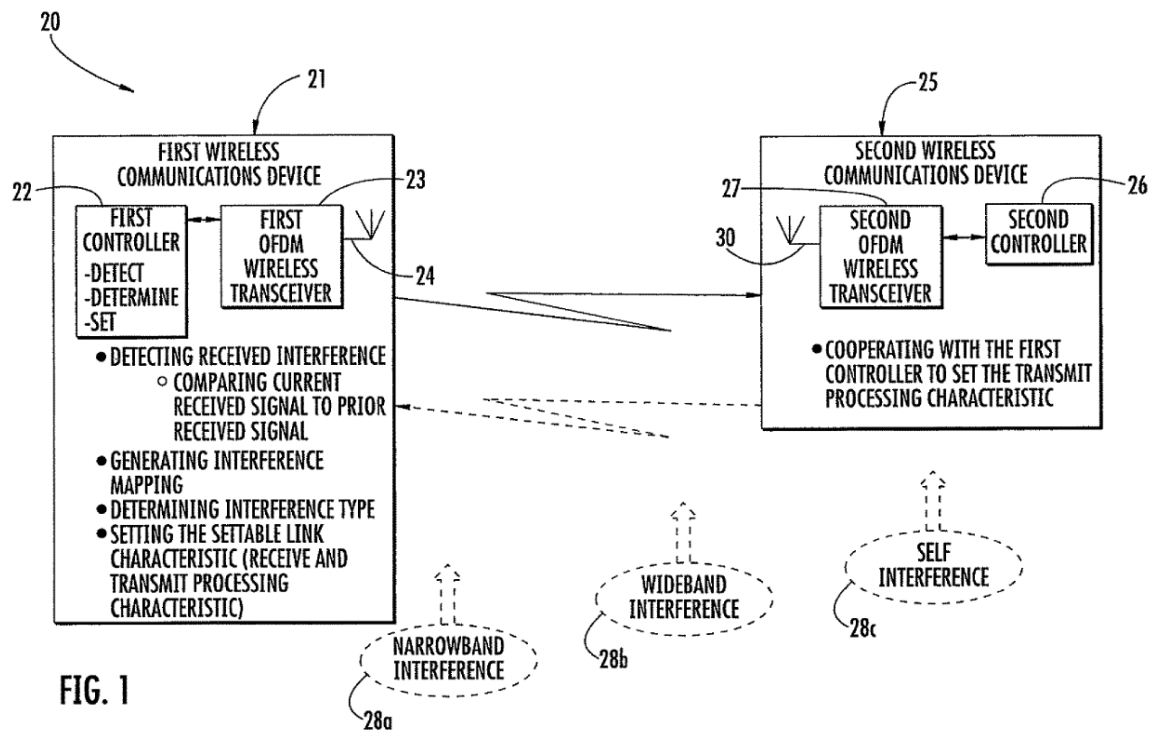


Figure 1 illustrates a schematic diagram of wireless communication system 20. *Id.* at 3:24–25, 3:51–52. Wireless communication system 20 includes “first and second [WCDs] 21, 25” which include “respective first and second controllers 22, 26” and “first and second wireless transceivers 23, 27” such as “orthogonal frequency-division multiplexing (OFDM) transceivers.” *Id.* at 3:65-4:5.

Figure 2 of the '780 patent is reproduced below.

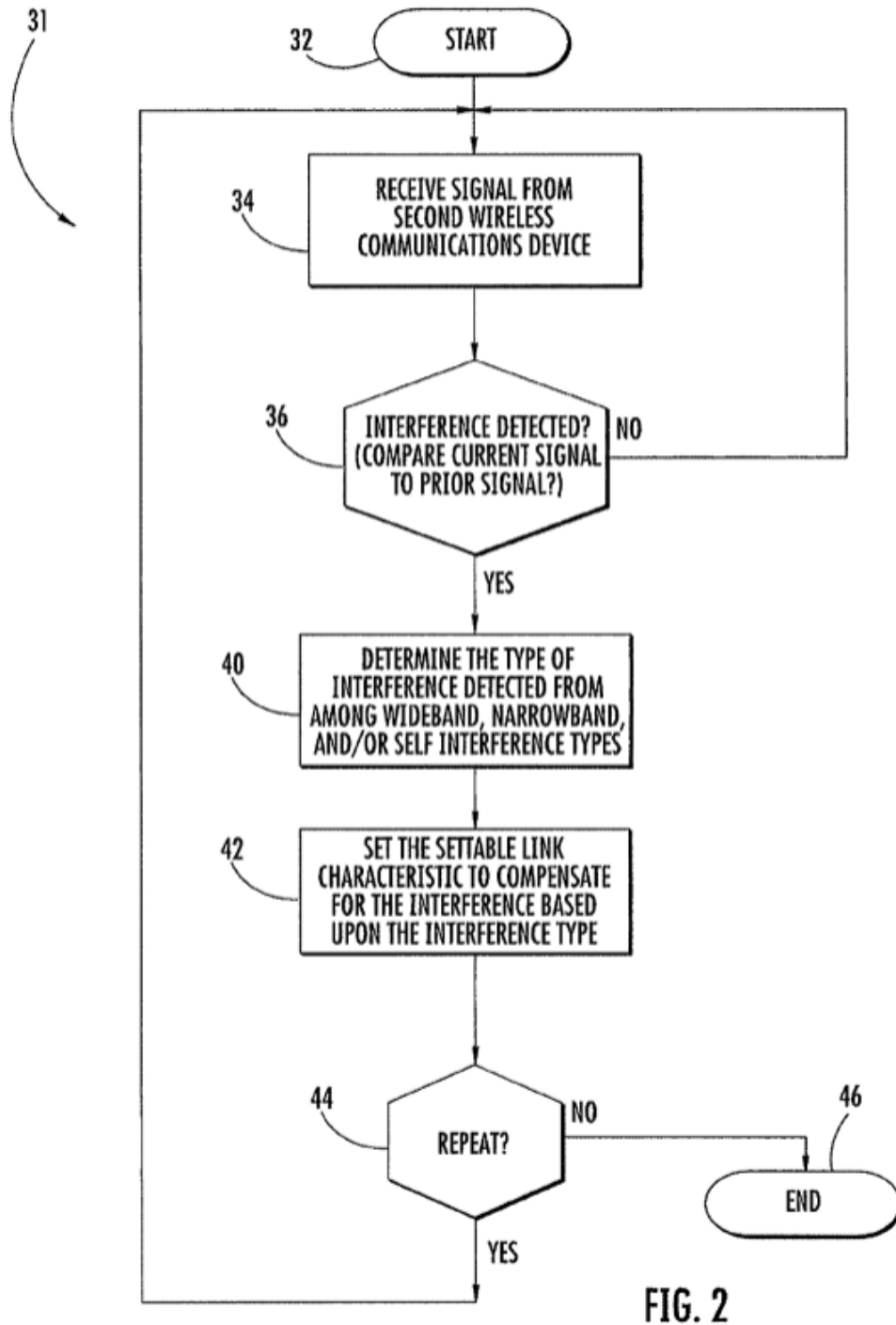


Figure 2 of the '780 patent illustrates a flowchart of a method for compensating for interference in wireless communication system 20. *Id.* at 3:26–27.

“The method for compensating interference 28a–28c in the wireless communication system 20 begins at Block 32, the first [WCD] 21 receives a transmission from the second [WCD] 25 at Block 34.” *Id.* at 4:6–10. “At decision Block 36, the first controller 22 illustratively detects whether there is any received interference 28a–28c.” *Id.* at 4:15–19. “[I]f interference 28a–28c is detected, the method moves to Block 40 where the first controller 22 determines a type of the interference from among a plurality of interference types comprising narrowband interference 28a, wideband interference 28b, and self interference 28c.” *Id.* at 4:41–46. “More specifically, the first controller 22 determines the interference type based upon at least one of fade characteristics (flat or frequency selective), noise characteristics (wideband or narrowband), and path characteristics (line-of-sight or multipath).” *Id.* at 4:47–51.

D. Challenged Claims

Claim 1 below is illustrative of the challenged claims. We have added the Petition’s labeling for ease in referencing the claim limitations.

1. [1.pre] A wireless communication system comprising:
 - [1.a] first and second wireless communications devices configured to communicate with one another via a wireless communications link having at least one settable link characteristic;
 - [1.b.i] said first and second wireless communications devices comprising respective first and second orthogonal frequency-division multiplexing (OFDM) wireless transceivers and [1.b.ii] respective first and second controllers coupled thereto and configured to store short term and long term historical characteristics of interference;
 - [1.c] said first controller configured to
 - detect received interference,
 - [1.d.i] determine a type of the received interference from among a plurality of interference types comprising wideband

interference, self interference, and narrowband interference [1.d.ii] based on comparing at least one characteristic of a current received signal with the short term and long term historical characteristics of interference, and
[1.e] set the at least one settable link characteristic to compensate for the received interference based upon the interference type.

Ex. 1001, 9:57–10:12.

E. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 1), supported by the declaration of Dr. Zhi Ding (Ex. 1003):¹

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
1–4, 7–14	103(a)	Diener, ³ Bergstrom ⁴

III. ANALYSIS

A. Principles of Law

Petitioner bears the burden to demonstrate unpatentability, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

¹ Patent Owner has not submitted declaration testimony at this stage.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011), revised 35 U.S.C. § 103 effective March 16, 2013. The ’780 patent was filed prior to March 16, 2013. Ex. 1001, code (22). We therefore apply the pre-AIA version of § 103. Our analysis on this record would not change under the AIA version of § 103.

³ U.S. Publication No. 2004/0047324 A1 to Diener, published Mar. 11, 2004 (Ex. 1006).

⁴ U.S. Patent No. 6,131,013 to Bergstrom et al., issued Oct. 10, 2000 (Ex. 1005).

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

We apply these principles to the Petition’s challenges.

B. Level of Ordinary Skill in the Art

We review the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time of the invention. *Graham*, 383 U.S. at 13, 17. Petitioner asserts that

a person of ordinary skill in the art . . . (“POSITA”) would have had a Bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field from an accredited program, and 2–3 years of experience in the design or development of wireless communication systems/networks including ranging/positioning systems, or the equivalent. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

Pet. 10 (citing Ex. 1003 ¶¶ 20–22).

Patent Owner has not filed Preliminary Response. We are persuaded, on the present record, that Petitioner’s proposal is consistent with the

problems and solutions in the '780 patent and prior art of record. We adopt Petitioner's definition of the level of skill for the purposes of this Decision.

C. Claim Construction

In *inter partes* review, we construe a claim using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b).

Petitioner asserts that in district court, the parties dispute the construction of three claim terms. Pet. 2–4. In particular, Petitioner proposed that “short term” means “on the order of seconds” and “long term” means “on the order of weeks, or greater.” *Id.* at 2–3. Petitioner argues its proposed constructions are correct based on the intrinsic record, including the '780 patent Specification. *Id.* (citing, e.g., Ex. 1001, 4:34–36).

Petitioner asserts that “[i]n district court, Petitioner and Patent Owner agreed that the term ‘self-interference’ encompasses at least ‘interference caused by two wireless communication systems being deployed too closely together or by two wireless communication systems using the same frequency band/channel.’” *Id.* at 4 (citing Ex. 1010, 28; Ex. 1011, 27). Petitioner asserts that the parties “dispute whether ‘self-interference’ also encompasses ‘interference caused by the wireless communication *device* itself’ because Applicant[]s argued during prosecution that the ‘self-interference’ is ‘self-inflicted’ to overcome prior art.” *Id.* (citing Ex. 1011, 34).

Based on the record at this early stage in the proceeding, for purposes of this Decision, we preliminarily adopt Petitioner’s constructions, which are consistent with the intrinsic record, as set forth below.

Claim Term	Adopted Construction
“short term”	“on the order of seconds”
“long term”	“on the order of weeks, or greater”
“self interference”	“interference caused by two wireless communication systems being deployed too closely together or by two wireless communication systems using the same frequency band/channel”

Based on the record before us at this early juncture, we need not make further determinations regarding claim construction to resolve a dispute between the parties. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368 (Fed. Cir. 2019) (“The Board is required to construe ‘only those 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))).

D. Asserted Obviousness over Diener and Bergstrom

Petitioner contends that claims 1–4 and 7–14 would have been obvious over Diener and Bergstrom. Pet. 1.

1. *Overview of Diener*

Diener is titled “System and Method for Management of a Shared Frequency Band Using Client-Specific Management Techniques.” Ex. 1006, code (54). Diener describes techniques and systems to “cooperatively manage use of a shared frequency band where signals of multiple types

occur (often simultaneously), such as an unlicensed band, and interference among the users of the band may occur.” *Id.* ¶ 51.

Diener discloses “one or more wireless networks each comprising multiple devices or nodes that operate in the shared frequency band.” *Id.* ¶ 52. Diener describes that “[t]he spectrum management systems, methods, software and device features described herein new [sic] are not limited to any particular wireless network, and are equally applicable to any wireless network technologies now known or hereinafter developed for use in a shared frequency band.” *Id.*

Figure 1 of Diener is reproduced below.

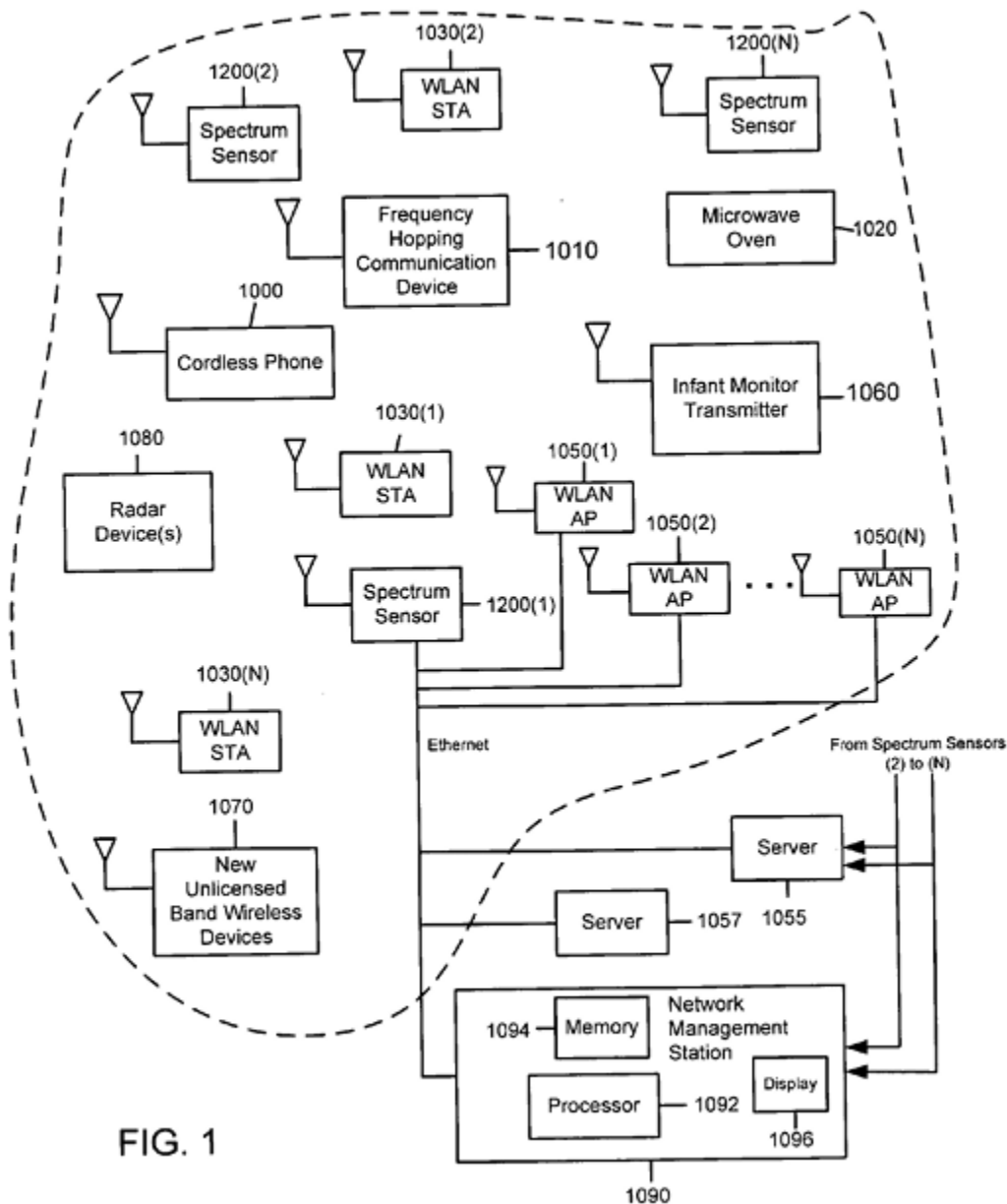


FIG. 1

Figure 1 of Diener, above, is a block diagram showing multiple devices that may be operating simultaneously in an unlicensed or shared frequency band. *Id.* ¶ 23.

The “environment” shown in Diener’s Figure 1 includes “devices that may operate in an unlicensed frequency band, including cordless phones 1000, frequency hopping communication devices 1010, microwave ovens

1020” and “infant monitor devices 1060.” *Id.* ¶ 53. Diener’s “environment” shown in Figure 1 also includes “[m]ultiple WLAN APs 1050(1) to 1050(N)” and their “one or more associated client STAs 1030(1) to 1030(N).” *Id.* Diener describes that “[o]ne or more of the WLAN APs 1050(1) to 1050(N) may be connected to a wired network (e.g., Ethernet network) to which also connected is a server 1055.” *Id.*

Diener describes that “the spectrum management methods described herein may be implemented in any device or network of devices operating in the frequency band (such as those shown in FIG.1).” *Id.* ¶ 54. “The necessary hardware and/or software functionalities would be deployed in the hardware/software platform of that device to enable the device to act as a cognitive radio device [CRD] and thereby perform the spectrum management steps of signal detecting, accumulating/measuring, classifying and controlling/reporting.” *Id.* According to Diener, “[t]here is at least a real-time spectrum analyzer (SAGE) 20 and a radio receiver or radio transceiver (hereinafter ‘radio’) 12 in the device.” *Id.* ¶ 69.

2. Overview of Bergstrom

Bergstrom is titled “Method and Apparatus for Performing Targeted Interference Suppression.” Ex. 1005, code (54). Bergstrom describes a “system” that “includes an interference classifier for classifying each of the undesired spectral components (if any) by interference-type and an interference suppressor for suppressing the undesired interference components in the receive[d] signal using one or more interference suppression methods that may be ‘targeted’ to the specific type of interference.” *Id.* at 2:38–44. Bergstrom describes that “[b]y targeting interference suppression by interference-type, a superior level of interference

suppression performance is achieved as compared to prior art systems that use a common suppression method for all types of interference.” *Id.* at 2:44–48. Bergstrom also describes an “interference source 40” that “can include partial band noise jammers, spread spectrum co-channel sources, wideband noise jammers, banded co-site signal sources, chirp jammers, multitone jammers, non-banded co-site signals, and others.” *Id.* at 5:52–58.

3. *Independent claim 1*

a. *Rationale to Combine*

Petitioner provides three arguments in support of its position that a person having ordinary skill in the art would have been motivated to combine the teachings of Diener and Bergstrom in the manner claimed. Pet. 24–29. First, Petitioner argues the ordinarily skilled artisan would have been motivated by “suggestions within Diener,” including Diener’s teaching of “‘other signal classification techniques’ and ‘[o]ther interference mitigation techniques,’ besides the examples disclosed by Diener.” *Id.* at 25 (quoting Ex. 1006 ¶¶ 102, 165). Petitioner further argues that the ordinarily skilled artisan would have viewed Bergstrom’s teachings as furthering “Diener’s ‘goal of spectrum management [that] is to take evasive action to avoid interference when possible, detect and report interference when it occurs and make intelligent decisions to mitigate interference when it cannot be avoided.’” *Id.* at 26 (citing Ex. 1006 ¶ 60).

Second, Petitioner argues a person having ordinary skill in the art would have been motivated by “various advantages or benefits of Bergstrom’s techniques including ‘a superior level of interference suppression performance,’ ‘real time’ responses, low ‘power consumption,’ optimized ‘[bit error rate] (BER) performance,’ ‘relatively low complexity,’

and ‘computationally efficient’ implementations.” *Id.* (quoting Ex. 1005, 2:44–61; *see also id.* (quoting Ex. 1005, 2:41–44 (arguing the ordinarily skilled artisan would have been motivated “to ‘suppress[] the undesired interference components in the receive signal’”). Petitioner further argues that the ordinarily skilled artisan would have been motivated because “Bergstrom teaches that classifying an interference signal into a ‘class superset’ (e.g., ‘narrow band’ or ‘wideband’) before classifying it more specifically into ‘class subset’ assists in ‘preclassification filtering’ and ‘signal separation’ to improve the ‘class subset’ (i.e., more specific) classification process.” *Id.* at 27 (citing Ex. 1005, 9:1–43, 13:34–14:13).

Third, Petitioner argues a person having ordinary skill in the art would have recognized that Diener describes “interference mitigation on a transmitter side” and would have been motivated to incorporate Bergstrom’s teachings “**on the receiver side** to supplement Diener’s system” to achieve “benefits disclosed by Bergstrom.” *Id.* at 28 (citing Ex. 1005, 2:44–61; Ex. 1006 ¶ 197). Petitioner argues that the ordinarily skilled artisan “would have appreciated that, in addition to or as an alternative to waiting for a next transmission or retransmission to change the transmit processing characteristic, directly suppressing interference in the already received signal on the receiver side as taught by Bergstrom” would have resulted in benefits described by Bergstrom. *Id.* (citing, e.g., Ex. 1005, 2:44–61). Petitioner argues that Bergstrom describes that one of its interference suppression methods “can be repeated each time a signal is received.” *Id.* at 29 (citing Ex. 1005, 19:9–10, Fig. 21).

At this stage, Petitioner’s undisputed reasons for combining Diener and Bergstrom are sufficiently persuasive for institution. Petitioner’s

undisputed arguments that a person having ordinary skill in the art would have had a reasonable expectation of success (Pet. 29– 31) also are sufficient for purposes of institution.

b. Element-by-Element Analysis

Patent Owner has not filed a Preliminary Response and, therefore, has not disputed that the combination of Diener and Bergstrom discloses the elements of claim 1. We address Petitioner’s element-by-element analysis of claim 1 below.

Petitioner asserts that to the extent the preamble is limiting, the Diener-Bergstrom combination teaches the preamble (“A wireless communication system”) by disclosing “that ‘system, method, software and related functions are provided for managing activity in a radio frequency band,’ such as ‘a system and method for managing communication with a plurality of wireless client devices operating in a radio frequency band.’” Pet. 31–32(citing, e.g., Ex. 1006 ¶¶ 12, 21).⁵

Petitioner next asserts that the Diener-Bergstrom combination teaches element 1.a, which is, “first and second wireless communications devices configured to communicate with one another via a wireless communications link having at least one settable link characteristic.” Pet. 32–35. Petitioner argues that “first and second wireless communications devices” are taught by Diener’s disclosures as follows: “a network base station device (e.g., a wireless network access point [AP] device),” “a “plurality of wireless client devices,”” and “[m]ultiple WLAN APs 1050(1) to 1050(N)’ and their ‘one or more associated client STAs 1030(1) to 1030(N).” *Id.* at 32 (citing

⁵ We take no position at this stage on whether the preamble is limiting.

Ex. 1006 ¶¶ 21, 53, 54, Fig. 1). Petitioner argues that Diener teaches that the devices are “configured to communicate with one another via a wireless communications link” by disclosing “radio communication between the network base station device and each of the plurality of wireless devices.” *Id.* at 33 (citing Ex. 1006 ¶ 21).

Petitioner argues that Diener teaches that the wireless communications link has “at least one settable link characteristic” by disclosing that “control is made of at least one parameter associated with radio communication” and that “[e]xamples of parameters . . . that may be controlled at the wireless base station device include packet fragmentation threshold (the length of a data packet) [and] transmission data rate and transmission scheduling.” *Id.* at 34 (quoting Ex. 1006 ¶ 21). For the recitation of “a wireless communications link having at least one settable link characteristic,” Petitioner alternatively points to Bergstrom’s disclosure of “an ‘interference suppressor’ that ‘includes a plurality of interference suppression modules.’” *Id.* at 35 (citing Ex. 1005, code (57), 3:39–61). Petitioner argues that a person having ordinary skill in the art “would have understood that the selected ‘interference suppression method’ or ‘module’ is a settable link characteristic.” *Id.* (citing Ex. 1003 ¶ 101).

Petitioner also asserts that the Diener-Bergstrom combination teaches element 1.b.i, which is, “said first and second wireless communications devices comprising respective first and second orthogonal frequency-division multiplexing (OFDM) wireless transceivers.” Pet. 35–37. For recitation 1.b.i, Petitioner relies on Diener’s disclosure that its wireless devices include “at least a real-time spectrum analyzer (SAGE) 20 and a radio receiver or radio transceiver (hereinafter ‘radio’) 12.” *Id.* at 35 (citing

Ex. 1006 ¶ 69). Petitioner also argues that “Diener explicitly discloses OFDM as one of the example modulation modes.” *Id.* at 37 (citing Ex. 1006 ¶ 150). Petitioner alternatively argues that “Diener discloses that the WLAN devices can be ‘IEEE 802.11g WLAN devices’” and that a person having ordinary skill in the art would have known “that ‘IEEE 802.11g employs [(OFDM)] transmission techniques.’” *Id.* (quoting Ex. 1006 ¶¶ 52, 58; Ex. 1007 ¶¶ 4–5; Ex. 1003 ¶ 104).

Petitioner also asserts that the Diener-Bergstrom combination teaches element 1.b.ii, which is, “respective first and second controllers coupled thereto and configured to store short term and long term historical characteristics of interference.” Pet. 37–48. For “respective first and second controllers,” Petitioner relies on Diener’s teachings of “any device or network of devices operating in the frequency band” and that the “necessary hardware and/or software functionalities . . . would be deployed in the hardware/software platform of that device.” *Id.* at 38 (citing Ex. 1006 ¶ 54). Petitioner also relies on an example, specifically, Diener’s SAGE 20. *Id.* at 39–40 (citing, e.g., Ex. 1006 ¶ 69). Petitioner also relies on functions performed by Diener’s wireless devices and argues that the functions are examples of implementations of a controller. *Id.* at 37–40 (citing, e.g., Ex. 1006 ¶¶ 54, 56, 69–70, 99–102, 162–176, Figs. 6, 11).

For “short term . . . historical characteristics of interference” recited in element 1.b.ii, Petitioner relies on Diener’s “accumulated signal pulse data” and the testimony of Dr. Ding. *Id.* at 41–42 (citing, e.g., Ex. 1006 ¶¶ 99, 157, 158, 161, Fig. 8; Ex. 1003 ¶¶ 111–112). Petitioner argues that Diener teaches that “accumulated signal pulse data” are “typically [accumulated] over relatively short periods of time” and that “pulse duration, [and] time

between pulses’ . . . are on the order of seconds or less.” *Id.* (citing, e.g., Ex. 1006 ¶¶ 157, 161, Fig. 8).

Dr. Ding testifies:

FIG. 8 shows an example of “accumulated signal pulse data” that include pulses 1–6, which include short term historical characteristics such as “a signal pulse with a very short duration, no more than 200 microsec and a time between [the current signal pulse 2 and a previous signal pulse 1] of no more than 20 microsec.” APPLE-1006, [0158], FIG. 8. At the time pulse 2 is received, it would be a “*current received signal*,” while pulse 1 would be a previously received signal.

Ex. 1003 ¶ 112.

For “long term historical characteristics of interference” recited in element 1.b.ii, Petitioner relies on Diener’s teachings of “reference data,” “known signals,” and “path/link loss” and the testimony of Dr. Ding. *Id.* at 42–45 (citing, e.g., Ex. 1006 ¶¶ 101, 102, 144, 564, Fig. 10; Ex. 1003 ¶¶ 113–125). Petitioner argues that Diener teaches that reference data “are ‘obtained from actual measurement and analysis’” and “include ‘a center frequency,’ ‘pulse bandwidth,’ ‘fingerprint ID’ of a particular type of signal (e.g., a microwave oven) that remain valid/recurring for a long period of time such as ‘weeks/months’ or longer.” *Id.* at 43 (citing Ex. 1003 ¶¶ 58, 65, 101, 144, 161, 189). Petitioner also argues that Diener teaches storing the reference data and known signals. *Id.* at 44 (citing Ex. 1006 ¶¶ 101, 189, 190). Petitioner also relies on other evidence of the knowledge of a person having ordinary skill in the art, including patent disclosures incorporated by reference. *Id.* at 43–44 (citing Ex. 1006 ¶ 102; Ex. 1018, code (57), ¶¶ 13, 29, 41–48, 54, 71, 79; Ex. 1019 ¶¶ 52, 83, 90, 244–250, Fig. 20).

Petitioner further asserts that the Diener-Bergstrom combination teaches the “first controller,” which is “configured to” perform steps recited

in claim elements 1.c through 1.e. We start with Petitioner’s assertion that the Diener-Bergstrom combination teaches the first controller is configured to “detect received interference” as recited in element 1.c. Pet. 48–49.

Petitioner relies on Diener’s teaching of detecting interference. *See, e.g.*, Pet. 49 (citing, e.g., Ex. 1006 ¶¶ 101, 164–165).

We next turn to Petitioner’s assertion that the Diener-Bergstrom combination teaches elements 1.d.i. and 1.d.ii, (Pet. 50–62), specifically, that the first controller is configured to

[1.d.i] determine a type of the received interference from among a plurality of interference types comprising wideband interference, self interference, and narrowband interference [1.d.ii] based upon comparing at least one characteristic of a current received signal with the short term and long term historical characteristics of interference.

Ex. 1001, 10:3–9.

For element 1.d.i, Petitioner relies on Diener’s teachings of classifying interference. Pet. 50 (citing, e.g., Ex. 1006 ¶¶ 54, 101, 172, 282, 448).

Petitioner argues that Diener teaches classifying “types” of interference. *Id.* at 51 (citing, e.g., Ex. 1006 ¶¶ 101, 102, 448, 462, 463). For teaching

“wideband interference, self interference, and narrowband interference”

types recited in element 1.d.i, Petitioner relies on the combined teachings of Diener and Bergstrom. *Id.* at 51–57. Relying on the testimony of Dr. Ding,

Petitioner asserts that the specific types of interference recited in element

1.d.i, that is, “wideband interference, self interference, and narrowband interference,” would have been obvious to a person having ordinary skill in

the art in light of certain examples described in Diener. *See, e.g., id.* at 52

(citing Ex. 1006 ¶¶ 101, 448; Ex. 1003 ¶ 139) (arguing the self interference

type is taught by Diener's disclosure that interference may be "caused by another IEEE 802.11 network on the same channel"), 54 (citing Ex. 1006 ¶ 69; Ex. 1003 ¶ 142) (arguing narrowband and wideband interference types are taught by Diener's disclosure of "the radio 12 operating in either a narrowband mode or a wideband mode").

Petitioner also relies on Bergstrom for teaching the specific types of interference recited in element 1.d.i, that is, "wideband interference, self interference, and narrowband interference." For instance, Petitioner relies on Bergstrom's disclosure of co-site signal interference sources for self interference. *Id.* at 53 (citing Ex. 1005, 5:42–58; Ex. 1003 ¶ 141). Petitioner relies on Bergstrom's disclosure of class supersets that "can include narrow band, partial band and wideband classes" and classifying interference from "wideband noise jammers" and "narrow band . . . jammers." *Id.* at 55–56 (citing Ex. 1005, 5:52–58, 8:45–50, 9:1–5, 9:44–47; Ex. 1003 ¶ 144). As discussed above (*see* § III.D.3.a), Petitioner provides sufficient rationale to make the proposed combination.

For element 1.d.ii, which is, "based upon comparing at least one characteristic of a current received signal with the short term and long term historical characteristics of interference," Petitioner relies on Diener's teachings of performing a comparison. Pet. 57 (citing, e.g., Ex. 1006 ¶¶ 101, 143, 157, 564, Fig. 9). Relying on the testimony of Dr. Ding, Petitioner argues "[a]s shown in FIG.8, the 'time between pulses' would necessarily include comparing at least one characteristic (e.g., a reception time) of a current received signal (e.g., a signal pulse such as pulse 2) with short term historical characteristics of interference (e.g., reception time of one or more other pulses such as pulse 1 received 'short periods of time' ago)." *Id.* at 58–

59 (citing Ex. 1006 ¶¶ 157, 158, Fig. 8; Ex. 1003 ¶ 148). Relying on the testimony of Dr. Ding, Petitioner also argues a person having ordinary skill in the art would have found it obvious to configure Diener’s cognitive radio device to perform comparisons to determine the interference type, for example, self interference or wideband interference. *Id.* at 59–62 (citing, e.g., Ex. 1003 ¶¶ 149–153).

Finally, we turn to Petitioner’s assertion that the Diener-Bergstrom combination teaches the first controller is configured to “set the at least one settable link characteristic to compensate for the received interference based upon the interference type” recited in element 1.e. Pet. 62–65. Petitioner relies on Diener’s disclosure of “adapting at least one of: its data rate, packet size, frequency channel, transmit power, etc. after classifying an interferer as a microwave oven, a frequency hopping device or alternatively, another WLAN.” Pet. 62 (citing, e.g., Ex. 1006 ¶¶ 54, 66). Petitioner also relies on Diener’s disclosure of automatically executing mitigation techniques after classifying interference by signal type. *Id.* (citing, e.g., Ex. 1006 ¶¶ 446, 448). Petitioner further relies on other disclosures in Diener relating to making adjustments. *See, e.g., id.* at 64 (citing, e.g., Ex. 1006 ¶¶ 71, 165, 183, 448).

On this record, Petitioner has made a sufficient showing that the combination of Diener and Bergstrom teaches the preamble and all the elements of claim 1, which Patent Owner does not dispute at this stage.

c. Summary as to Claim 1

Based on the preliminary record before us, Petitioner has shown a reasonable likelihood that the combination of Diener and Bergstrom would have rendered claim 1 obvious.

4. *Independent Claims 9 and 12*

For similar reasons as discussed above, Petitioner has shown a reasonable likelihood that the combination of Diener and Bergstrom would have rendered claims 9 and 12 obvious.

5. *Dependent Claims 2–4, 7, 8, 10, 11, 13, and 14*

Petitioner contends that dependent claims 2–4, 7, 8, 10, 11, 13, and 14 would have been obvious over the combination of Diener and Bergstrom. Petitioner provides a detailed analysis in support of its position that the combination of Diener and Bergstrom teaches the limitations in these dependent claims, which Patent Owner does not contest at this preliminary stage. Based on the current record, which we have reviewed, we determine that Petitioner has demonstrated a reasonable likelihood that the combination of Diener and Bergstrom would have rendered obvious claims 2–4, 7, 8, 10, 11, 13, and 14.

IV. CONCLUSION

At this stage of the proceeding, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its challenge as to at least one challenged claim. At this preliminary stage, we have not made a final determination as to the patentability of the challenged claims or any underlying factual and legal issues.

V. ORDER

It is, therefore,

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of all challenged claims of the '780 patent is instituted with respect to all grounds of unpatentability set forth 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 commencing on the entry date of this Decision.

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